

NORTHERN RAILWAY MECHANICAL
WORKSHOP, AMRITSAR WORKSHOP

Heavy Duty Metal Cutting Machine
(Band Saw)

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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.


WM/MSRW

2. **DESCRIPTION:** Heavy Duty Metal Cutting Band Saw (340 mm dia and 340 mm x 340 mm square) as per Specification No. ASRW/2025-26/Heavy Metal cutting band Saw

- 2.1 The machine shall have following configuration:
- 2.1.1 The machine shall be capable of cutting components listed in Annexure-F of section VI.
- 2.1.2 The machine should include a prominently displayed, "cutting speed v/s recommended feed" chart for different grades of materials to be cut.
- 2.1.3 The machine should include a suitably located control panel with all the necessary controls like feed length stop, manual/semi- auto/automatic feed control for different types of components with inter lock to prevent simultaneous application of both modes
- 2.1.4 All dials/scales indicating different measurements should be graduated in metric units with a least count of 0.1 mm.
- 2.1.5 A self-contained coolant system should be provided in the machine.
- 2.1.6 A self-contained closed loop, interlocked with machine control lubricating system should be provided in the machine.
- 2.1.7 Noise level of machine should not exceed 85 dB when measured at a distance of one meter from the periphery of the machine as per IS: 10988 standards or NMTBA/ISO/DIN Standards.

2.2 **Leading parameters**

Schedule-1		
2.2.1	Major parameters: (Note: No deviation in major parameter shall be accepted.)	
1.1	Cutting capacity (Square)	340 mm x 340 mm (Minimum)
1.2	Cutting capacity (Round)	340 mm (Minimum)
1.3	Cutting Length Accuracy and parallelism:	
	a) Cutting length accuracy:	± 0.2 mm/indexing i.e. per stroke/ per single complete cut
	b) Parallelism:	± 0.1 mm / 100 mm.
2.2.2	Other parameters	
1.1	Band speed range (infinitely variable)	20 m/min to 100 m/min
1.2	Smallest diameter/ Square/Angle Section that can be cut	35 mm (Minimum)
1.3	Table Capacity	1600 kg (Minimum)
1.4	Band saw AC drive motor power	5.5 kW (Minimum)

Note: In case of any deviation in other parameters above, technical justification should be furnished in offer.

2.3 **Performance Standards**

- 2.3.1 The tenderer shall also ensure adherence to all relevant legal and statutory requirements as applicable in ISO 14001:1996 standards for environmental Management System and ISO-9001:2000 for Quality Management system.
- 2.3.2 The tenderer shall furnish the cycle time (indicating cutting time and other element of time taken).
- 2.3.3 Band saw speed should also be commensurate with the maximum specified cutting speed of the machine and the values permissible with the cutting blade. The bidder should provide chart for study and reference along with the bid.
- 2.3.4 It should be possible to conduct dry run of the program at the time of proving out new programs.

2.4 Productivity

2.4.1 The timing should be maintainable for regular 08 hrs shift with machine availability of 85%.

2.4.2 The tenderer shall furnish breakup of the floor-to-floor timings indicating cutting time and other element of time taken for components mentioned in Annexure – F of section VI.

Note: Any offer without these details is liable to be rejected.

2.5 Prove out at firm's premises

2.5.1 The bidder shall prove the claimed cutting time/productivity requirement of the machine at manufacturer's works during inspection. The capability test shall also consist of making 4 nos. of parallel cuts each on 340mm x 340mm (minimum) square and 340mm (minimum) round bars of MS plates to IS-2062.

2.5.2 The firm or its authorized agent shall be required to collect the components for prove out from the consignee against Bank Guarantee/Indemnity bond and also bear the transportation costs. After prove out, the components shall be returned along with the machine so that deposited BG can be returned back. Alternatively, the material required for prove out of the components can be arranged by the manufacturer itself also.

2.5.3 The firm is required to demonstrate the components as per Annexure – F of section VI at the time of inspection in addition to their normal checks carried out during assembly & testing as part of quality control measures.

2.5.4 The machine shall be tested before delivery as per relevant Indian / International Standards for Geometric and positioning accuracies as well as performance tests for such type of machines. Full load testing of the machine for demonstrating Cutting of 340 X 340 mm capability at the manufacturer's premises & consignee's end.

2.6 Prove out at consignee's works

2.6.1 The bidder shall be required to demonstrate the performance/capability of the machine during installation and commissioning of machine by proving out the claimed cutting time/productivity requirement.

2.6.2 Productivity/ Performance test shall be performed for one/ two consecutive shifts for a period of 01 day covering the components as per clause 2.4 of Section IV within the time period for installation, commissioning and prove out, stipulated in the Delivery Schedule Chart (clause 7 of section-IV of bid document Part-II). The cycle time/ productivity per item/ component shall be arrived at by calculating the average of the time taken per products of the total numbers produced in a shift or over the time/Quantity specified for the test. If the cycle time/ Productivity is as per clause 2.4 of Section IV, the machine shall be considered as commissioned. Thereafter the performance shall be watched for a period of one month by the consignee before the final PTC is issued.

2.6.3 If the supplier fails to demonstrate during the first Performance/ Productivity Guarantee Test/, the Performance as per above Clause, the Railway shall permit the supplier to carryout necessary modifications and repairs to the equipment and to repeat the Performance/ Productivity Guarantee Test.

2.6.4 Extra cost incurred for retention of specialists and for modifications and repairs to the equipment in connection with the repetition of Performance/ Productivity/ Guarantee Test shall be borne by the contractor.

2.6.5 In case the supplier fails to demonstrate the performance Guarantee figures stipulated in clause as per clause 2.4 of Section IV above, even after repeated tests, the Railway reserves the right to reject the machine or accept it with lower performance. Railway shall be entitled to recover from the Contractor as penalty as given below, for accepting the machine with lower performance.

Productivity Drop	Rate of penalty (%) of the contract value) not cumulative
Up to 5%	2%
More than 5 % to 10%	4%
More than 10% to 15%	6%
More than 15 %	Rejection and Railways will have option to encash PBG, record poor performance other steps as per tender conditions like recovery etc.

- 2.6.6 The repetition of performance guarantee/ tests shall be completed within 90 days after the expiry of stipulated time period provided in the contract for Installation, commissioning and proving out of machine. The consignee shall adhere to the stipulations of clause 2102 of Section-II of Bid Document Part-I for repetition of performance guarantee/ tests.
- 2.6.7 Offers not meeting the cycle time at bid stage itself i.e. as per clause 2.4 shall not be considered even with loading penalty.
- 2.6.8 Any break down time caused by reasons beyond the control of contractor during prove out will not be reckoned for the purpose of levying the penalty.
- 2.6.9 If the supplier fails to demonstrate during the first Performance/ Productivity Guarantee Test/ the Performance as per Clause 2.6.1 above, the Railway shall permit the supplier to carryout necessary modifications and repairs to the equipment and to repeat the Performance/ Productivity Guarantee Test. Joint Inspection in presence of Inspecting agency, consignee and supplier, shall be carried out before permitting supplier for any modification/ repair (if any).

3. Quantity & Consignee

S. No.	Consignee	Quantity	Specification No.
1	CWM/ASRW	01	ASRW/2025-26/Heavy Metal cutting band Saw

4. Scope of Supply

- 4.1 The scope of supply shall include design, manufacture, supply, installation, testing, commissioning and proving of machine on turnkey basis. It shall include all the concomitant accessories/equipment (Clause 4.2 of Section IV) as detailed in the specification and other concomitant accessories/ equipments, which the manufacturer considers essential to make the machine operational, when installed and commissioned. It shall also include installation and commissioning of related equipment (Clause 12 of Section V), training of personnel in operation and maintenance of machine (Clause 10 of Section V) and supply of technical documentation (Clause 4 of Section V). The Preventive Maintenance during warranty and Comprehensive Annual Maintenance Contract after warranty shall be as per Clause no. 16 & 17 respectively of Section V of specification of this tender.

4.2 CONCOMITANT ACCESSORIES

The machine should be accompanied with the following concomitant accessories:

Applicable to CWM/ASRW Consignee		
4.2.1	Clamping fixtures/ arrangements for holding of the component on the machine (Clause 1.2.9.5 of Section V)	01 set
4.2.2	Bi-metallic band saw blades as per clause 1.2.7 of Section V to cut the materials conforming to IS-2062.	20 Nos.
4.2.3	Maintenance and operator tools (list of items, qty, description and the	01 set

	name of manufacturer to be furnished by the bidder)	
4.2.4	Rotating cleaning wire brush for band saw blade	10 nos.
4.2.5	First fill of hydraulic, coolant, lubricating oils and greases. Note 1. Lubricants, oils, Coolants, greases etc. shall be from indigenous sources likes IOC, HPCL, BPCL, Castrol etc. 2. Quantity, brand name and source of supply of indigenous oils to be indicated in the offer.	First Fill
4.2.6	Variable hydraulic pressure controlled vice.	01 set
4.2.7	Suitable arrangement for joining band saw	01 Set
4.2.8	Power swarf conveyor with bin for collection of swarf.	01 set
4.2.9	Blade tension meter for periodic checking of Blade tension	01 set
4.2.10	Heavy Duty Rigid Roller Conveyor as per Clause 1.2.18 of Section V (08 metres on both sides of the machine)	01 Set
4.2.11	Foundation fasteners/bolts for installation of machine	01 set
4.2.12	Electrical Cable required from mains to machine control panel	20 m
4.2.14	Servo controlled voltage stabilizer suitable for the machine as clause 2.13.2 of section V	1 no
4.2.15	Ultra isolation transformer suitable for the plant as per clause 2.13.3 of section V.	1 no
4.2.16	Any other accessory, which in the opinion of supplier is essentially required for making the band saw fully functional and required for performing all desired operations, treated as concomitant accessory	

4.3 Optional Accessories:

- 4.3.1 Spares required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipment including controls on double shift working basis – **One set**.
- 4.3.2 Automatic Preset counter – **One no.**
- 4.3.3 Any other accessory which can improve accuracy and reliability of the machine may be quoted separately as optional accessories clearly bringing out its advantages. Its price shall not be included in the basic price of the machine for purpose of commercial evaluation.

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 of section V.
 - 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
 - Consumables as per clause 6 of section V with breakup of individual items as applicable

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7. DELIVERY SCHEDULE CHART:

In the event of acceptance of the offer, the machine(s) shall be supplied as per the following Milestone Chart.

S. No.	Activity	Activity Code	Outer Limit of Time Schedule expected by ASRW
1.	Issue of LOA	D1	-
2.	Submission of PBG By Successful Bidder	D2	D1+30 days
3.	Issue of PO / Contract By ASRW (after verification of PBG)	D3	D2+30 days
4.	Supply/ Delivery of machine (for indigenous suppliers)	D4	For First machine, D3 + 120 days Thereafter subsequent machines: @ 1 machine per month
5.	Power connection for the machine and other onsite requirements to be provided by railways	D5	D4 + 7 days
6.	Railway to give call to supplier for the commissioning of machine	D6	D4 + 7 days
7.	Installation, commissioning and proving out of machine by supplier	D7	D5 + 30 days or D6 + 30 days (whichever is later)
8.	Issue of PTC by consignee	D8	D7 + 30 days
9.	Warranty by supplier	D9	D7 + 2 years
10.	CAMC	D10	D9 + 5 years

Note: Notwithstanding the delivery period indicated elsewhere in the tender document, the delivery indicated in this schedule shall be taken as overriding and final.

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TECHNICAL SPECIFICATION

Section-V

ABBREVIATIONS

A-1,A-2, A- 3, A-4	Standard paper sizes
AC	Alternating Current
ASRW	Amritsar Workshop
CAMC	Comprehensive Annual Maintenance Contract
AT	Acceptance of Tender
BG	Bank Guarantee
PCME	Principal Chief Mechanical Engineer
CME/PCM	Chief Mechanical Engineer/Post Contract Management
CNC	Computer Numeric Control
COS	Controller of Stores
dB	Decibel
DC	Direct Current
FA&CAO	Financial Advisor & Chief Accounts Officer
GA (Drawing)	General Arrangement (Drawing)
HRC	Hardness Rockwell 'C' Scale (value)
Hz	Hertz
IEC-Pub	International Electro technical Commission - Publication
JCN	Joint Commissioning Note
JRI	Joint Receipt Inspection
kW	Kilo Watt
LC	Letter of Credit
LD	Liquidated Damages
LOA	Letter of Acceptance
NC	Numeric Control
NIT	Notice Inviting Tenders
PBG	Performance Bank Guarantee
PDF	Portable Document Format
PLC	Programmable Logic Controller
PTC	Proving Test Certificate
PU	Production Unit (Any of the six Railway Production Units e.g. RCF, ICF etc.)
RDSO	Research Design & Standards Organisation
SS	Solid state, stainless steel
WBG	Warranty Bank Guarantee

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Specification No. ASRW/ 2025-26/Heavy Metal cutting band Saw

1. BASIC DESIGN FEATURES:

The General Characteristics of the machine shall be as per Clause 3 of Section- V and that of Electricals as per clause 2 of Section - V.

1.1 Safety Features

1.1.1 The Metal cutting Band Saw Machine should have safety features conforming to CE / IS / ISO standards and other applicable standards.

1.1.2 The Metal cutting Band Saw Machine should incorporate complete protection to the operator and to the machine itself from all possible operational failures. Suitable interlocking arrangement against faulty sequence of operation during individual operation /modes, wheel cover open, hydraulic oil failure, lubrication failure, sudden power failure / fluctuations in supply voltage etc. should be provided. The hydraulically operated work holding device should not loosen its grip even in the event of power failure.

1.1.3 The Metal cutting Band Saw Machine manufacturer must provide Emergency switches, safety guards on all rolling parts, band saw blade and suitable warning boards at appropriate locations on machine cautioning operator to use safe practices.

1.1.4 Safety for teeth breaking/wear and tear. There should be provision in the machine e.g. pressure cutting regulator valve /sensor etc. which should be able to sense and adjust the feed automatically so that the blade is safe from getting damaged. Once the hard spot is cut/over, the machine should come to the normal feed.

1.1.5 Safety for blade slippages, if due to some reason the blade starts slipping from the wheel, the machine should automatically sense it and switch off the drive motor thereby avoiding damage of blade breakage/wheel disc breakage.

1.1.6 The machine should automatically shut off (drive motor should immediately stop) in case of breakage of band saw blade for the safety of the operator and the machine and an audio visual indication/alarm should appear on the control panel.

1.1.7 The machine manufacturer must provide suitable warning boards at appropriate locations on machine cautioning operator to use safe practices.

