



ब्रेथवैट एण्ड कम्पनी लिमिटेड
(भारत सरकार का एक उपक्रम)

BRAITHWAITE & CO LIMITED

(A Government of India Undertaking)

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TENDER ENQUIRY NO. BCL/PUR/PD/AMC/Pneumatic System-Oil Hyd. Press/CW/2018 dt. 27.07.2018

Sealed Offers are invited in Two bid system for AMC of Pneumatic System, Oil Hydraulic Press, Lubrication & painting of Plants and machineries, De-scaling of compressors water lines Pressure Vessel test of Compressors and 2 (two) Nos. Single Wagon Pressure testing Rig Machines, along with supply of Spares on need basis at Clive Works, for a period of 12 calendar months, as per the Description of Job & Scope Of Work given below.

1. The jobs are to be carried out at Clive Works of BCL. Bidders are requested to visit site and inspect the plants, facilities, concerned machines, specifications of spares etc. and understand the job to be performed before submitting offer. Bidders shall contact Manager (Maint.) - Clive Works for this purpose. No claim shall be entertained afterwards.
2. Closing of tender Box : 14.30 hrs. on **09.08.2018**
3. Opening of the Part-I bid of the tender : 15.00 hrs. on **09.08.2018**

The offer should comprise of two parts as under:

- Part-I : Techno-commercial bid & E.M.D
Part-II : Price bid

Both Part - I & Part - II bids of the quotation shall be inserted separately in two (2) envelopes, being sealed and super-scribed with our Tender No. and Part No. These two envelopes shall be put into a 3rd envelope which should also be sealed & super-scribed with **Tender No. Date, Due Date & Box No.**

Sealed Tender, addressed to **Sr. Manager(Purchase)**, Braithwaite & Co. Ltd., 5, Hide Road, Kolkata - 700 043 may be dropped in our **Tender Box No. 2** (in case of hand delivery) or may be sent by Registered post but must reach us positively within **09.08.2018** (due date) up to 15.00 hrs. No offer shall be accepted after closing of the Tender Box in whatsoever mode of receipt.

The techno commercial bid (Part-I) shall be opened **on 09.08.2018 at 15.00 hrs.** Bidders may depute their authorized representative to be present during opening of the tender. The price bid(s) i.e. (Part-II) shall be opened for techno - commercially acceptable bidders only for which opening date and time will be intimated in due course.

Tender will be considered cancelled if the documents required for Part-I (Techno-commercial Bid) & Part-II (Price part) bids are not placed in respective / proper envelopes.

Tender documents can also be downloaded from our website www.braithwaiteindia.com and offer can be submitted meeting tender requirements.

For Braithwaite & Co. Ltd.

Website Conditions:-

Bidders who intend to submit offer against website display of this tender and are also not registered with BCL, should submit the following documents along with their techno commercial bids:

Experience documents related to execution of similar type of job in different industrial houses successfully during last 7 years ending on 31.03.2018. Such experience should cover execution of **1 (one) order** of value not less than **Rs. 19.38 Lacs** or **2(two) orders** having each value not less than **Rs 12.12 Lacs** or **3 (three) orders** having each value not less than **Rs 9.69 Lacs**. Copies of orders along with completion documents are to be submitted. Audited / C.A. certified Balance Sheet and Profit & Loss accounts for last 3 years ending on 31.03.2017. Bidders should have Annual Average **Turnover of at least Rs. 7.30 lacs** during last three years ending on 31.03.2018 and should have earned net profit in any of the above last three years. Copy of PAN, Trade License, GST registration certificates, PF / ESI registration documents, etc and Income Tax return for last 3 years ending 31.03.2017 shall be submitted.

In case of order placement, the bidder / Contractor shall have to get themselves registered with BCL by complying with vendor registration formalities.

GROUP - I (AMC OF INDUSTRIAL PNEUMATIC SYSTEM)

Description of job:

Maintenance Contract for preventive maintenance and break – down maintenance for Industrial Pneumatic System consisting of Pneumatic Pipe line & Accessories, Compressors and Cooling devices of Clive Works.

- The Pneumatic pipe line & accessories are to be maintained: This is consisting of the whole Pneumatic pipe line of Bay-1, Bay-2, Bay-3, Bay-4, Black Smith Shop, Tool room, Preparation, Bay-5, Bay-6, Bay-7, Painting & Finishing shop and Shot Blasting shop, which are to be maintained to an excellent working condition, free from leakage with all necessary repairing, modifications & testing whatsoever required.
- Details of Compressors to be maintained:

SI. No.	Make of Compressor, Model No.	Plant No.	Capacity	Location
1.	ATLAS COPCO, AR – 1	D - 48	400 cfm	6- Bay
2.	KHOSLA-2HA2 TIER	D - 62	500 cfm	6- Bay
3.	KIRLOSKAR –BTD-JM	D - 63	500 cfm	P. House
4.	ATLAS COPCO. AR -1,	D - 49	400 cfm	6- Bay
5.	BROOM MADE, type TS-2	D - 44	300 cfm	Power house
6.	BROOM MADE, type TS-2	D - 45	300 cfm	Power house

BCL may run the above 6 nos. compressor every month as per requirement of normal production job. In such case, certification & payment will be made on pro rata basis.

Job certification & payment of each compressor will be made on the basis of % of availability of each compressor as mentioned below:

For Availability of Compressor

90% to 100%	100% Payment
80% to 90%	90% Payment
70%to 80%	80% Payment
60% to 70%	70% Payment
50% to 60%	60% Payment
Below 50%	NIL No payment

$$\% \text{ Availability} = (\text{Total Available Hours} - \text{Hours of Breakdown}) / \text{Total Available Hours} \times 100.$$

SCOPE OF WORK WITH RELATED TERMS & CONDITIONS(For the above mentioned plants) :-

1. The Contractors have to follow the Preventive maintenance schedule from **Daily check** to Annual Survey repair as per the table shown below where 'C' denotes Control, 'M' denotes Maintenance & Cleanliness and 'R' denotes Replacement. For such work contractor have to maintain a separate logbook for job done & consumption of spare. The Preventive maintenance have to be carried out (Except Daily Check) in presence of maintenance personnel.

Control, Maintenance & Cleanliness and Replacement.	Daily Control	Weekly Control	3 months	6 months	9 months	12 months
Air Filter Element	C	M	M	R	M	R
Air Leakage	C	C	C	C	C	C
Air Hoses & connections	C	M	M	M	M	M
Discharge Valve (2/2 way solenoid valve)	-	-	-	-	-	C
(2/2 way solenoid valve membrane)	-	-	-	-	-	-
Collector Drainage valve (manual)	C	C	C	C	C	C
Air Tank Drainage valve (manual)	C	C	C	C	C	C
Oil Leakage	C	C	C	C	C	C
Oil Lever Control	C	C	C	C	C	C
Oil Change			R	R	R	R
Suction Pressure Valves	Maintenance for every 500 hours working					
Suction Pressure Valves Spring and Plate	-Do-					
Safety Valve	-	-	C	C	C	M
Safety Valve Rubber	-	-	-	-	-	-
Manometer	C	M	M	M	M	M
Non-return Valve	-	-	M	M	M	M
Pressure Switch	C	C	C	C	C	C
V-belt tensioning	C	C	C	C	C	C
V-belt Guard	C	C	C	C	C	C
All Electrical Cables & Connections	C	C	C	C	C	C
All Electrical Materials	C	C	C	C	C	C
Function Tests of all Devices	C	C	C	C	C	C
Compressor Noise	C	C	C	C	C	C
Compressor Vibration	C	C	C	C	C	C
Air Tank	C	M	M	M	M	M
All Bolts, Nuts (connection components)	C	M	M	M	M	M
Pipes & Coolers (Surface)	C	M	M	M	M	M
Crankcase Ventilation	C	M	M	M	M	M
Rubber W edge	C	C	C	C	C	C
General Cleanliness	C	M	M	M	M	M

Note: The contractor has to carry out Annual Survey Repair & Painting of all compressors once in every year with prior intimation to BCL. Maintenance department will arrange necessary shutdown of the compressors. After thorough repair and painting, each Pressure Vessel have to be tested by competent person/ Inspector as per Factory Act and certificate and the same is to be submitted to Maintenance department.

2. The contractor have to provide proper competent personnel for electrical, mechanical & plumbing jobs along with operation of compressors from 8 am to 9 pm in two shifts, for all working days including Sundays and Holidays (if required). On requirement of urgent production job, few compressors may be required to operate after 9:00 PM(night shift) on normal working days and after 04:30 PM on Sundays and holidays, adequate manning to be provided. To rectify any complicated or major defects of any compressor under AMC, the contractor must provide suitable manpower to tackle those problems on need basis only. Tentative manpower for Operation and Maintenance Tentative manpower for operation & Maintenance of Air compressors Cooling system and Pneumatic lines to be as follows:-

- a) Plumber - 01 (One) No.
- b) Operator / Electricians - 02 (Two) Nos.
- c) Operators / Fitter - 03 (Three) Nos.
- d) Helper - 02 (Two) Nos.

 Total 08 (Eight nos. manpower are to be maintained.)

- a. In case of any major breakdown the contractor have to and bound to work beyond normal working hours till rectification of the machine. Though normal working period in from 8.00 am to 9.00 pm, if any breakdown continues after 9.00 P.M. to 8 A.M. of the next day, the same will be treated as continuous breakdown and this non working hours (9.00 P.M. to 8 A.M. = 11 hours) will come under breakdown hours during calculation of availability.

