

RAIL COACH FACTORY, KAPURTHALA			
Specification No.	Description	Page No.	Date
Mech/M&P/3800/02 Rev.- NIL	Rough Terrain Hydraulic Mobile Crane Cap-20 Ton	1 of 25	09.05.2024

	INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID
i	The bidder must submit the technical offer as per the specification. All the information as asked for must be given accordingly. e.g. wherever a parametric value is sought, it should be furnished, similarly, if a brochure or drawing or sketch is warranted the same need to be provided.
ii	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) (where applicable).
iii	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 any of these accessories upfront, the price must be quoted for comparison purposes and their recommendation/suggestion indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
iv	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.
v	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 along with the supporting documents.
vi	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, the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
vii	<u><i>Bidder or his authorized agent, in their own interest, should visit RCF 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.</i></u>
ix	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 along with the offer.
x	Purchaser reserves the right to verify the details submitted by the bidder by actual site visits.
xi	Other term and condition of the contract will be as per Indian Railway Standard Conditions of Contract.

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1.	<b>PURPOSE FOR WHICH REQUIRED AND CAPABILITY:-</b>
1.1	<b>Capability:-</b>
1.1.1	The crane should be capable of:
i	Hoisting i.e. lifting and lowering of all loads up to the maximum specified working load at different specified speeds & radii.
ii.	Traveling at specified speeds under both loaded and unloaded Conditions.
iii.	Slewing through a given range in either direction as indicated at item 2.2.1 of Schedule-I.
iv.	Hoisting, traveling & derricking.
v.	It should be capable of working in a hot, humid and dusty atmosphere. Temperature range is expected to be $0^{\circ}$ -4 C to 50° C and humidity up to <u>98%</u> <del>100%</del> . The machines offered shall be suitably tropicalised to work under these atmospheric conditions without any adverse effect on their performance.
vi.	The temperature rise shall not reach such a value that there is a risk of injury to any insulating material or adjacent parts.
2	<b>DESCRIPTION &amp; SCOPE OF SUPPLY:-</b>
2.1	<b>Description:-</b>
2.1.1	The specification covers the design, manufacture, supply, testing and commissioning of Diesel-hydraulic Road Mobile Crane of capacity indicated at Schedule-I.
2.1.2	Necessary information regarding the conditions under which the crane is to be used, together with other particulars necessary for manufacture and commissioning of the crane, are given in Schedule-I.
2.1.3	Tenderer should furnish a description of technical details as per Schedule-II of the technical specification, in addition to clause-wise comments on these specifications.
2.1.4	<b>Standards:-</b>
	<p>The cranes shall be designed, manufactured and tested generally in accordance with the following specifications:</p> <p>i. ISS: 4573-1982 or latest Indian Standard Specification for Power driven mobile cranes, or equivalent international specification.</p> <p>ii. ISS: 807-1976 or latest, Indian Standard Code of Practice for design, Manufacture, erection and testing (structural portion) of cranes and hoists.</p> <p>iii. The stipulations in these technical specifications are complementary to those set out in the Indian Standard Specifications 4573 and 807 mentioned above. If any of the conditions mentioned in these specifications is at variance with those of the ISS, the technical specifications hereunder shall prevail. Similarly, if any of the requirements as per Leading Particulars in Schedule-I is at variance with any other clause of this Specification, the Leading Particulars in Schedule-I shall prevail.</p>
2.1.5	<p><u><b>Prove out at firm's premises:</b></u></p> <p><u><b>The crane shall be proved out at the firm's premises as per Indian Standard Specification as detailed under clause 2.1.4.</b></u></p>

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2.1.6	<b><u>Prove out at consignee's works:</u></b>
i	<b><u>Start up and trial Operations Test (Commissioning Test on receipt of authorisation from the Purchaser.</u></b>
ii	<b><u>The trials shall be carried out initially under no load conditions and on satisfactory completion of these, trials shall be repeated for various loads until the full rated load and operating range are covered.</u></b>
iii	<b><u>During the trial operation, all necessary adjustments shall be made so as to ensure compliance with the operating characteristics for the complete equipment as stipulated in the technical specifications.</u></b>
2.2	<b>Scope of supply</b>
2.2.1	The scope of supply shall include design, supply, installation, testing, commissioning and proving of Crane. It includes all the concomitant accessories/ equipments as detailed in the specification and other concomitant accessories/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned. It shall also include installation and commissioning of related equipment, training of personnel in operation and maintenance of machine and supply of technical documentation.
2.2.2	<b>Concomitant Accessories:-</b>
2.2.2.1	The scope of supply shall include all concomitant accessories that are required to make the crane fully operational on commissioning, and cost of such accessories shall be included in the basic price of the crane. For information of the purchaser, the price of each of the following concomitant accessories shall also be quoted separately in the offer:
i.	First fill of hydraulic oil, adequate to last till a change is due. Number of hours of crane operation after which a change is due should be indicated and the brand(s) of oil that can be used.
ii.	First fill of fuel oil as per tank capacity indicated in Schedule-II.
iii.	One set of service tools required for all normal maintenance activities including grease gun for lubrication. A list of service tools offered should be furnished and this should include any special purpose tools specific the crane, along with brief remarks on their utilisation. The list of service tools should include hydraulic pressure gauge with provision of quick attachment to read the pressure in the hydraulic system and grease gun for lubrication. <b><u>Any other accessory/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned connected to power source and give the specified output/productivity</u></b>
2.2.3	<b>Optional Accessories:-</b>
2.2.3.1	<b><u>Comprehensive Annual Maintenance Contract for the machine for a period of 5 (Five) years on yearly basis as per Terms &amp; conditions of Comprehensive Annual Maintenance Contract .</u></b>
2.2.3.2	<b><u>Any other accessory which can improve the productivity, performance, reliability, efficiency, or enhance the capability of the machine as a whole or part thereof, should be quoted as optional accessory.</u></b>