1.1.8 The machine should include a prominently displayed, 'cutting speed v/s recommended feed' chart for different grades of materials to be cut.

1.1.9 The machine should include a suitably located control panel with all the necessary controls clearly displaying parameters like Speed, Feed, Coolant level, Fault error code etc.

1.2 Specific Characteristics

1.2.1 General

1.2.2 Capability

1.2.2.1 The Metal cutting Band Saw Machine should be capable of accurately performing sawing operations i.e. making 4 nos. of parallel cuts each on 340mm x 340mm square and 340mm dia round bars of MS to IS:2062 & Stainless steel IRS M44 and be capable of accurately performing sawing of components listed at Annexure F to Section VI.

1.2.2.2 The Metal cutting Band Saw Machine should cut the component with flatness and parallelism within 0.2 mm per 100mm of cut at room temperature or better. The tolerance of cut-off length should be as per DIN 7168 (latest) or IS 8000: Part 1, or better. The firm should indicate the actual value of flatness, parallelism and tolerance of cut-off length that shall be achieved by the offered machine.

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- 1.2.2.3 The Metal cutting Band Saw Machine should provide vibration free cutting at full load. The machine should have adequate rigidity and weight to ensure perfect 1.2.2.3 parallel cuts. The design of machine should be such as to maintain the desired accuracy, flatness and parallelism of cut throughout the working life of the machine. The firm should furnish the details of design parameters incorporated to achieve this objective.
- 1.2.2.4 4 The firm should clearly indicate the features provided in mechanical, hydraulic, electrical, electronics and the coolant system to achieve the above operating conditions without affecting the machine performance.
- 1.2.2.5 The Metal cutting Band Saw Machine shall be required to work in tropical conditions under ambient conditions of temperature ranging from 50C – 480C, relative humidity of up to 98% and comparatively dusty shop atmosphere. All equipments should be designed to function efficiently under these tropical conditions.
- 1.2.2.6 The Metal cutting Band Saw Machine shall be capable of performing continuously with at least two Shifts working for its entire service life under specified ambient conditions without any deviation in performance or loss of accuracy.
- 1.2.3 **Rigidity-Control**
- 1.2.3.1 The machine should be rigid, robust and of sturdy construction. It should be designed to meet heavy-duty demands of cutting Railway components under severe workshop conditions and should be free from vibrations. The machine shall be of double column type.
- 1.2.3.2 All castings should be of high grade close grained cast iron conforming to Indian Standard Specification IS: 210 (latest) Grade FG 260/230 of Indian Standards or Grade EN GJL 250/300 conforming to DIN 1561 or equivalent ISO grade or CE standard grade. These should be suitably aged to ensure dimensional stability and continued accuracy over the machine life.
- 1.2.3.3 All important controls should be at one place, located at a convenient position for easy reach of the operator.
- 1.2.4 **Machine Base:**
- 1.2.4.1 The machine base shall be a heavy duty and torsion free box construction of stable single piece casting of high grade close grained cast iron like GG25, Meechanite Grade FG 260 conforming to IS 14329: 2000 (or latest), or fabricated from steel plates conforming to IS 2062: 1999 (or latest) or Fe 410 or equivalent DIN International Standard. The structure should be subjected to double stress relieving cycle. The first stress relieving should be done after welding and the second stress relieving should be done after rough machining and before finish machining. The process followed for stress relieving may be explained. If the machine base is of casting, the same should also be subjected to stress relieving cycle. The exact stress relieving cycle being followed may be explained in the offer. The machine base shall be suitably ribbed at all stress points for vibration free operation of the machine under full load. Arrangement for levelling of the bed and securing the anchoring of machine on foundation should also be provided.
- Note: **The tenderer should indicate the details of material of castings/steel plates used for fabrication, stress relieving cycle.**
- 1.2.4.2 The machining of structure should be carried out on precision machines in a single set up to ensure proper accuracy of the various surfaces of the frame.
- 1.2.4.3 The machine base should support the work table. The worktable shall have easily replaceable alloy steel wear strips so as to relieve the table from abrasion and wear.
- 1.2.4.4 The machine base should support the vice, chip collector, coolant reservoir, coolant pump, hydraulic system, sawing head and work piece. Hinged access doors or

removable panels should be provided to facilitate servicing and adjusting the internal components.

1.2.5 Saw Head and Guide Arms:

1.2.5.1 Saw head assembly should be made of fabricated or cast steel and should be properly stress relieved. The machine shall have blade guides, one fixed and one movable. Provision shall be provided for blade tensioning, for accurate alignment of blade. A protective cover should enclose the blade wheels and saw blades so that a minimum of blade length is exposed for sawing. The cover or guard should have a hinged door or other suitable means for providing ready access to blade and wheels.

1.2.5.2 The saw frame should be provided with backlash free linear motion guide and roller bearing. Frame should have also features of automatic height setting, rapid approach of saw frame down to the metal to be cut and rapid return to home positions, after sawing have been completed through PLC. The details may please be furnished in the offer.

1.2.5.3 Band guide shall consist of solid carbide or carbide inserts, hardened and ground side rollers on each side of the saw band, or a combination of these, and carbide back up blocks or roller mounted on LM bearings. The hardness of carbide back-up block should be 60+/-2 HRC.

1.2.5.4 The distance between saw guides should be optimum so that it does not affect the rigidity of the bed.

1.2.5.5 Saw head should be attached to linear motion guideways. Two blade guides, one fixed and one movable for supporting blades shall be provided.

1.2.6 Blade Drive Unit:

1.2.6.1 The blade speed should be infinitely variable. The drive should be provided through the frequency controlled AC Motor and AC drive for controlling the speed of blade

1.2.6.2 Wheels for blade drive should be made of steel casting of GG25/30 grade conforming to DIN standard or equivalent ISO/JIS standard. The casting should be suitably heat treated and precision machined. The band wheel should be flanged type. The diameter of these wheels should be adequate to minimize blade fatigue. The metal driving wheel face and back up flange should be hardened to not less than RC-45. The materials used and hardness value should be mentioned in the offer.

1.2.6.3 Wheels must be mounted on precision roller bearings. The system of lubrication, whether continuously lubricated or sealed for lifetime should also be clearly indicated in the offer.

1.2.6.4 An idler motion detector should be provided, which stop the machine automatically, if blade band is stalled in the machine.

1.2.6.5 An automatic band tensioner should be provided by means of hydraulic system, controllable through PLC. The force on the band should be commensurate with the size and power of the drive. The band tension should be electronically monitored. There should be a feature for automatic tension reduction when the blade comes to a stop. There should be provision for automatic switch off of motor in the event of blade breakage. Suitable band tension indicator to indicate the measured value of blade tension shall be provided.

1.2.6.6 The band tension should be minimum 30000 to 50000 PSI. Detailed justification along with the advantages must be specified in case any other value is offered.

1.2.6.7 The machine should have provision for active monitoring and controlling of band deflection i.e. the feed should reduce automatically if a band saw deflection occurs. Machine should stop if band deflection over rides preset value of maximum kerf of 5mm and the saw frame should return to home position. There should be interruption to the

auto cycle, if this happens. The features available in the machine for achieving this should be explained in detail.

1.2.7 Band Saw Blade:

1.2.7.1 The machine shall be supplied with bimetallic metal cutting blade having variable pitch conforming to IS 5030 Pt III-latest or other equivalent International Standards. The saw blade width, thickness and TPI should be mentioned in the offer. In case, any other size/type of blade is offered, detailed justification of the same must be furnished. The hardness of the blade teeth should be in the range of 68 +/- 2 HRC. The teeth designs, hardness of cutting teeth and back up plate of band saw should be detailed in the offer.

1.2.7.2 The bidders should ensure indigenous availability of bi-metallic cutting band saw blades of preferable standard makes. The bidder should indicate the actual grade of blade, average life of blade and standard to which it conforms. It should be possible to cut the materials as per speed recommended by the blade manufacturer. A material and cutting speed chart given by blade manufacturers should also be enclosed.

1.2.7.3 Band saw blade of 24 TPI, 18 TPI or better should be supplied.

1.2.8 Feed System:

1.2.8.1 Machine shall be equipped with PLC controlled infinitely variable and adjustable sawing feed rate for the blade. An automatic feed control through servo valve or some other appropriate mechanism should be provided to maintain constant amount of feed for a particular cutting operation. The actual system offered should be explained.

1.2.8.2 It shall incorporate variable feed pressure control to apply desired feed force to the blade, to cut efficiently regardless of work piece size or shape. Provision for rapid down approach, up to a pre-select height, and rapid up approach, to raise blade frame quickly to the home position shall be provided in the machine. Feed pressure indicator/scale shall be provided in the machine.

1.2.8.3 There should be provision for accurate, sensitive, finite variation of saw frame feed while the machine starts working from the home position. It should also be possible to stop cutting action at any point of time. The mechanism provided to achieve this should be indicated in the offer.

1.2.8.4 The machine should be capable of automatic feed/stroke adjustment through PLC, as applicable, depending upon the bloom size to be cut, cutting forces, on the blade and torque /driving force of band saw motor. The system offered should be explained.

1.2.8.5 There should be provision of automatic blade adjustments to cut any material and size with the same blade, simply by feeding of the cutting speed by the operator on the control panel. The actual system offered should also be explained.

1.2.9 Machine vice: (Clamping Fixture)

1.2.9.1 Hydraulically operated machine vice (clamping fixture) to accommodate minimum & maximum specified size of component as per Annexure-F to Section VI should be fitted. The fixed vice remains clamped before and after the blade cuts and a positive arrangement to avoid slippage of component during clamping shall be provided.

1.2.9.2 The vice shall have the provision for quick setting of opening size as well as clamping force adjustment to suit work piece/component requirements. Jaws shall have replaceable hardened wear plates. Material and hardness of wear plates may be specified in the offer. An out of stock limit switch should be provided to shut off the machine, if the vice tries to clamp the material for indexing and there is no material between the jaws.

1.2.9.3 Built in stand with antifriction rollers shall support the stock for entry in to the saw with minimum effort.

- 1.2.9.4 The machine should be provided with the adjustment of vice jaw pressure to suit the component to be clamped by means of servo controlled valves.
- 1.2.9.5 Machine should be provided with a suitable clamping fixture/arrangements to hold the component as per respective Schedules. The Clamping Fixture should be so designed that its performance is not affected by the bulging of the rear plate.
- 1.2.9.6 The clamping fixture should facilitate easy, quick setting and clamping of the components and subsequent feeding to the table. It must have at least two locating points to hold the work piece in place.
- 1.2.10 **Working Cycle Control System:**
- 1.2.10.1 All-important controls should be ergonomically designed and centralized on a control panel to ensure minimum fatigue to the operator.
- 1.2.10.2 A suitable operation of the machine in manual and semi-automatic mode should be provided. Suitable push button/selector switches should be provided for these modes and also for start/stop operations.
- 1.2.10.3 Suitable dedicated adjustment of feed rate, feed force and speed of the band should be provided. Infinitely variable feed control for adjustment of feed rate and AC Drive for setting the band saw speed from control panel shall be provided.
- 1.2.10.4 The machine should be provided with depth control device to sense the depth, while cutting the component, so that the machine automatically stops at the desired depth of cut. The depth control system provided should be detailed in the offer.
- 1.2.10.5 The machine should be provided with Digital display on screen/ control panel to display the length and weight of the bloom to be cut. The firm should furnish the actual details, i.e. make, resolution, accuracy of measuring system provided.
- 1.2.11 **Chip Removal System:**
- 1.2.11.1 The chip removal system from the gullets of the band teeth should be through hydraulic/electric motor driven band brush. In case of electric drive, there should be adequate protection to prevent ingress of coolant with provision of automatic stop after brush is worn out. The power chip brush should be synchronized with band saw speed. The diameter of brush and other details of chip removal system should also be explained in the offer.
- 1.2.11.2 It should be possible to operate the chip removal system in auto and manual mode by push button available on operator panel.
- 1.2.12 **Coolant System:**
- 1.2.12.1 The coolant system to cool blade tips and wash away the chips from the working area should be provided. The coolant system should consist of a coolant tank of adequate capacity and a heavy-duty coolant pump with filters, flushing hose, necessary piping and sump etc. to deliver required quantity of cutting oil at the point of blade entry shall be provided. The coolant reservoir shall rest directly on the floor under the machine. The reservoir should be easily accessible for thorough cleaning. The details should also be clearly indicated in the offer.
- 1.2.12.2 A curtain cutting fluid should be provided to ensure availability of abundant and uniform supply of fluid to band saw and work. It should also be possible to control the amount of cutting fluid i.e. flow rate.
- 1.2.12.3 It should be possible to operate the coolant system in auto and manual mode by push button available on operator panel.
- 1.2.12.4 Coolant tank cover should be wide & easily openable to facilitate cleaning of coolant tank.
- 1.2.13 **Lubrication:**

- 1.2.13.1 The machine should have suitable lubrication system. Suitable arrangements for indicating failure of lubricating system should be incorporated. The details of lubrication system offered shall be explained in the bid. Lubricants for first fill shall be supplied along with the machine.
- 1.2.14 **Hydraulic System:**
- 1.2.14.1 The hydraulic system elements should be of makes, as specified in clause 14 of Section V and conform to ISO/DIN standards
- 1.2.14.2 The hydraulic system layout should be as per ISO 4400/4401 or DIN24346/24340.
- 1.2.14.3 An energy efficient variable displacement pressure compensated pump should be provided for all the hydraulic functions. The pump should be protected with a non-return valve to avoid damages in case of mal functioning of the system.
- 1.2.14.4 The hydraulic system should be provided with strainer of 125-150-micron size on suction side and filters of 10-25-micron size on delivery side/return line. The filter should have minimum working life of 2000 Hrs. or higher
- 1.2.14.5 The maximum hydraulic oil temperature should be kept up to 60°C even under the highest ambient temperature conditions of 50°C.
- 1.2.14.6 Oil level sight gauge or suitable equipment showing the minimum and maximum oil level in the tank should be provided. The indicator shall have marking to show the lowest and highest permissible oil levels for the convenience of the operator. In addition, an oil dipstick with graduated marking clearly indicating minimum & maximum permissible oil levels to be provided. A drain plug at the lowest point of the hydraulic tank should be provided so that oil can be drained out without disconnecting any pipe or connection.
- 1.2.15 **Piping, Fittings & Tank:**
- 1.2.15.1 All pipes used in the hydraulic system should be of high quality and should be given anti corrosion treatment. Pipes and hoses should be clamped at suitable locations so that they do not crack/break under vibrations.
- 1.2.15.2 The pipe fittings should conform to SAE Grade and from reputed manufacturers. Stackable valves and manifold should preferably be used for ease of assembly, reduced piping and leakage through fittings.
- 1.2.15.3 Surfaces of hydraulic oil tank should be provided with anti-corrosion treatment such as Phosphating or hydraulic oil resistant anti-corrosive paint. The details of anti-corrosive treatment used should clearly be indicated in the offer.
- 1.2.15.4 Minimum connections should be provided as a facility for pressure checking, wherever required. The pressure gauge provided for hydraulic system should preferably be glycerin filled.
- 1.2.15.5 Fully labeled line diagram of hydraulic circuit, indicating different elements must be furnished with the offer.
- 1.2.16 **Noise level**
- 1.2.16.1 Noise level of machine should not exceed 85 dB when measured at a distance of one meter from the periphery of the machine as per IS: 10988 standards or NMTBA/ISO/DIN Standards.
- 1.2.17 **Machine Light**
- 1.2.17.1 Built-in work-light with universal attachment to illuminate the work area. The minimum illumination level should be 300 lux or better.
- 1.2.18 **Heavy Duty Rigid Roller Conveyor System.**
- Suitably designed Rigid Roller Conveyor System of 08 metres on both sides of the machine to facilitate loading/ unloading & cutting of material on the machine.

