ESTIMATED WEIGHT OF PIPING SYSTEMS - ITEM WISE - MATERIAL WISE (IN MT)

ITEM / MATERIAL	DMD		
	IBR	NIBR	TOTAL
PIPES			
AS (P91)	189	0	189
AS (P22)	34	0	34
CS	473	316	789
SS	0	40	40
SUB TOTAL	**696**	**356**	**1052**
FITTINGS			
AS (P91)	35	0	35
AS (P22)	2	0	2
CS	125	73	198
SS	0	8	8
SUB TOTAL	**162**	**81**	**243**
FLANGES			
AS (P91)	3	0	3
AS (P22)	0	0	0
CS	6	23	29
SS	0	3	3
SUB TOTAL	**9**	**26**	**35**
VALVES			
AS (P91)	30	0	30
AS (P22)	14	0	14
CS	168	101	269
SS	0	47	47
SUB TOTAL	**212**	**148**	**360**
OTHERS			
AS (P91)	4	0	4
AS (P22)	4	0	4
CS	3	7	10
SS	0	3	3
SUB TOTAL	**11**	**10**	**21**
TOTAL	**1090**	**621**	**1711**

ESTIMATED WEIGHT OF PIPING SYSTEMS - ITEM WISE - SYSTEM WISE (IN MT)

SYSTEM	IBR	DMD				
		AS (P91)	AS (P22)	CS	SS	TOTAL
ALL ITEMS						
MAIN STEAM	IBR	242	7	0	0	249
BOILER STARTUP STEAM	IBR	17	39	55	0	111
AUXILIARY STEAM	IBR	2	1	4	0	7
DEAERATOR PEGGING STEAM	IBR	1	5	27	0	33
EXTRACTION STEAM	IBR	0	0	207	0	207
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	19	0	19
BFP-SUCTION	IBR	0	0	50	0	50
FEED WATER	IBR	0	0	415	0	415
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	5	0	5
SPRAY TO BSS PRDS	NIBR	0	0	0	4	4
CONDENSATE - CS	NIBR	0	0	54	0	54
CONDENSATE - SS	NIBR	0	0	0	96	96
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	36	0	36
HP HEATE 5 & 6 DRAIN	NIBR	0	0	44	0	44
COOLING WATER	NIBR	0	0	93	0	93
AUX COOLING WATER	NIBR	0	0	105	0	105
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	136	0	136
MISC - DRAINS	NIBR	0	0	28	0	28
MISC - VENTS	NIBR	0	0	4	0	4
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	12	0	12
TOTAL		**262**	**52**	**1294**	**100**	**1708**
PIPES						
MAIN STEAM	IBR	178	2	0	0	180
BOILER STARTUP STEAM	IBR	10	28	36	0	74
AUXILIARY STEAM	IBR	1	1	4	0	6
DEAERATOR PEGGING STEAM	IBR	0	3	17	0	20
EXTRACTION STEAM	IBR	0	0	101	0	101
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	15	0	15
BFP-SUCTION	IBR	0	0	34	0	34
FEED WATER	IBR	0	0	268	0	268
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	4	0	4
SPRAY TO BSS PRDS	NIBR	0	0	0	3	3
CONDENSATE - CS	NIBR	0	0	25	0	25
CONDENSATE - SS	NIBR	0	0	0	37	37
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	26	0	26
HP HEATE 5 & 6 DRAIN	NIBR	0	0	28	0	28
COOLING WATER	NIBR	0	0	39	0	39
AUX COOLING WATER	NIBR	0	0	68	0	68
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	96	0	96
MISC - DRAINS	NIBR	0	0	20	0	20
MISC - VENTS	NIBR	0	0	3	0	3
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	8	0	8
SUB TOTAL		**189**	**34**	**792**	**40**	**1055**
FITTINGS						
MAIN STEAM	IBR	34	0	0	0	34

ESTIMATED WEIGHT OF PIPING SYSTEMS - ITEM WISE - SYSTEM WISE (IN MT)

SYSTEM	IBR	DMD				
		AS (P91)	AS (P22)	CS	SS	TOTAL
BOILER STARTUP STEAM	IBR	1	1	9	0	11
AUXILIARY STEAM	IBR	0	0	0	0	0
DEAERATOR PEGGING STEAM	IBR	0	0	2	0	2
EXTRACTION STEAM	IBR	0	0	46	0	46
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	1	0	1
BFP-SUCTION	IBR	0	0	8	0	8
FEED WATER	IBR	0	0	60	0	60
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	0	0	0
SPRAY TO BSS PRDS	NIBR	0	0	0	0	0
CONDENSATE - CS	NIBR	0	0	7	0	7
CONDENSATE - SS	NIBR	0	0	0	7	7
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	4	0	4
HP HEATE 5 & 6 DRAIN	NIBR	0	0	7	0	7
COOLING WATER	NIBR	0	0	28	0	28
AUX COOLING WATER	NIBR	0	0	10	0	10
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	12	0	12
MISC - DRAINS	NIBR	0	0	3	0	3
MISC - VENTS	NIBR	0	0	1	0	1
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	1	0	1
SUB TOTAL		**35**	**1**	**199**	**7**	**242**
FLANGES						
MAIN STEAM	IBR	3	0	0	0	3
BOILER STARTUP STEAM	IBR	0	0	0	0	0
AUXILIARY STEAM	IBR	0	0	0	0	0
DEAERATOR PEGGING STEAM	IBR	0	0	0	0	0
EXTRACTION STEAM	IBR	0	0	2	0	2
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	0	0	0
BFP-SUCTION	IBR	0	0	3	0	3
FEED WATER	IBR	0	0	1	0	1
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	0	0	0
SPRAY TO BSS PRDS	NIBR	0	0	0	0	0
CONDENSATE - CS	NIBR	0	0	3	0	3
CONDENSATE - SS	NIBR	0	0	0	3	3
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	0	0	0
HP HEATE 5 & 6 DRAIN	NIBR	0	0	0	0	0
COOLING WATER	NIBR	0	0	0	0	0
AUX COOLING WATER	NIBR	0	0	9	0	9
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	8	0	8
MISC - DRAINS	NIBR	0	0	0	0	0
MISC - VENTS	NIBR	0	0	0	0	0
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	1	0	1
SUB TOTAL		**3**	**0**	**27**	**3**	**33**
VALVES						
MAIN STEAM	IBR	27	5	0	0	32
BOILER STARTUP STEAM	IBR	2	7	10	0	19
AUXILIARY STEAM	IBR	1	0	0	0	1
DEAERATOR PEGGING STEAM	IBR	1	1	7	0	9

ESTIMATED WEIGHT OF PIPING SYSTEMS - ITEM WISE - SYSTEM WISE (IN MT)

SYSTEM	IBR	DMD				
		AS (P91)	AS (P22)	CS	SS	TOTAL
EXTRACTION STEAM	IBR	0	0	58	0	58
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	3	0	3
BFP-SUCTION	IBR	0	0	5	0	5
FEED WATER	IBR	0	0	84	0	84
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	1	0	1
SPRAY TO BSS PRDS	NIBR	0	0	0	1	1
CONDENSATE - CS	NIBR	0	0	19	0	19
CONDENSATE - SS	NIBR	0	0	0	46	46
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	5	0	5
HP HEATE 5 & 6 DRAIN	NIBR	0	0	8	0	8
COOLING WATER	NIBR	0	0	26	0	26
AUX COOLING WATER	NIBR	0	0	18	0	18
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	20	0	20
MISC - DRAINS	NIBR	0	0	1	0	1
MISC - VENTS	NIBR	0	0	0	0	0
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	2	0	2
SUB TOTAL		**31**	**13**	**267**	**47**	**358**
OTHERS						
MAIN STEAM	IBR	0	0	0	0	0
BOILER STARTUP STEAM	IBR	4	3	0	0	7
AUXILIARY STEAM	IBR	0	0	0	0	0
DEAERATOR PEGGING STEAM	IBR	0	1	1	0	2
EXTRACTION STEAM	IBR	0	0	0	0	0
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	0	0	0
BFP-SUCTION	IBR	0	0	0	0	0
FEED WATER	IBR	0	0	2	0	2
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	0	0	0
SPRAY TO BSS PRDS	NIBR	0	0	0	0	0
CONDENSATE - CS	NIBR	0	0	0	0	0
CONDENSATE - SS	NIBR	0	0	0	3	3
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	1	0	1
HP HEATE 5 & 6 DRAIN	NIBR	0	0	1	0	1
COOLING WATER	NIBR	0	0	0	0	0
AUX COOLING WATER	NIBR	0	0	0	0	0
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	0	0	0
MISC - DRAINS	NIBR	0	0	4	0	4
MISC - VENTS	NIBR	0	0	0	0	0
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	0	0	0
SUB TOTAL		**4**	**4**	**9**	**3**	**20**

ESTIMATED NO OF WELDS - SYSTEM WISE - MATL WISE

SYSTEM	IBR	DMD				
		AS (P91)	AS (P22)	CS	SS	TOTAL
MAIN STEAM	IBR	463	477	0	0	940
BOILER STARTUP STEAM	IBR	44	129	286	0	459
AUXILIARY STEAM	IBR	61	188	312	0	561
DEAERATOR PEGGING STEAM	IBR	22	170	550	0	742
EXTRACTION STEAM	IBR	0	0	2306	0	2306
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	359	0	359
BFP-SUCTION	IBR	0	0	722	0	722
FEED WATER	IBR	0	0	1812	0	1812
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	260	0	260
SPRAY TO BSS PRDS	NIBR	0	0	0	312	312
CONDENSATE - CS	NIBR	0	0	577	0	577
CONDENSATE - SS	NIBR	0	0	0	732	732
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	441	0	441
HP HEATE 5 & 6 DRAIN	NIBR	0	0	512	0	512
COOLING WATER	NIBR	0	0	210	0	210
AUX COOLING WATER	NIBR	0	0	317	0	317
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	1457	0	1457
MISC - DRAINS	NIBR	0	0	814	0	814
MISC - VENTS	NIBR	0	0	110	0	110
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	217	0	217
TOTAL		**590**	**964**	**11262**	**1044**	**13860**

ESTIMATED NO OF WELDS - SIZE WISE - MATL WISE

SIZE	DMD				
	AS (P91)	AS (P22)	CS	SS	TOTAL
IBR					
0.75	0	206	908	0	1114
1	0	372	1611	0	1983
1.5	4	188	27	0	219
2	179	15	255	0	449
2.5	0	0	0	0	0
3	16	44	248	0	308
4	63	19	357	0	439
5	0	0	0	0	0
6	0	44	217	0	261
8	24	30	577	0	631
10	48	26	459	0	533
12	40	0	287	0	327
14	0	0	695	0	695
16	116	4	151	0	271
18	0	0	166	0	166
20	100	0	77	0	177
24	0	4	146	0	150
28	0	0	9	0	9
30	0	0	104	0	104
32	0	12	18	0	30
36	0	0	0	0	0
40	0	0	0	0	0
44	0	0	50	0	50
TOTAL	**590**	**964**	**6362**	**0**	**7916**
NIBR					
0.75	0	0	12	13	25
1	0	0	171	20	191
1.5	0	0	0	182	182
2	0	0	1034	102	1136
2.5	0	0	6	0	6
3	0	0	195	63	258
4	0	0	975	42	1017
5	0	0	6	0	6
6	0	0	1024	141	1165
8	0	0	257	0	257
10	0	0	486	53	539
12	0	0	32	27	59
14	0	0	27	375	402
16	0	0	252	3	255
18	0	0	55	0	55

ESTIMATED NO OF WELDS - SIZE WISE - MATL WISE

SIZE	DMD				
	AS (P91)	AS (P22)	CS	SS	TOTAL
20	0	0	157	23	180
24	0	0	10	0	10
28	0	0	22	0	22
30	0	0	13	0	13
32	0	0	0	0	0
36	0	0	159	0	159
40	0	0	7	0	7
44	0	0	0	0	0
TOTAL	**0**	**0**	**4900**	**1044**	**5944**
TOTAL IBR + NIBR					
0.75	0	206	920	13	1139
1	0	372	1782	20	2174
1.5	4	188	27	182	401
2	179	15	1289	102	1585
2.5	0	0	6	0	6
3	16	44	443	63	566
4	63	19	1332	42	1456
5	0	0	6	0	6
6	0	44	1241	141	1426
8	24	30	834	0	888
10	48	26	945	53	1072
12	40	0	319	27	386
14	0	0	722	375	1097
16	116	4	403	3	526
18	0	0	221	0	221
20	100	0	234	23	357
24	0	4	156	0	160
28	0	0	31	0	31
30	0	0	117	0	117
32	0	12	18	0	30
36	0	0	159	0	159
40	0	0	7	0	7
44	0	0	50	0	50
TOTAL	**590**	**964**	**11262**	**1044**	**13860**

ESTIMATED INCH DIA - SYSTEM WISE - MATL WISE

SYSTEM	IBR	DMD				
		AS (P91)	AS (P22)	CS	SS	TOTAL
MAIN STEAM	IBR	4990	777	0	0	5767
BOILER STARTUP STEAM	IBR	428	833	3473	0	4734
AUXILIARY STEAM	IBR	182	306	732	0	1220
DEAERATOR PEGGING STEAM	IBR	72	460	2656	0	3188
EXTRACTION STEAM	IBR	0	0	20495	0	20495
BOILER FLASH TANK VENT TO DEAERATOR	IBR	0	0	1644	0	1644
BFP-SUCTION	IBR	0	0	6090	0	6090
FEED WATER	IBR	0	0	10845	0	10845
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR	0	0	442	0	442
SPRAY TO BSS PRDS	NIBR	0	0	0	672	672
CONDENSATE - CS	NIBR	0	0	4983	0	4983
CONDENSATE - SS	NIBR	0	0	0	7654	7654
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR	0	0	2867	0	2867
HP HEATE 5 & 6 DRAIN	NIBR	0	0	3122	0	3122
COOLING WATER	NIBR	0	0	5706	0	5706
AUX COOLING WATER	NIBR	0	0	5424	0	5424
CLOSED CIRCUIT COOLING WATER	NIBR	0	0	8651	0	8651
MISC - DRAINS	NIBR	0	0	2687	0	2687
MISC - VENTS	NIBR	0	0	626	0	626
INSTRUMENT AIR & PLANT AIR	NIBR	0	0	900	0	900
TOTAL		**5672**	**2376**	**81343**	**8326**	**97717**

ESTIMATED INCH DIA - SIZE WISE - MATL WISE

PIPE NPS	DMD				
	AS (P91)	AS (P22)	CS	SS	TOTAL
TOTAL IBR + NIBR					
0.75	0	168	727	12	907
1	0	372	1782	20	2174
1.5	6	290	41	275	612
2	358	30	2578	204	3170
2.5	0	0	16	0	16
3	48	132	1329	189	1698
4	252	76	5328	168	5824
5	0	0	30	0	30
6	0	264	7446	846	8556
8	192	240	6672	0	7104
10	480	260	9450	530	10720
12	480	0	3828	324	4632
14	0	0	10108	5250	15358
16	1856	64	6448	48	8416
18	0	0	3978	0	3978
20	2000	0	4680	460	7140
24	0	96	3744	0	3840
28	0	0	868	0	868
30	0	0	3510	0	3510
32	0	384	576	0	960
36	0	0	5724	0	5724
40	0	0	280	0	280
44	0	0	2200	0	2200
TOTAL	**5672**	**2376**	**81343**	**8326**	**97717**
IBR					
0.75	0	168	715	0	883
1	0	372	1611	0	1983
1.5	6	290	41	0	337
2	358	30	510	0	898
2.5	0	0	0	0	0
3	48	132	744	0	924
4	252	76	1428	0	1756
5	0	0	0	0	0
6	0	264	1302	0	1566
8	192	240	4616	0	5048
10	480	260	4590	0	5330
12	480	0	3444	0	3924
14	0	0	9730	0	9730
16	1856	64	2416	0	4336
18	0	0	2988	0	2988
20	2000	0	1540	0	3540

ESTIMATED INCH DIA - SIZE WISE - MATL WISE

PIPE NPS	DMD				
	AS (P91)	AS (P22)	CS	SS	TOTAL
24	0	96	3504	0	3600
28	0	0	252	0	252
30	0	0	3120	0	3120
32	0	384	576	0	960
36	0	0	0	0	0
40	0	0	0	0	0
44	0	0	2200	0	2200
SUM	**5672**	**2376**	**45327**	**0**	**53375**
NIBR					
0.75	0	0	12	12	24
1	0	0	171	20	191
1.5	0	0	0	275	275
2	0	0	2068	204	2272
2.5	0	0	16	0	16
3	0	0	585	189	774
4	0	0	3900	168	4068
5	0	0	30	0	30
6	0	0	6144	846	6990
8	0	0	2056	0	2056
10	0	0	4860	530	5390
12	0	0	384	324	708
14	0	0	378	5250	5628
16	0	0	4032	48	4080
18	0	0	990	0	990
20	0	0	3140	460	3600
24	0	0	240	0	240
28	0	0	616	0	616
30	0	0	390	0	390
32	0	0	0	0	0
36	0	0	5724	0	5724
40	0	0	280	0	280
44	0	0	0	0	0
SUM	**0**	**0**	**36016**	**8326**	**44342**

