TECHNICAL PRE-QUALIFICATION REQUIREMENT (PQR) FOR ELECTRIC WIRE ROPE HOIST (IN CASE OF OPEN TENDER)

SL NO	Technical Pre-Qualification Requirement (PQR) for FOR ELECTRIC WIRE ROPE HOIST	Bidder's Reply with Supportive documents
1	Vendor should be a manufacturer of Crane / Hoist.	
	List of customer to whom Electric Wire rope Hoist / Underslung Cranes / EOT Cranes / Cranes of same capacity or higher supplied to silo/bunker application, FGD application, Coal fired Power plant, Industrial application, Nuclear power plant.	
	Minimum one number of Previous inspection and test report to be furnished for the same capacity or higher Capacity for Highest Capacity Hoist as per Enquiry, along with Previous purchase order of same item.	

Bidder's Seal & signed

TECHNICAL SPECIFICATION
OF
ELECTRIC WIRE ROPE HOIST (EWRH) WITH TROLLEY

Buyer(Purchaser)	:	M/s.BHEL
Application	:	Wet Limestone Flue Gas Desulphurization

Bharat Heavy Electricals Limited
Ranipet – 632 406

REV	DATE	DESCRIPTION	PREPARED	APPROVED
00	19-08-2022	Fresh Release	Jyotish Kumar Patel JYOTISH KUMAR PATEL (DM/EDC-FGD)	KESAVAN V (SDGM/EDC-FGD)

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1.0. INTENT OF SPECIFICATION

This specification covers design, manufacture, inspection, testing at bidder's and/ or his sub vendor's work(s), packing, and transportation of ELECTRIC WIRE ROPE HOIST along with accessories etc. which is to be furnished in the Flue Gas Desulphurization plant.

a. 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/ Customer, who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgment is not in full accordance herewith.

b. The requirement(s) specified under different sections of this specification shall be considered while quoting for this tender.

c. The bidder shall be deemed to have understood completely all the tender drawings and documents and quoted accordingly.

d. The bidder has to note carefully the parameters, estimated capacities of equipment indicated and the tender drawing in the specification are only for guidance of the bidder. The system shall be designed as per relevant standards/ codes and exact capacities and quantities are to be estimated by the bidder. All such estimations and design calculations shall be submitted for Purchaser's approval.

e. Contract shall be unit rate basis for this package. Variations in quantities during contract stage shall be settled on basis of unit rate quoted by the bidder in the tender. During contract stage, quantities of various items of BOQ may vary to any extent and same unit rates will be applicable.

f. Deviation: There shall preferably be no deviation on technical specification. In case of any deviation, the bidder shall indicate separately the deviations clause-wise with respect to the specification in the 'Schedule of Deviation' given in **ANNEXURE-I**. Deviations in any other form including clarifications / assumptions / etc will not be considered and it will be construed that the bid conforms strictly to the specification.

g. Compliance to this specification shall not relieve the Bidder of the responsibility of furnishing equipment and accessories/auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions.

h. All accessories, items of work, though not indicated but required to make the system complete for its safe, efficient, reliable and trouble free operation and maintenance shall also be in supplier's scope unless specifically excluded.

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2.0 SCOPE:

This specification covers the design, material constructional features, manufacture, testing, inspection, packing, supervision for erection & commissioning and supply of electric wire rope hoists assembly, with cross travel complete in all respect including control box, flexible trailing cable, festooning arrangement of feeding power to trolley assembly (cable trolleys), drag chain, auxiliary girder, FUSE-SWITCH unit etc. The assembly shall be complete in all respect ready for erection & commissioning.

2.1 APPLICATION

The electric wire rope hoists and trolley are meant for handling for equipment installed at Flue Gas desulfurization plant.

2.2 SCOPE OF SUPPLY OF HOIST

Each Electric wire rope hoists should necessarily consists of the following items:

Capacity : As per Enquiry
Maximum trolley travel speed for electric hoists : As per Annexure-III (Hoist Details)
Maximum trolley hoisting speed for electric hoists : As per Annexure-III (Hoist Details)

S. No	Description	Unit	FOR EACH ELECTRIC WIRE ROPE HOISTS
1	EWRH assembly for lifting & cross travel including brakes, drum with ropes suitable for required height of lift, electrical control panel, Pendant PB with control cable with link chain suitable against each EWRH capacity, Height (H), Length of travel (L) & Radius (R) as per As per Annexure-III (Hoist Details) & Layout GA as per Enquiry.	ST	As Per Enquiry
2	Fuse with enclosure suitable for outdoor installation, wall mounted Per Crane	NO	1 for Each Hoist
3	Trailing flexible copper cable for power supply	MR	To suit for Each Hoist
4	Galvanized link drag chain	MR	To suit for Each Hoist
5	Cable trolley assembly	ST	To suit for Each Hoist
6	Auxiliary girder assembly for trailing cable for a cross travel length	MR	To suit for Each Hoist
7	Rain hood for Hoist motor, cross travel motor and control box per Hoist	ST	1 for Each Hoist
8	Grease gun with grease	NO	1 for Each Hoist
9	10 % lubricant	ST	1 for Each Hoist

2.3 DESIGN & CONSTRUCTIONAL REQUIREMENTS

Construction of Electric wire rope hoists with Trolley shall be of consistent capacity, lift, head room, Hoist & Trolley speed, Travel Length, radius of Travel, Monorail beam size and any other parameters as specified in **Annexure-III** (Hoist Details) and **Annexure-V** (General arrangement layout drawing).

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Note: Vendor has to design Hoist Headroom as minimum as possible. The Hoist Headroom value shall be specified in Vendor technical offer itself.

3.0 CODES AND STANDARDS

The applicable codes and standards are as given below (with latest amendments if any) / equivalent international standards.

3.1.0	Electric wire rope hoist	: IS 3938
3.2.0	Service class	: IS 807
3.3.0	Drum, Sheave	: IS 3938
3.4.0	Gears	: IS 3681,IS 7403
3.5.0	Rope	: IS 2266
3.6.0	Hook	: IS 3815
3.7.0	Bearings	: IS 6455,IS 6457
3.8.0	Grease nipple	: IS 4009
3.9.0	Motor	: IS 325,IS 4691,IS 4729
3.10	Cables	: IS 694 Part I&II,IS 3961 IS 1554,IS 9968,IS 6380
3.11	Structural materials	: IS 2062
3.12	Earthing	: IS 3043
3.13	Colour shade	: IS 5
3.14	AC Contactors	: IS 13947 Part - IV
3.15	HRC Cartridge fuse links upto 650V	: IS 9224
3.16	Heavy duty air brake switches and composite units for air brake switches and fuses for voltage not exceeding 1000V	: IS 4064
3.17	General requirements for switchgear and control gear for voltage not exceeding 1000 V	: IS 4237
3.18	Control switches for voltage upto and including 1000 V AC, 1200 V DC	: IS 6875 (Part-I&II)
3.19	The offered Hoist shall comply with all the latest statuary regulation and safety code/standard applicable. Nothing in this specification shall relieve the vendor of his responsibility.	

4.0 DESIGN REQUIREMENT

The Electric wire rope hoists shall be designed and constructed in accordance with the latest revision of **IS: 3938** and shall be suitable for **Duty class 2.**

Electric wire rope hoists and trolley shall be complete with hoisting and cross travel motor, wire rope drum, wire rope, hook, gear box for CTs hoist wheels with Trolley necessary gearing, sheaves, shoe type electro Mechanical Type brakes with asbestos lining for hoisting & cross travel, guides, weather and dust proof pendent push button station, & control panel, all wiring, 4 core Power cable with Festoon arrangement of feeding power to trolley assembly, galvanised drag (link) chain with complete supporting arrangement, pendent cable, limit switches, earthing terminals and other accessories to make system complete and ready for erection &

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commissioning. The hoist assembly shall be fully balanced. Counter weight, if any, required shall be supplied as a part of the system. Limit switches shall be provided for over hoisting, over lowering and for cross travel limits at both extreme position.

The supplier shall provide 63A fuse switch unit (FSU) with enclosure designed for IP 55 degree of protection, to receive the power supply. The FSU shall be provided with crimping type ATC lug to receive owner's Aluminium unarmoured power cable. The FSU shall be located 5meters away from the hoist. Control supply shall be 110V AC, 50Hz and the same shall be derived from 3ph, 415V, and 50Hz supply provided at 63A FSU. Suitable earthing terminal shall be provided in the FSU enclosure for terminating the earth conductor of the flexible trailing cable. All outdoor Electrical equipment's shall be suitable for IP 55 Degree of protection. Power supply provided for the panels shall be 415V, 3 PH, 3 wire only. Vendor to make suitable transformer arrangement inside the panel for single-phase control supply.

5.0 FEATURES OF CONSTRUCTION (MECHANICAL SYSTEM)

5.1 DRUM

Rope drum shall be either cast/seamless/welded to sustain concentrated loads resulting from the rope pull. Drum shall be machine grooved right or left or both with grooves of a proper shape to suit the ropes used. Drum shall accommodate all the length of the rope required for the lift plus two dead wraps at each anchor point, without over lapping. Each end of the rope shall be anchored to the drum in such a way as the anchorage is readily available for maintenance Each rope shall have two (2) full turns of the drum when the hook is at its lowest position and one (1) spare groove when the hook is at its highest position. The leading rope taken by the drum should not slope sideways when slack and it should not be caught between the gear wheel.

5.2 BOTTOM BLOCK

The bottom block shall be of enclosed type and shall have guard against rope jamming in normal use. It shall have standard forged swivel shank hook fitted on antifriction thrust bearing. Lock to prevent hook from rotation and locking arrangement to prevent accidental unlocking shall be provided. Pulley of the bottom block shall be provided with antifriction bearings.

5.3 SHEAVES

Rope sheaves shall be cast steel, cast steel, or mild steel as suitable for the Duty conditions and shall be confirm the relevant IS. Grooves shall be machined to the proper shape for the rope used. Sheaves shall be equipped with sheave guards to retain the rope in groove. Sheaves shall be fully guarded so that the rope cannot come off.

When the load is supported by more than one fall of the rope off the drum and bottom block are used, the rope system shall be equalized by using equalizing sheaves.

5.4 GEARS

Gears shall be cut from quality alloy steel of chromium, nickel. Pinions shall be of heat treated alloy steel.All gears and pinions shall be of hardened and tempered steel with machine cut teeth in metric modules. Surface hardening of steel is not acceptable.

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5.5 **BEARINGS**

All running shafts and wheels shall be fitted with ball / roller bearings with a rated life not less than 20 years based on equivalent running time as per IS:3938.Bearings shall comply with relevant IS/BS. depending upon the capacity and loading conditions the manufacturer shall design suitable grease lubricated or oil lubricated bearings.

5.6 **ROTATING AND STATIONERY SHAFT**

Shafts and axles shall be of 080 M40 as per BS 970

5.7 **LUBRICATION**

The hoists shall be supplied with all required lubricants, one number grease gun shall be supplied.

5.8 **HOIST ROPE**

Hoist ropes shall be of extra flexible steel rope with a well lubricated and having six strands of 36 wires per strands, pre-formed type, hemp cored, and regular lay construction. The rope shall be of sufficient length so that two full wraps shall remain on the drum at the extreme low position of the hook. Braking loads for the hoist rope shall not be less than six times the calculated load in the ropes at the drum, based on rated load on hook plus the weight of the bottom block plus the weight of the rope. Hoisting rope shall confirm to IS 2266.The rope shall be hot dip galvanized. The rope shall be free from kinks and shall be continuous. **Minimum number of falls of rope shall be four (4)**. Reverse bend of ropes is not acceptable.

5.9 **HOOK**

Swivelling type forged circular shank section Hooks shall be solid, forged, heat treated, high tensile steel of tough construction and shall be provided with a standard depress type safety latch. It shall have swivels and operate on bearings with hardened race. Lock to prevent hooks from unscrewing shall be provided. Hook shall be confirm to the relevant Indian standard.The materials Hooks shall be as per relevant Indian standard.

5.10 **BRAKES**

Hoisting motor and trolley motor shall be equipped with Electro Mechanical type with asbestos lining. The brakes shall apply when either the motor starter or the main power switch is in OFF position or in the event of "power failure". The braking capacity of the brakes shall be 150% of the rating of the hoist.

5.11 **ROPE GUIDE**

Rope guides shall have wear resistant property, prevents slack rope, and retains wire rope in the barrel grooves.

5.12 **TROLLEY WHEELS**

Trolley wheels shall be of single flange type in the taper treads. The wheels shall be mounted on antifriction bearings and shall be easily removable for repair/ replacement.

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5.13 **LINK (DRAG) CHAIN**

Hot dip Galvanised Link (drag) chain shall be provided for the Flexible Trailing cable, to avoid direct loading on the cable.

5.14 **AUXILIARY GIRDER FOR TRAILING CABLE**

Auxiliary girder system shall be provided for the support of Festoon arrangement of feeding power to trolley assembly. The Trolleys for the trailing cable shall be supported by the Auxiliary Girder. The Auxiliary Girder will be supported by the main beam (main beam will be supplied by the Purchaser). The hoist supplier shall provide obligatory support materials to support the Auxiliary Girder on the main beam at an interval not exceeding 750mm. complete structural materials required for Auxiliary Girder system shall be included in the scope of supply of the hoist supplier.

5.15 **MOTOR OPERATED GEARED TROLLEY**

Motor operated geared trolley shall have two (2) pairs of wheels, one pair of which shall be driven through motor. Trolley for cross travel shall be designed to accommodate a wide range of I-beams and shall Trolley shall be capable of travelling on straight as well as curved monorails with the design being such to maintain uniform distribution of pressure on the flanges.

6.0 ELECTRICAL SYSTEM

Electrical system comprises of 63A Fuse Switch Unit/MCB, Control panel, Pendent Push Button Station, Trailing cable, Pendent cable, Hoist & Cross travel motors with electro mechanical brake etc., to make the system complete. All these items are included in the scope of supply of the vendor.

6.1 **CONTROL PANEL**

Control panel shall be provided to house the electrical components like fuses, contactors, over load relays, isolators, switches, control supply transformers etc along with necessary wiring. The components shall be clearly identified by labels. The panel shall be made of sheet steel of minimum 2mm thick CRCA sheet steel and shall be dust and vermin proof, suitable for outdoor condition. The control panel shall be designed for IP 55 degree of protection. Adequate number of DOUBLE COMPRESSION type cable glands (heavy duty) of brass with nickel plating and Annealed Tinned Copper lugs shall be provided with dummy plugs. The door, removable cover plates and metal- to-metal joints shall be fully neoprene gasketted. The control panel shall be wall mounted type & easily approachable from the floor by a standing man.

6.2 **CONTROL SUPPLY TRANSFORMER**

Dry type step down control supply transformer 415V/110V AC shall be provided to derive control supply for starter operation and indication. The transformer shall have minimum class 'B' insulation. The rating of the transformer shall be decided based on maximum power consumption plus **25% margin**. The transformer shall meet IS 12021

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6.3 **MOTOR**

The motor shall meet IS 325 or equivalent international standards. The motor shall be designed for frequent reversal, braking and acceleration. Frequency of reversal shall be minimum 150 times/hour. The motor shall be rated for S4 duty 40% cyclic duration factor. Maximum continuous rating shall have **at least 10% margin** over maximum load demand including voltage and frequency variations, temperature rise and other variations. The body shall have two earthing points on opposite sides. For electric hoists, trolley movement and hoisting shall be effected by using two separate motors.

6.4 **ENCLOSURE**

The motor shall be provided with an enclosure fully meeting the requirements of IP 55 as per IS 4691 meant for outdoor service. In addition rain-hood shall be provided for the motors. The motor shall be Totally Enclosed Fan Cooled (TEFC) type

6.5 **INSULATION AND WINDING**

Motors shall have minimum class "B" type insulation. The winding shall be suitable for successful operation in hot, humid, & tropical climate with the ambient temperature of 50 degree centigrade. The temperature rise shall be limited to 70 degree C (by resistance method) over an ambient of 50 degree C. The insulation shall be given fungicidal and tropical treatment as per IS 3202.

6.6 **MOTOR FRAME**

The frame shall be cast and rigid.

6.7 **DIRECTION OF ROTATION**

The motors shall be designed for both directions of rotation.

6.8 **TERMINAL BOX OF MOTORS**

The terminal box shall be weather and water tight and suitable for outdoor service, having a degree of protection of IP 55.It shall be provided with removable front cover for making connections. Neoprene gaskets at cover joints shall be provided. The terminal box shall be suitable to withstand 31 MVA for 0.25 seconds without damaging the box with fuse protection. Nickel-plated brass double compression cables glands and ATC lugs shall be provided to receive the power cables.

6.9 **VIBRATION**

The motor vibration and noise shall be within the limits specified in IS 12065 and IS 12075. The noise level shall be limited to 85 dB when measured at a distance of 1.5m from the Hoist assembly.

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6.10 **SWITCHES**

Heavy-duty power switches with quick make and brake mechanism meeting relevant IS requirements shall be provided. The switches shall be adequately rated to get complete protection even under abnormal operating conditions.

6.11 **CONTACTOR**

All Contactors shall be suitable for DOL application of full voltage with coils suitable for the control voltage provided by the supplier. Contactor construction shall be rugged and such as to avoid ingress. For control purpose, only Auxiliary contactors shall be used. Relays are not acceptable in place of Auxiliary Contactors. The power contactors shall heave Mechanical interlocking in addition to Electrical interlocking so that at any point of time only any one of the two Power contactors (either Up of Down, Left or Right) will be energized.

6.12 **THERMAL OVER LOAD RELAYS**

Thermal over load relays wherever provided shall be ambient temperature compensated with suitable setting ranges. The relay shall be provided with a door mounted hand reset push button. The O/L relay shall have inbuilt single phasing protection as built-in feature.

6.13 **FUSES**

Only HRC fuses of plug-in type with Class-4 AC duty shall be provided. Fuse base shall be rugged. Adequate shrouding shall be provided for live accessible parts and it shall be possible to replace any fuse without damages of contacts when the circuit is alive.

6.14 **INDICATING LAMPS**

LED type indicating lamps of low watt consumption with suitable built-in series resistor shall be used. LED and lenses shall be inter-changeable and easily replace- able from the front. The indication lamps shall be properly shrouded so as to prevent the dust and water entry. Indicating lamp shall be provided for “Hoist motor ON”,”CT motor ON”, ”Hoist motor TRIP”, ” CT motor TRIP”, “Supply ON” etc.,

6.15 **WIRING**

The control panel wiring shall be complete in all respects and ready for connection of external power for terminating external cables. Necessary cable glands along with suitable terminal blocks and lugs to receive trailing cable and pendent push button cable shall be provided. The cable glands, lugs and terminal blocks shall not be supplied loose. Point to point wiring shall be adopted. Not more than two wires shall be terminated at each terminal. Wiring shall be neatly laid out and bunched together suitably. The wiring shall be done with min. 2.5 sq.mm multistranded copper, PVC insulated 650V/1100V wires.

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6.16 **TERMINATION**

All power and control wires shall be terminated on terminal block/component using crimping type tinned copper lugs/connectors.

Terminal block shall be used for control wiring. The terminal blocks shall be complete with insulated barriers, terminal studs, washers, nuts, lock nuts and identification strips with terminal numbering.

6.17 **PENDANT PUSH BUTTON STATION**

Pendant shall be provided with flourscent up, down, forward, reverse travel & Emergency stop push buttons. The Emergency Pus Button shall be Lockable type. Its power supply shall be limited to 24V AC.The Pendant Push Button station shall have the following LED type Indicating lamps. SUPPLY ON, HOIST MOTOR ON, CT MOTOR ON, HOIST MOTOR TRIP, CT MOTOR TRIP, EMEGENCY STOP.

The Pendant Push Button station shall be supported from the Control Panel with hot dip galvanized Link Chain.The Pendant Push Button Station shall be connected to the Control Panel using multi-core copper flexible control cable of 10m length.The Enclosure of Pendant Push button station shall be designed for IP 55 degree of protection.Push button shall be spring return type with 2NO+2NC self reset contacts rated for 5A at 415 volts AC.The push buttons for different operations like "HOIST/ LOWER, FORWARD/ REVERSE", "STOP" shall have different colours. All push buttons shall be as per relevant Indian standard. The Push button shall be properly shrouded so as to prevent water & dust entry.

6.18 **LIMIT SWITCHES:**

Limit switches shall be provided for over hoisting, over lowering, extreme left and extreme right positions. Necessary Limit switch actuating arrangement shall be provided to actuate the limit switch at the above positions. The Limit switches shall have enclosures designed for IP 55 degree of protection. Proximity switches are not acceptable in place of Limit switches.

6.19 **FUSE SWITCH UNIT**

Metal enclosed, FOUR/THREE POLE as suitable fuse switch unit (SFU) of 63A, 415V, AC, rating suitable for indoor location shall be provided. Suitable Nickel-Chromium plated brass DOUBLE COMPRESSION glands and crimp type ATC lugs to receive purchaser's 3c-6 sq. mm AL unarmoured FRLS cable & vendor's 4C-4 sqmm copper unarmoured cable shall be provided. Cable glands and lugs shall also be provided for the flexible trailing cable. The FSU shall be provided with 2 Nos of earthing terminals with M12 screws, nuts and washers. FSU with enclosure suitable for outdoor installation, **Wall mounted.**

6.20 **CABLES**

The trailing cable shall be 1100 V grade extra flexible having 4 cores and as per IS 9968. The trailing flexible cable shall carry the power supply to the Hoist from the Switch Fuse unit. The conductor cross section shall be minimum 4 sq.mm multi- stranded tinned copper of class 5 of IS

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8130. The insulation shall be heat resistant elastomeric compound based on ETHYLENE PROPYLENE RUBBER **(EPR)** with continuous withstanding temperature of 90 Deg C The inner sheath shall be heat resistant elastomeric compound with black colour. The outer sheath shall be marked with cable size, voltage grade by embossing, sequential marking at every one meter of length by embossing.

The power cables between HOIST / CT MOTORS to control box, the pendent cable and other control cables shall be as per IS 1554. The conductor shall be multi- stranded PLAIN ANNEALED copper with minimum cross section of 1.5 sqmm for control. The insulation shall be extruded PVC. The inner sheath shall be extruded PVC and the outer sheath shall be extruded-PVC. In addition, the outer sheath shall be marked with cable size, voltage grade, the word FRLS at every 5 meters and sequential marking of length at every one meter. The sheath shall be black in colour. Power cable supports shall be festoon type arrangement.

7.0 EARTHING

The structure, motor frames and enclosures of electrical equipment shall be effectively connected to earth complying with Indian Electricity rules and IS 3043. The earthing materials from hoist to FSU shall be in supplier's scope. BHEL will provide the earthing material from the Switch Fuse Unit to the nearest Earth Grid. Any other Items/components other than specified above, which are required for proper functioning of the Hoist are also part of the vendor Scope of Supply.

8.0 MAKE OF COMPONENTS:

Only one of the following makes shall be used. Mix up of make for same item is not acceptable. Any deviation with respect to the makes given below is not acceptable.

Sl No.	Components	Make
1.	Hoist/Cross travel motor	AUTOLEC/SIEMENS/KEC/NGEF/ABB/CROMPTON GREAVES /BHARAT BIJLEE
2.	Cable	INCAB/CCI/DELTON/FORT/GLOSTER/UNIVERSAL CABLES / ASIAN CABLES/ NICCO
3.	Fuse switch unit/MCB	L&T / SIEMENS / CONTROLS & SWITCHGEAR (STROMBERG) /GE//SCHNEIDER/SPACEAGE SWITCHGEAR/CGL/ABB
4.	Power switch	L&T/ SIEMENS/CONTROLS & SWITCHGEAR/ SCHNEIDER/GE
5.	Power contactor	L&T/SIEMENS/TELEMECHANIQUE/BCH/GE
6.	Auxiliary contactor	L&T/SIEMENS/TELEMECHANIQUE/BCH/GE
7.	Thermal overload relay	L&T/SIEMENS/TELEMECHNIQUE/BCH/GE
8.	Fuse	L&T/SIEMENS/GE/CONTROLS&SWITCHGEAR/BUSMANN/GE
9.	Push button	L&T/SIEMENS/TEKNIC/BCH/CONTROLS&SWITCHGEAR/TELEMECHANIQUE/GE
10.	LED type Indicating lamp	L&T/SIEMENS/BCH/TEKNIC/RASS CONTROLS/GE
11.	Internal wiring	BIS (IS) CERTIFIED MAKE
12.	Glands	COMET/SUNIL&CO/QUALITYPRECISION/BRACCO/ARUP ENGINEERING.
13.	Lugs	DOWELLS/3D

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14.	Terminal block	ELMEX/TOSHA/CONNECTWELL/WAGO/PHOENIX
15.	Control switch	L&T/SIEMENS/KAYCEE/CONTROLS&SWITCHGEAR/SCHNEIDER/GE
16.	Selector switch	L&T/ SIEMENS/KAYCEE/GE
17.	Fuse carriers	L&T/SIEMENS/GE/CONTROLS&SWITCHGEAR/BUSMANN
18.	Auxiliary transformer	AE/KAPPA/INDCOIL/LOGICSTAT/PRECISE/ SOUTHERNELECTRICAL/STATIC TRANSFORMER/G&M
19.	Limit switches	SIEMENS/BCH/JAI BALAJI
20.	Neutral link	L&T/SIEMENS/GE/SCHENIDER/CONTROLS & SWITCHGEAR
21.	Hoist Brake	BCH/L&T/ SIEMENS / NTPC APPROVED
22.	Cross Travel Brake	EMCO/PRETHE / NTPC APPROVED
23.	WIRE ROPE	USHA MARTIN/ BHARAT WIRE ROPES / MAYUR / ARADHYA
24.	Limit Switch	BCH/JAI BALAJI/SIEMENS/KAYCEE
25.	Bearings	SKF/FAG

Make of various components for NTPC projects are subject to NTPC approval. No additional delivery or price implication is acceptable due to NTPC comment on make of components. Mix up of make for same item is not acceptable in any enquiry.

9.0 PAINTING PROCEDURE:

For Painting of Hoist Refer **ANNEXURE-IV.**

PAINTING OF CONTROL PANELS:

(The below details are Tentative, Final details will be given in during drawing approval stage)

1) Surface treatment with minimum seven tank process.
2) Panel 2 coats of synthetic Enamel paint.
3) Shade- Siemens Grey.
4) The minimum coating thickness of power coated surfaces shall be minimum of 80 microns.

Paint shade shall be as per RAL 5012 (Blue) for Motor.

10.0 WARRANTY:

The warranty period shall be twenty four (24) months from the date of Supply or eighteen (18) months from the date of commissioning, whichever earlier.

11.0 START UP & COMMISSIONING SPARES:

Start-up & Commissioning Spares shall be part of the main supply of the EWRH. Start-up & commissioning spares are those spares, which may be required during the start- up, and commissioning of the equipment/system. Bidder shall provide an adequate stock of such start up and commissioning spares to be brought by him to the site for the equipment erection and commissioning. The spares must be available at site before the equipment's are energized.

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Items/comenponets belong to a HOIST shall be send to site in a single packing as far as possible or traceable identical number mark needs to mention in sub-assembly /sub parts.

FIRST FILL OF CONSUMABLES:

Bidder's scope shall also include supply and filling of all chemicals, reagents, resins, lubricants, grease, filters and consumable items for operation up to COD including top up requirements at the time of issuance of PAC/declaration of COD. All lubricants proposed for the plant operation shall be suitable for all operating and environmental conditions that will be met on site consistent with good maintenance procedures as instructed in the maintenance manuals. First fill of consumable shall be part of the main supply.

RECOMENDATED SPARE

The Bidder shall offer electrical / electronic / mechanical spares for 2 years trouble free operation of the Electric wire rope Hoists. (Unit Price along with quantity of each item of spare shall be offered in the price bid)

12.0 Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of EWRH will be done by owner as per vendor's Erection Manual and check List.
Supervision of Erection and Commissioning of the EWRH at project site is in bidder's scope. Bidder shall include towards supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs. TA/DA, boarding and lodging shall be borne by the bidder and shall be inclusive in supply portion.

However, refer the **ANNEXURE- II** for complete supervision of Erection, testing and Commissioning EWRH.
The charges quoted for the supervision will be considered for L1 evaluation. However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

13.0 DOCUMENTS TO BE SUBMITTED DURING BID STAGE

Along with the offer

1. Clause by clause confirmation for this Technical specification.
2. In case, Deviations are considered essential by the Bidder (after exhausting all possible efforts), the same shall be separately listed, to be spelt out clearly in **Annexure-I.**
3. Typical GA of HOIST with BOM for the system.
4. Rating of cross travel and hoist motor.
5. Headroom of Hoist.

The bidders are instructed not to submit bidders' own technical specification and any other technical details.

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14.0 DOCUMENTS TO BE FURNISHED ON PLACEMENT OF ORDER:

Immediately on placement of order, the supplier shall submit the following Documents to BHEL for approval. Manufacturing shall be initiated only after obtaining approval from BHEL.

1. General Arrangement drawing of Hoist, Cross Travel arrangement, Auxiliary Girder & Trailing cable system, Control Panel, Pendant Push button station etc.
2. Bill of materials for the Hoist, Cross travel arrangement, Auxiliary Girder System, all cables under the scope etc.
3. Calculation for Factor of safety on selection of Steel wire rope.
4. Power and Control scheme.
5. Bill of material indicating description of the item, rating, make, quantity, type reference etc., for a) Panel mounted components, b) Pendent mounted components, c) Items covered in the system like trailing cable, trolley etc.,the make of components shall be separate and form part of vendor QP.
6. Hoist mounting arrangement.
7. Gasketting and locking arrangement of Control panel.
8. Justification for a) Motor rating selected, b) Rope selected, c) VA rating of control transformer.
9. List of items mounted in the assembly and list of loose item supplied along with weight.
10. Packing drawings.
11. Data sheet for Hoist, Data sheet for Hoist & cross travel motor, Data sheet for Brake and Data sheet for trailing & pendent cable.
12. Cable schedule for hoist indicating size, termination between which equipment, Rating, quantity, make etc.
13. Shipping list indicating items, quantity, and weight and package number to be submitted before inspection call is given. Despatch shall be maintained in line With the shipping list.
14. All the drawings shall be prepared in AutoCAD. After final approval the above documents shall be submitted in CD apart from hard copy.
15. The drawings and data sheets shall be submitted in soft media.pdf format, apart from 6 sets from hard copy. For BHEL approval.

15.0 INSEPCTION:

The inspection will be carried out based on the following documents.

1. BHEL Purchase order
2. BHEL Technical specification
3. Quality plan, Quality checklist indicated in the Enquiry.

Bidder sign & seal:

4. BHEL approved supplier drawing/data sheets.

16.0 O&M MANUAL:

O&M instruction manual in the required quantity as in enquiry shall be supplied directly to BHEL Ranipet in required numbers as per enquiry immediately after the despatch of the hoist. Instruction manual shall be submitted in soft media apart from hard copies. Hard copy of the O&M manual shall be sent along with the hoist. Ten (10) hard copies and five (05) sets of electronic copies of all documents are to be submitted in the English language.

The O&M manual shall include but not limited to the following.

1. Dos & Don'ts during receipt, storage, erection & commissioning.
2. Instruction to be followed on receipt, storage & erection.
3. Construction details of the hoist assembly.
4. Drawing indicating various parts of EOH assembly with part numbers.
5. Recommended lubrication & maintenance schedule.
6. Cut view drawing for the Gear box assembly.
7. As built drawings, BOM, cable schedule.
8. Disposal procedure for environmental hazardous material if any.

17.0 PACKING AND FORWARDING:

The ELECTRICAL HOIST and accessories shall be properly packed to avoid damage during transit & storage. Wooden crate (fumigated) shall be covered with GI sheet of minimum 1mm thickness and same shall be used for packing various equipment / items as per shipping list. Lining with plastic sheet (water Proof) shall be provided inside the crate to avoid water entry during transit / storage. Two sets of manual (hard copies) with drawing & data sheet shall be sent along with the packing box. Each packing shall be accompanied with packing slip & all relevant drawings.
Each package or shipping units shall be clearly marked or stenciled on at least two sides –

NTPC SITE (ADDRESS AS PER ENQUIRY), PO number, Supplier name. In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.

Items/comenponets belong to a HOIST shall be send to site in a single packing as far as possible or traceable identical number mark needs to mention in sub-assembly /sub parts.

18.0 NAME PLATE

The name plate shall be non-corrosive material (metallic) indicating manufacturer's name, serial number, rating, capacity type. Name plate to be written in English. Equipment identification number to be mentioned in the name plate. Hoists shall have permanent inscription in English on each side readily recognizable from floor level stating safe working load.

19.0 MARKING

As per IS 3938 latest.

Bidder sign & seal:

20.0 ANNEXURES

ANNEXURE-I

LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT

Sl No	Clause No	Page No	Description of Deviation

Note: Enlarge the table to incorporate items

SIGNATURE OF BIDDER ----------

NAME ----------

DESIGNATION ----------

Bidder sign & seal:

		Bidders Acceptance / Comments
ANNEXURE - II Supervision of erection, testing and commissioning	Refer Enclosed specification.	
ANNEXURE - III HOIST details	Refer Enclosed specification.	
ANNEXURE - IV Painting of Hoist	Refer Enclosed specification.	
ANNEXURE - V General Arrangement layout Drawing	Refer Enclosed specification.	

SIGNATURE OF BIDDER ----------

NAME ----------

DESIGNATION ----------

Bidder sign & seal:

ANNEXURE-II

SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of ELECTRIC WIRE ROPE HOIST (EWRH) will be done by owner as per vendor's Erection Manual and check List.

However, the Bidder/vendor shall make visit for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

The Bidder/vendor have to make two numbers of visit for the supervision erection & commissioning, testing for **Each electric Hoist** – 1st visit for the supervision of erection & 2nd Visit for pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply for each Electric Hoist

SL NO	DESCRIPTION	QUANTITY (SET)
1	SUPERVISION OF ERECTION OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT BHILAI SITE AS FRIST VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.
2	SUPERVISION OF COMMISSIONING, INSPECTION AND TESTING OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT BHILAI SITE AS SECOND VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.

Vendor shall quotes charges for **complete work for supervision** for erection & commissioning, testing for each Electric Hoist.

Travel charges (visa/passport, all the to/fro travel charges to the site), TA/DA, boarding and lodging shall be borne by the bidder and shall be **inclusive in above supervision charges** portion for complete work for supervision for erection & commissioning, testing for each Electric Hoist.