2
2.1
2.2

GENERAL ELECTRIC SPECIFICATION

The provision of this General Specification shall apply, where ever relevant.

All equipments and material shall comply with appropriate Indian Standards (latest), International Standards or National Standards of the country of origin provided the latter are equivalent to or better than the former. The tenderer shall indicate the Standards applicable. The following standards are applicable in particular. (Corresponding International Standards like ASA, NEMA, BSS, DIN etc. may also be quoted).

IS : 325-1979 (latest)	- Three phase induction motors (corresponding to IEC pub-34-1) (Latest).
IS : 1248 (Latest)	- Direct acting indicating analogue electrical measuring instruments and their accessories (corresponding to IEC Pub-51) (Latest).
IS : 1231-1974 (Latest)	- Dimensions of three phase induction motors (corresponding to IEC Pub-72-1) (Latest).
IS : 1271-1985 (Latest)	- Classification of insulation material for electrical machinery & apparatus in relation to their thermal stability in service (corresponding to IEC-Pub-85) (Latest).
IS : 6875 (Latest)	- Push Buttons and related control switches corresponding to IEC Pub/73) (Latest).
IS : 375-1963 (Latest)	- Marking and arrangement of switch gear, bus bars, main connection & auxiliary wiring.
IS : 996-1979 (Latest)	- Single phase small AC and universal electrical motors.
IS : 1356 (Latest)	- Electrical equipment of machine tools.
IS : 2516 (Latest)	- Circuit breakers (corresponding to IEC Pub-56) (Latest)

2.3 Unless specified in the main specification, the AC motors and starters shall be of the following type. Tenderer is, however, free to give alternative proposal along with justification, if in his view alternative proposal is warranted by site conditions.

Type of motor type of starter.

	TYPE OF MOTOR	TYPE OF STARTER
2.3.1	Any type of AC motor starting current of which does not exceed 75 amps.	Direct on line.
2.3.2	AC squirrel cage, introduction motors, starting current of which is above 75 amps. if started direct on line.	Star delta or Auto transformer type.
2.3.3	AC slipring type motor	Resistance type air/fan Cooled
2.3.4	AC synchronous or synchronous induction motor.	Suitable maker's standard.
2.3.5	DC motor	Resistance type/Thyristor type.
2.4	The control gear for AC/DC motors shall incorporate the following protection devices as concomitant accessories.	

(WM/ASRW)

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- 2.4.1 **No Voltage Protection** - No voltage protection shall be provided so that machine will not start up again by itself when, following an interruption the supply is restored.
- 2.4.2 **Short Circuit Protection** - To protect against short circuits due to insulation failure of faulty connections HRC fuses/MPCB's shall be provided for each motor. The rating of the fuse shall be such as to take care of the over current due to motor starting
- 2.4.3 **Over Load Protection** - To prevent motors from overloading, overload protection shall be provided separately for each motor. Three phase motors shall be protected by overload tripping devices on each phase
- 2.4.4 **Single Phasing Protection**- On load single phasing protection shall be provided using MPCB as detailed above
- 2.5 Control equipment shall be mounted in separate drip proof enclosures. Control enclosures and compartments are to be so designed as to give adequate protection against ingress of dust, oil, coolant or chips. All control devices like contractors etc. shall be front mounted on a rigidly fabricated metal panel for ease of operation. All other electrics shall be installed that they are readily accessible when the doors and covers are opened. Hinged covers shall be interlocked with the machine tool control to prevent operation of the machine when cover is open
- 2.6 The motor shall be totally enclosed with or without fan cooled frame. Screen protected drip proof type motor may be provided if it is mounted inside protective enclosures
- 2.7 The electrical equipments shall comply with the requirement of Indian Electricity Act and Rules (latest)
- 2.8 All instruments shall be of the Industrial Grade "A" (IS-1248) switch board type the range of the instrument shall be such that the maximum load expected in the circuit shall produce a deflection of 60% to 80% of the full scale
- 2.9 The supplier shall furnish 3 sets of complete electrical and electronic wiring diagrams in full details to enable the maintenance staff to locate faults in the circuits, 3 sets of part catalogues, maintenance manuals operating instructions with details of coils and windings, used in the equipment to facilitate repairs and maintenance should also be supplied
- 2.10 For main motor class minimum "B" Class insulation shall be provided. If any other class of insulation is proposed, detailed justification for providing different class of insulation shall be given
- 2.11 Motors shall be designed to withstand frequent starts, stops and reversals as demanded in the operation of the machine
- 2.12 Two earthing terminals shall be provided on all electric motors including the control gear
- 2.13 **POWER SUPPLY**
- 2.13.1 The machine shall be suitable for operation on 415 volts 3 phase 50 cycles AC 3 wire or 4 wire system with neutral solidly earthed. The supply voltage may vary up to +10% -20%. The frequency may vary up to + 3%. However, full rated power of the motor shall be available at the lower voltage. Firm should confirm satisfactory performance of the machine at incoming power supply in the range

415V \pm 10%-20% and 50HZ \pm 3% frequency or should provide voltage stabilizer as specified against clause 2.13.2 below of required capacity.

2.13.2

The voltage stabilizer, if required, shall conform to:

- i. Input Voltage - 320 to 460 volts 3 phase 4 wire supply.
- ii. Output Voltage - 415 volts
- iii. Regulation - \pm 1% from No load to Full load
- iv. Rate of correction - 20 volts per second per phase
- v. Wave form distortion - NIL
- vi. Efficiency - Not less than 97%
- vii. Winding and class - Copper wire wound with "B" class of insulation of insulation or better

2.13.3

In case of machines equipped with NC, SS, CNC, Thyristor controlled devices and other sophisticated electronic gadgets including microprocessors etc. which are susceptible to power line spikes and surges, a suitable voltage stabilizer and ultra-isolation transformer to cover for the entire electrical load of the machine shall be offered as a concomitant accessory, conforming to Specification for voltage stabilizer as mentioned in clause 2.13.2 above and isolation transformer to the parameters mentioned below.

- i. Transformer ratio - 1:1
- ii. Winding - Copper wire wound with "F" class insulation or better
- iii. Protection - To arrest spikes and surges to the order of 3 KV for 200-400 micro seconds duration
- iv. Common Mode Rejection Ratio - 120 dB
- v. Isolation - Capacitance 005 Pf: resistance greater than 1000 Mega Ohms

2.13.4

Voltage stabilizer shall be equipped with a protective relay to trip the AC power supply to the machine instantaneously with audio and visual indication to the operator. Settings of the protective relay for low and high voltage shall be 320 volts and 460 volts respectively.

2.14

ATMOSPHERIC CONDITIONS

2.14.1

The ambient temperature at the site at which the machine will be installed may vary from -4°C to +50°C over the year. The relative humidity may be as high as 98%. The atmosphere is expected to be dusty. The machines offered shall be suitably tropicalised to work under these atmospheric conditions without any adverse effect on their performance.

2.15

The temperature rise shall not reach such a value that there is a risk of injury to any insulating material or adjacent parts.

2.16

The drive shall be capable of operating at any one of the speed required independent of the load in accordance with the requirements of the machine.

2.17

Information/data shall be furnished as per the format of submission of technical bid Annexure-A.

3 GENERAL CHARACTERISTIC

3.1 RIGIDITY AND STABILITY

- 3.1.1 The machine shall be robust, rigid and of sturdy construction. It shall be designed to meet heavy duty demands of various operations on the machine under normal Workshop environment for such machines. It shall be free for vibrations even when working at full capacity.
- 3.1.2 All machine castings shall be made of close grained high grade cast iron like Mechanite or equivalent materials meeting IS-210 Standards to ensure durability and rigidity. The casting shall be thermal stress relieved to ensure stability and continued accuracy.
- 3.1.3 All machine fabrications of critical load bearing assemblies like beds, columns etc. shall be adequately strengthened and stress relieved.
- 3.1.4 Change in ambient temperature shall not affect the performance of the machine.
- 3.1.5 There shall be no change in the performance of the machine either on switching on the machine or after continuous running.
- 3.1.6 There shall be no resonant vibrations throughout the working range of the machine at all load levels.

3.2 SAFETY CONTROLS

- 3.2.1 The machine shall incorporate safety devices to provide protection to the operator and machine against all possible operational and machinery failures.
- 3.2.2 Suitable interlock shall be provided to prevent machine operations in the event of:
 - 3.2.2.1 Faulty sequence of operation.
 - 3.2.2.2 Fluctuation in supply voltage.
 - 3.2.2.3 Resumption of power supply after power failure.
 - 3.2.2.4 Non-positioning of safety guards.
 - 3.2.2.5 Failure of hydraulic system (where applicable)
 - 3.2.2.6 Failure of lubricating system (In case of automatic including drop in pressure lubrication)
- 3.2.3 A fault or damage in the control circuit or interruption re-establishment after an interruption of fluctuation in whatever manner in the power supply to the machinery must not lead to dangerous situations in particular.
 - 3.2.3.1 The machinery must not start unexpectedly.
 - 3.2.3.2 The machinery must not be prevented from stopping if command has already been given.
 - 3.2.3.3 No moving part of the machinery or piece held by the machinery shall fall or be ejected.
 - 3.2.3.4 The protection devices must remain effective.
- 3.2.4 The machine shall be fitted with an emergency stop device to enable actual or impending danger to be averted. This device must be:-
 - 3.2.4.1 Conveniently located.

- 3.2.4.2 Clearly identifiable.
- 3.2.4.3 Stop the machine as quickly as possible without causing additional hazards.
- 3.2.4.4 The emergency stop must remain engaged. It should be possible to disengage it only by appropriate operation. Disengaging the control must not restart the machinery but only permit restarting.
- 3.2.5 Safety features shall also include.
- 3.2.5.1 Safety device against overload for all mechanical and electric items to the extent possible.
- 3.2.5.2 Safety stops against over-running of slides.
- 3.2.6 Guard and protection devices shall protect exposed persons against risks related to moving transmission parts (such as pulleys, belts, gears, rack and pinion, shafts etc.) and moving parts directly involved in the process to the extent possible. This shall meet the following requirements:-
 - 3.2.6.1 Be of robust construction.
 - 3.2.6.2 Not give rise to any additional risk.
 - 3.2.6.3 Not be easy to by-pass or render non-operational.
 - 3.2.6.4 Be located at an adequate distance from danger zone.
 - 3.2.6.5 Cause minimum obstruction to the view of the production process.
 - 3.2.6.6 Rigidly connected and not prone to rattling.
 - 3.2.6.7 Enable essential work to be carried out without the guard or protection device having to be dismantled.
- 3.2.7 A load meter shall be provided to indicate the load on the machine. The meter shall have a suitable mark to indicate the maximum load the machine can take. Full details of the above and other safety features indicating how each one functions must be explained in the offer.
- 3.3 **OPERATIONAL CONTROLS**
- 3.3.1 The operation of the machine shall be by push buttons or levers. The basic rules for the direction of operation of controls and the corresponding direction of movements of the machine tools shall be as per IS:2987-1985.
- 3.3.2 The control devices shall be:
 - 3.3.2.1 Clearly visible and identifiable.
 - 3.3.2.2 Ergonomically positioned for safe operation without hesitating or loss of time, and without ambiguity.
- 3.4 **LIGHTING**
- 3.4.1 Integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity shall be provided.
- 3.4.2 The manufacturer must ensure that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to lighting provided by the manufacturer.
- 3.4.3 Integral parts requiring frequent inspection and adjustment and maintenance areas must be provided with appropriate lighting.
- 3.4.4 The machine lighting should be of low voltage so as to prevent any hazard to the operator.
- 3.5 **MACHINE MAINTAINABILITY**

- 3.5.1 The machine shall be so designed as to require minimum possible maintenance and to give trouble free service.
- 3.5.2 All assemblies/parts of the machine shall be easily accessible for maintenance.
- 3.5.3 The machine shall not require major dis-assembly for checking and replacement of a particular part, especially for parts requiring periodical check-up and replacement.
- 3.5.4 The manufacturer must provide means of access e.g. stairs, ladders, cat walks etc. to allow access safely to all areas used for production, adjustments and maintenance operations.
- 3.6 **WEAR COMPENSATION ADJUSTMENT**
- 3.6.1 The original built in accuracy of the machine shall be capable of being maintained conveniently and economically by suitable adjustments for taking up wear on slides, bearings and load screws. The system of adjustments incorporated shall be explained in the offer.
- 3.7 **COOLANT SYSTEM (WHERE APPLICABLE)**
- 3.7.1 Suitable coolant system with pump, motor, tank, filter etc. shall be provided. The coolant pump shall be as per IS:2161-1962. The filter shall be of reusable type and indigenously available. If reusable filter cannot be offered the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare. Details of the coolant system shall be indicated in the offer.
- 3.7.2 The supply of coolant shall be in ample volume. Provision to re-circulate the coolant shall be available. A chip and coolant tray shall be provided. The volume of coolant flow shall be indicated. It shall be adjustable.
- 3.7.3 An enclosure shall be provided to prevent the coolant from splashing outside the machining zone. Details of enclosure shall be provided. Specific requirements of coolant system for grinding machines etc. shall be clearly indicated.
- 3.8 **LUBRICATION SYSTEM (WHERE APPLICABLE)**
- 3.8.1 The machine shall be provided with an automatic lubricating system for ensuring delivery of adequate quantity of lubricant to areas requiring continuous lubrication. Suitable arrangements must be provided for indication of failure of the lubricating system.
- 3.8.2 The system shall be provided with interlock to prevent machine operating/starting in the event of the failure lubrication system.
- 3.8.3 Reusable filters capable of filtering chips, dust particles etc. shall be provided. Indicators for showing clogged condition of filters shall be available. The filters shall be indigenously available. If reusable filter cannot be offered the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
- 3.8.4 Lubrication and filter cleaning chart shall be displayed on a metal plate at a conspicuous location on the machine indicating :-
- Specific location of points on the machine to be oiled lubricated/greased.
 - Periodicity of lubrication of these points.
 - Filter to be cleaned.
 - Periodicity of cleaning filters.