PIPE THICKNESSES -MATL WISE - SYSTEM WISE

SYSTEM	NPS	0.75	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24	28	30	32	36	40	44
	NB	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	1000	1100
	OD	26.7	33.4	48.3	60.3	73	88.9	114.3	141.3	168.3	219.1	273	323.8	355.6	406.4	457	508	610	711	762	813	914	1016	1118
AS (P91)																								
MAIN STEAM	IBR				5.54			11.13			18.26		25.4		30.96		38.1							
BOILER STARTUP STEAM	IBR							11.13				21.44												
AUXILIARY STEAM	IBR				5.54			11.13																
DEAERATOR PEGGING STEAM	IBR						7.62	11.13																
EXTRACTION STEAM	IBR																							
BOILER FLASH TANK VENT TO DEAERATOR	IBR																							
BFP-SUCTION	IBR																							
FEED WATER	IBR																							
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR																							
SPRAY TO BSS PRDS	NIBR																							
CONDENSATE - CS	NIBR																							
CONDENSATE - SS	NIBR																							
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR																							
HP HEATE 5 & 6 DRAIN	NIBR																							
COOLING WATER	NIBR																							
AUX COOLING WATER	NIBR																							
CLOSED CIRCUIT COOLING WATER	NIBR																							
MISC - DRAINS	NIBR																							
MISC - VENTS	NIBR																							
INSTRUMENT AIR & PLANT AIR	NIBR																							
AS (P22)																								
MAIN STEAM	IBR		6.35	10.15	11.07					7.11														
BOILER STARTUP STEAM	IBR		6.35	10.15							8.18										22.23			
AUXILIARY STEAM	IBR		4.55				5.49	6.02																
DEAERATOR PEGGING STEAM	IBR		4.55					6.02		7.11		9.27												
EXTRACTION STEAM	IBR																							
BOILER FLASH TANK VENT TO DEAERATOR	IBR																							
BFP-SUCTION	IBR																							
FEED WATER	IBR																							
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR																							
SPRAY TO BSS PRDS	NIBR																							
CONDENSATE - CS	NIBR																							
CONDENSATE - SS	NIBR																							
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR																							
HP HEATE 5 & 6 DRAIN	NIBR																							
COOLING WATER	NIBR																							
AUX COOLING WATER	NIBR																							
CLOSED CIRCUIT COOLING WATER	NIBR																							
MISC - DRAINS	NIBR																							
MISC - VENTS	NIBR																							
INSTRUMENT AIR & PLANT AIR	NIBR																							
CS																								
MAIN STEAM	IBR																							
BOILER STARTUP STEAM	IBR		4.55								6.35	6.35	9.53			9.53		9.53	9.53					
AUXILIARY STEAM	IBR		4.55	5.08		5.16	5.49																	
DEAERATOR PEGGING STEAM	IBR	3.91	4.55		3.91		5.49	6.02			6.35	9.27	9.53											
EXTRACTION STEAM	IBR	3.91	4.55							7.11	8.18	9.27	9.53	7.92	9.53	9.53	9.53	9.53		9.53				12.7

SYSTEM	NPS	0.75	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	18	20	24	28	30	32	36	40	44
	NB	20	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	1000	1100
	OD	26.7	33.4	48.3	60.3	73	88.9	114.3	141.3	168.3	219.1	273	323.8	355.6	406.4	457	508	610	711	762	813	914	1016	1118
BOILER FLASH TANK VENT TO DEAERATOR	IBR		4.55					6.02		7.11														
BFP-SUCTION	IBR	3.91	4.55		3.91						8.18	9.27	9.53	7.92	9.53									
FEED WATER	IBR	3.91	4.55					13.49				28		38		50								
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR		4.55		8.74																			
SPRAY TO BSS PRDS	NIBR																							
CONDENSATE - CS	NIBR				3.91			6.02		7.11	6.35	6.35	6.35	11.13	6.35		6.35							
CONDENSATE - SS	NIBR																							
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR							6.02		7.11	6.35	6.35												
HP HEATE 5 & 6 DRAIN	NIBR							6.02		7.11	8.18	9.27										12.7		
COOLING WATER	NIBR						4.8	5.4		5.4												10		
AUX COOLING WATER	NIBR												6	6	6		6							
CLOSED CIRCUIT COOLING WATER	NIBR				4.5		4.8	5.4		5.4	8.18	6		6		6	6	8	8	8			10	
MISC - DRAINS	NIBR				3.91					7.11		6.35	6.35											
MISC - VENTS	NIBR							6.02		7.11		6.35												
INSTRUMENT AIR & PLANT AIR	NIBR				4.5		4.8	5.4	5.4	5.4	6													
SS																								
MAIN STEAM	IBR																							
BOILER STARTUP STEAM	IBR																							
AUXILIARY STEAM	IBR																							
DEAERATOR PEGGING STEAM	IBR																							
EXTRACTION STEAM	IBR																							
BOILER FLASH TANK VENT TO DEAERATOR	IBR																							
BFP-SUCTION	IBR																							
FEED WATER	IBR																							
SPRAY TO AUX DEAERATOR PEGG PRDS	IBR																							
SPRAY TO BSS PRDS	NIBR			3.68	3.91		3.05	3.05																
CONDENSATE - CS	NIBR																							
CONDENSATE - SS	NIBR				3.91					3.4		4.19	4.57	4.78			5.54							
LP HEATER 1, 2, 3 & DEAERATOR DRAIN	NIBR																							
HP HEATE 5 & 6 DRAIN	NIBR																							
COOLING WATER	NIBR																							
AUX COOLING WATER	NIBR																							
CLOSED CIRCUIT COOLING WATER	NIBR																							
MISC - DRAINS	NIBR																							
MISC - VENTS	NIBR																							
INSTRUMENT AIR & PLANT AIR	NIBR																							

SIGN. AND DATE | REF. DRG. NO. | A4 FORMAT

INVENTORY NO

REVISION REASON:				REVISION REASON:			
REV.	DATE	ALTERED	CHECKED	REV.	DATE	ALTERED	CHECKED

GEN. DIM. LIMITS , FITS , & TOLERANCES AS PER P.S :- HY0230261

CONSULTANT: BECHTEL
FREDERICK, MARYLAND, U.S.A

PROJECT:
STG PACKAGE (4 X 93.1 MW STGs), CCPP
HAZIRA MANUFACTURING DIVISION (HMD)
STG PACKAGE (3 X 90.3 MW STGs), CCPP
DAHEJ MANUFACTURING DIVISION (DMD)

CUSTOMER: Reliance Industries Limited
RELIANCE INDUSTRIES LIMITED
COAL BASED CAPTIVE POWER PLANT (CCPP)

RIL DRG. NUMBER DAHEJ: 10091-G69-DAT000-BHB-0001

RIL DRG. NUMBER HAZIRA: 10090-G69-HAT000-BHB-0001

BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN.	KD	---	04.03.14	-N.A-
CHD.	KG	---	04.03.14	
APPD.	PSB		04.03.14	

DEPT. PE&SD	UNTOL. DIMS. GR.		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 450	¢/M/f		-NTS-	-N.A-	-N.A-	-N.A-	-N.A-

TITLE :
Painting and Coating Schedule (STG BOP)

CARD CODE -N.A-

BHEL DRAWING NO. PEMC-04398

REV. 00

SHT. No 01 NO. OF SHT. 07

PAINTING & COATING SCHEDULE FOR RIL- DMD

Sl.No.	Equipment/ Surface	Units involved	Area/ Location	Arrangement (Indoor / Outdoor)	Temp.	Surface Prepatation	Primer or 1st Coat Name of paint /DFT	2nd Coat Name of paint /DFT	3rd Coat Name of paint /DFT	Total DFT	Colour	Remarks
1	**STEAM TURBINE**											
a	Outer Casing	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	75	Aluminium RAL 9006	
b	Exhaust Hood	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Inorganic Zinc Silicate/50	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	100	Aluminium RAL 9006	
c	Steam Pipes & Brackets (Interconnecting Pipes & Piping on casing)	PESD	TG HALL	Indoor	113 deg.F	Pickling/ Mechanical Cleaning	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	75	Aluminium RAL 9006	
d	Steam Gland Body Cover	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Inorganic Zinc Silicate / 50	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	100	Aluminium RAL 9006	
e	Governing Actuators	PESD	TG HALL	Indoor	113 deg.F	Solvent Cleaning/Mech. Cleaning	Epoxy Zinc Rich	High Build MIO Epoxy / 100			As per supplier standard	
f	Governing: HPSU	PESD	TG HALL	Indoor	113 deg.F	Solvent Cleaning/Mech. Cleaning	Epoxy Zinc Rich / 50	High Build MIO Epoxy / 100			As per supplier standard	
g	Bearing Pedestals, Bed Plates,	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Epoxy Zinc Rich / 50	High Build MIO Epoxy / 100	Aliphatic Urethane / 50	200	Grey White RAL 9002	
2	**ST GENERATOR**											
a	Generator Enclosure	EM	TG HALL	INDOOR	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
b	Generator air duct	EM	TG HALL	INDOOR	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
c	Generator stator frame	EM	TG HALL	INDOOR	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
d	Generator bearings	EM	TG HALL	INDOOR	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
e	Exciter stator frame	EM	TG HALL	INDOOR	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
3	**BOILER FEED PUMP**	HPEP-HYD.	TG Hall	Indoor	Room Temp.	Surface of equipment shall be made free from rust ,mill scales,grease,oil,dirt,etc and made fit to receive one coatof primer.	Inorganic Zinc Silicate Primer	Heat Resistant Air Drying Silicon Aluminum	Heat Resistant Air Drying Silicon Aluminum	50	Aluminium of IS: 5	1. One coat of rust penetrative,hard film yellow to be applied on all exposed machined surfaces. 2.Grease IS:958 shall be applied liberally on all exposed threded portions
4	**SURFACE CONDENSER**	HPEP-HYD.		Indoor	≤ 199.4 deg. F	SP 10	Epoxy Zinc Rich/100-150	Finishing paint at site Polyurethane/80-120	-	180-270	Red/Grey	
5	**HP HEATER**	HPEP-HYD.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
6	**LP HEATER**	HPEP-HYD.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
7	**DEAERATOR**	HPEP-HYD.		Outdoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
8	**SJAE**	HPEP-HYD.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
9	**GENERATOR AIR COOLER**	HPEP-HYD.		Indoor	< 392 Deg. F	SP 10	Epoxy based zinc rich/100-150	Polyurethane/80-120		180-270	Grey	
10	**GLAND STEAM CONDENSER**	HPEP-HYD.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
11	**LUBE OIL CONSOLE**	PESD										
a	Lube Oil Tank (C.S.) (Outer)	PESD	TG HALL (6-7,12-13, A-A2/ 25-26,31-32)	Indoor	113 Deg. F	Blasting SA2½	Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
b	Lube Oil Tank (C.S.) (Inside)	PESD		Indoor	113 Deg. F		Temperature Rust Preventive coating, Category 'E'/ 40	Temperature Rust Preventive Rust Base 394 / 40	Temperature Rust Preventive Rust Base 394 / 40	120	--	
c	Duplex Filter (Outer)	PESD		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
d	Oil Seperator	PESD		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
e	Lube Oil Pump (LOP, AOP & EOP)	PESD		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
f	Vapour Exraction Fan	PESD		Indoor	113 Deg. F	Solvent Cleaning or Mechanical Cleaning	Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
g	Oil Purification Unit (Not a console part)	PESD		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
h	Jacking Oil Pump (Not a console part)	PESD		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
i	Gov Oil Accumulator (Not a console part)	PESD		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
j	Acoustic Enclosure for Turbine (Not a console part)	PESD		Indoor	113 Deg. F	Blasting SA2½ / mechanical cleaning	Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
k	Overhead Oil Tank (Not a console part) # Painting is not required on inner side of Tank.	PESD	TG HALL B-C Bay	Outdoor	122 Deg. F	Blasting SA2½	Epoxy Zinc Rich/75	High Build MIO Epoxy for SS / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
12	**PIPING & VALVES**											
a	Valves -BHEL Trichy											
a.1	Safety valves - BHEK Trichy	HPBP-TRICHY			400/600 Deg. F	SSPC-SP3	HR ALUMINUM GR.II UP TO 400deg.C/GR. I UP TO 600deg.C - DFT = 20microns	HR ALUMINUM GR.II UP TO 400deg.C/GR. I UP TO 600deg.C - DFT = 20microns	NIL	40 MICRONS		
a.2	Silencers - BHEL Trichy	HPBP-TRICHY			>400 Deg. F	SSPC-SP3	HR ALUMINUM GR. I UP TO DFT = 20microns	HR ALUMINUM GR. I UP TO DFT = 20microns	NIL	40 MICRONS		
b	Valves - BHEL Bhopal											
a.1	For External Unmachined Surface	BHEL- Bhopal	CW/ACW/CCW Water system	-	149 Deg. F	Shot Blast	Chemical Resistant Epoxy (Zinc Chromate/Zinc Phosphate) primer	Chemical Resistant Epoxy Finish paint (Colour-Grey)		(Total DFT - Primer +Finish Paint = 150 microns)		
b.2	For Direct Water passage & Water immersed surfaces	BHEL- Bhopal		-	149 Deg. F	Shot Blast	Chemical Resistant Epoxy (Zinc Chromate/Zinc Phosphate) primer	Coal Tar Pitch Epoxy Paint (Colour-Black)		(Total DFT - Primer +Finish Paint = 175 microns)		
b.3	For mated machined surface	BHEL- Bhopal		-	149 Deg. F	Shot Blast	-	Liberal Coat of Temporary Rust Preventive coat to get jet black finish				
c	Expansion bellows -BHEL Bhopal	BHEL- Bhopal	Flanges	-	149 Deg. F	Sand/Shot Blasted	Chemical Resistant Chlorinated Rubber based Primer paint	Chemical Resistant Chlorinated Rubber based Finishing paint				
d	IBR piping input - Piping centre				60 deg.C and Above	SSPC-SP3/Power Tool Cleaning	2 coats of Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	-----	-----	Total DFT = 60 microns min. Shade : Redoxide		
					Below 60 deg.C	SSPC-SP3/Power Tool Cleaning	2 coats of 50 microns each of HB Chlorinated Rubber based Zinc Phosphate Primer	-----	2 coats of 30 microns each of Chlorinated Rubber based finish paint	Total DFT = 160 microns min. Shade : Smoke Grey Shade No 692 of IS 5		
d.1	Uninsulated Carbon Steel Piping with Operating Temp <= 93 Deg C (Outdoor)	PE&SD,PC	TG HALL	INDOOR	<= 93 Deg C	SP-6	3-5 mils (76-127 microns) of Inorganic Zinc	4-6 mils (102-152 microns) of Epoxy	3-5 mils (76-127 microns) of Polyurethane	60 microns	Redoxide	2nd & 3rd Coat in Shop or Field
d.2	Uninsulated Carbon Steel Piping with Operating Temp > 93 & <= 400 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	INDOOR	> 93 & <= 400 Deg C	SP-10	3-5 mils (76-127 microns) of Inorganic Zinc	1.5-2.5 mils (38-64 microns) of Silicone Aluminium	1.5-2.5 mils (38-64 microns) of Silicone Aluminium			2nd & 3rd Coat in Shop or Field
d.3	Insulated Carbon Steel / Stainless Steel Piping with Operating Temp <= 200 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	INDOOR	<= 200 Deg C	SP-7/15	6-8 mils (152-203 microns) of High Temp Epoxy Phenolic with Glass Flakes	-	-			
d.4	Uninsulated Stainless Steel Piping with Operating Temp <= 93 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	INDOOR	<= 93 Deg C	SP-7/15	4-6 mils (102-152 microns) of Epoxy Mastic	3-5 mils (76-127 microns) of Polyurethane	-			
d.5	Insulated Carbon Steel / Stainless Steel Piping with Operating Temp > 200 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	INDOOR	> 200 Deg C	SP-3	2 coats of Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	-	-	60 microns		Shade : Redoxide
d.6	Insulated Alloy Steel Piping (Outdoor/Indoor)	PE&SD,PC	TG HALL	INDOOR	> 400 Deg C	SP-3	2 coats of Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	-	-	60 microns		Shade : Redoxide
e	Valves - Others											refer d.1 to d.6
f	Expansion bellows - others											refer d.1 to d.6
g	Pre-Fabricated Piping (Non-IBR service)											covered in the above demarcation
h	Steam Traps											refer d.1 to d.6
i	Piping Insulation											no -pinting for insulation
j	Pipe hangers											refer d.1 to d.6
k	Pre-fabricated pipe support shoes											refer d.1 to d.6
l	Structural steel for pipe supports											refer d.1 to d.6
m	Pre-Fabricated Piping (Non-IBR service_Integral scope)											
i	Oil piping-Carbon Steel		TG HALL	Indoor	149 Deg. F	SA 2 1/2 Shop	Inorganic Zinc Silicate/50	NA	Zinc Free" High Temperature Air Curing Finish Coat /100-125	165-215	Light Grey IS 631	
ii	Oil piping- Stainless steel		TG HALL	Indoor	113 Deg. F	SSPC SP 16 Shop	High Temperature Epoxy Novolac / 50-80	NA	High Temperature Epoxy Novolac / 50-80	200-300	Light Grey IS 631	
iii	Control oil piping_Carbon Steel		TG HALL	Indoor	149 Deg. F	SA 2 1/2 Field	Inorganic Zinc Silicate/50	NA	Zinc Free" High Temperature Air Curing Finish Coat /100-125	165-215	Light Grey IS 631	
iv	Control oil piping_Stainless steel		TG HALL	Indoor	113 Deg. F	SSPC SP 16 Field	High Temperature Epoxy Novolac / 50-80	NA	High Temperature Epoxy Novolac / 50-80	200-300	Light Grey IS 631	
v	Integral steam piping_Carbon Steel		TG HALL	Indoor	500 Deg. F	SA 2 1/2 Shop	Inorganic Zinc Silicate/50	NA	Zinc Free" High Temperature Air Curing Finish Coat /100-125		Light Grey IS 631	

