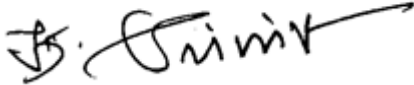




BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirappalli - 620 014



BHUSAWAL THERMAL POWER PLANT, 1 X 660 MW
M/s. MAHAGENCO, JALGOAN DIST., MAHARASHTRA
CUSTOMER NO. U6/1727, UNIT-6
PAINTING SCHEDULE

Prepared by	K. Srinivasan Senior Engineer/ Plant Lab		Document No: PL: C3 - PS / 1727
Reviewed by	D. Vijayakumar SM /PE/FB		Revision No: 00 Dated: 11-06-2018
Approved by	A. Santha kumari AGM / Plant Lab		Sheet No. 01 of 11

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RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	11-06-2018	New	Prepared in line with MAHAGENCO Bid Specification. No. DG/BSL U-6/2011/ T-1 & clarifications to Bidding Documents.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1 PS1AC	Collector & Separator Vessels (Except Internals), Supports 04-147,321,547;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 μm per coat	1	--	--	Synthetic enamel paint (Long Oil Alkyd) to IS2932 (DFT = 20 μm /coat)	2	International orange Shade No: 592 of IS 5	70
2 PSSB	Collector & Separator Vessels Internals & foundation materials 04-347; Machined components and threaded surfaces (Dd items): 07-302,303,309,331,360,361,362,393;09-303,304; 12-306,314,317,324,327,328,344,348,354,393; 17-304,306,319;19-304,306,307;21-602,605; 24-352,803,818,823,827,842;28-700; 32-700; 35-010,190,700; 39-012,700; 41-710;42-700,710; 43-710;45-710;47-710;48-019;65-710;67-710;	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20 μm per coat	2	--	--	--	--	--	40
3 PS 1JT	<u>Buck stays</u> 08-001,003,006,007,111,501,503,901, 08-910;34-100,200,300; <u>Boiler supporting structures,</u> <u>Columns, Girders, Bracings</u> 35-211,212,213,214,221,222,231,232; 35-311,312,321,322,331,332,341,342,351; 35-352,361,362, 381,382; 35-383, 390,441,442; 35-443, 451,452,453; 35-511,512,513;35-521,522,523; 35-531,532,533,993,995;	Blast cleaning to SA2 ½ or SSPC-SP10 (Near white metal) with surface profile 35 μ	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 35 μm per coat	2	--	--	#Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 25 μm per coat # Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20 μm per coat	2* 1	Light Grey Shade No: 631 of IS5	140

Out of 3 coats of finish paint, *first coat of synthetic enamel finish paint to 25 microns shall be given at shop / subcontracting works. Second coat of synthetic enamel finish to 25 microns and third coat of synthetic enamel paint to 20 microns shall be applied at site.

S. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
3 PS 1JT (continuation)	36-110,150,311,312,313,314; 36-315,316,321,322,323,324,325, 36-326,331,613,993; <u>Galleries, Stair-ways & inter connecting Walkways</u> 36-332,333,334,335, 341,342; 36-343,344,345,351,352,353,354,355; 36-361,362,363; 36-391,392,393,394; 36-395,610,620,740; 38-210,299,310; 38-381,410,510,610,710,993; 39-101,102, 39-141,142,150, 300,301,304,305,306,993; 48-015,115,225,265,385,435,465,485,495; 48-665,911,912;	Blast cleaning to SA2 ½ or SSPC-SP10 (Near white metal) with surface profile 35 μ	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 35 μm per coat	2	--	--	#Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 25 μm per coat # Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20 μm per coat	2* 1	Light Grey Shade No: 631 of IS5	140
4 PS3	Components >95° C Insulated other than components in Sl.No.6 &8 Ring Headers, Down Comers, Hot air Headers outside the gas path etc. 05-155,227,231,251,327,330,350; 07-110,125,223,231,232; 10-174,178,191,274,278,283,284, 10-285,291;12-178,900; 15-136,178;15-236,278;17-504,807,900; 18-001,010;19-701,702,753,903;21-600; 24-800,805,806,807,808,809,811,815; 32-010,210,810; 33-970; 37-010; 42-020,030,128,150,158; <u>Hot Air:</u> 48-202, 207,208,212,214, 48-222,224,232,234,262,264,267,662,664,667. <u>Flue Gas:</u> 48-372,382,384,386,432,434 48-462,464,482, 484,492,494;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 μm per coat	2	--	--	No paint	No paint	Red oxide	60

