

VOLUME - IA

Technical Conditions of Contract (TCC)
"Material Handling & Hiring of site establishment"
services

FOR
IOCL Paradip-Standby SRU (525TPD) Train
project

BHARAT HEAVY ELECTRICALS LIMITED



 <p>BHEL Maharashtra Company</p>	<p>Technical Conditions Of Contract (TCC) PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD</p>	<p>Ref No: HY/PE&SD/SC- Projects/TCC/2020- 21/MH&SE/ IOCL- SRU/01</p>		
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<p>COPYRIGHT AND CONFIDENTIAL</p> <p>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.</p>		<p>TECHNICAL CONDITIONS OF CONTRACT (TCC)</p> <p>FOR "Material Handling & Hiring of site establishment" services</p> <p>FOR</p> <p>IOCL PARADIP-STANDBY SRU (525TPD) TRAIN PROJECT</p>		
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Chapter I- Project Information

1.0 Project Details			
1	Customer	:	IOCL, Paradip, Odisha
2	Project Information	:	IOCL Paradip-Standby SRU (525TPD) Train project
3	Location	:	Paradip, Odisha
4	Address Detail	:	IOCL, Paradip, Jagatsinghpur District, Odisha, India
5	Nearest Railway Station	:	Paradip Railway Station
6	Road Approach	:	118KM from Bhubaneswar via Cuttack and NH 53
7	Nearest Air Port	:	Biju Patnaik Airport, Bhubaneswar, Odisha, 125KM
11	Ambient Air Temperature (Average)	:	a) Maximum : 39 ⁰ C b) Minimum : 16 ⁰ C
12	Average Relative Humidity	:	71 %
13	Climatic Condition	:	Tropical Climate

Bidder is advised to visit the project site and appraise himself about the local conditions and infrastructure available in the area for fulfilling their commitments under the contract. BHEL will not admit any claims whatsoever on account of Contractor's non-familiarization of local conditions.

Chapter II- Scope of Work

2.0 SCOPE OF WORK

2.1 Material Handling and site establishment services: The scope of work in general are receipt of project material, unloading, storing, preservation, issuing of material with proper documentation and providing & maintaining the site office set up materials as per chapter-IX for office establishment at IOCL, Paradip on as and when required basis for the period of Twenty four months.

Identification of equipment at storage yard, technical assistance for checking and making the shortage/damage reports, taking delivery at storage yard and direct unloading at execution/Assembly site of work under the scope of this tender specification along with the supply of all consumables (slippers, wooden planks, supports, Tarpaulins) tools & tackles (Hydra/Crane, Slings etc.) and all type of manpower (Hydra operator, supervisor, Store keeper, Rigger, helper etc) required for Material handling.

- a. It is not the intent to specify herein all details of material. Any item related to this work not covered, but necessary to complete the system will be deemed to have been included in the scope of the work.
- b. Site testing wherever required shall be carried out for all standard T & P's
- c. The contractor shall take full responsibility for satisfactory handling of Material & reconciliation under overall guidance of BHEL and shall locate any cause of malfunction and rectify the same for proper operation.
- d. The work shall be executed under the usual conditions without affecting project work and in conjunction with other operations and contracting agencies at site. The contractor and his personnel shall cooperate with the personnel of other agencies, co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
- e. All the work shall be carried out as per instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the contractor.
- f. All necessary certificates and licenses required to carry out this work are to be arranged by the contractor expeditiously at his cost.
- g. The contractor shall note that whenever required items/materials shall be unloaded at erection site / assembly yard by the prescribed route without disturbing and causing damage to other works in the most professional manner. All items, Hardware, etc., shall be stored in appropriate manner as per instructions of BHEL engineer.
- h. Contractor shall remove all scrap materials periodically generated from his working area in and collect the same at one place earmarked for the same. Load of scraps is to be shifted to a place earmarked by BHEL. Failure to collect the scrap is likely to lead to accidents and as such BHEL reserves the right

to collect and remove the scrap at contractor's risk and cost if there is any failure on the part of contractor in this respect.

- i. The contractor shall ensure that his premises are always kept clean and tidy to the extent possible. Any untidiness noted on the part of the contractor shall be brought to the attention of the contractor's site representative who shall take immediate action to clean the surroundings to the satisfaction of the Engineer-in-Charge
- j. The Contractor may have to execute work in such a place and condition where other agencies also will be under such circumstances.
- k. If any item or equipment not covered but requires to be unloaded, same shall be carried out by the contractor. Unit rate shall be considered for payment purpose. The unit rates quoted by the contractor shall be uniform for all the items.
- l. Scope of work covered under this specification requires quality workmanship & Material Management. The contractor shall ensure timely completion of work. The contractor shall have adequate tools, Consumables & etc in his possession. He shall also have adequate trained, qualified and experienced engineers, supervisory staff and skilled personnel.
- m. The manpower deployed by contractor shall match with above scope of works
- n. Contractor shall deploy adequate Manpower for Material Management to meet scope of works and Minimum manpower & T&P's shall be available at site on continuous basis to meet the daily site requirements.
- o. The scope of various material to be handled, indicated in this contract is indicative only. Bidder shall unload all the material pertaining to this Project and site establishment materials as specified in chapter- VI
- p. Maintenance: During hiring period, maintenance & cleaning of the Porta cabin and accessories shall be in the scope of bidder.

2.2 Transport services for BHEL Personnel round the clock: Contractor shall provide transport services to BHEL Personnel as specified below:

- 1) 7 seaters AC vehicle shall be deployed and should have standard tools, first aid kit and stepney.
- 2) Not all the vehicles mentioned shall be engaged at once at the start of the contract. Vehicles shall be engaged progressively as per the directions and instructions of BHEL site engineer.
- 3) One vehicle shall be running up to 75KM per day. (Excluding the Fuel cost, same shall be paid as per actual on monthly basis).
- 4) Diesel cost shall be paid considering 10 KM/ Litre vehicle mileage.
- 5) Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.
- 6) The vehicle will be maintained clean both inside & outside on a daily basis.
- 7) The contractor shall pay all applicable taxes and duties.

- 8) In case of vehicle breakdown, an alternative vehicle shall be arranged within four hours.
- 9) Operation hour shall be decided by site representative based on requirement.
- 10) The contractor shall provide, valid registration certificate, insurance, pollution of the vehicle and also the driver should be insured. (valid during the tenure of the contract).
- 11) All expenses towards salary of drivers, repair & maintenance, engine oil, damages due to accident, comprehensive insurance, road tax, or any other renewals, etc. shall have to be met by owner of vehicle.
- 12) The drivers so deployed must have valid driving license. Drivers so employed should not be under the influence of liquor or intoxicated during the duty hours.
- 13) Refusal to perform duty by drivers will be treated as non-deployment of the vehicle for that particular day and deduction at the rate of three times as per day rental charges will be recovered.
- 14) In case of misbehavior by the drivers, the contractor has to take immediate action and the decision of BHEL's representative in this regard will be final and binding.
- 15) The drive/contractor representative will meet BHEL's representative regularly to get instruction regarding the deployment of the vehicle.
- 16) Should the vehicle deployed meet with an accident, no claim on account of damage to the vehicle or the persons travelling in such vehicle including the employees of the contractor, drivers, cleaner of the vehicle shall be entertained by the company.
- 17) Should the vehicle deployed by the contractor meet with an accident due to reasons attributable to the contractor or his employees and cause damage to the persons/property of the company, the contractor shall liable to make good such losses in the manner as prescribed by the company.
- 18) The company shall further be entitled to recover the amount so paid by way of compensation under the previously mentioned act or under any other deducting the sum from bill or from any other sum due to him.

2.3 Catering Services to BHEL Employees:

- 1) Services in scope of this contract shall include cooking and serving of breakfast, lunch and dinner to BHEL employees as per directions and instruction given by BHEL site engineer. Place of cooking and serving shall be provided by BHEL.
- 2) Cook cum caretaker and helper should be skilled in preparing all kind Indian food.
- 3) Cleaning of utensils and cooking premises shall be the responsibility of bidder.
- 4) All the utensils (Cooking and serving) shall be supplied in new condition. No old items shall be accepted.
- 5) One (1) Gas cylinder should always be on standby (Reserve).
- 6) Refrigerator supplied by the contractor shall be of new condition.
- 7) Bidder has to ensure quality and hygiene of food.
- 8) All the cooking ration supply shall be in the scope of BHEL.
- 9) Decision of BHEL's site representative shall be final in case of any dispute.
- 10) Items shall be supplied in perfect working condition. All the services and materials within the scope of this contract shall have to be supplied within seven days of issue of work order.
- 11) Maintenance and repair of materials shall be in the scope of bidder.

2.4 "Construction Power Distribution Arrangement" Services: Purpose of this work is to establish (Build, operate, maintain, dismantle after contract completion and removal from site) construction power supply distribution boards, interconnection of distribution boards with customer's compact substation (CSS) through underground cabling, earthing of all equipment and associated civil works as per technical specifications:

Brief Scope of work under this tender consists of following:

1. Supply, installation, testing, commissioning, O&M, dismantling after project completion and removal from site of 415V 63A Feeder Pillar as per technical specification
2. Supply, installation, testing, commissioning, O&M, dismantling after project completion and removal from site of 415V 125A Feeder Pillar as per technical specification
3. Supply, installation, testing, commissioning, O&M, dismantling after project completion and removal from site of 415V 250A Feeder Pillar as per technical specification
4. Supply, installation, testing, commissioning, O&M, dismantling after project completion and removal from site of LT Power Cable & Its Accessories as per technical specification
5. Supply, installation, testing, commissioning, O&M, dismantling after project completion and removal from site of Earthing Material & Its Accessories as per technical specification
6. Civil Works as per technical specification

Chapter III- Facilities in the scope of Bidder/BHEL

S. No.	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1	ESTABLISHMENT			
3.1.1	FOR CONSTRUCTION PURPOSE:			
a	Open space for office (as per availability)			Location shall be finalized after joint survey with IOCL.
b	Open space for storage (as per availability)			NA
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipment, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Firefighting equipment like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	FOR LIVING PURPOSES OF THE BIDDER			
a	Open space for labour colony (as per availability)		Yes	Bidder has to take care.
b	Labour Colony with internal roads, sanitation, complying with statutory requirements.		Yes	
3.2.0	ELECTRICITY			
3.2.1	Electricity For construction purposes of Voltage 415/440 V			
a	Single point source		Yes	NA
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	

S. No.	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.2.2	Electricity for the office, stores, canteen etc of the bidder			Electricity shall be provided by IOCL at one point on chargeable basis. Further distribution shall be done by contractor.
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc		Yes	.
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	WATER SUPPLY			
3.3.1	For construction purposes			Water shall be provided by IOCL at one point on chargeable basis. Further distribution shall be done by contractor.
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	Water supply for bidder's office, stores, canteen etc			
a	Making the water available at single point		Yes	

S. No.	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	<u>Water supply for Living Purpose</u>			Bidder has to take care.
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4.0	LIGHTING			
a	For construction work (supply of all the necessary materials) 1. At bidder's office/ area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At bidders office/area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER			Bidder has to take care
a	Téléphone, fax, internet, e-mail etc.		Yes	
3.6.0	COMPRESSED AIR wherever required for the work		Yes	Bidder has to take care
3.7.0	Demobilization of all the above facilities		Yes	Bidder has to take care
3.8.0	TRANSPORTATION			Bidder has to take care
a	For site personnel of the bidder		Yes	

S. No.	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	For bidder's equipment and consumables (T&P, Consumables etc)		Yes	
3.9	Work Permits, gate pass etc. from customer for inward and outward movement of manpower, machinery and material		Yes	

Chapter IV- Tools & Plants to be deployed by Bidder

4. List of minimum major Tools & Plants to be deployed by the contractor:

The following tools and equipment but not limited to, are required for the efficient execution of the electrical and civil works. The contractor shall make them available for construction purposes, including all consumables likely to be used at his own cost at the time of mobilization.