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	Any accessories which in the opinion of the tenderer can contribute to higher production rates for improved efficiency should be clearly indicated and quoted for separately.																																													
2.2.4	<p><b>EVALUATION CRITERIA:-</b> Total value of the offer will be calculated based on</p> <ul style="list-style-type: none"><li>(i) The cost of the basic machine.</li><li>(ii) Cost of the concomitant accessories according to tender specifications <u>and additional spares/items as specified in schedule-I.</u></li><li>(iv) Essential Spares as per Schedule-III of Technical Specification.</li><li>(iii) Cost of additional items (chain/slings/wire rope/hooks) as specified in Schedule-I.</li><li>(iv) Cost of any other accessory which in the opinion of supplier is essentially required for making the machine fully functional.</li><li>(v) Applicable duties and taxes, insurance, freight, installation &amp; commissioning charges etc.</li><li>(vi) Cost of Comprehensive AMC charges for 05 years after completion of warranty period. This will not form a part of contract value.</li></ul>																																													
2.2.5	<p><b><u>OTHER ITEMS TO BE QUOTED:</u></b> <u>The following items will need to be quoted additionally though will not be part of commercial evaluation:</u></p> <ul style="list-style-type: none"><li>(i) <u>Optional Accessories with break up of individual items as specified in clause 2.2.3.</u></li><li>(ii) <u>Comprehensive Annual Maintenance Contract for the machine for a period of 5 (Five) years on yearly basis as per</u> <b>Terms &amp; conditions of Comprehensive Annual Maintenance Contract</b></li></ul>																																													
2.2.6	<p><b><u>DELIVERY SCHEDULE CHART:</u></b></p> <p><u>In the event of acceptance of the offer, the machine(s) shall be supplied as per the following Milestone Chart:</u></p> <table><tr><th><u>S.N.</u></th><th><u>Activity</u></th><th><u>Activity code</u></th><th></th><th><u>TIME SCHEDULE OFFERED BY BIDDER</u></th></tr><tr><td><u>1</u></td><td><u>Issue of LOA</u></td><td><u>D1</u></td><td><u>=</u></td><td></td></tr><tr><td><u>2</u></td><td><u>Submission of PBG By Successful Bidder</u></td><td><u>D2</u></td><td><u>D1+30 days</u></td><td></td></tr><tr><td><u>3</u></td><td><u>Issue of AT / Contract By RCF (after verification of PBG)</u></td><td><u>D3</u></td><td><u>D2+30 days</u></td><td></td></tr><tr><td><u>4</u></td><td><u>Supply/ Delivery of machine (for indigenous suppliers)</u></td><td><u>D4</u></td><td><u>D3+180 days</u></td><td></td></tr><tr><td><u>5</u></td><td><u>Railway to give call to supplier for the commissioning of machine</u></td><td><u>D5</u></td><td><u>D4 + 7 days</u></td><td></td></tr><tr><td><u>6</u></td><td><u>Installation, commissioning and proving out of machine by supplier</u></td><td><u>D6</u></td><td><u>D5 + 45</u></td><td></td></tr><tr><td><u>7</u></td><td><u>Issue of PTC by consignee</u></td><td><u>D7</u></td><td><u>D6 + 30 days</u></td><td></td></tr><tr><td><u>8</u></td><td><u>Warranty by supplier</u></td><td><u>D8</u></td><td><u>D6 + 2 years</u></td><td></td></tr></table>	<u>S.N.</u>	<u>Activity</u>	<u>Activity code</u>		<u>TIME SCHEDULE OFFERED BY BIDDER</u>	<u>1</u>	<u>Issue of LOA</u>	<u>D1</u>	<u>=</u>		<u>2</u>	<u>Submission of PBG By Successful Bidder</u>	<u>D2</u>	<u>D1+30 days</u>		<u>3</u>	<u>Issue of AT / Contract By RCF (after verification of PBG)</u>	<u>D3</u>	<u>D2+30 days</u>		<u>4</u>	<u>Supply/ Delivery of machine (for indigenous suppliers)</u>	<u>D4</u>	<u>D3+180 days</u>		<u>5</u>	<u>Railway to give call to supplier for the commissioning of machine</u>	<u>D5</u>	<u>D4 + 7 days</u>		<u>6</u>	<u>Installation, commissioning and proving out of machine by supplier</u>	<u>D6</u>	<u>D5 + 45</u>		<u>7</u>	<u>Issue of PTC by consignee</u>	<u>D7</u>	<u>D6 + 30 days</u>		<u>8</u>	<u>Warranty by supplier</u>	<u>D8</u>	<u>D6 + 2 years</u>	
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	<u><i>Notwithstanding the delivery period indicated elsewhere in the tender document, the delivery indicated in this schedule shall be taken as overriding and final.</i></u>
<b>3.0</b>	<b>BASIC DESIGN FEATURES:-</b>
<b>3.1</b>	<b>General Characteristics:-</b>
3.1.1	The crane should be rigid, robust and of sturdy construction.
3.1.2	The crane should be fitted with a suitable diesel engine capable of meeting all load demands indicated in <del>Para 2.1</del> above.
3.1.3	The crane should be able to move on its own power on pneumatic tubeless rubber tyred wheels on uneven railway workshop pathways.
3.1.4	All important controls should be located at a convenient position within easy reach of the operator.
3.1.5	The crane should have individual pilot switches or levers for control of hoist, derrick, slew and creep motions.
3.1.6	For movement of the crane automotive type of levers/pedals should be provided, including the brake pedal for braking the vehicle.
3.1.7	The crane should be fully counter-balanced and should be stable even at maximum specified grades both when stationary and mobile, and under all load conditions.
3.1.8	The crane should incorporate all safety devices so as to provide complete protection to the operator and the crane from all possible failures, to the following features. A full description and explanation of all the safety features provided must be given in the offer. These must include but need not be limited to those listed below.
i.	Protection against overload and over hoisting. For protection against overload an automatic safe load indicator should be provided to indicate safe load and radius at which the load is being lifted, with an audio-visual alarm and provision for the crane motion to be cut off when the load being lifted equals the safe working load. A limit switch will be provided to prevent over hoisting.
ii.	Pressure relief and overload valves in the hydraulic system.
iii.	Protection against engine heat and engine exhaust impinging directly on the operator and obstructing his vision, or otherwise causing inconvenience.
iv.	Hand brakes for parking.
3.1.9	In case of power failure, the equipment should stop immediately. A Safety device shall be provided to retain any movement of the equipment to prevent creep. The device provided shall be explained in the offer.
3.1.10	Maximum operator visibility under all operating conditions.
3.1.11	Control panel provided on the crane should include, but need not be limited to the following:
i.	Air pressure gauge.
ii.	Engine oil pressure gauge.
iii.	Fuel gauge.
iv.	Water temperature gauge.
v.	Hour meter.
vi.	Load and Radius Indicator.
3.1.12	Swing brake caliper disc brake integral with swing gear reducer manually applied with swing brake paddle, control in driver cabin for slow dynamic stopping and automatically