- b. There shall not be any payment to be given to the contractor for non working holidays in a month. Deduction for non working holidays shall be considering 8 hours duty like weekly off day (at present Sunday). However, in case of emergency / urgent requirement from production department, contractor's men may require to be booked in the non-working holiday and in the night shift. Payment for such booking shall be made to the contractor on pro rata basis. To execute such holiday booking / night shift booking, prior written permission from production & Maintenance department has to be taken by the contractor. **Approximate possibility of such Holiday / Nightshift booking is around 120 days in a year.**

The payment towards extra hours shall be made as per the following formula:

$$\frac{\text{(Rate per compressor per month) X (Extra hours) X (Number of Compressors booked) *}}{26 \text{ days X } 13 \text{ hours}}$$

* Number of compressors booked means number of compressors in the bay where production job is going on and booking is given for the compressor.

- c. The Contractor has to keep sufficient **Fast Moving Spares** in his stock, so as to reduce breakdown time as well as loss of production for want of compressed air.
3. Time for thorough maintenance of the compressors on Preventive / Routine basis would be allowed by BCL in prior consultation and written permission would be given by BCL for such work.
 4. A separate Log Book for attendance of personnel and day to day jobs are to be maintained by the party, which will be checked & signed from time to time by BCL authority.
 5. The compressors have to be maintained and operated from incoming Main Power Line near the compressor right from main switch, panel wires, starter, main driving motor, coolant pump motor etc. in the electrical side and filter, L.P. cylinder, inter cooler, inter stage pressure gauge L.P, H.P + NRV valve, air receiver fill valve, delivery valve, un loader pipe, un loader, coolant suction pipe from cooling tower to C pump with the valve and delivery pipe from pump through compressor to cooling tower, entire lubrication system, oil & air gland, cross head, connecting rod, piston rings, crank shaft, bid and bearing etc. party will repair the motor, starter, switch, panels etc.
 6. All lubricating oils, grease etc. will be supplied by BCL free of cost. However, in any exigency, where, in case of non availability of Lube Oils, the party may be asked to provide them in existing market rate (LPP of BCL) on reimbursable basis. Immediately after such emergency supply through stores, the party may raise bills on actual cost basis (LPP) on the support of challan and cash memo, this will help the party to maintain availability of compressors.
 7. Kerosene oil, Cleaning cloth, Emery paper, Cotton Waste and Paint brush to clean and Paint the equipments will be party's responsibility. However, Paint would be provided by BCL free of cost.
 8. Space, power, water welding lines electrodes, Oxygen & acetylene gas cylinders and machining facility (only machine operator) would be provided by BCL. Also M.S. sections, if required, to maintain the equipment in a steady condition, would be provided by BCL free of cost.
 9. All tools & tackles required to maintain the plant, shall have to be provided by the party.
 10. Supplying of water of acceptable quality to cooling tower / overhead storage tank would be under BCL's responsibility. BCL will also maintenance the overhead storage tank but the maintenance of cooling tower is under contractor's responsibility.
 11. All Compressors and Pressure Vessels under AMC must be tested twice in every year through a competent person as per Industrial Safety Guideline and the obtained certificate has to given to BCL maintenance for keeping records.

SCOPE OF WORK FOR OPERATION:-

1. Contractor has to provide adequate manpower to operate the compressors As & When required.
2. Usually these compressors are required to operate in General Shift & B-shift. During exigency, operation of Compressors may be required in Sunday / Holiday for which prior intimation will be given to the contractor & the contractor has to arrange operator from among available operators.
3. It will be the responsibility of the contractor to keep at least 5 compressors ready for running in all working days. Normally, depending upon load, 4 or less numbers compressors will run.
4. The compressors should be run in a staggered manner so that no compressor runs for more than 12 hours at a stretch.

5. The contractor has to maintain a Log Book for operation keeping record for running hours of all the compressors.

SCOPE OF WORK FOR MECHANICAL MAINTENANCE JOB:-

The maintenance work will cover overhauling periodic, preventive, running and break-down mechanical maintenance & installation in the system and sub-system including rotary and stationary components of service air and instrument air compressors which include all associated components of the compressed air system and its sub-system of all the units. The outline of AMC involves the following works. But the list appended below is not an exhaustive one & this will include all other works related to the system and sub - system including modification of the system / sub- system / lines / equipments, it is obvious that any other works which is not mentioned in the list below but within the purview of the system & sub- system of the compressor is to be attended within this LS contract. Some of the following jobs are to be carried out on daily/weekly/Monthly/By - monthly basis and the other jobs are to be carried out on need basis and the controlling officer or his representative(s) irrespective of number of break – down / overhauling servicing etc. of the compressors and the associated system / sub – system.

1. Cleaning & replacement of suction air filter and pipe, primary & secondary oil filter, tensioning and adjustment of belts. Change of compressor oil after specific time period or running hours.
2. Checking / replacement of gland packing and scrapper ring, dismantling and checking of all suction and delivery valves, NRV and unloading system.
3. Cleaning of water jacket and cylinder for sludge and scale formation, replacement for lube oil after cleaning of crank case.
4. Cleaning of inter cooler and after cooler tube bunch and shell, leakage test of cooler tubes & rectification.
5. Inspection / replacement of the components of piston assembly (i.e. piston rod, bearing ring, piston sealing ring piston halves)
6. Dismantling and re- assembly of total compressor like cylinder head, crank case, bearing, piston assembly, inter cooler and after cooler, all valves, NRV, suction pipe, water cooler pipes etc. for inspection / replacement as and when required, leveling of crank case and cylinder, cleaning of all cylinder internals, water path, replacement of all gaskets of joints, checking of all main and big end bearing for wearing and clearances with crank shaft comparing with designed value, displacement of all suction and delivery valves and their cleaning / replacement / assembly with new spring plate checking / replacement of valve plate un- loader system.
7. Checking of all oil pump and replacement of driving pin, dismantling of lubrication system and reassembly with new gaskets after thorough cleaning.
8. Servicing of all valves (oil, water, air).
9. Repairing / replacement of all plug valves, checking / servicing of safety valves of receiver tanks, checking / servicing of air drain trap system, checking of oil pressure of all running compressors, checking of all abnormal sound from the compressor and the associated system and sub- system.
10. Maintenance and servicing / replacement of air line traps / drains including instruments and service air line headers after air driers lines up to distribution terminal points and attending any leakages in main air headers & pipelines in any area.
11. Maintenance of air lines & cooling towers including daily checking & rectification of any leakages. All files, planks of cooling towers should be cleaned once in a month. The party should keep a record of the maintenance work done.
12. All maintenance work including daily checking should be recorded in a Logbook.
13. Any other job if found necessary for smooth functioning of compressor are to be carried out.

SCOPE OF WORK FOR PNEUMATIC PIPELINES AND ACCESSORIES:-

1. All pneumatic pipe lines (in structural department in Bay No. – 1 to Bay No – 4, Black Smith Shop, Tool room, Preparation, Bay No. 5, Bay No. 6, Bay No. 7 painting & finishing shop, Shot blasting) are to be checked and repair thoroughly on daily basis to restrict / eliminate these pipe lines.
2. Removal / restoration of old / defective pipe lines with accessories, installation of new pipelines with accessories, modification & testing as and when necessary.

SCOPE OF WORK FOR ELECTRICAL MAINTENANCE JOB :

1. Preventive and breakdown maintenance of 3 phase 415V 90KW compressors Motors along with associated control panel, Drier panel and LPB stations under :
 Regular cleaning of motors and associated control panels / LPB stations, greasing of bearings, tightness checking of terminals, electrical connections etc., cable disconnections/reconnection, shifting of unhealthy motor from work place to the spot as per direction of Engineers-In- charge, small repairing of motor, repair / replacement of defective components, replacement of damaged bearings, insulation of motors, assisting BCL engineers in checking / replacement of damaged bearings insulation of motors assisting BCL Engineers in Checking / inspection etc.
2. To attend break-down job of control panels of compressors.
3. Any other electrical job not indicated above but necessary for smooth functioning of compressor plant, such as power supply connection / disconnection, modification work which are not major in nature, shall be under the scope of this contract.
4. The contractor shall arrange all the necessary tools & tackles to carry out the schedule maintenance job (Viz. Multi-meter & Tong Tester, Megger etc.).
5. Common consumables like cleaning agent, cotton waste, old cloth, grease etc. are in the scope of the contractor.
6. Thorough cleaning and heat varnishing and painting of each motor once in a year.
7. Contractor has also carry out rewinding of motors of the compressors (as & when required basis) as per details given below:

Sl. No.	Motor Rating	Motor type	Tentative Quantity
1.	415V, 50 HZ 90 KW	Squirrel cage Induction Motor	4 nos.
2.	415V, 50 HZ 90 KW	Slip Ring Induction Motor	2 nos.
3.	415V, 50 HZ 55 KW	Slip Ring Induction Motor	2 nos.

Note – The Contractor has to give item wise rates for **stator winding, rotor winding, replacement of bearings, replacement of shaft, repairing of shaft and repairing of end covers**. Damaged copper shall be retained by the contractor.

MAINTENANCE SPARES WHICH ARE WITHIN THE SCOPE OF THE CONTRACTOR :

1. **Spares list for Pneumatic line:**

A. Fast Moving parts

Sl. No.	Description	Part No	Annual Qty	Quantity to be stocked
1.	High Tensile nut & bolt (Suitable in size)		800 nos.	100 nos.
2.	Hex nipple : ½" x ½"		350 nos.	50 nos.

