

NTPC LIMITED


2X660 MW TALCHAR TPP STAGE-III

**TECHNICAL SPECIFICATION
FOR
MILL REJECT SYSTEM
CONVEYOR TYPE**

SPECIFICATION NO.: PE-TS-497-160-A101 Rev 0



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, INDIA**

	TITLE	SPECIFICATION NO. PE-TS-497-160-A101
	2X660 MW TALCHAR TPS STAGE-III	REV 00
	MILL REJECT HANDLING SYSTEM (CONVEYOR TYPE)	Date APR 2023
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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

SUB-SECTION IA – Specific Technical Requirement (Mechanical)

SUB-SECTION IB – Specific Technical Requirement (Electrical)

SUB-SECTION IC – Specific Technical Requirement (C&I)

**TITLE****2X660 MW TALCHAR TPP STAGE-III****MILL REJECT SYSTEM (CONVEYOR TYPE)****SPECIFIC TECHNICAL REQUIREMENTS**

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Section


IA

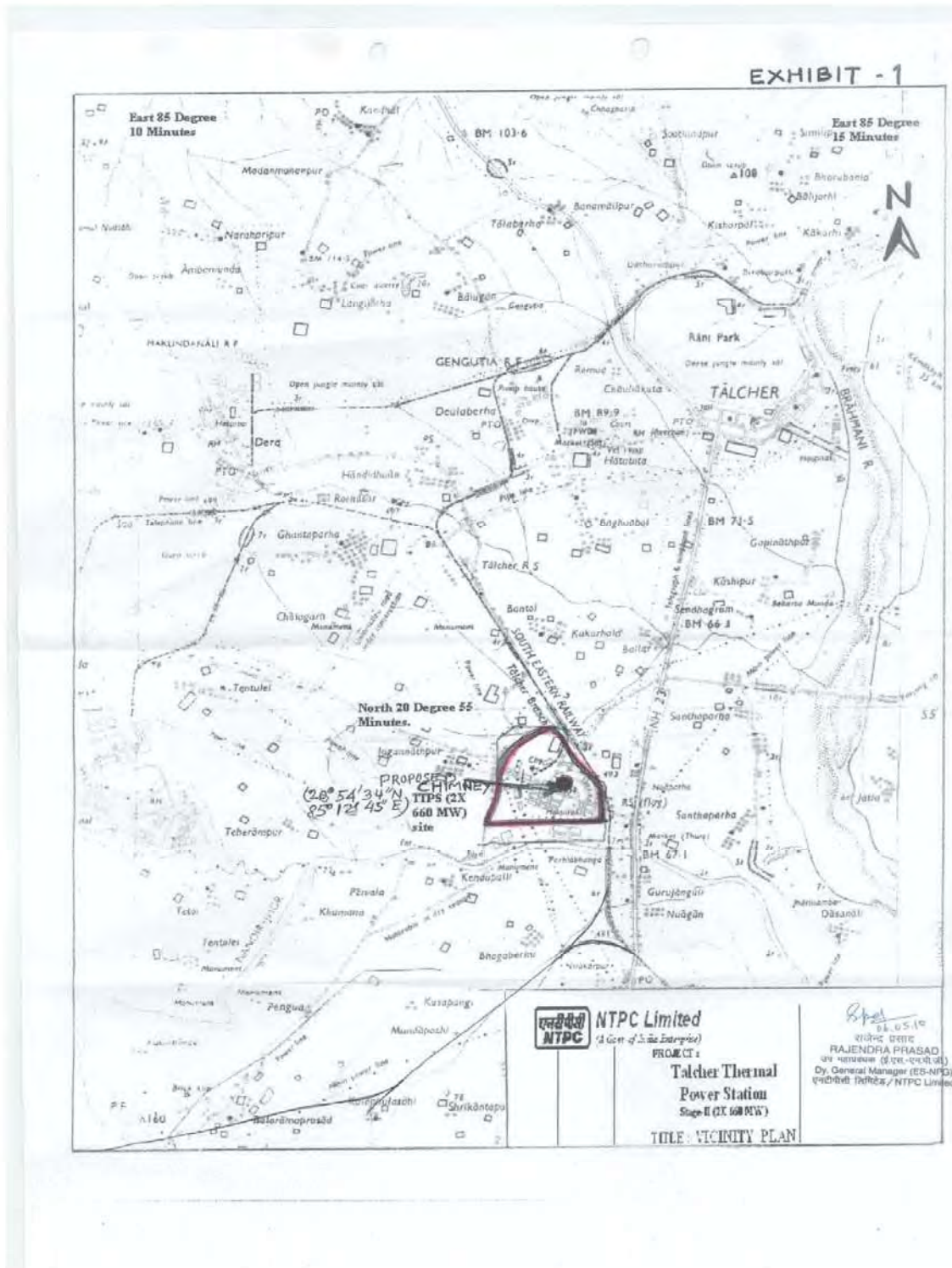
Date APR 23

PROJECT INFORMATION

CLAUSE NO.	PROJECT INFORMATION			
<p>1.00.00</p> <p>2.00.00</p> <p>2.01.00</p> <p>3.00.00</p> <p>3.01.00</p> <p>3.02.00</p> <p>3.03.00</p> <p>3.03.01</p> <p>3.03.03</p> <p>3.03.03</p>	<p style="text-align: center;">TALCHER TPP STAGE-III (2X660 MW)</p> <p>BACKGROUND</p> <p>Talcher Thermal Power Project is situated near Talcher town in Angul district of Orissa having capacity of 460 MW (4x60 MW + 2x110 MW). The project was implemented by Orissa State Electricity Board (OSEB). Subsequently TTPS was taken over by NTPC on 03.06.1995. The present proposal is for expansion of TTPS by adding 2 units of 660 MW.</p> <p>PROJECT HIGHLIGHTS</p> <p>Location</p> <p>The proposed site is located near Talcher town in Angul district of Orissa having latitude and longitude as 20°55' N and longitude 85°25' E respectively. The site is approachable from Banarpal–Talcher section of National Highway No. 23 at a distance of about 1 km from Anand Bazar. Nearest railway station is at Talcher on Talcher-Cuttack section of North Eastern Railway at about 4 Kms. The nearest commercial airport is Bhubaneswar at about 90 km.</p> <p>Vicinity Plan of the proposed project is placed at Annexure-I.</p> <p>BASIC INPUTS</p> <p>Land</p> <p>The plant facilities for this expansion stage would be accommodated within the land available in the existing power station and ash disposal shall be in mine voids.</p> <p>Water</p> <p>Make up water requirement for Talcher Thermal power project, Stage-III expansion (2x660 MW) would be about 40 Cusec with ash water recirculation system. Water requirement for the project will be met from upstream of the Samal barrage discharge on the River Brahmani and shall be pumped to the raw water reservoir located about 28 kms from intake well.</p> <p>FUEL</p> <p>Coal Requirement, Availability and Linkage</p> <p>The Coal Linkage for the project granted by SLC(LT) and CLOA has allocated 5.854 MMTPA coal from MCL.</p> <p>The primary fuel for the main steam generator shall be coal. The domestic coal quality parameters are indicated in Annexure-IV-2 and imported coal parameters are indicated in Annexure-IV-4 are to be considered for steam generator design.</p> <p>Coal Transportation</p> <p>The envisaged mode of coal transportation from the coal mines to the power plant is through Indian Railways network and will be unloaded in underground RCC Track Hoppers.</p> <p>Fuel Oil</p> <p>The fuel oil to be used for start-up, coal flame stabilization and low load operation of the steam generator shall be Light Diesel oil (LDO) having the characteristics given at Annexure-IV-1 and HSD Oil characteristics given at Annexure-IV-3.</p>			
<p style="text-align: center;">TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4540-001A-2</p>	<p style="text-align: center;">SUB-SECTION-IB PROJECT INFORMATION</p>	<p style="text-align: center;">PAGE 1 OF 15</p>	

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4.00.00	<p>STEAM GENERATOR TECHNOLOGY</p> <p>The steam generators shall be super critical once through type, water tube, direct pulverized coal fired, top supported, balanced draft furnace, single reheat, radiant, dry bottom type, suitable for outdoor installation. The gas path arrangement shall be single pass (Tower type) or two pass type.</p>			
5.00.00	<p>FLUE GAS DESULPHURIZATION SYSTEM (FGD) & SCR ready system:</p> <p>The project is envisaged with Flue Gas Desulfurization (FGD) system and DeNOx ready system meeting Ministry of Environment, Forest & Climate Change notification dated 07.12.2015. Limestone to be used for design of FGD system shall be as per the characteristic given at Annexure-IV-5.</p>			
6.00.00	<p>CAPACITY</p> <p>Talcher TPP, Stage-III : 2x660 MW - Present proposal</p>			
7.00.00	<p>BENEFICIARY STATES</p> <p>The project is being implemented as a regional project for meeting the power demand of Eastern Region Beneficiaries including Orissa – the home-state. The exact allocation of power shall be subject to the approval of Ministry of Power, Govt. of India.</p>			
8.00.00	<p>METEOROLOGICAL DATA</p> <p>The meteorological data from nearest observatory is placed at Annexure-II.</p>			
9.00.00	<p>Plant Water Scheme</p> <p>The Plant water scheme is included in Part-E of Technical Specification.</p>			
9.01.00	<p>Condenser Cooling (CW) Water System</p> <p>It is proposed to adopt a recirculating type cooling water system with cooling towers for the project. For the re-circulating type CW system it is proposed to supply clarified water as make up. Circulating water from CW pumps to TG area and from TG area to cooling tower will be carried through pipes/ducts. Cooled water from cooling tower will be led to CW pump house through the cold water channel by gravity.</p>			
9.02.00	<p>Equipment Cooling Water (ECW) System (Unit Auxiliaries)</p> <p>All plant auxiliaries shall be cooled by De-mineralized water (DM) in a closed circuit. The primary circuit DM water shall be cooled through plate type heat exchangers by Circulating Water tapped from CW system in a closed secondary circuit. The hot secondary circuit cooling water shall be cooled in the cooling towers and shall be returned back to the system.</p> <p>It is proposed to provide independent primary cooling water circuit for TG & its auxiliaries and Steam Generator & auxiliaries (including station auxiliaries) on Unit basis.</p>			
9.03.00	<p>Other Miscellaneous Water Systems</p> <p>CW system blow down water shall be used for the FGD process requirement, ash slurry pumps sealing, sealing of Vacuum pumps (if applicable) of Ash Handling plant, make-up to fire water system. The service water shall be taken from clarified water tank of Pre-treatment plant. The service (wash water) water collected from various areas and coal handling plant shall be treated as per requirement and reused. The drinking water requirement shall be provided from water treatment plant.</p>			
<p>TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p>TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4540-001A-2</p>	<p>SUB-SECTION-IB PROJECT INFORMATION</p>	<p>PAGE 2 OF 15</p>	

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<p>10.00.00</p> <p>11.00.00</p> <p>12.00.00</p> <p>13.00.00</p>	<p>The quality of Raw water is given in this sub-section at Annexure-III</p> <p>POWER EVACUATION SYSTEM</p> <p>In view of above and considering the present capacity of the project (1320 MW), it is proposed to adopt the step-up/power evacuation voltage as 400kV. Accordingly provision for 4 Nos. of 400 kV line bays has been considered in the generation switchyard. Station supply shall be derived directly from 400kV voltage level through 400kV Class station transformers. The issue of power evacuation of the project shall be taken up with appropriate Transmission Utility as per regulatory provision, based on final power allocation received from Ministry of Power.</p> <p>Criteria for Earthquake Resistant Design of Structures and Equipment</p> <p>All power plant structures and equipment, including plant auxiliary structures and equipment shall be designed for seismic forces as given in Part-B of this section.</p> <p>Criteria for Wind Resistant Design of Structures and Equipment</p> <p>All structures and equipment of the power plant, including plant auxiliary structures and equipment, shall be designed for wind forces as given as given in Part-B of this section.</p> <p>Vulnerability Atlas of India(VAI), prepared by Building Materials, Training and Promotion Council (BMTPC) under Ministry of Housing and Urban Affairs, is a comprehensive document which provides existing hazard scenario for the entire country and presents the digitized State/UT-wise hazard, maps with respect to earthquakes, winds and floods for district-wise identification of vulnerable areas. It also includes additional digitized maps for thunderstorms, cyclones and landslides. The main purpose of this Atlas is its use for disaster preparedness and mitigation at policy planning and project formulation and construction stage. The VAI provides necessary information for risk analysis and hazard assessment and is available at website www.bmtpc.org.</p> <p>As per Government's directive, it is mandatory for the bidders to refer VAI for multi-hazard risk assessment and include the relevant hazard proneness specific to project location while planning, designing and execution of the project in terms of following details:</p> <ol style="list-style-type: none"> i) Seismic zone (II to V) for earthquakes ii) Wind velocity iii) Area liable to floods and Probable max. surge height iv) Thunderstorms history v) Number of cyclone storms/sever cyclone storms and max sustained wind specific to coastal region vi) Landslides incidences with Annual rainfall normal vii) District wise Probable Max. Precipitation <p>Accordingly, bidder should refer VAI while planning, designing and execution of the project. However, for design of structures/facilities and equipment, the criteria for earthquake resistant design of structures and equipment, the criteria for Wind Resistant Design of Structures and Equipment and design parameters for drainage facilities, stipulated in the Technical Specification shall be followed.</p> <p>For other information like area liable to floods, probable max. surge height, landslide, thunderstorm, cyclone etc. agencies are required to refer the VAI.</p>			
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ANNEXURE-II

जलवायवी साक्षी
CLIMATOLOGICAL TABLE

उंची व अक्षांश
HEIGHT ABOVE M.S.L. 139 METRES

अक्षांश
LAT. 20°50'

अक्षांश
LONG. 65°06'

उंची व अक्षांश
HEIGHT ABOVE M.S.L. 139 METRES

उंची व अक्षांश
HEIGHT ABOVE M.S.L. 139 METRES

MONTH	STATION PRESSURE		MEAN AIR TEMPERATURE		EXTREMES		HUMIDITY		CLOUD AMOUNTS		RAINFALL		WIND					
	mmHg	INCH	Daily Max	Daily Min	Highest	Lowest	DATE	RELATIVE HUMIDITY	ALL CLOUDS	LOW CLOUDS	WETTEST MONTH	TOTAL MONTH	WINDY DAYS	WINDY HOURS				
JAN	1001.2	17.9	15.4	27.0	15.6	31.0	11.3	76	15.8	1.2	0.3	0.0	0.7	61.7	0.0	488	22	
FEB	997.6	23.7	18.5					47	13.6	1.1	0.3			1006			1006	
MAR	992.1	21.1	18.0	30.0	18.2	30.3	12.7	72	18.3	2.0	1.1	30.9	1.6	370.1	0.0	118.1	6	
APR	995.4	20.0	19.9					41	16.0	1.6	0.9			1961			1961	
MAY	996.7	25.3	21.0	35.5	21.0	30.2	15.9	67	21.7	1.5	0.8	25.0	1.7	206.0	0.0	115.0	30	
JUN	992.5	33.5	22.1					35	17.4	1.8	1.1			1990			1990	
JUL	993.1	28.7	24.4	39.0	24.4	42.5	20.0	70	27.3	1.7	0.7	35.9	2.3	132.4	0.0	67.2	2	
AUG	988.4	35.6	24.4					38	21.5	2.6	1.6			1997			1997	
SEP	990.4	30.6	25.0	30.8	25.0	44.3	21.6	68	20.7	1.9	0.9	75.6	3.6	333.1	0.0	105.0	30	
OCT	995.7	36.6	25.7					42	24.2	3.2	2.0			1995			1995	
NOV	995.9	29.7	26.0	36.2	25.0	42.5	21.7	74	30.7	4.3	2.8	210.1	8.5	528.2	39.4	161.2	15	
DEC	992.5	32.8	26.3					62	29.0	5.1	3.7			1990			1990	
JAN	996.1	27.0	25.4	32.1	24.4	35.2	23.4	81	30.5	5.4	3.6	250.3	12.1	532.5	102.4	249.8	25	
FEB	993.1	29.4	25.9					76	30.7	5.9	4.6			1932			1932	
MAR	985.5	27.5	25.3	31.4	23.9	34.5	21.3	83	30.6	5.5	4.0	325.3	13.4	835.0	95.5	257.3	21	
APR	993.9	29.8	25.8					78	31.1	5.9	4.6			1931			1931	
MAY	990.9	27.5	25.2	32.1	24.1	34.8	20.5	83	30.5	4.5	3.1	226.5	10.2	569.7	56.1	148.8	6	
JUN	987.8	28.9	25.6					76	30.3	5.3	4.0			1921			1921	
JUL	993.6	26.2	23.6	32.3	20.7	34.4	18.6	80	27.2	2.9	1.7	100.8	5.1	404.5	0.0	134.2	18	
AUG	992.1	29.3	24.3					66	26.5	3.3	2.3			1973			1973	
SEP	990.4	25.4	19.4	30.0	18.2	32.5	13.6	75	20.5	1.8	0.9	26.7	1.3	161.5	0.0	101.4	6	
OCT	993.8	27.3	20.9					54	19.7	1.9	1.0			1930			1930	
NOV	1001.7	17.8	15.3	27.7	15.1	30.3	11.5	75	15.5	1.0	0.4	3.1	0.3	39.8	0.0	48.8	14	
DEC	997.8	24.7	17.9					49	15.3	1.1	0.4			1991			1991	
ANNUAL TOTAL OR MEAN	993.8	25.2	22.0	32.9	21.5	44.1	9.1	75	24.0	2.8	1.7	1300.1	60.0	2693.4	796.1	257.3	21	
NUMBER OF YEARS	990.2	30.1	23.1					56	23.2	3.3	2.2			1990			1997	8
	26	18	18	17	17	17	17	18	18	26	26	30	30	94	94	100	100	

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ANNEXURE-III

RAW WATER ANALYSIS

SN	Constituent	As	mg/l (except pH & turbidity)
1	Calcium	CaCO ₃	80
2	Magnesium	CaCO ₃	35
3	Sodium	CaCO ₃	20
4	Potassium	CaCO ₃	5
5	Total Cation	CaCO ₃	140
6	HCO ₃	CaCO ₃	85
7	p Alkalinity	CaCO ₃	0
8	Chlorides	CaCO ₃	35
9	Sulphate	CaCO ₃	20
10	Total Anion	CaCO ₃	140
11	Reactive Silica	SiO ₂	25
12	Silica non-Reactive	SiO ₂	5
13	Total Iron	Fe	0.5
14	pH value	-	6.8-8.0
15	Turbidity	NTU	2000
16	TDS	ppm	190
17	Temp	deg C	20-35
18	KMnO ₄	ppm	2
19	TOC	ppm	5

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SUB-SECTION – IA
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1.0 INTENT OF SPECIFICATION

- 1.1 The specification is intended to cover design, engineering, manufacture, inspection and testing at vendor's/sub-vendor's works, painting, forwarding, proper packing and shipment and delivery at site, Mandatory spares, E&C spares and maintenance tools and tackles, Supervision of Erection & Commissioning, performance and guarantee testing and handing over of Mechanical Conveyor Type Mill Reject Handling System as per details in different sections of this specification for 2X660 MW TALCHAR TPP Stage-III is being set up by NTPC at Talchar in Odisha, India.
- 1.2 The contractor shall be responsible for providing all material, equipment & services, which are required to fulfil the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under this specification, irrespective of whether it has been specifically listed herein or not. Omission of specific reference to any component / accessory necessary for proper performance of the equipment shall not relieve the contractor of the responsibility of providing such facilities to complete the supply, supervision of erection & commissioning and PG testing of the MILL REJECT SYSTEM (CONVEYOR TYPE) and its accessories.
- 1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which in his judgement is not in full accordance herewith.
- 1.4 The extent of work under the contract includes all items shown in the flow diagram, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly extent of work also includes all items mentioned in the specification and/or schedules, notwithstanding the fact that such items may have been omitted in the drawing.
- 1.5 The general term and conditions, instructions to tenderer and other attachment referred to elsewhere are made part of the tender specification. The equipment materials and works covered by this specification is subject to compliance to all attachments referred to in the specification. The bidder shall be responsible for and governed by all requirements stipulated herein.
- 1.6 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information, ensure completeness of specification, to bring out any contradictory requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol-III of the specification **within 10 days of receipt of tender documents**. In absence of any such clarifications, in case of any contradictory requirement, the more stringent requirement as per interpretation of Purchaser/Customer shall prevail and shall be complied by the bidder without any commercial implication and delivery implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by Purchaser/ Customer as and when brought to their notice either by the bidder or by purchaser/ customer themselves. However, such requirements shall be binding on the successful bidder without any commercial & delivery implication.
- 1.7 The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions.
- 1.8 Deviations, if any, should be very clearly brought out clause by clause in the enclosed schedule; otherwise, it will be presumed that the vendor's offer is strictly in line with NIT specification.



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- 1.9 In the event of any conflict between the requirements of two clauses of this specification documents or requirements of different codes and standards specified, the more stringent requirement as per the interpretation of the owner shall apply.
- 1.10 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.
- 1.11 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder /vendor and Customer/ Purchaser/Employer will mean BHEL and /or customer including their consultant as interpreted by BHEL in the relevant context. For details refer the relevant clause in GCC.

Note:

Bidder to note that BHEL reserves the right for drawing/document submission through web based Document Management System. Bidder would be provided access to the DMS for drawing/document approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end.

- Internet explorer version – Minimum Internet Explorer 7.
- Internet speed – 2 mbps (Minimum preferred).
- Pop ups from our external DMS IP (124.124.36.198) should not be blocked.
- Vendor's internal proxy setting should not block DMS application's link (<http://dmsserver.bhelpem.com/Wrench%20Web%20Access/Login.aspx>).



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1.0 The mill rejects handling system shall be designed on the basis of the followings:-

S. No	Descriptions	Unit	Quantity
1	Number of mills (Working + Standby) at 100% BMCR	Nos.	7 Nos.(6W + 1 S)
2	Maximum mill rejects generation rate per mill (@ 1% of mill capacity)	t/h	1 TPH
3	Mill rejects temperature (normal/ max)	°C	180 /200
4	Mill arrangement		Front mill arrangement
5	Density of material	Kg / m ³	1600 kg/m ³ for volumetric calculation; 2400 kg/m ³ for civil & structural design calculation
6	Normal size	mm	(-) 40 mm (about 80-85 % of total reject)
7	Maximum size	mm	+50mm (about 15-20 % of total reject), however system shall be designed for maximum particle size of 100 mm.