- a) All T&Ps & Consumables are to be arranged by the contractor at his own cost.

T&P and Consumables for Material Handling Works			
Sl No	Description	Qty	Capacity
01	18T Hydra with Operator	1 no	18MT/ As required
02	Tire Mounted Crane	1 No	40T/ As required
02	Diesel	As required	As required
03	Fork Lift-1 No with operator	As required	As required
03	Wire rope slings	4 sets minimum	2- 25MT Verities
04	Webbing Slings	4 Sets minimum	2-15MT Verities
05	Chain block pulley	2 sets minimum	Capacity - 3T/As required
06	D-Shackles	4 sets minimum	3-5MT Verities

T&P and Consumables for Construction Power and other Services			
S.No.	Description	Minimum Quantity	Remarks
A. For Works			
1	Hydra	1	Need based
2	JCB	1	Need based
3	Tractor	1	Need based
4	Cable unwinding Machines, rollers etc	1 No	Need based
5	MC4 connector tool kit containing (1) crimping plier MC4, (2) open end spanner set MC4, (3) stripping plier MC4, (4) socket wrench insert to tighten, (5) socket wrench insert to secure, inserts for both 4 sq-mm and 6-sqmm (of both pliers).	2 Set	Need based
6	Electrical measuring Instruments a) Megger-1KV b) HV Tester-10KV d) Logic probe	1No 1No 1No	Need based

	e) Modbus communication check kits	1 No	
	f) Digital Multi meter	3 No	
7	Tong Testers	3 No	Need based
8	Digital power meters	1 No	Need based
9	Phase sequence meter	1 No	Need based
10	OFC termination kit, Splicing kits	1 Set	Need based
11	Primary /secondary injection kit	1 No each	Need based
12	Transformer oil filtration unit	1 No	Need based
13	Earth resistance measurement kit	1 No	Need based
14	Lugs, glands as in scope of supply	1 set	Need based
15	Transmission line stringing equipment	1 No	Need based
16	DG Sets	1 No	Need based
17	Cable jointing kit and associated tools	2 Set	Need based
18	Welding equipment	1 No	Need based
19	Flood lights	5 No	Need based
20	Set of screw drivers	1 Set	Need based
21	Set of Allen keys (mm & inch)	1 Set	Need based
22	Small size hacksaw & fraksaw	1 Set	Need based
23	Cutting pliers	2 No	Need based
24	Nose pliers	2 No	Need based
25	Insulation stripers	2 No	Need based
26	Dry cable jointer	1 No	Need based
27	Number punches	1 No	Need based
28	Alphabet punch	1 No	Need based
29	Embossing machine with cassettes (Numbers and alphabets)	1 No	Need based
30	Portable drilling machine up to 1-1/2"	1 Set	Need based
31	Soldering gun	1 No	Need based
32	Soldering Iron	1 No	Need based
33	Continuity tester	5 No	Need based
34	Double ended spanner Set of sizes 10-11, 12-13, 14-15, 16-17, 17-18	2 Nos each	Need based
35	Screwdriver Set	1 Set	Need based
36	Crimping tool with Dye range 50-400sq-mm cable, mechanical gear power, hand operated	1 Set	Need based
37	Crimping tool up to 6 sq-mm cable	1 set	Need based
38	Drilling machine AC, hand operated, with bit size up to 20 mm	1 set	Need based
39	Measuring Tape, 5m	2 Nos	Need based
40	Measuring Tape, 50 m	2 Nos	Need based
41	Allen Key set	1 Set	Need based

42	Adjustable spanner 2-inch size	1 No	Need based
43	Hammer	2 Nos	Need based
44	Rough file kit	1 Set	Need based
45	Cutting Pliers	2 Nos	Need based
46	Nose Pliers	2 Nos	Need based
47	Vacuum cleaner, of industrial type, for control room sweeping / cleaning.	1 No	Need based
48	Blowers for cleaning the panels	2 Nos	Need based
B. For civil works			
1	Digital Concrete Mixer 2 to 4 cum with hopper/Self-loading mobile concrete mixer (Azax)with printer	2 nos.	Need based
2	Needle Vibrator (Needle type 40mm)	4 nos.	Need based
3	Needle Vibrator (Needle type 25mm)	2 nos.	Need based
4	Dewatering Pump	2 nos.	Need based
5	Earth Compactor	2 nos.	Need based
6	Theodolite with staff	2 nos.	Need based
7	Dumpy level with staff	1 no.	Need based

Note: Contractor shall bring all the T&Ps required to handle the material as mentioned in chapter VI.

4.1 Other Requirements of Contractor's Instruments & T&P

- a) All the distribution boards, connecting cables, hoses etc., and temporary connection work including electrical connections shall have to be arranged by the contractor at his cost.
- b) The contractor at his cost shall arrange all T&P like cranes, truck/tractor, and trailers required for material handling purpose.
- c) Equipment, vehicles, tools and plants and materials brought to site by the contractor from his resources shall have distinctive identification marks and the description and quantity shall be intimated to BHEL in writing by the contractor.
- d) All construction materials brought by the contractor shall have prior approval regarding quality and quantity by BHEL. The contractor shall also provide without extra cost necessary enclosures containers and protective materials for proper storage of materials inside, whenever so instructed by the purchaser without any extra cost.
- e) No material or equipment or tools etc. shall be taken out of the worksite without the written consent of BHEL.
- f) BHEL shall not be responsible for the safety and protection of the materials of the contractor and the contractor shall make his own arrangements for proper watch and ward for his materials.

g) Until such time the work is taken over by BHEL/Execution Agencies, the contractor shall be responsible for proper protection of material. The contractor shall during the progress of work properly cover up and protect any part of the work liable to damage by exposure to the weather and shall take every reasonable precaution against accident or damage to the work from any cause.

NOTE:

1. This above list is only indicative and neither exhaustive nor limiting. Contractor shall deploy all necessary T&P and consumables to meet the schedules & as prescribed by bhel engineer and required for completion of work.
2. BHEL will not provide any tool, plants, facilities or any testing facility/apparatus for the work. It will be contractor's responsibility to arrange all required tools, plants and other testing apparatus, etc. at their own cost. The prices quoted & finalized are inclusive of the charges towards providing such T&P. No extra payment will be entertained because of this.
3. However, subject to availability, BHEL may provide few T&P to the contractor for expediting and in larger interest of the project. In case any such facility is provided to the contractor, BHEL will make necessary recovery in the running account/final bills towards the hire charges. A departmental charge @ 5% will also be affected such cases. The decision of BHEL on the hire charges will be final and binding on contractor.

Chapter V-Time Schedule

5.1 Time Schedule

5.1.1

The entire work of material handling and site office establishment services for this project shall be completed within 24 (Twenty-Four) months from the date of commencement of site work.

5.1.2

During the total period of contract, the contractor has to carry out the activities in a phased manner as required by BHEL.

5.1.3

The Material Handling work shall be commenced as may be stipulated in the letter of intent and shall be deemed as completed in all respect only when the project is completed and the decision of BHEL in this regard shall be final and binding of the contractor.

5.1.4

Overall project schedule for this Project shall be as mutually agreed between BHEL & bidder.

5.2 Commencement of Contract Period

The date of commencement of contract period shall be mutually agreed date between the bidder and BHEL engineer to start the work. In case of any ambiguity, the decision of BHEL engineer will be final.

Commencement of services pertaining to line item A and B may vary and decision for the same shall be based on sole discretion of BHEL. Contractor shall mobilize the resources accordingly.

5.3 Mobilization for material Handling & Associate works.

5.3.1

Vendor shall reach at site & deploy all the minimum T&P's, Consumable, and Manpower along with Bidder's site establishment as per directions of Construction Manager/ Project Manager of BHEL

5.3.2

In order to meet above schedule in general, and any other intermediate targets set, to meet customer / project schedule requirements, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL.

5.4 CONTRACT PERIOD

The contract period for completion of entire work under scope shall be **24 (Twenty-Four) months** from the —COMMENCEMENT OF CONTRACT PERIOD as specified earlier for completion of the entire work under this package.

5.5 GUARANTEE PERIOD

The guarantee period of twelve months shall commence from the date of completion of all works as certified by the BHEL site engineer.

5.6 PROTECTION OF WORK

The contractor shall have total responsibility for protecting his works until it is taken over by the Employer. No claim will be entertained by the Employer or the representative of the Employer for any damage or loss to the Contractor's works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings. Should any such damage to the Contractor's Works occur because of other party not being under his supervision or control, the Contractor shall make his claim directly with the party concerned.

If disagreement, conflict, or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the Contractor's Works the same shall be rectified. The Contractor shall not cause any delay in the repair of such damaged Works because of any delay in the resolution of such disputes. The Contractor shall proceed to repair the Work immediately and no cause thereof will be assigned pending resolution of such disputes.

5.7 Important Milestones

5.7.1 Establishment of Construction power distribution arrangement as per sl no. 3 of price bid format, shall be completed within 30 Days from the date of commencement of work.

5.7.2 Supply and installation of one time site office services as per sl no. 2.2 of price bid format, shall be completed within 21 Days from the date of commencement of work.