B. All slow and medium moving spares for Pneumatic line will be supplied by BCL.

2. **Spares list for Air Compressor, Make – Khosla, Model – 2 HA2TER Plant No: D -62**

A. Fast Moving Parts

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
1.	Copper Gasket for Valve Assembly		17 Nos.	10 Nos.
2.	Silicon Valve Cover "O" Ring		25 Nos.	10 Nos.
3.	H.P. Valve Plate		25 Nos.	10 Nos.
4.	Water Pump Disc R/ Disc		04 Nos.	02 Nos.
5.	Fuse		7 Nos.	4 Nos.
6.	L.P. Valve Plate		25Nos.	10 Nos.
7.	L.P. Valve Spring		7 Nos.	4 Nos
8.	Silicon Valve Cover" O " Ring		7 Nos.	4 Nos.
9.	Unloader " O " Ring Silicon		25 Nos.	10 Nos.
10.	Copper " O " Ring		25 Nos.	10 Nos.
11.	Lock Nut For H.P. Connecting Rod		5 sets	2 nos
12.	Inter Cooler " O" Ring	35360480Y	7 sets	4 nos
13.	After Cooler "O" Ring		7 sets	4 nos.
14.	L.P. Valve Plate		13 sets	10 nos.

B. Medium Moving Parts

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
1.	Gudgeon Pin	35322080H	3 sets	1 set
2.	Unloader Copper Pipe (¼"NB) with Brass Pipe Fittings		3 sets	1 set
3.	Air Filter Element		3 sets	1 set
4.	L.P. Valve Pusher Assembly		7 sets	1 set
5.	L.P. Valve Guard.		7 sets	1 set
6.	Air Gland Packing (LP)		2 sets	1 set
7.	Air Gland Packing (HP)		2 sets	1 set
8.	Oil Gland Packing (LP)		2 sets	1 set
9.	Oil Gland Packing (HP)		2 sets	1 set
10.	Oil Filter Element	35190360K	2 sets	1 set

C. Slow Moving parts

Sl. No.	Description	Part No.	Qty
1.	Main Bearing (each in two halves) (-.010")		4 sets
2.	Big End Bearig (each in two halves) (-.010")	35110040K	3 sets
3.	D-210 Vee Belts		2 sets
4.	Small End Bush	35138000H	3 sets
5.	H.P. Valve Pusher Assembly		5 sets
6.	L.P. Suction Valve Assembly		4 sets
7.	L.P. Delivery Valve Assembly.		4 sets
8.	H.P. Suction Valve Assembly.		4 sets
9.	H.P. Delivery Valve Assembly.		4 sets
10.	L.P. Suction Valve Seat.		4 sets
11.	L.P. Delivery Valve Seat.		4 sets
12.	H.P. Piston.	3532024Y	2 sets
13.	H.P. Piston Ring.	35324160Y	2 sets
14.	L.P. Piston.		2 sets
15.	L.P. Piston Ring.	35324440K	2 sets
16.	Main Bearing Sleeves.	35110120H	2 sets
17.	Cross Head H.P.	35176040K	2 sets
18.	Cross Head L.P.	35176040K	2 sets
19.	Cross Head Guide H.P.	35262041P	2 sets
20.	Cross Head Guide L.P.	35262041P	2 sets

3. Spare List for Air Compressor Make – ATLAS COPCO Model – AR – 1, Plant No. D -48/49.

A. Fast Moving Parts

Sl. No.	Description	Annual Qty	Quantity to be stocked
1.	L. P. Unloader " O" Ring	50 pcs.	20 pcs.
2..	H.P. Unloader "O" Ring	50 pcs	20 pcs.
3.	H.P. Delivery Gasket (Copper) for Valve	17 nos.	5 nos.
4.	H.P. Suction Gasket (Copper) for Valve	17 nos.	5 nos.
5.	H.P. Split Pin for valve assembly	50 pcs.	20 pcs.
6.	H.P. Oil Gland Packing	3 set	1 set
7.	H.P. ¼ " Unloader Pipe (Copper)	6 mtr.	2 mts.
8.	L.P. Valve Plates	13 nos.	5 nos.
9.	H.P. Valve Plates	13 nos.	5 nos.
10.	L.P. Valve Spring	50 pcs	20 pcs.
11.	H.P. Valve Spring	50 pcs	20 pcs.
12.	Copper Gasket for L.P. Valve Assembly(158 mm O.D*145 mm bore*2 mm thick)	17 nos.	5 nos.
13.	Copper Gasket for H.P. Valve Assembly(94 mm O.D*87 mm bore*2 mm thick)	17 nos.	5 nos.
14.	H.P. Unloader " O" Ring	25 nos.	10 pcs.
15.	L.P. Unloader "O" Ring	25 nos.	10 pcs.
16.	Water Pump R/Disc	7 nos.	3pcs.
17.	Cartridge Fuse	7 nos.	3 pcs.
18.	L.P. Split Pin for Valve Assembly	50 pcs.	20 pcs.

B. Medium Moving parts

Sl. No.	Description	Part No. (wherever available indicated)	Annual Qty	Quantity No. to be stocked
1	L.P. Valve Pusher		9 nos.	1 set
2	L.P. Oil Gland Packing		3 sets	1 set
3	L.P. Gudgeon Pin		3 nos.	1 set.
4	H.P. Valve Seat Section		9 nos.	1 set
5	H.P. Valve Seat Delivery		9 nos.	1 set
6	H.P. Valve Pusher		9 nos.	1 set
7	Lubricating Glass		7 nos.	1 set
8	Air Intake Filter Element		5 sets	1 set
9	L.P. Valve Seat with Center Bolt		7 nos.	1 set
10	H.P. Valve Seat with Center Bolt		7 nos.	1 set
11	Oil Filter Element		3 sets	1 set

C. Slow Moving parts

Sl. No.	Description	Part No.	Qty	Quantity to be stocked
1	L.P. Connecting Rod Bush (Small end)		3 nos.	
2	L.P. Connecting Rod Bush in Two Halves		3 nos.	
3	L.P. Connecting Rod		2 nos.	
4	H.P. Piston Ring		7 nos.	
5	H.P. Valve Assembly (suction + delivery)		5 nos.	
6	H.P. Valve Guard Suction with center Bolt		5 nos.	
7	H.P. Valve Guard delivery with centre Bolt		5 nos.	
8	H.P. Connecting Rod		2 nos.	
9	H.P. Connecting Big End Bearing in Two Halves		2 sets.	
10	H.P. Connecting Small End Bearing		2 nos.	
11	H.P. Gudgeon Pin		2 nos.	
12	L.P. Suction Valve Assembly		6 nos.	
13	L.P. Delivery Valve Assembly.		6 nos.	
14	H.P. Suction Valve Assembly		6 nos.	
15	H.P. Delivery Valve Assembly		6 nos.	
16	L.P. Piston Ring		2 sets	
17	H.P. Piston Ring		2 sets	
18	Air Intake Filter Element		2 sets	
19	C-158 Vee Belts		2 sets	

4. Spare List for Air Compressor Make – KIRLOSKAR, MODEL – BTD –JM, Plant No. D-63

A. Fast Moving parts

Sl. No.	Description	Part No. (wherever available indicated)	Annual Qty	Quantity to be stocked
1.	Garter Spring	2460100750	13 nos.	04 nos.
2.	Lift Washer	2460061250	17 nos.	05 nos.
3.	L.P. Valve Plate	2460060350	17 nos.	05 nos.
4.	H.P. Valve Plate	2460065350	17 nos.	05 nos.
5.	L.P. Cushion Plate	2460060450	09 nos.	04 nos.
6.	H.P. Cushion Plate	2460065450	09 nos.	04 nos.
7.	L.P. Valve Spring	2460060550	50 nos.	20 nos.
8.	H.P. Valve Spring	2460070550	50 nos.	20 nos.
9.	Valve Spring L.P	2460065550	50 nos.	20 nos.
10.	Valve Spring H.P.	2460075550	50 nos.	20 nos.
11.	Castle Nut	2460060950	13 nos.	05 nos.
12.	Split Pin	3000198450	50 nos.	20 nos.

Fast Moving Parts (contd.)

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
13	L.P. Unloader Spring	2460090150	11 nos.	04 nos.
14	'O' Ring Unloader Piston	9991269550	25 nos.	10 nos.
15	Water Pump R/ Disc		07 nos.	03 nos.
16	Fuse		07 nos.	03 nos.
17	Circlip	2460061150	50 nos.	20 nos.
18	Packing (Copper) L.P.	2460011850	25 nos.	10 nos.
19	Packing (Copper) H.P.	2460021850	17 nos.	05 nos.
20	'O' Ring Valve Cover L.P. (Suc)	9991289950	25 nos.	10 nos.
21	'O' Ring Valve Cover L.P. (DEL)	2460071050	25 nos.	10 nos.
22	'O' Ring Valve Cover H.P. (Suc)	9991289850	25 nos.	10 nos.
23	'O' Ring Valve Cover H.P. (DEL)	2460076050	25 nos.	10 nos.
24	Oil Seal	2460040850	03 nos.	

