



BHARAT HEAVY ELECTRICALS LIMITED

BAP – Ranipet, 632406

MM – PURCHASE Department (FGD)

NIT

Date: 01-09-2022

RFQ towards BHEL Ranipet Enq for.: Underslung crane

Sub: Requirement for “Design, Manufacture, Pre-dispatch inspection (AIA-TPI), Packing, Forwarding, dispatch, transportation, Supply, Supervision for “installation, Erection, inspection, Testing, commissioning, & Trial run” of Under Slung crane (USC)” for BHEL Site as tabulated below by BHEL-Ranipet.

Scope of supply: As subjected above in confirmation with Quality plan and tech Spec. The various packages consists as below

Package 1: USC Barh 2					
As per Spec FGD:USLCRANE:Rev 00, for oxidation blower and RC pump					
SI	Material code	DESCRIPTION	Qty Set	Delivery req	Quoted/ Not quoted
1	RFW21763 0001	Under slung Electric Crane capacity 10T, LT runway track Bottom EL (+) 10.892 m, floor level at EL (+) 0.0m, travel length 40 m, LT span 7 m	2	24-12-2022	
2	RFW21763 0002	Supervision for Erection and installation of above supplied crane at project site as per approved drawings and tech spec.	2	24-08-2023	
3	RFW21763 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec.	2	24-02-2024	

Package 2: USC Bhilai					
As per Spec FGD:USLCRANE:Rev 00, for oxidation blower and RC pump					
SI	Material code	DESCRIPTION	Qty Set	Delivery req	Quoted/ Not quoted
4	RFW21757 0001	Under slung Electric Crane capacity 7.5 T, LT runway track Bottom EL (+) 10.4 m, floor level at EL (+) 0.0 m, travel length 30 m, LT span 9 m	2	24-02-2023	
5	RFW21757 0002	Supervision for Erection and installation of above supplied crane at project site as per approved drawings and tech spec.	2	24-10-2023	
6	RFW21757 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec.	2	24-06-2024	



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Package 3: USC BRBCL

As per Spec FGD:USLCRANE:Rev 00, for oxidation blower and RC pump

SI	Material code	DESCRIPTION	Qty Set	Delivery req	Quoted/ Not quoted
7	RFW21780 0001	Under slung Electric Crane capacity 10 T, LT runway track Bottom EL (+) 10.4 m, floor level at EL (+) 0.0 m, travel length 30 m, LT span 9 m	4	24-12-2022	
8	RFW21780 0002	Supervision for Erection and installation of above supplied crane at project site as per approved drawings and tech spec.	4	24-08-2023	
9	RFW21780 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec.	4	24-02-2024	

Package 4: USC North Karanpura

As per Spec FGD:USLCRANE:Rev 00, for oxidation blower and RC pump

SI	Material code	DESCRIPTION	Qty Set	Delivery req	Quoted/ Not quoted
10	RFW21756 0001	Under slung Electric Crane capacity 10 T, LT runway track Bottom EL (+) 15.1 m, floor level at EL (+) 4.40 m, travel length 40 m, LT span 9 m	3	24-03-2023	
11	RFW21756 0002	Supervision for Erection and installation of above supplied crane at project site as per approved drawings and tech spec.	3	24-11-2023	
12	RFW21756 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec.	3	24-07-2024	

Package 5: USC NPGCL

As per Spec FGD:USLCRANE:Rev 00, for oxidation blower and RC pump

SI	Material code	DESCRIPTION	Qty Set	Delivery req	Quoted/ Not quoted
13	RFW21779 0001	Under slung Electric Crane capacity 10 T, LT runway track Bottom EL (+) 10.4 m, floor level at EL (+) 0.0 m, travel length 40 m, LT span 7.1 m	3	24-12-2022	
14	RFW21779 0002	Supervision for Erection and installation of above supplied crane at project site as per approved drawings and tech spec.	3	24-08-2023	
15	RFW21779 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec.	3	24-02-2024	



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Package 6: USC Ramagundam stage 1 & 2					
As per Spec FGD:USLCRANE:Rev 00, for oxidation blower and RC pump					
SI	Material code	DESCRIPTION	Qty Set	Delivery req	Quoted/ Not quoted
16	RFW21777 0001	Under slung Electric Crane capacity 10 T, LT runway track Bottom EL (+) 15.1 m, floor level at EL (+) 4.0 m, travel length 40 m, LT span 9.5 m	1	24-12-2022	
17	RFW21777 0002	Supervision for Erection and installation of above supplied crane at project site stage 1 as per approved drawings and tech spec.	1	24-08-2023	
18	RFW21777 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec at site stage 1.	1	24-02-2024	
19	RFW21778 0001	Under slung Electric Crane capacity 10 T, LT runway track Bottom EL (+) 14.6 m, floor level at EL (+) 3.5 m, travel length 33 m, LT span 9 m	3	24-12-2022	
20	RFW21778 0002	Supervision for Erection and installation of above supplied crane at project site stage 2 as per approved drawings and tech spec.	3	24-08-2023	
21	RFW21778 0003	Supervision for Commissioning, inspection and performance testing of supplied crane as per Approved drawing and tech spec at site stage 2.	3	24-02-2024	

Destination: BHEL Site, as per above table

Delivery required date:

For main equipment supply: As per above table or within 5 months from the date of manufacturing clearance, whichever is later. Bidder to quote the best possible delivery from the date of manufacturing clearance. Abnormal quoted delivery, liable for rejection of offer.

Supervision for erection and installation shall be as per above table or within 8 months from the date of supply, whichever is later.

Supervision of commissioning, testing, trial run and PG test shall be as per above table or within 8 months from the date of completion of installation and erection whichever is later.



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Technical Pre-Qualification requirement (PQR):

SL	Pre-Qualification Requirement (PQR)	Bidder's Reply with Supportive documents
1	Vendor should be a manufacturer of Crane / Hoist. Pls submit the relevant documentary evidences.	
2	List of customer to whom 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. Proof of such experience have to be submitted along with the bid in form of relevant documentary evidence.	
3	Minimum one number of Previous inspection and test report to be furnished for the same capacity or higher Capacity along with Previous purchase order of same item. No need to submit too many POs. Pls attach the full set as PO copy and inspection reports.	

Technical requirement

- (a). **Manufacturing: Document Submission**-Drawing, Data sheet and quality plan shall be submitted upon ordering for approval by BHEL. **Manufacturing clearance** will be provided upon approval of drawing with data sheet and QAP. Manufacturing shall be as per attached technical specification in the bid, Approved drawing, Quality plan and Data sheet. **Inspection**: as per CI (b) below stated. **Dispatch Clearance**: Upon submission of inspection reports along with test certificates in original and Packing list dispatch clearance will be provided by BHEL.
- (b). **Inspection**: Inspection (call to be raise by supplier at BHEL COIR portal) before despatch at supplier's works (as per Quality terms and Quality plan) by BHEL/authorised inspection agency (TPI-Third Party Inspection) and ~~customer NTPC (joint inspection shall be applicable)~~, for indigenous supplies at BHEL cost. **Inspection includes for painting and packing** also, as applicable. All the Test and inspection reports shall be sent to BHEL-Ranipet for review and dispatch clearance. Packing list and weightment details shall be sent for release of GMS by Engineering-BAP. Base on release of GMS, CoC No shall be issued by QC-BHEL. On receipt of CoC, and packing list, request letter from commercial-BAP to be submitted to QC-BHEL for issue of MDCC.
- (c). **Packing requirement**: Packing shall be waterproof as per tender technical specification, and the material code with description & Supplier name shall be marked on the packing.
- (d). **Documents**: Accepted IR copy along with relevant test certificates (in original) before despatch to be given to BHEL. This is required for Dispatch clearance.
- (e). **Reverse Auction** shall be conducted, Project wise package basis L1 shall be taken for Ordering.
- (f). **Delivery Location**: FOR destination (BHEL Site), as per bid
- (g). **Supervision for Installation, E&C, Trial run, Testing and performance test**: Bidder to quote of overall cost basis including travel, boarding, lodging, local conveyance, tools and tackles etc. No payment will be given other than the quoted cost. **Detailed list of facilities (labours, technicians, Material handling equipment, General tools) required for supervision for E&C, to complete the activity as per vendor plan shall be submitted along with drawing approval after ordering.**
Note: For each crane separate 2 visit shall be planned, even though for same site location. For example, 3 crane is required at location A, then 6 separate visit shall be planned. All the visit as per BHEL call only. All the pre-requisite shall be shared on post supply phase. Bidders are requested to quote accordingly.
- (h). **CEBG** : Not Applicable



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- (i). **PBG for 10%** of supply value valid for agreed guarantee period. In case of not submitted, equivalent values shall be with hold for 36 months, and will be released with supplementary invoice.

List of documents to be attached (filled in signed stamped copy):

1. NIT/ GeM bid copy
2. Tender Tech spec (BHEL) for each project package. Relevant annexures (Data sheet, Paint Scheme etc) and drawings shall also be submitted
3. Filled in QAP (Sample attached) along with COR and annex Q.
4. Filled-in Make in India declaration on Letter head (format attached)
5. PBG format
6. Integrity pact format
7. Udyam portal registration copy if MSE bidder
8. PQR-Technical documents
9. Pls submit financial documents (Balance sheet for profit and loss statements for previous 3 years)

Buyer Additional terms:

1. Quote shall be in INR only inclusive of Taxes (GST).
2. MSE firm shall upload the UDYAM portal registration certificate
3. Documentary evidences shall be uploaded for PQR
4. Bidder shall submit the filled-in signed stamped copy of documents as listed above
5. PBG for 10% of material value to be submitted shall be valid for 24 months from the date of supply plus 3 months for claim period. BG shall be as per format attached and from the list of consortium of bank as attached.
6. Non Submission of any of required documents as listed above, attracts for offer rejection.
7. Project wise Package basis evaluation methodology shall be adopted
8. Payment: For supply, 90% payment through NEFT within 90 days (45 days for MSE and 60 days for Medium category for MSME quote and UDYAM registration certificate submission) after receipt and acceptance of material based on site delivery acknowledgement slip along with BG at BHEL Ranipet. Balance 10% of supply and 100% of supervision for E&C shall be paid within 90 days (45 days for MSE and 60 days for Medium category for MSME quote and UDYAM registration certificate submission) after completion of Supervision for E&C, based on site acknowledgement.

For any query: Kindly provide the "Underslung Crane" in the subject of mail.

mail: ckbharti@bhel.in; jecashish@bhel.in

Ph: 9488 58 9287 / 7010 75 1675

You may raise the query through GeM also.

TECHNICAL PRE-QUALIFICATION REQUIREMENT (PQR) FOR UNDER SLUNG CRANE (IN CASE OF OPEN TENDER)

SL NO	Technical Pre-Qualification Requirement (PQR) for FOR UNDER SLUNG CRANE	Bidder's Reply with Supportive documents
1	Vendor should be a manufacturer of Crane / Hoist.	
	List of customer to whom 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 along with Previous purchase order of same item.	

Bidder's Seal & signed



Bharat Heavy Electricals Ltd
Boiler Auxiliaries Plant

Ranipet-632 406

FLUE GAS DESULPHURISATION


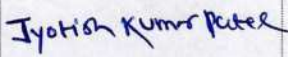

TECHNICAL SPECIFICATION

SPECIFICATION NO: FGD:USLCRANE

REV:00

TECHNICAL SPECIFICATION OF UNDER SLUNG ELECTRIC CRANE

REF: FGD: USLCRANE REV: 00

REV	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
00	08-08-2020	Fresh Release	 Pradeep Kumar Behera (AE-I/EDC-FGD)	 Jyotish Kumar Patel (DM/EDC-FGD)	 Kesavan V (SDGM/EDC-FGD)



**Boiler Auxiliaries Plant,
Bharat Heavy Electricals Limited,
Ranipet - 632406, Tamilnadu, INDIA.**

Enquiry No. & Dt.:	
Due Date :	
Supplier's Ref.:	
Date :	

Specification cum Compliance Certificate for UNDER SLUNG ELECTRIC CRANES

Note:-

1. The 'Offered' Column and where applicable, the 'Deviations' & 'Remarks' Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.

2. The offer and all documents enclosed with offer should be in English language only.

3. A Single or Double travelling Bridge / Grider (As per vendor design , To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.

Name & Address of the supplier:	

Telephone No.	
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Fax No.	
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e-mail :	
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Scope: Supply, Testing, Installation, Supervision of Erection & Commissioning of UNDER SLUNG ELECTRIC CRANE complying with the following specification

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
A	TECHNICAL DETAILS:				
1.0	APPLICATION:				
1.1	The subject crane is meant for the purpose of handling small to medium components of Recirculation Pump & Oxidation Blower during maintenance.	Vendor to note			
1.2	The Recirculation Pump house & Oxidation Blower room environment will be dust prone, humid, and ambient temperature going up to 45 to 50 ° C.	Vendor to note			
2.0	SCOPE OF SUPPLY:				
2.1	Design, manufacture, supply, Supervision of Erection & commissioning of Underslung Cranes, (a Single or double travelling Bridge / Grider (as per vendor design, To Suit) Underslung Crane shall be running on the lower flange of two runway Track or Beam for Long Travel) along with Festooning type arrangement of feeding power to trolley assembly, shrouded DSL for long travel with mountings and suitable current collector system.	Vendor to confirm			
3.0	QUANTITY REQUIRED:				
3.1	Under Slung Electric cranes as per Enquiry A Single or Double travelling Bridge / Grider (As per vendor design, To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.	Vendor to confirm			
3.2	The Vendor shall Offer suitable Festooning type & shrouded typr DSL System	Vendor to confirm			
4.0	MAIN FEATURES (Crane Operational Features):				

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
4.1	Speed System: single speed drive	Vendor to provide			
4.2	End Clearance: End clearance to be fixed to suit the workshop building clearances as per the enclosed tender ANNEXURE IV.	Vendor to submit the clearance drawing .			
5.0	CONTROL:				
5.1	Type of Control / Operation: Through pendent type control. (Operating level shall be 1000 mm approx.. above Floor level)	Vendor to confirm			
5.2	Control Voltage: 110 V AC	Vendor to confirm			
5.3	Input Power Supply: 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to confirm			
5.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm			
5.5	Mechanism Group Classification : M 6	Vendor to confirm			
5.6	DESIGN STANDARD OF CRANE : IS – 807 & 3177 / latest	Vendor to confirm			
5.7	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm			
6.0	STRUCTURAL FABRICATION (Constructional Details):				
6.1	Bridge/Girder: Suitable For Under slung Electric crane capacity as per Enquiry	Vendor to confirm			
6.2	The following shall be carried for Girders, end carriage, crab, gear box and rope drum	Vendor to confirm			
6.3	The Plates of thickness 25mm and above shall be ultrasonically tested.	Vendor to confirm			
6.4	NDT requirements on weldments shall be as follows : a) Butt weld in tensions : 100% RT and 100% DPT b) Butt weld in compression : 10 % RT and 100 % DPT c) Butt welds in rope drum : 100 % RT and 100 % DPT d) Fillets Welds : Random 10 % DPT	Vendor to confirm			
6.5	Raw Material: Steel plates conforming to IS 2062 tested and certified for quality by reputed inspection authorities, shall be used.	Vendor to confirm and produce certificates.			
6.6	Welded Joints (To be followed for Girder fabrication):				
6.7	Welding Electrodes for all Horizontal Welding E 7018 Electrode only should be used.	Vendor to confirm			
6.8	Welding Electrodes for all Vertical Welding E 7048 Electrode only should be used.	Vendor to confirm			
6.9	Welded Joint Testing: All Butt Welded Joints (both compression/ tension and flanges / web joints) shall be subjected to 100% X-Ray Testing and X-Ray Films to be produced for BHEL evaluation and form part of the documentation.	Vendor to confirm			
6.10	Splice Joints: No splice joint is allowed in Girder Fabrication. [Girder shall be of single piece only].	Vendor to confirm			
6.11	Wheel Assembly:				
6.12	The Wheel Assemblies of Cross Travel (CT) and Long Travel (LT) shall be of Live Axle System with L-Type Bearings only. Details to be submitted by the vendors.	Vendor to submit details			
6.13	Heat Treatment & NDT Examination:				
6.14	The Trolleys shall be stress relieved, if necessary, by thermal heat-treatment process after welding & NDT. All welding shall be tested by NDT means [MPI, LPI & RT] after stress relieving operation.	Vendor to confirm and produce necessary certificates			
6.15	Machining Operation:				

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
6.16	All mechanical mating surfaces and wheel seating areas are to be machined to the required finish and protected.	Vendor to confirm			
7.0	Painting Instructions:				
7.1	As per ANNEXURE III	Vendor to confirm			
8.0	MECHANICAL ELEMENTS:				
8.1	Gears: Gears in all the Stages shall be helical in design and to be of machined, lapped and hardened	Vendor to confirm			
8.2	Gear Box Casing: Shall be of fabricated type and stress relieved by thermal heat-treatment process, prior to machining.	Vendor to confirm			
8.3	Reduction gear shall be tested for reduction ratio, backlash & contact pattern. Gear box shall be subjected to no load run test, to check for oil leakage, temperature raise, noise and vibration.	Vendor to confirm			
8.4	Rope Drum: The hoist mechanism shall consist of a grooved rope drum driven by electric motor through gears. Rope Drum Shall be of fabricated type and stress relieved. The circumferential weld joints shall be tested by 100 % X-Ray quality. 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.	Vendor to confirm			
8.5	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				
8.6	ROPE GUIDE: Rope guides shall have wear resistant property. It shall prevent slack rope and retain wire rope in the barrel grooves.				
8.7	Type of Coupling: Only Geared Couplings to be used for <i>a) Between Electric Motor and Gear Box, b) Between Gear Box and Rope Drum and c) Between Gear Box and Trolley Wheels.</i>	Vendor to confirm			
8.8	Wheels: Shall be of forged and Wheel Tread hardened to 300-350 BHN . Wheels shall be fitted with L-Type Bearings	Vendor to confirm			
8.9	Wheels: Shall be of forged and Wheel Tread hardened to 300-350 BHN . Wheels shall be fitted with L-Type Bearings	Vendor to confirm			
8.10	Mechanical Joints: Fit Bolts (as per IS 3640 –1982) for all joints coming in main members.	Vendor to confirm			
8.11	Pulley Dimension: Rope Pulley diameter shall be 23 times that of Rope diameter.	Vendor to confirm			
8.12	Lifting Hook: Hooks shall be of C-type as per IS 15560 & with antifriction bearing and provided with latches.	Vendor to confirm			
8.13	All test including proof load test as per relevant IS standard shall be carried out. Certificate shall be submitted to BHEL for review.	Vendor to confirm			
8.14	MPI/DPT shall be carried out after proof load test	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
8.15	Lubrication:				
8.16	Suitable lubrication system shall be provided for gear box, all rotating parts wherever applicable. One number grease gun shall be supplied per project.	Vendor to furnish			
8.17	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.	Vendor to furnish			
8.18	Bumpers (End Stoppers):				
8.19	Bumpers of adequate size shall be provided both in CT & LT to stop the crane in the event of an overshoot by the operation.	Vendor to provide			
8.20	Guards: Suitable guards shall be provided for all rotating parts like couplings, wheels etc..	Vendor to provide			
8.21	FORGINGS (wheel,gears,pinions,axle,hooks&hook trunion) a) All forgings greater than or equal to 50mm diameter or thickness shall be subjected to ultrasonic test .b) DPT/MPI shall be done after hardfacing and machining	Vendor to provide			
8.22	WIRE ROPE:				
8.23	Wire rope shall be of pre-formed type, hemp cored, regular lay 6/36 construction and 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. 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. Minimum number of falls of rope shall be four (4).Hoisting rope shall confirm to IS 2266.The rope shall be hot dip galvanised. The rope shall be free from kinks and shall be continuous.	Vendor to confirm			
9.0	ELECTRICAL ELEMENTS:				
9.1	Electrical system comprises of 63A Fuse or to Suit Switch Unit/MCB, Control panel,Pendent Push Button Station, DSL, Pendent cable, Hoist, Long travel & Cross travel motors with brake, other electrical item etc., to make the system complete. All these items are included in the scope of supply of the vendor.	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
9.2	<p>Motors: The motors shall meet IS 325 or equivalent international standards. The motor shall be designed for frequent reversal, braking and acceleration similar to crane duty. 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. 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 or Totally Enclosed Surface Cooled (TESC) type. Motors shall have minimum class "F" type insulation with temperature rise limited to class "B". 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. The frame shall be cast and rigid. The motors shall be designed for both directions of rotation. 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. If the hoist motor is placed inside the rope drum, then the motor lead wires can also be taken out without necessity of a terminal box. The motor vibration and noise shall be within the limits specified in IS 12065 and IS 12075. The noise level shall be limited to 85dB.</p>	Vendor to confirm			
9.3	<p>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.</p>	Vendor to confirm			
9.4	<p>PUSH BUTTONS: The Pendant Push Button station shall have the following Push Buttons: a) Hoist, b) Lower, c) Forward, d) Reverse & e) Emergency Stop. The Emergency stops Push Button shall be Lockable type. The Pendant Push Button station shall have the following LED clustered type indicating lamps: a) SUPPLY ON, b) HOIST MOTOR Raise/Lower, c) CT MOTOR Forward/Reverse, d) HOIST MOTOR TRIP and e) CT MOTOR TRIP. 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 10 m length. The Enclosure of Pendant Push button station shall be designed for IP 55 degree of protection. Push buttons shall be spring return type with 2NO+2NC self-reset contacts rated for 5A at 415volts 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 IS. The Push buttons shall be properly shrouded so as to prevent water & dust entry.</p>	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
9.5	<p>CONTACTOR: All Contactors shall be suitable for DOL application with coils suitable for the control voltage provided by the supplier. Contactor construction shall be rugged. For control purpose, only auxiliary contactors shall be used. Relays are not acceptable in place of Auxiliary Contactors. The power contactors shall have Mechanical interlocking in addition to Electrical interlocking so that at any point of time only any one of the two Power contactors (either up or Down, Left or Right) will be energized. The contactor shall be AC4 duty for inching operation.</p>	Vendor to confirm			
9.6	<p>THERMAL OVER LOAD RELAYS: Thermal over load relays wherever provided shall be ambient temperature compensated with suitable setting ranges. The relay shall be auto reset type. 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.</p>	Vendor to confirm			
9.7	<p>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.</p>	Vendor to confirm			
9.8	<p>INDICATING LAMPS: LED clustered 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 replaceable 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.</p>	Vendor to confirm			
9.9	<p>WIRING: The control panel wiring shall be complete in all respects and ready for connection of external power for terminating external cables. Necessary double compression Nickel plated Brass cable glands along with suitable terminal blocks and lugs to receive trailing cable and pendant 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 minimum 2.5 sq.mm multi stranded copper, PVC insulated 1100V wires. Crab wiring: Junction box shall be avoided for wiring of crab and in bridge end.</p>	Vendor to confirm			
9.10	<p>TERMINATION All power and control wires shall be terminated on terminal block/component using crimping type Annealed Tinned Copper lugs/connectors. CLIP-ON type terminal block shall be used. The terminal blocks 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.</p>	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
9.11	<p>CONTROL PANEL</p> <p>Control panel shall be provided to house the electrical components like fuses/MCB, contactors, relays, isolators, switches, and 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 and shall be dust and vermin proof, suitable for outdoor condition. Adequate number of DOUBLE COMPRESSION type cable glands (heavy duty) of brass with nickel plating and Annealed Tinned Lugs shall be provided for incoming and outgoing power and control cables. The cable glands shall be provided with dummy plugs. The door, removable cover plates, and metal-to-metal joints shall be fully neoprene gasketed. The control panel shall be designed for IP 55 degree of protection.</p>	Vendor to confirm			
9.12	<p>PAINTING OF CONTROL PANELS: (The below details are Tentative, Final details will be given in during drawing approval stage)</p> <p>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.</p>	Vendor to confirm			
9.13	<p>CONTROL SUPPLY TRANSFORMER:</p> <p>Dry type, step down control supply transformer 415V / 110V AC shall be provided to derive control supply for starter operation & 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.</p>	Vendor to confirm			
9.14	<p>FUSE SWITCH UNIT/MCB:</p> <p>Metal enclosed, FOUR POLE fuse switch unit (TPN)/MCB of 63A, 415V, 3 phase 4 wire AC, rating suitable for outdoor location shall be provided to receive purchaser's supply. The enclosure shall be suitable for IP 55 degree of protection. Suitable Nickel-Chromium plated brass DOUBLE COMPRESSION glands and crimp type ATC lugs to receive purchaser's 4C-16 sq. mm Al armoured/ unarmoured FRLS cable & vendor's 4C-4 sqmm copper un-armoured cable shall be provided. Cable glands and lugs shall also be provided for the flexible trailing cable. The FSU/MCB shall be provided with 2 No's of earthing terminals with M12 screws, nuts and washers. The FSU/MCB shall be located at a fixed location about 5 m away from the start position of the hoist. The Fuse Switch unit/ MCB shall be wall mounted.</p>	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
9.15	CABLE: IS 694 Part I&II, IS 3961, IS 1554, IS 9968, IS 6380. 1)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 multistranded tinned copper of class 5 of IS 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	Vendor to confirm			
9.16	2) The power cables between HOIST / CT MOTORS / LT 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.	Vendor to confirm			
9.17	Crane Operation: Through pendent type control. (Operating level shall be 1000 mm approx.. above Floor level)	Vendor to confirm			
9.18	The Crane Control Voltage shall be 110 V AC	Vendor to confirm			
9.19	Type of Brakes:				
9.20	Hoist Brakes: Shall be of DC EM Brakes only	Vendor to confirm			
9.21	CT & LT Brakes: Shall be of Thruster Brakes only.	Vendor to confirm			
9.22	BRAKES: 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.	Vendor to confirm			
9.23	Protection: All Panels, Limit-Switches and Motors shall have IP 54 protection.	Vendor to confirm			
9.24	Electric Contactors: All Panels shall have SIEMENS/L&T/GE contactors suitable for Crane operations.	Vendor to confirm			
9.25	Contactors Rating: The rating of all Contactors shall be at least 50% higher than the respective electric motor full load current, at the specified duty cycle.	Vendor to confirm			
9.26	Long Travel Motion: A Dual Drive Mechanism shall be provided for LT (Long Travel) Motion.	Vendor to confirm			
9.27	Illumination:				
9.28	2 Nos. of 400 Watts HPMV Lamps & fittings shall be provided under the Bridge and 1 No. shall be provided under CT Trolley. Fittings shall be of non-integral type. (Total lights 3 Nos.)	Vendor to confirm			
9.29	All Electric Panels shall be provided with suitable illumination for visibility and trouble shooting.	Vendor to confirm			
9.30	Drives : single speed drive shall be provided for a) Main Hoist, c) Long Travel and d) Cross Travel.	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
9.31	Limits: Each hoist shall be provided with both rotary and counter weight limits. Limit switches shall be provided for both CT & LT. The limit switches shall have enclosures designed for IP 55 degree of protection. Proximity switches are not acceptable in place of Limit Switches.	Vendor to confirm			
9.32	DSL & Current Collector System:				
9.33	Cranes shall be provided with shrouded type DSL.	Vendor to confirm			
9.34	Supervision of Erection of DSL and supply of fixing elements are vendor's scope.	Vendor to confirm			
9.35	Current collection system suitable for the above cranes shall be offered along with the crane.	Vendor to confirm			
9.36	PENDANT PUSH BUTTON STATION The Pendant Push Button station shall have the following Push Buttons. Hoist, Lower, Forward, Reverse & Emergency Stop. The Emergency Pus Button shall be Lockable type. 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. 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 IS. The Push button shall be properly shrouded so as to prevent water & dust entry.	Vendor to confirm			
9.37	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/MCB shall be in supplier's scope.	Vendor to confirm			
9.38	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.	Vendor to confirm			
10.0	START UP & COMMISSIONING SPARES: Start-up & Commissioning Spares shall be part of the main supply of the EOH. 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 equipments are energized	Vendor to confirm			
10.1	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.	Vendor to confirm			


S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
10.2	The vendor shall offer electrical/ electronic / mechanical spares for 2 years trouble free operation of the crane. (Unit Price along with quantity of each item of spare shall be offered in the price bid)	Vendor to offer			
10.3	SPECIAL TOOLS & TACKLES: Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply of the machine. List of special tools & tackles shall be decided by bidder as per his proven practice. When special tools are provided, they shall be packaged in separate, boxes with lugs and marked as "Special Tools for (tag / item number)." Each tool shall be stamped or tagged to indicate its intended usage. Levers and eye bolts for the removal of parts to be serviced shall be submitted with special tools.	Vendor to offer			
11.0	MAKES OF BOUGHT OUT ITEMS: Vendor to incorporate their BOI Makes in their MQP.	Vendor to confirm			
11.1	Hoist Hooks: Herman Mohhta/Hercules/Silpa Udyog/Smriti Forgings/ Karachiwala	Vendor to specify their makes in their MQP			
11.2	Wire Ropes: USHA MARTIN/ BHARAT WIRE ROPES / MAYUR / ARADHYA	Vendor to specify their makes in their MQP			
11.3	Electric Motors: GE/Bhrat Bijlee/Siemens/KEC/ABB/Crompten / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.4	DC EM Brake Unit: BCH / EMCO / PETHE / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.5	Thruster Brake Unit: Electromag / Speed-O-Control / Omega / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.6	Limit Switches (Gravity Type): Siemens / EMM / BCH / SOC/SKC / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.7	Contactors: Siemens / L&T / GE	Vendor to specify their makes in their MQP			
11.8	Over - Load Relay: Siemens / L&T / GE / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.9	HRC Fuses: Siemens / L&T / GE / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.10	Rotary limit switch: Siemens/Omega/SOC / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.11	Resistance Box: Stromkraft / BCH / Ohmark / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.12	Switch fuse unit: Siemens / L & T / GE / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.13	Moulded Case C.B: Siemens / L & T / GE / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.14	PushButtons: L&T/SIEMENS/TEKNIC/BCH/CONTROLS&SWITCHGEAR/TELEMECHANIQ UE/GE / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.15	Couplings: WMI / Fenner / ALFEX / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.16	Bearings: SKF / FAG only	Vendor to specify their makes in their MQP			
11.17	Cables: Reputed Makes & ISI Approved	Vendor to specify their makes in their MQP			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
11.18	Bridge Light Fittings: Philips/GE/Crompton/ / NTPC APPROVED	Vendor to specify their makes in their MQP			
11.19	Other Elements: Vendor to specify the item and makes.	Vendor to specify their makes in their MQP			
11.20	NOTE: Make of various components for NTPC projects are subject to NTPC CUSTOMER 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.	Vendor to confirm			
12.0	DOCUMENTS/DETAILS for APPROVAL: The following documents / details shall be submitted to BHEL for Approval within <i>20 days of PO placement</i> , prior to taking up the manufacture of the crane.	Vendor to confirm			
13.0	Drawings / Documents:				
13.1	GA Drawing of the Crane.	Vendor to submit			
13.2	GA Drawing of Crab with Trolley.	Vendor to submit			
13.3	GA Drawing of Individual Mechanisms.	Vendor to submit			
13.4	Sub-Assembly Drawing for Wheels, Hook Blocks, Gear Boxes & Hoist Drums.	Vendor to submit			
13.5	Calculations for Selection of Electric Motors, Gear Reducers, Brakes, Couplings, etc.	Vendor to submit			
13.6	Calculations for Bridge Girder, Crab, End - Carriage and their connections.	Vendor to submit			
13.7	Calculations for Steel wire rope selection	Vendor to submit			
13.8	Wiring Diagram with Logic Circuits.	Vendor to submit			
13.9	Cable Selection based on current rating.	Vendor to submit			
14.0	Technical Details:				
14.1	Total Weight of the Crane including all Electrical Equipments.	Vendor to specify			
14.2	Total Weight of Trolley including all Electrical Equipments.	Vendor to specify			
14.3	Weight of each Bridge assembled and ready for erection with and without Mechanical and Electrical Equipment.	Vendor to specify			
14.4	Weight of each End - Carriage: In assembled and ready for erection condition.	Vendor to specify			
14.5	Total Weight of Structural, Mechanical and Electrical Equipments. (To be indicated separately)	Vendor to specify			
15.0	INSPECTION: The following Schedule of Stage Inspections shall be strictly adhered prior to dispatch from the Supplier's Works.	Vendor to confirm			
16.0	STAGE-I Inspection:				
16.1	Verification of Test Certificate for Raw Materials used for Girders, Trolleys, Gear Box Casings, etc.	Vendor to confirm			
16.2	Verification of X-Ray Report of Butt-Joints coming in the Girders and Random Testing on the Welds, by physical examination.	Vendor to confirm			
16.3	Trolley Frame Fabrication before setting the Mechanisms.	Vendor to confirm			
16.4	Steel Casting				
16.5	DPT and machined surface shall be carried out	Vendor to confirm			
17.0	STAGE- II Inspection:				

