REF: MISTEL:BHILAI

TECHNICAL INFORMATION OF MIST ELIMINATOR FOR NSPCL BHILAI 2X250 MW

A. TECHNICAL INFORMATION

Sl. No.	Description	Requirement	
1.	**End Customer**	NSPCL (NTPC-SAIL Power Corporation Limited)	
2.	**Project Name**	Bhilai 2X250 MW	
3.	**Location**	District Durg, Bhilai (East) , Chattisgarh State, India	
4.	**Type**	Three stage chevron type (First Stage shall be Flat or Roof Type, Second and Third stages shall be Diamond/Roof type)	
5.	**Material of construction of Mist Eliminator**		
i.	ME Panel	Polysulfone (Or) Super austenitic stainless steel (254 SMO)	
ii.	Washing Pipe	FRP with corrosion and erosion resistant in the inner and outer side (Silicon Carbide coating on FRP surface exposed to slurry)	
iii.	Wash Pipe Supports	Shall be lined with min 2mm thk Alloy 59/C276 or entire Material in Alloy 59/C276	
iv.	Washing Nozzles	PVDF or PP as per bidder's proven practice	
v.	Hardware inside absorber	a) Alloy 59/ C276 for load bearing applications b) All metallic fasteners provided shall be of Alloy 59/C276 c) For pipe clamps, C276 Bolt, C276 Nut, C276 washer and C276 spring washer to be provided	
vi.	Enclosure Plate	Same as that of ME Panel if it is part of Mist Eliminator (or) C276 material.	
v.	ME Panel	Polysulfone (Or) Super austenitic stainless steel (254 SMO)	
6.	**Quantity**		
i.	Quantity of Mist Eliminators for Unit-1,2	2 sets (1 set for each unit) 1 set means Complete Mist Eliminators, Washing systems and accessories	
7.	**Parameters**		
vi.	Gas flow	Vertical	
vii.	Casing Dimension	Length : 7900 mm	Width : 13900 mm
viii.	Design Pressure of Mist Eliminator Panel	660 mmH_2O (G)	
ix.	Max Allowable Pressure drop across Mist Eliminator element	20 mmH_2O (G) at Design point	
x.	Design Temperature	• 70 Deg C (Continuous) • 80 – 90 Deg C (30 minutes) • 90 – 100 Deg C (5 min)	

Customer / Plant: NTPC BHILAI (2x250MW)								
Cont. No. : G211, G212	Rev. 00		Rev. 01		Rev. 02		Rev. 03	
	Sign	Date	Sign	Date	Sign	Date	Sign	Date
Engineer : VV	-sd-	20.03.20						
Reviewer : PNR/ACR	-sd-	20.03.20						
Approver : RSB	-sd-	20.03.20						

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Sl. No.	Description	Requirement	
8.	**Gas condition at ME Inlet**	**Guarantee Point**	**Design Point**
i.	Gas Flow Rate (Nm^3/s-wet)	308	352
ii.	Gas Flow Rate (m^3/s-wet)	371	429
iii.	Gas Temperature (Deg C)	57.2	61.1
iv.	Density (kg/m^3)	1.044	1.018
v.	Operating Pressure at Mist Eliminator inlet (mm H_2O (G))	48	60
vi.	Gas Flow Distribution	+ or - 20%	
9.	**Gas Composition at ME Inlet**		
i.	SO_2 (Vol%-wet)	0.0071	0.0069
ii.	H_2O (Vol%-wet)	17.08	20.47
iii.	O_2 (Vol%-wet)	5.72	5.48
iv.	CO_2 (Vol%-wet)	10.19	9.78
v.	N_2 (Vol%-wet)	67.0	64.26
vi.	HCl (ppm-wet)	<3	<3
vii.	HF (ppm-wet)	<1	<1
vii.	Dust (mg/Nm^3-wet)	<50	<200
10.	Gypsum Slurry Density(t/m3)	1213	1213
11.	**Entrained Mist Condition:**		
i.	Mist Concentration at Inlet –at Guarantee & Design Point	200 g/Nm^3-dry	
ii.	Mist Concentration at Outlet –at Guarantee & Design Point	≤20 mg/Nm^3	

12.	**Mist Composition**	
i.	Solid	30 wt.%
ii.	Cl^-	19000 ppm
iii.	Mg^{2+}	7570 ppm
iv.	Ca^{2+}	1170 ppm
v.	Na^+	1240 ppm
vi.	SO_4^{2-}	8055 ppm