B. Medium Moving Parts

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
1.	Un loader Piston	2460080150	7 nos.	1 set
2	Air Filter Element		3 sets	1 set
3.	Lub Oil Filter Element		3 sets	1 set

C. Slow Moving Parts

Sl. No.	Description	Part No.	Qty	Quantity to be stocked
1.	Oil Scrapper Packing	2460100950	2 sets	
2.	6 pcs Packing	2460100650	2 sets	
3.	3 pcs packing	2460100550	2 sets	
4.	L.P Piston	2460030150	2 nos.	
5.	H.P. Piston	2460035150	2 nos.	
6.	L.P. Piston Ring	2460030850	2 sets	
7.	H.P. Piston Ring	2460035850	2 sets	
8	VEE BELT		2 sets	
9	Main Bearing	2460032350	2 sets	
10.	Bearing Lower Half	2460032250	2 sets	
11.	Bearing Upper Half	2460032350	4 sets	
12.	Valve Seat Suction L.P.	2460060150	4 sets	
13.	Valve Seat Suction H.P.	2460065150	4 sets	
14.	Valve Seat Delivery L.P	2460070150	4 sets	
15.	Valve Seat Delivery H.P	2460075150	4 sets	
16.	Valve Assembly Suction L.P.	2460060050	2 sets	
17.	Valve Assembly Suction H.P.	2460065050	2 sets	
18.	Valve Assembly Delivery L.P	2460070050	2 sets	
19.	Valve Assembly Delivery H.P	2460075050	2 sets	
20	Bush L.P & H.P	2460090450	3 sets	

5. Spare list for Air Compressor, Make – BROOM WADE Model – TS-2, Plant No. D-44 & D-45.

A. Fast moving parts

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
1.	H.P. Suction Valve Spring		50 nos.	20 nos.
2.	L.P. Suction Valve Spring		50 nos.	20 nos.
3.	Water Pump R/ Disc		07 nos.	03 nos.
4.	Fuse		07 nos.	03 nos.
5.	L.P. Suction valve plate		07 nos.	03 nos.
6.	L.P. Delivery valve plate		07 nos.	03 nos.

Fast Moving Parts (contd.)

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
7.	H.P. Suction valve plate		07 nos.	03 nos.
8.	H.P. Delivery valve plate		07 nos.	03 nos.
9.	Oil Gland Packing		3 sets	1 set

B. Slow moving Parts

Sl. No.	Description	Part No.	Annual Qty	Quantity to be stocked
1.	H.P. Piston Ring		2 sets	1 set
2.	L.P. Piston Ring		2 sets	1 set
3.	Air Gland Packing		3 sets	1 set
4.	C- 180 Vee Belts		2 sets	1 set
5.	L.P Suction valve Seat		4 sets	1 set
6.	H.P Suction valve Seat		4 sets	1 set
7.	H.P Delivery valve Seat		4 sets	1 set
8.	L.P Delivery valve Seat		4 sets	1 set

GROUP – II(AMC OF OIL HYDRAULIC PRESS & SINGLE WAGON PRESSURE TESTING RIG MACHINES)

Description of Job:

Annual Maintenance Contract (AMC) for preventive maintenance and break-down maintenance of Oil Hydraulic Press complete with power packs (both Mechanical and Electrical) & 2 Nos. Single Wagon Pressure Testing of Rig Machines at Clive Works.

- Annual Maintenance Contract for repairing, replacement / routine checkup / preventive maintenance work of the following 7 nos. Oil Hydraulic Press Complete with power Packs and 2 nos. Hydraulic Jack / Floor plating machine (both Mechanical & Electrical) 2 Nos. Single Wagon Pressure Testing Rig Machines at Clive Works.
- Details of Oil Hydraulic Press & Rig machines:

Sl.	Plant Nos.	Capacity
1.	L – 47	120 Ton
2.	L – 48	120 Ton
3.	L – 73	170 Ton
4.	L- 79	150 Ton
5.	L- 81	150 Ton
6.	L – 54	60 Ton
7.	L – 55	170 Ton
8.	Hydraulic Jack/Floor Plating Machine No. 1 & 2	
9.	Rig No. 1 & 2	

Job certification & payment of each hydraulic press will be made on the basis of % of availability as per % availability of each hydraulic press as mentioned below:

For Availability of hydraulic press & Rig machines

90% to 100%	100% Payment
80% to 90%	90% Payment
70%to 80%	80% Payment
60% to 70%	70% Payment
50% to 60%	60% Payment
Below 50%	NIL No payment

$$\% \text{ Availability} = (\text{Total Available Hours} - \text{Hours of Breakdown}) / \text{Total Available Hours} \times 100.$$

SCOPE OF WORK WITH RELATED TERMS & CONDITIONS (For the above mentioned plants)

1. To carry out this job, contractor shall have to engage at least one skilled Technician having experience in Hydraulic press, along with two helpers.

2. All the power packs should be cleaned and oil level of Hydraulic tanks, development of desired pressure, functional checking of all hydraulic valves, ports, pressure control regulators, solenoids coils, should be carried out on regular basis.
3. Posts should be lubricated by Grease on working positions (running) only once in a week.
4. Posts Bushes (in two halves) should be checked on a regular basis and adjusted when found necessary.
5. During operation of presses and jacking units, all the joints are to be checked for leakage and should be repaired immediately if there is any.
6. Cylinder Glands should be checked on regular basis and adjusted when found necessary.
7. Oil Pressure of Pumps of power packs should be on regular basis and adjusted if, necessary.
8. During weekly service each machine has to be thoroughly checked by dismantling accessory devices for checking / verification of the condition of the internal components. If any indication of defects found, the same has to be rectified immediately to avoid major damage of the machine.
9. All the joints, Glands are to be checked on routine basis (at least once in a week of running of jacking Units) and rectified to avail maximum availability of units for production work.
10. The contractor has to carry out preventive maintenance every month for each machine. Following are the scope of work for preventive maintenance:
 - a. Dismantling of the whole machine.
 - b. Checking of all internal components
 - c. Overhauling of these components.
 - d. Reassembly, testing and performance checking of the whole machine.
11. Annual survey, repair of each machine to carried out once during the tenure of the contract with following jobs.
 - a. All pending jobs of daily, weekly and monthly maintenance
 - b. Thorough overhauling of the machine
 - c. Replacement of hydraulic filters and hydraulic oils.
 - d. Replacement of damaged connectors and rubber hoses.
 - e. Thorough overhauling/heat varnishing & painting of pump, motor and starter
 - f. Painting of the machine.
12. All sorts of machining jobs are to be done by the contractor.
13. The contractor has to maintain separate Log books for maintenance and operation.
 - a. Maintenance log book for keeping all records towards the job carried out during preventive (Daily, weekly and monthly) and breakdown maintenance with consumption of spares.
 - b. Operation log book for keeping record of running hours of all the presses.
 - c. Log books are to be duly signed by Maintenance in-charge-CW.
 - d. All preventive breakdown jobs are to be carried out in presence of maintenance personnel with proper intimation to in-charge of the maintenance department.
14. No payment shall be given to the contractor for non working holidays in a month. Deduction for non working holidays shall be considering 8 hours duty like weekly off day (at present Sunday). However, in case of emergency / urgent requirement from Production department, contractor's men may require to be booked in the non working holiday and in the night shift. Payment for such booking shall be made to the contractor on pro rata basis. To execute such holiday booking / night shift booking, prior written permission from production & Maintenance department has to be taken by contractor. **Approximate possibility of such Holiday / Nightshift booking is around 120 days in a year.**

The payment towards extra hours shall be made as per the following formula:

$$\frac{\text{(Rate per compressor per month) X (Extra hours) X (Number of Compressors booked) *}}{26 \text{ days X } 13 \text{ hours}}$$

* Number of compressors booked means number of compressors in the bay where production job is going on and booking is given for the compressor.

15. The contractor has to provide proper competent personnel for electrical and mechanical jobs for all working days including Sunday. However, for production requirement, contractor may be asked to run the presses and jacks after 4:30 PM with proper intimation.
16. In case of any major breakdown, the contractor has to and bound to work beyond normal working hours till rectification of the machine. Though normal working period is from 8:00AM to 4:30PM, if any breakdown continues after 4:30PM to 8:00AM of the next day, the same shall be treated as continuous breakdown, and this 'non-working hours' (4:30PM to 8:00AM) will be treated as breakdown hours during the calculation of availability.
17. The contractor has to keep sufficient **fast moving spares** (marked as 'F' in the spare list) in his stock so as to reduce the breakdown time as well as loss of production for want of compressed air.
18. All tools & tackles required to maintain the plant, shall have to be provided by the party.
19. BCL will provide Overhead Crane facilities, Oxygen and Acetylene cylinder Gas cutting equipments, welding bus bar line, welding attachments, M.S. & Low Hydrogen Electrodes. Hyd. Oil & Grease Welder and Gas cutter shall be provided by the contractor.
20. All sorts of machining jobs are to be done by the contractor. Contractor may utilize BCL's machine but operators are to be provided by the contractor.
21. Any material that needs to be taken out of BCL's premises for repair should be covered by SD or proper Indemnity bond, as decided by In-charge(Maint)-CW.
22. Replacement of any spare(s) is to be done after prior sanction from In-charge(Maint)-CW and obtaining 'No Stock Certificate' from General Stores. Such replacement will be based on 'Joint Inspection Report' of the contractor and BCL. Rejected/damaged/replaced materials, if any, are to be returned to the General Stores with proper challan.
23. Preventive maintenance job can be done by the party after taking prior sanction from the In charge Maintenance – CW & VW. This time period will be out of penalty clause. The time period of preventive maintenance job is dependent upon the quantum of job involved.
24. If the performance of execution of work is found poor or not at the satisfaction level, there should be a provision for termination of the contract at any time during the AMC period without assigning any reason thereof.

