

Proposal for Procurement of Hydrostatic Coring Drilling Rigs through NMEDT

Background:

As per the policy decision taken by the competent authority, the old rigs of GSI are to be replaced with the modern hydrostatic rigs. Accordingly, old mechanical rigs are replaced with modern hydrostatic rigs in SR, WR and ER. The present proposal is for procurement of three hydrostatic rigs (300m - 2nos and 600 m - 1 No) for the Central Region against the replacement of three mechanical rigs which are more than twenty-five years old. This aligns with the policy decision for modernization of the drilling fleet.

Advantages:

The induction of three crawler mounted hydrostatic coring drilling rigs will ensure the deployment of these rigs in all terrain conditions within the Central Region and improve the efficiency of drilling capacity of the region.

Justification for Procurement:

A proposal is submitted before the Central Procurement Committee (CPC), an apex body under the chairmanship of Director General, GSI for procurement of hydrostatic coring drilling rigs. CPC approves the procurement of two (02) numbers crawler mounted hydrostatic coring drilling rigs of 300m capacity, and one (01) number crawler mounted hydrostatic coring drilling rigs of 600m capacity, for the Central Region.

Technical Specifications:

The technical specifications are attached as per:

- Annexure 'A' - Hydrostatic coring drilling rigs of 300m capacity along with associated accessories;
- Annexure 'B'- Hydrostatic coring drilling rigs of 600m capacity along with associated accessories.

Budget Status:

Director General, GSI has approved the procurement through National Mineral Exploration and Development Trust (NMEDT) fund.

Proposal:

Accordingly, this proposal is prepared for procurement of two (02) number crawler mounted hydrostatic coring drilling rigs of 300m capacity, and one (01) number crawler mounted hydrostatic coring drilling rigs of 600m capacity for the Central Region along with 01 year warranty with a dedicated operator, service engineer, and consumables. It also covers four years of CAMC with a dedicated service engineer and consumables.

Budget Requirement:

The total estimated cost for the hydrostatic coring drilling rigs is ₹ 5.75 Cr (including GST). This includes a one-year warranty with a dedicated operator, service engineer, and consumables as per the specification. It also covers four years of CAMC with a dedicated service engineer and consumables.

Timeline:

Indigenous manufacturers are available therefore no 'Make in India (MII)' exemption is required for procurement through the Government e-Marketplace (GeM).

Accordingly, the following procurement timeline is proposed:

- A. 02 months for completion of the bidding process from the date of sanction.
- B. 04 months for delivery after the award of work.

In view of the above, a total of approximately 06 months is proposed for the delivery of the hydrostatic coring drilling rigs from the date of sanction by NMEDT.

The fund flow (i.e; year wise fund requirement) is appended below -

S.No	Timeline	Fund required (without GST) in Lakhs (₹)	GST (18%) Amount in Lakhs (₹)	Total Fund required in Lakhs (₹)
01	1st Year	425.00	76.50	501.50
03	2nd Year (1st year CAMC)	15.00	2.70	17.70
04	3rd Year (2nd Year CAMC)	15.00	2.70	17.70
05	4th Year (3rd Year CAMC)	16.15	2.90	19.06
06	5th Year (4th Year CAMC)	16.15	2.90	19.06
TOTAL				575.02
TOTAL (Rounded Off)				575.00

TECHNICAL SPECIFICATION OF HIGH PERFORMANCE HYDROSTATIC CORING DRILLING RIG ALONG WITH ASSOCIATED ACCESSORIES AND HAVING CAPACITY TO DRILL MINIMUM 600M WITH 'N/ NQ' SERIES WIRELINE DRILL RODS, MINIMUM 400 M CAPACITY TO DRILL WITH H /HQ SERIES WIRELINE DRILL RODS AND MINIMUM 200M WITH P/PQ SERIES WIRELINE DRILL RODS