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TECHNICAL INFORMATION OF MIST ELIMINATOR FOR NSPCL BHILAI 2X250 MW

B. WASHING ARRANGEMENT

1.1 Washing water condition		
a.	Flow rate - Average	13.77 m^3/hr *1)
b.	Flow rate at M/E Inlet – Instantaneous Allowable Max	96 m^3/hr
c.	Flow rate at M/E Inlet – Instantaneous Min	80 m^3/hr
d.	Feed Pressure (at inlet flange of ME Wash header)	0.2 MPa (Max)
e.	Spray Nozzle –Top washing	90 °, Full Cone(vendor shall decide based on proven practice)
f.	Spray Nozzle –Bottom washing	120 °, Full Cone(vendor shall decide based on proven practice)
g.	Spray pipe level from ME Panel	< 700 mm

*1) Vendor shall decide

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C. WATER ANALYSIS

Process water is envisaged for Mist Eliminator washing. Process water analysis is provided below.

S.no	Constituents	Unit	PROCESS WATER
1.	Calcium as $CaCO_3$	ppm	190
2.	Magnesium as $CaCO_3$	ppm	121
3.	Chlorides as $CaCO_3$	ppm	110
4.	Sulphate as $CaCO_3$	ppm	93.5
5.	Alkalinity as $CaCO_3$	Ppm	297
6.	Iron as fe	ppm	0.55
7.	Total silica	ppm	38.5
8.	pH		7.5
9.	Turbidity	NTU	11

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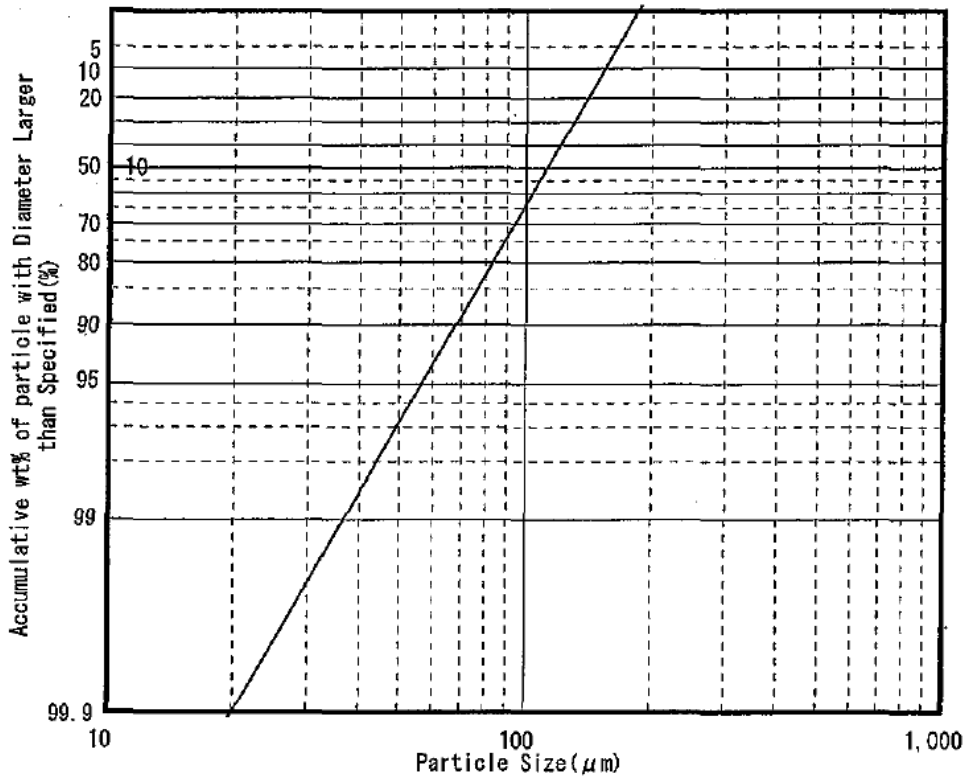
D. MIST PARTICLE SIZE DISTRIBUTION

a. Bidder shall note there is a tie beam located at the centre line of Absorber (Bidder shall refer to Note 01 :B in the typical drawing enclosed). This tie beam has to be used as Mist Eliminator beam.

b. Overall wash arrangement shall be as per the drawing (typical) enclosed.