vi	Integral steam piping_Alloy steel		TG HALL	Indoor	984 Deg. F	SA 2 1/2 Field	High Temperature Silicone Aluminium/25-40	High Temperature Silicone Aluminium/25-40	High Temperature Silicone Aluminium/25-40	75-120	Light Grey IS 631	
13	**HEAT EXCHANGERS**											
a	Equipment and Supports (≥ 2.5 square meter surface)	PE& SD			≤ 93 Deg. F	SP 10	Zinc Rich epoxy DFT- 3-5 mils	Epoxy DFT - 4-6 mils	Polyurethane DFT -3-5 mils		Aluminium/Grey	
14	**DOSING SYSTEMS**											
	CHEMICAL DOSING SKIDS(HYDRAZINE/AMMONIA & NaOH)											
i.	Not Exposed to Coal, coal Dust, Ash (Fly & Bottom), lime Stone or Bed sand – Structural steal, Misc. steel, Stairways (not galvanized), pipe racks, platforms, walkways Steel,& Supplement Support steel, etc.	PE& SD			≤ 93 Deg. F	SP 10	Inorganic zinc / 3-5 mils	---	---		Light Grey Colour For Beams And Pipe Supports	
iia	Stair Support Steel, Stringers, ladders, including safety cages	PE& SD			≤ 93 Deg. F	SP 10	Inorganic zinc or Epoxy Zinc rich / 3-5 mils	Epoxy /4-6 mils	Polyurethane / 3-5 mils		Black Colour For Platform	
	or											
iib	Stair Support Steel, Stringers, ladders, including safety cages	PE& SD			≤ 93 Deg. F	--	Hot Dip galvanized / To a minimum of 600 g/m2 per ASTM A123	Brush Blast (SP-7) / 4-6 mils of Epoxy mastic	Polyurethane / 3-5 mils		Black Colour for Ladders	
iii.a	Handrails Assemblies Steel	PE& SD			≤ 93 Deg. F	SP 10	Inorganic zinc or Epoxy Zinc rich /3-5 mils	Epoxy /4-6 mils	Polyurethane / 3-5 mils		Golden Yellow for Handrails	Safety Yellow Colour
	or											
iii.b	Handrails Assemblies Steel	PE& SD			Ambient	--	Hot Dip galvanized / To a minimum of 600 g/m square per ASTM A123	Brush Blast (SP-7) / 4-6 mils of Epoxy mastic	Polyurethane / 3-5 mils		Golden Yellow for Handrails	2nd and 3rd costs in shop or field with safety yellow colour
iv.	Safety Showers, Eye Wash Stations	PE& SD			Ambient	--	Manufacturer's Standard suitable for seacoast to extent possible				Green	
v.a	Electricals cabinets and panels	PE& SD			Ambient	SP 10					Light Grey	
	or											
v.b	Electricals cabinets and panels	PE& SD			Ambient	Galvanized or galvalumed steel coated with 5 to 6 mils of TGIC powder coating or acceptable equal.					Light Grey	
vi.	Exposed Instrument Tubing	PE& SD			Ambient	Suitable grade of 2205 Duplex stainless steel or acceptable equal.					Light Grey	
vii.	Off-The-Shelf items or small pumps, Instrument, motors (<15HP) components/Equipment (<2.5 M)	PE& SD			Ambient	Supplier standard's coating suitable for sea coast exposure to the extent possible					Light Grey	
15	**POWER CYCLE SYSTEMS**											
a	Control Valves	As per Manufacrurar's Standard										
b	Desuperheaters											
c	Atmospheric Flash Tank	PE&SD	Outside STG building	Outdoor	-196˚C to 230˚C	SA 2 ½	High temperature Epoxy Novolac / DFT: 100-150 microns	NA	High temperature Epoxy Novolac / DFT: 100-150 microns	200-300 microns	White(BS: Code 00-E-55)	External surface
					150˚C	SA 2 ½	Amine Adduct Cured Epoxy / DFT: 100-150 microns	NA	Amine Adduct Cured Epoxy / DFT: 100-150 microns	200-300 microns		Internal surface
16	**PUMPS**											
a.1	Condensate Extraction Pumps	Each Unit	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
a.2	Motors for Condensate Extraction Pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
b.1	CCW Pumps (For PHE)	Common for All 3 Units	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
b.2	Motors for CCW Pumps (For PHE)	Common for All 3 Units	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
c.1	Potable sump pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
c.2	Motors for Potable sump pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
d.1	Condensate forwarding pumps	Each Unit	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
d.2	Motors for Condensate forwarding pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
e.1	ACW Pump	Each Unit	STG Builiding	Outdoor	50	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
e.2	Motors for ACW Pump	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
f.1	Air Compressor	Common for All 3 Units	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
f.2	Motors for Air Compressor	Common for All 3 Units	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
17	**TANKS**											
17.1	Condensdate Storage tank (150m3)											
a	External Uninsulated upto 120 Deg. C	PE&SD		Outdoor		SA 2½	-Inorganic Zinc Silicate Primer -Dry film thickness: 65-90 microns -Required surface profile: 50 microns -Maximum temperature resistances: 400°C -Minimum Volume Solids: 58 ASTM D2697 1. The product shall conform to SSPC Paint 20 Type 1-C with a zinc dust level of greater than 70% by weight in the dry film. The zinc dust shall have a "metallic" zinc content that meets the requirements of ASTM D-520 Type 1. Random sample for zinc dust content to be checked at site/lab.	High Build MIO Epoxy -Intermediate Dry film thickness: 100-150 microns -Required surface preparation: Clean, dry epoxy primer (type 04) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 55ASTM D2697 The quantity of MIO in the main pigment shall be 80% by weight.	Aliphatic Urethane Finish -Dry film thickness: 40-75 microns -Required surface preparation: Clean, dry epoxy intermediate(type 05) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 60 ASTM D2697	215-350	White(BS: Code 00-E-55)	Where prep. Is carried out in a shop or offsite it is mandatory that the painting to be carried out at the same location.

b	Internal(Condensate Tanks)	PE&SD		Outdoor		SA 2 1/2	HB Epoxy Phenolic -Required surface profile: 50-80 microns -Minimum Volume solids : 65% ASTM D2697 -Dry film thickness : 100-150 microns/coat -Maximum temperature resistance :150°C	HB Epoxy Phenolic -Required surface profile: 50-80 microns -Minimum Volume solids : 65% ASTM D2697 -Dry film thickness : 100-150 microns/coat -Maximum temperature resistance :150°C	HB Epoxy Phenolic -Required surface profile: 50-80 microns -Minimum Volume solids : 65% ASTM D2697 -Dry film thickness : 100-150 microns/coat -Maximum temperature resistance :150°C	300-375		
c	Tank Bottom plate (inside)	PE&SD		Outdoor		SA 2 1/2	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	200-300		Shop built tanks will be shop painted.
d	External of underside of all tank	PE&SD		Outdoor		SA 2 1/2	Coal Tar Epoxy -Dry film thickness: 150-200 microns -Required surface profile: 75 microns	NA	NA	150-200		A strip 75 mm wide at plate edge shall be left bare to avoid welding cantamination
17.2	Expansion Tank for DMCW Circuit											
a	External Uninsulated upto 120 Deg. C	PE&SD		Outdoor		SA 2 1/2	-Inorganic Zinc Silicate Primer -Dry film thickness: 65-90 microns -Required surface profile: 50 microns -Maximum temperature resistances: 400°C -Minimum Volume Solids: 58 ASTM D2697 1. The product shall conform to SSPC Paint 20 Type 1-C with a zinc dust level of greater than 70% by weight in the dry film. The zinc dust shall have a "metallic" zinc content that meets the requirements of ASTM D-520 Type 1. Random sample for zinc dust content to be checked at site/lab.	High Build MIO Epoxy -Intermediate Dry film thickness: 100-150 microns -Required surface preparation: Clean, dry epoxy primer (type 04) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 55ASTM D2697 The quantity of MIO in the main pigment shall be 80% by weight.	Aliphatic Urethane Finish -Dry film thickness: 40-75 microns -Required surface preparation: Clean, dry epoxy intermediate(type 05) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 60 ASTM D2697	215-350	White(BS: Code 00-E-55)	Where prep. Is carried out in a shop or offsite it is mandatory that the painting to be carried out at the same location.
b	Internal(Demineralised water)	PE&SD		Outdoor		SA 2 1/2	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	NA	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	300-200		Shop built tanks will be shop painted.
c	Tank Bottom plate (inside)	PE&SD		Outdoor		SA 2 1/2	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	200-300		Shop built tanks will be shop painted.
d	External of underside of all tank	PE&SD		Outdoor		SA 2 1/2	Coal Tar Epoxy -Dry film thickness: 150-200 microns -Required surface profile: 75 microns	NA	NA	150-200		A strip 75 mm wide at plate edge shall be left bare to avoid welding cantamination
18	**ELECTRICAL SYSTEM ITEMS**											
a	LV PMCC's	PE&SD	Switchgear room/ Indoor	Ambient	Ambient	As per manufacturers standard					Shade 631 of IS 5	
b	LV MCC's	PE&SD		Ambient	Ambient	As per manufacturers standard					Shade 631 of IS 5	
c	Cable tray material	PE&SD	Entire STG & Switchgear building/Indoor	Ambient	Ambient	Hot Dip Galvanization as per IS 2629 & minimum thickness of Galvanization shall be 610gm/m ^{2}					Not Applicable	
d	LV Power cables	PE&SD		Ambient	Ambient	Not Applicable					Outer sheath shall be black	
e	Control cables	PE&SD		Ambient	Ambient	Not Applicable					Outer sheath shall be black	
f	Cable Glands & Lugs	PE&SD		Ambient	Ambient	Not Applicable					Not Applicable	
	Structural steel for cable tray supports	PE&SD	Entire STG & Switchgear building/Indoor	Ambient	Ambient	Red oxide Zinc Chromate primer					Not Applicable	
19	**C & I SYSTEM ITEMS**											
a	Field instrument package	PE&SD	Each Unit	indoor & out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	
b	Instrument hook up material	PE&SD	Each Unit	indoor & out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	
c	Instrumentation cables	PE&SD	Each Unit	indoor & out door	Amb. Temp	NA	NA	NA		NA	Black	
d	SWAS System	PE&SD	Each Unit	Indoor	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	RAL 7035	
e	Flow elements-Orifice	PE&SD	Each Unit	Out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	
g	Flow elements-Nozzle	PE&SD	Each Unit	Out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	