1. General	Hydrostatic core Drill with GPS tracking system along with camera and associated drilling accessories and having capability to drill hard to ultra-hard formation for commodities with irregular habit (different minerals viz. copper, Gold, base metal, REE, PGE etc.). The machine should be capable of working in remote and virgin areas. Rig should be capable to perform angle hole drilling in the borehole entry angle range 37° – 90°
2. Rated Capacity	It must have capacity to drill Minimum 600m with NQ/N size wire line drilling rods and must also be capable of drilling up to a minimum depth of 400m with HQ/H size wire line drilling rods and minimum 200m with PQ/P series wireline drill rods.
3. Prime Mover	
a) Type	- The Drill shall be powered by Turbo charged Air cooled/ water cooled Diesel engine of an established reputed make developing minimum 159 HP at 2200 rpm/169 HP at 2100 rpm. - The firm should specify make, model, rpm range (min. and max.) and corresponding torque developed by the prime mover and enclose the relevant portion of brochure/characteristic curves of the prime mover in technical bid. - The engine should be equipped with all necessary gauges, accessories and controls as per OEM of the Prime Mover. The safety mechanism for auto shut off at high temperature & at low oil pressure is desirable. - The engine shall be suitable for operation in extreme cold to extreme hot and humid conditions as: Min./Max temperature range: - 10° C to 50° C. - Emergency engine stop switches should be provided at the front and rear side of Drill. - Proof of purchase of prime mover from OEM along with date of purchase is to be provided at the time of pre dispatch inspection. - Standard Warranty of Prime mover from the date of commissioning of the drill machine should be minimum one year. The OEM of the engine should be present at PAN India for regular backup service support of the engine.
b) Battery Make & Capacity	Maintenance free Battery of reputed make and should be as per the recommended rating of the OEM of the prime mover. There should be free replacement warranty for a period of minimum eighteen months from the date of commissioning. The manufacturer of the battery must have PAN India presence for regular backup service support.
4. Drill Head	Top Drive, capable of performing angle hole drilling from 37° – 90° (i.e. Vertical Bore Hole), Hydraulically Gear driven drill head fitted with multi speed Transmission for various torque and speed combinations for different drilling formations. The Spindle RPM shall be 0 to 1200 RPM. The Drill Head shall be provided with floating spindle having suitable connection, with 2 7/8" internal flush API connection with one adapter each for connecting 2 7/8" API to P/PQ, H/HQ, N/NQ, B/BQ series wireline rods ; BW & NW drill rods and PX/PW, HX/HW, NX/NW casings at bottom and top to connect drill Rod and Water Swivel respectively. The Drill Head should have a minimum feed stroke of 2 meters. The make and model of Transmission Gearbox (Multi Speed -minimum four speed) is to be indicated in the technical bid [In case of reputed and established make Transmission GearBox Standard warranty shall be for one year from the date of commissioning. [Purchase of proof is to be made available during pre despatch inspection] and in case Transmission gear box is of Rig OEM make, replacement warranty shall be of three years from the date of commissioning of the rig. Drill head shall be designed to provide adequate torque required for drilling up to rated capacity of Drill machine, along with sufficient factor of safety. Drill head designed to accommodate P/PQ to B/BQ series wireline drill rods with corresponding connecting subs for these sizes and also for NW and BH rods and casing sizes as mentioned in the para.
5. Feed	Feed speed - down : 45 m/min Feed speed - Up : 10m /min Pull down force: 50 kN (minimum) Pull back force: 90 kN (minimum)
6. Main Winch	The main winch should have a pulling capacity of minimum 70 kN on the inner layer of the drum to hoist the entire weight of rated capacity drill rods in a single part line. A guide system / groove for better wire

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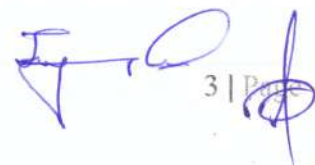
	rope winding is desirable. The firm is required to indicate the make, model and technical specification of the main winch. The make and model of Main Winch is to be indicated in the technical bid [In case of reputed and established make Standard warranty shall be for one year from the date of commissioning. [Proof of Purchase is to be made available during pre dispatch inspection] and in case Main Winch is of Rig OEM, replacement warranty shall be of three years from the date of commissioning of the rig. The minimum speed of the bare drum shall be 35 m/minute. One complete length of wire rope (IS:2266:2002 BIS approved make) of following given specification should be fitted on drum. Non rotating, fibre core, galvanised; Size: 16mm - 20mm; length – 35m (minimum) [Construction 18x7(6-1)] However, the firm has to specify the breaking load of the wire rope as per manufacturer and breaking load must be sufficient enough after considering the Factor of Safety.
7. Wireline Winch	A wire line winch for retrieval of the inner tube of the core barrel should be conveniently located and suitably driven & capable of handling wire rope for its rated capacity in the range of 10 kN pull on inner layer, with minimum line speed of 70m/min. One complete length wire rope of following given specification for the rated capacity should be fitted on wire line winch. Non rotating, steel core, galvanised; Size: 5mm - 6 mm; length: 700 m (Minimum)
8. Mast	Mast should be sturdy enough to withstand 2 times the designated load capacity of the Drill machine in a single part line. The mast length should be adequate for pulling drill rods of minimum 6 metres length at one go. Mast feed method - Hydraulic Mast should be suitably designed to take up angle hole drilling from vertical to 37 degrees. Mast is to be equipped with a dumping facility and it should rest on ground while drilling vertical as well as in angle bore holes. It should have a suitable mechanism to centralize the drill rods while making and breaking of joints during drilling vertical & angle bore holes. Mast should have provision for top man climbing. The mast should be telescopic or in one/ two piece for easy transportation of the drill rig from place to place. Graduation scale protractor to be provided to indicate the mast angle.
9. Controls and Gauges	All controls and gauges should be conveniently located for easy operation. The drill should be provided with RPM meter, feed indicator, bit weight indicator and drilling fluid pressure and discharge gauges. There should be some provision for measuring the torque (Directly /Indirectly).