Note: Material of Pyrite hopper and the chain conveyor shall be designed to withstand the temperature of 200 deg. C. However, occasional burning coal shall also be considered for system sizing.

2.0 System Description

The mill rejects or pyrites, transferred from each coal mill are collected in a small pyrite hopper through inlet chute. The water filled volume of the pyrite hopper has been considered as 30 minutes of maximum specified mill reject collection (1TPH) whichever is maximum. Each pyrite hopper shall be provided with pneumatically operated plate valve / gate valve with limit switch at the inlet and outlet of the pyrite hopper. Therefore, Limit switch shall be used to monitor the inlet valve open / close position whenever the pyrite hopper is to be emptied. In normal condition, the inlet valve shall be open and outlet valve will be closed. However, when rejects are required to be removed from the pyrite hopper, inlet valve will be closed first and outlet valve shall open to discharge the pyrites / rejects to conveyor to transport these in to the bunker.

Spray quenching arrangement shall be provided to bring the surface temperature of rejects below set point. For this, service water shall be sprayed over hot reject in the pyrite hopper or conveyor at suitable location after a pre-set time. Frequency of water quenching may be changed as required. One no. RTD and One no. level switches (radio frequency type) shall be provided in each pyrite hopper which shall sense the temperature and level in the pyrite hopper respectively.



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At the bottom of this pyrite hopper, pneumatically actuated plate / gate valve shall be provided to allow the discharge of the material onto main conveyor. Each pyrite hopper will feed the main conveyor through discharge spout sequentially. The main conveyor will collect the pyrites from all seven (7) working coal mills. Pyrites will be then discharged to vertical conveyor (Bucket conveyor) and then to bunker (silo).

A bunker of effective storage capacity 16 hours of rejects generation rate shall be provided for each unit. Manual discharge sector gate shall be provided at the bottom of the bunker along with canvass chute to unload the material onto purchaser's truck

A DDCMIS (By BHEL) control system based control system will be provided for mill reject handling system. Various controls and interlocks will be provided for the trouble free operation of the plant. Suitable alarm / annunciation system will be provided to warn of any mal-functioning of the mill reject handling system.

The mill rejects handling system shall be overground and shall be designed for minimum dust nuisance.

3.0 SCOPE OF WORK

Design, engineering, manufacture, inspection and testing at vendor's / sub-vendor's works, painting, forwarding, proper packing, shipment and delivery at site, including mandatory spares, maintenance tools & tackles and erection & commissioning spares, Supervision of Erection & Commissioning, Performance and guarantee testing and handing over of Metallic belt conveyor/Chain Flight Conveyor type **Mill Reject Handling System** as per details in different sections of this specification.

Detailed system write up & control philosophy shall be furnished by the successful bidder during detail engineering & the same shall be subject to customer approval during detail engineering.

3.1 SCOPE OF SUPPLY

Scope of supply shall comprise of but not necessarily limited to the following:

- 1) Pyrite Hoppers : 14 nos. of pyrite hoppers complete with flexible / expansion joint at its inlet / outlet, rupture disc, by pass chute, inspection window, fasteners and connecting chutes, water spray nozzles & steel supporting structures. Necessary insulation & cladding, if required, to maintain surface temperature of pyrite hopper within 60° C shall be provided. Also, 14 nos. of RTDs for pyrite hoppers (one at each pyrite hopper) shall be provided.
- 2) 14 nos. (1 No. per pyrite hopper) of RF type level switches for pyrite hoppers.
- 3) 14 nos. of pneumatic cylinder operated plate / knife gate valve with open and close limit switches at mill outlet / pyrite hopper inlet.
- 4) 14 nos. of pneumatic cylinder operated plate / knife gate valve with open and close limit switches at pyrite hopper outlet.
- 5) 14 nos. of pneumatic cylinder operated plate / knife gate valve at by pass chute of pyrite hopper with manual override to provision hand-wheel operation of valve. It should be provided with both open & close limit switches for interlock with pyrite hopper inlet plate / knife gate valve.



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- 6) 14 nos. vibrating feeders (if required) at pyrite hopper outlet for smooth unloading of rejects from pyrite hopper, shall be provided. The vibrating feeders shall be provided with electromagnetic drives, connection joints, inlet & outlet chutes along with steel supporting structures.
- 7) The chutes shall be provided between mill outlet and pyrite hopper, between pyrite hopper and conveyor, between conveyor discharge end pulley and bunker. The chutes shall also be provided between pyrite hopper and vibrating feeder (if applicable), between vibrating feeder and conveyor and between conveyor and bucket elevator if vibrating feeders are provided in the system.
- 8) Mechanical conveyor system of following types along with accessories including belt/chain flight, pans, carrying idlers, head pulley, tail pulley, take up device, suitable electric drives / gear box / geared motor, hydraulic/pneumatic tensioning arrangement, safety guard, sensors for automatic control system, bearings, shafts, etc. as applicable for the system shall be provided :-
Metallic belt conveyor/Chain Flight Conveyor.
- 9) All necessary supporting structural, supporting frame, short support, stringers, conveyor gallery with walkway, platforms, anchor fasteners as required for mechanical conveyor system shall be provided. 800 MM walkways on both sides of the conveyor shall be provided for maintenance. Conveyor shall be inclined at the end to discharge the material in bucket elevator (Bucket elevator shall be above ground no pit shall be provided for bucket elevator)
- 10) All insert plates, embedment plate, foundation bolts / anchor bolts etc. as required for bidder's equipment shall be provided by the bidder.
- 11) 2 nos. bucket elevators along with all accessories and auxiliaries for successful installation and operation of the system shall be provided.
- 12) Mill reject storage silos: Two nos. factory prefabricated mill reject bunker (i.e. one no per unit) along with structures, complete with lining in the conical portion as well as straight portion, lever operated bunker discharge gate with canvas chute at bunker outlet, staircase up to bunker top, operating & maintenance platform, hand railing, bag filter with pulse cleaning arrangement, 1 no. RF type level transmitter (if RF type level transmitter is not available then radar type level transmitter can be used) at each silo, pressure relieve valve, vent fan, Monorail hoists at each silo and monorail arrangement etc. The capacity of bunker shall be as indicated elsewhere in the specification. All steel structures shall be fabricated in factory, transported at site. All factory fabricated structures shall have bolted field connections.
- 13) All piping / tubing, fittings, isolation valves, solenoid valves etc. as required for the water / air service shall be provided to complete the system shall be provided by the bidder. All counter- flanges with nuts, bolts and gaskets at all the terminal points shall be provided by the bidder.
- 14) One (1) lot of Pneumatic boxes or panels / Local Control Panel / JB's properly mounted on rack / pyrite hopper structure as required to complete the system. All signals from instruments sensors on each pyrite hopper are to be terminated on local control panel / pneumatic panel dedicated to each pyrite hopper.
- 15) One (1) common instrumentation JB to be located at each unit to terminate the cables from individual mills, conveyors and bunker for further termination to DCS.
- 17) Initial fill of all lubricants and fluids.



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- 18) Electrical scope and requirements are indicated elsewhere in the specification.
- 19) C&I requirements are indicated elsewhere in the specification.
- 20) Mandatory spares as per **Annexure-II**
- 21) One set of Erection & commissioning spares and start up spares as required to complete the system shall be provided.
- 22) One set of maintenance tools & tackles, as defined in **Annexure-IV** in specification. These tools shall not be used for erection / commissioning purposes and shall be in an unused and new condition when they are handed over to the customer at site. Each tool shall be stamped so as to be identified easily for its use. The tools shall be supplied in steel toolbox and with a copy of instruction manual. The items supplied shall be of the best quality and specially protected against rusting in tropical climate. Items indicated in Annexure-IV are mandatory, further if bidder feels necessary to provide additional tools and tackles for smooth maintenance of equipments, may supply the same shall be quoted.
- 23) Relevant scope of supply as per GTR, GCC & SCC.
- 24) Any other instrument, item, structural items etc. as required for making the installation complete in all respect within battery limits and for satisfactory operation of the system (Refer system write up Annex-I), **unless specifically EXCLUDED from the scope under Clause No. 2.0 below.**

3.2 SCOPE OF SERVICES

Detailed Erection and commissioning procedure shall be submitted by successful bidder for carrying out the erection and commissioning at site by BHEL.

Scope of Supervision for Erection & commissioning: Tentatively following visits shall be planned by site team which shall be as follows:-

- a) One visit per unit for supervision for erection & commissioning (total 2 Visits).
- b) One visits per unit for initial operation of system (total 2 Visits).
- c) Any additional visit as per requirement of BHEL site office during erection of equipment.
- d) Performance guarantee test

Note: Bidder shall be informed at least 10 days in advance for the requirement of visit at Site. Visiting team shall consist of one or two expert of bidder as deemed necessary by them. Any other service required for making the installation complete in all respect within Battery limits and for satisfactory erection & commissioning of the system, **unless specifically EXCLUDED from scope under Clause No. 4.0 below.**

4.0 EXCLUSION

- 1) Civil work associated with Mill Reject Handling system including the followings:-
 - a) Road approach for various facilities related to Mill Reject Handling System.
 - b) Conveyor drive unit foundation
 - c) Mill Reject bunker foundation
- 3) Lighting of Mill bay and bunker area.
- 4) Electrical exclusion as per Electrical scope sheet enclosed elsewhere in the specification.
- 5) Relevant exclusion as per GTR, GCC, SCC & ECC



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5.0 SERVICES TO BE PROVIDED BY THE CUSTOMER

Relevant services as per GCC, SCC & ECC.

6.0 TERMINAL POINTS

Mill Reject inlet towards pyrite hopper side	:	Mill reject spout (tramp iron) as per details indicated in enclosed GA of Mills. Work downstream up to mill reject bunker outlet with canvas chute and discharge gate is by bidder.
Mill Reject outlet towards road tanker / Truck	:	Mill reject bunker outlet with canvas chute. Bidder shall terminate his work with the canvas chute and lever operated discharge gate.
Instrument Air	:	A 25 NB line for instrument air shall be provided by BHEL and terminal point shall be the first mill bay column of each unit. Isolation valve shall be provided by BHEL. Instrument air system supplier. Quantity (per unit) and pressure at terminal point shall be 1.0 M ³ /min and 5 – 7 kg/cm ² .
Service Water for quenching	:	Total 3 - 4 m ³ /Hr water with Service water quality for quenching of mill rejects at 2.5 to 3 Kg/cm ² shall be provided per unit. Tapping / terminal point for the same shall be the first mill bay column of each unit. Isolation valve shall be provided by BHEL.

All terminal points are provided with Isolation valves by BHEL. Any additional isolation valves, expander reducer and any other fittings required at the terminal points from system design point of view shall be in the scope of the bidder.

Further bidder shall check the adequacy of service water being provided by BHEL as indicated above. In case these are not adequate, water requirement for these services shall be indicated by the bidder along with their bid.

7.0 LAYOUT REQUIREMENTS

Conveyor and equipment installation shall be according to the regulations and recommendations of recognized Indian/International Standards, Codes and Statutes, as and where applicable, practice in vogue (to be supported with back up document to the satisfaction of customer).

8.0 EQUIPMENT DESIGN CRITERIA

8.1 The minimum design criteria to be followed for various equipment shall be as per requirements indicated under **Annexure-A** and standard technical specifications & Data Sheet-A for various equipment placed under Section-D. In case of any contradictory requirement in specification of particular equipment, the stringent requirement as per the



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BHEL's engineer shall prevail. Further In case of any contradictory requirement within the same section, and clarifications not having been sought by the bidders within the stipulated period, the most stringent requirement as per interpretation of the BHEL's engineer / customer will prevail. Successful bidder will furnish detailed data sheets / specifications / design calculations for various equipment for customer's / consultant's approval during detail engineering. All comments made by customer / consultant shall be incorporated by the successful bidder without any commercial and delivery implication.

Note: All equipment sizing, capacity of pyrite hopper shall be subject to customer's approval during detail engineering without any cost implication to the customer.

9.0 SUB-VENDOR ITEMS

The tentative make of sub-vendor items shall be as per **Annexure-I** enclosed. All these makes along with make of any other bought out items required for the system will be subject to approval of Customer during detail engineering and before the main vendor places order on the sub-vendor. There will, however, be no commercial implication on account customer's comment on the same

10.0 Mandatory spares

List of mandatory spares is attached as **Annexure-II**.

11.0 Quality of service water

Analysis of service water, required for quenching, is attached in project information.

12.0 List of drawings/ documents along with schedule of submission

The main drawings list along with schedule of submission after award of contract shall be done as per attached **Annexure-V**.

13.0 Painting

Relevant input drawings are listed below and attached as **Annexure III**.

14.0 General Technical Requirement

General technical requirement of end customer is attached as **Annexure IX**.

14.0 PERFORMANCE GUARANTEE

General technical requirement of end customer is attached as **Annexure VII**.

15.0 Input drawings

Relevant input drawings are listed below and attached as **Annexure X**.

- 1) Flow diagram for Mill Rejects Handling System Drg. No. PE – DG – 497 – 160 – A001, R0
- 2) Layout for Mill rejects handling system
- 4) General Arrangement of Mill HP-1103 (with planetary gear box)
- 5) Foundation plan of Mill

The flow diagram shows the minimum requirement to be followed including minimum requirement of instruments. Any additional equipment/instruments required for safe,



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efficient & reliable operation of the system within the battery limit shall also be considered as included in bidder's scope without any commercial/ cost implication to BHEL.

15.0 OTHER REQUIREMENTS

i) Site Visit before submission of offer

Bidders shall make Site visit in order to familiarize themselves with the existing facility and condition of site, if required, before submitting the bid in order to make their offer complete. BHEL shall not entertain any cost implication for making the system complete for any lack of input data during detail engineering.

ii) Technical Requirements

- 1) End connections for IA pipelines for sizes 50 NB & below shall be screwed and then seal welded with zinc rich electrode.
- 2) Chain, drag link, sprocket and sprocket shaft shall be designed considering factor of safety as 10 (min).
- 3) Bag filter with vent fan shall be provided in the bunker and in no case, conveyor shall be kept open to the atmosphere. Dusty air from the conveyor shall pass through vent fan only.
- 4) SS tubing is to be provided for pneumatic connection / instrument air connection.
- 5) All valves including isolation valves (water lines, air lines, before and after solenoid valves etc.) as required for successful operation shall be provided by bidder.
- 6) All structural supports excepts columns and pipe rack, as required for supporting of pipes of mill reject handling system, shall be provided by bidders.
- 7) Operation philosophy and control philosophy shall be submitted by the vendor during detail engineering stage for BHEL /CUSTOMER /CONSULTANT approval and approved document shall be adhered and the system shall be provided accordingly for which no commercial implication shall be entertained by BHEL.
- 8) All possible efforts shall be made by the bidder to get the approval of drawings and documents from BHEL / customer / consultant at the earliest and the documents prepared / generated by them or their sub-vendors shall be checked by their competent authority before submission to BHEL.
- 9) Revision made by the bidder in any drawings and documents shall be highlighted by indicating the no. of revisions in a triangle without fail so that the minimum time is required by BHEL to review the drawings and documents.
- 10) Civil works will be provided by BHEL / customer. Hence, bidder has to furnish the civil inputs in time. Bidder to furnish the civil foundation drawing along with the loading data for approval during detailed engineering stage showing / indicating the followings :-
 - a) Scope of work by BHEL / customer and bidder shall be indicated with different legend or in the form of note.
 - b) Recommended locations of earthing pads.



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- c) Civil loads shall be furnished showing detailed calculation.
- d) Details of pockets as required for anchor bolts.
- 12) Bidder to depute competent designer (s) at BHEL's/ CUSTOMER /CONSULTANT office during detailed engineering stage to discuss drawings and other technical documents as and when required by BHEL. However, minimum 7 days notice shall be served for the same.
- 13) All the drawings which are required to be furnished to BHEL during detailed engineering stage shall include technical parameters, details of paints, BOQ / BOM etc in tabular form indicating all components including bought out items and their quantity, material of construction indicating its applicable code / standard, weight, make etc.
- 14) All drawings and documents including general arrangement drawing, data sheet, calculation etc. shall be furnished to BHEL during detailed engineering stage and shall include / indicate the following details for clarity w.r.t. inspection, construction, erection and maintenance etc.:-
- a) All drawings and documents shall bear BHEL's title block and drawing / document number.
- b) All drawings and documents shall indicate the list of all reference drawings including general arrangement.
- c) All drawings shall include / show plan, elevation, side view, cross - section, skin section, blow - up view, all major self-manufactured and bought out items shall be labeled and included in BOQ / BOM in tabular form.
- 15) Bidder shall check that specification of all the items are available in the NIT specification. However, in the event of absence of specification for any item, bidder will approach BHEL to furnish the specification of missing items and new specification will be adhered by the bidder for which no commercial implication shall be entertained by BHEL.
- 16) Bar chart, list of drawings and documents including data sheet, manual calculation, quality plan, field quality plan, PG test procedure, list of sub – vendors (mechanical, C & I and erection and commissioning), technical specification and material of construction, painting specification / schedule, dispatch schedule etc. of various items as required by BHEL / customer / consultant shall be submitted to BHEL / customer / consultant during detail engineering stage for approval and the approved drawings / documents shall be adhered by the bidder without any commercial implication.
- 17) "Technical deviations" shall be clearly indicated in bidder's offer in "Schedule of deviation format" only.
- 20) The specific technical requirements of various items of mill reject handling system shall be as per enclosed technical specification. In case of any contradictory requirement, the stringent requirement as per the interpretation of BHEL's engineer shall be final and binding on the bidder for which BHEL shall not entertain any commercial implication during detail engineering stage.



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ANNEXURE A: EQUIPMENT DESIGN/SELECTION CRITERIA

S. No.	Equipment	Design / Selection / Sizing Criteria
01.	Metallic belt conveyor/Chain Flight Conveyor.	1) Rated capacity of the conveyor – 7 T/Hr. Design capacity of the conveyor – 10 T/Hr. 2) Should have provision of variable speed through VVVF drive, if applicable
02.	Bucket Elevator	Rated capacity of the conveyor – 7 T/Hr. Design capacity of the conveyor – 10 T/Hr. Design , type, speed, 75%percentage feeling shall be as per IS:7167 or equivalent standard Should have provision of variable speed through VVVF drive, if applicable
02.	Pyrite Hopper & Accessories	a) Capacity of pyrite hoppers : 30 Minutes of Maximum specified mill reject collection(1TPH) b) MOC: MS to IS 2062 Gr. A (min), min. 10 mm thk. suitably stiffened with rolled steel sections. c) Rupture Disc Bursting Pressure – 0.5 kg /cm2 (g)
03.	System Sizing Basis and Reject size to be handled	+50mm (about 15-20 % of total reject), however system shall be designed for maximum particle size of 100 mm. System shall be sized for one normal cycle. Max. size of rejects to be handled – up to100 mm (5% of total reject) rest 25 mm & below
04.	Bunker & its Accessories	a) Quantity – One (1) per unit b) Effective Storage Capacity – 100-105 T c) Minimum free board – 500 mm d) Bunker Plate – 10 mm thk. MS Plate conforming to IS 2062 Gr A e) Liner : 3 mm thick SS - 304 in conical & straight length portion of the bunker Manually operated sector Gate along with canvas chute i. Size – 400 mm x 400 mm (clear open) ii. Type – Twin Sector, manually lever operated iii. MOC – CI to IS 210/ MS 10 mm thick (min) to IS 2062 (Gr. A min) with 10 thick SAILHARD / TISCRA L LINER on inner surface Level Transmitter Bag Filter a) Material of Filter Cloth – Polyester felt needle suitable for Prolonged operation up to a temperature of 150°C without losing its collection efficiency & durability. b) Air to Cloth Ratio – 1.5 (Further 10 % additional bags shall be provided) c) Filter body – MS, IS 2062, Gr. A (min), 3.0 mm thick (min) d) Bag cage – MS, IS 1079, galvanised e) Outlet Air Quality – 30 mg/nm3 (max) f) Bag Cleaning Mechanism – Automatic and shall comprise of solenoid valves, air nozzles, adjustable solid state timer, one no. pressure switch for supply air for filter cleaning, one no. differential pressure switch across bag filter, piping and fittings etc.. g) Vent fan



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05.	Lines for Various Services	Service	Velocity in m/sec
		Compressed / Instrument Air / water lines	Pipe size below 50 mm, 15 m / sec
			Material of Construction & other details
			Pipes 50 NB & below shall have screwed / socket welded end. Material of construction of instrument air and water lines shall be IS 1239, Part -2. Instrument air pipe shall be galvanised internally as per IS 4736.
06.	Knife Gate/Plate Valve (pyrite hopper inlet, emergency discharge, hopper isolation/maintenance)	Material of Construction Body – CI to IS 210 Gr FG 260 Gate/Plate – SS or ASTM A240-Type 304 (min. 10 mm thickness) Size – 200 NB (min) for all valves	
07.	Fittings, Flanges, Fasteners & Gaskets	Fittings (Elbow, Tees and Reducers)	
		Service	Requirements
		Instrument Air	IS 1239, Part-2 (Galvanized)
		Water (if applicable) and conveying air	IS 1239, Part -2
		Flanges	
Service	Requirement		
All services	Fabricated out of IS 2062 Gr. A Plates/ Equivalent as per ASME B 16.5		



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QUALITY ASSURANCE

QUALITY PLANS, INSPECTION & TESTING PROCEDURE

The following Quality plans/ Check lists of mechanical items are attached for ready reference of supplier.

- a) Local Panel
- b) Pyrite Hopper
- c) Terminal Box
- d) Bunker Discharge Gate
- e) Pressure Relief Valve
- f) Chain Pulley Block
- g) Bag Filter
- h) Expansion bellow
- i) Knife Gate Valves
- j) Sump Pumps
- k) Pipes
- l) Plates & Structures


The inspection requirements indicated in the above QP's / CL's shall be adhered to as a minimum. However, manufacturer specific changes shall be suitably reflected for customer / client consideration. Inspection requirement of some of the items are also elaborated in the technical specification under Sec-D. The QP's for above items as well as other items not listed above but required, as part of the system shall be prepared by the successful bidder in project specific format to be finalised with the successful bidder after award of contract.