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	applied with swing holding brake lever for static holding. Holding brake is spring applied and hydraulically released by detaining swing brake lever.
3.1.13	<del>Four wheel steering should be provided and totally control from steering.</del>
3.1.14	Safety limit switch should be provided in winch, before wire rope finish from winch.
3.1.15	<del>Hyd. Oil cooler and T.Q. Oil cooler should be provided in the system.</del>
3.1.16	<del>Driver cabin should be provided fully A.C.</del>
3.1.17	100% visibility for driver while operating on road at 0 degree boom angle and working lifting and lowering of load.
3.1.18	Suitable ladders should be provided Rear and Left for maintenance staff
3.1.19	Additional gauges should be provided:
	<ul style="list-style-type: none"> <li>Hydraulic Oil temperature gauge.</li> <li>T.Q. Temperature gauge.</li> <li>T.Q. Oil pressure gauge.</li> </ul>
3.1.20	Out rigger vertical cylinder pad base should not be more than 50 mm from the ground level.
3.1.21	Driver cabin locking pin should be near the driver seat.
<b>3.2</b>	<b>Specific Characteristics:-</b>
<b>3.2.1</b>	<b>Superstructure and Chassis:-</b>
3.2.1.1	The superstructure and chassis should be of robust design made out of rolled beams, steel plates and sections. Any special design features should be fully described in the offer.
3.2.1.2	Cross bracing should be provided for mounting the engine, transmission, drive axle, counter weight, instrument panel, steering axle, engine accessories etc.
3.2.1.3	The chassis should be provided with four point hydraulically operated folding or out-and-down type outriggers. These should be described in the offer. The operation of the outriggers should be quick, easy and accurate.
3.2.1.4	The fuel and hydraulic oil tanks should be easily accessible for Periodical cleaning. The procedure for cleaning & its periodicity should be indicated in the offer.
<b>3.2.2</b>	<b>Boom:-</b>
3.2.2.1	The boom is built-up of different steel sections. It should be hydraulically operated with synchronised telescopic extraction and retraction, and should be without a pinning arrangement. Sliding arrangement for telescopic sections should be durable and easily maintainable. Details of telescopic movements should be described in detail, with the help of drawings, if necessary.
<b>3.2.3</b>	<b>Hydraulic System:-</b>
3.2.3.1	Gear type pump driven from gear box power take-off or through a torque convertor should be used for generating hydraulic pressure. Control valve arrangement for independently controlling hoist, derrick, slewing and telescopic motions should be provided. The arrangement provided is described in the offer.
3.2.3.2	The hydraulic pump and its elements shall be from reputed manufacturers like M/s. REXROTH; M/s VICKERS-SPERRY; M/sYUKEN; M/s L&T; M/s UT; M/s Parker; M/s Cassappa. The make of pump and other hydraulic equipments/elements shall be clearly indicated. Details of hydraulic system shall also be indicated in the offer.
3.2.3.3	The piston assembly shall be effectively pressure sealed at both ends to prevent oil