The charges quoted for the supervision will be considered for L1 evaluation.
However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

Annex Bhilai

ANNEXURE - III

ELECTRIC WIRE ROPE HOIST (EWRH) WITH MOTOR DRIVEN TROLLEY — PROJECT: BHILAI FGO PROJECT

SL NO	AREA	TYPE OF HOIST	CAPACITY OF HOIST	MAXIMUM SPEED		HOIST MONORAIL BEAM BOTTOM ELEVATIONS (Hoist Monorail BEAM in BHEL Scope)	FLOOR LEVEL	TRAVEL LENGTH	PATH	MINIMUM RAOIUS OF TRAVEL	HOIST MONORAIL I-BEAM (Hoist Monorail BEAM in BHEL Scope)	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK - HOIST HEAD ROOM - VENDOR TO SPECIFY	TOTAL QNTY
				HOSTING	CROSS TRAVEL									
			TON	METER PER MINUTE	METER PER MINUTE	(EL (+/-) IN METER)	(EL (+/-) IN METER)	(METER)	CURVED / STRAIGHT	(MM)	NPB / UB /ISMC/ISMB	(MM)	(MM)	(SET)
A. ABSORBER														
1	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +9.700M	EL. -0.5M	16M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
2	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +15.780M	EL. -0.5M	16M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
3	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC WIRE ROPE	2	6	15	EL. +6.600M	EL. -0.5M	6.5M	STRAIGHT	N/A	ISMB300	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
B. BOOSTER FAN & MOTOR														
4	BUF MOTOR	ELECTRIC WIRE ROPE	10	6	15	EL. +9.650M	EL. -0.5M	29M	STRAIGHT	N/A	*MRB-M	1800	1800	As per Enquiry
5	BUF FAN HOUSING	ELECTRIC WIRE ROPE	6	6	15	EL. +11.910M	EL. -0.5M	29M	STRAIGHT	N/A	*MRB-F	1500	1500	As per Enquiry

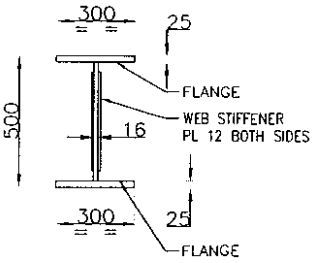
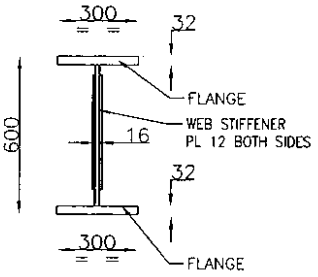
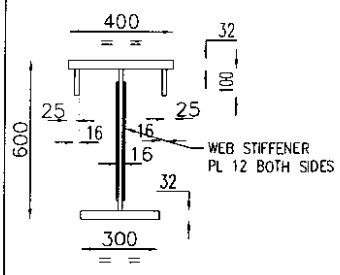
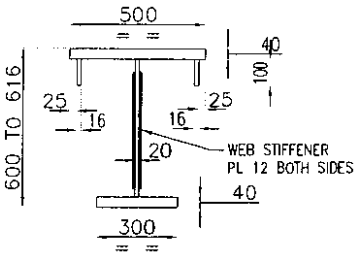
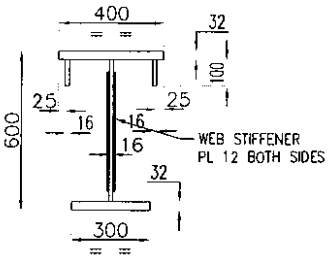
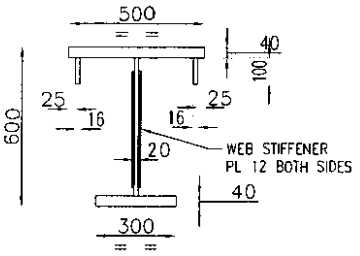
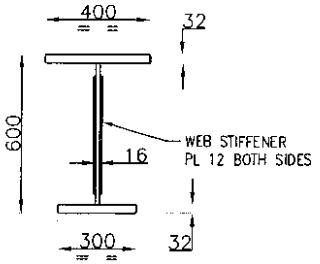
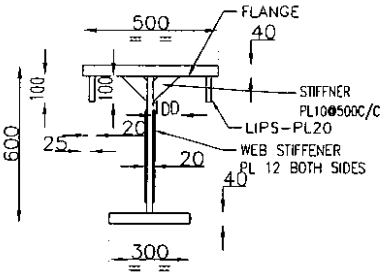
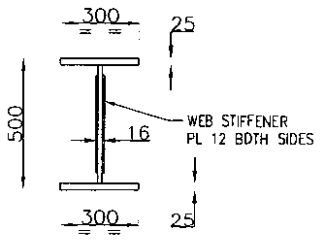
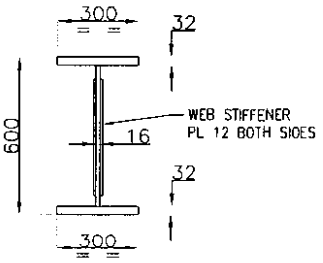
NOTE : 1) Depending upon Hoist head room , the actual height of lift for hoist shall be arrived.
2) * For MRB- M & MRB- F details, Refer below attachement. Next to this page.
3) Vendor to specify the Hoist head Room during Tender stage.

Annex Bhilai

Annex Bhilai

BUF HANDLING MONORAIL BEAM SIZES

05.08.2022

KORBA FGD UNIT	CUT NO	MRB-F (FOR FAN MAINT.) CROSS SECTION	MRB-M (FOR MOTOR MAINT.) CROSS SECTION
NSPCL BHILAI (2X250MW)	G211 G212	 (SWL 06 TOS)	 (SWL 10 TOS)
NTPC RAMAGUNDAM ST-I (3X200MW)	G208	 (SWL 13 TOS)	 (SWL 22 TOS)
NTPC RAMAGUNDAM ST-II (3X500MW)	G509 G510 G511	 (SWL 10 TOS)	 (SWL 20 TOS)
NPGCL NABINAGAR (3X660MW)	G609 G610 G611	 (SWL 13 TOS)	 (SWL 23 TOS)
BRBCL NABINAGAR (4X250MW)	G201 G202 G203 G204	 (SWL 8 TOS)	 (SWL 14 TOS)

Annex Bhilai

Annex Bhilai

SWL : SAFE WORKING LOAD – THIS IS THE LOAD FOR WHICH MONORAIL BEAMS ARE DESIGNED FOR.

BHEL	**BHEL, Ranipet - 632 406, India.** **Quality Assurance Department.** **Painting Scheme**	BHEL DOC No: **PS:BHIL:FGD:G211** Rev: **04** Dt: **10/12/2020** **NTPC Contract No: CC/CC&M-C-568-FC-NOA/141 Dt: 26/08/2019** **NTPC Doc No: 9993-109-PVM-H-001 Rev: 04 Dt: 10/12/2020**
Project	**FGD Package for NSPCL - BHILAI Expansion Power Project (2x250 MW) - BHEL Cust Nos: G211-G212**	

Sl No	Surface Location	PGMA	Surface Preparation	Primer & Intermediate Coats		Finish Coat		Total DFT (µm min)
				Paint	DFT (µm min)	Paint	DFT(µm min)	
	(Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)			**Intermediate:** One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	100	2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)		
14 ○ △	Slurry pumps & accessories, Water pumps **(Clause 7.05.00 of Section-VI, Part-B, Sub-Section-I-M5)**	FW701, FW702	Power Tool Cleaning to St3 (SSPC-SP3)	**Primer:** Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) DFT- 30µ / Coat; **Intermediate:** One coat of Synthetic Enamel intermediate coat to IS 2932; DFT- 50µ	60 50	Two coats of Synthetic Enamel to IS 2932, DFT- 50µ/ coat **Shade:** Light blue RAL 5012	100	210
15 ○	Handling Equipment- Hoists& Man hole door **(Clause 20.03.00 of Part- C Section VI)**	FW713, FW714, FW717	Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats;DFT per coat-30micron)	60	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	120
				Idler roller shall be applied with two coats of 70 microns at shop	140	--	--	140
16 ○	Limestone Silo- Inside surfaces (Conical portion) (For temporary protection, until erection only)	FW731	Blast cleaning to Sa 2½ (Near white metal) with surface profile 35-50µm conforming to ISO 8501-1	**Primer:** Two coats of Red Oxide Zinc phosphate primer to IS: 12744 (SS lining is inside the Limestone silo conical portion, hence primer is only envisaged; SS lining will be done at shops itself)	60	NIL	--	60
17 ○ △	Limestone Silo- Inside surfaces (Cylindrical portion) (For temporary protection, until erection only)	FW731	Blast cleaning to Sa 2½ (Near white metal) with surface profile 40-60µm conforming to ISO 8501-1	**Primer Coat:** One coat of two component moisture curing Inorganic Ethyl Zinc Silicate Primer to IS 14946, (Solid by volume- 60% (min)), (Metallic zinc content 80% (min)) DFT = 70 µm per coat (min.) Zinc dust composition shall be Type-II as per ASTM D520-00	70	--	--	70

Annex Bhilai

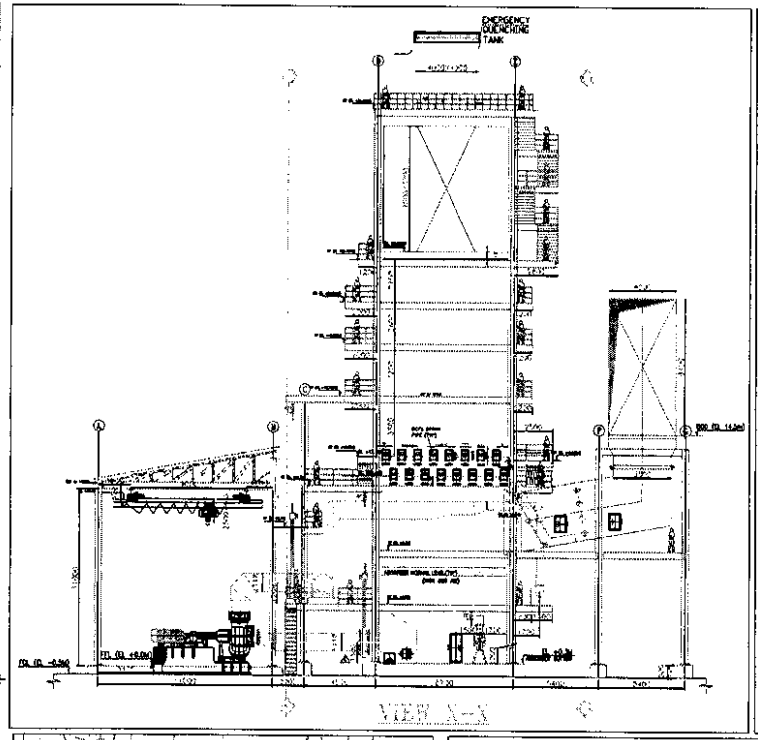
	BHEL, Ranipet - 632 406, India. Quality Assurance Department. Painting Scheme	BHEL DOC No: PS:BHIL:FGD:G211 Rev: 04 Dt: 10/12/2020 NTPC Contract No: CC/CC&M-C-568-FC-NOA/141 Dt: 26/08/2019 NTPC Doc No: 9993-109-PVM-H-001 Rev: 04 Dt: 10/12/2020
Project	FGD Package for NSPCL - BHILAI Expansion Power Project (2x250 MW) - BHEL Cust Nos: G211-G212	

Sl No	Surface Location	PGMA	Surface Preparation	Primer & Intermediate Coats		Finish Coat		Total DFT (µm min)
				Paint	DFT (µm min)	Paint	DFT(µm min)	

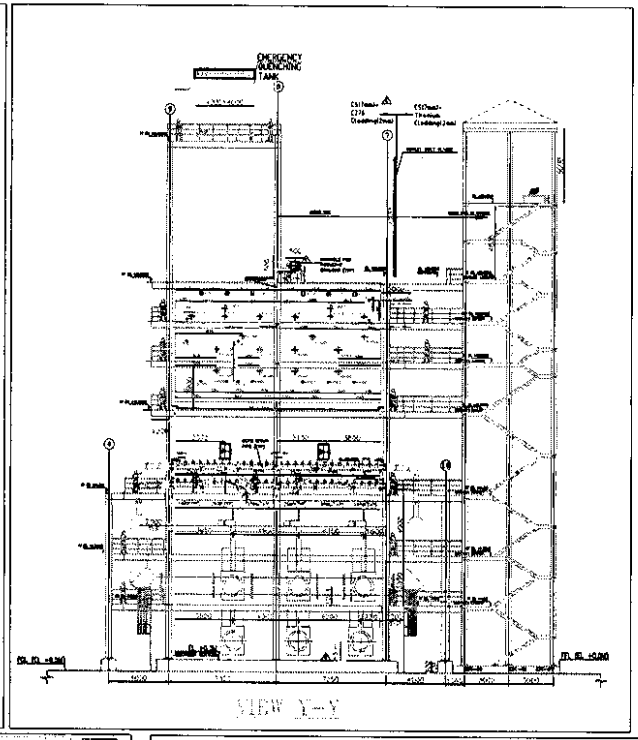
General Notes:

1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil.
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., Agitator / slide bearing and other sub-delivery components etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used, very minor items like clamps, small items etc.- Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed and painting under Sl no:01 of Fans shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipment, fans, piping, pipe services, supporting structures and other components is followed as per NTPC doc no: QS-01-DIV-W-4 at site.
6. All components covered under different PGMAs are to be painted. In case any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
8. Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
9. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
10. Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
11. Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
12. For the portion of steel surfaces embedded in concrete, the surface shall be prepared by Manual cleaning and provided with Primer coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron DFT.

Annex Bhilai



VIEW X-X



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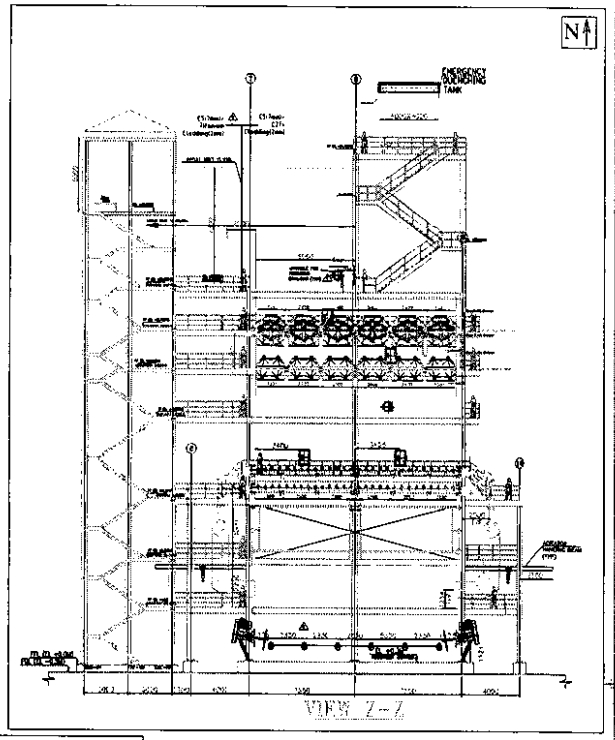

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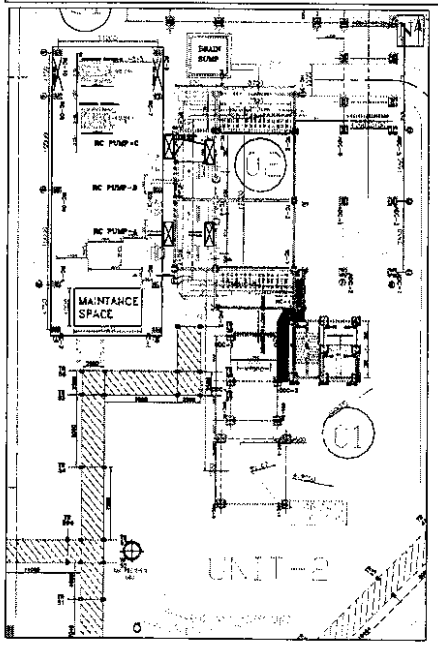
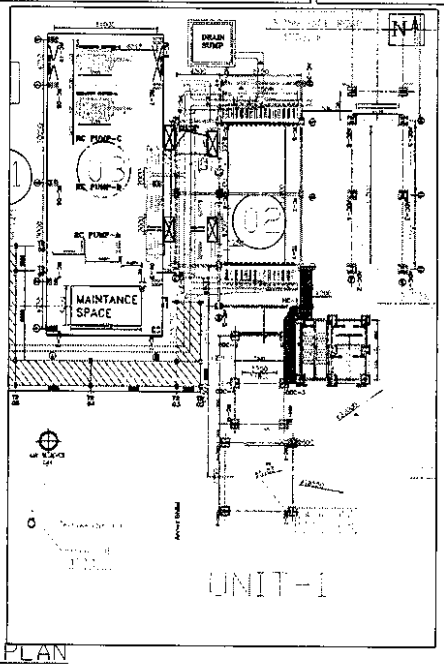
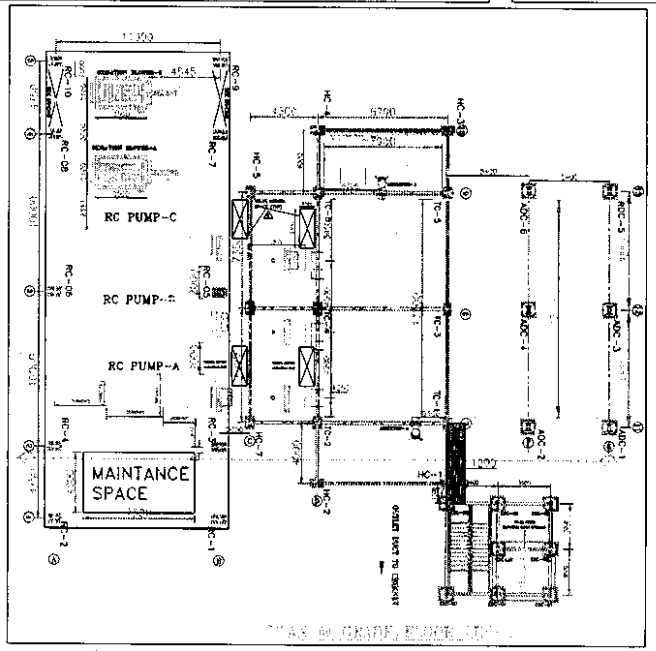


UNIT-2



UNIT-1

KEY PLAN



PLAN @ GRADE FLOOR LEVEL

LEGEND:-

FFL : FINISHED FLOOR LEVEL
FGL : FINISHED GROUND LEVEL

REF. DWGS

1. 9993-109-PVM-F-020 : FGD PLANT LAYOUT

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE IS MENTIONED.
2. EL(+) 0.000 CORRESPONDS TO RL(+)294.5 M.
3. FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA SHALL BE RL(+)294.0 M i.e. EL(-)0.500M.
4. PIPING INDICATED FOR REFERENCE ONLY.PIPING LAYOUT TO BE REFERRED FOR EXACT DETAILS OF PIPING.
5. INDICATED DETAILS OF RC PUMP & OXIDATION BLOWERS ARE TENTATIVE AND MAY CHANGE BASED ON ACTUAL DATA FROM VENDORS.
6. INDICATED ORIENTATION OF COLUMNS,COLUMN/BEAM SIZES ARE SUGGESTIVE ONLY,FOR EXACT ORIENTATION REFER STRUCTURAL DRAWINGS.

ANNEXURE-II

SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of ELECTRIC WIRE ROPE HOIST (EWRH) will be done by owner as per vendor's Erection Manual and check List.

However, the Bidder/vendor shall make visit for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

The Bidder/vendor have to make two numbers of visit for the supervision erection & commissioning, testing for **Each electric Hoist** – 1st visit for the supervision of erection & 2nd Visit for pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply for each Electric Hoist

SL NO	DESCRIPTION	QUANTITY (SET)
1	SUPERVISION OF ERECTION OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT NORTH KARANPURA SITE AS FRIST VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.
2	SUPERVISION OF COMMISSIONING, INSPECTION AND TESTING OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT NORTH KARANPURA SITE AS SECOND VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.

Vendor shall quotes charges for **complete work for supervision** for erection & commissioning, testing for each Electric Hoist.

Travel charges (visa/passport, all the to/fro travel charges to the site), TA/DA, boarding and lodging shall be borne by the bidder and shall be **inclusive in above supervision charges** portion for complete work for supervision for erection & commissioning, testing for each Electric Hoist.

The charges quoted for the supervision will be considered for L1 evaluation.
However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

Annex NKP

ANNEXURE - III HOIST details

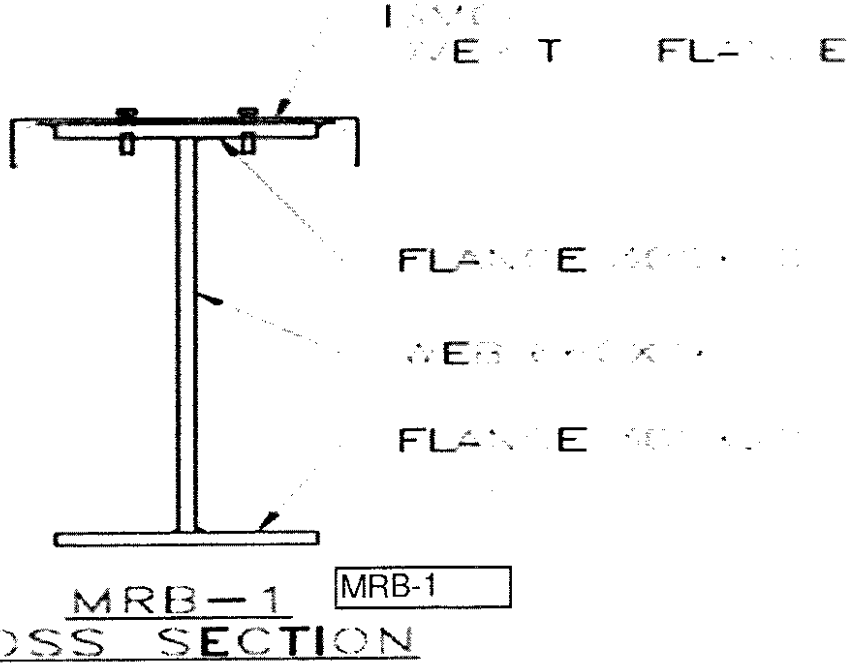
ELECTRIC WIRE ROPE HOIST (EWRH) WITH MOTOR DRIVEN TROLLEY										PROJECT:	NORTH KARANPURA	FGO PROJECT		
SL NO	AREA	TYPE OF HOIST	CAPACITY OF HOIST	MAXIMUM SPEED		HOIST MONO-RAIL I BEAM BOTTOM ELEVATIONS (Hoist Monorail BEAM in BHEL Scope)	FLOOR LEVEL	TRAVEL LENGTH	PATH	MINIMUM RADIUS OF TRAVEL	HOIST MONORAIL I-BEAM (Hoist Monorail BEAM in BHEL Scope)	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK - HOIST HEAO ROOM - VENDOR TO SPECIFY	TOTAL QNTY
				HOSTING	CROSS TRAVEL									
			TON	METER PER MINUTE	METER PER MINUTE	(EL (+/-) IN METER)	(EL (+/-) IN METER)	(METER)	CURVED / STRAIGHT	(MM)	NPB / UB /ISMC/ISMB	(MM)	(MM)	(SET)
A. GYPSUM DEWATERING BUILDING														
1	VACUUM PUMP	ELECTRIC	12	6	15	EL (+) 17.95M	EL (+) 5.5M	88	CURVED	5750	**NPB 600X220X122.45 - Tentatiue	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
2	VACUUM BELT FILTER	ELECTRIC	10	6	15	EL (+) 30.2M	EL (+) 5.0M	117	CURVED	4339	**NPB 600X220X122.45 - Tentative	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
B. BALL MILL BUILDING														
3	BALL MILL INNER	ELECTRIC	12	6	15	EL (+) 20.16M	EL (+) 4.5M	58	CURVED	4944	MB600+250X8 Detail For Refer attached Framing plan of beam drg.	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
4	BALL MILL OUTER	ELECTRIC	17.5	6	15	EL (+) 20.16M	EL (+) 4.5M	72	CURVED	4911		As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
C. ABSORBER														
5	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC	5	6	15	EL (+) 16.4M	EL (+) 4.5M	27	STRAIGHT	NA	NPB 600X 220X122.4 + CAPPING ISMC 400	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
6	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC	5	6	15	EL (+) 21.88M	EL (+) 4.5M	29	STRAIGHT	NA	NPB 600X 220X122.4 + CAPPING ISMC 400	As minimum as possible.- Vendor to specify Actaul ualue,	_____	As per Enquiry
7	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC	3	6	15	EL (+) 8.5M	EL (+) 4.5M	3	STRAIGHT	NA	ISM8 300	As minimum as possible.- Vendor to specify Actaul ualue,	_____	As per Enquiry
D. BOOSTER FAN & MOTOR														
8	BUF MOTOR	ELECTRIC	20	6	15	EL (+)13.594 M	EL (+) 2.50M	35	STRAIGHT	NA	*MRB 2	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
9	BUF FAN HOUSING	ELECTRIC	12	6	15	EL (+)16.944 M	EL (+) 2.50M	35	STRAIGHT	NA	*MR8 1	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
E. TANKS (BHEL SUPPLIED)														
10	LSST A&B (TANK)	ELECTRIC	3	6	15	EL (+) 36 M	EL (+) 4 M	35	STRAIGHT	NA	UB 305X165X46	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
11	AAT (TANK)	ELECTRIC	2	6	15	EL (+) 31 M	EL (+) 4 M	14	STRAIGHT	NA	UB 305X165X46	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry

NOTE : 1) Oepending upon Hoist head room , the actual height of lift for hoist shall be arrived.
2) * For MRB- 1 & 2 details, Refer below attachement. **Next to this page.** & ** are Tentative.

MONORAIL BEAM SIZE FOR BOOSTER FAN & MOTOR - MRB-1 & MRB-2

MONORAIL Size (in BHEL scope) for Booster Fan & Motor handling for NKP, BARH –I &II PROJRCT

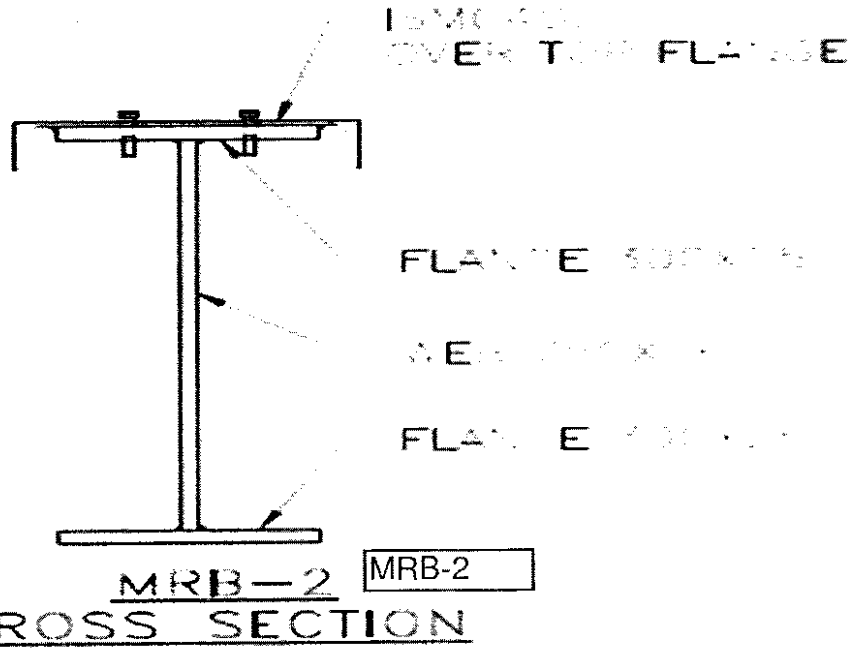
Vendor to confirm the beam size as per their design.



MRB-1

MRB—1

CROSS SECTION



MRB-2

MRB—2

CROSS SECTION

Annex NKP

Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

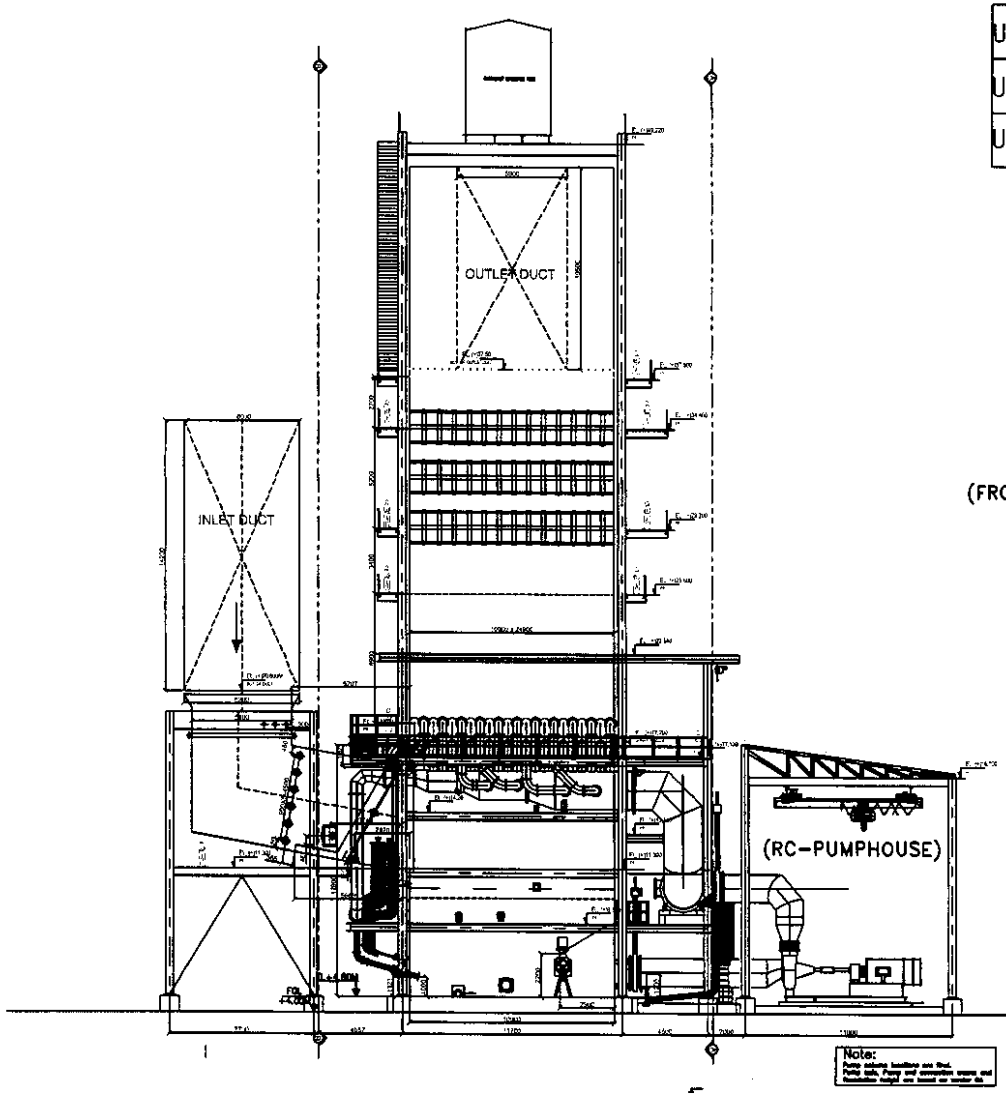
ANNEXURE - IV Painting of Hoist

30	Handling Equipment-Hoists& Man hole door **(Clause 20.03.00 of Part-C Section VI)**	FW 713 FW 714 FW 717	Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130

Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

GENERAL NOTES

1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., Agitator/ slide bearing and other sub-delivery components etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used, very minor items like clamps, small items etc - Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed and painting under Sl no:01 of Fans shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipments, fans, piping, pipe services, supporting structures and other components is followed as per NTPC doc no: QS-01-DIV-W-4 at site.
6. All components covered under different PGMAs are to be painted. Incase any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
8. Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
9. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
10. Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
11. Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
12. For the portion of steel surfaces embedded in concrete, the surface shall be prepared by Manual cleaning and provided with Primer coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron DFT.