MAINTENANCE SPARES WHICH ARE WITHIN THE SCOPE OF THE CONTRACTOR

A. Spares for Oil Hydraulic Press (L 47, L 48, L 73, L 79, L 81)

SL. No	Description	Quantity
1.	Seal Kit for each HYD. RAM	12 sets F
2.	D.O.L Starter	2 nos.
3.	Repair Kit For Vane Pump	2 sets
4.	Repair Kit for Control valve	2 sets
5	Repair Kit for Relief Valve	2 sets.
6	Filter Elements	5 nos. F
7	Repairing and Rewinding of Motors	3 nos.
G. M. Bushes for Cylinder Glands		
8	Size: 15 ½ "OD*14 ½ " BORE*6" LONG	1 no.
9	12 ¾ "OD*11 ½ " BORE*6" LONG	1 no.
10	19" OD*18" BORE*6" LONG	1 no.
11	Oil Level Gauge	2 nos. F
12	Oil pressure Gauge	2 nos. F
13	Oil temperature gauge	2 nos. F

B. Spares for oil Hydraulic Press (L 54, L 55)

SL. No	Description	Quantity
1.	Seal Kit For each Hyd. Ram	12 sets F
2.	D.O.L. Starter	1 set
3.	Repair Kit for Vane pump	1 set
4.	Repair Kit for Control valve	1 set
5.	Repair Kit for relief valve	1 set
6.	Filter Elements	2 sets F
7.	Repairing and Rewinding of Motors	1 set
8.	40mm S. Steel 2 Way Ball valve	1 set
9.	Oil Level gauge	2 nos. F
10.	Oil Pressure gauge	2 nos. F
11.	Oil temperature gauge	2 nos. F

C. Spares list for Wagon Floor Plates Hyd. Jacking (Jack -1 & 2)

SL. No	Description	Quantity
1	Oil Lever Gauge	2 nos. F
2	Filter Breather	4 nos. F
3	Pump	1 no.
4	Motor (0.55 KW, 1440 RPM, 3Ph)	1 no.
5	Pressure Release Valve	2 nos. F
6	D.C. Valve (DMG -01 -363)	2 nos. F
7	Pressure gauge Isolator	2 nos.
8	High Pressure Hose (¼ "NB*5000MM Long)	Nos. F
9	Modular Check valve	2 nos. F
10	Return Line Filter	4 nos. F
11	D.O.L Starter	1 no.
12	B/U Ring (BUR -4 B-2-62 NBR)	24 nos. F
13	Rod Bearing	24 nos. F
14	Rod seal (UR-36-44 B)	24 nos. F
15	Piston Bearing(WR-36-NBR)	24 nos. F
16	"O" Ring (OR 4B-2,62 NBR)	24 nos. F
17	Piston Seal (UR-50-40-7)	24 nos. F
18	Rod wiper (WR-36-NBR)	24 nos. F
19	Pressure Gauge(2.5"DIA, 10-100KG/CM2	3 nos.
20	Repairing of Pump	1 no.
21	Repairing of electrical motor	1 no.
22	Repairing of D. C Valve	1 no.
23	Repairing of Hydraulic Pressure Hose	1 no.
24	Repairing Of Hydraulic Jack	4 nos.

D. Spares list for Wagon Floor Plates Hyd. Jacking (Jack -1 & 2)

SL. No	Description	Quantity
1.	Pressure Gauge	03 Nos.
2.	Air Pressure Regulator	03 Nos.
3.	Air Valve	03 Nos.
4.	Diaphragm	03 Nos.
5.	Flexible Armoured Hose With both end connector along with fittings, nipple, nut, etc.	03 Nos.

GROUP – III(AMC OF LUBRICATION & PAINTING OF PLANTS & MACHINERIES AT CLIVE WORKS)**Description of job:**

Annual Maintenance contract (AMC) for lubrication & painting of plants and machineries, as per the list given below, at Clive Works on daily / routine /preventive work basis for the period of 2(two) years as per the following scope of work.

LIST OF PLANTS & MACHINARIES (that is to be lubricated with frequency of lubrication as standard)**A) Oil & Grease Lubrication daily (at least twice in a day at the starting of shifts & after lunch break)**

SL. No	Description of Plant and Machineries	Qty
1	Rolling & straightening m/c. with Stallage roller	6
2	Cold sawing machine	2
3	Hack sawing Machine	2
4	Guillotine shearing m/c. with Stallage roller	7
5	Pels Shearing Machine	4
6	Planning Machine	5
7	Milling machine	1
8	Lathe Machine	5
9	Shaping Machine	2
10	B.E. Water pumps	8
11	Winches	5
12	Profile Gas Cutting machine	3
13	Hydraulic Press Brake	1
14	Mechanical Press brake	1
15	Shot blasting machine	1
16	Rotary converter	1
17	Dewatering Pump	6

B) Weekly lubrication with oil & grease:-

SL. No	Description of Plant and Machineries	Qty
1	Asquith Drilling Machinery	50
2	Transporter	6
3	Saw Sharpening Machine	1
4	Milling Machine	2
5	Materials Handling Trolley	12
6	Cropping Machine	1

C) Weekly checking of grease chambers and if necessary replenish the same:-

SL. No	Description of Plant and Machineries	Qty
1	Guillotine Shearing Machine	4
2	Rolling Machine	1

D) Weekly checking of Shunter, Fork Lift and Coles crane (02 nos. each)**SCOPE OF WORK AND RELATED TERMS AND CONDITIONS (For the above mentioned plants):**

- Plant & Machineries which are to be run daily for production work are to be lubricated at the beginning of shift and just after lunch break and as and when required.
- Diesel and other lubricating oils are to be filled up to Loco Shunter, Coles cranes, Forklifts, Diesel compressors as and when required basis.
- Oil level of enclosed gear boxes, grease level of grease reservoirs of plants & machineries are to be checked at least once in a wee and necessary top up if required.

4. Lubricant oil glasses are to be taken out, cleaned, refitted & adjusted as per requirement one in every two months.
5. Grease manifold with pipelines are to be checked cleaned thoroughly & refitted once in every six months.
6. Complete replacement of oil for the oil chambers including thorough cleaning are to be done as and when required.
7. Proper requisition for lubricating oils, diesel oil etc are to be collected from maintenance department. The same to be duly signed from store and the lubricants / fuel etc. are to collected from oil stores.
8. Pumping out of water from different pits and trenches of machineries and plant including lorry weighbridge, accumulation of water during rain, monsoon etc. after carrying the pumps to different effected locations at Clive Works and same to be returned to maintenance department.
9. Each Plants & machineries under this contract are to be cleaned thoroughly once in every month & to be painted as and when required or once in every year.
10. To carry out the above job, the contractor should have to engage at least one semi skilled workmen.
11. Contractor has to provide necessary manpower (one fitter & one helper) , tools and tackles.
12. BCL will supply lub oil, Grease, Diesel oil, Kerosene oil (at oil store) cotton waste, containers of different capacity for lubrication only.
13. Sufficient manpower is to be provided for lubrication at a time in structural shop, Wagon shop, Fitting shop 7 BSS etc. Minimum 2 persons shall be engaged by the contractor to attend day to day requirements from 8AM to 6.30 PM. on pro-rata basis and overnight work may also be carried out on requirement basis on written permission of In-charge Maint. Department.
14. The contractor has to arrange safety measures for his workmen engaged for this job. BCL in no case shall be held responsible for any accident / mishap caused to the contractor's workmen during execution of jobs.
15. If the performance of execution of work is found poor or not at the satisfaction level, there should be a provision for termination of the contract at any time during the AMC period without assigning any reason thereof.

GROUP – IV

Description of job:

Annual Maintenance Contract (AMC) for testing of **6 Nos. Pressure Vessel** fitted with compressors at Clive Works. This job is to be carried out twice in a year of each vessel.

SCOPE OF WORK AND RELATED TERMS AND CONDITIONS:

1. All compressors and pressure vessels must be tested twice in every year through a competent person as per industrial safety guideline (1948 or its current amendment), Govt. Of West Bengal and present ISO norm(14000).
2. Contractor has to submit all original documents and certificates to BCL against execution of the above jobs.
3. Space, power, water, welding line, Electrodes would be provided by BCL, free of cost.
4. All tools and tackles required to maintain the pressure vessel test, are the responsibility of the contractor.

GROUP – V

Description of job:

Annual Maintenance Contract (AMC) for **De-scaling of Compressors** Water Lines at Clive Works.

SCOPE OF WORK AND RELATED TERMS AND CONDITIONS:

1. The Chemical cleaning is required to keep the Inter-cooler and After-Cooler of L.P. Cylinder Jacket arrangement & H.P. Cylinder Jacket and pipeline free from blockade due to sediment deposition of the circulating water.
2. Passivating of the entire circuit to be done with phosphate solution.
3. Each compressor is to be de-scaled once in every six month.

4. The chemical should be supplied in a secured manner in a suitable container to avoid any hazard during storing and charging.
5. Chemical should be eco-friendly.
6. Cylinder Jackets and the quantity of water discharged at the cooling tower to be checked after every cleaning.
7. Kerosene oil, cleaning cloth, cotton waste and brush to clean will be the party's responsibility.
8. Space, power, water, welding line, Electrodes would be provided by BCL, free of cost.
9. All tools and tackles required to maintain the pressure vessel test, are the responsibility of the contractor.