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10. Hydraulic systems	Adequate hydraulic hoses with proper connections, hydraulic pumps, hydraulic motors, hydraulic valves, control panels, hydraulic oil cooler etc. of desired capacity, as per design parameters of the OEM shall be provided. The hydraulic system should be designed to ensure the effective working of the drill machine up to the rated capacity in each size. Flow fuse/Pressure relief valves should be fitted for safety of the hydraulic system of the drill. It must have a minimum of three hydraulic pumps out of which one hydraulic pump should be a variable-displacement piston type. The hydraulic system must be provided with adequate safety provisions. Hydraulic pumps and hydraulic motors shall be of reputed make and established quality with the standard warranty from the date of commissioning of the rig. Manufacturers of Hydraulic Pumps & Motors must have its authorised distributors network and service centres in all major cities of the country. The following details of hydraulic system should be furnished in Technical bid i) Hydraulic Pumps: (a) Makes (b) Model (c) Flow rate (d) Working pressure (e) Applications. [Main pump should be of variable-displacement piston type] (ii) Hydraulic Motors: (a) Makes (b) Model (c) RPM (d) Pressure rating (e) Applications. [Main motor should be of variable displacement piston type] (iii) Hydraulic Cylinders: (a) Bore size and stroke length of each hydraulic cylinder. All hydraulic circuits should be connected with interlock hydraulic valves to lock the cylinders / jacks in the event of hose bursting failure. NOTE: - 1) Firm should clearly indicate Make, Model and Part number of OEM of hydraulic Pump, hydraulic Motor and various hydraulic Valves in technical bid, without which offer will not be considered for evaluation. II) In the event of placement of order, the Drill Rig having Hydraulic Pumps, Motors and Valves of different manufacturers, the Tag of original manufacturers attached with the component should not be removed, without original tags of the critical components of other OEM's, it will not be accepted at the time of inspection (Pre & Post delivery).
11. Rod clamp, foot clamp & rod breakout mechanism	The Drill shall be provided with a hydraulic operated rod clamp having jaws to hold NW, BW, B/BQ, N/NQ, H/HQ, P/PQ size drill rods for adding or removing. It should also facilitate holding casings i.e., PX/PW, HX/HW, NX/NW & BX/BW sizes. One set of jaws to hold B/BQ to P/PQ wireline rods & BW/NW drill rods and PX/PW, HX/HW, NX/NW & BX/BW casings should be provided with Drill. In the case of the common jaw, it should accommodate all the above sizes with provision for centraliser. Maximum clamp diameter: sufficient to accommodate PX/PW casing Clamping range: BW/NW & PQ/BQ rod to PX or PW/BX or BW casing Clamp Jaw Style: Pivoting Foot clamp diameter range: To accommodate above ranges. Two sets of TC inserts only for P/PQ, H/HQ drill rods jaws and for PW/PX, HW/HX, NW/NX casings jaws may be provided as spares. Drill should be provided with a suitable hydraulically operated mechanism from the control panel, for break off rod joints.
12. Triplex pump	The drill unit should be fitted with a hydraulic driven Triplex drilling fluid Pump having discharge about 140 LPM at 1000 PSI and capable of handling drilling fluid up to specific gravity of 1.2. Firm should indicate Make, Model and complete technical details of the Triplex pump in the technical bid. The triplex pumps should have ceramic liners. In case of a reputed and established make of triplex pump, standard warranty should be provided from the date of commissioning of the rig and in case, the triplex pump is of rig OEM, warranty shall be of three years from the date of commissioning. Triplex Drilling fluid pump should be equipped with a heavy-duty pressure gauge, relief valve, air vessel (optional), suction manifold, suction hose, delivery hose & discharge line. The Triplex fluid pump should be provided with standard tools required for regular maintenance.
13. Mounting	The entire Drill Unit including Mast and pump should be mounted on a heavy duty Crawler chassis, fitted with GPS tracking device. The machine shall be provided with a remote tramming system. 1. The width of the drill including crawler should not be more than 1900mm. 2. The crawler should be complete with triple grouser shoes having width of 300 mm/ as per OEM.

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	3. Gradeability of crawler should be 25° (<i>minimum</i>, without winch support) and speed 1.5 km/hr. approx. 4. Maximum ground pressure: 8 psi. 5. The crawler should be hydraulically operated with levers fitted on the front side of the drill with suitable brakes. 6. Suitable seating should be provided at a convenient location for driving/ operation of crawler drill.
14. Lighting	The Drill shall be supplied with heavy duty weather proof LED lights fitted in strategic positions for night time operation. The lighting arrangement will be powered from Rig's electrical system. In addition, there should be provision for an inverter for lighting arrangements.
15. Levelling Jacks	The Drill is to be provided with a minimum four Telescopic box type hydraulic levelling jacks for levelling the drill a borehole point. The firm should indicate Make, Bore size and Stroke length of each levelling jacks. Minimum ID – 100mm
16. Tools	The firm should provide a complete set of tools with each drill for regular & special application which can be used by them/ drill crew for day to day work.
17. Drilling Accessories	Each Drill shall have Drilling Accessories Viz. P/PQ and H/HQ wireline Drill rods, wireline Core Barrels, Overshot Assemblies, Core lifter and core lifter case, and Impregnated High Performance Bits, High Performance Reamer Shells, hoisting plug, Water Swivel etc. as given in the annexure of this specification.
18. Reference	The population list of hydrostatic drills with details of customers, address and contact no., its capacity etc. are to be indicated. Further the firm should produce copies of the order placed by the organizations within 7 years and also proof of delivery in the Technical Bid. The bidder shall be OEM of the rig.
19. Warranty	The Drill unit along with prime mover and all other components and accessories, supplied stores, and spares will have to be covered by one-year Warranty / Guarantee, or as otherwise specified above, from the date of commissioning of Drill in field operation, for any defects in material or workmanship or both. In the event of failure of any major components, the warranty/ guarantee shall be extended accordingly in terms of the bid above. During the warranty period, the firm should ensure 90% of availability of equipment for drilling operation. Dedicated service Engineers having sufficient experience in maintenance of hydrostatic drills should be present at site, at the time of starting of drilling rig in the morning and must visit the site 2nd time, during the running operation each day. In case, services of a specialised official is required at the time of breakdown, the same must be available within 72 Hrs of breakdown. 1. All sub/jaws are to be replaced free of cost during the first four months of warranty period. 2. Lubricants (Hydraulic oil, M. oil, Gear oil, Grease etc.) are to be supplied without any additional cost during the warranty period of one year from the date of commissioning. Firm has to provide a replacement schedule of lubricants in terms of hours/ period during warranty period. 3. All Filters (including Prime Movers) 4. All type of seal kits/O rings/circlips/springs/bush 5. Plunger cups and all seals, O rings for hydraulic cylinders, 6. Plunger cups, seals/ O rings for triplex pumps 7. Oil seals of rotation unit. All items mentioned above are to be replaced without any additional cost during the warranty period of one year from the date of commissioning. 8. The services of the dedicated service engineer at site is to be provided without any additional cost during the warranty period.
20. CAMC	<u>The firm should provide CAMC for next four years after expiry of warranty period as per the following assurance of availability of machine. Dedicated service Engineers should be present at site, at the time of starting of drilling rig in the morning and must visit the site 2nd time, during the running operation each day. In case services of specialised officials are required at the time of breakdown, the same must be available within 72 Hrs of breakdown. However, this period will be counted as breakdown time for the purpose of calculation of availability of time.</u> a. CAMC shall include Lubricants (Hydraulic oil, M. oil, Gear oil, Grease etc.) are to be supplied free of cost during the warranty period of one year. Firm has to provide a replacement schedule of lubricants in terms of hours/ period during warranty period. b. All Filters (including Prime Movers)