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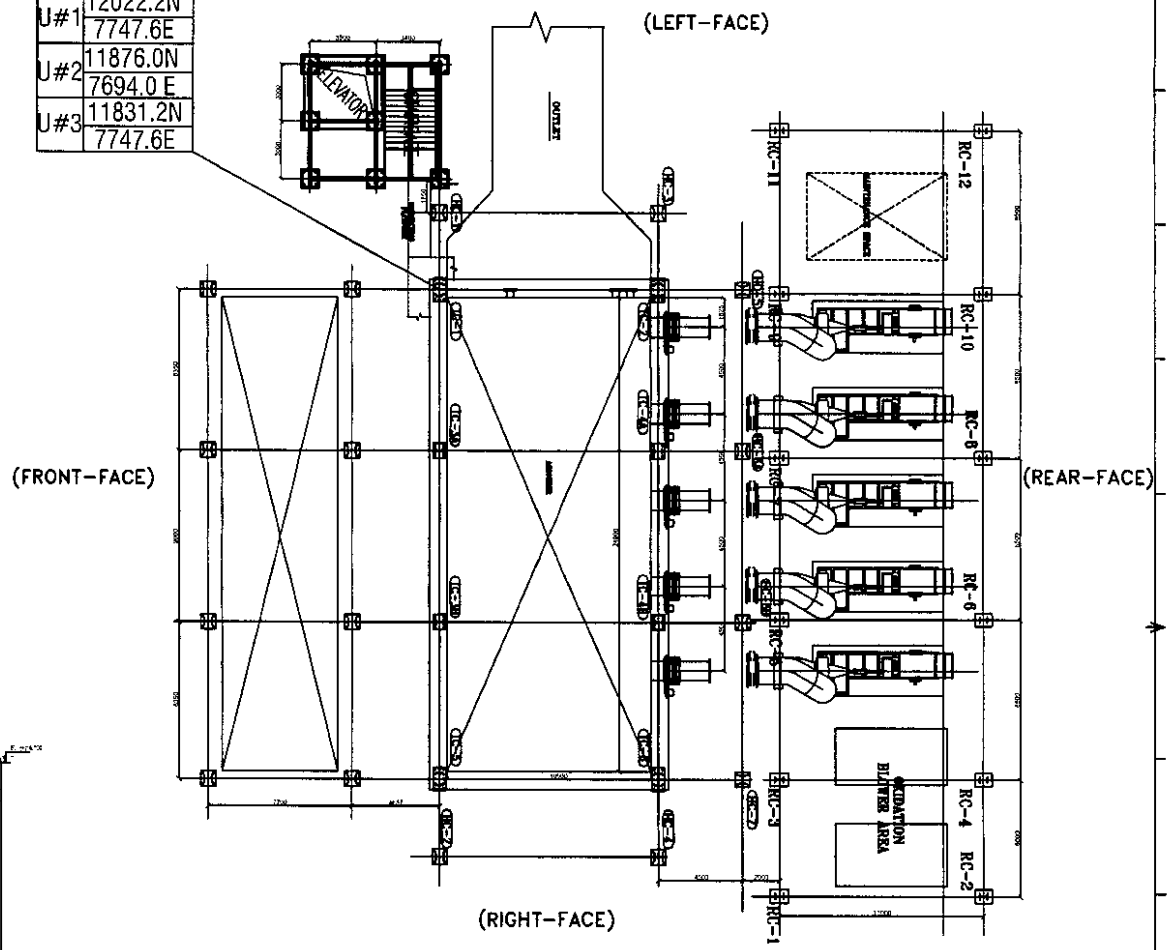
U#2	11876.0N 7694.0 E
U#3	11831.2N 7747.6E



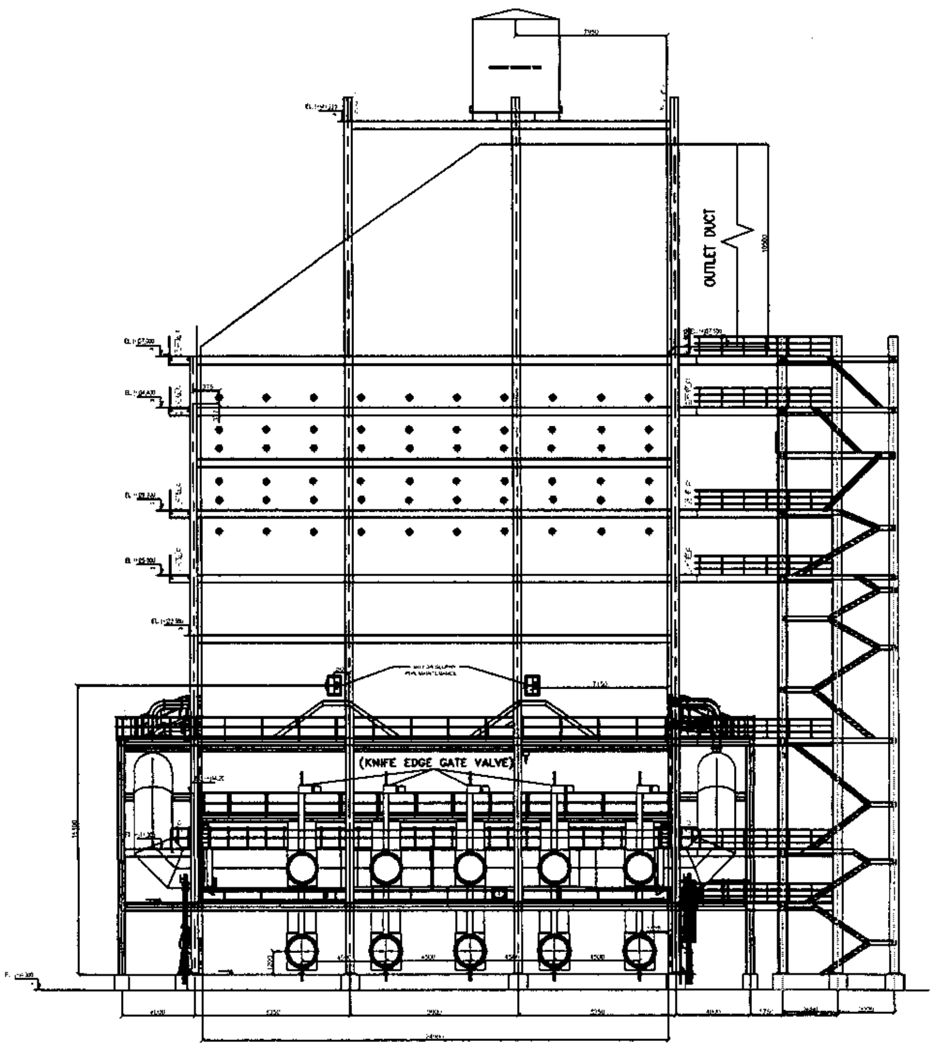
PLAN

Annex NKP

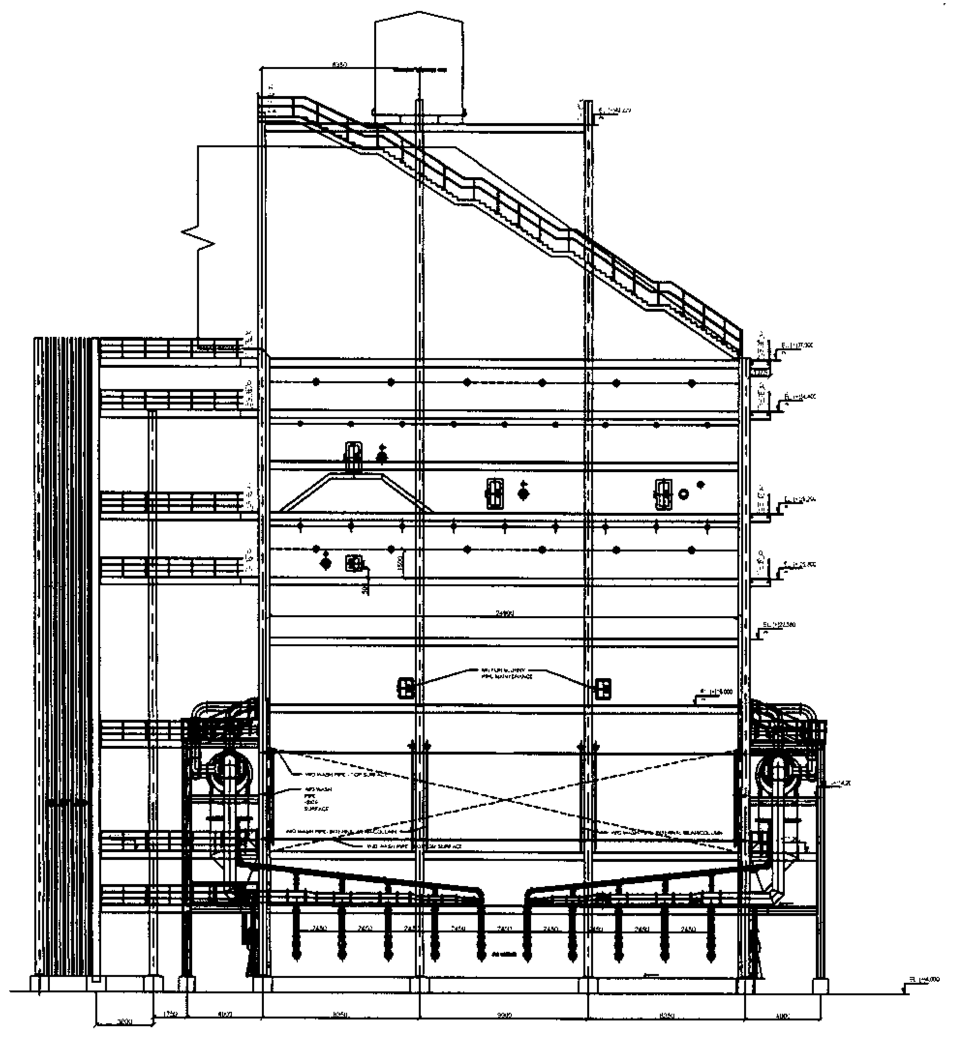
Annex NKP

Annex NKP

CUSTOMER NOS: G801, G802 & G803	
NTPC DRG NO: 4410-109-RP-PVM-D-010	
CUSTOMER: NTPC LIMITED.	
PROJECT: NKSTPP (3X660MW)NORTH KARANPURA	
TITLE: GENERAL LAYOUT OF ABSORBER	SCALE : NTS
DRAWING NO. 0-FW-000-01412	SH 01 OF 06 REV. 00



SECTION A-A



SECTION B-B

Annex NKP

ELEVATION	FACILITIES

CUSTOMER NOS: G601, G602 & G603

NTPC DRG NO: 4410-109-RP-PVM-B-010

CUSTOMER: NTPC LIMITED.

PROJECT: NKSTPP (3X660MW)NORTH KARANPURA

GENERAL LAYOUT OF ABSOBER

0-FW-000-01412 | SH 02 OF 06 | REV. 05

Annex NKP

ANNEXURE-II

SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of ELECTRIC WIRE ROPE HOIST (EWRH) will be done by owner as per vendor's Erection Manual and check List.

However, the Bidder/vendor shall make visit for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

The Bidder/vendor have to make two numbers of visit for the supervision erection & commissioning, testing for **Each electric Hoist** – 1st visit for the supervision of erection & 2nd Visit for pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply for each Electric Hoist

SL NO	DESCRIPTION	QUANTITY (SET)
1	SUPERVISION OF ERECTION OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT BARH-II SITE AS FRIST VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.
2	SUPERVISION OF COMMISSIONING, INSPECTION AND TESTING OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT BARH-II SITE AS SECOND VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.

Vendor shall quotes charges for **complete work for supervision** for erection & commissioning, testing for each Electric Hoist.

Travel charges (visa/passport, all the to/fro travel charges to the site), TA/DA, boarding and lodging shall be borne by the bidder and shall be **inclusive in above supervision charges** portion for complete work for supervision for erection & commissioning, testing for each Electric Hoist.

The charges quoted for the supervision will be considered for L1 evaluation.
However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

Annex Barh 2

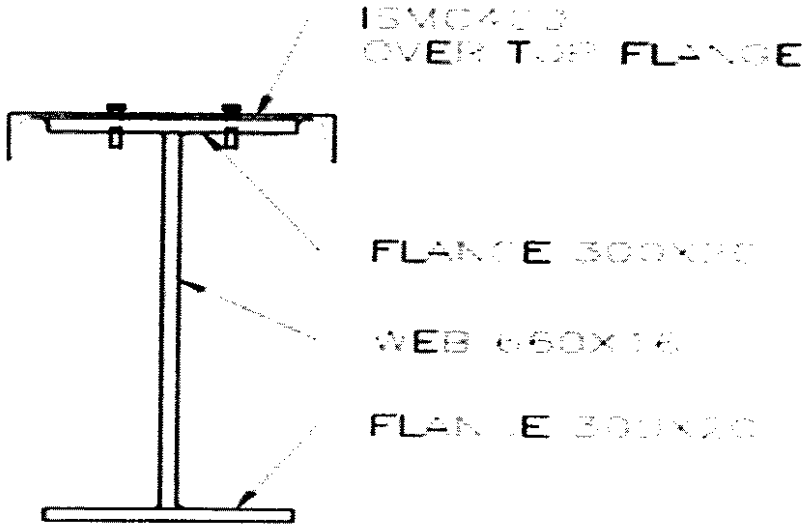
ELECTRIC WIRE ROPE HOIST (EWRH) WITH MDTOR DRIVEN TROLLEY										PROJECT:	BARH-II FGD PROJECT			
SL NO	AREA	TYPE OF Hoist	CAPACITY OF HOIST	MAXIMUM SPEED		HOIST MONO-RAIL I BEAM BOTTOM ELEVATIONS (Hoist Monorail in BHEL Scope)	FLOOR LEVEL	TRAVEL LENGTH	PATH	MINIMUM RADIUS OF TRAVEL	HOIST MONORAIL I-BEAM (in BHEL scope)	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK - HOIST HEAD ROOM: VENDOR TO SPECIFY	TOTAL QNTY
				HOSTING	CROSS TRAVEL									
			TON	METER PER MINUTE	METER PER MINUTE	(EL (+/-) IN METER)	(EL (+/-) IN METER)	(METER)	CURVED / STRAIGHT	(MM)	NPB / ISMB /UB	(MM)	(MM)	(SET)
A. GYPSUM BEWATERING BUILBING														
1	VACUUM PUMP	ELECTRIC	7.5	6	15	EL (+) 13.15M	EL (+) 0.0M	60M	CURVED	2500	NPB 600x220x122.45	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
2	VACUUM BELT FILTER	ELECTRIC	5	6	15	EL (+) 22.474M	EL (-) 0.5m	95M	CURVED	2000	NPB 600x220x122.45	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
B. BALL MILL BUILDING														
5	BALL MILL INNER	ELECTRIC	7.5	6	15	EL (+) 12.35M	EL (+) 0.0M	46M	CURVED	2000	MR 600X300X25 REFER FRAMING DRG	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
6	BALL MILL OUTER	ELECTRIC	12	6	15	EL (+) 12.35M	EL (+) 0.0M	57M	CURVED	2000	MR 600X300X25 REFER FRAMING DRG	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
C. ABSORBER														
8	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC	5	6	15	EL (+) 11.5M	EL (+) 0.0M	26	STRAIGHT	NA	NPB 600X 110 X 122.4 + CAPPING SMC 400	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
9	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC	5	6	15	EL (+) 16.155M	EL (+) 0.0M	28	STRAIGHT	NA	NPB 600X 220 X 122.4 + CAPPING SMC 400	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
10	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC	2	6	15	EL (+) 6.8M	EL (+) 0.0M	3	STRAIGHT	NA	ISMB 300	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
D. BOOSTER FAN & MOTOR														
10	BUF MOTOR	ELECTRIC	20	6	15	EL (+)10.994	EL (-) 0.5M	30	STRAIGHT	NA	*MRB 2	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
11	BUF FAN HOUSING	ELECTRIC	12	6	15	EL (+)13.194	EL (-) 0.5M	30	STRAIGHT	NA	*MRB 1	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
E. TANKS (BHEL SUPPLIED)														
12	LSST A (TANK)	ELECTRIC	2	6	15	EL (+) 24.5	EL (-) 0.5M	12	STRAIGHT	NA	UB 305X165X46	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry
13	LSST B (TANK)	ELECTRIC	2	6	15	EL (+) 24.5	EL (-) 0.5M	12	STRAIGHT	NA	UB 305X165X46	As minimum as possible.- Vendor to specify Actaul value,		As per Enquiry

NOTE : 1) Depending upon Hoist head room , the actual height of lift for hoist shall be arrived.
2) * For MRB- 1 & 2 details, Refer below attachement. Next to this page. & ** are Tentative.

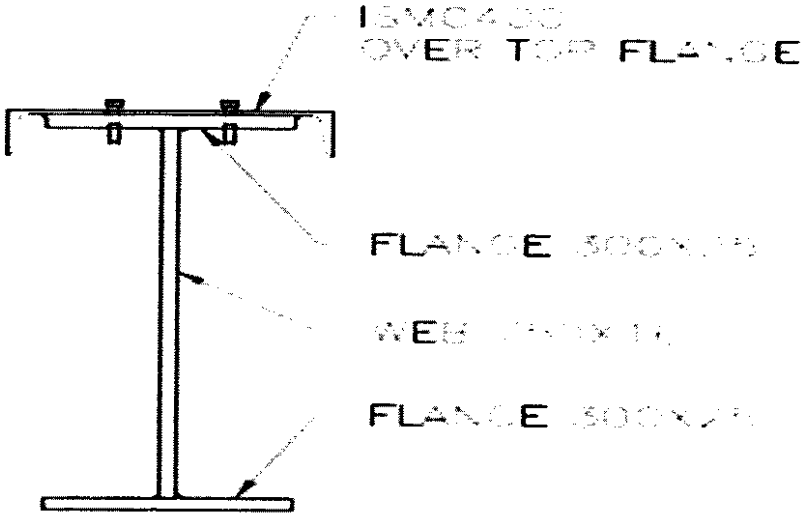
Annex Barh 2

MONORAIL Size (in BHEL scope) for Booster Fan & Motor handling for NKP, BARH –I &II PROJRCT

Vendor to confirm the beam size as per their design.



MRB—1
CROSS SECTION



MRB—2
CROSS SECTION

Annex Barh 2

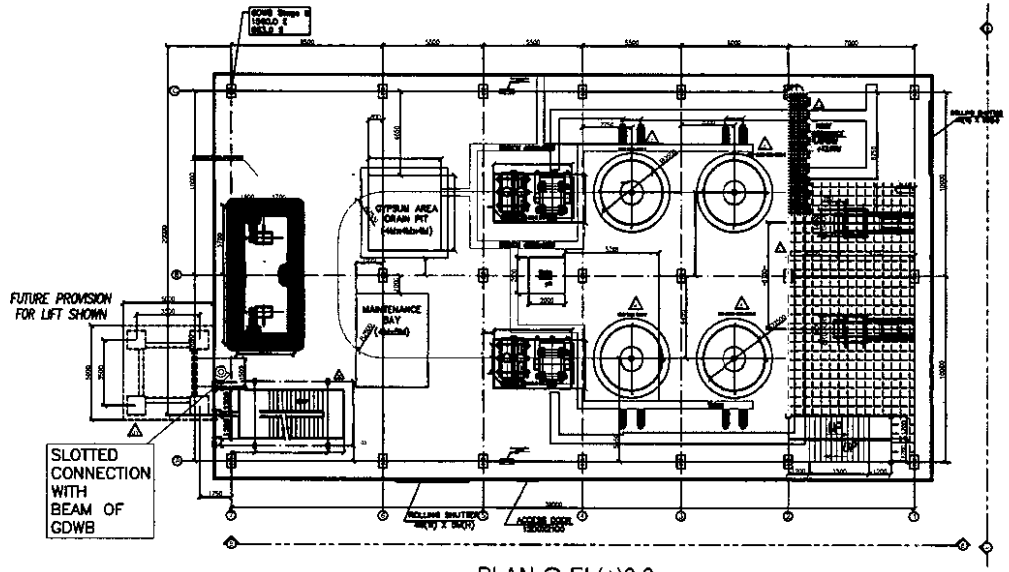
Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	
				Intermediate: One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	100	With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)		
30	Slurry pumps & accessories, Water pumps **(Referred from cl. 7.05.00 of Section-VI, Part-B, Sub section-I-M5)**	FW 701 FW 705	Power Tool Cleaning to St3 (SSPC-SP3)	Primer: Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Intermediate: One coat of Synthetic Enamel intermediate coat to IS 2932; DFT- 50µ	60 50	Two coats of Synthetic Enamel to IS 2932, DFT- 50µ/ coat Shade: Light blue RAL 5012	100	210
31	Monorail for hoist & cranes **(Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 710	Blast cleaning to Sa 2½ (Near white metal) with surface profile 40-60µm conforming to ISO 8501-1	Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume minimum 60% ±2). Zinc dust composition and properties shall be as per Type II as per ASTM D520-00 DFT- 70µ Intermediate: One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	70 100	Finish: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane paint to IS 13213 solid by volume min.55%±2) DFT- 35µ/ coat Shade: Grey white, RAL 9002 With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)	70	240
32	Handling Equipment-Hoists& Man hole door **(Clause 20.03.00 of Part-C Section VI)**	FW 713 FW 714 FW 717	Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130
33	Agitator support **Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 721	Blast cleaning to Sa 2½ (Near white metal) with surface	Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume	70	Finish: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane	70	240

Sl No	SURFACE LDCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

GENERAL NOTES

1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., Agitator/ slide bearing and other sub-delivery components etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used, very minor items like clamps, small items etc - Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed and painting under Sl no:01 of Fans shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipments, fans, piping, pipe services, supporting structures and other components is followed as per NTPC doc no: QS-01-DIV-W-4 at site.
6. All components covered under different PGMAs are to be painted. In case any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
8. Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
9. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
10. Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
11. Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
12. For the portion of steel surfaces embedded in concrete, the surface shall be prepared by Manual cleaning and provided with Primer coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron DFT.

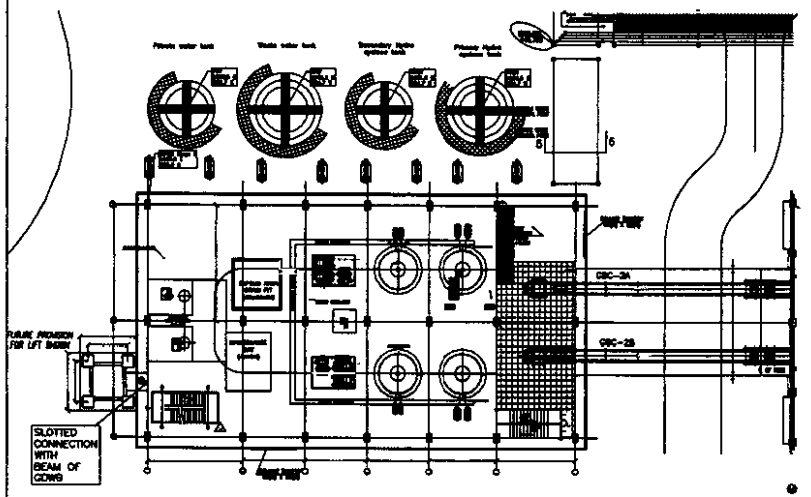
Annex Barh 2



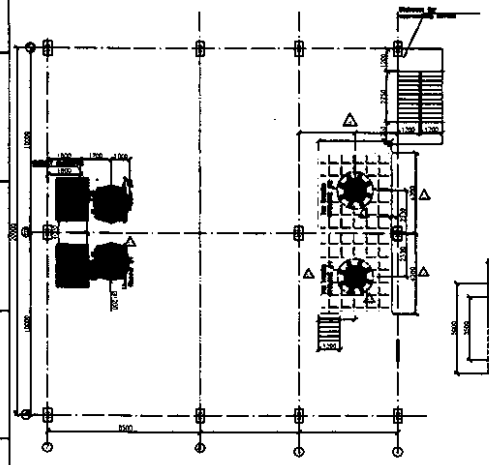
PLAN @ EL(+)0.0m

N

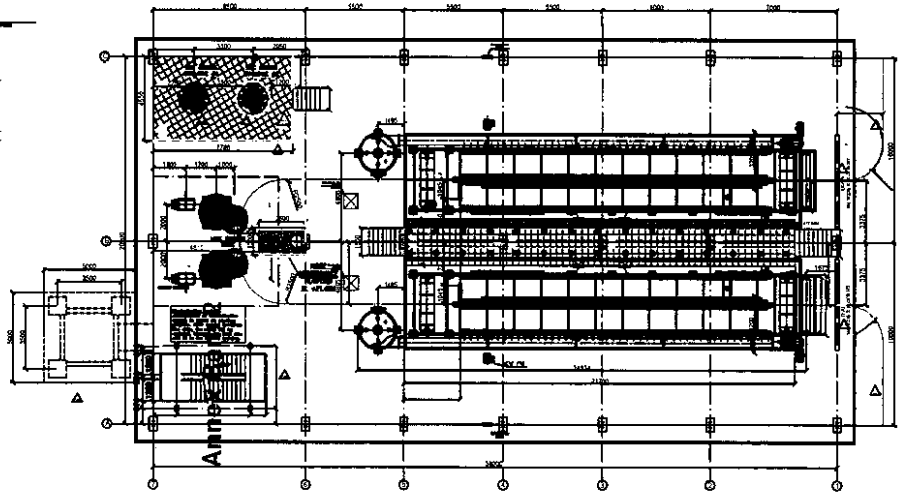
EL(-)0.500
FGL



△ KEY PLAN



Annex-B.2 @ EL(+)24.0m



PLAN @ EL(+)15.5m

Notes:

1. All Dimensions are in millimeters and elevations in meters.
2. EL 0.0m corresponds to Rl. +45.7M
3. GDWS building is at Rl. 46.2m
4. The equipment machinery sizes showing in the drawing is indicative only and will be confirmed after vendor data.The maximum anticipated size is provided in the drawing.
5. Floor openings,pipe crossings shall to confirmed during detail engineering.
6. Details of staircase,suitable doors,windows,ventilators shall be considered by civil designer for GDWS.
7. The building arrangement is made by taking the maximum dimensions of the equipments and its location. The size of the building is not expected to vary.
8. All structures, including platforms, staircase, handrails, pedestal, etc, coming inside this building and all other associated structures outside this building are in the scope of BHEL-PEM.

Please refer this drawing along with GA of GDWS (Sheet 2 of 2) 0-FW-000-01414

Reference Drawings

1. 9560-109-PVM-F-005 - Plant Layout of FGD System
2. 9560-109-PVM-Y-022 - Data sheet & General Arrangement of Vacuum Belt filters and its accessories

NTPC DRG NO:9560-109-PVC-B-011

TYPE OF PRODUCT OR NAME OF EQUIPMENT/PROJECT: NTPC / Barh, STAGE-2 2X660MW

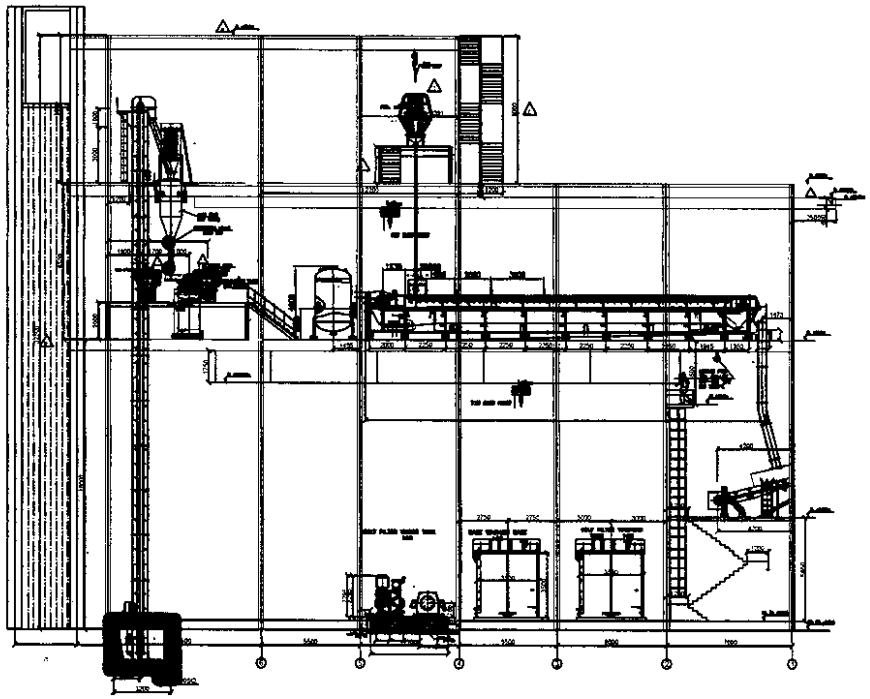
CONT.NO-CONT & ORDR

Bharat Heavy Electricals Ltd

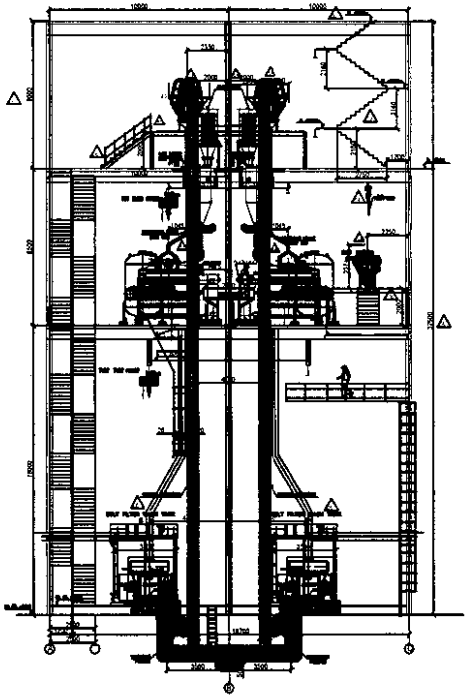
GA Annex Barh-2

0-FW-000-01415

Annex-B.2



SECTION - BB



LIST OF ITEMS	
1. PRIMARY HYDROCYLONE	2 NOS
2. VACUUM BELT FILTER	2 NOS
3. VACUUM RECEIVER TANK	2 NOS
4. SECONDARY HYDROCYCLONE	2 NOS
5. LIME DOSING TANK	2 NOS
6. VACUUM PUMPS	2 NOS
7. BELT FILTER WASH PUMPS	4 NOS
8. BELT FILTER WASH TANK	2 NO
9. CAKE WASH TANK PUMP	4 NO
10. CAKE WASH TANK	2 NO
11. ELECTRICAL HOIST G.F	1 NO
12. ELECTRICAL HOIST F.F	1 NO

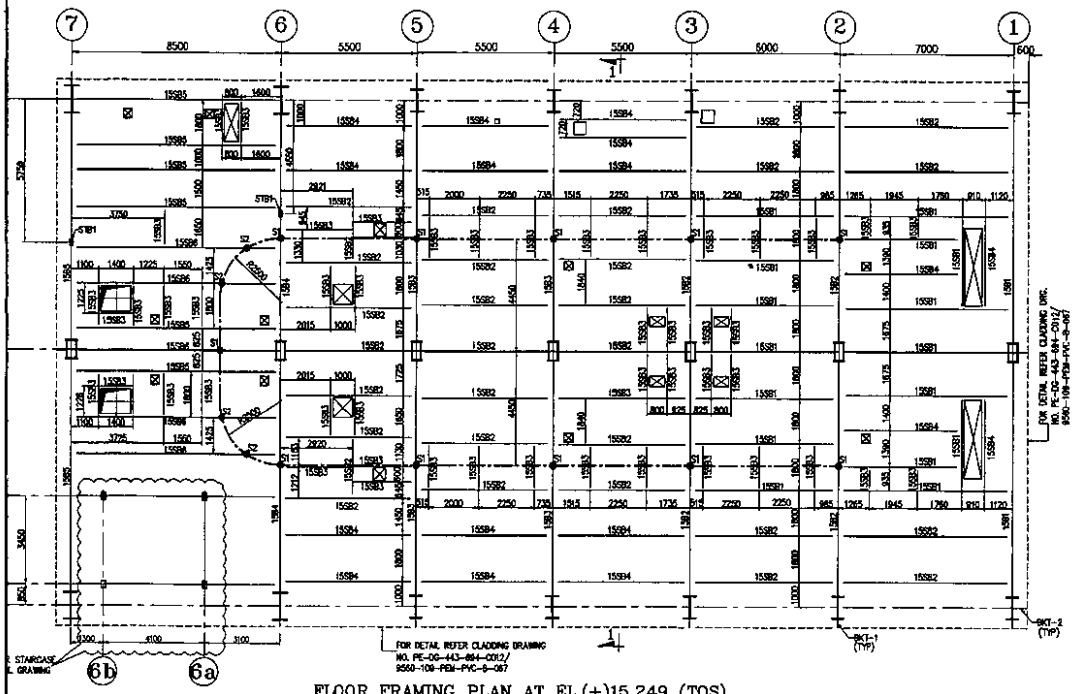
Annex Barh 2

Annex Barh 2

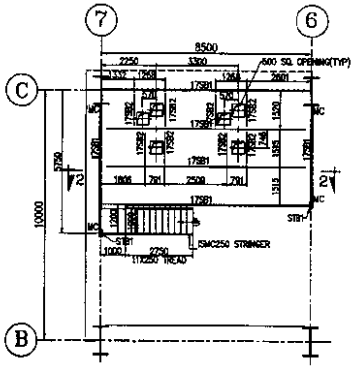
NTPC DRG NO: 9560-109-PVC-B-011

NTPC / Barh, STAGE-2 2X660MW

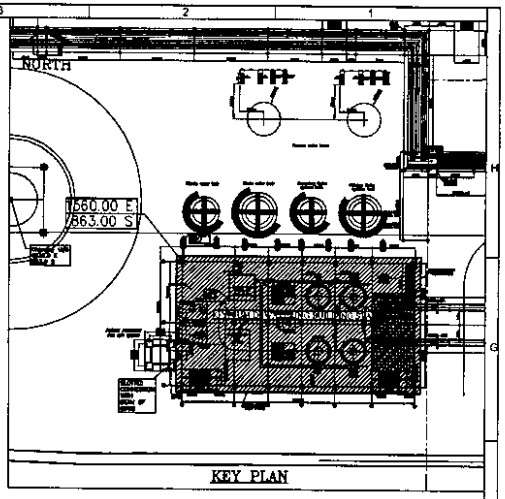
GA of Annex Barh 2



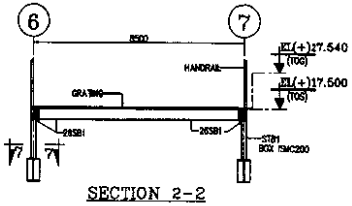
FLOOR FRAMING PLAN AT EL.(+)15.249 (TOS)



PLAN OF PLATFORM AT EL(+)17.50M



KEY PLAN



SECTION 2-2

NOTES:-

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CONTRACT TERMS & CONDITIONS, SPECIFICATIONS AND SCHEDULE OF ITEMS.
2. EL 0.00 M CORRESPONDS TO RL(+)46.70M.
3. ALL DIMENSIONS ARE IN MILLIMETER & ALL LEVELS/ELEVATIONS ARE IN METER UNLESS NOTED OTHERWISE.
4. FOR ANY DETAIL & NOTES, REFER GENERAL NOTES ORG. (STEEL STRUCTURE) DRG. NO. PE-DG-443-600-C002/9560-109-PEM-PVC-B-002
5. QUANTITIES INDICATED IN BILL OF MATERIALS ARE APPROXIMATE & DO NOT INCLUDE FOR STIFFENERS, SPLICING, CONNECTION & WASTAGES.
6. UNLESS OTHERWISE NOTED BOLTS, SIZE OF GUSSET, SIZE OF WELD SHOWN IN TYP. DETAIL ARE INDICATIVE ONLY. THE ACTUAL NUMBER OF BOLTS REQUIRED AND CONNECTION TO BE DECIDED BY FABRICATOR.
7. ALL WELDS SHALL BE 8mm FILLET CONTINUOUS UNLESS NOTED.
8. ALL CONNECTION OF SHALL BE SHEAR CONNECTION UNO.
9. PAINTING ON STEEL STRUCTURE SHALL BE AS PER TECHNICAL SPECIFICATION.
10. SPLICING IN FLANGES AND WEB SHALL BE STAGGERED. SPLICING SHALL BE OF FULL STRENGTH BUTT WELD.
11. ALL STRUCTURAL CONNECTIONS SHALL COMPLY TO SECTION-12 OF IS:800-2007

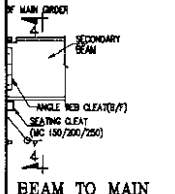
REFERENCE DRGS.:-

1. PLANT LAYOUT OF FGD SYSTEM SH. 2 — 00-FW-000-00718/9560-109-PVM-F-005
2. GENERAL NOTES FOR STRUCTURAL STEEL WORKS — PE-DG-443-600-C002/9560-109-PEM-PVC-B-025
3. GYPSUM DEWATERING BUILDING_GA of GDWS — 0-FW-000-P1615/9560-109-PVC-B-011
4. GYPSUM DEWATERING BUILDING_PILING LAYOUT OF FDN. — PE-DG-443-694-C003/9560-109-PEM-PVC-B-058
5. GYPSUM DEWATERING BUILDING_GA & RC DETAILS OF PILECAP, PEDESTAL & PLINTH BEAM — PE-DG-443-694-C004/9560-109-PEM-PVC-B-058
6. GYPSUM DEWATERING BUILDING_BASE PLATE & BOLT DETAILS — PE-DG-443-694-C005/9560-109-PEM-PVC-B-060
7. GYPSUM DEWATERING BUILDING_LONGITUDINAL FRAMING AND BRACING DETAILS — PE-DG-443-694-C008/9560-109-PEM-PVC-B-063
4. GYPSUM DEWATERIND BUILDING_FLOOR FRAMING AT SECOND FLOOR — PE-DG-443-694-C010/9560-109-PEM-PVC-B-065
8. GYPSUM DEWATERING BUILDING_FLOOR FRAMING AT ROOF LEVEL — PE-DG-443-694-C011/9560-109-PEM-PVC-B-068

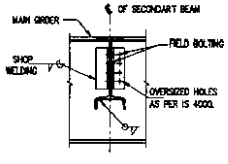
LEGEND:-

FFL : FLOOR FINISHED LEVEL
EL : ELEVATION
TYP : TYPICAL
B.O.BEAM : BOTTOM OF BEAM
MC: COTTOM OF BEAM
THK. : THICKNESS
T.O.S : TOP OF SURFACE

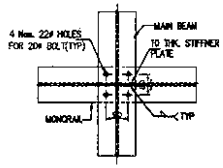
TOTAL QTY OF STEEL - 96.00 M.T.(APPROX)



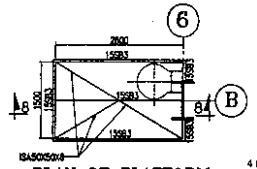
BEAM TO MAIN ECTION DETAIL



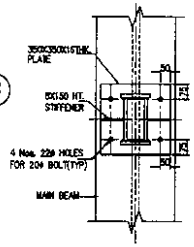
VIEW 4-4
(DIA. & NO. OF BOLTS ARE INDICATIVE, ACTUAL DIA. & NO. OF BOLTS TO BE REFERRED FROM CORRESPONDING FABRICATION DRG.)
(REFER ERECTION SEQUENCE-1)



SECTION 3-3



PLAN OF PLATFORM AT EL(+)20.500



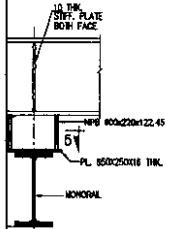
SECTION 7-7
(TYP. DETAIL OF STB-1 & STB-2)

SCHEDULE OF SECONDARY BEAMS

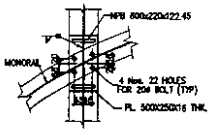
BEAM SHAPE	BEAM MKD.	BEAM SECTION					NOTE
	1558 1	MPB 500x200x90.86					ALL SECONDARY BEAMS SHALL HAVE SHEAR CONNECTION
	1558 2	MPB 400x180x68.31					
	1558 3	MPB 200x100x22.36					
	1558 4	MPB 300x150x42.25					
	1558 5	MPB 600x220x122.45					
	1758 1	MPB 450x190x77.58					
	1758 2	MPB 200x100x22.36					
			D	B	Tf	Tw	
	1558 8		600	300	20	16	
	STB-1		250	250	16	16	

SCHEDULE OF BEAM (M.C)

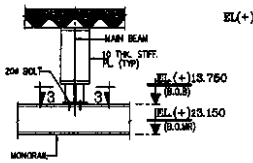
SL.NO.	BEAM MARKED	SECTION DETAILS D	B	Tf	Tw	BEAM SECTION	NOTE
1	1581	750	330	20	20		ALL MAIN BEAMS SHALL HAVE MOMENT CONNECTION
2	1582	750	350	32	25		
3	1583	800	400	32	25		
4	1584	800	450	36	25		
5	1585	800	400	32	25		



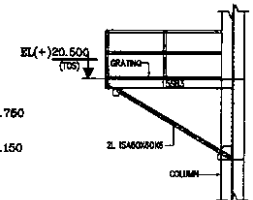
F SUPPORT S2



SECTION 5-5
(FOR SUPPORT S2)
(FOR SUPPORT S2 - INDICATIVE DETAIL FABRICATOR TO DETAIL INLINE AND MAY CHANGE PLATE ROTATION/SIZE/HOLE AT CURVATURE LOCATIONS ONLY. SUIT TO DETAILING REQUIREMENTS FOR BOTH MONORAILS.)



