CABLE SCHEDULE FIELD INSTRUMENT								
Sl No	Unit Cable No	From	To	Purpose	Cable Type	Remarks	Length(m)	Cable Route
1	ETP-JB-001-S1	ALUM Dosing Tank Level	JB-001(24way)	ALUM Dosing Tank Level measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
2	ETP-JB-001-S2	ALUM Pump Discharge pressure	JB-001(24way)	ALUM Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
3	ETP-JB-001-OG01	JB-001(24way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
4	ETP-JB-002-S1	Lime Dosing Tank Level	JB-002(24way)	Lime Dosing Tank Level measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
5	ETP-JB-002-S2	Lime Pump Discharge pressure	JB-002(24way)	Lime Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
6	ETP-JB-002-OG01	JB-002(24way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
7	ETP-JB-003-S1	PE Dosing Tank Level	JB-003(24way)	PE Dosing Tank Level measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
8	ETP-JB-003-S2	PE Pump Discharge pressure	JB-003(24way)	PE Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
9	ETP-JB-003-OG01	JB-003(24way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
10	ETP-JB-004-S1	Acid Dosing Tank Level	JB-004(48way)	Acid Dosing Tank Level measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
11	ETP-JB-004-S2	Overhead Water Storage tank Level	JB-004(48way)	Acid Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
12	ETP-JB-004-S3	Acid Dosing Pump Discharge pressure	JB-004(48way)	Acid Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
13	ETP-JB-004-S4	Acid Dosing Pump Discharge pressure	JB-004(48way)	Acid Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
14	ETP-JB-004-OG01	JB-004(48way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
15	ETP-JB-004-OG02	JB-004(48way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
16	ETP-JB-005-S1	Alkali Dosing Tank Level	JB-005(24way)	Alkali Dosing Tank Level measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
17	ETP-JB-005-S2	Alkali Dosing Pump Discharge pressure	JB-005(24way)	AlkaliDosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
18	ETP-JB-005-S3	Alkali Dosing Pump Discharge pressure	JB-005(24way)	Alkali Dosing Pump discharge measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
19	ETP-JB-005-OG01	JB-005(24way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
20	ETP-JB-005-OG02	JB-005(24way)	ETP DDCMIS		2PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
21	ETP-JB-006-S1	Sludge transfer sump Level	JB-006(48way)	Sludge sump Level measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
22	ETP-JB-006-S2	Sludge Transfer pump discharge Pressure	JB-006(48way)	Sludge transfer pump discharge pressure measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
23	ETP-JB-006-S3	Air Blower discharge header flow	JB-006(48way)	Air Blower discharge header flow measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
24	ETP-JB-006-S4	Air Blower discharge Pressure	JB-006(48way)	Air Blower discharge pressure measurement	2PX0.5SQMM (F Type)		50	Refer cable tray layout Drg
25	ETP-JB-006-OG01	JB-006(48way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
26	ETP-JB-006-OG02	JB-006(48 way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg

27	ETP-JB-007-S1	Coal Mill Waste sump (Unit-1) Level	JB-007(48way)	Coal Mill Waste sump (Unit_1)Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
28	ETP-JB-007-S2	Coal Mill Waste sump (Unit-1) Level	JB-007(48way)	Coal Mill Waste sump (Unit-1)Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
29	ETP-JB-007-S3	Coal Mill Oily Waste Transfer Pump (Unit-1) discharge Pressure	JB-007(48way)	Coal Mill Oily Waste transfer pump(Unit-1) discharge pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
30	ETP-JB-007-S4	Coal Mill Oily Waste Transfer Pump (Unit-1) discharge Pressure	JB-007(48way)	Coal Mill Oily Waste transfer pump (Unit-1)discharge pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
31	ETP-JB-007-OG01	JB-007(48way)	MAIN PLANT DDCMIS		8PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
32	ETP-JB-008-S1	Coal Mill Waste sump (Unit-2) Level	JB-008(48way)	Coal Mill Waste sump (Unit_2)Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
33	ETP-JB-008-S2	Coal Mill Waste sump (Unit-2) Level	JB-008(48way)	Coal Mill Waste sump (Unit-2)Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
34	ETP-JB-008-S3	Coal Mill Oily Waste Transfer Pump (Unit-2) discharge Pressure	JB-008(48way)	Coal Mill Oily Waste transfer pump(Unit-2) discharge pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
35	ETP-JB-008-S4	Coal Mill Oily Waste Transfer Pump (Unit-2) discharge Pressure	JB-008(48way)	Coal Mill Oily Waste transfer pump (Unit-2)discharge pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
36	ETP-JB-008-OG01	JB-008(48 way)	MAIN PLANT DDCMIS		8PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
37	ETP-JB-009-S1	Retention Pit for Oily Waste(Unit-1) from transformer Level	JB-009(24way)	Retention Pit for Oily Waste (Unit-1)from transformer Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
38	ETP-JB-009-S2	Transformer Yard Area Oily Waste Transfer Pump (Unit-1) discharge Pressure	JB-009(24way)	Transformer Yard Oily Waste Transfer pump (Unit-1) pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
39	ETP-JB-009-OG01	JB-009(12 way)	MAIN PLANT DDCMIS		8PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
40	ETP-JB-010-S1	Retention Pit for Oily Waste(Unit-2) from transformer Level	JB-010(24way)	Retention Pit for Oily Waste (Unit-2)from transformer Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
41	ETP-JB-010-S2	Transformer Yard Area Oily Waste Transfer Pump (Unit-2) discharge Pressure	JB-010(24way)	Transformer Yard Oily Waste Transfer pump (Unit-2) pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
42	ETP-JB-010-OG01	JB-010(12 way)	MAIN PLANT DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
43	ETP-JB-011-S1	Pre Settling Pit (Unit-1) from transformer Level	JB-011(24way)	Pre Settlig Pit (Unit-1) Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
44	ETP-JB-011-S2	Pre Settling Overflow Pump (Unit-1) discharge Pressure	JB-011(24way)	Pre Settling pump(Unit-1) pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
45	ETP-JB-011-OG01	JB-011(12 way)	MAIN PLANT DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
46	ETP-JB-012-S1	Pre Settling Pit (Unit-2) from transformer Level	JB-012(24way)	Pre Settlig Pit(Unit-2) Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
47	ETP-JB-012-S2	Pre Settling Overflow Pump (Unit-2) discharge Pressure	JB-012(24way)	Pre Settling Overflow pump(Unit-2) pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
48	ETP-JB-012-OG01	JB-012(12 way)	MAIN PLANT DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg

49	ETP-JB-013-S1	Power House Oily Waste sump (Unit-1) Level	JB-013(24way)	Power House Oily Waste sump(Unit-1) Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
50	ETP-JB-013-S2	Power House Oily area Service waste Pump (Unit-1) discharge Pressure	JB-013(24way)	Power House Oily area Service Waste Pump (Unit-1) pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
51	ETP-JB-013-OG01	JB-013(12 way)	MAIN PLANT DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
52	ETP-JB-014-S1	Power House Oily Waste sump (Unit-2) Level	JB-014(24way)	Power House Oily Waste sump(Unit-2) Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
53	ETP-JB-014-S2	Power House Oily area Service waste Pump (Unit-2) discharge Pressure	JB-014(24way)	Power House Oily area Service Waste Pump (Unit-2) pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
54	ETP-JB-014-OG01	JB-014(12 way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
55	ETP-JB-015-S1	Common Collection sump Level	JB-015(24way)	Collection sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
56	ETP-JB-015-S2	TPI Inlet Water Transfer Pump discharge Pressure	JB-015(24way)	TPI Inlet Water Transfer Pump pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
57	ETP-JB-015-OG01	JB-015(12 way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
58	ETP-JB-016-S1	Guard Pond Compartment-1 Level	JB-016(48way)	Guard Pond Overflow sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
59	ETP-JB-016-S2	Guard Pond Effluent Transfer Pump discharge Pressure	JB-016(48way)	Guard Pond Effluent Transfer Pump pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
60	ETP-JB-016-S3	Guard Pond Effluent Transfer Pump discharge Pressure	JB-016(48way)	Guard Pond Effluent Transfer Pump pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
61	ETP-JB-016-S4	Guard Pond Effluent Transfer Pump discharge flow	JB-016(48way)	Guard Pond Effluent Transfer Pump Flow measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
62	ETP-JB-016-OG01	JB-016(48 way)	ETP DDCMIS		12PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
63	ETP-JB-017-S1	Guard Pond Effluent Transfer Pump discharge PH	JB-017(24way)	Guard Pond Effluent Transfer Pump PH measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
64	ETP-JB-017-S2	Guard Pond Effluent Transfer Pump discharge Turbidity	JB-017(24way)	Guard Pond Effluent Transfer Pump Turbidity measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
65	ETP-JB-017-S3	Guard Pond Effluent Transfer Pump discharge Temperature	JB-017(24way)	Guard Pond Effluent Transfer Pump Temperature measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
66	ETP-JB-017-OG01	JB-018(24 way)	ETP DDCMIS		2PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
67	ETP-JB-017-OG02	JB-018(24 way)	ETP DDCMIS		4PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
68	ETP-JB-018-S1	CMB Compartment -1 Level	JB-018(48way)	GMB Overflow sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
69	ETP-JB-018-S2	CMB Effluent Transfer Pump discharge Pressure-1	JB-018(48way)	CMB Effluent Transfer Pump pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
70	ETP-JB-018-S3	CMB Effluent Transfer Pump discharge Pressure-2	JB-018(48way)	CMB Effluent Transfer Pump pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
71	ETP-JB-018-S4	CMB Effluent Transfer Pump discharge Flow	JB-018(48way)	CMB Effluent Transfer Pump Flow measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
72	ETP-JB-018-OG01	JB-018(48 way)	ETP DDCMIS		12PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
73	ETP-JB-019-S1	Gardening Pump discharge pressure	JB-019(48way)	Gardening Pump pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg

74	ETP-JB-019-S2	CMB Effluent Transfer Pump discharge PH	JB-019(48way)	CMB Effluent Transfer Pump PH measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
75	ETP-JB-019-S3	CMB Effluent Transfer Pump discharge Turbidity	JB-019(48way)	CMB Effluent Transfer Pump Turbidity measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
76	ETP-JB-019-S4	CMB Effluent Transfer Pump discharge Temperature	JB-019(48way)	CMB Effluent Transfer Pump Temperature measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
77	ETP-JB-019-OG01	JB-019(48 way)	ETP DDCMIS		8PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
78	ETP-JB-019-OG02	JB-019(48 way)	ETP DDCMIS		2PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
79	ETP-JB-021-S1	Polymer Dosing pump-1 strainer differential pressure	JB-021(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
80	ETP-JB-021-S2	Alkali Dosing pump-1 CMB strainer differential pressure	JB-021(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
81	ETP-JB-021-S3	Alkali Dosing pump-2 CMB strainer differential pressure	JB-021(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
82	ETP-JB-021-S4	Acid Dosing pump-1 Guard Pond strainer differential pressure	JB-021(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
83	ETP-JB-021-OG01	JB-021(48 way)	ETP DDCMIS		12PX0.5SQMM (G Type)		20	Refer cable tray layout Drg
84	ETP-JB-020-S1	Lime Dosing pump-2 strainer differential pressure	JB-020(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
85	ETP-JB-020-S2	Polymer Dosing pump-2 strainer differential pressure	JB-020(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
86	ETP-JB-020-S3	Acid Dosing pump-2 CMB strainer differential pressure	JB-020(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
87	ETP-JB-020-S4	Acid Dosing pump-2 Guard Pond strainer differential pressure	JB-020(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
88	ETP-JB-020-OG01	JB-021(48way)	ETP DDCMIS		12 PX0.5SQMM (G Type)		20	Refer cable tray layout Drg
89	ETP-JB-022-S1	Acid Dosing pump-1 CMB strainer differential pressure	JB-022(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
90	ETP-JB-022-S2	Alkali Dosing pump-1 Guard Pond strainer differential pressure	JB-022(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
91	ETP-JB-022-S3	Alun Dosing pump strainer differential pressure	JB-022(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
92	ETP-JB-022-S4	Lime Dosing pump strainer differential pressure	JB-022(48way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
93	ETP-JB-022-OG01	JB-022(48 way)	ETP DDCMIS		12PX0.5SQMM (G Type)		20	Refer cable tray layout Drg
94	ETP-JB-023-S3	Alkali Dosing pump-2 Guard pond strainer differential pressure	JB-023(24way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
95	ETP-JB-023-S4	Alum Dosing pump-2 strainer differential pressure	JB-023(24way)	Across Strianer Differential pressure measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
96	ETP-JB-023-OG01	JB-023(24 way)	ETP DDCMIS		2PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
97	ETP-JB-023-OG02	JB-023(24 way)	ETP DDCMIS		2PX0.5SQMM (F Type)		20	Refer cable tray layout Drg
98	ETP-JB-024-S1	CMB Compartment -1 Level	JB-024(24way)	GMB Overflow sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
99	ETP-JB-024-S2	CMB Overflow sump Level	JB-024(24way)	GMB Overflow sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg

100	ETP-JB-024-OG01	JB-024(24 way)	ETP DDCMIS		4PX0.5SQMM (G Type)		20	Refer cable tray layout Drg
101	ETP-JB-025-S1	Guard Pond Compartment-2 Level	JB-025(48way)	Guard Pond Overflow sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
102	ETP-JB-025-S2	Guard Pond Overflow sump Level	JB-025(48way)	Guard Pond Overflow sump Level measurement	2PX0.5SQMM (F Type)		75	Refer cable tray layout Drg
103	ETP-JB-025-OG01	JB-025(24 way)	ETP DDCMIS		4PX0.5SQMM (G Type)		20	Refer cable tray layout Drg

CABLE SCHEDULE FROM FIELD TO DCS

SL NO	TAG NAME	SIGNAL DESCRIPTION	TrTxt	FIELD CABLE NUMBER	CABLE TYPE (FIELD-JB)	CABLE SCOPE	FIELD SIDE TB	CORE COLOR	JB/ MCC/ LSPB	JB/ MCC/ LSPB TB NO	TRUNK CABLE NUMBER	TRUNK CABLE TYPE	TRUNK CABLE SCOPE	DCS CABINET	DCS end TB	CORE COLOUR
1	90GNN01CL001_XQ01	ALUMDOSING TANK LEVEL	LEVEL	ETP-JB-001-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-001	TB-01	ETP-JB-001-OG01	4PX0.5SQMM (F Type)	VENDOR	CR861	1DTBB1:05(T)	
							-	RD		TB-02					1DTBB1:06(T)	
2	90GNN01CP001_XQ01	ALUMDOSING TANK PUMP DISCHARGE PRESSURE	PRESSURE	ETP-JB-001-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR861	1DTBA1:49(T)	
							-	RD		TB-04					1DTBA1:50(T)	
3	90GNN02CL001_XQ01	LIME DOSING TANK LEVEL	LEVEL	ETP-JB-002-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-002	TB-01	ETP-JB-002-OG01	4PX0.5SQMM (F Type)	VENDOR	CR862	2DTBA1:37(T)	
							-	RD		TB-02					2DTBA1:38(T)	
4	90GNN02CP001_XQ01	LIME DOSING TANK PUMP DISCHARGE PRESSURE	PRESSURE	ETP-JB-002-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR862	2DTBA1:35(T)	
							-	RD		TB-04					2DTBA1:36(T)	
5	90GNN03CL001_XQ01	PE DOSING TANK LEVEL	LEVEL	ETP-JB-003-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-003	TB-01	ETP-JB-003-OG01	4PX0.5SQMM (F Type)	VENDOR	CR862	2DTBA1:43(T)	
							-	RD		TB-02					2DTBA1:44(T)	
6	90GNN03CP001_XQ01	PE DOSING TANK PUMP DISCHARGE PRESSURE	PRESSURE	ETP-JB-003-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR862	2DTBA1:41(T)	
							-	RD		TB-04					2DTBA1:42(T)	
7	90GNN04CL001_XQ01	ACID DOSING TANK LEVEL-CMB	LEVEL	ETP-JB-004-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-004	TB-01	ETP-JB-004-OG01	4PX0.5SQMM (F Type)	VENDOR	CR862	2DTBA1:33(T)	
							-	RD		TB-02					2DTBA1:34(T)	
8	90GNN08CL001_XQ01	OVERHEAD WTR STRG TANK LEVEL	LEVEL	ETP-JB-004-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-07				CR862	2DTBA1:39(T)	
							-	RD		TB-08					2DTBA1:40(T)	
9	90GNN04CP001_XQ01	ACID DOSING TANK PUMP DISCHARGE PRESSURE -CMB	PRESSURE	ETP-JB-004-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03	ETP-JB-004-OG02	4PX0.5SQMM (F Type)	VENDOR	CR861	1DTBA1:71(T)	
							-	RD		TB-04					1DTBA1:72(T)	
10	90GNN06CP001_XQ01	ACID DOSING TANK PUMP DISCHARGE PRESSURE -GUARD POND	PRESSURE	ETP-JB-004-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-05				CR861	1DTBA1:73(T)	
							-	RD		TB-06					1DTBA1:74(T)	
11	90GNS01CL001_XQ01	SLUDGE TRANSFER SUMP LEVEL	LEVEL	ETP-JB-006-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-006	TB-01	ETP-JB-006-OG01	4PX0.5SQMM (F Type)	VENDOR	CR862	2DTBB1:37(T)	
							-	RD		TB-02					2DTBB1:38(T)	
12	90GNS01CP001_XQ01	SLUDGE TRANSFER SUMP PUMP DISCHARGE PRESSURE	PRESSURE	ETP-JB-006-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR862	2DTBB1:71(T)	
							-	RD		TB-04					2DTBB1:72(T)	
13	90GNC10CF001_XQ01	AIR BOLWER DISCHARGE HEADER FLOW	FLOW	ETP-JB-006-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-05	ETP-JB-006-OG01	4PX0.5SQMM (F Type)	VENDOR	CR861	1DTBA1:75(T)	
							-	RD		TB-06					1DTBA1:76(T)	
14	90GNC10CP001_XQ01	AIR BLOWER DISCHARGE PRESSURE	PRESSURE	ETP-JB-006-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-07				CR861	1DTBA1:41(T)	
							-	RD		TB-08					1DTBA1:42(T)	
15	90GNN07CL001_XQ01	ALKALI DOSING TANK LEVEL	LEVEL	ETP-JB-005-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-005	TB-01	ETP-JB-005-OG01	4PX0.5SQMM (F Type)	VENDOR	CR861	1DTBA1:47(T)	
							-	RD		TB-02					1DTBA1:48(T)	
16	90GNN05CP001_XQ01	ALKALI DOSING PUMP DISCHARGE PRESSURE	PRESSURE	ETP-JB-005-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR861	1DTBA1:45(T)	
							-	RD		TB-04					1DTBA1:46(T)	
17	90GNN07CP001_XQ01	ALKALI DOSING PUMP DISCHARGE PRESSURE	PRESSURE	ETP-JB-005-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR861	1DTBA1:43(T)	
							-	RD		TB-04					1DTBA1:44(T)	
18	10GNA02CL001_XQ01	COAL MILL WASTE SUMP LEVEL (UNIT-1)	LEVEL	ETP-JB-007-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-007	TB-01	ETP-JB-007-OG01	8PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBA1:93(T)	
							-	RD		TB-02					1DTBA1:94(T)	
19	10GNA03CL001_XQ01	COAL MILL WASTE SUMP LEVEL (UNIT-1)	LEVEL	ETP-JB-007-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE35	1DTBB1:59(T)	
							-	RD		TB-04					1DTBB1:60(T)	
20	10GNA02CP001_XQ01	COAL MILL OILY WASTE TRANSFER PUMP DISCHARGE PR(UNIT-1)	PRESSURE	ETP-JB-007-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-05				CRE35	1DTBB1:31(T)	
							-	RD		TB-06					1DTBB1:32(T)	
21	10GNA03CP001_XQ01	COAL MILL OILY WASTE TRANSFER PUMP DISCHARGE PR(UNIT-1)	PRESSURE	ETP-JB-007-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-07				CRE35	1DTBB1:61(T)	
							-	RD		TB-08					1DTBB1:62(T)	
22	20GNA02CL001_XQ01	COAL MILL WASTE SUMP LEVEL (UNIT-2)	LEVEL	ETP-JB-008-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-008	TB-01	ETP-JB-008-OG01	8PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBA1:93(T)	
							-	RD		TB-02					1DTBA1:94(T)	
23	20GNA03CL001_XQ01	COAL MILL WASTE SUMP LEVEL (UNIT-2)	LEVEL	ETP-JB-008-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE35	1DTBB1:59(T)	
							-	RD		TB-04					1DTBB1:60(T)	
24	20GNA02CP001_XQ01	COAL MILL OILY WASTE TRANSFER PUMP DISCHARGE PR(UNIT-2)	PRESSURE	ETP-JB-008-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-05				CRE35	1DTBB1:31(T)	
							-	RD		TB-06					1DTBB1:32(T)	
25	20GNA03CP001_XQ01	COAL MILL OILY WASTE TRANSFER PUMP DISCHARGE PR(UNIT-2)	PRESSURE	ETP-JB-008-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-07				CRE35	1DTBB1:61(T)	
							-	RD		TB-08					1DTBB1:62(T)	
26	10GNA01CL001_XQ01	RETENTION PIT FOR OILY WASTE FROM TRANSFORMER YARD LEVEL (UNIT-1)	LEVEL	ETP-JB-009-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-009	TB-01	ETP-JB-009-OG01	4PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBA1:25(T)	
							-	RD		TB-02					1DTBA1:26(T)	
27	10GNA01CP001_XQ01	TRANSFORMER YARD OILY WASTE TRANSFER PUMP DISCHARGE PR(UNIT-1)	PRESSURE	ETP-JB-009-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE35	1DTBA1:69(T)	
							-	RD		TB-04					1DTBA1:70(T)	
28	20GNA01CL001_XQ01	RETENTION PIT FOR OILY WASTE FROM TRANSFORMER YARD LEVEL (UNIT-2)	LEVEL	ETP-JB-010-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-010	TB-01	ETP-JB-010-OG01	4PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBA1:25(T)	
							-	RD		TB-02					1DTBA1:26(T)	
29	20GNA01CP001_XQ01	TRANSFORMER YARD OILY WASTE TRANSFER PUMP DISCHARGE PR(UNIT-2)	PRESSURE	ETP-JB-010-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE35	1DTBA1:69(T)	
							-	RD		TB-04					1DTBA1:70(T)	
30	10GTA01CL001_XQ01	PRE SETTLING PIT FOR OILY WASTE FROM ESP AREA LEVEL (UNIT-1)	LEVEL	ETP-JB-011-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-011	TB-01	ETP-JB-011-OG01	4PX0.5SQMM (F Type)	VENDOR	CRE39	1DTBA1:17(T)	
							-	RD		TB-02					1DTBA1:18(T)	
31	10GTA01CP001_XQ01	PRE SETTLING OVERFLOW PUMP DISCHARGE PR(UNIT-1)	PRESSURE	ETP-JB-011-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE39	1DTBA1:21(T)	
							-	RD		TB-04					1DTBA1:22(T)	
32	20GTA01CL001_XQ01	PRE SETTLING PIT FOR OILY WASTE FROM ESP AREA LEVEL (UNIT-2)	LEVEL	ETP-JB-012-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-012	TB-01	ETP-JB-012-OG01	4PX0.5SQMM (F Type)	VENDOR	CRE39	1DTBA1:17(T)	
							-	RD		TB-02					1DTBA1:18(T)	
33	20GTA01CP001_XQ01	PRE SETTLING OVERFLOW PUMP DISCHARGE PR(UNIT-2)	PRESSURE	ETP-JB-012-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE39	1DTBA1:21(T)	
							-	RD		TB-04					1DTBA1:22(T)	
34	10GNA04CL001_XQ01	POWER HOUSE OILY WASTE SUMP LEVEL (UNIT-1)	LEVEL	ETP-JB-013-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-013	TB-01	ETP-JB-013-OG01	4PX0.5SQMM (F Type)	VENDOR	CRE37	1DTBA1:39(T)	
							-	RD		TB-02					1DTBA1:40(T)	
35	10GNA04CP001_XQ01	POWER HOUSE OILY AREA SERVICE WASTE TRANSFER PUMP DISCHARGE PR(UNIT-1)	PRESSURE	ETP-JB-013-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE37	1DTBA1:43(T)	
							-	RD		TB-04					1DTBA1:44(T)	
36	20GNA04CL001_XQ01	PRE SETTLING PIT FOR OILY WASTE FROM ESP AREA LEVEL (UNIT-2)	LEVEL	ETP-JB-014-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-014	TB-01	ETP-JB-014-OG01	4PX0.5SQMM (F Type)	VENDOR	CRE37	1DTBA1:39(T)	
							-	RD		TB-02					1DTBA1:40(T)	
37	20GNA04CP001_XQ01	PRE SETTLING OVERFLOW PUMP DISCHARGE PR(UNIT-2)	PRESSURE	ETP-JB-014-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRE37	1DTBA1:43(T)	
							-	RD		TB-04					1DTBA1:44(T)	
38	90GTA02CL001_XQ01	TPI OVERFLOW WATER SUMP LEVEL	LEVEL	ETP-JB-015-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-015	TB-01	ETP-JB-015-OG01	4PX0.5SQMM (F Type)	VENDOR	CR862	2DTBB1:73(T)	
							-	RD		TB-02					2DTBB1:74(T)	
39	90GTA02CP001_XQ01	TPI OVF WTR SUMP PMP DIS HD PRS	PRESSURE	ETP-JB-015-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CR862	2DTBB1:75(T)	
							-	RD		TB-04					2DTBB1:76(T)	
40	90GMA20CL001_XQ01	GUARD POND COMPARTMENT -1 LEVEL	LEVEL	ETP-JB-016-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-016	TB-01	ETP-JB-016-OG01	12PX0.5SQMM (F Type)	VENDOR	CR861	1DTBA1:51(T)	
							-	RD		TB-02					1DTBA1:52(T)	
41	90GMA30CP001_XQ01	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE PR	PRESSURE	ETP-JB-016-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-07				CR861	1DTBA1:13(T)	
							-	RD		TB-08					1DTBA1:14(T)	
42	90GMA30CP002_XQ01	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE PR	PRESSURE	ETP-JB-016-S5	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-09				CR861	1DTBA1:11(T)	
							-	RD		TB-10					1DTBA1:12(T)	
43	90GMA30CF001_XQ01	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE FLOW	FLOW	ETP-JB-016-S6	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-11				CR861	1DTBA1:15(T)	
							-	RD		TB-12					1DTBA1:16(T)	

44	90GMA30CQ001_XQ01	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE PH	PH	ETP-JB-017-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-017	TB-09	ETP-JB-017-OG01	2PX0.5SQMM (F Type)	VENDOR	CR862	2DTBB1:35(T)	
							-	RD		TB-10					2DTBB1:36(T)	
45	90GMA30CQ002_XQ01	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE TURBIDITY	TURBIDITY	ETP-JB-017-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-11	ETP-JB-017-OG02	4PX0.5SQMM (F Type)	VENDOR	CR861	1DTBB1:03(T)	
							-	RD		TB-12					1DTBB1:04(T)	
46	90GMA30CT201_XQ01	GUARD POND EFT TRNS PMP DISCH TEMP	TEMPERATURE	ETP-JB-017-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-13			VENDOR	CR861	1DTBA1:17(T)	
							-	RD		TB-14					1DTBA1:18(T)	
47	90GMA00CL001_XQ01	CMB COMPARTMENT -1 LEVEL	LEVEL	ETP-JB-018-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-018	TB-01	ETP-JB-018-OG01	12PX0.5SQMM (F Type)	VENDOR	CR862	2DTBA1:87(T)	
							-	RD		TB-02					2DTBA1:88(T)	
48	90GMA12CP001_XQ01	CMB GARDENING PUMP PUMP DISCHARGE PR	PRESSURE	ETP-JB-018-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-07				CR862	2DTBA1:63(T)	
							-	RD		TB-08					2DTBA1:64(T)	
49	90GMA11CP001_XQ01	CMB EFFLUENT TRANSFER PUMP DISCHARGE PR	PRESSURE	ETP-JB-018-S5	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-09				CR862	2DTBA1:57(T)	
							-	RD		TB-10					2DTBA1:58(T)	
50	90GMA11CP002_XQ01	CMB EFFLUENT TRANSFER PUMP DISCHARGE PR	PRESSURE	ETP-JB-018-S5	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-09				CR862	2DTBA1:91(T)	
							-	RD		TB-10					2DTBA1:92(T)	
51	90GMA11CF001_XQ01	CMB EFFLUENT TRANSFER PUMP DISCHARGE FLOW	FLOW	ETP-JB-019-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-019	TB-11	ETP-JB-019-OG01	8PX0.5SQMM (F Type)	VENDOR	CR862	2DTBA1:59(T)	
							-	RD		TB-12					2DTBA1:60(T)	
52	90GMA11CQ001_XQ01	CMB EFFLUENT TRANSFER PUMP DISCHARGE PH	PH	ETP-JB-019-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-11				CR862	2DTBB1:33(T)	
							-	RD		TB-12					2DTBB1:34(T)	
53	90GMA11CT201_XQ01	CMB EFFLUENT TRANSFER PUMP DISCHARGE TEMPERATURE	TEMPERATURE	ETP-JB-019-S4	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-11				CR862	2DTBA1:61(T)	
							-	RD		TB-12					2DTBA1:62(T)	
54	90GMA11CQ002_XQ01	CMB EFFLUENT TRANSFER PUMP DISCHARGE TURBIDITY	TURBIDITY	ETP-JB-019-S3	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-11	ETP-JB-019-OG02	2PX0.5SQMM (F Type)	VENDOR	CR861	1DTBB1:01(T)	
							-	RD		TB-12					1DTBB1:02(T)	
55	90GNN06AP001_XB91	ACID DOSING PUMP-A FOR GUARD POND	COMMAND START	ETP-001-S1					MCC	BHEL TO PROVIDE	ETP-001-OG01	8PX0.5SQMM (G Type)	VENDOR	CR861	1DTBC1:73(T)	
			COMMAND STOP	ETP-001-S2						BHEL TO PROVIDE					1DTBC1:74(T)	
			FDBK ON	ETP-001-S3						BHEL TO PROVIDE					1DTBC1:75(T)	
			FDBK OFF	ETP-001-S4						BHEL TO PROVIDE					1DTBC1:76(T)	
			MCC DISTBD	ETP-001-S5						BHEL TO PROVIDE					1DTBC1:41(T)	
			MCC AVLBL	ETP-001-S6						BHEL TO PROVIDE					1DTBC1:42(T)	
			EPB OPTD	ETP-001-S7						BHEL TO PROVIDE					1DTBC1:43(T)	
56	90GNN06AP001 - LSPB	ACID DOSING PUMP-A FOR GUARD POND		ETP-001-S8					LOCAL PB	BHEL TO PROVIDE	ETP-001-OG02	2PX0.5SQMM (F Type)	VENDOR	CR861	1DTBC1:63(T)	
															1DTBC1:64(T)	
57	90GNN06AP002_XB91	ACID DOSING PUMP-B FOR GUARD POND	COMMAND START	ETP-002-S1					MCC	BHEL TO PROVIDE	ETP-002-OG01	8PX0.5SQMM (G Type)	VENDOR	CR862	2DTBC2:17(T)	
			COMMAND STOP	ETP-002-S2						BHEL TO PROVIDE					2DTBC2:18(T)	
			FDBK ON	ETP-002-S3						BHEL TO PROVIDE					2DTBC2:19(T)	
			FDBK OFF	ETP-002-S4						BHEL TO PROVIDE					2DTBC2:20(T)	
			MCC DISTBD	ETP-002-S5						BHEL TO PROVIDE					2DTBC1:81(T)	
			MCC AVLBL	ETP-002-S6						BHEL TO PROVIDE					2DTBC1:82(T)	
			EPB OPTD	ETP-002-S7						BHEL TO PROVIDE					2DTBC1:83(T)	
58	90GNN06AP002 - LSPB	ACID DOSING PUMP-B FOR GUARD POND		ETP-002-S8					LOCAL PB	BHEL TO PROVIDE	ETP-002-OG02	2PX0.5SQMM (F Type)	VENDOR	CR862	2DTBC1:84(T)	
															2DTBC2:01(T)	
59	90GNN04AP001_XB91	ACID DOSING PUMP-A FOR CMB	COMMAND START	ETP-003-S1					MCC	BHEL TO PROVIDE	ETP-003-OG01	8PX0.5SQMM (G Type)	VENDOR	CR861	2DTBC2:02(T)	
			COMMAND STOP	ETP-003-S2						BHEL TO PROVIDE					2DTBC2:03(T)	
			FDBK ON	ETP-003-S3						BHEL TO PROVIDE					2DTBC2:04(T)	
			FDBK OFF	ETP-003-S4						BHEL TO PROVIDE					2DTBC2:05(T)	
			MCC DISTBD	ETP-003-S5						BHEL TO PROVIDE					2DTBC2:06(T)	
			MCC AVLBL	ETP-003-S6						BHEL TO PROVIDE					1DTBC2:17(T)	
			EPB OPTD	ETP-003-S7						BHEL TO PROVIDE					1DTBC2:18(T)	
60	90GNN04AP001 - LSPB	ACID DOSING PUMP-A FOR CMB		ETP-003-S8					LOCAL PB	BHEL TO PROVIDE	ETP-003-OG02	2PX0.5SQMM (F Type)	VENDOR	CR861	1DTBC2:19(T)	
															1DTBC2:20(T)	
61	90GNN04AP002_XB91	ACID DOSING PUMP-B FOR CMB	COMMAND START	ETP-004-S1					MCC	BHEL TO PROVIDE	ETP-004-OG01	8PX0.5SQMM (G Type)	VENDOR	CR862	1DTBC1:81(T)	
			COMMAND STOP	ETP-004-S2						BHEL TO PROVIDE					1DTBC1:82(T)	
			FDBK ON	ETP-004-S3						BHEL TO PROVIDE					1DTBC1:83(T)	
			FDBK OFF	ETP-004-S4						BHEL TO PROVIDE					1DTBC1:84(T)	
			MCC DISTBD	ETP-004-S5						BHEL TO PROVIDE					2DTBC1:01(T)	
			MCC AVLBL	ETP-004-S6						BHEL TO PROVIDE					2DTBC1:02(T)	
			EPB OPTD	ETP-004-S7						BHEL TO PROVIDE					2DTBC1:03(T)	
62	90GNN04AP002 - LSPB	ACID DOSING PUMP-B FOR CMB		ETP-004-S8					LOCAL PB	BHEL TO PROVIDE	ETP-004-OG02	2PX0.5SQMM (F Type)	VENDOR	CR862	2DTBC1:04(T)	
															2DTBC1:17(T)	
															2DTBC1:18(T)	
															2DTBC1:19(T)	
															2DTBC1:20(T)	
															2DTBC1:21(T)	
															2DTBC1:22(T)	
															2DTBC1:23(T)	
															2DTBC1:24(T)	

			COMMAND START	ETP-005-S1						BHEL TO PROVIDE					1DTBC1:37(T)		
										BHEL TO PROVIDE					1DTBC1:38(T)		
			COMMAND STOP	ETP-005-S2						BHEL TO PROVIDE					1DTBC1:39(T)		
										BHEL TO PROVIDE					1DTBC1:40(T)		
			FDBK ON	ETP-005-S3						BHEL TO PROVIDE					1DTBC1:05(T)		
										BHEL TO PROVIDE					1DTBC1:06(T)		
63	90GNN07AP001_XB91	ALKALI DOSING PUMP-A FOR GUARD POND	FDBK OFF	ETP-005-S4					MCC	BHEL TO PROVIDE	ETP-005-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC1:07(T)		
										BHEL TO PROVIDE					1DTBC1:08(T)		
			MCC DISTBD	ETP-005-S5						BHEL TO PROVIDE					1DTBC1:25(T)		
										BHEL TO PROVIDE					1DTBC1:26(T)		
			MCC AVLBL	ETP-005-S6						BHEL TO PROVIDE					1DTBC1:27(T)		
										BHEL TO PROVIDE					1DTBC1:28(T)		
			EPB OPTD	ETP-005-S7						BHEL TO PROVIDE					1DTBC1:29(T)		
										BHEL TO PROVIDE					1DTBC1:30(T)		
64	90GNN07AP001 - LSPB	ALKALI DOSING PUMP-A FOR GUARD POND		ETP-005-S8					LOCAL PB	BHEL TO PROVIDE	ETP-005-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC1:31(T)		
										BHEL TO					1DTBC1:32(T)		
										BHEL TO					2DTBA2:73(T)		
			COMMAND START	ETP-006-S1						BHEL TO PROVIDE					2DTBA2:74(T)		
										BHEL TO PROVIDE					2DTBA2:75(T)		
			COMMAND STOP	ETP-006-S2						BHEL TO PROVIDE					2DTBA2:76(T)		
										BHEL TO PROVIDE					2DTBA2:41(T)		
			FDBK ON	ETP-006-S3						BHEL TO PROVIDE					2DTBA2:42(T)		
										BHEL TO PROVIDE					2DTBA2:43(T)		
65	90GNN07AP002_XB91	ALKALI DOSING PUMP-B FOR GUARD POND	FDBK OFF	ETP-006-S4					MCC	BHEL TO PROVIDE	ETP-006-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBA2:44(T)		
										BHEL TO PROVIDE					2DTBA2:57(T)		
			MCC DISTBD	ETP-006-S5						BHEL TO PROVIDE					2DTBA2:58(T)		
										BHEL TO PROVIDE					2DTBA2:59(T)		
			MCC AVLBL	ETP-006-S6						BHEL TO PROVIDE					2DTBA2:60(T)		
										BHEL TO PROVIDE					2DTBA2:61(T)		
			EPB OPTD	ETP-006-S7						BHEL TO PROVIDE					2DTBA2:62(T)		
66	90GNN07AP002 - LSPB	ALKALI DOSING PUMP-B FOR GUARD POND		ETP-006-S8					LOCAL PB	BHEL TO PROVIDE	ETP-006-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBA2:63(T)		
										BHEL TO					2DTBA2:64(T)		
										BHEL TO					1DTBC1:77(T)		
			COMMAND START	ETP-007-S1						BHEL TO PROVIDE					1DTBC1:78(T)		
										BHEL TO PROVIDE					1DTBC1:79(T)		
			COMMAND STOP	ETP-007-S2						BHEL TO PROVIDE					1DTBC1:80(T)		
										BHEL TO PROVIDE					1DTBC1:45(T)		
			FDBK ON	ETP-007-S3						BHEL TO PROVIDE					1DTBC1:46(T)		
										BHEL TO PROVIDE					1DTBC1:47(T)		
67	90GNN05AP001_XB91	ALKALI DOSING PUMP-A FOR CMB	FDBK OFF	ETP-007-S4					MCC	BHEL TO PROVIDE	ETP-007-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC1:48(T)		
										BHEL TO PROVIDE					1DTBC1:65(T)		
			MCC DISTBD	ETP-007-S5						BHEL TO PROVIDE					1DTBC1:66(T)		
										BHEL TO PROVIDE					1DTBC1:67(T)		
			MCC AVLBL	ETP-007-S6						BHEL TO PROVIDE					1DTBC1:68(T)		
										BHEL TO PROVIDE					1DTBC1:69(T)		
			EPB OPTD	ETP-007-S7						BHEL TO PROVIDE					1DTBC1:70(T)		
68	90GNN05AP001 - LSPB	ALKALI DOSING PUMP-A FOR CMB		ETP-007-S8					LOCAL PB	BHEL TO PROVIDE	ETP-007-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC1:71(T)		
										BHEL TO					1DTBC1:72(T)		
										BHEL TO					2DTBC1:37(T)		
			COMMAND START	ETP-008-S1						BHEL TO PROVIDE					2DTBC1:38(T)		
										BHEL TO PROVIDE					2DTBC1:39(T)		
			COMMAND STOP	ETP-008-S2						BHEL TO PROVIDE					2DTBC1:40(T)		
										BHEL TO PROVIDE					2DTBC1:05(T)		
			FDBK ON	ETP-008-S3						BHEL TO PROVIDE					2DTBC1:06(T)		
										BHEL TO PROVIDE					2DTBC1:07(T)		
69	90GNN05AP002_XB91	ALKALI DOSING PUMP-B FOR CMB	FDBK OFF	ETP-008-S4					MCC	BHEL TO PROVIDE	ETP-008-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC1:08(T)		
										BHEL TO PROVIDE					2DTBC1:25(T)		
			MCC DISTBD	ETP-008-S5						BHEL TO PROVIDE					2DTBC1:26(T)		
										BHEL TO PROVIDE					2DTBC1:27(T)		
			MCC AVLBL	ETP-008-S6						BHEL TO PROVIDE					2DTBC1:28(T)		
										BHEL TO PROVIDE					2DTBC1:29(T)		
			EPB OPTD	ETP-008-S7						BHEL TO PROVIDE					2DTBC1:30(T)		
70	90GNN05AP002 - LSPB	ALKALI DOSING PUMP-B FOR CMB		ETP-008-S8					LOCAL PB	BHEL TO PROVIDE	ETP-008-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC1:31(T)		
										BHEL TO					2DTBC1:32(T)		