Out of 3 coats of finish paint, *first coat of synthetic enamel finish paint to 25 microns shall be given at shop / subcontracting works. Second coat of synthetic enamel finish to 25 microns and third coat of synthetic enamel paint to 20 microns shall be applied at site.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
5 PS9	Components >95° C and <400°C uninsulated other than components coming in gas path. 20-511; 24-820,824,835,860,865,867; 42-200,300,358;48-200,915;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 μm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 μm per coat	1	Aluminum	40
6 PS10	<u>Components uninsulated other than components coming in gas path.</u> Temp: >400°C & <600°C 09-003,004,005,503; 28-220;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 μm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 μm per coat	1	Aluminum	40
7 PS2	Loose tubes, SH, RH & Eco. coils, 11-074,078,374,378,406,416,467, 11-487,606,608,684,694,716,718, 11-767; 11-769,787,791,916,918,967,969,987,991; 12-184,187,368,405,514,515; 12-524,544,554,803,805;12-852,903,914,917; 12-924,927,928,944,948,954,968; 16-079,201,202,203,270,379; 19-402,802,814,824,884; 19-914,924,984;	SSPC – SP2 or SSPC – SP3 Hand tool / Power tool cleaning	Red Oxide Zinc Phosphate Dip coat primer to PR: CHEM: 09 – 03 DFT=35 μm per coat	1*	--	--	No paint	No paint	Red Oxide	35

*-In lieu of dip painting, 2 coats of brush painting of Red oxide Zinc Phosphate primer to a coating thickness of 60 μ is also permitted in line with Sr.No.9.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
8 PS1A	<p>Miscellaneous casing sheets, fuel piping, duct plates, expansion joints and coal handling items</p> <p>07-409,431,460,461,462,502,503,531,560; 12-906,907;21-601,604,700; 24-350,700,804; 24-817,822,825,826,836,837,840; 24-841,855,950,955,960; 30-219,233,234,235; 36-611, 621; 38-611; 39-302; 41-350,390,500; 42-001,002,005,010,046,065,070; 42-120,152,154; 42-157;43-004,005,104,105,200;45-200,801; 45-802,804,805,858;47-261,263,858;</p> <p><u>Cold Air</u> 48-012,014,018,112,114,141;</p> <p><u>Tempering Air:</u> 48-142,144,145,204,205; 65-736;67-204,272,276,283,801,802,803; 95-088,089,091,485;96-186;97-585,591,592;</p> <p>Handling equipments: 99-099,100,300,400,600;</p>	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 μm per coat	1	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20 μm per coat	2	Smoke Grey Shade No: 692 of IS5	70

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
9 PS3	Components >95° C coming in the gas path, Headers, Commissioning Spares & erection Materials, Miscellaneous materials etc., 05-137,147;06-400,401, 434,437; 06-451,453,455,500,501,731,732; 06-734, 737,741,744, 747,751,752; 06-753,755;07-315,316,318,423,993; 10-182,183,184,185;11-408,491; 12-850,993; 17-506;19-763,783,793,850,851,852,853; 20-998;24-993; 30-215; 30-103,223,224; 31-010,104; 34-390,400,500; 35-111,112,121,122,130,140,150; 36-130,327;42-858; 48-993;65-200;67-200;97-282,590; 20-988;21-987,988;24-987,988; 24-989;41-988;42-988;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 μm per coat	2	--	--	No paint	No paint	Red oxide	60
10 PS6	Hand rails and posts, ladders / rungs 34 - 820,850; 35 - 821,822, 823,851; 36 -820,851,852,853; 38 - 820,850;39 - 820,850; Floor Grills, Guard plates 34-810;35 -811;36-811,812,813,814; 38 -810;39 – 810;	Acid pickling to SSPC-SP8	Hot dip Galvanizing to a coating weight of 610 g/m ² (minimum) Refer Notes given below **							

Notes **: Guard plates, Hood Ladders, Stringer channels, angles and plates shall be painted as per painting scheme prescribed in Sl. No: 03