- e) Periodicity of replenishing lubricating oil for the centralized system.
- f) Any other similar relevant information
- 3.8.5 Points where manual lubrication is needed shall be separately indicated. Frequency of lubrication shall be also clearly mentioned.
- 3.8.6 Lubricating oils used in the machine shall be available in India. Successful tenderer will be required to indicate brand names of approved oils manufactured by various Indian Oil Companies
- 3.8.7 First fill of lubricating oils used in the machine shall be provided with the machine. Details of lubricating system provided shall be indicated.
- 3.9 **PNEUMATIC SYSTEM (WHERE APPLICABLE)**
- 3.9.1 The compressed air supply will be provided by the customer at the machine within pressure range of 4.5-7.5 kg/cm² and a moisture content or 1000 ppm. The pneumatic system of the machine should be designed accordingly. An alarm shall be provided for low air pressure.
- 3.9.2 Suitable filter/moisture trap shall be provided by the contractor in the system of pneumatic air intake. The filter shall be reusable type and indigenously available. If reusable filter cannot be offered, the filter cartridge shall be easily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
- 3.9.3 Air pressure regulator, if necessary, shall be provided by the tenderer.
- 3.9.4 The make of pneumatic control equipment shall be of reputed make. The makes shall be indicated.
- 3.10 **HYDRAULIC SYSTEM (WHERE APPLICABLE)**
- 3.10.1 Hydraulic circuit must be equipped with the following safety and inspection equipments:
 - (a) Pressure gauges at all places, where pressure has to be set up or inspected.
 - (b) Safety valves for hydraulic circuit if relief valve does not fulfill this function.
 - (c) Equipment for checking of temperature in the circuit or in the pump wherever necessary.
 - (d) Arrangement to show if the filters (including those in the pump set) are choked and need cleaning. The filters shall be of reusable type and indigenously available. If reusable filter cannot be offered, the filter cartridge shall be readily available in India. Source of supply shall be indicated. Adequate no. of filters for 2 years working on double shift basis shall be offered as spare.
 - (e) Alarm for low oil level.
- 3.10.2 The sump aggregate shall have the following:
 - (a) Oil level sight gauges or any other equipment showing the minimum and maximum oil levels in sump.
 - (b) A drain plug at the lowest portion of the tank.
 - (c) It shall be possible to drain the oil from the tank without disconnecting any pipes or other fittings.
- 3.10.3 The temperature of oil in hydraulic circuits shall not exceed 60 degrees C in any case. Suitable arrangement shall be incorporated to ensure that the oil is not overheated under local weather conditions at continuous normal working of the machine.
- 3.10.4 Facilities for bleeding of air in case of air lock shall be provided.

- 3.10.5 The hydraulic reservoir, pump and allied equipment shall be suitably segregated from the machine in order to remove major source of heat.
- 3.10.6 Hydraulic oils used on the machine shall be available in India. Successful tenderer will be required to indicate brand names of approved oils supplied by various Indian Oil Companies.
- 3.10.7 First fill of hydraulic oils used on the machine shall be provided with the machine.

4.0 **TECHNICAL LITERATURE (As applicable):**

- 4.1 One copy of the printed illustrative catalogue showing features of the machine and its elements must be enclosed with each copy of the bid.

- 4.2 The technical literature shall be provided for the complete machine, including imported and indigenously purchased components / sub- assemblies. The successful tenderer will have to furnish 4 (four) copies each of the following manuals directly to the consignee along with the machine. Out of these 04 sets, the bidder shall be required to submit one set of all documents in best available condition one month prior to the training for the machine. One set of technical literature should cover the following details:

- i. Operational & Maintenance manual of the machine.
- ii. Operational & Maintenance manual of the servo controlled voltage stabilizer.
- iii. Operational & Maintenance manual of the ultra-isolation transformer.
- iv. Instruction & Maintenance manual for Hydraulic Oil Cooling Unit.
- v. User manual for Tool changer system (if provided).
- vi. Technical & Maintenance manual for Hydraulic System.
- vii. Technical & Maintenance manual for Lubrication System.
- viii. Operator Guide for CNC Control System (if provided).
- ix. Programming Guide for CNC Control System (if provided).
- x. Diagnostic & Trouble shooting Guide for CNC Control System (if provided).
- xi. Start-up Guide for CNC Control System (if provided).
- xii. Machine Software Listing (if provided).
- xiii. Soft and hard copies of PLC Program in ladder form with cross reference listing and PLC project file.
- xiv. Drawings of tooling & fixtures, hard copies in A-2 size as well as soft copy in PDF format.
- xv. Wiring diagram, in which length of wires must be mentioned, hard copies in A-3 size as well as soft copy in PDF format.
- xvi. Mechanical drawings (spindle assembly, table assembly, column assembly), hard copies in A-1 size as well as soft copy in PDF format.
- xvii. Spare part manual including part lists no., hard copies in A-4 size as well as in PDF format.
- xviii. Lay out drawings in A-1 size, which clearly shows the position of all type of electrical components in machine.

Note: All manual and literature should be in English/Hindi.

5.0

SPARES

5.1

Since the machine will be under comprehensive preventive maintenance during warranty period of two (02) years and under CAMC for five (05) years after the warranty period, it is the sole responsibility of bidders to stock such spares as required for smoother execution of PMC during warranty and CAMC in order to achieve response time in compliance to machine availability as per stipulated requirements.

- 6.0 **CONSUMABLES:**
- 6.1 The list of consumable spares (if any) shall be furnished and quoted along with their unit rate.
- 6.2 Consumables shall be supplied along with the machine or as per agreed time table, if ordered.
- 7.0 **SPECIAL FEATURES:**
- 7.1 Special features incorporated in the machine, if any, shall be indicated separately in the bid clearly indicating the advantages.
- 8.0 **DEVIATIONS:**
- 8.1 The tenderer shall certify that the offered machine fully meets the specification. Various design features incorporated in the machine to fulfill different technical performance requirements shall be fully explained in the offer. However, minor deviations from these specifications which do not affect or in any way interfere with the stipulated performance standards or would result in improved safety/reliability or would reduce recurring maintenance/operating cost of the machine, can be considered for acceptance. The tenderer in such eventuality shall clearly indicate the details of these deviations and their implications as per the following format:
- 8.2 All Deviations shall be clearly indicated in the deviation statement as per the format of submission of technical bid Annexure-A.
- 9.0 **INSPECTION AND TESTING AT MANUFACTURER'S WORKS:**
- 9.1 The machine shall be inspected and tested during different stages of its manufacture starting from raw material till the completion of machine, by the purchaser or his authorized representative at the supplier's or his sub-supplier's works. The Quality Assurance Programme as per Annexure-I shall be submitted along with the bid. The bidder must submit the exhaustive QAP incorporating the tests as given in Annexure-I along with other tests /stage inspection as followed by them.
- 9.2 A load and functional test like no load test and maximum Horse Power test must be carried out at the manufacturer's works. Rigidity of the machine shall be demonstrated to the satisfaction of appointed inspector or inspecting agency.
- 9.3 Manufacturers must have suitable facilities at their works for carrying out various performance tests on the sub-assembly/assembly/machine. The tenderer shall clearly confirm that all facilities exist and shall be made available to the inspecting authority.
- 9.4 A Sample Inspection Chart for inspecting the equipment shall be supplied along with the bid. The inspection chart should indicate all the tests that are carried out during the machine manufacture and also the tests to be offered to inspecting agency. The standard to which this inspection chart conforms should be clearly indicated. Against each test, acceptable limit/ range of values shall be indicated.
- 9.5 The complete machine shall be inspected at manufacturer's premises as per approved GA drawing. Inspecting authority shall not carry out the final inspection in case GA Drawing is not approved by the consignee.

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10.0 TRAINING:

10.1 Free training by the firm shall be imparted in operation and maintenance of the machine. The training to be imparted shall cover operation, troubleshooting and repair of all mechanical, hydraulic, electrical & electronics equipment (CNC Control & AC Drives) and CNC/PLC part programming. This training shall be provided to 4 per consignee nominated by the consignee, for a period of 1 weeks free of cost at the manufacturer's premises. One weeks training will also be provided to one person free of cost from ASRW in design and construction of the machine. All charges pertaining to travel, boarding shall be borne by Indian Railways.

10.2 Subsequently, technical experts from the manufacturer will fully and adequately provide training to operators and maintenance staff nominated by the consignee at the time of commissioning of the machine.

10.3 The supplier will be responsible for co-coordinating with the consignee the travel plans of trainees to ensure that the training is imparted on the machine at its assembly and testing stage. The bidder shall also submit training schedule along with the offer.

Note: All training should be imparted in English/Hindi only.

11.0 FOUNDATION & RELATED DRAWINGS

11.1 SUBMISSION OF GA, FOUNDATION & RELATED DRAWINGS FOR APPROVAL:

11.1.1 For each machine, the supplier shall first submit 04 copies of GA drawings with complete layout of machine elements like bed, hydraulic tank, coolant tank, electrical panel, Servo Controlled Voltage Stabilizer etc. and other related diagrams (Mechanical, Hydraulic, Electrical & Electronics) along with machine weight, overall dimensions, electrical load with length of 3 phase, 415 V AC electric power cable for approval as per time schedule specified in Section-IV to each consignee for approval and to enable the consignee for making necessary arrangements for Installation & Commissioning of Machine on receipt. After getting approval from consignee, the supplier shall supply directly to each consignee 6 copies of approved GA foundation drawings and related diagrams for each machine within 04 weeks from the date of approval of GA drawing for information only in line with applicable IS Specifications (Latest) or relevant international standards

11.2 **APPROVAL OF GA DRAWING :** To be governed by Time Schedule in clause 7 of section-IV and following stipulations.

11.2.1 General Arrangement Drawings will be sent by the 'Contractor' to the Consignee as per Time Schedule annexed in LOA.

The 'Contractor' should ensure that drawings sent to ASRW are complete in all respects as specified in technical specification. The GA drawings shall be approved by the consignee and given back to the contractor, as per the Time Schedule in the LOA.

11.2.2 Delays in submission of drawings by Contractor will be added to the delay in supply of machine in case submission of GA drawing is delayed beyond stipulated time as per time schedule and LD will be levied as per bid document.

Part-I. Thus the number of days' delay in submission of GA drawing plus the number of days' delay in supply of machine, for the purpose of calculations of LD as per clause 1002 of section II of bid document Part-I. However, if the contractor supplies the machine before original delivery period as per AT the number of days by which machine has been supplied earlier than original delivery period that many days will be subtracted from the delay in submission of GA drawings and LD will be levied accordingly. Delays in approval of the drawings by consignee will not be on account of Contractor, except as detailed below.

- 11.2.3 In case Consignee finds some deficiencies in the Drawings and returns the same for rectification to the 'Contractor' the contractor must return the rectified drawings within 30 days from the date of issue of letter by Consignee. This period will not be counted towards LD calculation. The consignee shall ensure that all deficiencies in the Drawings shall be pointed for clarifications to the firm together at one time only instead of piecemeal multiple reference.
- 11.2.4 A repeat back reference(s) by Consignee to Contractor pointing out further defects/deficiencies in the Drawings, will be considered a delay on account of the contractor, except for special circumstances like change in location, review of arrangement etc. Thus, Contractors must take utmost care in ensuring completeness as per requirements of the Consignee.
- 11.2.5 Where GA Drawing cannot be approved by consignee due to clear site not being available etc., the Consignee must inform Contractor and ASRW, explaining the exact delay. However, initiative must be taken by Contractor to obtain such a certificate from Consignee. Contractor must bring any difficulty/dispute to the notice of ASRW immediately.
- 11.2.6 In their own interest, contractor must maintain a log of events in this respect with clear dates and regularly inform consignee and ASRW to avoid wrong levy of LD. Consignees must cooperate with Contractors by providing all assistance, including clear information about any expected delays in site availability, promptly and in writing.
- 11.2.7 If an order has been placed on the firm, the firm will have to advise the consignee well in advance regarding requirement of road permit and assistance required from the consignee, if any, so that delay on this account is avoided. Firm should also visit the site before dispatch of machine to assess the condition of path to be used for movement of trailer.
- 11.3 DISPATCH OF THE MACHINE FROM MANUFACTURER WORKS:**
- 11.3.1 The supplier should normally dispatch the machine only after the foundation is ready for installation and commissioning of the machine on arrival.
- 11.3.2 In case of delay on part of consignee in providing the clear site for construction of foundation or any other facility as specified in the contract to the supplier, the supplier will report the matter to ASRW. In case of delay in readiness of site on part of consignee, ASRW shall take up the matter with concerned Railway/ PU, and advise supplier accordingly.
- 11.3.3 In case proving of component at manufacturer works, the supplier should request for the same as soon as possible after receiving contract keeping allowance of transit time etc. and approximately 60 days for consignee to

handover the parts after receipt of the request accompanied by appropriate and valid bid guarantee. In the event of consignee certifying the non-availability of prove out components, such components will be deemed to be proved out at manufacturer works. However, the firm will prove out these components at consignee subject to the availability

12.0 **INSTALLATION, COMMISSIONING AND PROVING TESTS: (ON TURNKEY BASIS)**

12.1 Joint Check – The contractor or his agent would be required to carry out a joint check at consignee's end, along with the consignee, before unpacking is done, to avoid subsequent complaints regarding short shipment/transit damages. It is necessary that this joint receipt inspection be done immediately on receipt of the machine by consignee & bidder's representative to avoid commissioning delays due to shortages/transit damages. After receipt of the machine as above a Joint Receipt Inspection note (JRI) as per Annexure-C of Section-VI shall be prepared by the consignee and the firm's representative indicating the tentative time schedule for various activities of installation and commissioning. For Indian manufacturers, JRI note shall accompany the bill for 80% payment.