71	90GNN04AM001_XB91	ACID DOSING TANK AGITAOR	COMMAND START	ETP-009-S1					MCC	BHEL TO PROVIDE	ETP-009-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC1:33(T)	
										BHEL TO PROVIDE					1DTBC1:34(T)	
			COMMAND STOP	ETP-009-S2						BHEL TO PROVIDE					1DTBC1:35(T)	
										BHEL TO PROVIDE					1DTBC1:36(T)	
			FDBK ON	ETP-009-S3						BHEL TO PROVIDE					1DTBC1:01(T)	
										BHEL TO PROVIDE					1DTBC1:02(T)	
			FDBK OFF	ETP-009-S4						BHEL TO PROVIDE					1DTBC1:03(T)	
										BHEL TO PROVIDE					1DTBC1:04(T)	
			MCC DISTBD	ETP-009-S5						BHEL TO PROVIDE					1DTBC1:17(T)	
										BHEL TO PROVIDE					1DTBC1:18(T)	
			MCC AVLBL	ETP-009-S6						BHEL TO PROVIDE					1DTBC1:19(T)	
										BHEL TO PROVIDE					1DTBC1:20(T)	
			EPB OPTD	ETP-009-S7						BHEL TO PROVIDE					1DTBC1:21(T)	
										BHEL TO PROVIDE					1DTBC1:22(T)	
72	90GNN04AM001 - LSPB	ACID DOSING TANK AGITATOR		ETP-009-S8					LOCAL PB	BHEL TO PROVIDE	ETP-009-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC1:23(T)	
										BHEL TO					1DTBC1:24(T)	
73	90GNN07AM001_XB91	ALKALI DOSING TANK AGITAOR	COMMAND START	ETP-010-S1					MCC	BHEL TO PROVIDE	ETP-010-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC3:05(T)	
										BHEL TO PROVIDE					2DTBC3:06(T)	
			COMMAND STOP	ETP-010-S2						BHEL TO PROVIDE					2DTBC3:07(T)	
										BHEL TO PROVIDE					2DTBC3:08(T)	
			FDBK ON	ETP-010-S3						BHEL TO PROVIDE					2DTBC2:69(T)	
										BHEL TO PROVIDE					2DTBC2:70(T)	
			FDBK OFF	ETP-010-S4						BHEL TO PROVIDE					2DTBC2:71(T)	
										BHEL TO PROVIDE					2DTBC2:72(T)	
			MCC DISTBD	ETP-010-S5						BHEL TO PROVIDE					2DTBC2:89(T)	
										BHEL TO PROVIDE					2DTBC2:90(T)	
			MCC AVLBL	ETP-010-S6						BHEL TO PROVIDE					2DTBC2:91(T)	
										BHEL TO PROVIDE					2DTBC2:92(T)	
			EPB OPTD	ETP-010-S7						BHEL TO PROVIDE					2DTBC2:93(T)	
										BHEL TO PROVIDE					2DTBC2:94(T)	
74	90GNN07AM001 - LSPB	ALKALI DOSING TANK AGITATOR		ETP-010-S8					LOCAL PB	BHEL TO PROVIDE	ETP-010-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC2:95(T)	
										BHEL TO					2DTBC2:96(T)	
75	90GNN03AP001_XB91	POLYELECTROLYTE DOSING PUMP-A	COMMAND START	ETP-011-S1					MCC	BHEL TO	ETP-011-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC2:21(T)	
										BHEL TO PROVIDE					1DTBC2:22(T)	
			COMMAND STOP	ETP-011-S2						BHEL TO PROVIDE					1DTBC2:23(T)	
										BHEL TO PROVIDE					1DTBC2:24(T)	
			FDBK ON	ETP-011-S3						BHEL TO PROVIDE					1DTBC1:85(T)	
										BHEL TO PROVIDE					1DTBC1:86(T)	
			FDBK OFF	ETP-011-S4						BHEL TO PROVIDE					1DTBC1:87(T)	
										BHEL TO PROVIDE					1DTBC1:88(T)	
			MCC DISTBD	ETP-011-S5						BHEL TO					1DTBC2:09(T)	
										BHEL TO					1DTBC2:10(T)	
			MCC AVLBL	ETP-011-S6						BHEL TO					1DTBC2:11(T)	
										BHEL TO					1DTBC2:12(T)	
			EPB OPTD	ETP-011-S7						BHEL TO					1DTBC2:13(T)	
										BHEL TO					1DTBC2:14(T)	
76	90GNN03AP001 - LSPB	POLYELECTROLYTE DOSING PUMP-A		ETP-011-S8					LOCAL PB	BHEL TO	ETP-011-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC2:15(T)	
										BHEL TO					1DTBC2:16(T)	
77	90GNN03AP002_XB91	POLYELECTROLYTE DOSING PUMP-B	COMMAND START	ETP-012-S1					MCC	BHEL TO	ETP-012-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC1:73(T)	
										BHEL TO PROVIDE					2DTBC1:74(T)	
			COMMAND STOP	ETP-012-S2						BHEL TO PROVIDE					2DTBC1:75(T)	
										BHEL TO PROVIDE					2DTBC1:76(T)	
			FDBK ON	ETP-012-S3						BHEL TO PROVIDE					2DTBC1:41(T)	
										BHEL TO PROVIDE					2DTBC1:42(T)	
			FDBK OFF	ETP-012-S4						BHEL TO PROVIDE					2DTBC1:43(T)	
										BHEL TO PROVIDE					2DTBC1:44(T)	
			MCC DISTBD	ETP-012-S5						BHEL TO					2DTBC1:57(T)	
										BHEL TO					2DTBC1:58(T)	
			MCC AVLBL	ETP-012-S6						BHEL TO					2DTBC1:59(T)	
										BHEL TO					2DTBC1:60(T)	
			EPB OPTD	ETP-012-S7						BHEL TO					2DTBC1:61(T)	
										BHEL TO					2DTBC1:62(T)	
78	90GNN03AP002 - LSPB	POLYELECTROLYTE DOSING PUMP-B		ETP-012-S8					LOCAL PB	BHEL TO	ETP-012-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC1:63(T)	
										BHEL TO					2DTBC1:64(T)	
79	90GNN03AM001_XB91	POLY ELECTROLYTE DOSING TANK AGITAOR	COMMAND START	ETP-013-S1					MCC	BHEL TO	ETP-013-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC1:77(T)	
										BHEL TO PROVIDE					2DTBC1:78(T)	
			COMMAND STOP	ETP-013-S2						BHEL TO PROVIDE					2DTBC1:79(T)	
										BHEL TO PROVIDE					2DTBC1:80(T)	
			FDBK ON	ETP-013-S3						BHEL TO PROVIDE					2DTBC1:45(T)	
										BHEL TO PROVIDE					2DTBC1:46(T)	
			FDBK OFF	ETP-013-S4						BHEL TO PROVIDE					2DTBC1:47(T)	
										BHEL TO PROVIDE					2DTBC1:48(T)	
			MCC DISTBD	ETP-013-S5						BHEL TO					2DTBC1:65(T)	
										BHEL TO					2DTBC1:66(T)	
			MCC AVLBL	ETP-013-S6						BHEL TO					2DTBC1:67(T)	
										BHEL TO					2DTBC1:68(T)	
			EPB OPTD	ETP-013-S7						BHEL TO					2DTBC1:69(T)	
										BHEL TO					2DTBC1:70(T)	
80	90GNN03AM001 - LSPB	POLY ELECTROLYTE DOSING TANK AGITATOR		ETP-013-S8					LOCAL PB	BHEL TO	ETP-013-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC1:71(T)	
										BHEL TO					2DTBC1:72(T)	

81	90GNN01AP001_XB91	ALUM DOSING PUMP-A	COMMAND START	ETP-014-S1					MCC	BHEL TO PROVIDE	ETP-014-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBA2:61(T) 1DTBA2:62(T)	
			COMMAND STOP	ETP-014-S2						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBA2:63(T) 1DTBA2:64(T)	
			FDBK ON	ETP-014-S3						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBA2:29(T) 1DTBA2:30(T)	
			FDBK OFF	ETP-014-S4						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBA2:31(T) 1DTBA2:32(T)	
			MCC DISTBD	ETP-014-S5						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBA2:49(T) 1DTBA2:50(T)	
			MCC AVLBL	ETP-014-S6						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBA2:51(T) 1DTBA2:52(T)	
			EPB OPTD	ETP-014-S7						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBA2:53(T) 1DTBA2:54(T)	
82	90GNN01AP001 - LSPB	ALUM DOSING PUMP-A		ETP-014-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-014-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBA2:55(T) 1DTBA2:56(T)	
83	90GNN01AP002_XB91	ALUM DOSING PUMP-B	COMMAND START	ETP-015-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-015-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBA2:77(T) 2DTBA2:78(T)	
			COMMAND STOP	ETP-015-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:79(T) 2DTBA2:80(T)	
			FDBK ON	ETP-015-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:45(T) 2DTBA2:46(T)	
			FDBK OFF	ETP-015-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:47(T) 2DTBA2:48(T)	
			MCC DISTBD	ETP-015-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:65(T) 2DTBA2:66(T)	
			MCC AVLBL	ETP-015-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:67(T) 2DTBA2:68(T)	
			EPB OPTD	ETP-015-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:69(T) 2DTBA2:70(T)	
84	90GNN01AP002 - LSPB	ALUM DOSING PUMP-B		ETP-015-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-015-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBA2:71(T) 2DTBA2:72(T)	
85	90GNN01AM001_XB91	ALUM DOSING TANK AGITAOR	COMMAND START	ETP-016-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-016-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC2:57(T) 2DTBC2:58(T)	
			COMMAND STOP	ETP-016-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:59(T) 2DTBC2:60(T)	
			FDBK ON	ETP-016-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:25(T) 2DTBC2:26(T)	
			FDBK OFF	ETP-016-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:27(T) 2DTBC2:28(T)	
			MCC DISTBD	ETP-016-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:41(T) 2DTBC2:42(T)	
			MCC AVLBL	ETP-016-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:43(T) 2DTBC2:44(T)	
			EPB OPTD	ETP-016-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:45(T) 2DTBC2:46(T)	
86	90GNN01AM001 - LSPB	ALUM DOSING TANK AGITATOR		ETP-016-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-016-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC2:47(T) 2DTBC2:48(T)	
87	90GNN02AP001_XB91	LIME DOSING PUMP-A	COMMAND START	ETP-017-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-017-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC3:01(T) 1DTBC3:02(T)	
			COMMAND STOP	ETP-017-S2						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC3:03(T) 1DTBC3:04(T)	
			FDBK ON	ETP-017-S3						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:65(T) 1DTBC2:66(T)	
			FDBK OFF	ETP-017-S4						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:67(T) 1DTBC2:68(T)	
			MCC DISTBD	ETP-017-S5						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:81(T) 1DTBC2:82(T)	
			MCC AVLBL	ETP-017-S6						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:83(T) 1DTBC2:84(T)	
			EPB OPTD	ETP-017-S7						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:85(T) 1DTBC2:86(T)	
88	90GNN02AP001 - LSPB	LIME DOSING PUMP-A		ETP-017-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-017-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC2:87(T) 1DTBC2:88(T)	
89	90GNN02AP002_XB91	LIME DOSING PUMP-B	COMMAND START	ETP-018-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-018-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC2:21(T) 2DTBC2:22(T)	
			COMMAND STOP	ETP-018-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:23(T) 2DTBC2:24(T)	
			FDBK ON	ETP-018-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:85(T) 2DTBC1:86(T)	
			FDBK OFF	ETP-018-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:87(T) 2DTBC1:88(T)	
			MCC DISTBD	ETP-018-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:09(T) 2DTBC2:10(T)	
			MCC AVLBL	ETP-018-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:11(T) 2DTBC2:12(T)	
			EPB OPTD	ETP-018-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:13(T) 2DTBC2:14(T)	
90	90GNN02AP002 - LSPB	LIME DOSING PUMP-B		ETP-018-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-018-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC2:15(T) 2DTBC2:16(T)	

			COMMAND START	ETP-019-S1						BHEL TO PROVIDE					1DTBC2:57(T)		
										BHEL TO PROVIDE					1DTBC2:58(T)		
			COMMAND STOP	ETP-019-S2						BHEL TO PROVIDE					1DTBC2:59(T)		
										BHEL TO PROVIDE					1DTBC2:60(T)		
			FDBK ON	ETP-019-S3						BHEL TO PROVIDE					1DTBC2:25(T)		
										BHEL TO PROVIDE					1DTBC2:26(T)		
95	90GNN02AM001_XB91	LIME DOSING TANK AGITAOR	FDBK OFF	ETP-019-S4					MCC	BHEL TO PROVIDE	ETP-019-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC2:27(T)		
										BHEL TO PROVIDE					1DTBC2:28(T)		
			MCC DISTBD	ETP-019-S5						BHEL TO PROVIDE					1DTBC2:41(T)		
										BHEL TO PROVIDE					1DTBC2:42(T)		
			MCC AVLBL	ETP-019-S6						BHEL TO PROVIDE					1DTBC2:43(T)		
										BHEL TO PROVIDE					1DTBC2:44(T)		
			EPB OPTD	ETP-019-S7						BHEL TO PROVIDE					1DTBC2:45(T)		
										BHEL TO PROVIDE					1DTBC2:46(T)		
96	90GNN02AM001 - LSPB	LIME DOSING TANK AGITATOR		ETP-019-S8					LOCAL PB	BHEL TO PROVIDE	ETP-019-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC2:47(T)		
										BHEL TO					1DTBC2:48(T)		
			COMMAND START	ETP-020-S1						BHEL TO					1DTBA2:57(T)		
										BHEL TO PROVIDE					1DTBA2:58(T)		
			COMMAND STOP	ETP-020-S2						BHEL TO PROVIDE					1DTBA2:59(T)		
										BHEL TO PROVIDE					1DTBA2:60(T)		
			FDBK ON	ETP-020-S3						BHEL TO PROVIDE					1DTBA2:25(T)		
										BHEL TO PROVIDE					1DTBA2:26(T)		
97	90GNC01AN001_XB91	AIR BLOWER-A	FDBK OFF	ETP-020-S4					MCC	BHEL TO PROVIDE	ETP-020-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBA2:27(T)		
										BHEL TO PROVIDE					1DTBA2:28(T)		
			MCC DISTBD	ETP-020-S5						BHEL TO PROVIDE					1DTBA2:41(T)		
										BHEL TO PROVIDE					1DTBA2:42(T)		
			MCC AVLBL	ETP-020-S6						BHEL TO PROVIDE					1DTBA2:43(T)		
										BHEL TO PROVIDE					1DTBA2:44(T)		
			EPB OPTD	ETP-020-S7						BHEL TO PROVIDE					1DTBA2:45(T)		
										BHEL TO PROVIDE					1DTBA2:46(T)		
98	90GNN02AP001 - LSPB	AIR BLOWER-A		ETP-020-S8					LOCAL PB	BHEL TO PROVIDE	ETP-020-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBA2:47(T)		
										BHEL TO					1DTBA2:48(T)		
			COMMAND START	ETP-021-S1						BHEL TO					2DTBC3:01(T)		
										BHEL TO PROVIDE					2DTBC3:02(T)		
			COMMAND STOP	ETP-021-S2						BHEL TO PROVIDE					2DTBC3:03(T)		
										BHEL TO PROVIDE					2DTBC3:04(T)		
			FDBK ON	ETP-021-S3						BHEL TO PROVIDE					2DTBC2:65(T)		
										BHEL TO PROVIDE					2DTBC2:66(T)		
99	90GNN02AP002_XB91	AIR BLOWER-B	FDBK OFF	ETP-021-S4					MCC	BHEL TO PROVIDE	ETP-021-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB62	2DTBC2:67(T)		
										BHEL TO PROVIDE					2DTBC2:68(T)		
			MCC DISTBD	ETP-021-S5						BHEL TO					2DTBC2:81(T)		
										BHEL TO					2DTBC2:82(T)		
			MCC AVLBL	ETP-021-S6						BHEL TO					2DTBC2:83(T)		
										BHEL TO					2DTBC2:84(T)		
			EPB OPTD	ETP-021-S7						BHEL TO					2DTBC2:85(T)		
										BHEL TO					2DTBC2:86(T)		
100	90GNN02AP002 - LSPB	AIR BLOWER-B		ETP-021-S8					LOCAL PB	BHEL TO	ETP-021-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBC2:87(T)		
										BHEL TO					2DTBC2:88(T)		
			COMMAND START	ETP-022-S1						BHEL TO					1DTBC3:05(T)		
										BHEL TO PROVIDE					1DTBC3:06(T)		
			COMMAND STOP	ETP-022-S2						BHEL TO PROVIDE					1DTBC3:07(T)		
										BHEL TO PROVIDE					1DTBC3:08(T)		
			FDBK ON	ETP-022-S3						BHEL TO PROVIDE					1DTBC2:69(T)		
										BHEL TO PROVIDE					1DTBC2:70(T)		
101	90GNS01AP001_XB91	SLUDGE TRANSFER PUMP-A	FDBK OFF	ETP-022-S4					MCC	BHEL TO PROVIDE	ETP-022-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB61	1DTBC2:71(T)		
										BHEL TO PROVIDE					1DTBC2:72(T)		
			MCC DISTBD	ETP-022-S5						BHEL TO					1DTBC2:89(T)		
										BHEL TO					1DTBC2:90(T)		
			MCC AVLBL	ETP-022-S6						BHEL TO					1DTBC2:91(T)		
										BHEL TO					1DTBC2:92(T)		
			EPB OPTD	ETP-022-S7						BHEL TO					1DTBC2:93(T)		
										BHEL TO					1DTBC2:94(T)		
102	90GNS01AP001 - LSPB	SLUDGE TRANSFER PUMP-A		ETP-022-S8					LOCAL PB	BHEL TO	ETP-022-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBC2:95(T)		
										BHEL TO					1DTBC2:96(T)		
			COMMAND START	ETP-023-S1						BHEL TO					3DTBC2:09(T)		
										BHEL TO PROVIDE					3DTBC2:10(T)		
			COMMAND STOP	ETP-023-S2						BHEL TO PROVIDE					3DTBC2:11(T)		
										BHEL TO PROVIDE					3DTBC2:12(T)		
			FDBK ON	ETP-023-S3						BHEL TO PROVIDE					3DTBC1:73(T)		
										BHEL TO PROVIDE					3DTBC1:74(T)		
103	90GNS01AP002_XB91	SLUDGE TRANSFER PUMP-B	FDBK OFF	ETP-023-S4					MCC	BHEL TO PROVIDE	ETP-023-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBC1:75(T)		
										BHEL TO					3DTBC1:76(T)		
			MCC DISTBD	ETP-023-S5						BHEL TO					3DTBC1:89(T)		
										BHEL TO					3DTBC1:90(T)		
			MCC AVLBL	ETP-023-S6						BHEL TO					3DTBC1:91(T)		
										BHEL TO					3DTBC1:92(T)		
			EPB OPTD	ETP-023-S7						BHEL TO					3DTBC1:93(T)		
										BHEL TO					3DTBC1:94(T)		
104	90GNS01AP002 - LSPB	SLUDGE TRANSFER PUMP-B		ETP-023-S8					LOCAL PB	BHEL TO	ETP-023-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBC1:95(T)		
										BHEL TO					3DTBC1:96(T)		

105	90GMA01AP001_XB91	CMB GARDENING PUMP-A	COMMAND START	ETP-024-S1					MCC	BHEL TO PROVIDE	ETP-024-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA2:17(T)	
										BHEL TO PROVIDE					3DTBA2:18(T)	
			COMMAND STOP	ETP-024-S2						BHEL TO PROVIDE					3DTBA2:19(T)	
										BHEL TO PROVIDE					3DTBA2:20(T)	
			FDBK ON	ETP-024-S3						BHEL TO PROVIDE					3DTBA1:81(T)	
										BHEL TO PROVIDE					3DTBA1:82(T)	
			FDBK OFF	ETP-024-S4						BHEL TO PROVIDE					3DTBA1:83(T)	
										BHEL TO PROVIDE					3DTBA1:84(T)	
			MCC DISTBD	ETP-024-S5						BHEL TO PROVIDE					3DTBA2:01(T)	
										BHEL TO PROVIDE					3DTBA2:02(T)	
			MCC AVLBL	ETP-024-S6						BHEL TO PROVIDE					3DTBA2:03(T)	
										BHEL TO PROVIDE					3DTBA2:04(T)	
			EPB OPTD	ETP-024-S7						BHEL TO PROVIDE					3DTBA2:05(T)	
										BHEL TO PROVIDE					3DTBA2:06(T)	
106	90GMA01AP001 - LSPB	CMB GARDENING PUMP-A		ETP-024-S8					LOCAL PB	BHEL TO PROVIDE	ETP-024-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBA2:07(T)	
															3DTBA2:08(T)	
107	90GMA01AP002_XB91	CMB GARDENING PUMP-B	COMMAND START	ETP-025-S1					MCC	BHEL TO PROVIDE	ETP-025-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA2:21(T)	
										BHEL TO PROVIDE					3DTBA2:22(T)	
			COMMAND STOP	ETP-025-S2						BHEL TO PROVIDE					3DTBA2:23(T)	
										BHEL TO PROVIDE					3DTBA2:24(T)	
			FDBK ON	ETP-025-S3						BHEL TO PROVIDE					3DTBA1:85(T)	
										BHEL TO PROVIDE					3DTBA1:86(T)	
			FDBK OFF	ETP-025-S4						BHEL TO PROVIDE					3DTBA1:87(T)	
										BHEL TO PROVIDE					3DTBA1:88(T)	
			MCC DISTBD	ETP-025-S5						BHEL TO PROVIDE					3DTBA2:09(T)	
										BHEL TO PROVIDE					3DTBA2:10(T)	
			MCC AVLBL	ETP-025-S6						BHEL TO PROVIDE					3DTBA2:11(T)	
										BHEL TO PROVIDE					3DTBA2:12(T)	
			EPB OPTD	ETP-025-S7						BHEL TO PROVIDE					3DTBA2:13(T)	
										BHEL TO PROVIDE					3DTBA2:14(T)	
108	90GMA01AP002 - LSPB	CMB GARDENING PUMP-B		ETP-025-S8					LOCAL PB	BHEL TO PROVIDE	ETP-025-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBA2:15(T)	
										BHEL TO PROVIDE					3DTBA2:16(T)	
109	90GMA01AP003_XB91	CMB EFFLUENT TRANSFER PUMP-A	COMMAND START	ETP-026-S1					MCC	BHEL TO PROVIDE	ETP-026-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA2:57(T)	
										BHEL TO PROVIDE					3DTBA2:58(T)	
			COMMAND STOP	ETP-026-S2						BHEL TO PROVIDE					3DTBA2:59(T)	
										BHEL TO PROVIDE					3DTBA2:60(T)	
			FDBK ON	ETP-026-S3						BHEL TO PROVIDE					3DTBA2:25(T)	
										BHEL TO PROVIDE					3DTBA2:26(T)	
			FDBK OFF	ETP-026-S4						BHEL TO PROVIDE					3DTBA2:27(T)	
										BHEL TO PROVIDE					3DTBA2:28(T)	
			MCC DISTBD	ETP-026-S5						BHEL TO PROVIDE					3DTBA2:41(T)	
										BHEL TO PROVIDE					3DTBA2:42(T)	
			MCC AVLBL	ETP-026-S6						BHEL TO PROVIDE					3DTBA2:43(T)	
										BHEL TO PROVIDE					3DTBA2:44(T)	
			EPB OPTD	ETP-026-S7						BHEL TO PROVIDE					3DTBA2:45(T)	
										BHEL TO PROVIDE					3DTBA2:46(T)	
110	90GMA01AP003 - LSPB	CMB EFFLUENT TRANSFER PUMP-A		ETP-026-S8					LOCAL PB	BHEL TO PROVIDE	ETP-026-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBA2:47(T)	
										BHEL TO PROVIDE					3DTBA2:48(T)	
111	90GMA01AP004_XB91	CMB EFFLUENT TRANSFER PUMP-B	COMMAND START	ETP-027-S1					MCC	BHEL TO PROVIDE	ETP-027-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA2:61(T)	
										BHEL TO PROVIDE					3DTBA2:62(T)	
			COMMAND STOP	ETP-027-S2						BHEL TO PROVIDE					3DTBA2:63(T)	
										BHEL TO PROVIDE					3DTBA2:64(T)	
			FDBK ON	ETP-027-S3						BHEL TO PROVIDE					3DTBA2:29(T)	
										BHEL TO PROVIDE					3DTBA2:30(T)	
			FDBK OFF	ETP-027-S4						BHEL TO PROVIDE					3DTBA2:31(T)	
										BHEL TO PROVIDE					3DTBA2:32(T)	
			MCC DISTBD	ETP-027-S5						BHEL TO PROVIDE					3DTBA2:49(T)	
										BHEL TO PROVIDE					3DTBA2:50(T)	
			MCC AVLBL	ETP-027-S6						BHEL TO PROVIDE					3DTBA2:51(T)	
										BHEL TO PROVIDE					3DTBA2:52(T)	
			EPB OPTD	ETP-027-S7						BHEL TO PROVIDE					3DTBA2:53(T)	
										BHEL TO PROVIDE					3DTBA2:54(T)	
112	90GMA01AP004 - LSPB	CMB EFFLUENT PUMP-B		ETP-027-S8					LOCAL PB	BHEL TO PROVIDE	ETP-027-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBA2:55(T)	
										BHEL TO PROVIDE					3DTBA2:56(T)	
113	90GTA02AP001_XB91	TPI OVERFLOW WATER TRANSFER PUMP-A	COMMAND START	ETP-028-S1					MCC	BHEL TO PROVIDE	ETP-028-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBC1:65(T)	
										BHEL TO PROVIDE					3DTBC1:66(T)	
			COMMAND STOP	ETP-028-S2						BHEL TO PROVIDE					3DTBC1:67(T)	
										BHEL TO PROVIDE					3DTBC1:68(T)	
			FDBK ON	ETP-028-S3						BHEL TO PROVIDE					3DTBC1:33(T)	
										BHEL TO PROVIDE					3DTBC1:34(T)	
			FDBK OFF	ETP-028-S4						BHEL TO PROVIDE					3DTBC1:35(T)	
										BHEL TO PROVIDE					3DTBC1:36(T)	
			MCC DISTBD	ETP-028-S5						BHEL TO PROVIDE					3DTBC1:49(T)	
										BHEL TO PROVIDE					3DTBC1:50(T)	
			MCC AVLBL	ETP-028-S6						BHEL TO PROVIDE					3DTBC1:51(T)	
										BHEL TO PROVIDE					3DTBC1:52(T)	
			EPB OPTD	ETP-028-S7						BHEL TO PROVIDE					3DTBC1:53(T)	
										BHEL TO PROVIDE					3DTBC1:54(T)	
114	90GTA02AP001 -LSPB	TPI OVERFLOW WATER TRANSFER PUMP-A		ETP-028-S8					LOCAL PB	BHEL TO PROVIDE	ETP-028-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBC1:55(T)	
										BHEL TO PROVIDE					3DTBC1:56(T)	

115	90GTA02AP002_XB91	TPI Inlet Water Transfer Pump Motor-2	COMMAND START	ETP-029-S1					MCC	BHEL TO PROVIDE	ETP-029-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA3:05(T)	
										BHEL TO PROVIDE					3DTBA3:06(T)	
			COMMAND STOP	ETP-029-S2						BHEL TO PROVIDE					3DTBA3:07(T)	
										BHEL TO PROVIDE					3DTBA3:08(T)	
			FDBK ON	ETP-029-S3						BHEL TO PROVIDE					3DTBA2:69(T)	
										BHEL TO PROVIDE					3DTBA2:70(T)	
			FDBK OFF	ETP-029-S4						BHEL TO PROVIDE					3DTBA2:71(T)	
										BHEL TO PROVIDE					3DTBA2:72(T)	
			MCC DISTBD	ETP-029-S5						BHEL TO PROVIDE					3DTBA2:85(T)	
										BHEL TO PROVIDE					3DTBA2:86(T)	
			MCC AVLBL	ETP-029-S6						BHEL TO PROVIDE					3DTBA2:87(T)	
										BHEL TO PROVIDE					3DTBA2:88(T)	
			EPB OPTD	ETP-029-S7						BHEL TO PROVIDE					3DTBA2:89(T)	
										BHEL TO PROVIDE					3DTBA2:90(T)	
116	90GTA02AP002 -LSPB	TPI Inlet Water Transfer Pump Motor-2,(LPBS)		ETP-029-S8					LOCAL PB	BHEL TO PROVIDE	ETP-029-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBA2:91(T)	
										BHEL TO PROVIDE					3DTBA2:92(T)	
117	90GMA21AP001_XB91	GUARD POND EFFLUENT DISPOSAL PUMP-A	COMMAND START	ETP-030-S1					MCC	BHEL TO PROVIDE	ETP-030-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBC2:93(T)	
										BHEL TO PROVIDE					3DTBC2:94(T)	
			COMMAND STOP	ETP-030-S2						BHEL TO PROVIDE					3DTBC2:95(T)	
										BHEL TO PROVIDE					3DTBC2:96(T)	
			FDBK ON	ETP-030-S3						BHEL TO PROVIDE					3DTBC2:61(T)	
										BHEL TO PROVIDE					3DTBC2:62(T)	
			FDBK OFF	ETP-030-S4						BHEL TO PROVIDE					3DTBC2:63(T)	
										BHEL TO PROVIDE					3DTBC2:64(T)	
			MCC DISTBD	ETP-030-S5						BHEL TO					3DTBC2:77(T)	
										BHEL TO					3DTBC2:78(T)	
			MCC AVLBL	ETP-030-S6						BHEL TO					3DTBC2:79(T)	
										BHEL TO					3DTBC2:80(T)	
			EPB OPTD	ETP-030-S7						BHEL TO					3DTBC2:81(T)	
										BHEL TO					3DTBC2:82(T)	
118	90GMA21AP001 -LSPB	GUARD POND EFFLUENT DISPOSAL PUMP-A		ETP-030-S8					LOCAL PB	BHEL TO	ETP-030-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBC2:83(T)	
										BHEL TO					3DTBC2:84(T)	
119	90GMA21AP002_XB91	GUARD POND EFFLUENT DISPOSAL PUMP-B	COMMAND START	ETP-031-S1					MCC	BHEL TO	ETP-031-OG01	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBC2:53(T)	
										BHEL TO					3DTBC2:54(T)	
			COMMAND STOP	ETP-031-S2						BHEL TO PROVIDE					3DTBC2:55(T)	
										BHEL TO PROVIDE					3DTBC2:56(T)	
			FDBK ON	ETP-031-S3						BHEL TO PROVIDE					3DTBC2:21(T)	
										BHEL TO PROVIDE					3DTBC2:22(T)	
			FDBK OFF	ETP-031-S4						BHEL TO PROVIDE					3DTBC2:23(T)	
										BHEL TO PROVIDE					3DTBC2:24(T)	
			MCC DISTBD	ETP-031-S5						BHEL TO PROVIDE					3DTBC2:37(T)	
										BHEL TO PROVIDE					3DTBC2:38(T)	
			MCC AVLBL	ETP-031-S6						BHEL TO PROVIDE					3DTBC2:39(T)	
										BHEL TO PROVIDE					3DTBC2:40(T)	
			EPB OPTD	ETP-031-S7						BHEL TO PROVIDE					3DTBC2:41(T)	
										BHEL TO PROVIDE					3DTBC2:42(T)	
120	90GMA21AP002 -LSPB	GUARD POND EFFLUENT DISPOSAL PUMP-B		ETP-031-S8					LOCAL PB	BHEL TO PROVIDE	ETP-031-OG02	2PX0.5SQMM (F Type)	VENDOR	CRB63	3DTBC2:43(T)	
										BHEL TO PROVIDE					3DTBC2:44(T)	
121	90GNN02CP102_XG03	DP ACROSS LIME DOSING STRAINER -B	DIFF PRESSURE	ETP-JB-020-S1	2PX0.5SQMM (F Type)				JB-020	TB-01	ETP-JB-020-OG01	12PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBB3:35(T)	
122	90GNN03CP102_XG03	DP ACROSS PE DOSING STRAINER -B	DIFF PRESSURE	ETP-JB-020-S2	2PX0.5SQMM (F Type)					TB-02			VENDOR	CRB62	2DTBB3:37(T)	
123	90GNN04CP102_XG03	DP ACR ACID DOS STRAINER -B FOR CMB	DIFF PRESSURE	ETP-JB-020-S3	2PX0.5SQMM (F Type)					TB-03			VENDOR	CRB62	2DTBB3:39(T)	
124	90GNN06CP102_XG03	DP ACR ACID DOS STRN-B GUARD POND	DIFF PRESSURE	ETP-JB-020-S4	2PX0.5SQMM (F Type)					TB-04			VENDOR	CRB62	2DTBB3:41(T)	
125	90GNN03CP101_XG03	DP ACROSS PE DOSING STRAINER -A	DIFF PRESSURE	ETP-JB-021-S1	2PX0.5SQMM (F Type)				JB-021	TB-01	ETP-JB-021-OG01	12PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBB2:05(T)	
126	90GNN05CP101_XG03	DP ACR ALKALI DOS STRN-A FOR CMB	DIFF PRESSURE	ETP-JB-021-S2	2PX0.5SQMM (F Type)					TB-02			VENDOR	CRB61	1DTBB2:09(T)	
127	90GNN05CP102_XG03	DP ACR ALKALI DOS STRN-B FOR CMB	DIFF PRESSURE	ETP-JB-021-S3	2PX0.5SQMM (F Type)					TB-03			VENDOR	CRB61	1DTBB2:11(T)	
128	90GNN06CP101_XG03	DP ACR ACID DOS STRN-A GUARD POND	DIFF PRESSURE	ETP-JB-021-S4	2PX0.5SQMM (F Type)					TB-04			VENDOR	CRB61	1DTBB2:13(T)	
129	90GNN04CP101_XG03	DP ACR ACID DOS STRAINER-A FOR CMB	DIFF PRESSURE	ETP-JB-022-S1	2PX0.5SQMM (F Type)				JB-022	TB-01	ETP-JB-022-OG01	12PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBB2:07(T)	
130	90GNN07CP101_XG03	DP ACR ALKALI DOS STRN-A GUARD POND	DIFF PRESSURE	ETP-JB-022-S2	2PX0.5SQMM (F Type)					TB-02			VENDOR	CRB61	1DTBB2:15(T)	
131	90GNN01CP101_XG03	DP ACROSS ALUM DOSING STRAINER -A	DIFF PRESSURE	ETP-JB-022-S3	2PX0.5SQMM (F Type)					TB-03			VENDOR	CRB61	1DTBB2:01(T)	
132	90GNN02CP101_XG03	DP ACROSS LIME DOSING STRAINER -A	DIFF PRESSURE	ETP-JB-022-S4	2PX0.5SQMM (F Type)					TB-04			VENDOR	CRB61	1DTBB2:03(T)	
133	90GNN07CP102_XG03	DP ACR ALKALI DOS STRN-B GUARD POND	DIFF PRESSURE	ETP-JB-023-S1	2PX0.5SQMM (F Type)				ETP-JB-023	TB-01	ETP-JB-023-OG01	2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBB3:11(T)	
134	90GNN01CP102_XG03	DP ACROSS ALUM DOSING STRAINER -B	DIFF PRESSURE	ETP-JB-023-S2	2PX0.5SQMM (F Type)					TB-02		2PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBB3:33(T)	
135	90GMA11AA001	CMB EFFLUENT TRANSFER PUMP RECIR VLV,at CMB Area	OPEN CMD	ETP-032-S1					MCC	BHEL TO PROVIDE	ETP-032-OG1	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA1:75(T)	
										BHEL TO					3DTBA1:76(T)	
			CLOSE CMD	ETP-032-S2						BHEL TO PROVIDE					3DTBA1:73(T)	
										BHEL TO					3DTBA1:74(T)	
			FDBK ON	ETP-032-S3						BHEL TO PROVIDE					3DTBA1:41(T)	
										BHEL TO					3DTBA1:42(T)	
			FDBK OFF	ETP-032-S4						BHEL TO PROVIDE					3DTBA1:43(T)	
										BHEL TO					3DTBA1:44(T)	
			ACTUATOR DISTBD	ETP-032-S5						BHEL TO					3DTBA1:57(T)	
										BHEL TO					3DTBA1:58(T)	
			ACTUATOR REMOTE	ETP-032-S6						BHEL TO					3DTBA1:59(T)	
										BHEL TO					3DTBA1:60(T)	
136	90GMA12AA001	CMB GARDENING PUMP RECIR VLV	OPEN CMD	ETP-033-S1					MCC	BHEL TO	ETP-033-OG1	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA1:35(T)	
										BHEL TO					3DTBA1:36(T)	
			CLOSE CMD	ETP-033-S2						BHEL TO					3DTBA1:33(T)	
										BHEL TO PROVIDE					3DTBA1:34(T)	
			FDBK ON	ETP-033-S3						BHEL TO PROVIDE					3DTBA1:45(T)	
										BHEL TO					3DTBA1:46(T)	
			FDBK OFF	ETP-033-S4						BHEL TO PROVIDE					3DTBA1:47(T)	
										BHEL TO					3DTBA1:48(T)	
			ACTUATOR DISTBD	ETP-033-S5						BHEL TO					3DTBA1:61(T)	
										BHEL TO					3DTBA1:62(T)	
			ACTUATOR REMOTE	ETP-033-S6						BHEL TO					3DTBA1:63(T)	
										BHEL TO					3DTBA1:64(T)	