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
17.1	Inspection of Bridges and End – Carriages with Wheel Assembly and Alignment checking	Vendor to confirm			
17.2	Verification of Span & Diagonal Dimensions, Checking of Wheel Alignment, Mechanical Assemblies and Total Alignment as per IS-3177	Vendor to confirm			
17.3	Free running of the all the Mechanisms.	Vendor to confirm			
18.0	STAGE- III (Final Inspection):				
18.1	Measurement of CAMBER in the Bridges.	Vendor to confirm			
18.2	Full / Rated Load Test and Deflection Test.	Vendor to confirm			
18.3	Deflection and Permanent Set Measurement.	Vendor to confirm			
18.4	25% OVER-LOAD Lifting Ability Check.	Vendor to confirm			
18.5	Electric Hoist shall be tested as per IS 3938				
19.0	SUPERVISION OF CRANE ERECTION & COMMISSIONING:				
19.1	Supervision of Crane Erection & Commissioning: Supervision for Crane Erection & Commissioning of the Crane and Performance Prove –Out for 100% of Crane's Capacity , 125% lifting/ holding test and Smooth Functioning of the Crane (at BHEL site / Customer site) shall also be the RESPONSIBILITY of the supplier.	Vendor to confirm			
19.2	Crane Erection & Cabling: Supervision for Complete crane erection/installation, wiring/cabbling of the various components at BHEL shall be the scope of the supplier.	Vendor to confirm			
19.3	Supervision for DSL current collector fixing and cabling from current collector to crane main switch also shall be the scope of the supplier. Current collector and its holding brackets, Cable is crane supplier scope.	Vendor to confirm			
19.4	All safety equipments like safety boot, safety belt, helmet, gloves, goggles etc. required for erection personnel shall be brought by the vendor.	Vendor to confirm			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
19.5	<p>Erection of Cranes and its accessories will be done by owner as per vendor's Erection Manual and check List.</p> <p>The bidder has to send their supervision for two numbers of visit for erection & commissioning, testing for each crane - 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 Crane.</p> <p>Vendor shall quote charges for complete work for supervision for erection & commissioning, testing for each Under slung cranes.</p> <p>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 Under slung cranes.</p> <p>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.</p>	Vendor to confirm			
20.0	O & M MANUALS: 10 Copies of Erection, Operation & Maintenance Manual, containing the following technical drawings & details shall be submitted.	Vendor to confirm			
21.0	Drawings & Details:				
21.1	Crane GA Drawing	Vendor to confirm			
21.2	Crab Assembly Drawing	Vendor to confirm			
21.3	Total Crane Wiring Schematics	Vendor to confirm			
21.4	Detailed Wiring Diagrams for Sub-Systems / Panels	Vendor to confirm			
21.5	Wheel Assembly Drawings	Vendor to confirm			
21.6	Bottom Block Assembly Drawing	Vendor to confirm			
21.7	Gear Box Assembly Drawings	Vendor to confirm			
21.8	Coupling Drawing and Details	Vendor to confirm			
21.9	Specifications/Ratings of All Bought-Out-Items	Vendor to confirm			
21.10	Warranty / Guarantee Card for all Bought-Out-Items.	Vendor to confirm			
21.11	Trouble Shooting Chart for Main and all Sub-Systems	Vendor to confirm			
22.0	PERFORMANCE GUARANTEE:				
221.	The Performance of the Total Crane and / or the Components / Sub-Assemblies / Bought-Out-Items shall be guaranteed for a minimum period of 24 months from the date of acceptance of the crane at NTPC site.	Vendor to confirm			
23.0	PACKING & FORWARDING				

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
23.1	The Under slung cranes and accessories shall be properly packed so as to avoid damage during transit & storage. Wooden crate 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.	Vendor to confirm			
23.2	Each package or shipping units shall be clearly marked or stenciled on at least two sides - NTPC SITE (ADDRESS AS PER ENQUIRY). 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.	Vendor to confirm			
24.00	ANNEXURE I - DATA SHEET (VENDOR TO SUBMIT FILLED COPY OF DATA SHEET ALONG WITH THEIR OFFER)	Vendor to confirm			
25.00	ANNEXURE II- DETAILS OF UNDER SLUNG ELECTRIC CRANES	Vendor to confirm			
26.00	ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING EQUIPMENTS	Vendor to confirm			
27.00	ANNEXURE-IV- RC PUMP & OXIDATION BLOWER UNDER SLUNG ELECTRIC CRANE SHED GA	Vendor to confirm			
28.00	ANNEXURE-V- TYPICAL GA OF UNDER SLUNG ELECTRIC CRANES	Vendor to confirm			

ANNEXURE I		
	DATA SHEET	
	(VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)	
NTPC FGD PROJECT		
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING		
PROJECT NAME: BRBCL NABINAGAR (4X250MW) PROJECT		
1.0	Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0	Quantity	As per Enquiry
3.0	Main Hoist (minimum)	As per Enquiry
4.0	SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1	Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2	CT Span	Vendor to submit
5.0	Height of Lift:	
5.1	Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0	Bay Length:	
6.1	Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0	DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1	Hoists	40 % CDF
7.2	Long Travel	40 % CDF
7.3	Cross Travel	40 % CDF
8.0	SPEED: (Operating / Working Speed - Maximum)	
8.1	Main Hoist (Maximum)	7.5 mtrs./minute.
8.2	Cross Travel (CT) (Maximum)	12.0 mtrs./minute.
8.3	Long Travel (LT) (Maximum)	12.0 mtrs./minute.
9.0	MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1	Main Hoist	Vendor to submit
9.2	Cross Travel (CT)	Vendor to submit
9.3	Long Travel (LT)	Vendor to submit
10.0	GEAR BOX SIZES:	
10.1	Main Hoist	Vendor to specify
10.2	Cross Travel (CT)	Vendor to specify
10.3	Long Travel (LT)	Vendor to specify
11.0	Acceleration:	
11.1	Cross Travel (CT)	Vendor to specify
11.2	Long Travel (LT)	Vendor to specify
12.0	Hoist Rope Details: (Size & Number of Falls)	
12.1	Main Hoist rope Size	Vendor to specify
12.2	Falls	Vendor to specify
13.0	CONTROL (Remote control)	
13.1	Through pendent type control	Vendor to confirm
13.2	Control Voltage: Shall be 110V AC	Vendor to note
13.3	Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5	Mechanism Group Classification:	M 6
13.5	Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0	Wheel Sizes:	
14.1	Cross Travel (CT)	Vendor to specify
14.2	Long Travel (LT) -	Vendor to specify
15.0	Brake Drum Sizes:	
15.1	Main Hoist	Vendor to specify
15.2	Cross Travel (CT)	Vendor to specify
15.3	Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)

ANNEXURE - II

Details of Under slung Electric Crane for RC pumps and Blower Handling

PROJECT : BRBCL NABINAGAR (4X250MW) FGD

SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	(EL (+) METER)	(METER)	(METER)	(MM)	(NPB / ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	10	EL (+) 10.4	EL (+) 0.0	30	9	1000	NPB 600X220X122.4 + CAPPING ISMC300	2000	_____ MM	As per Enquiry

A Single or Double travelling Bridge / Grider (As per vendor design) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.
Please refer above tabulation for Long travel Runway Track detail.

NOTE : 1) Depending upon actual crane head room , the actual height of list for Crane shall be arrived.

Bidder Signed with seal

ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING

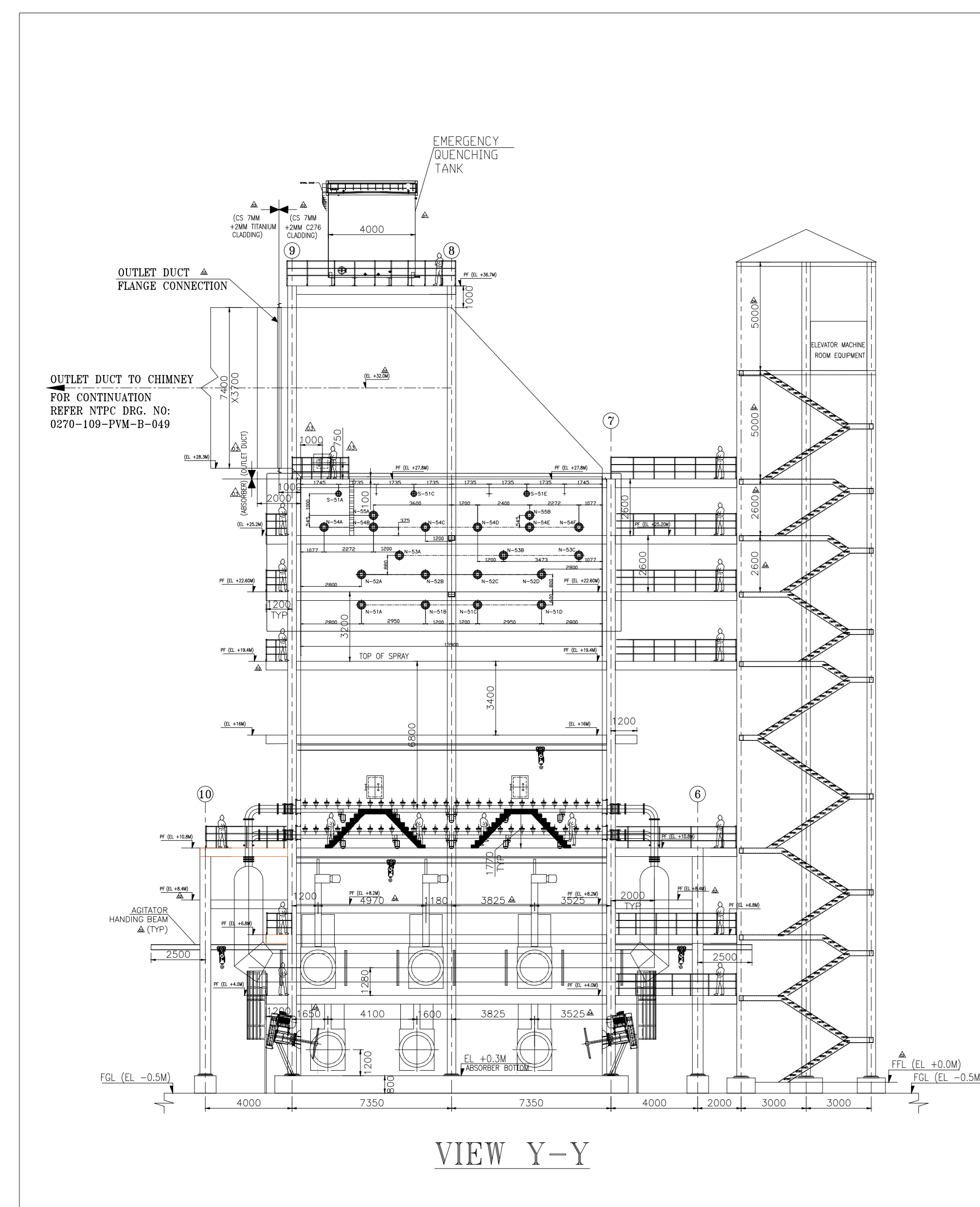
SI No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

11	Emergency quench system, Handling Equipment RC pump (Clause 20.03.00 of Part- C Section VI)	FW 227 FW 249	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	60	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	120
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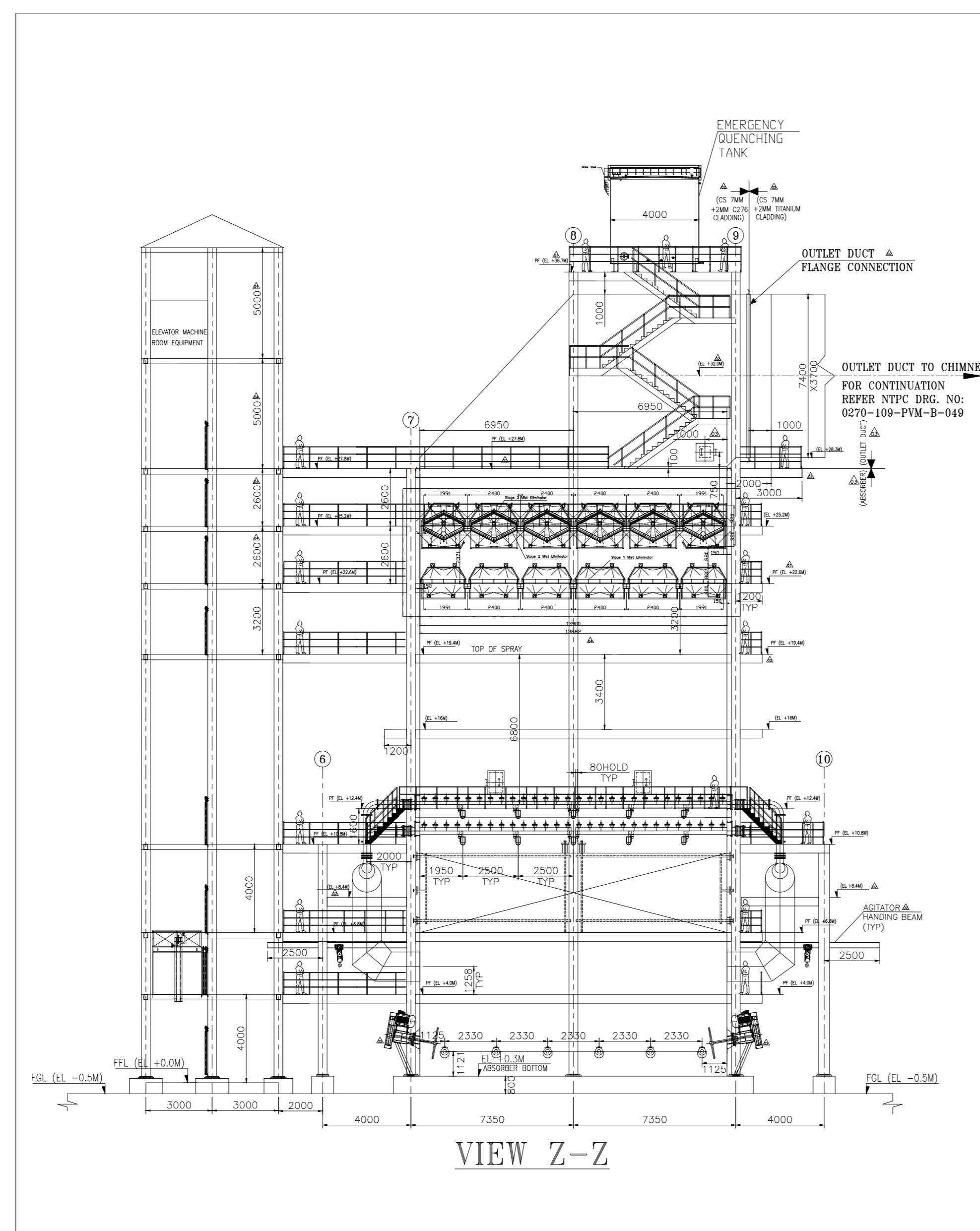
SI No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

GENERAL NOTES

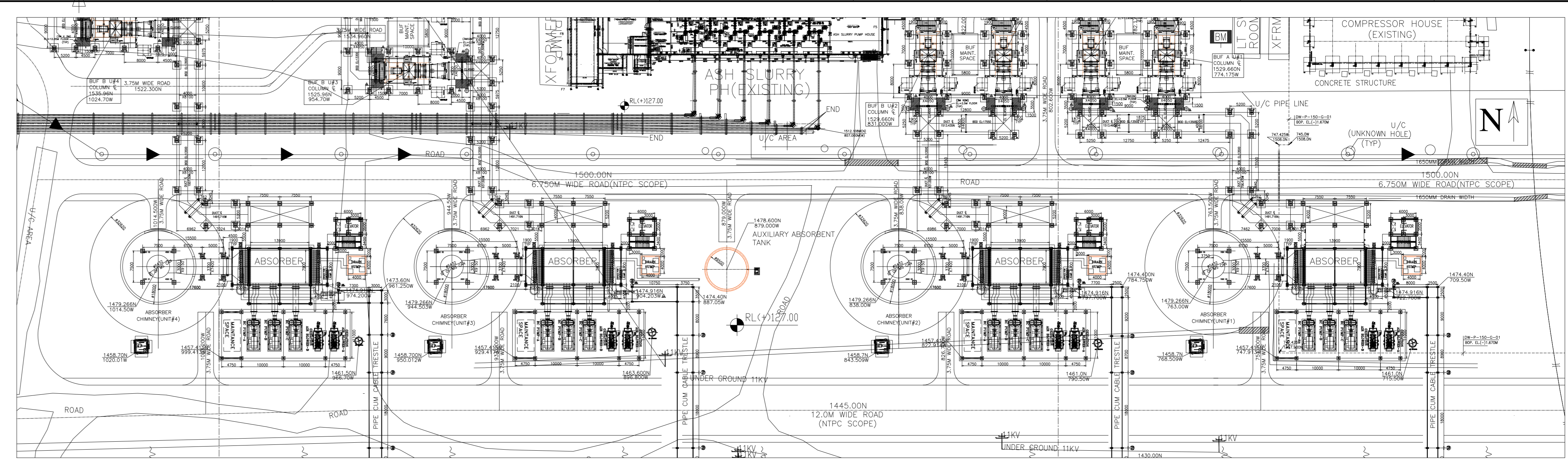
1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil
3. PGMA's covered in sub-supplier (ie., Purchased) items viz., Agitator/ slide bearing and other sub-delivery components 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 SI 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 PGMA's 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

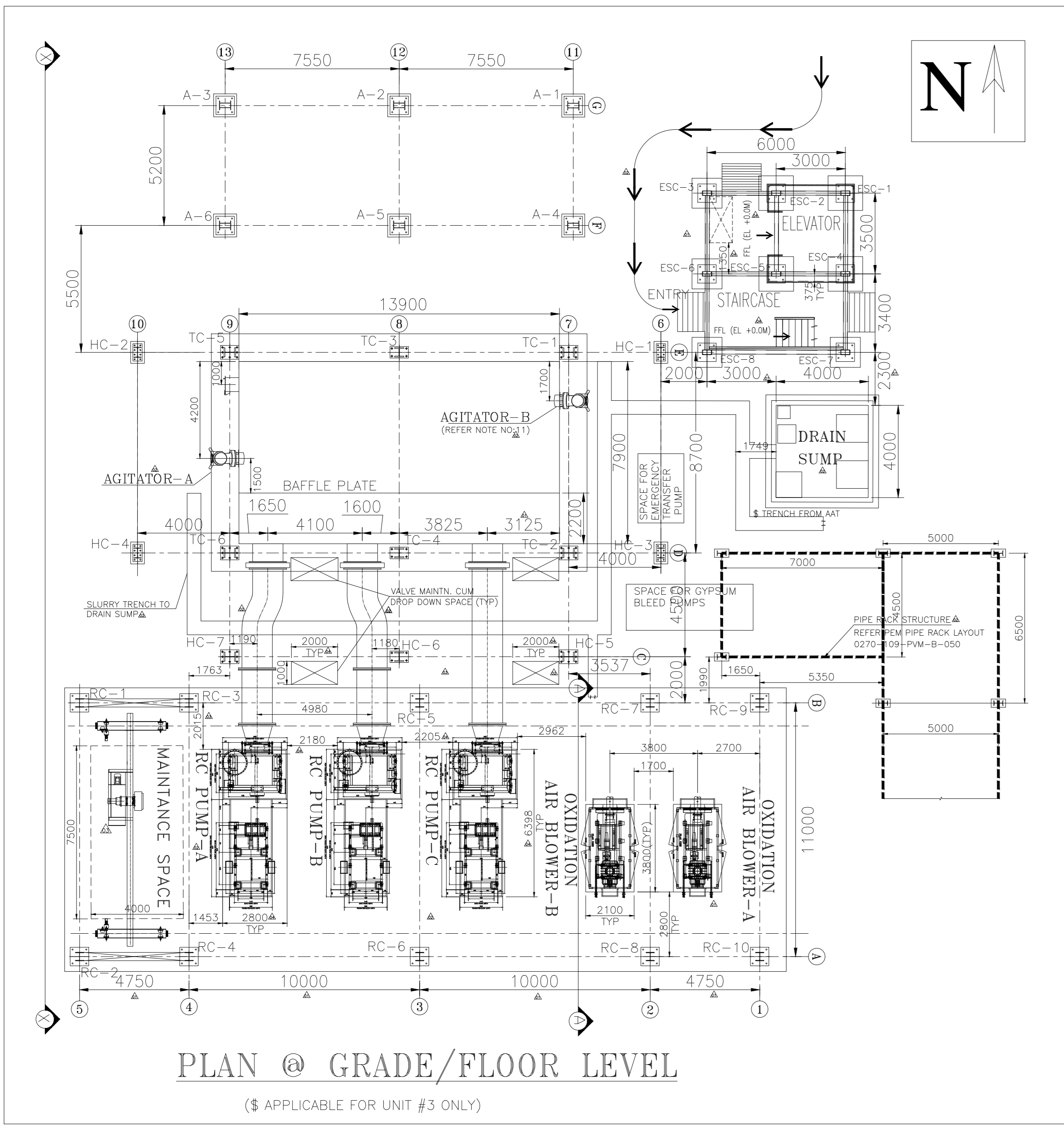


KEY PLAN

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS.
 2. FINISH FLOOR LEVEL = RL (+)127.5M, CORRESPONDS TO PLANT EL(+3)0.0M WHICH IS GROUND FLOOR OF STG BUILDING.
 3. FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA SHALL BE RL(+1)27.0M(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 JAS NOZZLES.
 7. SUITABLE CAVITY IN FOUNDATION TO BE PROVIDED FOR ABSORBER BOTTOM DRAINS NOZZLE WELDING.
 8. REFER STANDARD DRAWING NO:EGF-0052-411 FOR DETAILS OF EMERGENCY QUENCHING SPRAY PIPE DETAILS.
 9. REFER STANDARD DRAWING NO:EGF-0052-413 FOR DETAILS OF W/D INTERFACE WASHING PIPE DETAILS.
 10. REFER STANDARD DRAWING NO:EGF-0052-421 & EGF-0052-422 FOR DETAILS OF DCSF 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.

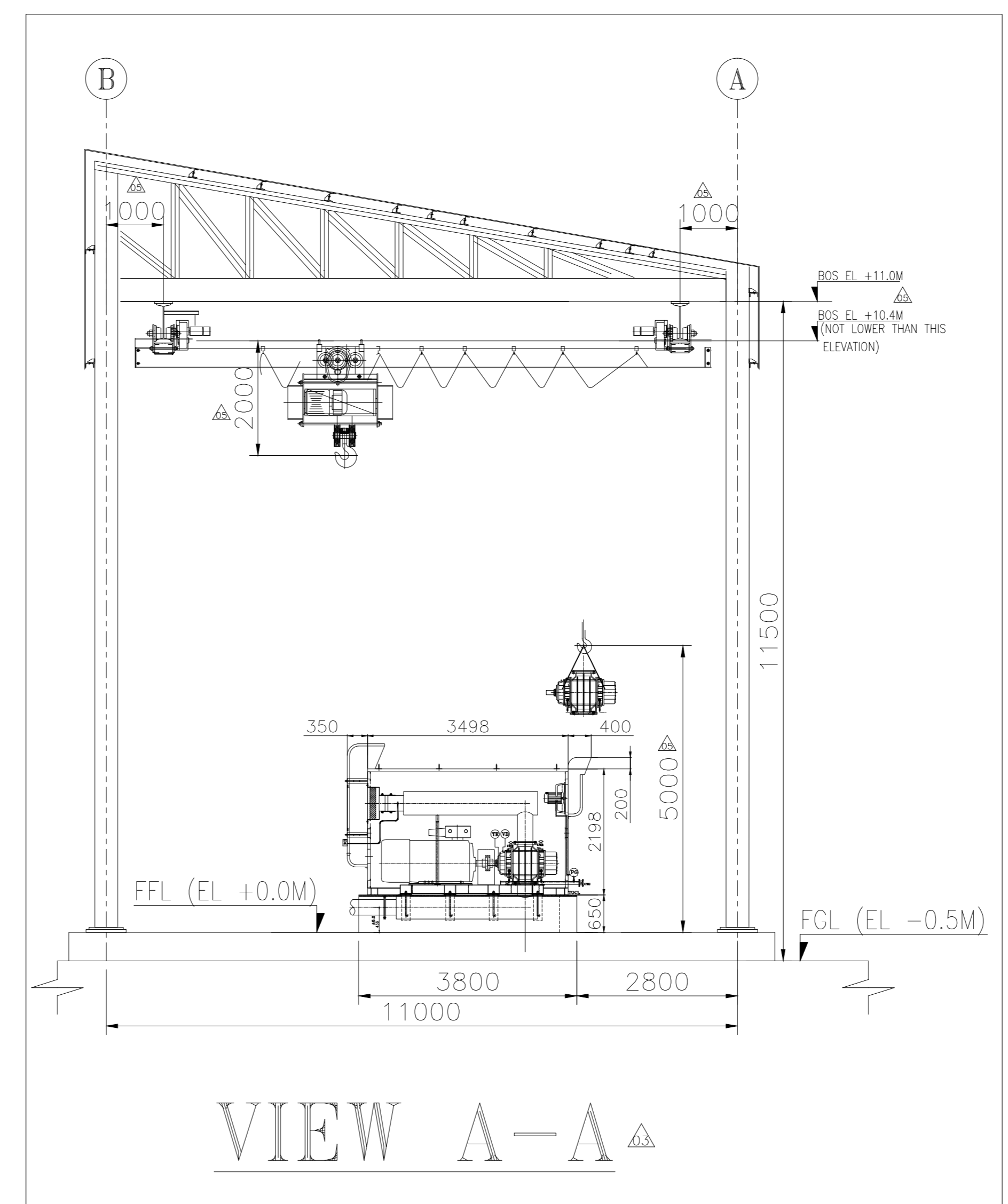
- REF. DWGS**
1. 0270-109-PVM-F-044 : FGD PLANT LAYOUT
 2. 0270-109-PVM-B-049 : GENERAL LAYOUT OF FGD DUCTING.
 3. 0270-109-PVM-F-001 : P&ID - Absorber ,Oxidation Blower,Gypsum Bleed Pump, Filtrate Water System & Mist Eliminator.
 4. 0270-109-PVM-B-011 : Data sheet & General Arrangement for Slurry Recirculation Pumps.
 5. 0270-109-PVM-B-012 : Data sheet & General Arrangement for Oxidation Air Blower.
 6. 0270-109-PVM-B-143 : GA and load data of all tanks.