12.2 **RESPONSIBILITIES OF CONSIGNEE AND BIDDER**

12.2.1 The consignee shall be responsible for-

- i. Provision of a clear covered (except where shed is in the scope of contract) site for construction of foundation as per the schedule to ensure its readiness before arrival of machine at site.
- ii. In case where construction of shed is also in the scope of contractor the consignee shall ensure site is encroachment and encumbrance free.
- iii. Electricity, water and compressed air for installation and commissioning of machine shall be provided free of cost within one week of arrival of machine at site.
- iv. Wherever a road mobile crane has to be arranged by the supplier for material handling, a clear approach for it up to the site has to be provided.
- v. Clear covered space for storage of material/equipment required for working/ construction of foundation and installation of the machine etc.
- vi. The consignee shall arrange the raw material for prove out at their end within 15 days of the dry run of the machine (installation, power connection, auxiliary connection like air, water connection) failing which such components will be deemed to have been proved out. The components supplied by the consignee in time will be required to be proved out as per time schedule chart.
- vii. The inspection of foundation, structures etc. and installation of the machine shall be done by authorized representative of the consignee.

12.2.2 The bidder shall be responsible for-

- i. Design & Construction of foundation, flooring of sufficient thickness, civil works (in line with scope of supply) suiting local soil conditions at the site in compliance with clause 3700 (3701 to 3704) of Bid Document Part-I

- ii. Advise consignee in time regarding schedule for requirement of clear site for construction of foundation and other infrastructure, resources & facilities required
- iii. Construction of foundation as well as flooring (if required) of sufficient thickness suiting local soil conditions, for machine shall be completed by the bidder at the site provided by the consignee before receipt of the machine at their premises
- iv. Provision of all tools and equipment, technical and unskilled manpower, material handling accessories/ equipment and material for installation and commissioning
- v. Unloading of the machine on receipt (both imported and indigenous machine) and its movement to the site of installation including provision of road mobile crane.
- vi. The bidder should ensure the proper earthing for the machine and its peripherals/accessories.
- vii. The bidder shall be responsible for meeting all the criteria set by State Pollution Control Board and Central Pollution Control Board, wherever applicable, with respect to air, water, noise, land etc. The bidder shall be responsible for obtaining clearance/certificate for installation/ commissioning /operation of the machine/system supplied. The consignee will provide the administrative help for establishment of communication with the Pollution Control Board.

12.3

Consignee will provide only 415 V+10%-20%, 3 phase 50 Hz+3% AC supply at a single point (mains). All types of cables, connections, circuit breakers etc. required for connecting power supply point to different parts of the machine/control cabinets, shall be the responsibility of the bidder. Requirement of grounding/earthing with required material shall also be incorporated by the bidder during construction of foundation. Electrical work like laying of power/electrical cables & earthing wires from mains to machine control panel (upto 20 meters) as well as within the machine, with supply of all materials shall also be carried out by the supplier.

12.4

The supplier shall demonstrate machine performance and prove out the claimed capability for successful commissioning at the consignee's works as per clause 2.4 of Section-IV. The M&P shall be deemed to be "commissioned" at consignee premises on the date when it is tested and meets with the specified capabilities/functions according to the technical specifications. In addition to above, in case of tooled-up M&P, the M&P shall be deemed to be "Commissioned" at consignee premises on the date when "prove out" components specified as per the relevant clause of technical specification have been successfully proved out meeting the productivity requirements of Technical specification. The consignee shall arrange the raw material for prove out at their end within X days of dry run of the machine (installation, power connection, auxiliary connections like air, water etc.) failing which such components will be deemed proved out. The components supplied by consignee in time will be required to be proved out within Y days thereafter. Any delay in providing the

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raw material or any other input" for proving out shall not be logged on supplier's account.

A Joint Commissioning Note (JCN) to this effect shall be made as per the format at Annexure-D of Section-VI. After issue of JCN the performance shall be watched for a period of one month, after which the PTC shall be issued. The issue of PTC cannot be delayed by more than 60 days from the issue of JCN. If some minor breakdowns are noticed after the issue of JCN, these shall be attended as per warranty obligations and suitable extension of the warranty period, under intimation to ASRW.

If an assembly/sub-assembly requires to be taken back to the manufacturer's premises for repair/replacement either before commissioning or during warranty, the manufacturer or his agent would be required to submit BG of suitable amount. In case the entire machine has to be taken back, a Bank Guarantee for the cost of the machine would have to be submitted. The bank guarantee should be of adequate value so as to cover the cost of the assembly/sub-assembly/paid up cost of the machine.

13.0

SERVICE FACILITY IN INDIA AND TECHNICAL SUPPORT

13.1

The tenderer will clearly spell out in the offer the facilities available with him or his agent for providing adequate after-sales service in India during warranty period in the appropriate section of Annexure 'A' of Bid Document Part-II. The complete details such as organization for after sales service, availability of technically competent engineers and warehousing facilities for spares should be clearly indicated. Bidders not offering complete servicing/repair facilities in India to ensure quick response to maintenance/ servicing calls are not likely to be considered.

13.2

After the warranty period and CAMC period, if any, the manufacturer or his agent shall agree to provide service supports for trouble shooting and obtaining spare parts. The manufacturer shall be obliged to provide spare parts required by the Purchasers for a period of 15 years from the date of delivery of the machine at the ultimate destination to safeguard against obsolescence.

13.3

Tenderer who are OEM, shall undertake to supply spare parts for a period of expected life of machine. Other tenderers shall submit undertaking from OEM for supply of spare parts for a period of expected life of the machine.

13.4

During warranty period, the supplier or his authorized agent shall attend for break down as soon as possible, but in no case later than 72 hours of receipt of intimation of the breakdown.

14.0

BOUGHT OUT ITEMS:

14.1

The bidder shall furnish along with the offer a list of all critical items/ sub-assemblies which are bought out by the bidder and proposed to be used, along with the manufacturer's name, brand model etc. The successful bidder may be

14.2

required to produce invoices to ensure genuineness of such products / verification by the Inspecting agency

The bidder should clearly indicate that in case of components/sub-assemblies taken from reputed companies such as Vickers, Rexroth, RITTAL, THK, and Shenburger etc., the parent company has already entered into contract with their Indian units/affiliates for undertakings repairs/after sales service during warranty and post warranty.

S.No.	Sub-assembly	Make
1	CNC & Drive Controller	SIEMENS/FANUC/Heidenhain
2	Hydraulic system	Rexroth/Vickers/Yuken/Atos/Parker
3	Feed back devices	Heidenhain, Fagor, Siemens, Fanuc
4	Ball screws	THK/INA/Tsubaki/Rexroth/ Steinmeyerstar/ Gamfior / Schenburger/ Shuton.
5	Air conditioner for Control cabinet	RITTAL/Warner Finley/Kelvin
6	Spindle Bearings	FAG/SKG/Timken/NTN/KOYO
7	Lubrication System	Cenlub/Dropco/Vogel/ Rexroth
8	Electrical Control Cabinet	RITTAL/ Siemens or of other reputed make with IP55 Protection level
9	Servo Controlled Voltage Stabilizer	Neel/Servomax/Consul/Aplab
10	Ultra Isolation Transformer	Neel/Servomax/Consul/Aplab
11	Electromagnetic clutch	Vortex /Ghatge Patil
12	A.C. Motors	NGEF/BBL/ABB/KEC/Crompton/ Siemens/ Allen Bradley
13	Brake motors	Siemens/KEC/Crompton/NGEF/BBL
14	Proximity Switch	Elap/Schneider/Omron/Scanner
15	Contactors	Siemens/BCH/ABB/Schneider/L&T
16	Limit switches	BCH/Siemens/L&T/Teknic/ Euchener/ Honeywell, USA
17	Push button	Teknic/Siemens/ Schneider/BCH
18	O' Rings & rubber seals	Merlin/Parker/Busak/Hunger/ Merkel/Soloseal/ Walkersolo/Halite
19	Pneumatic Control Equipment	Festo/Shavo Norgen/ Shradder Scovil/ Electro Pneumatics/ Parker/SMC Pneumatics
20	Control gears	L&T/Siemens/BCH/ABB/Schneider
21	Cable/wire	Siemens/Indramat/ Hubershnuer/ Finolex/ Havells
22	Gear reducer	Elecon/Greaves/Shanthi/ZF/ New Allenbury/ Bongfilivali
23	AC Drive	Fanuc/Siemens/ABB/ Allen Bradley /Schneider
24	AC servo motor	Fanuc/Siemens/ABB/Allen Bradley /Schneider
25	PLC	Siemens/Fanuc/ Mitsubishi/ Messung/ Hitachi/ABB/ Allenbradley/Schneider
26	Air circuit breaker	Siemens/L&T
27	Connectors	Harting/Kontakt/L&T/Omron

28.	Hydraulic seamless tubes	Parker/Maharashtra seamless/ Indian seamless
29.	MCCB	Schneider/ABB/Siemens/L&T
30.	Bi-metallic blades	TCT, Diamond, Miranda, Wikus, Alfa, DeWALT

Note:

1. In case any other reputed make is offered, satisfactory justification for the same will have to be given in the offer.
2. The bidder should explicitly mention "Not applicable", against the items, indicated above, whichever is not applicable in the offered machine.

15.0 COLOUR: The machine and its accessories shall be painted in Apple Green Colour No.281 to IS:5-1978, (if any specific colour code standardized by BIS is available, the same be given). The machine can also be painted in equivalent RAL/DIN/other International Standards. If there is a standard color scheme of the manufacturer, the same can also be considered and may be specified

16 Comprehensive Warranty:

- 16.1** The machine shall be designed for a life of 15 years with regular maintenance and all the structural members of the machine and the foundation shall be guaranteed for 15 years against cracks breakages and etc. during the course of normal operations. Tenderer would submit suitable undertaking.
- 16.2** Foreign suppliers who do not have registered office / maintenance facilities in India may authorize an Indian agent, who shall be responsible for maintenance and break down support. In such case, Indian agent should have experience of maintaining any type of five machines after commissioning. The tenderer should submit documentary evidence towards the experience of the Indian agent in maintaining the machines in India, along with the offer. The Indian agent should submit the details of infrastructure and manpower available with them in the bid.
- 16.3** In addition to warranty obligations/servicing facilities prescribed under Clause 3400 and 3500 of the Bid Document Pt-I, the warranty period would also cover comprehensive preventive maintenance, which will be inclusive of all spares, material and labour cost. All maintenance consumables like lubricants and grease except hydraulic oil / plant coolants shall form part of the scope of the preventive maintenance during the warranty.
- 16.4** The firm shall ensure that in case a failure is reported by a consignee qualified service engineer of the contractor shall visit the site within the prescribed response time from the date and time of complaint for the machine. This response time shall be **48 hours, for upto 06 cases in entire 02 years (or extended warranty period) & Nil thereafter. 48 hours' response time shall be permitted only if 2 successive failures are staggered 3 months apart.** Complaints shall be lodged by consignee by fax, phone, e-mail, whatsapp or per bearer at address given by the tenderer.
- 16.5** The details of preventive maintenance to be provided during warranty period shall be indicated by the tenderer giving details of type of preventive schedule, periodicity on items to be checked, items to be replaced and expected plant down time. Preventive maintenance schedules shall be conducted on weekends as far as possible or any other day through mutual agreement with consignees. Total breakdown hours shall be calculated after discounting response time and preventive maintenance period.
- 16.6** Penalty will be levied on the contractor for breakdown period on hours' basis (including holidays) after discounting for the response time. Penalty will be calculated with full/partial deduction of amount of WBG, which shall be deducted from the WBG deposited with the ASRW

Breakdown period	Applicable penalty
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Up to 500 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	Nil
Exceeding 500 hours to 1200 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	25% of WBG amount
Exceeding 1200 hours to 2100 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	50% of WBG amount
Exceeding 2100 hours in entire duration of warranty of 02 years (plus extended warranty period, if any)	Full encashment of Warranty Bank Guarantee besides other action like noting adverse performance of the bidder and/or agent for future tenders and their offer in the subsequent tenders will not be considered for placement of any order for next 02 years.

17. **Comprehensive Annual Maintenance Contract :** The contractor shall be required to take CAMC of the entire machine supplied under the scope of contract.
- 17.1 Tenderers are required to quote for a comprehensive Annual Maintenance Contract for the various scope of work supplied post warranty on yearly basis giving the rates for each year i.e. first year, second year....so on., which will be inclusive of all spares, material and labour costs. The duties and taxes as applicable should be indicated separately. All consumables spares and materials shall form a part of the scope of CAMC excluding Diesel/Fuel, lubricating oils or coolant
- 17.2 CAMC shall be operated, managed and paid by the respective consignees. The consignee shall indicate the bill payment authority & custodian of the CAMC BG. No further agreement is required for operating CAMC at consignee end.
- 17.3 CAMC is a part of scope of supply, if included in commercial evaluation criteria vide clause 5 of Section-IV
- 17.4 The duration of CAMC shall be 5 years from the date of expiry of warranty. Rates for CAMC as quoted by the tenderer on yearly basis, will remain applicable during the duration of CAMC and not subject to any variation except any statutory changes in taxes and duties as compared to quoted rates.
- 17.5 The contractor must provide CAMC services at the consignee location without any precondition. The CAMC should include complete responsibility for the bought out sub-assemblies and components like CNC system, diesel engine, AC unit etc.
- 17.6 The details of preventive maintenance services to be provided under CAMC shall be provided by the tenderer in the following format.

S. No	Type of Preventive Schedule	Periodicity	Items to be checked	Items of replacement	Expected Plant Down Time
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- 17.7 Preventive maintenance shall preferably be conducted on weekends through mutual agreement with the consignee. Each preventive maintenance schedule normally shall not exceed one day (24 hours). The preventive maintenance regime offered must be aimed at achieving minimum 95% uptime of the plant excluding the plant down time for preventive maintenance schedules.
- 17.8 The tenderer shall ensure that in case a failure is reported by a consignee, qualified

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service engineer(s) of the contractor shall visit the site within the prescribed response time from the date and time of complaint for the machine. This response time shall be

48 hours for upto only one case per quarter during the period of CAMC & Nil thereafter. 48 hours response time shall be permitted only if 2 successive failures are staggered 3 months apart. Complaints shall be lodged by consignee by fax, e-mail, WhatsApp or per bearer at communication given by the tenderer. The responsibility to keep the failure reporting address details current will rest with the tenderer.

17.9 In case preventive maintenance is carried out along with breakdown maintenance schedule, preventive maintenance time will be deducted from breakdown time of the plant.

17.10 Penalty Clause: Penalty shall be levied on the contractor for maintaining up time below the limit of 95% calculated on working days basis, after discounting for response time and preventive maintenance period. Penalty shall be calculated as %age of quarterly payment and will be deducted from the respective quarterly payments. Penalty calculation will be done over quarterly payment period.

S.No	Availability Slab	Applicable Penalty
1	95% and above	Nil
2	Below 95%	2.5% for every 1% (or part thereof) reduction in availability of plant below 95%.