Standard Quality Plans of few instruments & motors are enclosed elsewhere in the specification, for compliance by the bidder.


All QP's/CL's shall be submitted by the bidder for Customer/Consultant's review and approval. All comments made by customer / consultant shall be incorporated by the successful bidder without any commercial and delivery implication.

S/Contractor :- Manufacturer :-		Manufacturing Quality Plan Item :- Rupture Disc QAP No. :- LOI Nos:-				Project:- Package :- Mill Rejects System Client :-					
Contractor :- M/s BHEL		Contractor :- M/s BHEL		Contractor :- M/s BHEL		Contractor :- M/s BHEL		Contractor :- M/s BHEL			
Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks	
1	2	3	4	5	6	7	8	9	10	11	
1	Materials -> Rupture Disc Material	Physical & Chemical Properties	Major	Chemical Analysis, YTS & UTS	1 per Heat	ASTM A240 Type - 304 / Appved Data Sheet / Drg.	ASTM A240 Type - 304 / Appved Data Sheet	MTC	✓ V	V	
2	Final Inspection -> Dimension -> Burst Test of Rupture Disc	Measurement Functional	Major Major	Measurement Burst Test @ 200 Degree Centigrade	100% 1 per lot offered	App. Drawing Approved drawing / Datasheet	App. Drawing Min 0.4 bar (g) @ 200 degree C Max 0.6 bar (g) @ 200 degree C / App. Data Sheet	IR IR / Burst Test Certificate	✓ P ✓ P	P P	W W
Manufacturer / Sub Vendor		Contractor		LEGENDS:- Records identified by ✓ shall be essentially included in QA documentation. TC- Test Certificate, IR - Insp. Report M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT P->Perform, V-> Verification, W-> Witness		For Client Use:-		Document No.:-		Name & Signature of Approving Authority with Seal	
SIGNATURES											

Note :- In case of any difference in parameters specified in Drawing / Data Sheet & QAP, Value specified in Drg / Data Sheet shall be Final

S/Contractor :- 		S/Contractor :- Manufacturer :-		Manufacturing Quality Plan Item:- CHAIN PULLY BLOCK QAP No. :- LOI Nos:-			Project:- Package :- Mill Rejects System Client :-				
Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks	
1	2	3	4	5	6	7	8	9	10	11	
		Contractor :- M/s BHEL		Consultant :-							
				TYPE							
1	Materials -> Load Chain -> Load Sheave -> Gear & Pinion -> Hook	Mech. Properties Breaking Load Test, Proof Load test Mech. Properties Chemical Composition Chemical Composition Mech. Properties Chemical Composition	Major Major Major Major	Review of Mfr's Test Certificate Lab Analysis Lab Analysis Lab Analysis	1 per Lot 1 per Heat 1 per Heat 1 per Heat	IS:6216 /Appr. Drg / Appr. Data sheet IS:1865 /Appr. Drg / Data sheet IS:4432/Appr. Drg / Data sheet IS:8610 / IS:1875 /Appr. Drg / Data sheet	IS:6216 /Appr. Drg / Appr. Data sheet IS:1865 /Appr. Drg / Data sheet IS:4432/Appr. Drg / Data sheet IS:8610 / IS:1875 /Appr. Drg / Data sheet	MTC MTC MTC MTC	✓ PV ✓ PV ✓ PV ✓ PV	V V V V	
2	In Process -> Hook	Proof Load Test DPT after Load Test	Major Major	Load Test DPT	100% 100%	IS:8610 /Appr. Drg / Appr. Data sheet ASTM E-165	IS:8610 /Appr. Drg / Appr. Data sheet ASTM E-165 / No Defects	MTC / IR IR	✓ P ✓ P	V V	
3	Final Inspection -> Assembly	Operation Check Functional Test Load Test & Over Load Test Overall Dimensions Visual (After Load Test)	Major Major Major Major Major	Visual Visual Load Test Measurement Visual	100% 100% 100% 100% 100%	Smooth Operation / IS 3832 Appr. Drg / Appr. Data Sheet IS 3832	Smooth Operation / IS 3832 Appr. Drg / Appr. Data Sheet IS 3832	IR IR IR IR IR	✓ P ✓ P ✓ P ✓ P ✓ P	V V V V V	
		LEGENDS:-		Records identified by ✓ shall be essentially included in QA documentation. TC- Test Certificate, IR - Insp. Report		For Client Use:-		Document No.:-			
Manufacturer / Sub Vendor		Contractor		M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT		Name & Signature of Approving Authority with Seal					
SIGNATURES											


Note :- In case of any difference in parameters specified in Drawing / Data Sheet & QAP, Value specified in Drg / Data Sheet shall be Final

		S/Contractor :- Manufacturer :-			Manufacturing Quality Plan Item :- Bag Filter (Without Enclosure) QAP No. :- LOI Nos.:-			Project:- Package :- Mill Rejects System Client :-				
Sl. No.	Components / Operations	3	4	5	6	7	8	Contractor :- M/s BHEL Consultant :-				Remarks
								Characteristics	Classification	Type of Check	Quantum of Check	
1	2							9	10	11		
								TYPE	D	M	C	N
1	Materials											
1.1	Manifold Body / Casings (MS Plate / Sheet / Pipe)	Chemical & Physical	Major	Chemical & Mechanical	1 per Lot	App. Drawing / Data Sheet / IS:2062 Gr. A / IS:1079 Gr. 0 / IS: 1239 Class Med.	App. Drawing / Data Sheet / IS:2062 Gr. A / IS:1079 Gr. 0 / IS : 1239 Class Med.	MTC	✓	V	V	V
1.2	Bag Cages (Inserts)	Chemical & Physical	Major	Chemical & Mechanical	1 per Lot	App. Drawing / data sheet / IS:7887 Gr.8 / IS:1079 Gr. 0	App. Drawing / data sheet / IS:7887 Gr.8 / IS:1079 Gr. 0	MTC	✓	V	V	V
1.3	Solenoid Valves	Functional	Major	Operational	100%	Approved Drawing / Appr. Data Sheet	Approved Drawing / Appr. Data Sheet	MTC	✓	P	V	V
1.4	Sequence Controller	Functional	Major	Operational	100%	Approved Drawing / Appr. Data Sheet	Approved Drawing / Appr. Data Sheet	MTC	✓	P	V	V
1.5	Filter Bags (Make :- Charminar / Supreme)	Physical	Major	Visual / Measurement	100%	Approved Drawing / Appr. Data Sheet	Approved Drawing / Appr. Data Sheet	MTC	✓	P	V	V
2	In Process											
2.1	Manifold	Dimensional & Visual	Minor	Dimensional & Visual	100%	As per Mfr's Drg.	As per Mfr's Drg.	IR	✓	P	V	V
2.2	Welding	Welding	Major	DPT on Final Weld	100%	ASTM E-165	No Defect	IR	✓	P	V**	V
2.3	Hydro Test for 30 Minutes	Hydro Test for 30 Minutes	Major	Leakage	100%	Appr. Data sheet	No Leakage	IR	✓	P	V**	V

Document No.:-

Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks	
1	2	3	4	5	6	7	8	9	10	11	
								TYPE	D M C N		
3	Final Inspection Assembly \$-> Pneumatic Test at 1.1 times W/Pressure	Dimensional Pne. test \$of Manifold in Assly. Functional Test of Pulsing System	Major Major	Measurement Leakage by soap solution	100% 100%	Appr. Drawing Appr. Data Sheet	Appr. Drawing No Leakage	IR IR	✓ P ✓ P	V V	Pressure Drop across Filter Bags & Emission Level at Filter outlet shall be checked at Site
4	Painting	Measurement & Visual	Major	DFT / Finish	100%	Appr. Painting Schedule	Appr. Painting Schedule	IR	✓ P	-	
TESTING PROCEDURE TO BAG FILTER											
1-> Functional test through compressed air , Sequential pulsing through valves and sequential controller on No - Load Condition to be conducted. 2-> The Soenoid valve shall be connected to the sequential timer and suitable electric supply shall be provided. Air header to be connected to supply of compressed air. The Timer is set and Sequential operation of Solenoid operated valve is observed.											
						LEGENDS:- Records identified by ✓ shall be essentially included in QA documentation. TC- Test Certificate, IR - Insp. Report M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT P->Perform, V-> Verification, W-> Witness		For Client Use:-			Document No.:-
Manufacturer / Sub Vendor						Contractor		Name & Signature of Approving Authority with Seal			
SIGNATURES											

Note :- In case of any difference in parameters specified in Drawing / Data Sheet & GAP, Value specified in Drg / Data Sheet shall be Final

		S/Contractor :-		Manufacturing Quality Plan			Project:-					
		Manufacturer :-		Item :- MS GI ERW Pipes (IS:1239/IS3589) QAP No. :- LOI Nos:-			Package :- Mill Rejects System Client :-					
Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Consultant :-		Remarks		
1	Final Inspection of Finished Pipes	Physical Dimensional Mechanical Properties Chemical Hydro Test	Major Major Major Major Major	Visual Measurement Tensile, elongation, Bend or Flattening Chemical Analysis Pressure Testing	100% 100% IS: 4711 1 per heat 100%	IS:1239 / IS:3589 / Approved Data Sheet	8	Format of Records	Agency for Checking	Remarks		
2	Galvanising (For GI Pipes)	Uniformity & mass of Zinc Coating, Adhesion test, Free bore test	Major	As per IS:4736	As per IS:4736	As per IS:4736 / Approved Data Sheet	8	TYPE	D	M	C	N
3	Identification	Verification of Batch No. / Mfg stamp / Heat No.	Major	Visual	100%	Mfgr Practise / IS 1239 / IS 3589	8	IR	✓	P	W*	V
4	Review of QA Documents					As per QAP	8	IR / TC	✓	P / V	V	W*
								TC	✓	P / V	V	V
								IR / TC	✓	P	W*	W*
								IR	✓	P	W #	V
								IR	✓	P	W	V
								-----	✓	V	V	V
NOTES :-												
For SAIL Pipes verification of reports for the tests mentioned in Sl. No. 1 & 2 by BHEL & KPCL.												
For GI Pipes, Galvanising Check as per relevant standard shall be done.												
All material shall be as per approved data sheet in case of ambiguity in QAP, material as data sheet shall be final.												
LEGENDS:-												
Records identified by ✓ shall be essentially included in QA documentation. TC- Test Certificate, IR - Insp. Report												
M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT												
P->Perform, V-> Verification, W-> Witness												
SIGNATURES		Contractor			Mfgr Practise / IS 1239 / IS 3589			As per QAP			Document No.:-	
Manufacturer / Sub Vendor		Contractor			Mfgr Practise / IS 1239 / IS 3589			As per QAP			Name & Signature of Approving Authority with Seal	
Note :- In case of any difference in parameters specified in Drawing / Data Sheet & QAP, Value specified in Drg / Data Sheet shall be Final												

S/Contractor :- Manufacturer :-		Manufacturing Quality Plan Item :- Knife Gate Valve [Manual / Pneumatic] QAP No. : LOI Nos.:-			Project:- Package :- Mill Rejects System Client :-					
Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks
1	2	3	4	5	6	7	8	9	10	11
Contractor :- M/s BHEL										
Consultant :-										
TYPE										
D										
M										
C										
N										
1	Raw Material / Bought Out's									
1.1	Body	Chemical & Mechanical	Major	Foundary TC	1 per Heat	Relevant IS / Appr. Drg / Data Sheet	do	TC	✓ P/V	V
1.2	Gate	do	Major	Lab Analysis	1 per lot	do	do	Mill / Lab TC	✓ P/V	V
1.3	Stem (For Manual Valve)	do	Major	Lab Analysis	1 per batch	do	do	do	✓ P/V	V
1.4	Pneumatic Cylinder (For Pneu. Valve)	Visual & Functional	Major	Mfr's TC Review	100%	Smooth Operation	Smooth Operation	Mfr's TC	✓ P/V	V
2	In - Process Inspection									
2.1	Body, Gate	Dimensional	Major	Measurement	100%	Mfr's Drawing	In-Process Insp. Record	-	P	V
2.2	Body Shell Test	Leak Tightness	Major	Hydro Static Test #	100%	Approved Drg / Data Sheet	No Leakage	IR	✓ P	V
3	Final Inspection									
3.1	Assembled Valve	Dimension	Major	Measurement	100%	Approved Drg / Data Sheet	Approved Drg / Data Sheet	IR	✓ P	W
3.2	do	Function	Major	Operation	100%	Smooth Operation	Smooth Operation	IR	✓ P	W
3.3	do	Seat Leakage	Major	Hydro Static Test #	100%	Approved Drg / Data Sheet	Approved Drg / Data Sheet	IR	✓ P	W
LEGENDS:-										
Records identified by ✓ shall be essentially included in QA documentation. TC- Test Certificate, IR - Insp. Report										
M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT										
P->Perform, V-> Verification, W-> Witness										
For Client Use:-										
Document No.:-										
Name & Signature of Approving Authority with Seal										
SIGNATURES										
Manufacturer / Sub Vendor										
Contractor										

Note :- In case of any difference in parameters specified in Drawing / Data Sheet & QAP, Value specified in Drg / Data Sheet shall be Final

S/Contractor :-		Manufacturing Quality Plan			Project:- Package :- Mill Rejects System Client -					
Manufacturer :-		Item :- Sump Pump QAP No. :- LOI Nos.:-			Consultant :-					
Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Raw Material / Bought Out's									
1.1	Casing	Chemical, Mechanical, Hardness, Surface Defect	Major	Chem. Comp. Mechanical Hardness Visual	1 per Heat 1 per Heat 1 Per Heat 100 %	Relevant IS / Appr. Drg / Data Sheet	Relevant IS / Appr. Drg / Data Sheet	TC	✓ P/N V	V
1.2	Impeller	do	Major	do	do	do	do	do	✓ P/N V	V
1.3	Shaft	Chemical, Mechanical, Surface Defect	Major	Chem. Comp. Mechanical Visual & UT if Dia >50 mm	1 per Heat 1 per Heat 100 %	Relevant IS / Appr. Drg / Data Sheet / ASTM E 388 for UT	Relevant IS / Appr. Drg / Data Sheet / ASTM E 388	do	✓ P/N V	V
1.4	Shaft Sleeve	Chemical Hardness	Major	Chem. Comp. Hardness	do	do	do	do	✓ P/N V	V
2	In - Process Inspection									
2.1	Casing	Soundness of Casting / Leakage	Major	Hydro Static Test	100%	Appr drg. / Data Sheet / IS 5120	No Leakage	IR	✓ P V	V
2.2	Impeller	Residual unbalance	Major	Dyanamic / Static Balancing	100%	Approved Drg / Data Sheet / ISO 1940 Gr. 6.3	ISO 1940 Gr. 6.3	IR	✓ P V	V

Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks
1	2	3	4	5	6	7	8	9	10	11
								TYPE	D M C N	
3	<u>Final Inspection</u> 3.3 Performance Test with Calibrated Test Lab Motor	Q Vs Head, Power & Efficiency, Noise & Vibration	Major	Measurement & Curves	100%	Approved Drg / Data Sheet / HIS	Approved Drg / Data Sheet / HIS	IR	✓	Noise - 85 db max. & Vibration - 50 microns max.
3.2	Pump strip test in case of doubt due to abnormal sound	Undue Wear	Major	Visual / Strip Test	100%	Mfr's Standard	No Undue Wear	IR	✓	
3.3	Painting	Visual & Measurement	Major	Visual & Measurement	100%	As per approved Painting Schedule	As per approved Painting	IR	-	
LEGENDS:- Records identified by ✓ shall be essentially included in QA documentation, TC- Test Certificate, IR - Insp. Report M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT P->Perform, V-> Verification, W-> Witness										Document No.:-
Manufacturer / Sub Vendor	Contractor									Name & Signature of Approving Authority with Seal
SIGNATURES										

Note :- In case of any difference in parameters specified in Drawing / Data Sheet & QAP, Value specified in Drg / Data Sheet shall be Final


S/Contractor :- Manufacturer :-		Manufacturing Quality Plan Item :-EXPANSION BELLOW QAP No. :- LOI Nos:-			Project:- Package :- Mill Rejects System Client :-							
Contractor :- M/s BHEL		Contractor :- M/s BHEL			Consultant :-							
Sl. No.	Components / Operations	Characteristics	Classification	Type of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks		
1	2	3	4	5	6	7	8	9	10	11		
								TYPE	D	M	C	N
1	Raw Material											
1.1	Bellows	physical & Chemical	Major	Lab Analysis	1 per Heat	AS204 TP304/ Approved Drg.	AS204 TP304/ Approved Drg.	MTC	✓	V	V	V
1.2	Flanges/ End Pipe	physical & Chemical	Major	Lab Analysis	1 per lot	IS 2062 / Approved Drg.	IS 2062 / Approved Drg.	MTC	✓	V	V	V
2	In - Process Inspection											
2.1	Bellows & Pipe ** For Bellows	Dimension Soundness Weld of L-Seam	Major Of major	Measurement DPT *(Before & After Forming)	100% 100%	Approved Drg. ASTM E- 165	Approved Drg. No Cracks/ Linear Indication	IR IR	✓ ✓	P P	V V	V V
3	Final Inspection											
3.1	Assembly	DP Test of Fillet Weld of Bellows to Pipe & Pipe to Flange	Major	visual	100%	ASTM E-165	No Crack / Linear Indication	IR	✓	P	W	V
3.2	Testing	Dimensions pressure	Major Critical	Measurement Hydraulic	100% 100%	Approved Drg EJMA D.3.2.1/ Data sheet	Approved Drg EJMA D.3.2.1/ Approved Drg.	IR IR	✓ ✓	P P	W W	W W
3.30	Painting	Spring Rate Test (Axial) Deflection Visual/ Measurement	Critical Critical Major	Stiffness Test Deflection Test DFT	100% 100%	EJMA / Data Sheet EJMA / Data Sheet	EJMA / Data Sheet EJMA/Data Sheet	IR IR	✓ ✓	P p	W W	W W
LEGENDS:-												
Records identified by ✓ shall be essentially included in QA documentation. TC- Test Certificate, IR - Insp. Report												
M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT												
P->Perform, V-> Verification, W-> Witness												
For Client Use:-										Document No.:-		
Manufacturer / Sub Vendor		Contractor		Name & Signature of Approving Authority with Seal								


Note :- In case of any difference in parameters specified in Drawing / Data Sheet & QAP, Value specified in Drg / Data Sheet shall be Final


Manufacturer's Name & Address :		MANUFACTURING QUALITY PLAN					Project :											
SAIL / TISCO		Item : MS Plates & Structures		QP No. : Rev. No. : 0 Date : Page No.: 11 of 1		BHEL Ref. : Contract No. : Contractor : BHEL SUB-CONTRACTOR-		P		W		V						
Sub-System :		Class		Type/method of check		Extent of Check		Reference Document		Acceptance		Format of Record						
3		4		5		6		7		8		9						
2		3		4		5		6		7		8						
1		3		5		6		7		8		9						
RAW MATERIAL																		
1	Steel Plates	Chemical composition and Mechanical test		Review of correlated MTC		One/heat		IS:2062		IS:2062		Mfgr. TC		✓	3		2.1	
2		Visual and dimensional Check		Visual and measurement		100%		Mfgr. TC		Mfgr. TC IS 1852		Mfgr. TC		✓	3	2.1		Refer Note Below
3		Identification / Marking		Co-relation establish		100%		AS per manufacturing practice IS 2062		AS per manufacturing practice IS 2062		Mfgr. TC		✓	3	2	1	
LEGEND :																		
1 - BHEL / CUSTOMER																		
2 - VENDOR																		
3 - Manufacturer																		
CR - Critical Characteristics																		
MA - Major Characteristics																		
MI - Minor Characteristics																		
MANUFACTURER/ SUBCONTRACTOR		CONTRACTOR		P - Agency Performing the Test W - Agency Witnessing the Test V - Agency Verifying the Test		BHEL Doc. No. PE-QP-279-166-A801		Rev. 0		REVIEWED BY		NAME & SIGNATURE OF APPROVING AUTHORITY						
SIGNATURE																		


Notes:


- 1 In case material is despatched directly from SAIL/TISCO plant/stockyard or procured from dealer against co-related TC's witnessing by BHEL is waived off and material will be accepted based on MTC of SAIL/TISCO.
- 2 In case material is procured from dealer and co-related TC's are not available, check on 100% quantity of plates will be performed on sample drawn from each plate at NABL certified/ approved laboratory or any govt approved laboratory for chemical & physical properties, However dimensional check shall be witnessed by BHEL.
- 3 There will not be any inspection by CUSTOMER.