The Mist Particle Size Distribution shall be as per below fig

Fig. 2 Mist Particle Size Distribution(EXPECTED VALUE)



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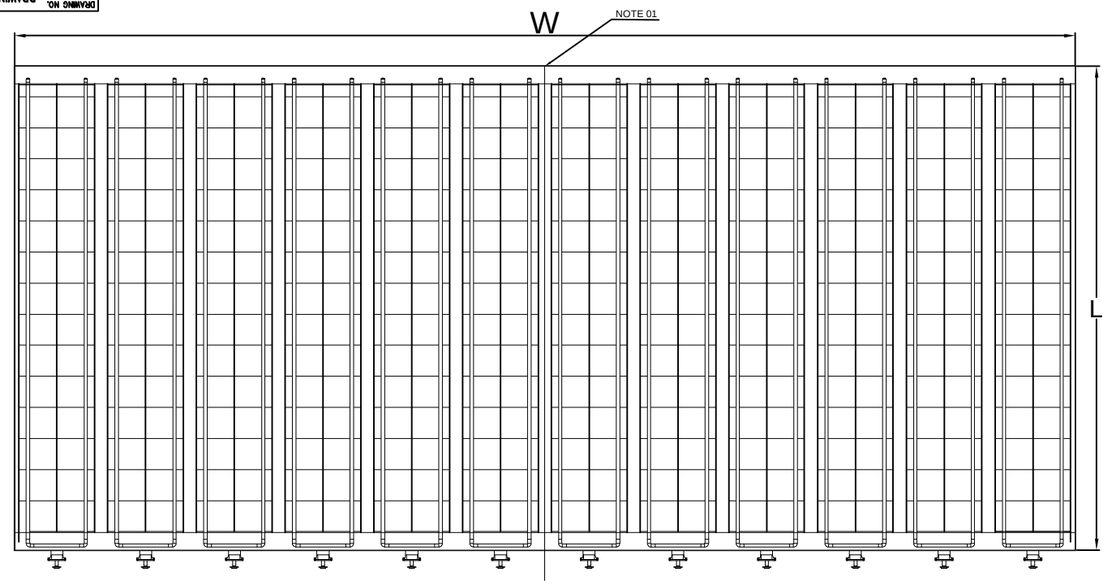
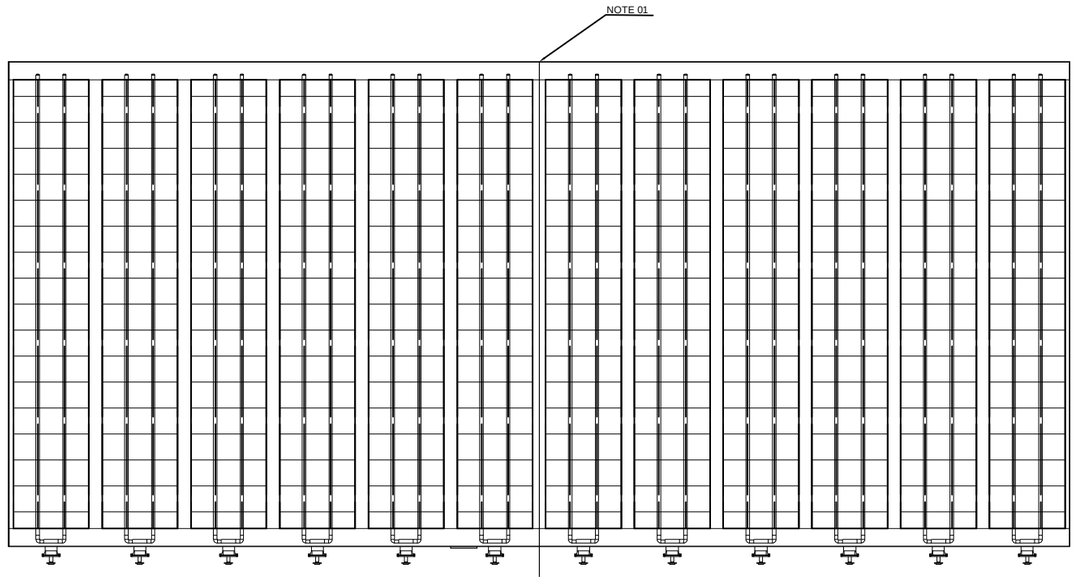
DRAWING NO.

