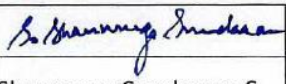
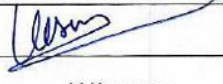


00	31-03-2020	Fresh Release	 Shanmuga Sundaram S	 V Kesavan
REV	DATE	DESCRIPTION	Prepared	Checked & Approved

1.0 TECHNICAL INFORMATION

Sl. No.	Description	Requirement
1.	End Customer	NTPC Limited
2.	Project Name	Nabinagar Stage-1 3x660 MW
3.	Type	Three stage chevron type (Flat or Roof Type)
4.	Quantity	
i.	Quantity of Mist Eliminators for Unit-1,2,3	3 sets (1 set for each unit) 1 set means Complete Mist Eliminators, Washing systems and accessories.
5.	MOC	
i.	ME Panel	Polysulfone
ii.	Washing Pipe	a) Rubber lined carbon steel or glass fiber reinforced plastics b) Polypropylene or PVC is also acceptable provided bidder has proven experience for the same. Supporting documents to be produced.
iii.	Wash Pipe Supports	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.
6.	Parameters	
i.	Gas flow	Vertical
ii.	Casing Dimension	Length : 10900 mm Width : 23900 mm
iii.	Design Pressure of Mist Eliminator Panel	660 mmH ₂ O (G)
iv.	Max Allowable Pressure drop across Mist Eliminator element	20 mmH ₂ O (G) at Design point 16 mmH ₂ O (G) at Guarantee point
v.	Design Temperature	• 70 Deg C (Continuous) • 80 – 90 Deg C (30 minutes) • 90 – 110 Deg C (5 min)
7.	Gas condition at ME Inlet	Guarantee Point Design Point

Sl. No.	Description	Requirement	
i.	Gas Flow Rate (Nm ³ /s-wet)	734.62	814.95
ii.	Gas Flow Rate (m ³ /s-wet)	891.04	1000.1
iii.	Gas Temperature (Deg C)	58.2	62.1
iv.	Density (kg/m ³)	1.02907	1.00164
v.	Operating Pressure at Mist Eliminator inlet (mm H ₂ O (G))	45	64
vi.	Gas Flow Distribution	+ or - 20%	
8.	Gas Composition at ME Inlet		
i.	SO ₂ (Vol%-wet)	0.0021	0.0020
ii.	H ₂ O (Vol%-wet)	17.87	21.40
iii.	O ₂ (Vol%-wet)	5.89	5.64
iv.	CO ₂ (Vol%-wet)	9.36	8.96
v.	N ₂ (Vol%-wet)	66.87	64.0
vi.	HCl (ppm-Dry)	<2	<2
9.	HF (ppm-Dry)	<1	<1
i.	Dust (mg/Nm ³ -wet)	<50	<200
10.	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	
11.	Mist Composition		
i.	Solid	30 wt. %	
ii.	Cl ⁻	22116 ppm	
iii.	Mg ²⁺	10189 ppm	
iv.	Ca ²⁺	728.28 ppm	
v.	Na ⁺	3003.03 ppm	
vi.	SO ₄ ²⁻	16453.95 ppm	

1.1 WASHING ARRANGEMENT

I.	Washing water condition	
a.	Flow rate - Average	32.1 m ³ /hr *1)
b.	Flow rate at M/E Inlet – Instantaneous Allowable Max	120 m ³ /hr
c.	Flow rate at M/E Inlet – Instantaneous Min	100 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 (vendor shall decide based on proven practice)

II.	Washing Method						
		First Stage		Second Stage		Third Stage	
		Front Surface	Back Surface	Front Surface	Back Surface	Front Surface	Back Surface
a.	Total Washing Area m ²	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9	10.9 x 23.9
b.	Washing Water Source	Refer Clause 1.2					
c.	Washing Water Average Flow rate m ³ /h	*	*	*	*	*	**
d.	Instantaneous Max Water Flow rate m ³ /h	*	*	*	*	*	**
e.	Duration of One washing for One Divided Section Sec	*	*	*	*	*	**
f.	Time of One washing Cycle (min)	*	*	*	*	*	**
*Washing method shall be confirmed by the vendor. ** Only for Maintenance *1) shall be finalized by vendor							