Chapter VI- List of Major Equipment

6.0 List of Major Equipment for Material Handling:

Material details					
A	HPEP Hyderabad Material				
Sl No	Description of item	Dimension	Qty (Nos)	Weight (Kg/Unit)	Total Weight
1	Amine Acid Gas preheater (088-E-001)				
1.1	Complete Assly	L 8000 x W 1000 x H 1500	1	16000	16000
2	Air Preheater (088-E-002)				
2.1	Complete Assly	L 5000 x W 1400 x H 1900	1	25000	25000
3	1st Condenser (088-E-003)				
3.1	Complete Assly.	L 16000 x W 2400 x H 3000	1	40000	40000
4	1st Reheater (088-E-004)				
4.1	Complete Assly.	Ø 1500 x H 7500	1	42000	42000
5	2nd Condenser (088-E-005)				
5.1	Complete Assly.	L 15500 x W 2300 x H 3000	1	40000	40000
6	2nd Reheater (088-E-006)				
6.1	Complete Assly.	Ø 1500 x H 7500	1	43000	43000
7	Final Condenser (088-E-007)				
7.1	Complete Assly.	L 17000 x W 1600 x H 3500	1	50000	50000
8	BFW Preheater (088-E-008)				
8.1	Complete Assly.	L 3400 x W 400 x H 800	1	1500	1500
9	Sulphur Cooler (088-E-009)				
9.1	Complete Assly.	L 6000 x W 500 x H 900	1	2,500	2500
10	Condensate Drum Vent Condenser (088-AC-001)				
10.1	Complete Assly.	L 5500 x W 5000 x H 4000	1	12,500	12500
11	Blowdown Cooler (088-AC-002)				
11.1	Complete Assly.	L 6500 x W 2500 x H 3500	1	8,500	8500

12	SULFUR PIT EJECTORS (088-EJ-001A/B)				
12.1	Complete Assy.	L 2900 x W 800 x H 900 *	2	450	900
	Total Weight A (MT)				282
B.1	Vessels				
1	Degassing Contactor	2300x15000x16		35000	
2	Acid Gas KO Drum	2200x11000x16		18000	
3	SWS Acid Gas KO Drum	1600x9000x14		9000	
4	Waste Heat Exchanger Steam Drum	-		-	
5	1st Condenser Seal Pot	559x8000x10,12,14		5000	
6	2nd Condenser Seal Pot	508x8000x10,12,14		5000	
7	Final Condenser Seal Pot	457x8000x10,12,14		5000	
8	Degassing Seal Pot	559x8000x10,12,14		5000	
9	Condensate Drum	1200x10000x10		6500	
10	Blowdown Drum	1200x6500x10		5800	
11	Incinerator WHE Steam Drum	-		-	
12	Incinerator WHE Mud Drum	-		-	
13	Fuel Gas KO Drum	900x5500x10		4500	
14	1st Converter	3600x18000x24		85000	
15	2nd Converter	3600x18000x24		85000	
	Total Weight B.1 (MT)			269	
B.2	INCINERATOR PACKAGE				
S.No	ITEM DESCRIPTION	Dimensions	Qty	Weight (MT)	
1	Incinerator Burner	Dia - 2.0m , Length - 4m	6000	6000	
2	Incinerator Chamber	Dia - 4.87m , Length - 15.9m	120000	120000	
3	Incinerator Chamber Refractory		130000	130000	
4	Incinerator Fans (Along with motor)	2 no.s, 560kW motors	100000	100000	
5	Incinerator Waste Heat Exchanger	Length-10m, Width-6m, Steam Drum C.L Elevation -14m	200000	200000	
6	Incinerator Steam Drum				
7	Incinerator Mud Drum				
8	Incinerator Desuperheater				
9	Incinerator Stack	Dia-5m/2.5m, Height-71m	200000	200000	
10	TSP Dosing Package (Skid Mounted)	L-3m, W-3m, H-5m	5000	5000	
11	Supporting Structures & Platforms		40000	40000	
	Total Weight B.2 (MT)			801	

B.3	REACTION FURNACE PACKAGE				
S.No	ITEM DESCRIPTION	Dimensions	Qty	Weight (MT)	
1	Reaction Furnace Burner	Dia - 1.5m , Length - 4m		10000	
2	Reaction Furnace	Dia - 3.76m , Length - 14m		250000	
3	Waste Heat Exchanger Steam Drum	Dia - 2.10m, Length - 6m		45000	
4	Waste Heat Exchanger 1st Pass	Dia - 3.70m, Length - 6m		120000	
5	Waste Heat Exchanger 2nd Pass	Dia - 3.40m, Length - 9m		130000	
6	TSP Dosing Package (Skid Mounted)	L-3m, W-3m, H-5m		5000	
Total Weight B.2 (MT)				560	
C	Balance of plant (BOP)				
S.No	ITEM DESCRIPTION	Dimensions	Qty	Weight (MT)	
1	Mech			710	
2	Electrical			383	
3	C&I			155	
4	Non IBR Piping			1300	
5	IBR Piping (CS)			350	
6	Valves, etc.			19	
Total Weight C (MT)				2917	
Grand Total (MT) Approx.				4829	

No material shall be treated as excess material; Bidder shall unload & store all materials pertaining to the project.

The contractor shall be responsible for the quality of workmanship and shall guarantee the work done, shall rectify/replace at no extra cost, all defects due to faulty/ Mishandling.

In the event of contractor failing to replace/repair the defective works within the time, required BHEL may proceed to undertake the replacement/repairs of such defective supplies/works at the contractor's risk and cost without prejudice to any other points/right

Chapter VII- DG Specification

Technical Spec for DG Set-Silent DG

Diesel Engine

New Kirloskar /CUMMINS/or any other reputed brands with silent version, cabling to the load to be included. 3 cylinder, inline, 4 stroke cycle, water cooled natural aspirated, developing rated power at 1500 RPM under NTP condition of BS:5514. The engine shall be provided with electrical starting arrangement & shall give the rated electrical output at 0.8 pf, 415V at the alternator terminal.

Alternator

Single bearing alternator suitable for operation generating on required KVA rating at 1500 RPM,415 Volts, 0.8 pf(lag) suitable for 50 Hz ,3 phase, 4 wired system, confirming to BS5000/IS 4722. The Alternator is brushless type, screen protected, revolving field, self-excited, self-generated through an AVR. The alternator should have the following feature

±1.0% Voltage regulation (max) in static conditions

IP: 23 protections with insulation class H

Permissible overload of 10% for one Hr in 12 Hours of operation

Chapter VIII- Scope of Monthly Site Office Services

1. Site office services to be provided on hiring basis at IOCL SRU-Paradip for BHEL Personnel: Stage-A

Sl No	Description
1	Providing two number of computer data operators for material management services
2	Providing seven number of unskilled manpower for miscellaneous site office works (cleaning and watch and ward)
3	Supplying & providing Packaged drinking water in 20L =5 bottle per day including dispenser (on all working days)
4	<p>Providing installing, Operation & Maintenance of 1 No. 25 KVA DG Set (Kirloskar/Cummins silent version) & its complete cabling up to load points (Excluding the Fuel cost, same shall be paid as per actuals on monthly basis).</p> <p>To be used as Power back-up and average daily operation of 2 Hrs</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Diesel cost shall be paid considering 5 Litre/ Hour for DG set. 2. Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.
5	<p>Supplying and maintaining portable one number Chemical Toilet with both septic and overhead tank (20ft. x 10ft. x 8.5t. with all fittings)</p> <p>(Chemical toilet shall contain min 5 nos urinals, one number Indian commode, one number western commode, two number wash basins, with fitting inclusive)</p>
6	Providing general Electrical maintenance, Including Plumbing services for site office establishment as directed by BHEL Engineer
7	Providing cleaning services of site office (Site office + Chemical toilet + pantry etc.) including consumables like liquid surface cleaner, dish cleaning bar, broom, mop etc. all inclusive
8	<p>Supply and maintenance of five number of PC for site office,</p> <p>Minimum Specification: 17" LED Monitor/ Intel Pentium Gold 5405U processor/ 4GBRAM /1TB HDD/Windows10 /MS Office 2019 /Integrated Intel UHD Graphics,</p> <p>Software installed: AutoCAD 2019, PDF reader</p> <p>Make: Acer/ Lenovo/ HP/ or similar kind</p>
9	Supply and maintenance of two number Xerox cum scanner cum printer for A3-A5 size, including consumables like Cartridge -Reputed Make (like Xerox, Canon, HP, Samsung, Panasonic, Epson, Dell, Toshiba) Multifunction Laser printer.

10	Providing consumables for multifunctional printer, item no 9: minimum two number of A4 size 75 GSM paper ream, one number A3 size 75 GSM paper ream during a month
11	Providing and maintenance of one number A0 size B/W wide format printer plotter including consumables like ink tank/ Cartridge on monthly hire basis. (Make: HP/ Epson/ Canon or similar make)
12	Providing consumables for A0 size plotter, item no 11: two number of Paper rolls and ink cartridges as per requirement during a month
13	Providing, establishing and maintaining services of two number landline broadband telephone connections with following minimum requirement 1. Internet speed: 8Mbps till 2GB per day and 2Mbps beyond 2GB per day with unlimited data download 2. Local + STD calls: Unlimited on any network for unlimited 24 Hours
14	Providing one number induction cooktop (Min 1.5KW), cooking wares for snacks, serving wares for preparing and serving snacks at site office for minimum fifteen personnel
15	Providing and maintaining license free analog trans receiver hand held communication devices minimum five number (walkie talkie):Min Specification: Range 5-6KM, Battery min 2500mAh, Channel capacity min 16 nos
16	Providing services of one number seven seater vehicle, Mahindra Bolero, Scorpio or similar kind for BHEL personnel for movement in and around the site and Paradip city (including Night charges, driver, maintenance and service, Daily up to 75 running KM and Excluding the Fuel cost, same shall be paid as per actuals on monthly basis). Note: 1. Diesel cost shall be paid considering 10KM/Litre vehicle mileage. 2. Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.
17	Providing Catering Services for BHEL Employees: As per scope in chapter-X of TCC

2. Site office services to be provided on hiring basis at IOCL SRU-Paradip for BHEL Personnel: Stage-B

Sl No	Description
1	Providing two number of computer data operators for material management services
2	Providing seven number of unskilled manpower for miscellaneous site office works (cleaning and watch and ward)
3	Supplying & providing Packaged drinking water in 20L =5 bottle per day including dispenser (on all working days)

4	<p>Providing installing, Operation & Maintenance of 1 No. 25 KVA DG Set (Kirloskar/Cummins silent version) & its complete cabling up to load points (Excluding the Fuel cost, same shall be paid as per actuals on monthly basis).</p> <p>To be used as Power back-up and average daily operation of 2 Hrs</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Diesel cost shall be paid considering 5 Litre/ Hour for DG set. 2. Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.
5	<p>Supplying and maintaining portable one number Chemical Toilet with both septic and overhead tank (20ft. x 10ft. x 8.5t. with all fittings)</p> <p>(Chemical toilet shall contain min 5 nos urinals, one number Indian commode, one number western commode, two number wash basins, with fitting inclusive)</p>
6	<p>Providing general Electrical maintenance, Including Plumbing services for site office establishment as directed by BHEL Engineer</p>
7	<p>Providing cleaning services of site office (Site office + Chemical toilet + pantry etc.) including consumables like liquid surface cleaner, dish cleaning bar, broom, mop etc. all inclusive</p>
8	<p>Supply and maintenance of five number of PC for site office,</p> <p>Minimum Specification: 17" LED Monitor/ Intel Pentium Gold 5405U processor/ 4GBRAM /1TB HDD/Windows10 /MS Office 2019 /Integrated Intel UHD Graphics,</p> <p>Software installed: AutoCAD 2019, PDF reader</p> <p>Make: Acer/ Lenovo/ HP/ or similar kind</p>
9	<p>Supply and maintenance of two number Xerox cum scanner cum printer for A3-A5 size, including consumables like Cartridge -Reputed Make (like Xerox, Canon, HP, Samsung, Panasonic, Epson, Dell, Toshiba) Multifunction Laser printer.</p>
10	<p>Providing consumables for multifunctional printer, item no 9: minimum two number of A4 size 75 GSM paper ream, one number A3 size 75 GSM paper ream during a month</p>
11	<p>Providing and maintenance of one number A0 size B/W wide format printer plotter including consumables like ink tank/ Cartridge on monthly hire basis. (Make: HP/ Epson/ Canon or similar make)</p>
12	<p>Providing consumables for A0 size plotter, item no 11: two number of Paper rolls and ink cartridges as per requirement during a month</p>
13	<p>Providing, establishing and maintaining services of two number landline broadband telephone connections with following minimum requirement</p> <ol style="list-style-type: none"> 1. Internet speed: 8Mbps till 2GB per day and 2Mbps beyond 2GB per day with unlimited data download 2. Local + STD calls: Unlimited on any network for unlimited 24 Hours