PAINTING & COATING SCHEDULE FOR RIL- HMD

Sl.No.	Equipment/ Surface	Units involved	Area/ Location	Arrangement (Indoor / Outdoor)	Temp.	Surface Prepatation	Primer or 1st Coat Name of paint /DFT	2nd Coat Name of paint /DFT	3rd Coat Name of paint /DFT	Total DFT	Colour	Remarks
1	**STEAM TURBINE**											
a	Outer Casing	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	75	Aluminium RAL 9006	
b	Exhaust Hood	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Inorganic Zinc Silicate/50	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	100	Aluminium RAL 9006	
c	Steam Pipes & Brackets (Interconnecting Pipes & Piping on casing)	PESD	TG HALL	Indoor	113 deg.F	Pickling/ Mechanical Cleaning	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	75	Aluminium RAL 9006	
d	Steam Gland Body Cover	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Inorganic Zinc Silicate / 50	Heat Resistant Air drying Aluminium/ 25	Heat Resistant Air drying Aluminium/ 25	100	Aluminium RAL 9006	
e	Governing Actuators	PESD	TG HALL	Indoor	113 deg.F	Solvent Cleaning/Mech. Cleaning	Epoxy Zinc Rich	High Build MIO Epoxy / 100			As per supplier standard	
f	Governing: HPSU	PESD	TG HALL	Indoor	113 deg.F	Solvent Cleaning/Mech. Cleaning	Epoxy Zinc Rich / 50	High Build MIO Epoxy / 100			As per supplier standard	
g	Bearing Pedestals, Bed Plates,	PESD	TG HALL	Indoor	113 deg.F	Blasting SA2 1/2	Epoxy Zinc Rich / 50	High Build MIO Epoxy / 100	Aliphatic Urethane / 50	200	Grey White RAL 9002	
2	**ST GENERATOR**											
a	Generator Enclosure	EM	TG HALL	Indoor	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
b	Generator air duct	EM	TG HALL	Indoor	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
c	Generator stator frame	EM	TG HALL	Indoor	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
d	Generator bearings	EM	TG HALL	Indoor	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
e	Exciter stator frame	EM	TG HALL	Indoor	Ambient	Shot Blasting SA 2 1/2	Epoxy Zinc Rich/75	2 Coats of Epoxy high build/100	2 coats of Epoxy Polyurethane/75	250	Light Grey shade no 631 of IS 5	
3	**BOILER FEED PUMP**	HPEP-Hyd.	TG HALL	Indoor	Room Temp.	Surface of equipment shall be made free from rust ,mill scales,grease,oil,dirt,etc and made fit to receive one coatof primer.	Inorganic Zinc Silicate Primer	Heat Resistant Air Drying Silicon Aluminum	Heat Resistant Air Drying Silicon Aluminum	50	Aluminium of IS: 5	1. One coat of rust penetrative,hard film yellow to be applied on all exposed machined surfaces. 2.Grease IS:958 shall be applied liberally on all exposed threded portions
4	**SURFACE CONDENSER**	HPEP Hyd.		Indoor	≤ 199.4 Deg. F	SP 10	Epoxy Zinc Rich/100-150	Finishing paint at site Polyurethane/80-120	-	180-270	Red/Grey	
5	**HP HEATER**	HPEP Hyd.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
6	**LP HEATER**	HPEP Hyd.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
7	**DEAERATOR**	HPEP Hyd.		Outdoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
8	**SJAE**	HPEP Hyd.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
9	**GENERATOR AIR COOLER**	HPEP Hyd.		Indoor	< 392 Deg. F	SP 10	Epoxy based zinc rich/100-150	Polyurethane/80-120		180-270	Grey	
10	**GLAND STEAM CONDENSER**	HPEP Hyd.		Indoor	≥ 428 Deg. F	SP 10	Inorganic Zinc/80-120	Silicone Aluminium/80	-	160-200	Aluminium	
11	**LUBE OIL CONSOLE**	HPEP Hyd.										
a	Lube Oil Tank (C.S.) (Outer)	HPEP Hyd.	TG HALL A-A2/ (6-7,12-13, 25-26,31-32)	Indoor	113 Deg. F	Blasting SA2½	Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
b	Lube Oil Tank (C.S.) (Inside)	HPEP Hyd.		Indoor	113 Deg. F		Temperature Rust Preventive coating, Category 'E'/ 40	Temperature Rust Preventive Rust Base 394 / 40	Temperature Rust Preventive Rust Base 394 / 40	120	--	
c	Duplex Filter (Outer)	HPEP Hyd.		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
d	Oil Seperator	HPEP Hyd.		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
e	Lube Oil Pump (LOP, AOP & EOP)	HPEP Hyd.		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
f	Vapour Exraction Fan	HPEP Hyd.		Indoor	113 Deg. F	Solvent Cleaning or Mechanical Cleaning	Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
g	Oil Purification Unit (Not a console part)	HPEP Hyd.		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
h	Jacking Oil Pump (Not a console part)	HPEP Hyd.		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
i	Gov Oil Accumulator (Not a console part)	HPEP Hyd.		Indoor	113 Deg. F		Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
j	Acoustic Enclosure for Turbine (Not a console part)	HPEP Hyd.		Indoor	113 Deg. F	Blasting SA2½ / mechanical cleaning	Epoxy Zinc Rich/75	High Build MIO Epoxy / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
k	Overhead Oil Tank (Not a console part)	HPEP Hyd.	TG HALL B-C Bay	Outdoor	122 Deg. F	Blasting SA2½	Epoxy Zinc Rich/75	High Build MIO Epoxy for SS / 100	Aliphatic Urethane /50	225	Light Grey RAL 7035	
12	**PIPING & VALVES**											
a	**Valves -BHEL Trichy**											
a.1	Safety valves - BHEK Trichy	HPBP-TRICHY			400/600 Deg. F	SSPC-SP3	HR ALUMINUM GR.II UP TO 400deg.C/GR. I UP TO 600deg.C - DFT = 20microns	HR ALUMINUM GR.II UP TO 400deg.C/GR. I UP TO 600deg.C - DFT = 20microns	NIL	40 MICRONS		
a.2	Silencers - BHEL Trichy	HPBP-TRICHY			>400 Deg. F	SSPC-SP3	HR ALUMINUM GR. I UP TO DFT = 20microns	HR ALUMINUM GR. I UP TO DFT = 20microns	NIL	40 MICRONS		
b	Valves - BHEL Bhopal											
a.1	For External Unmachined Surface	BHEL- Bhopal	CW/ACW/CCW Water system	-	149 Deg. F	Shot Blast	Chemical Resistant Epoxy (Zinc Chromate/Zinc Phosphate) primer	Chemical Resistant Epoxy Finish paint (Colour-Grey)		(Total DFT - Primer +Finish Paint = 150 microns)		
b.2	For Direct Water passage & Water immersed surfaces	BHEL- Bhopal		-	149 Deg. F	Shot Blast	Chemical Resistant Epoxy (Zinc Chromate/Zinc Phosphate) primer	Coal Tar Pitch Epoxy Paint (Colour-Black)		(Total DFT - Primer +Finish Paint = 175 microns)		
b.3	For mated machined surface	BHEL- Bhopal		-	149 Deg. F	Shot Blast	-	Liberal Coat of Temporary Rust Preventive coat to get jet black finish				
c	Expansion bellows -BHEL Bhopal	BHEL- Bhopal	Flanges	-	149 Deg. F	Sand/Shot Blasted	Chemical Resistant Chlorinated Rubber based Primer paint	Chemical Resistant Chlorinated Rubber based Finishing paint	9,700.00	=J36/100		
d	IBR piping input - Piping centre				60 deg.C and Above	SSPC-SP3/Power Tool Cleaning	2 coats of Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	-----	-----	Total DFT = 60 microns min. Shade : Redoxide		
					Below 60 deg.C	SSPC-SP3/Power Tool Cleaning	2 coats of 50 microns each of HB Chlorinated Rubber based Zinc Phosphate Primer	-----	2 coats of 30 microns each of Chlorinated Rubber based finish paint	Total DFT = 160 microns min. Shade : Smoke Grey Shade No 692 of IS 5		
d.1	Uninsulated Carbon Steel Piping with Operating Temp <= 93 Deg C (Outdoor)	PE&SD,PC	TG HALL	Indoor	<= 93 Deg C	SP-6	3-5 mils (76-127 microns) of Inorganic Zinc	4-6 mils (102-152 microns) of Epoxy	3-5 mils (76-127 microns) of Polyurethane	60 microns	Redoxide	2nd & 3rd Coat in Shop or Field
d.2	Uninsulated Carbon Steel Piping with Operating Temp > 93 & <= 400 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	Indoor	> 93 & <= 400 Deg C	SP-10	3-5 mils (76-127 microns) of Inorganic Zinc	1.5-2.5 mils (38-64 microns) of Silicone Aluminium	1.5-2.5 mils (38-64 microns) of Silicone Aluminium			2nd & 3rd Coat in Shop or Field
d.3	Insulated Carbon Steel / Stainless Steel Piping with Operating Temp <= 200 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	Indoor	<= 200 Deg C	SP-7/15	6-8 mils (152-203 microns) of High Temp Epoxy Phenolic with Glass Flakes	-	-			
d.4	Uninsulated Stainless Steel Piping with Operating Temp <= 93 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	Indoor	<= 93 Deg C	SP-7/15	4-6 mils (102-152 microns) of Epoxy Mastic	3-5 mils (76-127 microns) of Polyurethane	-			
d.5	Insulated Carbon Steel / Stainless Steel Piping with Operating Temp > 200 Deg C (Outdoor/Indoor)	PE&SD,PC	TG HALL	Indoor	> 200 Deg C	SP-3	2 coats of Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	-	-	60 microns		Shade : Redoxide
d.6	Insulated Alloy Steel Piping (Outdoor/Indoor)	PE&SD,PC	TG HALL	Indoor	> 400 Deg C	SP-3	2 coats of Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	-	-	60 microns		Shade : Redoxide
e	Valves - Others											refer d.1 to d.6
f	Expansion bellows - others											refer d.1 to d.6
g	Pre-Fabricated Piping (Non-IBR service)											covered in the above demarcation
h	Steam Traps											refer d.1 to d.6
i	Piping Insulation											no -pinting for insulation
j	Pipe hangers											refer d.1 to d.6
k	Pre-fabricated pipe support shoes											refer d.1 to d.6
l	Structural steel for pipe supports											refer d.1 to d.6
m	Pre-Fabricated Piping (Non-IBR service_Integral scope)											
i	Oil piping-Carbon Steel		TG HALL	Indoor	149 Deg. F	SA 2 1/2 Shop	Inorganic Zinc Silicate/50	NA	Zinc Free" High Temperature Air Curing Finish Coat /100-125	165-215	Light Grey IS 631	
ii	Oil piping- Stainless steel		TG HALL	Indoor	113 Deg. F	SSPC SP 16 Shop	High Temperature Epoxy Novolac / 50-80	NA	High Temperature Epoxy Novolac / 50-80	200-300	Light Grey IS 631	
iii	Control oil piping_Carbon Steel		TG HALL	Indoor	149 Deg. F	SA 2 1/2 Field	Inorganic Zinc Silicate/50	NA	Zinc Free" High Temperature Air Curing Finish Coat /100-125	165-215	Light Grey IS 631	
iv	Control oil piping_Stainless steel		TG HALL	Indoor	113 Deg. F	SSPC SP 16 Field	High Temperature Epoxy Novolac / 50-80	NA	High Temperature Epoxy Novolac / 50-80	200-300	Light Grey IS 631	
v	Integral steam piping_Carbon Steel		TG HALL	Indoor	500 Deg. F	SA 2 1/2 Shop	Inorganic Zinc Silicate/50	NA	Zinc Free" High Temperature Air Curing Finish Coat /100-125		Light Grey IS 631	
vi	Integral steam piping_Alloy steel		TG HALL	Indoor	984 Deg. F	SA 2 1/2 Field	High Temperature Silicone Aluminium/25-40	High Temperature Silicone Aluminium/25-40	High Temperature Silicone Aluminium/25-40	75-120	Light Grey IS 631	
13	**HEAT EXCHANGERS**											

a	Equipment and Supports (≥ 2.5 square meter surface)	PE& SD			≤ 93 Deg. F	SP 10	Zinc Rich epoxy DFT- 3-5 mils	Epoxy DFT - 4-6 mils	Polyurethane DFT -3-5 mils		Aluminium/Grey	
14	**DOSING SYSTEMS**											
	CHEMICAL DOSING SKIDS(HYDRAZINE/AMMONIA & NaOH)											
i.	Not Exposed to Coal, coal Dust, Ash (Fly & Bottom), lime Stone or Bed sand – Structural steal, Misc. steel, Stairways (not galvanized), pipe racks, platforms, walkways Steel,& Supplement Support steel, etc.	PE& SD			≤ 93 Deg. F	SP 10	Inorganic zinc / 3-5 mils	---	---		Light Grey Colour For Beams And Pipe Supports	
iia	Stair Support Steel, Stringers, ladders, including safety cages	PE& SD			≤ 93 Deg. F	SP 10	Inorganic zinc or Epoxy Zinc rich / 3-5 mils	Epoxy /4-6 mils	Polyurethane / 3-5 mils		Black Colour For Platform	
	or											
iib	Stair Support Steel, Stringers, ladders, including safety cages	PE& SD			≤ 93 Deg. F	--	Hot Dip galvanized / To a minimum of 600 g/m2 per ASTM A123	Brush Blast (SP-7) / 4-6 mils of Epoxy mastic	Polyurethane / 3-5 mils		Black Colour for Ladders	
iii.a	Handrails Assemblies Steel	PE& SD			≤ 93 Deg. F	SP 10	Inorganic zinc or Epoxy Zinc rich /3-5 mils	Epoxy /4-6 mils	Polyurethane / 3-5 mils		Golden Yellow for Handrails	Safety Yellow Colour
	or											
iii.b	Handrails Assemblies Steel	PE& SD			Ambient	--	Hot Dip galvanized / To a minimum of 600 g/m square per ASTM A123	Brush Blast (SP-7) / 4-6 mils of Epoxy mastic	Polyurethane / 3-5 mils		Golden Yellow for Handrails	2nd and 3rd costs in shop or field with safety yellow colour
iv.	Safety Showers, Eye Wash Stations	PE& SD			Ambient	--	Manufacturer's Standard suitable for seacoast to extent possible				Green	
v.a	Electricals cabinets and panels	PE& SD			Ambient	SP 10					Light Grey	
	or											
v.b	Electricals cabinets and panels	PE& SD			Ambient	Galvanized or galvalumed steel coated with 5 to 6 mils of TGIC powder coating or acceptable equal.					Light Grey	
vi.	Exposed Instrument Tubing	PE& SD			Ambient	Suitable grade of 2205 Duplex stainless steel or acceptable equal.					Light Grey	
vii.	Off-The-Shelf items or small pumps, Instrument, motors (<15HP) components/Equipment (<2.5 M)	PE& SD			Ambient	Supplier standard's coating suitable for sea coast exposure to the extent possible					Light Grey	
15	**POWER CYCLE SYSTEMS**											
a	Control Valves	As per Manufacrurar's Standard										
b	Desuperheaters											
c	Atmospheric Flash Tank	PE&SD	Outside STG building	Outdoor	-196˚C to 230˚C	SA 2 ½	High temperature Epoxy Novolac / DFT: 100-150 microns	NA	High temperature Epoxy Novolac / DFT: 100-150 microns	200-300 microns	White(BS: Code 00-E-55)	External surface
					150˚C	SA 2 ½	Amine Adduct Cured Epoxy / DFT: 100-150 microns	NA	Amine Adduct Cured Epoxy / DFT: 100-150 microns	200-300 microns		Internal surface
16	**PUMPS**											
a.1	Condensate Extraction Pumps	Each Unit	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
a.2	Motors for Condensate Extraction Pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
b.1	CCW Pumps (For PHE)	Common for All 4 Units	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
b.2	Motors for CCW Pumps (For PHE)	Common for All 4 Units	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
c.1	Potable sump pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
c.2	Motors for Potable sump pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
d.1	Condensate forwarding pumps	Each Unit	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
d.2	Motors for Condensate forwarding pumps	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
e.1	ACW Pump	Each Unit	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
e.2	Motors for ACW Pump	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
f.1	Air Compressor	Common for All 4 Units	STG Builiding	Outdoor	50 Deg. C	SP-10	1 Coat of two component of Inorganic Zinc Silicate Coating@ 65-75µ DFT /Coating Total: 65-75µ	1 Coat of Two component Epoxy Zinc phosphate primer cured with polyamine hardener@40µ DFT/Coat Total: 40µ	2 Coat of High Build Epoxy finish coating cured with polyamine harder@ 100 µ DFT/Coat & 1 Coat of Two component Acrylic-Polyurethane finish paint@ 400 µ DFT/Coat: Total=2x100+40=240 µ	345-355 µ	Navy Blue (RAL 5014)	
f.2	Motors for Air Compressor	Each Unit	STG Builiding	Outdoor	Ambient	SP-10	3 mils of Epoxy Primer	3 mils of Epoxy	3 mils of Epoxy Polyurethane	225 µ	Blue Grey (RAL 7031)	
17	**TANKS**											
17.1	Condensdate Storage tank (150m3)											
a	External Uninsulated upto 120 Deg. C	PE&SD		Outdoor		SA 2½	-Inorganic Zinc Silicate Primer -Dry film thickness: 65-90 microns -Required surface profile: 50 microns -Maximum temperature resistances: 400°C -Minimum Volume Solids: 58 ASTM D2697 1. The product shall conform to SSPC Paint 20 Type 1-C with a zinc dust level of greater than 70% by weight in the dry film. The zinc dust shall have a "metallic" zinc content that meets the requirements of ASTM D-520 Type 1. Random sample for zinc dust content to be checked at site/lab.	High Build MIO Epoxy -Intermediate Dry film thickness: 100-150 microns -Required surface preparation: Clean, dry epoxy primer (type 04) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 55ASTM D2697 The quantity of MIO in the main pigment shall be 80% by weight.	Aliphatic Urethane Finish -Dry film thickness: 40-75 microns -Required surface preparation: Clean, dry epoxy intermediate(type 05) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 60 ASTM D2697	215-350	White(BS: Code 00-E-55)	Where prep. Is carried out in a shop or offsite it is mandatory that the painting to be carried out at the same location.

b	Internal(Condensate Tanks)	PE&SD		Outdoor		SA 2 1/2	HB Epoxy Phenolic -Required surface profile: 50-80 microns -Minimum Volume solids : 65% ASTM D2697 -Dry film thickness : 100-150 microns/coat -Maximum temperature resistance :150°C	HB Epoxy Phenolic -Required surface profile: 50-80 microns -Minimum Volume solids : 65% ASTM D2697 -Dry film thickness : 100-150 microns/coat -Maximum temperature resistance :150°C	HB Epoxy Phenolic -Required surface profile: 50-80 microns -Minimum Volume solids : 65% ASTM D2697 -Dry film thickness : 100-150 microns/coat -Maximum temperature resistance :150°C	300-375		
c	Tank Bottom plate (inside)	PE&SD		Outdoor		SA 2 1/2	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	200-300		Shop built tanks will be shop painted.
d	External of underside of all tank	PE&SD		Outdoor		SA 2 1/2	Coal Tar Epoxy -Dry film thickness: 150-200 microns -Required surface profile: 75 microns	NA	NA	150-200		A strip 75 mm wide at plate edge shall be left bare to avoid welding cantamination
17.2	Expansion Tank for DMCW Circuit											
a	External Uninsulated upto 120 Deg. C	PE&SD		Outdoor		SA 2 1/2	-Inorganic Zinc Silicate Primer -Dry film thickness: 65-90 microns -Required surface profile: 50 microns -Maximum temperature resistances: 400°C -Minimum Volume Solids: 58 ASTM D2697 1. The product shall conform to SSPC Paint 20 Type 1-C with a zinc dust level of greater than 70% by weight in the dry film. The zinc dust shall have a "metallic" zinc content that meets the requirements of ASTM D-520 Type 1. Random sample for zinc dust content to be checked at site/lab.	High Build MIO Epoxy -Intermediate Dry film thickness: 100-150 microns -Required surface preparation: Clean, dry epoxy primer (type 04) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 55ASTM D2697 The quantity of MIO in the main pigment shall be 80% by weight.	Aliphatic Urethane Finish -Dry film thickness: 40-75 microns -Required surface preparation: Clean, dry epoxy intermediate(type 05) -Maximum temperature resistance: 120oC -Minimum Volume Solids: 60 ASTM D2697	215-350	White(BS: Code 00-E-55)	Where prep. Is carried out in a shop or offsite it is mandatory that the painting to be carried out at the same location.
b	Internal(Demineralised water)	PE&SD		Outdoor		SA 2 1/2	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	NA	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	300-200		Shop built tanks will be shop painted.
c	Tank Bottom plate (inside)	PE&SD		Outdoor		SA 2 1/2	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	Amine Adduct Cured Epoxy -Dry film thickness: 100-150 microns -Required surface profile: 50 microns	200-300		Shop built tanks will be shop painted.
d	External of underside of all tank	PE&SD		Outdoor		SA 2 1/2	Coal Tar Epoxy -Dry film thickness: 150-200 microns -Required surface profile: 75 microns	NA	NA	150-200		A strip 75 mm wide at plate edge shall be left bare to avoid welding cantamination
18	**ELECTRICAL SYSTEM ITEMS**											
a	LV PMCC's	PE&SD	Switchgear room	Indoor	Ambient	As per manufacturers standard					Shade 631 of IS 5	
b	LV MCC's	PE&SD			Ambient	As per manufacturers standard					Shade 631 of IS 5	
c	Cable tray material	PE&SD	Entire STG & Switchgear building	Indoor	Ambient	Hot Dip Galvanization as per IS 2629 & minimum thickness of Galvanization shall be 610gm/m^2					Not Applicable	
d	LV Power cables	PE&SD			Ambient	Not Applicable					Outer sheath shall be black	
e	Control cables	PE&SD			Ambient	Not Applicable					Outer sheath shall be black	
f	Cable Glands & Lugs	PE&SD			Ambient	Not Applicable					Not Applicable	
g	Structural steel for cable tray supports	PE&SD	Entire STG & Switchgear building	Indoor	Ambient	Red oxide Zinc Chromate primer					Not Applicable	
19	**C & I SYSTEM ITEMS**											
a	Field instrument package	PE&SD	Each Unit	indoor & out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	
b	Instrument hook up material	PE&SD	As reqd.	indoor & out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications					Vendor standard	
c	Instrumentation cables	PE&SD	As reqd.	indoor & out door	Amb. Temp	NA	NA	NA	NA	NA	Black	
d	SWAS System	PE&SD	Each Unit	Indoor	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	RAL 7035	
e	Flow elements-Orifice	PE&SD	Each Unit	Out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	
g	Flow elements-Nozzle	PE&SD	Each Unit	Out door	Amb. Temp	Supplier standard coating suitable for power plant/Industrial applications				As reqd.	Vendor standard	