PAINTING SCHEME FOR VALVES

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT μ m (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
11	Cast carbon steel valves (Conventional) Cast alloy steel valves (Conventional) All API valves, QCNRV, SV & SRV Silencers, 24-885; 21-800,825; Safety valves & ERV 21-850; 24-880,881;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I/DFT 20 μ m per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I/DFT 20 μ m per coat	1	Aluminium	40
-	Forged valves	Chemical cleaning	Phosphating to a coating weight of 1500 mg per sq.ft.	--	--	--	--	--	--	--
12	Soot Blower components (Outside surface – shell) 20-051,054,201,204,794,962;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 μ m per coat	2	--	--	Syn. Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20 μ m per coat	2	Verdigris Green Shade No. 280 of IS5	100
PS 1AS	HP / LP system	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I 20 μ m per coat	2	--	--	--	--	--	40

Sl.No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
13 PS15	For CLH & VLH* PGs 07,08,12,17,19,21,24,47,48 &80 07-402,403,405,505;12-506; 17-904,906,919; 19-506,507,904,905,906,907; 24-351,353,810; 48-206,395;	Abrasive blast cleaning to Sa2½ 35- 50 μm	Epoxy zinc rich Primer to IS 14589 Gr II % VS = 35(min)	1 DFT =40 μm Per coat	--	--	Aliphatic acrylic poly-urethane paint % VS = 35(min)	1 DFT= 30 μm Per coat	Phirozi blue Shade No. 176 of IS 5	70
14 PS8A	Components >95 C & < 150 C, un-insulated Fuel pipes 47-269;	SSPC-SP3/ Power Tool Cleaning	General purpose Aluminium paint to IS 2339 DFT= 20 μm per coat	1	--	--	General purpose Aluminium paint to IS 2339 DFT= 20 μm per coat	1	Aluminum	40
15 PS 5B	All Columns below '0' level (embedded in concrete) PGs 34, 35,36,38 39	SSPC-SPI/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20 μm per coat	2	--	--	--	--	--	40

*- For components other than CLH & VLH, Painting scheme shall be as given in Sl. No. 8.

NOTES:

1. Rust Preventive Coating should be given on HSFG Bolt and nut threads.
2. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves, machined surfaces and retainers shall be coated with Temporary Rust Preventive Fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
3. Ground shade/ colour of Finish paints & identification tag/Band for equipments, pipings pipe service, boiler supporting structures and other boiler components shall be followed.
4. Refer respective engineering document for all sub-vendor items not covered under this document.
5. No painting is required for Stainless Steel, non-ferrous & galvanized components. Abrasive blast cleaning to SSPC-SP6 (Sa2) shall be done to prepare the surfaces of hot worked pipes prior to application of primer.
6. Wherever inside surfaces of components under PGMA 48 – XXX & others, need protection till erection, two coats of Red-oxide zinc phosphate primer paint to IS12744 to a DFT of 60 microns followed by 1 coat of synthetic enamel paint to IS 2932 – shade smoke grey shall be applied, after blast cleaning. For items meant for spares and subcontracting where no further processing is involved, the painting scheme selected shall be the same as that of similar product configuration/ description.
07. The Temporary Rust Preventive coating that already been applied on any components, tubes, pipes etc., shall be visually inspected for good adherence. If the coating is intact, direct coating of alkyd based red oxide paints over the coating is permitted. In case the coating has peeled off over a large area, the coating is to be removed by suitable solvents / heating to 350 –400 °C for an hour before primer paint application –but, in this case, it should be ensured that the minimum surface cleanliness required for primer paint application shall be SSPC – SP2 (equivalent – Hand Tool cleaning).