- LEGEND:-**
- FLL : 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
 - TC : TOP OF CONCRETE
 - VL : VERTICAL LADDER
 - CGL : CAGE LADDER

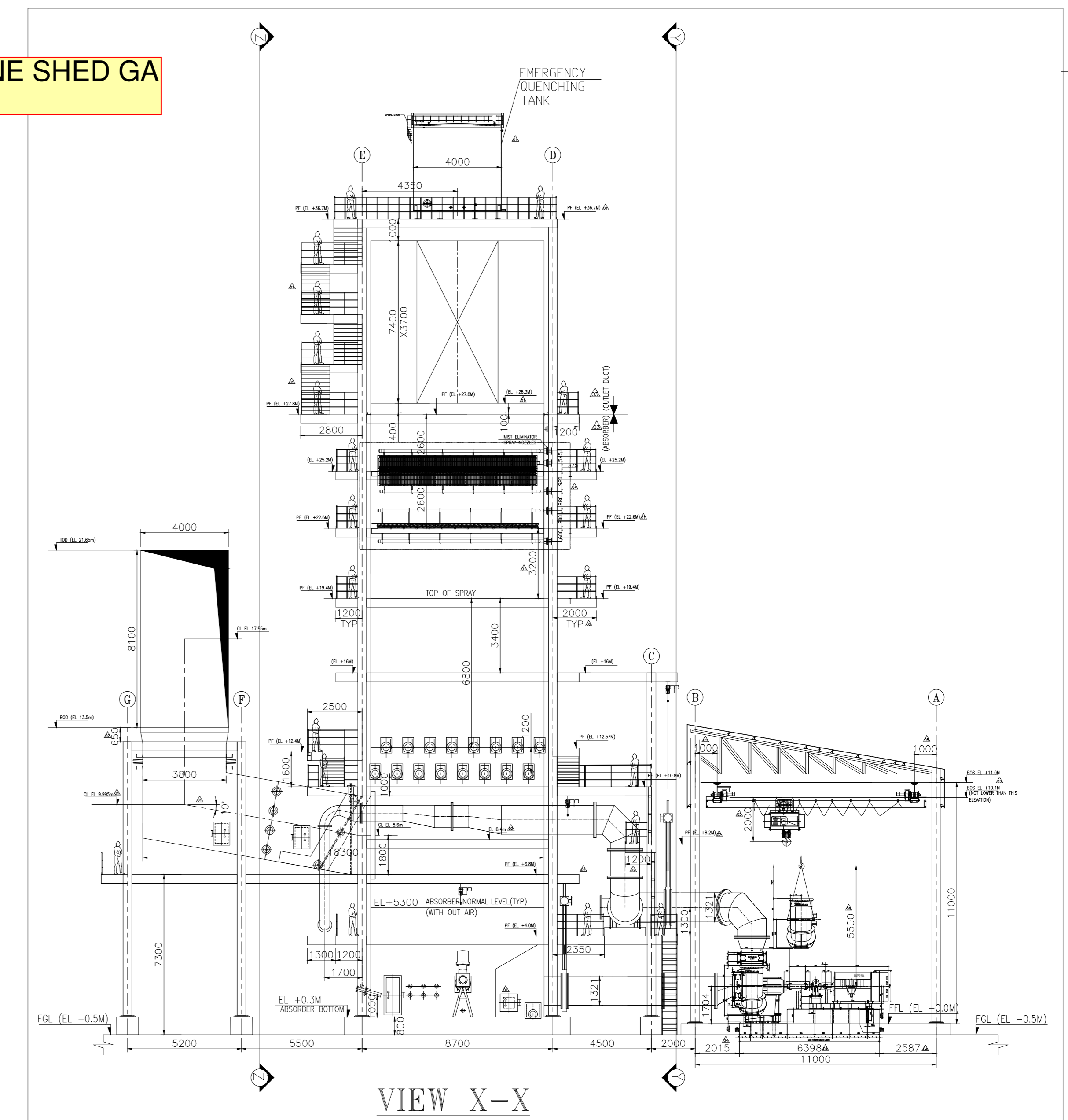


PLAN @ GRADE/FLOOR LEVEL
(\$ APPLICABLE FOR UNIT #3 ONLY)

ANNEXURE-IV- RC PUSMP & OXIDATION BLOWER UNDER SLUNG ELECTRIC CRANE SHED GA



VIEW A-A



VIEW X-X

PROGRESSIVE

REV.	DATE	ALTD.	CHD.	APPD.	REV.	DATE	ALTD.	CHD.	APPD.	REV.	DATE	ALTD.	CHD.	APPD.	REV.	DATE	ALTD.	CHD.	APPD.
05	25.07.21		SUKUMAR KUMAR SUNDAR		04	23.03.22		SUKUMAR KUMAR SUNDAR		03	22.10.21		SUKUMAR KUMAR SUNDAR		02	28.01.21		SUKUMAR KUMAR SUNDAR	
RC PUMP DETAILS, ABSORBER ELEVATOR CUM STAIRCASE ENTRY, F/L UPDATED. MANHOLE W-S/E ELEVATOR UPDATED. ELEVATOR/STAIR CASE STRUCTURE DETAILS UPDATED AS PER RELEASE DRAWING. MIST ELIMINATOR DETAILS UPDATED.																			
EMERGENCY QUENCHING NOZZLES & WET DRY INTERFACE NOZZLES SIZES UPDATED AS PER REVISED DATA SHEET. VIEW A-A ADDED. ABSORBER & OUTLET DUCT MATERIAL DEMARCATION UPDATED AS PER NTPC.																			
REVISED IN LINE WITH NTPC COMMENTS. VALVE HANDLING/AGITATOR HANDLING & PLATFORMS UPDATED.																			
REVISED IN LINE WITH NTPC COMMENTS. LATEST PLANT LAYOUT & MIST ELIMINATOR STANDARD ARRANGEMENT.																			

CUSTOMER NOS: G201,G202,G203,G204

NTPC DRAWING NO : Q270-109-PVM-B-010

CUSTOMER: BHARATHA RAIL BIJLEE COMPANY LIMITED.


CONSULTANT: NTPC LIMITED.

PROJECT: NABINAGAR 4X250MW FGD PACKAGE

DEPT.	NAME	SIGN	DATE
CHD	SANTOSH/B.S		18-04-2020
APPD	K.KUMAR		18-04-2020
APPD	V.V.SUNDAR		18-04-2020

TITLE: GA OF ABSORBER (PLAN & ELEVATIONS) SCALE: 1: NTS

DRAWING NO: 0-FW-000-01902 SH 01 OF 04 REV:05

ANNEXURE I		
	DATA SHEET	
	(VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)	
NTPC FGD PROJECT		
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING		
PROJECT NAME: BARH-II PROJECT		
1.0	Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0	Quantity	As per Enquiry
3.0	Main Hoist (minimum)	As per Enquiry
4.0	SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1	Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2	CT Span	Vendor to submit
5.0	Height of Lift:	
5.1	Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0	Bay Length:	
6.1	Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0	DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1	Hoists	40 % CDF
7.2	Long Travel	40 % CDF
7.3	Cross Travel	40 % CDF
8.0	SPEED: (Operating / Working Speed - Maximum)	
8.1	Main Hoist	7.5 mtrs./minute.
8.2	Cross Travel (CT)	12.0 mtrs./minute.
8.3	Long Travel (LT)	12.0 mtrs./minute.
9.0	MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1	Main Hoist	Vendor to submit
9.2	Cross Travel (CT)	Vendor to submit
9.3	Long Travel (LT)	Vendor to submit
10.0	GEAR BOX SIZES:	
10.1	Main Hoist	Vendor to specify
10.2	Cross Travel (CT)	Vendor to specify
10.3	Long Travel (LT)	Vendor to specify
11.0	Acceleration:	
11.1	Cross Travel (CT)	Vendor to specify
11.2	Long Travel (LT)	Vendor to specify
12.0	Hoist Rope Details: (Size & Number of Falls)	
12.1	Main Hoist rope Size	Vendor to specify
12.2	Falls	Vendor to specify
13.0	CONTROL (Remote control)	
13.1	Through pendent type control	Vendor to confirm
13.2	Control Voltage: Shall be 110V AC	Vendor to note
13.3	Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5	Mechanism Group Classification:	M 6
13.5	Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0	Wheel Sizes:	
14.1	Cross Travel (CT)	Vendor to specify
14.2	Long Travel (LT) -	Vendor to specify
15.0	Brake Drum Sizes:	
15.1	Main Hoist	Vendor to specify
15.2	Cross Travel (CT)	Vendor to specify
15.3	Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)

ANNEXURE - II

Details of Under slung Electric Crane for RC pumps and Blower Handling										PROJECT : BARH-II FGD		
SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	EL (+) METER	(METER)	(METER)	(MM)	(NPB /ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	10	EL (+) 10.892	EL (+) 0.00	40	7	1000	NPB 600X220X122.4 + CAPPING ISMC400	2500	_____ MM	As per Enquiry

A Single or Double travelling Bridge / Grider (As per vendor design) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.
Please refer above tabulation for Long travel Runway Track detail.

NOTE : 1) Depending upon actual crane head room , the actual height of list for Crane shall be arrived.

Bidder Signed with seal

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

ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING EQUIPMENTS

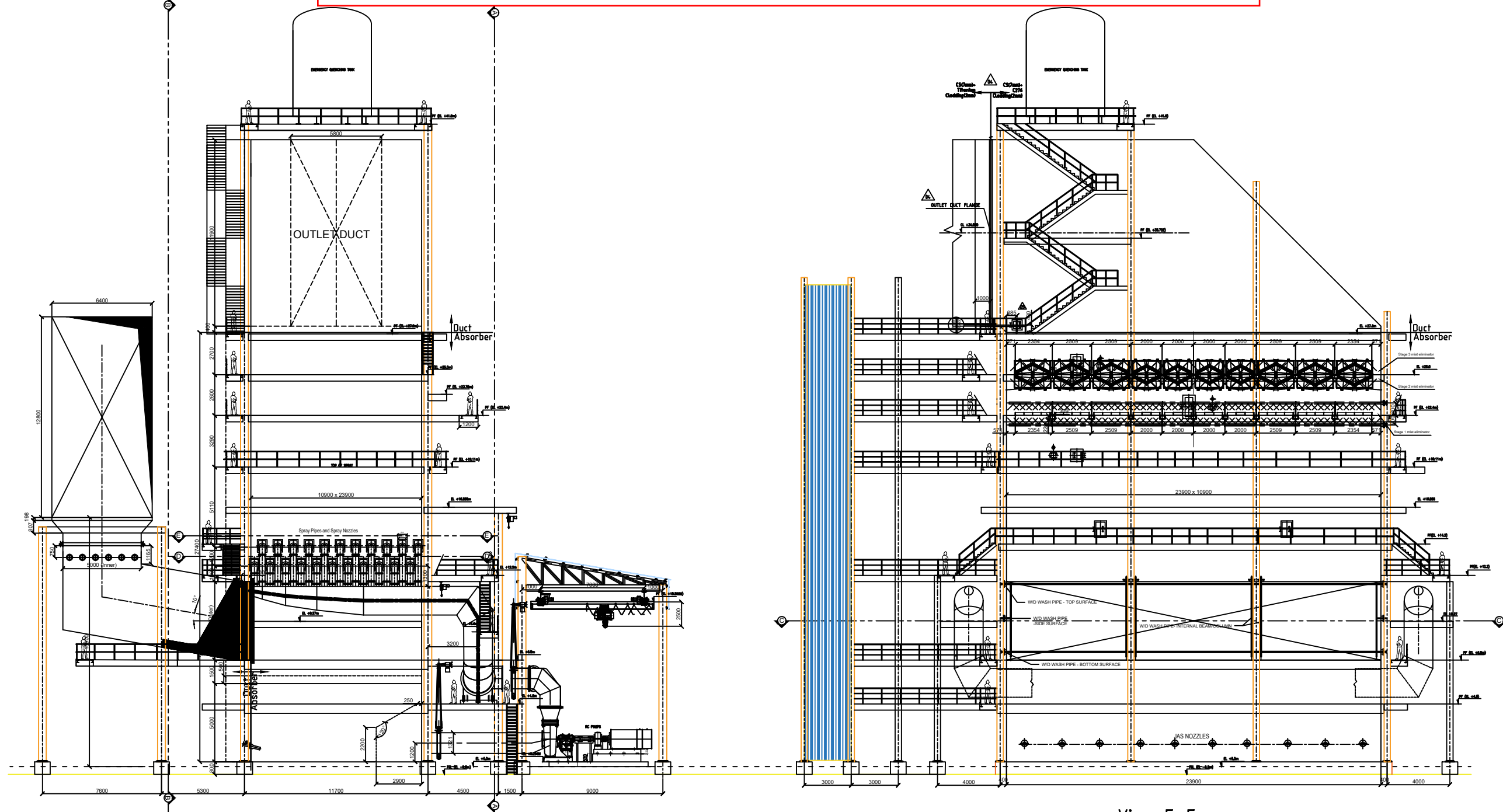
32	Handling Equipment- Hoists		Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130
----	-------------------------------	--	--	--	----	--	----	-----

SI 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. PGMA's 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 SI 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 PGMA's 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.

ANNEXURE-IV- RC PUMP & OXIDATION BLOWER CRANE SHED GA



CRANE ARRANGEMENT

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

REV	DATE	ALTERED	CHECKED	APPROVED	REVISION	REMARKS
00	21.11.19		MNK	KBP	WIS	Initial Issue
01	27.08.20		MNK	VMR	KK	Revised as per comments
02	23.12.20		MNK	VMR	KK	Revised based on internal comments
03	17.02.21		MNK	VMR	KK	Revised based on NTPC & internal comments
04	08.11.21		MNK	VMR	KK	Revised based on NTPC & internal comments
05	14.05.22		MNK	VMR	KK	Revised based on internal comments
06	26.08.22		MNK	VMR	KK	Revised based on internal comments

NTPC Dwg. No.: 9560-109-PVM-B-058

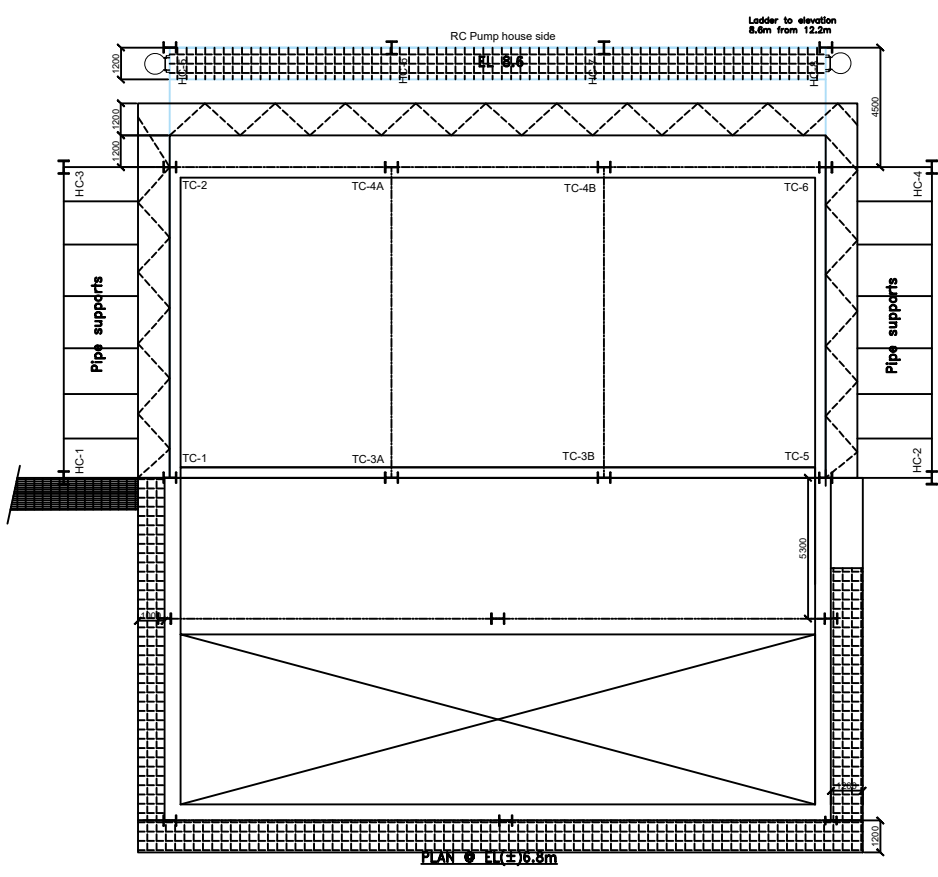
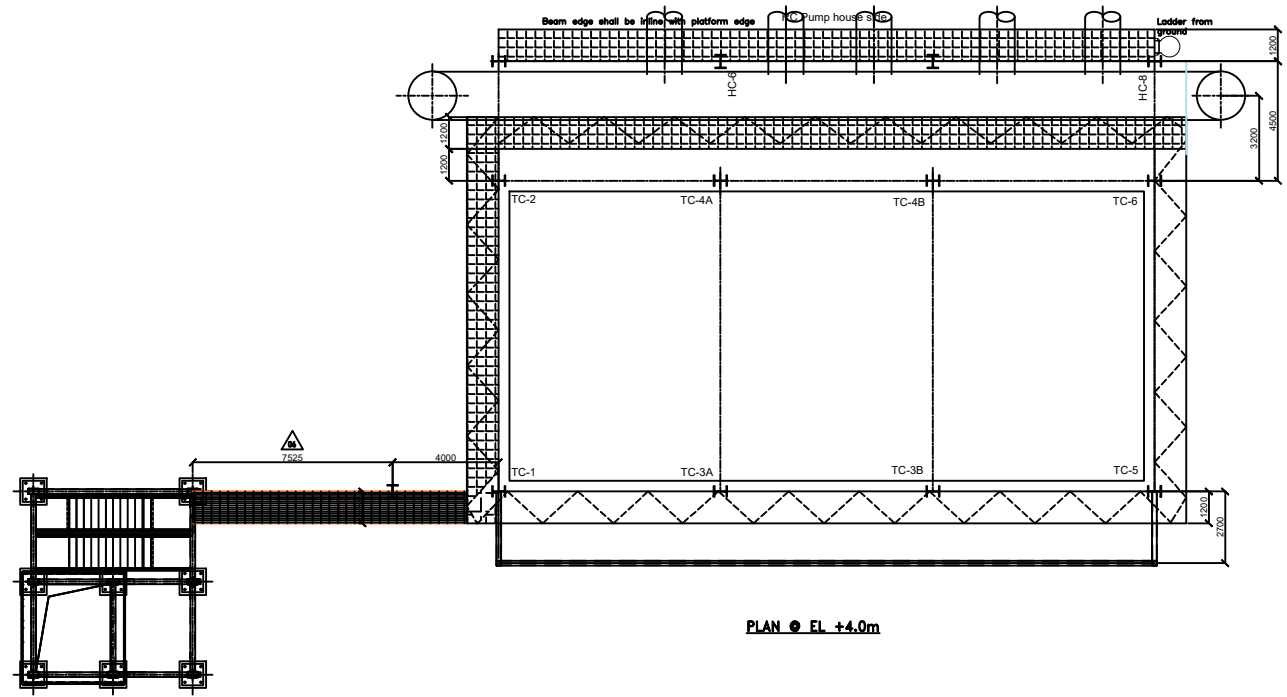
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: NTPC/BARH STPP, STAGE-2 2x860MW
 CUST.NO:G607-606

Scale: 1:100

Weight: 406

Sh 01 of 08

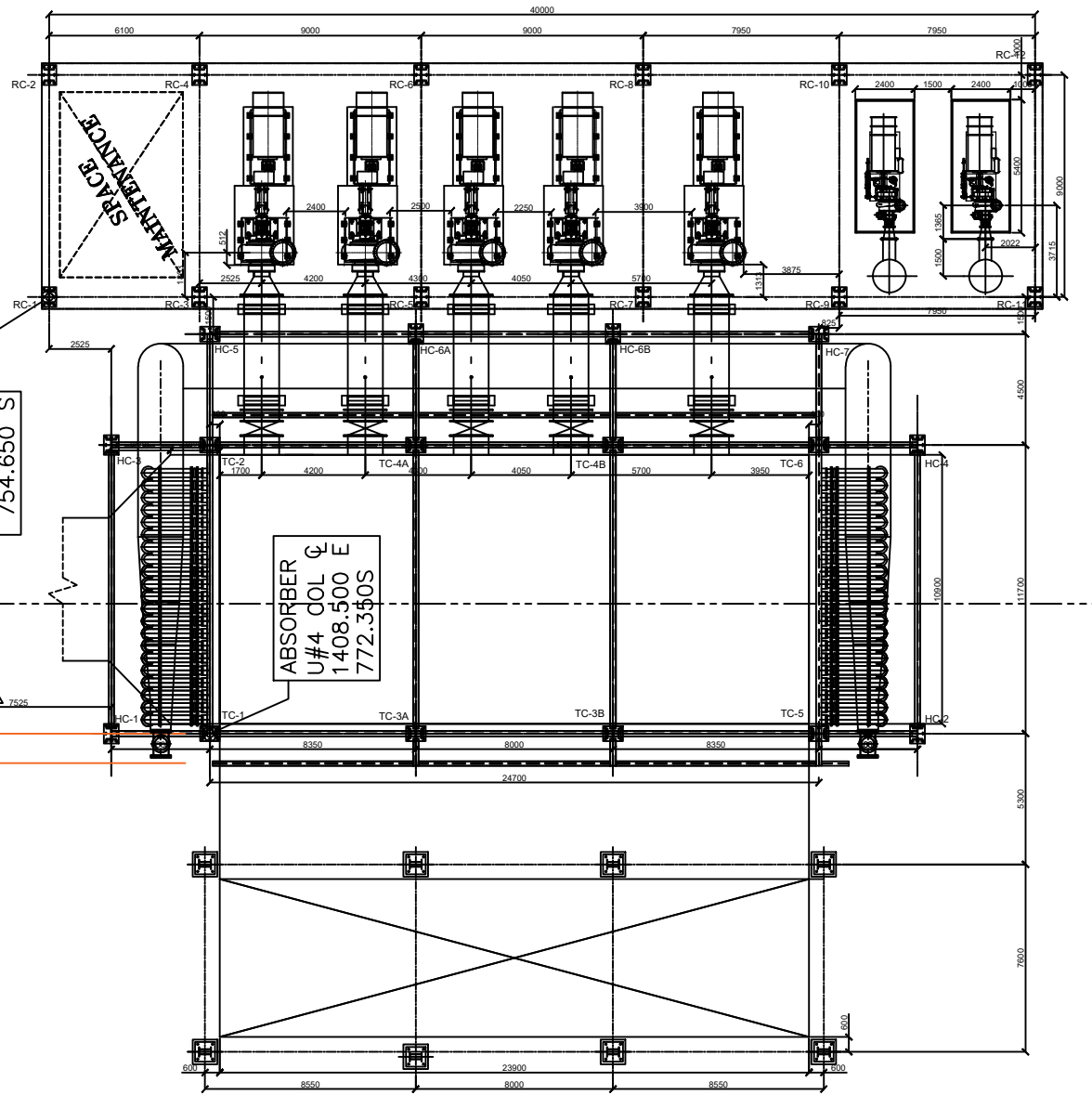
0-FW-000-01384-06



X-Axis
Y-Axis

RC Pump
Unit#4
1401.975 E
754.650 S

ABSORBER
U#4 COL G
1408.500 E
772.350 S



View C-C
Plan view Unit#4

Unit#5 is mirror of Unit#4 along X-axis
Pitch of RC pump suction pipe is different for Unit#5

REV	DATE	ALTERED	CHECKED	APPROVED	REVISION REMARKS
00	21.11.19	MARK	KBP	VVS	Initial issue
01	27.08.20	MARK	VAR	HK	Change in material specification
02	23.12.20	MARK	VAR	HK	Modified based on internal comments
03	17.02.21	MARK	VAR	HK	Modified based on NTPC & internal comments
04	26.11.21	PK	VAR	HK	Modified based on NTPC & internal comments
05	26.11.21	PK	VAR	HK	Access doors included in elevation level
06	14.03.22	PK	VAR	HK	Revised location and platform updated

NTPC Dwg. No.: 9560-109-PVM-B-058

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: NTPC/BARH STPP, STAGE-2, 2x660MW
CUST. NO: G607-608

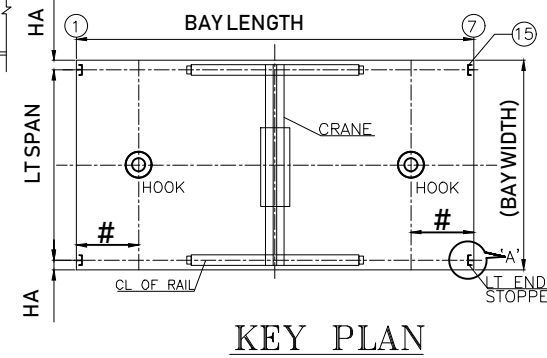
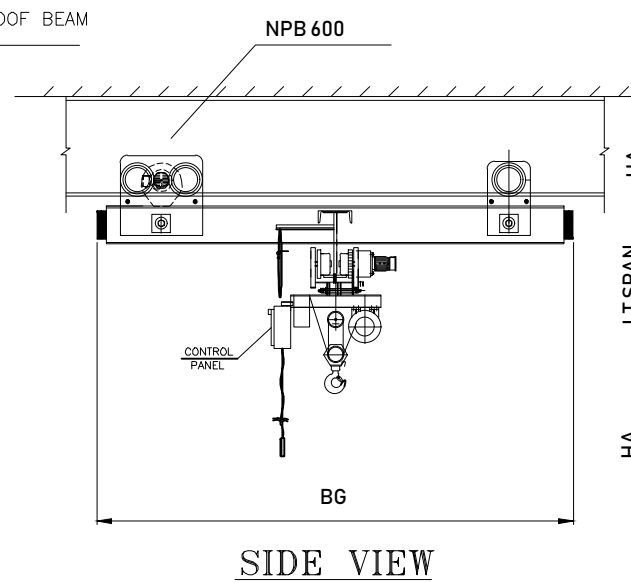
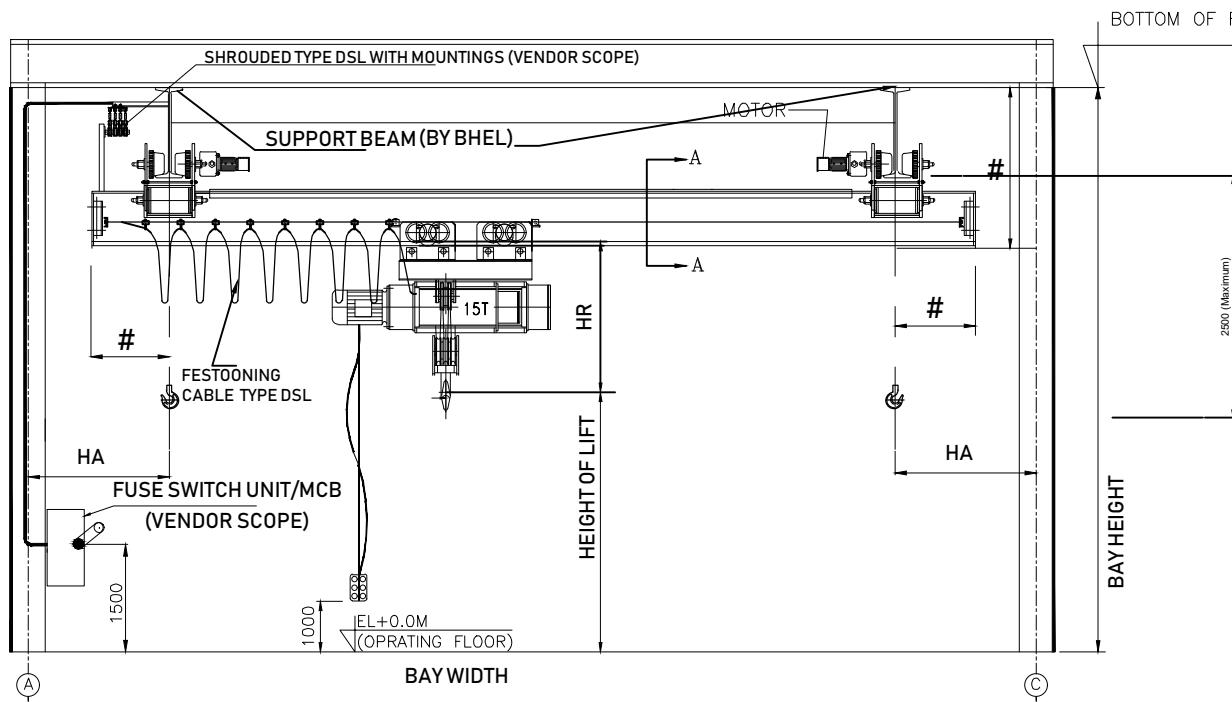
Bharat Heavy Electricals Ltd
BOILER AUXILIARIES PLANT
RANIPET-632 406

DATE: 21.11.19
REV: 01

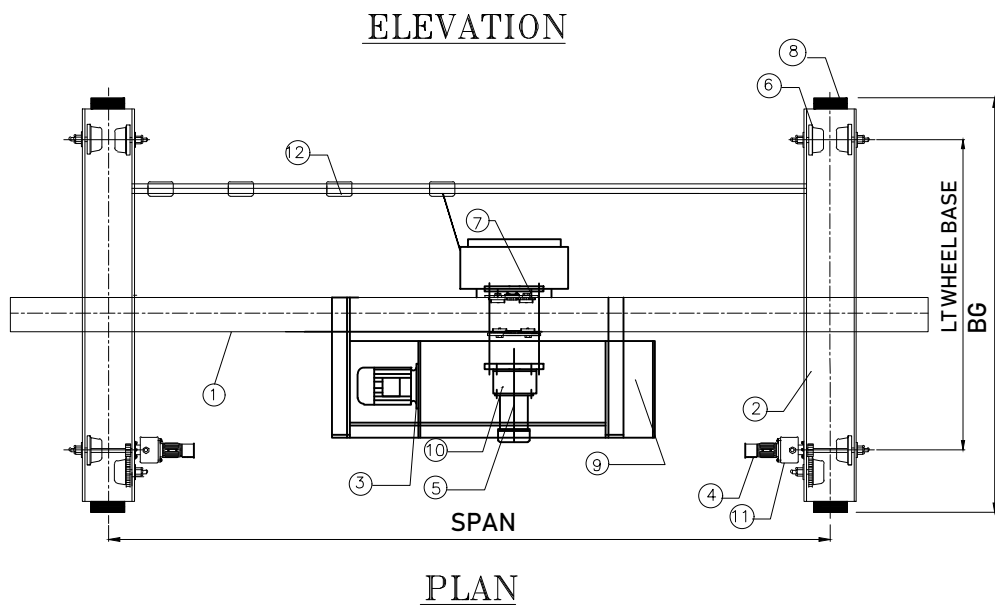
TITLE: GA of Absorber#4
Sh 03 of 06

DRAWING NO: 0-FW-000-01386 06

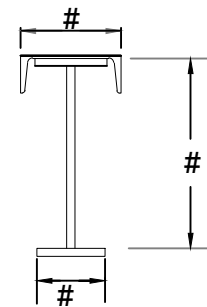
ANNEXURE-V- TYPICAL GA OF UNDER SLUNG ELECTRIC CRANES



19	CT/LT GEAR BOX HOUSING	VENDOR TO SPECIFY
18	HOIST GEAR BOX HOUSING	VENDOR TO SPECIFY
17	PULLEY	VENDOR TO SPECIFY
16	ROPE DRUM	VENDOR TO SPECIFY
15	LT END STOPER	VENDOR TO SPECIFY
14	CT END STOPER	VENDOR TO SPECIFY
13	HOOK	VENDOR TO SPECIFY
12	CT DSL	VENDOR TO SPECIFY
11	LT GEAR	VENDOR TO SPECIFY
10	CTGEAR	VENDOR TO SPECIFY
9	MH GEAR	VENDOR TO SPECIFY
8	BUFFER	VENDOR TO SPECIFY
7	CT WHEEL	VENDOR TO SPECIFY
6	LT WHEEL	VENDOR TO SPECIFY
5	CT MOTOR	VENDOR TO SPECIFY
4	LT MOTOR	VENDOR TO SPECIFY
3	MH MOTOR	VENDOR TO SPECIFY
2	LT END CARRAIGE/BEAM	VENDOR TO SPECIFY
1	GIRDER/TROLLEY PLATE	VENDOR TO SPECIFY
DENOT.	ITEMS DISCRPTION.	VENDOR TO SPECIFY
BOM		



CRANE GIRDER
DETAIL AT SECTION AA
(GIRDER SIZE + CAPPING SIZE : AS PER VENDOR DESIGN)



		VENDORS TO INFORM
HR	HEAD ROOM	
HA	HOOK APPROACH	
BG	BOGIE LENGTH	
HL	HEIGHT OF LIFT	
WB	LT WHEEL BASE	

CRANE CAPACITY/LIFT		CRANE CAPACITY/LIFT : AS PER SPEC.					
LOCATION		OXIDATION BLOWER AND RC PUMP					
WEIGHT OF CRANE		VENDOR TO SPECIFY					
MAX. LT WHEEL LOAD		VENDOR TO SPECIFY					
CONTROL SUPPLY		110 V					
POWER SUPPLY		415 V±10%, 3 PH., 50HZ.					
BEARING		VENDOR TO SPECIFY					
CONTROL		PENDANT PUSH BUTTON FROM FLOOR LEVEL.					
GEAR BOX	MOTION	REDUCTION	MATL. OF GEAR & PINION	HARDNESS	LUBRICATION		
	HOIST	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY		
	CT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY		
SPEED	HOIST	AS PER SPEC.					
	CT	AS PER SPEC.					
	LT	AS PER SPEC.					
MOTORS	HOIST	VENDOR TO SPECIFY					
	CT	VENDOR TO SPECIFY					
	LT	VENDOR TO SPECIFY					
BRAKE	MOTION	SIZE	RATING	TYPE	LIMIT SWITCH	TYPE	QTY.
	HOIST	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	HOIST	VENDOR TO SPECIFY	#
	CT	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	TROLLEY	VENDOR TO SPECIFY	#
	LT	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	CRANE	VENDOR TO SPECIFY	#
WIRE ROPE/FALLS/SPEC.		VENDOR TO SPECIFY					
CLASS OF DUTY		VENDOR TO SPECIFY					
BAY LENGTH	AS PER SPEC.	LT WH. DIA./QTY.		VENDOR TO SPECIFY			
HEIGHT OF LIFT	AS PER SPEC.	CT WH. DIA./QTY.		VENDOR TO SPECIFY			
SPAN	AS PER SPEC.	SHEAVE DIA		VENDOR TO SPECIFY			
CAPACITY	AS PER SPEC.	DRUM DIA/LENGHT		VENDOR TO SPECIFY			
TECHNICAL SPECIFICATION							

NOTES:-

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
- # - VENDOR TO SPECIFY
- A Single or Double travelling Bridge / Grider (As per vendor design , To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.