137	90GMA12AA002	CMB GARDENING PUMP TO HORTICULTURE ISO VLV,at CMB Area	OPEN CMD	ETP-034-S1					MCC	BHEL TO PROVIDE	ETP-034-OOG1	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA1:39(T)	
										BHEL TO PROVIDE					3DTBA1:40(T)	
			CLOSE CMD	ETP-034-S2						BHEL TO PROVIDE					3DTBA1:37(T)	
										BHEL TO PROVIDE					3DTBA1:38(T)	
			FDBK ON	ETP-034-S3						BHEL TO PROVIDE					3DTBA1:49(T)	
										BHEL TO PROVIDE					3DTBA1:50(T)	
			FDBK OFF	ETP-034-S4						BHEL TO PROVIDE					3DTBA1:51(T)	
										BHEL TO PROVIDE					3DTBA1:52(T)	
			ACTUATOR DISTBD	ETP-034-S5						BHEL TO PROVIDE					3DTBA1:65(T)	
										BHEL TO PROVIDE					3DTBA1:66(T)	
			ACTUATOR REMOTE	ETP-034-S6						BHEL TO PROVIDE					3DTBA1:67(T)	
										BHEL TO PROVIDE					3DTBA1:68(T)	
138	90GMA11AA002	CMB EFFLUENT TRSFR PMP TO CHP DUST SUPP ISO VLV,at CMB Area	OPEN CMD	ETP-035-S1					MCC	BHEL TO PROVIDE	ETP-035-OOG1	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBA3:03(T)	
										BHEL TO PROVIDE					3DTBA3:04(T)	
			CLOSE CMD	ETP-035-S2						BHEL TO PROVIDE					3DTBA3:01(T)	
										BHEL TO PROVIDE					3DTBA3:02(T)	
			FDBK ON	ETP-035-S3						BHEL TO PROVIDE					3DTBA2:65(T)	
										BHEL TO PROVIDE					3DTBA2:66(T)	
			FDBK OFF	ETP-035-S4						BHEL TO PROVIDE					3DTBA2:67(T)	
										BHEL TO PROVIDE					3DTBA2:68(T)	
			ACTUATOR DISTBD	ETP-035-S5						BHEL TO PROVIDE					3DTBA2:81(T)	
										BHEL TO PROVIDE					3DTBA2:82(T)	
			ACTUATOR REMOTE	ETP-035-S6						BHEL TO PROVIDE					3DTBA2:83(T)	
										BHEL TO PROVIDE					3DTBA2:84(T)	
139	90GMA11AA003	CMB EFFLUENT TRSFR PMP TO GUARD POND ISO VLV,at CMB Area	OPEN CMD	ETP-036-S1					MCC	BHEL TO PROVIDE	ETP-036-OOG1	8PX0.5SQMM (G Type)	VENDOR	CRB63	3DTBC2:91(T)	
										BHEL TO PROVIDE					3DTBC2:92(T)	
			CLOSE CMD	ETP-036-S2						BHEL TO PROVIDE					3DTBC2:89(T)	
										BHEL TO PROVIDE					3DTBC2:90(T)	
			FDBK ON	ETP-036-S3						BHEL TO PROVIDE					3DTBC2:57(T)	
										BHEL TO PROVIDE					3DTBC2:58(T)	
			FDBK OFF	ETP-036-S4						BHEL TO PROVIDE					3DTBC2:59(T)	
										BHEL TO PROVIDE					3DTBC2:60(T)	
			ACTUATOR DISTBD	ETP-036-S5						BHEL TO PROVIDE					3DTBC2:73(T)	
										BHEL TO PROVIDE					3DTBC2:74(T)	
			ACTUATOR REMOTE	ETP-036-S6						BHEL TO PROVIDE					3DTBC2:75(T)	
										BHEL TO PROVIDE					3DTBC2:76(T)	
140	90GMA30AA001	GUARD POND EFFLUENT DISPOSAL PUMP RECIR VLV,GUARD POND Area	OPEN CMD	ETP-037-S1					MCC	BHEL TO PROVIDE	ETP-037-OOG1	8PX0.5SQMM (G Type)		CRB63	3DTBC2:51(T)	
										BHEL TO PROVIDE					3DTBC2:52(T)	
			CLOSE CMD	ETP-037-S2						BHEL TO PROVIDE					3DTBC2:49(T)	
										BHEL TO PROVIDE					3DTBC2:50(T)	
			FDBK ON	ETP-037-S3						BHEL TO PROVIDE					3DTBC2:17(T)	
										BHEL TO PROVIDE					3DTBC2:18(T)	
			FDBK OFF	ETP-037-S4						BHEL TO PROVIDE					3DTBC2:19(T)	
										BHEL TO PROVIDE					3DTBC2:20(T)	
			ACTUATOR DISTBD	ETP-037-S5						BHEL TO PROVIDE					3DTBC2:33(T)	
										BHEL TO PROVIDE					3DTBC2:34(T)	
			ACTUATOR REMOTE	ETP-037-S6											3DTBC2:35(T)	
										BHEL TO PROVIDE					3DTBC2:36(T)	
141	90GMA30AA002	TREATED EFFLUENT TO ASH WATER SUMP ISO VLV ,GUARD POND Area	OPEN CMD	ETP-038-S1					MCC	BHEL TO PROVIDE	ETP-038-OOG1	8PX0.5SQMM (G Type)		CRB63	3DTBC1:27(T)	
										BHEL TO PROVIDE					3DTBC1:28(T)	
			CLOSE CMD	ETP-038-S2						BHEL TO PROVIDE					3DTBC1:25(T)	
										BHEL TO PROVIDE					3DTBC1:26(T)	
			FDBK ON	ETP-038-S3						BHEL TO PROVIDE					3DTBC1:37(T)	
										BHEL TO PROVIDE					3DTBC1:38(T)	
			FDBK OFF	ETP-038-S4						BHEL TO PROVIDE					3DTBC1:39(T)	
										BHEL TO PROVIDE					3DTBC1:40(T)	
			ACTUATOR DISTBD	ETP-038-S5						BHEL TO PROVIDE					3DTBC1:57(T)	
										BHEL TO PROVIDE					3DTBC1:58(T)	
			ACTUATOR REMOTE	ETP-038-S6											3DTBC1:59(T)	
										BHEL TO PROVIDE					3DTBC1:60(T)	
142	90GMA30AA003	TREATED EFFLUENT TO CW BLOWDOWN HDR ISO VLV	OPEN CMD	ETP-039-S1					MCC	BHEL TO PROVIDE	ETP-039-OOG1	8PX0.5SQMM (G Type)		CRB63	3DTBC2:15(T)	
										BHEL TO PROVIDE					3DTBC2:16(T)	
			CLOSE CMD	ETP-039-S2						BHEL TO PROVIDE					3DTBC2:13(T)	
										BHEL TO PROVIDE					3DTBC2:14(T)	
			FDBK ON	ETP-039-S3						BHEL TO PROVIDE					3DTBC1:77(T)	
										BHEL TO PROVIDE					3DTBC1:78(T)	
			FDBK OFF	ETP-039-S4						BHEL TO PROVIDE					3DTBC1:79(T)	
										BHEL TO PROVIDE					3DTBC1:80(T)	
			ACTUATOR DISTBD	ETP-039-S5						BHEL TO PROVIDE					3DTBC2:01(T)	
										BHEL TO PROVIDE					3DTBC2:02(T)	
			ACTUATOR REMOTE	ETP-039-S6						BHEL TO PROVIDE					3DTBC2:03(T)	
										BHEL TO PROVIDE					3DTBC2:04(T)	
143	10GNA01AP001_XB91	TRANSFORMER YARD AREA OILY WASTE TRANSFER PUMP-A(UNIT-1)	COMMAND START	ETP-040-S1					MCC	BHEL TO PROVIDE	ETP-040-OOG1	8PX0.5SQMM (G Type)		CRE36	2DTBA2:49(T)	
										BHEL TO PROVIDE					2DTBA2:50(T)	
			COMMAND STOP	ETP-040-S2						BHEL TO PROVIDE					2DTBA2:51(T)	
										BHEL TO PROVIDE					2DTBA2:52(T)	
			FDBK ON	ETP-040-S3						BHEL TO PROVIDE					2DTBA1:29(T)	
										BHEL TO PROVIDE					2DTBA1:30(T)	
			FDBK OFF	ETP-040-S4						BHEL TO PROVIDE					2DTBA1:31(T)	
										BHEL TO PROVIDE					2DTBA1:32(T)	
			MCC DISTBD	ETP-040-S5						BHEL TO PROVIDE					2DTBA1:49(T)	
										BHEL TO PROVIDE					2DTBA1:50(T)	
			MCC AVLBL	ETP-040-S6						BHEL TO PROVIDE					2DTBA1:51(T)	
										BHEL TO PROVIDE					2DTBA1:52(T)	
			EPB OPTD	ETP-040-S7						BHEL TO PROVIDE					2DTBA1:53(T)	
										BHEL TO PROVIDE					2DTBA1:54(T)	
144	10GNA01AP001 -LSPB	TRANSFRMR YARD AREA OILY WASTE TRANSFER PUMP-A(UNIT-1)		ETP-040-S8					LOCAL PB	BHEL TO PROVIDE	ETP-040-OOG2	2PX0.5SQMM (F Type)	VENDOR	CRE36	2DTBA1:55(T)	
										BHEL TO PROVIDE					2DTBA1:56(T)	
145	10GNA01AP002_XB91	TRANSFRMR YARD AREA OILY WASTE TRANSFER PUMP-B(UNIT-1)	COMMAND START	ETP-041-S1					MCC	BHEL TO PROVIDE	ETP-041-OOG1	8PX0.5SQMM (G Type)		CRE36	2DTBC2:93(T)	
										BHEL TO PROVIDE					2DTBC2:94(T)	
			COMMAND STOP	ETP-041-S2						BHEL TO PROVIDE					2DTBC2:95(T)	
										BHEL TO PROVIDE					2DTBC2:96(T)	
			FDBK ON	ETP-041-S3						BHEL TO PROVIDE					2DTBC2:81(T)	
										BHEL TO PROVIDE					2DTBC2:82(T)	
			FDBK OFF	ETP-041-S4						BHEL TO PROVIDE					2DTBC2:83(T)	
										BHEL TO PROVIDE					2DTBC2:84(T)	
			MCC DISTBD	ETP-041-S5						BHEL TO PROVIDE					2DTBC2:49(T)	
										BHEL TO PROVIDE					2DTBC2:50(T)	
			MCC AVLBL	ETP-041-S6						BHEL TO PROVIDE					2DTBC2:51(T)	
										BHEL TO PROVIDE					2DTBC2:52(T)	
			EPB OPTD	ETP-041-S7						BHEL TO PROVIDE					2DTBC2:53(T)	
										BHEL TO PROVIDE					2DTBC2:54(T)	

146	10GNA01AP002 -LSPB	TRASFRMR YARD AREA OILY WASTE TRANSFER PUMP-B(UNIT-1)		ETP-041-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-041-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE36	2DTBC2:55(T) 2DTBC2:56(T)	
147	20GNA01AP001_XB91	TRANSFORMER YARD AREA OILY WASTE TRANSFER PUMP-A(UNIT-2)	COMMAND START	ETP-042-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-042-OG01	8PX0.5SQMM (G Type)		CRE36	2DTBA2:49(T) 2DTBA2:50(T)	
			COMMAND STOP	ETP-042-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:51(T) 2DTBA2:52(T)	
			FDBK ON	ETP-042-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:29(T) 2DTBA1:30(T)	
			FDBK OFF	ETP-042-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:31(T) 2DTBA1:32(T)	
			MCC DISTBD	ETP-042-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:49(T) 2DTBA1:50(T)	
			MCC AVLBL	ETP-042-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:51(T) 2DTBA1:52(T)	
			EPB OPTD	ETP-042-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:53(T) 2DTBA1:54(T)	
148	20GNA01AP001 -LSPB	TRANSFORMER YARD AREA OILY WASTE TRANSFER PUMP-A(UNIT-2)		ETP-042-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-042-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE36	2DTBA1:55(T) 2DTBA1:56(T)	
149	20GNA01AP002_XB91	TRANSFORMER YARD AREA OILY WASTE TRANSFER PUMP-B(UNIT-2)	COMMAND START	ETP-043-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-043-OG01	8PX0.5SQMM (G Type)		CRE36	2DTBC2:93(T) 2DTBC2:94(T)	
			COMMAND STOP	ETP-043-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:95(T) 2DTBC2:96(T)	
			FDBK ON	ETP-043-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:81(T) 2DTBC2:82(T)	
			FDBK OFF	ETP-043-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:83(T) 2DTBC2:84(T)	
			MCC DISTBD	ETP-043-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:49(T) 2DTBC2:50(T)	
			MCC AVLBL	ETP-043-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:51(T) 2DTBC2:52(T)	
			EPB OPTD	ETP-043-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC2:53(T) 2DTBC2:54(T)	
150	20GNA01AP002 -LSPB	TRANSFORMER YARD AREA OILY WASTE TRANSFER PUMP-B(UNIT-2)		ETP-043-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-043-OG02	2PX0.5SQMM (F Type)	VENDOR	CFRE36	2DTBC2:55(T) 2DTBC2:56(T)	
151	10GNA02AP001_XB91	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-1,COAL MILL AREA-1	COMMAND START	ETP-044-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-044-OG01	8PX0.5SQMM (G Type)		CRE35	1DTBC2:77(T) 1DTBC2:78(T)	
			COMMAND STOP	ETP-044-S2						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:79(T) 1DTBC2:80(T)	
			FDBK ON	ETP-044-S3						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:69(T) 1DTBC2:70(T)	
			FDBK OFF	ETP-044-S4						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:71(T) 1DTBC2:72(T)	
			MCC DISTBD	ETP-044-S5						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:05(T) 1DTBC2:06(T)	
			MCC AVLBL	ETP-044-S6						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:07(T) 1DTBC2:08(T)	
			EPB OPTD	ETP-044-S7						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:09(T) 1DTBC2:10(T)	
152	10GNA02AP001 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-1,COAL MILL AREA-1(LPBS)		ETP-044-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-044-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBC2:11(T) 1DTBC2:12(T)	
153	10GNA02AP002_XB91	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-2,COAL MILL AREA-1	COMMAND START	ETP-045-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-045-OG01	8PX0.5SQMM (G Type)		CRE36	2DTBC1:01(T) 2DTBC1:02(T)	
			COMMAND STOP	ETP-045-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:03(T) 2DTBC1:04(T)	
			FDBK ON	ETP-045-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:45(T) 2DTBC1:46(T)	
			FDBK OFF	ETP-045-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:47(T) 2DTBC1:48(T)	
			MCC DISTBD	ETP-045-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:29(T) 2DTBC1:30(T)	
			MCC AVLBL	ETP-045-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:31(T) 2DTBC1:32(T)	
			EPB OPTD	ETP-045-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:69(T) 2DTBC1:70(T)	

154	10GNA02AP002 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-2,COAL MILL AREA-1(LPBS)		ETP-045-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-045-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE36	2DTBC1:71(T) 2DTBC1:72(T)	
155	10GNA03AP001_XB91	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-1,COAL MILL AREA-2	COMMAND START	ETP-046-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-046-OG1	8PX0.5SQMM (G Type)		CRE38	2DTBA3:05(T) 2DTBA3:06(T)	
			COMMAND STOP	ETP-046-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA3:07(T) 2DTBA3:08(T)	
			FDBK ON	ETP-046-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:93(T) 2DTBA2:94(T)	
			FDBK OFF	ETP-046-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:95(T) 2DTBA2:96(T)	
			MCC DISTBD	ETP-046-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:89(T) 2DTBA1:90(T)	
			MCC AVLBL	ETP-046-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:91(T) 2DTBA1:92(T)	
			EPB OPTD	ETP-046-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:93(T) 2DTBA1:94(T)	
156	10GNA03AP001 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-1,COAL MILL AREA-2,(LPBS)		ETP-046-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-046-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE38	2DTBA1:95(T) 2DTBA1:96(T)	
157	10GNA03AP002_XB91	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-2,COAL MILL AREA-2	COMMAND START	ETP-047-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-047-OG1	8PX0.5SQMM (G Type)		CRE35	1DTBC2:73(T) 1DTBC2:74(T)	
			COMMAND STOP	ETP-047-S2						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:75(T) 1DTBC2:76(T)	
			FDBK ON	ETP-047-S3						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:65(T) 1DTBC2:66(T)	
			FDBK OFF	ETP-047-S4						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:67(T) 1DTBC2:68(T)	
			MCC DISTBD	ETP-047-S5						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:49(T) 1DTBC2:50(T)	
			MCC AVLBL	ETP-047-S6						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:51(T) 1DTBC2:52(T)	
			EPB OPTD	ETP-047-S7						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:53(T) 1DTBC2:54(T)	
158	10GNA03AP002 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-1) Motor-2,COAL MILL AREA-2,(LPBS)		ETP-047-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-047-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBC2:55(T) 1DTBC2:56(T)	
159	20GNA02AP001_XB91	Coal Mill Oily Waste Transfer Pump(Unit-2) Motor-2,COAL MILL AREA-1	COMMAND START	ETP-048-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-048-OG1	8PX0.5SQMM (G Type)		CRE35	1DTBC2:77(T) 1DTBC2:78(T)	
			COMMAND STOP	ETP-048-S2						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:79(T) 1DTBC2:80(T)	
			FDBK ON	ETP-048-S3						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:69(T) 1DTBC2:70(T)	
			FDBK OFF	ETP-048-S4						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:71(T) 1DTBC2:72(T)	
			MCC DISTBD	ETP-048-S5						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:05(T) 1DTBC2:06(T)	
			MCC AVLBL	ETP-048-S6						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:07(T) 1DTBC2:08(T)	
			EPB OPTD	ETP-048-S7						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:09(T) 1DTBC2:10(T)	
160	20GNA02AP001 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-2) Motor-2,COAL MILL AREA-1,(LPBS)		ETP-048-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-048-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBC2:11(T) 1DTBC2:12(T)	

161	20GNA02AP002_XB91	Coal Mill Oily Waste Transfer Pump(Unit-2) Motor-1,COAL MILL AREA-2	COMMAND START	ETP-049-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-049-OOG1	8PX0.5SQMM (G Type)		CRE36	2DTBC1:01(T) 2DTBC1:02(T)	
			COMMAND STOP	ETP-049-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:03(T) 2DTBC1:04(T)	
			FDBK ON	ETP-049-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:45(T) 2DTBC1:46(T)	
			FDBK OFF	ETP-049-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:47(T) 2DTBC1:48(T)	
			MCC DISTBD	ETP-049-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:29(T) 2DTBC1:30(T)	
			MCC AVLBL	ETP-049-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:31(T) 2DTBC1:32(T)	
			EPB OPTD	ETP-049-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:69(T) 2DTBC1:70(T)	
162	20GNA02AP002 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-2) Motor-1,COAL MILL AREA-2,(LPBS)		ETP-049-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-049-OOG2	2PX0.5SQMM (F Type)	VENDOR	CRE36	2DTBC1:71(T) 2DTBC1:72(T)	
163	20GNA03AP001_XB91	Coal Mill Oily Waste Transfer Pump(Unit-2) Motor-2,COAL MILL AREA-2	COMMAND START	ETP-050-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-050-OOG1	8PX0.5SQMM (G Type)		CRE38	2DTBA3:05(T) 2DTBA3:06(T)	
			COMMAND STOP	ETP-050-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA3:07(T) 2DTBA3:08(T)	
			FDBK ON	ETP-050-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:93(T) 2DTBA2:94(T)	
			FDBK OFF	ETP-050-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:95(T) 2DTBA2:96(T)	
			MCC DISTBD	ETP-050-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:89(T) 2DTBA1:90(T)	
			MCC AVLBL	ETP-050-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:91(T) 2DTBA1:92(T)	
			EPB OPTD	ETP-050-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA1:93(T) 2DTBA1:94(T)	
164	20GNA03AP001 -LSPB	Coal Mill Oily Waste Transfer Pump(Unit-2) Motor-2,COAL MILL AREA-2,(LPBS)		ETP-050-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-050-OOG2	2PX0.5SQMM (F Type)	VENDOR	CRE38	2DTBA1:95(T) 2DTBA1:96(T)	
165	20GNA03AP002_XB91	COAL MILL OILY WASTE TRANSFER PUMP-B(UNIT-2)	COMMAND START	ETP-051-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-051-OOG1	8PX0.5SQMM (G Type)		CRE35	1DTBC2:73(T) 1DTBC2:74(T)	
			COMMAND STOP	ETP-051-S2						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:75(T) 1DTBC2:76(T)	
			FDBK ON	ETP-051-S3						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:65(T) 1DTBC2:66(T)	
			FDBK OFF	ETP-051-S4						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:67(T) 1DTBC2:68(T)	
			MCC DISTBD	ETP-051-S5						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:49(T) 1DTBC2:50(T)	
			MCC AVLBL	ETP-051-S6						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:51(T) 1DTBC2:52(T)	
			EPB OPTD	ETP-051-S7						BHEL TO PROVIDE BHEL TO PROVIDE					1DTBC2:53(T) 1DTBC2:54(T)	
166	20GNA03AP002 -LSPB	COAL MILL OILY WASTE TRANSFER PUMP-B(UNIT-2)		ETP-051-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-051-OOG2	2PX0.5SQMM (F Type)	VENDOR	CRE35	1DTBC2:55(T) 1DTBC2:56(T)	
167	10GNA04AP001_XB91	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-A(UNIT-1)	COMMAND START	ETP-052-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-052-OOG1	8PX0.5SQMM (G Type)		CRE38	2DTBA2:77(T) 2DTBA2:78(T)	
			COMMAND STOP	ETP-052-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:79(T) 2DTBA2:80(T)	
			FDBK ON	ETP-052-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:65(T) 2DTBA2:66(T)	
			FDBK OFF	ETP-052-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:67(T) 2DTBA2:68(T)	
			MCC DISTBD	ETP-052-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:33(T) 2DTBA2:34(T)	
			MCC AVLBL	ETP-052-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:35(T) 2DTBA2:36(T)	
			EPB OPTD	ETP-052-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:37(T) 2DTBA2:38(T)	
168	10GNA04AP001 -LSPB	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-A(UNIT-1)		ETP-052-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-052-OOG2	2PX0.5SQMM (F Type)	VENDOR	CRE38	2DTBA2:39(T) 2DTBA2:40(T)	
169	10GNA04AP002_XB91	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-B(UNIT-1)	COMMAND START	ETP-053-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-053-OOG1	8PX0.5SQMM (G Type)		CRE38	2DTBC1:01(T) 2DTBC1:02(T)	
			COMMAND STOP	ETP-053-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:03(T) 2DTBC1:04(T)	
			FDBK ON	ETP-053-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:45(T) 2DTBC1:46(T)	
			FDBK OFF	ETP-053-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:47(T) 2DTBC1:48(T)	
			MCC DISTBD	ETP-053-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:29(T) 2DTBC1:30(T)	
			MCC AVLBL	ETP-053-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:31(T) 2DTBC1:32(T)	
			EPB OPTD	ETP-053-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:69(T) 2DTBC1:70(T)	

170	10GNA04AP002 -LSPB	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-B(UNIT-1)		ETP-053-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-053-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE38	2DTBC1:71(T) 2DTBC1:72(T)	
171	20GNA04AP001_XB91	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-A(UNIT-2)	COMMAND START	ETP-054-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-054-OG01	8PX0.5SQMM (G Type)		CRE38	2DTBA2:77(T) 2DTBA2:78(T)	
			COMMAND STOP	ETP-054-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:79(T) 2DTBA2:80(T)	
			FDBK ON	ETP-054-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:65(T) 2DTBA2:66(T)	
			FDBK OFF	ETP-054-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:67(T) 2DTBA2:68(T)	
			MCC DISTBD	ETP-054-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:33(T) 2DTBA2:34(T)	
			MCC AVLBL	ETP-054-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:35(T) 2DTBA2:36(T)	
			EPB OPTD	ETP-054-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBA2:37(T) 2DTBA2:38(T)	
172	20GNA04AP001 -LSPB	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-A(UNIT-2)		ETP-054-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-054-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE38	2DTBA2:39(T) 2DTBA2:40(T)	
173	20GNA04AP002_XB91	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-B(UNIT-2)	COMMAND START	ETP-055-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-055-OG01	8PX0.5SQMM (G Type)		CRE38	2DTBC1:01(T) 2DTBC1:02(T)	
			COMMAND STOP	ETP-055-S2						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:03(T) 2DTBC1:04(T)	
			FDBK ON	ETP-055-S3						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:45(T) 2DTBC1:46(T)	
			FDBK OFF	ETP-055-S4						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:47(T) 2DTBC1:48(T)	
			MCC DISTBD	ETP-055-S5						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:29(T) 2DTBC1:30(T)	
			MCC AVLBL	ETP-055-S6						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:31(T) 2DTBC1:32(T)	
			EPB OPTD	ETP-055-S7						BHEL TO PROVIDE BHEL TO PROVIDE					2DTBC1:69(T) 2DTBC1:70(T)	
174	20GNA04AP002 -LSPB	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-B(UNIT-2)		ETP-055-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-055-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE38	2DTBC1:71(T) 2DTBC1:72(T)	
175	10GTA01AP001_XB91	PRE SETTLING PIT OVERFLOW SUMP PUMP-A(UNIT-1)	COMMAND START	ETP-056-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-056-OG01	8PX0.5SQMM (G Type)		CRE41	3DTBC2:81(T) 3DTBC2:82(T)	
			COMMAND STOP	ETP-056-S2						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:83(T) 3DTBC2:84(T)	
			FDBK ON	ETP-056-S3						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:73(T) 3DTBC2:74(T)	
			FDBK OFF	ETP-056-S4						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:75(T) 3DTBC2:76(T)	
			MCC DISTBD	ETP-056-S5						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:57(T) 3DTBC2:58(T)	
			MCC AVLBL	ETP-056-S6						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:59(T) 3DTBC2:60(T)	
			EPB OPTD	ETP-056-S7						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:61(T) 3DTBC2:62(T)	
176	10GTA01AP001 -LSPB	PRE SETTLING PIT OVERFLOW SUMP PUMP-A(UNIT-1)		ETP-056-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-056-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE41	3DTBC2:63(T) 3DTBC2:64(T)	
177	10GTA01AP002_XB91	PRE SETTLING PIT OVERFLOW SUMP PUMP-B(UNIT-1)	COMMAND START	ETP-057-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-057-OG01	8PX0.5SQMM (G Type)		CRE41	3DTBC2:89(T) 3DTBC2:90(T)	
			COMMAND STOP	ETP-057-S2						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:91(T) 3DTBC2:92(T)	
			FDBK ON	ETP-057-S3						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:37(T) 3DTBC2:38(T)	
			FDBK OFF	ETP-057-S4						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:39(T) 3DTBC2:40(T)	
			MCC DISTBD	ETP-057-S5						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:17(T) 3DTBC2:18(T)	
			MCC AVLBL	ETP-057-S6						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:19(T) 3DTBC2:20(T)	
			EPB OPTD	ETP-057-S7						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:21(T) 3DTBC2:22(T)	
178	10GTA01AP002 -LSPB	PRE SETTLING PIT OVERFLOW SUMP PUMP-B(UNIT-1)		ETP-057-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-057-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE41	3DTBC2:23(T) 3DTBC2:24(T)	
179	20GTA01AP001_XB91	PRE SETTLING PIT OVERFLOW SUMP PUMP-A(UNIT-2)	COMMAND START	ETP-058-S1					MCC	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-058-OG01	8PX0.5SQMM (G Type)		CRE41	3DTBC2:81(T) 3DTBC2:82(T)	
			COMMAND STOP	ETP-058-S2						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:83(T) 3DTBC2:84(T)	
			FDBK ON	ETP-058-S3						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:73(T) 3DTBC2:74(T)	
			FDBK OFF	ETP-058-S4						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:75(T) 3DTBC2:76(T)	
			MCC DISTBD	ETP-058-S5						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:57(T) 3DTBC2:58(T)	
			MCC AVLBL	ETP-058-S6						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:59(T) 3DTBC2:60(T)	
			EPB OPTD	ETP-058-S7						BHEL TO PROVIDE BHEL TO PROVIDE					3DTBC2:61(T) 3DTBC2:62(T)	
180	20GTA01AP001 -LSPB	PRE SETTLING PIT OVERFLOW SUMP PUMP-A(UNIT-2)		ETP-058-S8					LOCAL PB	BHEL TO PROVIDE BHEL TO PROVIDE	ETP-058-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE41	3DTBC2:63(T) 3DTBC2:64(T)	

181	20GNA01AP002_XB91	PRE SETTLING PIT OVERFLOW SUMP PUMP-B(UNIT-2)	COMMAND START	ETP-059-S1					MCC	BHEL TO PROVIDE	ETP-059-0OG1	8PX0.5SQMM (G Type)		CRE36	2DTBC2:93(T)	
										BHEL TO PROVIDE					2DTBC2:94(T)	
			COMMAND STOP	ETP-059-S2						BHEL TO PROVIDE					2DTBC2:95(T)	
										BHEL TO PROVIDE					2DTBC2:96(T)	
			FDBK ON	ETP-059-S3						BHEL TO PROVIDE					2DTBC2:81(T)	
										BHEL TO PROVIDE					2DTBC2:82(T)	
			FDBK OFF	ETP-059-S4						BHEL TO PROVIDE					2DTBC2:83(T)	
										BHEL TO PROVIDE					2DTBC2:84(T)	
			MCC DISTBD	ETP-059-S5						BHEL TO PROVIDE					2DTBC2:49(T)	
										BHEL TO PROVIDE					2DTBC2:50(T)	
			MCC AVLBL	ETP-059-S6						BHEL TO PROVIDE					2DTBC2:51(T)	
										BHEL TO PROVIDE					2DTBC2:52(T)	
			EPB OPTD	ETP-059-S7						BHEL TO PROVIDE					2DTBC2:53(T)	
										BHEL TO PROVIDE					2DTBC2:54(T)	
182	20GNA01AP002 -LSPB	PRE SETTLING PIT OVERFLOW SUMP PUMP-B(UNIT-2)		ETP-051-S8					LOCAL PB	BHEL TO PROVIDE	ETP-059-OG02	2PX0.5SQMM (F Type)	VENDOR	CRE36	2DTBC2:55(T)	
										BHEL TO PROVIDE					2DTBC2:56(T)	
183	90GMA20CL002_XQ01	GUARD POND COMPARTMENT -2 LEVEL	LEVEL	ETP-JB-024-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-024	TB-01	ETP-JB-024-OG01	4PX0.5SQMM (F Type)	VENDOR	CRB61	1DTBA1:09(T)	
							-	RD		TB-02					1DTBA1:10(T)	
184	90GMA21CL001_XQ01	GUARD POND OVERFLOW SUMP LEVEL	LEVEL	ETP-JB-024-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRB61	1DTBA1:19(T)	
							-	RD		TB-04					1DTBA1:20(T)	
185	90GMA00CL001_XQ01	CMB COMPARTMENT -2 LEVEL	LEVEL	ETP-JB-025-S1	2PX0.5SQMM (F Type)	VENDOR	+	BL	JB-025	TB-01	ETP-JB-025-OG01	4PX0.5SQMM (F Type)	VENDOR	CRB62	2DTBA1:89(T)	
							-	RD		TB-02					2DTBA1:90(T)	
186	90GMA01CL001_XQ01	CMB OVERFLOW SUMP LEVEL	LEVEL	ETP-JB-025-S2	2PX0.5SQMM (F Type)	VENDOR	+	BL		TB-03				CRB62	2DTBA1:65(T)	
							-	RD		TB-04					2DTBA1:66(T)	

REV	DATE	ALTERED	CHECKED	DOC. TITLE :
				INSTRUMENT SCHEDULE FOR EFFLUENT TREATMENT PLANT
				STATUS : CONTRACT
				JOB NO.: 17-04

FALGUNI SAHA
2021.08.04 09:47:51 +05'30'

CUSTOMER: **TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.**
2x660 MW Ennore Sez STPP

PACKAGE: EFFLUENT TREATMENT PLANT

ORGINATOR	TURNKEY CONTRACTOR:-	**CWL. DOC. NO.**
	CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE-II, NEW DELHI-110020 PHONE: 011 26386095 EMAIL: clearwater@bol.net.in	

BHARAT HEAVY ELECTRICALS LIMITED

PROJECT ENGINEERING MANAGEMENT, NEW DELHI

REV.	NAME	SIGN	DATE	BHEL DOCUMENT NO.	REV
				PE-V0-412-164-A021	01

NO. OF SHEETS		EXCLUDING COVER PAGE

TITLE	INSTRUMENT SCHEDULE FOR EFFLUENT TREATMENT PLANT
BHEL DRG NO	PE-V0-412-164-A021
CLIENT	BHARAT HEAVY ELECTRICALS LTD
PROJECT	2 X 660 MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

SL. NO.	TAG NO	DESCRIPTION	MEDIUM	TYPE/MODEL OF INSTRUMENT	TYPE OF SIGNAL	RANGE	SENSOR TYPE	OPERATING PROCESS PARAMETER	DESIGN PROCRESS	ENGG.UNIT	PROCESS CONNECTION	ELECTRICAL CONNECTION	LINE SIZE	P&ID
A.PRESSURE GAUGE														
1	90GNN07CP501	ALKALI DOSING PUMP -1 DISCHARGE FOR GUARD POND	ALKALI	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
2	90GNN07CP502	ALKALI DOSING PUMP -2 DISCHARGE FOR GUARD POND	ALKALI	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
3	90GNN05CP501	ALKALI DOSING PUMP -1 DISCHARGE FOR CMB	ACID	REMOTE DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
4	90GNN05CP502	ALKALI DOSING PUMP -2 DISCHARGE FOR CMB	ACID	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
5	90GNN04CP501	ACID DOSING PUMP -1 DISCHARGE FOR CMB & GUARD POND	ACID	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
6	90GNN04CP502	ACID DOSING PUMP -2 DISCHARGE FOR CMB & GUARD POND	ACID	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
7	90GNN06CP501	ACID DOSING PUMP -1 DISCHARGE FOR CMB	ACID	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
8	90GNN06CP502	ACID DOSING PUMP -2 DISCHARGE FOR CMB	ACID	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
9	90GNN01CP501	ALUM DOSING PUMP -1 DISCHARGE	ALUM SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
10	90GNN01CP502	ALUM DOSING PUMP -2 DISCHARGE	ALUM SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
11	90GNN02CP501	LIME DOSING PUMP -1 DISCHARGE	LIME SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.0		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
12	90GNN02CP502	LIME DOSING PUMP -2 DISCHARGE	LIME SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.0		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
13	90GNN03CP501	POLY ELECTROLYTE DOSING PUMP -1 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
14	90GNN03CP502	POLY ELECTROLYTE DOSING PUMP -2 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	25NB	PE-V0-412-164-A004
15	90GMA01CP503	CMB EFFLUENT TRANSFER PUMP -1 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	350NB	PE-V0-412-164-A004
16	90GMA01CP504	CMB EFFLUENT TRANSFER PUMP -2 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-1.5		KG/CM2	1/2 " NPT (M)	NA	350NB	PE-V0-412-164-A004
17	90GMA01CP501	GARDENING PUMPS-1 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2.24		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
18	90GMA01CP502	GARDENING PUMPS-2 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2.24		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
19	90GMA21CP501	GUARD POND EFFLUENT TRANSFER PUMP-1 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-3.8		KG/CM2	1/2 " NPT (M)	NA	400NB	PE-V0-412-164-A004
20	90GMA21CP502	GUARD POND EFFLUENT TRANSFER PUMP-2 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-3.8		KG/CM2	1/2 " NPT (M)	NA	400B	PE-V0-412-164-A004
21	90GTA02CP501	TPI INLET WATER TRANSFER PUMP-1 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	100NB	PE-V0-412-164-A004
22	90GTA02CP502	TPI INLET WATER TRANSFER PUMP-2 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	100NB	PE-V0-412-164-A004
23	20GNA04CP501	POWER HOUSE OILY AREA SERVICE WASTE TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
24	20GNA04CP502	POWER HOUSE OILY AREA SERVICE WASTE TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
25	10GTA01CP501	PRE SET OVERFLOW PUMP-1 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
26	10GTA01CP502	PRE SET OVERFLOW PUMP-2 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
27	20GTA01CP501	PRE SET OVERFLOW PUMP-1 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
28	20GTA01CP502	PRE SET OVERFLOW PUMP-2 DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	65NB	PE-V0-412-164-A004
29	10GNA02CP501	COAL MILL OILY WASTER TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
30	10GNA02CP502	COAL MILL OILY WASTER TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
31	10GNA03CP501	COAL MILL OILY WASTER TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
32	10GNA03CP502	COAL MILL OILY WASTER TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004