All dimensions are in millimeters





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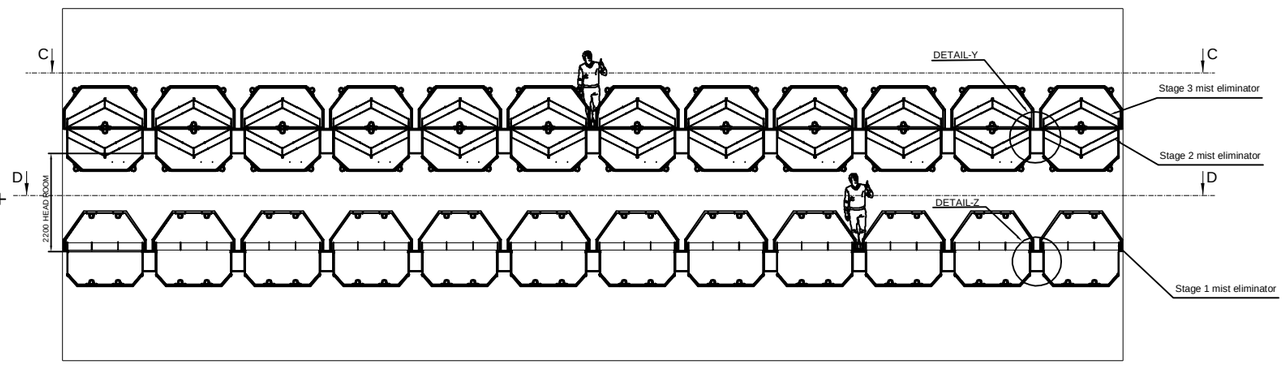

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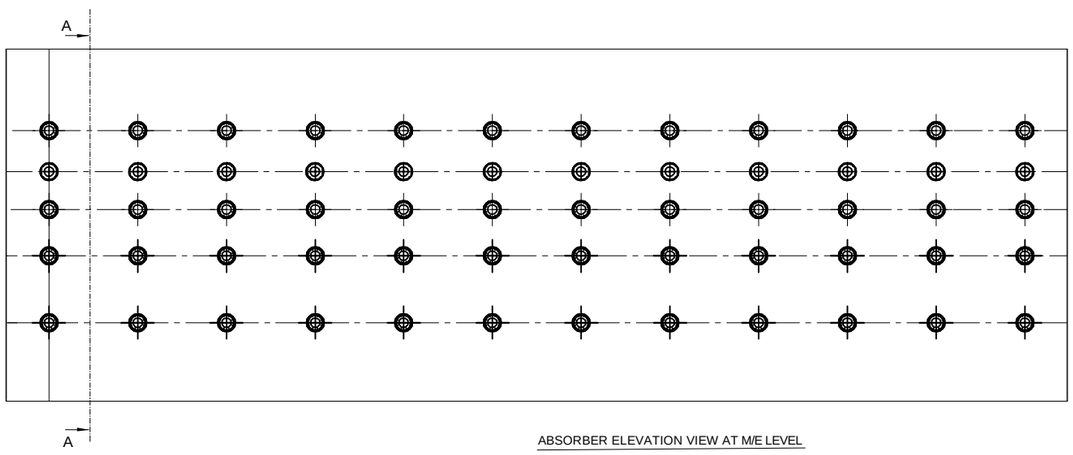
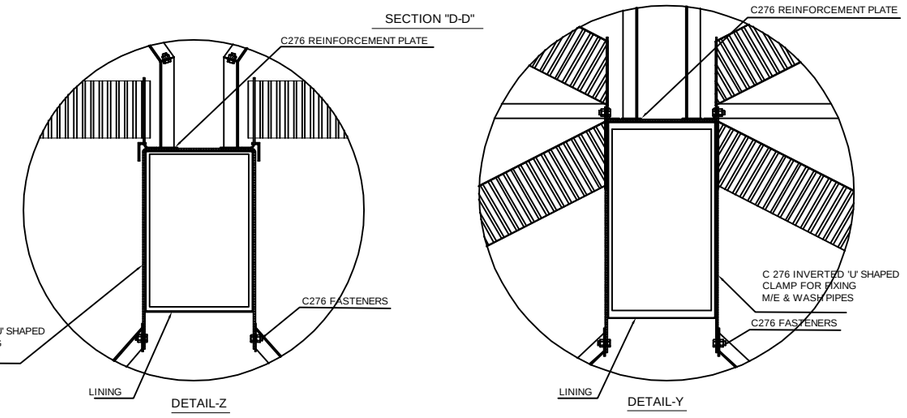
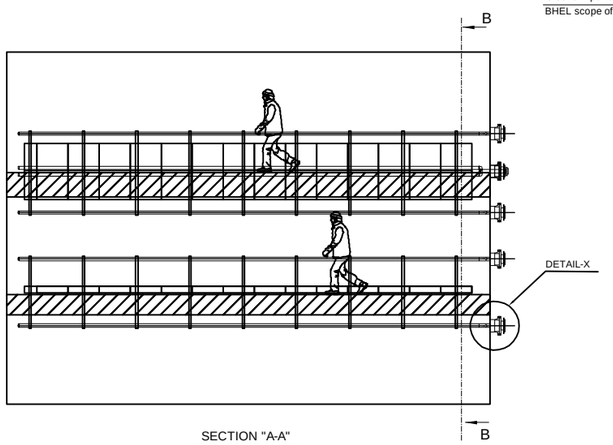