S/Contractor :		Manufacturing Quality Plan				Project:-					
 Mfr:- Works:-		Item :-Local Panels QAP No. LOI Nos:-				Package :- Mill Rejects System Client :-					
		Contractor :- M/s BHEL		Consultant :-		Format of Records		Agency for Checking		Remarks	
Sl. No.	Components / Operations	3	4	5	6	7	8	9	10	11	
Characteristics Checked		Category	Type/Method of Check	Quantum of Check	Reference Documents	Acceptance Norms	TYPE	D	M	C	N
1	Materials CRCA Sheet	Major	Visual	100%	Appr. Drg / IS: 513	Appr. Drg / IS: 513	IR	-	P	-	-
	Visual	Major	Chem.& Physical.	100%	Do	Do	TC	✓	V	V	V
	Chem. & Physical.	Major	Measurement	100%	App. Drawing	App. Drawing	IR/TC	✓	V	V	V
2	Bought outs Verification of type, size & Make of FLV unit, PG, PS, SV	Major	Visual	100%	Appr. Drawing / Data Sheet	Approved Drawing / Data Sheet	IR/TC	✓	V	V	V
3	Painting Pre Treatment 7 tank process	Major	Physical	100%	Appr. Painting Schedule	Appr. Painting Schedule	IR/TC	✓	V	V	V
4	Final Inspection	Major	Visual	100%	Appr. Drawing / Data Sheet	Appr. Drawing / Data Sheet	IR/TC	✓	P	W	V
	Dimension	Major	Measurement	100%	Appr. Drawing / Data Sheet	Appr. Drawing / Data Sheet	IR/TC	✓	P	W	V
	Check for Pneumatic Circuit	Major	Visual	100%	Appr. Drawing / Data Sheet	Appr. Drawing / Data Sheet	IR/TC	✓	P	W	V
	Check for Wiring / Mountings / Terminations	Major	Visual / Continuity	100%	Appr. Drawing / Data Sheet	Appr. Drawing / Data Sheet	IR/TC	✓	P	W	V
	Functional Check for Solenoid Valve	Major	Functional	100%	Appr. Drawing / Data Sheet	Appr. Drawing / Data Sheet	IR/TC	✓	P	W	V
5	QA Documents Review	Major	verification	100%	-	-	-	-	-	-	-
		LEGENDS:-		Records identified by ✓ shall be essentially included in QA documentation. TC-Test Certificate, IR - Insp. Report							
Manufacturer / Sub Vendor		Contractor		M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N ->CLIENT							
		SIGNATURES		P->Perform, V-> Verification, W-> Witness							
				Name & Signature of Approving Authority with Seal							
				For Client Use:-							
				Document. No.:							

SI/Contractor :-		Manufacturing Quality Plan				Project: Package :- Mill Rejects System Client :-				
		Item :- Pyrite Hopper QAP No. LOI Nos				Contractor :- M/s BHEL				
Mfr:- Works:-		Category		Type/Method of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks
Sl. No.	Components / Operations	Characteristics Checked	4	5	6	7	8	9	10	11
1										
1	Raw Materials									
1.1	Plates for Body	Dimensions Surface Defects Physical Check Chemical Check	Major	Measurement Visual TS & Elongation Chemical Comp.	100% 100% 1/Heat 1/Heat	App. Drg. / Data Sheet / IS Standard	App. Drg. / Data Sheet / IS Standard	- - ✓ ✓	P P PV PV	- - V V
1.2	Spray Nozzle	Surface Defects Chemical Check Dimensions	Major	Visual Chemical Comp. Measurement	100% 1/Lot 100%	Mfr's Drg. / IS Standard	Mfr's Drg. / IS Standard	- ✓ ✓	P PV PV	- V V
2	In - Process Insp.									
2.1	Welders & Welding	WPS / PQR / WPQ Welding Defects	Major	Procedure / Qualification DPT on Root run DPT on Final run	100% 100% 10%	ASME sec - IX ASTM E-165 ASTM E-165	ASME sec - IX ASTM E-165 ASTM E-165	✓ ✓ ✓	PV PV PV	V V W
2.2	Fabrication	Fit up, Marking, Cutting, Grinding	Minor	Visual, Measurement	100%	Mfr's Standard	Mfr's Standard	-	P	-
3	Final Inspection									
3.1	Final Assly	Completeness & Dimension	Major	Visual	100%	App. Drg. / Data sheet	App. Drg. / Data sheet	✓	PV	W*
3.2	Painting	Finish / DFT	Major	Visual, Measurement	100%	App. Painting Schedule	App. Painting Schedule	IR	PV	W
4	QA Documentation									
4.1	TC & IR	Completeness	Major	Verification & approval	100%	App. Quality Plan	App. Quality Plan	-	PV	V
		LEGENDS:-		Records identified by ✓ shall be essentially included in QA documentation. TC-Test Certificate , IR - Insp. Report M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> Client P->Perform, V-> Verification, W-> Witness						
Manufacturer / Sub Vendor		Contractor		For Client Use:-						
SIGNATURES				Document No.:-						
				Name & Signature of Approving Authority with Seal						

S/Contractor :-		Manufacturing Quality Plan				Project:- Package :- Mill Rejects System Client :-				
 Mfgr:-		Item :- Terminal Box		Reference Documents		Acceptance Norms		Agency for Checking		
		QAP No. :-		Quantum of Check		8		10		
Mfgr:-		M/s BHEL		7		9		11		
Sl. No.	Components / Operations	Characteristics Checked	Category	Type/Method of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Remarks	
1	2	3	4	5	6	7	8	9	11	
Raw Materials										
1	Plates for Body	Dimensions Surface Defects Physical Check Chemical Check	Major	Measurement Visual TS & Elongation Chemical Comp.	100% 100% 1/Heat 1/Heat	App. Drg. / Data Sheet / IS Standard	App. Drg. / Data Sheet / IS Standard	- - MTC MTC	- - V V	- - V V
In - Process Insp.										
2	2.1 Welders Qualification & Welding	WPS / PQR / WPQ Welding Defects	Major	Procedure / Qualification DPT on Root run DPT on Final run Measurement	100% 100% 10% 100%	ASME sec - IX ASTM E-165 ASTM E-165 Mfr/Appr. Drg	ASME sec - IX ASTM E-165 ASTM E-165 Mfr/Appr. Drg	WPS / PQR IR IR IR	V V V V	Welders to be approved by BHEL / KPCL
2	2.2 Flange Machining and Drilling	Dimensions	Major	Joint set up, PCD, Orientation	100%	Mfr/Appr. Drg	Mfr/Appr. Drg	IR	-	If Applicable
2	2.3 Connection -pipe to flange, pipe to body	Fit up	Major	Visual Measurement	100%	Mfr's Standard	Mfr's Standard	IR	-	
2	2.4 Fabrication	Fit up, Marking, Cutting, Grinding	Minor	Visual, Measurement	100%	Mfr's Standard	Mfr's Standard	-	-	
Final Inspection										
3	3.1 Final Assly	Completeness & Dimension	Major	Visual	100%	App. Drg. / Data sheet	App. Drg. / Data sheet	IR	V	W
3	3.2 Painting	Finish / DFT	Major	Visual, Measurement	100%	App. Painting Schedule	App. Painting Schedule	IR	-	W
QA Documentation										
4	4.1 TC & IR	Completeness	Major	Verification & approval	100%	App. Quality Plan	App. Quality Plan	-	-	V
LEGENDS:-										
Records identified by ✓ shall be essentially included in QA documentation. TC-Test Certificate , IR - Insp. Report										
M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT										
P->Perform, V-> Verification, W-> Witness										
Manufacturer / Sub Vendor								Document No.:-		
SIGNATURES										
Name & Signature of Approving Authority with Seal										

SI/Contractor :-		Manufacturing Quality Plan				Project:-					
 Mfr:- Works:-		Item :- Bunker Sector Gate				Package :- Mill Rejects System					
		QAP No. :-				Client :-					
Mfr:- Works:-		Contractor :- M/s BHEL				Consultant :-					
Sl. No.	Components / Operations	Characteristics Checked	Category	Type/Method of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	Agency for Checking	Remarks	
1	2	3	4	5	6	7	8	9	10	11	
1											
Raw Materials											
1.1	Plates for Body	Dimensions Surface Defects Physical Check Chemical Check	Major	Measurement Visual TS & Elongation Chemical Comp.	100% 100% 1/Heat 1/Heat	App. Drg. / Data Sheet / IS Standard	App. Drg. / Data Sheet / IS Standard	- - TC TC	- - PV PV	- - V V	
1.2	Shaft	Physical Check Chemical Check UT IF Dia > 50 mm	Major	TS & Elongation Chemical Comp. Internal defect	1/Heat 1/Heat 100%	do	do	TC TC IR	PV PV PV	V V V	
1.3	Cylinder / Actuator	Visual / Specification	Major	Visual	100%	do	do	Mfr's TC	V	V	
In - Process Insp.											
2											
2.1	Welders & Welding	WPS / PQR / WPK Welding Defects	Major	Procedure / Qualification DPT on Root run DPT on Final run	100% 100% 10%	ASME sec - IX ASTM E-165 ASTM E-165	ASME sec - IX ASTM E-165 ASTM E-165	WPS / PQR IR IR	PV PV PV W	V V V V	
Final Inspection											
3											
3.1	Final Assly	Completeness & Dimension	Major	Visual	100%	App. Drg. / Data sheet	App. Drg. / Data sheet	IR	PV	W	
3.2	Operation with job / shop actuator	Opening & Closing of Gate	Major	Visual	100%	Proper Working	Smooth Operation	IR	PV	W	
3.3	Painting	Finish / DFT	Major	Visual, Measurement	100%	App. Painting Schedule	App. Painting Schedule	IR	PV	W	
QA Documentation											
4											
4.1	TC & IR	Completeness	Major	Verification & approval	100%	App. Quality Plan	App. Quality Plan	-	PV	V	
LEGENDS:-											
Records identified by ✓ shall be essentially included in QA documentation. TC - Test Certificate, IR - Insp. Report											
M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N-> CLIENT											
P-> Perform, V-> Verification, W-> Witness											
Manufacturer / Sub Vendor								Document No.:-			
SIGNATURES											
Name & Signature of Approving Authority with Seal											

SI/Contractor :-		Manufacturing Quality Plan				Project:- Package :- Mill Rejects System Client :-					
		Item :- Pressure Relief Valve QAP No. : LOI Nos:-				Contractor :- M/s BHEL					
Mfr:- Works:-		Category	Type/Method of Check	Quantum of Check	Reference Documents	Acceptance Norms	Consultant :-				
Sl. No.	Components / Operations	3	5	6	7	8	Format of Records	Agency for Checking	Remarks		
1	2	4	5	6	7	8	9	10	11		
							TYPE	D M C K			
1	Raw Materials										
1.1	Plates for Body	Major	Measurement Visual TS & Elongation Chemical Comp.	100% 100% 1/Heat 1/Heat	App. Drg. / Data Sheet / IS Standard	App. Drg. / Data Sheet / IS Standard	- - MTC MTC	- - P/V P/V	- - V V		
2	In - Process Insp.										
2.1	Welders & Welding	Major	Procedure / Qualification DPT on Root run DPT on Final run Visual, Measurement	100%	ASME sec - IX	ASME sec - IX	WPS / PQR	P/V P/V	V V	Welders to be approved by BHEL / KPCL	
2.2	Fabrication	Major	Fit up, Marking, Cutting, Grinding	100%	ASTM E-165 ASTM E-165 Mfr's Standard	ASTM E-165 ASTM E-165 Mfr's Standard	IR IR -	P/V P/V P	V V -		
3	Final Inspection										
3.1	Final Assly	Major	Completeness & Dimension	100%	App. Drg. / Data sheet	App. Drg. / Data sheet	IR	P/V	W		
3.2	Painting	Major	Visual, Measurement	100%	App. Painting Schedule	App. Painting Schedule	IR	P/V	W	Painting before disp.	
4	QA Documentation										
4.1	TC & IR	Major	Verification & approval	100%	App. Quality Plan	App. Quality Plan	-	P/V	V		
		LEGENDS:-		Records identified by ✓ shall be essentially included in QA documentation. TC-Test Certificate, IR - Insp. Report M-> Manufacturer/Sub Contractor, C-> Contractor (BHEL) or their nominated agency & N -> CLIENT P->Perform, V-> Verification, W-> Witness						Document No.:-	
Manufacturer / Sub Vendor		Contractor		Name & Signature of Approving Authority with Seal							
SIGNATURES											



TITLE

2X660 MW TALCHAR TPP STAGE-III

MILL REJECT SYSTEM (CONVEYOR TYPE)

SPECIFIC TECHNICAL REQUIREMENTS

SPECIFICATION NO. PE-TS-497-160-A101

REV 00

Section

IA

Date APR 23


SECTION – IA
CUSTOMER SPECIFICATION


SUB-SECTION–IIA-17

MILL REJECT HANDLING SYSTEM

**TALCHER THERMAL POWER PROJECT
STAGE-III (2X660 MW)
EPC PACKAGE**

**TECHNICAL SPECIFICATION
SECTION-VI, PART-A
BID DOC NO: CS-4540-001A-2**

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES		
	<p style="text-align: center;">MILL REJECT SYSTEM</p> <p>1.00.00 To handle the Mill Rejects on a continuous basis, the Bidder shall provide a Mill Reject Handling System. The Mill Reject Handling System shall comprise Mechanical Conveying system. The Rejects shall be stored in storage silo. From the storage silo, the Mill Rejects shall be disposed off in trucks.</p> <p>1.01.00 The scope of supply for mill reject handling system shall include but not limited to the following:</p> <p>1.01.01 Mechanical conveying system:</p> <p>(a) One (01) no. pyrite hopper with discharge chute, emergency chute work etc. for each mill as required.</p> <p>(b) One (01) no. pneumatically operated isolation gate for inlet and one (1) no. pneumatically operated isolation gate for outlet of pyrite hoppers complete with compressed air pipe work, solenoid valves & supporting arrangement for each pyrite hopper.</p> <p>(c) Mechanical feeder including Vibrating Feeder (<u>if applicable</u>) for mill rejects below each pyrite hopper for feeding at consistent rate to the mill reject conveyor.</p> <p>(d) Metallic Belt conveyor/Chain Flight Conveyor along with drives, accessories, supports etc for conveying the mill rejects from the mills for each row of mills in each unit. The conveyor shall be fully enclosed.</p> <p>(e) Bucket elevator along with drives, accessories and supporting structures to raise the mill rejects discharge by the metallic belt conveyor for discharging into storage silo.</p> <p>(f) Mill reject storage silos, one (1) no for each row of mills in steel construction each having an effective storage capacity of sixteen (16) hours considering all the working mills of the respective Mill bay in operation and rejecting @ of 1 % of mill capacity for the worst coal conditions. Necessary supporting steel structure, platform, staircase, manual operated unloading Gate, 3 mm thick SS plate liners covering straight length portion and conical portion of mill reject system hoppers (bunkers), level switches, air relief devices, etc. shall also be provided.</p> <p>The storage Silos shall be designed to provide a clear access of 4.5 m for a Road Tanker/Truck to be placed under the silo & receive the rejects using suitable chute work.</p> <p>(g) Suitable spray quenching system, to cool the mill reject in pyrite hoppers.</p> <p>(h) Complete control & instrumentation as specified in C&I section.</p> <p>(i) Necessary electrical equipment as specified.</p> <p>(j) Civil structural works associated with Mill reject handling system including foundation bolts, pockets, grouting and underpinning etc.</p> <p>(k) One (1) no. fixed type sump pump of 10 m³/hr capacity for each underground pit for Bucket elevator area, if applicable.</p>		
<p style="text-align: center;">TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATIONS SECTION-VI, Part-A BID DOC NO: CS- CS-4540-001A-2</p>	<p style="text-align: center;">SUB-SECTION-IIA-17 MILL REJECT HANDLING SYSTEM</p>	<p style="text-align: center;">PAGE 1 OF 1</p>


CLAUSE NO.	SCOPE OF SUPPLY & SERVICES 		
1.01.02	<p>Mechanical conveying system:</p> <ul style="list-style-type: none"> (a) One (01) no. pyrite hopper with discharge chute, emergency chute work etc. for each mill as required. (b) One (01) no. pneumatically operated isolation gate for inlet and one (1) no. pneumatically operated isolation gate for outlet of pyrite hoppers complete with compressed air pipe work, solenoid valves & supporting arrangement for each pyrite hopper. (c) Mechanical feeder including Vibrating Feeder (if applicable) for mill rejects below each pyrite hopper for feeding at consistent rate to the mill reject conveyor. (d) Metallic Belt conveyor/Chain Flight Conveyor along with drives, accessories, supports etc for conveying the mill rejects from the mills for each row of mills in each unit. The conveyor shall be fully enclosed. (e) Bucket elevator along with drives, accessories and supporting structures to raise the mill rejects discharge by the metallic belt conveyor for discharging into storage silo. (f) Mill reject storage silos, one (1) no for each row of mills in steel construction each having an effective storage capacity of sixteen (16) hours considering all the working mills of the respective Mill bay in operation and rejecting @ of 1 % of mill capacity for the worst coal conditions. Necessary supporting steel structure, platform, staircase, manual operated unloading Gate, 3 mm thick SS plate liners covering straight length portion and conical portion of mill reject system hoppers (bunkers), level switches, air relief devices, etc. shall also be provided. The storage Silos shall be designed to provide a clear access of 4.5 m for a Road Tanker/Truck to be placed under the silo & receive the rejects using suitable chute work. (g) Suitable spray quenching system, to cool the mill reject in pyrite hoppers. (h) Complete control & instrumentation as specified in C&I section. (i) Necessary electrical equipment as specified. (j) Civil structural works associated with Mill reject handling system including foundation bolts, pockets, grouting and underpinning etc. (k) One (1) no. fixed type sump pump of 10 m³/hr capacity for each underground pit for Bucket elevator area, if applicable. 		
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATIONS SECTION-VI, Part-A BID DOC NO: CS-4540-001A-2	SUB-SECTION-IIA-17 MILL REJECT HANDLING SYSTEM	PAGE 2 OF 2

SUB-SECTION–A-22

MILL REJECT HANDLING SYSTEM

**TALCHER THERMAL POWER PROJECT
STAGE-III (2X660 MW)
EPC PACKAGE**

**TECHNICAL SPECIFICATION
SECTION-VI, PART-B
BID DOC. NO. CS-4540-001A-2**

CLAUSE NO.	TECHNICAL REQUIREMENTS																																	
1.00.00	<p>MILL REJECT HANDLING SYSTEM</p> <p>Mechanical conveying system shall be employed for handling of the mill rejects. Each mill reject discharge hopper shall be fitted with Feeder which shall discharge the mill rejects through Mechanical Conveyors to a storage Silo. The transmitting vessel shall operate on level probe mode with timer back-up.</p>																																	
2.00.00	<p>MILL REJECT HANDLING SYSTEM OF MECHANICAL TYPE MEETING THE FOLLOWING REQUIREMENT SHALL BE PROVIDED:</p> <p>The discharged rejects from coal mill shall be collected in a dedicated pyrite hopper. Each pyrite hopper shall be provided with cylinder operated knife gate valves at inlet and outlet. Material from pyrite hoppers shall be removed by Mechanical conveyor and fed to main conveyor for further conveying. The main conveyor shall feed to a bucket elevator which in turn will feed to main storage silo.</p>																																	
2.01.00	<table border="1" data-bbox="378 737 1393 1690"> <tr> <td colspan="2" data-bbox="378 737 954 768">1. Pyrite Hopper</td> <td data-bbox="954 737 1393 768"></td> </tr> <tr> <td data-bbox="378 768 443 800">a)</td> <td data-bbox="443 768 954 800">Minimum effective storage</td> <td data-bbox="954 768 1393 800">: 30 minutes of maximum specified mill reject collection</td> </tr> <tr> <td data-bbox="378 800 443 915">b)</td> <td data-bbox="443 800 954 915">No. pyrite hopper</td> <td data-bbox="954 800 1393 915">: One (1) for each mill, supported independently on steel columns</td> </tr> <tr> <td data-bbox="378 915 443 1094">c)</td> <td data-bbox="443 915 954 1094">Function</td> <td data-bbox="954 915 1393 1094">: To store mill reject on load maintenance of conveyors and act as a transition tank for falling mill rejects during normal working.</td> </tr> <tr> <td data-bbox="378 1094 443 1241">d)</td> <td data-bbox="443 1094 954 1241">Number and type of isolation gates</td> <td data-bbox="954 1094 1393 1241">: Cylinder operated sliding type gates reject feeding at inlet and outlet of pyrite hopper.</td> </tr> <tr> <td colspan="3" data-bbox="378 1241 1393 1293">e) Accessories</td> </tr> <tr> <td data-bbox="378 1293 443 1451"></td> <td data-bbox="443 1293 954 1451">Pyrite hopper</td> <td data-bbox="954 1293 1393 1451">: Access doors/ manholes /Inspection windows/ Poke holes Size: 300 mm dia circular or 300 mm x 300 mm, if rectangular or</td> </tr> <tr> <td colspan="2" data-bbox="378 1451 954 1503">2) Material of construction</td> <td data-bbox="954 1451 1393 1503"></td> </tr> <tr> <td data-bbox="378 1503 443 1640">a)</td> <td data-bbox="443 1503 954 1640">Pyrite hopper</td> <td data-bbox="954 1503 1393 1640">: Tested quality mild steel plates of thickness not less than 10 mm (IS: 2062) and suitably stiffened with rolled steel sections.</td> </tr> <tr> <td data-bbox="378 1640 443 1690">b)</td> <td data-bbox="443 1640 954 1690">Slide gates</td> <td data-bbox="954 1640 1393 1690">: Carbon steel</td> </tr> </table>			1. Pyrite Hopper			a)	Minimum effective storage	: 30 minutes of maximum specified mill reject collection	b)	No. pyrite hopper	: One (1) for each mill, supported independently on steel columns	c)	Function	: To store mill reject on load maintenance of conveyors and act as a transition tank for falling mill rejects during normal working.	d)	Number and type of isolation gates	: Cylinder operated sliding type gates reject feeding at inlet and outlet of pyrite hopper.	e) Accessories				Pyrite hopper	: Access doors/ manholes /Inspection windows/ Poke holes Size: 300 mm dia circular or 300 mm x 300 mm, if rectangular or	2) Material of construction			a)	Pyrite hopper	: Tested quality mild steel plates of thickness not less than 10 mm (IS: 2062) and suitably stiffened with rolled steel sections.	b)	Slide gates	: Carbon steel	
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TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATIONS SECTION-VI, Part-B BID DOC NO: CS-4540-001A-2	SUB-SECTION-A-22 MILL REJECT HANDLING SYSTEM	PAGE 1 OF 3																															

CLAUSE NO.