PAINING OF CONTROL PANELS:

- SURFACE TREATMENT WITH MINIMUM SEVEN TANK PROCESS.
- PANEL 2 COATS OF SYNTHETIC ENAMEL PAINT.
- SHADE-SIEMENS GREY
- THE MINIMUM COATING THICKNESS OF POWDER COATED SURFACES SHALL BE MIN OF 80 MICRONS.


Painting:

Primers:
Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) of Min DFT 70 microns.

Final:
Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats) of Min. DFT 60 microns.

Total DFT: 130 microns.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		NTPC PROJECT					
BHARAT HEAVY ELECTRICALS LTD. UNIT: BOILER AUXILIARIES PLANT. RANIPET-632 406		DRN	NAME	SIGN	DATE	NO. OF VAR.	
		CHD					
DEPT AQCS	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG)	REF. TO ASSY/OLD DRG.	ITEM NO.	NO. OF ITEMS	
CODE 882		N.T.S					
TITLE			CODE	CARD	DRAWING NO.		REV
TYPICAL GA OF UNDER SLUNG CRANE				U 01	3-FW-0-00001		00

ANNEXURE I		
	DATA SHEET	
	(VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)	
NTPC FGD PROJECT		
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING		
PROJECT NAME: BHILAI PROJECT		
1.0	Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0	Quantity	As per Enquiry
3.0	Main Hoist (minimum)	As per Enquiry
4.0	SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1	Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2	CT Span	Vendor to submit
5.0	Height of Lift:	
5.1	Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0	Bay Length:	
6.1	Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0	DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1	Hoists	40 % CDF
7.2	Long Travel	40 % CDF
7.3	Cross Travel	40 % CDF
8.0	SPEED: (Operating / Working Speed - Maximum)	
8.1	Main Hoist	7.5 mtrs./minute.
8.2	Cross Travel (CT)	12.0 mtrs./minute.
8.3	Long Travel (LT)	12.0 mtrs./minute.
9.0	MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1	Main Hoist	Vendor to submit
9.2	Cross Travel (CT)	Vendor to submit
9.3	Long Travel (LT)	Vendor to submit
10.0	GEAR BOX SIZES:	
10.1	Main Hoist	Vendor to specify
10.2	Cross Travel (CT)	Vendor to specify
10.3	Long Travel (LT)	Vendor to specify
11.0	Acceleration:	
11.1	Cross Travel (CT)	Vendor to specify
11.2	Long Travel (LT)	Vendor to specify
12.0	Hoist Rope Details: (Size & Number of Falls)	
12.1	Main Hoist rope Size	Vendor to specify
12.2	Falls	Vendor to specify
13.0	CONTROL (Remote control)	
13.1	Through pendent type control	Vendor to confirm
13.2	Control Voltage: Shall be 110V AC	Vendor to note
13.3	Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5	Mechanism Group Classification:	M 6
13.5	Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0	Wheel Sizes:	
14.1	Cross Travel (CT)	Vendor to specify
14.2	Long Travel (LT) -	Vendor to specify
15.0	Brake Drum Sizes:	
15.1	Main Hoist	Vendor to specify
15.2	Cross Travel (CT)	Vendor to specify
15.3	Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)


ANNEXURE - II

Details of Under slung Electric Crane for RC pumps and Blower Handling										PROJECT : BHILAI FGD		
SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	EL (+) METER	(METER)	(METER)	(MM)	(NPB /ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	7.5	EL (+) 10.4	EL (+) 0.00	30	9	1000	NPB 600X220X122.4 + CAPPING ISMC400	2500	_____ MM	As per Enquiry

A Single or Double travelling Bridge / Grider (As per vendor design) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.
Please refer above tabulation for Long travel Runway Track detail.


NOTE : 1) Depending upon actual crane head room , the actual height of list for Crane shall be arrived.

Bidder Signed with seal

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

ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING EQUIPMENTS

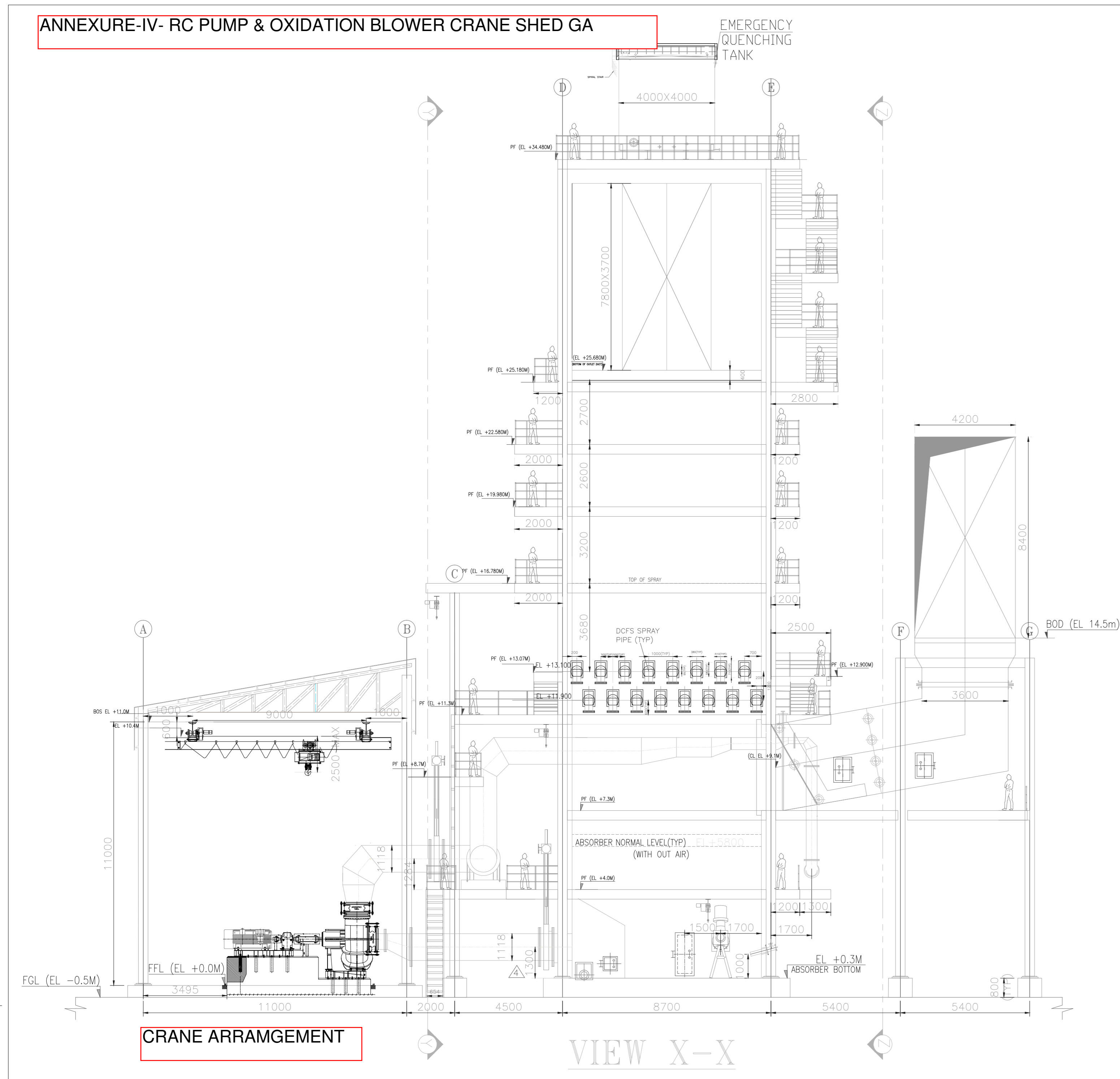
6	Handling Equipment - RC Pump	FW249	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	60	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	40	120
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		BHEL, Ranipet - 632 406, India. Quality 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						
SI 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:

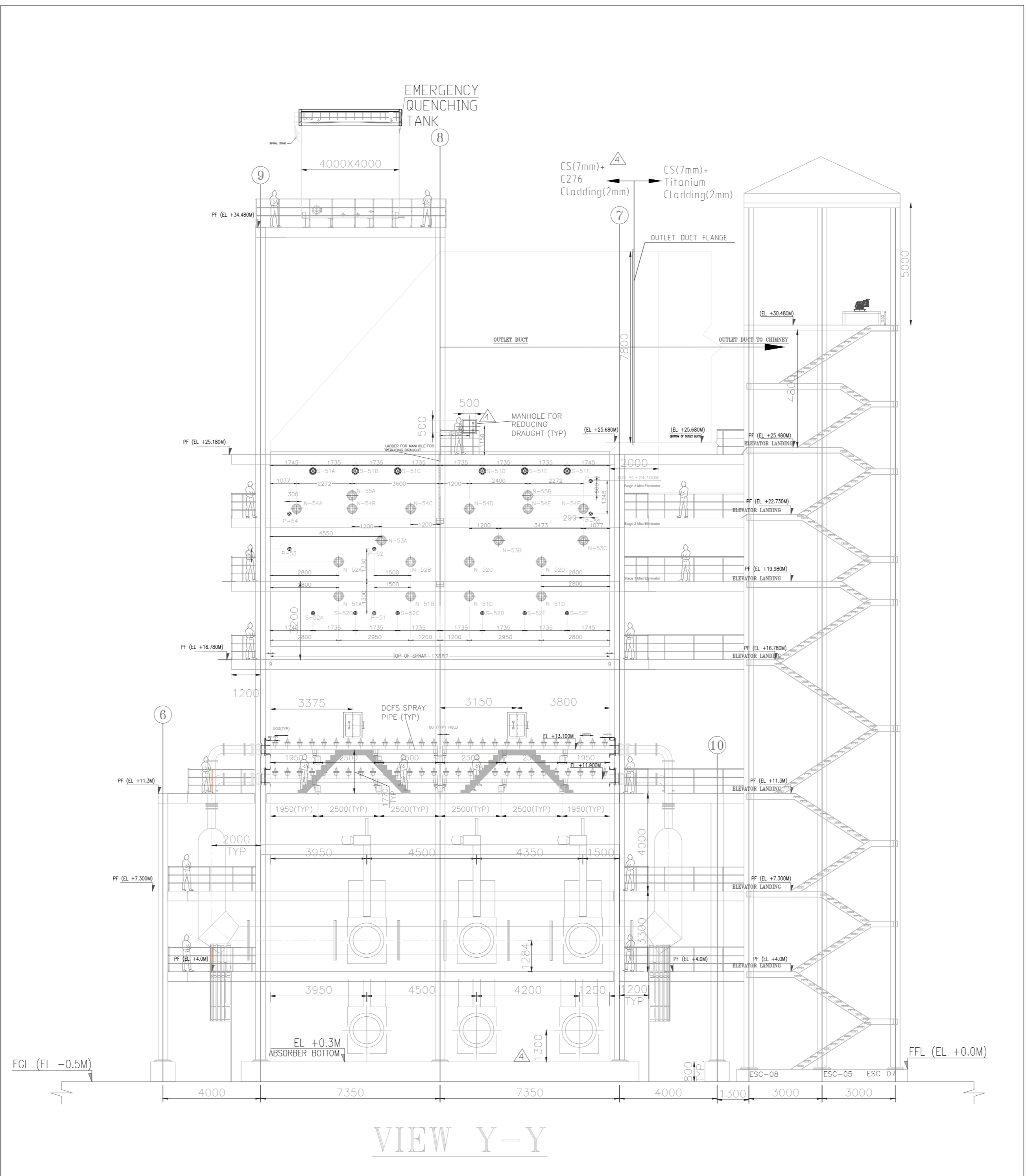
1. No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil.
3. PGMA's covered in sub-supplier (ie., Purchased) items viz., Agitator / slide bearing and other sub-delivery components 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 SI 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 PGMA's 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.

ANNEXURE-IV- RC PUMP & OXIDATION BLOWER CRANE SHED GA

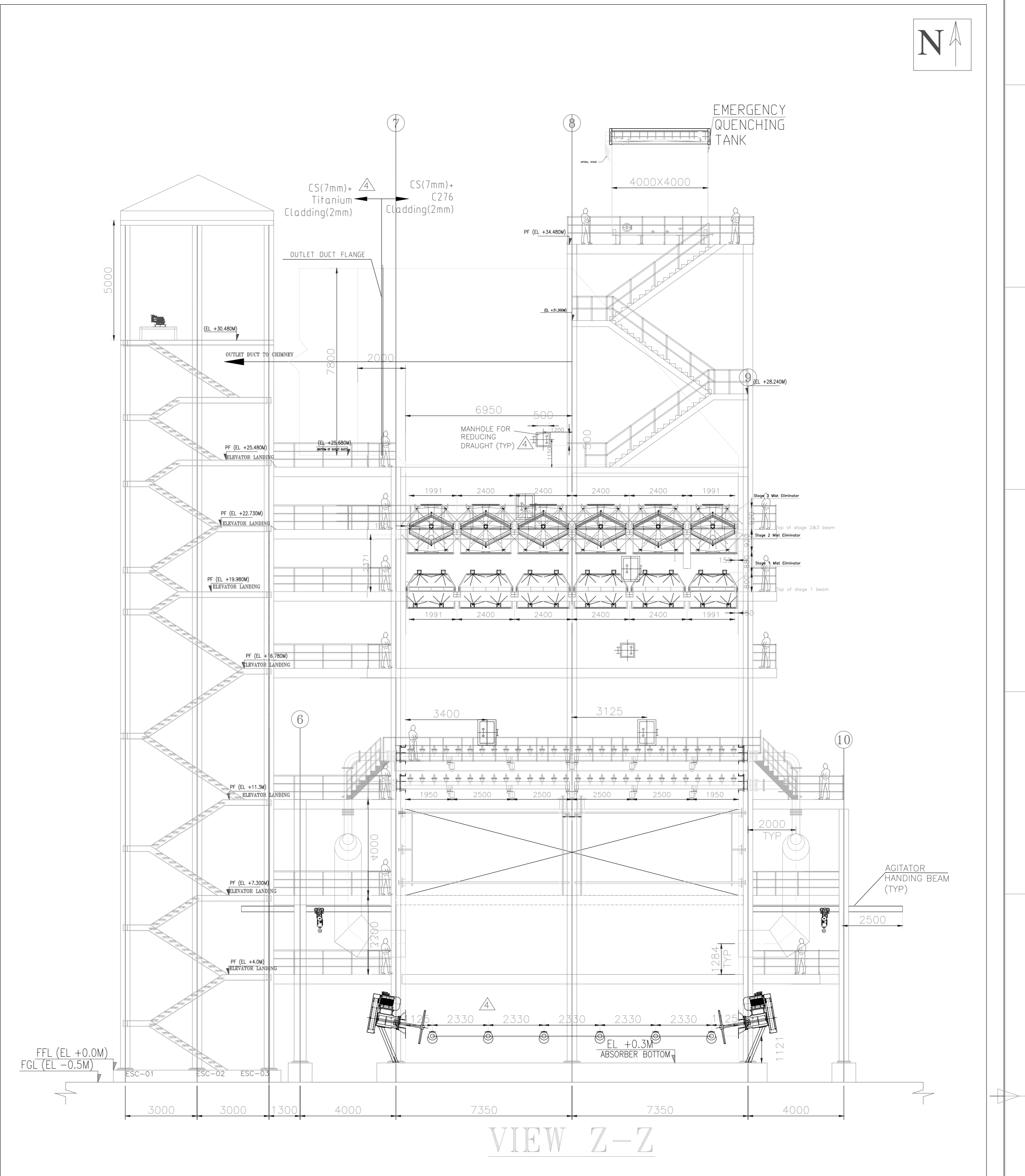


CRANE ARRANGEMENT

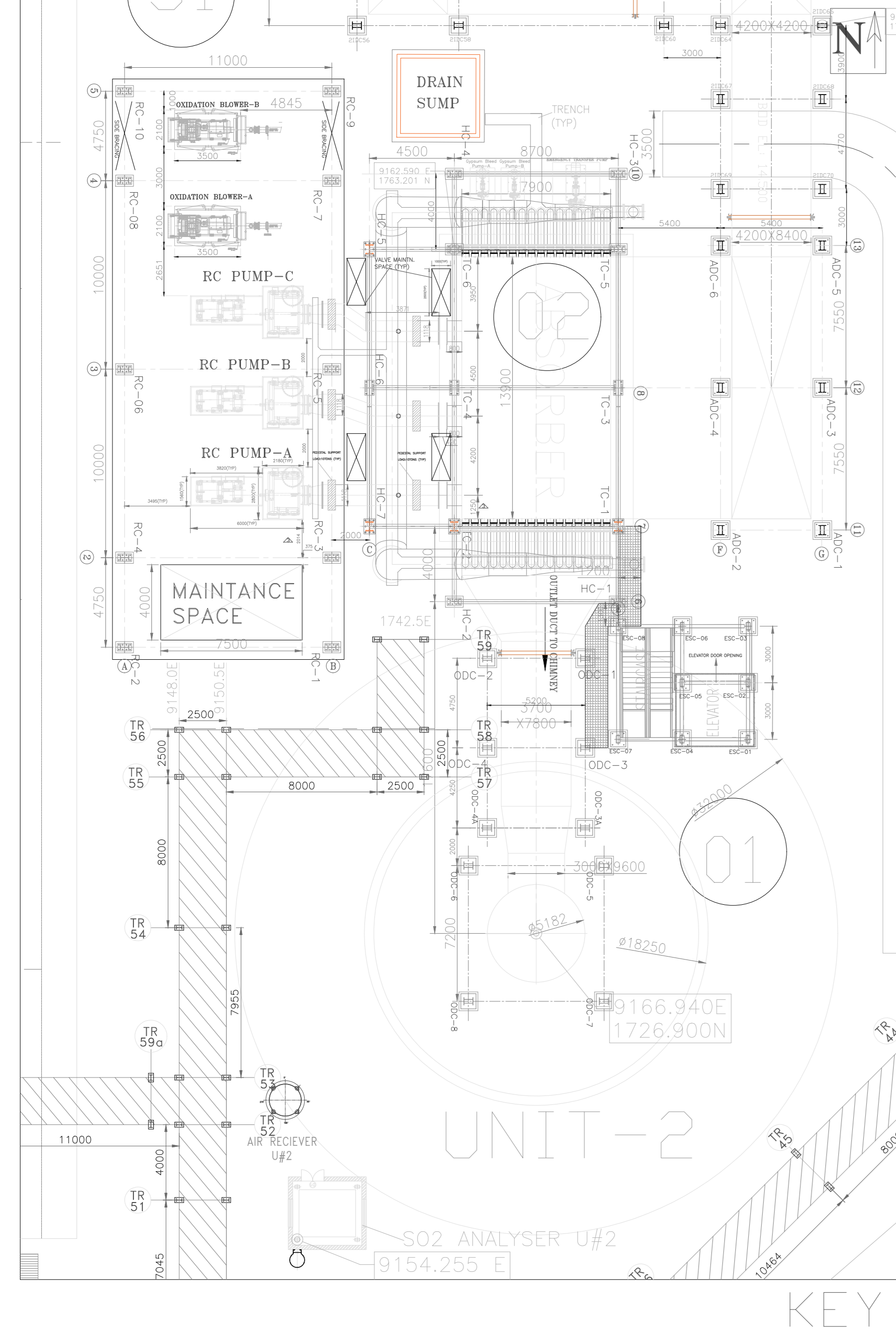
VIEW X-X



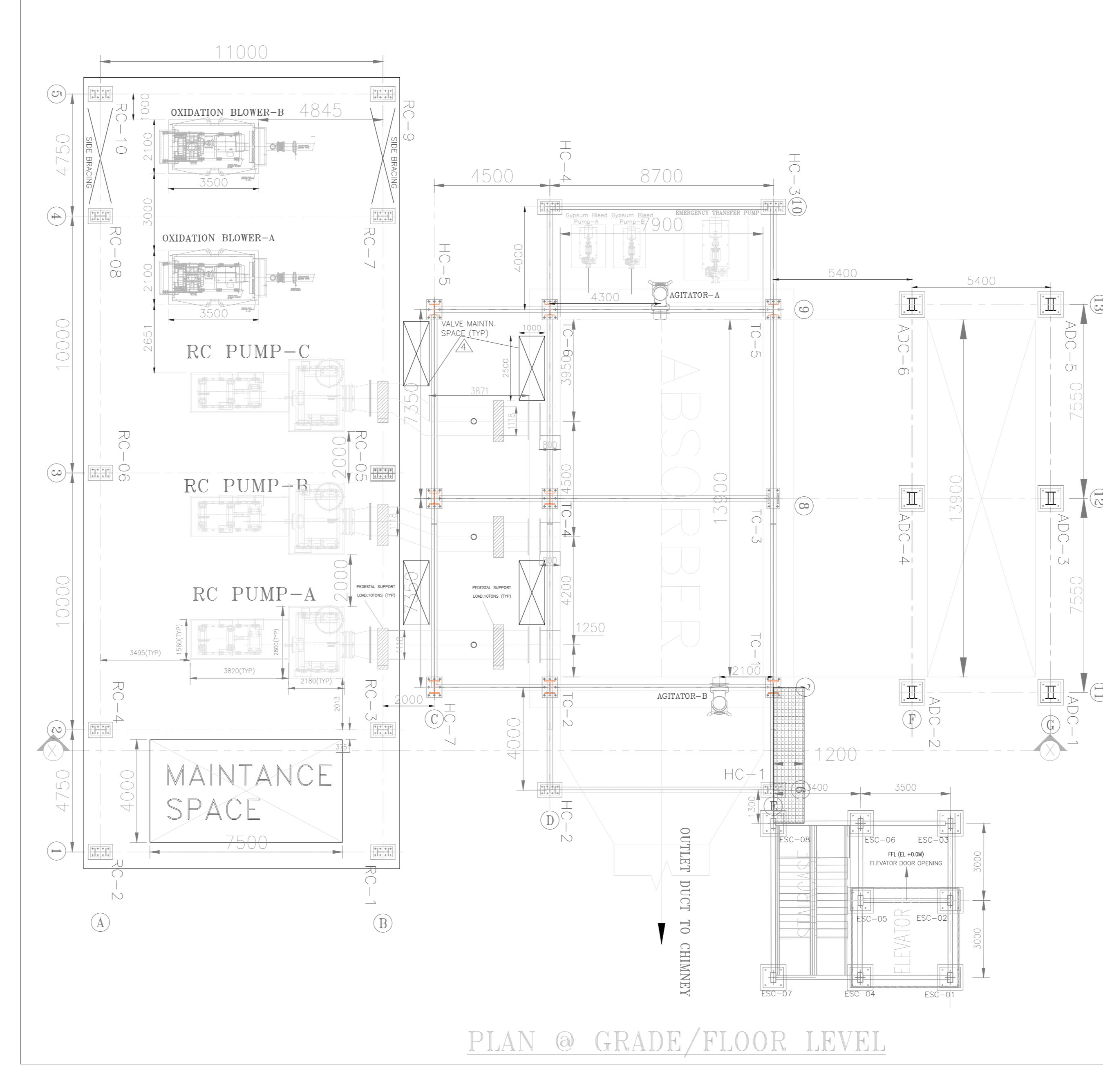
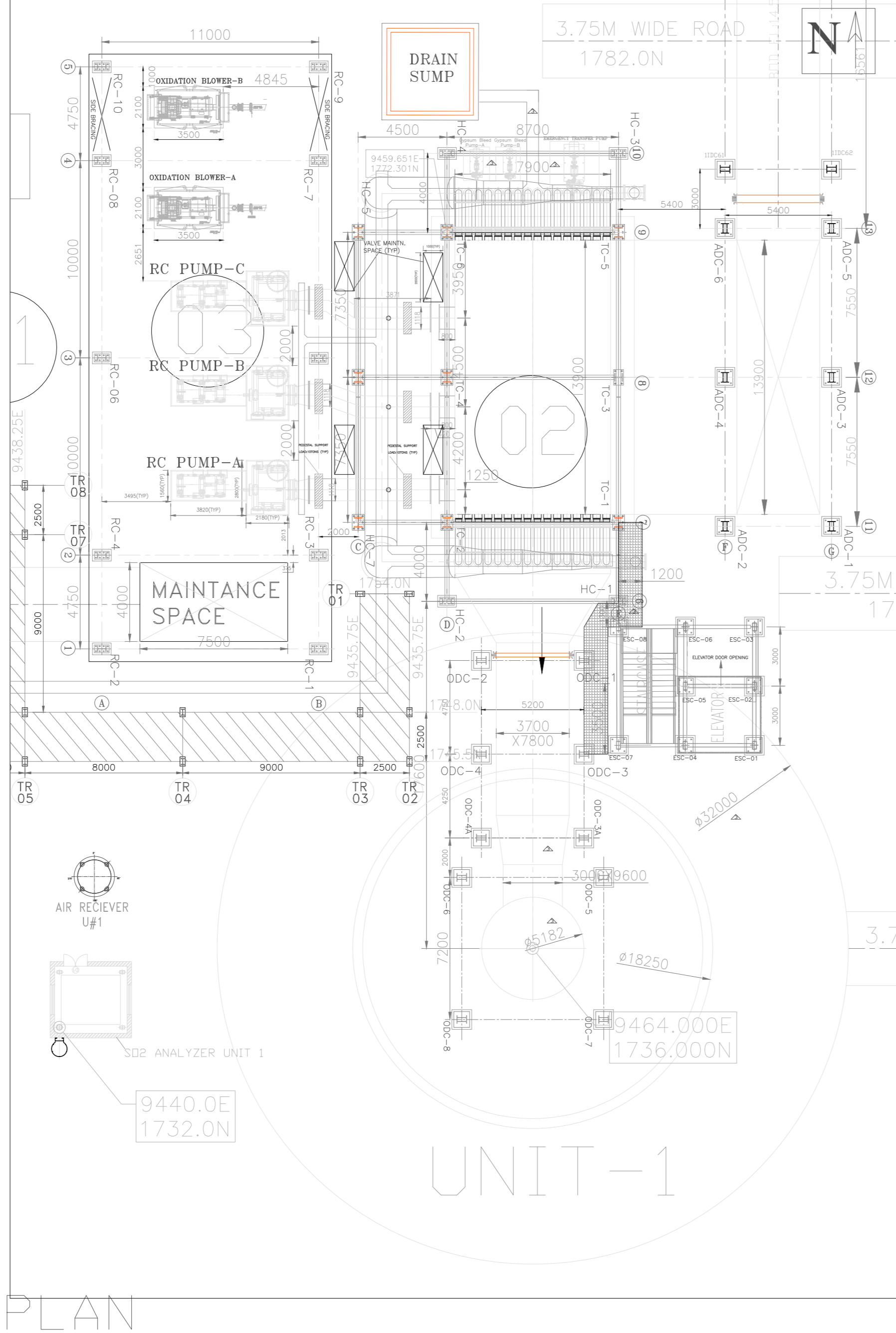
VIEW Y-Y



VIEW Z-Z



KEY PLAN



PLAN @ GRADE/FLOOR LEVEL

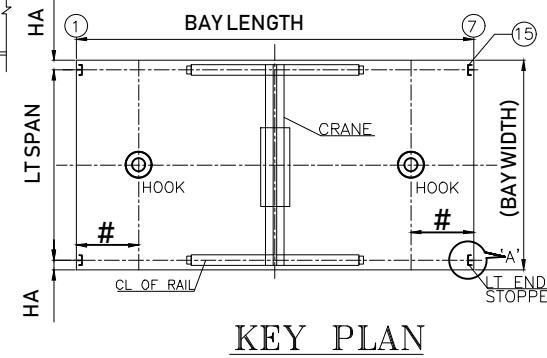
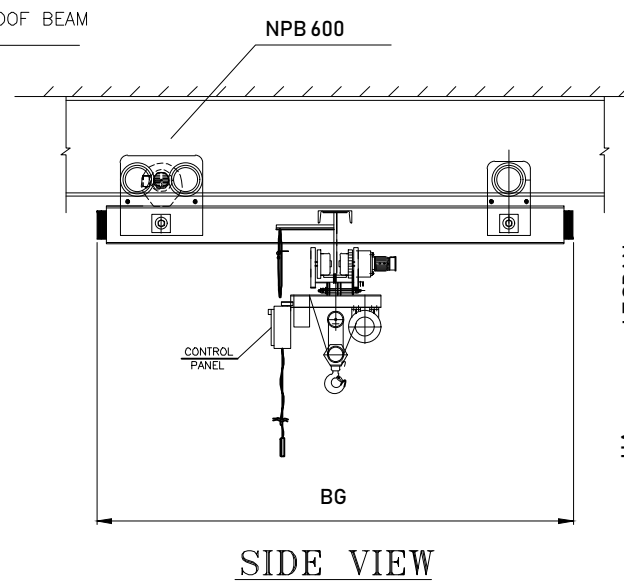
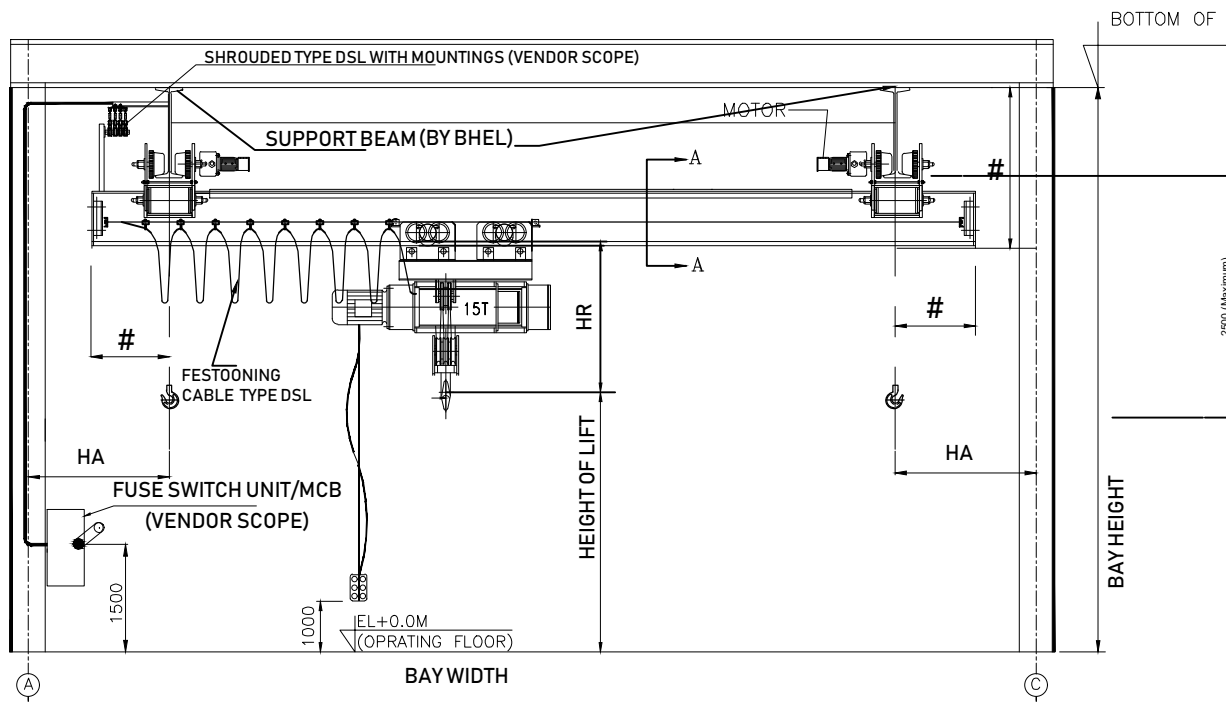
LEGEND:-
 FFL : FINISHED FLOOR LEVEL
 FGL : FINISHED GROUND LEVEL
REF. DWGS
 1. 9993-109-PVM-F-020 : FGD PLANT LAYOUT
NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE IS MENTIONED.
 2. EL(+/-) 0.000 CORRESPONDS TO RL(+/-)294.5 M.
 3. FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA SHALL BE 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.