DETAILS OF SUPPORT S1



SECTION 8-8

JOB NO.	443
STATUS	CONTRACT
DISTRIBUTION	
TO	
No. OF	
REV.	DATE. ALTD CHD APPD

NTPC DRG. No. 9560-109-PEM-PVC-B-064

PROJECT: BARH SUPER THERMAL PDWER PROJECT STAGE-II (2X660MW)

OWNER: NTPC Limited (A GOVERNMENT OF INDIA ENTERPRISE)

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

DEPT CODE		NAME	SIGN	DATE
G	DRN	RAMAJEET	-SD-	04.07.2022
	DSGN	MK	-SD-	01.07.2022
	CHD	AK	-SD-	04.07.2022
	APPD	AH	-SD-	04.07.2022

TITLE: GYPSUM DEWATERING BUILDING
FLOOR FRAMING AT FIRST FLOOR

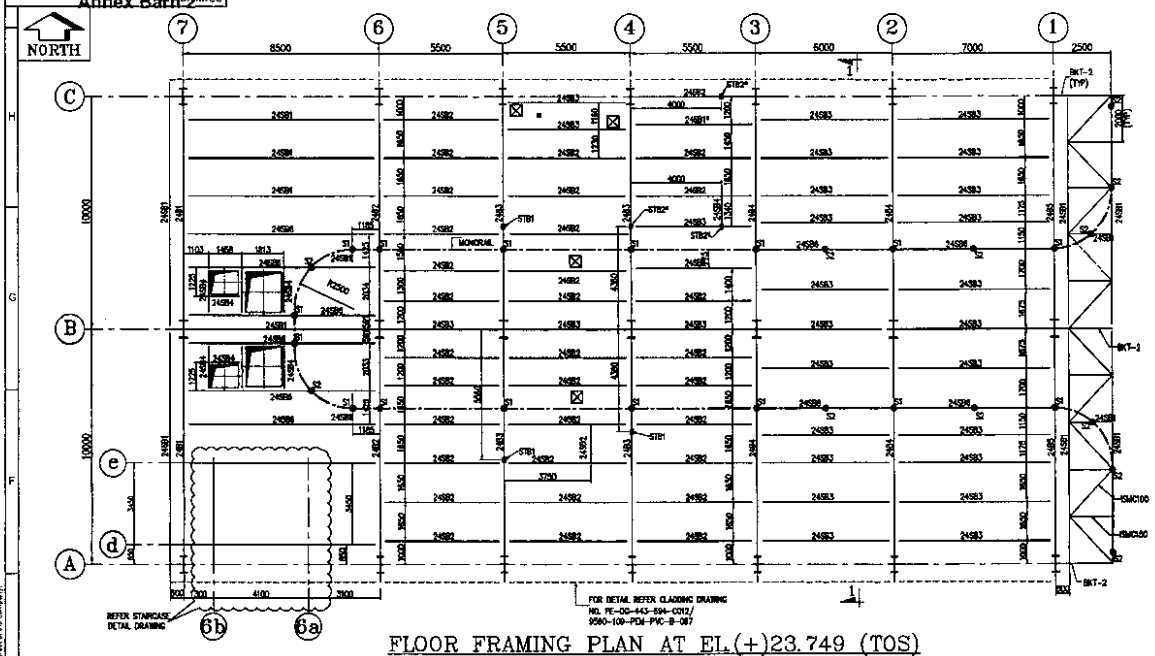
C & I	MAX.	ELEC.	MPL	DEPT.	SCALE 1:100	DRAWING NO.
				SIGN		Annex Barh2-443-694-C009
				DATE		SHEET 01 OF 01 REV. 0

Aug 17, 2022 - 10:52am

FIRST ANGLE PROJECTION

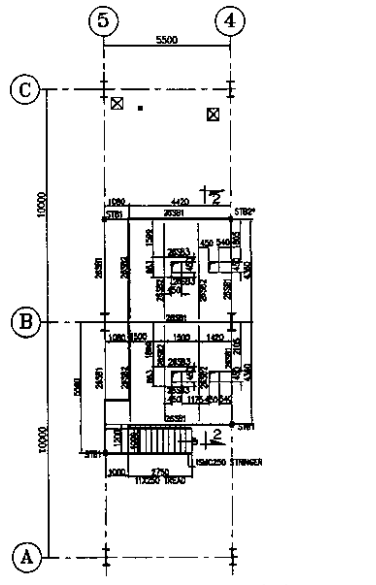
ALL DIMENSIONS ARE IN MM

Annex Barh 2

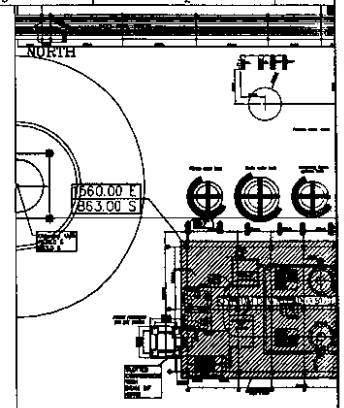


FLOOR FRAMING PLAN AT EL.(+)23.749 (TOS)

(* FOR DETAIL OF STUB ST82 AND 24581 REFER DRG NO 9560-109-PEM-PVC-B-086)



PLAN OF PLATFORM AT EL(+)26.00M



KEY PLAN

NOTES:-

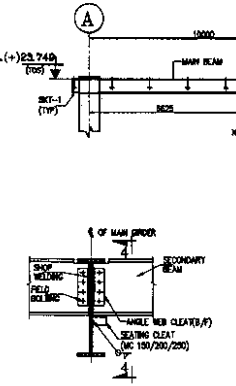
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CONTRACT SPECIFICATIONS AND SCHEDULE OF ITEMS.
2. EL 0.00 M CORRESPONDS TO RL(+)48.70M.
3. ALL DIMENSIONS ARE IN MILLIMETER & ALL LEVELS/ELEVATIONS NOTED OTHERWISE.
4. FOR ANY DETAIL & NOTES, REFER GENERAL NOTES DRG. (STEEL) PE-DG-443-600-C002/9560-109-PEM-PVC-B-002
5. QUANTITIES INDICATED IN BILL OF MATERIALS ARE APPROXIMATE STIFFENERS, SPLICING, CONNECTION & WASTAGES.
6. UNLESS OTHERWISE NOTED BOLTS, SIZE OF GUSSET, SIZE OF WE ARE INDICATIVE ONLY. THE ACTUAL NUMBER OF BOLTS REQUIRE DECIDED BY FABRICATOR.
7. ALL WELDS SHALL BE 8mm FILLET CONTINUOUS UNLESS NOTED
8. ALL CONNECTION OF SHALL BE SHEAR CONNECTION U.N.O.
9. PAINTING ON STEEL STRUCTURE SHALL BE AS PER TECHNICAL
10. SPLICING IN FLANGES AND WEB SHALL BE STAGGERED. SPLICING STRENGTH BUTT WELD.
11. ALL STRUCTURAL CONNECTIONS SHALL COMPLY TO SECTION-12

REFERENCE DRGS.:-

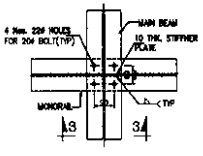
1. PLANT LAYOUT OF FGD SYSTEM SH. 2 ---- 0
2. GENERAL NOTES FOR STRUCTURAL STEEL WORKS ---- 9
3. GYPSUM DEWATERING BUILDING_GA of GDWS ---- 0
4. GYPSUM DEWATERING BUILDING_PILING LAYOUT OF FDN. ---- P
5. GYPSUM DEWATERING BUILDING_GA & RC DETAILS OF PILECAP, PEDESTAL & PLINTH BEAM ---- P
6. GYPSUM DEWATERING BUILDING_BASE PLATE & BOLT DETAILS ---- P
7. GYPSUM DEWATERING BUILDING_LONGITUDINAL FRAMING AND BRACI
8. GYPSUM DEWATERING BUILDING_FLOOR FRAMING AT FIRST FLOOR-P
6. GYPSUM DEWATERING BUILDING_FLOOR FRAMING AT ROOF LEVEL ---- P

LEGEND:-

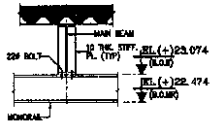
FFL : FLOOR FINISHED LEVEL
EL : ELEVATION
TYP : TYPICAL
TOG : TOP OF GRATING
TOS : TOP OF STEEL
THK. : THICKNESS



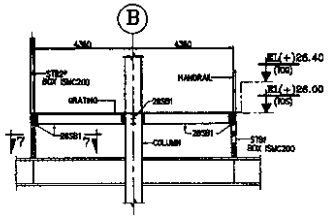
SECTION 1-1



DETAILS OF SUPPORT S1

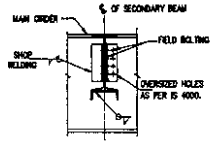


SECTION 3-3



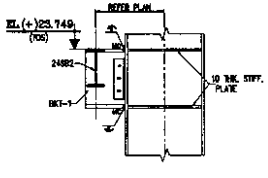
SECTION 2-2

SECONDARY BEAM TO MAIN BEAM CONNECTION DETAIL



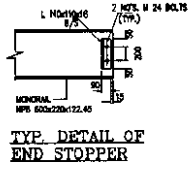
VIEW 4-4

(DIA. & NO. OF BOLTS ARE INDICATIVE. ACTUAL DIA. & NO. OF BOLTS TO BE REFERRED FROM CORRESPONDING FABRICATION DRG.) (REFER ERECTION SEQUENCE-1)

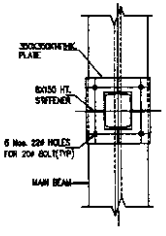


TYP. DETAIL OF BKT-1

(CONNECTION IN COLUMN FLANGE)

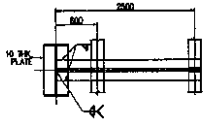


TYP. DETAIL OF END STOPPER



SECTION 7-7

(TYP. DETAIL OF STB-1 & STB-2)

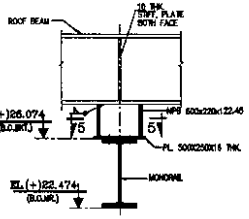


SECTION 6-6

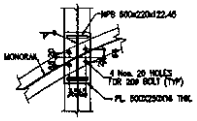
SCHEDULE OF SECONDARY BEAMS

BEAM SHAPE	BEAM MK.	BEAM SECTION	NOTE
	24581	NPB 600x220x122.45	ALL SECONDARY BEAMS SHALL HAVE SHEAR CONNECTION.
	24586	NPB 300x150x92.25	
	24582	NPB 400x180x66.31	
	24584	NPB 200x100x22.36	
	28581	NPB 450x190x77.58	
	28582	NPB 300x150x92.25	
	28583	NPB 200x100x22.36	
	BKT2	NPB 600x220x122.45	

	D	B	Tf	Tw
25586	675	300	25	20
25586	600	325	20	16



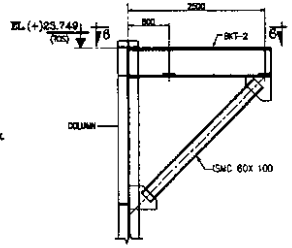
DETAILS OF SUPPORT S2



SECTION 5-5

(FOR SUPPORT S2)

(FOR SUPPORT S2 - INDICATIVE DETAIL. FABRICATOR TO DETAIL IN-LINE AND MAY CHANGE PLATE NOTATION/SIZE/HOLE ST CURVATURE LOCATIONS ONLY. SUIT TO DETAILING REQUIREMENTS FOR BOTH MONORAILS.)



TYP. DETAIL OF BKT-2

(CONNECTION IN COLUMN WEB)

SCHEDULE OF BEAM (M.C)

SL.NO.	BEAM MARKED	SECTION DETAILS D	B	Tf	Tw	BEAM SECTION	NOTE
1	2481	650	325	25	20		ALL MAIN BEAMS SHALL HAVE MOMENT CONNECTION.
2	2482	675	350	25	20		
3	2483	675	325	25	20		
4	2484	625	270	20	16		
5	2485	625	270	20	16		

TOTAL QTY OF STEEL – 66.00 M.T.(APPR

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD

NTPC DRG. No. 9560-109-PEM-PVC-B-0

PROJECT: BARH SUPER THERMAL POWE STAGE-II (2X660MW)

OWNER: NTPC Limited (A GOVERNMENT OF INDIA ENTERPRISE)

DISTRIBUTION

JOB NO. 443
STATUS CONTRACT
TP
No. OF

BHARAT HEAVY ELECTRICALS LIMITED POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA

DEPT CODE: C

TITLE: GYPSUM DEWATERING BUIL
FLOOR FRAMING AT SECOND

C & I	MAK.	DEC.	MPL.	DEPT.	SCALE 1:100	DRG NO.
				SIGN		
				DATE		SHEET

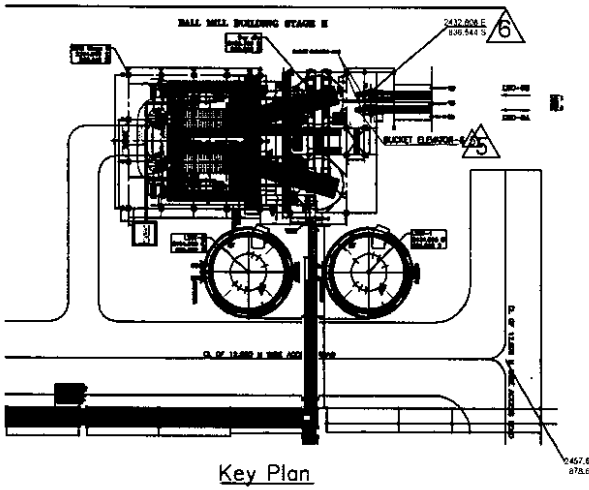
Annex Barh 2

52800-000-B3-0

BALL MILL BUILDING STAGE II

N

FGL -0.5M



Key Plan

N

Oay Silo
2426.158 E
836.545 S

LSST-1
2434.608 E
864.803 S

LSST-2
2414.608 E
864.803 S

BM8-II
2394.508 E
832.445 S

▲LIST OF EQUIPMENTS

1.	WET BALL MILL	– 2NOS
2.	MILL CIRCUIT TANK	– 2NOS
3.	MILL CIRCUIT PUMP	– 4NOS
4.	MILL HYDROCYCLONE	– 2NOS
5.	DISTRIBUTION BOX	– 2NOS
6.	DEDUSTING SYSTEM	– 2NOS
7.	GRAVIMETRIC FEEDER	– 2NOS
B.	HP&LP OIL PUMP SKID	– 2NOS
9.	JET LUBRICATION STATION	– 2NOS
1D.	ELECTRICAL HOIST	– 2NOS
11.	ELEVATOR	– 1NO

Note:

Elevation 0.0 corresponds to RL 46.7m

FGL at Ball mill building area is at RL 46.2m

All dimensions are in millimeters

Annex Barh 2

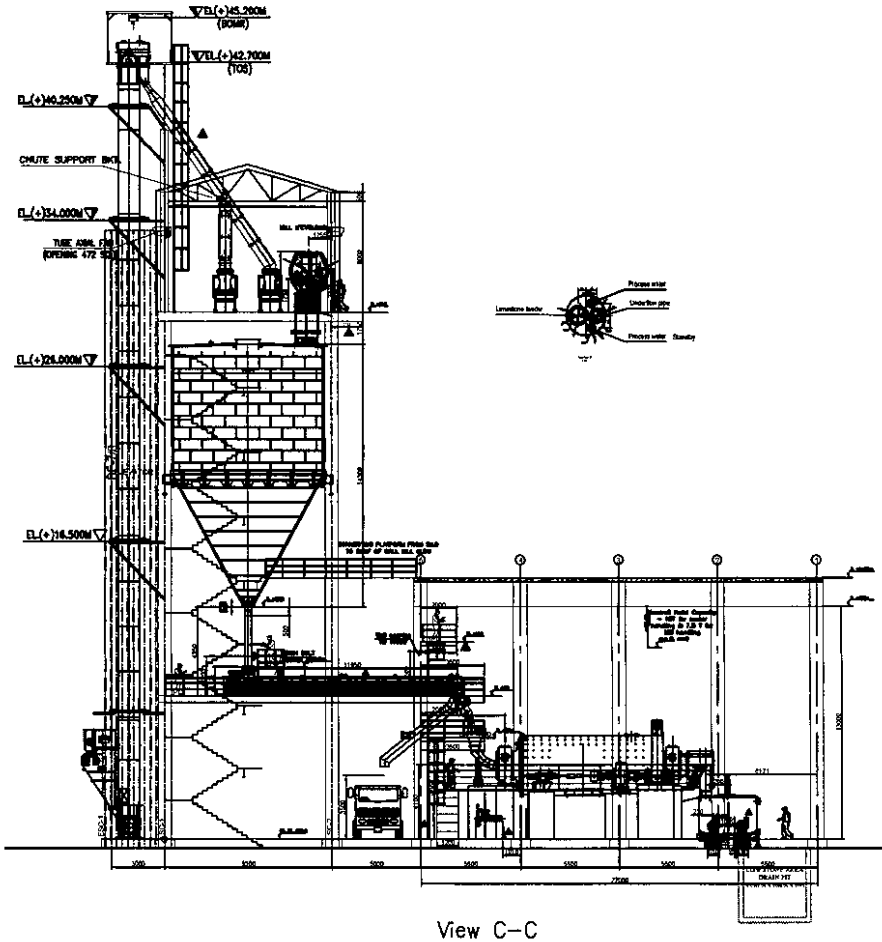
Annex Barh 2

NTPC Dwg. No.: 9580-109-PVC-B-010

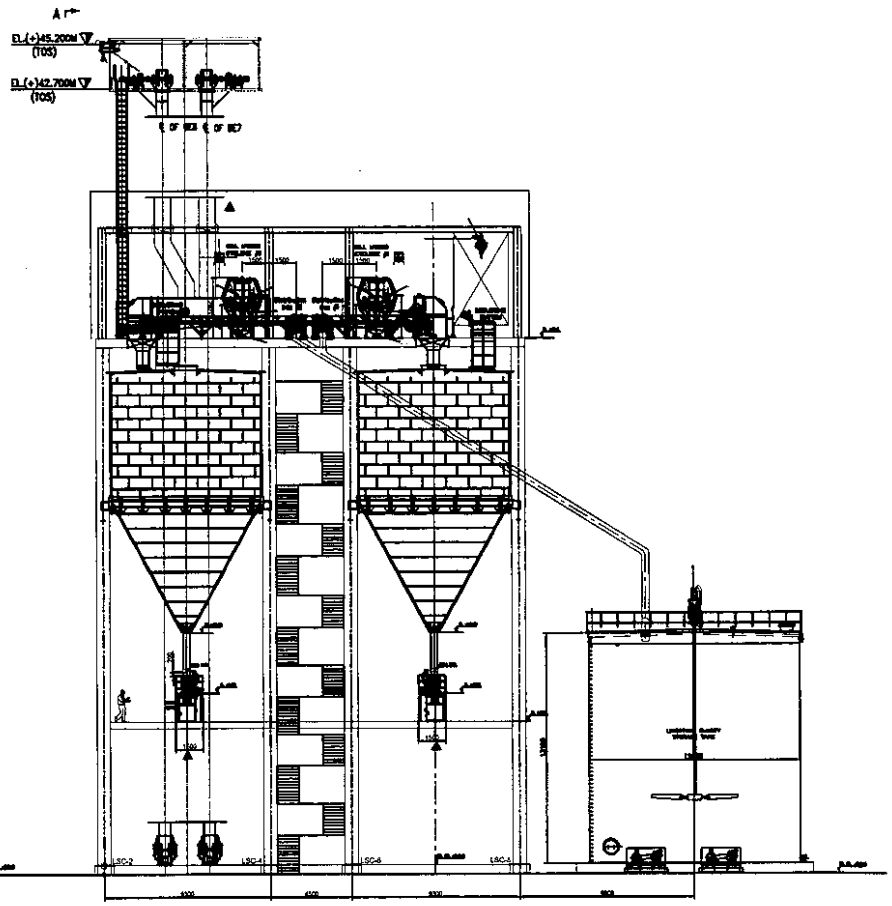
NTPC / Barh, STAGE-II, 2-660MW

GA of Ball Mill Building

Annex-Barh 2



View C–C



View B–B

Note.
1. 9560-109-PVM-Y-031 - Data sheet and General arrangement of wet ball mill and its accessories
2. 9560-109-PVM-F-005 - Plant Layout of FGD System
3. All structures with in Ball mill building are in PEM-scope.

Pipe load on Ball Mill Building

Load on each column at 9m above FFL,
Vertical load: 10T
Moment: 15T-M

Annex Barh 2

Annex Barh 2

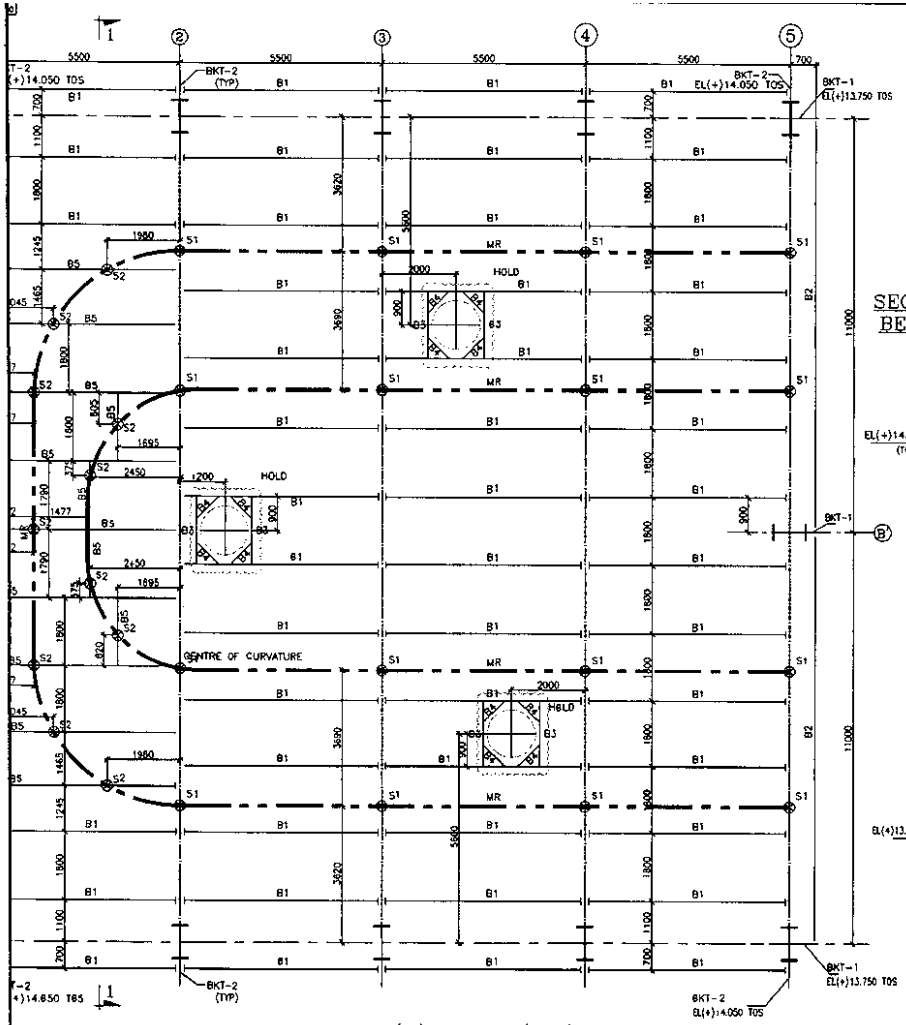
NTPC Dwg. No.: 9560-109-PVC-B-010

NTPC / Barh, STAGE-II, 2-660MW

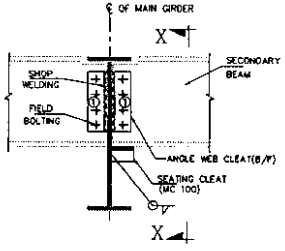
Bharat Heavy Electricals Ltd
BOILER AUXILIARIES PLANT
RANIPET-632 406

GA of Ball Mill Building

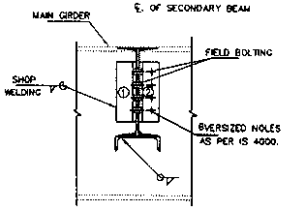
Annex Barh 2



ROOF PLAN EL(+)14.350M (TOS)

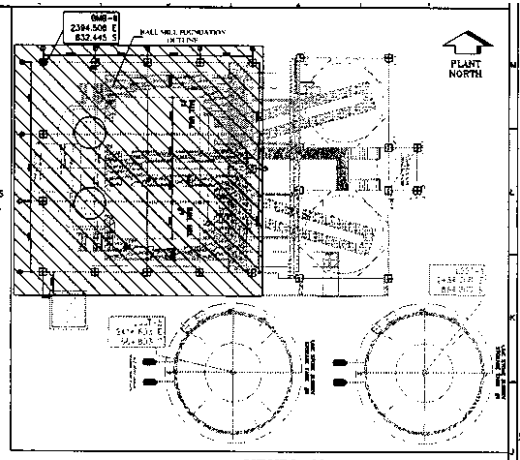


SECONDARY BEAM TO MAIN BEAM CONNECTION DETAIL

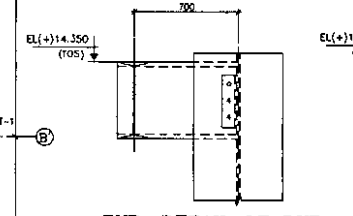


VIEW X–X

(DIA. & NO. OF BOLTS ARE INDICATIVE, ACTUAL DIA. & NO. OF BOLTS TO BE REFERRED FROM CORRESPONDING FABRICATION DRG.)

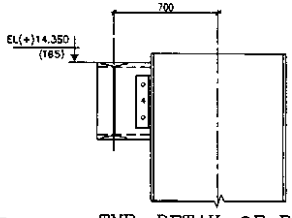


KEYPLAN



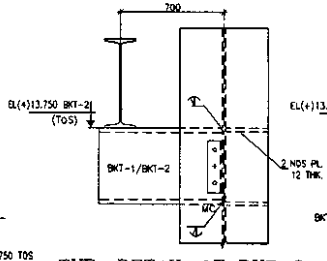
TYP. DETAIL OF BKT-1

(CONNECTION IN COLUMN WEB)



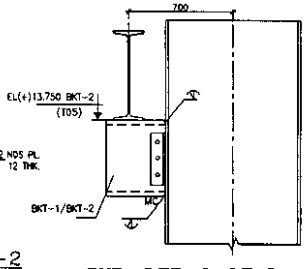
TYP. DETAIL OF BKT-1

(CONNECTION IN COLUMN WEB)



TYP. DETAIL OF BKT-2

(CONNECTION IN COLUMN WEB)



TYP. DETAIL OF BKT-2

(CONNECTION IN COLUMN FLANGE)

ERECTION SEQUENCE-1

1. ONE LEG OF ANGLE 1 SHALL BE WELDED WITH MAIN BEAM AT SHOP.
2. HOLES FOR BOLT SHALL BE DRILLED AT SHOP IN EITHER OUTSTANDING LEG OF ANGLE 1 AS PER FABRICATION DRAWING.
3. ANGLE 2 WILL HAVE HOLES DRILLED IN BOTH LEGS AT SHOP AS PER FABRICATION DRAWING AND SHALL BE SHIPPED LOOSE TO SITE.
4. AFTER PLACING SECONDARY BEAM IN POSITION, BOTH ANGLE 1 & 2 SHALL BE BOLTED TO SECONDARY BEAM.
5. OUTSTANDING LEG OF ANGLE 2 SHALL BE BOLTED TO MAIN BEAM.

NOTES

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CONTRACT TERMS AND CONDITIONS, TECHNICAL SPECIFICATIONS AND SCHEDULE OF ITEMS.
2. ALL DIMENSIONS ARE IN MM & ELEVATIONS IN METERS UNLESS NOTED OTHERWISE.
3. ALL ELEVATIONS ARE WITH RESPECT TO MAIN POWER HOUSE BUILDING GROUND FLOOR LEVEL AS EL.(±)0.00 M. WHICH CORRESPONDS TO R.L. +46.700M. ABOVE M.S.L.
4. FOR GENERAL NOTES FOR STRUCTURAL STEEL WORKS REF. BHEL DWG. NO. PE-DG-443-600-C002/NTPC DWG. NO. 9560-109-PEM-PVC-B-026.
5. ALL WORK SHALL BE CARRIED OUT AS PER TECHNICAL SPECIFICATION, SCHEDULE OF ITEMS CONFORMING TO THE QUALITY CHECKS,SPECIFIED THEREIN AND IN FIELD QUALITY PLAN.
6. ALL WELDS SHALL BE 8mm FILLET CONTINUOUS UNLESS NOTED.
7. ALL CONNECTION OF MAIN BEAM TO SECONDARY BEAM SHALL BE SHEAR CONNECTION UNO.
8. PAINTING ON STEEL STRUCTURE SHALL BE AS PER TECHNICAL SPECIFICATION.
9. ALL STRUCTURAL CONNECTIONS SHALL COMPLY TO SECTION-12 OF IS:800-2007.
10. STRUCTURE COMING FROM BALL MILL SILO BUILDING TO BALL MILL BUILDING SHALL BE SUPPORTED WITH PTFE SLIDER BEARING AT BALL MILL BUILDING END.

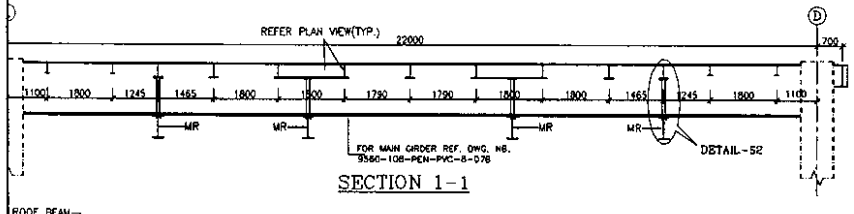
REFERENCE DRGS.

1. PLANT LAYOUT OF FGD SYSTEM SH. 1 ---- 0-FW-000-80718/9560-109-PVM-F-005
2. LAYOUT AND ELEVATION DETAIL OF ------- 8-FW-000-00625/9560-109-PVC-B-016 GA BALL MILL BUILDING
3. ARCH. PLANS & SECTIONS------ PE-DG-443-691-C001/9560-109-PEM-PVC-B-073
4. ARCH. ELEV. & FINISHING SCHEDULE- PE-DG-443-691-C002/9560-109-PEM-PVC-B-074
5. PILING LAYOUT OF FOUNDATION------PE-DG-443-691-C005/9560-109-PEM-PVC-B-075
6. DETAIL OF COLUMN, MAIN BEAM,------PE-DG-443-691-C006/9560-109-PEM-PVC-B-079 TRANSVERSE & LONGITUDINAL FRAMING
7. DETAIL OF INTERMEDIATE PLATFORM---PE-DG-443-601-C008/9560-189-PEM-PVC-9-080
8. WALL BEAM & CLADDING DETAILS-----PE-DG-443-691-C009/9560-109-PEM-PVC-B-081

LEGEND:-

FFL : FLOOR FINISHED LEVEL
TOS : TOP OF STEEL
FGL : FINISHED GROUND LEVEL
TOC : TOP OF CONCRETE
EL : ELEVATION
TYP : TYPICAL
B.B.BEAM : BOTTOM OF BEAM
MC : MOMENT CONNECTION

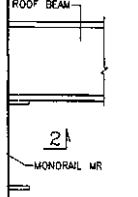
TOTAL QTY OF STEEL - 36 MT(APPROX.)



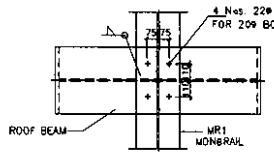
SECTION 1-1

SCHEDULE OF SECONDARY BEAMS

SL.NO.	BEAM MARKED	SECTION DETAILS D	B	Tf	Tw	BEAM SECTION
1	B1	NPB300X150X46.32				I
2	B2	NPB600X220X122.45				
3	BKT-1	ISMB-600				
4	BKT-2	ISMB-400				
5	B5	ISMC-150				
6	B4	ISMC-100				
7	S5	400	250	28	16	
8	MR	600	300	25	14	

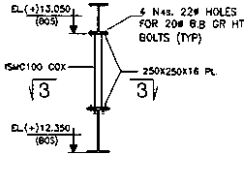


F SUPPORT
(S1)

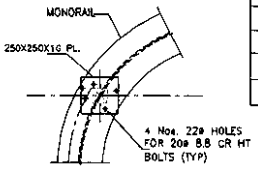


SECTION 2-2

(FOR SUPPORT S1)



DETAILS OF SUPPORT MONORAIL (S2)



SECTION 3-3

(FOR SUPPORT S2 - INDICATIVE DETAIL, FABRICATOR TO DETAIL INLINE AND MAY CHANGE PLATE ROTATION/SIZE/HOLE AT CURVATURE LOCATIONS ONLY, SUIT TO DETAILING REQUIREMENTS FOR BOTH MONORAILS.)