08. In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods of <25mm/tubes/drain pipes are used, power tool / hand tool cleaning to SSPC – SP3 shall be followed and the painting shall be done as described in Sl.No.8.
09. For all commissioning components-erection materials (xx-993) two coats of Redoxide Zinc Phosphate Primer shall be applied to meet the temporary protection till erection, after power tool cleaning. This painting Schedule is valid for only Customer No: U6/1727- 1X660 MW BOILER for MAHAGENCO BHUSAWAL TPP.
10. Touch-up painting of damaged areas shall be carried out as per clause no. 15.1 of Page. No. 80 of 555 of Section – 4, Volume – II, master specifications of bid specification no. DG/BSL U-6/2011/ T-1.
11. All components covered under different PGMA's are to be painted in case any component is left out, the same shall be deemed to be included under the relevant section based on paint logic approved.
12. For very small components like clamps etc. Sl.no.8 shall be followed with power tool cleaning.
13. Only weldable primer 2 coats to a DFT of 50 μ (2x25 μ) shall be applied on both external and internal surfaces within 50mm from the end of the component to be welded subsequently at site. At those locations no other paint shall be applied. All small components (less than 300x300 mm in dimension) shall be given only weldable primer.
14. DUs coming under Constant Load Hangers (CLH)/ Variable Load Hangers (VLH) shall be painted as per the system - PS 15 indicated in Sl. No. 13 of the table. However, for DUs other than CLH/VLH, the painting shall be as per Painting Scheme PS 1A indicated in Sl. No. 8 of the table.
15. For internal protection of Pipes, tubes, headers and other pressure parts, Volatile Corrosion Inhibitor (VCI) pellets shall be put (after sponge testing/ draining/ or drying) and subsequently end capped. The dosage of VCI pellets shall be approximately 100 g/ Cu.m. For tubes typically 4 – 5 tablets per end are to be put. For C & I items the dosage of self-indicating Silica Gel (colourless) shall be 250 g/ cu.m. (About 2 to 3 bags weighing approximately 100 grams each). VCI pellets shall not be used for stainless steel components and its composite associates.
16. All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.
17. Soot blower components i.e Valve head assembly having high surface temperature (> 200 and <600 deg. C) shall be applied with HR aluminium IS13183 Gr.II paint (up to 400 deg.C) and Gr.I paint (up to 600 deg.C)
18. Handrails of PGMA under Sl. No. 3 need to be galvanized in line with scheme for handrails (i.e. Sl .No. 10). For chequered plates having thickness <=5mm, surface preparation can be power tool cleaning to St3 and painting shall be in line with Sl. No. 8.
19. It is mandatory that for finish coat each layer shall have a permanent DFT and free from any paint defects like sags, wrinkles etc. Total DFT of a component correspond to respective painting scheme has to be ensured.
20. Inside surfaces of fabricated structure (e.g. Box type column) shall be painted with two coats of red oxide primer paint during fit up stage.
21. Painting of bunker structures to be in line with painting scheme of supporting structures (Sl. No. 3).