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	will be sent by GSI, after pre dispatch inspection is completed] on various functions & operation of the Drill to GSI Graduate Engineers who will be taking over the charge of these units in field and Onsite training for drill crew for two weeks [12 working days] after the commissioning of the unit at the bore hole location, without any additional cost. Commissioning of equipment and training to GSI personnel shall be in the scope of supply. The supplier shall provide one operator for operating the rig for a period of one year from the date of commission.																		
24. Transit insurance, Registration, Permit etc.	Transit Insurance up to the destination of the drill rig i.e. at site, mud pumps and associated accessories shall be arranged by the Bidder. It is the mutual responsibility of the successful bidder as well as the concerned office of GSI to get the vehicle transferred in the name of GSI at the earliest. (GSI as well as the bidder will provide all the required documents for the purpose of transfer as required by RTO).																		
25. Availability clause	With reference to point 19 and 20 of this specification, the successful bidder shall ensure: i) Guaranteed annual availability of minimum 90 % during warranty period. ii) Penalty calculation will be made on yearly basis for availability shortfall. iii) In case the actual availability of equipment falls short of the minimum guaranteed availability as stated above supplier will be liable to pay penalty to GSI @ 0.5% of landed value of the equipment for every 1% shortfall during the warranty period and there will be the ceiling of 10% of the Order value on penalty. During the CAMC the firm will be liable to pay penalty to GSI @ 1% of Annual CAMC cost for every 1% shortfall Amount will be deducted during the last quarter of CAMC. Payments of CAMC will be made on a half-yearly basis.																		
26. Payment	As per GeM terms and conditions																		
27. Safety	All the moving parts should be covered with adequate safety guards viz. Engine, Main Winch, Drill head etc																		
<u>ANNEXURE</u> <u>(for point 17</u> <u>of this</u> <u>technical</u> <u>specification</u> 1	1. P Wireline drill rods – 20 nos., H Wireline drill rods – 133 nos. with each drill 2. 'P' & 'H' wireline Double Tube Core Barrel Assembly complete in all respects of 3m length core carrying capacity. P Wireline core barrels – 02 nos., H Wireline core barrels – 03 nos. with each drill Additional (01 Inner Tube Assy. + 01 Locking Couplings 01 Adapter Coupling + 05 Core Lifter + 02 Core Lifter Case + 01 Stop Ring + 01 Shut off Valve + 01 Landing Rig + 01 Inner Tube Stabilizer) with HQ barrel assembly with each drill. P/ H / H3 Overshot Assembly–02 nos. for P, 03 nos. for H, 01 no. for H3 with each drill. 3. H3 wireline triple tube core barrel (3 m long) complete set comprising H3 head assembly, H3 inner tube components and H3 outer tube components - 01 set with each drill. Additional H3 wireline triple tube core barrel components (01 Pump out adapter, 01 Piston plug, 02 O-ring, 01 Core ejection piston, 01 Split tube, 01 stop ring, 05 core lifter, 02 core lifter case) with each drill. 4. Reaming Shell and impregnated Diamond bit for P, H/H3 size of suitable series for drilling through copper / base metal / gold in hard and fractured to very hard formations. Quantities of Bits and Reaming Shells to be supplied with each drill <table><tr><th>Sn</th><th>Description</th><th>Overburden</th><th>Hard</th><th>Hard & Fractured</th><th>Very Hard including BHJ / BHQ & Quartzite</th></tr><tr><td>01</td><td>P diamond core bit</td><td>02</td><td>03</td><td>03</td><td>02</td></tr><tr><td>02</td><td>H diamond core bit</td><td>01</td><td>10</td><td>05</td><td>10</td></tr></table>	Sn	Description	Overburden	Hard	Hard & Fractured	Very Hard including BHJ / BHQ & Quartzite	01	P diamond core bit	02	03	03	02	02	H diamond core bit	01	10	05	10
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01	P diamond core bit	02	03	03	02														
02	H diamond core bit	01	10	05	10														

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03	H3 diamond core bit	-	-	05	-
04	P diamond reaming shell	03 nos.			
05	H diamond reaming shell	06 nos.			
06	H3 diamond reaming shell	03 nos.			