TECHNICAL REQUIREMENTS



2.02.00

Metallic Conveyors

2.03.00


Data Sheet


1)	Function	:	To convey mill rejects, from pyrite hopper to main storage silo.
2)	Location	:	Under the coal mill, and up to main mill reject storage silo in each unit/ bucket elevator.
3)	No.	:	one (1) no. working set of conveyors per row of mills per boiler
4)	Capacity	:	It shall be designed for continuous removal of mill rejects.
5)	Continuous normal operating capacity	:	To meet the mill rejects removal rates specified.
6)	Continuous maximum operating capacity	:	At least 25% margin on normal operating capacity.
7)	Tensioning arrangement		Hydraulic/pneumatic
8)	Metallic belt conveyor/Chain Flight Conveyor will be required to handle highly abrasive rejects continuously. So all components shall be of proven design having a track record of trouble free-operation in order to avoid problems of frequent stoppages. The conveyor shall be sized for startup with load.		
9)	The conveyor shall be fully enclosed in casing.		
10)	Separate conveyor (if applicable) shall be provided to remove fines. The conveyor may operate continuously/intermittently.		
11)	The conveyor/rollers bearings shall be grease packed with facility of recharging from outside		
12)	Reliable and proven hydraulic/pneumatic auto take up arrangements, with facility of adjustment of tension. The tension assembly shall be designed to absorb any momentary shock loading.		
13)	800 mm walkway along both sides of conveyor for Maintenance shall be provided.		
14)	Suitable clean (if applicable) out conveyor shall be provided for removal of spillage/fines.		


2.04.00


Material of construction of conveyor components


a)	conveyor	:	Heat resistant stainless steel /Stainless steel / alloy carbon steel / carbon steel, suitable for 200 deg C (minimum). Any other suitable material of construction of proven design
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CLAUSE NO.	TECHNICAL REQUIREMENTS			
			is also acceptable.	
	b)	casing	Carbon steel	
2.05.00	Bucket Elevator			
2.05.01	General Requirement			
	Suitable type of the Bucket Elevator shall be chosen for mill rejects handling. The bucket shall be sized to handle rated capacity of mill rejects discharge by the metallic belt conveyor at the minimum material bulk density and maximum bucket filling of 75%.			
2.05.02.1.1	Casing			
	Casing to be self-supported, dust-tight construction and capable of supporting head shaft, drive, and service platform.			
	Boot section to be fabricated of minimum 6mm steel plate, with front and rear access panels as on shown in the attached layout drawing.			
	A beam is to be provided in casing for servicing internal gravity take-up. The beam may be located either in the boot section or intermediate section as applicable.			
2.05.02.1.2	Belting (if applicable)			
	Suitable heat resistant and fire resistant belting shall be provided			
2.05.02.1.3	Take-up			
	Take-up shall be screw or internal gravity type with guide rails and weights included.			
2.05.02.1.4	Drive			
	Bucket elevator drive should be sized as follows:			
	Minimum power for drive, either:			
	100% bucket filling @ minimum material bulk density, or			
	75% bucket filling @ maximum material bulk density, whichever is greater.			
2.05.06	Inspection and Access Doors			
	Inspection doors and access doors shall be loose-hinged type with quick-opening jamb bar fasteners and gaskets enclosed and retained in the door. Access doors shall be 1.5X1.5m minimum.			
<p style="text-align: center;">TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATIONS SECTION-VI, Part-B BID DOC NO: CS-4540-001A-2</p>	<p style="text-align: center;">SUB-SECTION-A-22 MILL REJECT HANDLING SYSTEM</p>	<p style="text-align: center;">PAGE 3 OF 3</p>	

CLAUSE NO.	TECHNICAL REQUIREMENTS											
D-1-12(D)	<p style="text-align: right;">Annexure- (D)</p> <p>CRITERIA FOR WIND RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT</p> <p>All structures shall be designed for wind forces in accordance with IS:875 (Part-3) and as specified in this document. See Annexure – I for site specific information.</p> <p>Along wind forces shall generally be computed by the Peak (i.e. 3 second gust) Wind Speed method as defined in the standard.</p> <p>Along wind forces on slender and wind sensitive structures and structural elements shall also be computed, for dynamic effects, using the Gust Factor or Gust Effectiveness Factor Method as defined in the standard. The structures shall be designed for the higher of the forces obtained from Gust Factor method and the Peak Wind Speed method.</p> <p>Analysis for dynamic effects of wind must be undertaken for any structure which has a height to minimum lateral dimension ratio greater than “5” and/or if the fundamental frequency of the structure is less than 1 Hz.</p> <p>Susceptibility of structures to across-wind forces, galloping, flutter, ovaling etc. should be examined and designed/detailed accordingly following the recommendations of IS:875(Part-3) and other relevant Indian standards.</p> <p>It should be estimated if size and relative position of other structures are likely to enhance the wind loading on the structure under consideration. Enhancement factor, if necessary, shall suitably be estimated and applied to the wind loading to account for the interference effects.</p> <p>Damping in Structures</p> <p>The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">a) Welded steel structures</td> <td style="text-align: right;">: 1.0%</td> </tr> <tr> <td>b) Bolted steel structures/ RCC structures</td> <td style="text-align: right;">: 2.0%</td> </tr> <tr> <td>c) Prestressed concrete structures</td> <td style="text-align: right;">: 1.6%</td> </tr> <tr> <td>d) Steel stacks</td> <td style="text-align: right;">: As per IS: 6533 & CICIND Model Code whichever is more critical.</td> </tr> </table>			a) Welded steel structures	: 1.0%	b) Bolted steel structures/ RCC structures	: 2.0%	c) Prestressed concrete structures	: 1.6%	d) Steel stacks	: As per IS: 6533 & CICIND Model Code whichever is more critical.	
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b) Bolted steel structures/ RCC structures	: 2.0%											
c) Prestressed concrete structures	: 1.6%											
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CLAUSE NO.	TECHNICAL REQUIREMENTS		
	<p style="text-align: right;">ANNEXURE-I</p> <p><u>SITE SPECIFIC DESIGN PARAMETERS</u></p> <p>The various design parameters, as defined in IS: 875 (Part-3), to be adopted for the project site shall be as follows:</p> <p>a) The basic wind speed “V_b” at ten metres above the mean ground level : 50 metres/second</p> <p>b) The risk coefficient “K_1” : 1.08</p> <p>c) Category of terrain : Category-2</p>		
<p>TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p>TECHNICAL SPECIFICATIONS SECTION-VI, PART-B BID DOC NO.: CS-4540-001A-2</p>	<p>SUB-SECTION-D-1-12(D) CIVIL WORKS WIND DESIGN CRITERIA</p>	<p>PAGE 2 OF 2</p>

CLAUSE NO.	TECHNICAL REQUIREMENTS																			
D-1-12(E)	<p style="text-align: right;">Annexure-(E)</p> <p>CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT</p> <p>All structures and equipment shall be designed for seismic forces adopting the site specific seismic information provided in this document and using the other provisions in accordance with IS:1893 (Part 1 to Part 4). Pending finalization of Part 5 of IS:1893, provisions of part 1 shall be read along with the relevant clauses of IS:1893:1984, for embankments.</p> <p>A site specific seismic study has been conducted for the project site. The peak ground horizontal acceleration for the project site, the site specific acceleration spectral coefficients (in units of gravity acceleration 'g') in the horizontal direction for the various damping values and the multiplying factor (to be used over the spectral coefficients) for evaluating the design acceleration spectra are as given at Appendix-I.</p> <p>Vertical acceleration spectral values shall be taken as 2/3rd of the corresponding horizontal values.</p> <p>The site specific design acceleration spectra shall be used in place of the response acceleration spectra, given at figure-2 in IS:1893 (Part 1) and Annex B of IS:1893 (Part 4). The site specific acceleration spectra along with multiplying factors specified in Appendix-I includes the effect of the seismic environment of the site, the importance factor related to the structures and the response reduction factor. Hence, the design spectra do not require any further consideration of the zone factor (Z), the importance factor (I) and response reduction factor (R) as used in the IS:1893 (Part 1 to Part 4).</p> <p>Damping in Structures</p> <p>The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 5%;">a)</td> <td style="width: 70%;">Steel structures</td> <td style="width: 5%; text-align: center;">:</td> <td style="width: 15%;">2%</td> </tr> <tr> <td>b)</td> <td>Reinforced Concrete structures</td> <td style="text-align: center;">:</td> <td>5%</td> </tr> <tr> <td>c)</td> <td>Reinforced Concrete Stacks</td> <td style="text-align: center;">:</td> <td>3%</td> </tr> <tr> <td>d)</td> <td>Steel stacks</td> <td style="text-align: center;">:</td> <td>2%</td> </tr> </table> <p>Method of Analysis</p> <p>Since most structures in a power plant are irregular in shape and have irregular distribution of mass and stiffness, dynamic analysis for obtaining the design seismic forces shall be carried out using the response spectrum method. The number of vibration modes used in the analysis should be such that the sum total of modal masses of all modes considered is at least 90 percent of the total seismic mass and shall also meet requirements of IS:1893 (Part 1). Modal combination of the peak response quantities shall be performed as per Complete Quadratic Combination (CQC) method or by an acceptable alternative as per IS:1893 (Part 1).</p>			a)	Steel structures	:	2%	b)	Reinforced Concrete structures	:	5%	c)	Reinforced Concrete Stacks	:	3%	d)	Steel stacks	:	2%	
a)	Steel structures	:	2%																	
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TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATIONS SECTION-VI, PART-B BID DOC NO.: CS-4540-001A-2	SUB-SECTION-D-1-12(E) CIVIL WORKS SEISMIC DESIGN CRITERIA	PAGE 1 OF 6																	

CLAUSE NO.	TECHNICAL REQUIREMENTS			
	<p>In general, seismic analysis shall be performed for the three orthogonal (two principal horizontal and one vertical) components of earthquake motion. The seismic response from the three components shall be combined as specified in IS:1893.</p> <p>The spectral acceleration coefficient shall get restricted to the peak spectral value if the fundamental natural period of the structure falls to the left of the peak in the spectral acceleration curve.</p> <p>For buildings, if the design base shear (V_B) obtained from modal combination is less than the base shear (\bar{V}_B) computed using the approximate fundamental period (T_a) given in IS:1893:Part 1 and using site specific acceleration spectra with appropriate multiplying factor, the response quantities (e.g. member forces, displacements, storey forces, storey shears and base reactions) shall be enhanced in the ratio of \bar{V}_B/V_B. However, no reduction is permitted if \bar{V}_B is less than V_B.</p> <p>Design/Detailing for Ductility for Structures</p> <p>The site specific design acceleration spectra is a reduced spectra and has an in-built allowance for ductility. Structures shall be engineered and detailed in accordance with relevant Indian/International standards to achieve ductility.</p>			
<p>TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p>TECHNICAL SPECIFICATIONS SECTION-VI, PART-B BID DOC NO.: CS-4540-001A-2</p>	<p>SUB-SECTION-D-1-12(E) CIVIL WORKS SEISMIC DESIGN CRITERIA</p>	<p>PAGE 2 OF 6</p>	

CLAUSE NO.	TECHNICAL REQUIREMENTS		
	<p style="text-align: right;">APPENDIX-I</p> <p><u>SITE SPECIFIC SEISMIC PARAMETERS FOR DESIGN OF STRUCTURES AND EQUIPMENT</u></p> <p>The various site specific seismic parameters for the project site shall be as follows:</p> <ol style="list-style-type: none"> 1) Peak ground horizontal acceleration (MCE) : 0.16 g 2) Multiplying factor to be applied to the site specific horizontal acceleration spectral coefficients (in units of gravity acceleration 'g') to obtain the design acceleration spectra <ol style="list-style-type: none"> a) for special moment resisting steel frames designed and detailed as per IS:800 : 0.04 b) for special concentrically braced steel frames designed and detailed as per IS:800 : 0.03 c) For special moment resisting RC frames designed and detailed as per IS:456 and IS:13920 : 0.024 d) for RCC chimney, RCC Natural Draft Cooling Tower : 0.08 e) for liquid retaining tanks : 0.048 f) for Steel chimney, Absorber tower, Vessels : 0.06 g) for design of structures not covered under 2 (a) to 2 (f) above and under 3 below, in general (excluding special structure/configuration/ materials) : 0.04 3) Multiplying factor to be applied to the site specific horizontal acceleration spectral coefficients (in units of gravity acceleration 'g') for design of equipment and structures where inelastic action is not relevant or not permitted : 0.08 <p>Note: g = acceleration due to gravity</p> <p>The horizontal seismic acceleration spectral coefficients are furnished as Annexure – S in subsequent pages.</p>		
<p style="text-align: center;">TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATIONS SECTION-VI, PART-B BID DOC NO.: CS-4540-001A-2</p>	<p style="text-align: center;">SUB-SECTION-D-1-12(E) CIVIL WORKS SEISMIC DESIGN CRITERIA</p>	<p style="text-align: center;">PAGE 3 OF 6</p>

ANNEXURE - S

HORIZONTAL SEISMIC ACCELERATION SPECTRAL COEFFICIENTS for
Talcher TPP
(In units of 'g')

Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
	2%	3%	5%
0	1	1	1
0.03	1	1	1
0.04	1.388	1.338	1.261
0.05	1.790	1.676	1.509
0.06	2.204	2.015	1.748
0.07	2.627	2.355	1.980
0.08	3.059	2.696	2.205
0.09	3.499	3.036	2.424
0.097	3.810	3.275	2.575
0.098	3.810	3.310	2.596
0.1	3.810	3.310	2.640
0.11	3.810	3.310	2.640
0.108	3.810	3.310	2.640
0.11	3.810	3.310	2.640
0.115	3.810	3.310	2.640
0.12	3.810	3.310	2.640
0.125	3.810	3.310	2.640
0.13	3.810	3.310	2.640
0.135	3.810	3.310	2.640
0.14	3.810	3.310	2.640
0.145	3.810	3.310	2.640
0.15	3.810	3.310	2.640
0.2	3.810	3.310	2.640
0.25	3.810	3.310	2.640
0.3	3.810	3.310	2.640
0.35	3.810	3.310	2.640
0.37	3.810	3.310	2.640
0.38	3.810	3.310	2.640
0.39	3.713	3.310	2.640
0.4	3.620	3.310	2.640
0.43	3.367	3.079	2.456
0.45	3.218	2.942	2.347
0.52	2.785	2.546	2.031

CLAUSE NO.

TECHNICAL REQUIREMENTS



Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
	2%	3%	5%
0.555	2.609	2.386	1.903
0.56	2.586	2.364	1.886
0.565	2.563	2.343	1.869
0.57	2.540	2.323	1.853
0.575	2.518	2.303	1.837
0.58	2.497	2.283	1.821
0.585	2.475	2.263	1.805
0.59	2.454	2.244	1.790
0.595	2.434	2.225	1.775
0.6	2.413	2.207	1.760
0.65	2.228	2.037	1.625
0.7	2.069	1.891	1.509
0.75	1.931	1.765	1.408
0.8	1.810	1.655	1.320
0.85	1.704	1.558	1.242
0.9	1.609	1.471	1.173
0.95	1.524	1.394	1.112
1	1.448	1.324	1.056
1.05	1.379	1.261	1.006
1.1	1.316	1.204	0.960
1.15	1.259	1.151	0.918
1.2	1.207	1.103	0.880
1.25	1.158	1.059	0.845
1.3	1.114	1.018	0.812
1.35	1.073	0.981	0.782
1.4	1.034	0.946	0.754
1.45	0.999	0.913	0.728
1.5	0.965	0.883	0.704
1.55	0.934	0.854	0.681
1.6	0.905	0.828	0.660
1.65	0.878	0.802	0.640
1.7	0.852	0.779	0.621
1.75	0.827	0.757	0.603
1.8	0.804	0.736	0.587
1.85	0.783	0.716	0.571
1.9	0.762	0.697	0.556
1.95	0.743	0.679	0.542
2	0.724	0.662	0.528
2.05	0.706	0.646	0.515
2.1	0.690	0.630	0.503

TALCHER THERMAL POWER PROJECT
STAGE-III (2X660 MW)
EPC PACKAGE

TECHNICAL SPECIFICATIONS
SECTION-VI, PART-B
BID DOC NO.: CS-4540-001A-2

SUB-SECTION-D-1-12(E)
CIVIL WORKS
SEISMIC DESIGN
CRITERIA

PAGE
5 OF 6

Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
	2%	3%	5%
2.15	0.673	0.616	0.491
2.2	0.658	0.602	0.480
2.25	0.644	0.588	0.469
2.3	0.630	0.576	0.459
2.35	0.616	0.563	0.449
2.4	0.603	0.552	0.440
2.45	0.591	0.540	0.431
2.5	0.579	0.530	0.422
2.55	0.568	0.519	0.414
2.6	0.557	0.509	0.406
2.65	0.546	0.500	0.398
2.7	0.536	0.490	0.391
2.75	0.527	0.481	0.384
2.8	0.517	0.473	0.377
2.85	0.508	0.465	0.371
2.9	0.499	0.457	0.364
2.95	0.491	0.449	0.358
3	0.483	0.441	0.352
3.05	0.467	0.434	0.346
3.1	0.452	0.427	0.341
3.15	0.438	0.427	0.335
3.2	0.424	0.414	0.330
3.25	0.411	0.401	0.320
3.3	0.399	0.389	0.310
3.35	0.387	0.378	0.301
3.4	0.376	0.367	0.292
3.45	0.365	0.356	0.284
3.5	0.355	0.346	0.276



TITLE

2X660 MW TALCHAR TPP STAGE-III

MILL REJECT SYSTEM (CONVEYOR TYPE)

SPECIFIC TECHNICAL REQUIREMENTS

SPECIFICATION NO. PE-TS-497-160-A101

REV 00

Section

IA

Date APRL'23

SECTION – IA

ANNEXURES

ANNEXURE- I					
SUB VENDOR LIST FOR MILL REJECT HANDLING SYSTEM (CONVEYOR TYPE)					
Sl. No.	DESCRIPTION	MAKE	WORKS	INSPECTION CATEGORY	REMARKS
A					
SELF MANUFACTURED					
1	Chain Links/Steel belt/Apron	Self Manufactured	Supplier's works	I / II	In case bid has been submitted on collaboration route, items identified under self manufactured items shall be sourced from collaborator/ Principal/ approved and proven sources of principal
2	Conveyor casing				
3	Pyrite Hopper				
5	Bunker Discharge Gate (Sector Gate)				
6	Pressure Relief Valve				
B					
BOUGHTOUT ITEMS (ELECTRICAL)					
1	Motor	Marathon,	kolkata	I	Upto 15 KW
		Crompton Greaves	Ahmednagar		
		NGEF	Bangalore		
		ABB	Bangalore/Faridabad		
		Siemens	Mumbai		
		Jyoti	Baroda		
		LHP	Solapur		
		BHEL	Bhopal		
		Bharat Electric (BHEL)			
		Bharat Bijlee	Mumbai		
KEC	Bangalore/Hubli				
2	Air Filter/Lubricator/Regulator	SHAVONORGAN	MUMBAI/BANGLORE	III	
		PLACKA	CHENNAI		
3	Annunciator	IIC	MUMBAI	III	
		Minilec	AHEMDABAD		
		PROCON	CHENNAI		
4	Solenoid Valve	Rotex	Baroda	III	
		Avcon	Mumbai		
		Asco	Chennai		
		SMC	Noida		
		Nucon	Hyderabad		
5	Pulse Jet Valves	ASCO	CHENNAI	III	
		MANIK	PUNE		
6	Cable Lug	DOWELLS	MUMBAI	III	
		BILLET (3D)	VALSAD		
		WAGO	INDIA		
		COMETT	MUMBAI		
7	Limit Switch	BCH	NEW DELHI	III	
		SIEMENS	NEW DELHI		
		JAIBALAJI	NEWDELHI		
8	Interposing Relay	ECONIX	MUMBAI	III	
		PHEONIX	DELHI		
9	ZERO SPEED SWITCHES	JAYSHREE	PUNE	III	
		PROTOCONTROL	PUNE		
		P&F	BANGALORE		
10	JUNCTION BOX	AJMERA INDUSTRIAL & ENGINEERING WORKS	SHREE NAGESH INDL. ESTATE,STATION ROAD, MUMBAI	III	FOR GALVANIZED AND FRP JUNCTION BOXES
		FLEXPRO ELECTRICALS PVT. LTD.	GIDC, Kabilpore, Navsari-Gujarat		Metal type junction box only
		K.S.INSTRUMENTS PVT.LTD.	Industrial Suburb, Yeshwanthpur Bangalore-Karnataka		
		SUCHITRA INDUSTRIES	REJAMAHALVILAS EXTN 2ND STG BANGALORE		
		Shrenik & Company,	Panchratna Industrial Estate, Sarkhej-Bavla Road Ahmedabad-Gujarat		Registered for FRP JB's AND METAL JB's.
		Hoffman	BANGALORE		
		Rittal	BANGALORE		
11	FUSE	GE	INDIA	III	
		Busmann	INDIA		
12	MCCB /SFU, MPCB, MCB with 'C' Characteristics, Power Contactor	Schenider	INDIA	III	
		Siemens	INDIA		
		ABB	INDIA		
		L&T	INDIA		

13	VFD	Schenider	INDIA	III	
		Allen Bradelly	INDIA		
		ABB	INDIA		
		YASKAWA	INDIA		
		Toshiba	INDIA		
14	Selector Switch	Siemens	INDIA	III	
		L&T	INDIA		
		Kaycee	INDIA		
		Schenider	INDIA		
15	Indication Lamps, PushButton, Aux. Contactor, Aux. Relays	Siemens	INDIA	III	
		ABB	INDIA		
		L&T	INDIA		
		Schenider	INDIA		
16	Timer	BCH	INDIA	III	
		EAPL	INDIA		
17	Control Transformer, Reactors	Kappa	BANGALORE	III	
		TS International	BANGALORE		
18	Power Monitor Relay	Minilec		III	
19	TEMPERATURE ELEMENT	GOA INSTRUMENTS INDUSTRIES PVT.LTD.,	Goa	II	
		DETRIVE INSTRUMENTATION & ELECTRONICS LTD.	WORLI, MUMBAI		
		PYRO ELECTRIC INSTRUMENTS GOA PVT.LTD.	GOA		
		TECHNO INSTRUMENTS	Gandhinagar-Gujarat		
		Tempsens Instrument (I) Pvt Ltd	UDAIPUR-RAJASTHAN		
		TM TECNOMATIC SPA	CREMONA--ITALY		
		TOSHNIWAL INDUSTRIES PVT. LTD.,	Ajmer,-Rajasthan		
		Thermal Instrument India Pvt. Ltd.	Mahim Mumbai		
		Baumer Technologies India Pvt. Ltd.	ANDHERI(E) MUMBAI		
20	TRANSMITTERS	ABB LIMITED	FARIDABAD-HARYANA	II	PRESSURE TRANSMITTER, DP TRANSMITTER and TEMP TRANSMITTER
		Endress + Hauser (India) Pvt. Ltd.,	New Delhi		For temperature transmitter only. . .
		Moore Industries International Inc.	CALIFORNIA-USA		INDIAN REPRESENTATIVE: CHEMTROL INDUSTRIES LTD.
		NIVO CONTROLS PVT. LTD.	Indore-M.P		For Capacitance type only
		Pune Techtrol Pvt. Ltd.	MIDC Bhosari, Pune-Maharashtra		Only for capacitance Type Level Transmitter
		EMERSON PROCESS MANAGEMENT (INDIA) PVT.LTD.	BANDRA EAST MUMBAI-MAHARASHTRA		
		SIEMENS LIMITED	Worli Mumbai-Maharashtra		
		SMART INSTRUMENTS LTD, BRAZIL	Agents: Digital Electronic Ltd. 74/11 'C' Cross Road MIDC Andheri (East) MUMBAI-MAHARASHTRA-INDIA Phone- 28208477 Pincode : 400093 Email : corp@delbby.rpgms.ems.vsnl.net.in		LD-301 & T-301 TRANSMITTER FROM M/S SMART EQUIPMENTS BRAZIL.
		SBEM PVT. LTD.	PUNE SATARA ROAD PUNE,-MAHARASHTRA		FOR CAPACITANCE TYPE.
		Honeywell Automation India Limited	NEW DELHI-DELHI-INDIA		
		TOSHNIWAL INDUSTRIES PVT. LTD.,	Ajmer,-Rajasthan,		