INPUT TO E&C TENDER

PROJECT: RIL CCPP 3 x 90.3 MW STG (DMD)

WONO: 1-0-851-359-00

ESTIMATED PIPING INSULATION AREA/VOLUME

SL NO	LINE NUMBER	WORK TEMP	INS THK	INSULATION MATERIAL	NB	OD	INS THK PYROGEL	INS THK MINWOOL	INS THK TOTAL	PIPE LENGTH	NO OF UNITS	PER UNIT				TOTAL			
												INS AREA PER UNIT	INS VOL PG PER UNIT	INS VOL MW PER UNIT	INV VOL COMB PER UNIT	INS AREA TOTAL	INS VOL PG TOTAL	INS VOL MW TOTAL	INS VOL COMB TOTAL
		[Deg C]	[mm]			[mm]	[mm]	[mm]	[mm]	[m]		[Sq.m]	[Cu.m]	[Cu.m]	[Cu.m]	[Sq.m]	[Cu.m]	[Cu.m]	[Cu.m]
1	HSAB-BSS-BHL-0-B051-10-65C-HC	530	40/210	PGEL/MW	250	273.1	40	210	250	39.66	1	40.84	1.63	8.58	10.21	40.84	1.63	8.58	10.21
2	HSAB-BSS-BHL-0-B052-10-65C-HC	530	40/210	PGEL/MW	250	273.1	40	210	250	1.5	1	1.55	0.06	0.32	0.38	1.55	0.06	0.32	0.38
3	HSAB-BSS-BHL-0-B053-10-65C-HC	530	40/210	PGEL/MW	250	273.1	40	210	250	3.24	1	3.34	0.13	0.7	0.83	3.34	0.13	0.7	0.83
4	HSAB-BSS-BHL-0-B054-32-23C-HC	474	40/200	PGEL/MW	800	819	40	200	240	1	1	3.08	0.12	0.61	0.73	3.08	0.12	0.61	0.73
5	HSAB-BSS-BHL-0-B055-32-23C-HC	474	40/200	PGEL/MW	800	819	40	200	240	1	1	3.08	0.12	0.61	0.73	3.08	0.12	0.61	0.73
6	HSAB-BSS-BHL-0-B062-28-11C-HC	200	10/65	PGEL/MW	700	711	10	65	75	139.4	1	373.64	3.73	24.29	28.02	373.64	3.73	24.29	28.02
7	HSAB-HS-BHL-0-B001-20-65C-HC	530	50/200	PGEL/MW	500	508	50	200	250	6.29	1	12.05	0.6	2.41	3.01	12.05	0.6	2.41	3.01
8	HSAB-HS-BHL-0-B002-20-65C-HC	530	50/200	PGEL/MW	500	508	50	200	250	6.29	1	12.05	0.6	2.41	3.01	12.05	0.6	2.41	3.01
9	HSAB-HS-BHL-0-B003-20-65C-HC	530	50/200	PGEL/MW	500	508	50	200	250	116.8	1	223.68	11.18	44.74	55.92	223.68	11.18	44.74	55.92
10	HSAB-HS-BHL-0-B004-20-65C-HC	530	50/200	PGEL/MW	500	508	50	200	250	111.8	1	214.1	10.7	42.82	53.52	214.1	10.7	42.82	53.52
11	HSAB-HS-BHL-0-B010-4-65C-HC	530	50/165	PGEL/MW	100	114.3	50	165	215	22.11	1	9.53	0.48	1.57	2.05	9.53	0.48	1.57	2.05
12	HSAB-HS-BHL-0-B201-1.5-65C-HC	530	0/175	PGEL/MW	40	48.3	0	175	175	1.3	1	0.24	0	0.05	0.05	0.24	0	0.05	0.05
13	HSAB-HS-BHL-0-B202-1.5-65C-HC	530	0/175	PGEL/MW	40	48.3	0	175	175	1.89	1	0.35	0	0.06	0.06	0.35	0	0.06	0.06
14	HSAB-HS-BHL-0-B251-3-65C-HC	530	40/160	PGEL/MW	80	88.9	40	160	200	1.77	1	0.59	0.02	0.1	0.12	0.59	0.02	0.1	0.12
15	HSAB-HS-BHL-0-B252-3-65C-HC	530	40/160	PGEL/MW	80	88.9	40	160	200	1	1	0.34	0.01	0.05	0.06	0.34	0.01	0.05	0.06
16	HSAE-FDW-BHL-0-B651-18-61C-HC	236.5	20/75	PGEL/MW	450	457	20	75	95	58.49	1	100.76	2.02	7.56	9.58	100.76	2.02	7.56	9.58
17	HSAE-FDW-BHL-0-B652-18-61C-HC	236.5	20/75	PGEL/MW	450	457	20	75	95	73.67	1	126.92	2.54	9.52	12.06	126.92	2.54	9.52	12.06
18	HSAE-FDW-BHL-0-B653-18-61C-HC	236.5	20/75	PGEL/MW	450	457	20	75	95	14.93	1	25.73	0.52	1.93	2.45	25.73	0.52	1.93	2.45
19	HSAE-FDW-BHL-0-B654-18-61C-HC	236.5	20/75	PGEL/MW	450	457	20	75	95	14.93	1	25.73	0.52	1.93	2.45	25.73	0.52	1.93	2.45
20	HSAE-FDW-BHL-0-B655-3-51C-HC	174.4	20/40	PGEL/MW	80	88.9	20	40	60	122.17	1	40.94	0.82	1.63	2.45	40.94	0.82	1.63	2.45
21	HSAE-FDW-BHL-0-B661-1-51C-HC	174.4	0/40	PGEL/MW	25	33.4	0	40	40	20.46	1	2.58	0	0.11	0.11	2.58	0	0.11	0.11
22	HSAE-FDW-BHL-0-B662-1-51C-HC	174.4	0/40	PGEL/MW	25	33.4	0	40	40	20.18	1	2.54	0	0.1	0.1	2.54	0	0.1	0.1
23	HSAE-FDW-BHL-0-B671-2-51C-HC	174.4	20/25	PGEL/MW	50	60.3	20	25	45	16.22	1	3.68	0.07	0.1	0.17	3.68	0.07	0.1	0.17
24	HSAE-FDW-BHL-0-B671-8-11B-HC	170.4	20/50	PGEL/MW	200	219.1	20	50	70	64.4	1	53.2	1.07	2.66	3.73	53.2	1.07	2.66	3.73
25	HSAE-FDW-BHL-0-B672-2-51C-HC	174.4	20/25	PGEL/MW	50	60.3	20	25	45	16.22	1	3.68	0.07	0.1	0.17	3.68	0.07	0.1	0.17
26	HSAE-FDW-BHL-0-B672-8-11B-HC	170.4	20/50	PGEL/MW	200	219.1	20	50	70	41.1	1	33.95	0.68	1.69	2.38	33.95	0.68	1.69	2.38
27	HSAE-FDW-BHL-0-B673-8-11B-HC	170.4	20/50	PGEL/MW	200	219.1	20	50	70	9.01	1	7.44	0.14	0.37	0.52	7.44	0.14	0.37	0.52
28	HSAE-FDW-BHL-0-B674-8-11B-HC	170.4	20/50	PGEL/MW	200	219.1	20	50	70	8.99	1	7.43	0.14	0.37	0.52	7.43	0.14	0.37	0.52
29	HSAF-BS-BHL-0-B191-6-11C-HC	172	20/40	PGEL/MW	150	168.3	20	40	60	15.25	1	9.67	0.19	0.38	0.58	9.67	0.19	0.38	0.58
30	HSAF-BS-BHL-0-B192-6-11C-HC	172	20/40	PGEL/MW	150	168.3	20	40	60	15.23	1	9.66	0.19	0.38	0.58	9.66	0.19	0.38	0.58
31	HSAF-BS-BHL-0-B193-6-11C-HC	172	20/40	PGEL/MW	150	168.3	20	40	60	105.65	1	67.03	1.34	2.68	4.02	67.03	1.34	2.68	4.02
32	HSSA-AXS-BHL-0-B203-3-23C-HC	480	35/140	PGEL/MW	80	88.9	35	140	175	9.31	1	3.12	0.11	0.43	0.54	3.12	0.11	0.43	0.54
33	HSSA-AXS-BHL-0-B206-3-23C-HC	480	35/140	PGEL/MW	80	88.9	35	140	175	8.84	1	2.96	0.11	0.42	0.53	2.96	0.11	0.42	0.53
34	HSSA-AXS-BHL-0-B211-3-21C-HC	260	15/65	PGEL/MW	80	88.9	15	65	80	24.94	1	8.36	0.12	0.54	0.66	8.36	0.12	0.54	0.66
35	HSSA-AXS-BHL-0-B212-3-21C-HC	260	15/65	PGEL/MW	80	88.9	15	65	80	169.17	1	56.7	0.85	3.68	4.54	56.7	0.85	3.68	4.54
36	HSSA-AXS-BHL-0-B213-3-21C-HC	260	15/65	PGEL/MW	80	88.9	15	65	80	164.95	1	55.28	0.83	3.59	4.42	55.28	0.83	3.59	4.42
37	HSSA-AXS-BHL-0-B253-10-23C-HC	475.9	40/175	PGEL/MW	250	273.1	40	175	215	14.26	1	14.68	0.59	2.57	3.16	14.68	0.59	2.57	3.16
38	HSSA-AXS-BHL-0-B256-10-23C-HC	475.9	40/175	PGEL/MW	250	273.1	40	175	215	14.02	1	14.44	0.58	2.53	3.11	14.44	0.58	2.53	3.11
39	HSSA-AXS-BHL-0-B261-10-11C-HC	190	20/50	PGEL/MW	250	273.1	20	50	70	0.5	1	0.52	0.01	0.02	0.04	0.52	0.01	0.02	0.04
40	HSSA-AXS-BHL-0-B262-10-11C-HC	190	20/50	PGEL/MW	250	273.1	20	50	70	43.11	1	44.39	0.89	2.22	3.11	44.39	0.89	2.22	3.11
41	HSSA-AXS-BHL-0-B263-10-11C-HC	190	20/50	PGEL/MW	250	273.1	20	50	70	77.39	1	79.68	1.6	3.98	5.58	79.68	1.6	3.98	5.58
42	HSAB-AV-BHL-1-B009-6-11B-HC		25/90	PGEL/MW	150	168.3	25	90	115	14.07	3	8.93	0.23	0.8	1.03	26.79	0.69	2.4	3.09
43	HSAB-BSS-BHL-1-B063-18-11C-HC	200	10/65	PGEL/MW	450	457	10	65	75	53.25	3	91.74	0.91	5.96	6.88	275.22	2.73	17.88	20.64
44	HSAB-BSS-BHL-1-B064-12-11C-HC	200	20/50	PGEL/MW	300	323.8	20	50	70	3.43	3	4.19	0.08	0.2	0.29	12.57	0.24	0.6	0.87
45	HSAB-BSS-BHL-1-B065-12-11C-HC	200	20/50	PGEL/MW	300	323.8	20	50	70	2.26	3	2.76	0.06	0.14	0.2	8.28	0.18	0.42	0.6
46	HSAB-HS-BHL-1-B005-16-65C-HC	530	50/200	PGEL/MW	400	406.4	50	200	250	32.47	3	49.75	2.48	9.95	12.43	149.25	7.44	29.85	37.29
47	HSAB-HS-BHL-1-B006-12-65C-HC	530	40/210	PGEL/MW	300	323.8	40	210	250	7.3	3	8.92	0.36	1.87	2.23	26.76	1.08	5.61	6.69
48	HSAB-HS-BHL-1-B007-12-65C-HC	530	40/210	PGEL/MW	300	323.8	40	210	250	10.05	3	12.26	0.49	2.58	3.07	36.78	1.47	7.74	9.21
49	HSAB-HS-BHL-1-B008-2-65C-HC	530	25/150	PGEL/MW	50	60.3	25	150	175	21.92	3	4.98	0.12	0.74	0.86	14.94	0.36	2.22	2.58
50	HSAD-CDD-BHL-1-B513-14-22B-HC	75.5	10/40	PGEL/MW	350	355.6	10	40	50	33.5	3	44.9	0.44	1.8	2.24	134.7	1.32	5.4	6.72
51	HSAD-CDD-BHL-1-B514-14-22B-HC	104.7	10/40	PGEL/MW	350	355.6	10	40	50	49.47	3	66.32	0.66	2.65	3.31	198.96	1.98	7.95	9.93
52	HSAD-CDD-BHL-1-B515-14-22B-HC	140.1	10/40	PGEL/MW	350	355.6	10	40	50	4.48	3	6	0.06	0.24	0.3	18	0.18	0.72	0.9