5. The water swivel & hoisting plug should have a suitable adapter to connect "P, H, BW" drill rod and conforming to load & static hoisting capacity of 7.5 Ton (min).
Water swivel (02 nos.) & Hoisting plug (01 no.) of Boart Longyear Standards. - with each drill

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TECHNICAL SPECIFICATION OF HIGH PERFORMANCE HYDROSTATIC CORING DRILLING RIG ALONG WITH ASSOCIATED ACCESSORIES AND HAVING CAPACITY TO DRILL MINIMUM 300M WITH 'N/ NQ' SERIES WIRELINE DRILL RODS, MINIMUM 200 M CAPACITY TO DRILL WITH H /HQ SERIES WIRELINE DRILL RODS AND MINIMUM 100M WITH P/PQ SERIES WIRELINE DRILL RODS

1. General	Hydrostatic core Drill with GPS tracking system along with camera and associated drilling accessories and having capability to drill hard to ultra-hard formation for commodities with irregular habit (different minerals viz. copper, Gold, base metal, REE, PGE etc.). The machine should be capable of working in remote and virgin areas. Rig should be capable to perform angle hole drilling in the borehole entry angle range 37° – 90°
2. Rated Capacity	It must have capacity to drill Minimum 300m with NQ/N size wire line drilling rods and must also be capable of drilling up to a minimum depth of 200m with HQ/H size wire line drilling rods and minimum 100m with PQ/P series wireline drill rods.
3. Prime Mover	
a) Type	- The Drill shall be powered by Turbo charged Air cooled/ water cooled Diesel engine of an established reputed make developing minimum 90 HP at 2200 rpm/70 HP at 2300 rpm. - The firm should specify make, model, rpm range (min. and max.) and corresponding torque developed by the prime mover. - The engine should be equipped with all necessary gauges, accessories and controls. The safety mechanism for auto shut off at high temperature & at low oil pressure is desirable. - The engine shall be suitable for operation in extreme cold to extreme hot and humid conditions as: Min./Max temperature range: - 10° C to 50° C. - Emergency engine stop switches should be provided at the front and rear side of Drill. - Proof of purchase of prime mover from OEM along with date of purchase is to be provided at the time of inspection. - Standard Warranty of Prime mover from the date of commissioning of the drill machine should be a minimum one year. The OEM of the engine should be present at PAN India for regular backup service support of the engine.
b) Battery Make & Capacity	Maintenance free Battery of reputed make and should be as per the recommended rating of the OEM of the prime mover. There should be free replacement warranty for a period of minimum eighteen months from the date of commissioning. The manufacturer of the battery must have PAN India presence for regular backup service support.
4. Drill Head	Top Drive, capable of performing angle hole drilling from 37° – 90° (Vertical Bore Hole) Hydrostatically fully Gear driven type drill head fitted with multi speed Transmission for various torque and speed combinations for different drilling formations. The Spindle RPM shall be 0 to 1200 RPM. The Drill Head shall be provided with floating spindle having suitable connection, with hexagonal floating spindle with 2 7/8" internal flush API connection with one adapter each for connecting 2 7/8" API to P/PQ, H/HQ, N/NQ, B/BQ series wireline and BW & NW drill rods and PX/PW, HX/HW, NX/NW casings at bottom and top to connect drill Rod and Water Swivel respectively. The Drill Head should have a minimum feed stroke of 2 meters. The make and model of Transmission Gearbox (Multi Speed -minimum four speed) is to be indicated in the technical bid [In case of reputed and established make Transmission Gear box Standard warranty shall be for one year from the date of commissioning.[Proof of purchase is to be made available during pre despatch inspection] and in case Transmission gear box is of Rig OEM make, replacement warranty shall be of three years from the date of commissioning of the rig. Drill head shall be designed to provide adequate torque required for drilling up to rated capacity of Drill machine, along with sufficient factor of safety. Drill head designed to accommodate P/PQ to B/BQ series wireline drill rods with corresponding connecting subs for these sizes and also for NW and BH rods and casing sizes as mentioned in the para.
5. Feed	Feed speed - down : 45 m/min Feed speed - Up : 10m /min Pull down force: 30 kN (minimum) Pull back force: 45 kN (minimum)