17.11 For CAMC, a Bank Guarantee (BG) equivalent to 5% of the combined quoted cost of equipment including accessories, shall be deposited by the contractor to the consignee, 90 days before the expiry of warranty. BG will have the validity of 5 years and 6 months.

The confirmation for the submission of this BG will be submitted to COFMOW for the release of WBG. The CAMC BG will be returned on completion of CAMC period. In case, the contractor fails to provide CAMC services successfully, the CAMC BG will be forfeited. This will be in addition to penalty as per Clause 17.10 above.

17.12 Up time of less than 75% for two consecutive quarters will constitute complete failure of contractor to provide the CAMC services successfully and will result in forfeiture of CAMC BG, besides other action like noting adverse performance of the bidder and/or agent for future tenders and their offer in the subsequent tenders will not be considered for placement of any order for next 02 years. This will be in addition to penalty Clause 17.10 above for the period of actual performance.

17.13 Since CAMC is part of evaluation of offer, it is the sole responsibility of contractor to stock all spares and materials as required for smoother execution of CAMC in order to achieve up time in compliance to plant availability as per stipulated requirements.

17.14 In case of damage on account of any external factor, viz., floods, earthquake, fire, arson or sabotage, it shall be the responsibility of the Railways for restoration of the plant to the earlier working order prior to the external factor and the entire cost for repair of the plant shall be borne by the railways.

17.15 In case of damage to the plant as mentioned in para 17.14, any spare parts and material necessary to restore the plant to proper working order shall be arranged by the contractor and charged on actual basis duly certified by authorized railway official in the next quarterly bills. The rates charged for such spare parts shall be based upon the spare part rate list provided by tenderer and supported by necessary documents.

17.16 In all cases of failure except as mentioned in Clause 17.14 any other spare part or material necessary to restore the plant to proper working order will be arranged by the contractor as a part of CAMC.

17.17 Normally quarterly payment (@ 1/4th of the annual quoted rates) under CAMC will be

made to the contractor within 30 days from the end of that quarter subject to submission

of the following documents by the contractor to the paying authority assigned by the consignee:

- a) Consignee's certificate for work done as per Annexure-G of Section-VI with calculation of down time and penalty applicable.
 - b) A certificate by consignee that no spare part is due with the contractor as per clause 17.13 above.
 - c) Bills submitted by the contractor & accepted by consignee.
 - d) Attested photocopy of the CAMC BG.
- 17.18** In case of failure of the contractor to provide CAMC services as defined in Clause 17.12, the CAMC BG shall be forfeited with levy of other penalties as applicable under advice to the contractor regarding termination of CAMC.
- 17.19** Other general conditions shall be governed by Bid Document Part-I (Section-I, II and III) as applicable to respective COFMOW A/T.

(WM/ASRW)

(SSE/BSS)

SECTION VI

Annexure-A

FORMAT FOR SUBMISSION OF TECHNICAL BID

1. a) We, M/s.----- offer our ----- machine, model no-----as per the description given in Schedule of Requirements.
- b) We state that, except for the following, for which clause wise brief description and justification for deviation has been indicated, our machine fully complies with all the clauses as given in technical specification Section- IV & V.
- c) We also confirm all the schedules given in the Delivery Schedule at para 7 of Section-IV.

S.No.	Clause/Item	Brief description of Deviation	Justification for deviation

Note 1: The bidder shall mention all technical deviations only in the format enclosed above and / or in proforma for statement of deviation from technical specification as per Annexure-9 of Bid-Documents Part-I.

Note 2: The deviation mentioned elsewhere in the bid shall not be considered and the bid shall be evaluated based on the information provided against Annexure-A of Section-VI.

Note 3: In case tenderer offers internationally accepted alternative specifications as per clause 1.7 of Instructions to Tenderers for filling technical bid, complete details of alternative specification, apart from filling above deviation statement, may be enclosed.

2. We further certify that we are meeting the reference clause as:

- (A) We are the regular manufacturer of this type of machine.
- (B) We have made the following past supplies of similar machines as per clause A(2) & A(3) of special conditions during last 10 years:-

S. No	Name of the Purchaser with Address.	Purchaser's Phone, Email Address, Name of the contact person	Purchase/ Supply Order number and date (along with a copy of the PO)	Quantity Supplied (with proof of supply) @	Date of Supply (@)	Date of Installation and/ or Commissioning @	Cutting Capacity in square & round section

@ (along with copies of relevant documents to establish linkages of documents/ entities as detailed in clause 5 of Qualifying Requirements).

- (C) We are submitting following performance certificate from past users as per clause A (4) of Special Conditions:-

S. No.	Name of the Purchaser with Address	Purchase/ Supply Order number and date (along with a copy of the PO) (It should be the one(s) which are enlisted at clause 2 B above.)	Quantity Supplied	Date of Supply	Date of Installation and/ or Commissioning	Date of issue of Performance Certificate	Performance as per Annexure-A1

3. We are having following facilities available with us or our agent for providing adequate aftersales service in India during warranty period. Complete details of after sales service, availability of technically competent engineers and warehousing facilities for spares is indicated below:

- After sales service centers;
- Availability of technically competent engineers;
- Warehousing facilities for spares;

4. We have quoted for the following optional accessories as indicated under clause 4.3 of section IV

S No.	Description of the optional accessory	Quantity (in Nos.)	Rate	Indigenous	Shelf Life (in Months)

5. We have quoted for following recommended perishable and non-perishable spares required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipments including controls on double shift working basis:

Perishable Spares:

S No.	Description of the spares	Part number	Quantity (In Nos)	Rate (In Rs.)	Shelf Life (in Months)

Non-perishable spares:

S.No.	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rs.)

6. *We hereby confirm that we are the OEM and undertake to supply spare parts for a period of expected life of machine.

OR

*We hereby confirm that we are not the OEM, but are submitting undertaking from OEM for supply of spare parts for a period of expected life of the machine to provide maintenance spares (as and when ordered) after the expiry of the Warranty/ CAMC

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for 5 years (life of machine - 15yrs) including the maintenance spares required for the bought out sub-assemblies and parts.

(*Strike out whichever is not applicable)

7. We have quoted consumables required as per clause 6.1 of Section V of Bid Document Pt-II, in the format give below

Sr No.	Description of the consumable spares	Qty	Unit	Rate

8. It is certified that we are having suitable facilities at our works for carrying out various performance tests on the sub-assembly/assembly/machine and these shall be made available to the inspecting authority.

9. **BOUGHT OUT ITEMS:** We hereby furnish a list of all critical items/ sub-assemblies which are bought out by us and proposed to be used, along with the manufacturer's name, brand model etc.

S. No.	Description	Item no.1	Item no.2	Item no.3
1.	Brief description of item			
2.	Model no.			
3.	Make			
4.	Quantity/machine			
5.	Manufacturer's name and complete address			
6.	Whether imported or indigenous			
7.	Country of origin			

10. The details of Preventive Maintenance during warranty and comprehensive Annual Maintenance Contract as per clause 16.7 & clause 17 of Section-V respectively. The Preventive Maintenance during warranty and comprehensive Annual Maintenance Contract is in the scope of this tender. Details of preventive maintenance services including cleaning of machine to be provided under PMC during warranty and CAMC as per clause 16.3 is given in the following format.

S.No	Type of preventive schedule	Periodicity	Items to Be checked	Items of Replacement	Expected plant Down time

11. We further submit the following information about the offered machine as per the technical specification **section V** and Important Features of the tender section IV. We understand that any omission of any of the below mentioned information will render our offer incomplete to that extent.

Note :- Bidder shall photocopy the specification (Section-IV & V) and furnish comments/ details against each clause or link to deviation statement. Any fraudulent change(s) made in COMFOW specifications (while making photocopy) will lead to summarily rejection of offer. Appropriate punitive action may be initiated

S.N.	Information required	As per Clause No.	Value /Write up/ Brochure																																																				
1.	<table border="1"> <tr> <td>2.2</td><td colspan="3">Leading parameters</td></tr> <tr> <td>2.2.1</td><td colspan="3">Major parameters:</td></tr> <tr> <td>Clause no. of Section-IV</td><td>Item Description</td><td>As specified</td><td>Value/ Write up/ Brochure (As offered)</td></tr> <tr> <td>1.1</td><td>Cutting capacity (Square)</td><td>340 mm x 340 mm (Minimum)</td><td></td></tr> <tr> <td>1.2</td><td>Cutting capacity (Round)</td><td>340 mm (Minimum)</td><td></td></tr> <tr> <td>2.2.1.3</td><td colspan="3">Cutting Length Accuracy and parallelism</td></tr> <tr> <td></td><td>a) Cutting length accuracy:</td><td>± 0.2 mm/indexing i.e. per stroke/ per single complete cut</td><td></td></tr> <tr> <td></td><td>b) Cutting length accuracy:</td><td>± 0.2 mm/indexing i.e. per stroke/ per single complete cut</td><td></td></tr> <tr> <td>2.2.2</td><td colspan="3">Other Parameters</td></tr> <tr> <td>1.1</td><td>Band speed range (infinitely variable)</td><td>20 m/min to 100 m/min</td><td></td></tr> <tr> <td>1.2</td><td>Smallest diameter/ Square/Angle Section that can be cut</td><td>35 mm (Minimum)</td><td></td></tr> <tr> <td>1.3</td><td>Table Capacity</td><td>1800 kg (Minimum)</td><td></td></tr> <tr> <td>1.4</td><td>Band saw AC drive motor power</td><td>5.5 kW (Minimum)</td><td></td></tr> </table> <p>Note: In case of any deviation in other parameters above, technical justification should be furnished in offer.</p>	2.2	Leading parameters			2.2.1	Major parameters:			Clause no. of Section-IV	Item Description	As specified	Value/ Write up/ Brochure (As offered)	1.1	Cutting capacity (Square)	340 mm x 340 mm (Minimum)		1.2	Cutting capacity (Round)	340 mm (Minimum)		2.2.1.3	Cutting Length Accuracy and parallelism				a) Cutting length accuracy:	± 0.2 mm/indexing i.e. per stroke/ per single complete cut			b) Cutting length accuracy:	± 0.2 mm/indexing i.e. per stroke/ per single complete cut		2.2.2	Other Parameters			1.1	Band speed range (infinitely variable)	20 m/min to 100 m/min		1.2	Smallest diameter/ Square/Angle Section that can be cut	35 mm (Minimum)		1.3	Table Capacity	1800 kg (Minimum)		1.4	Band saw AC drive motor power	5.5 kW (Minimum)			
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2.	Technical Details/Particulars of Motors, Control Gears, Voltage Stabilizer & Isolation Transformer																																																						
2.1	A.C. Motors and Control Gears AC MOTOR <ul style="list-style-type: none"> • Manufacturer's Name • Type of enclosure • Type of duty (Ref. IS: 325) (Latest) • Rating-Continuous/intermittent • Output (KW/BHP) • AC voltage across phases, number of phases & frequency. • Speed in RPM • Class of insulation • Normal full load current • Starting current • Maximum current at the time of change over from lower speed to higher speed. 																																																						

	<ul style="list-style-type: none"> • Type of Motor-Squirrel cage/slipping (wound rotor) • Temperature rise of windings and other parts allowed above an ambient temperature of 50-degree C. • Frame size of motor • End use of motor <p>CONTROL GEARS</p> <ul style="list-style-type: none"> • Manufacturer's Name • Type of control gear (Direct on line/Star Delta/Auto-transformer etc.) • Rating of starting gear in KW & amps. • Short circuit protection (y/n) • No volt trip (y/n) • Overload trip (y/n) • Delayed action current sensitive single phasing preventor (y/n) • Standard specifications to which the motor • control gear and its ancillary offered conform to 		
2.2	<p>D.C. Motors and Control Gears</p> <p>DC MOTOR</p> <ul style="list-style-type: none"> • Manufacturer's Name • Type of enclosure • Type of duty (Ref. IS- 4722) (Latest) • Rating-Continuous/intermittent • Output (KW/BHP) • DC voltage across phases, number of phases & frequency • Method of excitation whether shunt, series, compound or separately excited, if separately excited state excitation voltage. • Speed in RPM • Class of insulation • Normal full load current in amps. • Starting current • Temperature rise of windings and other parts allowed above an ambient temperature of 50° C. • Frame size of motor • End use of motor <p>CONTROL GEARS</p> <ul style="list-style-type: none"> • Manufacturer's Name 		

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Asst
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	<ul style="list-style-type: none"> Type of control gear (Direct on line/Resistance type/Thyristor type) Rating of starting gear in KW & amps Short circuit protection (Y/N) No volt trip (y/n) Overload trip (y/n) Standard specifications to which the motor control gear and its ancillary offered conform to Standard specification to which control gear conforms to 		
2.3	Voltage Stabiliser & Ultra Isolation Transformer VOLTAGE STABILISER <ul style="list-style-type: none"> Manufacturer's Name Type of voltage stabilizer: <ol style="list-style-type: none"> DC servo motor type AC servo motor type Solid state Rated capacity in KVA Nos. of phases & frequency Type of input supply unbalanced Input voltage Output voltage Rate of correction Class of insulation & winding (only copper wound is acceptable) Type of control circuitry Class of duty Type of cooling Indicating instruments and their ranges Safety features ULTRA ISOLATION TRANSFORMER <ul style="list-style-type: none"> Manufacturer's Name Rated capacity Ratio of input/output voltage Class of insulation Arrangement for suppression of power line surges, spikes, transients and noises Type for cooling. 		
3	Operating & Maintenance Tools <ul style="list-style-type: none"> Make Description Quantity 	4.2.3 of Section IV	
4	Lubricating, hydraulic, cutting oil & grease <ul style="list-style-type: none"> Indigenous brand 	4.2.5 of Section IV	

	• Quantity		
5	Details of optional accessories	4.3 of Section IV	
6	Safety features <ul style="list-style-type: none"> • Nos. & location of emergency switches • Nos. of hardware limit switches • Nos. of interlock switches & overloads • Any other safety feature 	1.1 of Section V	
7	Actual value of flatness, parallelism and tolerance of cut-off length.	1.2.2.2 of Section V	
8	The details of <ul style="list-style-type: none"> • Material of castings/steel plates • Stress relieving cycle 	1.2.4.1 of Section V	
9	The system of lubrication	1.2.6.3 of Section V	
10	The features available in the machine to stop if band deflection over rides preset value of maximum kerf of 5mm	1.2.6.7 of Section V	
11	The saw blade width, thickness and TPI. The teeth designs, hardness of cutting teeth and back up plate of band saw should be detailed in the offer.	1.2.7.1 of Section V	
12	The actual grade of blade & average life of blade & name of blade manufacturer.	1.2.7.2 of Section V	
13	The actual system offered for feed	1.2.8.1 of Section V	
14	The mechanism provided to stop cutting action at any point of time	1.2.8.3 of Section V	
15	The system offered for automatic feed/stroke adjustment	1.2.8.4 of Section V	
16	The actual system offered for automatic blade adjustments to cut any material and size with the same blade	1.2.8.5 of Section V	
17	Material and hardness of wear plates	1.2.9.2 of Section V	
18	Detail of the depth control system provided	1.2.10.4 of Section V	
19	Actual details, i.e. make, resolution, accuracy of measuring system	1.2.10.5 of Section V	
20	The diameter of brush and other details of chip removal system	1.2.11.1 of Section V	
21	Details of coolant system	1.2.12.1 of Section V	
22	Details of lubrication system	1.2.13.1 of Section V	
23	The details of anti-corrosive treatment used	1.2.15.3 of Section V	
24	Technical details of motors and control gear	2.2 of section V	
25	Dimensions of the machine(L x W x H) mm x mm x mm		
26	Total working area (L x W x H) required mm x mm x mm		

Signature of the
authorized representative of the
bidder with company stamp

Handwritten signature
SSE/BSS

FORMAT FOR INDEMNITY BOND

This deed of Indemnity executed by M/s. _____ hereinafter referred to as Indemnifier which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, representative and assignees in favour of Central Organisation for Modernisation of Workshops, Railway offices Complex, Tilak Bridge, New Delhi – 110 002 India, hereinafter referred to as the Indemnified which expression shall unless repugnant to the context or meaning thereof, include its successors and assignees witnesses as to

Whereas the Indemnifier herein had participated in a global tender for the supply of _____ (machine name) which is opened on _____ (date) on terms and conditions set out inter alia in the Tender Document.