		V. AUTOMAT & INSTRUMENTS (P) LTD.	NEW DELHI-		a)DISPLACEMENT TYPE TRANSMITTERS. b)PRESSURE AND DP TRANSMITTERS
		YOKOGAWA INDIA LIMITED,	HOSUR ROAD, BANGALORE,- KARNATAKA		
21	TEMPERATURE GAUGE	A.N. INSTRUMENTS PVT. LTD.	MARKETING DIVISION, 5th FLOOR, 59-B, CHOWRINGHEE ROAD, KOLKATA-WEST BENGAL	III	
		ASHCROFT INDIA PVT LTD.	Plot No.2306, Phase II, GIDC Chhatral Kalol-Gujarat		
		BUJENBERG GUAGE CO.LTD.	PO BOX-5, ALTRINCHAM CHESHIRE-UK-UK		
		FORBES MARSHALL (HYD) LTD.	PLOT NO.A-19/2, & T-4/2, IDA, NACHARAM, HYDERABAD-ANDHRA PRADESH-		
		GOA INSTRUMENTS INDUSTRIES PVT.LTD.,	D2/5, Mapusa Industrial Estate, Mapusa, Goa,- MAHARASHTRA		
		GOA THERMOSTATIC INSTRUMENTS PVT.LTD.	FLAT -B , GF, HILL CROWN APTS., COLLEGE ROAD, MAPUSA-GOA		
		GAUGE BOURDON INDIA PVT. LTD.	194/195, Gopi Tank Road, Off Pandurang Naik Marg, Mahim Mumbai.-Maharashtra.		
		H.GURU INDUSTRIES	10 B, HO-CHI-MINH SARANI, KOLKATA-		
		H.GURU INSTRUMENTS (SOUTH INDIA) P. LTD	32,INDUSTRIAL SUBURB YESWANTHAPUR BANGALORE-KARNATAKA		
		Baumer Technologies India Pvt. Ltd.	36, DAMJI SHAMJI INDUSTRIAL COMPLEX, OFF.-MAHAKALI CAVES ROAD, ANDHERI(E) MUMBAI-Maharashtra		
22	PRESSURE GAUGE/ DIFF.PRESSURE GAUGE	A.N. INSTRUMENTS PVT. LTD.	MARKETING DIVISION, 5th FLOOR, 59-B, CHOWRINGHEE ROAD, KOLKATA-WEST BENGAL	III	
		ASHCROFT INDIA PVT LTD.	Plot No.2306, Phase II, GIDC Chhatral Kalol-Gujarat.-INDIA		
		BOSE PANDA INSTRUMENTS PVT.LTD.	44, Saheed Hemanta Kumar Bose, Sarani, Kolkata-West Bengal-India		
		FORBES MARSHALL (HYD) LTD.	PLOT NO.A-19/2, & T-4/2, IDA, NACHARAM, HYDERABAD-ANDHRA PRADESH		
		GAUGE BOURDON INDIA PVT. LTD.	194/195, Gopi Tank Road, Off Pandurang Naik Marg, Mahim Mumbai.-Maharashtra.		
		H.GURU INDUSTRIES	10 B, HO-CHI-MINH SARANI, KOLKATA-WEST BENGAL		
		H.GURU INSTRUMENTS (SOUTH INDIA) P. LTD	32,INDUSTRIAL SUBURB YESWANTHAPUR		

		Baumer Technologies India Pvt. Ltd.	36, DAMJI SHAMJI INDUSTRIAL COMPLEX, OFF.-MAHAKALI CAVES ROAD, ANDHERI(E) MUMBAI-Maharashtra		
23	Pressure/DP/Vacuum Switch	Indfoss	Ghaziabad	II	NTPC approved sub-vendors(No PEM-C & I list is avl in PMD)
		SOR	USA		
		Dressor	USA		
		Delta control	UK		
		Trafag	Ranipet		
		GIC(Gauges Bourdon)	Panvel		
		ASHCROFT INDIA PVT LTD.	USA/GERMANY		
		Switzer	Chennai		
24	Level Switch (Float/Displacer)	DK Instruments	Kolkata	III	NTPC approved sub-vendors
		Levcon	Kolkata		
		Sigma	Mumbai		
		V-Automat	New Delhi		
		SBEM	Pune		
		Flow Star	Faridabad		
25	Level Indicator	Flow Star	Faridabad	III	NTPC approved sub-vendors (No PEM-C & I list is avl in PMD)
		Scientific Devices	Mumbai		
		Gauges Bourden	Panvel		
		SBEM	Pune		
		Pune Techtrol	Pune		
		Levcon	Kolkata		
		Sigma	Mumbai		
		V-Automat	New Delhi		
DK Instruments	Kolkata				
26	DC Lead Acid / Ni-Cd Batteries	AMCO SAFT INDIA LTD	ABBANAKUPPE WORKS HEBBAL-BELLARY- JAKKUR ROAD BANGALORE- KARNATAKA-INDIA	III	Ni-Cd batteries only
		EXIDE INDUSTRIES LTD	8/42, Kirti Nagar Industrial Area, NEW DELHI		Lead Acid batteries only.
		HBL POWER SYSTEMS LTD	8-2-601,ROAD NO.10, BANJARA HILLS, HYDERABAD-ANDHRA PRADESH		Ni/Cd and TUBULAR TYPE for Lead acid
		HOPPECKE BATTERIEN GMBH & CO.KG,	BONTKIRCHENER STRASSE 1, D-59929 BRILON HOPPECKE, -- GERMANY.		
27	DC BATTERY CHARGER	AMARA RAJA POWER SYSTEMS LIMITED	TIRUPTI, ANDHRA PRADESH TRIPUTI- TAMIL NADU-INDIA Phone- +91-877- 2285561 Pincode : Email : amararaja@amararaja.co in	III	
		CHHABI ELECTRICALS PVT.LTD.	MIDC , JALGAON- MAHARASHTRA		
		CHLORIDE POWER SYSTEMS & SOLUTIONS LIMITED	GARIAHAT ROAD KOLKATA-WEST BENGAL- INDIA		
		DUBAS ENGG PVT LTD	347/1A , BILEKAHALLI , 6TH CROSS 2ND STAGE,B.T.M LAYOUT OFF-BANNERGHATTA ROAD BANGALORE		
		HBL POWER SYSTEMS LTD	ROAD NO.10, BANJARA HILLS, HYDERABAD- ANDHRA PRADESH- INDIA		
		JEMA ENERGY	Paseo del Circuito 10, Lasarte-Oria--SPAIN		For Static SCR Type Full Wave fully Control type

		MASS-TECH CONTROLS PVT.LTD.	2/7 , MEGHAL INDL.ESTATE DEVIDAYAL ROAD MULUND ,MUMBAT		
		STATCON POWER CONTROLS LTD	A-34 , SECTOR-59 NOIDA-UTTAR PRADESH		APPROVED WORKS is , Khasara No. -509, Bama Road, Chhijarsi, Kullich Nagar, Pilkhuwa, Hapur, Ghaziabad, U.P. India- 245304
28	INSTRUMENT FITTINGS	AURA INCORPORATED	Delhi	III	
		Astec Valves & Fittings Pvt. Ltd.,	Mumbai		
		Arya Crafts & Engineering Pvt. Ltd.	Mumbai		
		Comfit & Valve Pvt. Ltd.	Nandasan		
		FLUIDFIT ENGINEERS PVT. LTD.	Mumbai		
		Fluid Controls Pvt. Ltd.	Mumbai		
		HP VALVES & FITTINGS INDIA PVT. LTD.	Chennai		
		PRECISION ENGINEERING INDUSTRIES	Mumbai		
		Panam Engineers,	Mumbai		
		Perfect Instrumentation Control (India) Pvt. Ltd.	Mumbai		
		VIKAS INDUSTRIAL PRODUCTS	Noida		
29	Control / Power Cable	Cords Cable	Bhiwadi		I
		Radiant Cables	Hyderabad		
		PolyCab	Daman		
		KEI	Bhiwadi		
		Nicco	Kolkata		
		Ravin Cables	Pune		
		Incab	Pune		
		HVPL	Faridabad		
		Torrent cable	Nadiad		
		Havells	Alwar		
		Paramount	Khushkhera		
		SRI Ram Cables	Bhiwadi		
		Thermocables	Hyderabad		
		Torrent cable	Nadiad		
		Universal Cables	SATNA		
		Gemscab	Bhiwadi		
		Delton	Faridabad		
30	Cable Glands	SUNIL& COMPANY	KOLKATA	III	
		ARUP ENGG	KOLKATA		
		COMMET	MUMBAI		
		QUALITY PRECISION	KOLKATA		
31	cable lugs	Dowells	Mumbai	III	
		Billet 3D	Valsad		
		Chetna	Nasik		
32	Terminal Block	Phoenix	INDIA	III	
		Wago	INDIA		
		Connectwel	INDIA		
		EROS METAL WORKS (P) LTD.	Nagpur		Galvanising Unit located at Phas-3, E-11/1, MIDC, Pune ,

33	Cable trays and its accessories	INDUSTRIAL PERFORATION (I) PVT.LTD.	Kolkata	III	
		INDIANA GRATINGS PVT. LTD.	Mumbai		Galvanizing to be done from BHEL-PEM approved galvanizers.
		INDIA ELECTRICALS SYNDICATE	Kolkata		Galvanising can be done from their own galvanising plant or PEM approved galvanising units
		INDMARK FORMTECH PVT. LTD.	Pune		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.
		JAMNA METAL COMPANY	Delhi		
		Maheshwari Electrical Mfrs. Pvt. Ltd.,	Noida		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.
		NAMDHARI INDUSTRIAL TRADERS PVT. LTD	Ludhiana		
		PREMIER POWER PRODUCTS (CAL) PVT. LTD.	Kolkata		its galvanization plant M/s Galbro Ispat Galvanizers Pvt. Ltd.
		PATNY SYSTEMS (P) LTD	SEUNDRABAD		Galvanisation to be done at its own plant or from BHEL-PEM approved additional works at Raipur including galvanizing plant.
		PARMAR METALS PVT.LTD.	RAJKOT		MSSED-MICRO; Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers. remarks changed w.e.f. 03.07.2014; , Additional Works at "Sankrail Industrial park, Bhagabatipur Mauja, Dhulagarh, Howrah-711302" approved w.e.f. 08.12.2014 ,
		PASSIVE INFRA PROJECTS PVT. LTD.	Delhi		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.,
		PENTAX FERRO INCORPORATE	Mumbai		Approved in permanent category for fabrication of Cable trays & Acc. only. Galvanizing to be done from BHEL approved galvanizers. , ,
		RUKMANI ELECTRICAL & COMPONENTS PVT LTD	Kolkata		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.
		RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	Kolkata		
		RABI ENGINEERING WORKS PVT. LTD.	Kolkata		
		SARAL INDUSTRIES	Rae Bareilly		
UNITECH FABRICATORS and ENGINEERS PVT LTD	Kolkata				
VINFAB ENGINEERS INDIA PVT. LTD.	Mumbai	Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.			
34	CABLE TRAY SUPPORT SYSTEM -BOLTABLE	AM-TECH ENGG.SERVICES	Pune	III	
		INDUSTRIAL PERFORATION (I) PVT.LTD.	Kolkata		
		INDMARK FORMTECH PVT. LTD.	Pune		WORKS ADDRESSES ARE APPLICABLE FOR MANUFACTURING AND GALVANISING.
		PREMIER POWER PRODUCTS (CAL) PVT. LTD.	Kolkata		
		RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	Kolkata		Galvanizing Unit located at Phas-3, E-11/1, MIDC, Pune ,
		STEELITE ENGINEERING	Mumbai		
		Associated Power Structures Pvt. Ltd.	G. I. D. C., Makarpura, Vadodara-Gujarat		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.

35	CABLE TRAY SUPPORT SYSTEM-WELDED(GALV)	INDUSTRIAL PERFORATION	DUM DUM KOLKATA-	III	
		INDMARK FORMTECH PVT. LTD.	MIDC BHOSARI PUNE-MAHARASHTRA		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.
		JAMNA METAL COMPANY	DSIDC, NARLA INDL. AREA DELHI		Galvanisation to be done at its own
		PREMIER POWER PRODUCTS	Kolkata,-West Bengal		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.
		PATNY SYSTEMS (P) LTD	SARDAR PATEL ROAD SEUNDRABAD		Registered in permanent category along with galvanizer M/s Saral Projects and Processors . . .
		PASSIVE INFRA PROJECTS PVT. LTD.	VAISHALI, PITAMPURA Delhi-		Galvanisation to be done at its own plant or from BHEL-PEM approved galvanizers.
		RUKMANI ELECTRICAL & COMPONENTS PVT LTD	KOLKATA-WEST BENGAL-INDIA		
		RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	P.K. TAGORE STREET, MAIN BUILDING KOLKATA-WEST BENGAL		
		RABI ENGINEERING WORKS PVT. LTD.	R.N. GUHA ROAD, DUM DUM, KOLKATA-WEST BENGAL		
		SARAL INDUSTRIES	Industrial Area-1 Sultanpur Road Rae Bareli-Uttar Pradesh		
	UNITECH FABRICATORS and ENGINEERS PVT LTD	M.B.RAOD , BIRATI KALABAGAN KOLKATA		HEAT SHRINKABLE TYPE ONLY.	
36	CABLE TRAY SUPPORT SYSTEM-WELDED(UNGALV)	RASHTRIYA ISPAT NIGAM LIMITED	AMBAWADI AHEMDABAD-	III	
		STEEL AUTHORITY OF INDIA LTD.	ISPAT BHAWAN LODI ROAD NEW DELHI-		
37	CABLE TERM.& JOINT KITS	3M Electro and Communication India P.Ltd	Rajendra Place, DELHI	III	
		HARI CONSOLIDATED PVT.LTD.,NEW DELHI	JHANDEWALAN, NEW DELHI-Delhi		
		RAYCHEM RPG PRIVATE LIMITED	JANAKPURI NEW DELHI		
		YAMUNA CABLE ACCESSORIES PVT. LTD.	Ambala Road, Jagadhri Yamunanagar-Haryana		
38	MICRO-PROCESSOR / MICRO-CONTROLLER	ALLEN BRADLY	BANGALORE	II	
		SIEMENS	BANGALORE		
		GE	BANGALORE		
		SCHENIDER	BANGALORE		
39	Battery	EXIDE	Kolkata	III	
		HBL Power System	Hyderabad		
		AMAR RAJA	Tirupati		
		Amco soft	Bangalore		
		HBL Power System	Hyderabad		
		SAFT	France/Sweden		
C	BOUGHTOUT ITEM (MECHANICAL)				
	BUCKET ELEVATOR CHAIN	HEKO GMBH	GERMANY	II	
		Rud	GERMANY		

1		Aumund	Chennai		for complete bucket elevator
2	BUCKET ELEVATOR SPROCKETS	HEKO GMBH	GERMANY	II	
		Rud	GERMANY		
3	Knife Gate/Plate Valve (H/W Operated & Cylinder Optd)	Aumund	Chennai	I	for complete bucket elevator
		DEZURIKK	CHENNAI		upto 400NB 150 class
		FOURESS	MUMBAI		
		VASS	CHENNAI		
		ORBINOX	COIMBATORE		
		JAASH	INDORE		upto 50 NB 800 Class: 350NB 150 class
4	Ball Valve	Precision Engg	Nasik	I	
		Microfinish Valves Ltd	Hubli		upto 50NB 800 class
		Weir BDk engg Industries	NEW DELHI		
		Flow chem. Industries	Ahemdabad		
		Audco	Chennai		(1) BALL VALVES: FCS/FSS - 1/2" to 2" #800 & CCS/CSS - 2.1/2" to 4" # 150 (2) BALL VALVES: GUN METAL VALVES SIZE 15 NB TO 80 NB - UPTO PN16.0
		Akay India	Hubli		
		A V Valves	Agra		Size up to 2" & #800 with MOC as FCS & FSS and for size from 65 NB to 150 NB & #150 with MOC as CCS and CSS.
		Asian Industrial valves & Instruments Ltd.	Chennai		Steel ball Valves upto 50NB, #800 and 65NB to 150NB. #150
		ATAM Valves	Jalandhar		
		GM ENGINEERING	Rajkot		CAST STEEL UPTO 200 MM,CLASS 150/300.
		Hawa Valves (India) Pvt. Ltd.	Navi Mumbai		
		INTERVALVE (INDIA) LTD.	Pune		FOR CARBON STEEL/STAINLESS STEEL UPTO SIZE 200NB.
		NILON VALVES PRIVATE LIMITED	Ahmedabad		
		LEADER VALVES LTD.	Jalandhar		FORGED CARBON & ALLOY STEEL BALL VALVES ,SCREWED TYPE BALL VALVES RATING 800 , SIZES UPTO 50 & CC& ALLOY STEEL BALL VALVES RATING 150 , SIZES 65 TO 200 FLANGED TYPE.
		DEMBLA VALVES LTD.	Thane		
		SURYA VALVES AND INSTRUMENTS MFG CO.	Chennai		
		UNIFLOW	Chennai		
		VALTECH INDUSTRIES	Mumbai		
VAAS AUTOMATION	NEW DELHI				
Belgaum Aqua Valve	Belgaum				
5	Metallic Expansion Bellow(Metallic)	METALLIC BELLOWS	CHENNAI	II	UPTO 20 TONNES
6	Rupture Disc	BS & B SAFETY SYSTEM	CHENNAI	II	
		ARMSEL MHE PVT. LTD	Bangalore		CAPACITY UPTO 10 TONS. BOIs BHEL APP.SUB-VENDORS.
		Alpha Services	Bhiwadi		

7	Electric Hoist	CONSOLIDATED HOISTS PVT LTD	Pune	II	
		CENTURY CRANE ENGINEERS PVT. LTD.	Faridabad		
		EDDY CRANES PVT. LTD.	Mumbai		
		Grip Engineers Pvt. Ltd.,	Faridabad		
		GLOBAL TECHNOLOGIES	Hydrabad		
		HERCULES HOISTS LTD.	Khalapur		UPTO 25.0 T CAPACITY.
		LIFTING EQUIPMENTS and ACCESSORIES	Delhi		
		Mangla Hoists Pvt Ltd	Delhi		
		MEEKA MACHINERY PVT. LTD.	Ahemdabad		UPTO 15 TONNES.
		REVA INDUSTRIES LTD.	Faridabad		
		ROCKWELL HOISTO CRANES PVT. LTD.	Bahadurgarh		
		SAFEX ENERGY PVT. LTD.	Ahemdabad		
		TUOBRO FURGUSON (INDIA) PVT LTD	Kolkata		
		TECHNO INDUSTRIES	Ahemdabad		
8	Mono Rail Hoist / Chain Pulley Block	HERCULES (INDEF)	MUMBAI	II	
		LEAP	NEW DELHI		
		TRACTEL	FARIDABAD		
		LIFTING EQUIPMENTS & ACESSORIES	DELHI		
9	Horzional/Vertical Centrifugal Pump	KBL	Kirolskarwadi	I	
		M&P	Pune		
		Flowmore	Ghaziabad		
		Sulzer pumps india ltd.	Navi mumbai		
		Worthington	Ghaziabad		
		Bharat pumps & compressors ltd	Allahabad		
		Flowserve India Controls Pvt. Ltd.	Coimbatore		
	Jyoti ltd.	Vadodara			
	Vertical Centrifugal Pump	Kishore Pump	Pune		
		Sam Turbo	Coimbatore		
		KSB	Pune		
		Best and Crompton	Chennai		
		Voltas	Mumbai		
		V-Flo Pumps & Systems Co. Ltd.,	Beijing, China		
10	Pneumatic Actuator/Cylinder(Metallic)	SCHRADDER	MUMBAI	II	
		NUCON	HYDERABAD		
		Rotex	MUMBAI		
		VAAS	CHENNAI		
11	Fittings	M.S. Fittings	Kolkata	II	
		Metal lloyds	Mumbai		
		True Forge	Faridabad		
		Tube Products	Baroda		
		NL Hazra	Kolkata		
		Gujrat Infra Pipes	Baroda		
		Edwards	USA		
		Pipefit Engineers	Baroda		
		Siddarth & Gautam	Faridabad		
EBY	Mumbai	Upto 400 NB ERW Pipes as per IS 3589 and SAW as per IS 3589			