GENERAL TERMS & CONDITIONS:

1. Earnest Money Deposit (EMD): ₹ 25,000/- (Rupees Twenty five thousand only)

- a. No offer shall be accepted without EMD except exemptions mentioned in the tender.
- b. Earnest Money Deposit of ₹ 25,000/- is required to be submitted in the form of Demand Draft / Pay Order drawn in favour of "Braithwaite & Co. Limited", payable at Kolkata, or in the form of Bank Guarantee as per format to be provided on demand. In case of Bank Guarantee, the validity period should initially be 120 days from the date of opening of tender. The units registered with DGS&D, SSI units registered with NSIC, MSME Units and PSU units for the tendered job / item(s) may be exempted from submission of EMD. Necessary documentary evidence in support of availing above exemption shall have to be submitted along with the techno-commercial bid. Such bidders shall declare their UAM number, failing which they will not be able to enjoy the benefits as per PP Policy for MSMEs order,2012.
- c. EMD is liable to be forfeited if the bidder withdraws or amends impairs or derogates from the tender in any respect within the period of validity of this tender.
- d. EMD shall be returned to unsuccessful bidder after finalization of the tender without any interest. For successful bidder, the same will be retained by BCL till completion of the job or till submission of Security Deposit or if so decided by the successful bidder, may be adjusted against Security Deposit for the said job.

2. Security Deposit

- a. For due fulfillment of the contractual obligations, the successful bidder shall furnish Security Deposit in the form of Bank Guarantee / Demand Draft / Pay Order for a sum equal to **5% of the contract value** within 15 days from the date of issue of the Purchase Order. The Security Deposit shall remain valid till guarantee / warranty period.
- b. As and when an amendment is issued to the contract, the successful bidder / contractor, within 15 days of receipt of such an amendment, shall furnish to the purchaser an amendment to the Security Deposit and / or Bank Guarantee rendering the same valid for the contract as amended.
- c. In case of submission of Bank Guarantee, the same shall be verified by BCL from the concerned issuing bank. The Security Deposit shall remain valid till Warranty / Guarantee period. In case security deposit is not submitted within 15 days from the date of issue of P.O, the release of security deposit at the end of the contract will be after taking into account of the corresponding period of delay in submission of the same even though the warranty / guarantee period expires.
- d. Security Deposit may also be built up by deducting the amount proportionately from each bill of the successful bidder / contractor on their request. However, 50% of the total amount of the Security Deposit is to be deposited by the successful bidder on receipt of Purchase Order. Balance 50% may be recovered from running bill.
- e. The units registered with DGS&D, SSI units registered with NSIC, MSME Units and PSU units for the tendered job / item(s) may be exempted from submission of Security Deposit. Necessary documentary evidence in support of availing above exemption shall have to be submitted along with the techno-commercial bid.
- f. Security Deposit will be returned only on completion of contractor's obligations under the contract and against refund request along with copies of documents such as related P.O. (including amendments), acknowledgement for submission of S.D., job completion certificate (if any) etc.

3. Performance Guarantee

The successful bidder / contractor shall have to submit a Performance Bank Guarantee of **5% of Order value** as per format to be provided by BCL after placement of order. In respect of bidders registered with DGS & D, NSIC for the tendered jobs, SSI unit or PSU unit though qualified for/availed exemption of submission of security deposit, Performance Guarantee @ **5% of order value** is to be submitted by them. The Performance Guarantee shall have to be submitted before receipt of first payment. This shall remain valid up to the guarantee / warranty period of the contract. PBG shall be returned / refunded only after successful completion of warranty period of the contract.

The Security Deposit, if submitted, may be converted to Performance Guarantee. The successful bidder/contractor who submits Security Deposit, no separate performance Bank Guarantee is required to be submitted in such case.

4. Offer should remain valid for **90 days** from the date of opening of this tender.

5. Contract Period: 12 months.

6. Ordered rate(s) should remain firm up to end of the contract and also up to subsequent delivery date extension for a reasonable period. However, statutory variations (as per change in Govt. Policy) in Tax Structure/Slab, will be paid only on production/submission of proof.
7. Quantity Variation : Order quantity/value/period may vary $\pm 30\%$, at the same rate, terms & conditions depending upon requirement.
8. Repeat Order: BCL also reserves the right to place repeat order for maximum 75% of original order quantity/value/period at the same rate & terms of original order for which acceptance of the same from the supplier shall be taken prior to placement of such repeat order.
9. Liquidated Damages: In the event of failure on the part of the supplier to complete the job within the stipulated completion period. Braithwaite reserves the right to recover a sum of 0.5 % for every week or part thereof, by way of L.D. subject to a maximum of 10 % of the ordered value.
10. Risk Purchase: In the event of failure on the part of the supplier to supply within the reasonable period of time as decided by the Purchaser. The purchaser reserves the right to procure the materials from other agency / agencies at your risk and cost as per the order on Risk Purchase basis and shall recover the extra cost thereof, if incurred on the supplier.
11. Arbitration: All questions, disputes or difference whatsoever shall arise between the Purchaser and the supplier upon or in relation to or in connection with the contract either may forthwith give to the other notice in writing of the existence of such question, dispute or difference and the same shall be referred to the adjudication of Sole Arbitrator who shall be the CMD / M(D) shall have the right and authority to appoint any Officer of the Company as arbitrator not below the rank of a General Manager who is not directly connected with the purchase order. Such a reference submitted to the Arbitrator shall be deemed to be the submission to the Arbitrator within the meaning of the Arbitration and Conciliation Act, 1996 & statutory modification thereof. The proceedings of the arbitration shall be held in Kolkata.
12. Prior Written Permission (PWP) must be taken before supply of any spares (other than free supply items) for repair maintenance work within the AMC.
13. Replacement of any spare(s) to be done after taking prior sanction from Maintenance In-Charge(CW) and obtaining 'NO STOCK CERTIFICATE ' from General Stores. Replacement of any spare(s) will be based on 'Joint Inspection Report'(JIR)of the party and BCL.
14. All supplied materials should be routed through General Stores (CW)-BCL.
15. To execute all the above jobs, the Contractor must provide one Diploma Mechanical Engineer for all working and maintenance for proper supervision and efficient maintenance repair work.
16. Log book to record all activities on above mentioned AMC on day to day basis by party, should be duly signed by user department officer. Attendance Register to record attendance of supervisor/technician by the party on day to day basis should also be duly signed by user department officer.
17. The contractor must look after all statutory obligations and safety of all workmen engaged for the job.
18. Any legal dispute that may arise will be settled within the jurisdiction of Courts at Kolkata.
19. Guarantee/Warranty period: 12 (twelve) months from the date of execution of the job and last supply of spares only.
20. The entire job is to be carried out under the supervision and instruction of In-charge (Maint.)-CW or his any authorized representative.
21. Delivery: For Spares, free delivery to our Clive Works on as & when required basis.
22. Payment Terms: 100 % with 30 days credit, after submission of monthly GST compliant AMC bill(s) supported by relevant documents, duly certified by Manager (Maint.) – CW&VW as per availability chart mentioned. Payment for spares items will be made against Dummy order(s) to be issued separately based on Prior Written Permission (**PWP**) and Joint Inspection Report (**JIR**) along with recommendations from In-charge (Maintenance) – CW & VW. Bills for spares along with PWP, JIR and MRR (where applicable) to be submitted within 15 days from receipt of Dummy order(s).

Payment of AMC bill will be made on the basis of % availability of each machine as mentioned below.

For Availability of machines

a)	90% to 100%	100% payment
b)	80% to below 90%	90% payment
c)	70% to below 80%	80% payment
d)	60% to below 70%	70% payment
e)	50% to below 60%	60% payment
f)	Below 50%	NIL No Payment

% Availability = (Total available Hrs – Hrs of breakdown / Total available Hrs) x 100.

The following clauses regarding GST must be adhered to during submission of bills.

- The successful bidder/Firm shall give compliance regarding documentation/monthly returns to ensure availing Input Tax Credit (ITC) by BCL, failing which BCL will deduct the resultant amount.
 - During Submission of Bill, the successful bidder/firm shall mention the GSTIN No.
 - BCL reserves the right to keep the payment of GST amount on hold till the receipt of ITC by BCL is ensured.
23. The contractor has to ensure the safety of men deployed by him. BCL, in no case, will be held responsible for any accident/mishap caused to the contractor's men during execution of the contract. In no case, BCL will be held responsible for PF & ESI liability. Contractor must abide by all statutory responsibilities like PF/ESI/GST, etc.
24. Indemnity:- Bidder shall indemnify BCL against all claims in respect of their contractual obligations in the event of non-compliance of statutory rules / obligations / laws / taxes & duties etc.
25. Evaluation of Lowest bid shall be done on the basis of Grand Total rates (excluding GST) of all AMC jobs. However, Unit Rates all inclusive (i.e inclusive of GST) for spares to be quoted but these shall not come under evaluation. But price negotiation may be done with the L-1 bidder if required.
26. BCL reserves the right of postpone the due date of the tender / to cancel the tender at any stage.
27. Termination: BCL reserves the right to terminate the contract by giving 7 days notice (if required) due to Poor performance / negligence of obligation under the contract.
28. An unconditional acceptance of all notes, terms & conditions of the tender must be given along with the offer in Techno-Commercial Bid. ALTERNATELY, submission of tender form duly signed with stamp on all the pages shall also be considered as unconditional acceptance of the tender terms from the bidder.
29. Price Bid shall be opened only if Part-I is qualified.