And whereas, clause of the above mentioned tender document described that the machine shall be designed for a life of 15 years with regular maintenance and all the structural members of the machine should be guaranteed for 15 years against cracks, breakages etc. during the course of normal operations from the date of commissioning whichever is earlier of the stores supplied by the Indemnifier to the indemnified.

The indemnifier hereby irrevocably agrees to indemnify the indemnified that in the event of the said machine not achieving the life guarantee, the indemnifier shall as may be deemed necessary repair the defective machine at site, free of cost, within a reasonable time specified by the indemnified or reimburse the pro-rata cost of the machine to the extent a life not achieved as per the guarantee, or supply a spare stores for the defective portion only free of cost at site.

Bidder's authorized signatory
With seal

Station:


Date:


Witness: 1.-----

(Signature with Name, Designation & Address)

2. -----

(Signature with Name, Designation & Address)


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Annexure-C

JOINT RECEIPT INSPECTION NOTE

Note: With the issue of JRI, payment is released to the contractor, as per the terms of contract. Consignee shall satisfy themselves that the conditions of contract are met before issue of the JRI.

Sub: Receipt of consignment for machine _____ **Date:** _____
Ref: ASRW PO number _____

1.	Name of consignee/Railway	
2.	Machine name	
3.	Quantity	
4.	Name of supplier	
5.	Consignment of the machine received on	
6.	The foundation & associated works essential for "Safe Installation of Machine" are ready (for turnkey contracts only) *	

* If there are Delays on account of Consignee such as clear site is not given, then the condition 6 will not be a valid ground for holding JRI.
 It is certified that the consignment of the machine has been received complete and in good condition as per specification shown in the contract.

Tentative plan for installation and commissioning of the machine is as under

1.	Date of clear site provided	
2.	Contract	Turnkey/Non-turnkey
3.	Status of readiness of foundation:	
3(a)	Already constructed on	
3(b)	Under construction & likely date of its completion	
3(c)	Construction yet to be started from and likely date of its completion	
4.	Status of availability of electrical power, water and compressed air etc.	Available/Not-available
5.	Number of components to be proved out on the machine	
6.	Likely date for start of erection/installation	
7.	Likely date for switch-on the machine	
8.	Likely date of completion of commissioning of the machine	

Representative of firm
Designation

Representative of consignee
Designation
(Minimum Gazetted level)

[Handwritten signature]

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[Handwritten signature]
 SFE/EST

JOINT COMMISSIONING NOTE

Date.....

Sub: Commissioning of (name of machine).....

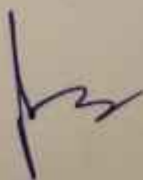
Ref: COFMOW AT No.....


1.	Name of consignee/Railway	
2.	Machine name	
3.	Quantity	
4.	Name of supplier	
5.	Machine received on	

6. All the parameters of the machine are found okay. The proving test on the machine was conducted from to and machine is working satisfactorily.
7. Machine has finally been commissioned on..... The machine has been handed over for regular use and kept under one month observation to watch its performance.
8. Following minor deficiencies (if any) found during joint observation trials are to be attended/rectified by the firm during one month observation and before issuing the PTC for the machine:
- -
 -

Representative of firm
Designation

Representative of consignee
Designation
(Minimum Gazetted level)


(WM/ASRW)


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PERFORMANCE APPRAISAL FORM

APPRAISAL ON COMPLETION OF ____ YEAR of WARRANTY PERIOD

To, M/s.	Dated	
1. ASRW AT No.		
2. Consignee/Railway		
3. Name of supplier		
4. Machine Name		
5. Machine received on		
6. Machine commissioned on		
7. PTC issued on		
8. Warranty period expired on		
9. Performance during warranty period:		
9(a) Total number of breakdowns		
9(b) Total downtime in number of days		
10(a) Any warranty complaint pending on date	Yes/No	
10(b) If yes, then the date and nature of defect(s)		

11. In case, of the machine with mandatory PMC during warranty period, following details of breakdown hours for preceding eight quarters must also be furnished.

Quarter	Period From -----To-----	Breakdown hours
1		
to		
8		

Signature -----
 Name -----
 Designation: DY.CME
 Office Stamp

1. Dy CMM/ASRW
2. AFA/ASRW

Note:

- i.) This appraisal may please be sent immediately on completion of first and second year of warranty period. If any extension of warranty period required, may please also be mentioned with details
- ii) Sr.Scale Officer having independent charge is also authorised to sign.

LIST OF COMPONENTS TO BE LOADED ON THE MACHINE

Applicable for Schedule-1			
S N	Component Name	Drawing No.	Operation to be carried out
1	Draft Gear RF-361	Sketch of components	Cutting of Rear Wall Plate

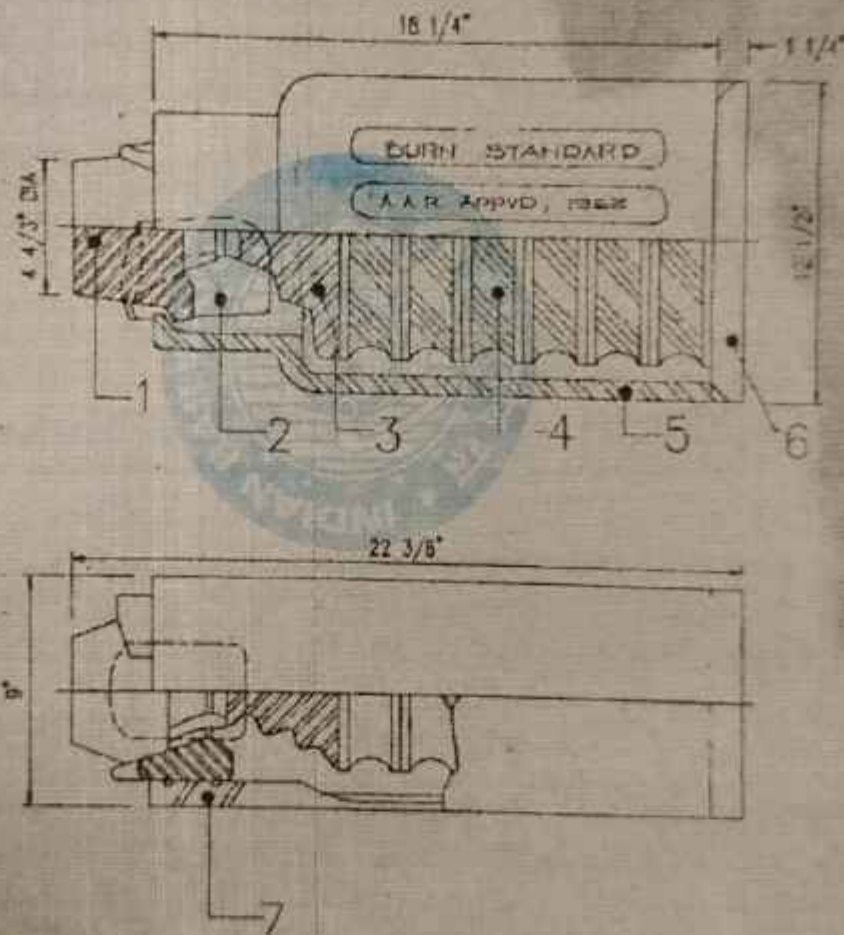
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High Capacity Draft Gear RF-361

1. Wedge 30°	STL Forging Carburized	555-683 BHN	1
2. Shims 30°	--do-- --do--	444-495 BHN	3
3. Top Follower	Drop Forged Heat Treated		1
4. Elastomer units (Rubber pads)	Class RP-8		6
5. Housing (cylinder)	Cast Steel Quenched		1
6. Rear Wall plate	ASTM A572 Grade 50		1
7. Bore Inserts	Non Ferrous		6
No. Item	Matl. Specn.	Hardness No.	Qty. set

DRAFT GEAR ASSEMBLY (SKETCH - 1)



Consignee's Certificate for Quarterly Work Done Under CAMC

1. Name of Plant: _____
2. Consignee _____
3. ASRW AT No. _____
4. Name of Contractor _____
5. Quarterly charges for CAMC (Standard): Rs. _____
As per ASRW AT no. _____ dt. _____
6. Quarter for which bills are preferred: _____
From: _____ To: _____
7. No. of Breakdowns during the quarter: _____
8. **Calculation of Penalty and Net CAMC charges payable to Contractor for the quarter:**
 - i. Total Plant Down Time (in days): _____
 - ii. Standard down days for preventive maintenance (in days/quarter): _____
 - iii. Total grace period for break down: _____
 - iv. Net down time for the plant [= (i)-{(ii)+(iii)}]: _____
 - v. 100% Availability for the quarter (in days): _____
 - vi. Actual availability [= (v)-(iv)]: _____
Actual availability in %age [= {(vi) / (v)}x 100]: _____
 - vii. Calculation of penalty:
 - a. %age availability below 90% to 80%: _____
 - b. %age availability below 80%: _____
 - c. Penalty[={(vii a)x(5)x0.005 +(vii b)x(5)x0.01)}]: _____
 - viii. Net amount payable as CAMC charges to [= (5)-(vii c)] _____

It is certified that all spares borrowed by the contractor for the previous quarter have been returned in good condition.

Signature of authorized representative of consignee

NORTHERN RAILWAY MECHANICAL WORKSHOP, AMRITSAR

Report on Capability Assessment of New Vendors

M/s (Name of Vendor).....

Machine/Product Class

Contents:

- Para - 1 : General Information
 Para - 2 : General Information (Technical)
 Para - 3 : Design Capability
 Para - 4 : Manufacturing Process
 Para - 5 : Quality Assurance
 Para - 6 : After-Sales Service
 Para - 7 : Past Performance
 Para - 8 : Commercial Information
 Para - 9 : Conclusions
 Para - 10 : Recommendations

List of Annexures :

- A : List of Managerial Staff
 B : Plan of Works to be assessed
 C : List of Machinery & Plant
 D : List of Raw Materials in Stock
 E : Q.A.P. of the Firm.
 F: List of QC equipments, Measuring equipments and Gauges
 G : List of Important Customers & Orders
 H : List of pending orders
 I : Performance of Machines supplied
 J: Proof of Ownership
 K : Factory License, NSIC/ SSI
 L: Copy of Latest Electricity Bill
 M : Certified copies of Balance Sheet and Profit & Loss accounts
 N : Income Tax Clearance Certificate

Other Annexure (if any)

Report on Capability Assessment of New Vendors

i)	Name of Vendor:	
ii)	Purpose: (Assessing officers should detail the purpose of assessment, manufacturer, name of the machine and the tender number which necessitated assessment or otherwise.)	
iii)	Scope: (The scope should define scope of capability assessment carried out detailing the machine/system or range of machines/systems.)	
iv)	Details of Stores/Items/Parts/ components for which assessment is carried out. (Indicate complete description. Vendor should submit a request to include more similar items in the assessment if required). Assessment done on	
S. No.	Clause Description	
1.0	General Information	
1.1.	Background of vendor in Brief	
1.1.2	Location	
1.2	Postal Address	
i)	Head Office	
ii)	Works/Factory (as per Factory License):	
1.3	Telephone No. (with STD code and Mobile)	
i)	Head Office	
ii)	Works/Factory	
iii)	Authorized Person who can be contacted telephonically:	
1.4	E-mail IDs	
i)	Head Office	
ii)	Works/Factory	
iii)	Authorized Person	
1.5	Description of Factory/Works.	
i)	Total land area: (in Sq. metres)	
ii)	Total covered area: (in Sq. metres)	
iii)	Different sub-units (With details of covered/ uncovered area, etc.)	
iv)	Special features, if any:	
1.6	No. of personnel employed (category-wise).	
i)	Managerial (List to be attached as Annexure-A)	

ii)	Supervisory Permanent: Temporary:	
iii)	Skilled artisans Permanent: Temporary:	
iv)	Unskilled Permanent: Temporary:	
1.7	Hours of working	
1.8	Is this first inspection for assessment? If it is a re-inspection, details of earlier capability assessment(s) to be recorded and attached	
2.0	General Information--Technical	
2.1	Description of different departments in the Factory/Works and function of each department.	
2.1.1	The break-up of different work areas given below	
	Unit - I	
	Administrative Block:	
	Fabrication and assembly:	
	Machine Shop:	
	Store:	
	Laboratory:	
	Unit - II, Unit-III...	
	Administrative Block:	
	Fabrication and assembly:	
	Machine Shop:	
	Store:	
	Laboratory:	
2.1.2	A plan of the works, as described above, to be attached	
2.2	Detailed description of Machinery and Plant in each department Unit wise (make and year of procurement/commissioning to be provided. For special type of equipment copy of pamphlets/ write-ups to be furnished so as to supplement the description). The list of machinery & plant available to be attached.	
1.2.1	It was observed that (Comments of Assessing Office(s), on machines and infrastructure)	