SL NO	LINE NUMBER	WORK TEMP	INS THK	INSULATION MATERIAL	NB	OD	INS THK PYROGEL	INS THK MINWOOL	INS THK TOTAL	PIPE LENGTH	NO OF UNITS	PER UNIT				TOTAL			
												INS AREA PER UNIT	INS VOL PG PER UNIT	INS VOL MW PER UNIT	INV VOL COMB PER UNIT	INS AREA TOTAL	INS VOL PG TOTAL	INS VOL MW TOTAL	INS VOL COMB TOTAL
		[Deg C]	[mm]			[mm]	[mm]	[mm]	[mm]	[m]		[Sq.m]	[Cu.m]	[Cu.m]	[Cu.m]	[Sq.m]	[Cu.m]	[Cu.m]	[Cu.m]
53	HSAD-CDD-BHL-1-B516-14-22B-HC	140.1	10/40	PGEL/MW	350	355.6	10	40	50	21.73	3	29.14	0.29	1.16	1.45	87.42	0.87	3.48	4.35
54	HSAE-FDW-BHL-1-B601-16-11C-HC	170.4	20/50	PGEL/MW	400	406.4	20	50	70	42.75	3	65.5	1.31	3.28	4.58	196.5	3.93	9.84	13.74
55	HSAE-FDW-BHL-1-B602-6-11B-HC	170.4	20/40	PGEL/MW	150	168.3	20	40	60	3	3	1.91	0.04	0.07	0.11	5.73	0.12	0.21	0.33
56	HSAE-FDW-BHL-1-B603-12-11B-HC	170.4	20/50	PGEL/MW	300	323.8	20	50	70	1.88	3	2.29	0.05	0.12	0.17	6.87	0.15	0.36	0.51
57	HSAE-FDW-BHL-1-B604-14-11B-HC	170.4	20/50	PGEL/MW	350	355.6	20	50	70	8.05	3	10.79	0.22	0.54	0.76	32.37	0.66	1.62	2.28
58	HSAE-FDW-BHL-1-B605-12-11B-HC	170.4	20/50	PGEL/MW	300	323.8	20	50	70	11.93	3	14.57	0.29	0.73	1.02	43.71	0.87	2.19	3.06
59	HSAE-FDW-BHL-1-B606-10-51C-HC	174.4	20/50	PGEL/MW	250	273.1	20	50	70	10.09	3	10.39	0.2	0.52	0.72	31.17	0.6	1.56	2.16
60	HSAE-FDW-BHL-1-B607-4-51C-HC	174.4	20/40	PGEL/MW	100	114.3	20	40	60	26.91	3	11.59	0.23	0.47	0.7	34.77	0.69	1.41	2.1
61	HSAE-FDW-BHL-1-B608-12-11B-HC	170.4	20/50	PGEL/MW	300	323.8	20	50	70	1.88	3	2.29	0.05	0.12	0.17	6.87	0.15	0.36	0.51
62	HSAE-FDW-BHL-1-B609-14-11B-HC	170.4	20/50	PGEL/MW	350	355.6	20	50	70	8.05	3	10.79	0.22	0.54	0.76	32.37	0.66	1.62	2.28
63	HSAE-FDW-BHL-1-B610-12-11B-HC	170.4	20/50	PGEL/MW	300	323.8	20	50	70	11.93	3	14.57	0.29	0.73	1.02	43.71	0.87	2.19	3.06
64	HSAE-FDW-BHL-1-B611-10-51C-HC	174.4	20/50	PGEL/MW	250	273.1	20	50	70	10.09	3	10.39	0.2	0.52	0.72	31.17	0.6	1.56	2.16
65	HSAE-FDW-BHL-1-B612-4-51C-HC	174.4	20/40	PGEL/MW	100	114.3	20	40	60	30.91	3	13.32	0.26	0.53	0.79	39.96	0.78	1.59	2.37
66	HSAE-FDW-BHL-1-B613-12-11B-HC	170.4	20/50	PGEL/MW	300	323.8	20	50	70	1.88	3	2.29	0.05	0.12	0.17	6.87	0.15	0.36	0.51
67	HSAE-FDW-BHL-1-B614-14-11B-HC	170.4	20/50	PGEL/MW	350	355.6	20	50	70	8.05	3	10.79	0.22	0.54	0.76	32.37	0.66	1.62	2.28
68	HSAE-FDW-BHL-1-B615-12-11B-HC	170.4	20/50	PGEL/MW	300	323.8	20	50	70	11.93	3	14.57	0.29	0.73	1.02	43.71	0.87	2.19	3.06
69	HSAE-FDW-BHL-1-B616-10-51C-HC	174.4	20/50	PGEL/MW	250	273.1	20	50	70	11.32	3	11.65	0.23	0.59	0.82	34.95	0.69	1.77	2.46
70	HSAE-FDW-BHL-1-B617-4-51C-HC	174.4	20/40	PGEL/MW	100	114.3	20	40	60	26.91	3	11.59	0.23	0.47	0.7	34.77	0.69	1.41	2.1
71	HSAE-FDW-BHL-1-B618-14-51C-HC	174.4	20/50	PGEL/MW	350	355.6	20	50	70	7.44	3	9.97	0.2	0.5	0.71	29.91	0.6	1.5	2.13
72	HSAE-FDW-BHL-1-B619-14-51C-HC	174.4	20/50	PGEL/MW	350	355.6	20	50	70	50.6	3	67.84	1.36	3.4	4.75	203.52	4.08	10.2	14.25
73	HSAE-FDW-BHL-1-B620-14-51C-HC	202.9	20/75	PGEL/MW	350	355.6	20	75	95	32.34	3	43.36	0.86	3.25	4.12	130.08	2.58	9.75	12.36
74	HSAE-FDW-BHL-1-B621-14-61C-HC	236.5	20/75	PGEL/MW	350	355.6	20	75	95	41.68	3	55.87	1.12	4.19	5.3	167.61	3.36	12.57	15.9
75	HSAE-FDW-BHL-1-B622-3-51C-HC	174.4	20/40	PGEL/MW	80	88.9	20	40	60	70.88	3	23.76	0.48	0.95	1.43	71.28	1.44	2.85	4.29
76	HSAF-BS-BHL-1-B194-6-11C-HC	172	20/40	PGEL/MW	150	168.3	20	40	60	72.46	3	45.97	0.92	1.84	2.76	137.91	2.76	5.52	8.28
77	HSAF-EXS-BHL-1-B006-8-21C-HC	312.3	30/100	PGEL/MW	200	219.1	30	100	130	13.67	3	11.29	0.34	1.13	1.46	33.87	1.02	3.39	4.38
78	HSAF-EXS-BHL-1-B301-8-21C-HC	338.7	25/90	PGEL/MW	200	219.1	25	90	115	23.8	3	19.66	0.49	1.76	2.26	58.98	1.47	5.28	6.78
79	HSAF-EXS-BHL-1-B303-10-21C-HC	262.6	25/75	PGEL/MW	250	273.1	25	75	100	35.38	3	36.42	0.91	2.74	3.65	109.26	2.73	8.22	10.95
80	HSAF-EXS-BHL-1-B305-10-11C-HC	196.5	20/50	PGEL/MW	250	273.1	20	50	70	7.02	3	7.22	0.14	0.36	0.5	21.66	0.42	1.08	1.5
81	HSAF-EXS-BHL-1-B306-10-11C-HC	196.5	20/50	PGEL/MW	250	273.1	20	50	70	7.47	3	7.69	0.16	0.38	0.54	23.07	0.48	1.14	1.62
82	HSAF-EXS-BHL-1-B307-14-11C-HC	196.5	20/50	PGEL/MW	350	355.6	20	50	70	1	3	1.34	0.02	0.07	0.1	4.02	0.06	0.21	0.3
83	HSAF-EXS-BHL-1-B308-14-11C-HC	196.5	20/50	PGEL/MW	350	355.6	20	50	70	17.91	3	24.01	0.48	1.2	1.68	72.03	1.44	3.6	5.04
84	HSAF-EXS-BHL-1-B309-8-11C-HC	196.5	20/50	PGEL/MW	200	219.1	20	50	70	13.11	3	10.82	0.22	0.54	0.76	32.46	0.66	1.62	2.28
85	HSAF-EXS-BHL-1-B312-16-11C-HC	142.98	10/40	PGEL/MW	400	406.4	10	40	50	3.48	3	5.33	0.05	0.22	0.26	15.99	0.15	0.66	0.78
86	HSAF-EXS-BHL-1-B313-16-11C-HC	142.98	10/40	PGEL/MW	400	406.4	10	40	50	3.48	3	5.33	0.05	0.22	0.26	15.99	0.15	0.66	0.78
87	HSAF-EXS-BHL-1-B314-24-11C-HC	142.98	15/50	PGEL/MW	600	610	15	50	65	1	3	2.3	0.04	0.12	0.16	6.9	0.12	0.36	0.48
88	HSAF-EXS-BHL-1-B316-20-11C-HC	107.33	15/50	PGEL/MW	500	508	15	50	65	2.86	3	5.47	0.08	0.28	0.36	16.41	0.24	0.84	1.08
89	HSAF-EXS-BHL-1-B317-20-11C-HC	107.33	15/50	PGEL/MW	500	508	15	50	65	2.86	3	5.47	0.08	0.28	0.36	16.41	0.24	0.84	1.08
90	HSAF-EXS-BHL-1-B318-30-11C-HC	107.33	15/50	PGEL/MW	750	762	15	50	65	27.71	3	79.6	1.19	3.98	5.17	238.8	3.57	11.94	15.51
91	HSAF-EXS-BHL-1-B320-30-11C-HC	78.17	15/50	PGEL/MW	750	762	15	50	65	5.17	3	14.86	0.23	0.74	0.97	44.58	0.69	2.22	2.91
92	HSAF-EXS-BHL-1-B321-30-11C-HC	78.17	15/50	PGEL/MW	750	762	15	50	65	5.17	3	14.86	0.23	0.74	0.97	44.58	0.69	2.22	2.91
93	HSAF-EXS-BHL-1-B322-44-11C-HC	78.17	15/50	PGEL/MW	1100	1118	15	50	65	26.71	3	112.57	1.69	5.63	7.32	337.71	5.07	16.89	21.96
94	HSAF-HD-BHL-1-B701-6-21B-HC	208.8	20/65	PGEL/MW	150	168.3	20	65	85	19.39	3	12.3	0.25	0.8	1.06	36.9	0.75	2.4	3.18
95	HSAF-HD-BHL-1-B702-6-21B-HC	204.3	20/65	PGEL/MW	150	168.3	20	65	85	6.98	3	4.43	0.08	0.29	0.37	13.29	0.24	0.87	1.11
96	HSAF-HD-BHL-1-B703-6-21B-HC	208.8	20/65	PGEL/MW	150	168.3	20	65	85	4.03	3	2.56	0.05	0.17	0.22	7.68	0.15	0.51	0.66
97	HSAF-HD-BHL-1-B704-6-21B-HC	170.4	20/40	PGEL/MW	150	168.3	20	40	60	6.14	3	3.9	0.08	0.16	0.24	11.7	0.24	0.48	0.72
98	HSAF-HD-BHL-1-B705-6-21B-HC	208.8	20/65	PGEL/MW	150	168.3	20	65	85	4.58	3	2.9	0.06	0.19	0.25	8.7	0.18	0.57	0.75
99	HSAF-HD-BHL-1-B706-8-21B-HC	208.8	10/40	PGEL/MW	200	219.1	10	40	50	19.02	3	15.71	0.16	0.62	0.78	47.13	0.48	1.86	2.34
100	HSAF-HD-BHL-1-B708-6-21B-HC	180.4	20/40	PGEL/MW	150	168.3	20	40	60	4.03	3	2.56	0.05	0.11	0.16	7.68	0.15	0.33	0.48
101	HSAF-HD-BHL-1-B709-6-21B-HC	180.4	20/40	PGEL/MW	150	168.3	20	40	60	8.39	3	5.33	0.11	0.22	0.32	15.99	0.33	0.66	0.96
102	HSAF-HD-BHL-1-B710-6-21B-HC	180.4	20/40	PGEL/MW	150	168.3	20	40	60	4.58	3	2.9	0.06	0.12	0.18	8.7	0.18	0.36	0.54
103	HSAF-HD-BHL-1-B711-8-21B-HC	180.4	10/40	PGEL/MW	200	219.1	10	40	50	17.16	3	14.17	0.14	0.56	0.71	42.51	0.42	1.68	2.13
104	HSAF-HD-BHL-1-B714-36-11B-HC		15/50	PGEL/MW	900	914	15	50	65	5.46	3	18.82	0.29	0.94	1.22	56.46	0.87	2.82	3.66
105	HSAF-HD-BHL-1-B751-6-11B-HC	110.3	10/40	PGEL/MW	150	168.3	10	40	50	3.88	3	2.46	0.02	0.1	0.12	7.38	0.06	0.3	0.36
106	HSAF-HD-BHL-1-B753-6-11B-HC	110.3	10/40	PGEL/MW	150	168.3	10	40	50	5.94	3	3.77	0.04	0.16	0.19	11.31	0.12	0.48	0.57
107	HSAF-HD-BHL-1-B754-8-11B-HC	110.3	10/40	PGEL/MW	200	219.1	10	40	50	10.76	3	8.89	0.08	0.36	0.44	26.67	0.24	1.08	1.32
108	HSAF-HD-BHL-1-B755-8-11B-HC	81.1	10/40	PGEL/MW	200	219.1	10	40	50	3.99	3	3.3	0.04	0.13	0.17	9.9	0.12	0.39	0.51
109	HSAF-HD-BHL-1-B757-8-11B-HC	81.1	10/40	PGEL/MW	200	219.1	10	40	50	5.64	3	4.66	0.05	0.19	0.24	13.98	0.15	0.57	0.72
110	HSAF-HD-BHL-1-B758-10-11B-HC	81.1	10/40	PGEL/MW	250	273.1	10	40	50	10.99	3	11.32	0.11	0.46	0.56	33.96	0.33	1.38	1.68
111	HSAF-HD-BHL-1-B759-10-11B-HC	78	10/40	PGEL/MW	250	273.1	10	40	50	28.86	3	29.71	0.3	1.19	1.49	89.13	0.9	3.57	4.47

SL NO	LINE NUMBER	WORK TEMP	INS THK	INSULATION MATERIAL	NB	OD	INS THK PYROGEL	INS THK MINWOOL	INS THK TOTAL	PIPE LENGTH	NO OF UNITS	PER UNIT				TOTAL			
												INS AREA PER UNIT	INS VOL PG PER UNIT	INS VOL MW PER UNIT	INV VOL COMB PER UNIT	INS AREA TOTAL	INS VOL PG TOTAL	INS VOL MW TOTAL	INS VOL COMB TOTAL
		[Deg C]	[mm]			[mm]	[mm]	[mm]	[mm]	[m]		[Sq.m]	[Cu.m]	[Cu.m]	[Cu.m]	[Sq.m]	[Cu.m]	[Cu.m]	[Cu.m]
112	HSAF-HD-BHL-1-B760-10-11B-HC	78	10/40	PGEL/MW	250	273.1	10	40	50	14.75	3	15.19	0.16	0.61	0.77	45.57	0.48	1.83	2.31
113	HSSA-AXS-BHL-1-B004-14-11C-HC	220	10/65	PGEL/MW	350	355.6	10	65	75	2.59	3	3.47	0.04	0.23	0.26	10.41	0.12	0.69	0.78
114	HSSA-AXS-BHL-1-B214-3-21C-HC	260	15/65	PGEL/MW	80	88.9	15	65	80	4.83	3	1.62	0.02	0.11	0.13	4.86	0.06	0.33	0.39
115	HSSA-AXS-BHL-1-B215-1.5-21C-HC	260	0/80	PGEL/MW	40	48.3	0	80	80	5.31	3	0.97	0	0.07	0.07	2.91	0	0.21	0.21
116	HSSA-AXS-BHL-1-B216-1.5-21C-HC	260	0/80	PGEL/MW	40	48.3	0	80	80	4.59	3	0.84	0	0.07	0.07	2.52	0	0.21	0.21
117	HSSA-AXS-BHL-1-B264-8-11C-HC	190	20/50	PGEL/MW	200	219.1	20	50	70	65.24	3	53.89	1.08	2.7	3.78	161.67	3.24	8.1	11.34
118	WBS-GS-BHL-1-T100-2-21C-HC		20/65	PGEL/MW	50	60.3	20	65	85	1	3	0.23	0	0.01	0.01	0.69	0	0.03	0.03
119	WBS-GS-BHL-1-T103-12-11B-HC		30/100	PGEL/MW	300	323.8	30	100	130	1.37	3	1.67	0.05	0.17	0.22	5.01	0.15	0.51	0.66
120	WBS-GS-BHL-1-T104-6-11B-HC		25/90	PGEL/MW	150	168.3	25	90	115	2.37	3	1.5	0.04	0.13	0.17	4.5	0.12	0.39	0.51
121	WBS-GS-BHL-1-T105-10-11B-HC		25/100	PGEL/MW	250	273.1	25	100	125	2.93	3	3.01	0.07	0.3	0.37	9.03	0.21	0.9	1.11
122	WBS-GS-BHL-1-T120-6-11B-HC		25/90	PGEL/MW	150	168.3	25	90	115	26.3	3	16.69	0.42	1.5	1.92	50.07	1.26	4.5	5.76
123	WBS-GS-BHL-1-T121-6-11B-HC		25/90	PGEL/MW	150	168.3	25	90	115	8.59	3	5.45	0.13	0.49	0.62	16.35	0.39	1.47	1.86
	TOTAL											**3113.9**	**71.26**	**267.2**	**338.5**	**5942.76**	**123.02**	**439.98**	**562.98**