REV.	DATE	ALD.	CHD.	APPD.	REMARKS
04	08.11.21	NKS	BS	KK	REVISED AS PER NTPC COMMENTS
03	09.01.21	NKS	BS	KK	REVISED AS PER NTPC COMMENTS
02	21.10.20	NKS	BS	KK	REVISED AS PER NTPC COMMENTS
01	23.07.20	NKS	BS	KK	REVISED AS PER NTPC COMMENTS

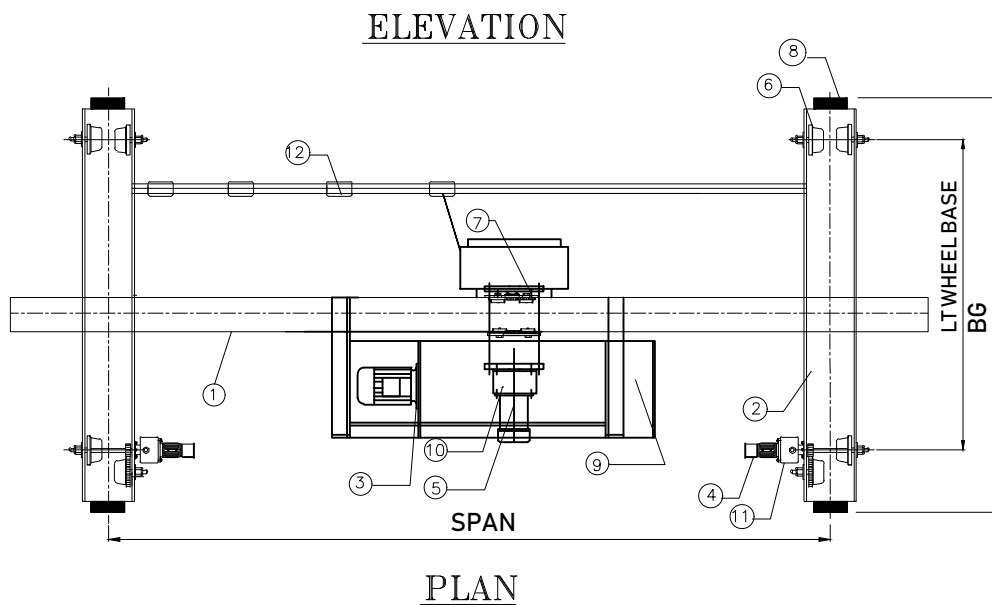
CUSTOMER NOS: G211,G212
 NTPC DRAWING NO : 9993-109-PVM-B-010
 CUSTOMER: NSPCL
 CONSULTANT: NTPC LIMITED.
 PROJECT: BHILAI 2X250MW FGD PACKAGE

TITLE: GA OF ABSORBER (PLAN & ELEVATIONS)
 DRAWING NO: 0-FW-000-02220
 REV:04

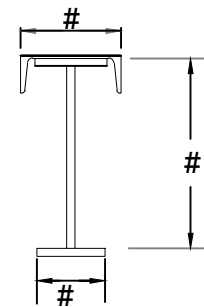
ANNEXURE-V- TYPICAL GA OF UNDER SLUNG ELECTRIC CRANES



19	CT/LT GEAR BOX HOUSING	VENDOR TO SPECIFY
18	HOIST GEAR BOX HOUSING	VENDOR TO SPECIFY
17	PULLEY	VENDOR TO SPECIFY
16	ROPE DRUM	VENDOR TO SPECIFY
15	LT END STOPER	VENDOR TO SPECIFY
14	CT END STOPER	VENDOR TO SPECIFY
13	HOOK	VENDOR TO SPECIFY
12	CT DSL	VENDOR TO SPECIFY
11	LT GEAR	VENDOR TO SPECIFY
10	CTGEAR	VENDOR TO SPECIFY
9	MH GEAR	VENDOR TO SPECIFY
8	BUFFER	VENDOR TO SPECIFY
7	CT WHEEL	VENDOR TO SPECIFY
6	LT WHEEL	VENDOR TO SPECIFY
5	CT MOTOR	VENDOR TO SPECIFY
4	LT MOTOR	VENDOR TO SPECIFY
3	MH MOTOR	VENDOR TO SPECIFY
2	LT END CARRAIGE/BEAM	VENDOR TO SPECIFY
1	GIRDER/TROLLEY PLATE	VENDOR TO SPECIFY
DENOT.	ITEMS DISCRPTION.	VENDOR TO SPECIFY
BOM		



CRANE GIRDER
DETAIL AT SECTION AA
(GIRDER SIZE + CAPPING SIZE : AS PER VENDOR DESIGN)



CRANE CAPACITY/LIFT		CRANE CAPACITY/LIFT : AS PER SPEC.					
LOCATION		OXIDATION BLOWER AND RC PUMP					
WEIGHT OF CRANE		VENDOR TO SPECIFY					
MAX. LT WHEEL LOAD		VENDOR TO SPECIFY					
CONTROL SUPPLY		110 V					
POWER SUPPLY		415 V±10%, 3 PH., 50HZ.					
BEARING		VENDOR TO SPECIFY					
CONTROL		PENDANT PUSH BUTTON FROM FLOOR LEVEL.					
GEAR BOX	MOTION	REDUCTION	MATL. OF GEAR & PINION	HARDNESS	LUBRICATION		
	HOIST	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY		
	CT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY			
LT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY				
SPEED	HOIST	AS PER SPEC.					
	CT	AS PER SPEC.					
	LT	AS PER SPEC.					
MOTORS	HOIST	VENDOR TO SPECIFY					
	CT	VENDOR TO SPECIFY					
	LT	VENDOR TO SPECIFY					
BRAKE	MOTION	SIZE	RATING	TYPE	LIMIT SWITCH	TYPE	QTY.
	HOIST	#	VENDOR TO SPECIFY		HOIST	VENDOR TO SPECIFY	#
	CT	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	TROLLEY	VENDOR TO SPECIFY	#
	LT	#	VENDOR TO SPECIFY		CRANE	VENDOR TO SPECIFY	#
WIRE ROPE/FALLS/SPEC.		VENDOR TO SPECIFY					
CLASS OF DUTY		VENDOR TO SPECIFY					
BAY LENGTH		AS PER SPEC.		LT WH. DIA./QTY.		VENDOR TO SPECIFY	
HEIGHT OF LIFT		AS PER SPEC.		CT WH. DIA./QTY.		VENDOR TO SPECIFY	
SPAN		AS PER SPEC.		SHEAVE DIA		VENDOR TO SPECIFY	
CAPACITY		AS PER SPEC.		DRUM DIA/LENGHT		VENDOR TO SPECIFY	
TECHNICAL SPECIFICATION							

		VENDORS TO INFORM
HR	HEAD ROOM	
HA	HOOK APPROACH	
BG	BOGIE LENGTH	
HL	HEIGHT OF LIFT	
WB	LT WHEEL BASE	

NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
2. # - VENDOR TO SPECIFY
3. A Single or Double travelling Bridge / Grider (As per vendor design , To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.

PAINING OF CONTROL PANELS:

- (A) SURFACE TREATMENT WITH MINIMUM SEVEN TANK PROCESS.
- (B) PANEL 2 COATS OF SYNTHETIC ENAMEL PAINT.
- (C) SHADE-SIEMENS GREY
- (D) THE MINIMUM COATING THICKNESS OF POWDER COATED SURFACES SHALL BE MIN OF 80 MICRONS.


Painting:

Primers:
Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) of Min DFT 70 microns.

Final:
Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats) of Min. DFT 60 microns.

Total DFT: 130 microns.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		NTPC PROJECT						
		BHARAT HEAVY ELECTRICALS LTD.		DRN	NAME	SIGN	DATE	NO. OF VAR.
		UNIT: BOILER AUXILIARIES PLANT.		CHD				
RANIPET-632 406				APPD				
DEPT AQCS	GRADE OF UNTOL.DIM	SCALE N.T.S	WEIGHT (KG)	REF. TO ASSY/OLD DRG.		ITEM NO.	NO. OF ITEMS	
CODE 882								
TITLE			CODE	CARD	DRAWING NO.		REV	
TYPICAL GA OF UNDER SLUNG CRANE				U 01	3-FW-0-00001		00	

ANNEXURE I		
	DATA SHEET	
	(VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)	
NTPC FGD PROJECT		
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING		
PROJECT NAME: NORTH KARAN PROJECT		
1.0	Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0	Quantity	As per Enquiry
3.0	Main Hoist (minimum)	As per Enquiry
4.0	SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1	Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2	CT Span	Vendor to submit
5.0	Height of Lift:	
5.1	Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0	Bay Length:	
6.1	Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0	DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1	Hoists	40 % CDF
7.2	Long Travel	40 % CDF
7.3	Cross Travel	40 % CDF
8.0	SPEED: (Operating / Working Speed - Maximum)	
8.1	Main Hoist	7.5 mtrs./minute.
8.2	Cross Travel (CT)	12.0 mtrs./minute.
8.3	Long Travel (LT)	12.0 mtrs./minute.
9.0	MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1	Main Hoist	Vendor to submit
9.2	Cross Travel (CT)	Vendor to submit
9.3	Long Travel (LT)	Vendor to submit
10.0	GEAR BOX SIZES:	
10.1	Main Hoist	Vendor to specify
10.2	Cross Travel (CT)	Vendor to specify
10.3	Long Travel (LT)	Vendor to specify
11.0	Acceleration:	
11.1	Cross Travel (CT)	Vendor to specify
11.2	Long Travel (LT)	Vendor to specify
12.0	Hoist Rope Details: (Size & Number of Falls)	
12.1	Main Hoist rope Size	Vendor to specify
12.2	Falls	Vendor to specify
13.0	CONTROL (Remote control)	
13.1	Through pendent type control	Vendor to confirm
13.2	Control Voltage: Shall be 110V AC	Vendor to note
13.3	Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5	Mechanism Group Classification:	M 6
13.5	Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0	Wheel Sizes:	
14.1	Cross Travel (CT)	Vendor to specify
14.2	Long Travel (LT) -	Vendor to specify
15.0	Brake Drum Sizes:	
15.1	Main Hoist	Vendor to specify
15.2	Cross Travel (CT)	Vendor to specify
15.3	Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)

ANNEXURE - II

Details of Under slung Electric Crane for RC pumps and Blower Handling										PROJECT : NORTH KARPURA FGD		
SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	EL (+) METER	(METER)	(METER)	(MM)	(NPB /ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	10	EL (+) 15.1	EL (+) 4.40	40	9	1000	NPB 600X220X122.4 + CAPPING ISMC400	2500	_____ MM	As per Enquiry

A Single or Double travelling Bridge / Grider (As per vendor design) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.
Please refer above tabulation for Long travel Runway Track detail.

NOTE : 1) Depending upon actual crane head room , the actual height of list for Crane shall be arrived.

Bidder Signed with seal

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

ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING EQUIPMENTS

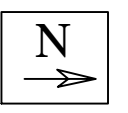
30	Handling Equipment-		Power Tool Cleaning to st3 (SSPC-SP3	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) Idler roller shall be applied with two coats of 70 microns at shop	70	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	130
----	---------------------	--	--------------------------------------	--	----	--	----	-----

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

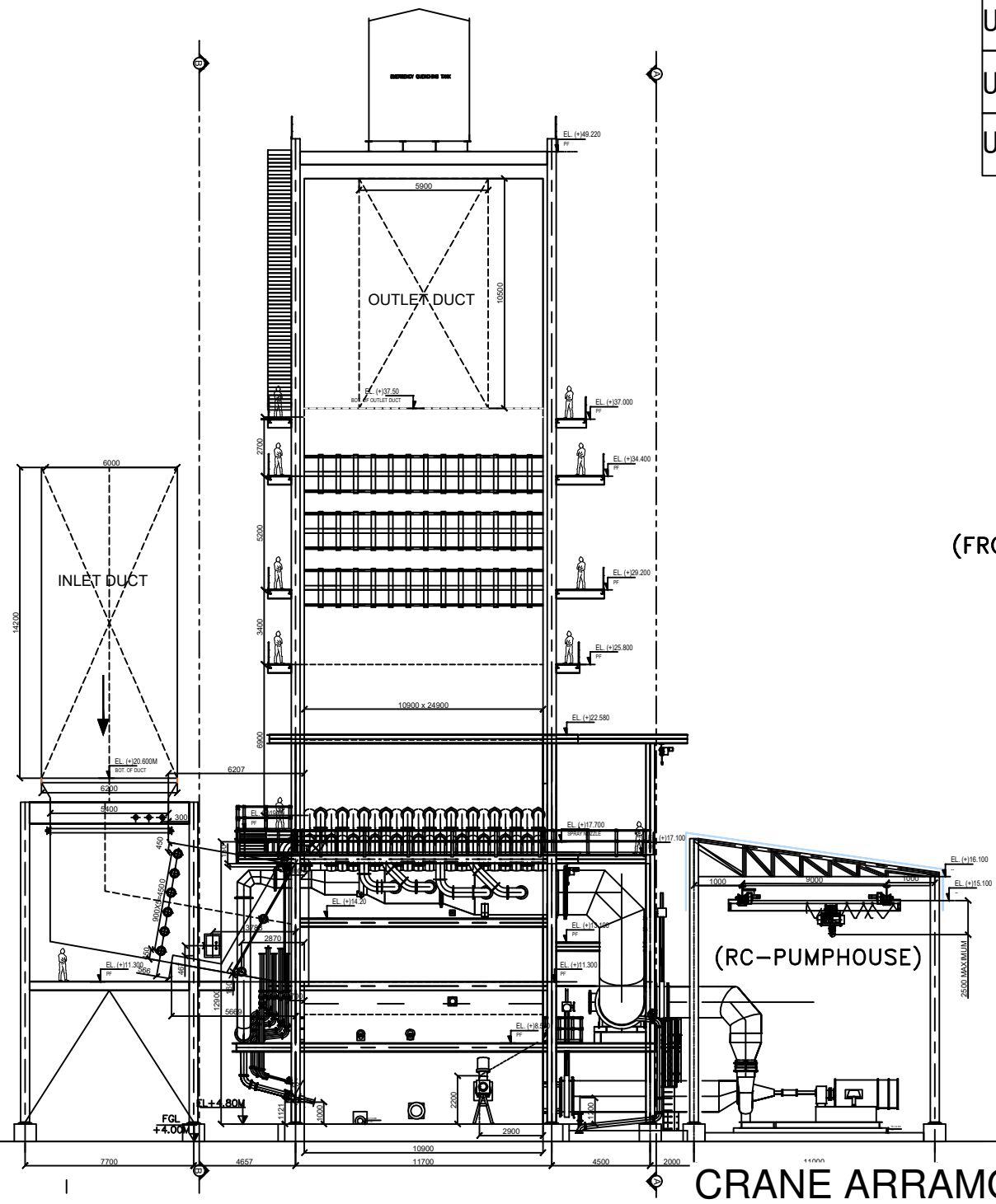
GENERAL NOTES

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. PGMA's 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 SI 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 PGMA's 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.

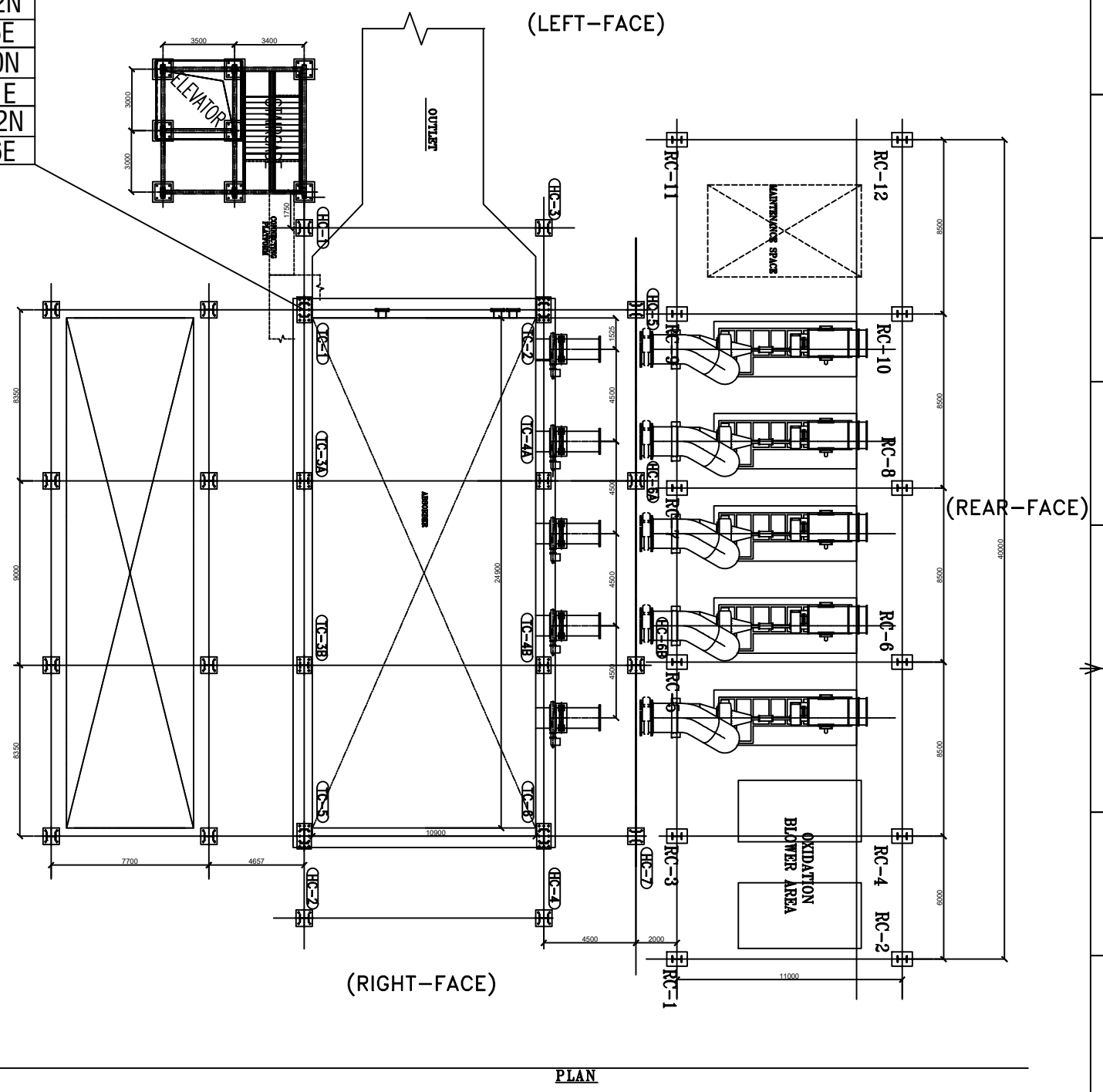
ANNEXURE-IV- RC PUMP & OXIDATION BLOWER CRANE SHED GA



U#1	12022.2N
	7747.6E
U#2	11876.0N
	7694.0 E
U#3	11831.2N
	7747.6E



CRANE ARRANGEMENT



REV	DATE	ALD	CHK	APPD	REV	DATE	ALD	CHK	APPD	REV	DATE	ALD	CHK	APPD	REV	DATE	ALD	CHK	APPD	REV	DATE	ALD	CHK	APPD					
01	09.01.21	S	RL	XSP	01	26.12.20	S	RL	XSP	01	09.12.20	S	RL	XSP	01	03.08.2020	SVP	RL	XSP	01	02.04.2020	SVP	RL	XSP	01	07.12.2019	SVP	RL	XSP

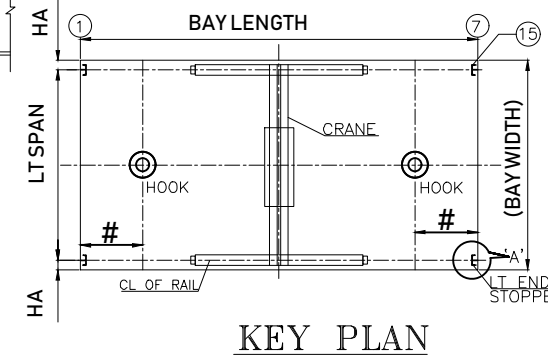
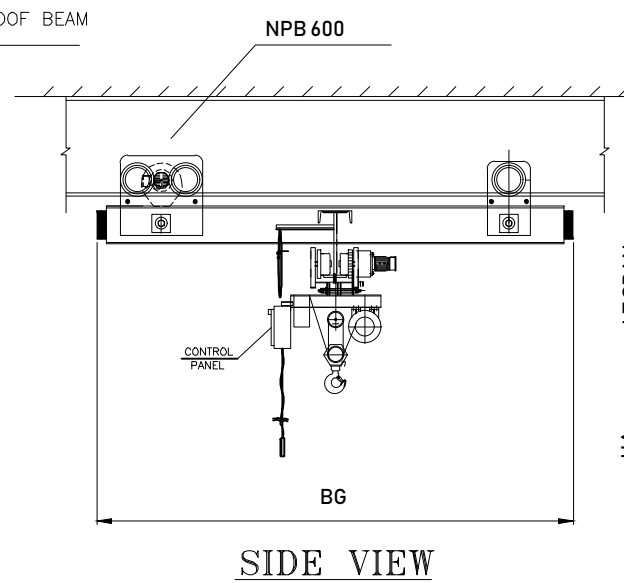
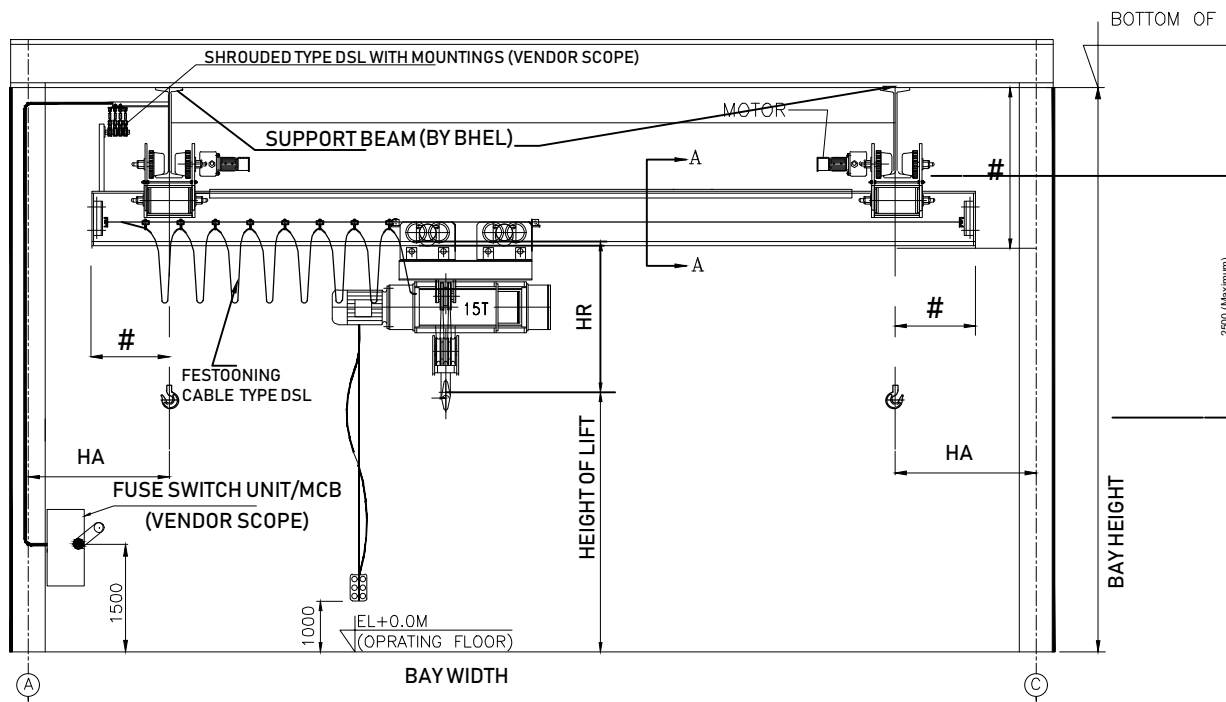
CUSTOMER NOS: G601, G602 & G603
 NTPC DRG NO: 4410-109-RP-PVM-B-010
 CUSTOMER: NTPC LIMITED.
 PROJECT: NKSTPP (3X660MW)NORTH KARANPURA

DEPT	NAME	SIGN	DATE
COO	SRIVISHNU	-	30.09.19
M	LOGANATHAN	-	30.09.19
APPD	PADHI	-	30.09.19

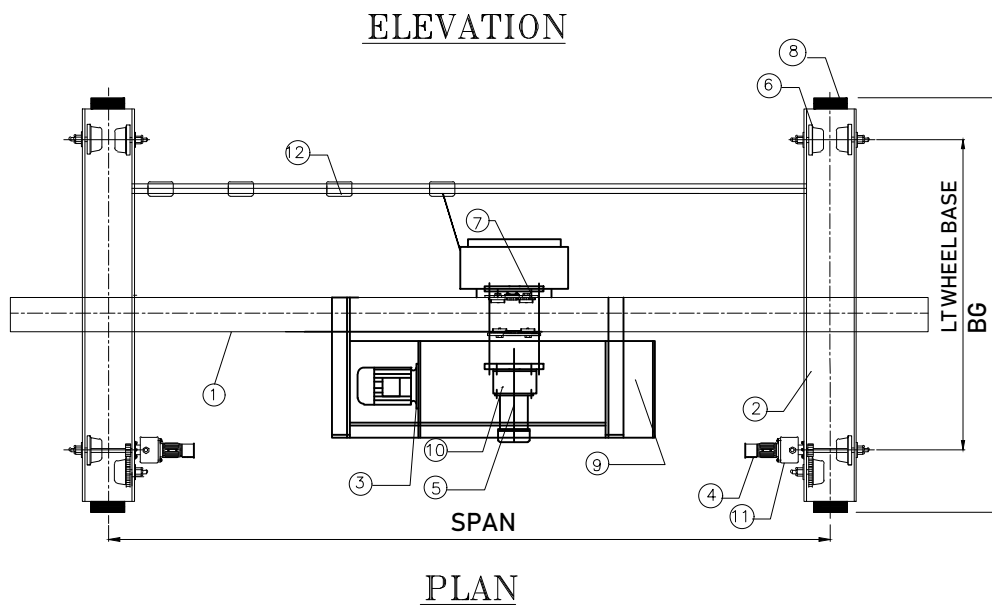
TITLE: GENERAL LAYOUT OF ABSORBER
 DRAWING NO. 0-FW-000-01412 SH 01 OF 06 REV. 06
 SCALE: 1: NTS

0-FW-000-01412 ON DRAWING

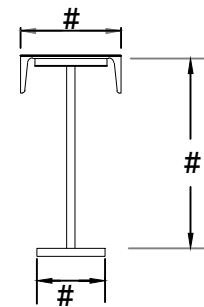
ANNEXURE-V- TYPICAL GA OF UNDER SLUNG ELECTRIC CRANES



19	CT/LT GEAR BOX HOUSING	VENDOR TO SPECIFY
18	HOIST GEAR BOX HOUSING	VENDOR TO SPECIFY
17	PULLEY	VENDOR TO SPECIFY
16	ROPE DRUM	VENDOR TO SPECIFY
15	LT END STOPER	VENDOR TO SPECIFY
14	CT END STOPER	VENDOR TO SPECIFY
13	HOOK	VENDOR TO SPECIFY
12	CT DSL	VENDOR TO SPECIFY
11	LT GEAR	VENDOR TO SPECIFY
10	CTGEAR	VENDOR TO SPECIFY
9	MH GEAR	VENDOR TO SPECIFY
8	BUFFER	VENDOR TO SPECIFY
7	CT WHEEL	VENDOR TO SPECIFY
6	LT WHEEL	VENDOR TO SPECIFY
5	CT MOTOR	VENDOR TO SPECIFY
4	LT MOTOR	VENDOR TO SPECIFY
3	MH MOTOR	VENDOR TO SPECIFY
2	LT END CARRAIGE/BEAM	VENDOR TO SPECIFY
1	GIRDER/TROLLEY PLATE	VENDOR TO SPECIFY
DENOT.	ITEMS DISCRPTION.	VENDOR TO SPECIFY
BOM		



CRANE GIRDER
DETAIL AT SECTION AA
(GIRDER SIZE + CAPPING SIZE : AS PER VENDOR DESIGN)



CRANE CAPACITY/LIFT		CRANE CAPACITY/LIFT : AS PER SPEC.					
LOCATION		OXIDATION BLOWER AND RC PUMP					
WEIGHT OF CRANE		VENDOR TO SPECIFY					
MAX. LT WHEEL LOAD		VENDOR TO SPECIFY					
CONTROL SUPPLY		110 V					
POWER SUPPLY		415 V±10%, 3 PH., 50HZ.					
BEARING		VENDOR TO SPECIFY					
CONTROL		PENDANT PUSH BUTTON FROM FLOOR LEVEL.					
GEAR BOX	MOTION	REDUCTION	MATL. OF GEAR & PINION	HARDNESS	LUBRICATION		
	HOIST	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY		
	CT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY			
LT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY				
SPEED	HOIST	AS PER SPEC.					
	CT	AS PER SPEC.					
	LT	AS PER SPEC.					
MOTORS	HOIST	VENDOR TO SPECIFY					
	CT	VENDOR TO SPECIFY					
	LT	VENDOR TO SPECIFY					
BRAKE	MOTION	SIZE	RATING	TYPE	LIMIT SWITCH	TYPE	QTY.
	HOIST	#	VENDOR TO SPECIFY		HOIST	VENDOR TO SPECIFY	#
	CT	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	TROLLEY	VENDOR TO SPECIFY	#
	LT	#	VENDOR TO SPECIFY		CRANE	VENDOR TO SPECIFY	#
WIRE ROPE/FALLS/SPEC.		VENDOR TO SPECIFY					
CLASS OF DUTY		VENDOR TO SPECIFY					
BAY LENGTH		AS PER SPEC.		LT WH. DIA./QTY.		VENDOR TO SPECIFY	
HEIGHT OF LIFT		AS PER SPEC.		CT WH. DIA./QTY.		VENDOR TO SPECIFY	
SPAN		AS PER SPEC.		SHEAVE DIA		VENDOR TO SPECIFY	
CAPACITY		AS PER SPEC.		DRUM DIA/LENGHT		VENDOR TO SPECIFY	
TECHNICAL SPECIFICATION							

		VENDORS TO INFORM
HR	HEAD ROOM	
HA	HOOK APPROACH	
BG	BOGIE LENGTH	
HL	HEIGHT OF LIFT	
WB	LT WHEEL BASE	

NOTES:-

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
- # - VENDOR TO SPECIFY
- A Single or Double travelling Bridge / Grider (As per vendor design , To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.