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	leakage. The cylinder gland packing's shall be designed for almost dry rod operation.
3.2.3.4	The material used for sealing, 'O' rings, gland packings and chevron packings shall be such as Nitrile Rubber/Turcite-Turcon/PTFE etc. of reputed make. The average life of the proposed material shall be indicated in the offer.
3.2.3.5	The hydraulic system shall be provided with double safety pressure relief valves and safety valves in all hydraulic cylinder for protection against pipe and hose ruptures shall be provided. The arrangement offered to check clogging of filters shall be explained in the offer.
3.2.3.6	The working pressure at which the equipment should be able to generate shall be clearly mentioned in the offer. Pressure gauge to indicate pressure should also be provided
3.2.3.7	A hydraulic circuit diagram for sequence of operations must be supplied with the offer. Each element in the diagram should be suitably numbered and correspondingly labeled for the convenience of the operating and maintenance staff.
3.2.3.8	Any hydraulic circuit pipes need not pass through the driver cabin to prevent the temperature rise of driver cabin.
3.2.3.9	Suitable hydraulic oil cooler should be provided to prevent the excessive temperature rise of hydraulic oil.
3.2.3.10	<u><i>The hydraulic system shall be provided with hydraulic oil cooler to maintain the viscosity and properties of hydraulic oil during continuous working of crane. The arrangement provided shall be explained in the offer.</i></u>
<b>3.2.4</b>	<b>Hoist System:-</b>
3.2.4.1	Hoisting should be achieved with the help of suitable hydraulic motor through a suitable reduction gear box. The arrangement provided should be explained in the offer. The make & model of hydraulic motor and reduction gear box shall also be indicated in the bid.
3.2.4.2	Suitable hydraulic brake should be provided in the hoisting system.
3.2.4.3	Standard shank type plain hook should be provided. The hook should conform to relevant latest Indian Standard Specification IS: 15560 (latest). Hook should be mounted on grease lubricated antifriction thrust bearings and a protective skirt should be provided over the bearings. Proof load test as per Indian Standard Specification, from a recognized test house should be submitted by the successful bidder.
3.2.4.4	Wire rope should be of adequate size to lift the maximum specified load safely. The material specification and type of wire ropes provided should be indicated in the offer. The make of wire rope should be of USHA martin/Bombay wire rope/Fort William.
<b>3.2.5</b>	<b>Derricking System:-</b>
3.2.5.1	Derricking should be achieved with the help of a suitable hydraulic system. The arrangement provided should be described in the offer.
<b>3.2.6</b>	<b>Slewing system:-</b>
3.2.6.1	Slewing should be achieved with the help of a suitable double acting hydraulic cylinder or motor driving the slew pinion through a reduction gear box.
3.2.6.2	Suitable hydraulically actuated brake should be provided for Braking the motion which should be fail safe. Details of the arrangement should be explained in the offer.
3.2.6.3	Large diameter double slew ring of steel balls running in hardened races should be provided with a mechanical slew lock to secure the superstructure in two positions i.e. over rear and front.

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3.2.6.4	Slewing should be possible in either direction through the range indicated at Schedule-I.
<b>3.2.7</b>	<b>Transmission:-</b>
3.2.7.1	Crane travel should be achieved through a suitable gear box/Torque converter. It should be possible to achieve variable speed in both forward and reverse directions. The transmission system provided should be fully described in the offer and the number of speeds provided should be indicated.
3.2.7.2	The transmission gears should be of alloy steel suitably hardened and ground, with hardness of gears not being less than Rockwell C-50.
3.2.7.3	The drive axle should be solidly mounted to the chassis frame. The drive should be achieved through normal differential planetary arrangement.
3.2.7.4	The steering wheels should be automotive type. The steering should be fully hydraulic so as to be easy, smooth and effortless capable of turning the machine in the minimum specified turning radius. The drive should be provided with 4x4 wheel drive with four wheel steer.
3.2.7.5	All wheels should be equipped with pneumatic rubber tyres. These Should be mounted on ball/roller bearings of adequate load bearing capacity.
3.2.7.6	Suitable brakes should be provided on all the four wheels. The crane should also be provided with a suitable parking brake, which should be spring actuated lever operated type. The brake system provided should be fully described in the offer.
<b>3.2.8</b>	<b>Operator's cab:-</b>
3.2.8.1	The operator's cab should be of steel construction or FRP (Fiber Reinforced Plastic), totally enclosed type with lockable door hinged or sliding, electric fan, cab interior lights and electric horn and fire extinguisher. The type of cabin, i.e. revolving/fixed shall be as per item 2.3 of Schedule-I. It should have an upholstered seat adjustable on sides. The operator's cab windows should be hinged or sliding type and fitted with wind screen having toughened glass panes. The cab's front should be fitted with wipers. It should be provided with suitable heat insulation. The cabin should have good visibility on both sides either directly or through the provisions of reflecting mirrors at suitable location. and fully air conditioned.
<b>3.2.9</b>	<b>Diesel Engine:-</b>
3.2.9.1	The engine should be suitably fitted on the crane and should normally be water cooled.
<b>3.2.10</b>	<b>Lubrication:-</b>
3.2.10.1	All roller/ball bearings should be pre-packed with grease. Grease nipples and other lubrication points should be provided at easily accessible locations.
<b>3.2.11</b>	<b>Electric System:-</b>
3.2.11.1	A 12/24 Volt battery should be provided for lighting and engine starting system. Suitable controlled battery charging system should also be provided. The lighting system should include two head lights, 2 side lights, Marker lights, top and tail lights, cab head light, load/radius indicator light and inspection lamp..
<b>3.2.12</b>	<b>Colour:-</b>
3.2.12.1	The colour scheme shall be as per standard yellow and black ivory used internationally for material handling equipment, or as per consignee's specific requirement, to be ascertained by the manufacturer directly from the consignee at the time of manufacture.
3.3	<b><u>GENERAL MECHANICAL CHARACTERISTIC</u></b>
3.3.1	<b><u>RIGIDITY AND STABILITY</u></b>



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3.3.1.1	<u>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.</u>
3.3.1.2	<u>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.</u>
3.3.1.3	<u>All machine fabrications of critical load bearing assemblies like beds, columns etc. shall be adequately strengthened and stress relieved.</u>
3.3.1.4	<u>Change in ambient temperature shall not affect the performance of the machine.</u>
3.3.1.5	<u>There shall be no change in the performance of the machine either on switching on the machine or after continuous running.</u>
3.3.1.6	<u>There shall be no resonant vibrations throughout the working range of the machine at all load levels.</u>
3.3.2	<u><b>SAFETY CONTROLS</b></u>
3.3.2.1	<u>The machine shall incorporate safety devices to provide protection to the operator and machine against all possible operational and machinery failures.</u>
3.3.2.2	<u>Suitable interlock shall be provided to prevent machine operations in the event of:</u>
i	<u>Faulty sequence of operation.</u>
ii	<u>Fluctuation in supply voltage.</u>
iii	<u>Resumption of power supply after power failure.</u>
iv	<u>Non-positioning of safety guards.</u>
v	<u>Failure of hydraulic system (where applicable)</u>
vi	<u>Failure of lubricating system (In case of automatic including drop in pressure lubrication)</u>
3.3.2.3	<u>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</u>
i	<u>The machinery must not start unexpectedly.</u>
ii	<u>The machinery must not be prevented from stopping if command has already been given.</u>
iii	<u>No moving part of the machinery or piece held by the machinery shall fall or be ejected.</u>
iv	<u>The protection devices must remain effective.</u>