PRICE BID

1. This part should be free from any condition.
2. Quoted rates against this tender shall remain Firm till completion of the order.
3. No correction, alteration, over writing etc. will be allowed.
4. Price Bid without signature shall be considered as cancelled.
5. Rate(s) quoted must be written both in figures & words, in case of difference, the rate quoted in words shall be considered.
6. The bidder shall submit rates as per following formats. The GST rate in Percentage shall also be mentioned.

(A) For AMC of Industrial Pneumatic System

SL. No	Descriptions	Qty	Period	AMC Rate /machine/month (excluding GST)	Total Amount for 12 months.
		(a)	(b)	(c)	(d)=(a)x(b)x(c)
1.	Annual Maintenance Contract for preventive maintenance and breakdown maintenance for industrial pneumatic system consisting with Pneumatic pipe line & accessories compressors and cooling devices of Clive Works.	6 nos.	12 months		

(B) For AMC of Hydraulic Press

SL. No	Descriptions	Qty	Period	AMC Rate /machine/month (excluding GST)	Total Amount for 12 months.
		(a)	(b)	(c)	(d)=(a)x(b)x(c)
2	Annual Maintenance Contract for preventive maintenance and breakdown maintenance for Oil Hydraulic Press complete with power packs (both mechanical & electrical) at Clive Works.	9 Nos.	12 months		

(C) For AMC of Single Wagon Pressure testing Rig

SL. No	Description	Qty	Period	AMC Rate / Month/ Machine (excluding GST)	Total Amount for 12 months.
		(a)	(b)	(c)	(d)=(a)x(b)x(c)
1.	AMC for preventive Maintenance and break down maintenance for 2(two) single Wagon Pressure testing Rig at Clive Works	2 Nos.	12 months		

(D) For Lubrication & painting of Plants and machineries.

SL. No	Description	Period	AMC Rate / Month (excluding GST)	Total Amount for 12 months.
		(a)	(b)	(c) = (a) x (b)
1.	Lubricant & painting of Plant and machineries at Clive Works.	12 months		

(E) For AMC for Testing Of Pressure Vessel

SL. No	Description	Qty	Period	AMC Rate / Month/ Machine (excluding GST)	Total Amount for 12 months.
		(a)	(b)	(c)	(d)=(a)x(b)x(c)
1.	AMC for testing of Pressure vessel fitted with compressors, to be carried out Twice in a year	6 Nos.	12 months		

(F) For AMC for De-scaling of compressors

SL. No	Description	Qty	Period	AMC Rate / Month/ Machine (excluding GST)	Total Amount for 12 months.
		(a)	(b)	(c)	(d)=(a)x(b)x(c)
1.	AMC De-scaling of compressors water lines at Clive Works	6 Nos.	12 months		

Grand Total of (A+B+C+D+E) for 12 months (excluding GST) = Rs.

(Rupees.....)

Price for spares items to be quoted as per format given as under:

1. Spares list for pneumatic line

A. Fast Moving parts

Sl. No.	Description	Annual Qty	Quantity to be stocked	Unit Rate (all incl.)
01.	High Tensile nut & bolt (Suitable in size)	800 nos.	100 nos.	
02.	Hex nipple : ½" x ½"	350 nos.	50 nos.	

2. Spares list for Air Compressor, Make – Khosla, Model – 2 HA2TER Plant No: D -62

A. Fast moving parts

Sl. No.	Description	Annual Qty	Quantity to be stocked	Unit Rate (all incl.)
01.	Copper Gasket for Valve Assembly	17 Nos.	10 Nos.	
02.	Silicon Valve Cover "O" Ring	25 Nos.	10 Nos.	
03.	H.P. Valve Plate	25 Nos.	10 Nos.	
04.	Water Pump Disc R/ Disc	04 Nos.	02 Nos.	
05.	Fuse	7 Nos.	4 Nos.	
06.	L.P. Valve Plate	25Nos.	10 Nos.	
07.	L.P. Valve Spring	7 Nos.	4 Nos.	
08.	Silicon Valve Cover" O " Ring	7 Nos.	4 Nos.	
09.	Unloader " O " Ring Silicon	25 Nos.	10 Nos.	
10.	Copper " O " Ring	25 Nos.	10 Nos.	
11.	Lock Nut For H.P. Connecting Rod	5 sets	2 sets.	
12.	Inter Cooler " O" Ring	7 sets	4 sets.	
13.	After Cooler "O" Ring	7 sets	4 sets.	
14.	L.P. Valve Plate	13 sets	10 sets.	

B. Medium moving parts

Sl. No.	Description	Annual Qty	Quantity to be stocked	Unit Rate (all incl.)
01.	Gudgeon Pin	3 sets	1 set	
02.	Unloader Copper Pipe (¼"NB) with Brass Pipe Fittings	3 sets	1 set	
03.	Air Filter Element	3 sets	1 set	
04.	L.P. Valve Pusher Assembly	7 sets	1 set	
05.	L.P. Valve Guard.	7 sets	1 set	
06.	Air Gland Packing (LP)	2 sets	1 set	
07.	Air Gland Packing (HP)	2 sets	1 set	
08.	Oil Gland Packing (LP)	2 sets	1 set	
09.	Oil Gland Packing (HP)	2 sets	1 set	
10.	Oil Filter Element	2 sets	1 set	

C. Slow moving parts

Sl. No.	Description	Qty	Unit Rate (all incl.)
01.	Main Bearing(each in two halves) (-.010")	4 sets	
02.	Big End Bearing(each in two halves) (-.010")	3 sets	
03.	D-210 Vee Belts	2 sets	
04.	Small End Bush	3 sets	
05.	H.P. Valve Pusher Assembly	5 sets	
06.	L.P. Suction Valve Assembly	4 sets	
07.	L.P. Delivery Valve Assembly.	4 sets	
08.	H.P. Suction Valve Assembly.	4 sets	
09.	H.P. Delivery Valve Assembly.	4 sets	
10.	L.P. Suction Valve Seat.	4 sets	
11.	L.P. Delivery Valve Seat.	4 sets	
12.	H.P. Piston.	2 sets	
13.	H.P. Piston Ring.	2 sets.	
14.	L.P. Piston.	2 sets	
15.	L.P. Piston Ring.	2 sets	
16.	Main Bearing Sleeves.	2 sets	
17.	Cross Head H.P.	2 sets	
18.	Cross Head L.P.	2 sets	
19.	Cross Head Guide H.P.	2 sets	
20.	Cross Head Guide L.P.	2 sets	

3. Spare List for Air Compressor Make – ATLAS COPCO Model – AR – 1, Plant No. D -48/49.

A. Fast moving Parts

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit Rate (all incl)
1	L. P. Unloader " O" Ring	50 pcs.	20 pcs.	
2	H.P. Unloader "O" Ring	50 pcs	20 pcs.	
3	H.P. Delivery Gasket (Copper) for Valve	17 nos.	5 nos.	
4	H.P. Suction Gasket (Copper) for Valve	17 nos.	5 nos.	
5	H.P. Split Pin for valve assembly	50 pcs.	20 pcs.	
6	H.P. Oil Gland Packing	3 set	1 set	
7	H.P. ¼ " Unloader Pipe (Copper)	6 mtr.	2 mts.	
8	L.P. Valve Plates	13 nos.	5 nos.	
9	H.P. Valve Plates	13 nos.	5 nos.	
10	L.P. Valve Spring	50 pcs	20 pcs.	
11	H.P. Valve Spring	50 pcs	20 pcs.	
12	Copper Gasket for L.P. Valve Assembly (158mm O.D*145mm bore*2mm thick)	17 nos.	5 nos.	
13	Copper Gasket for H.P. Valve Assembly (94mm O.D*87mm bore*2mm thick)	17 nos.	5 nos.	
14	H.P. Unloader " O" Ring	25 nos.	10 pcs.	
15	L.P. Unloader "O" Ring	25 nos.	10 pcs.	
16	Water Pump R/Disc	7 nos.	3pcs.	
17	Cartridge Fuse	7 nos.	3 pcs.	
18	L.P. Split Pin for Valve Assembly	50 pcs.	20 pcs.	