NTPC DRAWING NO. 9560-109-PEM-PVC-B-079

OWNER : NTPC

NTPC Limited
(A GOVERNMENT OF INDIA ENTERPRISE)
CONSULTING DIVISION

PROJECT : BARH SUPER THERMAL POWER PROJECT
STAGE-II (2X660MW)

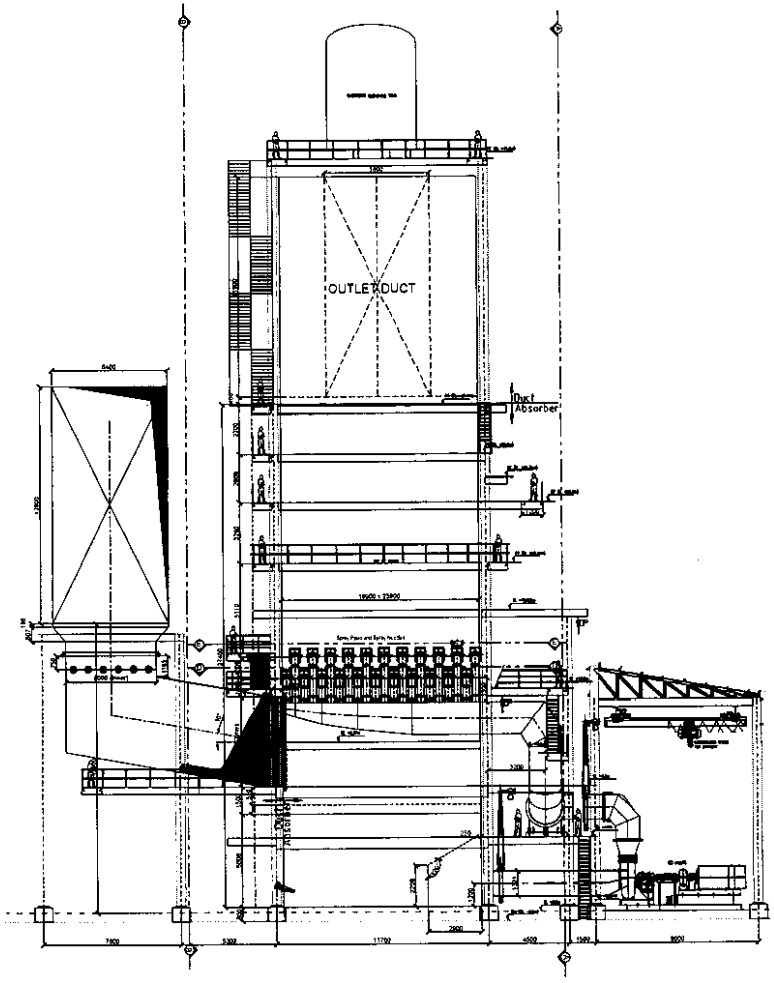
JOB NO 663
STATUS CONTRACT
DISTRIBUTION
TO
No. OF

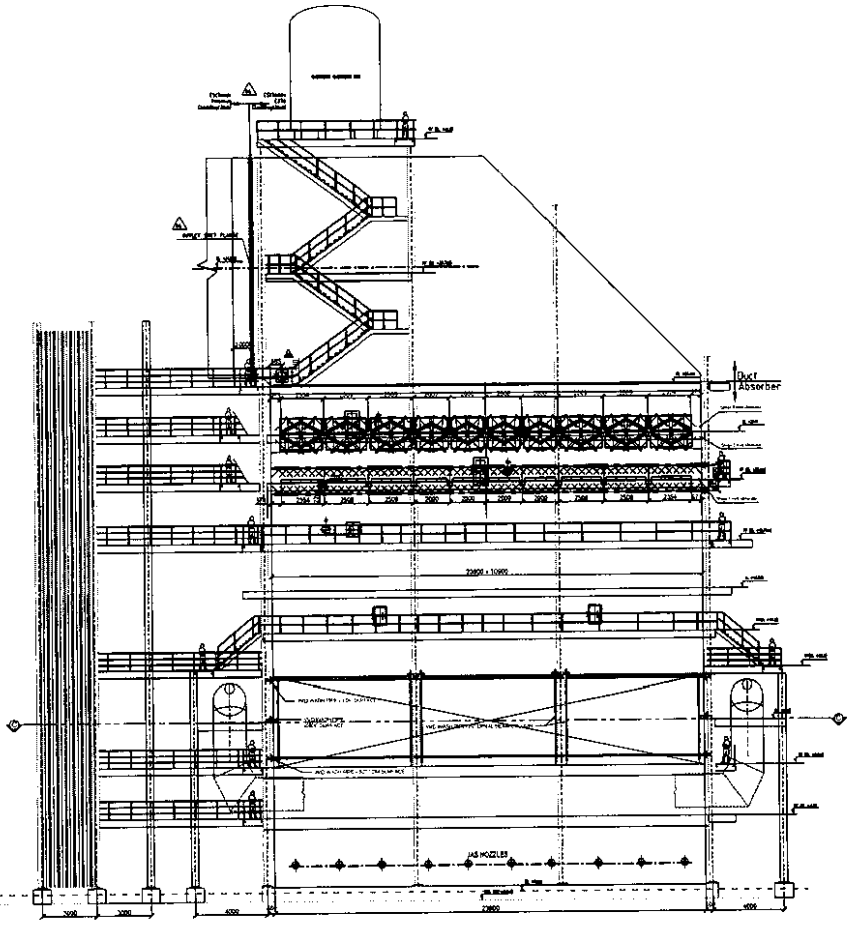
BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

DEPT CODE		NAME	SIGN	DATE
C	DRN	RAJAN	-SD-	04.09.2020
	DESN	BA	-SD-	04.09.2020
	CHD	AD	-SD-	04.09.2020
	APPD	AM	-SD-	04.09.2020

TITLE :
BALL MILL BUILDING
FRAMING PLAN OF ROOF BEAMS

MFG	ELEC	C&I	MSE	MAT	DEPT	SCALE	VARIES	DRAWING NO. PE-DG-443-691-C007
					SIGN			Annex 9xm2
					DATE			SHEET 1 OF 1 REV. 1





View F-F

Note:

Elevation 0.0 corresponds to RL 46.7m

FGL at Absorber area is at RL 46.2m

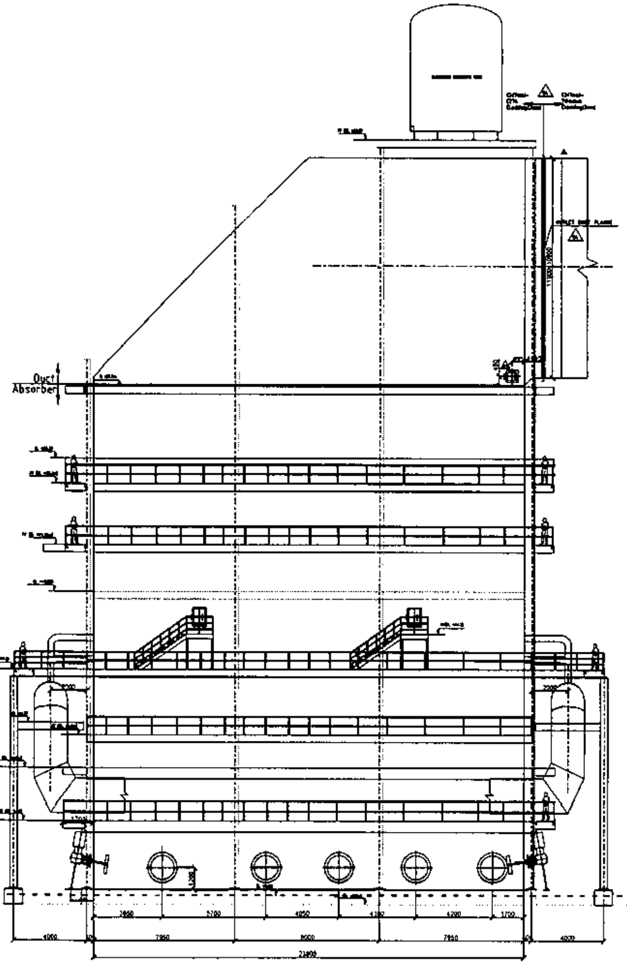
All dimensions are in millimeters

NTPC Dwg. No.: 9560-10

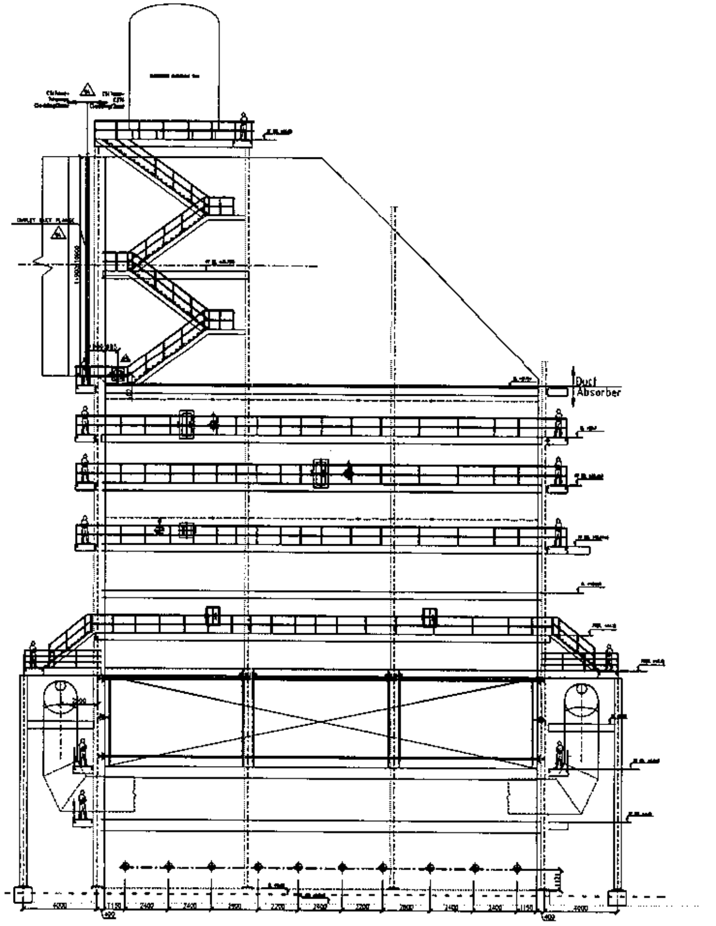
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: NTPC/BARH STPP.

Bharat Heavy Electricals Ltd
BOILER AUXILIARIES PLANT
RANIPET-632 406

GA of Absorber



View A-A



View B-B

DUCT	IS 2062 E250 A/BR + 2mm Titanium Cladding				
...IRE	-	-	-	CARBON STEEL	-
...ATOR		-	-		Poly Sulfone
...	-		-	ALLOY 926 OR BETTER MATERIAL	-
...IGED	-	-	-	FRP/Vinylester Epoxy +Alumina	-
BOLT & NUT	A193 B7 & A194 2H	A193 B7 & A194 2H	A193 B7 & A194 2H	A193 B7 & A194 2H	A193 B7 & A194 2H
BOLT & NUT	UNS S 31603 (SS 316L)	UNS N 10276 (C276)	UNS N 10276 (C276)	-	UNS N 10276 (C276)
NOZZLE	UNS S 31603 (SS 316L)	UNS N 10276 (C276)	SiC		Poly Propylene
PIPE (Overall)	UNS S 31603 (SS 316L)	UNS N 10276 (C276)	FRP + SiC Coating	-	Poly Propylene
HEADER (Header)	-	-	CS + Rubber lining	-	-
... & NUT	-	-	-	IS 2062 E250 A/BR	-
SUPPORT	UNS S 31603	UNS N 10276 (C276)	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining
...ET	PTFE	PTFE	RUBBER	RUBBER	RUBBER
FLANGE	IS 2062 E250 BR	UNS N 10276 (C276)	IS 2062 E250 BR + 2mm C276 Lining	IS 2062 E250 BR + 2mm C276 Lining	IS 2062 E250 BR + 2mm C276 Lining
NECK	IS 2062 E250 BR (IS 5378 / IS 2648)	UNS N 10276 (C276)	IS 2062 E250 BR + 2mm C276 Lining	IS 2062 E250 BR + 2mm C276 Lining	IS 2062 E250 AL + 2mm C276 Lining
BOLT & NUT	CS + GALV	-	CS + GALV	CS + GALV	CS + GALV
COVER	IS 2062 E250 A/BR		CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining
...ANGE	IS 2062 E250 A/BR	-	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining
...NECK	IS 2062 E250 A/BR	-	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining	CS + 2mm C276 Cladding/Lining
PLATE	-	-	-	CS (7mm min) + 2mm C276	-
...SING	IS 2062 E250 A/BR, 7mm thick	UNS N 10276 (C276) 4mm thick	CS (7mm min) + 2mm C276 Cladding/Lining	CS (7mm min) + 2mm C276 Cladding/Lining	CS (7mm min) + 2mm C276 Cladding/Lining
AREA →	EMERGENCY QUENCHING AREA	GAS INLET AREA (WET DRY)	ABSORBER SPRAY PIPE AREA	ABSORBER TANK AREA	MIST ELIMINATOR AREA
		ABSORBER			

MATERIAL SPECIFICATION

NTPC Dwg. No.: 9560-109-PVM-9-068

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: NTPC/BARH STPP, STAGE-2, 2x660MW

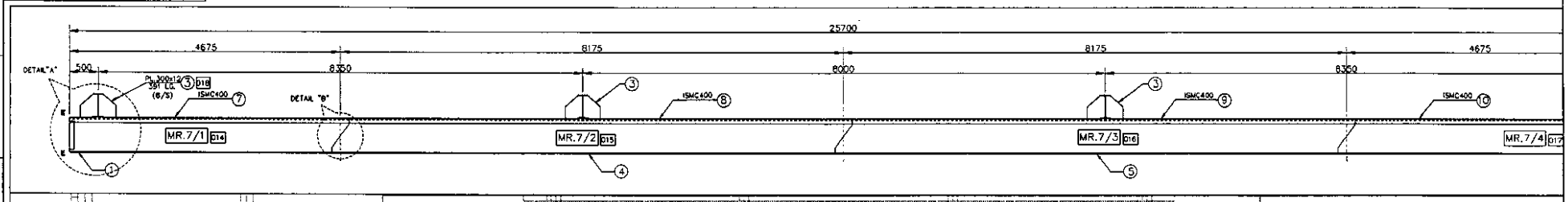
CUST. NO: C607-606

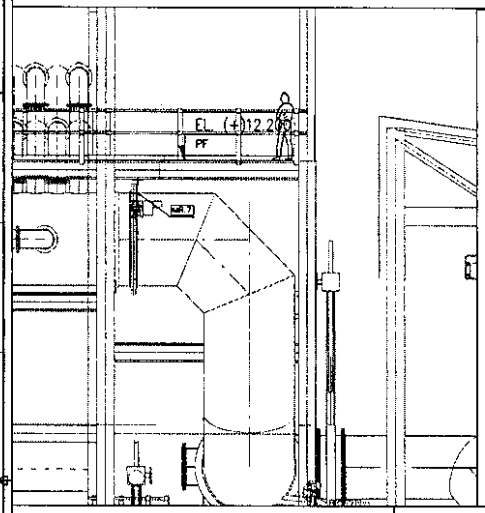
Bharat Heavy Electricals Ltd
BOILER AUXILIARIES PLANT
RANIPET-632 406

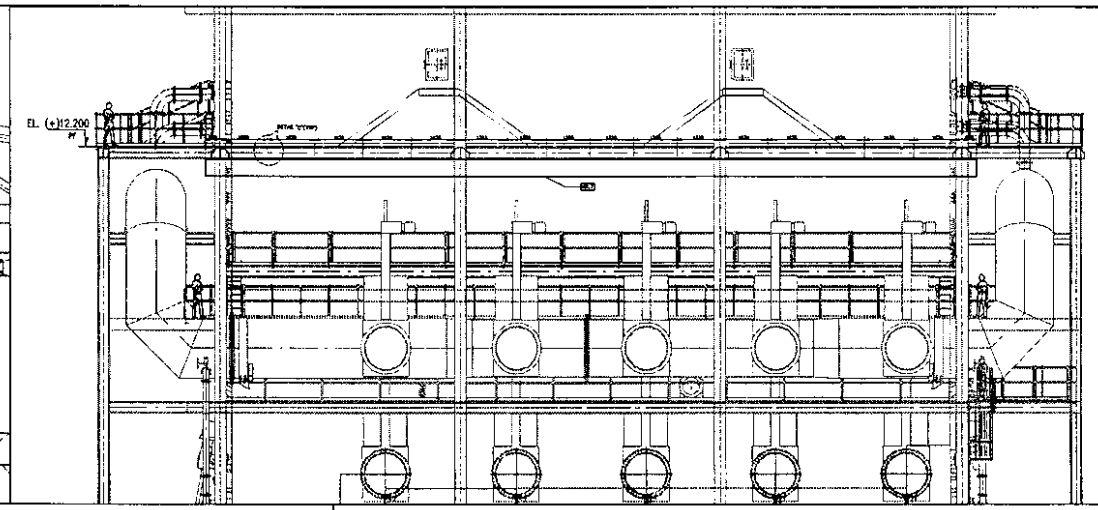
SCALE 1:300

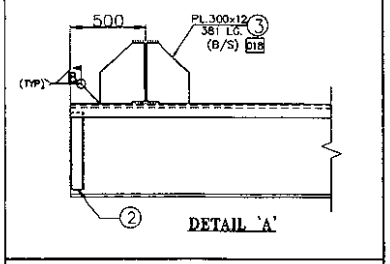
TITLE: GA of Absorber#4
Sh 02 of 06

DRAWING NO.: 0-FW-000-01385 REV 05

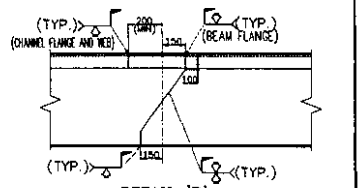




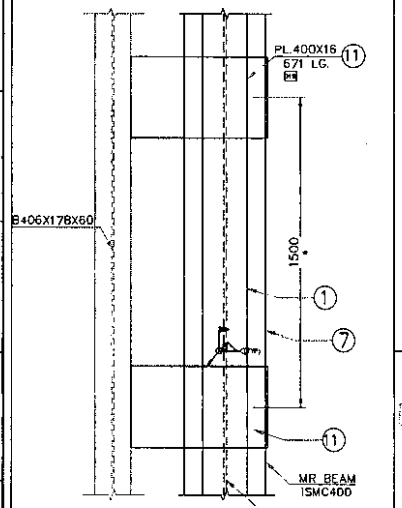




DETAIL 'A'

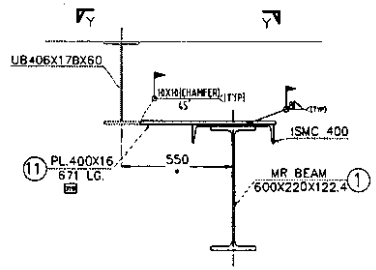


DETAIL 'B'



VIEW Y-Y

* TENTATIVE CONFORM WITH ENGINEERING BEFORE ERECTION.



DETAIL-C

* TENTATIVE CONFORM WITH ENGINEERING BEFORE ERECTION.

						AA1012708209		M	52				
20	07/08/09/10	ISMC 400				IS2062			REFER GMS				
								NO	33.72				
19	11	GUSSET -(GS - 7/11)		3-FW-710-08580					13+13				
								NO	7.33				
18	03	GUSSET -(GS - 7/3)		3-FW-710-08580					8+8				
								NO	581.12				
17	06	MONORAIL (MR-7/4)		3-FW-710-08580					1+1				
								NO	1000.62				
16	05	MONORAIL (MR-7/3)		3-FW-710-08580					1+1				
								NO	1000.62				
15	04	MONORAIL (MR-7/2)		3-FW-710-08580					1+1				
								NO	581.12				
14	01	MONORAIL (MR-7/1)		3-FW-710-08580					1+1				
			STD		ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNITWEIGH	GS	ZONE		
DU.NO	ITEM NO.	DESCRIPTION		DRAWING NUMBER	VAR.NO	MATERIAL SPEC		D1	QUANTITY				

BILL OF MATERIALS

ISMC 400 SHALL BE SENT TO SITE IN RUNNING METRES.

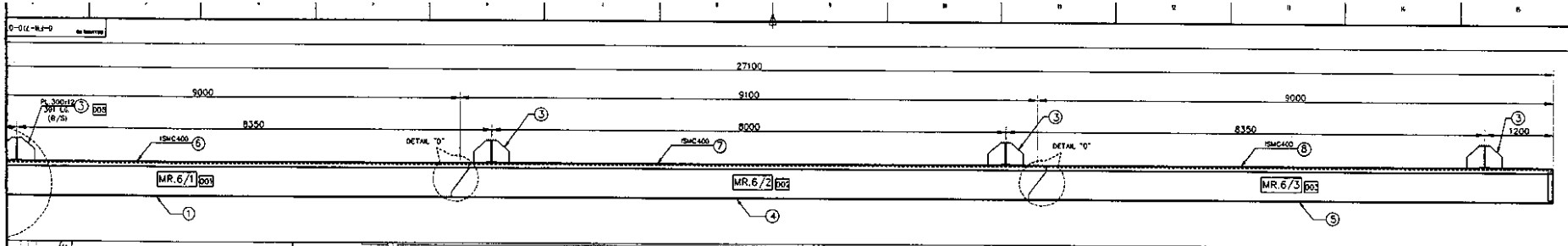
NOTES:-

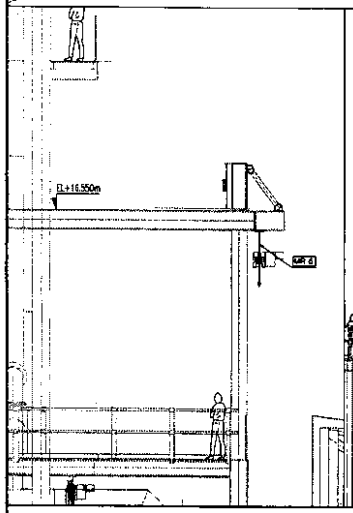
1. ALL DIMENSIONS ARE IN MM. & LEVELS ARE IN M.
2. ALL MEMBERS AND GUSSETS PLATES TO BE CUT AFTER FULL SCALE SHOP LAYOUT BEFORE FABRICATION
3. ALL SHOP WELD ARE 8mm. THICK U.N.O.
4. STANDARD FABRICATION NOTES IN DRAWING NO: 4-00-000-32487 TO BE FOLLOWED
5. * TENTATIVE CONFORM WITH ENGINEERING BEFORE ERECTION.
6. BOM FOR ALL UNITS (G6D7, G6D8)

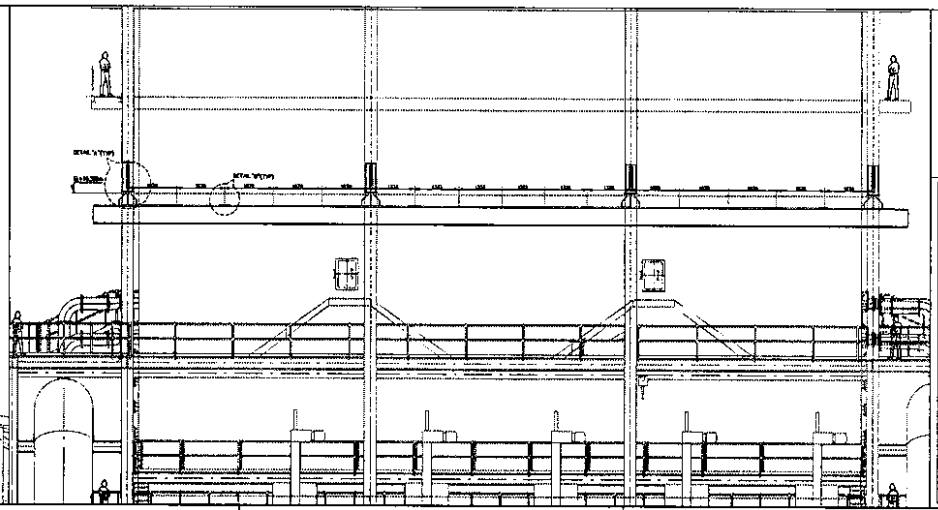
--- DU.NO
--- ITEM NO

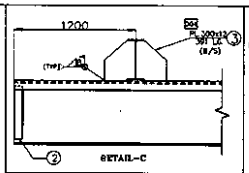
BHARAT HEAVY ELECTRICALS LTD.

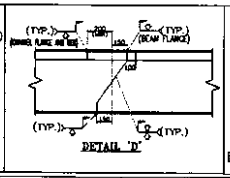
MONORAIL BEAM

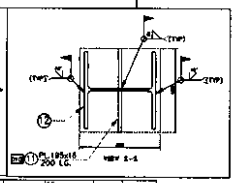






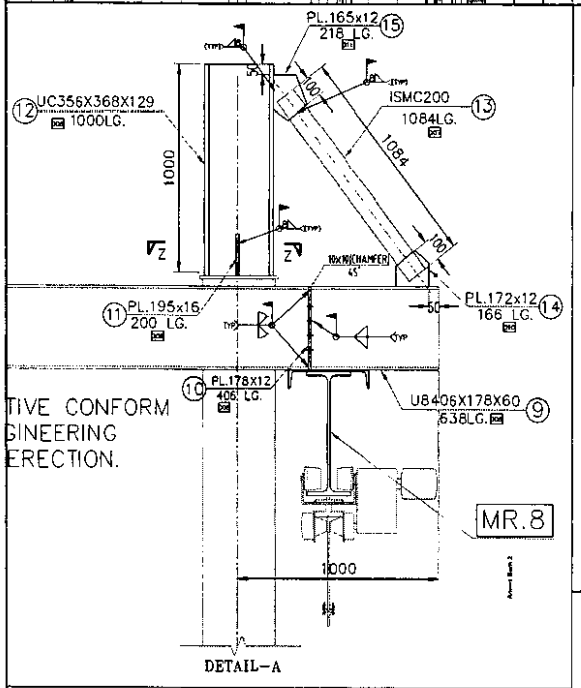


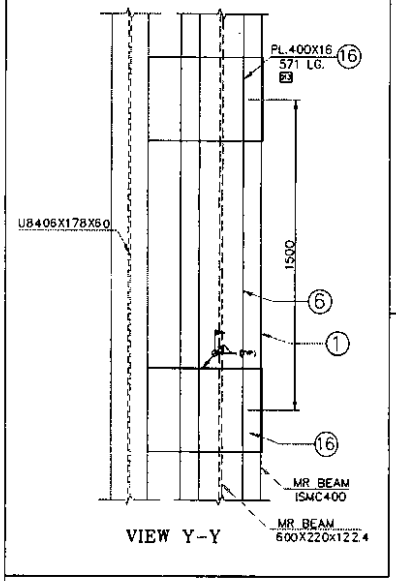


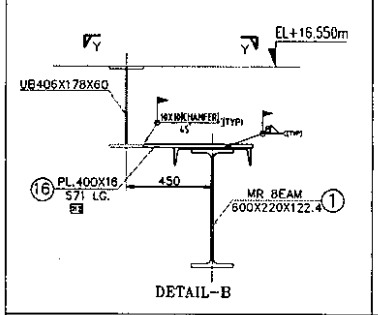


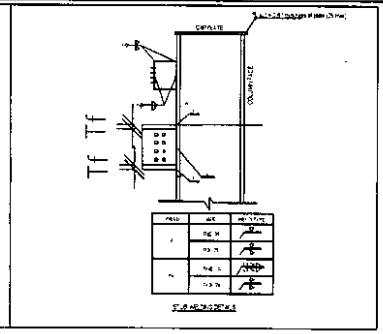
13	06/07/08	ISMC 400				AA101270209 IS2062		M	155	REFER GMS
12	16	GUSSET (GS -6/16)		3-FW-710-08562				NO	28.7	13+13
11	15	GUSSET (GS -6/15)		3-FW-710-08562				NO	2.51	4+4
10	14	GUSSET (GS -6/14)		3-FW-710-08562				NO	2.16	4+4
9	11	STIFFENER PL - (PL-11)		3-FW-710-08562				NO	4.30	8+8
8	10	CONNECING PL -(PL-10)		3-FW-710-08562				NO	6.41	4+4
7	03	GUSSET -(GS- 6/3)		3-FW-710-08562				NS	7.53	8+8
6	13	2N MC200 - 1084L		3-FW-710-08562				NS	48.35	4+4
5	12	UC356X368X129 - 1000L		3-FW-710-08562				NO	128.00	4+4
4	09	UB 406x178x99 - 638L		3-FW-710-08562				NO	38.34	4+4
3	05	MONORAIL (MR-6/3)		3-FW-710-08562				NO	1113.5	1+1
2	04	MONORAIL (MR-6/2)		3-FW-710-08562				NO	1113.64	1+1
1	01	MONORAIL (MR-6/1)		3-FW-710-08562				NO	1116.5	1+1
DU.NO	ITEM NO.	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO VAR.NO	MATERIAL CODE MATERIAL SPEC	A/C/P	UNIT. QUANTITY	UNITWEIGH	GS ZONE

BILL OF MATERIALS









ISMC 400 SHALL BE SENT TO SITE IN RUNNING METRES.

NOTES: -

1. ALL DIMENSIONS ARE IN MM. & LEVELS ARE IN M.
2. ALL MEMBERS AND GUSSETS PLATES TO BE CUT AFTER FULL SCALE SHOP LAYOUT BEFORE FABRICATION
3. ALL SHOP WELD ARE 8mm. THICK U.N.O.
4. STANDARD FABRICATION NOTES IN DRAWING NO: 4-00-000-32487 & 0-FW-220-01837 TO BE FOLLOWED
5. * TENTATIVE CONFORM WITH ENGINEERING BEFORE ERECTION.
6. BOM FOR ALL UNITS (G607, G608)

TIVE CONFORM
GINEERING
ERECTION.

··· DU.NO
--- ITEM NO

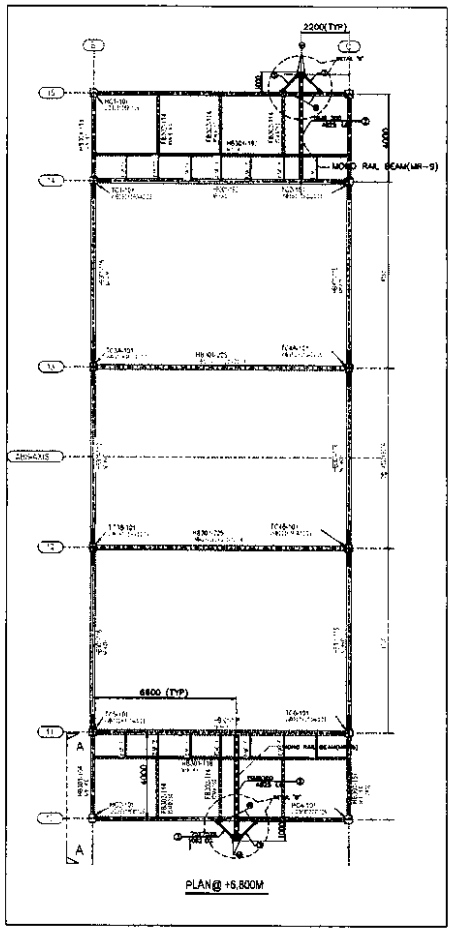
BOLT LIST

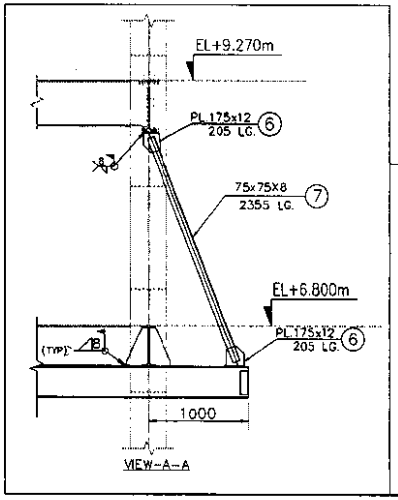
HSFG BOLT (CLASS 10.6) (IS. 3757) DIA OF BOLT	ITEM MKD.	LENGTH OF BOLT	THREADED LENGTH	TOTAL NO. OF BOLTS.	NO. OF PLAIN WASHER	NO. OF HSS NUTS
M24	81	60	--	32	64	32

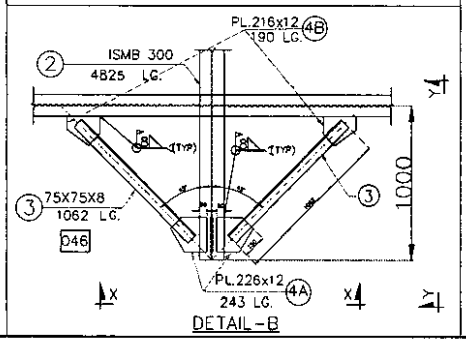
ENARAT HEAVY ELECRICALS L.T.D.

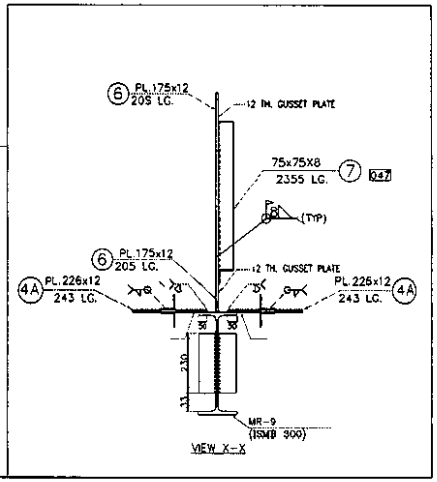
MONORAIL BEAM

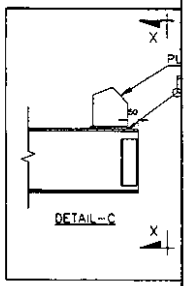
0-FW-710-07864 00

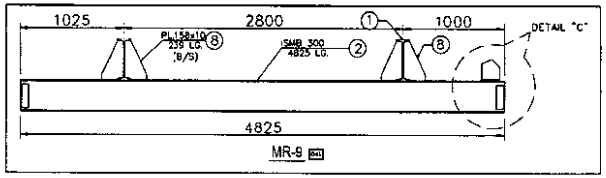


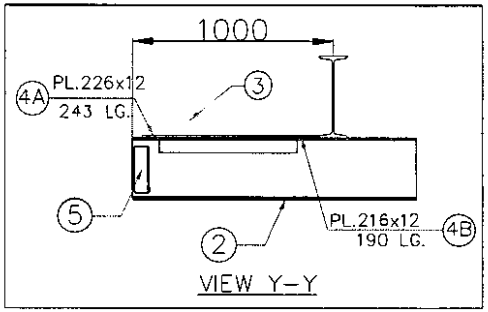


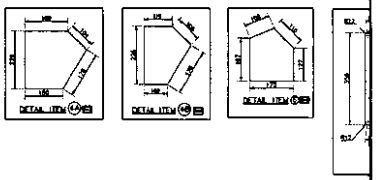












Arrangement shown is Indicative/ Tentative. Site can suitably adjust depending on interference and available space.
Raw Materials required are supplied as Erection materials DU NO. 27,28 & 29. The Raw materials can be cut to suite the requirement.

--- DU.NO
--- ITEM NO

NOTES:-

1. ALL DIMENSIONS ARE IN MM. & LEVELS ARE IN M.
2. ALL MEMBERS AND GUSSETS PLATES TO BE CUT AFTER FULL SCALE SHOP LAYOUT BEFORE FABRICATION
3. ALL SHOP WELD ARE 8mm. THICK U.N.O.
4. STANDARD FABRICATION NOTES IN DRAWING NO: 4--DD--000--32487 TO BE FOLLOWED

***ALL DIMENSIONS ARE IN MM. & L

BHARAT HEAVY ELECTRICALS LTD.

MONORAIL BEAM

ANNEXURE-II

SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of ELECTRIC WIRE ROPE HOIST (EWRH) will be done by owner as per vendor's Erection Manual and check List.

However, the Bidder/vendor shall make visit for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

The Bidder/vendor have to make two numbers of visit for the supervision erection & commissioning, testing for **Each electric Hoist** – 1st visit for the supervision of erection & 2nd Visit for pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply for each Electric Hoist

SL NO	DESCRIPTION	QUANTITY (SET)
1	SUPERVISION OF ERECTION OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT NABINAGAR 3X660 SITE AS FRIST VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.
2	SUPERVISION OF COMMISSIONING, INSPECTION AND TESTING OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT NABINAGAR 3X660 SITE AS SECOND VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.

Vendor shall quotes charges for **complete work for supervision** for erection & commissioning, testing for each Electric Hoist.

Travel charges (visa/passport, all the to/fro travel charges to the site), TA/DA, boarding and lodging shall be borne by the bidder and shall be **inclusive in above supervision charges** portion for complete work for supervision for erection & commissioning, testing for each Electric Hoist.