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3.3.2.3	<u><i>The machine shall be fitted with an emergency stop device to enable actual or impending danger to be averted. This device must be:-</i></u>
i	<u><i>Conveniently located.</i></u>
ii	<u><i>Clearly identifiable.</i></u>
iii	<u><i>Stop the machine as quickly as possible without causing additional hazards.</i></u>
iv	<u><i>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.</i></u>
3.3.2.4	<u><i>Safety features shall also include.</i></u>
i	<u><i>Safety device against overload for all mechanical and electric items to the extent possible.</i></u>
ii	<del><u><i>Safety stops against over-running of slides.</i></u></del>
3.3.2.5	<u><i>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:-</i></u>
i	<u><i>Be of robust construction</i></u>
ii	<u><i>Not give rise to any additional risk</i></u>
iii	<u><i>Not be easy to by pass or render non-operational</i></u>
iv	<u><i>Be located at an adequate distance from danger zone</i></u>
	<del><u><i>Cause minimum obstruction to the view of the production process.</i></u></del>
v	<u><i>Rigidly connected and not prone to rattling</i></u>
vi	<u><i>Enable essential work to be carried out without the guard or protection device having to be dismantled</i></u>
vii	<u><i>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.</i></u>
3.3.3	<u><b>OPERATIONAL CONTROLS</b></u>
3.3.3.1	<u><i>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</i></u>
3.3.3.2	<u><i>The control devices shall be</i></u>
i	<u><i>Clearly visible and identifiable.</i></u>
ii	<u><i>Ergonomically positioned for safe operation without hesitating or loss of time, and without ambiguity.</i></u>

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3.3.3.3	<u><i>CNC Controls (where applicable) – The general requirements of CNC controls are given at Schedule-IV</i></u>
3.3.4	<u><i>LIGHTING</i></u>
3.3.4.1	<u><i>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.</i></u>
3.3.4.2	<u><i>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.</i></u>
3.3.4.3	<u><i>Integral parts requiring frequent inspection and adjustment and maintenance areas must be provided with appropriate lighting.</i></u>
3.3.4.4	<u><i>The machine lighting should be of low voltage so as to prevent any hazard to the operator.</i></u>
3.3.5	<u><i>MACHINE MAINTAINABILITY</i></u>
3.3.5.1	<u><i>The machine shall be so designed as to require minimum possible maintenance and to give trouble free service.</i></u>
3.3.5.2	<u><i>All assemblies/parts of the machine shall be easily accessible for maintenance.</i></u>
3.3.5.3	<u><i>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.</i></u>
3.3.5.4	<u><i>The manufacturer must provide means of access e.g. stairs, ladders, cat walks etc. to allow access safety to all areas used for production, adjustments and maintenance operations.</i></u>
3.3.6	<u><i>WEAR COMPENSATION ADJUSTMENT</i></u>
	<u><i>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.</i></u>
3.3.7	<u><i>COOLANT SYSTEM (WHERE APPLICABLE)</i></u>
3.3.7.1	<u><i>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.</i></u>
3.3.7.2	<u><i>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.</i></u>
3.3.7.3	<u><i>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.</i></u>
3.3.7	<u><i>LUBRICATION SYSTEM (WHERE APPLICABLE)</i></u>

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3.3.7.1	<u>The machine shall be provided with a suitable 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.</u>
3.3.7.2	<u>The system shall be provided with interlock to prevent machine operating/starting in the event of the failure lubrication system.</u>
	<u>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.</u>
	<u>Lubrication and filter cleaning chart shall be displayed on a metal plate at a conspicuous location on the machine indicating :-</u>
	<u>(a) Specific location of points on the machine to be oiled lubricated/greased.</u>
	<u>(b) Periodicity of lubrication of these points.</u>
	<u>(c) Filter to be cleaned.</u>
	<u>(d) Periodicity of cleaning filters.</u>
	<u>(e) Periodicity of replenishing lubricating oil for the centralized system.</u>
	<u>(f) Any other similar relevant information.</u>
	<u>Points where manual lubrication is needed shall be separately indicated.</u> <u>Frequency of lubrication shall be also clearly mentioned.</u>
3.3.7.3	<u>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.</u>
	<u>First fill of lubricating oils used in the machine shall be provided with the machine. Details of lubricating system provided shall be indicated.</u>
3.3.8	<u>PNEUMATIC SYSTEM (WHERE APPLICABLE)</u>
	<u>The compressed air supply will be provided by the customer at the machine within pressure range of 4.5-7.5 kg/cm<sup>2</sup> 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.</u>
	<u>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.</u>
3.3.8.1	<u>Air pressure regulator, if necessary, shall be provided by the tenderer.</u>
3.3.8.2	<u>The make of pneumatic control equipment shall be of reputed make. The makes shall be indicated.</u>