2.3	Plans for future expansion, if any.....	
2.4	Details of raw-materials held in stock (state whether imported/indigenous).	
2.5	Production Capacity.	
i)	Per month :	
ii)	Per year :	
2.5.1	Whether Production capacity has been certified by external agencies? If yes, then details/ certificates to be attached. (Comments of Assessing Officer(s))	
2.6	Enumerate Type of Stores/Items, which the firm is capable of manufacturing. (Comments of Assessing Officer(s))	
3.0	Design Capability	
3.1	Availability of Qualified Personnel. (Comments of Assessing Officer(s))	
3.2	Assessment of Expertise and Facilities. (Comments of Assessing Officer(s))	
4.0	Manufacturing Process	
4.1	In-house Manufacturing Facilities for the item(s) being assessed. (Comments of Assessing Officer(s))	
4.2	Details of manufacturing process relevant to the items for which assessment is carried out. (Comments of Assessing Officer(s))	
4.3	Important Items/processes Outsourced by the Vendors (Comments of Assessing Officer(s))	
4.4	What is the system of traceability of the components/sub-assemblies manufactured in-house and outsourced? (Assessment team to comment on the traceability records maintained by the vendor for the range of machines manufactured, from the stage of drawings to dispatch of material/machine.)	
5.0	Quality Assurance	
5.1	Does the factory have an established Quality Assurance Programme? If yes, please enclose a copy of the write-up? If not, what plans are there if any for setting it up? (Comments of Assessing Officer(s))	
5.2	Details of Quality Assurance Organization. Names of key personnel, their qualifications, designations and position in overall management structure (Data in tabular form, explain with organization chart, if necessary).	
5.2.1	The QC organization is headed by Shri, who is designated as, with	

	Responsibility for	(Comments of Assessing Officer(s))
5.3	Enlist Quality Control Testing Facilities and Laboratory equipment available.	
5.3.1	In-house facilities available for inspection and QC include the following:	
	i)	
	ii)	
	iii)	
	iv)	
	v)	
5.4	Availability of gauges	
5.4.1	The following important items of gauging and other related equipment are available:	
5.5	Calibration of Laboratory/test equipment/gauges, indicated in para 5.3 and 5.4 above:	
i)	How is the calibration done? :	
ii)	Frequency of calibration. :	
iii)	System to ensure that calibration of above equipments : does not fall overdue.	
iv)	Action taken if such calibration has fallen overdue: (Comments of Assessing Officer(s))	
5.6	Source of procurement of raw-materials, important bought-outs, and steps taken to ensure their quality. (Comments of Assessing Officer(s))	
5.7	Details of inspection/ checks done on material during various stages of the above manufacturing process. (Comments of Assessing Officer(s))	
5.8	Have acceptable values for the parameters inspected during above stage checks been laid down? If yes, the action taken if value of the parameter inspected does not meet the desired laid-down value. (Comments of Assessing Officer(s))	
5.9	System for documentation of the results of the above stage checks. (Comments of Assessing Officer(s))	
6.0	After-Sales Service	
6.1	After-Sales Service Facilities Available at Works and Branch Offices.	
6.2	What is the system of recording customer complaints and action taken their upon? (Comments of Assessing Officer(s))	
6.3	Assessment of Quality of Service Including Response times. (Comments of Assessing Officer(s))	
7.0	Past Performance	

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7.1	List of important customers of the firm (as relevant to the works for which assessment being done)	
7.2	Details of important orders executed/ supplies in the past. Also included in	
7.3	Details of Pending orders in hand	
7.4	Whether another unit/factory of the firm is already approved by ASRW for supply of stores/ components. (Comments of Assessing Officer(s))	
7.5	Performance of machines manufactured and supplied in the past to different consignees. (Comments of Assessing Officer(s))	
7.5.1	Machines at M/s..... (Name of consignee)	
7.5.2	Conclusions on performance (Attach performance certificates from atleast 5 consignees where machines are working for more than one year since commissioning (Comments of Assessing Officer(s))	
8.0	Commercial Information	
8.1	Copies of following documents obtained and attached as Annexures.	
i)	Proof of Ownership. : Annexure-1.	
ii)	Factory, License, NSIC/SSI:	
iii)	Latest Electricity Bill.:	
iv)	CA/CS certified copies of Balance sheets and Profit & Loss accounts :	
8.2	Whether the firm is registered under Indian Factories Act. (Comments of Assessing Officer(s))	
8.3	Whether the firm comes under the scope of Industries (Development & Regulations) Act, 1951. (Comments of Assessing Officer(s))	
8.4	Income Tax Clearance Certificate Copy attached at	
9.0	Conclusions (Comments of Assessing Officer(s))	
10.0	Recommendations (Should detail the findings in line with the scope of the assessment)	

(Signatures of the Assessing Officer(s)
Name & Designation

Place:
Date:

Annexure-A1 (Certificate of Performance)

Important Note: i) The certificate shall not be older than one year from the original date of closing of tender. The performance certificate issued after original date of closing of tender (in cases where tender closing date has been extended) are also acceptable however the machine must have completed one year of satisfactory working after date of commissioning as on original date of closing of tender.

ii) Performance certificate shall contain following information.

Letter Head of issuing authority

(See Important Note above) Date of issuance:

CWM/ASRW
TO WHOMSOEVER IT MAY CONCERN

SN	Head	Details
1	Name of the Supplier	
2	Name of End User	
3	Name of the machine/description of machine	
4	Purchase/Supply Order Number	
5	Date of Purchase/Supply Order	
6	Date of Supply of machine(s)	
7	Quantity supplied	
8	Manufacturer's Serial Number(s) of machine(s) or Plant/system etc. number (or some mode to identify the machine) (Optional)	
9	Date of Commissioning (Give individual date for each machine)	
10	Performance of the machine	Satisfactory/unsatisfactory
11	Any other information which user intends to append, for example a) aspects bringing out similar nature of machine, b) major/leading parameters of the machine	

Name & Designation

Contact Number

Signature of the issuing authority

Email id

(Seal of the Organisation)

(WM/ASRW)

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Aug
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QUALITY ASSURANCE PLAN

MACHINE DESCRIPTION:

Category	S No.	Component/ Process	Sample Size	Type of Check	Quality record	Type of Check	Remarks
Bought Out Raw Material		Steels	1 Sample / Size	Chemical & Mech.	TC & INV	CHP	
Bought Out Components		Bearings	100%	Visual	Inv	CHP	
		Electric Motors	100%	Review of TC	TC & INV	V	
		Hydraulic Pumps & Elements	100%	Review of TC	TC & INV	V	
		Rubber Seals, O Rings & Seals	100%	Visual	TC & INV	V	
		Controllers	100%	Review of TC	TC & INV	V	
		Ball Screw	100%	Visual	IIR	V	
Bought out sub- assemblies		Weld joints					
		Load Bearings	100 %	RT	IR	CHP	
		Others	5 %	DPT	IIR	V	
		Hardness and	100%	Hardness	IIR	V	
In process Inspection stage							
		Heat Treatment	100%	Review of Inv.	IIR	V	
		Castings	100%	Visual	IIR	V	
		Spindles	100%		IIR	V	
		surface finish of components	Rando m	Surface	IIR	V	
		Noise level	100 %	Sound	IIR	CHP	
		Temperature rise	100 %	Measurem ent	IIR	V	
		Structures Geometry alignment, Guideways	100%	Relevant ISO/DIN/IS / JIS standard	IR	CHP	

INV - Invoice
Customer Hold Point
Inspection Report

TC - Test Certificate
IIR - Internal Inspection Report

V - Verification
CHP -
IR -

Dated

M/s

Ref. ASRW Contract/AT No. dt.

a) Description of the machine (s) _____

b) Machine No.(s) _____

c) Quantity _____

d) Bill of Lading No. _____ dt. _____ } (for imported

e) Name of the vessel _____ } contract

f) R/R No./L.R./Dispatch particulars _____

g) Name of the Consignee _____

h) Date of first submission of GA/foundation drawings (if applicable) _____

indicate delays in number of days: On Railways Account _____ days

on Firm's Account _____ days

Total _____ days

i) Date of final approval of GA/foundation drawings (if applicable) _____

indicate delays in number of days: On Railways Account _____ days

on Firm's Account _____ days

Total _____ days

j) Date of receipt of the machine _____

k) Date of joint verification _____

l) For machines ordered on non-turnkey basis:

i)- Date of power supply provided for the machine by the
Railway _____

ii)- Date of call to the contractor after site/foundation/installation etc
is ready by the Railway _____

m) For machines ordered on turnkey basis:

i)- Date of intimation of readiness of site for starting foundation
work (if relevant in terms of contract) _____

ii)- Date of readiness of foundation by the contractor _____

iii)- Date of readiness of other infrastructure facilities like shed, track
linkage etc. by the Railway/contractor (delete whichever is not
applicable) _____

iv)- Date of power supply provided for the machine by the
Railway _____

v)- Indicate delays in number of days: On Rly. account _____ days

On Firm's account _____ days

Total _____ days

n) Time allowed for commissioning after date of call as per L (ii) above or after date
of readiness of site as per m(iii) above (as relevant in terms of contract) number of
days allowed _____

And
SSE/BSS

- o) Date of commissioning of the machine _____
Indicate delays in commissioning in number of days:
i)- On firm's account due to reasons such as non-arrival of engineer,
problem in machine/toolings etc.
_____ (state reason) _____ days during **Installation/commissioning & prove out.**
ii)- On Railway's account due to reasons such as non-provision of
Raw/Trial material, Crane, Staff, Measuring tools/gauges etc.
_____ (state reason) _____ days during **Installation/commissioning & prove out**
- p) Whether delay in supply of the machine (if any), has caused any loss/inconvenience to the Railways (Yes/No) _____.
If yes, extent of loss in monetary terms: Rs. _____ (Details to be enclosed if loss is quantifiable. However, if loss is not quantifiable then indicate "Not Quantifiable" in the space provided).
2. Details of Accessories/Spares not yet supplied and recoveries to be made on that account.
- | <u>S. No.</u> | <u>Description</u> | <u>Amount to be recovered</u> |
|---------------|--------------------|-------------------------------|
| a) | | |
| b) | | |
3. The proving test has been done to our entire satisfaction and the operators have been trained to operate the machine as per provisions of the contract. If not, the amount to be recovered on this account: Rs. _____
4. You have failed to fulfill the contractual obligations with regard to the following:
a) _____
b) _____
5. The amount of recovery on account of non-supply of accessories and spares is given under para - 2 & 3 above and loss/damage on account of your failure to fulfil the contractual obligations as given in Para 4 above will be advised to you by ASRW. These shall be recovered from your bills/Performance Guarantee Bond in terms of Para 0705 of General Conditions of contract. Bid Documents Part- I.
6. This issue of commissioning/PTC certificate proves only the technical acceptability and functioning of the machine on the date of issue of the Certificate. This issue of PTC does not amount to waiver of any of the terms and conditions of the contract or delay in supply of drawings, machine or commissioning thereof and it does not absolve the supplier of its liability for any loss or damages suffered by the Railways due to same.

Signature _____ (To be signed in all the pages)
Name _____
Designation: **JAG/ SG officer**
Office Stamp

Copy by Speed/Regd. Post to:

1. **Dy.CMM /ASRW**
2. **AFA/ ASRW,**
3. **Dy.CME/Plg & EnHM, Hq , New Delhi**

Signature _____
Name _____
Designation: **JAG/SG officer**
Office Stamp

Note: Sr. Scale Officer having independent charge is also authorized to sign this certificate.

SPECIAL CONDITION

Specification No. ASRW/2025-26/Heavy Metal cutting band Saw


Qualifying Requirement of Heavy Duty Horizontal High Speed Metal Cutting Band Saw (340 mm and 340 mm x 340 mm square):

1. The tenderer shall provide satisfactory evidence, acceptable to the purchaser to show that he is a regular manufacturer, has adequate plant & manufacturing capacity and has a "Quality Assurance Program". The manufacturer shall have valid ISO 9001 certificate on the original date of closing of tender and a copy of same should be submitted along with the bid. Band Saw Machine should be within the scope of ISO certificate.
2. The bidder/ manufacturer must have supplied at least 03 no of same/similar machine in last 05 years (to be reckoned from the original date of closing of tender).

Statement of past supplies along with, (i) purchaser's name and (ii) address, (iii) email address and (iv) phone/fax number of purchaser, (v) purchase order (PO) or supply order number and (vi) PO date (vii) along with the copies of purchase order (PO), (viii) quantity supplied (with proof of supply), (ix) date of supply and (x) their commissioning date shall be submitted with the offer.

Copies of POs/commissioning/performance certificate submitted shall also indicate the parameters/ specification of subject machine to prove same/ similarity aspect of the machine as mentioned in para 3 below; technical specifications of the machine from the related document of the PO may be attached to supplement the PO in regard to the respective parameters of similarity aspect of the machine. Specifications attached shall have linkages to the PO.

3. For the purpose of similarity, similar machine required under clause 2 means: **"Heavy Duty Metal Cutting Band Saw of minimum cutting capacity i.e. 340 mm x 340 mm for square section and 340 mm diameter in round or more"**.
4. The tenderer shall, in their offer, submit performance certificate of at least 01 number of such machine (which are counted for the purpose of clause 2 above) supplied in the last 05 years and the machine covered by these certificates must have worked satisfactorily for at least one year from the date of commissioning as on the original date of closing of tender.



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The certificate shall not be older than one year from the original date of closing of tender. The performance certificate issued after original date of closing of tender (In case, where tender closing date has been extended) are also acceptable, however, the machine must have completed at least one year of satisfactory working after date of commissioning as on original date of closing of tender.

The performance certificate submitted by the tenderer shall have been issued by the actual end user organization of the machine, with their clear signature and address therein, in whose premises the machine is installed and commissioned. Performance certificates should be as per Annexure-A1.

5. All necessary information/ document(s) required for establishing reference requirement as per clause (2) to (4) above shall be submitted by the bidder along with original offer itself for establishing linkage of documents/entities such as manufacturer /PO/ consignee/ supply/ Installation/ Commissioning/ performance certificate of the machine. No further clarification/ correspondence shall be sought/ entertained in this regard. In case, no information or incomplete information or illegible information is furnished by the bidder, their offer shall be summarily rejected.
6. Non-compliance of following shall lead to summarily rejection of the offer and no correspondence in this regard will be entertained.
 - a) The productivity requirement, as specified in Clause 2.4 of Section IV of the bid documents shall be clearly furnished.
 - b) There shall not be any deviation from the Major parameters mentioned in clause 2.2.1 of section IV of the Bid Documents Part-II.


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