PAINING OF CONTROL PANELS:

- SURFACE TREATMENT WITH MINIMUM SEVEN TANK PROCESS.
- PANEL 2 COATS OF SYNTHETIC ENAMEL PAINT.
- SHADE-SIEMENS GREY
- THE MINIMUM COATING THICKNESS OF POWDER COATED SURFACES SHALL BE MIN OF 80 MICRONS.


Painting:

Primers:
Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) of Min DFT 70 microns.

Final:
Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats) of Min. DFT 60 microns.

Total DFT: 130 microns.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		NTPC PROJECT						
		BHARAT HEAVY ELECTRICALS LTD.		DRN	NAME	SIGN	DATE	NO. OF VAR.
		UNIT: BOILER AUXILIARIES PLANT.		CHD				
RANIPET-632 406				APPD				
DEPT AQCS	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG)	REF. TO ASSY/OLD DRG.		ITEM NO.	NO. OF ITEMS	
CODE 882		N.T.S						
TITLE			CODE	CARD	DRAWING NO.		REV	
TYPICAL GA OF UNDER SLUNG CRANE			U 01		3-FW-0-00001		00	

ANNEXURE I		
	DATA SHEET	
	(VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)	
NTPC FGD PROJECT		
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING		
PROJECT NAME: NABINAGAR (3X660MW) PROJECT		
1.0	Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0	Quantity	As per Enquiry
3.0	Main Hoist (minimum)	As per Enquiry
4.0	SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1	Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2	CT Span	Vendor to submit
5.0	Height of Lift:	
5.1	Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0	Bay Length:	
6.1	Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0	DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1	Hoists	40 % CDF
7.2	Long Travel	40 % CDF
7.3	Cross Travel	40 % CDF
8.0	SPEED: (Operating / Working Speed - Maximum)	
8.1	Main Hoist (Maximum)	7.5 mtrs./minute.
8.2	Cross Travel (CT) (Maximum)	12.0 mtrs./minute.
8.3	Long Travel (LT) (Maximum)	12.0 mtrs./minute.
9.0	MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1	Main Hoist	Vendor to submit
9.2	Cross Travel (CT)	Vendor to submit
9.3	Long Travel (LT)	Vendor to submit
10.0	GEAR BOX SIZES:	
10.1	Main Hoist	Vendor to specify
10.2	Cross Travel (CT)	Vendor to specify
10.3	Long Travel (LT)	Vendor to specify
11.0	Acceleration:	
11.1	Cross Travel (CT)	Vendor to specify
11.2	Long Travel (LT)	Vendor to specify
12.0	Hoist Rope Details: (Size & Number of Falls)	
12.1	Main Hoist rope Size	Vendor to specify
12.2	Falls	Vendor to specify
13.0	CONTROL (Remote control)	
13.1	Through pendent type control	Vendor to confirm
13.2	Control Voltage: Shall be 110V AC	Vendor to note
13.3	Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5	Mechanism Group Classification:	M 6
13.5	Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0	Wheel Sizes:	
14.1	Cross Travel (CT)	Vendor to specify
14.2	Long Travel (LT) -	Vendor to specify
15.0	Brake Drum Sizes:	
15.1	Main Hoist	Vendor to specify
15.2	Cross Travel (CT)	Vendor to specify
15.3	Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)

ANNEXURE - II

Details of Under slung Electric Crane for RC pumps and Blower Handling								PROJECT : NABINAGAR (3X660MW) FGD				
SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	(EL (+) METER)	(METER)	(METER)	(MM)	(NPB / ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	10	EL (+) 10.4	EL (+) 0.0	40	7.1	1700	NPB 600X220X122.4 + CAPPING ISMC300	2000	_____ MM	As per Enquiry
<p>A Single or Double travelling Bridge / Grider (As per vendor design) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel. Please refer above tabulation for Long travel Runway Track detail.</p> <p>NOTE : 1) Depending upon actual crane head room , the actual height of list for Crane shall be arrived.</p>												

Bidder Signed with seal

ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING EQUIPMENTS

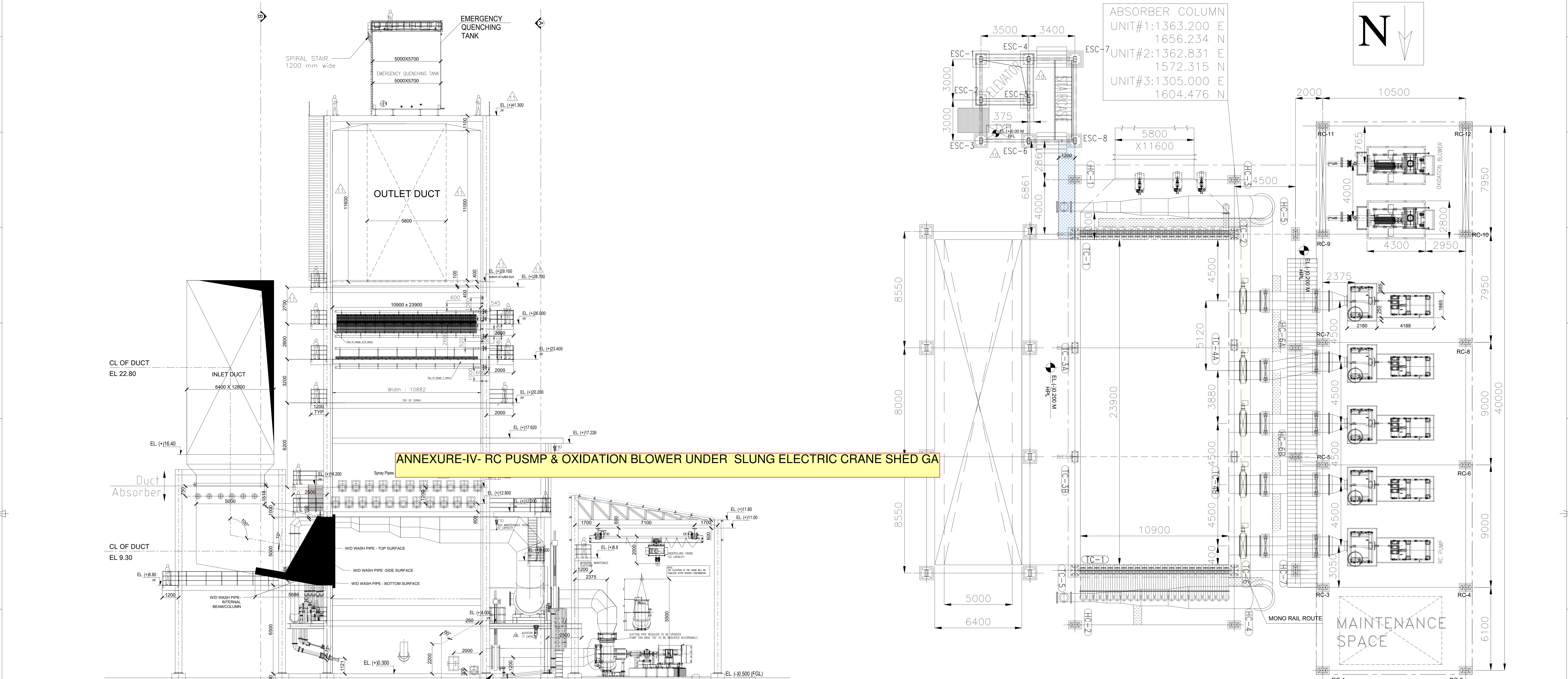
SI No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

11	Emergency quench system, Handling Equipment RC pump (Clause 20.03.00 of Part- C Section VI)	FW 227 FW 249	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	60	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	120
----	--	------------------	---------------------------------------	--	----	--	----	-----

SI 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. PGMA's 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 SI 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 PGMA's 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.



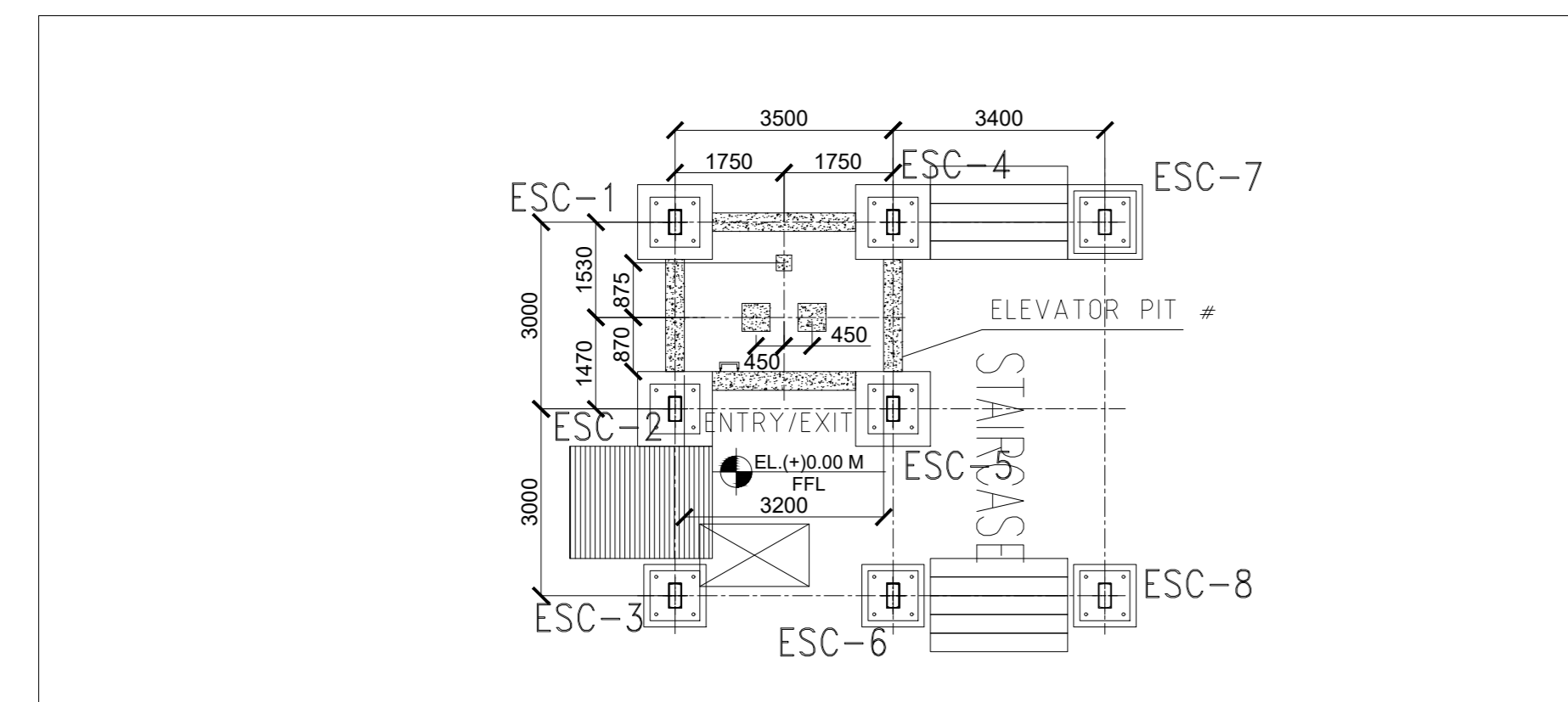
ANNEXURE-IV- RC PUSMP & OXIDATION BLOWER UNDER SLUNG ELECTRIC CRANE SHED GA

ELEVATION

PLAN

Note: CONCRETE EXTENSION TILL THE VALVE EDGE

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	KGV DISCHARGE	5T	01 NO
3	KGV SUCTION	5T	01 NO
4	AGITATOR	1T	01 NO

REFERENCE DRAWINGS:

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

CUSTOMER NOS:G609, G610, G611

NTPC DRAWING NO : 0370-109-PVM-B-010
 CUSTOMER: NTPC LIMITED.
 PROJECT: NABINAGAR SUPER THERMAL POWER PROJECT
 (3X660MW)

DEPT	NAME	SIGN	DATE
DRN	SRIVISHNU	--sd--	20-10-2020
CHD	LOGANATHAN	--sd--	20-10-2020
APPD	KUMAR	--sd--	20-10-2020

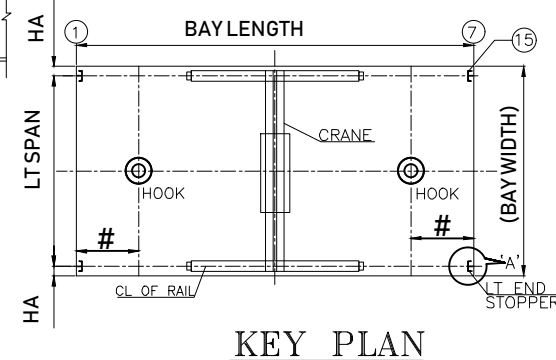
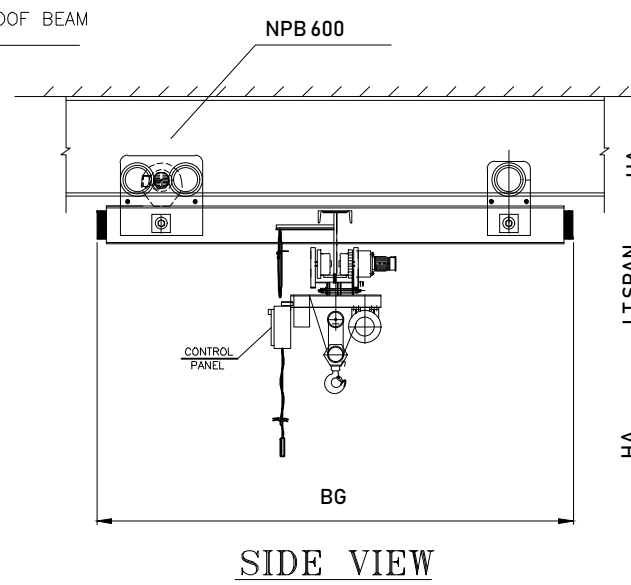
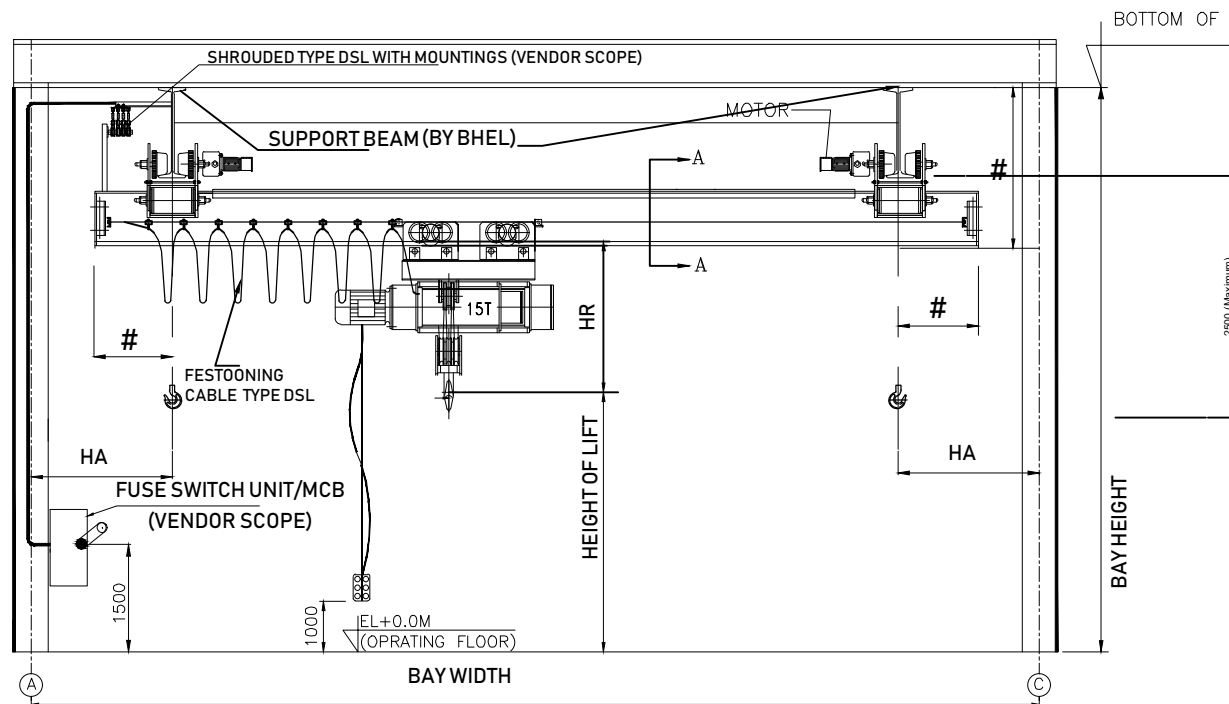
TITLE: **GENERAL ARRANGEMENT ABSORBER**

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

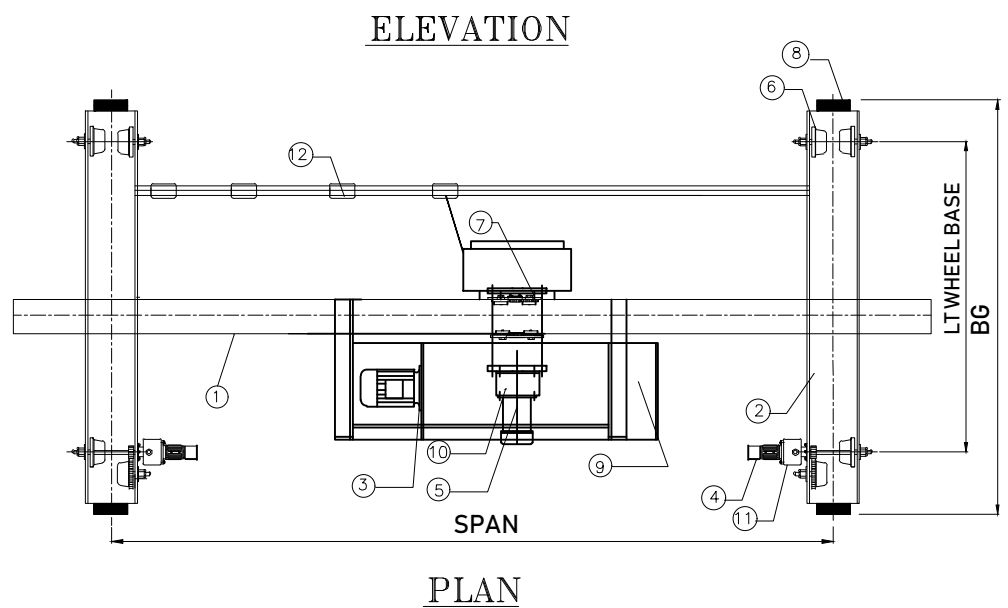
REV.	DATE	ALTD.	CKD.	APPD.	REV.	DATE	ALTD.	CKD.	APPD.	REV.	DATE	ALTD.	CKD.	APPD.	REV.	DATE	ALTD.	CKD.	APPD.
11	25.07.22	SUKUMAR	SUKUMAR	KUMAR	10	01.04.2022	SUKUMAR	SUKUMAR	KUMAR	09	30.11.2021	LOGANATHAN	LOGANATHAN	KUMAR	08	08.11.2021	LOGANATHAN	LOGANATHAN	KUMAR
REVISED AS PER NTPC COMMENTS					REVISED AS PER NTPC COMMENTS					REVISED AS PER NTPC COMMENTS									
07	08.10.2021	ILAN	LOGANATHAN	KUMAR	06	14.06.2021	ILAN	LOGANATHAN	KUMAR	05	05.04.2021	ILAN	LOGANATHAN	KUMAR	04	05.02.2021	ILAN	LOGANATHAN	KUMAR
REVISED AS PER NTPC COMMENTS					REVISED AS PER NTPC COMMENTS					REVISED AS PER NTPC COMMENTS									
REVISED AS PER NTPC COMMENTS					REVISED AS PER NTPC COMMENTS					REVISED AS PER NTPC COMMENTS									

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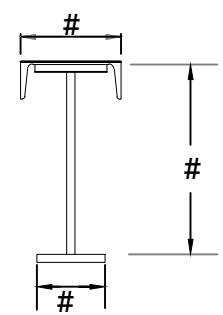
ANNEXURE-V- TYPICAL GA OF UNDER SLUNG ELECTRIC CRANES



19	CT/LT GEAR BOX HOUSING	VENDOR TO SPECIFY
18	HOIST GEAR BOX HOUSING	VENDOR TO SPECIFY
17	PULLEY	VENDOR TO SPECIFY
16	ROPE DRUM	VENDOR TO SPECIFY
15	LT END STOPER	VENDOR TO SPECIFY
14	CT END STOPER	VENDOR TO SPECIFY
13	HOOK	VENDOR TO SPECIFY
12	CT DSL	VENDOR TO SPECIFY
11	LT GEAR	VENDOR TO SPECIFY
10	CTGEAR	VENDOR TO SPECIFY
9	MH GEAR	VENDOR TO SPECIFY
8	BUFFER	VENDOR TO SPECIFY
7	CT WHEEL	VENDOR TO SPECIFY
6	LT WHEEL	VENDOR TO SPECIFY
5	CT MOTOR	VENDOR TO SPECIFY
4	LT MOTOR	VENDOR TO SPECIFY
3	MH MOTOR	VENDOR TO SPECIFY
2	LT END CARRAIGE/BEAM	VENDOR TO SPECIFY
1	GIRDER/TROLLEY PLATE	VENDOR TO SPECIFY
DENOT.	ITEMS DISCRPTION.	VENDOR TO SPECIFY
BOM		



CRANE GIRDER
DETAIL AT SECTION AA
(GIRDER SIZE + CAPPING SIZE : AS PER VENDOR DESIGN)



CRANE CAPACITY/LIFT		CRANE CAPACITY/LIFT : AS PER SPEC.					
LOCATION		OXIDATION BLOWER AND RC PUMP					
WEIGHT OF CRANE		VENDOR TO SPECIFY					
MAX. LT WHEEL LOAD		VENDOR TO SPECIFY					
CONTROL SUPPLY		110 V					
POWER SUPPLY		415 V±10%, 3 PH., 50HZ.					
BEARING		VENDOR TO SPECIFY					
CONTROL		PENDANT PUSH BUTTON FROM FLOOR LEVEL.					
GEAR BOX	MOTION	REDUCTION	MATL. OF GEAR & PINION	HARDNESS	LUBRICATION		
	HOIST	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY		
	CT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY			
LT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY				
SPEED	HOIST	AS PER SPEC.					
	CT	AS PER SPEC.					
	LT	AS PER SPEC.					
MOTORS	HOIST	VENDOR TO SPECIFY					
	CT	VENDOR TO SPECIFY					
	LT	VENDOR TO SPECIFY					
BRAKE	MOTION	SIZE	RATING	TYPE	LIMIT SWITCH	TYPE	QTY.
	HOIST	#	VENDOR TO SPECIFY		HOIST	VENDOR TO SPECIFY	#
	CT	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	TROLLEY	VENDOR TO SPECIFY	#
	LT	#	VENDOR TO SPECIFY		CRANE	VENDOR TO SPECIFY	#
WIRE ROPE/FALLS/SPEC.		VENDOR TO SPECIFY					
CLASS OF DUTY		VENDOR TO SPECIFY					
BAY LENGTH		AS PER SPEC.		LT WH. DIA./QTY.		VENDOR TO SPECIFY	
HEIGHT OF LIFT		AS PER SPEC.		CT WH. DIA./QTY.		VENDOR TO SPECIFY	
SPAN		AS PER SPEC.		SHEAVE DIA		VENDOR TO SPECIFY	
CAPACITY		AS PER SPEC.		DRUM DIA/LENGHT		VENDOR TO SPECIFY	
TECHNICAL SPECIFICATION							

NOTES:-

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
- # - VENDOR TO SPECIFY
- A Single or Double travelling Bridge / Grider (As per vendor design , To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.

PAINING OF CONTROL PANELS:

- SURFACE TREATMENT WITH MINIMUM SEVEN TANK PROCESS.
- PANEL 2 COATS OF SYNTHETIC ENAMEL PAINT.
- SHADE-SIEMENS GREY
- THE MINIMUM COATING THICKNESS OF POWDER COATED SURFACES SHALL BE MIN OF 80 MICRONS.

Painting:

Primers:
Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) of Min DFT 70 microns.


Final:
Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats) of Min. DFT 60 microns.

Total DFT: 130 microns.