14	Providing one number induction cooktop (Min 1.5KW), cooking wares for snacks, serving wares for preparing and serving snacks at site office for minimum fifteen personnel
15	Providing and maintaining license free analog trans receiver hand held communication devices minimum five number (walkie talkie):Min Specification: Range 5-6KM, Battery min 2500mAh, Channel capacity min 16 nos
16	Providing services of two number seven seater vehicle, Mahindra Bolero, Scorpio or similar kind for BHEL personnel for movement in and around the site and Paradip city (Including Night charges, driver, maintenance and service , Daily up to 75 running KM, Excluding the Fuel cost, same shall be paid as per actuals on monthly basis). Note: 1. Diesel cost shall be paid considering 10KM/Litre vehicle mileage. 2. Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.
17	Providing Catering Services for BHEL Employees: As per scope in chapter-X of TCC

3. Site office services to be provided on hiring basis at IOCL SRU-Paradip for BHEL Personnel: Stage-C

Sl No	Description
1	Providing two number of computer data operators for material management services
2	Providing seven number of unskilled manpower for miscellaneous site office works (cleaning and watch and ward)
3	Supplying & providing Packaged drinking water in 20L =5 bottle per day including dispenser (on all working days)
4	Providing installing, Operation & Maintenance of 1 No. 25 KVA DG Set (Kirloskar/Cummins silent version) & its complete cabling up to load points (Excluding the Fuel cost, same shall be paid as per actuals on monthly basis). To be used as Power back-up and average daily operation of 2 Hrs Note: 1. Diesel cost shall be paid considering 5 Litre/ Hour for DG set. 2. Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.

5	Supplying and maintaining portable one number Chemical Toilet with both septic and overhead tank (20ft. x 10ft. x 8.5t. with all fittings) (Chemical toilet shall contain min 5 nos urinals, one number Indian commode, one number western commode, two number wash basins, with fitting inclusive)
6	Providing general Electrical maintenance, Including Plumbing services for site office establishment as directed by BHEL Engineer
7	Providing cleaning services of site office (Site office + Chemical toilet + pantry etc.) including consumables like liquid surface cleaner, dish cleaning bar, broom, mop etc. all inclusive
8	Supply and maintenance of five number of PC for site office, Minimum Specification: 17" LED Monitor/ Intel Pentium Gold 5405U processor/ 4GBRAM /1TB HDD/Windows10 /MS Office 2019 /Integrated Intel UHD Graphics, Software installed: AutoCAD 2019, PDF reader Make: Acer/ Lenovo/ HP/ or similar kind
9	Supply and maintenance of two number Xerox cum scanner cum printer for A3-A5 size, including consumables like Cartridge -Reputed Make (like Xerox, Canon, HP, Samsung, Panasonic, Epson, Dell, Toshiba) Multifunction Laser printer.
10	Providing consumables for multifunctional printer, item no 9: minimum two number of A4 size 75 GSM paper ream, one number A3 size 75 GSM paper ream during a month
11	Providing and maintenance of one number A0 size B/W wide format printer plotter including consumables like ink tank/ Cartridge on monthly hire basis. (Make: HP/ Epson/ Canon or similar make)
12	Providing consumables for A0 size plotter, item no 11: two number of Paper rolls and ink cartridges as per requirement during a month
13	Providing, establishing and maintaining services of two number landline broadband telephone connections with following minimum requirement 1. Internet speed: 8Mbps till 2GB per day and 2Mbps beyond 2GB per day with unlimited data download 2. Local + STD calls: Unlimited on any network for unlimited 24 Hours
14	Providing one number induction cooktop (Min 1.5KW), cooking wares for snacks, serving wares for preparing and serving snacks at site office for minimum fifteen personnel
15	Providing and maintaining license free analog trans receiver hand held communication devices minimum five number (walkie talkie):Min Specification: Range 5-6KM, Battery min 2500mAh, Channel capacity min 16 nos

16	Providing services of three number seven seater vehicle, Mahindra Bolero, Scorpio or similar kind for BHEL personnel for movement in and around the site and Paradip city (Including Night charges, driver, maintenance and service, Daily up to 75 running KM and Excluding the Fuel cost, same shall be paid as per actuals on monthly basis). Note: 1. Diesel cost shall be paid considering 10KM/Litre vehicle mileage. 2. Average of prevailing Diesel rates, as on 1st and 15th Day of the respective month, shall be considered for arriving at Diesel rate for calculating the Diesel cost.
17	Providing Catering Services for BHEL Employees: As per scope in chapter-X of TCC

Note:

1. In case of any short supply of service (s) of any item, BHEL reserves the right to get that done at risk & cost of contractor. Actual cost of that service and 5% administrative charges shall be deducted from contractor's respective RA bills.

Chapter IX- Schedule of items for Material handling

Item no	Item Description	Unit
1	Material Handling Works (Receipt, Unloading & Preservation at site)	
1.1	Material handling (Receipt, unloading, stacking & preservation of materials, handling and loading to execution contractor's vehicle at the time of issue) for materials being issued/received at IOCL Paradip site as per material list attached in TCC, including providing all necessary equipment, T&P and manpower viz, Hydra, forklift, T&P, consumables, diesel, hydra driver, store keeper, supervisor, rigger and helpers all complete as per instruction and direction of BHEL Engineer	Month

Note:

1. Item no 1.1 will consist minimum of the followings (either one, combination of few or all items listed below depending on requirements on case to case basis) to execute the above work:
 - 1.1 One (1) 18T hydra type crane including driver, diesel, T&Ps and all consumables etc all-inclusive.
 - 1.2 One (1) tire mounted 40 T Crane (1 nos) (Including Driver, fuel, slings, ropes and other required tools, tackles & consumables all inclusive)
 - 1.3 One (1) forklift including driver, diesel, T&Ps and all consumables etc all-inclusive.
 - 1.4 One (1) Rigger, 2 Helpers.
 - 1.5 One (1) Store Keeper
 - 1.6 One (1) Supervisor
 - 1.7 Required T & P with specific job.
2. In case of any short supply of service (s), part or full as defined above, BHEL reserves the right to get that done at risk & cost of contractor. Actual cost of that service and 5% administrative charges shall be deducted from contractor's respective RA bills.

Chapter X: Schedule of Quantities-Catering Services

Sl No	Item Description
1	Providing services of Cook cum care taker-1 No (Including food cost of cook)
2	Providing services of Helper-1 Nos (Including food cost of helper)
3	Providing cooking utensils, vessels, crockeries and cutlerys and appliances for 10 person
4	Providing, service and maintenance of Cooking gas stove with gas connection (Two cylinder) including refilling of cylinders every month (Or as required)
5	Providing, service, maintenance of refrigerator, 220Litre, Single door
6	Providing dining table (3" X 6") with 6 Chairs-1 set
7	Providing, service and maintenance of RO/Aqua guard Water purifier, 8 Liter
8	Providing services of 'cleaning the cooking and serving premises' including supply consumables for cleaning (Broom, harpic, detergent, cleaning clothes, brushes etc.)

Note:

1. In case of any short supply of service (s) of any item, BHEL reserves the right to get that done at risk & cost of contractor. Actual cost of that service and 5% administrative charges shall be deducted from contractor's respective RA bills.

Chapter XI- General

1.0 GENERAL

- 1.1 All the work shall be carried out as per the instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the Bidder.
- 1.2 The Bidder shall at his cost perform any services, tests etc, although not specified but nevertheless required for the completion of work.
- 1.3 If any portion of the work is found to be defective in workmanship or not conforming to BHEL requirements ,the Contractor shall re-do the work at his cost failing which the work will be got done by BHEL at the cost and risk of the contractor.
- 1.3 The terminal points as decided by BHEL shall be final and binding on the Contractor.
- 1.4 All tools and tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables etc. required for this scope of work shall be provided by the Contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause.
- 1.5 The contractor shall make adequate security arrangements including employment of security personnel and ensure protection from theft, fire, pilferage, damage and loss of materials/equipment kept under bidder custody.
- 1.6 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings etc, shall be used for handling of the equipment without the specific permission of the engineer.
- 1.7 Contractor shall ensure proper housekeeping and remove all scrap materials periodically from various work area covered in the scope and deposit the same at the place earmarked for this purpose. In case of contractor's failure to do the same, BHEL reserves the right to remove scrap at contractor's cost and risk.
- 1.8 Access to site for inspection by BHEL and customer engineers shall be made available by the contractor at all times.
- 1.9 Contractor shall mobilize sufficient quantity of sleepers for stacking of materials in his custody.
- 1.10 Site Inspection: The owner/employer / BHEL or his authorized agents may inspect various stages of work during the period of contract awarded to him. The contractor shall make necessary arrangements for such inspection and carryout the rectification pointed out by the owner/employer without any extra cost. No cost whatsoever for such duplication of inspection/work will be entertained.

- 1.11 Filed Quality Assurance Formats: It is the responsibility of the contractor to collect and fill up relevant FQA Log sheets and present the same to BHEL after carrying out the necessary checks as per the log sheets and obtaining the signature of BHEL/Customer in token of their acceptance. Monthly Running Bill Payment to the contractor will be linked with the submission of these log sheets.
- 1.12 The contractor agrees to indemnify the company against all claims and losses arising as a liability under the Payment of Wages Act, Employees Provident Fund & Miscellaneous Provisions Act, Industrial Disputes Act, Employees State Insurance Act, Contract Labour (Regulation and Abolition) Act, Workmen's Compensation Act, Arbitration Act, Minimum Wages Act, Inter State Migration Act, etc. or criminal law in force so far as they relate to security personnel employed by the contractor for the company.
- 1.13 Income Tax or any other statutory dues liable to be paid by the contractor shall be recovered from the bills of the contractor for which TDS certificate will be issued by BHEL.
- 1.14 With regard to the interpretation of the terms and conditions of this contract, the decision of the Head of the Region/BHEL PE&SD shall be final.
- 1.15 Any dispute arising out of this contract shall be within the jurisdiction of the Court of Hyderabad only.
- 1.16 Any addition/ deletion on the scope of work and terms and conditions under this contract shall be implemented based on mutual discussions between the “company” and the “contractor”.
- 1.17 Letter of Award No ----- issued by BHEL/PE&SD, Hyderabad (including the enclosures) shall form the integral part of this agreement.
- 1.18 In witness hereof the parties have respectively set their signature in the presence of:

2.0 COLLECTION AND RETURN OF EQUIPMENT, MATERIALS & CONSUMABLES

- 2.1 The Contractor should note that the transport of equipment to erection site, assembly yards etc should be done by the prescribed route, without disturbing the other works and contractors and in the most professional manner.
- 2.2 The contractor shall return all parts, materials & consumables of BHEL remaining unused & extra material in their custody. In case of any misuse or use over actual requirement, BHEL reserves the right to recover the cost of parts/materials used in excess or misused, with departmental charges.
- 2.3 All packing and forwarding material shall be returned as soon as the material is unpacked. The location for storage of such materials shall be as indicated by BHEL Engineer.