TITLE	INSTRUMENT SCHEDULE FOR EFFLUENT TREATMENT PLANT
BHEL DRG NO	PE-V0-412-164-A021
CLIENT	BHARAT HEAVY ELECTRICALS LTD
PROJECT	2 X 660 MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

SL. NO.	TAG NO	DESCRIPTION	MEDIUM	TYPE/MODEL OF INSTRUMENT	TYPE OF SIGNAL	RANGE	SENSOR TYPE	OPERATING PROCESS PARAMETER	DESIGN PROCRESS	ENGG.UNIT	PROCESS CONNECTION	ELECTRICAL CONNECTION	LINE SIZE	P&ID
33	20GNA02CP501	COAL MILL OILY WASTER TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
34	20GNA02CP502	COAL MILL OILY WASTER TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
35	20GNA03CP501	COAL MILL OILY WASTER TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
36	20GNA03CP502	COAL MILL OILY WASTER TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
37	10GNA01CP501	TRANSFORMER YARD OILY WASTE TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
38	10GNA01CP502	TRANSFORMER YARD OILY WASTE TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
39	20GNA01CP501	TRANSFORMER YARD OILY WASTE TRANSFER PUMP-1 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
40	20GNA01CP502	TRANSFORMER YARD OILY WASTE TRANSFER PUMP-2 DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	50NB	PE-V0-412-164-A004
41	90GNS01CP501	SLUDGE TRANSFER PUMP-1 DISCHARGE	SLUDGE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	63NB	PE-V0-412-164-A004
42	90GNS01CP502	SLUDGE TRANSFER PUMP-2 DISCHARGE	SLUDGE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-2		KG/CM2	1/2 " NPT (M)	NA	63NB	PE-V0-412-164-A004
43	90GNC01CP501	AIR BLOWER DISCHARGE FOR CPI SLUDGE PIT	AIR	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-0.4		KG/CM2	1/2 " NPT (M)	NA	80NB	PE-V0-412-164-A004
44	90GNC01CP502	AIR BLOWER DISCHARGE FOR CPI SLUDGE PIT	AIR	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM	0-0.4		KG/CM2	1/2 " NPT (M)	NA	80NB	PE-V0-412-164-A004
B.DIFFEENTIAL PRESSURE GAUGE														
45	90GNN03CP501	ACROSS STRAINER OF POLY ELECTROLYTE DOSING PUMP-1 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
46	90GNN03CP502	ACROSS STRAINER OF POLY ELECTROLYTE DOSING PUMP-2 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
47	90GNN04CP501	ACROSS STRAINER OF ACID DOSING PUMP-1 FOR CMB DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
48	90GNN04CP502	ACROSS STRAINER OF ACID DOSING PUMP-2 FOR CMB DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
49	90GNN06CP501	ACROSS STRAINER OF ACID DOSING PUMP-1 FOR GUARD POND DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
50	90GNN06CP502	ACROSS STRAINER OF ACID DOSING PUMP-2 FOR GUARD POND DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
51	90GNN07CP501	ACROSS STRAINER OF ALKALI DOSING PUMP-1 GUARD POND DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
52	90GNN07CP502	ACROSS STRAINER OF ALKALI DOSING PUMP-2 GUARD POND DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
53	90GNN05CP501	ACROSS STRAINER OF ALKALI DOSING PUMP-1 CMB DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
54	90GNN05CP502	ACROSS STRAINER OF ALKALI DOSING PUMP-1 CMB DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
55	90GNN01CP501	ACROSS STRAINER OF ALUM DOSING PUMP-1 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
56	90GNN01CP502	ACROSS STRAINER OF ALUM DOSING PUMP-2 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
57	90GNN02CP501	ACROSS STRAINER OF LIME DOSING PUMP-1 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
57	90GNN02CP502	ACROSS STRAINER OF LIME DOSING PUMP-2 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	1/2 " NPT (M)	NA	15NB	PE-V0-412-164-A004
C. LEVEL INDICATOR														
58	10GNA01CL501	RETENTION PIT FOR OILY WASTE FROM TRANSFORMER YARD AREA	OILY WASTE	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-3.2		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
59	20GNA01CL501	RETENTION PIT FOR OILY WASTE FROM TRANSFORMER YARD AREA	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-3.2		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
60	10GNA02CL501	COAL MILL OILY WASTE SUMP-1 UNIT-1	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.2		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
61	10GNA03CL501	COAL MILL OILY WASTE SUMP-2 UNIT-1	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.2		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
62	20GNA02CL501	COAL MILL OILY WASTE SUMP-1 UNIT-2	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.2		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
63	20GNA03CL501	COAL MILL OILY WASTE SUMP-2 UNIT-2	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.2		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004

TITLE	INSTRUMENT SCHEDULE FOR EFFLUENT TREATMENT PLANT
BHEL DRG NO	PE-V0-412-164-A021
CLIENT	BHARAT HEAVY ELECTRICALS LTD
PROJECT	2 X 660 MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

SL. NO.	TAG NO	DESCRIPTION	MEDIUM	TYPE/MODEL OF INSTRUMENT	TYPE OF SIGNAL	RANGE	SENSOR TYPE	OPERATING PROCESS PARAMETER	DESIGN PROCRESS	ENGG.UNIT	PROCESS CONNECTION	ELECTRICAL CONNECTION	LINE SIZE	P&ID
64	10GTA01CL501	PRE SETTLING PIT UNIT-1 PIT	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-2.3		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
65	20GTA01CL501	PRE-SETTLING PIT UNIT-2 PIT	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-2.3		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
66	90GMA20CL501	GUARD POND COMPARTMENT-1	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-3		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
67	90GMA20CL502	GUARD POND COMPARTMENT-2	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-3		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
68	90GMA21CL501	GUARD POND PUMP SUMP	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-6		0-5.25		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
69	10GNA04CL501	POWER HOUSE OILY WASTE SUMP	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.6		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
70	20GNA04CL501	POWER HOUSE OILY WASTE SUMP	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.6		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
71	90GTA02CL501	COMMON COLLECTION SUMP	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-2.7		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
72	90GNS01CL501	SLUDGE PIT	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-2.3		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
73	90GMA00CL501	CMB COMPARTMENT-1	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-3.5		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
74	90GMA00CL502	CMB COMPARTMENT-2	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-5		0-3.5		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
75	90GMA01CL501	CMB PUMP SUMP	WASTE WATER	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-6		0-5.25		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
76	90GNN04CL501	HYDROCHLORIC ACID DOSING TANK FOR CMB GUARD POND	ACID SOL	REFLEX TYPE	NA	0-2		0-1.3		MTR.	FLANGE MOUNTED	NA	N.A.	PE-V0-412-164-A004
77	90GNN07CL501	ALKALI DOSING TANK FOR CMB GUARD POND	ALKALI SOL	REFLEX TYPE	NA	0-2		0-1.3		MTR.	FLANGE MOUNTED	NA	N.A.	PE-V0-412-164-A004
78	90GNN03CL501	POLY ELECTROLYTE SOLUTION PREPARATION TANK	ALUM SOLUTION	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.9		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
79	90GNN01CL501	ALUM SOLUTION PREPARATION TANK	ALUM SOLUTION	HORIZONTAL SCALE TYPE LEVEL INDICATOR.	NA	0-2		0-1.9		MTR.	HORIZONTALLY MOUNTED.	NA	N.A.	PE-V0-412-164-A004
D.PRESSURE TRANSMITTER														
80	90GNN07CP001	ALKALI DOSING PUMP DISCHARGE TO GUARD POND	ALKALI	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
81	90GNN05CP001	ALKALI DOSING PUMP DISCHARGE TO CMB	ALKALI	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
82	90GNN06CP001	ACID DOSING PUMP DISCHARGE FORGUARD POND	ACID	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
83	90GNN04CP502	ACID DOSING PUMPDISCHARGE FOR CMB	ACID	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
84	90GNN01CP001	ALUM DOSING PUMP DISCHARGE	ALUM SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
85	90GNN02CP001	LIME DOSING PUMP DISCHARGE	LIME SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
86	90GNN03CP001	POLY ELECTROLYTE DOSING PUMP DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	25NB	PE-V0-412-164-A004
87	90GMA11CP001	CMB EFFLUENT TRANSFER PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	350NB	PE-V0-412-164-A004
88	90GMA11CP002	CMB EFFLUENT TRANSFER PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	350NB	PE-V0-412-164-A004
89	90GMA12CP001	GARDENING PUMPS DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	65NB	PE-V0-412-164-A004
90	90GMA30CP001	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	400NB	PE-V0-412-164-A004
91	90GMA30CP002	GUARD POND EFFLUENT TRANSFER PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	400B	PE-V0-412-164-A004
92	90GTA02CP001	TPI INLET WATER TRANSFER PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	100NB	PE-V0-412-164-A004
93	10GNA04CP001	POWER HOUSE OILY AREA SERVICE WASTE TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	65NB	PE-V0-412-164-A004
94	20GNA04CP001	POWER HOUSE OILY AREA SERVICE WASTE TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	65NB	PE-V0-412-164-A004
95	10GTA01CP001	PRE SET OVERFLOW PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	65NB	PE-V0-412-164-A004
96	20GTA01CP001	PRE SET OVERFLOW PUMP DISCHARGE	WASTE WATER	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	65NB	PE-V0-412-164-A004

TITLE	INSTRUMENT SCHEDULE FOR EFFLUENT TREATMENT PLANT
BHEL DRG NO	PE-V0-412-164-A021
CLIENT	BHARAT HEAVY ELECTRICALS LTD
PROJECT	2 X 660 MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

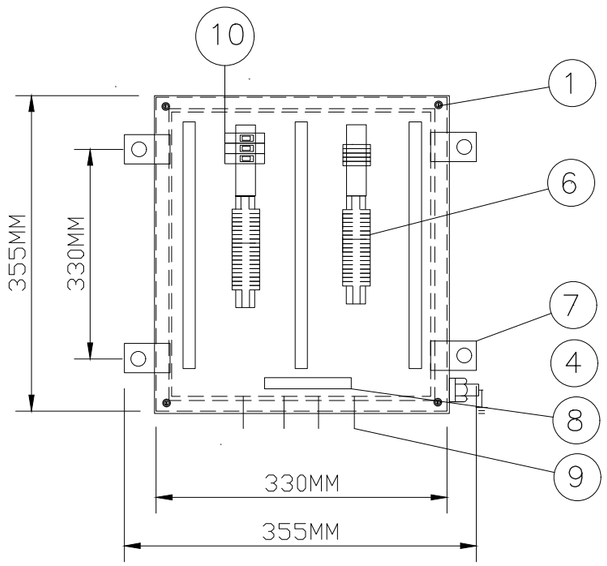
SL. NO.	TAG NO	DESCRIPTION	MEDIUM	TYPE/MODEL OF INSTRUMENT	TYPE OF SIGNAL	RANGE	SENSOR TYPE	OPERATING PROCESS PARAMETER	DESIGN PROCRESS	ENGG.UNIT	PROCESS CONNECTION	ELECTRICAL CONNECTION	LINE SIZE	P&ID
97	10GNA02CP001	COAL MILL OILY WASTER TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	50NB	PE-V0-412-164-A004
98	10GNA03CP001	COAL MILL OILY WASTER TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	50NB	PE-V0-412-164-A004
99	10GNA03CP002	COAL MILL OILY WASTER TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	50NB	PE-V0-412-164-A004
100	20GNA02CP001	COAL MILL OILY WASTER TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	50NB	PE-V0-412-164-A004
101	10GNA01CP001	TRANSFORMER YARD OILY WASTE TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	50NB	PE-V0-412-164-A004
102	20GNA01CP001	TRANSFORMER YARD OILY WASTE TRANSFER PUMP DISCHARGE	OILY WASTE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	50NB	PE-V0-412-164-A004
103	90GNS01CP001	SLUDGE TRANSFER PUMP DISCHARGE	SLUDGE	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	63NB	PE-V0-412-164-A004
104	90GNC01CP001	AIR BLOWER DISCHARGE FOR CPI SLUDGE PIT	AIR	DIAPHRAGM SEAL TYPE	NA	0-6	SS-316, DIAPHRAGM			KG/CM2	2", 150#RF	NA	80NB	PE-V0-412-164-A004
E. LEVEL TRANSMITTER														
105	10GNA01CL001	RETENTION PIT FOR OILY WASTE FROM TRANSFORMER YARD AREA	OILY WASTE	ULTRASONIC TYPE	NA	0-5		0-3.2		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
106	20GNA01CL001	RETENTION PIT FOR OILY WASTE FROM TRANSFORMER YARD AREA	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-3.2		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
107	10GNA02CL001	COAL MILL OILY WASTE SUMP-1 UNIT-1	WASTE WATER	ULTRASONIC TYPE	NA	0-2		0-1.2		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
108	10GNA03CL001	COAL MILL OILY WASTE SUMP-2 UNIT-1	WASTE WATER	ULTRASONIC TYPE	NA	0-2		0-1.2		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
109	20GNA02CL001	COAL MILL OILY WASTE SUMP-1 UNIT-2	WASTE WATER	ULTRASONIC TYPE	NA	0-2		0-1.2		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
110	20GNA03CL001	COAL MILL OILY WASTE SUMP-2 UNIT-2	WASTE WATER	ULTRASONIC TYPE	NA	0-2		0-1.2		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
111	10GTA01CL001	PRE SETTLING PIT UNIT-1 PIT	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-2.3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
112	20GTA01CL001	PRE-SETTLING PIT UNIT-2 PIT	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-2.3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
113	90GMA20CL001	GUARD POND COMPARTMENT-1	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
114	90GMA20CL002	GUARD POND COMPARTMENT-2	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
115	90GMA21CL001	GUARD POND OVERFLOW SUMP	WASTE WATER	ULTRASONIC TYPE	NA	0-6		0-5.25		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
116	10GNA04CL001	POWER HOUSE OILY WASTE SUMP	WASTE WATER	ULTRASONIC TYPE	NA	0-2		0-1.6		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
117	20GNA04CL001	POWER HOUSE OILY WASTE SUMP	WASTE WATER	ULTRASONIC TYPE	NA	0-2		0-1.6		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
118	90GTA02CL001	COMMON COLLECTION SUMP	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-2.7		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
119	90GNS01CL001	SLUDGE PIT	WASTE WATER	ULTRASONIC TYPE	NA	0-5		0-2.3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
120	90GMA00CL001	CMB COMPARTMENT-1	CLEAR WATER	ULTRASONIC TYPE	NA	0-5		0-3.5		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
121	90GMA00CL002	CMB COMPARTMENT-2	CLEAR WATER	ULTRASONIC TYPE	NA	0-5		0-3.5		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
122	90GMA01CL001	CMB OVERFLOW SUMP	CLEAR WATER	ULTRASONIC TYPE	NA	0-6		0-5.25		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
123	90GNN04CL001	HYDROCHLORIC ACID DOSING TANK FOR CMB GUARD POND	ACID SOL	ULTRASONIC TYPE	NA	0-2		0-1.3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
124	90GNN07CL001	ALKALI DOSING TANK FOR CMB GUARD POND	ALKALI SOL	ULTRASONIC TYPE	NA	0-2		0-1.3		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
125	90GNN03CL001	POLY ELECTROLYTE SOLUTION PREPARATION TANK	POLY ELECTROLYTE	ULTRASONIC TYPE	NA	0-2		0-1.9		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
126	90GNN01CL001	ALUM SOLUTION PREPARATION TANK	ALUM SOLUTION	ULTRASONIC TYPE	NA	0-2		0-1.9		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
127	90GNN08CL001	ALUM SOLUTION PREPARATION TANK	ALUM SOLUTION	ULTRASONIC TYPE	NA	0-2		0-1.9		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004
127	90GNN02CL001	LIME DOSINGTANK	LIME SOLUTION	ULTRASONIC TYPE	NA	0-2		0-1.9		MTR.	2" NPT Threaded	NA	N.A.	PE-V0-412-164-A004

TITLE	INSTRUMENT SCHEDULE FOR EFFLUENT TREATMENT PLANT
BHEL DRG NO	PE-V0-412-164-A021
CLIENT	BHARAT HEAVY ELECTRICALS LTD
PROJECT	2 X 660 MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

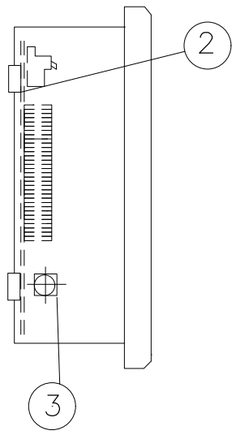
SL. NO.	TAG NO	DESCRIPTION	MEDIUM	TYPE/MODEL OF INSTRUMENT	TYPE OF SIGNAL	RANGE	SENSOR TYPE	OPERATING PROCESS PARAMETER	DESIGN PROCRESS	ENGG.UNIT	PROCESS CONNECTION	ELECTRICAL CONNECTION	LINE SIZE	P&ID
F. FLOW TRANSMITTER														
128	90GMA11CF001	CMB EFFLUENT TRANSFER PUMP	WASTE WATER	ULTRASONIC TYPE	ANALOGUE			1000		CU.MTR./HR.	CLAMPED	NA	400NB	PE-V0-412-164-A004
129	90GMA30CF001	GUARD POND EFFLUENT TRANSFER PUMP	WASTE WATER	ULTRASONIC TYPE	ANALOGUE			1200		CU.MTR./HR.	CLAMPED	NA	450NB	PE-V0-412-164-A004
130	90GNC10CF001	AIR BLOWER DISCHARGE FOR CPI SLUDGE PIT	AIR	ELECTROMAGNETIC TYPE	ANALOGUE			270		CU.MTR./HR.	FLANGE MOUNTED	NA	80NB	PE-V0-412-164-A004
H.DIFFEENTIAL PRESSURE SWITCH														
133	90GNN03CP101	ACROSS STRAINER OF POLY ELECTROLYTE DOSING PUMP-1 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
134	90GNN03CP102	ACROSS STRAINER OF POLY ELECTROLYTE DOSING PUMP-2 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
135	90GNN04CP101	ACROSS STRAINER OF ACID DOSING PUMP-1 FOR CMB DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
136	90GNN04CP102	ACROSS STRAINER OF ACID DOSING PUMP-2 FOR CMB DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
137	90GNN06CP101	ACROSS STRAINER OF ACID DOSING PUMP-1 FOR GUARD POND DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
138	90GNN06CP102	ACROSS STRAINER OF ACID DOSING PUMP-2 FOR GUARD POND DISCHARGE	ACID	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
139	90GNN07CP101	ACROSS STRAINER OF ALKALI DOSING PUMP-1 GUARD POND DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
140	90GNN07CP102	ACROSS STRAINER OF ALKALI DOSING PUMP-2 GUARD POND DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
141	90GNN05CP101	ACROSS STRAINER OF ALKALI DOSING PUMP-1 CMB DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
142	90GNN05CP102	ACROSS STRAINER OF ALKALI DOSING PUMP-1 CMB DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
143	90GNN01CP101	ACROSS STRAINER OF ALUM DOSING PUMP-1 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
144	90GNN01CP102	ACROSS STRAINER OF ALUM DOSING PUMP-2 DISCHARGE	POLY ELECTROLYTE	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
145	90GNN02CP101	ACROSS STRAINER OF LIME DOSING PUMP-1 DISCHARGE	LIME SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
146	90GNN02CP102	ACROSS STRAINER OF LIME DOSING PUMP-2 DISCHARGE	LIME SOLUTION	DIAPHRAGM SEAL TYPE	NA	0-2				KG/CM2	3/4 " NPT(M)			PE-V0-412-164-A004
G.TEMERATURE TRANSMITTER														
147	90GMA11CT201	CMB EFFLUENT TRANSFER PUMP	WASTE WATER	2PT 100 Duplex Type	NA	0-50				DEGREE C	FLANGE MOUNTED		400NB	PE-V0-412-164-A004
148	90GMA30CT201	GUARD POND EFFLUENT TRANSFER PUMP	WASTE WATER	2PT 100 Duplex Type	NA	0-50				DEGREE C	FLANGE MOUNTED		450NB	PE-V0-412-164-A004
I.ANALYZER INSTRUMENTS														
149	90GMA11CQ002	TURBIDITY ANALYZER	WASTE WATER	TURBIDITY ANALYZER	N/A	0-100				NTU	Sensor pole mounted,controller wall mounted		100NB	PE-V0-412-164-A004
150	90GMA11CQ001	pH METER	WASTE WATER	pH METER	N/A	0-14				PPM	Sensor pole mounted,controller wall mounted		100NB	PE-V0-412-164-A004
151	90GMA30CQ002	TURBIDITY ANALYZER	WASTE WATER	TURBIDITY ANALYZER	N/A	0-100				NTU	Sensor pole mounted,controller wall mounted		100NB	PE-V0-412-164-A004
152	90GMA30CQ001	pH METER	WASTE WATER	pH METER	N/A	0-14				PPM	Sensor pole mounted,controller wall mounted		100NB	PE-V0-412-164-A004

NOTES:- 1. RANGE OF THE INSTRUMENTS SHALL BE SELECTED LATER AS PER PROCESS FINALIZATION AND THE SAME WILL BE PROVIDED ALONG WITH MANUFACTURER DOCUMENTS.

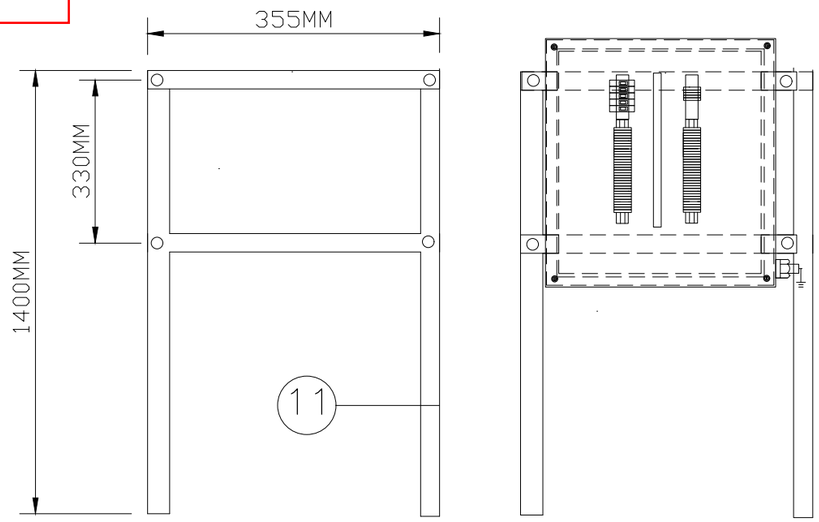
Please check quantity of JB as per cable schedule.
Please furnish total quantity of JB.



JUNCTION BOX FROM VIEW



JUNCTION BOX SIDE VIEW



MOUNTING STAND FRONT VIEW

JB NOS TO CORRECT:JB-001/JB-002/JB-003/JB-005/JB-009/JB-010/JB-011/JB-012/JB-013/JB-014/JB-015
JB-017/JB-023/JB-024/JB-025 (ALL 24 WAY)

JUNCTION BOX NO. AE-E71 TO AE E79 & AE-E710 /E711

ITEM	DESCRIPTION	QTY	MAKE
11	JB MOUNTING STAND MS	1	MS
10	2A MCB SP	3	ABB
9	CABLE GLAND ENTRY HOLES AT BOTTOM , 3 NO. CABLE ENTRY DIA 19MM & 1 NO. DIA 25MM To be plugged	8	6 NOS. =19MM DIA & 2 NO. =25MM DIA
8	NAME PLATE LETTER SIZE 3 MM SIZE 75MM X 20MM	1	ACRYLIC
7	MOUNTING LUG	4	BRASS
6	TERMINAL BLOCK SUI TO 2.5 SQ.MM	24	ELMEX/CONNECTWELL/WAGO/PHOENIX
5	COVER FIXING SCREW	2	BRASS
4	EARTHING STICKER	2	PLASTIC
3	EARTHING HARWARE (M6 EARTHING BOLT WITH 2 NUTS SPRING WASHER & PLAIN WASHER AT BOTTOM SIDE	1	BRASS
2	COMPONENT MOUNTING PLATE	1	2 MM THICK MS
1	ENCLOSURE HOT PRESS MOULDED WITH HINGES COLOUR RAL 9002 PROTECTION 1P66 DOOR GASKET WITH NEOPRENE RUBBER		4MM THICK FRP

TECHNICAL DETAILS

S. NO.	DESCRIPTION	PROVISIONS
1.	JB TYPE	FLAME PROOF/WEATHER PROOF
2.	ENCLOSURE	IP-65/EXPLOSION/FLAME PROOF AS PER AREA CLASSIFICATION
3.	MATERIAL	FRP WITH PROTECTIVE COATING
4.	CABLE GLANDS	DOUBLE COMPRESSION TYPE: NICKEL PLATED BRASS WITH PVC HOODS
5.	TERMINALS	SCREW LESS CAGE CLAMP TYPE SPRING LOADED
6.	GROUNDING	TWO TERMINALS FOR LOBBY AND SHIELD GROUND
7.	DOOR	HINGED, LOCKABLE TYPE
8.	HARDWARE	a) SUITABLE MOUNTING CLAMPS AND OTHER ACCESSORIES SHALL BE IN SCOPE OF BIDDER.
		b) THE BRACKETS, BOLTS, NUTS, SCREWS, GLANDS, LUGS REQUIRED FOR ERECTION SHALL BE OF BRASS
		c) M6 NI PLATED BRASS EARTHING STUD SHALL BE PROVIDED (EXTERNAL 2 NOS. INTERNAL 1NO.)
		d) GASKET (NORMAL)-NEOPRENE THICKNESS 6.0MM

MOUNTING STAND FRONT VIEW

NOTE:
-ALL THE DIMENSIONS ARE IN MM
-OVERALL DIMENSION TOLERANCE IS +_5MM
-THICKNESS TOLERANCE IS +_5MM

REV.	DT.	REVISION DETAIL
01	26.12.2020	FOR APPROVAL
00	07.03.2019	FOR APPROVAL

OWNER'S CONSULTANT: DESIGN PVT LIMITED
CONSULTING ENGINEER
NEW DELHI,HYDERABAD-INDIA

CONTRACTOR: BHARAT HEAVY ELCTRONICS LTD.
POWER SYSTEM,PROJECT ENGINEERING MANAGEMENT,NOIDA,UP

CLEAWAT
CLEAR WATER LTD.
B-14/1, OKHLA INDUSTRIAL AREA, PHASE-II, NEW DELHI-20,
PHONE :-26385990 & 26386095 ; MOB. 09811215540
E-MAIL :-clearwater@bol.net.in

CWL DRG. NO. 17-04/E-A73

TITLE. JB FOR EFFULIENT TREATMENT PlANT (FIELD SUMPS)

SH. 01 OF 02

PROJECT. 2 X 660MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

BHEL DRG. NO. PE-V0-412-164-A035

JUNCTION BOX NO. AE-E71 TO AE E79 & AE -E710 /E711

4-20mA TO DDCMIS PANEL

1

to PLC

TBS-01

1 2 3 4 5 6 7 8 9 10

4-20mA Loop Powered 2wire

1P 2P SPARE + − PT

PRESSURE TRANSMITTER

1P 2P SPARE + − LT

LEVEL TRANSMITTER

4-20mA Loop Powered 2wire

FROM DDCMIS PANEL 24VDC

1

MCB 2A MCB 2A MCB 2A

1 2 3 4 5 6 7 8 9 10 11 12

EARTHING

1P 2P SPARE + − PT

PRESSURE TRANSMITTER

1P 2P SPARE + − LT

LEVEL TRANSMITTER

4-20mA Loop Powered 2wire

REV.	DT.	REVISION DETAIL
01	26.12.2020	FOR APPROVAL
00	07.03.2019	FOR APPROVAL

OWNER'S CONSULTANT: DESEIN

DESIGN PVT LIMITED
CONSULTING ENGINEER
NEW DELHI,HYDERABAD-INDIA

CONTRACTOR: BHEL

BHARAT HEAVY ELCTRONICS LTD.
POWER SYSTEM,PROJECT ENGINEERING MANAGEMENT,NOIDA,UP

CLEAWAT

CLEAR WATER LTD.
B-14/1, OKHLA INDUSTRIAL AREA, PHASE-II, NEW DELHI-20,
PHONE :-26385990 & 26386095 ; MOB. 09811215540
E-MAIL :-clearwater@bol.net.in

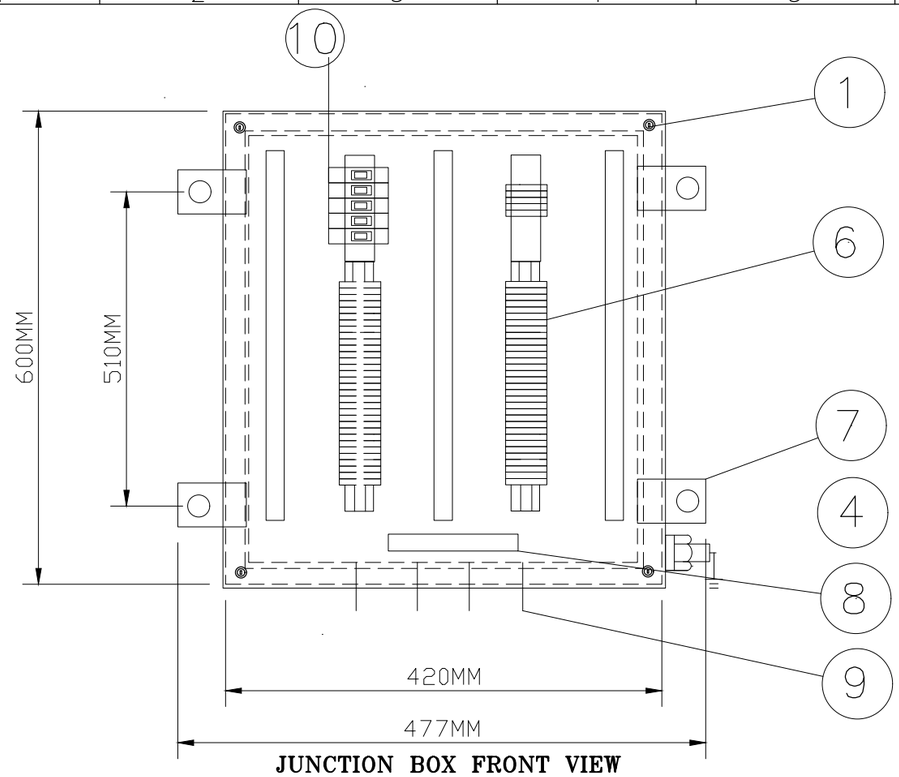
CWL DRG. NO. 17-04/E-A73

TITLE. MCC AT EFFULIENT TREATMENT PlANT (FIELD SUMPS)

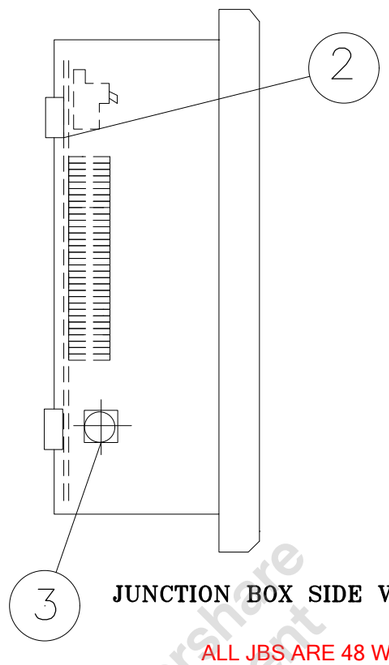
SH. 02 OF 02

PROJECT. 2 X 660MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

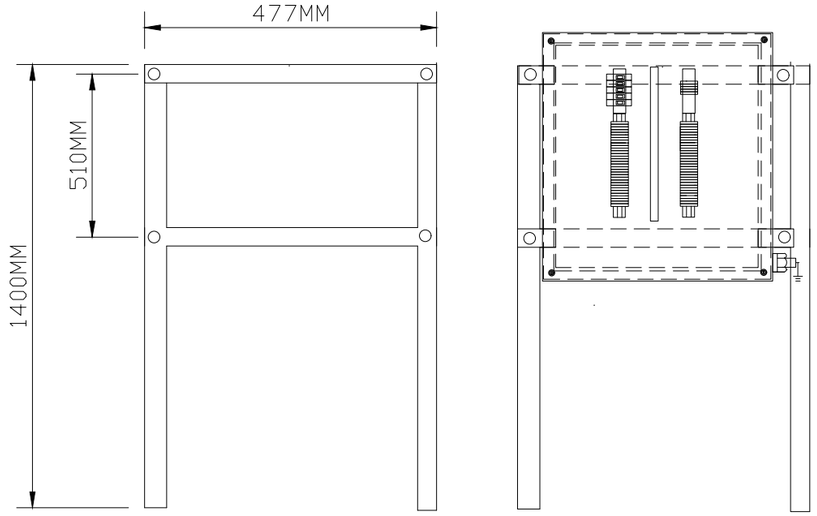
BHEL DRG. NO. PE-V0-412-164-A035



JUNCTION BOX FRONT VIEW



JUNCTION BOX SIDE VIEW



MOUNTING STAND FRONT VIEW

ALL JBS ARE 48 WAY

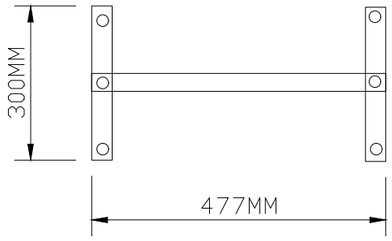
JB NOS TO CORRECT-JB-004/JB-006/JB-007/JB-008/JB-016/JB-018/JB-019/JB-020/JB-021/JB-022

JUNCTION BOX – (AE-E712) INSTRUMENTS ON DDCMIS

ITEM	DESCRIPTION	QTY	MAKE
11	JB MOUNTING STAND MS	1	MS
10	2A MCB SP	5	ABB
9	CABLE GLAND ENTRY HOLES AT BOTTOM , 3 NO. CABLE ENTRY DIA 19MM & 1 NO. DIA 25MM To be plugged	8	6 NOS. =19MM DIA & 2 NO. =25MM DIA
8	NAME PLATE LETTER SIZE 3 MM SIZE 75MM X 20MM	1	ACRYLIC
7	MOUNTING LUG	4	BRASS
6	TERMINAL BLOCK SUI TO 2.5 SQ.MM	48	ELMEX/CONNECTWELL/WAGO/PHOENIX
5	COVER FIXING SCREW	2	BRASS
4	EARTHING STICKER	2	PLASTIC
3	EARTHING HARWARE (M6 EARTHING BOLT WITH 2 NUTS SPRING WASHER & PLAIN WASHER AT BOTTOM SIDE	1	BRASS
2	COMPONENT MOUNTING PLATE	1	2 MM THICK MS
1	ENCLOSURE HOT PRESS MOULDED WITH HINGES COLOUR RAL 9002 PROTECTION 1P66 DOOR GASKET WITH NEOPRENE RUBBER		4MM THICK FRP

TECHNICAL DETAILS

S. NO.	DESCRIPTION	PROVISIONS
1.	JB TYPE	FLAME PROOF/WEATHER PROOF
2.	ENCLOSURE	IP-65/EXPLOSION/FLAME PROOF AS PER AREA CLASSIFICATION
3.	MATERIAL	FRP WITH PROTECTIVE COATING
4.	CABLE GLANDS	DOUBLE COMPRESSION TYPE: NICKEL PLATED BRASS WITH PVC HOODS
5.	TERMINALS	SCREW LESS CAGE CLAMP TYPE SPRING LOADED
6.	GROUNDING	TWO TERMINALS FOR LOBBY AND SHIELD GROUND
7.	DOOR	HINGED, LOCKABLE TYPE
8.	HARDWARE	a) SUITABLE MOUNTING CLAMPS AND OTHER ACCESSORIES SHALL BE IN SCOPE OF BIDDER.
		b) THE BRACKETS, BOLTS, NUTS, SCREWS, GLANDS, LUGS REQUIRED FOR ERECTION SHALL BE OF BRASS
		c) M6 NI PLATED BRASS EARTHING STUD SHALL BE PROVIDED (EXTERNAL 2 NOS. INTERNAL 1NO.)
		d) GASKET (NORMAL)-NEOPRENE THICKNESS 6.0MM



MOUNTING STAND FRONT VIEW

NOTE:
- ALL THE DIMENSIONS ARE IN MM
- OVERALL DIMENSION TOLERANCE IS +_5MM
- THICKNESS TOLERANCE IS +_5MM

REV .	DT.	REVISION DETAIL
01	26.12.2020	FOR APPROVAL
00	07.03.2019	FOR APPROVAL

OWNER'S CONSULTANT: DESIGN PVT LIMITED
CONSULTING ENGINEER
NEW DELHI,HYDERABAD-INDIA

CONTRACTOR: BHARAT HEAVY ELCTRONICS LTD.
POWER SYSTEM,PROJECT ENGINEERING MANAGEMENT,NOIDA,UP

CLEAWAT

CLEAR WATER LTD.
B-14/1, OKHLA INDUSTRIAL AREA, PHASE-II, NEW DELHI-20,
PHONE :-26385990 & 26386095 ; MOB. 09811215540
E-MAIL :-clearwater@bol.net.in