		VENDORS TO INFORM
HR	HEAD ROOM	
HA	HOOK APPROACH	
BG	BOGIE LENGTH	
HL	HEIGHT OF LIFT	
WB	LT WHEEL BASE	

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		NTPC PROJECT						
		BHARAT HEAVY ELECTRICALS LTD.		DRN	NAME	SIGN	DATE	NO. OF VAR.
		UNIT: BOILER AUXILIARIES PLANT.		CHD				
RANIPET-632 406				APPD				
DEPT AQCS	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG)	REF. TO ASSY/OLD DRG.		ITEM NO.	NO. OF ITEMS	
CODE 882		N.T.S						
TITTLE			CODE	CARD	DRAWING NO.		REV	
TYPICAL GA OF UNDER SLUNG CRANE			U 01		3-FW-0-00001		00	

ANNEXURE I

 DATA SHEET (VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)		
NTPC FGD PROJECT		
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING		
PROJECT NAME: RAMAGUNDAM -I (3X200MW) PROJECT		
1.0	Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0	Quantity	As per Enquiry
3.0	Main Hoist (minimum)	As per Enquiry
4.0	SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1	Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2	CT Span	Vendor to submit
5.0	Height of Lift:	
5.1	Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0	Bay Length:	
6.1	Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0	DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1	Hoists	40 % CDF
7.2	Long Travel	40 % CDF
7.3	Cross Travel	40 % CDF
8.0	SPEED: (Operating / Working Speed - Maximum)	
8.1	Main Hoist (Maximum)	7.5 mtrs./minute.
8.2	Cross Travel (CT) (Maximum)	12.0 mtrs./minute.
8.3	Long Travel (LT) (Maximum)	12.0 mtrs./minute.
9.0	MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1	Main Hoist	Vendor to submit
9.2	Cross Travel (CT)	Vendor to submit
9.3	Long Travel (LT)	Vendor to submit
10.0	GEAR BOX SIZES:	
10.1	Main Hoist	Vendor to specify
10.2	Cross Travel (CT)	Vendor to specify
10.3	Long Travel (LT)	Vendor to specify
11.0	Acceleration:	
11.1	Cross Travel (CT)	Vendor to specify
11.2	Long Travel (LT)	Vendor to specify
12.0	Hoist Rope Details: (Size & Number of Falls)	
12.1	Main Hoist rope Size	Vendor to specify
12.2	Falls	Vendor to specify
13.0	CONTROL (Remote control)	
13.1	Through pendent type control	Vendor to confirm
13.2	Control Voltage: Shall be 110V AC	Vendor to note
13.3	Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4	Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5	Mechanism Group Classification:	M 6
13.5	Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6	WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0	Wheel Sizes:	
14.1	Cross Travel (CT)	Vendor to specify
14.2	Long Travel (LT) -	Vendor to specify
15.0	Brake Drum Sizes:	
15.1	Main Hoist	Vendor to specify
15.2	Cross Travel (CT)	Vendor to specify
15.3	Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)

DATA SHEET (VENDOR TO SUBMIT FILLED COPY ALONGWITH THEIR OFFER)	
NTPC FGD PROJECT	
DETAILS OF UNDER SLUNG EOT CRANES FOR OXIDATION BLOWER AND RECIRCULATION PUMP HANDLING	
PROJECT NAME: RAMAGUNDAM -II (3X500MW) PROJECT	
1.0 Capacity: UNDER SLUNG ELECTRIC CRANES	As per Enquiry
2.0 Quantity	As per Enquiry
3.0 Main Hoist (minimum)	As per Enquiry
4.0 SPAN (Wheel Centre to Wheel Centre Dimension):	
4.1 Long Travel Span for Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
4.2 CT Span	Vendor to submit
5.0 Height of Lift:	
5.1 Hoist height for Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
6.0 Bay Length:	
6.1 Oxidation blower & Recirculation Pump Area	Please Refer the Attached ANNEXURE IV
7.0 DUTY CYCLE: (Related to Drive Motor & Mechanisms)	
7.1 Hoists	40 % CDF
7.2 Long Travel	40 % CDF
7.3 Cross Travel	40 % CDF
8.0 SPEED: (Operating / Working Speed - Maximum]	
8.1 Main Hoist (Maximum)	7.5 mtrs./minute.
8.2 Cross Travel (CT) (Maximum)	12.0 mtrs./minute.
8.3 Long Travel (LT) (Maximum)	12.0 mtrs./minute.
9.0 MOTOR DETAILS: Vendor to provide details like capacity of motor, Frame size, make, type and No. of poles etc.	Vendor to confirm & submit details
9.1 Main Hoist	Vendor to submit
9.2 Cross Travel (CT)	Vendor to submit
9.3 Long Travel (LT)	Vendor to submit
10.0 GEAR BOX SIZES:	
10.1 Main Hoist	Vendor to specify
10.2 Cross Travel (CT)	Vendor to specify
10.3 Long Travel (LT)	Vendor to specify
11.0 Acceleration:	
11.1 Cross Travel (CT)	Vendor to specify
11.2 Long Travel (LT)	Vendor to specify
12.0 Hoist Rope Details: (Size & Number of Falls)	
12.1 Main Hoist rope Size	Vendor to specify
12.2 Falls	Vendor to specify
13.0 CONTROL (Remote control)	
13.1 Through pendent type control	Vendor to confirm
13.2 Control Voltage: Shall be 110V AC	Vendor to note
13.3 Input Power Supply: Shall be 415 ± 10% Volts , 50 ± 3% Hz, 3 Phase- AC.	Vendor to note
13.4 Duty Class: Class – 3 [Indoor Service]	Vendor to confirm
13.5 Mechanism Group Classification:	M 6
13.5 Design Standard: The crane design standard as per IS – 807 & 3177 / 1999.	Vendor to confirm
13.6 WIRE ROPE HOIST: The electric hoist shall be designed and constructed in accordance with the latest revision of IS:3938 and shall be suitable for duty class 2.	Vendor to confirm
14.0 Wheel Sizes:	
14.1 Cross Travel (CT)	Vendor to specify
14.2 Long Travel (LT) -	Vendor to specify
15.0 Brake Drum Sizes:	
15.1 Main Hoist	Vendor to specify
15.2 Cross Travel (CT)	Vendor to specify
15.3 Long Travel (LT)	Vendor to specify

(VENDOR TO SUBMIT FILLED COPY OF ABOVE DATA SHEET ALONGWITH THEIR OFFER)

ANNEXURE - II


Details of Under slung Electric Crane for RC pumps and Blower Handling								PROJECT : RAMAGUNDAM-I (3X200MW) FGD				
SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	(EL (+) METER)	(METER)	(METER)	(MM)	(NPB /ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	10	EL (+) 15.1	EL (+) 4.0	40	9.5	1000	NPB 600X220X122.4 + CAPPING ISMC300	2500	_____ MM	As per Enquiry
Details of Under slung Electric Crane for RC pumps and Blower Handling								PROJECT : RAMAGUNDAM-II (3X500MW) FGD				
SL NO	AREA	TYPE OF CRANE	CAPACITY OF CRANE	LONG TRAVEL RUNWAY TRACK OR BEAM FLANGE BOTTOM ELEVATION (LT RUNWAY TRACK OR BEAM in BHEL SCOPE)	FLOOR LEVEL	TRAVEL LENGTH (METER)	LONG TRAVEL SPAN	DISTANCE BETWEEN RUNWAY TRACK OR BEAM FLANGE CENTER TO SHED COLUMN CENTRE ON BOTH SIDE	LONG TRAVEL RUNWAY TRACK OR BEAM (IN BHEL Scope)	MAXIMUM HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO HOIST HOOK	ACTUAL HEIGHT OF BOTTOM OF RUNWAY TRACK OR BEAM FLANGE LOWER TO CRANE HOOK - VENDOR TO SPECIFY IN THEIR OFFER	TOTAL QNTY
			TON	(EL (+) METER)	(EL (+) METER)	(METER)	(METER)	(MM)	(NPB /ISMC)	(MM)	(MM) VENDOR TO SPECIFY	(SET)
1	RC pumps & Oxidation Blower Shed	UNDER SLUNG ELECTRIC CRANE	10	EL (+) 14.6	EL (+) 3.5	33	9	1000	NPB 600X220X122.4 + CAPPING ISMC300	2500	_____ MM	As per Enquiry


A Single or Double travelling Bridge / Grider (As per vendor design) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.
Please refer above tabulation for Long travel Runway Track detail.

NOTE : 1) Depending upon actual crane head room , the actual height of list for Crane shall be arrived.

Bidder Signed with seal

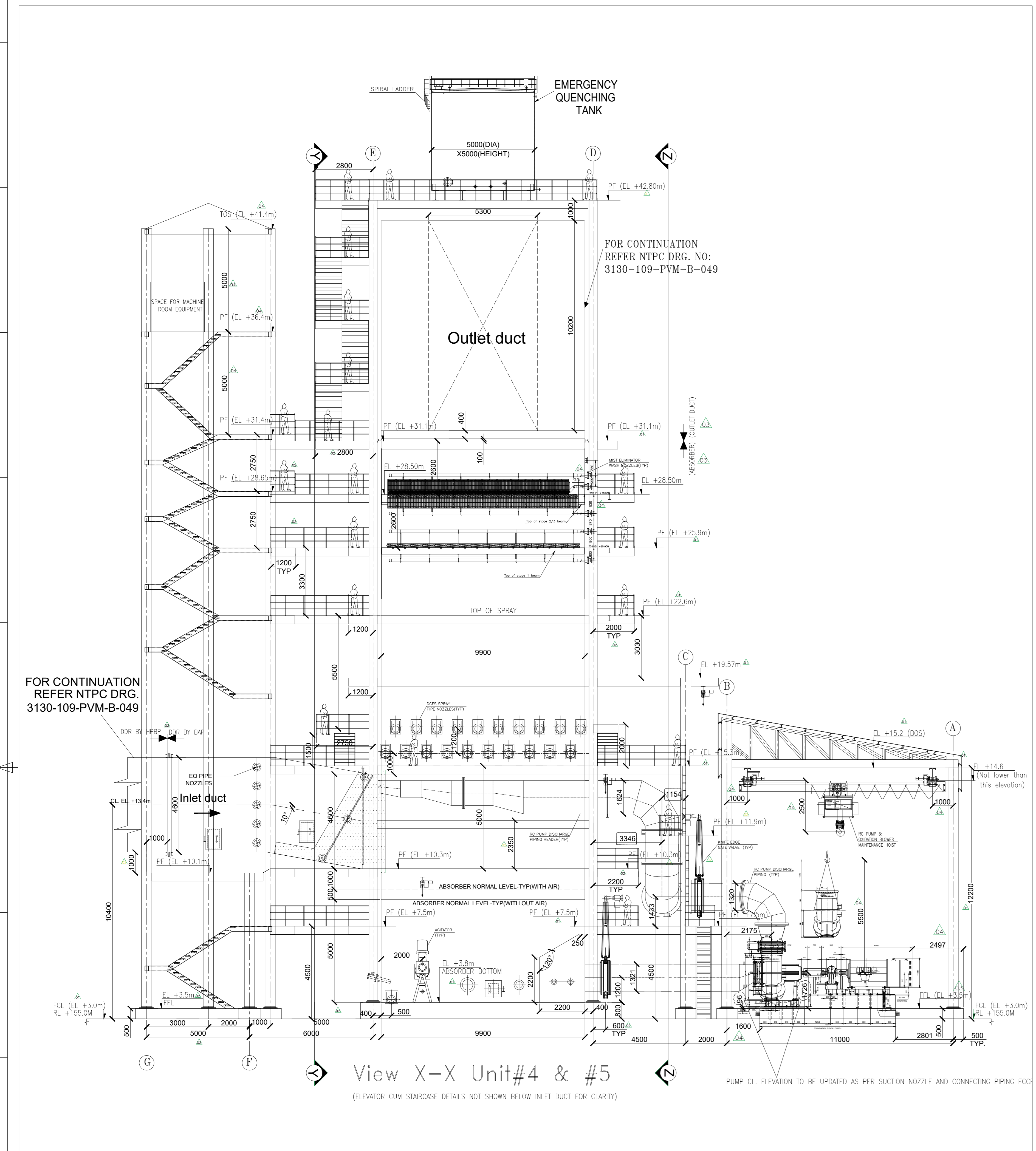
ANNEXURE-III- PAINTING SCHEME FOR MATERIAL HANDLING EQUIPMENTS

		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)	
				intermediate paint pigmented with Tio ₂ DFT- 100µ		DFT-25µ Shade: Grey White, RAL9002	25	
12	Emergency quench system, Handling Equipment RC pump – Minor items like nozzles, flanges, pipes & inspection doors, viewing ports (Clause 20.03.00 of Part- C Section VI)	FW 227 FW 249	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	60	Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats)	60	120

	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:

- No painting is required for Galvanized, non-ferrous & stainless steel items, except as indicated above.
- Machined items are to be applied with coat of temporary rust preventive oil.
- 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.
- 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 SI no:01 of Fans shall be followed.
- 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.
- 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.
- 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.
- Painting requirement for all electrical equipment shall be as per the details identified in specification for the respective equipment.
- 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.
- Finish coat to be applied after an interval of min 10 hrs and within 6 months (after completion of intermediate coat).
- Primer coat on steel shall be applied in shop immediately after blast cleaning by airless spray technique.
- 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 X-X Unit#4 & #5
(ELEVATOR CUM STAIRCASE DETAILS NOT SHOWN BELOW INLET DUCT FOR CLARITY)

NOTES:

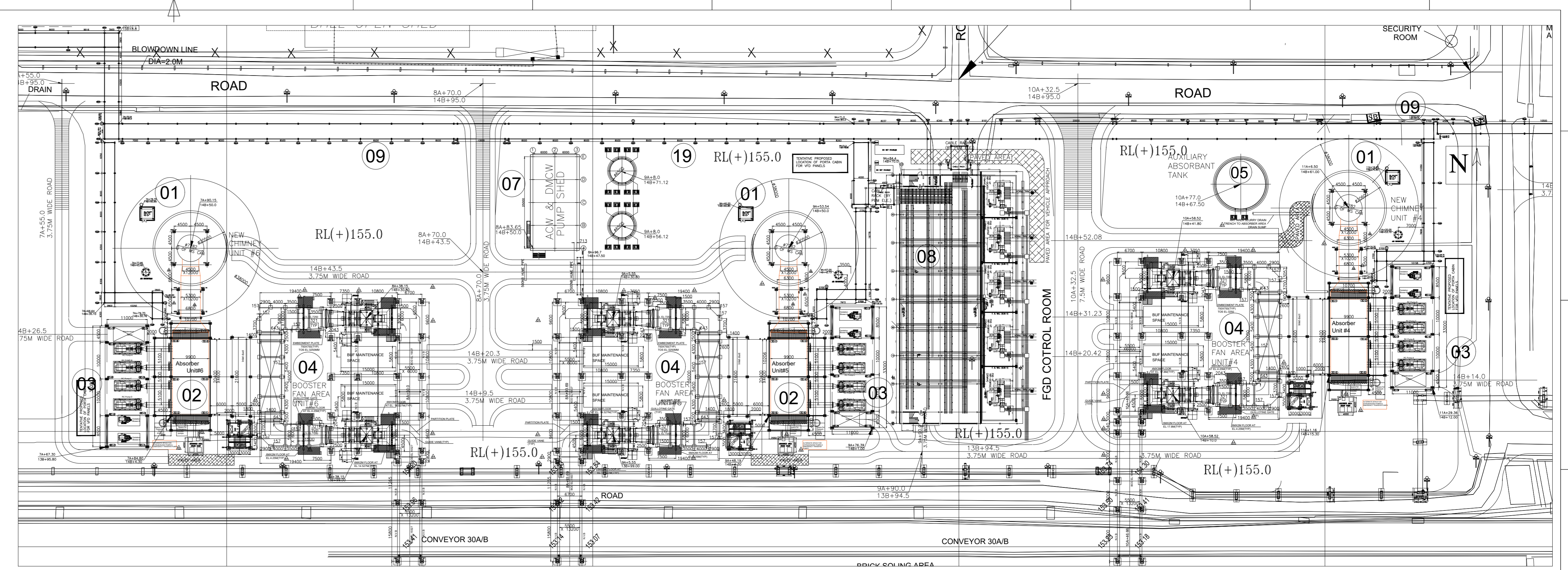
- ALL DIMENSIONS ARE IN MILLIMETERS.
- FINISH FLOOR LEVEL = RL (+)152.0M, CORRESPONDS TO PLANT EL(+0.0M) WHICH IS GROUND FLOOR OF STG BUILDING.
- FINISHED GROUND/GRADE LEVEL NEAR ABSORBER AREA(STAGE-II) SHALL BE RL(+155.0M) i.e. EL(+3.0M).
- PIPING INDICATED FOR REFERENCE ONLY, PIPING LAYOUT TO BE REFERRED FOR EXACT DETAILS OF PIPING.
- INDICATED DETAILS OF RC PUMP & OXIDATION BLOWERS ARE TENTATIVE AND MAY CHANGE BASED ON ACTUAL DATA FROM VENDORS.
- INDICATED ORIENTATION OF COLUMNS, COLUMN, BEAM SIZES ARE SUGGESTIVE ONLY, FOR EXACT ORIENTATION REFER STRUCTURAL DRAWINGS.
- REFER STANDARD DRAWINGS NO: EGF-0052-433 & EGF-0052-434 FOR DETAIL DIMENSIONS OF JAS NOZZLES.
- SUITABLE CAVITY IN FOUNDATION TO BE PROVIDED FOR ABSORBER BOTTOM DRAINS NOZZLE WELDING.
- REFER STANDARD DRAWING NO: EGF-0052-411 FOR DETAILS OF EMERGENCY QUENCHING SPRAY PIPE DETAILS.
- REFER STANDARD DRAWING NO: EGF-0052-413 FOR DETAILS OF W/D INTERFACE WASHING PIPE DETAILS.
- REFER STANDARD DRAWING NO: EGF-0052-421 & EGF-0052-422 FOR DETAILS OF DCFS SPRAY PIPES.
- MINIMUM STAIR CASE WIDTH OF 1200MM SHALL BE PROVIDED AS PER NTPC TECHNICAL SPECIFICATION.
- ABSORBER DIMENSIONS INDICATED IN "PLAN @ GRADE/FLOOR LEVEL" VIEW ARE ABSORBER CASING OUTSIDE DIMENSIONS.
- 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.
- 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.

LEGEND:-

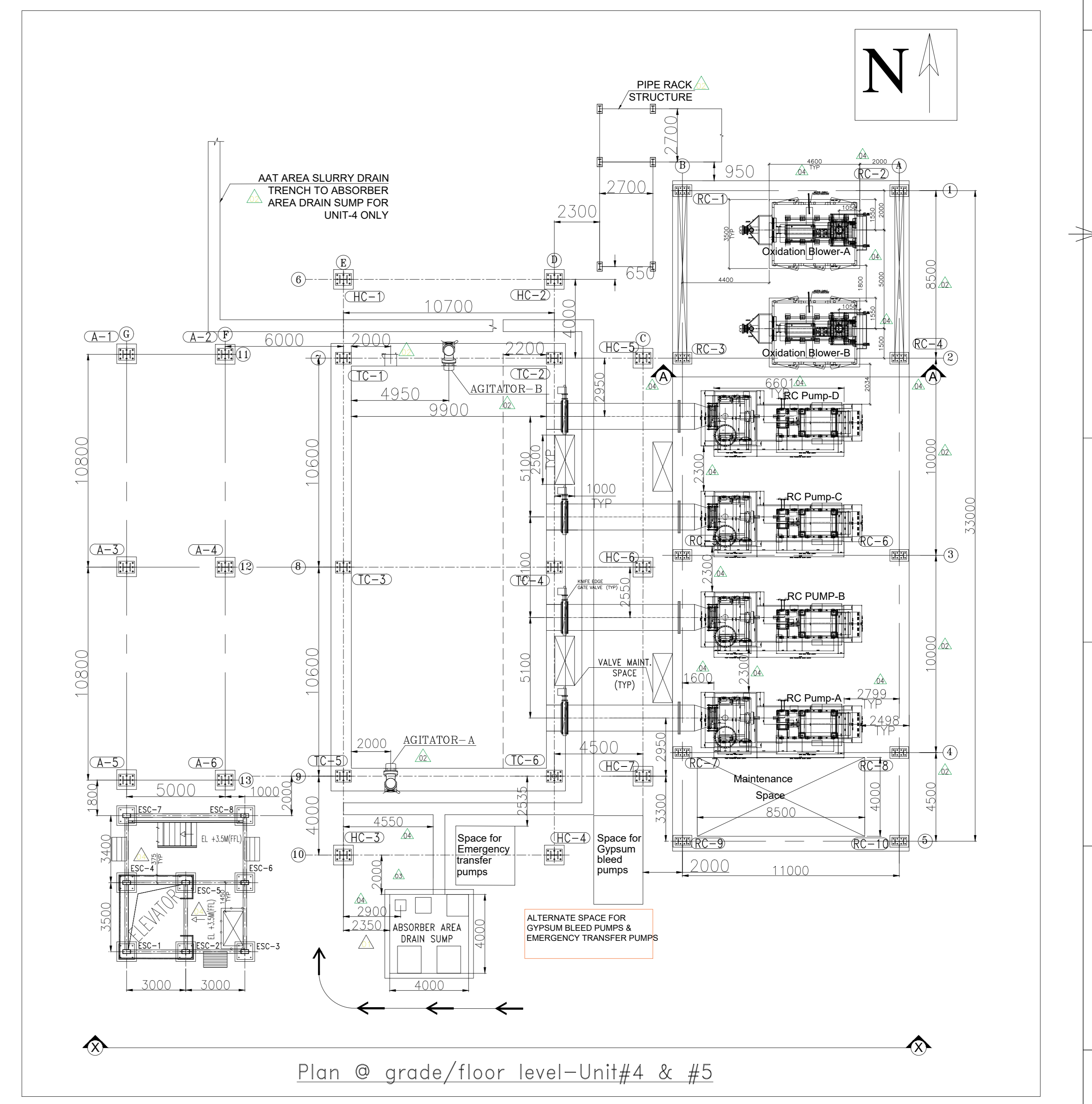
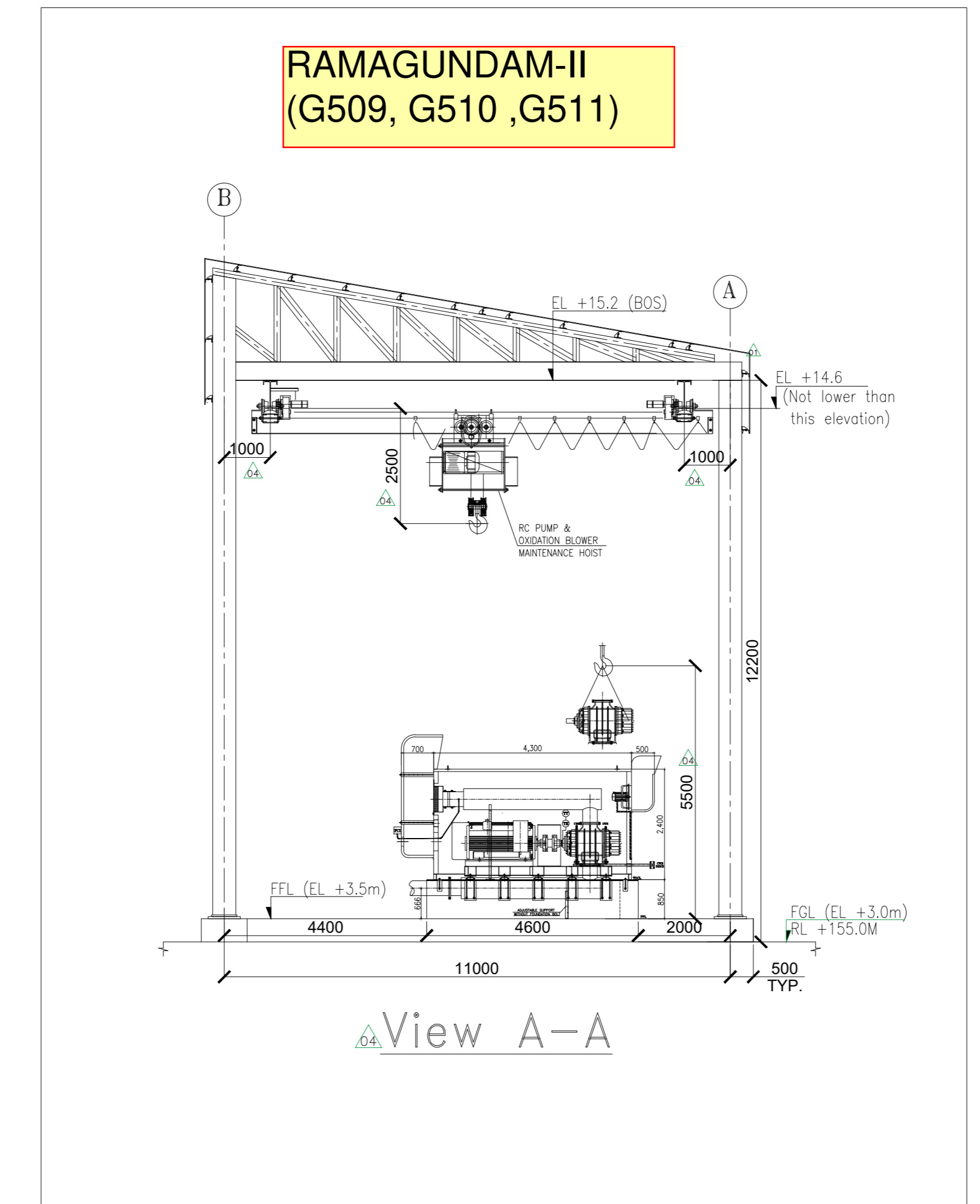
- FFL : FINISHED FLOOR LEVEL
- FGL : FINISHED GROUND LEVEL
- BOB : BOTTOM OF BASE PLATE LEVEL
- D : DOOR 1.2M WIDE
- RS : ROLLING SHUTTER 4M X4M
- TOPF : TOP OF PLATFORM
- PL : PAVED LEVEL
- TOG : TOP OF GRATING
- TOC : TOP OF CONCRETE
- VL : VERTICAL LADDER
- CGL : CAGE LADDER

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-012	: Data sheet & General Arrangement for Oxidation Air Blower.



KEY PLAN



PROGRESSIVE

CUST. NO - G509, 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

04	25.07.22	SUKUMAR	KUMAR	SUNDAR	ELEVATOR FFL UPDATED AS PER CIVIL DRAWINGS. RC PUMP AND AGITATOR LOCATIONS UPDATED AS PER BIDDING. NOZZLE LOCATIONS/SHAMP LOCATION UPDATED. LOCATION OF NEW STAIR CASE STRUCTURE UPDATED. PLAN AT EL +3.0M & SPRAY PIPE DETAILS UPDATED. FROM FFL TO TOP OF THE STAIRCASE.	25.09.20	25
03	02.11.21	SUKUMAR	KUMAR	SUNDAR	DRY SHAMP LOCATION UPDATED AS PER FLOOR PLAN. MANHOLE PROVIDED IN ABSORBER OUTLET. ABSORBER & OUTLET DUCT MATERIAL. DIMENSIONS UPDATED AS PER SPEC.	25.09.20	25
02	13.03.21	SUKUMAR	KUMAR	SUNDAR	KEY PLAN UPDATED.	25.09.20	25
01	04.07.20	SUKUMAR	KUMAR	SUNDAR	REVISED AS PER NTPC COMMENTS.	25.09.20	25

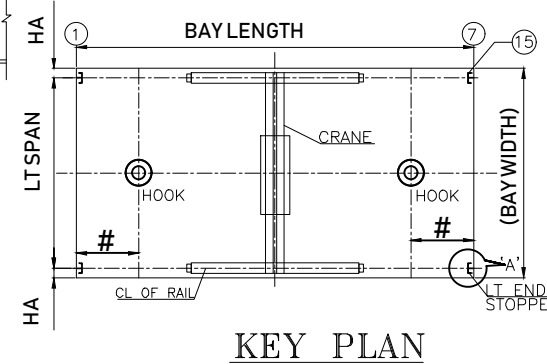
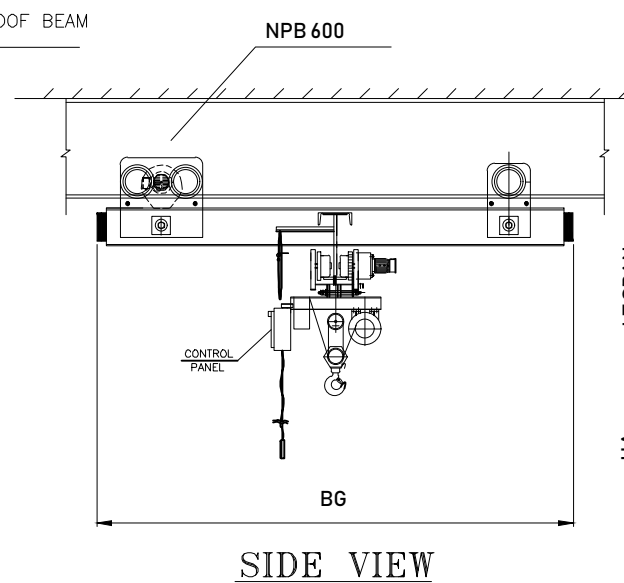
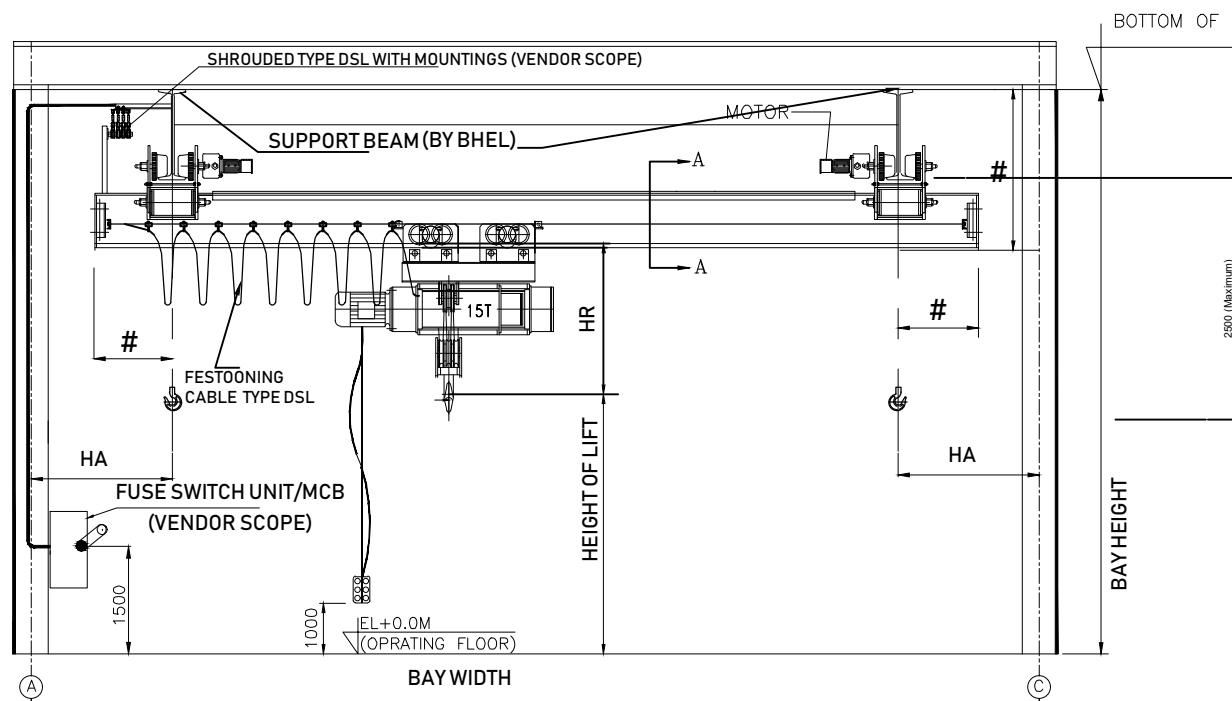
GA OF ABSORBER
STAGE-II (3X500MW)

Sh 01 of 15 U 01

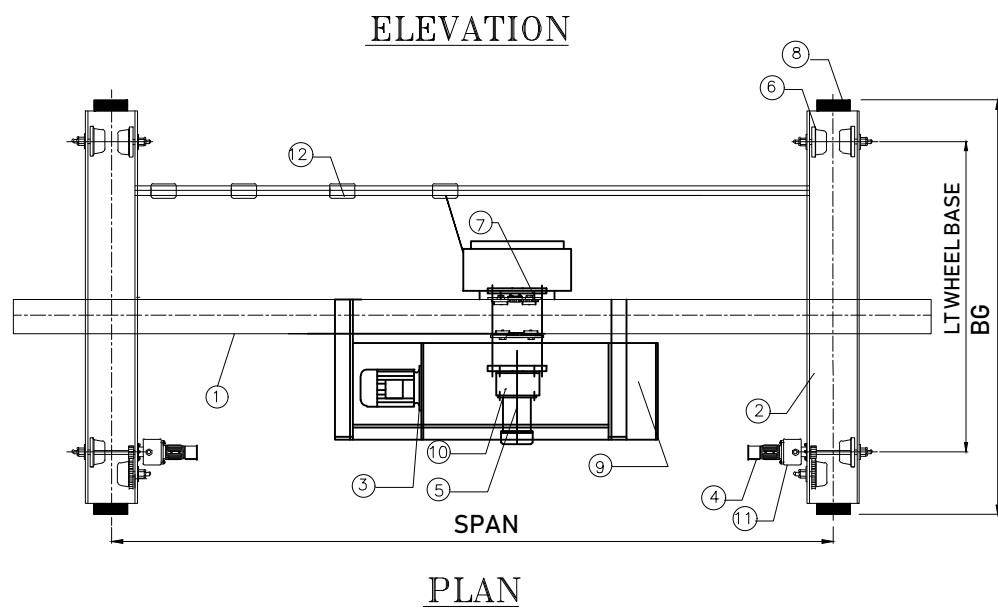
DRAWING NO: 0-FW-000-02087-04

REV	DATE	ALTERED	CHECKED	APPROVED	REVISION REMARKS
04	25.07.22	SUKUMAR	KUMAR	SUNDAR	ELEVATOR FFL UPDATED AS PER CIVIL DRAWINGS. RC PUMP AND AGITATOR LOCATIONS UPDATED AS PER BIDDING. NOZZLE LOCATIONS/SHAMP LOCATION UPDATED. LOCATION OF NEW STAIR CASE STRUCTURE UPDATED. PLAN AT EL +3.0M & SPRAY PIPE DETAILS UPDATED. FROM FFL TO TOP OF THE STAIRCASE.
03	02.11.21	SUKUMAR	KUMAR	SUNDAR	DRY SHAMP LOCATION UPDATED AS PER FLOOR PLAN. MANHOLE PROVIDED IN ABSORBER OUTLET. ABSORBER & OUTLET DUCT MATERIAL. DIMENSIONS UPDATED AS PER SPEC.
02	13.03.21	SUKUMAR	KUMAR	SUNDAR	KEY PLAN UPDATED.
01	04.07.20	SUKUMAR	KUMAR	SUNDAR	REVISED AS PER NTPC COMMENTS.