- 2.4 The terminal points decided by BHEL should be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.
- 2.5 The contractor shall perform any services, tests etc. Which may not be specified but nevertheless required for the completion of work within quoted rates.
- 2.6 All cranes, transport equipment, handling equipment, tools, tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables etc required for this scope of work shall be provided by the contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clauses. The contractor's quoted rates should be inclusive of all such contingencies.
- 2.7 All the materials during storing shall be stored well above ground level as necessary to avoid water ingress etc, by use of wooden/ concrete blocks/ sleepers. No material shall be stored directly on the ground at any time.
- 2.8 No BHEL crane will be available under this tender specification for handling of equipment. Contractor shall take specific note of this aspect and shall arrange all necessary T&P and lifting/handling/transportation arrangements..
- 2.9 For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL & suit the site requirement.
- 2.10 The contractor shall perform all required services which may not be specified herein but nevertheless required for the completion of work within quoted rates.
- 2.11 All cranes, transport equipment, handling equipment, tools, tackles, fixtures, equipment, manpower, supervisors/engineers, consumables (excluding those indicated as BHEL scope), etc required for this scope of work shall be provided by the contractor and shall conform to Safety Requirements/ Load Testing etc. as per BHEL/IOCL rules & Regulations at site.
- 2.12 All expenditure including taxes and incidentals in this connection will have to be borne by the contractor unless otherwise specified in the relevant clauses elsewhere here. The contractor's quoted rates shall include of all such contingencies. In this connection refer relevant clause of general conditions of contract.
- 2.13 The contractor shall take due precaution during Materials Handling of equipment/works under these specifications to avoid deface, injure, damages, destruction by contractor or his workmen or servants to any pipelines, railway lines, roads, canals, cables, culverts, drains, sewer,

telephone lines, water mains, dykes, poles, pillars, fences, wires, supports and embedment's and other underground or over ground works, Structural or constructions whatsoever and shall at his own cost and initiative forthwith restore and repair any damage thereto the entire satisfaction of customer/BHEL at his own expense or in default, the customer/ BHEL site engineer may cause the same to be made good by other agency or by other means and deduct the expense with BHEL overhead (of which the site engineer's decision is final) from any sums that may be then or at any time thereafter become due to the contractor or from his security deposit or any other money due.

2.14 As such, the marine cover and erection all risk cover insurance for the project for permanent incorporation of materials and services at site lies with customer. The contractor shall have to take necessary all risk insurance policy (motor vehicles act, worker's compensation act, fatal accidents act, personal injuries insurance act, emergency risk insurance act and/or other industrial legislation from time to time with Indian insurance company(ies) approved by owner **for his manpower and his employees deployed at site under work compensation act including but not limited to third party insurance at the project along with his T&Ps before starting of the work and shall submit the necessary document/policy in support of above to BHEL/customer at site. The insurance policy taken shall be kept in-force till completion of contract. The workmen's compensation insurance and third party insurance liability limits shall be as customer specification. Contractor shall indemnify the customer CORE / BHEL harmless against such losses, which are on account of contractor.**

2.15 Recoveries will be made from contractor's bills for any liability accrued to BHEL/ CORE for the accidents and refund of the same shall be considered later, after the claim is fully settled by insurance authorities.

2.16 Customer has taken the marine cover and all risk cover insurance for the project for permanent incorporation of materials and services at site. However contractor shall take all due precautions, arrange & follow the safety & security requirements/regulations for materials issued to him & works under his execution and shall be responsible for safety & security of these materials & works for any loss or damages. For any damage / loss to the material during inland transportation, storage etc., contractor shall intimate promptly to BHEL/customer and shall prepare & submit the necessary detailed report / documents / information, facilitating inspection / discussions by the officials / surveyors deputed by insurer with all expenditure on contractor's account. Contractor shall take care for timely information for conducting survey, submission of monetary estimate & furnish the requisite documents to surveyors/insurer, taking necessary precautions so that the loss/damage is not aggravated further, protecting damaged goods etc. As part of scope of work.

Contractor shall promptly make repair / rectify/replace and make good any damage or loss to CORE /BHEL materials and works on above account as per instructions of BHEL engineer in charge at site without any delay & waiting for settlement of insurance claim from insurer.

Contractor's claim (if any) for such works will be settled as per applicable item rate of contract after settlement of claim from insurer / customer & after ascertaining / establishing that contractor is not responsible for such loss or damages. The contractor's claim for such repair / replacement shall not be more than the payment settled by insurer / customer and in such case the contractor's payment will be limited to seventy percent of settled amount by insurer/customer against claim amount.

- 2.17 The contractor shall submit survey report/performance report of the tools and plants deployed by him and being utilized on the work under the scope. These survey reports/performance reports are to be obtained by contractor from the customer of BHEL/insurance authorities and submitted to BHEL at no extra cost.
- 2.18 Contractor shall deploy & maintain, the separate exclusive workforce / manpower arrangements and T&Ps resources including the heavy lift equipment /arrangements for Material Handling scope of works.
- 2.19 All vehicles/ electrical motors devices shall have to be provision of fire extinguisher/muffler facilities etc.
- 2.20 Contractor shall provide FIRST AID / emergency medical facilities and maintain these facilities throughout the contract period & extension period (if any) as scope of work.

- 2.21 For any items or class of work not specified herein but required for total completion of work, the same shall be carried out as per BHEL requirement. However, payment of these items/class of work shall be regulated on the basis of rate arrived by the following method:
 - 2.21.1 Based on unit rate of items in the rate schedule.
 - 2.21.2 Wherever any item rate for similar type of work or nearby item rate does not exist in the rate schedule, rate will be worked out on the basis of work element or from fundamentals of estimation.
- 2.22 Dewatering inside material storing area for equipment is contractor scope.

Chapter XII- Storage

1.0 STORAGE

- 1.1 The equipment should be preferably in its original package and should not be unpacked until it absolutely necessary for its installation. The equipment should be best protected in its cases. It should be arranged away from walls.
- 1.2 The wooden pallet provided for packing itself can be retained for raised platform to protect equipment from ground damps, sinking into around and to circulate air under the stored equipment. This shall also help in lifting the packing with forklift truck.
- 1.3 Periodic inspection of silica gel placed inside the equipment is necessary. It has to be replaced when decolorization takes place or regenerated.
- 1.4 Due care should be taken to ensure that the equipment is not exposed to fumes gases etc. which can affect electrical contacts of relays and terminal boards.
- 1.5 The storage room and the equipment should be checked at regular interval of every week to ensure protection from termites, mold growth, condensation of water etc. which can damage the equipment.
- 1.6 All panels, electrical equipment's, and other materials kept in the store room should be identified and registered in a book. Inspection report should be recorded. Any discrepancy observed should be communicated to Site In-charge.
- 1.7 Packing material shall be retained if the cubicle to be repacked after inspection.
- 1.8 Cables shall be stored separately and preserved above the wooden supports.

3.0 Sub-Assemblies

- a) All sub-assemblies should be kept in a separate place where it is easily accessible.
- b) Sub-assemblies should have a protective cover in case it is stored without wooden packing/case to prevent accumulation of dust. Silica gel packets should also be kept along with it.
- c) Sub-assemblies should not be stacked one above the other.

4.0 Loose items (wherever applicable)

- 4.1 The loose items supplied for the main equipment falling into various categories like tools, cables, recorders and display units, cable glands, frames etc. are to be categorized and stored separately.

5.0 PRESERVATION OF COMPONENTS

- 5.1 Contractor shall arrange for preservation of components/ materials as per BHEL's storage and preservation manual and/or as per instructions of BHEL Manager.

Chapter XIII- Manpower Requirement

1 MANPOWER REQUIREMENT FOR MATERIAL HANDLING SHALL AS FOLLOWS:

- 1.1 The Site in charge of contractor shall be provided with PCs and good communication facilities like telephone, fax, email etc. at the cost and expense of the contractor. Lack of communication facilities shall not be an excuse for extension of completion date.
- 1.2 All instructions from BHEL/Customer shall be directed to the contractor through the Site in-charge and he shall be responsible for all the contractor's activities at site. The contractor shall name his authorized representative prior to or immediately on commencement of operations at site
- 1.3 The Site In charge shall be present at site during all normal working hours and his contact address after normal working hours shall be made available to BHEL so that if any emergency arises, the presence of the contractor's site Representative at site can be called for.
- 1.4 The contractor shall not change the site Representative without the consent of BHEL. Should BHEL require the replacement of the contractor's site Representative for justifiable reasons (including inadequate progress of work) the contractor shall ensure that replacement is made as soon as possible and work is not allowed to suffer delay on this account.
- 1.5 The contractor shall provide to the satisfaction of BHEL sufficient and qualified staff for the execution of works. If and whenever any of the contractor's staff is found guilty of any misconduct or be incompetent or insufficiently qualified in the performance of his duties the contractor shall remove them from site as directed by Site Engineer.
- 1.6 The contractor shall ensure that all his supervisor's staff and workmen conduct themselves in a proper manner. They shall all be persons who are familiar with and skilled at the jobs allocated to them. Any misconduct / inefficiency noted on the part of the contractor's personnel shall be brought to the attention of the contractor's site representative who shall immediately take such action as necessary including the removal of such misconducting / inefficient persons, if so required by the Engineer-in-Charge.
- 1.7 The contractor shall ensure that replacement for such persons removed from site is provided immediately and the work is not allowed to suffer delay on that account.

Chapter XIV- Documentation

1 DOCUMENTATION

1.1 The following information shall be furnished within one weeks of award of contract for purchaser's approval

- a) Mobilization Plan
- b) Detailed organization chart
- c) Details of T&P available with contractors with document proofs.

1.2 The following information shall be furnished after testing and inspection:

- d) Revalidation of Test certificates of various T&P's, if certificates are found to be invalid or any discrepancies/abnormalities observed in T&P's during execution.

Chapter XV- Progress and Monitoring of Work

1 PROGRESS AND MONITORING OF WORK.

- 1.1 It is the responsibility of the contractor to provide all relevant information on a regular basis regarding progress, labour availability, equipment deployment, testing, etc.
- 1.2 The contractor shall submit daily, weekly and monthly progress reports, manpower reports, material reports, and equipment reports etc. as per formats specified by BHEL. The progress reports shall indicate the progress achieved against plan, indicating reasons for delays, if any. The report shall also give remedial actions which the contractor intends to make good the slippage or lost time so that further works can proceed as per the original plan the slippages do not accumulate and affect the overall Programme.
- 1.3 The contractor to reflect actual progress achieved during the month and shall be submitted to BHEL, so that slippages can be observed and necessary action taken in order to ensure that the situation does not get out of control shall update the construction schedule forming part of this contract each month.
- 1.4 If required by BHEL, the contractor shall change the sequence of his operation so that work on priority sectors can be completed within the projects schedule. The contractor shall afford maximum assistance to BHEL in this connection without causing delay to agreed completion date
- 1.5 In addition a weekly / fortnightly progress meeting shall be held at BHEL site office for coordinating job progress and all agreements reached there at shall be maintained.
- 1.6 Wherever sequences are furnished by BHEL, the contractor shall follow the same sequence.
- 1.7 The manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged.
- 1.8 During the course of Material handling, if the progress is found unsatisfactory, or if the target dates fixed from time to time for every milestone are to be advanced, or in the opinion of BHEL, if it is found that the skilled workmen like fitters, operators, technicians employed are not sufficient BHEL may induct required additional workmen to improve the progress and recover all charges incurred on this account including all expenses together with BHEL overheads from contractor's bill.