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3.3.9	<u><b>HYDRAULIC SYSTEM (WHERE APPLICABLE)</b></u>
3.3.9.1	<u>Hydraulic circuit must be equipped with the following safety and inspection equipments:</u>
i	<u>Pressure gauges at all place, where pressure has to be set up or inspected.</u>
ii	<u>Safety valves for hydraulic circuit if relief valve does not fulfill this function.</u>
iii	<u>Equipment for checking of temperature in the circuit or in the pump wherever necessary.</u>
iv	<u>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.</u>
v	<u>Indication for low oil level.</u>
3.3.9.2	<u>The sump aggregate shall have the following:</u>
i	<u>Oil level sight gauges or any other equipment showing the minimum and maximum oil levels in sump.</u>
ii	<u>A drain plug at the lowest portion of the tank.</u>
iii	<u>It shall be possible to drain the oil from the tank without disconnecting any pipes or other fittings.</u>
iv	<u>The temperature of oil in hydraulic circuits shall not exceed 90 degrees C continuous running. Suitable arrangement shall be incorporated to ensure that the oil is not overheated under local weather conditions at continuous normal working of the machine.</u>
v	<u>Facilities for bleeding of air in case of air lock shall be provided.</u>
vi	<u>The hydraulic reservoir, pump and allied equipment shall be suitably segregated from the machine in order to remove major source of heat.</u>
vii	<u>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.</u>
viii	<u>First fill of hydraulic oils used on the machine shall be provided with the machine.</u>
4.	<b>TECHNICAL LITERATURE:-</b>
4.1	One copy of the printed illustrative catalogue showing features of the crane and its elements must be enclosed with each copy of the bid.
4.2	The technical literature shall be provided for complete crane including imported and indigenously purchased components/subassemblies. The successful tenderer will have to furnish 4 (four) copies each of the following manuals directly to the consignee along with the crane. Out of these 04 sets, the bidder shall be required to submit one set of all

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	<p>documents in best available condition one month prior to the training for the crane. One set of technical literature should cover the following details:</p> <ol style="list-style-type: none"> <li>Operational &amp; Maintenance manual of the machine.</li> <li>Instruction &amp; Maintenance manual for Hydraulic Oil Cooling Unit.</li> <li>Technical &amp; Maintenance manual for Hydraulic System.</li> <li>Technical &amp; Maintenance manual for Lubrication System.</li> <li>Diagnostic &amp; Trouble shooting Guide for crane.</li> <li>Wiring diagram, in which length of wires must be mentioned, hard copies in A-3 size as well as soft copy in PDF format.</li> <li>Spare part manual including part lists no. of each component with exploded views wherever possible and assembly drawing, hard copies in A-4 size as well as in PDF format.</li> </ol> <p><b>Note: All manual and literature should be in English/Hindi.</b></p>
<b>5.0</b>	<b>SPARES:-</b>
5.1	Spares should be offered as per Schedule-III (RMC). These are mandatory spares.
5.2	Spares shall be supplied along with the crane, if ordered.
<b>6.0</b>	<b>SPECIAL FEATURES:-</b>
6.1	Special features incorporated into the crane, if any, shall be Indicated separately by the tenderer, clearly indicating the advantages of these features.
<b>7.0</b>	<b>DEVIATIONS:-</b>
7.1	The tenderer should certify that the crane offered fully meets the specifications. Various design features incorporated in the crane to fulfill different technical and performance requirements should be fully explained in the offer. However, minor deviations from this specification, 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 crane , can be considered for acceptance. The tenderer in such eventuality, shall clearly indicate the details of the deviations and there implications.
<b>8.0</b>	<b>INSPECTION OF EQUIPMENT AND TESTING AT MANUFACTURER'S WORKS:-</b>
8.1	A load and functional test like no load test and maximum Horse Power test must be carried out at the manufacturer's works. Rigidity and stability of the crane shall be demonstrated to the satisfaction of appointed inspector or inspecting agency.
8.2	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.
8.3	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.



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8.4	<p>The tenderer shall submit Quality Assurance Plan being followed at the manufacturer's works for ensuring quality of the products offered. In case, the firm is ISO certified, a copy of valid certificate may also be enclosed with the offer.</p> <p><u><del>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 OAP incorporating the tests as given in Annexure-I along with other tests /stage inspection as followed by them.</del></u></p>
9.0	<b>TRAINING:-</b>
9.1	Technical experts from the manufacturer will fully and adequately provide free training in operation and maintenance of the machine to operators and maintenance staff nominated by the consignee at the time of commissioning of the machine. The training to be imparted shall cover operation, troubleshooting and repair of all mechanical, hydraulic, electrical & electronic systems.
10.0	<b>INSTALLATION, COMMISSIONING AND PROVING TESTS:-</b>
10.1	<p><b>Joint Check</b> – 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 &amp; 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) shall be prepared by the consignee and the firms 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.</p>
10.2	<b>RESPONSIBILITIES OF CONSIGNEE AND BIDDER:-</b>
10.2.1	<p>The <b>consignee</b> shall be responsible for:-</p> <ul style="list-style-type: none"> <li>i. Clear covered space for storage of material/equipment required for working installation/commissioning of the machine etc.</li> <li>ii. The consignee shall arrange the weights 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).</li> <li>iii. Unloading of the crane on receipt and its movement to the site of installation</li> </ul>
10.2.2	<p><b>The bidder shall be responsible for:-</b></p> <p>Provision of all tools and equipment, technical and unskilled manpower, accessories/ equipment and material for installation and commissioning.</p> <p><u><del>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.</del></u></p>
10.3	The supplier shall demonstrate machine performance and prove out the claimed capability for successful commissioning at the consignee's works as per <u>clause 2.1.5</u> &