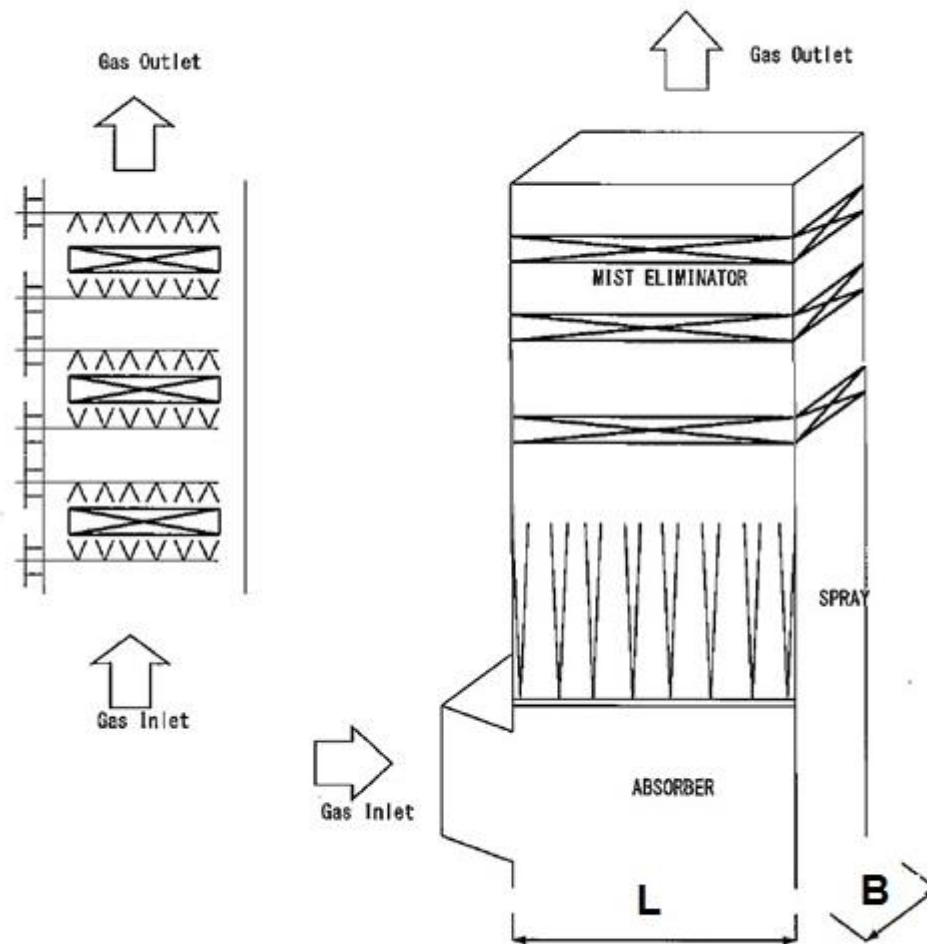
1.2 WATER ANALYSIS

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	720.5
2.	Magnesium as CaCO ₃	ppm	286
3.	Sodium as CaCO ₃	ppm	357.5
4.	Potassium as CaCO ₃	ppm	1364
5.	Iron as fe	ppm	110
6.	Total alkalinity as CaCO ₃	ppm	511.5
7.	Chlorides as CaCO ₃	ppm	55
8.	Sulphate as CaCO ₃	ppm	687.5
9.	Silica	ppm	1364
10.	pH	-	7.0-8.2
11.	Turbidity	NTU	10

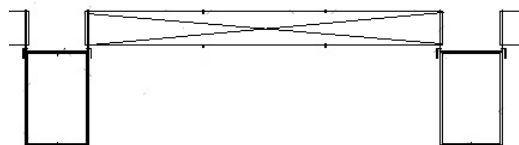
1.3 MIST ELIMINATOR ARRANGEMENT AND MIST PARTICLE SIZE DISTRIBUTION:

Typical sketch



L-Length-10900 mm, B-Breadth-23900 mm

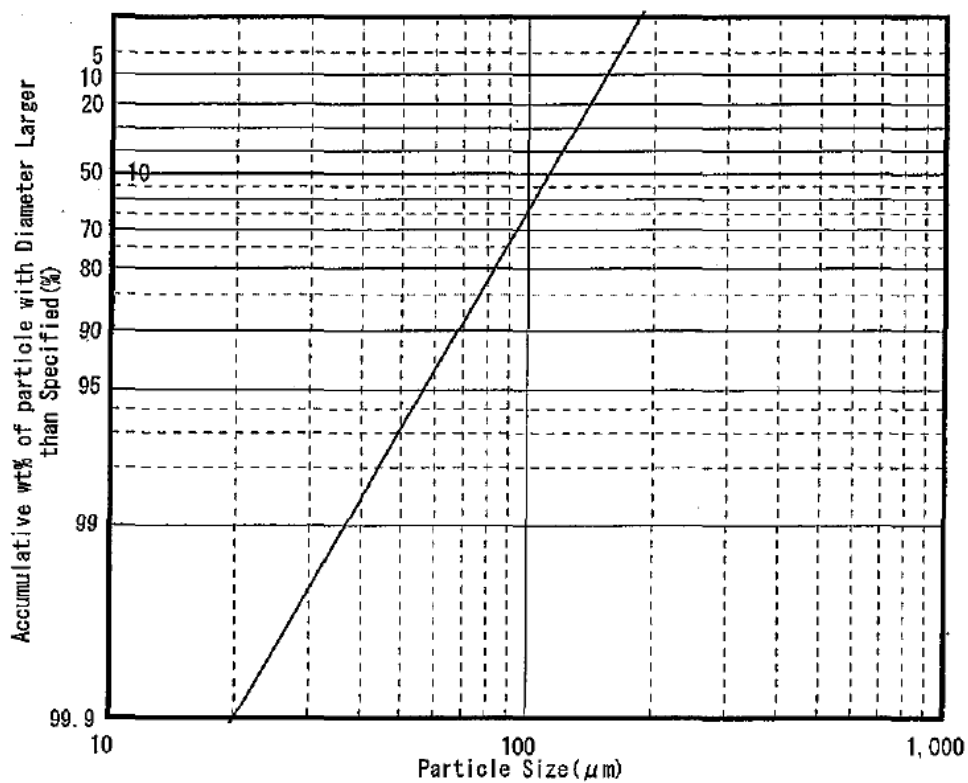
Mist Eliminator modules shall be provided with non slipping end stopper as given below:

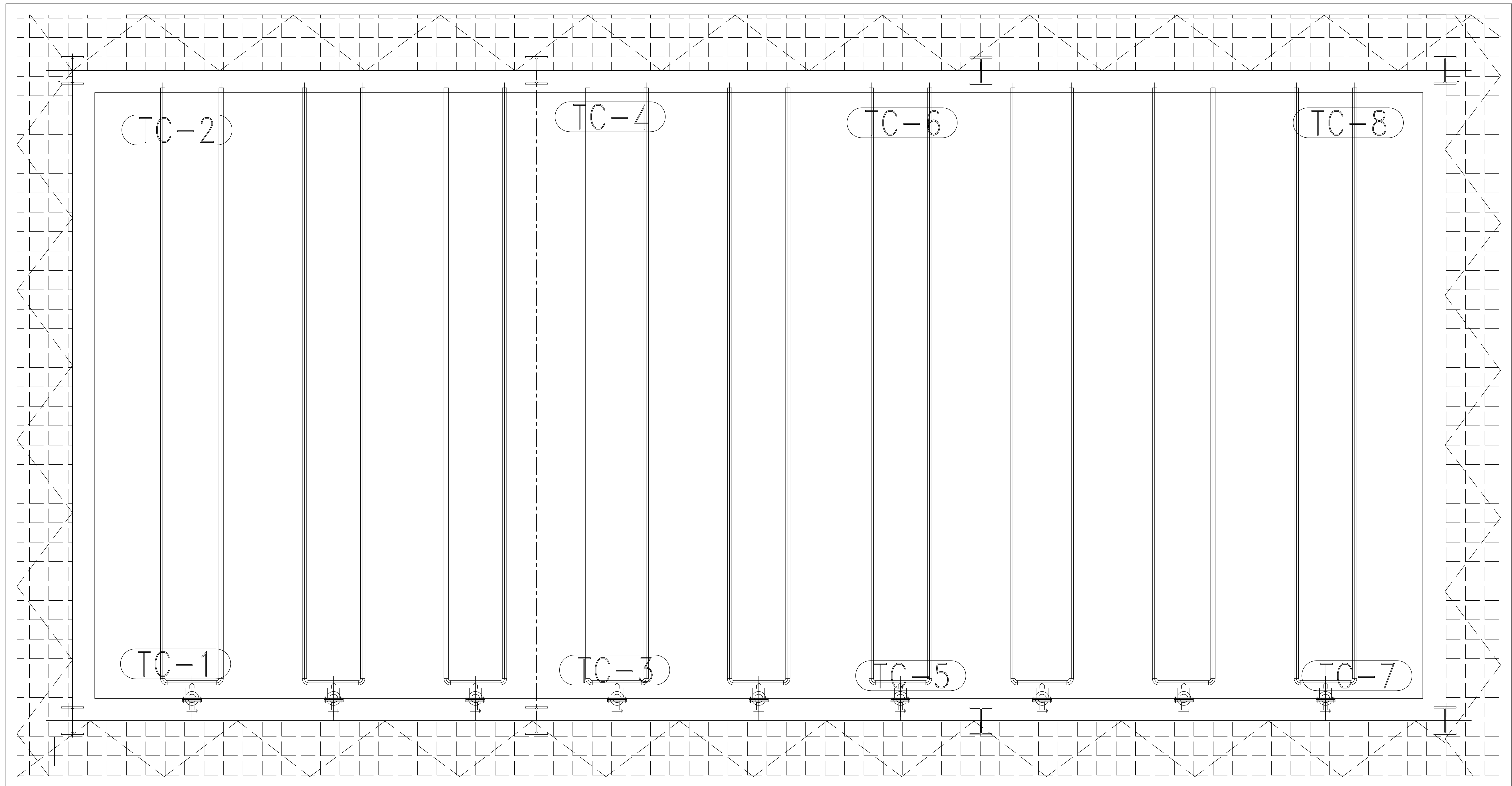


Note:

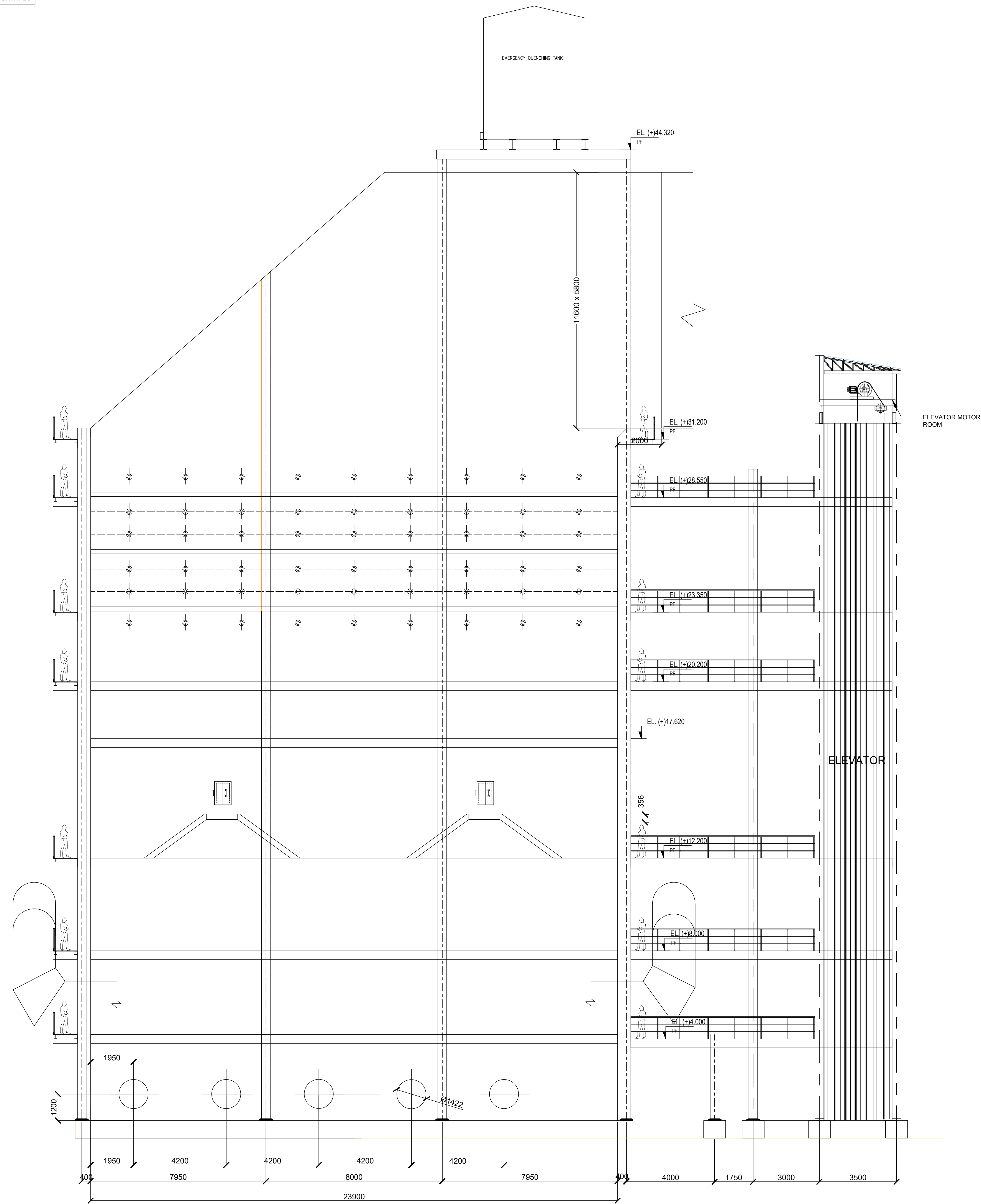
- Bidder to decide the spray washing arrangement considering the water flow rate mentioned above.
- Only Typical arrangement is shown in the fig with Flat Type of Mist Eliminator. Bidder can also offer Roof Type Mist Eliminator for all the three stages (or) First stage flat type , 2nd and 3rd stage Roof Type.
- Three level of ME support beams will be provided by BHEL. The distance between the 1st stage and the 3rd stage ME support beam is 5.2 meter approx..

Fig.2 Mist Particle Size Distribution(EXPECTED VALUE)





PLAN @ EL + 23.350 & +28.550



View A-A