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6. Main Winch	The main winch should have a pulling capacity of minimum 45 kN on the inner layer of the drum to hoist the entire weight of rated capacity drill rods in a single part line. A guide system / groove for better wire rope winding is desirable. The firm is required to indicate the make, model and technical specification of the main winch. The make and model of Main Winch is to be indicated in the technical bid [In case of reputed and established make Standard warranty shall be for one year from the date of commissioning]. [Proof of Purchase is to be made available during pre dispatch inspection] and in case Main Winch is of Rig OEM, replacement warranty shall be of three years from the date of commissioning of the rig. The minimum speed of the bare drum shall be 35 m/minute. One complete length of wire rope (IS:2266:2002 BIS approved make) of following given specification should be fitted on drum. Non rotating, fibre core, galvanised; Size: 13mm; length – 35m (minimum) [Construction 18x7(6-1)] However, the firm has to specify the breaking load of the wire rope as per manufacturer and breaking load must be sufficient enough after considering the Factor of Safety.
7. Wireline Winch	A wire line winch for retrieval of the inner tube of the core barrel should be conveniently located and suitably driven & capable of handling wire rope for its rated capacity in the range of 10 kN pull on inner layer, with minimum line speed of 70m/min. One complete length wire rope of following given specification for the rated capacity should be fitted on wire line winch. Non rotating, steel core, galvanised; Size: 5mm – 6 mm; length: 350 m (Minimum)
8. Mast	Mast should be sturdy enough to withstand 2 times the designated load capacity of the Drill machine in a single part line. The mast length should be adequate for pulling drill rods of minimum 6 metres length under the drill head at one go. Mast feed method - Hydraulic Mast should be suitably designed to take up angle hole drilling from vertical to 37 degrees. Mast is to be equipped with a dumping facility and it should rest on ground while drilling vertical as well as in angle bore holes. It should have a suitable mechanism to centralize the drill rods while making and breaking of joints during drilling vertical & angle bore holes. Mast should have provision for top man climbing. The mast should be telescopic or in one/ two piece for easy transportation of the drill rig from place to place. Graduation scale protractor to be provided to indicate the mast angle.
9. Controls and Gauges	All controls and gauges should be conveniently located for easy operation. The drill should be provided with RPM meter, feed indicator, bit weight indicator and drilling fluid pressure and discharge gauges. There should be some provision for measuring the torque (Directly /Indirectly).
10. Hydraulic systems	Adequate hydraulic hoses with proper connections, hydraulic pumps, hydraulic motors, hydraulic valves, control panels, hydraulic oil cooler etc. of desired capacity, as per design parameters of the OEM shall be provided. The hydraulic system should be designed to ensure the effective working of the drill machine up to the rated capacity in each size. Flow fuse/Pressure relief valves should be fitted for safety of the hydraulic system of the drill. It must have a minimum of three hydraulic pumps out of which one hydraulic pump should be a variable-displacement piston type. The hydraulic system must be provided with adequate safety provisions. Hydraulic pumps and hydraulic motors shall be of reputed make and established quality with the standard warranty from the date of commissioning of the rig. Manufacturers of Hydraulic Pumps & Motors must have its authorised distributors network and service centres in all major cities of the country. The following details of the hydraulic system should be furnished in Technical bid i) Hydraulic Pumps: (a) Makes (b) Model (c) Flow rate (d) Working pressure (e) Applications. [Main pump should be of variable-displacement piston type] (ii) Hydraulic Motors: (a) Makes (b) Model (c) RPM (d) Pressure rating (e) Applications. [Main motor should be of variable displacement piston type] (iii) Hydraulic Cylinders: (a) Bore size and stroke length of each hydraulic cylinder. All hydraulic circuits should be connected with interlock hydraulic valves to lock the cylinders / jacks in the event of hose bursting failure.

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	NOTE: - 1) Firm should clearly indicate Make, Model and Part number of OEM of hydraulic Pump, hydraulic Motor and various hydraulic Valves in technical bid, without which offer will not be considered for evaluation. II) In the event of placement of order, the Drill Rig having Hydraulic Pumps, Motors and Valves of different manufacturers, the Tag of original manufacturers attached with the component should not be removed, without original tags of the critical components of other OEM's, it will not be accepted at the time of inspection (Pre & Post delivery).
11. Rod clamp, foot clamp & rod breakout mechanism	The Drill shall be provided with a hydraulic operated rod clamp having jaws to hold NW, BW, BQ, NQ, HQ, PQ size drill rods for adding or removing. It should also facilitate holding casings i.e., PX/PW, HX/HW, NX/NW & BX/BW sizes. One set of jaws to hold B to P wireline rods & BW/NW drill rods and PX/PW, HX/HW, NX/NW & BX/BW casings should be provided with the rig. In the case of the common jaw, it should accommodate all the above sizes with provision for centraliser. Maximum clamp diameter: sufficient to accommodate PX/PW casing Clamping range: BW/NW & PQ/BQ rod to PX or PW/BX or BW casing Clamp Jaw Style: Pivoting Foot clamp diameter range: To accommodate above ranges. Two sets of TC inserts for PQ to HQ and PW or PX to HX or HW may be provided. Drill should be provided with a suitable mechanism hydraulically operated from the control panel for break off rod joints.
12. Triplex pump	The drill unit should be fitted with a hydraulic driven Triplex drilling fluid Pump having discharge about 140 LPM at 1000 PSI and capable of handling drilling fluid up to specific gravity of 1.2. The firm should indicate Make, Model and complete technical details of the Triplex pump in the technical bid. The triplex pumps should have ceramic liners. In case of a reputed and established make of triplex pump, standard warranty should be provided from the date of commissioning of the rig and in case, the triplex pump is of rig OEM, warranty shall be of three years from the date of commissioning. Triplex Drilling fluid pump should be equipped with a heavy-duty pressure gauge, relief valve, air vessel (optional), suction manifold, suction hose, delivery hose & discharge line. The Triplex fluid pump should be provided with standard tools required for regular maintenance.
13. Mounting	The entire Drill Unit including Mast and pump should be mounted on a heavy duty Crawler chassis, fitted with GPS tracking device. The machine shall be provided with a remote tramming system. 1. The width of the drill including crawler should not be more than 1900mm. 2. The crawler should be complete with triple grouser shoes having width of 300 mm/ as per OEM. 3. Gradeability of crawler should be 25° (<i>minimum</i>, without winch support) and speed 1.5 km/hr. approx. 4. Maximum ground pressure: 8 psi. 5. The crawler should be hydraulically operated with levers fitted on the front side of the drill with suitable brakes. 6. Suitable seating should be provided at a convenient location for driving/ operation of crawler drill.
14. Lighting	The Drill shall be supplied with heavy duty weather proof LED lights fitted in strategic positions for night time operation. The lighting arrangement will be powered from Rig's electrical system. In addition, there should be provision for an inverter for lighting arrangements.
15. Leveling Jacks	The Drill is to be provided with a minimum four Telescopic box type hydraulic leveling jacks for leveling the drill at a borehole point. The firm should indicate Make, Bore size and Stroke length of each leveling jacks. Minimum ID – 100mm
16. Tools	The firm should provide a complete set of tools with each drill for regular & special application which can be used by them/ drill crew for day to day work.
17. Drilling	Each Drill shall have Drilling Accessories Viz. P/PQ and H/HQ wireline Drill rods, wireline Core Barrels,