CWL DRG. NO. 17-04/E-B73

TITLE. JB AT EFFULIENT TREATMENT PlANT (SLUDGE SUMP-ETP AREA)

SH. 01 OF 03

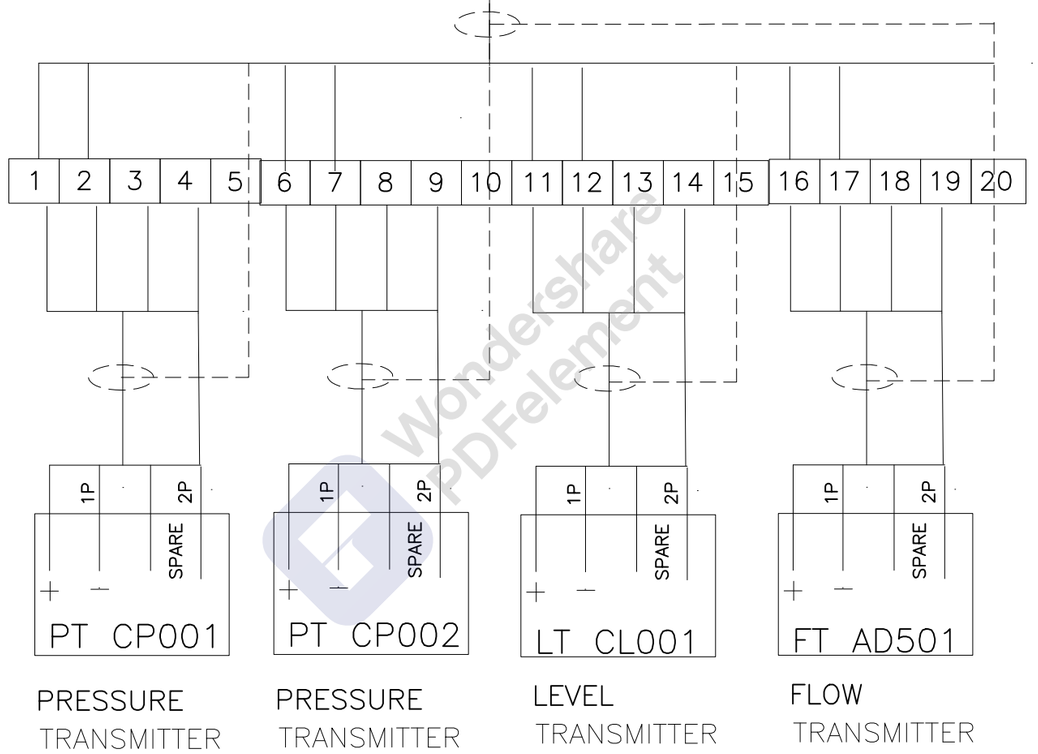
PROJECT. 2 X 660MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

BHEL DRG. NO. PE-V0-412-164-A035

4-20mA TO DDCMIS PANEL

1

TBS-01



4-20mA Loop
Powered 2wire

PRESSURE TRANSMITTER

PRESSURE TRANSMITTER

LEVEL TRANSMITTER

FLOW TRANSMITTER

JB-016/JB-018

JUNCTION BOX - (AE-E712) Instruments on DDCMIS

REV.	DT.	REVISION DETAIL
01	26.12.2020	FOR APPROVAL
00	07.03.2019	FOR APPROVAL

OWNER'S CONSULTANT: DESEIN

DESIGN PVT LIMITED
CONSULTING ENGINEER
NEW DELHI,HYDERABAD-INDIA

CONTRACTOR: BHEL

BHARAT HEAVY ELCTRONICS LTD.
POWER SYSTEM,PROJECT ENGINEERING MANAGEMENT,NOIDA,UP

CLEAWAT

CLEAR WATER LTD.
B-14/1, OKHLA INDUSTRIAL AREA, PHASE-II, NEW DELHI-20,
PHONE :-26385990 & 26386095 ; MOB. 09811215540
E-MAIL :-clearwater@bol.net.in

CWL DRG. NO. 17-04/E-B73

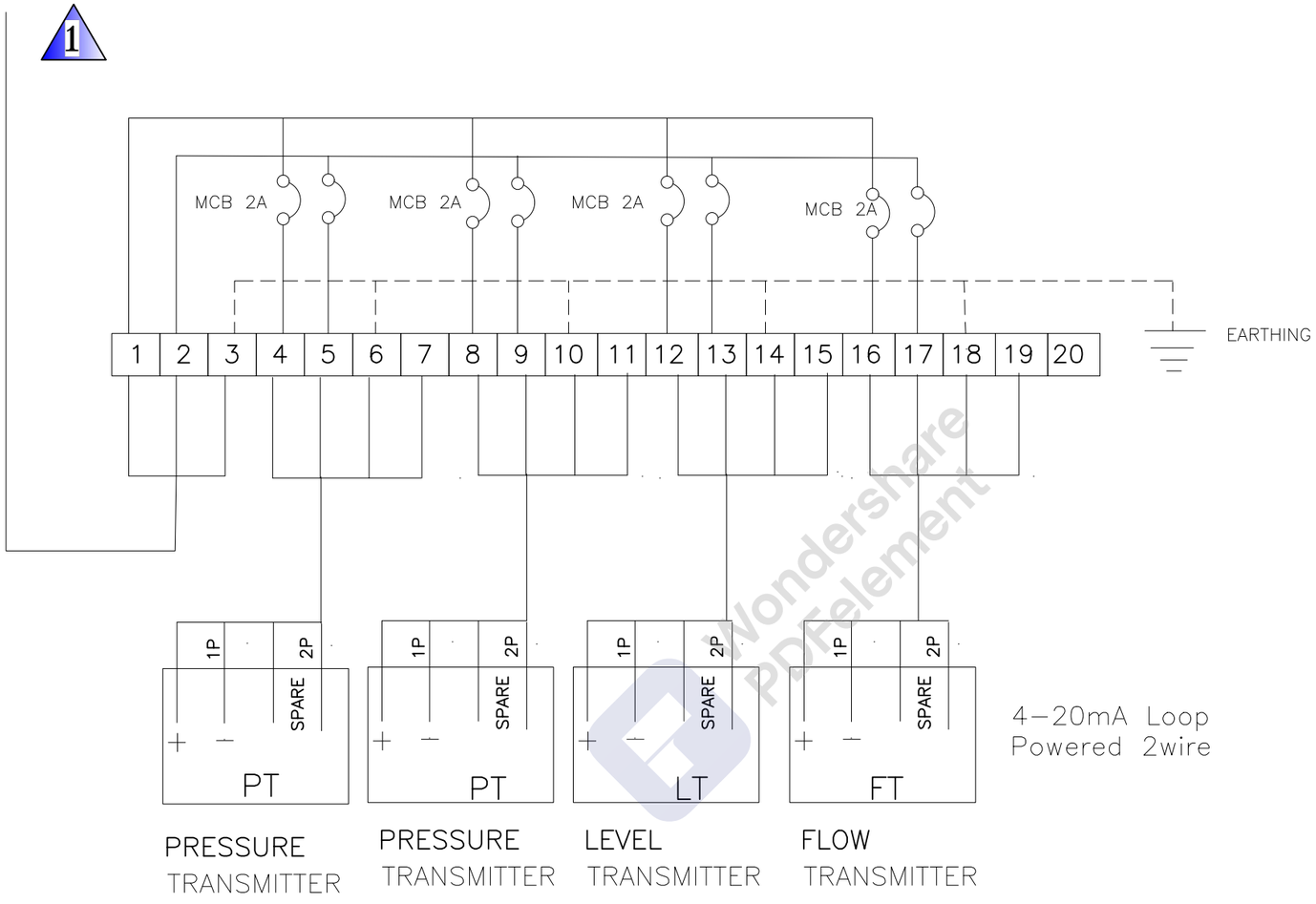
TITLE. JB AT EFFULIENT TREATMENT PlANT (SLUDGE SUMP-ETP AREA)

SH. 02 OF 03

PROJECT. 2 X 660MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

BHEL DRG. NO. PE-V0-412-164-A035

FROM DDCMIS PANEL 24VDC



JB-007/JB-008/JB-019/JB-021/JB-020/JB-022

JUNCTION BOX – (AE–E713/714/AP060) Instruments on DDCMIS

REV.	DT.	REVISION DETAIL
01	26.12.2020	FOR APPROVAL
00	07.03.2019	FOR APPROVAL

OWNER'S CONSULTANT: DESEIN
DESIGN PVT LIMITED
CONSULTING ENGINEER
NEW DELHI,HYDERABAD–INDIA

CONTRACTOR: BHEL
BHARAT HEAVY ELCTRONICS LTD.
POWER SYSTEM,PROJECT ENGINEERING MANAGEMENT,NOIDA,UP

CLEAWAT
CLEAR WATER LTD.
B–14/1, OKHLA INDUSTRIAL AREA, PHASE–II, NEW DELHI–20,
PHONE :–26385990 & 26386095 ; MOB. 09811215540
E–MAIL :–clearwater@bol.net.in

CWL DRG. NO. 17–04/E–B73

TITLE. JB AT EFFULIENT TREATMENT PlANT (SLUDGE SUMP–ETP AREA)

SH. 03 OF 03

PROJECT. 2 X 660MW ENNORE SEZ STPP(AT ASH DYKE OF NCTPS,CHENNAI)

BHEL DRG. NO. PE–V0–412–164–A035

REV	DATE	ALTERED	CHECKED	DOC. TITLE :
				I.O. LIST FOR ETP ENNORE
				STATUS : CONTRACT
				JOB NO.: 17-04

FALGUNI SAHA
2021.07.27 10:26:48 +05'30'

CUSTOMER: **TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.**
2x660 MW Ennore Sez STPP

PACKAGE: **EFFLUENT TREATMENT PLANT**

ORGINATOR	TURNKEY CONTRACTOR:-	CWL. DOC. NO.
	CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE-II, NEW DELHI-110020 PHONE: 011 26386095 EMAIL: clearwater@bol.net.in	**17-04E(71- IO LIST)** **Dt. 31.10.2020**

BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NEW DELHI

REV.	NAME	SIGN	DATE	BHEL DOCUMENT NO.	REV
				PE-VO-412-164-A038	03
				NO. OF SHEETS	EXCLUDING COVER PAGE

TITLE	**IO LIST FOR ETP**
PROJECT NAME	**2X660 MW ENNORE SEZ STPP**
CLIENT	**TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.**
CONSULTANT	**DESEIN PVT. LTD, NEW DELHI**
EPC CONTRACTOR	**BHEL (BHARAT HEAVY ELECTRICALS LTD.)**
PACKAGE	**Effluent Treatment Plant**
DOCUMENT NO	**PE-V0-412-164-A038 Rev03**
P&ID	**PE-V0-412-164-A004 Rev02**
DRIVE CONTROL PHILOSOPHY	**PE-DM-412-145-I002 Rev06**

NOTES:

1	IO LIST CONTAINS I/Os OF FIELD CONTACTS/SIGNALS TO BE CONNECTED TO DDCMIS. IN ADDITION TO THIS FOLLOWING I/O's SHALL ALSO BE PROVIDED :- ALL SIGNALS i.e. COMMANDS/FEEDBACKS BETWEEN DCS AND MCC/ SOLENOID OPTD DRIVES/ELECTRICAL ACTUATOR/DRIVE/ RELAY PANEL AS SHOWN IN DRIVE CONTROL PHILOSOPHY, DRG NO. PE-DM-412-145-I002 FOR ALL THE DRIVES INDICATED IN DRIVE LIST OF ETP PLANT.
2	PREFIX '10 & 20' SHALL BE CONSIDERED WITH KKS TAG NO. FOR UNIT-1 & 2 RESPECTIVELY.
3	THE KKS TAG NOS. FOR INSTRUMENTS COMMON TO UNIT-1 & 2 HAVE BEEN PREFIXED WITH '90'.
4	I/O REDUNDANCY SHALL BE CONSIDERED AS PER SPECIFICATION, VOL. V, CHAPTER 4.
5	COMPLETE SPARE PHILOSOPHY IS INLING WITH VOL. V, Cl. NO. 4.05.02.3 AND 4.03.11.
6	20% SPARES FULLY WIRED I/O CHANNELS OF EACH TYPE HAS BEEN ENVISAGED. IN ADDITION TO THIS FULLY WIRED 10% OR MINIMUM ONE NO EXTRA ASSIGNED COMPLETE SPARES CARDS (WHICHEVER IS MORE) FOR EACH TYPE OF I/O MODULE HAS BEEN ENVISAGED.
7	THE SPARES CAPACITY/REQUIREMENTS IS INLINE WITH TECHNICAL SPECIFICATION, VOL. V, CL NO 4.03.11.

REFERENCE:

1	a) P&ID FOR EFFLUENT TREATMENT PLANT : DRG NO. PE-V0-412-164-A004. b) DRIVE CONTROL PHILOSOPHY : PE-DM-412-145-I002.

LEGEND:

1	ETP	EFFLUENT TREATMENT PLANT
2	LT	LEVEL TRANSMITTER
3	PT	PRESSURE TRANSMITTER
4	FT	FLOW TRANSMITTER
5	TT	TEMPERATURE TRANSMITTER
6	DPT	DP TRANSMITTER
7	pHT	pH ANALYSER TRANSMITTER
8	TurbT	TURBIDITY ANALYSER TRANSMITTER
9	LTUD	LOW TENSION UNIDIRECTIONAL DRIVE
10	PE	POLYELECTROLYTE
11	VSTC	VARIABLE STROKE CONTROLLER

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DRIVE CONTROL PHILOSOPHY	PE-DM-412-145-I002 Rev06

ANALOG IO LIST

S No.	BHEL DWG NO.	SHEET REFERENCE	DWG NAME	KKS NO	DESCRIPTION	SENSOR	SIGNAL TYPE	SOURCE	DESTINATION	REMARKS
1	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA01CL001	TRASFRMR YARD OILY WASTE SUMP LEVEL (UNIT-1)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
2	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA01CL001	TRASFRMR YARD OILY WASTE SUMP LEVEL (UNIT-2)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
3	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA01CP001	TRASFRMR YARD OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-1)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
4	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA01CP001	TRASFRMR YARD OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-2)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
5	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA02CL001	COAL MILL AREA-1 OILY WASTE SUMP LEVEL (UNIT-1)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
6	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA02CL001	COAL MILL AREA-1 OILY WASTE SUMP LEVEL (UNIT-2)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
7	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA02CP001	COAL MILL AREA-1 OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-1)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
8	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA02CP001	COAL MILL AREA-1 OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-2)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
9	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA03CL001	COAL MILL AREA-2 OILY WASTE SUMP LEVEL (UNIT-1)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
10	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA03CL001	COAL MILL AREA-2 OILY WASTE SUMP LEVEL (UNIT-2)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
11	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA03CP001	COAL MILL AREA-2 OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-1)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
12	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA03CP001	COAL MILL AREA-2 OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-2)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
13	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA04CL001	POWER HOUSE OILY WASTE SUMP LEVEL (UNIT-1)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
14	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA04CL001	POWER HOUSE OILY WASTE SUMP LEVEL (UNIT-2)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
15	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA04CP001	POWER HOUSE OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-1)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
16	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA04CP001	POWER HOUSE OILY WASTE TRNSFR PMP DISCH HDR PRESS (UNIT-2)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
17	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GTA01CL001	PRE-SETTLING PIT OVERFLOW SUMP LEVEL (UNIT-1)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
18	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GTA01CL001	PRE-SETTLING PIT OVERFLOW SUMP LEVEL (UNIT-2)	LT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
19	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GTA01CP001	PRE-SETTLING PIT OVERFLOW SUMP PMP DISCH HDR PRESS (UNIT-1)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
20	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GTA01CP001	PRE-SETTLING PIT OVERFLOW SUMP PMP DISCH HDR PRESS (UNIT-2)	PT	4-20 mA	FIELD	MAIN PLANT DDCMIS	TO BE ACQUIRED IN DDCMIS PANEL IN MAIN PLANT CONTROL ROOM
21	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GTA02CL001	TPI INLET WATER SUMP LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
22	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GTA02CP001	TPI INLET WATER SUMP PMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
23	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA00CL001	CMB COMPARTMENT-1 LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
24	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA00CL002	CMB COMPARTMENT-2 LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
25	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA01CL001	CMB OVERFLOW SUMP LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
26	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA12CP001	CMB GARDENING PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
27	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11CP001	CMB EFFLUENT TRANSFR PMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
28	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11CP002	CMB EFFLUENT TRANSFR PMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
29	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11CF001	CMB EFFLUENT TRANSFR PMP-C/D DISCH FLOW	FT	4-20 mA	FIELD	ETP DDCMIS	
30	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11CQ001	pH AT CMB EFFLUENT TRANSFR PMP-C/D DISCH	pH	4-20 mA	FIELD	ETP DDCMIS	
31	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11CQ002	TURBIDITY AT CMB EFFLUENT TRANSFR PMP-C/D DISCH	TurbT	4-20 mA	FIELD	ETP DDCMIS	
32	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11CT201	CMB EFFLUENT TRANSFR PMP-C/D DISCH TEMP	TT	4-20 mA	FIELD	ETP DDCMIS	
33	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA20CL001	GUARD POND COMPARTMENT-1 LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	

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EPC CONTRACTOR	BHEL (BHARAT HEAVY ELECTRICALS LTD.)
PACKAGE	Effluent Treatment Plant
DOCUMENT NO	PE-V0-412-164-A038 Rev03
P&ID	PE-V0-412-164-A004 Rev02
DRIVE CONTROL PHILOSOPHY	PE-DM-412-145-I002 Rev06

ANALOG IO LIST

34	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA20CL002	GUARD POND COMPARTMENT-2 LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
35	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA21CL001	GUARD POND OVERFLOW SUMP LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
36	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30CP001	GUARD POND EFFLUENT DISPOSAL PMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
37	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30CP002	GUARD POND EFFLUENT DISPOSAL PMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
38	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30CF001	GUARD POND EFFLUENT TRANSFR PMP DISCH FLOW	FT	4-20 mA	FIELD	ETP DDCMIS	
39	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30CT201	GUARD POND EFFLUENT TRANSFR PMP DISCH TEMP	TT	4-20 mA	FIELD	ETP DDCMIS	
40	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30CQ001	pH OF TREATED EFFLUENT	pH	4-20 mA	FIELD	ETP DDCMIS	
41	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30CQ002	TURBIDITY OF TREATED EFFLUENT	TurbT	4-20 mA	FIELD	ETP DDCMIS	
42	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNC10CP001	AIR BLOWER DISCH PR	PT	4-20 mA	FIELD	ETP DDCMIS	
43	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNC10CF001	AIR BLOWER DISCH FLOW	FT	4-20 mA	FIELD	ETP DDCMIS	
44	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNS01CL001	SLUDGE PIT LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
45	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNS01CP001	SLUDGE TRANSFER PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
46	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01CL001	ALUM SOLUTION PREPERATION TANK LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
47	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01CP001	ALUM DOSING PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
48	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02CL001	LIME DOSING TANK LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
49	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02CP001	LIME DOSING PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
50	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03CL001	PE SOLUTION PREPERATION TANK LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
51	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03CP001	PE DOSING PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
52	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN04CL001	HYDROLIC ACID DOSING TANK LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
53	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN04CP001	ACID DOSING PUMP FOR CMB DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
54	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN05CP001	ALKALI DOSING PUMP FOR CMB DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
55	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN06CP001	ACID DOSING PUMP FOR GUARD PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
56	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07CL001	ALKALI DOSING TANK LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
57	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07CP001	ALKALI DOSING PUMP FOR GUARD PUMP DISCH HDR PRESS	PT	4-20 mA	FIELD	ETP DDCMIS	
58	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN08CL001	OVERHEAD WTR STRG TANK LEVEL	LT	4-20 mA	FIELD	ETP DDCMIS	
59	--	UPS SYSTEM	UPS SYSTEM	90BRV51EH001	UPS-1 OUTPUT CURRENT		4-20 mA	UPS PNL	ETP DDCMIS	
60	--	UPS SYSTEM	UPS SYSTEM	90BRV51EH002	UPS-1 OUTPUT VOLTAGE		4-20 mA	UPS PNL	ETP DDCMIS	
61	--	UPS SYSTEM	UPS SYSTEM	90BRV51EH003	UPS-1 OUTPUT FREQ		4-20 mA	UPS PNL	ETP DDCMIS	
62	--	UPS SYSTEM	UPS SYSTEM	90BRV52EH001	UPS-2 OUTPUT CURRENT		4-20 mA	UPS PNL	ETP DDCMIS	
63	--	UPS SYSTEM	UPS SYSTEM	90BRV52EH002	UPS-2 OUTPUT VOLTAGE		4-20 mA	UPS PNL	ETP DDCMIS	
64	--	UPS SYSTEM	UPS SYSTEM	90BRV52EH003	UPS-2 OUTPUT FREQ		4-20 mA	UPS PNL	ETP DDCMIS	

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PACKAGE	Effluent Treatment Plant
DOCUMENT NO	PE-V0-412-164-A038 Rev03
P&ID	PE-V0-412-164-A004 Rev02
DRIVE CONTROL PHILOSOPHY	PE-DM-412-145-I002 Rev06

BINARY IO LIST

S No.	BHEL DWG NO.	DWG_NAME	KKS NO	DESCRIPTION	STATUS	SIGNAL TYPE	SOURCE	DESTINATION	REMARKS
1	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01CP101	DP ACROSS ALUM DOSING STRAINER-A	HIGH	NO	FIELD	ETP DDCMIS	
2	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01CP102	DP ACROSS ALUM DOSING STRAINER-B	HIGH	NO	FIELD	ETP DDCMIS	
3	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02CP101	DP ACROSS LIME DOSING STRAINER-A	HIGH	NO	FIELD	ETP DDCMIS	
4	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02CP102	DP ACROSS LIME DOSING STRAINER-B	HIGH	NO	FIELD	ETP DDCMIS	
5	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03CP101	DP ACROSS PE DOSING STRAINER-A	HIGH	NO	FIELD	ETP DDCMIS	
6	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03CP102	DP ACROSS PE DOSING STRAINER-B	HIGH	NO	FIELD	ETP DDCMIS	
7	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN04CP101	DP ACROSS ACID DOSING STRAINER-A FOR CMB	HIGH	NO	FIELD	ETP DDCMIS	
8	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN04CP102	DP ACROSS ACID DOSING STRAINER-B FOR CMB	HIGH	NO	FIELD	ETP DDCMIS	
9	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN05CP101	DP ACROSS ALKALI DOSING STRAINER-A FOR CMB	HIGH	NO	FIELD	ETP DDCMIS	
10	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN05CP102	DP ACROSS ALKALI DOSING STRAINER-A FOR CMB	HIGH	NO	FIELD	ETP DDCMIS	
11	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN06CP101	DP ACROSS ACID DOSING STRAINER-A FOR GUARD POND	HIGH	NO	FIELD	ETP DDCMIS	
12	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN06CP102	DP ACROSS ACID DOSING STRAINER-B FOR GUARD POND	HIGH	NO	FIELD	ETP DDCMIS	
13	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07CP101	DP ACROSS ALKALI DOSING STRAINER-A FOR GUARD POND	HIGH	NO	FIELD	ETP DDCMIS	
14	PE-V0-412-164-A004	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07CP102	DP ACROSS ALKALI DOSING STRAINER-B FOR GUARD POND	HIGH	NO	FIELD	ETP DDCMIS	
15	--	UPS SYSTEM	90BRV51EH201	UPS -1 RECTIFIER-1	TRIPPED	NO	UPS PNL	ETP DDCMIS	
16	--	UPS SYSTEM	90BRV51EH202	UPS -1 RECTIFIER-2	TRIPPED	NO	UPS PNL	ETP DDCMIS	
17	--	UPS SYSTEM	90BRV51EH203	UPS -1 INVERTER-1	TRIPPED	NO	UPS PNL	ETP DDCMIS	
18	--	UPS SYSTEM	90BRV51EH204	UPS -1 INVERTER-2	TRIPPED	NO	UPS PNL	ETP DDCMIS	
19	--	UPS SYSTEM	90BRV51EH205	UPS -1 BATTERY-1 LOW	TRUE	NO	UPS PNL	ETP DDCMIS	
20	--	UPS SYSTEM	90BRV51EH206	UPS -1 BATTERY-2 LOW	TRUE	NO	UPS PNL	ETP DDCMIS	
21	--	UPS SYSTEM	90BRV51EH207	UPS -1 LOAD ON STATIC BYPASS	TRUE	NO	UPS PNL	ETP DDCMIS	
22	--	UPS SYSTEM	90BRV51EH208	UPS -1 STATIC BYPASS FAILED	TRUE	NO	UPS PNL	ETP DDCMIS	
23	--	UPS SYSTEM	90BRV51EH209	UPS -1 INVERTER OFF OR FAILED	TRUE	NO	UPS PNL	ETP DDCMIS	
24	--	UPS SYSTEM	90BRV51EH210	UPS -1 FAN TRIPPED	TRUE	NO	UPS PNL	ETP DDCMIS	
25	--	UPS SYSTEM	90BRV51EH211	UPS ACDB-1 INCOMER TRIPPED	TRUE	NO	UPS PNL	ETP DDCMIS	
26	--	UPS SYSTEM	90BRV52EH211	UPS ACDB-2 INCOMER TRIPPED	TRUE	NO	UPS PNL	ETP DDCMIS	
27	--	UPS SYSTEM	90BRV52EH201	UPS -2 RECTIFIER-1	TRIPPED	NO	UPS PNL	ETP DDCMIS	
28	--	UPS SYSTEM	90BRV52EH202	UPS -2 RECTIFIER-2	TRIPPED	NO	UPS PNL	ETP DDCMIS	
29	--	UPS SYSTEM	90BRV52EH203	UPS -2 INVERTER-1	TRIPPED	NO	UPS PNL	ETP DDCMIS	
30	--	UPS SYSTEM	90BRV52EH204	UPS -2 INVERTER-2	TRIPPED	NO	UPS PNL	ETP DDCMIS	
31	--	UPS SYSTEM	90BRV52EH205	UPS -2 BATTERY-1 LOW	TRUE	NO	UPS PNL	ETP DDCMIS	
32	--	UPS SYSTEM	90BRV52EH206	UPS -2 BATTERY-2 LOW	TRUE	NO	UPS PNL	ETP DDCMIS	

TITLE	IO LIST FOR ETP
PROJECT NAME	2X660 MW ENNORE SEZ STPP
CLIENT	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.
CONSULTANT	DESEIN PVT. LTD, NEW DELHI
EPC CONTRACTOR	BHEL (BHARAT HEAVY ELECTRICALS LTD.)
PACKAGE	Effluent Treatment Plant
DOCUMENT NO	PE-V0-412-164-A038 Rev03
P&ID	PE-V0-412-164-A004 Rev02
DRIVE CONTROL PHILOSOPHY	PE-DM-412-145-I002 Rev06

BINARY IO LIST

33	--	UPS SYSTEM	90BRV52EH207	UPS -2 LOAD ON STATIC BYPASS	TRUE	NO	UPS PNL	ETP DDCMIS	
34	--	UPS SYSTEM	90BRV52EH208	UPS -2 STATIC BYPASS FAILED	TRUE	NO	UPS PNL	ETP DDCMIS	
35	--	UPS SYSTEM	90BRV52EH209	UPS -2 INVERTER OFF OR FAILED	TRUE	NO	UPS PNL	ETP DDCMIS	
36	--	UPS SYSTEM	90BRV52EH210	UPS -2 FAN TRIPPED	TRUE	NO	UPS PNL	ETP DDCMIS	
37	--	UPS SYSTEM	90BRV50EH201	COOLING FAN FAIL	TRUE	NO	UPS PNL	ETP DDCMIS	
38	--	UPS SYSTEM	90BRV50EH202	230 V AC/24 V DC CONVERTOR FAIL	TRUE	NO		ETP DDCMIS	
39	--	UPS SYSTEM	90BRV50EH203	24 V DC UNDER VOLTAGE	TRUE	NO		ETP DDCMIS	
40	--	UPS SYSTEM	90BRV50EH204	24 V DC OVER VOLTAGE	TRUE	NO		ETP DDCMIS	
41	--	UPS SYSTEM	90BRV50EH205	LOSS OF UPS POWER SUPPLY FEEDER	TRUE	NO	UPS PNL	ETP DDCMIS	
42	--	UPS SYSTEM	90BRV50EH206	FLAME & SMOKE DETECTOR	TRUE	NO		ETP DDCMIS	
43	--	UPS SYSTEM	90GTA02CE001	TPI OVERFLOW WATER TRANSFER PUMP-A CURRENT	TRUE	NO		ETP DDCMIS	
44	--	UPS SYSTEM	90GTA02CE001	TPI OVERFLOW WATER TRANSFER PUMP-B CURRENT	TRUE	NO		ETP DDCMIS	

TITLE	DRIVE LIST FOR ETP
PROJECT NAME	2X660 MW ENNORE SEZ STPP
CLIENT	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.
CONSULTANT	DESEIN PVT. LTD, NEW DELHI
EPC CONTRACTOR	BHEL (BHARAT HEAVY ELECTRICALS LTD.)
PACKAGE	Effluent Treatment Plant
DOCUMENT NO	PE-V0-412-164-A039 Rev03
P&ID	PE-V0-412-164-A004 Rev02
DRIVE CONTROL PHILOSOPHY	PE-DM-412-145-I002 Rev06

DRIVE LIST

S.No.	BHEL DWG NO.	SHEET REFERENCE	DWG NAME	KKS NO	DESCRIPTION	DRIVE	DRIVE TYPE	CONTROL SCOPE	REMARKS
1	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA01AP001	TRASFRMR YARD AREA OILY WASTE TRANSFER PUMP-A (UNIT-1)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
2	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA01AP002	TRASFRMR YARD AREA OILY WASTE TRANSFER PUMP-B (UNIT-1)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
3	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA01AP001	TRASFRMR YARD AREA OILY WASTE TRANSFER PUMP-A (UNIT-2)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
4	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA01AP002	TRASFRMR YARD AREA OILY WASTE TRANSFER PUMP-B (UNIT-2)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
5	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA02AP001	COAL MILL OILY WASTE TRANSFER PUMP -A (UNIT-1) COAL MILL AREA-1	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
6	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA02AP002	COAL MILL OILY WASTE TRANSFER PUMP -B (UNIT-1) COAL MILL AREA-1	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
7	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA03AP001	COAL MILL OILY WASTE TRANSFER PUMP -A (UNIT-1) COAL MILL AREA-2	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
8	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA03AP002	COAL MILL OILY WASTE TRANSFER PUMP -B (UNIT-1) COAL MILL AREA-2	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
9	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA02AP001	COAL MILL OILY WASTE TRANSFER PUMP -A (UNIT-2) COAL MILL AREA-1	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
10	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA02AP002	COAL MILL OILY WASTE TRANSFER PUMP -B (UNIT-2) COAL MILL AREA -1	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
11	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA03AP001	COAL MILL OILY WASTE TRANSFER PUMP -A (UNIT-2) COAL MILL AREA-2	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
12	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA03AP002	COAL MILL OILY WASTE TRANSFER PUMP -B (UNIT-2) COAL MILL AREA 2	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
13	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA04AP001	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-A (UNIT-1)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
14	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GNA04AP002	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-B (UNIT-1)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
15	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA04AP001	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-A (UNIT-2)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
16	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GNA04AP002	POWER HOUSE AREA OILY WASTE TRANSFER PUMP-B (UNIT-2)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
17	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GTA01AP001	PRE-SETTLING PIT OVERFLOW SUMP PUMP-A (UNIT-1)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
18	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	10GTA01AP002	PRE-SETTLING PIT OVERFLOW SUMP PUMP-B (UNIT-1)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
19	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GTA01AP001	PRE-SETTLING PIT OVERFLOW SUMP PUMP-A (UNIT-2)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
20	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	20GTA01AP002	PRE-SETTLING PIT OVERFLOW SUMP PUMP-B (UNIT-2)	LTUD	BINARY	MAIN PLANT DDCMIS	TO BE CONTROLLED FROM MAIN PLANT DDCMIS PANEL
21	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GTA02AP001	TPI INLET WATER TRANSFER PUMP-A	LTUD	BINARY	ETP DDCMIS	
22	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GTA02AP002	TPI INLET WATER TRANSFER PUMP-B	LTUD	BINARY	ETP DDCMIS	
23	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA01AP003	CMB EFFLUENT TRANSFER PUMP-A	LTUD	BINARY	ETP DDCMIS	
24	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA01AP004	CMB EFFLUENT TRANSFER PUMP-B	LTUD	BINARY	ETP DDCMIS	
25	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA01AP001	CMB GARDENING PUMP-A	LTUD	BINARY	ETP DDCMIS	
26	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA01AP002	CMB GARDENING PUMP-B	LTUD	BINARY	ETP DDCMIS	
27	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11AA001	CMB EFFLUENT TRANSFER PUMP RECIR VLV	BID	BINARY	ETP DDCMIS	
28	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11AA002	CMB EFFLUENT TRSFR PMP TO CHP DUST SUPP ISO VLV	BID	BINARY	ETP DDCMIS	
29	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA12AA002	CMB GARDENING PUMP TO HORTICULTURE ISO VLV	BID	BINARY	ETP DDCMIS	
30	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA11AA003	CMB EFFLUENT TRSFR PMP TO GUARD POND ISO VLV	BID	BINARY	ETP DDCMIS	
31	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA21AP001	GUARD POND EFFLUENT DISPOSAL PUMP-A	LTUD	BINARY	ETP DDCMIS	

TITLE	**DRIVE LIST FOR ETP**
PROJECT NAME	**2X660 MW ENNORE SEZ STPP**
CLIENT	**TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.**
CONSULTANT	**DESEIN PVT. LTD, NEW DELHI**
EPC CONTRACTOR	**BHEL (BHARAT HEAVY ELECTRICALS LTD.)**
PACKAGE	**Effluent Treatment Plant**
DOCUMENT NO	**PE-V0-412-164-A039 Rev03**
P&ID	**PE-V0-412-164-A004 Rev02**
DRIVE CONTROL PHILOSOPHY	**PE-DM-412-145-I002 Rev06**

DRIVE LIST

32	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA21AP002	GUARD POND EFFLUENT DISPOSAL PUMP-B	LTUD	BINARY	ETP DDCMIS	
33	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30AA001	GUARD POND EFFLUENT DISPOSAL PUMP RECIR VLV	BID	BINARY	ETP DDCMIS	
34	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30AA002	TREATED EFFLUENT TO ASH WATER SUMP ISO VLV	BID	BINARY	ETP DDCMIS	
35	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GMA30AA003	TREATED EFFLUENT TO CW BLOWDOWN HDR ISO VLV	BID	BINARY	ETP DDCMIS	
36	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNC01AN001	AIR BLOWER-A	LTUD	BINARY	ETP DDCMIS	
37	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNC01AN002	AIR BLOWER-B	LTUD	BINARY	ETP DDCMIS	
38	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNS01AP001	SLUDGE TRANSFER PUMP-A	LTUD	BINARY	ETP DDCMIS	
39	PE-V0-412-164-A004	SH 1 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNS01AP002	SLUDGE TRANSFER PUMP-B	LTUD	BINARY	ETP DDCMIS	
40	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01AP001	ALUM DOSING PUMP-A	LTUD	BINARY	ETP DDCMIS	
41	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01AP002	ALUM DOSING PUMP-B	LTUD	BINARY	ETP DDCMIS	
42	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN01AM001	ALUM SOL PREP ANK AGITATOR	LTUD	BINARY	ETP DDCMIS	
43	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02AP001	LIME DOSING PUMP-A	LTUD	BINARY	ETP DDCMIS	
44	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02AP002	LIME DOSING PUMP-B	LTUD	BINARY	ETP DDCMIS	
45	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN02AM001	LIME DOSING TANK AGITATOR	LTUD	BINARY	ETP DDCMIS	
46	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03AP001	POLYELECTROLYTE DOSING PUMP-A	LTUD	BINARY	ETP DDCMIS	
47	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03AP002	POLYELECTROLYTE DOSING PUMP-B	LTUD	BINARY	ETP DDCMIS	
48	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN03AM001	POLYELECTROLYTE DOSING TANK AGITATOR	LTUD	BINARY	ETP DDCMIS	
49	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN04AP001	ACID DOSING PUMP-A FOR CMB	LTUD	BINARY	ETP DDCMIS	
50	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN04AP002	ACID DOSING PUMP-B FOR CMB	LTUD	BINARY	ETP DDCMIS	
51	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN05AP001	ALKALI DOSING PUMP-A FOR CMB	LTUD	BINARY	ETP DDCMIS	
52	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN05AP002	ALKALI DOSING PUMP-B FOR CMB	LTUD	BINARY	ETP DDCMIS	
53	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN06AP001	ACID DOSING PUMP-A FOR GUARD POND	LTUD	BINARY	ETP DDCMIS	
54	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN06AP002	ACID DOSING PUMP-B FOR GUARD POND	LTUD	BINARY	ETP DDCMIS	
55	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07AP001	ALKALI DOSING PUMP-A FOR GUARD POND	LTUD	BINARY	ETP DDCMIS	
56	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07AP002	ALKALI DOSING PUMP-B FOR GUARD POND	LTUD	BINARY	ETP DDCMIS	
57	PE-V0-412-164-A004	SH 2 OF 3	P & ID FOR EFFLUENT TREATMENT PLANT	90GNN07AM001	ALAKLI DOSING TANK AGITAOR	LTUD	BINARY	ETP DDCMIS	

FALGUNI SAHA

From: शुभाशीष गुप्ता Subhashish Gupta <subhashishgupta@bhel.in>
Sent: Monday, September 30, 2019 2:00 PM
To: 'clear water'
Subject: FW: Remarks on : PE-V0-412-164-A031 REV :0,

Please submit the revised document inline with the comments in trailing mail.