The charges quoted for the supervision will be considered for L1 evaluation.
However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

Annex NPGCL

ANNEXURE - III

ELECTRIC WIRE ROPE HOIST (EWRH) WITH MOTOR DRIVEN TROLLEY

PROJECT: NABINAGAR 3X660MW FGD PROJECT

SL NO	AREA	TYPE OF HOIST	CAPACITY OF HOIST	MAXIMUM SPEED		HDIST MONORAIL BEAM BOTTOM ELEVATIONS (Hoist Monorail BEAM in BHEL Scope)	FLOOR LEVEL	TRAVEL LENGTH	PATH	MINIMUM RADIUS OF TRAVEL	HOIST MONORAIL I-BEAM (Hoist Monorail BEAM in BHEL Scope)	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK	HEIGHT DF BDTTOM DF MONORAIL I-BEAM TO HOIST HOOK - HOIST HEAD ROOM - VENDOR TO SPECIFY	TOTAL QNTY
				HOSTING	CROSS TRAVEL									
			TON	METER PER MINUTE	METER PER MINUTE	(EL (+/-) IN METER)	(EL (+/-) IN METER)	(METER)	CURVED / STRAIGHT	(MM)	NPB / UB /ISMC/ISMB	(MM)	(MM)	(SET)
A. ABSORBER														
1	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +10.6M	EL. -0.5M	26M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
2	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +16.6M	EL. -0.5M	26M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
3	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC WIRE ROPE	2	6	15	EL.+6.1M	EL. -0.5M	6.5M	STRAIGHT	N/A	ISMB300	As minimum as possible.- Vendor to specify Actaul value,	_____	As per Enquiry
B. BOOSTER FAN & MOTOR														
4	BUF MOTOR	ELECTRIC WIRE ROPE	22	6	15	EL. +11.45M	EL. -0.5M	29M	STRAIGHT	N/A	*MRB-M	2250	2250	As per Enquiry
5	BUF FAN HOUSING	ELECTRIC WIRE ROPE	13	6	15	EL. +13.95M	EL. -0.5M	29M	STRAIGHT	N/A	*MRB-F	1650	1650	As per Enquiry

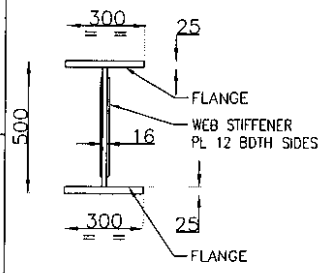
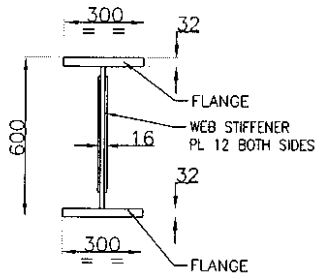
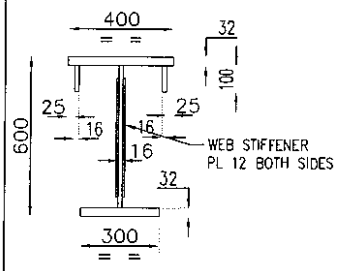
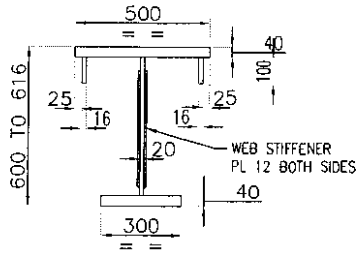
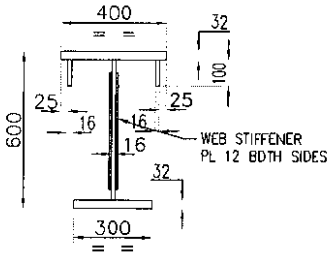
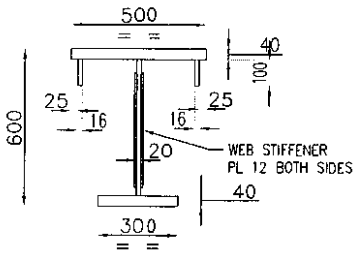
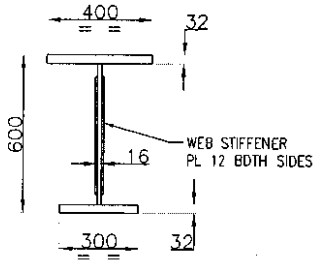
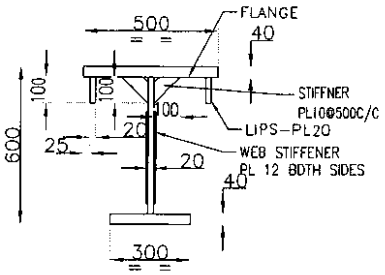
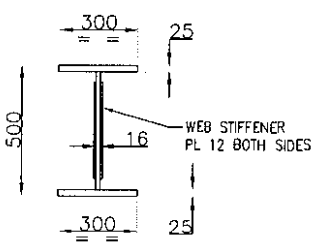
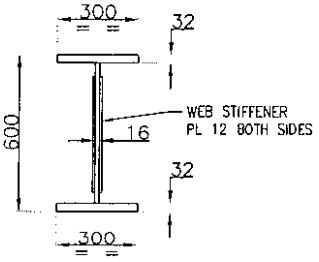
NOTE : 1) Oepending upon Hoist head room , the actual height of lift for hoist shall be arrived.
2) * For MRB- M & MRB- F details, Refer below attachement. Next to this page.
3) Vendor to specify the Hoist head Room during Tender stage.

Annex NPGCL

Annex NPGCL

BUF HANDLING MONORAIL BEAM SIZES

05.08.2022

KORBA FGO UNIT	CUT NO	MRB-F (FOR FAN MAINT.) CROSS SECTION	MRB-M (FOR MOTOR MAINT.) CROSS SECTION
NSPCL BHILAI (2X250MW)	G211 G212	 (SWL 06 TOS)	 (SWL 10 TOS)
NTPC RAMAGUNDAM ST-I (3X200MW)	G208	 (SWL 13 TOS)	 (SWL 22 TOS)
NTPC RAMAGUNDAM ST-II (3X500MW)	G509 G510 G511	 (SWL 10 TOS)	 (SWL 20 TOS)
NPGCL NABINAGAR (3X660MW)	G609 G610 G611	 (SWL 13 TOS)	 (SWL 23 TOS)
BRBCL NABINAGAR (4X250MW)	G201 G202 G203 G204	 (SWL 8 TOS)	 (SWL 14 TOS)

Annex NPGCL

Annex NPGCL

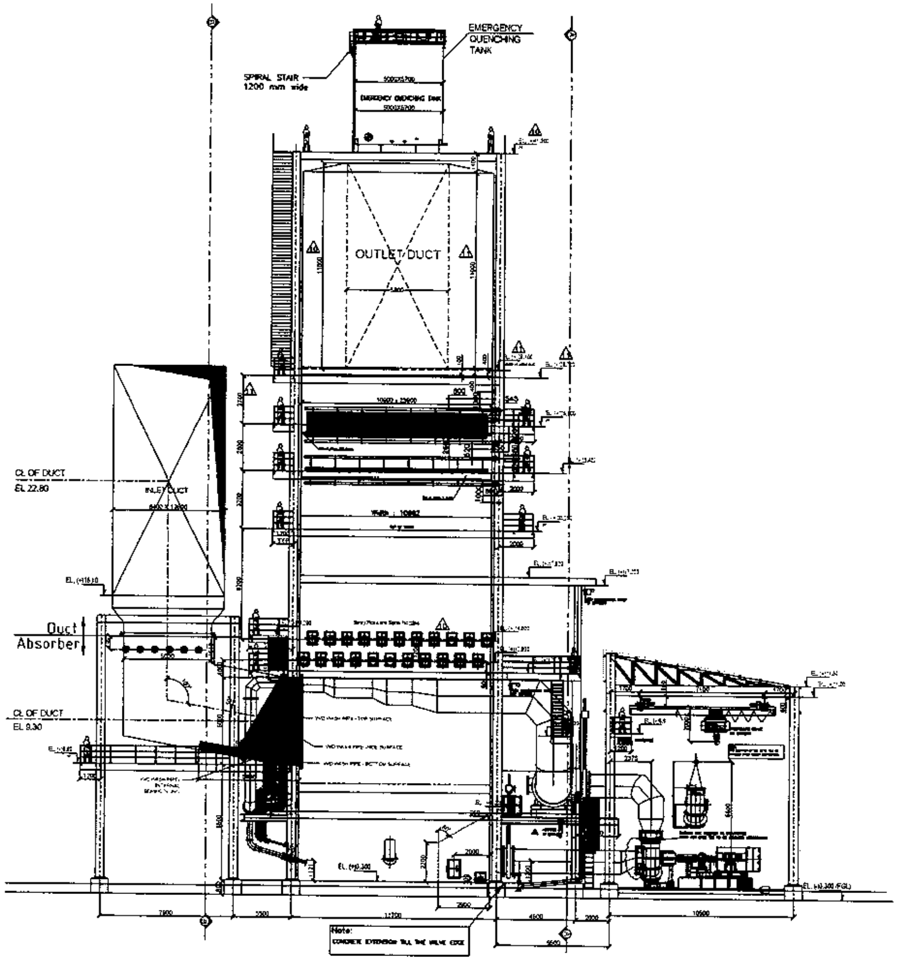
SWL : SAFE WORKING LOAD - THIS IS THE LOAD FOR WHICH MONORAIL BEAMS ARE OESIGNEO FOR.

Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	
				Intermediate: One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	100	With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)		
28	Slurry pumps & accessories, Water pumps **(Referred from cl. 7.05.00 of Section-VI, Part-B, Sub section-I-M5)**	FW 701 FW 702	Power Tool Cleaning to St3 (SSPC-SP3)	Primer: Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Intermediate: One coat of Synthetic Enamel intermediate coat to IS 2932; DFT- 50µ	60 50	Two coats of Synthetic Enamel to IS 2932, DFT- 50µ/ coat Shade: Light blue RAL 5012	100	210
29	Monorail for hoist & cranes **(Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 710	Blast cleaning to Sa 2½ (Near white metal) with surface profile 40-60µm conforming to ISO 8501-1	Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume minimum 60% ±2). Zinc dust composition and properties shall be as per Type II as per ASTM D520-00 DFT- 70µ Intermediate: One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	70 100	Finish: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane paint to IS 13213 solid by volume min.55%±2) DFT- 35µ/ coat Shade: Grey white, RAL 9002 With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)	70	240
30	Handling Equipment-Hoists& Man hole door **(Clause 20.03.00 of Part-C Section VI)**	FW 713 FW 714 FW 717	Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130
31	Agitator support **Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 721	Blast cleaning to Sa 2½ (Near white metal) with surface	Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume	70	Finish: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane	70	240

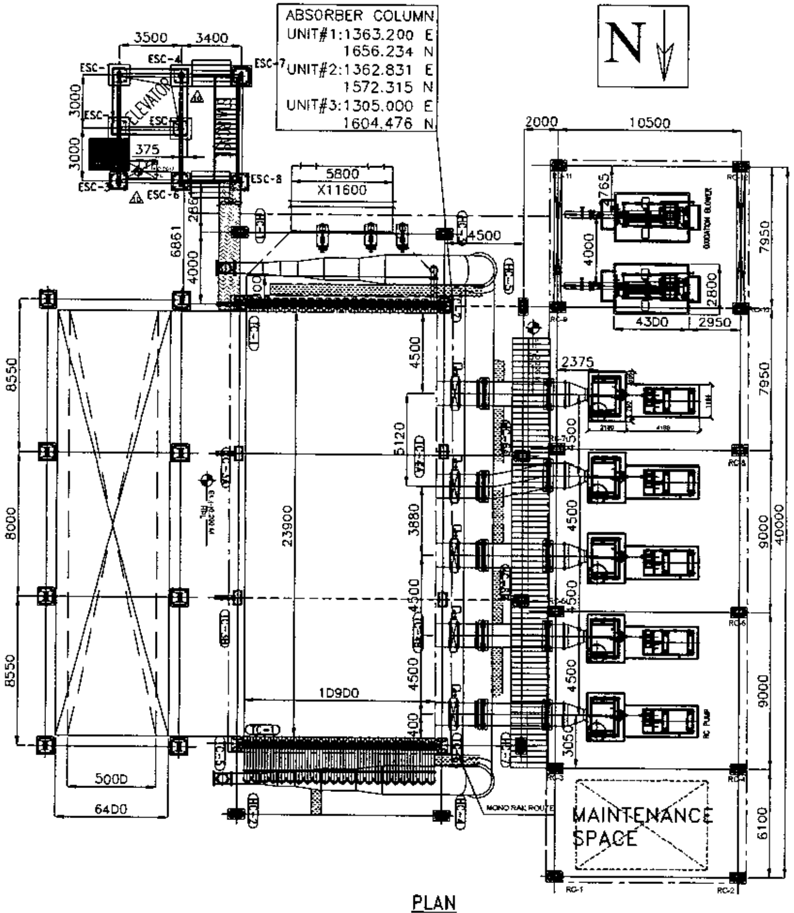
Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

GENERAL NOTES

1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., Agitator/ slide bearing and other sub-delivery components etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used, very minor items like clamps, small items etc - Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed and painting under Sl no:01 of Fans shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipments, fans, piping, pipe services, supporting structures and other components is followed as per NTPC doc no: QS-01-DIV-W-4 at site.
6. All components covered under different PGMAs are to be painted. Incase any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
8. Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
9. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
10. Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
11. Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
12. For the portion of steel surfaces embedded in concrete, the surface shall be prepared by Manual cleaning and provided with Primer coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron DFT.

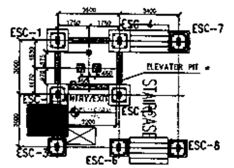


ELEVATION



PLAN

RCPH SEPARATE ELEVATION VIEW TO BE UPDATED WITH OXIDATION BLOWER TO BE SHOWN



ELEVATOR PIT PLAN AT EL:+0.00M

* (REFER CIVIL DRAWING FOR DETAILS OF ELEVATOR PIT WALL)
(SIZE OF ELEVATOR PEDESTALS ESC-1,ESC-2,ESC-4&ESC-5 IS 1200MM X 1200MM)
(SIZE OF STAIR CASE PEDESTALS ESC-3,ESC-6,ESC-7&ESC-8 IS 1000MM X 1000MM)

PROGRESSIVE

SL.NO.	HOIST	CAPACITY	QTY.
1	UNDERSLUNG CRANE	10T	01 NO
2	RGV DISCHARGE	5T	03 NO
3	RGV SUCTION	5T	03 NO
4	AGITATOR	1T	01 NO

REFERENCE DRAWINGS:

PLANT LAYOUT :0378-109-PVM-F-044-01
DUCT GA :0370-109-PVM-8-049

CUSTOMER NOS: G609, G610, G611

NTPC DRAWING NO : 0370-109-PVM-8-010

CUSTOMER: NTPC LIMITED.

PROJECT: NABINAGAR SUPER THERMAL POWER PROJECT (3X660MW)

BHARAT HEAVY ELECTRICALS LIMITED, UNIT: BOILER AUXILIARIES PLANT, RANIPET

	NAME
DRN	SRIVISHNU
CHD	LOGANATHAN
APPD	KUMAR

SCALE : NTS

TITLE: GENERAL ARRANGEMENT ABSORBER

DRAWING NO. 0-FW-000-01948 SH 01 OF 06 REV: 11

REVISED AS PER ABSORBER DATA SHEET - REV 06
REVISED AS PER NTPC COMMENTS

0-FW-000-01412

ANNEXURE-II

SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of ELECTRIC WIRE ROPE HOIST (EWRH) will be done by owner as per vendor's Erection Manual and check List.

However, the Bidder/vendor shall make visit for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

The Bidder/vendor have to make two numbers of visit for the supervision erection & commissioning, testing for **Each electric Hoist** – 1st visit for the supervision of erection & 2nd Visit for pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply for each Electric Hoist

SL NO	DESCRIPTION	QUANTITY (SET)
1	SUPERVISION OF ERECTION OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT BRBCL NABINAGAR 4X250MW SITE AS FRIST VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.
2	SUPERVISION OF COMMISSIONING, INSPECTION AND TESTING OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT BRBCL NABINAGAR 4X250MW SITE A5 SECOND VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.

Vendor shall quotes charges for **complete work for supervision** for erection & commissioning, testing for each Electric Hoist.

Travel charges (visa/passport, all the to/fro travel charges to the site), TA/DA, boarding and lodging shall be borne by the bidder and shall be **inclusive in above supervision charges** portion for complete work for supervision for erection & commissioning, testing for each Electric Hoist.

The charges quoted for the supervision will be considered for L1 evaluation.
However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

Annex BRBCL

ANNEXURE - III

ELECTRIC WIRE ROPE HOIST (EWRH) WITH MOTOR DRIVEN TROLLEY

PROJECT: BRBCL NABINAGAR 4X250MW FGD PROJECT

SL NO	AREA	TYPE OF HOIST	CAPACITY OF HOIST	MAXIMUM SPEED		HOIST MONORAIL BEAM BOTTOM ELEVATIONS (Hoist Monorail BEAM in BHEL Scope)	FLOOR LEVEL	TRAVEL LENGTH	PATH	MINIMUM RADIUS OF TRAVEL	HOIST MONORAIL I-BEAM (Hoist Monorail BEAM in BHEL Scope)	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK	HEIGHT OF BOTTOM OF MONRAIL I-BEAM TO HOIST HOOK - HOIST HEAD RDOM - VENDOR TO SPECIFY	TOTAL QNTY
				HOSTING	CROSS TRAVEL									
			TON	METER PER MINUTE	METER PER MINUTE	(EL (+/-) IN METER)	(EL (+/-) IN METER)	(METER)	CURVED / STRAIGHT	(MM)	NPB / UB /ISMC/ISMB	(MM)	(MM)	(SET)
A. ABSORBER														
1	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +9.2M	EL. -0.5M	16M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
2	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +15.0M	EL. -0.5M	16M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
3	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC WIRE ROPE	2	6	15	EL. +6.1M	EL. -0.5M	6.5M	STRAIGHT	N/A	ISMB300	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
B. BOOSTER FAN & MOTOR														
4	BUF MOTOR	ELECTRIC WIRE ROPE	13	6	15	EL. +9.15M	EL. -0.5M	27.0M	STRAIGHT	N/A	*MRB-M	1800	1800	As per Enquiry
5	BUF FAN HOUSING	ELECTRIC WIRE ROPE	7.5	6	15	EL. +11.55M	EL. -0.5M	27.0M	STRAIGHT	N/A	*MRB-F	1500	1500	As per Enquiry

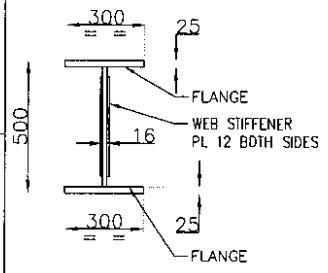
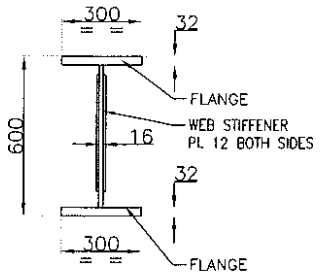
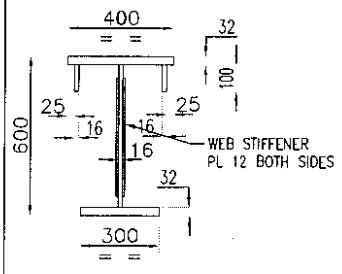
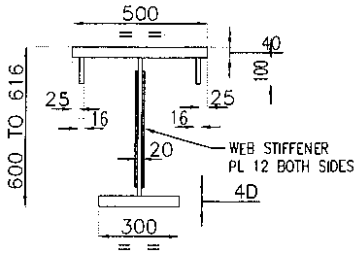
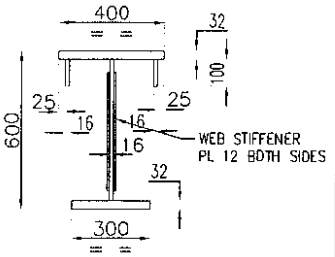
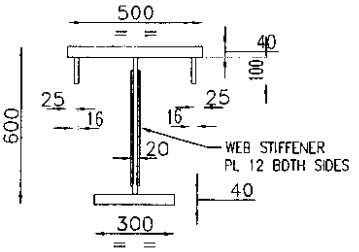
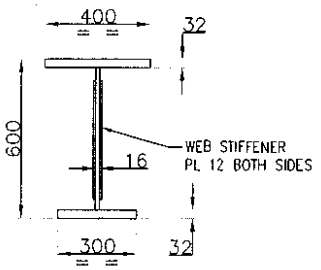
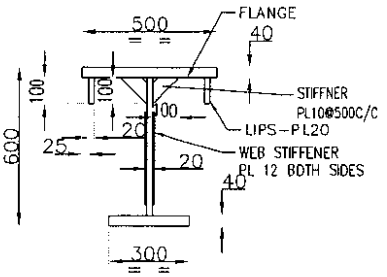
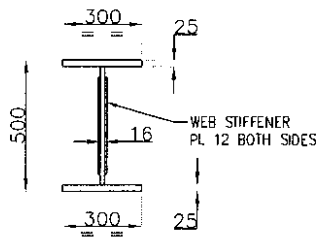
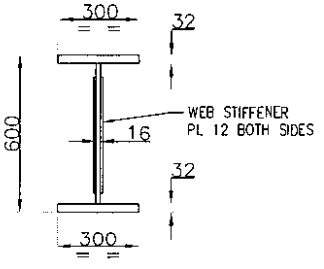
NOTE : 1) Oepending upon Hoist head room , the actual height of lift for hoist shall be arrived.
2) * For MRB- M & MRB- F details, Refer below attachement. **Next to this page.**
3) Vendor to specify the Hoist head Room during Tender stage.

Annex BRBCL

Annex BRBCL

BUF HANDLING MONORAIL BEAM SIZES

05.08.2022

KORBA FGD UNIT	CUT NO	MRB–F (FOR FAN MAINT.) CROSS SECTION	MRB–M (FOR MOTOR MAINT.) CROSS SECTION
NSPCL BHILAI (2X250MW)	G211 G212	 (SWL 06 TOS)	 (SWL 10 TOS)
NTPC RAMAGUNDAM ST–I (3X200MW)	G208	 (SWL 13 TOS)	 (SWL 22 TOS)
NTPC RAMAGUNDAM ST–II (3X500MW)	G509 G510 G511	 (SWL 10 TOS)	 (SWL 20 TOS)
NPGCL NABINAGAR (3X660MW)	G609 G610 G611	 (SWL 13 TOS)	 (SWL 23 TOS)
BRBCL NABINAGAR (4X250MW)	G201 G202 G203 G204	 (SWL 6 TOS)	 (SWL 14 TOS)

Annex BRBCL

Annex BRBCL

SWL : SAFE WORKING LOAD – THIS IS THE LOAD FOR WHICH MONORAIL BEAMS ARE DESIGNED FOR.

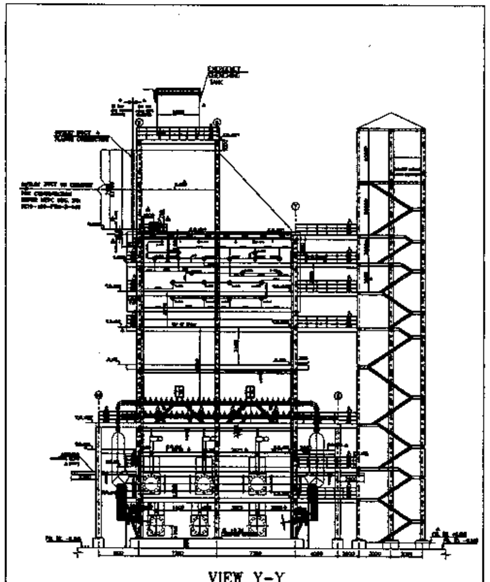
Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	
				Intermediate: One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	100	With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)		
28	Slurry pumps & accessories, Water pumps **(Referred from cl. 7.05.00 of Section-VI, Part-B, Sub section-I-M5)**	FW 701 FW 702	Power Tool Cleaning to St3 (SSPC-SP3)	Primer: Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Intermediate: One coat of Synthetic Enamel intermediate coat to IS 2932; DFT- 50µ	60 50	Two coats of Synthetic Enamel to IS 2932, DFT- 50µ/ coat Shade: Light blue RAL 5012	100	210
29	Monorail for hoist & cranes **(Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 710	Blast cleaning to Sa 2½ (Near white metal) with surface profile 40-60µm conforming to ISO 8501-1	Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume minimum 60% ±2). Zinc dust composition and properties shall be as per Type II as per ASTM D520-00 DFT- 70µ Intermediate: One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	70 100	Finish: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane paint to IS 13213 solid by volume min.55%±2) DFT- 35µ/ coat Shade: Grey white, RAL 9002 With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)	70	240
30	Handling Equipment-Hoists& Man hole door **(Clause 20.03.00 of Part-C Section VI)**	FW 713 FW 714 FW 717	Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130
31	Agitator support **Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 721	Blast cleaning to Sa 2½ (Near white metal) with surface	Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume	70	Finish: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane	70	240

Annex BRBCL

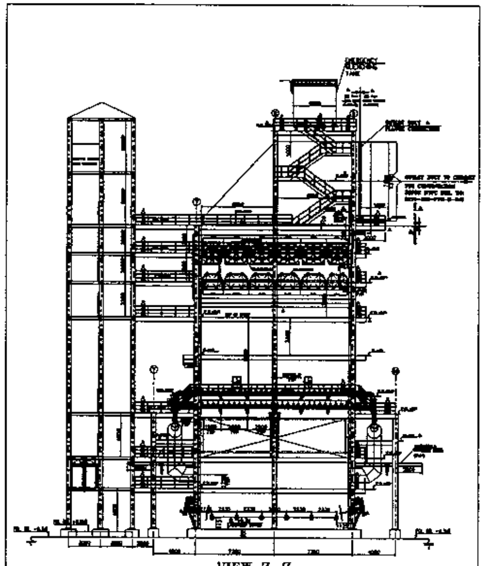
Sl No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

GENERAL NOTES

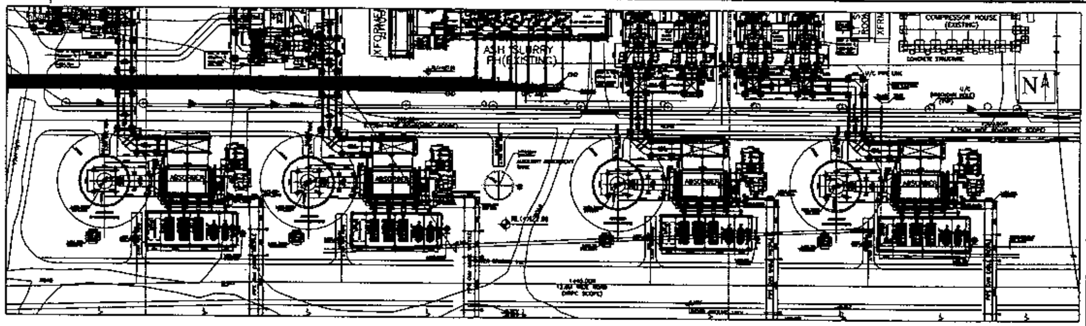
1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., Agitator/ slide bearing and other sub-delivery components etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used, very minor items like clamps, small items etc - Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed and painting under Sl no:01 of Fans shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipment, fans, piping, pipe services, supporting structures and other components is followed as per NTPC doc no: QS-01-DIV-W-4 at site.
6. All components covered under different PGMAs are to be painted. Incase any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
8. Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
9. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
10. Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
11. Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
12. For the portion of steel surfaces embedded in concrete, the surface shall be prepared by Manual cleaning and provided with Primer coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron DFT.



VIEW Y-Y



VIEW Z-Z



KEY PLAN

NOTES:

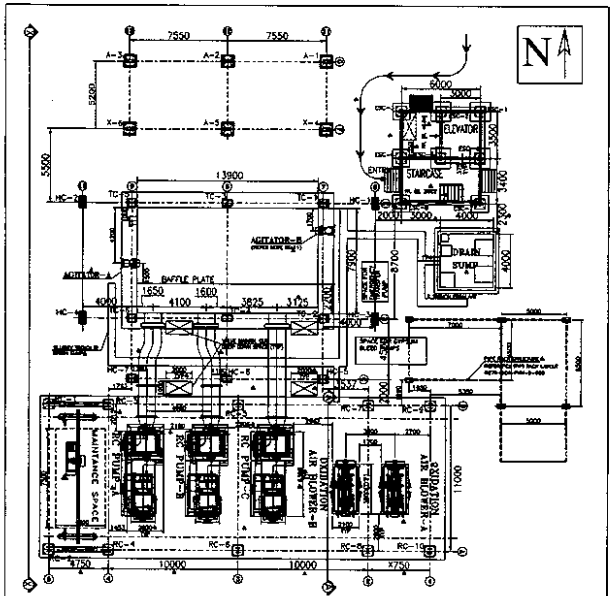
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. FINISH FLOOR LEVEL = RL (+)127.5M, CORRESPONDS TO PLANT EL(±)0.0M WHICH IS GROUND FLOOR OF STG BUILDING.
3. FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA SHALL BE RL(+)127.0M(NTPC TO CONFIRM) i.e. EL(-)0.50M.
4. PIPING INDICATED FOR REFERENCE ONLY,PIPING LAYOUT TO BE REFERRED FOR EXACT DETAILS OF PIPING.
5. INDICATED ORIENTATION OF COLUMNS,COLUMN,BEAM SIZES ARE SUGGESTIVE ONLY,FOR EXACT ORIENTATION REFER STRUCTURAL DRAWINGS.
6. REFER STANDARD DRAWINGS NO:EGF-0052-433 & EGF-0052-434 FOR DETAIL DIMENSIONS OF WAS NOZZLES.
7. SUITABLE CAVITY IN FOUNDATION TO BE PROVIDED FOR ABSORBER BOTTOM DRAINS NOZZLE WELDING.
8. REFER STANDARD DRAWING NO: EGF-0052-41(FOR DETAILS OF EMERGENCY QUENCHING SPRAY PIPE DETAILS.
9. REFER STANDARD DRAWING NO: EGF-0052-4(3 FOR DETAILS OF W/D INTERFACE WASHING PIPE DETAILS.
10. REFER STANDARD DRAWING NO:EGF-0052-421 & EGF-0052-422 FOR DETAILS OF DCFS SPRAY PIPES.
11. APPROACH TO AGITATOR-B FROM DRAIN SUMP SIDE TO BE ENSURED WHILE FINALIZATION OF PIPE ROUTING.
12. ABSORBER DIMENSIONS INDICATED IN "PLAN @ GRADE/FLOOR LEVEL" VIEW ARE ABSORBER CASING OUTSIDE DIMENSIONS.
13. CLEARANCE FOR ERECTION OF CLADDING SURROUNDING THE ELEVATOR SHAFT TO BE CONSIDERED, IF STAIR CASE STRINGER BEAMS ARE ERECTED BEFORE THE ERECTION OF ELEVATOR SHAFT CLADDING.

REF. DWGS

1. 8270-109-PVM-F-844 : FGD PLANT LAYOUT
2. 0270-109-PVM-B-049 : GENERAL LAYOUT OF FGD DUCTING.
3. 8270-109-PVM-F-091 : P&ID – Absorber ,Oxidation Blower,Gypsum Bleed Pump, Filtrate Water System & Mist Eliminator.
4. 8270-109-PVM-B-01(: Data sheet & General Arrangement for Slurry Recirculation Pumps.
5. 0270-109-PVM-B-012 : Data sheet & General Arrangement for Oxidation Air Blower.
6. 0278-109-PVM-B-143 : GA and load data of all tanks.

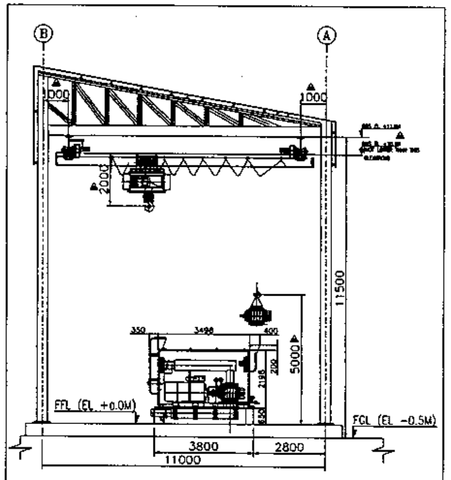
LEGEND:-

FFL	: FINISHED FLOOR LEVEL
FGL	: FINISHED GROUND LEVEL
BOB	: BOTTOM OF BASE PLATE LEVEL
D	: DOOR 1.2M WIDE
RS	: ROLLING SHUTTER 4M X4M
TOPF	: TOP OF PLATFORM
PL	: PAVED LEVEL
TOG	: TOP OF GRATING
TOC	: TOP OF CONCRETE
VL	: VERTICAL LADDER
CGL	: CAGE LADDER

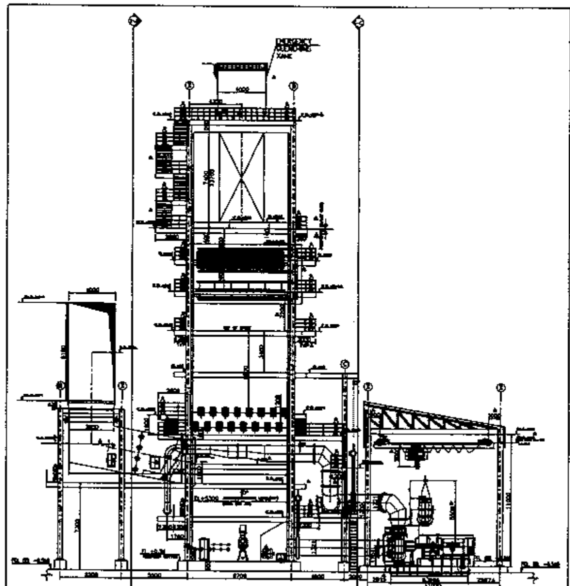


PLAN @ GRADE/FLOOR LEVEL

($ APPLICABLE FOR UNIT #3 ONLY)



VIEW A-A



VIEW X-X

PROGRESSIVE

CUSTOMER NOS:	C201,C202,C203,C204
NTPC DRAWING NO :	8278-189-PVM-B-010
CUSTOMER:	BHARTIYA RAIL BIJLEE COMPANY LIMITED.
CONSULTANT:	NTPC LIMITED.
PROJECT:	NABINAGAR 4X250MW F09 PACKAGE
TITLE	GA OF ABSORBER (PLAN & ELEVATIONS)
DRAWING NO.	0-FW-000-01902
SHEET	SH 01 OF 04
REV	REV:05

Annex BRBCL

ANNEXURE-II

SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Price of each item is to be given separately for **SUPERVISION OF ERECTION, TESTING AND COMMISSIONING**

Erection of ELECTRIC WIRE ROPE HOIST (EWRH) will be done by owner as per vendor's Erection Manual and check List.

However, the Bidder/vendor shall make visit for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.

The Bidder/vendor have to make two numbers of visit for the supervision erection & commissioning, testing for **Each electric Hoist** – 1st visit for the supervision of erection & 2nd Visit for pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply for each Electric Hoist

SL NO	DESCRIPTION	QUANTITY (SET)
1	SUPERVISION OF ERECTION OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT RAMAGUNDAM – I & II SITE AS FRIST VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.
2	SUPERVISION OF COMMISSIONING, INSPECTION AND TESTING OF ELECTRIC WIRE ROPE HOIST AS PER SPEC FGD: EWRH REV00 AT RAMAGUNDAM – I & II SITE AS SECOND VISIT FOR EACH ELECTRIC HOIST.	As Per Enquiry.

Vendor shall quotes charges for **complete work for supervision** for erection & commissioning, testing for each Electric Hoist.

Travel charges (visa/passport, all the to/fro travel charges to the site), TA/DA, boarding and lodging shall be borne by the bidder and shall be **inclusive in above supervision charges** portion for complete work for supervision for erection & commissioning, testing for each Electric Hoist.

The charges quoted for the supervision will be considered for L1 evaluation.
However, BHEL reserves the right to engage the services of the bidder for supervision of E&C.