INPUT TO E&C TENDER
PROJECT: RIL CCPP 3 x 90.3 MW STG (DMD)
WONO: 1-0-851-359-00

ESTIMATED PIPING PAINTING AREA

SL NO	LINE NUMBER	MATERIAL	WORK TEMP	NB	OD	PIPE LENGTH	NO OF UNITS	PER UNIT PAINT AREA	TOTAL PAINT AREA
			[Deg C]		[mm]	[m]		[Sq.m]	[Sq.m]
A	**INSULATED PIPES**								
1	HSAB-BSS-BHL-0-B051-10-65C-HC	AS	530	250	273.1	39.66	1	40.84	40.84
2	HSAB-BSS-BHL-0-B052-10-65C-HC	AS	530	250	273.1	1.5	1	1.55	1.55
3	HSAB-BSS-BHL-0-B053-10-65C-HC	AS	530	250	273.1	3.24	1	3.34	3.34
4	HSAB-BSS-BHL-0-B054-32-23C-HC	AS	474	800	819	1	1	3.08	3.08
5	HSAB-BSS-BHL-0-B055-32-23C-HC	AS	474	800	819	1	1	3.08	3.08
6	HSAB-HS-BHL-0-B001-20-65C-HC	AS	530	500	508	6.29	1	12.05	12.05
7	HSAB-HS-BHL-0-B002-20-65C-HC	AS	530	500	508	6.29	1	12.05	12.05
8	HSAB-HS-BHL-0-B003-20-65C-HC	AS	530	500	508	116.8	1	223.68	223.68
9	HSAB-HS-BHL-0-B004-20-65C-HC	AS	530	500	508	111.8	1	214.1	214.10
10	HSAB-HS-BHL-0-B010-4-65C-HC	AS	530	100	114.3	22.11	1	9.53	9.53
11	HSAB-HS-BHL-0-B201-1.5-65C-HC	AS	530	40	48.3	1.3	1	0.24	0.24
12	HSAB-HS-BHL-0-B202-1.5-65C-HC	AS	530	40	48.3	1.89	1	0.35	0.35
13	HSAB-HS-BHL-0-B251-3-65C-HC	AS	530	80	88.9	1.77	1	0.59	0.59
14	HSAB-HS-BHL-0-B252-3-65C-HC	AS	530	80	88.9	1	1	0.34	0.34
15	HSSA-AXS-BHL-0-B203-3-23C-HC	AS	480	80	88.9	9.31	1	3.12	3.12
16	HSSA-AXS-BHL-0-B206-3-23C-HC	AS	480	80	88.9	8.84	1	2.96	2.96
17	HSSA-AXS-BHL-0-B253-10-23C-HC	AS	475.9	250	273.1	14.26	1	14.68	14.68
18	HSSA-AXS-BHL-0-B256-10-23C-HC	AS	475.9	250	273.1	14.02	1	14.44	14.44
19	HSAB-BSS-BHL-0-B062-28-11C-HC	CS	200	700	711	139.4	1	373.64	373.64
20	HSAE-FDW-BHL-0-B651-18-61C-HC	CS	236.5	450	457	58.49	1	100.76	100.76
21	HSAE-FDW-BHL-0-B652-18-61C-HC	CS	236.5	450	457	73.67	1	126.92	126.92
22	HSAE-FDW-BHL-0-B653-18-61C-HC	CS	236.5	450	457	14.93	1	25.73	25.73
23	HSAE-FDW-BHL-0-B654-18-61C-HC	CS	236.5	450	457	14.93	1	25.73	25.73
24	HSAE-FDW-BHL-0-B655-3-51C-HC	CS	174.4	80	88.9	122.17	1	40.94	40.94
25	HSAE-FDW-BHL-0-B661-1-51C-HC	CS	174.4	25	33.4	20.46	1	2.58	2.58
26	HSAE-FDW-BHL-0-B662-1-51C-HC	CS	174.4	25	33.4	20.18	1	2.54	2.54
27	HSAE-FDW-BHL-0-B671-2-51C-HC	CS	174.4	50	60.3	16.22	1	3.68	3.68
28	HSAE-FDW-BHL-0-B671-8-11B-HC	CS	170.4	200	219.1	64.4	1	53.2	53.20
29	HSAE-FDW-BHL-0-B672-2-51C-HC	CS	174.4	50	60.3	16.22	1	3.68	3.68
30	HSAE-FDW-BHL-0-B672-8-11B-HC	CS	170.4	200	219.1	41.1	1	33.95	33.95
31	HSAE-FDW-BHL-0-B673-8-11B-HC	CS	170.4	200	219.1	9.01	1	7.44	7.44
32	HSAE-FDW-BHL-0-B674-8-11B-HC	CS	170.4	200	219.1	8.99	1	7.43	7.43
33	HSAF-BS-BHL-0-B191-6-11C-HC	CS	172	150	168.3	15.25	1	9.67	9.67
34	HSAF-BS-BHL-0-B192-6-11C-HC	CS	172	150	168.3	15.23	1	9.66	9.66
35	HSAF-BS-BHL-0-B193-6-11C-HC	CS	172	150	168.3	105.65	1	67.03	67.03
36	HSSA-AXS-BHL-0-B211-3-21C-HC	CS	260	80	88.9	24.94	1	8.36	8.36
37	HSSA-AXS-BHL-0-B212-3-21C-HC	CS	260	80	88.9	169.17	1	56.7	56.70
38	HSSA-AXS-BHL-0-B213-3-21C-HC	CS	260	80	88.9	164.95	1	55.28	55.28
39	HSSA-AXS-BHL-0-B261-10-11C-HC	CS	190	250	273.1	0.5	1	0.52	0.52
40	HSSA-AXS-BHL-0-B262-10-11C-HC	CS	190	250	273.1	43.11	1	44.39	44.39
41	HSSA-AXS-BHL-0-B263-10-11C-HC	CS	190	250	273.1	77.39	1	79.68	79.68
42	HSAB-HS-BHL-1-B005-16-65C-HC	AS	530	400	406.4	32.47	3	49.75	149.25
43	HSAB-HS-BHL-1-B006-12-65C-HC	AS	530	300	323.8	7.3	3	8.92	26.76
44	HSAB-HS-BHL-1-B007-12-65C-HC	AS	530	300	323.8	10.05	3	12.26	36.78
45	HSAB-HS-BHL-1-B008-2-65C-HC	AS	530	50	60.3	21.92	3	4.98	14.94
46	HSAB-AV-BHL-1-B009-6-11B-HC	CS		150	168.3	14.07	3	8.93	26.79
47	HSAB-BSS-BHL-1-B063-18-11C-HC	CS	200	450	457	53.25	3	91.74	275.22
48	HSAB-BSS-BHL-1-B064-12-11C-HC	CS	200	300	323.8	3.43	3	4.19	12.57
49	HSAB-BSS-BHL-1-B065-12-11C-HC	CS	200	300	323.8	2.26	3	2.76	8.28
50	HSAE-FDW-BHL-1-B601-16-11C-HC	CS	170.4	400	406.4	42.75	3	65.5	196.50
51	HSAE-FDW-BHL-1-B602-6-11B-HC	CS	170.4	150	168.3	3	3	1.91	5.73
52	HSAE-FDW-BHL-1-B603-12-11B-HC	CS	170.4	300	323.8	1.88	3	2.29	6.87
53	HSAE-FDW-BHL-1-B604-14-11B-HC	CS	170.4	350	355.6	8.05	3	10.79	32.37
54	HSAE-FDW-BHL-1-B605-12-11B-HC	CS	170.4	300	323.8	11.93	3	14.57	43.71
55	HSAE-FDW-BHL-1-B606-10-51C-HC	CS	174.4	250	273.1	10.09	3	10.39	31.17
56	HSAE-FDW-BHL-1-B607-4-51C-HC	CS	174.4	100	114.3	26.91	3	11.59	34.77
57	HSAE-FDW-BHL-1-B608-12-11B-HC	CS	170.4	300	323.8	1.88	3	2.29	6.87
58	HSAE-FDW-BHL-1-B609-14-11B-HC	CS	170.4	350	355.6	8.05	3	10.79	32.37

SL NO	LINE NUMBER	MATERIAL	WORK TEMP	NB	OD	PIPE LENGTH	NO OF UNITS	PER UNIT PAINT AREA	TOTAL PAINT AREA
			[Deg C]		[mm]	[m]		[Sq.m]	[Sq.m]
59	HSAE-FDW-BHL-1-B610-12-11B-HC	CS	170.4	300	323.8	11.93	3	14.57	43.71
60	HSAE-FDW-BHL-1-B611-10-51C-HC	CS	174.4	250	273.1	10.09	3	10.39	31.17
61	HSAE-FDW-BHL-1-B612-4-51C-HC	CS	174.4	100	114.3	30.91	3	13.32	39.96
62	HSAE-FDW-BHL-1-B613-12-11B-HC	CS	170.4	300	323.8	1.88	3	2.29	6.87
63	HSAE-FDW-BHL-1-B614-14-11B-HC	CS	170.4	350	355.6	8.05	3	10.79	32.37
64	HSAE-FDW-BHL-1-B615-12-11B-HC	CS	170.4	300	323.8	11.93	3	14.57	43.71
65	HSAE-FDW-BHL-1-B616-10-51C-HC	CS	174.4	250	273.1	11.32	3	11.65	34.95
66	HSAE-FDW-BHL-1-B617-4-51C-HC	CS	174.4	100	114.3	26.91	3	11.59	34.77
67	HSAE-FDW-BHL-1-B618-14-51C-HC	CS	174.4	350	355.6	7.44	3	9.97	29.91
68	HSAE-FDW-BHL-1-B619-14-51C-HC	CS	174.4	350	355.6	50.6	3	67.84	203.52
69	HSAE-FDW-BHL-1-B620-14-51C-HC	CS	202.9	350	355.6	32.34	3	43.36	130.08
70	HSAE-FDW-BHL-1-B621-14-61C-HC	CS	236.5	350	355.6	41.68	3	55.87	167.61
71	HSAE-FDW-BHL-1-B622-3-51C-HC	CS	174.4	80	88.9	70.88	3	23.76	71.28
72	HSAF-BS-BHL-1-B194-6-11C-HC	CS	172	150	168.3	72.46	3	45.97	137.91
73	HSAF-EXS-BHL-1-B006-8-21C-HC	CS	312.3	200	219.1	13.67	3	11.29	33.87
74	HSAF-EXS-BHL-1-B301-8-21C-HC	CS	338.7	200	219.1	23.8	3	19.66	58.98
75	HSAF-EXS-BHL-1-B303-10-21C-HC	CS	262.6	250	273.1	35.38	3	36.42	109.26
76	HSAF-EXS-BHL-1-B305-10-11C-HC	CS	196.5	250	273.1	7.02	3	7.22	21.66
77	HSAF-EXS-BHL-1-B306-10-11C-HC	CS	196.5	250	273.1	7.47	3	7.69	23.07
78	HSAF-EXS-BHL-1-B307-14-11C-HC	CS	196.5	350	355.6	1	3	1.34	4.02
79	HSAF-EXS-BHL-1-B308-14-11C-HC	CS	196.5	350	355.6	17.91	3	24.01	72.03
80	HSAF-EXS-BHL-1-B309-8-11C-HC	CS	196.5	200	219.1	13.11	3	10.82	32.46
81	HSAF-EXS-BHL-1-B312-16-11C-HC	CS	142.98	400	406.4	3.48	3	5.33	15.99
82	HSAF-EXS-BHL-1-B313-16-11C-HC	CS	142.98	400	406.4	3.48	3	5.33	15.99
83	HSAF-EXS-BHL-1-B314-24-11C-HC	CS	142.98	600	610	1	3	2.3	6.90
84	HSAF-EXS-BHL-1-B316-20-11C-HC	CS	107.33	500	508	2.86	3	5.47	16.41
85	HSAF-EXS-BHL-1-B317-20-11C-HC	CS	107.33	500	508	2.86	3	5.47	16.41
86	HSAF-EXS-BHL-1-B318-30-11C-HC	CS	107.33	750	762	27.71	3	79.6	238.80
87	HSAF-EXS-BHL-1-B320-30-11C-HC	CS	78.17	750	762	5.17	3	14.86	44.58
88	HSAF-EXS-BHL-1-B321-30-11C-HC	CS	78.17	750	762	5.17	3	14.86	44.58
89	HSAF-EXS-BHL-1-B322-44-11C-HC	CS	78.17	1100	1118	26.71	3	112.57	337.71
90	HSAF-HD-BHL-1-B701-6-21B-HC	CS	208.8	150	168.3	19.39	3	12.3	36.90
91	HSAF-HD-BHL-1-B702-6-21B-HC	CS	204.3	150	168.3	6.98	3	4.43	13.29
92	HSAF-HD-BHL-1-B703-6-21B-HC	CS	208.8	150	168.3	4.03	3	2.56	7.68
93	HSAF-HD-BHL-1-B704-6-21B-HC	CS	170.4	150	168.3	6.14	3	3.9	11.70
94	HSAF-HD-BHL-1-B705-6-21B-HC	CS	208.8	150	168.3	4.58	3	2.9	8.70
95	HSAF-HD-BHL-1-B706-8-21B-HC	CS	208.8	200	219.1	19.02	3	15.71	47.13
96	HSAF-HD-BHL-1-B708-6-21B-HC	CS	180.4	150	168.3	4.03	3	2.56	7.68
97	HSAF-HD-BHL-1-B709-6-21B-HC	CS	180.4	150	168.3	8.39	3	5.33	15.99
98	HSAF-HD-BHL-1-B710-6-21B-HC	CS	180.4	150	168.3	4.58	3	2.9	8.70
99	HSAF-HD-BHL-1-B711-8-21B-HC	CS	180.4	200	219.1	17.16	3	14.17	42.51
100	HSAF-HD-BHL-1-B714-36-11B-HC	CS		900	914	5.46	3	18.82	56.46
101	HSAF-HD-BHL-1-B751-6-11B-HC	CS	110.3	150	168.3	3.88	3	2.46	7.38
102	HSAF-HD-BHL-1-B753-6-11B-HC	CS	110.3	150	168.3	5.94	3	3.77	11.31
103	HSAF-HD-BHL-1-B754-8-11B-HC	CS	110.3	200	219.1	10.76	3	8.89	26.67
104	HSAF-HD-BHL-1-B755-8-11B-HC	CS	81.1	200	219.1	3.99	3	3.3	9.90
105	HSAF-HD-BHL-1-B757-8-11B-HC	CS	81.1	200	219.1	5.64	3	4.66	13.98
106	HSAF-HD-BHL-1-B758-10-11B-HC	CS	81.1	250	273.1	10.99	3	11.32	33.96
107	HSAF-HD-BHL-1-B759-10-11B-HC	CS	78	250	273.1	28.86	3	29.71	89.13
108	HSAF-HD-BHL-1-B760-10-11B-HC	CS	78	250	273.1	14.75	3	15.19	45.57
109	HSSA-AXS-BHL-1-B004-14-11C-HC	CS	220	350	355.6	2.59	3	3.47	10.41
110	HSSA-AXS-BHL-1-B214-3-21C-HC	CS	260	80	88.9	4.83	3	1.62	4.86
111	HSSA-AXS-BHL-1-B215-1.5-21C-HC	CS	260	40	48.3	5.31	3	0.97	2.91
112	HSSA-AXS-BHL-1-B216-1.5-21C-HC	CS	260	40	48.3	4.59	3	0.84	2.52
113	HSSA-AXS-BHL-1-B264-8-11C-HC	CS	190	200	219.1	65.24	3	53.89	161.67
114	WBS-GS-BHL-1-T100-2-21C-HC	CS		50	60.3	1	3	0.23	0.69
115	WBS-GS-BHL-1-T103-12-11B-HC	CS		300	323.8	1.37	3	1.67	5.01
116	WBS-GS-BHL-1-T104-6-11B-HC	CS		150	168.3	2.37	3	1.5	4.50
117	WBS-GS-BHL-1-T105-10-11B-HC	CS		250	273.1	2.93	3	3.01	9.03
118	WBS-GS-BHL-1-T120-6-11B-HC	CS		150	168.3	26.3	3	16.69	50.07
119	WBS-GS-BHL-1-T121-6-11B-HC	CS		150	168.3	8.59	3	5.45	16.35
120	HSAD-CDD-BHL-1-B513-14-22B-HC	SS	75.5	350	355.6	33.5	3	44.9	134.70
121	HSAD-CDD-BHL-1-B514-14-22B-HC	SS	104.7	350	355.6	49.47	3	66.32	198.96
122	HSAD-CDD-BHL-1-B515-14-22B-HC	SS	140.1	350	355.6	4.48	3	6	18.00
123	HSAD-CDD-BHL-1-B516-14-22B-HC	SS	140.1	350	355.6	21.73	3	29.14	87.42