ABSORBER ELEVATION VIEW AT M/E LEVEL

SECTION "D-D"





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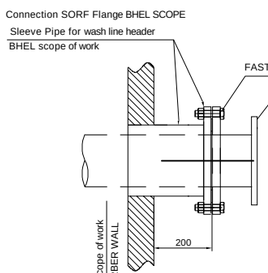

DETAIL-X

THE FOLLOWING ITEMS ARE IN VENDOR SCOPE:

a) MIST ELIMINATOR MODULE WITH END STOPPER PLATE FOR ALL THE STAGES

b) FLUSHING PIPES WITH SPRAY NOZZLES AND FLANGE FOR THE FRONT AND BACK WASH FOR ALL THE STAGES

c) HORIZONTAL MEMBER FOR PIPE SUPPORT WITH MOUNTING CLAMP FOR PIPE

d) VERTICAL MEMBER (LEG SUPPORT- L ANGLE) FROM THE MAIN BEAM TO HORIZONTAL PIPE SUPPORT

e) INVERTED U-CLAMP (HANGER TYPE) FOR MOUNTING BOTTOM WASH PIPE SUPPORT

f) PAD PLATE AT THE END OF THE LEG SUPPORT

g) ALL FASTENERS (MADE OF C-276) FOR SUPPORT MEMBERS/LOAD BEARING MEMBER INSIDE ABSORBER

h) FASTENERS/GASKETS FOR THE FLANGES OUTSIDE ABSORBER AS PER THE DRAWING

i) ANY BLANKING PLATE, IF REQUIRED, SHALL BE PROVIDED

BHEL WILL PROVIDE ONLY THE MAIN SUPPORT BEAM AND OUTER RING SUPPORT FOR THE MIST ELIMINATOR. ALL SUPPORTS FOR PIPE SHALL BE TAKEN FROM THE MAIN SUPPORT BEAM /OUTER RING .

PIPE SUPPORTS SHALL NOT BE TAKEN FROM ABSORBER CASING.

1st STAGE MAY BE WITH ROOF TYPE/FLAT.

2nd & 3rd STAGE HAS TO BE DIAMOND(AS PER DRAWING).

NOZZLE LOCATION ON 'W' SIDE ONLY.

NOTE 01:

A) WHEN W ≤ 20.4M CENTRAL BEAM AT "W/2 LOCATION" IS MANDATORY , IT'S LOCATON CAN NOT BE DISTURBED TO ACCOMADATE M/E

B) WHEN W > 20.4M CENTRAL BEAM NOT APPLICABLE, INSTEAD TWO BEAMS ONE ON EITHER SIDE AT A DISTANCE OF 4 TO 5.5 M AWAY FROM THE CENTRE LINE, THESE TWO BEAMS ARE MANDATORY AND IT'S LOCATION CAN NOT DISTURBED TO ACCOMADATE M/E. EXACT LOCATION OF BEAMS WILL BE INFORMED DURING DETAIL ENGINEERING .

REV	DATE	ALTERED / CHECKED
ZONE		

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.
UNIT: BOILER AUXILIARIES PLANT, RANIPET – 632 406.

	NAME	SIGN	DATE
DRN	SR		15-DEC-20
CHD	BHARMIKA		
APPD	V MOHAVAN		

NO.OF VAR. –

DEPT	GRADE OF LIM'TOL. DIM	SCALE	WEIGHT (KG).	REF. TO ASSY/OLD DRG.	ITEM NO.	BILL OF MAT.
FCD	–	N.T.S	–	–	–	–
CODE 9789						

TITLE: TYPICAL ARRANGEMENT OF M/E (3 STAGE)

CARD CODE: U 01

DRAWING NO.: SKETCH M/E 01

REV: 00

Size A0