Chapter XVI- Termination

5 **TERMINATION:**

Notwithstanding anything contained herein the contract may be terminated with due notice of one month on either side.

WITNESS

(with full address)

1.

2.

Signature of the Contractor

(To be signed by a person holding valid
Power of Attorney of the Company)

WITNESS

1.

2.

For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

Chapter XVII: Obligations of the Contractors

1.1 The contractor shall fully comply with the following enactments:

- (a) Contract Labour (R & A) Act, 1970 and rules formed therein under Central Rules.
- (b) Minimum Wages Act 1948 (Wage Rates not less than that notified by State Labour Department / Central Labour Dept., / BHEL whichever is higher from time to time).
- (c) Payment of Wages Act.
- (d) ESI Act, 1948
- (e) EPF Act, 1952
- (f) Employees' Compensation Act, 1923.
- (g) Provisions of Factories Act 1948 & Rules thereof
- (h) The inter-state migrant workmen (regulation of employment and conditions of service) Act, 1979
- (i) Payment of Bonus Act, 1965
- (j) Payment of Gratuity Act, 1972

1.2 The contractor shall obtain License from the Assistant Labour Commissioner (Central), or appropriate government if he engages twenty or more workmen.

1.3 The Contractor shall produce the following Registers and forms before commencement of work, for verification by the Executing Officer.

- (a) Form XII - Register of contractors
- (b) Form XIII - Register of workmen employed by contractor (Rule 75)
- (c) Form XIV - Employment card issued by contractor (Rule 76)
- (d) Form XVI - Muster Roll (Rule 78(1)(a)(i))
- (e) Form XVII - Register of wages (Rule 78(1)(a)(i))
- (f) Form XVIII - Register of wages-cum Muster Roll (in case of weekly payment)
- (g) Form XIX - Wage Slip (Rule 78(b))
- (h) Form XX - Register of deduction for damages or loss (Rule 78(1)(a)(ii))
- (i) Form XXI - Register of files(Rule 78(1)(a)(ii))
- (j) Form XXII - Register of advances(Rule 78(1)(a)(ii))
- (k) Form XXIII - Register of overtime(Rule 78(1)(a)(iii))
- (l) Form XXIV - Return to be sent by the contractor to licensing officer (Rule 82(1))

1.4 The contractor shall make himself or his representative (supervisor) available at the work spot every day during execution of work, for effective supervision.

1.5 The contractor shall attend to all inspections notified/conducted by the Human Resource department, Labour department, P.F. authorities, Inspector of Factories, ESI inspectors, or any other such authorities.

1.6 Non-compliance of any provisions under the act/rule/instructions/guidelines shall make the contractor liable for penal action including termination of contract.

1.7 Contractor shall furnish in a separate letter his place of residence and postal address. The delivery at the above named place or posting in a Post Box regularly maintained by the Post and Telegraph Department or sending letters registered for acknowledgement of any notice, letter or other communication to the contractor shall be deemed sufficient service there upon he contractor. Change in address shall come into force at any time by an instrument executed by the contractor and delivered to the BHEL official who has signed the contract.

1.8 The contractor must satisfy himself by personal study thoroughly the scope of proposed work in detail and all conditions affecting the work before entering into the contract. There shall not be at any time, dispute/complaint of any nature regarding scope of work and interpretation of specifications or any misunderstanding with regard to nature or omission of the work to be done nor shall any application for compensation in terms of time and money shall be accepted by BHEL regarding the above.

1.9 Contractor shall in his absence keep competent agent constantly on the works and any directions or explanations given by the "Contract Executing Officer" or his representative to such agent shall be held to have been given to the contractor himself.

1.10 Contractor on the advice of BHEL officials shall immediately remove any person employed by him, who may in the opinion of the BHEL official, is incompetent or involves himself in misconduct. Such persons shall not be again employed on the works without written permission of the BHEL official.

1.11 The contractor shall give all notices required by the Acts, regulation, bye laws, Legal Acts and pay all fees in connection therewith unless and otherwise arranged and decided in writing with BHEL. He shall also ensure that no attachments are made against materials or work forming part of or for the use of the contractor. In all such cases, contractor shall protect and indemnify BHEL against any claim or liability arising from or based on the violation of any such laws, ordinances, regulations, orders, decrees or attachment either by himself or by his employees.

1.12 It shall be contractor's sole responsibility to protect the public and his employees against accident from any cause and provide required safety equipment and shall indemnify BHEL against any claims for damages for injury to the person or property resulting from any such accidents and shall, where the provisions of the Employees Compensation Act and Public Liability Act as applicable, take steps to properly insure against any claims thereunder.

1.13 In the event of any accident in respect of which compensation may become payable under the Employees Compensation Act, VIII of 1923 whether by the contractor or by BHEL as Principal Employer, it

shall be lawful for BHEL to retain out of monies due and payable to the contractor such sum or sums of money as may, in the opinion of BHEL shall be final in regard to all matter arising in this clause.

1.14 No work shall be done on Sundays or on other declared Holidays of BHEL without the written permission of BHEL officer in charge of the work. The contractor shall comply with the provisions of the Factories Act 1948 if the same are applicable. No contract labour shall be engaged on any National Holidays.

1.15 The contractor shall keep his work place clean and safe to avoid injuries to men and damage to finished products / equipment.

1.16 On the occurrence of an accident, which results in the death of any of the workmen employed by the contractor or which is so serious as to be likely to result in the death of any such workmen, the contractor shall within 24 hours of the happening of such an accident intimate in writing to the BHEL official in charge of the work.

1.17 The contractor shall indemnify BHEL against all losses or damages sustained by BHEL resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or dues if any and become payable by BHEL, as a consequence of failure, BHEL to give notice under the Employees Compensation Act 1923 or otherwise confirm to the provisions of the said Act in regard to such accident.

1.18 The contractor shall ensure adherence to all statutory requirements applicable to BHEL.

1.19 The contractor shall ensure abidance by all the labour laws especially including Contract labour (R&A) Act 1970, Payment of Wages Act 1936, Employees Compensation Act 1923, Minimum Wages Act 1948, ESI Act 1948, Payment of Bonus Act 1965, and Provident Fund Misc. Prov. Act 1952, as amended from time to time.

1.20 The contractor shall comply with provisions of Provident Fund Misc. Prov. Act 1952 through PF code allotted to him / her.

1.21 Notwithstanding the above clause, in case of any financial loss incurred by company on account of contravention of the Provident Fund regulations or any regulations of rule touching the same by the contractor, the contractor shall submit an undertaking to indemnify the company to the extent of the loss incurred by the company.

1.22 The contractor should engage only those laborers whose age is 18 (eighteen) years or more.

1.23 The contractor shall not resort to subcontracting under any circumstances without prior permission of BHEL. If found sub-contracting at a later date, BHEL reserves the right to take whatever action it deems fit, including cancellation of the Contract.

1.24 The contractor shall provide the required safety equipment to the labors engaged by him / her.

1.25 Contractor shall issue "Employment Card" as per statute to all labour and supervisors covered under the job work contract.

1.26 The contractor shall be responsible to settle any grievances of the labour deployed by him / her within two weeks.

**Chapter XVIII: HSE (Health, Safety, Environment) and PPE (personal Protective Equipment)
Guidelines**

1. Contractor shall follow all the HSE guidelines as mentioned chapter IX off SCC and IOCL (Annexure-1).
2. In case of any dispute/ contradiction, IOCL HSE rules and guidelines shall prevail.

Chapter XIX- Statutory Regulation

6.1 BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998 and

INTER-STATE MIGRANT WORKMEN ACT, 1979 (IN CASE BIDDER ENGAGE MANPOWER FROM OTHER STATE)

In case any portion of work involves execution through building or construction workers and/or inter-state migrant workers, then compliance to the above titled Acts as applicable shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances, it may be ensured as under:-

It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a license to the Competent Authority under the BOCW Act and/or ISMW Act as applicable and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of license / permission to BHEL within a period of one month from the date of award of contract.

It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these acts and rules including that of payment / deposit of cess as per the applicability under above referred Acts within a period of one month from the receipt of payment.

It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building/Inter-state Migrant workmen) engaged by the sub-contractor during the preceding month.

It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.

Volume IA
Part II
Technical Specification
(For Construction Power Distribution arrangement services)

Chapter-I: Technical specification for Electrical Works

CONTENTS

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ANNEXURES

SL. NO.	ANNEXURE NO.	DESCRIPTION
1.0	Annexure-III	Construction Power Supply Arrangement SLD, Dwg. No. PY-DL-3-M170-1101-01 R00

1.0 INTENT OF SPECIFICATION:

This specification covers the design, manufacture, assembly, testing at manufacturer's works, packing and transportation to site of Feeder Pillars Package for Construction Power, complete installation with all accessories, Testing & Commissioning, Operation & Maintenance for total contract period (for period of 24 months) for efficient and trouble free safe operation on hiring basis.

It is not the intent to specify completely herein all details of the equipment; nevertheless, the equipment shall be complete and operative in all respects and shall confirm to the highest standard of engineering, design and workmanship.

2.0 SITE CONDITIONS:

Sl. No.	Description	Data
1	Project	525 TPD Standby SRU, IOCL
2	Site Location	Paradip, Odisha
3	Elevation Above MSL	Minimum 3.91 m above Indian Mean Sea Level
4	Maximum Ambient Temperature	42.4°C
5	Minimum Ambient Temperature	11.3°C
6	Design Maximum Temperature	42.4°C
7	Design Minimum Temperature	11.3°C
8	Design Ambient Temperature	40°C
9	Relative Humidity (Average Monthly)	Maximum 95%, Minimum 55%
10	Seismic Zone	Zone-III of Seismic Zoning Map of India

3.0 PURPOSE:

- 3.1 The Feeder Pillars under this enquiry are envisaged as part of construction power supply system of above project. The purpose of Feeder Pillars is distribution of power supply to various construction equipments required to carry out erection and commissioning of the above project.
- 3.2 Typical electrical loads that may be connected to the Feeder Pillars are grinding machines, welding machines, bending machines, drilling machines, dewatering pump sets, lighting etc.