SL NO	LINE NUMBER	MATERIAL	WORK TEMP	NB	OD	PIPE LENGTH	NO OF UNITS	PER UNIT PAINT AREA	TOTAL PAINT AREA
			[Deg C]		[mm]	[m]		[Sq.m]	[Sq.m]
	INSULATED PIPES - TOTAL							**3113.94**	**5942.76**
B	**UNINSULATED PIPES**								
1	WCR-BHL-0-B013-44-11D	CS		1000	1016	4.44	1	17	17.00
2	WCR-BHL-0-B014A-28-11D	CS		700	711	2.31	1	6.19	6.19
3	WCR-BHL-0-B014B-28-11D	CS		700	711	2.31	1	6.19	6.19
4	WCR-BHL-0-B014C-28-11D	CS		700	711	2.31	1	6.19	6.19
5	WCR-BHL-0-B073B-10-11D	CS		250	273.1	11.72	1	12.07	12.07
6	WCR-BHL-0-B074A-14-11D	CS		350	355.6	43.64	1	58.5	58.50
7	WCR-BHL-0-B074B-24-11D	CS		600	610	71.92	1	165.4	165.40
8	WCR-BHL-0-B074C-20-11D	CS		500	508	98.71	1	189.04	189.04
9	WCR-BHL-0-B074D-14-11D	CS		350	355.6	43.99	1	58.97	58.97
10	WCR-BHL-0-B116-44-11D	CS		1000	1016	14.06	1	53.86	53.86
11	WCS-BHL-0-B001A-24-11D	CS		600	610	3.69	1	8.48	8.48
12	WCS-BHL-0-B001B-24-11D	CS		600	610	3.69	1	8.48	8.48
13	WCS-BHL-0-B001C-24-11D	CS		600	610	3.69	1	8.48	8.48
14	WCS-BHL-0-B002A-30-11D	CS		750	762	34.48	1	99.05	99.05
15	WCS-BHL-0-B002C-30-11D	CS		750	762	40.6	1	116.63	116.63
16	WCS-BHL-0-B007-24-11D	CS		600	610	61.78	1	142.07	142.07
17	WCS-BHL-0-B008-20-11D	CS		500	508	77.87	1	149.12	149.12
18	WCS-BHL-0-B009A-6-11D	CS		150	168.3	11.23	1	7.13	7.13
19	WCS-BHL-0-B010A-3-11D	CS		80	88.9	3.59	1	1.2	1.20
20	WCS-BHL-0-B011A-3-11D	CS		80	88.9	3.59	1	1.2	1.20
21	WCS-BHL-0-B012A-3-11D	CS		80	88.9	3.59	1	1.2	1.20
22	WCS-BHL-0-B073A-10-11D	CS		250	273.1	10.74	1	11.05	11.05
23	WCS-BHL-0-B076-14-11D	CS		350	355.6	43.64	1	58.5	58.50
24	WCS-BHL-0-B115-14-11D	CS		350	355.6	43.99	1	58.97	58.97
25	HSAD-CDD-BHL-0-B579-3-22B-NI	SS	48.5	80	88.9	37.71	1	12.64	12.64
26	HSAD-CDD-BHL-0-B580-3-22B-NI	SS	48.5	80	88.9	62.73	1	21.02	21.02
27	HSAD-CDD-BHL-0-B581-4-22B-NI	SS	48.5	100	114.3	41.8	1	18.01	18.01
28	HSAD-CDD-BHL-0-B582-4-22B-NI	SS	48.5	100	114.3	11.43	1	4.92	4.92
29	HSAD-CDD-BHL-1-B403-16-11B-NI	CS	47.3	400	406.4	1.25	3	1.92	5.76
30	HSAD-CDD-BHL-1-B404-16-11B-NI	CS	47.3	400	406.4	3.19	3	4.88	14.64
31	HSAD-CDD-BHL-1-B405-16-11B-NI	CS	47.3	400	406.4	3.19	3	4.88	14.64
32	HSAD-CDD-BHL-1-B406-10-11B-NI	CS	47.3	250	273.1	1.69	3	1.74	5.22
33	HSAD-CDD-BHL-1-B407-10-11B-NI	CS	47.3	250	273.1	1.69	3	1.74	5.22
34	HSAD-CDD-BHL-1-B408-10-11B-NI	CS	47.3	250	273.1	11.88	3	12.23	36.69
35	HSAD-CDD-BHL-1-B409-10-11B-NI	CS	49.2	250	273.1	7	3	7.21	21.63
36	HSAD-CDD-BHL-1-B410-3-11B-NI	CS	49.2	80	88.9	6.17	3	2.06	6.18
37	HSAD-CDD-BHL-1-B4XX-10-11B-NI	CS	47.3	250	273.1	14.5	3	14.93	44.79
38	HSAD-VA-BHL-1-B411-4-11B-NI	CS		100	114.3	13.27	3	5.72	17.16
39	HSAD-VA-BHL-1-B412-4-11B-NI	CS		100	114.3	8.6	3	3.71	11.13
40	HSAD-VA-BHL-1-B413-6-11B-NI	CS		150	168.3	11.52	3	7.31	21.93
41	HSAD-VA-BHL-1-B416-10-11B-NI	CS		250	273.1	3.89	3	4.01	12.03
42	HSAD-VA-BHL-1-B4X1-6-11B-NI	CS		150	168.3	4.08	3	2.59	7.77
43	HSAD-VA-BHL-1-B4X2-6-11B-NI	CS		150	168.3	4.08	3	2.59	7.77
44	LO-BHL-1-T027-8-11A	CS		200	219.1	2.47	3	2.04	6.12
45	LO-BHL-1-T028-8-11A	CS		200	219.1	5.51	3	4.55	13.65
46	LO-BHL-1-T029-6-11A	CS		150	168.3	5.88	3	3.73	11.19
47	LO-BHL-1-T030-6-11A	CS		150	168.3	5.9	3	3.74	11.22
48	LO-BHL-1-T032-10-11A	CS		250	273.1	7.92	3	8.16	24.48
49	LO-BHL-1-T034-4-11A	CS		100	114.3	29.52	3	12.72	38.16
50	WCR-BHL-1-B020-4-11D	CS		100	114.3	0.24	3	0.11	0.33
51	WCR-BHL-1-B021-4-11D	CS		100	114.3	0.24	3	0.11	0.33
52	WCR-BHL-1-B022-4-11D	CS		100	114.3	35.8	3	15.43	46.29
53	WCR-BHL-1-B026-3-11D	CS		80	88.9	2.72	3	0.91	2.73
54	WCR-BHL-1-B027-3-11D	CS		80	88.9	2.75	3	0.92	2.76
55	WCR-BHL-1-B028-3-11D	CS		80	88.9	47	3	15.76	47.28
56	WCR-BHL-1-B030-8-11D	CS		200	219.1	26.8	3	22.14	66.42
57	WCR-BHL-1-B034-2-11D	CS		50	60.3	4.13	3	0.94	2.82
58	WCR-BHL-1-B035-2-11D	CS		50	60.3	4.14	3	0.94	2.82
59	WCR-BHL-1-B036-2-11D	CS		50	60.3	24.89	3	5.66	16.98
60	WCR-BHL-1-B043-2-11D	CS		50	60.3	3.96	3	0.9	2.70
61	WCR-BHL-1-B044-2-11D	CS		50	60.3	3.96	3	0.9	2.70
62	WCR-BHL-1-B045-2-11D	CS		50	60.3	3.96	3	0.9	2.70
63	WCR-BHL-1-B048-3-11D	CS		80	88.9	15.31	3	5.14	15.42

SL NO	LINE NUMBER	MATERIAL	WORK TEMP	NB	OD	PIPE LENGTH	NO OF UNITS	PER UNIT PAINT AREA	TOTAL PAINT AREA
			[Deg C]		[mm]	[m]		[Sq.m]	[Sq.m]
64	WCR-BHL-1-B056-4-11D	CS		100	114.3	3.6	3	1.55	4.65
65	WCR-BHL-1-B062-4-11D	CS		100	114.3	4.03	3	1.74	5.22
66	WCR-BHL-1-B065-4-11D	CS		100	114.3	12.3	3	5.3	15.90
67	WCR-BHL-1-B072-6-11D	CS		150	168.3	7.54	3	4.79	14.37
68	WCR-BHL-1-B083-4-11D	CS		100	114.3	3.6	3	1.55	4.65
69	WCR-BHL-1-B089-4-11D	CS		100	114.3	4.03	3	1.74	5.22
70	WCR-BHL-1-B092-4-11D	CS		100	114.3	12.3	3	5.3	15.90
71	WCR-BHL-1-B095-6-11D	CS		150	168.3	7.54	3	4.79	14.37
72	WCR-BHL-1-B101-4-11D	CS		100	114.3	3.6	3	1.55	4.65
73	WCR-BHL-1-B108-4-11D	CS		100	114.3	4.03	3	1.74	5.22
74	WCR-BHL-1-B111-4-11D	CS		100	114.3	12.3	3	5.3	15.90
75	WCR-BHL-1-B115-6-11D	CS		150	168.3	7.54	3	4.79	14.37
76	WCR-BHL-1-B507-14-11D	CS		350	355.6	128.21	3	171.88	515.64
77	WCR-BHL-1-B510-36-11D	CS		900	914	17.39	3	59.92	179.76
78	WCR-BHL-1-B511-36-11D	CS		900	914	1	3	3.44	10.32
79	WCR-BHL-2-B507-14-11D	CS		350	355.6	84.04	3	112.67	338.01
80	WCR-BHL-3-B507-14-11D	CS		350	355.6	54.51	3	73.08	219.24
81	WCR-BHL-4-B507-14-11D	CS		350	355.6	100.87	3	135.23	405.69
82	WCS-BHL-0-B003A-18-11D	CS		450	457	0.5	3	0.86	2.58
83	WCS-BHL-0-B003B-18-11D	CS		450	457	0.5	3	0.86	2.58
84	WCS-BHL-0-B004A-18-11D	CS		450	457	0.5	3	0.86	2.58
85	WCS-BHL-0-B004B-18-11D	CS		450	457	0.5	3	0.86	2.58
86	WCS-BHL-0-B005A-18-11D	CS		450	457	0.5	3	0.86	2.58
87	WCS-BHL-0-B005B-18-11D	CS		450	457	0.5	3	0.86	2.58
88	WCS-BHL-0-B006A-18-11D	CS		450	457	0.5	3	0.86	2.58
89	WCS-BHL-0-B006B-18-11D	CS		450	457	0.63	3	1.08	3.24
90	WCS-BHL-1-B017-4-11D	CS		100	114.3	37.92	3	16.34	49.02
91	WCS-BHL-1-B018-4-11D	CS		100	114.3	2.09	3	0.9	2.70
92	WCS-BHL-1-B019-4-11D	CS		100	114.3	0.95	3	0.41	1.23
93	WCS-BHL-1-B023-3-11D	CS		80	88.9	49.1	3	16.45	49.35
94	WCS-BHL-1-B024-3-11D	CS		80	88.9	3.06	3	1.02	3.06
95	WCS-BHL-1-B025-3-11D	CS		80	88.9	3.08	3	1.03	3.09
96	WCS-BHL-1-B029-8-11D	CS		200	219.1	28.74	3	23.74	71.22
97	WCS-BHL-1-B031-2-11D	CS		50	60.3	26.39	3	6	18.00
98	WCS-BHL-1-B032-2-11D	CS		50	60.3	4.16	3	0.95	2.85
99	WCS-BHL-1-B033-2-11D	CS		50	60.3	4.17	3	0.95	2.85
100	WCS-BHL-1-B037-3-11D	CS		80	88.9	14.11	3	4.73	14.19
101	WCS-BHL-1-B040-2-11D	CS		50	60.3	4.49	3	1.02	3.06
102	WCS-BHL-1-B041-2-11D	CS		50	60.3	4.49	3	1.02	3.06
103	WCS-BHL-1-B042-2-11D	CS		50	60.3	4.49	3	1.02	3.06
104	WCS-BHL-1-B052-4-11D	CS		100	114.3	4.71	3	2.03	6.09
105	WCS-BHL-1-B058-4-11D	CS		100	114.3	4.92	3	2.12	6.36
106	WCS-BHL-1-B064-4-11D	CS		100	114.3	16.54	3	7.13	21.39
107	WCS-BHL-1-B070-6-11D	CS		150	168.3	6.83	3	4.33	12.99
108	WCS-BHL-1-B075-6-11D	CS		150	168.3	6.83	3	4.33	12.99
109	WCS-BHL-1-B079-4-11D	CS		100	114.3	4.71	3	2.03	6.09
110	WCS-BHL-1-B085-4-11D	CS		100	114.3	4.92	3	2.12	6.36
111	WCS-BHL-1-B091-4-11D	CS		100	114.3	16.54	3	7.13	21.39
112	WCS-BHL-1-B099-4-11D	CS		100	114.3	4.71	3	2.03	6.09
113	WCS-BHL-1-B106-4-11D	CS		100	114.3	4.92	3	2.12	6.36
114	WCS-BHL-1-B110-4-11D	CS		100	114.3	16.54	3	7.13	21.39
115	WCS-BHL-1-B114-6-11D	CS		150	168.3	6.83	3	4.33	12.99
116	WCS-BHL-1-B501-18-11D	CS		450	457	8.64	3	14.88	44.64
117	WCS-BHL-1-B502-18-11D	CS		450	457	3.54	3	6.1	18.30
118	WCS-BHL-1-B503-18-11D	CS		450	457	8.17	3	14.08	42.24
119	WCS-BHL-1-B504-14-11D	CS		350	355.6	2.54	3	3.41	10.23
120	WCS-BHL-1-B505-14-11D	CS		350	355.6	7.47	3	10.02	30.06
121	WCS-BHL-1-B506-14-11D	CS		350	355.6	135.65	3	181.85	545.55
122	WCS-BHL-1-B508-36-11D	CS		900	914	7.67	3	26.42	79.26
123	WCS-BHL-1-B509-36-11D	CS		900	914	7.67	3	26.42	79.26
124	WCS-BHL-2-B506-14-11D	CS		350	355.6	95.15	3	127.56	382.68
125	WCS-BHL-3-B506-14-11D	CS		350	355.6	54.02	3	72.42	217.26
126	WCS-BHL-4-B506-14-11D	CS		350	355.6	93.58	3	125.45	376.35
127	HSAD-CDD-BHL-1-B501-20-12B-NI	SS	39.5	500	508	18.32	3	35.09	105.27
128	HSAD-CDD-BHL-1-B502-14-12B-NI	SS	39.5	350	355.6	1.23	3	1.64	4.92
129	HSAD-CDD-BHL-1-B503-14-12B-NI	SS	39.5	350	355.6	1.23	3	1.64	4.92

SL NO	LINE NUMBER	MATERIAL	WORK TEMP	NB	OD	PIPE LENGTH	NO OF UNITS	PER UNIT PAINT AREA	TOTAL PAINT AREA
			[Deg C]		[mm]	[m]		[Sq.m]	[Sq.m]
130	HSAD-CDD-BHL-1-B504-14-12B-NI	SS	39.5	350	355.6	1.23	3	1.64	4.92
131	HSAD-CDD-BHL-1-B505-6-22B-NI	SS	39.5	150	168.3	30.97	3	19.64	58.92
132	HSAD-CDD-BHL-1-B506-6-22B-NI	SS	39.5	150	168.3	29.01	3	18.41	55.23
133	HSAD-CDD-BHL-1-B507-6-22B-NI	SS	39.5	150	168.3	27.6	3	17.51	52.53
134	HSAD-CDD-BHL-1-B508-10-22B-NI	SS	39.5	250	273.1	1.09	3	1.13	3.39
135	HSAD-CDD-BHL-1-B509-10-22B-NI	SS	39.5	250	273.1	1.09	3	1.13	3.39
136	HSAD-CDD-BHL-1-B510-10-22B-NI	SS	39.5	250	273.1	1.09	3	1.13	3.39
137	HSAD-CDD-BHL-1-B511-14-22B-NI	SS	39.5	350	355.6	36.04	3	48.31	144.93
138	HSAD-CDD-BHL-1-B512-14-22B-NI	SS	45.6	350	355.6	25.86	3	34.67	104.01
139	HSAD-CDD-BHL-1-B576-3-22B-NI	SS	39.5	80	88.9	6.27	3	2.1	6.30
140	HSAD-CDD-BHL-1-B577-2-22B-NI	SS	39.5	50	60.3	57.09	3	12.98	38.94
141	HSAD-CDD-BHL-1-B578-1.5-22B-NI	SS	39.5	40	48.3	38.51	3	7.01	21.03
142	LO-BHL-1-T012-4-12A	SS		100	114.3	7.7	3	3.31	9.93
143	LO-BHL-1-T022-2-12A	SS		50	60.3	4.94	3	1.13	3.39
144	LO-BHL-1-T023-3-12A	SS		80	88.9	5.1	3	1.7	5.10
145	LO-BHL-1-T024-2-12A	SS		50	60.3	7.41	3	1.68	5.04
146	LO-BHL-1-T025-1.5-12A	SS		40	48.3	7.66	3	1.39	4.17
147	LO-BHL-1-T026-1.5-12A	SS		40	48.3	7.66	3	1.39	4.17
148	LO-BHL-1-T033-4-12A	SS		100	114.3	28.59	3	12.32	36.96
	UNINSULATED PIPES - TOTAL							**3046.21**	**6535.51**

	ALL PIPES - TOTAL							**6160.15**	**12478.27**