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	Schedule-I. 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.
10.4	<p>The contractor or his agent shall commission and prove out the crane within 30 days from the date of intimation by the consignee in respect of receipt at site.</p> <p><u><del>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 can not 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 COFMOW. If no intimation is given to COFMOW and the PTC is not issued till the expiry of 60 days from the issue of JCN, then the issue will be discussed in a meeting between CME/PCM and the consignee. Based on this, decision to issue PTC will be taken by CME/PCM, the concerned technical officer and CME.</del></u></p>
10.5	The crane performance shall be observed by the consignee for a period of 30 days (each working day having two shifts of 8 hours) after successful commissioning of the crane as stated above, before final proving test certificate is issued.
10.6	If an assembly/sub assembly is required 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 an indemnity Bond. In case the entire crane has to be taken back, a Bank Guarantee would have to be submitted. The indemnity Bond/Bank Guarantee should be of adequate value so as to cover the cost of the assembly/sub assembly/paid up cost of crane.
<b>11.0</b>	<b>PERFORMANCE AND REFERENCE:-</b>
11.1	<del>The tenderer should provide satisfactory evidence, acceptable to the purchaser, to show that he is a licensed manufacturer with adequate plant and manufacturing capacity, and has a Quality Assurance Programme designed to ensure in-house control of consistent quality standards.</del>
11.2	<del>Bids for Road Mobile Cranes shall be considered acceptable only from Those bidders who have supplied at least five equipments of the type offered (i.e. fully mobile full slew crane type 1 as defined in IS-4573-1982 or latest version), of same or higher capacity to Railway, PSU or reputed industrial companies provided three of such equipments should have been working satisfactorily for more than one year on the date of opening of the bid. The tenderer shall furnish a statement showing the details of the supplies made by him of the equipments mentioned above giving the particulars of purchaser’s name, address, telephone No. and fax No. of actual user (contact person), purchase order No., date and quantity supplied, capacity of crane. The performance certificate from a responsible person of the user organization should be furnished along with the bid.</del>
<b>12.0</b>	<b>SERVICE FACILITY IN INDIA AND TECHNICAL SUPPORT:-</b>

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12.1	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. 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.
12.2	After the warranty period and AMC 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 <del>13 years</del> <u>15 years</u> from the date of delivery of the machine at the ultimate destination to safeguard against obsolescence.
12.3	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.
12.4	Tenderers shall indicate the list of spares required for maintenance of the machine beyond warranty/AMC period. Current cost of such spares and current service charges for the items of work of repair of machine shall also be indicated.
12.5	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.
<b>13.0</b>	<b>BOUGHT OUT ITEMS:-</b>
13.1	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 required to produce invoices to ensure genuineness of such products / verification by the Inspecting agency.
<b>14.0</b>	<b>COLOUR:</b>
	<u><i>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.</i></u>
<b>15.0</b>	<b>WARRANTY OBLIGATION</b> –The following conditions regarding Maintenance and reliability shall also apply:-
15.1	The machine shall be designed for a life of 15 years with regular maintenance and all the structural members of the machine shall be guaranteed for 7 years against cracks breakages etc. during the course of normal operations. Tenderer would submit suitable undertaking.
15.2	The machine shall at all times give contractual out-put and accuracy. Any deficiency or break down for a total of <del>01 hr.</del> <u>02 hr</u> or more for a day would be treated as failure for the day, for the purpose of extending warranty period.

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15.3	<p>The tenderer shall ensure that in case a failure is reported by a consignee qualified service engineers shall visit the site within two days from the date of complaint on calendar day's basis. The period of <del>two days</del> <u>three days (excluding date of complaint)</u> after the failure report shall be treated as grace period, which will not count towards breakdown time for up to one failure per month and a maximum of 3 failures per quarter. In case the number of failure exceeds one failure per month or three during any quarter of warranty, grace period of only 1 day will be permissible for such additional failure. Complaints shall be lodged by consignee by fax phone, e-mail or per bearer at address given by the tenderer.</p>
15.4	<p>Maximum permissible down time till it is restored back to the contractual output and accuracy levels, in any quarter of the year during the warranty period, shall be 150 hrs. In case the total break down period in any one of year during warranty period, exceeds 500 hrs., the purchaser would be entitled to encash Bank guarantee towards warranty. To ensure this a record of breakdown in hours on quarterly basis should be maintained by the consignee</p>

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### SCHEDULE –I- LEADING PARAMETER

NOTE :	S. Nos. 3, 4, 6, 8,10.1 and 10.2 are major requirements in respect of which no lower performance level will be accepted.	
S.No.	Item Description	
1.	<u>No. of Crane</u>	<u>1 no. (One)</u>
2.	Type of Crane	(As per IS 4573-1982)
2.1	Mobility.	Self Propelled.
2.2	Slewing / Articulating range degree.	360 degree either side.
2.2.1	Slewing OR Articulating.	Full Swing.
2.3	Type of Operator's cab	Revolving.
3.	<b>Lifting Capacity (85 % of tipping load)</b>	
3.1	With outriggers at 3.0 M radius ( <u>static over 360 deg slew</u> )	20 Ton ( <u>min</u> ) at any slew position.
3.2	Free on wheels at 3 m radius (Static over 360 degree slew)	10 T ( <u>min</u> ) Over Front. 7 T ( <u>min</u> ) at any slew position.
4.	<b>OPERATING SPEEDS (No load at rated engine RPM)</b>	
4.1	Hoist speed Single line (Unladen)	55 to 65 M/Min. <u>55 M/Min. (min)</u>
4.2	Slewing (Unladen)	2 to 3 RPM
5.	Jib operation	Hydraulic powered
5.1	Extended length	25.0 M <u>21 M (Min)</u>
5.2	Retracted length	8 to 9 M
6.	Maximum travel speed in Km /Hr	30 Km/hr.(minimum)
7.	Lift above ground level	<u>21 M (Min)</u> 25 M with boom fully extended (Out of 25 M, atleast 21M boom length should be hydraulically powered)
8.	Maximum turning radius.	6 M.
9.	Any other requirement.	
9.1	The boom in fully extended condition may have provision of one detachable section. The fixing arrangement of this section shall be explained in the offer. This supersedes the requirements of clause no. 3.2.2.1 of technical specification, if such extension is fitted.	
9.2	The drive should be provided with 4x4 wheel drive with four wheel steer. This supersedes the requirements of clause no. Clause 3.2.7.4 of technical specification.	