From: SHIVRAJ SINGH BANSALA-CNI [mailto:SSBANSALA@bhel.in]
Sent: 30 September 2019 12:55
To: SUBHASHISH GUPTA - PEM <subhashishgupta@bhel.in>; 'PANKAJ KAPSIMAY - PEM' <pankajkapsimay@bhel.in>
Subject: FW: Remarks on : PE-V0-412-164-A031 REV :0,

कृप्या

From: pedm@bhel.in [mailto:pedm@bhel.in]
Sent: 26 September 2019 15:39
To: rohitjuneja@bhel.in; karuna.kaushik@bhel.in; anilkumarpal@bhel.in; blbedi@bhel.in
Cc: ssbansala@bhel.in; munawwar@bhel.in; pmgsalil@bhel.in; nikhilgoel@bhel.in
Subject: Remarks on : PE-V0-412-164-A031 REV :0, GA

Remarks on Drawing no PE-V0-412-164-A031 Rev NO: 0 is as follows.
Drawing No : PE-V0-412-164-A031
Drawing Title : GA OF ATMOSPHERIC TANKS FOR EFFLUENT TREATMENT PLANT
Revision No :0
Approval Category : 3
Remarks : TANGEDCO COMMENTS: 1.Correct name of Owner as "TANGEDCO" in name plate. 2.Note 11.3 - Enamel painting is not acceptable. Painting shall be epoxy based. Please revise in line with specification and indicate DFT for each coat and no. of coats. 3.GA Lime, Alum & Polyelectrolyte Tanks - With max level of (+) 2.1 M & min level of (+) 0.7 M the effective capacity of tanks is coming to 4.396 M. The effective capacity should be 5 cum. Please revise drawing accordingly.
Job No. :
Ref. No. :
TANGEDCOM No. :
Please resubmit after incorporating our comments.
Regards
TANGEDCO (Mechanical)

Please note that this is a system generated email. Please dont reply on this ID

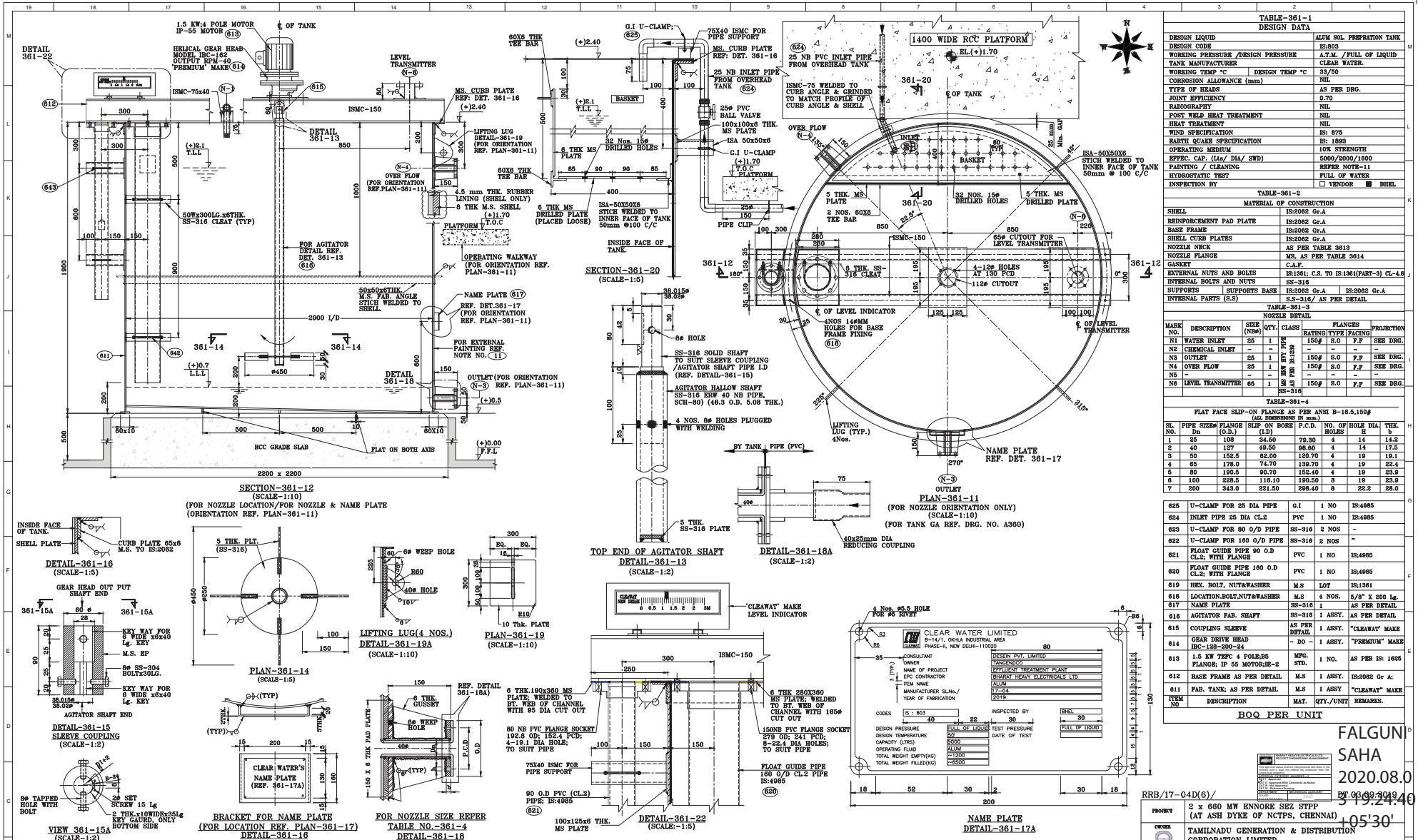

TABLE-361-1 DESIGN DATA			
DESIGN LIQUID			ALUM SOL. PREPRATION TANK
DESIGN CODE			IS:803
WORKING PRESSURE /DESIGN PRESSURE			A.T.M. /FULL OF LIQUID
TANK MANUFACTURER			CLEAR WATER.
WORKING TEMP °C	DESIGN TEMP °C		33/50
CORROSION ALLOWANCE (mm)			NIL
TYPE OF HEADS			AS PER DRG.
JOINT EFFICIENCY			0.70
RADIOGRAPHY			NIL
POST WELD HEAT TREATMENT			NIL
HEAT TREATMENT			NIL
WIND SPECIFICATION			IS: 875
EARTH QUAKE SPECIFICATION			IS: 1893
OPERATING MEDIUM			10% STRENGTH
EFFEC. CAP. (Lts/ DIA/ SWD)			5000/2000/1600
PAINTING / CLEANING			REFER NOTE-11
HYDROSTATIC TEST			FULL OF WATER
INSPECTION BY			☐ VENDOR ■ BHEL

TABLE-361-2 MATERIAL OF CONSTRUCTION			
SHELL		IS:2062 Gr.A	
REINFORCEMENT PAD PLATE		IS:2062 Gr.A	
BASE FRAME		IS:2062 Gr.A	
SHELL CURB PLATES		IS:2062 Gr.A	
NOZZLE NECK		AS PER TABLE 3613	
NOZZLE FLANGE		MS, AS PER TABLE 3614	
GASKET		C.A.F.	
EXTERNAL NUTS AND BOLTS		IS:1361; C.S. TO IS:1361(PART-3) CL-4.6	
INTERNAL BOLTS AND NUTS		SS-316	
SUPPORTS	SUPPORTS BASE	IS:2062 Gr.A	IS:2062 Gr.A
INTERNAL PARTS (S.S)		S.S-316/ AS PER DETAIL	

TABLE-361-3
NOZZLE DETAIL

MARK NO.	DESCRIPTION	SIZE (NBø)	QTY.	CLASS	FLANGES RATING	FLANGES TYPE	FLANGES FACING	PROJECTION
N1	WATER INLET	25	1		150ƒ	S.O	F.F	SEE DRG.
N2	CHEMICAL INLET	–	–		–	–	–	–
N3	OUTLET	25	1		150ƒ	S.O	F.F	SEE DRG.
N4	OVER FLOW	25	1		150ƒ	S.O	F.F	SEE DRG.
N5	–	–	–		–	–	–	–
N6	LEVEL TRANSMITTER	65	1		150ƒ	S.O	F.F	SEE DRG.
				SS-316				

TABLE-361-4
FLAT FACE SLIP-ON FLANGE AS PER ANSI B-16.5,150ƒ
(ALL DIMENSIONS IN mm.)

SL. NO.	PIPE SIZE Dn	FLANGE (O.D.)	SLIP ON BORE (I.D)	P.C.D.	NO. OF HOLES	HOLE DIA. H	THK. b
1	25	108	34.50	79.30	4	14	14.2
2	40	127	49.50	98.60	4	14	17.5
3	50	152.5	62.00	120.70	4	19	19.1
4	65	178.0	74.70	139.70	4	19	22.4
5	80	190.5	90.70	152.40	4	19	23.9
6	100	228.5	116.10	190.50	8	19	23.9
7	200	343.0	221.50	298.40	8	22.2	28.0

ITEM NO	DESCRIPTION	MAT.	QTY./UNIT	REMARKS.
625	U-CLAMP FOR 25 DIA PIPE	G.I	1 NO	IS:4985
624	INLET PIPE 25 DIA CL.2	PVC	1 NO	IS:4985
623	U-CLAMP FOR 80 O/D PIPE	SS-316	2 NOS	–
622	U-CLAMP FOR 160 O/D PIPE	SS-316	2 NOS	–
621	FLOAT GUIDE PIPE 90 O.D CL.2; WITH FLANGE	PVC	1 NO	IS:4985
620	FLOAT GUIDE PIPE 160 O.D CL.2; WITH FLANGE	PVC	1 NO	IS:4985
619	HEX. BOLT, NUT&WASHER	M.S	LOT	IS;1361
618	LOCATION.BOLT,NUT&WASHER	M.S	4 NOS.	5/8" X 200 Lg.
617	NAME PLATE	SS-316	1	AS PER DETAIL
616	AGITATOR PAB. SHAFT	SS-316	1 ASSY.	AS PER DETAIL
615	COUPLING SLEEVE	AS PER DETAIL	1 ASSY.	"CLEAWAT" MAKE
614	GEAR DRIVE HEAD IBC-162B-200-24	– DO –	1 ASSY.	"PREMIUM" MAKE
613	1.5 KW TEFC 4 POLE;B5 FLANGE; IP 55 MOTOR;IE-2	MFG. STD.	1 NO.	AS PER IS: 1635
612	BASE FRAME AS PER DETAIL	M.S	1 ASSY.	IS:2062 Gr A;
611	FAB. TANK; AS PER DETAIL	M.S	1 ASSY	"CLEAWAT" MAKE

BOQ PER UNIT

NOTES:–
1. ALL DIMENSIONS ARE IN MM. AND LEVELS ARE IN METRES.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. IF IN DOUBT, PLEASE ASK.
4. GRIND SMOOTH ALL INTERNAL WELD AND SHARP CORNERS.
5.1 FABRICATION PROCEDURE SHALL CONFROM TO IS:800.
5.2 ALL WELDING SHALL BE AS PER IS:816.
5.3 ALL WELDING SHALL BE 3 TO 5 mm THK. UNLESS OTHERWISE MENTIONED.
5.4 TAG WELDING SHALL BE ADOPETED.
5.5 SS-309 FILLER IS TO BE USED FOR WELDING MS TO SS AND VICE VERSE.
6. ALL PIPE FITTINGS ABOVE 50 NB DIA. SHALL BE BUTT WELD TYPE CONFORMING TO ANSI-B16.5 CLASS 150.
7. VARIATION IN LENGTH OF PIPE MAY BE +/–3mm.
8.1 ALL FLANGES ARE TO BE DRILLED OFF CENTRE.
8.2 ALL FLANGES DIMENSIONS SHALL CONFORM TO TABLE-361-4 UNLESS OTHERWISE SPECIFIED.
9 ALL HOLES ARE 13ø FOR 1/2" BOLT UNLESS OTHERWISE SPECIFIED.
10 ALL FABRICATED SS METAL SURFACES SHALL BE DISPATCHED AFTER ACID WASH AND BUFF FINISHED.
11.1 SURFACE PREPARATION SHALL BE MANUAL WITH WIRE BRUSHING. PRIMER SHALL BE APPLIED IMMEDIATELY AFTER SURFACE PREPARATION.
11.2 ALL FABRICATED MS METAL SURFACES SHALL BE DISPATCHED AFTER PRIMER EPOXY PAINTING. FINAL PAINTING SHALL BE DONE AT SITE AFTER ERECTION.
11.3 EXTERNAL M.S. MOC FACES SHALL HAVE TWO SHOP COATS OF EPOXY RED-OXIDE ZINC PHOSPHATE PRIMER, EACH COAT 35-40 MICRONS, TOTAL THK. DFT=50-70 MICRONS TWO FINISH COAT OF SYNTHETIC ENAMAL (ALKYD MED.) DARK ADMIRALTY GREY, EACH COAT OF 35-40 MICRONS, TOTAL THK. DFT.=80=100 MICRONS; AGGREGATE TOTAL DFT= 140-160 MICRONS, APPLIED BY BRUSH ON DRY SURFACE.
12 TANK FIXING OVER THE PEDESTAL SHALL BE BY USING GRIP TYPE FDN. BOLT.

LEGEND:– (ABBREVIATION)
T.L.L.– TOP LIQUID LEVEL
L.L.L.– LOW LIQID LEVEL
F.F.L.– FINISHED FLOOR LEVEL
F.G.L.– FINISHED GROUND LEVEL
T.O.C.– TOP OF CONCRETE
CL. – CENTRE LINE
EL. – ELEVATION
DET. – DETAIL
TYP. – TYPICAL

TABLE-361-5
SCHEDULE OF PAD PLATES PER TANK

SIZE	tc (THK.)	D	QTY.
25 N.B.	5	125	NIL
32 N.B.	5	125	NIL
40 N.B.	5	152	2
50 N.B.	5	182	1 NO.
65 N.B.	5	150	NIL

IDENTIFICATION OF DRG. / PLAN / SECTION
CLEAWAT DRG. NO.
PLAN/SECTION NO.
17-04/A361/00
FABRICATED DRG. NO.

REV.No.	DETAILS REVISIONS	DATE
2	GA DRG. OF CHEMICAL HOUSE	A360
1	LAYOUT	A011
0	FOR APPROVAL	03.09.2019

SL. NO.	DESCRIPTION REFERENCE DRGS.	CLEWAT DRG. NO.

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QUALITY OBJECTIVES
- CUSTOMER SATISFACTION BY IMPROVING DELIVERY / COMPLETION PERIOD & RESPONSE.
- QUALITY OF SUPPLIES BY IMPROVING SUB-VENDOR PERFORMANCE.
- CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.

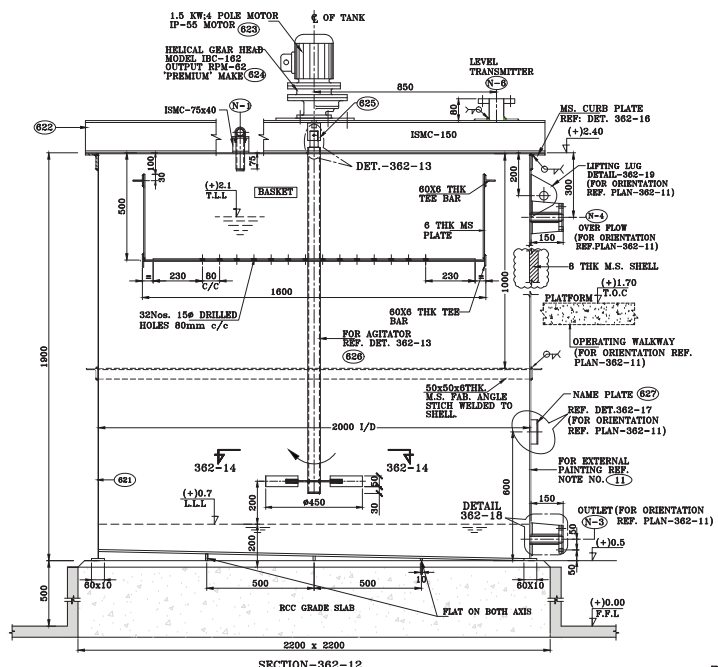
RRB/17-04D(6)/

PROJECT	2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT:	DESEIN PVT. LIMITED CONSULTING ENGINEERS NEW DELHI; HYDERABAD- INDIA
CONTRACTOR	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA,NEW DELHI
ORIGINATOR	PACKAGE CONTRACTOR :– CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE–II, NEW DELHI–110020 PHONE :–26388095 E-mail :–clearwater@bol.net.in

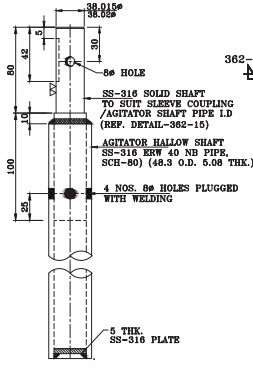
CLEAWAT DRG. NO.	17-04/A361 (SH. 1 OF 1)
VER	00
BHEL DRG. NO.	PE-VD-412-164-A031 (SH. 1 OF 4)
REV.	00
SCALE	1:10

TITLE:– G.A & DETAIL OF ALUM SOLUTION PREPARATION TANK (EFFLUENT TREATMENT PLANT)

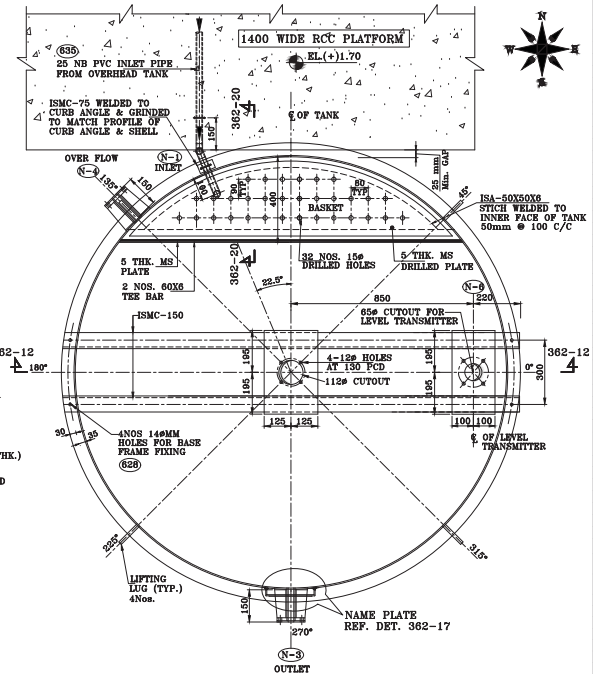
FALGUNI SAHA 2020.08.05 19:24:40 +05'30'



SECTION-362-12
(SCALE-1:10)
(FOR NOZZLE LOCATION/FOR NOZZLE & NAME PLATE ORIENTATION REF. PLAN-362-11)



TOP END OF AGITATOR SHAFT
DETAIL-362-13
(SCALE-1:2)



PLAN-362-11
(FOR NOZZLE ORIENTATION ONLY)
(SCALE-1:10)
(FOR TANK GA REF. DRG. NO. A360)

TABLE-362-1
DESIGN DATA

DESIGN LIQUID		LIME SOL. PREPRATION TANK
DESIGN CODE		IS:803
WORKING PRESSURE /DESIGN PRESSURE		A.T.M. /FULL OF LIQUID
TANK MANUFACTURER		CLEAR WATER.
WORKING TEMP °C	DESIGN TEMP °C	33/50
CORROSION ALLOWANCE (mm)		NIL
TYPE OF HEADS		AS PER DRG.
JOINT EFFICIENCY		0.70
RADIOGRAPHY		NIL
POST WELD HEAT TREATMENT		NIL
HEAT TREATMENT		NIL
WIND SPECIFICATION		IS: 875
EARTH QUAKE SPECIFICATION		IS: 1893
OPERATING MEDIUM		5 % STRENGTH
EFFEC. CAP. (Lts/ DIA/ SWD)		5000/2000/1600
PAINTING / CLEANING		REFER NOTE-11
HYDROSTATIC TEST		FULL OF WATER
INSPECTION BY		☐ VENDOR ■ BHEL

TABLE-362-2
MATERIAL OF CONSTRUCTION

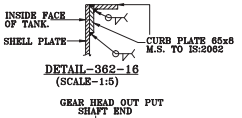
SHELL		IS:2062 Gr.A	
REINFORCEMENT PAD PLATE		IS:2062 Gr.A	
BASE FRAME		IS:2062 Gr.A	
SHELL CURB PLATES		IS:2062 Gr.A	
NOZZLE NECK		AS PER TABLE 3623	
NOZZLE FLANGE		MS, AS PER TABLE 3624	
GASKET		C.A.F.	
EXTERNAL NUTS AND BOLTS		IS:1363; C.S. TO IS:1362(PART-3) CL-4.8	
INTERNAL BOLTS AND NUTS		SS-304	
SUPPORTS	SUPPORTS BASE	IS:2062 Gr.A	IS:2062 Gr.A
INTERNAL PARTS (M.S)		AS PER DETAIL	

TABLE-362-3
NOZZLE DETAIL

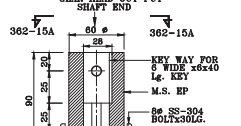
MARK NO.	DESCRIPTION	SIZE (NB#)	QTY.	CLASS	FLANGES RATING	FLANGES TYPE	FLANGES FACING	PROJECTION
N1	WATER INLET	25	1	MEDIUM GRADE HEAVY PIPE AS PER IS:1239	150#	S.O	F.F	SEE DRG.
N2	CHEMICAL INLET	–	–		–	–	–	–
N3	OUTLET	40	1		150#	S.O	F.F	SEE DRG.
N4	OVER FLOW	25	1		150#	S.O	F.F	SEE DRG.
N5	–	–	–		–	–	–	–
N6	LEVEL TRANSMITTER	65	1		150#	S.O	F.F	SEE DRG.
				SS-316				

TABLE-362-4
FLAT FACE SLIP-ON FLANGE AS PER ANSI B-16.5,150#
(ALL DIMENSIONS IN mm.)

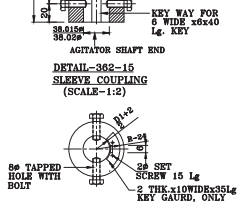
SL. NO.	PIPE SIZE ø Dn	FLANGE (O.D.)	SLIP ON BORE (I.D)	P.C.D.	NO. OF HOLES	HOLE DIA. H	THK. b
1	25	108	34.50	79.30	4	14	14.2
2	40	127	49.50	98.60	4	14	17.5
3	50	152.5	62.00	120.70	4	19	19.1
4	65	178.0	74.70	139.70	4	19	22.4
5	80	190.5	90.70	152.40	4	19	23.9
6	100	228.5	116.10	190.50	8	19	23.9
7	200	343.0	221.50	298.40	8	22.2	28.0



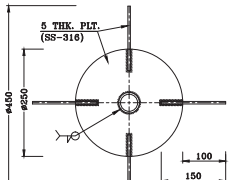
DETAIL-362-16
(SCALE-1:5)



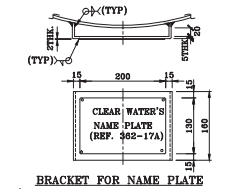
DETAIL-362-15
SLEEVE COUPLING
(SCALE-1:2)



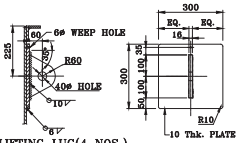
VIEW 362-15A
(SCALE-1:2)



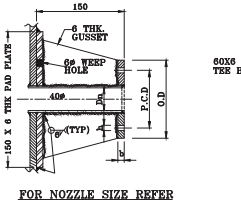
PLAN-362-14
(SCALE-1:5)



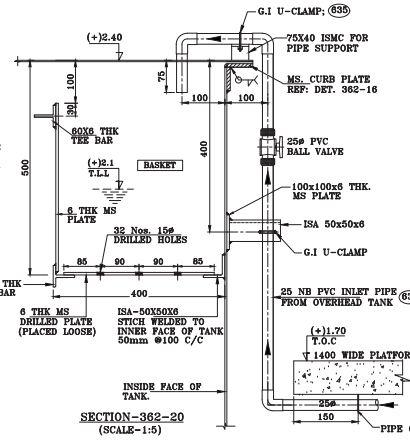
BRACKET FOR NAME PLATE
(FOR LOCATION REF. PLAN-362-17)
DETAIL-362-16
(SCALE-1:5)



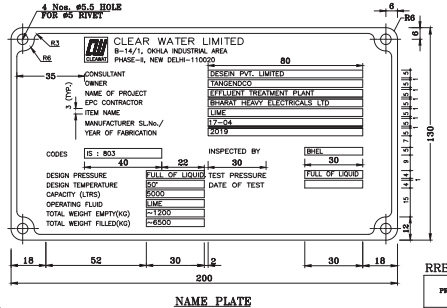
LIFTING LUG(4 NOS.)
DETAIL-362-19A
(SCALE-1:10)



FOR NOZZLE SIZE REFER TABLE NO.-362-4
DETAIL-362-18
(SCALE-1:5)



SECTION-362-20
(SCALE-1:5)



635	U-CLAMP FOR 25 DIA PIPE	G.I	1 NO	IS:4985
634	INLET PIPE 25 DIA CL.2	PVC	1 NO	IS:4985
633	U-CLAMP FOR 80 O/D PIPE	SS-316	2 NOS	–
632	U-CLAMP FOR 160 O/D PIPE	SS-316	2 NOS	–
631	FLOAT GUIDE PIPE 90 O.D CL.2; WITH FLANGE	PVC	1 NO	IS:4985
630	FLOAT GUIDE PIPE 160 O.D CL.2; WITH FLANGE	PVC	1 NO	IS:4985
629	HEX. BOLT, NUT&WASHER	M.S	LOT	IS:1362
628	LOCATION.BOLT,NUT&WASHER	M.S	4 NOS.	5/8" X 200 Lg.
627	NAME PLATE	SS-316	1	AS PER DETAIL
626	AGITATOR FAB. SHAFT	SS-316	1 ASSY.	AS PER DETAIL
625	COUPLING SLEEVE	AS PER DETAIL	1 ASSY.	"CLEAWAT" MAKE
624	GEAR DRIVE HEAD IBC-128-200-24	– DO –	1 ASSY.	"PREMIUM" MAKE
623	1.5 KW TEFC 4 POLE;B5 FLANGE; IP 55 MOTOR;IE-2	MFG. STD.	1 NO.	AS PER IS: 1625
622	BASE FRAME AS PER DETAIL	M.S	1 ASSY.	IS:2062 Gr A;
621	FAB. TANK; AS PER DETAIL	M.S	1 ASSY	"CLEAWAT" MAKE
ITEM NO	DESCRIPTION	MAT.	QTY./UNIT	REMARKS.

BOQ PER UNIT

NOTES:–
1. ALL DIMENSIONS ARE IN MM. AND LEVELS ARE IN METRES.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. IF IN DOUBT, PLEASE ASK.
4. GRIND SMOOTH ALL INTERNAL WELD AND SHARP CORNERS.
5.1 FABRICATION PROCEDURE SHALL CONFROM TO IS:800.
5.2 ALL WELDING SHALL BE AS PER IS:816.
5.3 ALL WELDING SHALL BE 3 TO 5 mm THK. UNLESS OTHERWISE MENTIONED.
5.4 TAG WELDING SHALL BE ADOPETED.
5.5 SS-309 FILLER IS TO BE USED FOR WELDING MS TO SS AND VICE VERSE.
6. ALL PIPE FITTINGS ABOVE 50 NB DIA. SHALL BE BUTT WELD TYPE CONFORMING TO ANSI-B16.5 CLASS 150.
7. VARIATION IN LENGTH OF PIPE MAY BE +/–3mm.
8.1 ALL FLANGES ARE TO BE DRILLED OFF CENTRE.
8.2 ALL FLANGES DIMENSIONS SHALL CONFORM TO TABLE-362-4 UNLESS OTHERWISE SPECIFIED.
9 ALL HOLES ARE 13ø FOR 1/2" BOLT UNLESS OTHERWISE SPECIFIED.
10 ALL FABRICATED SS METAL SURFACES SHALL BE DISPATCHED AFTER ACID WASH AND BUFF FINISHED.
11.1 SURFACE PREPARATION SHALL BE MANUAL WITH WIRE BRUSHING. PRIMER SHALL BE APPLIED IMMEDIATELY AFTER SURFACE PREPARATION.
11.2 ALL FABRICATED MS METAL SURFACES SHALL BE DISPATCHED AFTER PRIMER EPOXY PAINTING. FINAL PAINTING SHALL BE DONE AT SITE AFTER ERECTION.
11.3 EXTERNAL M.S. MOC FACES SHALL HAVE TWO SHOP COATS OF EPOXY RED-OXIDE ZINC PHOSPHATE PRIMER, EACH COAT 35-40 MICRONS, TOTAL THK. DFT=50-70 MICRONS TWO FINISH COAT OF SYNTHETIC ENAMAL (ALKYD MED.) DARK ADMIRALTY GREY, EACH COAT OF 35-40 MICRONS, TOTAL THK. DFT.=80=100 MICRONS; AGGREGATE TOTAL DFT= 140–160 MICRONS, APPLIED BY BRUSH ON DRY SURFACE.
12 TANK FIXING OVER THE PEDESTAL SHALL BE BY USING GRIP TYPE FDN. BOLT

LEGEND:– (ABBREVIATION)
T.L.L.– TOP LIQIUD LEVEL
L.L.L.– LOW LIQID LEVEL
F.F.L.– FINISHED FLOOR LEVEL
F.G.L.– FINISHED GROUND LEVEL
T.O.C.– TOP OF CONCRETE
CL. – CENTRE LINE
EL. – ELEVATION
DET. – DETAIL
TYP. – TYPICAL

TABLE-362-5
SCHEDULE OF PAD PLATES PER TANK

SIZE	tc (THK.)	D	QTY.
25 N.B.	5	125	NIL
32 N.B.	5	125	NIL
40 N.B.	5	152	2
50 N.B.	5	152	1 NO.
65 N.B.	5	180	NIL

IDENTIFICATION OF DRG. / PLAN / SECTION
CLEAWAT DRG. NO.
PLAN/SECTION NO.
17–04/A362/00
JOB NO.

REV.No.	DETAILS REVISIONS	DATE
0	FOR APPROVAL	03.09.2019
1	GA DRAWING OF CHEMICAL HOUSE	A360
2	LAYOUT	A011
SL. NO.	DESCRIPTION REFERENCE DRGS.	CLEWAT DRG. NO.

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- QUALITY OF SUPPLIES BY IMPROVING SUB-VENDOR PERFORMANCE.
- CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.

RRB/17–04D(6)/ DT.03.09.2019

PROJECT	2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT:	DESEIN PVT. LIMITED CONSULTING ENGINEERS NEW DELHI; HYDERABAD– INDIA
CONTRACTOR	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA,NEW DELHI
ORIGINATOR	PACKAGE CONTRACTOR :– CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE–II, NEW DELHI–110020 PHONE :– 26390005 E–mail :–clearwater@bol.net.in

CLEAWAT DRG. NO. 17–04/A362 (SH. 1 OF 1) VER 00
BHEL DRG.NO. PE-V/3-412-164-A031 (SH. 2 OF 4) REV. 00

TITLE:– G.A & DETAIL OF LIME SOLUTION PREPARATION TANK (EFFLUENT TREATMENT PLANT)
SCALE 1:10

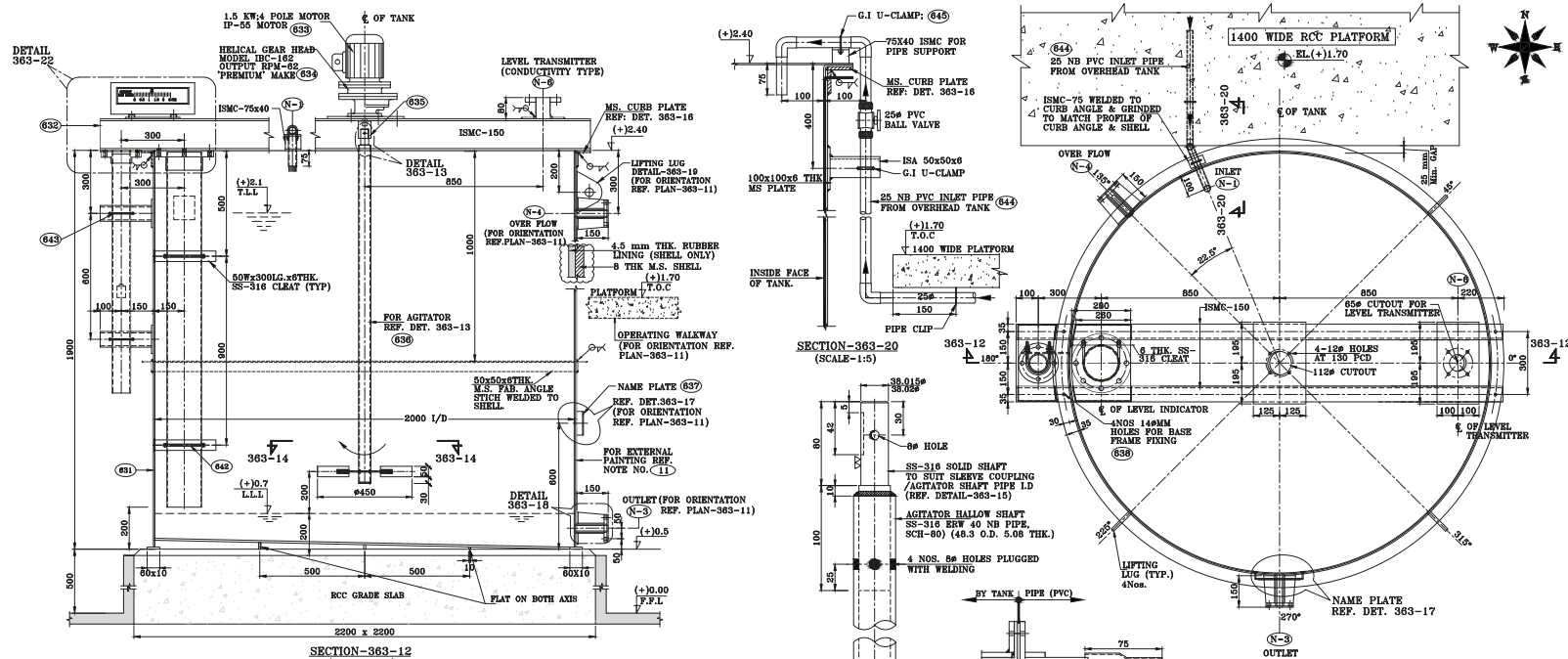

TABLE-363-1
DESIGN DATA

DESIGN LIQUID		PE SOL. PREPRATION TANK
DESIGN CODE		IS:803
WORKING PRESSURE /DESIGN PRESSURE		A.T.M. /FULL OF LIQUID
TANK MANUFACTURER		CLEAR WATER.
WORKING TEMP °C	DESIGN TEMP °C	33/50
CORROSION ALLOWANCE (mm)		NIL
TYPE OF HEADS		AS PER DRG.
JOINT EFFICIENCY		0.70
RADIOGRAPHY		NIL
POST WELD HEAT TREATMENT		NIL
HEAT TREATMENT		NIL
WIND SPECIFICATION		IS: 875
EARTH QUAKE SPECIFICATION		IS: 1893
OPERATING MEDIUM		1% STRENGTH
EFFEC. CAP. (Lts/ DIA/ SWD)		5000/2000/1600
PAINTING / CLEANING		REFER NOTE-11
HYDROSTATIC TEST		FULL OF WATER
INSPECTION BY		☐ VENDOR ■ BHEL

TABLE-363-2
MATERIAL OF CONSTRUCTION

SHELL		IS:2062 Gr.A	
REINFORCEMENT PAD PLATE		IS:2062 Gr.A	
BASE FRAME		IS:2062 Gr.A	
SHELL CURB PLATES		IS:2062 Gr.A	
NOZZLE NECK		AS PER TABLE 3633	
NOZZLE FLANGE		MS,AS PER TABLE 3634	
GASKET		C.A.F.	
EXTERNAL NUTS AND BOLTS		IS:1363; C.S. TO IS:1363(PART-3) CL-4.8	
INTERNAL BOLTS AND NUTS		SS-316	
SUPPORTS	SUPPORTS BASE	IS:2062 Gr.A	IS:2062 Gr.A
INTERNAL PARTS (S.S)		S.S-316/AS PER DETAIL	

TABLE-363-3
NOZZLE DETAIL

MARK NO.	DESCRIPTION	SIZE (Nø)	QTY.	CLASS	FLANGES RATING	FLANGES TYPE	FLANGES FACING	PROJECTION
N1	WATER INLET	25	1	MEDIUM GRADE ERW PIPE AS PER IS:1239	150ø	S.O	F.F	SEE DRG.
N2	CHEMICAL INLET	–	–		–	–	–	–
N3	OUTLET	40/25	1		150ø	S.O	F.F	SEE DRG.
N4	OVER FLOW	40/25	1		150ø	S.O	F.F	SEE DRG.
N5	–	–	–		–	–	–	–
N6	LEVEL TRANSMITTER	65	1	SCH-40 ERW PIPE AS PER IS:3589 SS-316	150ø	S.O	F.F	SEE DRG.

TABLE-363-4
FLAT FACE SLIP-ON FLANGE AS PER ANSI B-16.5,150ø
(ALL DIMENSIONS IN mm.)