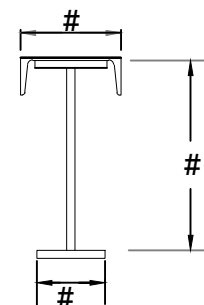
ANNEXURE-V- TYPICAL GA OF UNDER SLUNG ELECTRIC CRANES



19	CT/LT GEAR BOX HOUSING	VENDOR TO SPECIFY
18	HOIST GEAR BOX HOUSING	VENDOR TO SPECIFY
17	PULLEY	VENDOR TO SPECIFY
16	ROPE DRUM	VENDOR TO SPECIFY
15	LT END STOPER	VENDOR TO SPECIFY
14	CT END STOPER	VENDOR TO SPECIFY
13	HOOK	VENDOR TO SPECIFY
12	CT DSL	VENDOR TO SPECIFY
11	LT GEAR	VENDOR TO SPECIFY
10	CTGEAR	VENDOR TO SPECIFY
9	MH GEAR	VENDOR TO SPECIFY
8	BUFFER	VENDOR TO SPECIFY
7	CT WHEEL	VENDOR TO SPECIFY
6	LT WHEEL	VENDOR TO SPECIFY
5	CT MOTOR	VENDOR TO SPECIFY
4	LT MOTOR	VENDOR TO SPECIFY
3	MH MOTOR	VENDOR TO SPECIFY
2	LT END CARRAIGE/BEAM	VENDOR TO SPECIFY
1	GIRDER/TROLLEY PLATE	VENDOR TO SPECIFY
DENOT.	ITEMS DISCRPTION.	VENDOR TO SPECIFY
BOM		



CRANE GIRDER
DETAIL AT SECTION AA
(GIRDER SIZE + CAPPING SIZE : AS PER VENDOR DESIGN)



CRANE CAPACITY/LIFT		CRANE CAPACITY/LIFT : AS PER SPEC.					
LOCATION		OXIDATION BLOWER AND RC PUMP					
WEIGHT OF CRANE		VENDOR TO SPECIFY					
MAX. LT WHEEL LOAD		VENDOR TO SPECIFY					
CONTROL SUPPLY		110 V					
POWER SUPPLY		415 V±10%, 3 PH., 50HZ.					
BEARING		VENDOR TO SPECIFY					
CONTROL		PENDANT PUSH BUTTON FROM FLOOR LEVEL.					
GEAR BOX	MOTION	REDUCTION	MATL. OF GEAR & PINION	HARDNESS	LUBRICATION		
	HOIST	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY		
	CT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY			
LT	VENDOR TO SPECIFY	VENDOR TO SPECIFY	VENDOR TO SPECIFY				
SPEED	HOIST	AS PER SPEC.					
	CT	AS PER SPEC.					
	LT	AS PER SPEC.					
MOTORS	HOIST	VENDOR TO SPECIFY					
	CT	VENDOR TO SPECIFY					
	LT	VENDOR TO SPECIFY					
BRAKE	MOTION	SIZE	RATING	TYPE	LIMIT SWITCH	TYPE	QTY.
	HOIST	#	VENDOR TO SPECIFY		HOIST	VENDOR TO SPECIFY	#
	CT	#	VENDOR TO SPECIFY	VENDOR TO SPECIFY	TROLLEY	VENDOR TO SPECIFY	#
	LT	#	VENDOR TO SPECIFY		CRANE	VENDOR TO SPECIFY	#
WIRE ROPE/FALLS/SPEC.		VENDOR TO SPECIFY					
CLASS OF DUTY		VENDOR TO SPECIFY					
BAY LENGTH		AS PER SPEC.		LT WH. DIA./QTY.		VENDOR TO SPECIFY	
HEIGHT OF LIFT		AS PER SPEC.		CT WH. DIA./QTY.		VENDOR TO SPECIFY	
SPAN		AS PER SPEC.		SHEAVE DIA		VENDOR TO SPECIFY	
CAPACITY		AS PER SPEC.		DRUM DIA/LENGHT		VENDOR TO SPECIFY	
TECHNICAL SPECIFICATION							

		VENDORS TO INFORM
HR	HEAD ROOM	
HA	HOOK APPROACH	
BG	BOGIE LENGTH	
HL	HEIGHT OF LIFT	
WB	LT WHEEL BASE	

NOTES:-

- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
- # - VENDOR TO SPECIFY
- A Single or Double travelling Bridge / Grider (As per vendor design , To Suit) Underslung Electric Crane shall be running on the lower flange of two runway Track or Beam for Long Travel.

PAINING OF CONTROL PANELS:

- SURFACE TREATMENT WITH MINIMUM SEVEN TANK PROCESS.
- PANEL 2 COATS OF SYNTHETIC ENAMEL PAINT.
- SHADE-SIEMENS GREY
- THE MINIMUM COATING THICKNESS OF POWDER COATED SURFACES SHALL BE MIN OF 80 MICRONS.

Painting:

Primers:
Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) of Min DFT 70 microns.

Final:
Synthetic Enamel to IS 2932 Shade: Grey white RAL 9002 (Two coats) of Min. DFT 60 microns.

Total DFT: 130 microns.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		NTPC PROJECT						
		BHARAT HEAVY ELECTRICALS LTD.		DRN	NAME	SIGN	DATE	NO. OF VAR.
		UNIT: BOILER AUXILIARIES PLANT.		CHD				
RANIPET-632 406				APPD				
DEPT AQCS	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG)	REF. TO ASSY/OLD DRG.		ITEM NO.	NO. OF ITEMS	
CODE 882		N.T.S						
TITLE			CODE	CARD	DRAWING NO.		REV	
TYPICAL GA OF UNDER SLUNG CRANE				U 01	3-FW-0-00001		00	

Annexure to Enquiry no:		Date	##Specific confirmations by the manufacture
Sl.No	BHEL / Customer Requirement		
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 invariably 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 flowing 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	<p>Inspection at Foreign 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.</p>	
8	<p>Painting shall be done strictly 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 advance before proceding including the BOI being procured for assy / skid like motors etc</p>	
9	<p>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/Endorsement Sheet (As applicable), (iii) TCs identified 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.</p>	
10	<p>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.</p>	
10	<p>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.</p>	
11	<p>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.</p>	
12	<p>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.</p>	
13	<p>## 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.</p>	

PROJECT: NTPC Nabinagar 4 x 250 MW (BHEL W.O no: G 201, G202, G203 and G204) 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 UNDERSLUNG CRANES 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-G204/Nabinagar/Underslung Cranes: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 26.08.2022		##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: UNDERSLUNG CRANES

01	Quality plan Requirement	<ol style="list-style-type: none"> MQP (Manufacturing Quality Plan) is applicable for these Underslung Cranes and accordingly Underslung Crane Manufacturer shall submit the MQP in ultimate customer – NTPC (copy attached) format. If any of the Underslung Cranes manufacturer is having, ultimate customer NTPC approved MQP (Manufacturing Quality Plan) / RQP (Reference Quality Plan) and having validity, the same is applicable for these Underslung Crane for inspection. Accordingly, Underslung Cranes Manufacturer shall submit the filled up Endorsement sheet (copy attached) with ultimate customer approved MQP/RQP with signature & seal in the event of a Purchase Order from BHEL. If Underslung Cranes Manufacturer does not have MQP/RQP, they should submit a fresh MQP to BHEL (in NTPC format) for review & approval in line with the attached Indicative MQP. (copy attached). 	
02	Inspection Methodology	BHEL/BHEL AIA Inspection as per approved MQP /RQP with endorsement sheet / approved data sheet / drg / spec is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
05	For inspection call	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr MS 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.	
06	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.	
07	Painting	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
08	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 (.) <ol style="list-style-type: none"> Index Sheet MQP/RQP/Endorsement sheet TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in. Final Inspection Report + all applicable Test Certificates BHEL/BHEL authorized Inspection Agency report + TC Type test reports conducted/submitted with approval 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 (G604 to G606) 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 UNDERSLUNG CRANES used in FGD APPLICATION NTPC BARH II (2 X 660 MW) FGD PROJECT (BHEL W.O No.: G607-G608)		DOC.NO: BAP/QR/ G604-G606 /Barh-II/ Underslung Cranes: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 19.08.2022		##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: UNDERSLUNG CRANES

01	Quality plan Requirement	<ol style="list-style-type: none"> MQP (Manufacturing Quality Plan) is applicable for these Underslung Cranes and accordingly Underslung Crane Manufacturer shall submit the MQP in ultimate customer – NTPC (copy attached) format. If any of the Underslung Cranes manufacturer is having, ultimate customer NTPC approved MQP (Manufacturing Quality Plan) / RQP (Reference Quality Plan) and having validity, the same is applicable for these Underslung Crane for inspection. Accordingly, Underslung Cranes Manufacturer shall submit the filled up Endorsement sheet (copy attached) with ultimate customer approved MQP/RQP with signature & seal in the event of a Purchase Order from BHEL. If Underslung Cranes Manufacturer does not have MQP/RQP, they should submit a fresh MQP to BHEL (in NTPC format) for review & approval in line with the attached Indicative MQP. (copy attached). 	
02	Inspection Methodology	BHEL/BHEL AIA Inspection as per approved MQP /RQP with endorsement sheet / approved data sheet / drg / spec is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
05	For inspection call	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr MS 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.	
06	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.	
07	Painting	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
08	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 (.) <ol style="list-style-type: none"> Index Sheet MQP/RQP/Endorsement sheet TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in. Final Inspection Report + all applicable Test Certificates BHEL/BHEL authorized Inspection Agency report + TC Type test reports conducted/submitted with approval 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: 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 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR & ADDRESS: (To be filled by VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for UNDERSLUNG CRANES 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/ Underslung Cranes: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 19.08.2022		##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: UNDERSLUNG CRANES

01	Quality plan Requirement	<ol style="list-style-type: none"> MQP (Manufacturing Quality Plan) is applicable for these Underslung Cranes and accordingly Underslung Crane Manufacturer shall submit the MQP in ultimate customer – NTPC (copy attached) format. If any of the Underslung Cranes manufacturer is having, ultimate customer NTPC approved MQP (Manufacturing Quality Plan) / RQP (Reference Quality Plan) and having validity, the same is applicable for these Underslung Crane for inspection. Accordingly, Underslung Cranes Manufacturer shall submit the filled up Endorsement sheet (copy attached) with ultimate customer approved MQP/RQP with signature & seal in the event of a Purchase Order from BHEL. If Underslung Cranes Manufacturer does not have MQP/RQP, they should submit a fresh MQP to BHEL (in NTPC format) for review & approval in line with the attached Indicative MQP. (copy attached). 	
02	Inspection Methodology	BHEL/BHEL AIA Inspection as per approved MQP /RQP with endorsement sheet / approved data sheet / drg / spec is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
05	For inspection call	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr MS 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.	
06	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.	
07	Painting	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
08	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 (.) <ol style="list-style-type: none"> Index Sheet MQP/RQP/Endorsement sheet TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in. Final Inspection Report + all applicable Test Certificates BHEL/BHEL authorized Inspection Agency report + TC Type test reports conducted/submitted with approval 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-FCNOA-6695 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR & ADDRESS: (To be filled by VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for UNDERSLUNG CRANES used in FGD APPLICATION NTPC NORTH KARANPURA (3X 660 MW) FGD PROJECT (BHEL W.O No.: G601, G602, G603)		DOC.NO: BAP/QR/ G601-G603 /NKP/ Underslung Cranes: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 19.08.2022		##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: UNDERSLUNG CRANES

01	Quality plan Requirement	<ol style="list-style-type: none"> MQP (Manufacturing Quality Plan) is applicable for these Underslung Cranes and accordingly Underslung Crane Manufacturer shall submit the MQP in ultimate customer – NTPC (copy attached) format. If any of the Underslung Cranes manufacturer is having, ultimate customer NTPC approved MQP (Manufacturing Quality Plan) / RQP (Reference Quality Plan) and having validity, the same is applicable for these Underslung Crane for inspection. Accordingly, Underslung Cranes Manufacturer shall submit the filled up Endorsement sheet (copy attached) with ultimate customer approved MQP/RQP with signature & seal in the event of a Purchase Order from BHEL. If Underslung Cranes Manufacturer does not have MQP/RQP, they should submit a fresh MQP to BHEL (in NTPC format) for review & approval in line with the attached Indicative MQP. (copy attached). 	
02	Inspection Methodology	BHEL/BHEL AIA Inspection as per approved MQP /RQP with endorsement sheet / approved data sheet / drg / spec is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
05	For inspection call	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr MS 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.	
06	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.	
07	Painting	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
08	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 (.) <ol style="list-style-type: none"> Index Sheet MQP/RQP/Endorsement sheet TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in. Final Inspection Report + all applicable Test Certificates BHEL/BHEL authorized Inspection Agency report + TC Type test reports conducted/submitted with approval 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) CONTRACT NO: CS-0370-109-(1A) -2-FC -NOA-0059 1819 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR & ADDRESS: (To be filled by VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for UNDERSLUNG CRANES used in FGD APPLICATION NTPC Nabinagar 3 x 660 MW (BHEL W.O no: G 609, G 610 and G 611)		DOC.NO: BAP/QR/G609-G611/Nabinagar/Underslung Cranes: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 26.08.2022		##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: UNDERSLUNG CRANES

01	Quality plan Requirement	<ol style="list-style-type: none"> MQP (Manufacturing Quality Plan) is applicable for these Underslung Cranes and accordingly Underslung Crane Manufacturer shall submit the MQP in ultimate customer – NTPC (copy attached) format. If any of the Underslung Cranes manufacturer is having, ultimate customer NTPC approved MQP (Manufacturing Quality Plan) / RQP (Reference Quality Plan) and having validity, the same is applicable for these Underslung Crane for inspection. Accordingly, Underslung Cranes Manufacturer shall submit the filled up Endorsement sheet (copy attached) with ultimate customer approved MQP/RQP with signature & seal in the event of a Purchase Order from BHEL. If Underslung Cranes Manufacturer does not have MQP/RQP, they should submit a fresh MQP to BHEL (in NTPC format) for review & approval in line with the attached Indicative MQP. (copy attached). 	
02	Inspection Methodology	BHEL/BHEL AIA Inspection as per approved MQP /RQP with endorsement sheet / approved data sheet / drg / spec is must before dispatch. No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.	
05	For inspection call	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr MS 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.	
06	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.	
07	Painting	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
08	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 (.) <ol style="list-style-type: none"> Index Sheet MQP/RQP/Endorsement sheet TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in. Final Inspection Report + all applicable Test Certificates BHEL/BHEL authorized Inspection Agency report + TC Type test reports conducted/submitted with approval 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 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 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR & ADDRESS: (To be filled by VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for UNDERSLUNG CRANES 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/ Underslung Cranes: 001 Rev NO.: 00 PAGE : Page 1 of 1 DATE: 26.08.2022		##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: UNDERSLUNG CRANES

01	Quality plan Requirement	<ol style="list-style-type: none"> MQP (Manufacturing Quality Plan) is applicable for these Underslung Cranes and accordingly Underslung Crane Manufacturer shall submit the MQP in ultimate customer – NTPC (copy attached) format. If any of the Underslung Cranes manufacturer is having, ultimate customer NTPC approved MQP (Manufacturing Quality Plan) / RQP (Reference Quality Plan) and having validity, the same is applicable for these Underslung Crane for inspection. Accordingly, Underslung Cranes Manufacturer shall submit the filled up Endorsement sheet (copy attached) with ultimate customer approved MQP/RQP with signature & seal in the event of a Purchase Order from BHEL. If Underslung Cranes Manufacturer does not have MQP/RQP, they should submit a fresh MQP to BHEL (in NTPC format) for review & approval in line with the attached Indicative MQP. (copy attached). 	
02	Inspection Methodology	<p>BHEL/BHEL AIA Inspection as per approved MQP /RQP with endorsement sheet / approved data sheet / drg / spec is must before dispatch.</p> <p>No material shall be dispatched without BHEL inspection with required CHP/MDCC clearances.</p>	
05	For inspection call	To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing, vendor is requested to contact Mr MS 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.	
06	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.	
07	Painting	Paint color and coating thickness to be ensured as per requirements stipulated in Engg spec / drg / data sheet.	
08	Document package	<p>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 (.)</p> <ol style="list-style-type: none"> Index Sheet MQP/RQP/Endorsement sheet TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in. Final Inspection Report + all applicable Test Certificates BHEL/BHEL authorized Inspection Agency report + TC Type test reports conducted/submitted with approval 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.

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			<u>2REVIEW & ENDORSEMENT BY NTPC</u> PROJECT SPECIFIC QP NUMBER ALLOTTED BHEL/BHEL AIA inspection is must before dispatch.
CONTRACT NO.:			
MAIN SUPPLIER	M/S.BHEL, RANIPET , TAMIL NADU., INDIA		
MANUFACTURER WORKS & ADDRESS	(TO BE FILLED BY UNDERSLUNG CRANES MANUFACTURER)		
ITEM /EQUIPMENT / SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL TYPE/SIZE/RATING etc.	UNDERSLUNG CRANES FOR FGD APPLICATION		
APPROVED QP NO.: RQP/SQP/RFQP/SFQP			
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)			<i>(TICK APPLICABLE)</i>
I. That the item/ component is identical to that considered for SQP approval. <input checked="" type="checkbox"/>			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.
			<u>DISTRIBUTION OF ENDORSEMENT OF</u> 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
		(TO BE FILLED BY UNDERSLUNG CRANES MANUFACTURER)	
SIGN.: (Main Supplier)	DATE:	SIGN.: (Manufacturer)	DATE:
			NTPC (Reviewed /Approved by/ Date & Seal)

Suppliers not having NTPC approved RQP/MQP shall submit their MQP in line with this Indicative MQP for BHEL review and approval along with List of Make for Bought Out Items.

MANUFACTURER'S NAME & ADDRESS:			MANUFACTURING QUALITY PLAN (for indicative purpose only)							PROJECT :					
			ITEM :				MQP NO. :			PACKAGE :					
			SUB-SYSTEM :				DATE :			CONTRACT NO. :					
							PAGE No.			MAIN SUPPLIER : BHEL					
SL. NO.	COMPONENT / OPERATIONS	CHARACTERISTICS	CL	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS	
					M	CIN				D'	M	C	N		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1.1	RAW MATERIAL: MS Plates for Trolley Plates , pulleys & Rope drum (or seamless Pipe) MS beams & Channels	Chemical & Mechanical Properties	B	Lab Analysis	Sample	Sample	IS: 2062 Gr A or B	IS: 2062 Gr A or B	MTC / ALC	√	P	V	—	The plates of thickness 25mm and above shall be ultrasonically tested.	
1.2	Castings for Bearing Plates, Rope Guide, Pulleys etc	Chemical & Mechanical Properties.	B	Lab Analysis	Sample	Sample	As per DPSI approved drgs	As per approved drgs	MTC / ALC	—	P	V	—		
1.3	Forgings for Shafts,wheels,Hook, Axles & Gears / Pinion Wheels Hardness.	Chemical,Mechanical & Properties. Hardness	B	Document review	100%	100%	As per DPSI approved drgs	As per approved drgs	MTC / ALC	—	P	V	—		
		Soundness	B	Document review	100%	100%	As per DPSI approved drgs	As per approved drgs	MTC / ALC	—	P	—	—	*UT required for dia / thick-ness above 40mm. *MPI and LPI apply after Machining process for Hooks Only.	
			B	UT / MPI Test Report	100%	100%	A388/ASME Sec VIII Div2	A388/ASME Sec VIII Div2	IR	—	P	V	V		
1.4	BOUGHTOUT ITEMS Trailing cables (Power & control)	Routine Test,Make,Type & Rating	B	Document review	100%	100%	NTPC Approved TDS	Approved TDS/ IS: 694-1990	MTC	√	V	V	V		
1.5	Wire Rope	Breaking load, Dimensional,Make,Type & Rating	B	Document review	As per IS	As per IS	IS:2266/2355 Appd Drg	IS:2266/2355 Appd Drg	MTC	√	V	V	—		
1.6	Motor	Routine Test,Make,Type & Rating	A	Review	100%	10%	IS: 325 / Appvd drg	IS: 325 / Appvd drg	MTC and COG	√	V	V	V	*For Motors acceptance refers Note No.-3.	
1.7	Brake	Routine Test,Make,Type & Rating	B	Document review	100%	10%	Mfg Std	Mfg Std	MTC	√	P	V	V		
1.8	o/l relay	Routine Test for VFD & Control Transformer	B	Document review	100%	100%	IS: 12021 / Mfr Std	Mfr TC	Mfr TC	√	V	V	V		
1.9	Control Transformer,MCB,Fuse Lamp.Selector Switch,Contractor,VFD, o/l relay	Make,Type & Rating	B	Document review	100%	100%	As per approved drgs/Spec	Appvd drg	IR	√	P	V	V		
			LEGEND: Cl : Class (A : Critical,B : Major, C : Minor). ** M : Manufacturer/Sub-contractor, C : BHEL N : CLIENT *P*: PERFORM; *W*: WITNESS; *V*: VERIFICATION. MTC : Manufacturer's Test Certificate. ALC : Approved Lab Certificate. IR : Inspection Report. *Records,Identified with Tick(√) shall be essentially included in QA documentation.												
MANUFACTURER/SUBCONTRACTOR	MAIN SUPPLIER														
SIGNATURE															
									REVIEWED BY	APPROVED BY			APPROVAL SEAL		
NAME & SIGN. OF APPROVING AUTHORITY & SEAL															

MANUFACTURER'S NAME & ADDRESS:		MANUFACTURING QUALITY PLAN							PROJECT :					
		ITEM : BOILER LIFTING DEVICE-CRANES & HOISTS.					MCP NO. : DATE : PAGE No. 2 of 3		PACKAGE : CONTRACT NO. : MAIN SUPPLIER :					
SUB-SYSTEM :														
SL. NO.	COMPONENT / OPERATIONS	CHARACTERISTICS	CL	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N			P	D	M	C	N	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.1	Welding Soundness.	Butt Joints under tension & compression and T-Joints (if any for Girder, Rope Drum and End carriage). (100%RT& DPT) Other Butt Joints 100% MPI & DPT.	B	RT	100%	100%	ASME Sec VIII Div1, UE51/UW52	ASME Sec VIII Div1, UE51/UW52	IR	-	P	V	V	RT Films Review.
		Fillet weld (Major Load Parts) Ideal Run Test	B	MPI/LPI	100%	100%	ASME Sec VIII Div1, Appex.-8	ASME Sec VIII Div1, Appex.-8	IR	√	P	V	-	
2.2	Gear Box		B	LPI	100%	100%	ASME Sec VIII Div1, Appex.-8	ASME Sec VIII Div1, Appex.-8	IR	√	P	V	-	
			B	Temp.Rise, Vibration, Noise Level, Reduction Ratio, Oil Leakage test	100%	10%	Approved Data sheet/Tech. Specification	As per Manufacturer standard.	IR	√	P	W	V	Sampling Test per Type/Capacity.
2.3	Wheels/shafts/axle/gear & pinion	Strength	B	MPI / LPI	100%	100%	ASME Sec VIII Div2	ASME Sec VIII Div2	IR	-	P	V	-	NDT shall be done after hardfacing & Machining .
2.4	Hook	Strength	B	Prrof Load Test	100%	10%	IS: 15560/IS: 3815	As per approved drgs & TDS	IR	√	P	W	V	NDT(MPI/LPI) shall be done after Proof load test of Hook .
		Soundness (After load test)	B	MPI/LPI	100%	10%	ASME Sec VIII Div1, Appex.-8	ASME Sec VIII Div1, Appex.-8	IR	√	P	W	V	Paint adhesion no peel off, thickness min 50 microns (Powder coated).
2.5	Control Panel	HV,IR	A	Electrical Test	100%	100%	IS: 13947 Part I- 1993	As per approved drgs & TDS	IR	√	P	W	W	
		Functional / Interlock test	A	Electrical Test	100%	100%	As per DPSI approved drgs	As per approved drgs	IR	√	P	W	W	
		Paint Shade & Thickness, Adhesion	A	Visual/Measurement	100%	100%	As per DPSI approved drgs	As per approved drgs	IR	√	P	W	W	
		DOP by paper insertion	A	Visual	100%	100%	Not able to insert when door is closed.	As per approved drgs	IR	√	P	W	W	
		Dimension	A	Visual/Measurement	100%	100%	As per DPSI approved drgs	As per approved drgs	IR	-	P	W	W	
		LEGEND: C1 : Class (A : Critical, B : Major, C : Minor) ** M : Manufacturer/Sub-contractor, C : BHEL N : CLIENT *P*: PERFORM; *W*: WITNESS; *V* : VERIFICATION. MTC : Manufacturer's Test Certificate. ALC : Approved Lab Certificate. IR : Inspection Report. *Records/Identified with Tick(√) shall be essentially included in QA documentation.												
MANUFACTURER/SUBCONTRACTOR	MAIN SUPPLIER													
SIGNATURE														
									REVIEWED BY	APPROVED BY			APPROVAL SEAL	
NAME & SIGN. OF APPROVING AUTHORITY & SEAL														

MANUFACTURING QUALITY PLAN											PROJECT :			
MANUFACTURER'S NAME & ADDRESS:				ITEM :			MQP NO.:		PACKAGE :					
				SUB-SYSTEM :			DATE :		CONTRACT NO. :					
							PAGE No. 3 of 3		MAIN SUPPLIER : I					
S/L NO.	COMPONENT / OPERATIONS	CHARACTERISTICS	CL	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N			g	D'	M	C	N	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
3.1	Assembled Crane & Hoist	Overall Dimensional and Functional test.	B	Visual Measurement	100%	10%	As per approved drgs	As per DPSI approved drgs	IR	√	P	W	W	Sampling Test per Type/Capacity.
3.2	Performance	Load Test / Overload Test	B	Speeds, Deflection of Girder	100%	10%	IS:3177, IS:807 & IS:3938 & Approved G A Drawing Should not exceed span/900	IS:3177, IS:807 & Approved G A Drawing Should not exceed span/900	IR	√	P	W	W	Sampling Test per Type/Capacity. @: 100% witness for Cranes, 100% witness for Hoists of 10T and above, 10% witness for Hoists of 6T-10T Capacity.
3.3	Painting and Packing	Appearance	B	Visual	100%	-	As per approved Procedure, Drg, Tech specification.	As per approved Procedure, Drg Tech Specification		-	P	V	-	
<p>LEGEND: C1 : Class (A : Critical, B : Major, C : Minor) ** M : Manufacturer/Sub-contractor, C : Doosan power Systems India Pvt. Ltd. N : BHEL "P": PERFORM; "W": WITNESS; "V": VERIFICATION. MTC : Manufacturer's Test Certificate. ALC : Approved Lab Certificate. IR : Inspection Report. *Records, identified with Tick(√) shall be essentially included in QA documentation.</p>														
MANUFACTURER/SUBCONTRACTOR		MAIN SUPPLIER												
SIGNATURE														
REVIEWED BY		APPROVED BY		APPROVAL SEAL										
NAME & SIGN. OF APPROVING AUTHORITY & SEAL														
NOTES: 1) ALL MATERIAL OF CONSTRUCTION AND MAKES SHALL BE AS PER APPROVED DRAWINGS & BOI LIST - upto 50 KW 2) MAKE OF MOTORS & BRAKES SHALL BE AS PER APPROVED DRAWINGS AND BOI LIST - upto 50 KW 3) Acceptance of motor less than 30KW based on Manufacturer COC. And Above than 30KW acceptance based on inspection Witnessed report and manufacturer COC.														
A). <u>Less than 30 KW</u> -Acceptance of motor less than 30 KW is based on COC of the manufacturer & the contractor confirming as follows. It is hereby confirmed that the above mentioned motor/motor was /were manufactured taking care of NTPC specific requirement regarding amb, temp, voltage & frequency Variation, hot start, pull out torque, starting KVA/KW, temp, rise, distance between centre of stud & gland plate and tested in accordance with approved drawings/data sheet. B). <u>30 KW and above</u> - Acceptance of motor rating between 30 KW & 50 Kw is based on NTPC review of Routine test inspection as per IS 325 witnessed by main contractor along with COC of the manufacturer & the contractor confirming as follows. It is hereby confirmed that the above mentioned motor/motor was /were manufactured taking care of NTPC specific requirement regarding amb, temp, voltage & frequency Variation, hot start, pull out torque, starting KVA/KW, temp, rise, distance between centre of stud & gland plate and tested in accordance with approved drawings/data sheet.														

UNDERSLUNG CRANES SUPPLIER WITH MFR.'s LOGO (TO BE FILLED BY UNDERSLUNG CRANES SUPPLIER)	UNDERSLUNG CRANES MANUFACTURER'S NAME AND ADDRESS (TO BE FILLED BY UNDERSLUNG CRANES MANUFACTURER)	MANUFACTURING QUALITY PLAN				PROJECT: PACKAGE: FGD PACKAGE	
		ITEM: UNDERSLUNG CRANES FOR FGD APPLICATION	QP NO.: FGD: UNDERSLUNG CRANES:001	CONTRACT NO:		MAIN CONTRACTOR: BHEL - RANIPET	
		SUB-SYSTEM: FGD	REV.NO.: 00	DATE:		SUB CONTRACTOR (OEM) & ADDRESS: (TO BE FILLED BY OEM SUPPLIER)	
		PAGE: OF....					

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				D*	M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.

		LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: UNDERSLUNG CRANE MANUFACTURER C: MAIN SUPPLIER - BHEL/BHEL AIA, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFIED IN COLUMN "N" AS 'W'		DOC. NO.: REV..... CAT.....	
UNDERSLUNG CRANE MANUFACTURER/ MAIN (BHEL) SUPPLIER	SIGNATURE		FOR NTPC USE	REVIEWED BY	APPROVED BY



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)/ Contractor (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 Principal 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) _____

*(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", SRI 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 and its 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
10. DATE OF EXPIRY OF CLAIM PERIOD

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	
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	
Union Bank of India	

Registered Office

BHEL House, Siri Fort, New Delhi-110049 (India)

CIN: L74899DL1964GOI004281

Phone: 011-66337000, Fax: 011-66337428

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