12	MS/GI ERW Pipes	SAIL	Rourkela	II	NTPC approved sub-vendors and BHEL list
		Jindal	Ghazibad/Hissar	I	Upto 300 NB ERW Pipes as per IS 1239/3589
		Surya Roshni	Bahadur Garh	I	Upto 400 NB ERW Pipes as per IS 1239/3589 and SAW as per IS 3589
		TATA Tube	Jamshedpur	II	Upto 150 NB ERW Pipes as per IS 1239
		PSL	Chennai/Vizag/Ku	I	Spiral Weld SAW as per IS 3589
		Lalit Profile	Thane	I	Spiral Weld SAW as per IS 3589
		Samshi Pipes Industri	Vadodara	I	Spiral Weld SAW as per IS 3589
		Mukut Pipes	Rajpura	I	Longitudinal SAW (Single side weld) as per IS 3589
		Indus Tubes	G B Nagar	I	Upto 300 NB ERW Pipes as per IS 1239/3589
		Mann Ind	Indore	I	Spiral Weld SAW as per IS 3589
		Surendra Engg	Rajpura	I	Spiral Weld SAW as per IS 3589
		Pratibha Pipes & Stru	Thane	I	Spiral Weld SAW as per IS 3589
		JCO Gas Pipe	Chindwara	I	Spiral Weld SAW as per IS 3589
		Nukat Tanks and Vess	Tarapur		Longitudinal SAW (Single side weld) as per IS 3589
		DADU Pipes	Sikandrabad	I	Upto 300 NB ERW Pipes as per IS 1239/3589
		Good Luck Tubes	Sikandrabad	I	
		Advance Steel Tubes	Sahibabad	I	
		Bihar Tubes	Sikandrabad	I	
		Hi Tech Pipes	Sikandrabad	I	
		Ratnamani	Kutch/Ahmedabad	I	Upto 400 NB ERW Pipes as per IS 3589 and SAW as per IS 3589
Maharashtra Seamless	Raigad	I	200-500 NB ERW Pipes as per IS 3589		
Welspun	Anjar/Bharuch		Upto 400 NB ERW Pipes as per IS 1239/3589 and SAW as per IS 3589		
13	Seamless Pipes	ISMT	Ahmednagar/Bara	III	
		Maharashtra Seamless	Raigad		
14	S.S. Pipes (For small Quantity 500 m)	REMI	Mumbai	III	
		Ratmani	Ahmedabad		
		Apex Tubes	Behror		
		Choksi	Ahmedabad		
15	Steel Plate, Structural Steel and section for Fire water storage tank	SAIL	ANY PLANT	III	For small quantity: Authorised stockist/ dealer of approved listed makes for which TCs/IRs will be furnished
		Essar Steel			
		TISCO			
		RINL			
		Jindal			
		Lloyd			
Ispat					

		Indian Iron & Steel Co. Ltd			
16	Bag Filter	ORIENT FAN (FORMERLY - ACCO)	KOLKATA	II	
		THERMAX	PUNE		
		FLAKT	MUMBAI		
		BATLIBOI	DELHI		
		DCL	HYDERABAD		
17	GEARED MOTOR	PBL	ANAND - V.V NAGAR	III	
		PREMIUM	PUNE		
		BONFIGLIOLI	CHENNAI		
		SEW	Germany		
		IC	AURANGABAD		
18	CI Gate/ Globe/NRV/SRV	H.Sarkar	Howrah	III	SIZE UPTO 300NB & PR.CL.
		A.V. VALVES LTD	Agra		
		Leader	Jalandhar		
		SURYA VALVES AND INSTR	Chennai		
		ATAM VALVES PVT. LTD.	JALANDHAR		
		FLUIDLINE VALVES COMPA	Mumbai		
		G.M. DALUI AND SONS PVT.	Howrah		
		KBL	Kondhapuri		
		Bankim	Kolkata		
		VENUS PUMPS AND ENGG.	Kolkata		
19	GM valve	A.V. VALVES LTD	Agra	III	
		ATAM VALVES PVT. LTD.	Mumbai		
		Leader	Jalandhar		
		VALTECH INDUSTRIES			
		SANT VALVES PVT. LTD.	Jalandhar		
20	GEAR BOX	PBL	ANAND - V.V NAGAR	III	
		SHANTHI	COIMBATORE		
		PREMIUM	PUNE		
		BONFIGLIOLI	CHENNAI		
		IC	AURANGABAD		
		FLENDER			
21	COUPLINGS	ELECON	ANAND - V.V NAGAR	III	
		FENNER	CHENNAI		
		FLUIDOMAT	KOLKATA		
22	BEARINGS	FAG	INDIA	III	
		SKF	INDIA		
		NTN	INDIA		
23	BEARINGS (B/E BOOT SECTION)	HEKO	GERMANY	III	
24	Paint	Asian Paints (I) Ltd.	Mumbai	III	
		Berger Paints India Ltd	Delhi		
		Goodlass Nerolac	Mumbai		
		Jenson & Nicholson (I) Ltd	Gurgaon		
		CDC carboline (I) Ltd.	Delhi		
		Shalimar Paints Ltd.	Gurgaon		

		Addison Paints Ltd	Chennai		
		Grand Polycoat	Mumbai		
		Bombay Paints	Mumbai		
		Jotun Paints	Pune		
		Hemple Paints	Singapore		
25	PLUMMER BLOCKS	WINCO	BANGALORE	III	
		MASTA	AHMEDABAD		
		COSMO	MUMBAI		
26	TRANSMISSION CHAIN	RENOLD	KARUR	III	
27	MAINTENANCE TOOLS BOX	BRANDED		III	
INSPECTION CATEGORY TYPE					
CAT-I	The QAP for these items shall be approved by customer and joint inspection shall be done by Customer & BHEL as per approved QAP.				
CAT-II	The QAP/Check List for these items shall be approved by BHEL and inspection shall be done by BHEL as per approved QAP/Check List. Approved QAP/Check list shall be given for Information to Customer.				
CAT-III	These shall be COC (Certificate of Compliance) items. Only verification Test Certificates shall be done by BHEL.				
NOTE	1) Bidder to note that Make of various items and inspection category indicated against each item is tentative and shall be subject to approval of BHEL / Customer during detail engineering stage without any commercial implication at contract stage				

2) In case of imported components, makes of BOI shall be subject to BHEL/ customer approval during detail engineering stage without any commercial implication at contract stage.

SUB-VENDOR LIST

7	LT Switchgear - Floor mounted Fixed type indoor LT Switchgear Panel (ACDB / DCDB)	CAT I				
					Schneider (formerly L&T)	Mumbai / Coimbatore/Ahmednagar
					C&S Electric	Noida/ Haridwar
					Schneider	Nasik
					Siemens	Kalwa
					Schneider	Vadodara
						#
	1.1 KV LT Power Cables (Type-XLPE Insulated, PVC sheathed (incl FRLS))	CAT I				
					Advance Cable	Bengaluru
					Apar Industries Ltd	Umbergaon
					Cords Cables	Bhiwadi
					CMI	Baddi
					Delton Cable Ltd	Faridabad
					Dynamic Cables	Jaipur
					Gemscabs Industries	Bhiwadi
					Gupta Power Cables	Khurda
					Havells India Ltd	Alwar
					KEC International	Silvassa, Mysore
					KEI Industries	Bhiwadi
					Paramount Cable	Khushkhhera
					Polycab Wires Pvt. Ltd	Daman
					Ravin Cables	Pune
					Special Cables	Rudrapur
					Suyog Cables	Vadodara
					Thermocables	Hyderabad
					Tirupati Plastomatics	Jaipur
					Torrent Cable Ltd	Nadiad
					Universal Cable Ltd.	Satna
						#

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES1	AC CONTACTORS	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	AC CONTACTORS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC CONTACTORS	3	E1144	TELEMECHANIQUE/SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
	AC CONTACTORS	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AC CONTACTORS	5	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
ES2	AC LOAD BREAK SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC LOAD BREAK SWITCH	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AC LOAD BREAK SWITCH	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	AC LOAD BREAK SWITCH	4	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	AC LOAD BREAK SWITCH	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
ES3	AC MCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	AC MCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	AC MCCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	AC MCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC MCCB	5	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	AC MCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
ES7	AUXILIARY RELAYS	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	AUXILIARY RELAYS	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	AUXILIARY RELAYS	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
	AUXILIARY RELAYS	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA	Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com	
	AUXILIARY RELAYS	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES8	BIMETAL RELAYS	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	BIMETAL RELAYS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	BIMETAL RELAYS	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	BIMETAL RELAYS	4	E1144	TELEMECHANIQUE/SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
ES9	BUCHHOLZ RELAY	1	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	BUCHHOLZ RELAY	2	E1020	ATVUS INDUSTRIES	689, BLOCK 'O', NEW ALIPORE, CALCUTTA-700053	(91)-(33)-24001101 / 9885 sales@atvus.in	
	BUCHHOLZ RELAY	3	E1070	INSTRUMENTS & CONTROLS	146,GIDC IND.ESTATE,MAKARPURA, VADODRA-390010	0265-2642729	
ES10	CABLE CLAMPS & CABLE TIES	1	E1045	ELECTROMAC IND.CORPN.	27/28 AF,NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E), MUMBAI-400059	91-22-28324829 / 66919034/ Mr. Devang Patel/ 91-9867074600 devang@electromacglands.com	
	CABLE CLAMPS & CABLE TIES	2	I01	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
	CABLE CLAMPS & CABLE TIES	3	N05	NOVOFLEX MARKETING PVT. LTD.	RAIKVA' - 5TH FLOOR, UNIT-6 3A, RAM MOHAN MULLICK GARDEN LANE KOLKATA - 700 010	Phone: +91 33 2372 0088 Email: sales@novoflex.co.in, novoflexcal@vsnl.net	
	CABLE GLANDS	1	E1201	ALLIED TRADERS & EXPORTERS	C-124 A, SECTOR-2, NOIDA -201 301, UTTAR PRADESH, INDIA	Mr. Vijay Mohan Sood +(91)-(120)-2525694 +(91)-(120)-3052594 +(91)-(11)-23287156 vijay_mohansood@yahoo.com	
	CABLE GLANDS	2	E1017	ARUP ENGG & FOUNDRY WORKS	391/119,PRINCE ANWAR SHAH ROAD, CALCUTTA-700068	033 2473 0850	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES11	CABLE GLANDS	3	E1206	BALIGA LIGHTING EQPT.PVT.LTD.	63A,CP RAMASWAMY ROAD, ALWARPET,P.B.No 6910, CHENNAI-600018	44-24995505,22680990-4	
	CABLE GLANDS	4	E1036	COMMET BRASS PRODUCTS	NUTAN CHEMICAL COMPOUND, WALBHAT ROAD, GOREGAON, MUMBAI-400063	91-022-26852961/62/63 comet@vsnl.net	
	CABLE GLANDS	5	DW08	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/ 022-29270878.	
	CABLE GLANDS	6	E1044	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059	91-22-28324829 / 66919034 devang@electromacglands.com	
	CABLE GLANDS	7	I01	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
ES12	CABLE LUGS	1	E1040	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST).	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/	
	CABLE LUGS	2	E1149	UNIVERSAL MACHINES LTD.	4,B.D.BAG (EAST) 90,STEPHEN HOUSE,5TH FLR CALCUTTA-700001	033 2282 2540	
ES13	D.C. MCCB	1	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
	D.C. MCCB	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	D.C. MCCB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL,	044-49681447	
	D.C. MCCB	4	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES14	EARTH LEAKAGE CB	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	EARTH LEAKAGE CB	2	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	EARTH LEAKAGE CB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	EARTH LEAKAGE CB	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	EARTH LEAKAGE CB	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	EARTH LEAKAGE CB	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	EARTH LEAKAGE CB	7	E1068	INDO ASIAN	B-24, PHASE - II, NOIDA - 201305, U.P.	120-3042222	
	EARTH LEAKAGE CB	8	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE	011 - 25793021	
	EARTH LEAKAGE CB	9	E1120	S&S POWER SWITCHGEAR LTD.	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004	044 - 24988056, 044 - 24988057, 044 - 24988058	
ES15	JELLY FILLED CABLES	1	D01	DELTON SALES LTD.	DELTON HOUSE 4801, BHARAT RAM ROAD,24DARYAGANJ N.DELHI-110002	3273905-8,3262517	
	JELLY FILLED CABLES	2	H01	HINDUSTAN CABLES	A-40 ASIAN GAMES VILLAGE RANJIT SINGH BLOCK NEW DELHI-110049	011-26493673	
	JELLY FILLED CABLES	3	E1096	TELELINK-NICCO	NICCO HOUSE 2,HARE STREET,CALCUTTA-700001	91-033-66285000	
	JELLY FILLED CABLES	4	E1151	USHA BELTRON LTD.	TATISILWAI , ranchi- 835105	91 651 415 897, 415 816	
ES16	GI CONDUITS	BIS APPROVED MAKE					
ES17	GI CONDUIT (EPOXY PAINTED)	BIS APPROVED MAKE					
ES18	FLEXIBLE CONDUITS (LEAD COATED)	1	P03	PLICA INDIA PVT. LTD.	V.P.AGARWAL MANAGING DIRECTOR, PLICA INDIA PVT. LTD. 149, MODEL TOWN EAST GHAZIABAD - 201009	M - 9810052131 / 0120-4563979 / 9810557567 Mail: agr@plicaindia.com	
ES19	FLEXIBLE CONDUIT (PVC COATED)	REPUTED MAKE					
ES20	DC CONTACTORS	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	DC CONTACTORS	2	E1030	BHEL (BHOPAL)	HEAVY ELECTRICAL PLANT		
	DC CONTACTORS	3	E1044	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059	91-22-28324829 / 66919034 devang@electromacglands.com	
	DC CONTACTORS	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015	011-41419554/59	
	DC CONTACTORS	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	DC CONTACTORS	6	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
	DC CONTACTORS	7	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	CONTROL SWITCHES/ SELECTOR SWITCH	1	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	CONTROL SWITCHES/ SELECTOR SWITCH	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES21	CONTROL SWITCHES/ SELECTOR SWITCH	3	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479000	
	CONTROL SWITCHES/ SELECTOR SWITCH	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	CONTROL SWITCHES/ SELECTOR SWITCH	5	SR01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR,		
	CONTROL SWITCHES/ SELECTOR SWITCH	6	RE05	RECOM PVT. LTD.	M/S RECOM PVT. LTD.,16A , 2ND FLOOR A, WING RAJ INDUSTRIAL COMPLEX, MILITARY	Mr. Chandrashekar Kamath (MD) : 09820249503	
ES22	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	2	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	3	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	4	E1082	LOGICSTAT	B-160, INDUSTRIAL AREA, C BLOCK RD, OKHLA I, OKHLA INDUSTRIAL AREA, NEW DELHI, DL 110020	011 2681 0032	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	5	E1106	PRECISE ELECTRICALS	47A-49A, CHAKALA ROAD ANDHERI(E), MUMBAI 99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	6	E1128	UNILEC ENGINEERS PVT. LTD.	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	7	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.co m, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	FOR CONTROL TRANSFORMER ONLY
ES23	LT- CURRENT TRANSFORMER	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER- B, PLOT NO. 78, SECTOR 18, GURGAON- 122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	LT- CURRENT TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LT- CURRENT TRANSFORMER	3	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
	LT- CURRENT TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	LT- CURRENT TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD	5341779,5427041	
	LT- CURRENT TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A, CHAKALA ROAD ANDHERI(E), MUMBAI 99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	LT- CURRENT TRANSFORMER	7	E1128	SILKAANS ELECT.MFG.CO.PVT.LTD	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	LT- CURRENT TRANSFORMER	8	E1111	PRAYOG ELECTRICALS PVT. LTD.	GROUND FLOOR, THAKORE INDUSTRIAL COMPUND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMBIKA TEMPLE,MUMBAI Mumbai - 400086, Maharashtra, India	91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR)	
	LT- CURRENT TRANSFORMER	9	CO1	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
	LT- CURRENT TRANSFORMER	10	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.co m, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
	LT- POTENTIAL TRANSFORMER	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER- B, PLOT NO. 78, SECTOR 18, GURGAON- 122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	LT- POTENTIAL TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LT- POTENTIAL TRANSFORMER	3	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES24	LT- POTENTIAL TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	LT- POTENTIAL TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD	5341779,5427041	
	LT- POTENTIAL TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI 99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	LT- POTENTIAL TRANSFORMER	7	E1128	SILKAANS ELECT.MFG.CO.PVT.LTD	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	LT- POTENTIAL TRANSFORMER	8	E1111	PRAYOG ELECTRICALS PVT. LTD.	GROUND FLOOR, THAKORE INDUSTRIAL COMPU,ND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMBIKA TEMPLE,MUMBAI Mumbai - 400086, Maharashtra, India	91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR)	
LT- POTENTIAL TRANSFORMER	9	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.co m, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)		
ES25	DC SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	DC SWITCH	2	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELHI-110014	Rajiv Sharma-9312004687	
	DC SWITCH	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER- B, PLOT NO. 78, SECTOR 18, GURGAON- 122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES26	DISTRIBUTION BOX	1	SR01	M/S SHRENIK & CO.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213		
ES27	EMER. PORTABLE LTG. SET	1	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
	EMER. PORTABLE LTG. SET	2	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
ES28	FUSE BASE	1	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA – 201305, U.P.	120-3042222	
	FUSE BASE	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	FUSE BASE	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI- 110015	011-41419554/59	
	FUSE BASE	4	CD1	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
	FUSE BASE	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER- B, PLOT NO. 78, SECTOR 18, GURGAON- 122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
	FUSE BASE	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA- 121003	0129-2567580, 09871799449	
	FUSE BASE	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	FUSE BASE	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	FUSE BASE	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	FUSE BASE	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES29	HRC FUSES	1	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA – 201305, U.P.	120-3042222	
	HRC FUSES	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	HRC FUSES	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI- 110015	011-41419554/59	
	HRC FUSES	4	CD1	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI- 110020	011-3088 7520-29	
	HRC FUSES	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER- B, PLOT NO. 78, SECTOR 18, GURGAON- 122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
	HRC FUSES	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA- 121003	0129-2567580, 09871799449	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	HRC FUSES	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	HRC FUSES	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	HRC FUSES	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	HRC FUSES	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES30	GALVANISING	1		Jenco Industrial Corporation	Chincholi Bunder Khkar Road Near Link Road Devruwadi Malad (W) Mumbai 400064		
	GALVANISING	2		National Galvanizing Company	66, Barrackpore Kamarhatt Trunck Road Calcutta-700058		
	GALVANISING	3		Sigma Galvanising Pvt. Ltd.	Plot No.C-169, TTC, MIDC Ind Area Navin Mumbai-400705	8725402,8725765	
	GALVANISING	4		B.P. Projects PVT LTD	167A, Vivekananda Road Kolkata-700006	033 2553 1254	
	GALVANISING	5		Standard Galvanisers	Makardah Road, Kabara Para, Bankra, Howarah -711403	28756318/28741986/28725402/28725765	
	GALVANISING	6		Steel Products	National Highway No. 6, Chamrail, Kona, Howrah-711114		
	GALVANISING	7		Unitech Fabricators & Engineers Pvt. Ltd.	Village- Ajab Nagar, P.O. -Molla Simla, P.S. Singur, Dist - Hoogly, Pin-712223	022 -27686606/ 1907	
	GALVANISING	8		Shivam Engineers & Fabricators	A0-282-284, Industrial Area, South Side of G.T. Road, Ghaziabad, U.P.		
	GALVANISING	9		B.G. Shirke Construction Technology Pvt. Ltd	72-76, Mundhawa, Pune - 401 036		
	GALVANISING	10		Galbro Ispat Galvanizers Pvt. Ltd.	GUT 11 AND 12, OPP. Kudus Steel,Rolling Mill, Wada, Thane , Mumbai		
	GALVANISING	11		Eros Metals	G-97, MIDC, Bhutibori , Naggpur		
	GALVANISING	12		Industrial Perforation (India) Pvt. Ltd.	Ganganagr, Katakhal, Kolkata-700132		
	GALVANISING	13		Indmark Formtech Pvt. Ltd.	Phase - 3, E - 11 / 1, M. I. D. C., Chakan, Pune - 410 501, Maharashtra, India.		
	GALVANISING	14		Namdhari Industrial Traders Pvt. Ltd.	Village Latton Dana, Chandigarh Road, Ludhiana		
	GALVANISING	15		Neha Galvaniser	Jalan Industrial Estate, Gate No-1, 1st Right Choise Lane, Near N.G-6, Jangalpur, PO Domjur Howrah - 700071, West Bengal, India		
	GALVANISING	16		Patny Systems (P) Ltd.	Unit-IV, Sy No. -228/9, Plot No. 6, IP Kuchavaram, Toopran(M) Dist.- Medak, Telegana - 502336		
	GALVANISING	17		Parmar Metal Company	Survey No.207,Veraval (Shapar) Dist. Rajkot, India.		
	GALVANISING	18		Rukmani Electrical & Components Pvt Ltd	Urla Industrial Area, Urla Sarora Road, Raipur- 493 221 (Chhattisgarh)		
	GALVANISING	18		Rukmani Fab & Gal Pvt Ltd	Shankharidaha Baniyarah, Jalan Industrial Complex, Gate no.3, Lane no. 4, Domjur, Howrah , W.B. - 711411		
	GALVANISING	19		DMP Projects Pvt.Ltd.	Dulagarh Industrial Park , PS-Sankrail , Howrah -711302		
	GALVANISING	20		Vinfab Engineers India Private Limited	Gut no. 224/1 &2 Bhiwandi Wada State Highway, Village Khupri, Dist. Thane, Maharashtra -421303		
	GALVANISING	21		Saral Projects & Processors	B-1, Industrial Area, Site-II, Amawan Road Rae Bareli		
	GALVANISING	22		Brahampuri Steels Limite	172 (F) Industrial Area, Jhotwara, Jaipur-302013		
	GALVANISING	23		Indiana Gratings PVT. LTD	F-5, MIDC Jejuri, Pune-412 303		
GALVANISING	24	AT08	M/S AVAIDS TECHNOVATORS PVT. LTD.	131, MATSYA INDUSTRIAL AREA, ALWAR RAJASTHAN			
	GI WIRE & FLAT	1	I039	INDUSTRIAL PERFORATION (I) PVT.LTD.	MR. A. K. SAHA 327, R.N.GUHA ROAD, DUM DUM KOLKATA-West Bengal-India Phone-9830241788 Pincode : 700028 Email : ipipl@cal2.vsnl.net.in	011 2737 3579	
	GI WIRE & FLAT	2	I070	INDIA ELECTRICALS SYNDICATE	Mr. Suresh Kumar Agarwal 55, Ezra Street, Kolkata-West Bengal-India Phone- 033-22354047 Pincode : 700001 Email : cabletray@vsnl.com	022-28511704	
	GI WIRE & FLAT	3	I072	INDMARK FORMTECH PVT. LTD.	Mr. Narendra R. Meher J Block, Plot No.-375, MIDC BHOSARI PUNE-MAHARASHTRA-INDIA Phone- 020-27130546 Pincode : 411026 Email : indmarkformtech@vsnl.net		
	GI WIRE & FLAT	4	P039	PREMIER POWER PRODUCTS (CAL) PVT. LTD.	Chatterjee International Centre, 33A, Jawaharlal Nehru Road, 6th Floor, Suit No. - 11A, Kolkata,-West Bengal-India Phone-9331008739 Pincode : 700071 Email : hemantdaga@dagaventures.com		
	GI WIRE & FLAT	5	P050	PATNY SYSTEMS (P) LTD	PATNY PLAZA 160 , SARDAR PATEL ROAD SEUNDRABAD SECUNDRABAD-TELANGANA-INDIA Phone- 040-27902451 Pincode : 500003 Email : mr.mkt@patnysystems.com		