SL. NO.	PIPE SIZE ø Dn	FLANGE (O.D.)	SLIP ON BORE (I.D)	P.C.D.	NO. OF HOLES	HOLE DIA. H	THK. b
1	25	108	34.50	79.30	4	14	14.2
2	40	127	49.50	98.60	4	14	17.5
3	50	152.5	62.00	120.70	4	19	19.1
4	65	178.0	74.70	139.70	4	19	22.4
5	80	190.5	90.70	152.40	4	19	23.9
6	100	228.5	116.10	190.50	8	19	23.9
7	200	343.0	221.50	298.40	8	22.2	28.0

645	U-CLAMP FOR 25 DIA PIPE	G.I	1 NO	IS:4985	
644	INLET PIPE 25 DIA CL.2	PVC	1 NO	IS:4985	
643	U-CLAMP FOR 80 O/D PIPE	SS-316	2 NOS	–	
642	U-CLAMP FOR 160 O/D PIPE	SS-316	2 NOS	–	
641	FLOAT GUIDE PIPE 90 O.D CL.2; WITH FLANGE	PVC	1 NO	IS:4985	
640	FLOAT GUIDE PIPE 160 O.D CL.2; WITH FLANGE	PVC	1 NO	IS:4985	
639	HEX. BOLT, NUT&WASHER	M.S	LOT	IS:1363	
638	LOCATION.BOLT,NUT&WASHER	M.S	4 NOS.	5/8" X 200 Lg.	
637	NAME PLATE	SS-316	1	AS PER DETAIL	
636	AGITATOR FAB. SHAFT	SS-316	1 ASSY.	AS PER DETAIL	
635	COUPLING SLEEVE	AS PER DETAIL	1 ASSY.	"CLEAWAT" MAKE	
634	GEAR DRIVE HEAD IBC-128-200-24	– DO –	1 ASSY.	"PREMIUM" MAKE	
633	1.5 KW TEFC 4 POLE;B5 FLANGE; IP 55 MOTOR;IE-2	MFG. STD.	1 NO.	AS PER IS: 1625	
632	BASE FRAME AS PER DETAIL	M.S	1 ASSY.	IS:2062 Gr A;	
631	FAB. TANK; AS PER DETAIL	M.S	1 ASSY	"CLEAWAT" MAKE	
ITEM NO	DESCRIPTION	MAT.	QTY./UNIT	REMARKS.	

BOQ PER UNIT

NOTES:–

1. ALL DIMENSIONS ARE IN MM. AND LEVELS ARE IN METRES.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. IF IN DOUBT, PLEASE ASK.
4. GRIND SMOOTH ALL INTERNAL WELD AND SHARP CORNERS.

5.1 FABRICATION PROCEDURE SHALL CONFROM TO IS:800.
5.2 ALL WELDING SHALL BE AS PER IS:816.
5.3 ALL WELDING SHALL BE 3 TO 5 mm THK. UNLESS OTHERWISE MENTIONED.
5.4 TAG WELDING SHALL BE ADOPETED.
5.5 SS-309 FILLER IS TO BE USED FOR WELDING MS TO SS AND VICE VERSE.

6. ALL PIPE FITTINGS ABOVE 50 NB DIA. SHALL BE BUTT WELD TYPE CONFORMING TO ANSI-B16.5 CLASS 150.
7. VARIATION IN LENGTH OF PIPE MAY BE +/–3mm.

8.1 ALL FLANGES ARE TO BE DRILLED OFF CENTRE.
8.2 ALL FLANGES DIMENSIONS SHALL CONFORM TO TABLE-363-4 UNLESS OTHERWISE SPECIFIED.
9 ALL HOLES ARE 13ø FOR 1/2" BOLT UNLESS OTHERWISE SPECIFIED.
10 ALL FABRICATED SS METAL SURFACES SHALL BE DISPATCHED AFTER ACID WASH AND BUFF FINISHED.
11.1 SURFACE PREPARATION SHALL BE MANUAL WITH WIRE BRUSHING. PRIMER SHALL BE APPLIED IMMEDIATELY AFTER SURFACE PREPARATION.
11.2 ALL FABRICATED MS METAL SURFACES SHALL BE DISPATCHED AFTER PRIMER EPOXY PAINTING. FINAL PAINTING SHALL BE DONE AT SITE AFTER ERECTION.
11.3 EXTERNAL M.S. MOC FACES SHALL HAVE TWO SHOP COATS OF EPOXY RED-OXIDE ZINC PHOSPHATE PRIMER, EACH COAT 35–40 MICRONS, TOTAL THK. DFT=50–70 MICRONS TWO FINISH COAT OF SYNTHETIC ENAMAL (ALKYD MED.) DARK ADMIRALTY GREY, EACH COAT OF 35–40 MICRONS, TOTAL THK. DFT.=80=100 MICRONS; AGGREGATE TOTAL DFT= 140–160 MICRONS, APPLIED BY BRUSH ON DRY SURFACE.
12 TANK FIXING OVER THE PEDESTAL SHALL BE BY USING GRIP TYPE FDN. BOLT.

LEGEND:– (ABBREVIATION)

T.L.L– TOP LIQIUD LEVEL
L.L.L– LOW LIQID LEVEL
F.F.L– FINISHED FLOOR LEVEL
F.G.L– FINISHED GROUND LEVEL
T.O.C– TOP OF CONCRETE
CL – CENTRE LINE
EL – ELEVATION
DET. – DETAIL
TYP. – TYPICAL

TABLE-363-5
SCHEDULE OF PAD PLATES PER TANK

SIZE	tc (THK.)	D	QTY.
25 N.B.	5	125	NIL
32 N.B.	5	125	NIL
40 N.B.	5	152	2
50 N.B.	5	182	1 NO.
65 N.B.	5	150	NIL

IDENTIFICATION OF DRG. / PLAN / SECTION
CLEAWAT DRG. NO.
PLAN/SECTION NO.
17-04/A363/00
JOB NO.

REV.No.	DETAILS REVISIONS	DATE
2	GA DRAWING OF CHEMICAL HOUSE	A360
1	LAYOUT	A011
SL. NO.	DESCRIPTION / REFERENCE DRGS.	CLEWAT DRG. NO.
00	FOR APPROVAL	03.09.2019

CAUTION
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IN ITS QUEST TO SATISFY THE CUSTOMER, CLEAR WATER LTD. PURSUES CONTINUAL IMPROVEMENT IN THE QUALITY OF ITS PRODUCTS, SERVICES AND PERFORMANCE LEADING TO TOTAL CUSTOMER SATISFACTION AND BUSINESS GROWTH THROUGH DEDICATION, COMMITMENT AND TEAM WORK OF ALL EMPLOYEES.

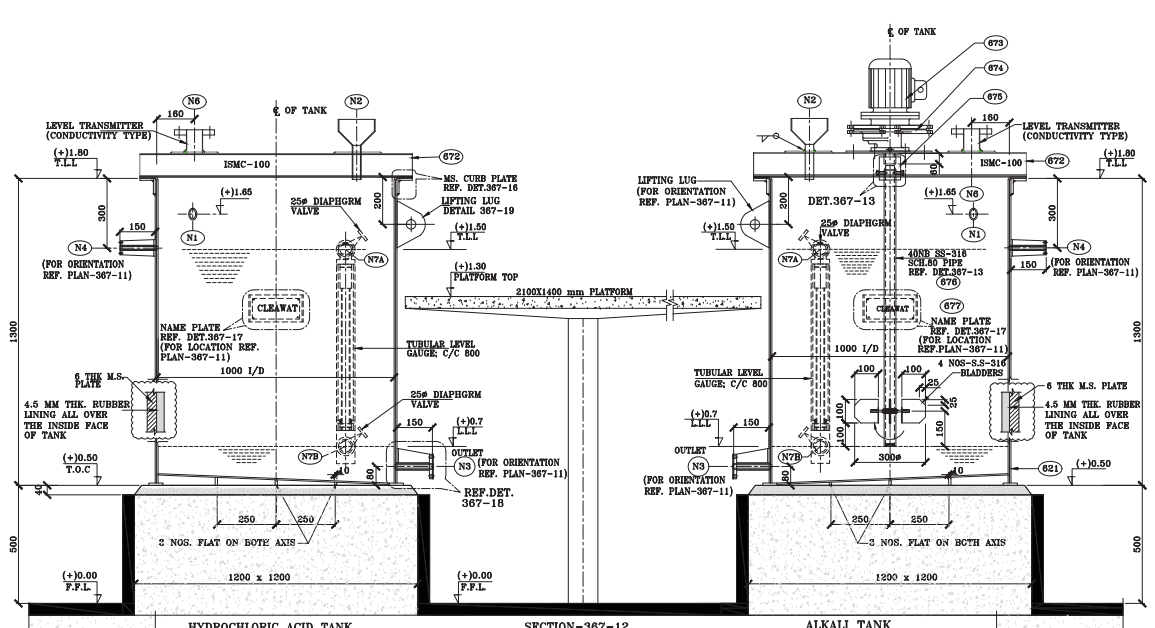
QUALITY OBJECTIVES
○ CUSTOMER SATISFACTION BY IMPROVING DELIVERY / COMPLETION PERIOD & RESPONSE.
○ QUALITY OF SUPPLIES BY IMPROVING SUB-VENDOR PERFORMANCE.
○ CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.

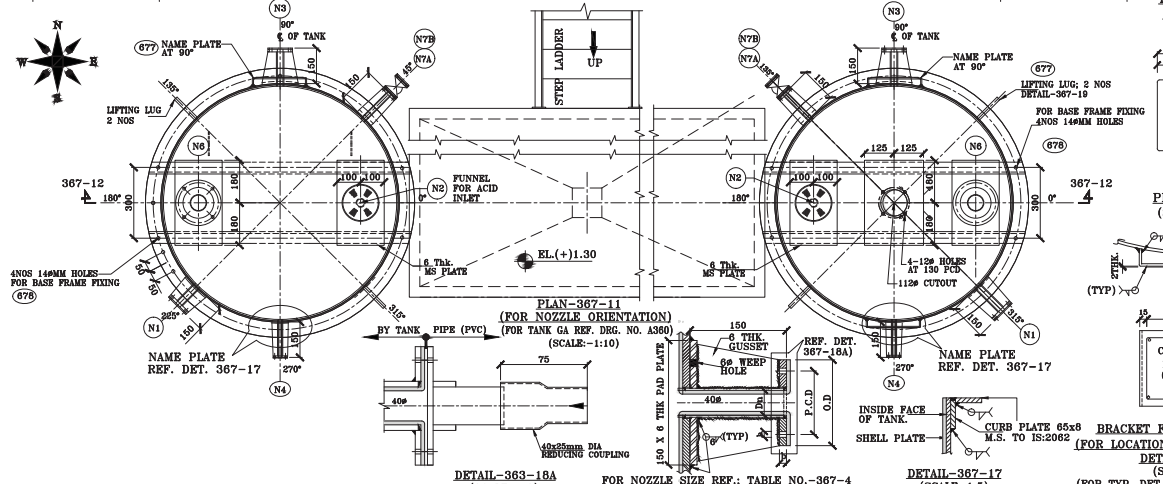
RRB/17-04D(6)/ DT.03.09.2019

PROJECT: 2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER: TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT: DESEIN PVT. LIMITED — CONSULTING ENGINEERS — NEW DELHI; HYDERABAD– INDIA
CONTRACTOR: BHARAT HEAVY ELECTRICALS LTD — POWER SECTOR — PROJECT ENGINEERING MANAGEMENT — NOIDA,NEW DELHI
ORIGINATOR: PACKAGE CONTRACTOR :– CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE–II, NEW DELHI–110020 PHONE :– 26389005 E–mail :–clearwater@bol.net.in

CLEAWAT DRG. NO. 17–04/A363 (SH. 1 OF 1) VER 00
DESI. DRG.NO. PE-VO-412-164-A031 (SH. 3 OF 4) REV. 00

TITLE:– G.A & DETAIL OF PE SOLUTION PREPARATION TANK (EFFLUENT TREATMENT PLANT)
SCALE 1:10

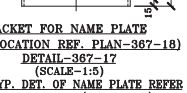




DETAIL-363-18A
(SCALE-1:2)

FOR NOZZLE SIZE REF.; TABLE NO.-367-4
DETAIL-367-18
(SCALE-1:5)

DETAIL-367-17
(SCALE-1:5)



BRACKET FOR NAME PLATE
(FOR LOCATION REF. PLAN-367-18)
DETAIL-367-17
(SCALE-1:5)
(FOR TYP. DET. OF NAME PLATE REFER DRAWING NO. A361 (SH 1 OF 1)

TABLE-367-5
DESIGN DATA

DESIGN LIQUID	ACID TANK	
DESIGN CODE	IS:803	
WORKING PRESSURE /DESIGN PRESSURE	A.T.M. /FULL OF LIQUID	
TANK MANUFACTURER	CLEAR WATER.	
WORKING TEMP °C / DESIGN TEMP °C	33/50	
CORROSION ALLOWANCE (mm)	NIL	
TYPE OF HEADS	AS PER DRG.	
JOINT EFFICIENCY	0.70	
RADIOGRAPHY	NIL	
POST WELD HEAT TREATMENT	NIL	
HEAT TREATMENT	NIL	
WIND SPECIFICATION	IS: 875	
EARTH QUAKE SPECIFICATION	IS: 1893	
OPERATING MEDIUM	30 – 35% STRENGTH HCL	
EFFEC. CAP. (Lts/ DIA / SWD)	1000/1000/1000	
PAINTING / CLEANING	REFER NOTE-10&11	
HYDROSTATIC TEST	FULL OF WATER	
INSPECTION BY	☐ VENDOR ■ CLIENT / BHEL	

TABLE-367-6
MATERIAL OF CONSTRUCTION

SHELL	IS:2062 Gr.A	
REINFORCEMENT PAD PLATE	IS:2062 Gr.A	
BASE FRAME	IS:2062 Gr.A	
SHELL CURB PLATES	IS:2062 Gr.A	
NOZZLE NECK	AS PER TABLE 3693	
NOZZLE FLANGE	MS, AS PER TABLE 3694	
GASKET	C.A.F.	
EXTERNAL NUTS AND BOLTS	IS:1363; C.S. TO IS:1363(PART-3) CL-4.6	
INTERNAL BOLTS AND NUTS	SS-316	
SUPPORTS / SUPPORTS BASE	IS:2062 Gr.A	IS:2062 Gr.A
INTERNAL PARTS (S.S)	S.S-316	

TABLE-367-7

TABLE-367-1
DESIGN DATA

DESIGN LIQUID	ALKALI TANK	
DESIGN CODE	IS:803	
WORKING PRESSURE /DESIGN PRESSURE	A.T.M. /FULL OF LIQUID	
TANK MANUFACTURER	CLEAR WATER.	
WORKING TEMP °C / DESIGN TEMP °C	33/50	
CORROSION ALLOWANCE (mm)	NIL	
TYPE OF HEADS	AS PER DRG.	
JOINT EFFICIENCY	0.70	
RADIOGRAPHY	NIL	
POST WELD HEAT TREATMENT	NIL	
HEAT TREATMENT	NIL	
WIND SPECIFICATION	IS: 875	
EARTH QUAKE SPECIFICATION	IS: 1893	
OPERATING MEDIUM	10% STRENGTH ALKALI	
EFFEC. CAP. (Lts/ DIA/ SWD)	1000/1000/1000	
PAINTING / CLEANING	REFER NOTE-10&11	
HYDROSTATIC TEST	FULL OF WATER	
INSPECTION BY	☐ VENDOR ■ CLIENT / BHEL	

TABLE-367-2
MATERIAL OF CONSTRUCTION

SHELL	IS:2062 Gr.A	
REINFORCEMENT PAD PLATE	IS:2062 Gr.A	
BASE FRAME	IS:2062 Gr.A	
SHELL CURB PLATES	IS:2062 Gr.A	
NOZZLE NECK	AS PER TABLE 3693	
NOZZLE FLANGE	MS, AS PER TABLE 3694	
GASKET	C.A.F.	
EXTERNAL NUTS AND BOLTS	IS:1363; C.S. TO IS:1363(PART-3) CL-4.6	
INTERNAL BOLTS AND NUTS	SS-316	
SUPPORTS / SUPPORTS BASE	IS:2062 Gr.A	IS:2062 Gr.A
INTERNAL PARTS (S.S)	S.S-316	

TABLE-367-3
NOZZLE DETAIL

MARK NO.	DESCRIPTION	SIZE (NBø)	QTY.	CLASS	FLANGES RATING	FLANGES TYPE	FLANGES FACING	PROJECTION
N1	WATER INLET	25	1	MS AS PER IS:1239 ERW HVY PIPE	150#	S.O	F.F	SEE DRG.
N2	CHEMICAL INLET	–	–		–	–	–	–
N3	OUTLET	40/25	1		150#	S.O	F.F	SEE DRG.
N4	OVER FLOW	40/25	1		150#	S.O	F.F	SEE DRG.
N5	–	–	–		–	–	–	–
N6	LEVEL TRANSMITTER	65	1	SS-316	150#	S.O	F.F	SEE DRG.

TABLE-367-4
FLAT FACE SLIP-ON FLANGE AS PER ANSI B-16.5,150#
(ALL DIMENSIONS IN mm.)

SL. NO.	PIPE SIZEø Dn	FLANGE (O.D.)	SLIP ON BORE (I.D)	P.C.D.	NO. OF HOLES	HOLE DIA. H	THK. h
1	25	108	34.50	79.30	4	14	14.2
2	40	127	49.50	98.60	4	14	17.5
3	50	152.5	62.00	120.70	4	19	19.1
4	65	178.0	74.70	139.70	4	19	22.4
5	80	190.5	90.70	152.40	4	19	23.9
6	100	228.5	116.10	190.50	8	19	23.9
7	200	343.0	221.50	298.40	8	22.2	28.0

ITEM NO	DESCRIPTION	MAT.	QTY./UNIT	REMARKS.
679	HEX. BOLT, NUT&WASHER	M.S.	LOT	IS;1363
678	LOCATION.BOLT,NUT&WASHER	M.S.	4 NOS.	5/8" X 200 lg.
677	NAME PLATE	SS-316	1	AS PER DETAIL
676	COUPLING	AS PER DETAIL	1 ASSY.	"CLEAWAT" MAKE
675	AGITATOR FABRICATED SHAFT	SS-316	1 ASSY.	AS PER DETAIL
674	GEAR DRIVE HEAD IBC-128-200-24	– DO –	1 ASSY.	"PREMIUM" MAKE
673	1.5 KW TEFC 4 POLE;B5 FLANGE;IE-2;IP 55 MOTOR	MFG. STD.	1 NO.	AS PER IS : 325 FRAME SIZE: M3HA90S4
672	BASE FRAME AS PER DETAIL	MS	1 ASSY.	IS:2062 Gr A;
671	FAB. TANK AS PER DETAIL	MS	1 ASSY	"CLEAWAT" MAKE

BOQ FOR ACID/ALKALI TANK

NOTES:–
1. ALL DIMENSIONS ARE IN MM. AND LEVELS ARE IN METRES.
2. THIS DRAWING SHOULD NOT BE SCALED.
3. IF IN DOUBT, PLEASE ASK.
4. GRIND SMOOTH ALL INTERNAL WELD AND SHARP CORNERS.
5.1 FABRICATION PROCEDURE SHALL CONFROM TO IS:800.
5.2 ALL WELDING SHALL BE AS PER IS:816.
5.3 ALL WELDING SHALL BE 3 TO 5 mm THK. UNLESS OTHERWISE MENTIONED.
5.4 TAG WELDING SHALL BE ADOPETED.
5.5 SS-309 FILLER IS TO BE USED FOR WELDING MS TO SS AND VICE VERSE.
6. ALL PIPE FITTINGS ABOVE 50 NB DIA. SHALL BE BUTT WELD TYPE CONFORMING TO ANSI-B16.5 CLASS 150.
7. VARIATION IN LENGTH OF PIPE MAY BE +/–3mm.
8.1 ALL FLANGES ARE TO BE DRILLED OFF CENTRE.
8.2 ALL FLANGES DIMENSIONS SHALL CONFORM TO TABLE-367-4 UNLESS OTHERWISE SPECIFIED.
9 ALL HOLES ARE 13ø FOR 1/2" BOLT UNLESS OTHERWISE SPECIFIED.
10 ALL FABRICATED SS METAL SURFACES SHALL BE DISPATCHED AFTER ACID WASH AND BUFF FINISHED.
11.1 SURFACE PREPARATION SHALL BE MANUAL WITH WIRE BRUSHING. PRIMER SHALL BE APPLIED IMMEDIATELY AFTER SURFACE PREPARATION.
11.2 ALL FABRICATED MS METAL SURFACES SHALL BE DISPATCHED AFTER PRIMER EPOXY PAINTING. FINAL PAINTING SHALL BE DONE AT SITE AFTER ERECTION.
11.3 EXTERNAL M.S. MOC FACES SHALL HAVE TWO SHOP COATS OF EPOXY RED–OXIDE ZINC PHOSPHATE PRIMER, EACH COAT 25–35 MICRONS, TOTAL THK. DFT=50–70 MICRONS TWO FINISH COAT OF SYNTHETIC ENAMAL (ALKYD MED.) DARK ADMIRALTY GREY, EACH COAT OF 25–35 MICRONS, TOTAL THK. DFT.=50=70 MICRONS; AGGREGATE TOTAL DFT= 100–140 MICRONS, APPLIED BY BRUSH ON DRY SURFACE.
12 TANK FIXING OVER THE PEDESTAL SHALL BE BY USING GRIP TYPE FDN. BOLT.

LEGEND:–(ABBREVIATION)
T.L.L.– TOP LIQUID LEVEL
L.L.L.– LOW LIQUID LEVEL
F.F.L.– FINISHED FLOOR LEVEL.
F.G.L.– FINISHED GROUND LEVEL
T.O.C.– TOP OF CONCRETE
CL – CENTRE LINE
EL – ELEVATION
DET. – DETAIL
TYP. – TYPICAL

TABLE-367-1A
SCHEDULE OF PAD PLATES PER TANK

SIZE	tc (THK.)	D	QTY.
25 N.B.	5	125	NIL
32 N.B.	5	125	NIL
40 N.B.	5	152	2
50 N.B.	5	162	1 NO.
65 N.B.	5	150	NIL

IDENTIFICATION OF DRG. / PLAN / SECTION
CLEAWAT DRG. NO.
PLAN/SECTION NO.
17-04/A/367/00
PROJECT NO.

SL. NO.	DESCRIPTION	REFERENCE DRGS.
2	GA DRG. OF CHEMICAL HOUSE	A360
1	LAYOUT	A011

REV. No.	DETAILS REVISIONS	DATE
0	FOR APPROVAL	03.09.2019

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QUALITY OBJECTIVES
• CUSTOMER SATISFACTION BY IMPROVING DELIVERY / COMPLETION PERIOD & RESPONSE.
• QUALITY OF SUPPLIES BY IMPROVING SUB-VENDOR PERFORMANCE.
• CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.

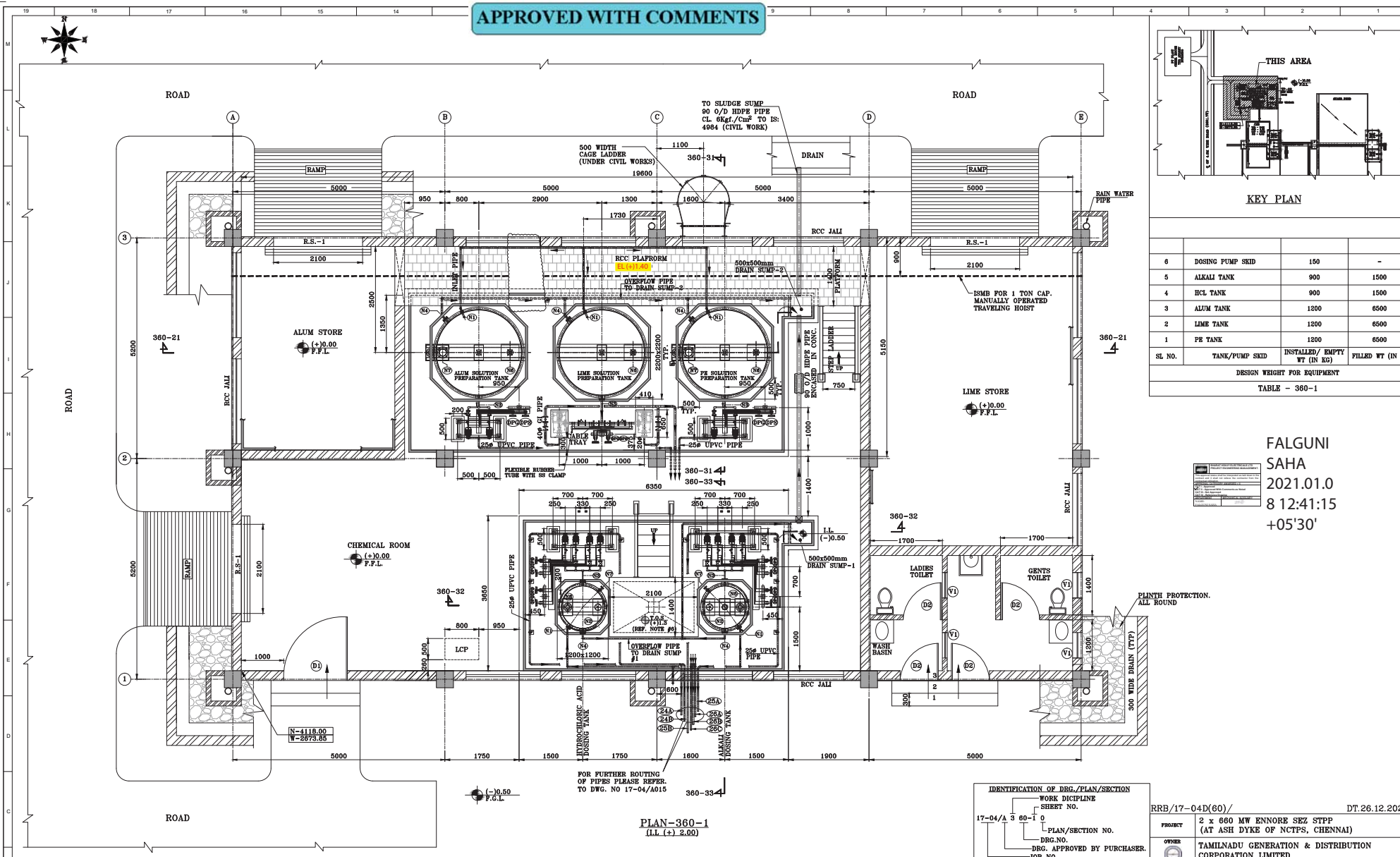
RRB/17–04D(6)/ DT.03.09.2019

PROJECT: 2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER: TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT: DESEIN PVT. LIMITED
CONSULTING ENGINEERS NEW DELHI; HYDERABAD– INDIA
CONTRACTOR: BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA,NEW DELHI
ORIGINATOR: PACKAGE CONTRACTOR :– CLEAR WATER LTD. B–14/1, OKHLA INDUSTRIAL AREA PHASE–II, NEW DELHI–110020 PHONE :–26380095 E–mail :–clearwater@bol.net.in
CLEAWAT DRG. NO. 17–04/A367 (SH. 1 OF 1) VER 00
BHEL DRG.NO. PE-VO-412-164-A031 (SH. 4 OF 4) REV. 00
TITLE:– G.A & DETAIL OF ACID DOSING /ALKALI SOLUTION PREPARATION TANK WITH AGITATOR (EFFLUENT TREATMENT PLANT)
SCALE 1:10

Sr. No.	TANGEDCO Comments	BHEL /CWL Reply	TANGEDCO Response	BHEL/CWL Reply dated-19/09/2019	TANGEDCO Response	BHEL/CWL Reply dated-07/01/2021	TANGEDCO Response
1	All the points are noted by TANGEDCO except the following points						
2	Indicate single leaf door beside all rolling shutters	I) For Stores , Rolling Shutter provision is a standard practice and accordingly it has been provided . Ii) For entrance to Tank Area , we had provided a Rolling Shutter only . As desired and discussed , we have enlarged area and have indicated Rolling shutter as well Door for entrance to Chemical House . Please refer to GA Drgs.	Indicate single leaf door beside all rolling shutters. Revise drawing accordingly	a) In Chemical stores, Rolling Shutters are provided. Single leaf doors are not provided for entrance to Chemical Stores as per std. Engineering practices. b) For entrance, single leaf door has been provided.	Indicate single leaf door beside all rolling shutters. Revise drawing accordingly	Please note that rolling shutter has been envisaged as per standard practice, no single leaf door is required. We ensure that the facility provided is sufficient to meet the requirement. The detail is already shown in approved in Architectural Drawing for Chemical house for ETP (Ref Drg No. PE-DG-412-676-C006). Please accept.	Not acceptable. Please provide single leaf door beside all rolling shutters. BHEL CIVIL TO REPLY
3	The platform along Column 3 shall be increased to man height (min 2100 mm) so that man movement below RCC platform is possible. Revise tank elevations accordingly.	Under the walkway , no equipment is located . However, we have raised the IL of Platform from (+) 1.4 to 1.7 while retaining the FFL as +/- 0.00 .	Please provide minimum head room clearance of 2100 mm for man movement. Revise drawing accordingly.	a) No equipment is located below the walkway and hence man movement for Operational reason is not envisaged. b) If 2100 mm height is provided below the operating floor then, Tanks foundations have to be raised at least by 500 m and consequently ceiling height will have to	Please provide minimum head room clearance of 2100 mm for man movement. Revise drawing accordingly.	Please note that the platform height has been kept at (+)1.4m level inline with approved in Architectural Drawing for Chemical house for ETP (Ref Drg No. PE-DG-412-676-C006). There is no equipment coming under the walkway, hence,	Not acceptable. Please provide minimum head room clearance of 2100 mm for man movement. Revise drawing accordingly. EARLIER REPLY STANDS. ALSO ADD : IF INCREASE THE HEIGHT THEN IT WILL BE DIFFICULT FOR HANDLING CHEMICAL IN DOSING TANKS IN STANDING CONDITION.

Sr. No.	TANGEDCO Comments	BHEL /CWL Reply	TANGEDCO Response	BHEL/CWL Reply dated-19/09/2019	TANGEDCO Response	BHEL/CWL Reply dated-07/01/2021	TANGEDCO Response
				be raised .		platform at (+)1.4m height is hold good. The overall building height is 5.65 m (TOC) and the platform is located at (+)1.4m, hence, more than 2100 mm man movement space is available. Please accept.	
4	Show ventilation fans with elevation.	For location and no. of Ventilation Fans, please refer to Civil Construction Drg. Table has been added as desired by BHEL	Please indicate location in this drawing.	Ventilation Fans shall be indicated by BHEL in Construction Drgs as these are covered in a separate package .	Please indicate location in this drawing.	The same is already shown in approved in Architectural Drawing for Chemical house for ETP (Ref Drg No. PE-DG-412-676-C006). Please accept.	Please show location in this drawing also. CWL PLS INDICATE. -676-C006 DOC ENLCOSED FOR REFERENCE.
5	Piping shall be routed to avoid interference and minimum clearances required shall be maintained including man movement.	Piping routing is indicated in Mech GA Drgs. Lot of effort has been made to route the piping avoiding Interference with man movement . We are ready to discuss and explain , if so required .	Submit the piping layout to review the same.	Pipe routing is already indicated in Drg.	TANGEDCO Comments on pipe routing were already uploaded in PEDM. BHEL is to resubmit the same after incorporating the comments.	The same is under revision and shall be uploaded soon after incorporating the comments marked in pipe routing drawing.	Noted Piping shall be routed to avoid interference and minimum minimum head room clearance of 2100 mm for man movement. shall be maintained NOTED

APPROVED WITH COMMENTS



PLAN-360-1
(LL (+) 2.00)

KEY PLAN

SL NO.	TANK/PUMP SKID	INSTALLED/ EMPTY WT (IN KG)	FILLED WT (IN KG)
6	DOSING PUMP SKID	150	-
5	ALKALI TANK	900	1500
4	HCL TANK	900	1500
3	ALUM TANK	1200	6500
2	LIME TANK	1200	6500
1	PE TANK	1200	6500
DESIGN WEIGHT FOR EQUIPMENT			

TABLE - 360-1

FALGUNI SAHA
2021.01.08 12:41:15 +05'30'

NOTES:-
1. ALL DIMENSIONS ARE IN mm. AND LEVELS ARE IN METRES.
2. IF IN DOUBT, PLEASE ASK.
3. ALL ELEVATION ARE REFFERED TO THE F.G.L OF POWER HOUSE BUILDING AS EL.0.00 M WHICH CORRESPONDS TO RL.(+) 10.00M
4. CHEMICAL HOUSE FINISHED FLOOR LEVEL (FFL) EL. IS (+) 0.00M.
5. UPVC PIPE SHALL CONFIRM TO CL.4 AS PER 4985.
6. HDPE PIPE SHALL CONFIRM TO CLASS 4Kgf/cm² AS PER IS 4984
7. ALL MS PIPE SHALL CONFIRM TO HVY CL AS PER IS: 1239;
8. FOR PIPING ROUTING PLEASE REFER DWG. NO. 17-04/A015.
9. FOR PIPE SCHEDULE OF PIPE GALLERY REF. DWG. NO 17-04/A011

LEGEND:- (NOZZLE)

N1	WATER INLET
N2	CHEMICAL INLET
N3	OUTLET
N4	OVER FLOW
N5	DRAIN
N6	LEVEL TRANSMITTER
N7	LEVEL INDICATOR/ GAUGE

LEGEND:- (ABBREVIATION)

T.L.L.	TOP LIQUID LEVEL
L.L.L.	LOW LIQID LEVEL
F.F.L.	FINISHED FLOOR LEVEL
F.G.L.	FINISHED GROUND LEVEL
T.O.C.	TOP OF CONCRETE
B.O.C.	BOTTOM OF CONCRETE
P.P.C.	PLAIN CEMENT CONCRETE
N.T.S.	NOT TO SCALE
CL.	CENTRE LINE
EL.	ELEVATION
COL.	COLUMN
DET.	DETAIL
TYP.	TYPICAL
SPEC.	SPECIFICATION
DRG.	DRAWING

REV. No.	REVISIONS DETAIL	DATE
03	RE-SUBMITTED FOR APPROVAL	26.12.2020
02	REVISED AS PER COMMENTS/RE-SUBMITTED	12.09.2019
01	REVISED AS PER COMMENTS/RE-SUBMITTED	27.06.2019
0A	SUBMITTED FOR APPROVAL	17.05.2019
2	P&I DIAGRAM	17-04/012
1	LAYOUT PLAN	17-04/A011
SL. NO.	DESCRIPTION	CLEWAT DRG. NO.
	REFERENCE DRGS.	

IDENTIFICATION OF DRG./PLAN/SECTION
17-04/A 3 60-1 0
WORK DICIPLINE
SHEET NO.
PLAN/SECTION NO.
DRG.NO.
DRG. APPROVED BY PURCHASER.
JOB NO.

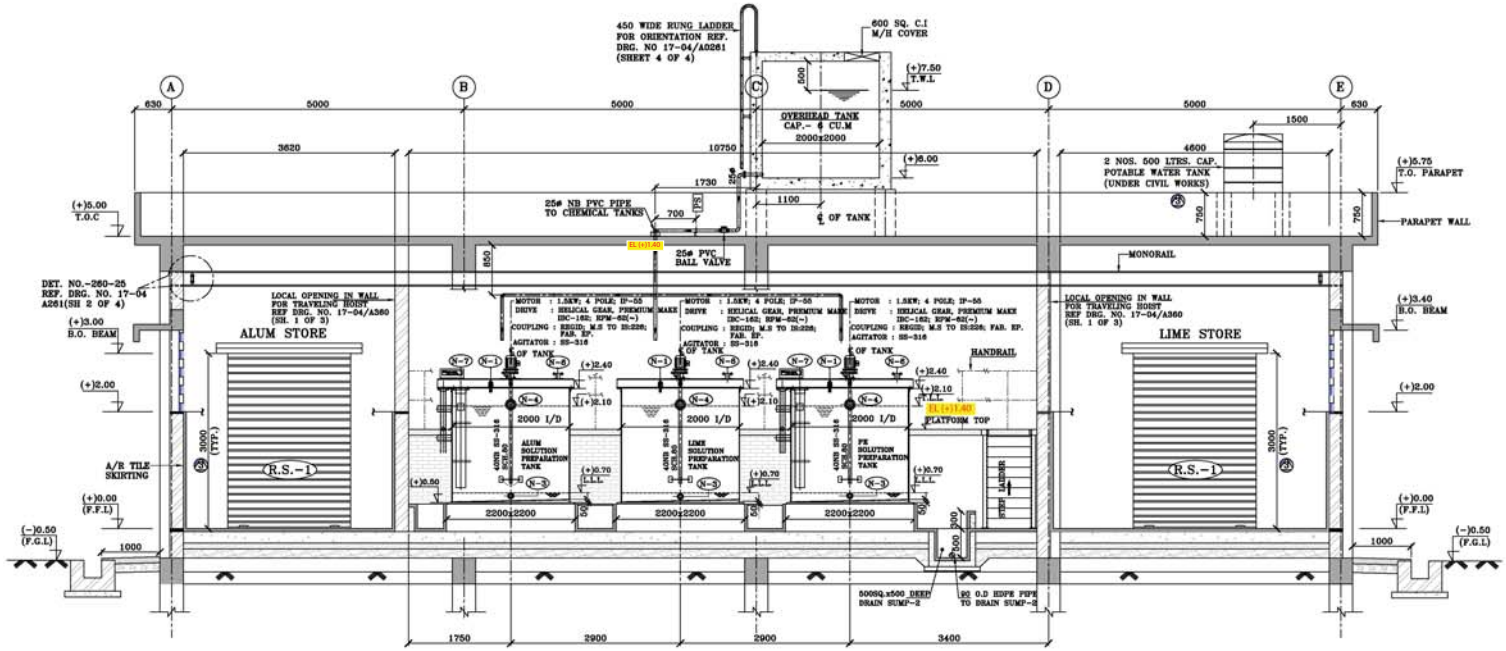
RRB/17-04D(60)/ DT.26.12.2020

PROJECT	2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT:	DESEIN PVT. LIMITED CONSULTING ENGINEERS NEW DELHI; HYDERABAD- INDIA
CONTRACTOR	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA,NEW DELHI
ORIGINATOR	PACKAGE CONTRACTOR :- CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE-II, NEW DELHI-110020 PHONE :-26386095 E-mail :-clearwater@bol.net.in
CLEWAT DRG. NO.	17-04/A360 (SH. 1 OF 3)
VER	00
BHEL DRG.NO.	PE-V0-412-164-A017
REV.	03
TITLE:-	G.A OF CHEMICAL HOUSE GROUND FLOOR PLAN (EFFLUENT TREATMENT PLANT)
SCALE	1:40

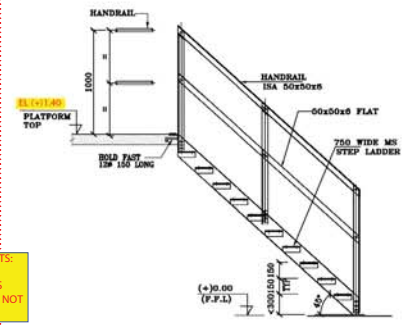
CAUTION
THIS DRG. IS CONFIDENTIAL AND IS THE PROPERTY OF "CLEAR WATER LTD" ITIMUST NOT BE DISCLOSED/COPIED OR LENT TO A THIRD PARTY WITHOUT WRITTEN CONSENT OF CLEAR WATER LTD.