4.0 SCOPE OF SUPPLY:

4.1 Supply of Feeder Pillars.

- 4.2 **Supply of Incoming side Power Cables for each Feeder Pillar.**
- 4.3 **Supply of Cable Glands and Lugs for Feeder Pillar end for all Incoming side Power Cables.**
- 4.4 **Supply of Above Ground Earthing Materials.**

5.0 CODES AND STANDARDS:

- 5.1 The equipment to be furnished under this specification shall be in accordance with the applicable section of the latest version of the following BIS standards unless otherwise specified:

<i>Standard</i>	<i>Description</i>
IS 60947	LV Switchgear and controlgear
IS 60529	Degree of protection
IS 8623, IS 61439	Factory built assemblies of switchgear & controlgear for voltages up to & including 1000 V AC & 1200 V DC
IS 10118	Code of practice for installation & maintenance of switchgear
IS 5578 & 11353	Guide for uniform system of marking and identification of conductors and apparatus terminals
IS 13703	HRC cartridge fuses
IS 4237	General Requirements for Switchgear and Control gear for Voltages not exceeding 1000 V
IS 5	Colors for ready mixed Paints and Enamels
IS 6875	Switches and Push Buttons
IS 8828	Miniature circuit breaker
IS 2705	Current transformers
IS 3231	Relays
IS 1248	Indicating instruments
IS 8530	AC electricity meters

IS 3202	Climate proofing of electrical equipment
IS 6005	Code of practice for Phosphating iron & steel
IS 5082	Wrought aluminium & aluminium alloys for electrical purposes
IS 694	PVC insulated cables for working voltages up to and including 1100 V
IS	

5.2 The equipment shall also confirm to the provisions of Indian Electricity Rules and other statutory regulations currently in force in the country.

5.3 In case Indian Standards are not available for any equipment, Standards issued by the IEC/ BS/ VDE/ IEEE/ NEMA or equivalent agency shall be applicable.

6.0 ORDER OF PRIORITY:

6.1 In case of any contradictions between various referred Standards/ Specifications/ Data Sheets/ Statutory regulations/ enclosed annexures, the following sequence shall be followed as order of priority:

1. Statutory regulations
2. This specification
3. Codes and Standards

6.2 In case of further contradiction among above documents, it is bidder's responsibility to highlight the same during bid stage itself. Else, BHEL's decision shall be final during execution. The same shall be complied without any time/ cost implication to BHEL.

7.0 GENERAL REQUIREMENTS:

7.1 The offered equipment shall be brand new with state of art technology and proven field track record. No prototype equipment shall be offered.

7.2 Only major relays, meters and controls are indicated in the SLD. Any auxiliary relays, timers, switches, contactors, contacts, indications etc. as required while developing the control schematics and felt necessary for safe operation, even if these are not specifically mentioned, shall be supplied without any time and price implications.

8.0 TECHNICAL REQUIREMENTS:

8.1 Operating Conditions:

Sl. No.	Description	Data
1	Voltage	415V \pm 10%
2	No. of Phases	3-phase
3	Frequency	50Hz \pm 5 %
4	Fault Level	As specified in SLD
5	System Earthing	Solidly Earthed
6	Auxiliary Supply	240V \pm 10%, 1-ph, 50Hz AC
7	Control Supply	240V AC for Indication Lamps, ELR and other Control Circuit

8.2 Feeder Pillars:

8.2.1 The Feeder Pillars of following ratings shall be supplied:

415V 63A Feeder Pillar - 1 no.

415V 125A Feeder Pillar - 1 no.

415V 250A Feeder Pillar - 1 no.

Feeder details are as per attached Annexure-III i.e. Construction Power Supply Arrangement SLD, Dwg. No. PY-DL-3-M170-1101-01 R00.

8.2.2 The Feeder Pillars shall be **Weatherproof** suitable for installation and satisfactory operation in **outdoor area**. The service conditions shall be considered as typical of a refinery/ petrochemical plant within a coastal environment. The atmosphere is to be considered saliferous, sulphurous and dusty.

8.2.3 All the equipment described in this specification is intended for continuous duty at the specified ratings under the specified ambient conditions.

8.2.4 The equipment design shall be suitable to render satisfactory operation under the conditions prevailing at site, and the equipment shall operate satisfactorily under normal load and voltage variations. The design shall further include all necessary provisions ensuring the safety of the operating and maintenance personnel.

8.2.5 All equipments shall be capable of carrying their full load currents without undue heating.

8.2.6 Minimum degree of enclosure protection shall be **IP 55** for the Feeder Pillars. Additionally, GI/ FRP canopy shall be provided.

8.2.7 **The Feeder Pillars shall be of non-compartmentalized design.**

8.2.8 The doors and enclosure shall be made from 2.0 mm thick CRCA sheet steel while the gland plate shall be made from 3.0 mm thick CRCA sheet steel.

8.2.9 The Feeder Pillars shall be suitable for mounting on brick/ RCC pedestal and necessary hardware shall be provided for mounting.

8.2.10 Operating height for any component shall not exceed 1600 mm.

8.2.11 Continuous lifting angle or lifting hooks shall be provided to facilitate installation.

8.2.12 Close fitting, gasketed, hinged, lift-off doors shall be provided. The doors shall be provided with integral lock and master key.

8.2.13 The Feeder Pillars shall be vermin proof.

8.2.14 All potential free contacts including unused contacts shall be duly wired to the terminal block.

8.2.15 All incoming and outgoing connections will be by cables entering from bottom.

8.2.16 Removable gland plates shall be provided and adequate working clearance shall be ensured for the termination of cables.

8.2.17 The Feeder Pillar shall be provided with door switched lighting fixture, single phase 5/15A socket for power outlet and space heater with thermostatic control.

8.2.18 Bus bar conductors/ links shall be made of Aluminium. All connections shall be in accordance with the best modern practice.

Adequate provisions must be made for the expansion and contraction of the bus bars conductors/ links and other bus bar connections with variation in temperature.

Electrical clearances shall conform to applicable standards and shall not require cutting away of adjacent framework.

8.2.19 Ground bus with 50 x 6 mm Al shall be provided extending throughout the length. All metallic parts not forming part of the live circuits, all instrument transformer terminals to be earthed and other earthing terminals as well as all cable screens shall be connected to the earthing bar. Doors and movable parts shall be connected to the earth bus with flexible copper connections.

Each end of this bus shall be drilled and provided with suitable bolts and nuts for connection to 50x6 GI strip.

8.2.20 Clearances in air of live parts shall be atleast 25.4 mm between live conductors and 19.4mm for phase-to-earth. However, clearances between terminals at components shall be as per applicable individual standards for components.

8.2.21 All instruments, control knobs and indicating lamps shall be flush mounted on the front side.

The meters shall be of standard size (atleast 72 x 72 mm). The front glasses shall be non-reflecting anti-glare type.

All instruments shall be dust and moisture-proof.

AC ammeters and voltmeters shall be analog/ digital type of not less than 1.5 accuracy class.

8.2.22 **Moulded Case Circuit Breakers:** MCCBs shall be of single break type having one pole per phase. These shall be of 2 or 3-pole type as required having adjustable thermal magnetic release for overload and short circuit protection, with "On-Trip-Off", indicating/ operating mechanism.

MCCBs shall be manually operated and shunt trip type.

8.2.23 **CBCT and ELR:** The CBCT and ELR shall be provided for earth fault currents of range 30mA-30A.

8.2.24 **Terminal Blocks:** All terminal blocks shall be mounted in an accessible position with the spacing between adjacent blocks not less than 100 mm and space between the bottom blocks and the cable gland plate being a minimum of 200 mm.

Sufficient terminals shall be provided to allow for the connection of all incoming and outgoing cables of sizes as mentioned in the attached SLD.

Terminal blocks shall be provided with mounting identification numbers and/or letters.

Terminals shall be of the channel mounting type and shall comprise a system of individual terminals so that terminal blocks can be formed for easy and convenient cabling.

Not more than two conductors shall be connected under one terminal clamp.

The live terminals shall be shrouded to avoid accidental contact.

Current transformer terminal blocks shall have provisions for short-circuiting and disconnecting.

Control circuits and power circuits shall be completely separated by use of divided or separate terminal blocks.

Atleast 10% spare terminals shall be provided.

8.2.25 **Wiring:** All secondary and control wiring shall be stranded copper; PVC insulated and shall not be smaller than 1.5 sq. mm with voltage rating 1.1 kV.

For current and potential transformer secondary circuits, the minimum cross section of the conductors shall not be less than 2.5 sq. mm with voltage rating 1.1 kV.

Larger size wiring shall be used where needed for the current carrying capacity requirements.

All connections shall be made with solder less lugs.

Wiring shall terminate at terminal blocks at one side only. Where tap connections are required, they shall be made on terminal blocks.

Splices or tee connections between terminal points are not acceptable. Wire runs shall be neatly dressed inside the panels or in wiring troughs.

8.2.26 Indicating and Signaling Lamps: Indication Lamps shall be of Clustered LED Type.

Each indicating and signaling lamp shall have a removable cap, which can be inscribed with wording and shall not be affected with the heat of the lamp.

Light bulbs shall be replaceable from the front of the panel.

8.2.27 Name Plates: The Feeder Pillars shall be provided with suitable nameplates, identifying the name of the panel. Each feeder shall be clearly identified with suitably located nameplates. Nameplates shall also be furnished for all feeder components, instruments, lamps etc.

Warning/ Danger labels shall be provided outside and inside the Feeder Pillars.

8.2.28 The Feeder Pillars shall be provided with epoxy based powder coated painting as per manufacturer standard. Paint shade shall be 632 of IS-5.

8.3 Cables:

8.3.1 Incoming side Power Cables for each Feeder Pillar shall be supplied as per sizes mentioned in attached SLD. The length requirement is mentioned below:

4C x 50 sq. mm Al XLPE Armoured Cable: **50 m**

4C x 120 sq. mm Al XLPE Armoured Cable: **150 m**

Above cable quantity is tentative. BOQ may vary by \pm 20% during detailed engineering. Same shall be confirmed during drawings approval.

8.3.2 Cable shall be XLPE insulated. Armour shall be GI strip wire. Inner and outer sheath of the cables shall be of PVC FRLSH compound conforming to the requirements of type ST 2 compound of IS 5831.

8.3.3 Outgoing Power Cables are not in the scope of this enquiry.

8.4 **Cable Glands and Lugs:**

- 8.4.1 Cable Glands and Lugs shall be supplied for Feeder Pillar end for **incoming side power cables**.
- 8.4.2 Cable sizes for incoming side power cables shall be considered as mentioned in attached SLD.
- 8.4.3 Cable glands for 3-core cables shall be weatherproof double compression nickel plated brass type and Cable lugs shall be of tinned heavy duty copper/ aluminium.

8.5 **Above Ground Earthing Materials:**

- 8.5.1 50 x 6 GI Strip - 120 m (For above ground earthing of 63A, 125A, 250A feeder pillars to nearby riser).

9.0 **INSPECTION, TESTING AND ACCEPTANCE:**

- 9.1 The bidder has to supply the equipments of best quality. The bidder has to maintain quality control during manufacturing of equipments as per the approved Quality Assurance Plan.
- 9.2 Before raising inspection call, bidder shall submit all the internal test reports/ certificates for the equipment.
- 9.3 Inspection shall be as per the approved quality assurance plan.
- 9.4 All routine and acceptance tests as per relevant IS/IEC standards and as per approved Quality Assurance Plan shall be carried out at manufacturer's works under his care and expense.
- 9.5 All equipments supplied by vendor shall have proven design and shall comply with the requirements of type tests prescribed in the relevant IEC/IS standard. For Feeder Pillars, suitable valid type test certificate for IP Class made on equipment of similar type and capacity shall be submitted during technical bid submission and these type test certificates shall not be older than 5 years from the date of bid submission. In case valid type test certificates are not available or are older than 5 years, vendor shall conduct these tests free of cost and submit the certificates before dispatch without any time and price implications to BHEL.