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Accessories	Overshot Assemblies, Core lifter and core lifter case, and Impregnated High Performance Bits, High Performance Reamer Shells, hoisting plug, Water Swivel etc. as given in the annexure of this specification.
18. Reference	The population list of hydrostatic drills with details of customers, address and contact no., its capacity etc. are to be indicated. Further the firm should produce copies of the order placed by the organizations within 7 years and also proof of delivery in the Technical Bid. The bidder shall be OEM of the rig.
19. Warranty	The Drill unit along with prime mover and all other components and accessories, supplied stores, and spares will have to be covered by one-year Warranty / Guarantee, or as otherwise specified above, from the date of commissioning of Drill in field operation, for any defects in material or workmanship or both. In the event of failure of any major components, the warranty/ guarantee shall be extended accordingly in terms of the bid above. During the warranty period, the firm should ensure 90% of availability of equipment for drilling operation. Dedicated service Engineers having sufficient experience in maintenance of hydrostatic drills should be present at site, at the time of starting of drilling rig in the morning and must visit the site 2nd time, during the running operation each day. In case, services of a specialised official is required at the time of breakdown, the same must be available within 72 Hrs of breakdown. 1. All sub/jaws are to be replaced free of cost during the first four months of warranty period. 2. Lubricants (Hydraulic oil, M. oil, Gear oil, Grease etc.) are to be supplied without any additional cost during the warranty period of one year from the date of commissioning. The firm has to provide a replacement schedule of lubricants in terms of hours/ period during warranty period. 3. All Filters (including Prime Movers) 4. All type of seal kits/O rings/circlips/springs/bush 5. Plunger cups and all seals , O rings for hydraulic cylinders, 6. Plunger cups, seals/ O rings for triplex pumps 7. Oil seals of rotation unit. All items mentioned above are to be replaced without any additional cost during the warranty period of one year from the date of commissioning. 8. The services of the dedicated service engineer at site is to be provided without any additional cost during the warranty period.
20. CAMC	<u>The firm should provide CAMC for next four years after expiry of warranty period as per the following assurance of availability of machine. Dedicated service Engineers should be present at site, at the time of starting of drilling rig in the morning and must visit the site 2nd time, during the running operation each day. In case services of specialised officials are required at the time of breakdown, the same must be available within 72 Hrs of breakdown. However, this period will be counted as breakdown time for the purpose of calculation of availability of time.</u> a. CAMC shall include Lubricants (Hydraulic oil, M. oil, Gear oil, Grease etc.) are to be supplied free of cost during the warranty period of one year. Firm has to provide a replacement schedule of lubricants in terms of hours/ period during warranty period. b. All Filters (including Prime Movers) c. All types of seal kits/O rings/circlips/springs/bush d. Plunger cups and all seals / O rings for hydraulic cylinders, e. Plunger cups, seals/ O rings for triplex pumps. f. Oil seals of rotation unit. The replacement schedule for each year of CAMC shall be provided by the firm at the start of the CAMC period every year. g. All the other items not included above, like Hydraulic hose / jaws/ wire rope/ high end equipment/ battery/ other consumable spares etc. are not covered in CAMC. The firm shall provide a monthly report clearly indicating the details of the spare parts which may need replacement during next quarter along with the lead time to ensure the timely action for its procurement at our end either through the bidder or through the concerned OEM. However, in order to ensure uninterrupted operations, the bidder shall ensure timely supply of the spares as required.

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	h. Downtime due to non-availability of spares which are not covered in CAMC shall be treated as idle time, provided the service Engineer has informed in writing to the OIC /AIC for taking necessary action for its procurement but could not be procured in time. GSI will provide a space in the drilling camp for storage of spares / lubricant. Transportation to Service Engineer from his residence (<i>if it falls within 10 km from base camp</i>) will be provided. Agreed for average running hours / year as 3500 hrs. For 1st year--- 90% availability For 2nd year--- 85% availability For 3rd year ---80% availability For 4th year --- 75% availability The availability of the equipment will be calculated by using the formula given below: $\text{Percentage of Availability} = \frac{(\text{Working hours} + \text{Idle Hours}) \times 100\%}{\text{Available Shift Hours (8 or 12 or 16 or 24)}}$ Idle hours shall include time required in Crew Shifting, Machine Shifting, Geophysical Logging, and Cement Plugging and due to any force Majeure clause including law and order problem The total available Shift hours is combination of "Working Hours" and "Breakdown Hours" + "Idle Hours". In the above formula, normally Shift for 1 or 2 shifts of 8 hours each OR 1 or 2 shifts of 12 hours' duration will be considered. Breakdown hours: means all hours of work lost due to mechanical, electrical, hydraulic or any other system failure of the machine excluding: (Schedule and Preventive maintenance, routine servicing). The counting of breakdown hours will start from the time of reporting to the dedicated service engineer at site. i. Every month the availability of the drill machine is to be recorded jointly by OIC/AIC, GSI and dedicated service engineer and to be submitted to the Regional Drilling Head, Engineering Division regularly. j. All breakdowns/problems noticed will be informed to you or your representative immediately for necessary repair/rectification as the need may be. k. Loss of hours due to any reasons such as breakdown on account of premature failure of high end equipment, due to non-availability of spares which are not covered in CAMC and the service Engineer has informed in writing to the OIC /AIC for taking necessary action for its procurement but could not be procured by GSI in time, strikes of workmen, natural calamities, accidents, non-availability of HSD fuel, operators not reporting on time, drill string getting stuck due to adverse rock conditions and time utilized by operator in trying to get the string out / to arrange fishing tools etc. and other force Majeure reasons shall not be considered as breakdown hours for calculating the percentage of availability.
21. After Sales Service	Firms should indicate sales & services infrastructure in India, and complete address of branch offices at different locations in India, if any. Though the CAMC is for four years the firm should confirm in writing regarding the availability of spares for next five years after expiry of CAMC and should confirm to provide AMC /CAMC for next five years (after expiry of present CAMC) if required by GSI, to ensure uninterrupted service for at least ten years from the date of commissioning.
22. Parts catalog and operations manual	Three sets of parts catalog & operational manual for each Drill unit, vehicle, Prime mover, Hydraulic system (for all pumps, motors & controls valves) and Mud pump should be supplied.
23. Commissioning, Training and Operation	The representative of the firm shall commission the equipment at GSI Drill site without any additional cost. The complete drill unit including Triplex fluid pump & related system should be supplied to GSI "in ready to operate condition" i.e. all the lubricants should be filled in and all the hoses and wire ropes should be in fitted condition. Immediately after dispatch of the rig, the firm shall arrange one week [5 working days] training programme at its premises for the officer incharges of these units [Nominations will be sent by GSI, after pre dispatch inspection is completed] on various functions & operation of the Drill to GSI Graduate Engineers who will be taking over the charge of these units in field and Onsite training for drill crew for two weeks [12 working days] after the commissioning of the unit at the bore hole location, without any additional cost. Commissioning of equipment and