QUALITY POLICY
IN ITS QUEST TO SATISFY THE CUSTOMER, CLEAR WATER LTD. PURSUES CONTINUAL IMPROVEMENT IN THE QUALITY OF ITS PRODUCTS, SERVICES AND PERFORMANCE LEADING TO TOTAL CUSTOMER SATISFACTION AND BUSINESS GROWTH THROUGH DEDICATION, COMMITMENT AND TEAM WORK OF ALL EMPLOYEES.

QUALITY OBJECTIVES
- CUSTOMER SATISFACTION BY IMPROVING DELIVERY / COMPLETION PERIOD & RESPONSE.
- QUALITY OF SUPPLIES BY IMPROVING SUB-VENDOR PERFORMANCE.
- CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.



SECTION-360-21
(SCALE-1:40)



TYP. DET. OF STEP LADDER
(SCALE-1:20)
(UNDER CIVIL WORKS)

BHEL COMMENTS: PLS ADD THIS DETAILS IN THIS DRAWING. CRS NOT REQUIRED

NOTES:-

1. ALL DIMENSIONS ARE IN mm. AND LEVELS ARE IN METRES.
2. IF IN DOUBT, PLEASE ASK.
3. FOR OTHER NOTES REFER DRAWING NO. 17-04/A360 (SHT 1 OF 3)

LEGEND:-(NOZZLE MKD)

N1	WATER INLET
N2	CHEMICAL INLET
N3	OUTLET
N4	OVER FLOW
N5	DRAIN
N6	LEVEL TRANSMITTER
N7	LEVEL INDICATOR/ GAUGE

LEGEND:- (ABBREVIATION)

T.L.L.-	TOP LIQUID LEVEL
L.L.L.-	LOW LIQID LEVEL
F.F.L.-	FINISHED FLOOR LEVEL
F.G.L.-	FINISHED GROUND LEVEL
T.O.C.-	TOP OF CONCRETE
B.O.C.-	BOTTOM OF CONCRETE
P.P.C.-	PLAIN CEMENT CONCRETE
N.T.S.-	NOT TO SCALE
CL. -	CENTRE LINE
EL. -	ELEVATION
COL. -	COLUMN
DET. -	DETAIL
TYP. -	TYPICAL
SPEC.-	SPECIFICATION
C/C -	CENTRE TO CENTRE

SL. NO.	DESCRIPTION	CLEWAT DRG. NO.
	REFERENCE DRGS.	
2	P&I DIAGRAM	17-04/012
1	LAYOUT PLAN	17-04/A011

No.	REVISIONS DETAIL	DATE
02	SUBMITTED FOR APPROVAL	26.12.2020
02	REVISED AS PER COMMENTS/RE-SUBMITTED	12.09.2019
01	REVISED AS PER COMMENTS/RE-SUBMITTED	27.08.2019
0A	SUBMITTED FOR APPROVAL	15.05.2019

QUALITY POLICY

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QUALITY OBJECTIVES

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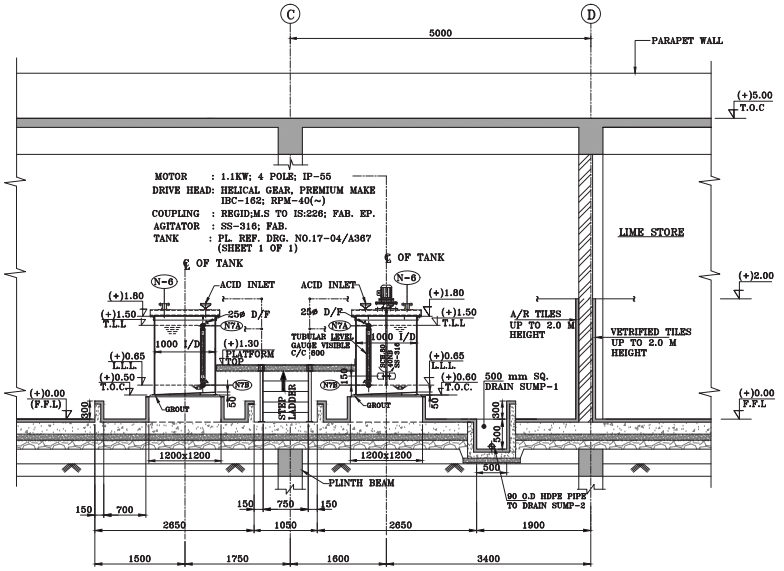
- CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.

IDENTIFICATION OF DRG./PLAN/SECTION

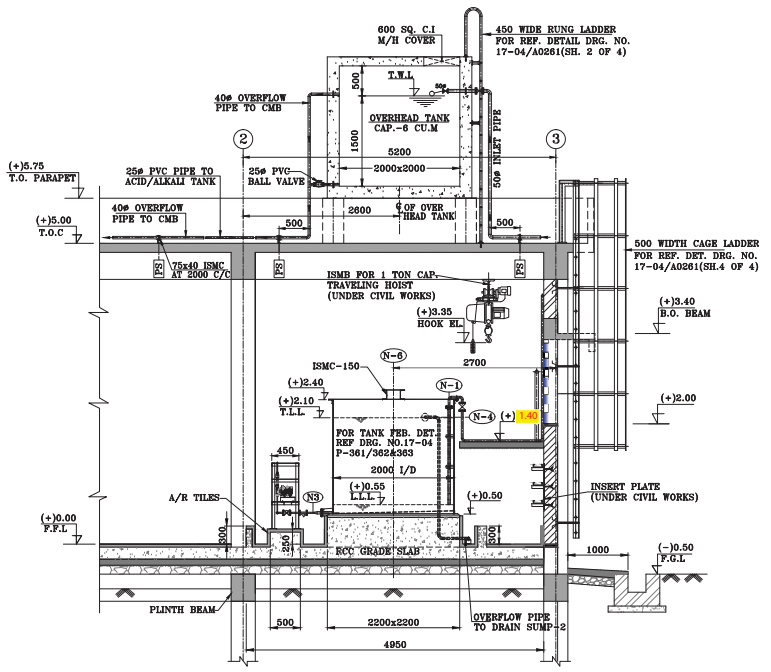
17-04/A 3 60-20 0
- WORK DISCIPLINE
- SHEET NO.
- PLAN/SECTION NO.
- DRG.NO.
- DRG. APPROVED BY PURCHASER.
- JOB NO.

RRB/17-04D(60)/ DT.26.12.2020

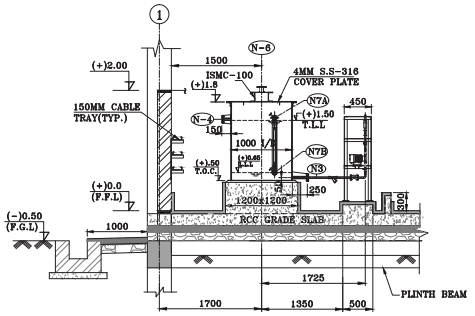
PROJECT	2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT: DESEIN	DESEIN PVT. LIMITED, CONSULTING ENGINEERS, NEW DELHI; HYDERABAD- INDIA
CONTRACTOR	BHARAT HEAVY ELECTRICALS LTD, POWER SECTOR, PROJECT ENGINEERING MANAGEMENT, NOIDA,NEW DELHI
ORIGINATOR	PACKAGE CONTRACTOR :- CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE-II, NEW DELHI-110020 PHONE :-26386095 E-mail :-clearwater@bol.net.in
CLEWAT DRG. NO.	17-04/A360 (SH. 2 OF 3)
BHEL DRG.NO.	PE-VO-412-164-A017
VER	00
REV.	03
TITLE:-	G.A OF CHEMICAL HOUSE SECTION DETAILS (EFFLUENT TREATMENT PLANT)
SCALE	1:40



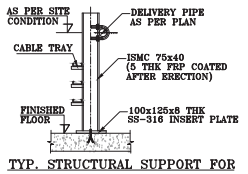
SECTION-360-32
(SCALE-1:40)



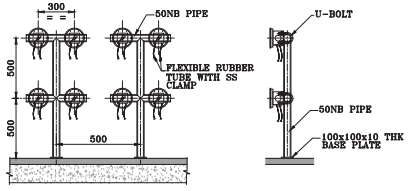
SECTION-360-31
(SCALE-1:40)



SECTION-0360-33
(SCALE-1:40)



TYP. STRUCTURAL SUPPORT FOR CHEMICAL DELIVERY LINES INSIDE CHEMICAL HOUSE



TYPICAL PRESSERE GUAGE FIXING ARRGT.
(SCALE-1:20)

IDENTIFICATION OF DRG./PLAN/SECTION

17-04/A 3 60-3 0

- WORK DICIPLINE
- SHEET NO.
- PLAN/SECTION NO.
- DRG.NO.
- DRG. APPROVED BY PURCHASER.
- JOB NO.

NOTES:-

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3. FOR OTHER NOTES REFER DRAWING NO. 17-04/A360 (SHT 1 OF 3)

LEGEND:-(NOZZLE MKD)

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REFERENCE DRGS.

SL NO.	DESCRIPTION	CLEWAT DRG. NO.
2	P&I DIAGRAM	17-04/012
1	LAYOUT PLAN	17-04/A011

REVISIONS DETAIL

REV. NO.		DATE
03	RE-SUBMITTED FOR APPROVAL	26.12.2020
02	REVISED AS PER COMMENTS / RE-SUBMITTED	12.09.2019
01	REVISED AS PER COMMENTS / RE-SUBMITTED	27.08.2019
00	SUBMITTED FOR APPROVAL	16.05.2019

QUALITY POLICY

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- CAPABILITY OF HUMAN RESOURCES BY UPGRADING SKILL AND COMPETENCE.

RRB/17-04D(60)/ DT.26.12.2020

PROJECT	2 x 660 MW ENNORE SEZ STPP (AT ASH DYKE OF NCTPS, CHENNAI)
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LIMITED
CONSULTANT:	DESEIN PVT. LIMITED CONSULTING ENGINEERS NEW DELHI; HYDERABAD- INDIA
CONTRACTOR	BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA,NEW DELHI
ORIGINATOR	PACKAGE CONTRACTOR :- CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE-II, NEW DELHI-110020 PHONE :-26386095 E-mail :-clearwater@bol.net.in
CLEWAT DRG. NO.	17-04/A360 (SH. 3 OF 3)
VER	00
BHEL DRG.NO.	PR-VO-412-164-A017
REV.	03
TITLE:-	G.A OF CHEMICAL HOUSE SECTION DETAIL (EFFLUENT TREATMENT PLANT)
SCALE	1:40

TAMILNADU GENERATION AND DISTRIBUTION CORPORATION

From Er. N.Mala, B.E., Superintending Engineer/Electrical, Thermal Hydro Projects, TANGEDCO,5th Floor, Western wing, 144,NPKRR Maaligai, Anna salai, Chennai-2 Tel: 044-28521591, Mobile:+919445857544. Email: sethhyp@tnebnet.org.	To Bharat Heavy Electricals Limited, POWER PROJECT ENGINEERING INSTITUTE HRD & ESI COMPLEX NOIDA - 201301(U.P)

Lr.No.SE/E/THPro./EE2/AEE/F.BHEL/PEM/ D.432 /19 dtd. 04 .05.2019

Project Title	2x660 MW ENNORE SEZ Supercritical TPP
TANGEDCO REFERENCE No.	LOA. Lr.No. CE/P/SE/M/P/EE-10/E/P/F.2x660 MW Ennore SEZ STPP/D.60/ 14,dt.27.09.2014
BHEL Reference No:	1. BHEL Email dated 06.02.2019 2. Desein Comment IOM. No . 1993 dt .01.05.2019
Subject	TANGEDCO – Comments - TECHNICAL DATA SHEET FOR INSTRUMENTS FOR EFFLUENT TREATMENT PLANT / Documents / Drawings received from BHEL / PEM - Reg

Sir,

The Comments on the drawing/document submitted by M/s BHEL on the above subject vide BHEL transmittal under reference is furnished below.

Sl. No	DRG/DOC.No:	DESCRIPTION	Rev No.	Status	Remarks
01	PE-V0-412-164-A015	TECHNICAL DATA SHEET FOR INSTRUMENTS FOR EFFLUENT TREATMENT PLANT	00	03	M/s. BHEL is requested to submit the revised documents/ drawings after suitably incorporating the comments

Status : Category **1**- Approved. Category: **2** – Approved with comments, Resubmit for approval under, Category **1**. Category **3** – Not approved (See attachment Memo) Resubmit for approval. Category **4** – Information furnished is noted.

Yours faithfully,

…Sd.04.05.2019…

Superintending Engineer/Thhyp/Projects-I

Copy to Shri E.V. Anand/DESEIN Consultants India Pvt. Ltd.,DESEIN HOUSE,Greater Kailash-II New Delhi-48 (E-Mail)
Copy submitted to The Chief Engineer/Civil/Ennore SEZ/Chennai 600120.(E-Mail)

ANNEXURE

S.No.	TANGEDCO Comments
1.	Index Sheet shall be included.
2.	KKS tag no and quantities for each instrument shall be provided as same indicated in the approved P&ID.
3.	Each KKS tag no. shall have prefix 10 or 20 or 90 as per requirements in line with specification depending on allocation for respective unit or for common system.
4.	Origin of country shall be indicated for complete unit (Sensor & Transmitter) in line with approved vendor list.
5.	Vendor name shall be as per approved vendor list only. BHEL is advised to also enclosed the copy of approved vendor list accordingly.
6.	All field instruments shall be weatherproof, drip tight, dust tight and splash proof suitable for use under outdoor ambient conditions prevalent in the subject plant. All field-mounted instruments shall be mounted in suitable locations where maximum accessibility for maintenance is achieved.
7.	The enclosures of all electronic instruments shall conform to IP-65 unless otherwise specified (Explosion proof for NEC article 500, class 1, Division 1 area & flame proof) and an anti-corrosive paint shall be applied to the field mounted enclosures / instruments.
8.	All the field instruments shall also be provided with SS tag nameplate and double compression type Nickel-plated brass cable gland.
9.	Snubbers/Pulsation dampners shall be used, where the process media is unstable for measurement such as the discharge of a pump as per technical specification Vol. V, cl.no. 3.03.01, 3.03.02, 3.03.03 and Technical specification/Contract Vol. VII, Installation drawings.
10.	Globe valves shall be provided instead of Gate / ball valves in line with specification.
11.	BHEL to also note as per TANGEDCO's Letter no: SE/E/T&H(P)/EE-8 /F.2x660MW Ennore SEZ STPP/D 95 / 15 , dated 01.07.2015 for Sea/Saline water services, following shall be applicable:-
i.	For Low Pressure application, MOC of impulse tubing & impulse pipe shall be CPVC (3/8") Sch 80 or better, Industrial grade up to manifold. MOC of impulse tubing, fittings (from manifold to instrument) and manifold shall be super duplex SS.
ii.	As per EDN DOCUMENT, ASTM D1784 CPVC PIPE(INDUSTRIAL GRADE) - 1/2"NB SCH 80SHALL be included.
iii.	For High pressure application, MOC of Impulse tubing, impulse pipes, fittings and manifold shall be super duplex SS (1/2"). BHEL to follow the above requirements in totality.
12.	BHEL to ensure the compliance of specification, Vol. V, Chapter 3, cl. No. 3.03.03 for Pressure Gauges.
i.	Please include the type of sensors for pressure Gauges as per specification depending upon pressure ranges.
ii.	Over range protection shall be 150 percent (%) of full scale inline with technical specifications vol. V, Ch-3, cl. No. 3.03.03.
iii.	Material of movement shall be SS316 instead of SS304 inline with technical specifications vol. V, Ch-3, cl. No. 3.03.03.
iv.	Material of case shall be SS316 instead of SS304 inline with technical specifications vol. V, Ch-3, cl. No. 3.03.03.
v.	Scale detail shall be added like 270 degree dial rotation/deflection. Graduations in black lines on white dial provided with glass cover. Smallest scale division shall be one (1) percent of full scale value or smaller .Pointer stop for all gauges
vi.	External zero adjustment shall be provided inline with technical specifications vol. V, Ch-3, cl. No. 3.03.03.
vii.	As per technical specification, Vol. V, Ch-3, cl. No. 3.03.03, BHEL to provide Rubber blow out disc with open front construction for Ranges 5 to 20 Kg/cm2.
viii.	As per technical specification, Vol. V, Ch-3, cl. No. 3.03.03, BHEL to provide Neoprene safety diaphragm at the back with solid front construction for Ranges above 20 Kg/cm2.
13.	Please confirm compliance the following as per specification, Vol. V, Chapter 3, cl. No. 3.03.12 for USLT:- Complete details shall be included in the data sheets accordingly.

i.	Operating frequency range shall be 10 KHz to 50 KHz (typical).
ii.	Head mounted alpha-numeric back lit LCD/LED display is provided.
iii.	Calibration and configuration is accessible from front of panel & HART calibrator.
iv.	Status for power, Hi / Lo / V. Hi / V. Lo- level indication, fault etc. are available.
v.	Diagnostic is available on line.
vi.	2SPDT Potential free changeover contacts @ 8A 230V AC are provided.
vii.	Accuracy and repeatability are +/- 0.25% of span or better
viii.	Resolution is +/- 0.1% of span
ix.	Temperature compensation is provided with the sensor.
x.	Enclosure is provided with minimum IP-67 protection class and Epoxy painted die cast Aluminum or SS316L housing.
xi.	Operating frequency range shall be 10 KHz to 50 KHz (typical).
xii.	BOM shall be updated as per final approved P&IDs.
xiii.	In line with specification, Vol. V, Chapter 3, Counter and mating flange (SS316 material), fastener, gaskets, Nuts, bolts etc. shall also be included, wherever required.
xiv.	Signal and Electrical connection shall be screwed connection with double compression type Nickel-plated brass/SS316 cable glands. Please check & confirm the requirements.
xv.	All the outdoor field instruments such as analysers/transmitters/meters etc. shall be provided with suitable Free standing cabinet(s)/panel/rack so that the equipments are protected against rain/ sunlight etc. Please confirm & comply.
xvi.	SS Tag Plate with detail description & Tag. No. shall be provided.
xvii.	Additional separate local display unit with large Alphanumeric back light LCD/LED shall be provided **as per specification, Vol. V, Chapter 3, cl. No. 3.03.12 for USLT.**
14.	BHEL to ensure the compliance of specification, Vol. V, Chapter 3, cl. No. 3.03.01 for **Pressure transmitters**.
i.	BOM shall be updated as per final approved P&IDs.
ii.	Type of sensor shall be specified inline with technical specifications vol. V, Ch-3, cl. No. 3.03.01.
iii.	Origin of country shall be indicated for complete unit (Sensor & Transmitter) in line with approved vendor list.
iv.	Stability of +/- 0.15% of URL for 5 years.
v.	Local indication with LCD indicator (5 digit) with scale of Engg. Units
vi.	Span and Zero - Locally adjustable, non-interacting
vii.	Zero suppression / elevation facility.
viii.	Electrical connection Suitable for Plug in type connection (Both side of transmitter), unused entry with blind plug.
ix.	Turn down ratio shall be 1 :100.
x.	Accuracy shall be +/- 0.04%.
xi.	In line with specification, Vol. V, Chapter 3, Counter and mating flange (SS316 material), fastener, gaskets, Nuts, bolts etc. shall also be included, wherever required.
xii.	SS Tag Plate with detail description & Tag. No. shall be provided.

15.	SBEM is not approved make for clamp on type ultrasonic type Flow meter. Clamp on type Ultrasonic type flow meter shall be provided as per specification for Uppur project, as the specification for same is not envisaged for Ennore SEZ project.
16.	Please confirm compliance the specification, Vol. V, Chapter 5, cl. No. 5.21.00 for Turbidity analyser.
i.	Power supply to analysers shall be indicated from UPS only.
ii.	All major equipment/systems shall be served from UPS through redundant two 100% capacity feeders (from 2x100% ACDB) with a automatic change over at load point to ensure un-interrupted supply even on loss of one feeder as described elsewhere in the specifications, Vol. V, chapter 2. Power supply to analysers shall be designed accordingly.
iii.	Each and every analyser shall be provided with HART protocol. In case same is not available, same shall be provided with alternative protocol like Modbus/profibus etc.
iv.	All analysers shall be supplied with chemicals/regents required for 12 months operation. Bidder shall also provide start up kits, buffer solution for pH and conductivity analyzer. The analyser supplier shall submit the preparation procedure / formula of the reagent to be used in analyser solution.
v.	In line with specification, Vol. V, Chapter 3, Counter and mating flange (SS316 material), fastener, gaskets, Nuts, bolts etc. shall also be included, wherever required.
vi.	Signal and Electrical connection shall be screwed connection with double compression type Nickel-plated brass/SS316 cable glands. Please check & confirm the requirements.
vii.	All the outdoor field instruments such as analysers/transmitters/meters etc. shall be provided with suitable Free standing cabinet(s)/panel/rack so that the equipments are protected against rain/ sunlight etc. Please confirm & comply.
viii.	SS Tag Plate with detail description & Tag. No. shall be provided.
ix.	Material of seamless tubes shall be corrected as Super duplex SS.
x.	Double compression type fittings shall be provided.
xi.	Hach has the latest TU 5 series turbidity meter, why the same is not offered.
17.	Please confirm compliance the following as per specification, Vol. V, Chapter 5, cl. No. 5.12.00 for pH analyser:- Complete details shall be included in the data sheets accordingly.
i.	pH electrodes shall conform to IS: 6804-1972 or latest equv standard.
ii.	Type of cell and monitor shall be specified as per specification.
iii.	Flange rating and material shall be ANSI 300 lb SS316L material respectively.
iv.	Material shall be provided as per specification.
v.	Diagnostic is available on line.
vi.	Accuracy, stability and repeatability shall be as per specification or better.
vii.	Separate annunciation contacts shall be provided.
viii.	Automatic temperature compensation in the range 0-100 deg c shall be provided with inbuilt PT 100.
ix.	RFI/EMI shielded, weather and corrosion proof casing shall be provided.
x.	Response time shall be as per specification or better.
xi.	Automatic calibration facility shall be provided.
xii.	One controller per sensor shall be provided. Multi channel controller are not acceptable.
xiii.	All analysers shall be supplied with chemicals/regents required for 12 months operation. Bidder shall also provide start up kits, buffer solution for pH and conductivity analyzer. The analyser supplier shall submit the preparation procedure / formula of the reagent to be used in analyser solution.
18.	All the outdoor field instruments such as analysers/transmitters/meters etc. shall be provided with suitable Free standing cabinet(s)/panel/rack so that the equipments are protected against rain/ sunlight etc. Please confirm & comply.

….Sd.04.05.2019…

Superintending Engineer/THHYP

APPROVED WITH COMMENTS

REV	DATE	ALTERED	CHECKED	DOC. TITLE :
				TECHNICAL DATA SHEET FOR INSTRUMENTS FOR EFFLUENT TREATMENT PLANT
				STATUS : CONTRACT
				JOB NO.: 17-04

BHARAT HEAVY ELECTRICALS LTD
PROJECT ENGINEERING MANAGEMENT.

This approval status shall be interpreted as laid down in the contract and it shall not relieve the contractor from the contractual obligation.

APPROVAL CATEGORY AWARDED = II
CAT I - Approved
CAT II - Approved With Comments as Noted
CAT III - Not Approved
CAT IV - Reference Drawing

DEPARTMENT	MECHANICAL AUXILIARY
NAME: FALGUNI SAHA	

FALGUNI SAHA
2020.11.06 09:44:19 +05'30'

CUSTOMER: **TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.**
2x660 MW Ennore Sez STPP

PACKAGE: EFFLUENT TREATMENT PLANT

ORGINATOR	TURNKEY CONTRACTOR:-	CWL. DOC. NO.
	CLEAR WATER LTD. B-14/1, OKHLA INDUSTRIAL AREA PHASE-II, NEW DELHI-110020 PHONE: 011 26386095 EMAIL: clearwater@bol.net.in	**DS-01/17-04M(92-PH) REV 00** **Dtd. 31.01.2019**

BHARAT HEAVY ELECTRICALS LIMITED

PROJECT ENGINEERING MANAGEMENT, NEW DELHI

REV.	NAME	SIGN	DATE	BHEL DOCUMENT NO.	REV
0	R. R. BAGARI		31.01.2019	**PE-V0-412-164-A015**	0

NO. OF SHEETS		EXCLUDING COVER PAGE

BHEL DOC NO: PE-V0-412-164-A015			
Clear Water Limited **B-14/1, Okhla Indl. Area, Phase-II,** **New Delhi- 110 020**	**DATA SHEET** **Pressure Transmitter with Remote Diaphragm seal**	**CWL DOC. No.**	**DS-01/17-04(92-PT)**
		REV	**00**
		Sheet	**1 of 3**

	Type	Electronic (HART) Smart – 2 Wire
	Make	Honeywell
	Tag No	Ref sh. 3 of 3
	Qty	Ref sh. 3 of 3
	Model No	Ref sh. 3 of 3; Flanged process connection; Diaphragm and all other wetted parts in SS316L with 5 meter SS armored SS316 capillary with DC200 Fill Fluid Counter Flange & Nuts & Bolt + DCCG (Ni-Plated)
	Sensor	Piezo resistive
	Power Supply	10.5 to 42 V DC
	Output Signal	4 to 20 mA DC along with superimposed digital signal
	Load Resistance	600 Ohms@ 24V DC
	Communication	HART protocol
	Calibration Range	Ref sh. 3 of 3
	Instrument Range	Min Span : 0-0.1 Bar; Max Span : 0-6 Bar
	Accuracy	+/-0.06 % of Span
	Turndown Ration	100 : 1
	Max. Allow. Working press	5 bar
	Stability	Stability up to 0.02% of URL per year for 5 years
	Over range protection	150% of operating pressure
	Max. Allow. Working Temperature	125 Deg. C (Suitable length of impulse line to be used, considering 100 Deg. C temperature drop for every One meter length of impulse pipe)
	Connection Location	Bottom
	Electrical Connection	½" NPT F
	Measuring Element	Diaphragm
	Element material	SS-316L
	Fill Fluid	Silicone Oil
	Housing Material	Polyester Powder Coated Aluminium
	Diaphragm Material	SS 316L
	Protection Class	IP66
	Local Zero & Span Adjustment	Provided
	Wetted Parts	SS316
	Other Wetted Parts	SS316L
	Process Connection	2", 150#RF ; under piping 1/2" Nozzle shall be provided on Pipe with isolating Gauge Cock ; Matching Flange shall have 2 " threaded bore
	Capillary Material	SS316 L
	Armor Material	SS 316 L

			Project: 2x660 MW Ennore Sez STPP **Client:** Ennore **Consultant:** Desein Pvt Ltd
00	Submitted for approval	12.11.2018	
REV	**DESCRIPTION**	**DATE**	

BHEL DOC NO: PE-V0-412-164-A015			
Clear Water Limited **B-14/1, Okhla Indl. Area, Phase-II,** **New Delhi- 110 020**	**DATA SHEET** **Pressure Transmitter with Remote Diaphragm seal**	**CWL DOC. No.**	**DS-01/16-02M(92-PT)**
		REV	**00**
		Sheet	**2 of 3**

	Capillary Length	5 meter
	Filling Fluid	DC200
	Integral output meter	Provided
	Counter Flange	Provided with drill hole (to connect to ½" nozzle)
	Cable Gland	Provided (Ni-Plated)
	Mounting Bracket	Provided, 2" pipe mounting bracket
	Scale	Engineering Unit
	Test Certificate	Calibration test report
	Inspection Catalogue	III
	COC Criteria	i) Review of Factory Calibration Certificate
		ii) Visual ; W & G certificate
	O & Maintenance Manual	To be provided with Supply ;

			Project: 2x660 MW Ennore Sez STPP **Client:** Ennore **Consultant:** Desein Pvt Ltd
00	Submitted for approval	12.11.2018	
REV	**DESCRIPTION**	**DATE**	

BHEL DOC NO: PE-V0-412-164-A015						
Clear Water Limited **B-14/1, Okhla Indl. Area, Phase-II,** **New Delhi- 110 020**		**DATA SHEET** **PressureTransmitter with Remote Diaphragm seal**			**CWL DOC. No.**	**DS-01/17-04(92-PT)**
					REV	**00**
					Sheet	**3 of 3**
Tag No.	**Type**	**Qty (Nrs)**	**Calibration Range (Kg/Cm^2)**	**Span (Max) (Kg/Cm^2)**	**Model Number**	**Location**
Refer to P & I Drg.	PT with remote seal diaphragm	10	0 to 3	0 to 6	STR745-11A0000-00000 00000-C-AHT-11C-011A0-F3-0000 +1 x Remote Seal with 2";150# RF SS 316L flanged process connection; 5 Mtr.SS Armoured SS-316L Capillary with DC 200 Fill Fluid	Field Sumps
		6	0 to 4	0 to 6		ETP Area
		7	0 to 3	0 to 6		Chemical House
		2	0 to 4	0 to 6		Spare
	Total	25				

Note : -

i) Each Pressure Transmitter shall be supplied with factory calibration as per indicated range. How ever operating range could be altered / modified as per requirement at site with Hart Calibrator

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Project: 2x660 MW Ennore Sez STPP
Client: Ennore
Consultant: Desein Pvt Ltd

BHEL DOC NO.: PE-V0-412-164-A015			
Clear Water Limited **B- 14/1, Okhla Industrial Area, Phase II** **New Delhi-110020**	**Data Sheet** **ULTRASONIC TYPE PIPE FLOW METER**	**CWL DOC. NO.**	**DS-01/17-04M(92-U-FM)**
		REV	**00**
		Sheet	**1 of 2**

	GENERAL		
	Application	Flow measurement in MS Pipe; internally 600 micron PU coated	
	Make	SBEM	
	Type	2 Wire Microprocessor based Ultrasonic	
	Model Number	153 UCW 1 M1 100005	
	Tag No.	90GMA11	90GMA30
	Qty.	1	1
	Location	Delivery header of CMB pumps to Guard Pond	Delivery header of Guard Pond pumps
	Application	Measurement of Treated Effluent Water	
	Mounting Sensor	Sensor clamped on pipe ; Converter mounted in LCP.	
	Pressure (Max.) MWC	22	23
	Pressure (Min.) MWC	17	21
	Temperature	Ambient	
	Humidity	0-95% Max (Non-Condensing)	
	FLOW DETAILS		
	Flow range (cu.m/hr) Max.	450 to 1100	1100 to 1300
	Pipe Size	350NB ; 6 thk; MS to IS : 3589; internally 600 micron PU coated	450NB ; 6 thk; MS to IS : 3589; internally 600 micron PU coated
	LEVEL TRANSMITTER SPECIFICATIONS		
	Power Supply	Std. – 85 – 230 VAC	
	Measured Values	Volumetric Flow,	
	Flow Velocity (D-32 m/s bi-directional)	0.7 to 2.4m/s	
	Accuracy	± 1% for dia DN50-DN700 mm and V> 0.5 m/s	
	Repeatability	0.3%	
	Sensors	Clamped on Pipe ; externally	
	Display	2 Line backlight LCD	
	Keyboard	4x4 Numeric Keyboard membrane	
	Pipe Materials	MS	
	Pipe Internal Lining	600 micron Pu coated	
	Outputs	4-20mA ;	
	Communication	RS 485 / RS 232 with MODBUS {ASC or RTU}	

			Project: 2x660 MW Ennore Sez STPP **Client:** Ennore **Consultant:** Desein Pvt Ltd
00	Submitted for approval	10.12.2018	
REV	**DESCRIPTION**	**DATE**	

BHEL DOC NO.: PE-V0-412-164-A015			
Clear Water Limited **B- 14/1, Okhla Industrial Area, Phase II** **New Delhi-110020**	**Data Sheet** **ULTRASONIC TYPE PIPE FLOW METER**	**CWL DOC. NO.**	**DS-01/17-04M(92-U-FM)**
		REV	**00**
		Sheet	**2 of 2**

	Inputs	Not applicable ;	
	Data Logging	Built-in or optional PC based	
	Protection	IP 67 (Applicable for Converter as well Clamp on Sensors)	
	Display	Local display	
	Sensors		
	Pipe Diameter (mm)	400 NB	450 NB
	Materials	ABS	
	Frequency	1 MHz	
	Installation	V.Z	
	Magnetic Coupling	Yes	
	Temperature	0 to 70°C	
	Size (mm)	60 x 45 x 45	
	Cable (m)	30m standard ;	
	Catalouge	**Attached**	
	O & M Manual	To be provided with Supply	
	Inspection Criteria	III	
	COC Criteria	i) Review of Factory Calibration Certificate ii) Visual iii) Review of W & G Certificate	
	Calibration method Confirms to	ISA – R.P. 16.6	
	Spare	Not required as per Mandatory Spare list.	
	Acceptance Std.	Approved Instrument Vendor QAP Doc No CQ-136-0501	
	Note :		
	i) Clamp on sensors shall be erected as per O & M Manual		
	ii) Gel shall be applied to thoroughly cleaned pipe surface		
	iii) Wall mounted Converter shall be placed close to Clamp On Sensors ; distance not exceeding 2 to 3 m as jointing of cable is not permitted		
	iv) No spares are required		
			Project: 2x660 MW Ennore Sez STPP **Client:** Ennore **Consultant:** Desein Pvt Ltd
00	Submitted for approval	10.12.2018	
REV	**DESCRIPTION**	**DATE**	

BHEL DOC NO: PE-V0-412-164-A015			
Clear Water Limited **B- 14/1, Okhla Industrial Area, Phase II** **New Delhi – 110 020**	**Data Sheet for** **Diaphragm Type sealed Pressure Gauge**	**CWL Doc. No.**	**DS-01/17-04M(92-PG)**
		Rev	**00**
		Sheet	**1 of 3**

A)	**General**	
1.	Make:	ANI
2.	Type	Direct Reading
3.	Quantity (Nos)	Ref. Sheet 3 of 3 for BOQ
4	Tag. Nos	Ref. Sheet 3 of 3
B)	**FEATURES**	
1.	Model No.	i) 6 SUDG SD – For Diaphragm with chemical seal
		ii) 6 SUDG SDF-- For Diaphragm with chemical seal with additional Flange
2.	Dial Diameter (mm)	150
3.	Ambient Temperature (°C)	(-)25 to 65
4.	Process Temperature (°C)	Ambient
5.	Mounting	Direct Bottom Entry (without Capilliary)
6.	Operating Pressure range	75 % of the scale Value; Max.
7.	Over Pressure Limit	125% of maximum Scale Value
8.	Dial Colour	White with Black Numerals
		Tag. No. to be printed in black colour
9.	Pointer	Aluminum, Black Coloured Micrometer zero adjustable Type
10.	Ring	Bayonet
11	Blow Out Protection	Back
12	Over Range Protection	125% Maximum Pressure
13	Adjustment	Zero and Range
14	Pressure Element	- Diaphragm with Chemical Seal for gauges for Chemical application .
		- Diaphragm With chemical seal with additional Flange for Sludge application
15	Accuracy	+ / - 1% of FSD
16	Enclosure	Outdoor mounted IP 65 –IS: 2147
C)	**MATERIAL**	
1.	Dial / Window	Aluminium; Black graduation on white background / Shatter proof glass
2.	Case	Pressed AISI 304 SS case with Bayonet Type bezel, Weather proof as per IP-65
3.	Blow off Disc	Neoprene
4.	Gasket and Filling Plug	Neoprene
5.	Lens	Provided
6.	Pressure Element	SS 316
7.	Movement	SS 316
8.	Socket	SS 316
9	Size / Type	½ NPT (M)
10	Instrument / Pipe Connection	½” NPT (M) ; under C & I Erection activity of Clear Water
11.	**Standard**	Accuracy as per IS 3624-1987
12	**Safety Vent of housing**	Blow out Disc provided consisting of rubber Grommet at the back

			Project: 2x660 MW Ennore Sez STPP **Client:** Ennore **Consultant:** Desein Pvt Ltd
00	For approval	13.11.18	
Rev	**Description**	**Date**	

BHEL DOC NO: PE-V0-412-164-A015			
Clear Water Limited **B- 14/1, Okhla Industrial Area, Phase II** **New Delhi – 110 020**	**Data Sheet for** **Diaphragm Type sealed Pressure Gauge**	**CWL Doc. No.**	**DS-01/ 17-04(92-PG)**
		Rev	**00**
		Sheet	**2 of 3**

D)	**STANDARD ACCESSORY**	
1.	Gauge Cock / Globe Valve	a) 1/2"scd.3 way Gauge cock-SS 316 for Chemical application Gauges only ; connection -- ½" NPT (M) X (F) X (F); not suitable for Sludge application; b) For Gauges with additional Flange connection with 11/2"bore shall have 1 1/2" isolation Scd. ball valve as per IS : 778
E)	Mandatory Spares	- 2 nos. of Gauges of each size and range; Minimum 10 %
		- For BOQ , please refer to Sh. 3 of 3
F)	Document	i) Manufacturer's Catalogue; Mounting and Connectors detail.
G)	**TESTS**	
1	Inspection Category	III
	Inspection Criteria	Factory Calibration Test, Accuracy Test, Repeatability Test, Hydro Test (1.5 Times of Max Pressure) and Reliability Test certificate shall be provided by Gauge Vendor
H)	O & M	Document shall be provided along with Plant O & M

			Project: 2x660 MW Ennore Sez STPP **Client:** Ennore **Consultant:** Desein Pvt Ltd
00	For approval	13.11.18	
Rev	**Description**	**Date**	