ANNEXURE - III

ELECTRIC WIRE ROPE HOIST (EWRH) WITH MOTOR DRIVEN TROLLEY — PROJECT: RAMAGUNDAM-I &II FGD PROJECT

SL NO	AREA	TYPE OF HOIST	CAPACITY OF HOIST	MAXIMUM SPEED		HOIST MONORAIL BEAM BOTTOM ELEVATIONS (Hoist Monorail BEAM in BHEL Scope)	FLOOR LEVEL	TRAVEL LENGTH	PATH	MINIMUM RADIUS OF TRAVEL	HOIST MONORAIL I-BEAM (Hoist Monorail BEAM in BHEL Scope)	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK	HEIGHT OF BOTTOM OF MONORAIL I-BEAM TO HOIST HOOK - HOIST HEAD ROOM - VENDOR TO SPECIFY	TOTAL QNTY
				HOSTING	CROSS TRAVEL									
			TON	METER PER MINUTE	METER PER MINUTE	(EL (+/-) IN METER)	(EL (+/-) IN METER)	(METER)	CURVED / STRAIGHT	(MM)	NPB / UB /ISMC/ISMB	(MM)	(MM)	(SET)
RAMAGUNDAM-I FGD PROJECT(G208) 3X200														
A. ABSORBER														
1	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +15.2M	EL.+3.5M	29M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
2	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +21.4M	EL.+3.5M	29M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
3	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC WIRE ROPE	2	6	15	EL. +10.1M	EL.+3.5M	6.5M	STRAIGHT	N/A	ISMB300	As minimum as possible.- Vendor to specify Aetaul ualue,	———	As per Enquiry
B. BOOSTER FAN & MOTOR														
4	BUF MOTOR	ELECTRIC WIRE ROPE	22	6	15	EL. +15.4M	EL.+3.5M	32.0M	STRAIGHT	N/A	MRB-M	2400	2400	As per Enquiry
5	BUF FAN HOUSING	ELECTRIC WIRE ROPE	12	6	15	EL. +18.2M	EL.+3.5M	32.0M	STRAIGHT	N/A	MRB-F	2000	2000	As per Enquiry
RAMAGUNDAM-II FGD PROJECT(G509 TO G511) 3X500														
A. ABSORBER														
6	ELECTRIC HOIST FOR RC PUMP INLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +13.7M	EL.+3.0M	22.5M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
7	ELECTRIC HOIST FOR RC PUMP OUTLET VALVE	ELECTRIC WIRE ROPE	5	6	15	EL. +18.57M	EL.+3.0M	22.5M	STRAIGHT	N/A	NPB600X220X122.4 + CAPING ISMC400	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
8	ELECTRIC HOIST ABSORBER AGITATOR	ELECTRIC WIRE ROPE	2	6	15	EL. +9.6M	EL.+3.0M	6.5M	STRAIGHT	N/A	ISMB300	As minimum as possible.- Vendor to specify Actaul value,	———	As per Enquiry
B. BOOSTER FAN & MOTOR														
9	BUF MOTOR FOR UNIT#4	ELECTRIC WIRE ROPE	20	6	15	EL. +12.75M	EL.+3.0M	41M	STRAIGHT	N/A	MRB-M	2100	2100	As per Enquiry
10	BUF FAN HOUSING UNIT#4	ELECTRIC WIRE ROPE	10	6	15	EL. +16.4M	EL.+3.0M	41M	STRAIGHT	N/A	MRB-F	1800	1800	As per Enquiry
11	BUF MOTOR FOR UNIT#5&6	ELECTRIC WIRE ROPE	20	6	15	EL. +12.1M	EL.+3.0M	41M	STRAIGHT	N/A	MRB-M	2100	2100	As per Enquiry
12	BUF FAN HOUSING UNIT#5&6	ELECTRIC WIRE ROPE	10	6	15	EL. +15.60M	EL.+3.0M	41M	STRAIGHT	N/A	MRB-F	1800	1800	As per Enquiry

NOTE : 1) Depending upon Hoist head room , the actual height of lift for hoist shall be arrived.
2) * For MRB- M & MRB- F details, Refer below attachement. Next to this page.
3) Vendor to specify the Hoist head Room during Tender stage.

Annex Ramagundam

BHEL, Ranipet - 632 406, India. Quality Assurance Department. Painting Scheme	BHEL DOC No: **PS:RAMA:FGD:G208** Rev: **03** Dt: 14/09/2020 **NTPC Contract No: CS-3120/3130-109(3)-9-FC-NOA-6845 Dt: 22/08/2019** **NTPC Doc No: 3130-109-PVM-H-001** Rev: **03 Dt: 14/09/2020**	
Project	**FGD Package of Ramagundam STPS Stage- I & II - BHEL Cust Nos: G208-G210 (3x200 MW) & G509-G511 (3x500 MW)**	

Sl No	Surface Location	PGMA	Surface Preparation	Primer & Intermediate Coats		Finish Coat		Total DFT (µm min)
				Paint	DFT (µm min)	Paint	DFT(µm min)	
				and properties shall be as per Type II as per ASTM D520-00 DFT- 70µ **Intermediate:** One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	100	**Shade:** Grey white, RAL 9002 With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)		
32 ○	Handling Equipment- Hoists& Man hole door **(Clause 20.03.00 of Part- C Section VI)**	FW 713 FW 714 FW 717	Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130
33 ○	Agitator support **Clause 31.03.00 of Sec.VI, Part-B, Subsection- IV-D)**	FW 721	Blast cleaning to Sa 2½ (Near white metal) with surface profile 40-60µm conforming to ISO 8501-1	**Primer:** One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume minimum 60% ±2). Zinc dust composition and properties shall be as per Type II as per ASTM D520-00 DFT- 70µ **Intermediate:** One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ	70 100	**Finish:** Two coats of two pack aliphatic isocyanate cured acrylic polyurethane paint to IS 13213 solid by volume min.55%±2) DFT- 35µ/ coat **Shade:** Grey white, RAL 9002 With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E)	70	240

Annex Ramagundam

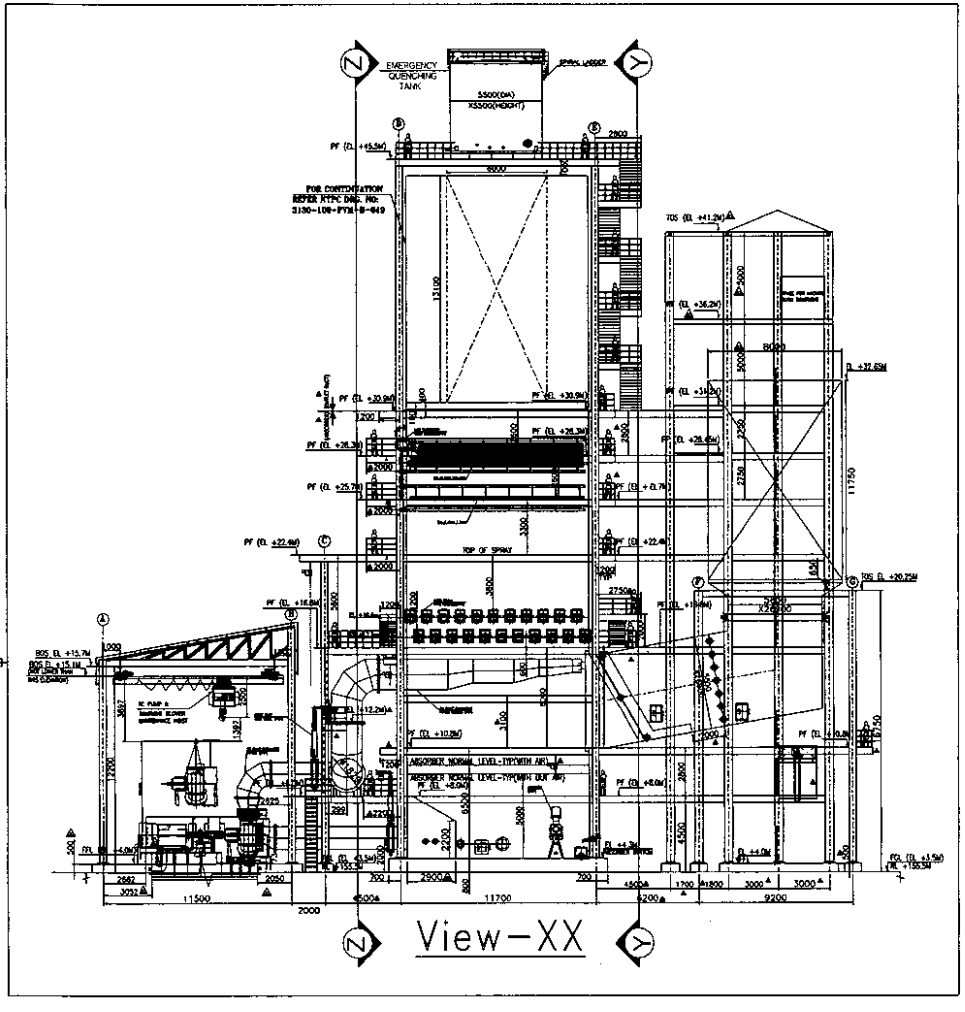
	BHEL, Ranipet - 632 406, India. Quality Assurance Department. Painting Scheme	BHEL DOC No: PS:RAMA:FGD:G208 Rev: 03 Dt: 14/09/2020 NTPC Contract No: CS-3120/3130-109(3)-9-FC-NOA-6845 Dt: 22/08/2019 NTPC Doc No: 3130-109-PVM-H-001 Rev: 03 Dt: 14/09/2020
Project	FGD Package of Ramagundam STPS Stage- I & II - BHEL Cust Nos: G208-G210 (3x200 MW) & G509-G511 (3x500 MW)	

Sl No	Surface Location	PGMA	Surface Preparation	Primer & Intermediate Coats		Finish Coat		Total DFT (µm min)
				Paint	DFT (µm min)	Paint	DFT(µm min)	

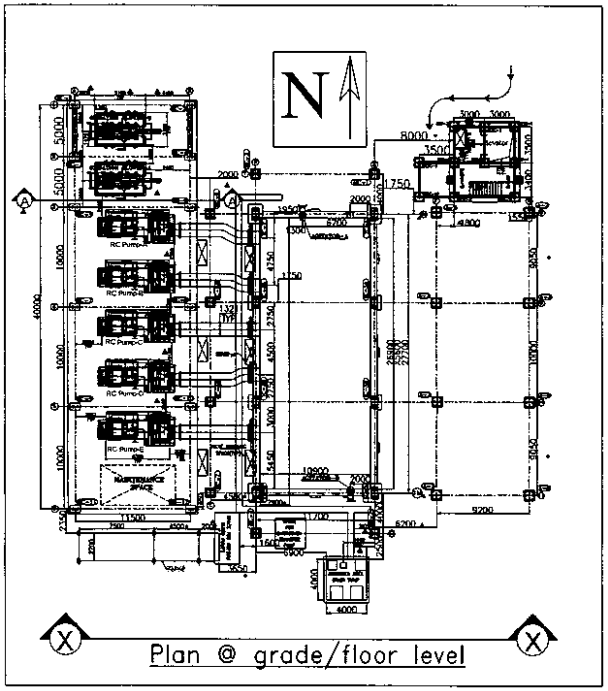
General Notes:

1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil.
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., Agitator / slide bearing and other sub-delivery components etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used, very minor items like clamps, small items etc.- Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed and painting under Sl no:01 of Fans shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipment, fans, piping, pipe services, supporting structures and other components is followed as per NTPC doc no: QS-01-DIV-W-4 at site.
6. All components covered under different PGMAs are to be painted. In case any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
8. Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
9. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
10. Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
11. Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
12. For the portion of steel surfaces embedded in concrete, the surface shall be prepared by Manual cleaning and provided with Primer coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron DFT.

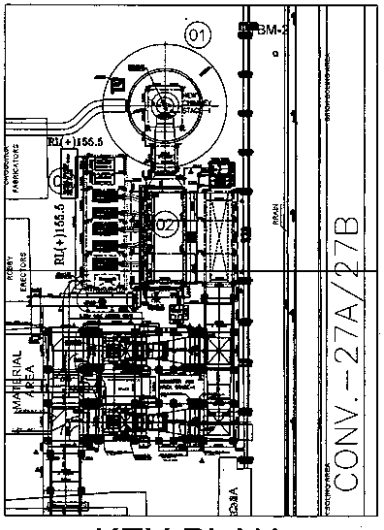
Annex Ramagundam



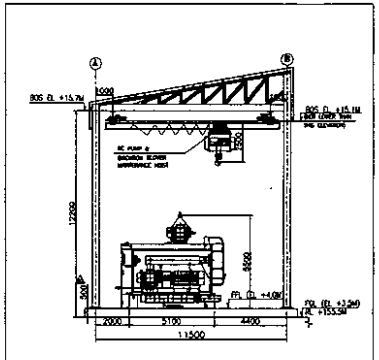
View–XX



Plan @ grade/floor level



KEY PLAN



View A–A

LEGEND:–

FFL	: FINISHED FLOOR LEVEL
FGL	: FINISHED GROUND LEVEL
BOS	: BOTTOM OF BASE PLATE LEVEL
D	: DOOR 1.2M WIDE
RS	: ROLLING SHUTTER 4M X4M
TOPF	: TOP OF PLATFORM
PL	: PAVED LEVEL
TOG	: TOP OF GRATING
TOC	: TOP OF CONCRETE
VL	: VERTICAL LADDER
CGL	: CAGE LADDER

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. FINISH FLOOR LEVEL = RL (+)152.0M, CORRESPONDS TO PLANT EL(+)0.0M WHICH IS GROUND FLOOR OF STG BUILDING.
3. FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA(STAGE-1) SHALL BE RL(+)155.5M i.e. EL(+)3.5M.
4. PIPING INDICATED FOR REFERENCE ONLY,PIPING LAYOUT TO BE REFERRED FOR EXACT DETAILS OF PIPING.
5. INDICATED DETAILS OF RC PUMP & OXIDATION BLOWERS ARE TENTATIVE AND MAY CHANGE BASED ON ACTUAL DATA FROM VENDORS.
6. INDICATED ORIENTATION OF COLUMNS,COLUMNBEAM SIZES ARE SUGGESTIVE ONLY,FOR EXACT ORIENTATION REFER STRUCTURAL DRAWINGS.
7. REFER STANDARD DRAWINGS NO:EGF-0052-433 & EGF-0052-434 FOR DETAIL DIMENSIONS OF AIR NOZZLES.
8. SUITABLE CAVITY IN FOUNDATION TO BE PROVIDED FOR ABSORBER BOTTOM DRAINS NOZZLE WELDING.
9. REFER STANDARD DRAWING NO: DG1-0052-411 FOR DETAILS OF EMERGENCY QUENCHING SPRAY PIPE DETAILS.
10. REFER STANDARD DRAWING NO: EGF-0052-413 FOR DETAILS OF N/D INTERFACE WASHING PIPE DETAILS.
11. REFER STANDARD DRAWING NOS:EGF-0052-421 & EGF-0052-422 FOR DETAILS OF EGF'S SPRAY PIPES.
12. MINIMUM STAIR CASE WIDTH OF 1200MM SHALL BE PROVIDED AS PER NTPC TECHNICAL SPECIFICATION.
13. ⚠ ABSORBER DIMENSIONS INDICATED IN "PLAN @ GRADE/FLOOR LEVEL" VIEW ARE ABSORBER CASING OUTSIDE DIMENSIONS.
14. ⚠ INSERTION OF WET DRY INTERFACE & EMERGENCY QUENCHING PIPES SHALL BE THROUGH MANHOLES PROVIDED ON INLET DUCT,NEAR TO THESE NOZZLES,ACCORDINGLY ADDITIONAL FLANGE JOINTS SHALL BE PROVIDED ON THESE PIPES NEAR INLET DUCT WALL.
15. ⚠ ABSORBER PLATFORM STRUCTURE AT EL: 10.0M TO BE SUITABLY MODIFIED IF FOULING WITH STAIR CASE CUM ELEVATOR STRUCTURE.
16. ⚠ CLEARANCE FOR ERECTION OF CLADDING SURROUNDING THE ELEVATOR SHAFT TO BE CONSIDERED, IF STAIR CASE STRINGER BEAMS ARE ERECTED BEFORE THE ERECTION OF ELEVATOR SHAFT CLADDING.

REF. DWGS

1.	3130-109-PVM-F-044	: FGD PLANT LAYOUT
2.	3130-109-PVM-B-049	: GENERAL LAYOUT OF FGD DUCTING.
3.	3130-109-PVM-F-001	: PA&D – Absorber ,Oxidation Blower,Gypsum Bleed Pump,Filtrate Water System & Mist Eliminator.
4.	3130-109-PVM-U-003	: ABSORBER DESIGN BASIS/CRITERIA.
5.	3130-109-PVM-B-143	: GA and load data of all tanks (Slurry tank, Filtrate tank & Water tank).
6.	3130-109-PVC-B-646	: GA & RCC Detail of Foundation of Recycle Pump.
7.	3130-109-PVM-B-012	: Data sheet & General Arrangement for Oxidation Air Blower.

PROGRESSIVE

CUST.NO-C208,G209 & G210

NTPC Dwg. No.: 3130-109-PVM-B-010

CUSTOMER: NTPC LIMITED.

PROJECT: RAMAGUNDAM SUPER THERMAL POWER PLANT

STAGE-I(3X200MW) & STAGE-II(2X500MW)-FGD PACKAGE.

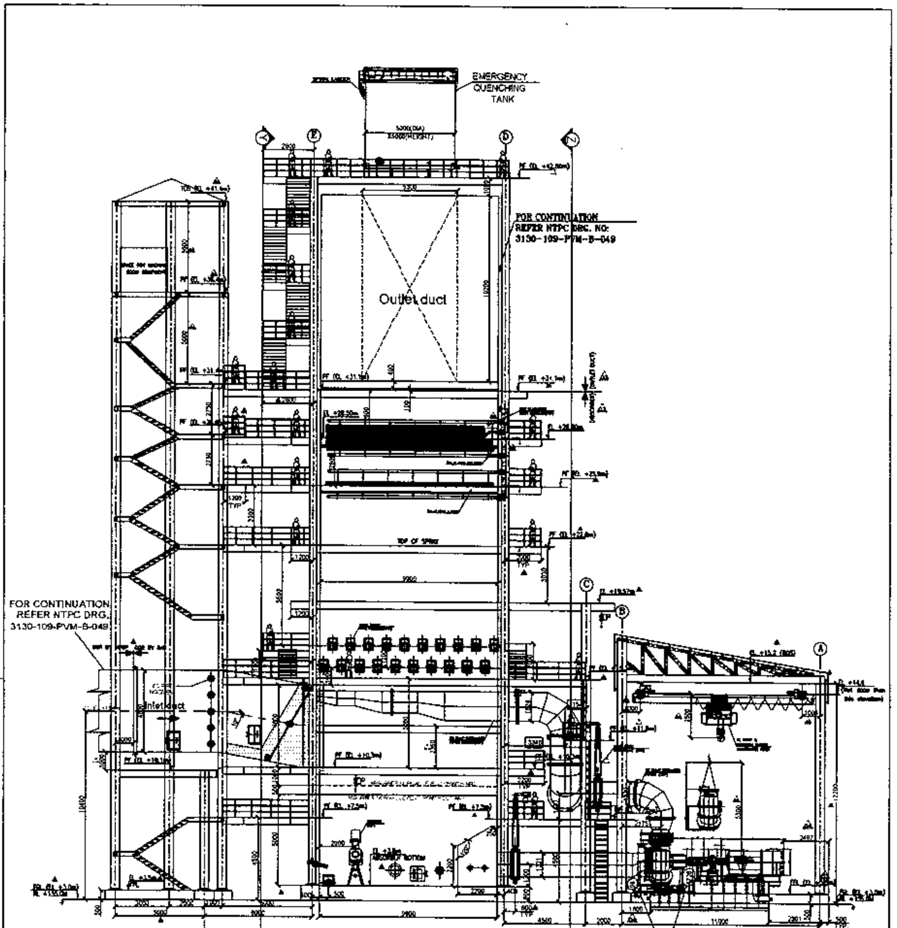
Bharat Heavy Electricals Ltd
WELDING ENGINEERING PLANT
RANIPET-632 406

GA OF ABSORBER
STAGE-II(2X500MW)

Sh: 11 of 15 | U: 01

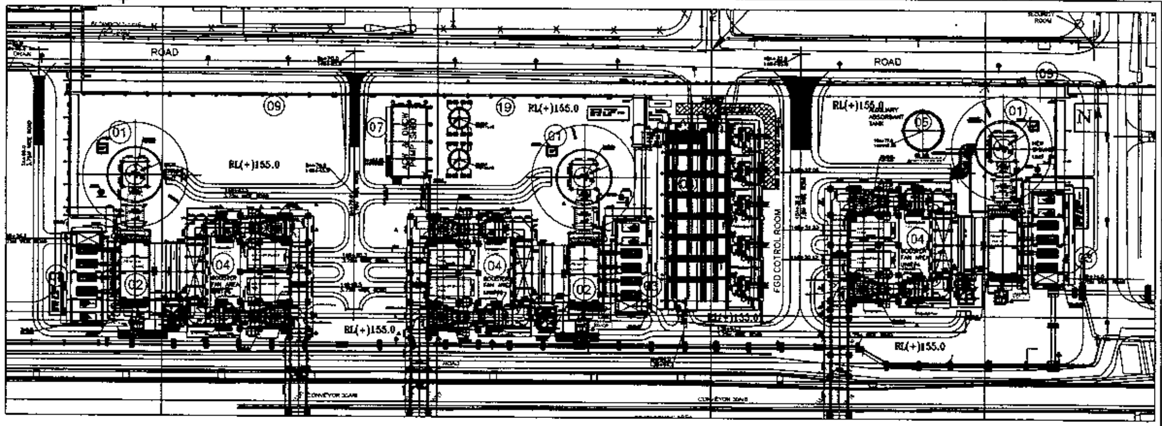
0-FW-000-0229203

Size: A0

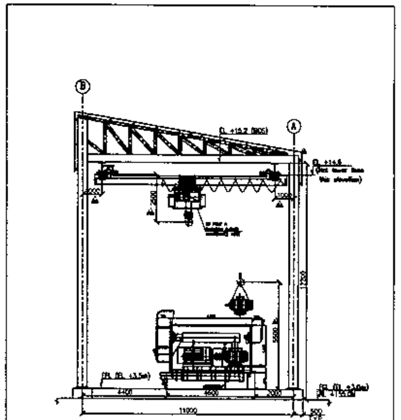


View X-X Unit#4 & #5

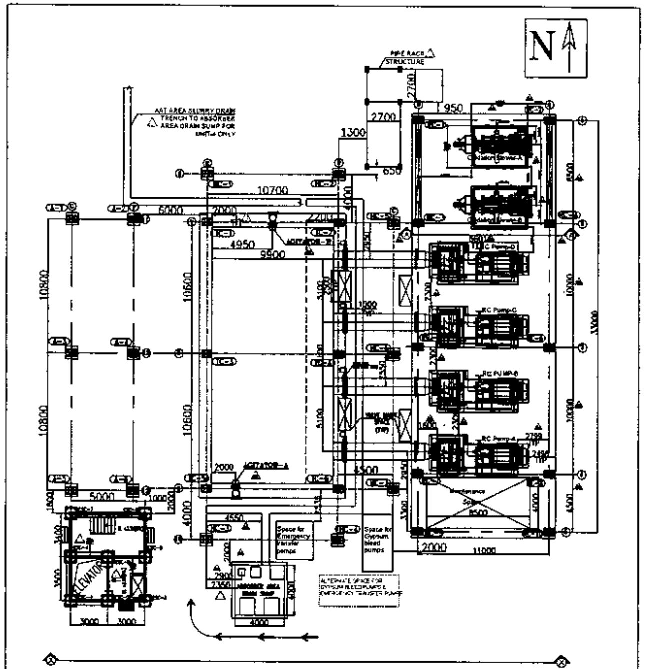
(ELEVATOR CUM STAIRCASE BEAMS NOT SHOWN BELOW INLET DUCT PER CLARITY)



KEY PLAN



View A-A



Plan @ grade/floor level-Unit#4 & #5

LEGEND:-

FFL	: FINISHED FLOOR LEVEL
FGL	: FINISHED GROUND LEVEL
BOB	: BOTTOM OF BASE PLATE LEVEL
D	: DOOR 1.2M WIDE
RS	: ROLLING SHUTTER 4M X4M
TOPF	: TOP OF PLATFORM
PL	: PAVED LEVEL
TOG	: TOP OF GRATING
TOC	: TOP OF CONCRETE
VL	: VERTICAL LADDER
CGL	: CAGE LADDER

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. FINISH FLOOR LEVEL = RL (+)152.0M, CORRESPONDS TO PLANT EL(±)0.0M WHICH IS GROUND FLOOR of STG BUILDING.
3. FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA(STAGE-II) SHALL BE RL(+)155.0M i.e. EL(+)3.0M.
4. PIPING INDICATED FOR REFERENCE ONLY,PIPING LAYOUT TO BE REFERRED FOR EXACT DETAILS OF PIPING.
5. INDICATED DETAILS OF RC PUMP & OXIDATION BLOWERS ARE TENTATIVE AND MAY CHANGE BASED ON ACTUAL DATA FROM VENDORS.
6. INDICATED ORIENTATION OF COLUMNS,COLUMN,BEAM SIZES ARE SUGGESTIVE ONLY,FOR EXACT ORIENTATION REFER STRUCTURAL DRAWINGS.
7. REFER STANDARD DRAWINGS NO:EGF-0052-433 & EGF-0052-434 FOR DETAIL DIMENSIONS OF JAS NOZZLES.
8. SUITABLE CAVITY IN FOUNDATION TO BE PROVIDED FOR ABSORBER BOTTOM DRAINS NOZZLE WELDING.
9. REFER STANDARD DRAWING NO: EGF-0052-411 FOR DETAILS OF EMERGENCY QUENCHING SPRAY PIPE DETAILS.
10. REFER STANDARD DRAWING NO: EGF-0052-413 FOR DETAILS OF W/D INTERFARE WASHING PIPE DETAILS.
11. REFER STANDARD DRAWING NO:EGF-0052-421 & EGF-0052-422 FOR DETAILS OF OCFS SPRAY PIPES.
12. MINIMUM STAIR CASE WIDTH OF 1200MM SHALL BE PROVIDED AS PER NTPC TECHNICAL SPECIFICATION.
13. ABSORBER DIMENSIONS INDICATED IN "PLAN @ GRADE/FLOOR LEVEL" VIEW ARE ABSORBER CASING OUTSIDE DIMENSIONS.
14. INSERTION OF WET DRY INTERFACE & EMERGENCY QUENCHING PIPES SHALL BE THROUGH MANHOLES PROVIDED ON INLET DUCT,NEAR TO THESE NOZZLES.ACCORDINGLY ADDITIONAL FLANGE JOINTS SHALL BE PROVIDED ON THESE PIPES NEAR INLET DUCT WALL.
15. CLEARANCE FOR ERECTION OF CLADDING SURROUNDING THE ELEVATOR SHAFT TO BE CONSIDERED, IF STAIR CASE STRINGER BEAMS ARE ERECTED BEFORE THE ERECTION OF ELEVATOR SHAFT CLADDING

REF. DWGS

1. 3130-109-PVM-F-044 : FGD PLANT LAYOUT
2. 3130-109-PVM-B-049 : GENERAL LAYOUT OF FGD DUCTING.
3. 3130-109-PVM-F-001 : P&ID – Absorber ,Oxidation Blower,Gypsum Bleed Pump,Filtrate Water System & Mist Eliminator.
4. 3130-109-PVM-U-003 : ABSORBER DESIGN BASIS/CRITERIA.
5. 3130-109-PVM-B-143 : GA and load data of all tanks (Slurry tank, Filtrate tank & Water tank).
6. 3130-109-PVC-B-046 : GA & RCC Detail of Foundation of Recycle Pump.
7. 3130-109-PVM-B-812 : Data sheet & General Arrangement for Oxidation Air Blower.

PROGRESSIVE

REV	DATE	ALTERED	CHECKED	APPROVED	REVISION REMARKS
04	25.07.22				
03	02.11.21				
02	13.03.21				KEY PLAN UPDATED.
01	04.07.20				REVISED AS PER NTPC COMMENTS.

CUST.NO-G508,G510 & G511

NTPC Dwg. No.: 3130-109-PVM-B-010

CUSTOMER: NTPC LIMITED.
PROJECT: RAMAGUNDAM SUPER THERMAL POWER PLANT
STAGE-I(3X200MW) & STAGE-II(3X500MW)-FGD PACKAGE

Bharat Heavy Electricals Ltd
BOILER AUXILIARIES PLANT
RANIPET-632 406

GA OF ABSORBER
STAGE-II(3X500MW) P: 01 of 15

0-FW-000-02087 | 04

Size A0

Annexure to Enquiry no:	Date	
Sl.No	**BHEL / Customer Requirement**	##Specific confirmations by the manufacture
1	**Quality Plan Requirement:**	
1a	MQP (Manuafcutering Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Typical MQP is attached for indicative purposes for guidance & use.	
1b	MQP shall invaribly cover w.r.t Inward inspection including on Raw materail Procurement, In process and Final inspection in elaborated way/details.	
1c	Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL/customer for finalization of Quality plan including test procedure/methodology during preaward / post award approval / detailed engineering in the event of an order.	
1d	No deviation on BHEL/Customer approved MQP is acceptable.	
1e	Bidder shall agree to submit all cross referred documents other than codes/standrads to BHEL/Customer/Consultant.	
2	**Important Notes shall be included in MQP :** (a) Latest revision of Standard s & Specification shall apply. Only International Standards are applicable. Indian & Chinese Standards are not applicable. (b) Materials shall be procured in compliance to Functional Technical Specification. (c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product. (d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V. (e) Gauges and measuring Instruments, with valid calibration only shall be used. (f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule. (g) Finished Products shall be packed to comply with Approved Packing Schedule. (h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.	
3	**Domestic / Inland Inspection** will be carried out by BHEL/BHEL apointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consulatnat. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentaion Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable). **"The inspection charges at actuals incurred by BHEL will be loaded to compare with foreign suppliers".**	
4	**Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Forgign Sources**: (1) Any one of the fllowing Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself. (2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. However **cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own , then these charges non claimable by the bidder.** **List of TPIA** (1). M/s Bureau Veritas, (2). M/s TUV-Nord, (3). M/s TUV-SUD, (4). M/s TUV Rheinland, (5). M/s Lloyds Register, (6). M/s SGS, (7). M/s Germanischer Lloyds, (8). M/s QUEST, (9). M/s Certification Engineers International, (10). M/s Intertek, (11). M/s IR Class Systems and Solutions, (12). M/s DNV, (13). M/s Fichtner, (14). M/s ABS Inspection Services.	
5	**Stage Inspection during manufacturing Process :** Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review,verification and clearanace for further processing. This inspection call shall be given well in advance (atleast 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.	
6	**Inspection before despatch for domestic supplier :** Inspection before despatch at supplier's works shall be carried out by BHEL/BHEL appointed Inspection agency. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .	

Sl.No	BHEL / Customer Requirement	##Specific confirmations by the manufacture
7	**Inspection at Forign Source/Supplier:** (a) As in sl no: 3. shall be ensured without fail, (b) No materail / items shall be despatched without getting the written communication from BHEL / Customer inspection carried out by BHEL/BHEL apointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consulatnat. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentaion Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable). (c) Inspection before despatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in Sl no: 03 at supplier's cost.	
8	**Painting** shall be done strictely as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc shall be brought to the notice to BHEL well in adavnce before proceding including the BOI being procured for assy / skid like motors etc	
9	Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages (i) Index Sheet, (ii) MQP/RQP/Endorsemment Sheet (As applicable), (iii) TCs identfied by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP, (iv) Final inspection report + TC including Chemical + Mechnaical + HT + NDT etc, (v) Third party Inspection report + TC, (vi) Customer CHP/ MDCC, (vii) Type test / Performance Test reports conducted, (viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer, (ix) BOM with As Build Drgs with actual make / rating used with BHEL/customer approved drawings.	
10	**Packing / Seaworthy Packing** shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care tarnsit / handling / transhipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.	
10	**Packing** shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care tarnsit / handling / transhipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.	
11	**Outsourcing of test facilities:** Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accreadted third party lab / Govt / Govt Lab for major testing such as NDT, Electrical & Mechanical testing.	
12	**Important Note:** No deviation on the above requirement 01 to 11 is acceptable w.r.t Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidances in the offer itself.	
13	## Necessorily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.	