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	training to GSI personnel shall be in the scope of supply. The supplier shall provide one operator for operating the rig for a period of one year from the date of commission.
24. Transit insurance, Registration, Permit etc.	Transit Insurance up to the destination of the drill rig, mud pumps and associated accessories up to the consignee location shall be arranged by the Bidder. It is the responsibility of the successful bidder to provide all the documents required to get the vehicle transferred in the name of GSI. (GSI will also provide all the required documents for the purpose). The consignee and the bidder will ensure that change in registration is effected smoothly and timely.
25. Availability clause	With reference to point 19 and 20 of this specification, the successful bidder shall ensure: i) Guaranteed annual availability of minimum 90 % during warranty period. ii) - Penalty calculation will be made on yearly basis for availability shortfall. iii) In case the actual availability of equipment falls short of the minimum guaranteed availability as stated above supplier will be liable to pay penalty to GSI @ 0.5% of landed value of the equipment for every 1% shortfall during the warranty period and there will be the ceiling of 10% of the Order value on penalty. During the CAMC the firm will be liable to pay penalty to GSI @ 1% of Annual CAMC cost for every 1% shortfall Amount will be Technical specification for 300m hydrostatic core drilling rig deducted during the last quarter of CAMC. Payments of CAMC will be made on a half-yearly basis.
26. Payment	As per GeM terms and conditions
27. Safety	All the moving parts should be covered with adequate safety guards viz. Engine, Main Winch, Drill head etc

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ANNEXURE (Para 17 of this specification)

1. H / P size Wireline drill rod 3.0 M length as per specification mentioned in annexure - 1. Bidders shall give a free replacement warranty for any manufacturing defect / premature failure.

P/PQ rods – 10 nos., H/HQ rods – 67 nos. with each drill

2. H /H3 / P size Wireline core barrel with 3.0 M core capacity complete in all respects as per specification mentioned in annexure - 1.

P/PQ size barrels – 02 nos., H/HQ size barrels – 03 nos. with each drill

Additional (01 Inner Tube Assy. + 01 Locking Couplings 01 Adapter Coupling + 05 Core Lifter + 02 Core Lifter Case + 01 Stop Ring + 01 Shut off Valve + 01 Landing Rig + 01 Inner Tube Stabiliser) with H size core barrel assembly with each drill.

P/ H Overshot Assembly–02 nos. for P size, 03 nos. for H size with each drill.

3. **H3/HQ3** wireline triple tube core barrel complete set comprising H3/HQ3 head assembly, H3/HQ3 inner tube components and H3/HQ3 outer tube components - **01 set with each drill.**
Additional H3/HQ3 wireline triple tube core barrel components (01 Pump out adapter, 01 Piston plug, 02 O-ring, 01 Core ejection piston, 01 Split tube, 01 stop ring, 05 core lifter, 02 core lifter case) with each drill.
4. Reaming Shell and impregnated Diamond bit for H /H3 / P sizes as per specification mentioned in annexure - 1, of suitable series for drilling through copper / base metal / gold in hard and fractured to very hard formations.

Quantities of Bits and Reaming Shells to be supplied with each drill

Sn	Description	Overburden	Hard	Hard & Fractured	Very Hard including BHJ / BHQ & Quartzite
01	P/PQ diamond core bit	02	03	03	02
02	H/HQ diamond core bit	01	10	05	10
03	H3/HQ3 diamond core bit	-	-	05	-
04	P/PQ diamond reaming shell	03 nos.			
05	H/HQ diamond reaming shell	06 nos.			
06	H3 diamond reaming shell	03 nos.			

5. The water swivel & hoisting plug should have a suitable adapter to connect "P/PQ wireline, H/HQ wireline, BW" drill rod and conforming to load & static hoisting capacity of 5 Ton (min).

Water swivel (02 nos.) & Hoisting plug (01 no.) - with each drill

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