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES31	GI WIRE & FLAT	6	P079	PASSIVE INFRA PROJECTS PVT. LTD.	MR. VARUN AGRAWAL 182, VAISHALI, PITAMPURA Delhi-DELHI-INDIA Phone- 9871183059 Pincode : 110088 Email : ATANU.SAHA@PASSIVEINFRA.COM		
	GI WIRE & FLAT	7	R036	RUKMANI ELECTRICAL & COMPONENTS PVT LTD	11A, MAHARISHI DEBENDRA ROAD 1ST FL, ROOM NO.4 KOLKATA-WEST BENGAL-INDIA Phone- Pincode : 700007 Email : maruthikabra@gmail.com		
	GI WIRE & FLAT	8	R037	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	MR. G.D. SINGHEE/MR. MAHESH SINGHEE 26, P.K. TAGORE STREET, MAIN BUILDING KOLKATA-WEST BENGAL-INDIA Phone- 9830177331 Pincode : 700006 Email : mahesh@ratans.com		
	GI WIRE & FLAT	9	R041	RABI ENGINEERING WORKS PVT. LTD.	MR. TAPAN KUMAR SEN/MR. SIDDHARTHA 327, R.N. GUHA ROAD, DUM DUM, KOLKATA-WEST BENGAL-INDIA Phone- 9748753002 Pincode : 700028 Email : rabiengineering@gmail.com		
	GI WIRE & FLAT	10	R200	RAJASTHAN METAL SMELTING CO.	Mr. R. K. Tibrewala D-80, Road No. 7, V.K.I.A., Jaipur-Rajasthan-India Phone- 0141-2332269 Pincode : 302013 Email : info@rmscoindia.com		
	GI WIRE & FLAT	11	S210	SARAL INDUSTRIES	Mr. Y.K. Gupta L-1, L-2, Industrial Area-1 Sultanpur Road Rae Bareilly-Uttar Pradesh-India Phone- 0535-2702474 Pincode : 229010 Email : saralindustries@gmail.com		
	GI WIRE & FLAT	12		PARCO Engineers Pvt. Ltd.	401, skyline Epitom Building ,Near to Jolly Gym Khana, Kirod Road , Vidhyavihar, MH 400086 India		
	GI WIRE & FLAT	13	U019	UNITECH FABRICATORS and ENGINEERS PVT LTD	INDRAPRASHTHA APARTMENT 24 , M.B.ROAD, BIRATI KALABAGAN KOLKATA KOLKATA-WEST BENGAL-INDIA Phone- Pincode : 700051 Email : ufepl@vsnl.net; ufepl@rediffmail.com	022 - 26230814	
ES32	HIGH MAST	1	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID :rabans@bajajelectricals.com;	
	HIGH MAST	2	TL01	M/S TRANSRAIL LIGHTING LIMITED (TLL)	M/S TRANSRAIL LIGHTING LIMITED (TLL), GAMMON INDIA LIMITED 2ND FLOOR , CENTRIC PLAZA, PLOT NO.8 POCKET-4, SECTOR-11 DWARKA , NEW DELHI -110075	hemant.jain@transrailttd.com'	
ES33	IND.POWER & WLDG SOCKETS	1	C02	CROMPTON GREAVES	3RD FLOOR, EXPRESS BUILDING,9-10, BAHADUR SHAH ZAFAR MARG, NEAR ITO CROSSING,NEW DELHI-110002, INDIA	91 11 23460700 - 999 *Sunil.Das@cgglobal.com	
	IND.POWER & WLDG SOCKETS	2	E1207	CYCLO ELECTRIC DEVICE & SERV.CO.	: A-3, NEAR ANTHEM BIOSCIENCE, KSSIDC INDUSTRIAL AREA, BOMMASANDRA, BOMMASANDRA INDUSTRIAL AREA, BANGALORE, KARNATAKA 560099	Mr. H.Jaishanker +919845039081, 080 - 27833102, 080 - 27833103 : +91 80 41460985 'cycloelectric@gmail.com	
	IND.POWER & WLDG SOCKETS	3	B04	BCH	20/4, MATHURA ROAD, FARIDABAD - 121006, HARYANA, INDIA	0(129)-4063000, 9015800189(Ramesh Giri) 'ramesh.giri@bchindia.com	
	IND.POWER & WLDG SOCKETS	4	B02	BEST & CROMPTON	Best & Crompton Engineering Ltd	Ph : +91 44 4551 4724 , MRKT	BEST &
	IND.POWER & WLDG SOCKETS	5	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC. , TTC INDL AREA, NAVI MUMBAI – 400705.	Tel : 022 27620299 / 97 / 96 mail@ajmera.net	
ES34	INTERPOSING RELAY	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	INTERPOSING RELAY	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	INTERPOSING RELAY	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDD, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
	INTERPOSING RELAY	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA	Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com	
	INTERPOSING RELAY	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES35	INDICATING LAMPS	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	INDICATING LAMPS	2	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	6832259,6918834-37	
	INDICATING LAMPS	3	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	INDICATING LAMPS	4	E1153	VAISHNO(HOTLINE SWGR.& CONTROL)	G-19, SECTOR - 11, NOIDA - 201301, UTTAR PRADESH, INDIA	8377805157 9818338922	
	INDICATING LAMPS	5	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	9818338922	
	INDICATING LAMPS	6	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	INDICATING LAMPS	7	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	JUNCTION BOXES (NON FLAME PROOF)	1	J01	JASPER ENGINEERS PVT. LTD.	A-23, SECTOR - 8, NOIDA-201301	0120-4033520/533	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES36	JUNCTION BOXES (NON FLAME PROOF)	2	EC05	Electro Controls & Devices	M/S ELECTRO CONTROLS & DEVICES, F-41, SITE-C, SURAJPUR INDUSTRIAL AREA GREATER NOIDA, UTTAR PRADESH :201308	Mr. Sanjay Sharma (Chief Promoter) 0120-2569487, 2560100,2560300	
	JUNCTION BOXES (NON FLAME PROOF)	3	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213	020-026708100	
	JUNCTION BOXES (NON FLAME PROOF)	4	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126	
	JUNCTION BOXES (NON FLAME PROOF)	5	ACE01	Adroit Control Engineers Pvt.Ltd.	M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL AREA, SECTOR-25 FARIDABAD – 121004	011-47600700, 0129-4251400	
	JUNCTION BOXES (NON FLAME PROOF)	6	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126 contact person : Vishwa bandhu E-mail:d.gupta@pmipl-online.com ;admin@pmipl-online.com	
	JUNCTION BOXES (NON FLAME PROOF)	7	MK01	MIKA ENGINEERS	BRANCH OFFICE : 'D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi Email: asgar@mikaengineers.com E-mail : mika@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230 74373	TYPE-S ONLY
	JUNCTION BOXES (NON FLAME PROOF)	8	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	TEL: +912066745000 Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126 contact person : Vishwa bandhu E-mail:d.gupta@pmipl-online.com ;admin@pmipl-online.com	
	JUNCTION BOXES (NON FLAME PROOF)	9	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
	JUNCTION BOXES (NON FLAME PROOF)	10	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC., TTC INDL AREA, NAVI MUMBAI – 400705.	Tel : 022 27620299 / 97 / 96 mail@ajmera.net	
	JUNCTION BOXES (NON FLAME PROOF)	11	SB02	S.B. ELECTRICAL ENGINEERING CORPORATION	03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002	022- 22069831; 022-66637259	
	JUNCTION BOXES (NON FLAME PROOF)	12	RT13	RITTAL INDIA PVT. LTD.	Empire Building ,Level -1 A-41, Mohan Co-Operative Industrial Estate ,Mathura Road, New Delhi -110044	Amit Bansal Phone: 011-42004000, D: 011-42004033 - Mobile: +91 971772245 - mailto:amit.b@rittal-india.com www.rittal-india.com	
	JUNCTION BOXES (NON FLAME PROOF)	13	HP08	HPL ELECTRIC AND POWER LTD.	Works Address: Village Shavella, PO:Jabli, Teh- Kasauli, Dist-Solan, Himachal Pradesh-173209	Mr. Ashwani Kumar mailto:'ashwani@hplindia.com' M:9971127370	
	ES37	JUNCTION BOXES (FLAME PROOF)	1	SS01	SUDHIR SWITCHGEAR	305/6, APEEJAY HOUSE, 130, BOMBAY SAMACHAR MARG, MUMBAI - 400 023. INDIA	Telephone Nos. : 40460000 (100 lines) Fax Nos. : ++91-22-22049381 Email : md@sudhirsitchgears.com ; works@sudhirsitchgears.com ;scud@vsnl.com
	LIGHTING DISTRIBUTION BOARDS	1	E1007	ADVANCE ENGG. COMPANY	38,SETHI IND. ESTATE 10/E,SUREN RD,ANDHERI MUMBAI-400097	91 - 22 - 24360086	
	LIGHTING DISTRIBUTION BOARDS	2	STRG01	Sterling Generators Pvt. Ltd.	C-56/38, INSTITUTIONAL AREA, SECTOR-62, NOIDA -201307, U.P.	Nityanand Engineer-Sales & Marketing (Panel Division) Noida, UP 201307, India Mobile:+91-8510022170	
	LIGHTING DISTRIBUTION BOARDS	3	E1091	MIKA ENGINEERS	BRANCH OFFICE : 'D'-101, DHEERAJ HERITAGE RESIDENCY II, SHASTRI NAGAR, SANTACRUZ (W), MUMBAI 400 054.	Director : Mr. Asgar Karimi E-mail : mika@mtnl.net.inTelfax : 022-26610081/82/83/84Tel : 02527-249066/70 Cell : 099230 74373 ; Email: asgar@mikaengineers.com	
	LIGHTING DISTRIBUTION BOARDS	4	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
E538	LIGHTING DISTRIBUTION BOARDS	5	KM1	KMG ATOZ SYSTEMS	"ATOZ HOUSE" C-49, SECTOR-81, GAUTAM BUDDH NAGAR, NOIDA – 201 305 U. P. (INDIA)	Tel : +91-120-4207920 Fax : +91-120-4207921, 4327958 Phone:098 10 802710	
	LIGHTING DISTRIBUTION BOARDS	6	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001	0124-4030247,248, 4559700, 9911087173	
	LIGHTING DISTRIBUTION BOARDS	7	AVA01	AVAIODS TECHNOVATORS LTD.	PLOT NO.25 ,SECTOR-3,IMT-MANESAR, GURGEON-122050 (HARYANA)	KRISHNA KALRA- 09958096168	
	LIGHTING DISTRIBUTION BOARDS	8	ACE01	Adroit Control Engineers Pvt.Ltd.	M/S ADROIT CONTROL ENGINEERS PVT.LTD. PLOT-3, KRISHNA INDL AREA, SECTOR-25 FARIDABAD – 121004	011-47600700, 0129-4251400	
	LIGHTING DISTRIBUTION BOARDS	9	JC01	JACKSON ENGINEERS	A-43, HOSEIRY COMPLEX, OPPOSITE NSEZ, NOIDA-201305	0120-4302600, 2568923,27	
	LIGHTING DISTRIBUTION BOARDS	10	ADL01	Adlec Systems Private Limited	PLOT NO-277, SWARN PARK, UDYOG NAGAR, MUNDKA, MAIN ROHTAK ROAD, UDYOG NAGAR, NEW DELHI, DELHI 110041	011 2834 5061	
	LIGHTING DISTRIBUTION BOARDS	11	POP01	Popular Switchgears Pvt Ltd	712, ARUN CHAMBERS, TARDEO MAIN ROAD, TARDEO, NEAR TARDEO AIRCONDITIONER MARKET, MUMBAI - 400034	-9362634406	
	LIGHTING DISTRIBUTION BOARDS	12	CS01	CANDS	1/202, ANSA INDUSTRIAL ESTATE, SAKI VIHAR ROAD, SAKINAKA, ANDHERI (EAST), MUMBAI-72	022-28570858	
	LIGHTING DISTRIBUTION BOARDS	13	PYRE01	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd.(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya (psisodia@pyrotechlighting.com) Ankit Kumar Sr. Engineer(North Region -Sales & Marketing) # +91- 7340061769, 8287897309	
	LIGHTING DISTRIBUTION BOARDS	14	PCS01	Positronics Pvt. Ltd.	POSITRONICS HOUSE ,882/ 2, G.I.D.C. MAKARPURA,VADODARA 390010 GUJARAT	+91 265 2642496 Fax: +91 265 264 7033 / 234 0944 E- mail : info@positronicsindia.com Website:www.positronicsindia.com	
	LIGHTING DISTRIBUTION BOARDS	15	ISC01	Industrial Switchgears & Control Pvt Ltd	S-02 AMARDEEP MAHAL, NANDA PATKAR RD, VILE PARLE EAST, MUMBAI - 400057	(91)-22-26182011	
	LIGHTING DISTRIBUTION BOARDS	16	VC01	M/s Vidhyut Control (I) Pvt.Ltd.	D-12 & 13, SECTOR-17, KAVI NAGAR INDL.AREA, GHAZIABAD – 201002 (DELHI NCR) U.P. INDIA		
LIGHTING DISTRIBUTION BOARDS	17	MIL01	MILESTONE SWITCHGEARS PVT. LTD.	MILESTONE SWITCHGEARS PVT. LTD. 97, UDYOG VIHAR, PHASE-1, GURGEON HARYANA - 122016	Phone Nos.: 0124-4994900 (30 Lines) Fax: 0124-4002973 Email: jaideep.ahuja@milestonesindia.com URL: www.milestonesindia.com		
E539	LIGHTING FIXTURES (NON LED)	2	E1206	BALIGA LIGHTING EQPT PVT LTD	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018	44-24995505,22680990-4	
	LIGHTING FIXTURES (NON LED)	3	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424	02637-265140, Mr. Jssk kumar	
	LIGHTING FIXTURES (NON LED)	4	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
	LIGHTING FIXTURES (NON LED)	5	C02	CROMPTON GREAVES	3RD FLOOR, EXPRESS BUILDING,9-10, BAHADUR SHAH ZAFAR MARG, NEAR ITO CROSSING,NEW DELHI-110002, INDIA	91 11 23460700 - 999 Sunil.Das@cgglobal.com, Mr. Prashant Wewhare 9930095703	
	LIGHTING FIXTURES (NON LED)	6	E1051	EVERGREEN ENGG. CO.	EVERGREEN ENGG COMPANY WORKS-5, PLOT NO. 9,10,11,12, SURVEY NO. 242, CHINCH PADA, VASAI EAST-401208	(0250) 6458250	
	LIGHTING FIXTURES (NON LED)	7	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE III,GURGAON-122002	01244606001, Sharad (+919871150447)	
	LIGHTING FIXTURES (NON LED)	8	WP01	WIPRO LTD.	WIPRO CONSUMER CARE AND LIGHTING, 5TH FLOOR, GODREJ ETERNIA -C, OLD PUNE- MUMBAI ROAD, SHIVAJINAGAR, PUNE -411005	020-66098700	
	LIGHTING FIXTURES (NON LED)	9	HP01	M/S HPL ELECTRIC & POWER PVT. LTD	M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL. AREA , KUNDLI, DIST. - SONEPAT (HARYANA) - 131028	mohitsharma@hplindia.com'	
	LIGHTING FIXTURES (NON LED)	10	SR01	SURYA ROSHNI LIMITED	PADMA TOWER, RAJENDRA PLACE, RAJENDRA PLACE NEW DELHI	011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com	
	LIGHTING FIXTURES (NON LED)	11	H102	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA-201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922	
	LIGHTING FIXTURES (NON LED)	12	HN13	M/s Halonix Technologies Limited	M/s Halonix Technologies Limited B-31 , Phase –II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305	Mr. Mohit Gautam 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; 'rahul.singh@halonix.co.in'	

SUB-VENDOR LIST

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES40	LIGHTING FIXTURES (LED)	1	NE01	Neev Luminaries	B-6/3 Okhla Industrial Area Phase-2 New Delhi 110020	Phone: 011 40604830-31, M:8826995888 Fax: +91 11 4060 4831 info@neevergy.in, Jitendra Sahu <jsahu@neevergy.com>	
	LIGHTING FIXTURES (LED)	2	HI01	HAVELLS INDIA LIMITED	QRG TOWERS , 2D SECTOR-126, NOIDA- 201301	GIRISH KUMAR SHRIVASTAVA +91-9810528922, girish.srivastava@havells.com\	
	LIGHTING FIXTURES (LED)	3	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049	CONTACT PERSON : Mr. S. SREEMANY. SR. MANAGER (PROJECTS) CONTACT DETAILS : (+91) 9871025705. MAIL ID : srabans@bajajelectricals.com;	
	LIGHTING FIXTURES (LED)	4	SR01	SURYA ROSHNI LIMITED		011-25810093 ; 9810071832 (Akhilesh Agrawal) aagrawal@sroshni.com	
	LIGHTING FIXTURES (LED)	5	P01	PHILIPS	9TH FLOOR,DLF 9B, DLF CYBER CITY, DLF PHASE- III,GURGAON-122002	01244606001, Sharad (+919871150447), Mr. Guruseelan M 8939693949, Mr Ashish Sethi 9007077089	
	LIGHTING FIXTURES (LED)	6	HP01	M/S HPL ELECTRIC & POWER PVT. LTD	M/S HPL ELECTRIC & POWER PVT. LTD. PLOT NO. 76-B,PHASE-IV, SEC-57, HSIIDC, INDL. AREA , KUNDLI, DIST.- SONEPAT (HARYANA) - 131028	mohitsharma@hplindia.com, Mr. Nitesh Verma 8851036938, Mr Ajay lakra 9560045423	
	LIGHTING FIXTURES (LED)	7	INS1	INSTA POWER	PLOT NO. - 457 PHASE - V, UDYOG VIHAR, GURGAON - 122016	124-4124000, Mr amit Bhardwar: 8800508090	
	LIGHTING FIXTURES (LED)	8	PT13	Pyrotech Electronics Pvt. Ltd.	M/s Pyrotech Electronics Pvt. Ltd.(Unit -1) Led Light, Sensor Division F-16A, Road No.3 Mewar Industrial Area, Madri Udaipur -313003, Rajasthan,	Concern Person – Mr. Praveen sisodiya : 9314310042(phisodiya@pyrotechli ghting.com) Ms Ritika 9509245814	
	LIGHTING FIXTURES (LED)	9	HN13	M/s Halonix Technologies Limited	M/s Halonix Technologies Limited B-31 , Phase –II, Noida Distt. Gautam Budh Nagar (U.P.) Pin- 201305	Mr. Mohit Gautam 'Tel: +919568152111 'mohit.gautam@halonix.co.in'; M: 9891868793'rahul.singh@halonix. co.in'	
	LIGHTING FIXTURES (LED)	10	JA13	M/s JAQUAR & COMPANY PVT. LTD.	M/s JAQUAR & COMPANY PVT. LTD. Plot No.3 , Sector M-11, IMT Manesar. Gurgaon- 122050 Haryana	Mr. Dhruv Kumar 'Tel: +919350043727 dhruv.kumar@jaquar.com ; gaurav.bhalla@jaquar.com : 9582950282	
	LIGHTING FIXTURES (LED)	11	CR13	M/s CROMPTON GREAVES CONSUMER ELECTRICALS LTD.	M/s CROMPTON GREAVES CONSUMER ELECTRICALS LTD.Tower-3, 1st Floor, East Wing Equinox Business Park LBS Marg, Kurla (West), Mumbai-400070	Mr S L Sivakumar 'Sivakumar L' <sivakumar.sl@crompton.co.in> M: 9176609363	
	LIGHTING FIXTURES (LED)	12	WI13	M/s WIPRO ENTERPRISES PRIVATE LTD.	M/s WIPRO ENTERPRISES PRIVATE LTD. L-8, MIDC Waluj, Aurangabad-431136, Maharashtra, India	Ms Dhanya K K 'dhanya.kk8@wipro.com' M 9891815476, Mr Puneet kalia 'puneet.kalia@wipro.com'	
	LIGHTING FIXTURES (LED)	13	NI13	M/s Nessa Illumination Technologies Pvt. Ltd.	M/s Nessa Illumination Technologies Pvt. Ltd.36/A Devraj Industrial Park, Opp. Sameep Fabrics, Pipalaj Pirana Road, Piplaj, Ahmedabad	Mr. Dhaval Shah <dhaval@nessa.in> M 9825650354, Mr. Akshat Khare <akshat@nessa.in> M: 9016111723	
	LIGHTING FIXTURES (LED)	14	FE13	M/s. Forus Electric Pvt. Ltd.	M/s. Forus Electric Pvt. Ltd. B-313, Okhla Industrial Area, Phase-1, New delhi-110020	Mr. Amit Bharadwaj <amit.bharadwaj@foruselectric.c om> M 8800508090, Mr. Uttam Goyal <uttam@foruselectric.com> M: 8527652687	