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## SCHEDULE-II

**N.B:** If above, clauses are found inadequate for furnishing all necessary information about the crane offered, tenderer may append further information as desired.

### INFORMATION TO BE SUPPLIED BY THE TENDERER

1. Total weight of mobile crane including electrical equipment and axle loads.
2. Working outreach in meters.
  - i. Maximum
  - ii. Minimum
3. Lifting capacity at maximum radius, min. radius and 3 other radii in between.
  - i) With outriggers.
  - ii) Free on wheels.
4. Rope size and construction details.
5. Number of rope falls supporting the load.
6. Material of drum
7. Material of gears and gear box.
8. Brakes, type, make and size.
9. Make and type of bearings.
10. Specifications for the hook.
  - i. Type of hook
  - ii. Is locking device to prevent swiveling of the hook provided?
  - iii. Is closing finger provided on the hook.
11. Chassis Details.
  - i. Make and model no. of standard chassis
  - ii. Overall dimensions
  - iii. Wheel base
  - iv. Wheel span
  - v. Overall height of crane with jib in lowest position.
  - vi. Outriggers base
  - vii. Diameter of wheels
  - viii. Maximum wheel load



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- ix. Tail radius of revolving super structure
  - x. Distances from center line of revolving. Superstructures to ends and sides of chassis.
12. Diesel Engine.
- i. Make & model
  - ii. Number of cylinders.
  - iii. Stroke
  - iv. Bore
  - v. Compression ratio
  - vi. H.P. (Max. & continuous)
  - vii. RPM
  - viii. Specific fuel consumption
  - ix. Fuel tank capacity
  - x. Any other particulars of special features.
13. Gradeability.
14. Particulars of safety devices.
15. Submit functional diagrams with sectional views.

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**SCHEDULE-III**  
**SPARES FOR MAINTENANCE OF DIESEL HYDRAULIC ROAD MOBILE CRANE**

S.No.	DESCRIPTION	Qty.
1	Telescopic cylinder assembly (seal kit)	1 set
2	Steering cylinder (seal kit)	1 set
		1 set
3	Outrigger jack cylinder (seal kit)	1 no.
4	Solenoid valve assembly coil	1 no.
5	Front console assembly	
	i) Ignition switch	1 no.
	ii) Toggle switch	1 no.
6	Filter hydraulic/transmission	
	i) Filter element	2 nos.
	ii) Filter assembly	2 nos.
7	Engine filters	
	i) Element fuel filter	4 nos.
	ii) Filter air cleaner	2 nos.
	iii) Element lube filter	4 nos.
8	V-belt	1 nos.
9	Boom Hydraulic hoses	2 nos.
10	Cylinder lift hoses	1 no.
11	Hydraulic hoist hoses	2 nos.
12	Hydraulic Steering hoses	2 nos.
13	Hydraulic outrigger hoses	2 nos.
14	Hydraulic tank assembly	1 no.
	i) Strainer	
<u>15</u>	<u>Suitable Hydraulic Jack of required capacity With lever and wheel spanner.</u>	<u>1 no.</u>
<u>16</u>	<u>Hydraulic Pressure gauge with provision of quick attachment to read pressure in hyd. system</u>	<u>1 set</u>
<u>17</u>	<u>Grease Gun for lubrication</u>	<u>1 no.</u>

**Note:**

1. Tenderer should clearly indicate the quantity included in each set for each item.
2. Any other item which in the opinion of the bidder, is considered necessary to be stocked for maintenance should be indicated separately under recommended list of spares.
3. The items which are not required/used in the model offered by the bidder should be marked as 'Not Applicable'.
4. Rate for each item should be indicated separately.

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**ANNEXURE-A**

**JOINT RECEIPT INSPECTION NOTE**

**Date.....**

**Sub: Receipt of consignment for machine.....**

**Ref: RCF/KXH Contract No.....**

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

**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:**

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

**Representative of firm**

**Designation**

**Representative of consignee**

**Designation**

**(Minimum Gazetted level)**

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**ANNEXURE –B**

**JOINT COMMISSIONING NOTE**

**Date:.....**

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

**Ref: RCF/KXH AT No.....**

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

**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 release of balance 20% payment to the firm:**

**a.**

**b.**

**c.**

**Representative of firm**

**Designation**

**Representative of consignee**

**Designation**

**(Minimum Gazetted level)**

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**ANNEXURE –C**

**PERFORMANCE APPRAISAL FORM**  
**APPRAISAL ON COMPLETION OF WARRANTY PERIOD**

**Dated:.....**

**To, M/s. ....**

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

**11. In case, Reliability clause of the machine during warranty period is also given in, then following details of breakdown hours for preceding eight quarters may also be furnished.**

<b><u>Quarter</u></b>	<b><u>Period</u></b> <b><u>From -----To-----</u></b>	<b><u>Breakdown hours</u></b>
<b><u>1</u></b>		
<b><u>to</u></b>		
<b><u>8</u></b>		

**Signature-----**

**Name-----**

**Designation:**

**DY.CME (User Shop)**

**Office Stamp**

**PCMM/RCF**

**PFA/RCF**

**CPE/RCF**

**Note:**

**i.) This appraisal may please be sent immediately on completion of warranty period. If any extension of warranty period required, may please also be mentioned with details.**