10.0 **DOCUMENTATION:**

10.1 **Documents to be submitted along with the technical bid/ offer:**

1. Feeder Pillar-wise GA, dimensions and weights
2. Type test certificate for Feeder Pillars as per relevant standards not older than 5 years for IP Class made on equipment of similar type and capacity.
3. Check List for Bid submission (Refer Cl. No. 17.0 below).

Technical offer of the bidder will be evaluated only on the basis of deviation schedule and Price Format. Nature of Deviations shall only be of Design/ Manufacturing constraints and non-availability of items/ components/ makes in market.

Panel dimensions are for fixing Purchaser's tentative area layout.

Un-priced price format consists of various items required in this enquiry. All fields shall be quoted in this format only.

Note: No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of price implications.

10.2 **Offer is liable for rejection when**

- Not used

10.3 **Documents to be submitted after award of contract:**

1. GA, SLD, BoM and Schematic Drawings of Feeder Pillars
2. Power Cable Data Sheets
3. Cable Glands and Lugs BoM
4. Quality Plan
5. Catalogues/ O&M Manuals
6. Inspection Test Reports
7. Packing List

11.0 **GUARANTEE:**

11.1 The supplier shall be fully responsible in respect of design, selection of components, manufacture, and quality of workmanship and operation of all the equipments, accessories etc. supplied under this scope of contract up to the Guarantee period.

11.2 Guarantee period shall be as per the commercial terms and conditions of the NIT.

12.0 **PACKING AND DISPATCH:**

12.1 The equipment shall be properly packed for selected mode of transportation i.e. by ship/ rail or trailer. The panels shall be wrapped in polyethylene sheets before being placed in wooden cases to prevent damage to the finish. Cases shall have skid bottoms for handling. Cases shall be suitable for lifting by cranes. Special precaution notations such as Fragile, This side up, center of gravity,

weight, Owner's particulars, Purchase order number etc. shall be clearly marked on the package together with other details as per purchase order.

- 12.2 The detailed packing list shall be furnished for BHEL's review and acceptance before seeking dispatch clearance. Vendor shall dispatch the Feeder Pillars generally with all components mounted. If, for reason of preventing transit damage or for any other reasons, the components/items have to be packed separately and dispatched then such loose items have also to be listed in the packing list. The list shall have references duly tracing them to the respective packing box/crate. If such loose items are not declared then it shall be deemed that there are no such loose items.
- 12.3 The equipment may be stored outdoors for long periods before installation. The packing should be suitable for outdoor storage in areas with heavy rains and high ambient temperature unless otherwise agreed.

13.0 Installation, Testing, Commissioning, Operation & Maintenance

Bidder is required to install, test & commission the complete system as described in the above clauses as per the manufacturer's installation guidelines, agreed Quality plan and best practices as per applicable standards.

Bidders are also required to Operate & maintain the system and do necessary repairs, rectification, replacement of spares & parts, if needed including consumables as required during the currency of contract.

14.0 SPECIAL CONDITIONS:

- 14.1 Bidder should confirm that “after-sales service” facilities will be made available free of cost for proper commissioning/ maintenance of equipments offered. The vendor should depute their Technician/ Engineer at their cost for rectification of any defects during guarantee/ warranty period.

15.0 LIST OF SUB-VENDORS:

Sl. No.	Item	Make/ Sub-Vendor
1	Auxiliary Relays	ABB/ Alstom T&D/ Areva (now Schneider Electric)/ Easun Reyrolle/ Schneider Electric/ Jyoti/ Omran
2	Control Switches/ Selector Switches	Alstom T&D/ Hotline Switchgear & Controls/ Kaycee Industries/ L&T/ Reliable Electronic Components/ Siemens/ Switron Devices
3	Fuses	Cooper Bussman/ GE/ Havells/ L&T/ Novateur Electrical & Digital Systems/ Siemens
4	CT & PT	Controls & Switchgear/ Gilbert & Maxwell Electricals/ Kalpa/ Kappa/ L&T/ Narayan Powertech/ Pragati/ Precise/ Silkaans Electricals
5	MCB	ABB/ C&S Electric/ Havells/ Novateur Electrical & Digital Systems/ Indiana Current Control/ Legrand/ Siemens/ Standard Electricals/ Schneider Electric
6	MCCB	GE/ L&T/ Siemens/ Schneider Electric/ ABB/ Havells
7	Push Button & Indicating Lamps	C&S Electric/ Essen Deinki/ Hotline Switchgear & Controls/ L&T/ Precifine Products/ Schneider Electric/ Shri Tulsi Switchgears/ Siemens/ Teknic
8	Protection Relays	ABB/ Alstom/ Easun Reyrolle/ GE/ Schneider Electric/ Siemens
9	Power Cables	Govind Cable Industries/ Gupta Power Infrastructure Ltd./ Zenium Cables Limited/ Apar Industries Limited/ Elkay Telelinks Limited/ Suyog Electricals Ltd./ Torrent Power Limited (Cable Unit)/ Polycab India Limited/ Gemscab Industries Ltd./ Special Cables Pvt. Ltd./ Paramount Communications Ltd./ Delton Cables Limited/ KEI Industries Limited/ CMI Limited/ Cords Cable Industries Ltd./ KEC International Limited/ Thermo Cables Limited/ Universal Cables Ltd.
10	Cable Glands	Flexpro Electricals Pvt. Ltd./ FCG Power Industries/ Kaysons Techno Equipments Pvt. Ltd./ Metal Craft Industries/ Prompt Engineering Works, Mumbai/ Flameproof Equipments Pvt. Ltd./ FCG Flameproof Control Gears/ Electromac Industries/ Braco Electricals India Pvt. Ltd./ Sigma Instruments Company
11	Cable Lugs	Automic Electric & Refrigeration Co/ Chetna Engineering Co./ Electromac Industries/ Braco Electricals India Pvt. Ltd./ Forward Engineering Industries/ Dowells Elektro Werke, Mumbai
12	Earthing Material	Industrial Perforation (I) Pvt. Ltd./ Unitech Fabricators & Engineers/ Ratan Projects & Engg./ India Electricals Syndicate/ Premier Power Products/ Saral Industries/ Rajasthan Metal Smelting Co./ Anil Steels Pvt. Ltd./ Patny Systems Pvt. Ltd./ Reputed Make

LIST OF MATERIAL CODES AS PER ENQUIRY

<i>Variant No.</i>	<i>Description</i>	<i>Quantity</i>	<i>Material Code</i>
1	415V 63A Feeder Pillar	1 no.	PY9755431012
2	415V 125A Feeder Pillar	1 no.	PY9755431020
3	415V 250A Feeder Pillar	1 no.	PY9755431039
4	LT Power Cable & Its Accessories	1 set	PY9755431047
5	Earthing Material & Its Accessories	1 set	PY9755431055

Chapter-II: Technical Specification for Civil Works

SCOPE OF WORK

Civil work for mounting power feeder panel on brick masonry structure, paving adjacent area of power feeder panels, excavation of soil and burying cable, back feeling with sand and soil form tape up point to feeder panels.

1.0 The work will involve:

- i. Brick masonry foundation with plastering partially below ground and partially above ground (approx. 2m long, 1m height and 230mm width, three nos)
- ii. Paving with PCC (approx. area 12 SQM)
- iii. Feeder Panels installation (three nos, approx. weight 330kg each) on foundation and fixing with anchor fastener to keep feeder panels in position on foundation.
- iv. Trench (approx.. 120m long 0.7m deep and 0.3m width) excavation, back feeling partly with sand, cable laying, and back fling with excavated soil.

2.0 GENERAL

- a) The scope of work will also include such other related works although they may not be specifically mentioned in the above paragraph and all such incidental items not specified but reasonably implied and necessary for completion of the job as a whole all as desired and as directed by the engineer.
- b) The detail scope of work covered above is not a comprehensive list of items of work involved. The detail scope of work may vary considerably depending on the actual construction requirements.

3.0 ALSO INCLUDED IN THE SCOPE

Unless otherwise specified, the work to be provided by the contractor for the items mentioned in the "Schedule of items", shall include but not be limited to the following.

- a) Furnishing all labour, materials, supervision, construction plans, equipment, supplies, transport, to and from the site, fuel, electricity, compressed air, water, transit and storage insurance and all other incidental items and temporary works not shown on specified but reasonably implied or necessary for the proper completion, maintenance and handling over the works, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by the engineer during the course of works.
- b) Furnishing samples of all materials required by the engineers for testing/inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.
- c) Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer.
- d) Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that are required for all works including temporary works.
- e) Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.
- f) Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.

g) On completion of work, all the temporary items etc. shall be dismantled and leveled and debris shall be removed as per instructions of BHEL by the contractor at his cost. In the event of his failure to do so, the expenditure towards clearance of the same will be recovered from the contractor. The decision of BHEL Engineer in this regard is final.

4.0 WORK BY OTHERS

No work under the specification will be provided by any agency other than the contractor unless specifically mentioned elsewhere in the contract.

5.0 TECHNICAL SPECIFICATIONS FOR INFORMATION.

SL. NO .	DESCRIPTION	SPECIFICATION NUMBER	RE V	PA GES
1	GENERAL SCOPE.	PEDC/STD.SPEC/001	0	4
2	EARTHWORK INEXCAVATION & BACKFILLING.	PEDC/STD.SPEC/003	0	23
3	CEMENT CONCRETE-PLAIN& REINFORCED.	PEDC/STD.SPEC/004	0	56

NOTE: Contractor has to make himself well conversant with the customer specification. In case of ambiguity between BHEL and customer specification, customer specification shall prevail.

6.0 PREAMBLE TO THE SCHEDULE OF QTS. (SOQ)

- 1) Details of the items in this Schedule shall be read in conjunction with the corresponding BHEL specifications, drawings and other documents and shall have precedence over any contrary statement mentioned any where in this document.
- 2) The work shall be carried out as per construction drawings, specifications, the description of the items in this schedule and/or Engineer's instructions. The approximate dimension/data mentioned above may vary at a large extent during actual construction. Final drawings will be issued progressively during the execution of the work.
- 3) Items of work provided in this schedule but not covered in the specifications shall be executed strictly as per instructions of the Engineer.
- 4) Unless specifically mentioned otherwise in the contract, the bidder shall quote his rates for the finished items and shall provide for the complete cost towards fuel, tools, tackle, equipment, constructional plant, temporary works, labour materials, levies , taxes , transport, layout, repairs, rectification, maintenance till handing over, supervision, shops, establishments, services , temporary roads, revenue expenses, contingencies, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the works according to the contract.
- 5) The rate quoted shall be inclusive of cleaning the site of any vegetations, dressing and leveling etc., required for commencement of site activities. No separate payment will be made towards the same.

- 6) Engineers decision shall be final and binding on the contractors regarding clarification of items in this schedule with respect to the other section of the contract.
- 7) In case of any discrepancy between item descriptions, relevant drawing and/ or specification clarification shall be sought at tender stage itself. Otherwise it shall be assumed that the bidder has quoted for the more stringent requirement.

7.0 HIERARCHY

In case of any conflict/deviations amongst various documents, the order of precedence shall be as follows

- Statutory Regulations
- Items in Schedule of quantities
- IS/BS standards
- BHEL’s standard specification (with prior approval of Engineer-in-charge).