ENDORSEMENT SHEET FOR QP

~~REFERENCE~~ / *STANDARD* / ~~FIELD~~ QUALITY PLAN (~~RQP~~ / SQP~~/RFQP/SFQP~~)

TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION		To be filled in by NTPC
PROJECT NAME		*2REVIEW & ENDORSEMENT BY NTPC* **PROJECT SPECIFIC QP NUMBER ALLOTTED**
CONTRACT NO.:		**QP NO:**
MAIN SUPPLIER	**M/S.BHEL, RANIPET , TAMIL NADU., INDIA**	
MANUFACTURER WORKS & ADDRESS	(TO BE FILLED BY EOH MANUFACTURER)	**REV. NO.: 00 DT :**
ITEM /EQUIPMENT / SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL TYPE/SIZE/RATING etc.	**ELECTRICALLY OPERATED WIRE ROPE HOIST FOR FGD APPLICATION**	
APPROVED QP NO.: ~~RQP~~/SQP/~~RFQP/SFQP~~	**0000-999-QOM-S053 Rev No. 00 dt 05.04.2013**	
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)		*(TICK APPLICABLE)*
I. That the item/ component is identical to that considered for SQP approval.		**The *MQP/RQP/SQP* is endorsed for this project without any change**
II. That there are minor changes in the item/ component with respect to that considered for ~~MQP/RQP~~/SQP approval, however the same do not affect the contents of ~~MQP/RQP~~/SQP		
III. That there are minor changes in the item/ component with respect to that considered for ~~MQP/RQP~~/SQP *approval, however the same affect the* ~~MQP/RQP~~/SQP *slightly, as indicated below / in attached sheet.*		**The SQP is endorsed for this project with changes as indicated.**
		DISTRIBUTION OF ENDORSEMENT OF **A) *MQP/RQP/SQP*:** *1. MAIN SUPPLIER (WITH A COPY OF MQP/RQP/SQP)* *2. MANUFACTURER* *3. RIO* *4. CQA-SPL* *5. CQA-O/C* **B) RFQP/SFQP:** *1. MAIN SUPPLIER (with a copy of MQP/RQP/SQP* *2. MANUFACTURER* *3. NTPC FQA (with a copy of MQP/RQP/SQP* *4. NTPC Erection (with a copy of MQP/RQP/SQP* *5. CQA-SPL* *6. CQA-O/C*
SIGN.: (Main Supplier) DATE:	(TO BE FILLED BY EOH MANUFACTURER) *SIGN.: (Manufacturer) DATE:*	**NTPC (Reviewed /Approved by/ Date & Seal)**

NTPC	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC)	STANDARD QUALITY PLAN	QP NO.	0000-999-QOM -S-083	REVIEWED BY:	APPROVED BY:
	ELECTRIC OPERATED HOIST UP TO 5MT. CAP.	CONFORMING TO CODE: [illegible]	REV. NO.	00	H S MAURYA	
			DATE	05.04.2013	S SINGH	
			PAGE	Page 1 of 4	M K ASTHANA	
			VALID UPTO	04.04.2016	RAJEEV GARG	

SN	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	Format of RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.			11.
A.	RAW MATERIAL INSPECTION:													
A.1	MS PLATES FOR STRUCTURAL MEMBERS & FABRICATED ROPE DRUM	CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEM & MECH	1 SAMPLE/ HEAT		MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS/ DRAWINGS		MTC	√	P	V	V	IN THE ABSENCE OF CORRELATED TC CHECK TESTING SHALL BE DONE
		ULTRASONIC TEST OF PLATES	MAJOR	NDT	100%	100%	ASTM A-435	ASTM A-435	IR	√	P	V	V	ONLY FOR THICKNESS ≥ 25 MM
A.2	PIPE FOR ROPE DRUM (IF SEAM LESS PIPE IS USED)	CHEMICAL, MECHANICAL PROPERTIES & ACID ETCHING	MAJOR	CHEM & MECH	1 SAMPLE / HEAT/ SIZE		MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS/ DRAWINGS.		MTC	√	P	V	V	
		ULTRASONIC TEST FOR SEAMLESS PIPE	MAJOR	UT	100%	100%	ASTM E-213	ASTM E-213	IR	√	P	V	V	
A.3	FORGINGS/ ROLLED BARS FOR GEARS, PINIONS, WHEELS, AND BRAKE DRUM	CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEM & MECH	1 SAMPLE/ HEAT/ SIZE/ HT BATCH		MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS /DRAWINGS		MTC	√	P	V	V	IN THE ABSENCE OF CORRELATED TC CHECK TESTING SHALL BE DONE
		ULTRASONIC TEST	MAJOR	NDT	100%	100%	ASTM A-388	REFER NOTE - 1	IR	√	P	V	V	ONLY FOR DIA ≥ 40 MM
B.	BOUGHT OUT ITEMS :													
B.1	HOOKS	MAKE & IDENTIFICATION	MAJOR	VISUAL	100%	100%	HOOK TC FROM COMPETANT AUTHORITY/ APPROVED MAKES		TC	√	P	V	V	REFER ANNEX-I FOR MAKE
		CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEM & MECH	1 SAMPLE/ HEAT/ HT BATCH		MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS /DRAWINGS		MTC	√	P	V	V	
		PROOF LOAD TEST	MAJOR	MECHANICAL	100%	100%	IS:15560/ IS: 5749	IS:15560/ IS: 5749	IR	√	P	V	V	
		INTERNAL DEFECTS BEFORE & AFTER PROOF LOAD TEST	CRITICAL	NDT	100%	100%	ASTM – A 388	REFER NOTE - 1	IR	√	P	V	V	ON SHANK PORTION ONLY
		DPT TEST BEFORE & AFTER PROOF LOAD TEST	CRITICAL	NDT	100%	100%	ASTM E-165	NO DEFECT	IR	√	P	V	V	
B.2	WIRE ROPES	MAKE & IDENTIFICATION	MAJOR	VISUAL	100%	100%	APPROVED MAKES			√	P	V	V	REFER ANNEX-I FOR MAKE
		DIMENSION & BREAKING STRENGTH	MAJOR	REVIEW	100% (EACH BATCH)		IS: 2266 / APPROVED DATA SHEET		MTC	√	P	V	V	
B.3	MOTOR	MAKE/ TYPE/ RATING	MAJOR	VISUAL	100%	100%	NTPC APPROVED DRAWING/ DATA SHEET/ NTPC SPECIFICATION / IS:325		IR		P	V	V	REFER ANNEX-I FOR MAKE
		ROUTINE TESTS	MAJOR	REVIEW	100%	100%			MTC		V	V	V	
B.4	GEAR BOX	MAKE/ TYPE/ RATING	MAJOR	VISUAL	100%	100%	NTPC APPROVED DRAWING/ DATA SHEET/ NTPC SPECIFICATION / APPROVED MAKES		IR	√	P	V	V	REFER ANNEX-I FOR MAKE
		BACKLASH, TOOTH CONTACT & REDUCTION RATIO	MAJOR	REVIEW	100%	100%			MTC	√	V	V	V	
		NO LOAD RUN TEST (NOISE LEVEL, TEMP RISE & OIL LEAKAGE)	MAJOR	REVIEW	100%	100%	NTPC APPROVED DRAWING/ DATA SHEET/ NTPC SPECIFICATION/ NO LEAKAGE		MTC	√	V	V	V	

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'

Note:# NTPC Inspection Engineer to check, approval data/ revision no. of reference documents at the time of inspection

	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC)	STANDARD QUALITY PLAN	QP NO.	0000-999-QOM –G–053	REVIEWED BY:	APPROVED BY:
NTPC	ELECTRIC OPERATED HOIST UPTO 3WE 15 TON	CONFORMING TO CODE : IS: 3938	REV. NO.	09	H S MAURYA	
			DATE	05.04.2013	S SINGH	
			PAGE	Page 2 of 4	M K ASTHANA	
			VALID UPTO	04.04.2016	RAJEEV GARG	

SN	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	Format of RECORD	D	AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.		10.			11.
B.5	BRAKES –EM/ EHT	MAKE/ TYPE/ RATING	MAJOR	VISUAL,	100%	100%	NTPC APPROVED DRAWING/ NTPC SPECIFICATION/ IS: 3938		IR	√	P	V	V	REFER ANNEX-I FOR MAKE
		ROUTINE TESTS	MAJOR	REVIEW	100%	100%			MTC	√	V	V	V	
B.6	LIMIT SWITCH/ OVERLOAD RELAY/ SFU / CONTACTOR/ CONTROL TRANSFORMER/ PUSH BUTTON/ TERMINAL BLOCK/ INDICATING LAMP/ SELECTOR SWITCH	MAKE/ TYPE/ RATING	MAJOR	VISUAL	100%	100%	APPROVED DRAWING/ NTPC TECH. SPECS/ APPROVED MAKES		IR	√	P	V	V	REFER ANNEX-I FOR MAKE
B.7	CABLES - LT POWER/ CONTROL/ EPR FLEXIBLE TRAILING	MAKE/ TYPE/ RATING	MAJOR	VISUAL	100%	100%	NTPC APPROVED DRAWING/ NTPC SPECIFICATION/ IS:1554/ IS:8968/ IS: 4289/ IS.7098		IR	√	P	V	V	REFER ANNEX-I FOR MAKE
		ROUTINE & ACCEPTANCE TESTS	MAJOR	REVIEW	100%	100%			MTC	√	V	V	V	
B.8	VVVFD (AS APPLICABLE)	MAKE/ TYPE/ RATING	MAJOR	VISUAL	100%	100%	NTPC APPROVED DRAWING/ NTPC SPECIFICATION/ APPROVED MAKES		IR	√	P	V	V	REFER ANNEX-I FOR MAKE
		ROUTINE & ACCEPTANCE TESTS	MAJOR	REVIEW	100%	100%			MTC	√	V	V	V	
B.9	CONTROL PANEL & PENDENT STATION HOUSING/ BOX	MAKE/ TYPE/ RATING	MAJOR	VISUAL	100%	100%	NTPC APPROVED DRAWING/ NTPC SPECIFICATION/ APPROVED MAKES		IR	√	P	V	V	REFER ANNEX-I FOR MAKE
		SHEET/ GLAND PLATE MATERIAL & THK, DOOR ALIGNMENT, PAINT SHADE/ THK (MIN 70 µ)/ ADHESION	MAJOR	VISUAL	100%	100%			IR		P	V	V	
C	IN PROCESS INSPECTION:													
C.1	ROLLING & WELDING OF ROPE DRUM (FABRICATED)	WPS, POR &WPQ	MAJOR	REVIEW	100%	100%	APPROVED WPS, ASME SEC-IX	ASME SEC-IX	QW-481-484	√	P	V	V	REFER NOTE-2
		ROLLING & WELD EDGE PREPARATION	MAJOR	VISUAL & MEASURE	100%	100%	MANUFACTURING DRAWING/ APPROVED WPS		IR		P	V	–	
		POST WELD HEAT TREATMENT	MAJOR	REVIEW	100%	100%	ASME-SEC-VIII DIV 1 (UCS-56)		SR CHART	√	P	V	V	SR CHART REVIEW BY NTPC DURING FINAL INSPECTION.
		NDT TEST ON WELD	MAJOR	DPT	100%	100%	ASME SEC – V	ASME SECTION – VIII, DIV -I, APP. 6 / 8	DPT REPORT	√	P	V	V	
		RADIOGRAPHY OF BUTT WELD JOINTS	CRITICAL	RT	100%	100%	ASME –SEC-V	ASME –SEC-VIII DIVISION – I, UW 51 & UW-52	RT FILMS & RSPORT	√	P	V	V	FILM REVIEW BY NTPC DURING THE FINAL INSPECTION CHP
C.2	ROPE DRUM, WHEELS, PULLEYS & HOOK SHANK AFTER MACHINING	VISUAL & DIMENSIONAL	MAJOR	VISUAL & MEASURE	100%	100%	MANUFACTURER'S DRAWINGS		IR		P	V	–	
		NDT ON MACHINED SURFACES	MAJOR	DPT	100%	100%	ASTM E-165	NO DEFECT	IR	√	P	V	V	

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
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Note:# NTPC Inspection Engineer to check, approval date / revision no. of reference documents at the time of Inspection

	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC)	STANDARD QUALITY PLAN	QP NO.	0000-999-QOM--S--053	REVIEWED BY:	APPROVED BY:
NTPC	ELECTRIC OPERATED HOIST UPTO 5MT& 10 TON	CONFORMING TO CODE : IS: 3938	REV. NO.	00	H S MAURYA	
			DATE	05.04.2013	S SINGH	
			PAGE	Page 3 of 4	M K ASTHANA	
			VALID UPTO	04.04.2016	RAJEEV GARG	

SN	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	Format of RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.			11.
D	FINAL INSPECTION:													
D.1	COMPLETE ASSEMBLED HOIST ALONG WITH ACTUAL CONTROL PANEL, VVFD & , PUSH BUTTON (AS APPLICABLE)	VISUAL & DIMENSIONAL	MAJOR	VISUAL & MEASURE	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	REFER NOTE-
	OVERLOAD TEST AT 125%	HOLDING CAPACITY OF BREAK, LIMIT RELAYS OPERATION	MAJOR	VISUAL	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	
	NO LOAD TEST & FULL LOAD TEST.	CURRENT DRAWN,SPEED OF HOIST, ENCHING OPERATION, INTERLOCKING SEQUENCE OPERATION	MAJOR	VISUAL & MEASURE	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	
D.2	CONTROL PANEL	VISUAL, MAKE VERIFICATION & DIMENSION	MAJOR	VISUAL & MEASURE	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	
		DEGREE OF PROTECTION TEST BY PAPER INSERTION METHOD	MAJOR	VISUAL	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	
		HV, IR	MAJOR	MEASURE	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	
		PAINT SHADE,ADHESION, THICKNESS,	MAJOR	VISUAL & MEASURE	100%	100%	IS: 3938/ APPROVED DRAWING/ DATA SHEET	IR	√		P	W	W	THICKNESS> 70 MICRON
D.3	PAINTING OF HOIST	ADHESION ,VISUAL & DFT MEASUREMENT	MAJOR	VISUAL & MEASURE	100%	100%	AS PER NTPC SPECIFICATION	IR	√		P	V	V	

NOTES:

1. BACK WALL ECHO SHALL BE SET AT 100% OF FULL SCREEN HEIGHT AT SOUND AREA OF THE BAR USING NORMAL BEAM PROBE OF 2 MHz TO 5 MHz. AT THIS SENSITIVITY LEVEL, ANY DEFECT ECHO EXCEEDING 20% OF FSH IS NOT ACCEPTABLE. IN ADDITION, LOSS OF BACK WALL ECHO MORE THAN 20% OF FSH IS ALSO NOT ACCEPTABLE.
2. WPS, PQR & WELDERS QUALIFIED BY LLOYDS, BVQI, TUV, DNV, NTPC, BHEL, NPCIL ARE ACCEPTABLE. ONLY QUALIFIED WELDRES SHALL BE DEPLOYED FOR WELDING.
3. **MOTOR POWER RATING LESS THAN 30KW:**
   ACCEPTANCE OF MOTOR LESS THAN 30KW IS BASED ON COC OF THE MANUFACTURER & THE CONTRACTOR CONFIRMING AS FOLLOWS:
   "IT IS HEREBY CONFIRMED THAT THE ABOVE MENTIONED MOTOR/ MOTORS WAS/ WERE MANUFACTURED TAKING CARE OF NTPC SPECIFIC REQUIREMENTS REGARDING AMBIENT TEMP., VOLTAGE & FREQUENCY VARIATION, HOT STARTS, PULL OUT TORQUE, STARTING KVA/KW, TEMP. RISE, DISTANCE BETWEEN CENTRE OF STUD & GLAND PLATE AND TESTED IN ACCORDANCE WITH APPROVED DRAWING/ DATA SHEETS."
3. HV TEST ON CONTROL PANELS WILL BE DONE ISOLATING VVVF DRIVE AND OTHER ELECTRONIC PARTS. HV TEST AT 2 KV FOR POWER & 1.5 KV FOR CONTROL CIRCUIT.
4. ALL CRITICAL DIMENSIONS SHALL BE MEASURED. THE CURRENT AND SPEED FOR HOISTING MOTION AND LONG TRAVEL MOTION SHALL BE MEASURED DURING NO LOAD TEST AND SAFE WORKING LOAD (SWL) TEST. ALL INTERLOCKS, BRAKE OPERATION, LIMIT SWITCHES AND SAFETY MEASURES SHALL BE CHECKED.

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION AS APPROPRIATE, CNP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'

Note:- NTPC Inspection Engineer to check, approval date./ revision no. of reference documents at the time of inspection

NTPC	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC)	STANDARD QUALITY PLAN	QP NO.	0000-999-QOM --S--053	REVIEWED BY:	APPROVED BY:
	ELECTRIC OPERATED HOIST UPTO SWL 15 TON	CONFORMING TO CODE : IS: 3938	REV. NO.	00	H S MAURYA	
			DATE	05.04.2013	S SINGH	
			PAGE	Page 4 of 4	M K ASTHANA	
			VALID UPTO	04.04.2016	RAJEEV GARG	

SN	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	Format of RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.			11.
5.	LIST OF ALL MAJOR BOUGHT OUT ITEMS AND THEIR ACCEPTABLE MAKES ARE LISTED BELOW													

LIST OF BOUGHT OUT ITEMS AND THEIR SOURCES

1	STEEL	SAIL, TISCO, RINL, JSW,JISL,ESSAR,IISCO, WELSPUN
2	WIRE ROPE	USHA MARTIN, BHARAT WIRE ROPE, BOMBAY WIRE ROPE
3	HOOK	*HERMAN MOHATA, SMRITI FORGING, *ARACHIWALA Approved upto 15T
4	GEAR BOX	ELECON, SHANTI GEAR,NEW ALLENBURRY WORKS, PETL, BONFIGLIOLI - ITALY
5	MOTOR	LHP, ABB, SIEMENS,MARATHON ELECTRIC, KEC, BBL,CGL, NGEF(UP TO 15 KW),JYOTI
6	LIMIT SWITCHES	JAIBALAJI,BCH,SPEED-O-CONTROL (NOTED),SIEMENS
7	CONTACTOR&OLR,TIME DELAY RELAY , AUX RELAY	SIEMENS, L&T,TELEMECHANIC,C&S
8	FUSES, SFU, MCB,MCCB	SIEMENS,L&T,GEII, C&S
9	FLEXIBLE CABLE, LT POWER AND CONTROL CABLE	UNIVERSAL,POLYCAB,KEI,NICCO,DELTON",PARAMOUNT",CORDS",GEMS",HAVELLS" * ONLY FOR FIXED CABLE
10	BEARING	SKF,FAG,NRB,NTN,NBC, TIMKEN,
11	PUSH BUTTONS	VAISHNO, SIEMENS,L&T,TELEMECHANIC
12	PUSH BUTTON STATIONS (PENDANT)	VAISHNO, SIEMENS,L&T
13	INDICATING LIGHT	VAISHNO, SIEMENS
14	TRANSFORMERS (CONTROL)	INDCOIL,LOGICSTAT,PACTIL,AE,PRAGATI,PRAYOG,PRECISE,SOUTHERN ELECTRIC,GUJARAT PLUG-IN,KAPPA
15	CURRENT TRANSFORMERS	INDCOIL,AE,PRAGATI,PRECISE,KAPPA
16	VVVF DRIVE	L&T,ABB,SIEMENS,SCHIENDER,DANFOSS
17	CONTROL PANEL	RITTAL,PYROTECH,POSITRONICS, MPP
18	BRAKES - DCEM	EMCO,PETHE,WMI,BCH
19	BRAKES - EHT	WMI,ELECTROMAG
20	TERMINAL BLOCK	ELMEX,CONNECTWELL,WAGO(FOR CONTROL ONLY)
21	INDICATING METER	MECO,RISHABH, IMP
22	DSL&CURRENT COLLECTING SYSTM	SUSHEEL,STOMAG
23	SELECTOR SWITCH	L&T, KAYCEE

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER. N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS W

Note:# NTPC Inspection Engineer to check, approval date / revision no. of reference documents at the time of inspection

PROJECT: NSPCL - BHILAI Expansion Power Project (2x250 MW) (BHEL W.O no: G211 and G212) CONTRACT NO: CC/CC&M-C-568-FCNOA/141 Dt: 26/08/2019	CONTRACT QUALITY REQUIREMENTS (CQR) for ELECTRICALLY OPERATED HOISTS used in FGD APPLICATION NSPCL - BHILAI Expansion Power Project (2x250 MW) (BHEL W.O no: G 211 and G212)	DOC.NO: BAP/QR/ G211-G212 /Bhilai/EOH: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 09.09.2022	##Enquiry No: ## Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:

Sl. NO.	DESCRIPTION	BHEL/ NTPC Requirements	##Specific confirmations by the vendor
		ITEM: ELECTRICALLY OPERATED HOISTS	
01	**Quality plan Requirement**	Vendor shall confirm to meet the requirement of SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013 and arrange to submit the SQP duly endorsed (signature and stamp) in all pages along with duly filled in Endorsement sheet for accepting the QAP in totality in the event of Purchase Order.	
02	**Type test requirements**	Vendor shall confirm for successful conduction & completion of all the tests & type tests if any as indicated in the attached SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013.	
05	**Inspection Methodology**	BHEL/BHEL AIA Inspection as per this SQP is must before dispatch. No material shall be dispatched without BHEL/BHEL AIA inspection with required CHP/MDCC clearances.	
06	**For inspection call**	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr M S Aditya Chakravarthy, Manager (QC-Proc)., Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali, DM (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
07	**Packing**	Required Packing & preservation shall also to be ensured as per requirements stipulated in Engg spec / drg / data sheet/PO condition to avoid any damage during transit., handling damages & storage at site.	
08	**Painting**	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
09	**Document package**	Specific confirmation for Document Package in the event of an order (2 hard copies + 2 CDs in PDf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) SQP (iii) TCs identified by BHEL/NTPC for record for "CHP" and Verification portion as given in. (iv) Final Inspection Report + all applicable Test Certificates (v) BHEL/BHEL authorized Inspection Agency report + TC (vi) Type test reports conducted/submitted with approval **(vii) NTPC CHP/MDCC**	

##Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise their offer may not be considered w.r.t Quality Requirements being customer specific requirements.

PROJECT: NTPC NORTH KARANPURA (3 X 660 MW) FGD (G601 to G603) CONTRACT NO: CS-4410-109-2-FC-NOA-6695 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR & ADDRESS: (To be filled by VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for ELECTRICALLY OPERATED HOISTS used in FGD APPLICATION **NTPC NORTH KARANPURA (3X660 MW) FGD PROJECT (BHEL W.O No.: G601, G602, G603)**	DOC.NO: BAP/QR/ G601-G603/NKP/ EOH 001 Rev NO.: 00 PAGE: Page 1 of 1 DATE: 23.08.2022	##Enquiry No: ## Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:

Sl. NO.	DESCRIPTION	BHEL/NTPC Requirements	##Specific confirmations by the vendor
		ITEM: ELECTRICALLY OPERATED HOISTS	
01	**Quality plan Requirement**	Vendor shall confirm to meet the requirement of SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013 and arrange to submit the SQP duly endorsed (signature and stamp) in all pages along with duly filled in Endorsement sheet for accepting the QAP in totality in the event of Purchase Order.	
02	**Type test requirements**	Vendor shall confirm for successful conduction & completion of all the tests & type tests if any as indicated in the attached SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013.	
05	**Inspection Methodology**	BHEL/BHEL AIA Inspection as per this SQP is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
06	**For inspection call**	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr M S Aditya Chakravarthy, Manager (QC-Proc)., Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali, DM (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
07	**Packing**	Required Packing & preservation shall also to be ensured as per requirements stipulated in Engg spec / drg / data sheet/PO condition to avoid any damage during transit., handling damages & storage at site.	
08	**Painting**	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
09	**Document package**	Specific confirmation for Document Package in the event of an order (2 hard copies + 2 CDs in PDf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) SQP (iii) TCs identified by BHEL/NTPC for record for "CHP" and Verification portion as given in. (iv) Final Inspection Report + all applicable Test Certificates (v) BHEL/BHEL authorized Inspection Agency report + TC (vi) Type test reports conducted/submitted with approval **(vii) NTPC CHP/MDCC**	

##Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise their offer may not be considered w.r.t Quality Requirements being customer specific requirements.

PROJECT: NTPC BARH II (2 X 660 MW) FGD (G607 to G608) CONTRACT NO: CS-9560-109(1B)-9-FC-NOA-6720 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR & ADDRESS: (To be filled by VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for ELECTRICALLY OPERATED HOISTS used in FGD APPLICATION **NTPC BARH II (2 X 660 MW)** **FGD PROJECT** **(BHEL W.O No.: G607-G608)**	DOC.NO: BAP/QR/ G607-G608/Barh-II/ EOH 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 23.08.2022	##Enquiry No: ## Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:

Sl. NO.	DESCRIPTION	BHEL/NTPC Requirements	##Specific confirmations by the vendor
		ITEM: ELECTRICALLY OPERATED HOISTS	
01	**Quality plan Requirement**	Vendor shall confirm to meet the requirement of SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013 and arrange to submit the SQP duly endorsed (signature and stamp) in all pages along with duly filled in Endorsement sheet for accepting the QAP in totality in the event of Purchase Order.	
02	**Type test requirements**	Vendor shall confirm for successful conduction & completion of all the tests & type tests if any as indicated in the attached SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013.	
05	**Inspection Methodology**	BHEL/BHEL AIA Inspection as per this SQP is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
06	**For inspection call**	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr M S Aditya Chakravarthy, Manager (QC-Proc)., Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali, DM (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
07	**Packing**	Required Packing & preservation shall also to be ensured as per requirements stipulated in Engg spec / drg / data sheet/PO condition to avoid any damage during transit., handling damages & storage at site.	
08	**Painting**	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
09	**Document package**	Specific confirmation for Document Package in the event of an order (2 hard copies + 2 CDs in PDf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) SQP (iii) TCs identified by BHEL/NTPC for record for "CHP" and Verification portion as given in. (iv) Final Inspection Report + all applicable Test Certificates (v) BHEL/BHEL authorized Inspection Agency report + TC (vi) Type test reports conducted/submitted with approval **(vii) NTPC CHP/MDCC**	

##Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise their offer may not be considered w.r.t Quality Requirements being customer specific requirements.

PROJECT: **NTPC Nabinagar 3 x 660 MW** **(BHEL W.O no: G 609, G 610 and G 611)** **NTPC CONTRACT NO:** **CS-0370-109-(1A) -2-FC -NOA-0059 1819 for Nabinagar 3 x 660 MW** **PACKAGE: FGD PACKAGE** **MAIN CONTRACTOR:** **BHEL - RANIPET** **SUB CONTRACTOR & ADDRESS:** **(To be filled by VENDOR)**	**CONTRACT QUALITY REQUIREMENTS (CQR) for ELECTRICALLY OPERATED HOISTS used in FGD APPLICATION** **NTPC Nabinagar** **3 x 660 MW FGD Project** **(BHEL W.O no: G 609, G 610 and G 611)**	**DOC.NO:** **BAP/QR/G609-G611/Nabinagar/ EOH 001 Rev NO.: 00** **PAGE : Page 1 of 1** **DATE: 03.09.2022**	**##Enquiry No:** **## Supplier Name & Address:** **##Offer reference:** **##Date:** **Contact Official Name:** **Mobile no:** **Email id:**

Sl. NO.	DESCRIPTION	BHEL/ NTPC Requirements	##Specific confirmations by the vendor
		ITEM: ELECTRICALLY OPERATED HOISTS	
01	**Quality plan Requirement**	Vendor shall confirm to meet the requirement of SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013 and arrange to submit the SQP duly endorsed (signature and stamp) in all pages along with duly filled in Endorsement sheet for accepting the QAP in totality in the event of Purchase Order.	
02	**Type test requirements**	Vendor shall confirm for successful conduction & completion of all the tests & type tests if any as indicated in the attached SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013.	
05	**Inspection Methodology**	BHEL/BHEL AIA Inspection as per this SQP is must before dispatch. No material shall be dispatched without BHEL/BHEL AIA inspection with required CHP/MDCC clearances.	
06	**For inspection call**	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr M S Aditya Chakravarthy, Manager (QC-Proc)., Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali, DM (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
07	**Packing**	Required Packing & preservation shall also to be ensured as per requirements stipulated in Engg spec / drg / data sheet/PO condition to avoid any damage during transit., handling damages & storage at site.	
08	**Painting**	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
09	**Document package**	Specific confirmation for Document Package in the event of an order (2 hard copies + 2 CDs in PDf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) SQP (iii) TCs identified by BHEL/NTPC for record for "CHP" and Verification portion as given in. (iv) Final Inspection Report + all applicable Test Certificates (v) BHEL/BHEL authorized Inspection Agency report + TC (vi) Type test reports conducted/submitted with approval **(vii) NTPC CHP/MDCC**	

##Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise their offer may not be considered w.r.t Quality Requirements being customer specific requirements.

PROJECT: NTPC Nabinagar 4 x 250 MW **(BHEL W.O no: G 201, G202, G203 and G204)** **NTPC CONTRACT NO:** CS-0270-109(1A) -2-FC/19-20/1819 **PACKAGE: FGD PACKAGE** **MAIN CONTRACTOR:** **BHEL - RANIPET** **SUB CONTRACTOR & ADDRESS:** **(To be filled by VENDOR)**	**CONTRACT QUALITY REQUIREMENTS (CQR) for ELECTRICALLY OPERATED HOISTS used in FGD APPLICATION** **NTPC Nabinagar 4 x 250 MW** **(BHEL W.O no: G 201, G202, G203 and G204)**	**DOC.NO: BAP/QR/G201 to G204/NTPC Nabinagar/ EOH: 001** **Rev NO.: 00** **PAGE : Page 1 of 1** **DATE: 03.09.2022**	**##Enquiry No:** **## Supplier Name & Address:** **##Offer reference:** **##Date:** **Contact Official Name:** **Mobile no:** **Email id:**

Sl. NO.	DESCRIPTION	BHEL/ NTPC Requirements	##Specific confirmations by the vendor
		ITEM: ELECTRICALLY OPERATED HOISTS	
01	**Quality plan Requirement**	Vendor shall confirm to meet the requirement of SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013 and arrange to submit the SQP duly endorsed (signature and stamp) in all pages along with duly filled in Endorsement sheet for accepting the QAP in totality in the event of Purchase Order.	
02	**Type test requirements**	Vendor shall confirm for successful conduction & completion of all the tests & type tests if any as indicated in the attached SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013.	
05	**Inspection Methodology**	BHEL/BHEL AIA Inspection as per this SQP is must before dispatch. No material shall be dispatched without BHEL/BHEL AIA inspection with required CHP/MDCC clearances.	
06	**For inspection call**	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr M S Aditya Chakravarthy, Manager (QC-Proc)., Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali, DM (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
07	**Packing**	Required Packing & preservation shall also to be ensured as per requirements stipulated in Engg spec / drg / data sheet/PO condition to avoid any damage during transit., handling damages & storage at site.	
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##Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise their offer may not be considered w.r.t Quality Requirements being customer specific requirements.

PROJECT: NTPC Ramagundam Stage I & II Project (3 X 200 MW + 3 X 500 MW) (BHEL W.O no: G208-G210 & G509-511) CONTRACT NO: CS-3120/3130-109(3)-9-FC-NOA- 6845	CONTRACT QUALITY REQUIREMENTS (CQR) for ELECTRICALLY OPERATED HOISTS used in FGD APPLICATION NTPC Ramagundam Stage I & II Project (3 X 200 MW + 3 X 500 MW) (BHEL W.O no: G208-G210 & G509-511)	DOC.NO: BAP/QR/ G208-G210 & G509-511/Ramagundam/EOH: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 09.09.2022	##Enquiry No: ## Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:

Sl. NO.	DESCRIPTION	BHEL/ NTPC Requirements	##Specific confirmations by the vendor
		ITEM: ELECTRICALLY OPERATED HOISTS	
01	**Quality plan Requirement**	Vendor shall confirm to meet the requirement of SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013 and arrange to submit the SQP duly endorsed (signature and stamp) in all pages along with duly filled in Endorsement sheet for accepting the QAP in totality in the event of Purchase Order.	
02	**Type test requirements**	Vendor shall confirm for successful conduction & completion of all the tests & type tests if any as indicated in the attached SQP ref no. SQP QP No. 0000-999-QOM-S-053 Rev 00 dt 05.04.2013.	
05	**Inspection Methodology**	BHEL/BHEL AIA Inspection as per this SQP is must before dispatch. No material shall be dispatched without BHEL/BHEL AIA inspection with required CHP/MDCC clearances.	
06	**For inspection call**	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr M S Aditya Chakravarthy, Manager (QC-Proc)., Mobile no: +91 9489202788., Email id: msachakravarthy@bhel.in and Mr Zeeshan Ali, DM (QC-Proc)., Mobile no: +91 9443149691., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
07	**Packing**	Required Packing & preservation shall also to be ensured as per requirements stipulated in Engg spec / drg / data sheet/PO condition to avoid any damage during transit., handling damages & storage at site.	
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##Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise their offer may not be considered w.r.t Quality Requirements being customer specific requirements.

***(To be submitted In the company letter head by supplier)**

Form - 1

Subject: Public Procurement (Preference to Make In india)

References:

1.P-45021/2/2017-B.E-II dated. 15th June-2017,
2.P-45021/2/2017-PP(BE-II) dated. 28th May-2018 ,
3.P-45021/2/2017-PP(BE-II) dated. 29th May-2019.
4.P-45021/2/2017-PP(BE-II) dated. 4th June-2020

We hereby declare with reference to above subject and references that M/s ----------(Tick whichever is applicable as below)

"Class-I local supplier" meeting the requirement of minimum local content equal to 50%(fifty percent) or more defined in the above government notification for the goods and services (or)
"Class-II local Supplier" meeting the requirement of local content 20% to less than 50%(fifty percent) defined in the above government notification for the goods and services

Please mention the details against the following:

Enquiry no:---------- dated. ----------

Type of Supplier (Class-I/Class-II) .....

Product:----------

Project:.....

Details of location at which local value addition will be made is as follows:

We also understand that the false declarations will be in breach of the code of Integrity under rule 175(1)(i)(h) of the General financial rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Authorized Signature M/s _____

(Signature and seal)

Place:.....

Date:.....

From.
M/s_____
Address:_____

Note: For offer value INR 10 crores or more, shall be vetted/endorsed by statutory auditor or cost auditor, for the declared local content.

***(To be submitted In the company letter head by supplier)**

Form – 2

I/we are bidder from _____ (Address with country). We do not belong to any of the below category mentioned.

1. Any of entity/office/workshop of your organisation/incorporation, established in a country sharing land border with India, If yes, provide the full address of all such locations.

2. Any of subsidiary of your organisation/incorporation, established in a country sharing land border with India, If yes, provide the full address of all such locations.

3. Any of entity/office/workshop of your organisation/incorporation, controlled in a country sharing land border with India, If yes, provide the full address of all such locations.

4. Any of entity whose beneficial owner is situated in a country sharing land border with India, If yes, provide the full name, address of all such locations.

5. Any Indian Agent available, If so, Provide details of address and contacts.

6. Any employee/directors who is/are citizen of country sharing land border with India, If yes, provide the full name, employee code and address of all such locations.

7. Any of consortium/joint venture of your organisation/incorporation, established in a country sharing land border with India, If yes, provide the full address of all such locations.

Meaning of beneficial owner

1) In case of a company or limited liability partnership, beneficial owner is the natural person, who, whether acting alone or together, or through one or more judicial person, has a controlling ownership interest or who exercises control through other means.

Explanation

a) Controlling ownership interest means ownership of or entitlement to more than twenty-five percent of shares or capital or profits of the company.
b) "control" shall include the right to appoint majority of the directors or to control the management rights or shareholder's agreement or voting agreement.

2) In case or a partnership firm the beneficial owner is the natural person (s) who whether acting alone or together or through one or more judicial person, has ownership of the entitlement to more than fifteen percent of capital or profits of the partnership.

3) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more judicial person, has ownership of the entitlement to more than fifteen percent of the property or capital or [profits of such association or body of individual.

4) Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official.

5) In case of a trust, the identification of beneficial owner (s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust and any other

***(To be submitted In the company letter head by supplier)**

natural person exercising the ultimate effective control over the trust through a chain of control of ownership.

6) An agent is a person employed to do any act for another, or to represent another in dealing with third person.

We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India, we hereby declare that we do not belongs to any such country and are eligible to be considered.

In case, any of information is found to be false, even after bid acceptance, immediate termination may happen and action will be taken as per law.

Format is being filled without altering any of the clause mentioned in the given format**

Dated: _____

Authorised Sign and stamp_____

:

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:
Date:

To
Bharat Heavy Electricals Limited,
Boiler Auxiliaries Plant,
RANIPET -632 406,
Tamil Nadu,
INDIA

Dear Sirs,

In consideration of the **Bharat Heavy Electricals Limited** 1 (hereinafter referred to as the `Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at **"BHEL House", SIRI Fort, New Delhi- 110049** through its Unit at **Boiler Auxiliaries Plant located at Ranipet-632406, Tamil Nadu, INDIA** having awarded to _____ 2 having its registered office at _____ herein after referred to as the `Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No. / **PO No** _____ dated _____3. Valued at Rs_____ 4 (Rupees (In words) . _____) for _____5 (hereinafter called the `Contract') and the Contractor having agreed to provide a Contract Performance Guarantee equivalent to 10% (Ten Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract.

We _____ (hereinafter referred to as the Bank), having registered/Head Office at _____ and inter alia a branch at _____ being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs _____ **(Rupees _____)** without any demur, immediately on a demand from the Employer. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding **Rs. _____ (Rupees_____).**

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We the _____ bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid andits claims satisfied or discharged.

We _____ BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force up to _____ 6 with a validity period of ____months & claim period of 3 months and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the _____7 we shall be discharged from all liabilities under this guarantee thereafter.

We _____BANK, lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed Rs _____ (Rupees _____ Only) 8
b) This Guarantee shall be valid up to _____ 9
c) Unless the Bank is served a written claim or demand on or before _____ 10 all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dtd :
Place of Issue:

1.NAME AND ADDRESS OF EMPLOYER i.e., Bharat Heavy Electricals Limited.
2 NAME AND ADDRESS OF VENDOR/CONTRACTOR/SUPPLIER
3.DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE
4.BG AMOUNT IN FIGURES AND WORDS
5.PROJECT/SUPPLY DETAILS
6.VALIDITY DATE with a validity of 3 months claim period.
7.DATE OF EXPIRY OF CLAIM PERIOD
8.BG AMOUNT IN FIGURES AND WORDS
9.VALIDITY DATE

Ple note: The Validity period wrt our conditions applicable for the Supply / Erection & condition.

Bankers, Auditors & Share Transfer Agent

Bankers
Axis Bank
Bank of Baroda
Canara Bank
Central Bank of India
CITI Bank N.A
Deutsche Bank AG
Export-Import Bank of India
HDFC Bank Limited
ICICI Bank Limited
IDBI Bank
Indian Bank
Indian Overseas Bank
Indusind Bank
Kotak Mahindra Bank
Punjab National Bank
RBL Bank Ltd.
Standard Chartered Bank
State Bank of India
The Federal Bank Limited
The Hongkong and Shanghai Banking Corporation Limited
Union Bank of India
Yes Bank Limited

Registered Office
BHEL House, Siri Fort, New Delhi-110049 (India)
CIN: L74899DL1964GOI004281
Phone: 011-66337000, Fax: 011-66337428
Website : www.bhel.com E-mail: shareholderquery@bhel.in

Annexure-1

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Cotractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.

8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Prinicpal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal
(Office Seal)

For & On behalf of the Bidder/ Contractor
(Office Seal)

Place _____
Date _____

Witness:_____
(Name & Address) _____
_____

Witness:_____
(Name & Address) _____
_____