B. Medium moving part

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit Rate (all incl.)
01	L.P. Valve Pusher	9 nos.	1 set	
02	L.P. Oil Gland Packing	3 sets	1 set	
03	L.P. Gudgeon Pin	3 nos.	1 set.	
04	H.P. Valve Seat Section	9 nos.	1 set	
05	H.P. Valve Seat Delivery	9 nos.	1 set	
06	H.P. Valve Pusher	9 nos.	1 set	
07	Lubricating Glass	7 nos.	1 set	
08	Air Intake Filter Element	5 sets	1 set	
09	L.P. Valve Seat with Center Bolt	7 nos.	1 set	
10	H.P. Valve Seat with Center Bolt	7 nos.	1 set	
11	Oil Filter Element	3 sets	1 set	

C. Slow moving parts

Sl. No.	Description	Qty	Unit rate (all incl)
01	L.P. Connecting Rod Bush (Small end)	3 nos.	
02	L.P. Connecting Rod Bush in Two Halves	3 nos.	
03	L.P. Connecting Rod	2 nos.	
04	H.P. Piston Ring	7 nos.	
05	H.P. Valve Assembly (suction + delivery)	5 nos.	
06	H.P. Valve Guard Suction with center Bolt	5 nos.	
07	H.P. Valve Guard delivery with centre Bolt	5 nos.	
08	H.P. Connecting Rod	2 nos.	
09	H.P. Connecting Big End Bearing in Two Halves	2 sets.	
10	H.P. Connecting Small End Bearing	2 nos.	
11	H.P. Gudgeon Pin	2 nos.	
12	L.P. Suction Valve Assembly	6 nos.	
13	L.P. Delivery Valve Assembly.	6 nos.	
14	H.P. Suction Valve Assembly	6 nos.	
15	H.P. Delivery Valve Assembly	6 nos.	
16	L.P. Piston Ring	2 sets	
17	H.P. Piston Ring	2 sets	
18	Air Intake Filter Element	2 sets	
19	C-158 Vee Belts	2 sets	

4. Spare List for Air Compressor Make – KIRLOSKAR, MODEL – BTD –JM, Plant No. D-63

A. Fast moving parts

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit rate (all incl.)
01.	Garter Spring	13 nos.	04 nos.	
02.	Lift Washer	17 nos.	05 nos.	
03.	L.P. Valve Plate	17 nos.	05 nos.	
04.	H.P. Valve Plate	17 nos.	05 nos.	
05.	L.P. Cushion Plate	09 nos.	04 nos.	
06.	H.P. Cushion Plate	09 nos.	04 nos.	
07.	L.P. Valve Spring	50 nos.	20 nos.	
08.	H.P. Valve Spring	50 nos.	20 nos.	
09.	Valve Spring L.P.	50 nos.	20 nos.	
10	Valve Spring H.P.	50 nos.	20 nos.	
11	Castle Nut	13 nos.	05 nos.	
12	Split Pin	50 nos.	20 nos.	
13	L.P. Unloader Spring	11 nos.	04 nos.	
14	'O' Ring Unloader Piston	25 nos.	10 nos.	
15	Water Pump R/ Disc	07 nos.	03 nos.	
16	Fuse	07 nos.	03 nos.	
17	Circlip	50 nos.	20 nos.	
18	Packing (Copper) L.P.	25 nos.	10 nos.	
19	Packing (Copper) H.P.	17 nos.	05 nos.	
20	'O' Ring Valve Cover L.P. (Suc)	25 nos.	10 nos.	
21	'O' Ring Valve Cover L.P. (DEL)	25 nos.	10 nos.	
22	'O' Ring Valve Cover H.P. (Suc)	25 nos.	10 nos.	
23	'O' Ring Valve Cover H.P. (DEL)	25 nos.	10 nos.	
24	Oil Seal	3 nos.		

B. Medium moving Parts

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit Rate (all incl.)
01.	Un loader Piston	7 nos.	1 set	
02	Air Filter Element	3 sets	1 set	
03.	Lub Oil Filter Element	3 sets	1 set	

C. Slow Moving parts

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit Rate (all incl.)
01.	Oil Scrapper Packing	2 sets		
02.	6 pcs Packing	2 sets		
03.	3 pcs packing	2 sets		
04.	L.P Piston	2 nos.		
05.	H.P. Piston	2 nos.		
06.	L.P. Piston Ring	2 sets		
07.	H.P. Piston Ring	2 sets		
08.	VEE BELT	2 sets		
09.	Main Bearing	2 sets		
10.	Bearing Lower Half	2 sets		
11.	Bearing Upper Half	4 sets		
12.	Valve Seat Suction L.P.	4 sets		
13.	Valve Seat Suction H.P.	4 sets		
14.	Valve Seat Delivery L.P	4 sets		
15.	Valve Seat Delivery H.P	4 sets		
16.	Valve Assembly Suction L.P.	2 sets		
17.	Valve Assembly Suction H.P.	2 sets		
18.	Valve Assembly Delivery L.P	2 sets		
19.	Valve Assembly Delivery H.P	2 sets		
20.	Bush L.P & H.P	3 sets		

5. Spare list for Air Compressor, Make – BROOM WADE Model – TS-2, Plant No. D-44, 45

A. Fast moving parts

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit Rate (all incl.)
01.	H.P. Suction Valve Spring	50 nos.	20 nos.	
02.	L.P. Suction Valve Spring	50 nos.	20 nos.	
03.	Water Pump R/ Disc	07 nos.	03 nos.	
04.	Fuse	07 nos.	03 nos.	
05.	L.P. Suction valve plate	07 nos.	03 nos.	
06.	L.P. Delivery valve plate	07 nos.	03 nos.	
07.	H.P. Suction valve plate	07 nos.	03 nos.	
08.	H.P. Delivery valve plate	07 nos.	03 nos.	
09.	Oil Gland Packing	3 sets	1 set	

B. Slow moving Parts

Sl. No.	Description	Annual Qty	Qty to be stocked	Unit Rate (all incl.)
01.	H.P. Piston Ring	2 sets	1 set	
02.	L.P. Piston Ring	2 sets	1 set	
03.	Air Gland Packing	3 sets	1 set	
04.	C- 180 Vee Belts	2 sets	1 set	
05.	L.P Suction valve Seat	4 sets	1 set	
06.	H.P Suction valve Seat	4 sets	1 set	
07.	H.P Delivery valve Seat	4 sets	1 set	
08.	L.P Delivery valve Seat	4 sets	1 set	

6. Spares for Oil Hydraulic Press (L 47, L 48, L 73, L 79, L 81)

SL. No	Description	Qty	Unit Rate (all incl.)
1.	Seal Kit for each HYD. RAM	12 sets F	
2.	D.O.L Starter	2 nos.	
3.	Repair Kit For Vane Pump	2 sets	
4.	Repair Kit for Control valve	2 sets	
5.	Repair Kit for Relief Valve	2 sets.	
6.	Filter Elements	5 nos. F	
7.	Repairing and Rewinding of Motors	3 nos.	
G. M. Bushes for Cylinder Glands			
8	Size: 15 ½ "OD*14 ½ " BORE*6" LONG	1 no.	
9	12 ¾ "OD*11 ½ " BORE*6" LONG	1 no.	
10	19" OD*18" BORE*6" LONG	1 no.	
11	Oil Level Gauge	2 nos. F	
12	Oil pressure Gauge	2 nos. F	
13	Oil temperature gauge	2 nos. F	

C. Spares for oil Hydraulic Press (L 54, L 55)

SL. No	Description	Qty	Unit Rate (all incl.)
1.	Seal Kit For each Hyd. Ram	12 sets F	
2.	D.O.L. Starter	1 set	
3.	Repair Kit for Vane pump	1 set	
4.	Repair Kit for Control valve	1 set	
5.	Repair Kit for relief valve	1 set	
6.	Filter Elements	2 sets F	
7.	Repairing and Rewinding of Motors	1 set	
8.	40mm S. Steel 2 Way Ball valve	1 set	
9.	Oil Level gauge	2 nos. F	
10.	Oil Pressure gauge	2 nos. F	
11.	Oil temperature gauge	2 nos. F	

7. Spares list for Wagon Floor Plates Hyd. Jacking (Jack -1 & 2)

SL. No	Description	Qty	Unit Rate (all incl.)
1	Oil Lever Gauge	2 nos. F	
2	Filter Breather	4 nos. F	
3	Pump	1 no.	
4	Motor (0.55 KW, 1440 RPM, 3Ph)	1 no.	
5	Pressure Release Valve	2 nos. F	
6	D.C. Valve (DMG -01 -363)	2 nos. F	
7	Pressure gauge Isolator	2 nos.	
8	High Pressure Hose (¼ "NB*5000MM Long)	Nos. F	
9	Modular Check valve	2 nos. F	
10	Return Line Filter	4 nos. F	
11	D.O.L Starter	1 no.	
12	B/U Ring (BUR -4 B-2-62 NBR)	24 nos. F	
13	Rod Bearing	24 nos. F	
14	Rod seal (UR-36-44 B)	24 nos. F	
15	Piston Bearing(WR-36-NBR)	24 nos. F	
16	"O" Ring (OR 4B-2,62 NBR)	24 nos. F	
17	Piston Seal (UR-50-40-7)	24 nos. F	
18	Rod wiper (WR-36-NBR)	24 nos. F	
19	Pressure Gauge(2.5"DIA, 10-100KG/CM2	3 nos.	
20	Repairing of Pump	1 no.	
21	Repairing of electrical motor	1 no.	
22	Repairing of D. C Valve	1 no.	
23	Repairing of Hydraulic Pressure Hose	1 no.	
24	Repairing of Hydraulic jack	4 nos.	

8. Maintenance Spares for Single Wagon Pressure Testing Rig Machines

SL. No	Description	Qty	Unit Rate (all incl.)
1	Pressure Gauge	03 nos.	
2	Air Pressure Regulator	03 nos.	
3	Air Valve	03 nos	
4	Diaphragm	03 nos	
5	Flexible Armored Hose with both end connector along with fittings, nipple, nut, etc.	03 nos	

9. Rewinding of Motors of Compressors on as and when required basis.

SL. No	Description of Job / Operation	Rate Per motor(all inclusive)		
		Squirrel cage Induction Motor (415V, 50 HZ 90 KW) - 4 nos	Slip Ring Induction Motor (415V, 50 HZ 90 KW) – 2 nos.	Slip Ring Induction Motor (415V, 50 HZ 55 KW) – 2 nos.
01.	Stator Winding			
02.	Rotor Winding			
03.	Replacement of Bearings			
04.	Replacement of Shaft			
05.	Repairing of Shaft			
06.	Repairing of End Covers			