Details for paint procurement & application purposes

Sl.No.	Generic nature of paint	Theoretical Covering Capacity Sq.m per Litre.	No. of pack	Volume solids, % (min)**	DFT in microns per coat (approx.)	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Epoxy Zinc rich primer to IS14589 Gr.II	8	2	35	40	Grey	--	Spray	24
2	Aliphatic acrylic polyurethane paint to IS 13213	12	2	40	30	Phirozi – Blue.	176	Spray	24
3	Heat resistant Aluminium paint to IS 13183 Grade I/II	10	1	-	20	--	--	Brush / Spray	24
4	Red oxide zinc phosphate primer paint to IS 12744	10	1	--	30	-	--	Brush / Spray	12
5	Red oxide Zinc Phosphate Dip coat primer paint to PR: CHEM: 09-03	10	1	--	35	--	---	Dip	12
6	Long oil alkyd synthetic enamel finish paint to IS2932	10	1	--	20	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
7	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	20	--	--	--	12
8	General purpose Aluminium paint to IS 2339	10	2	--	20	Aluminum	--	Brush	12

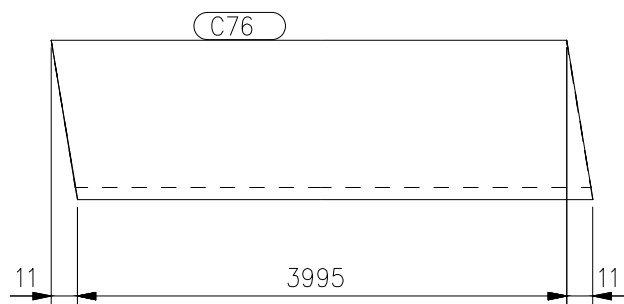
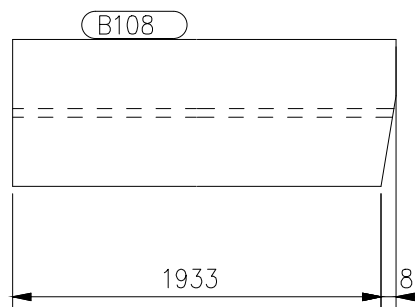
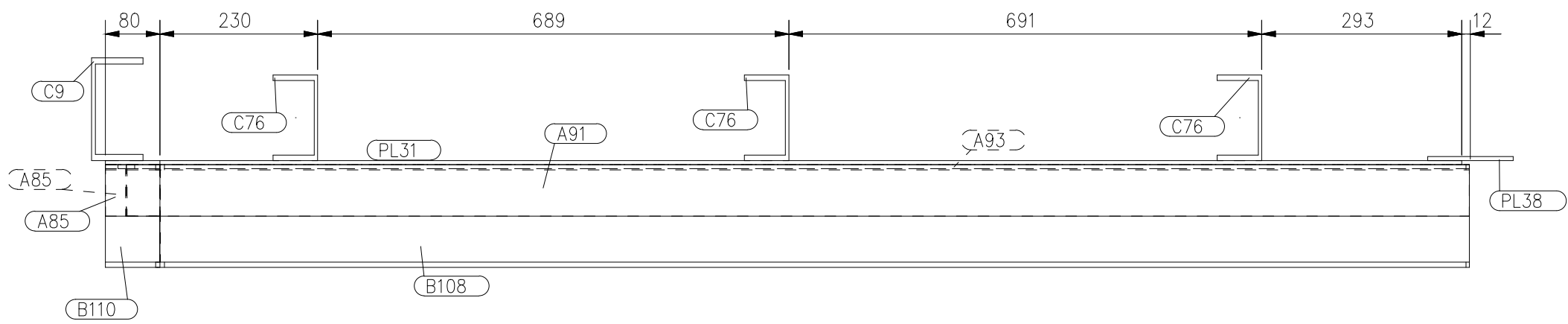
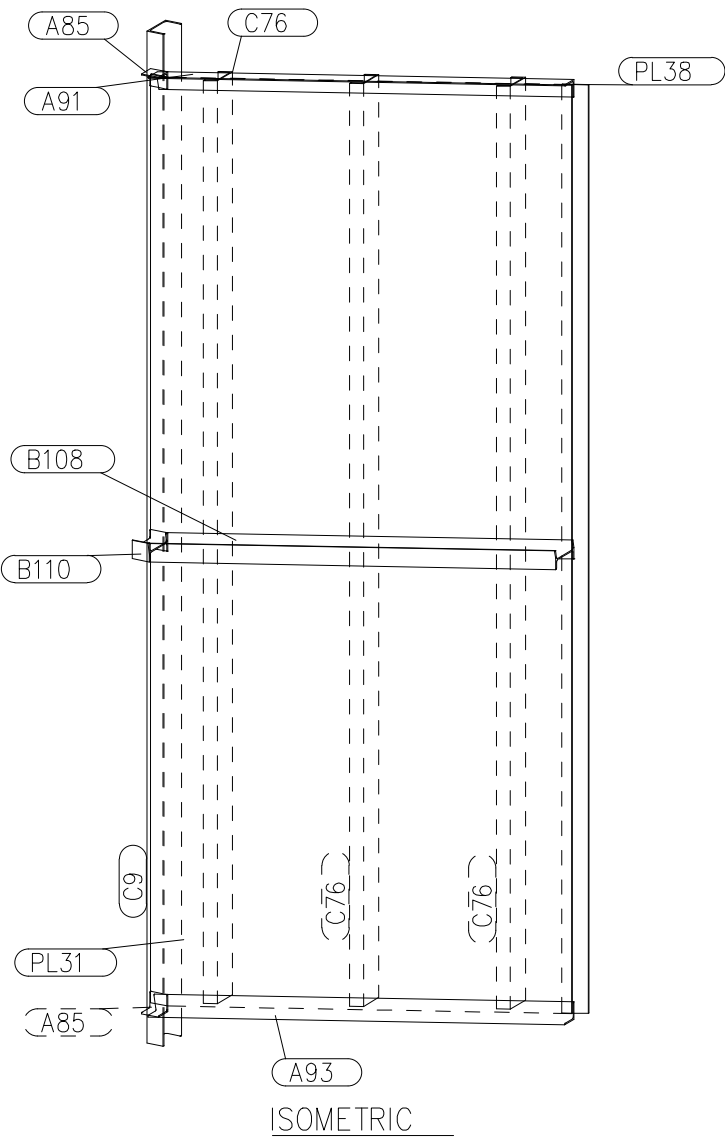
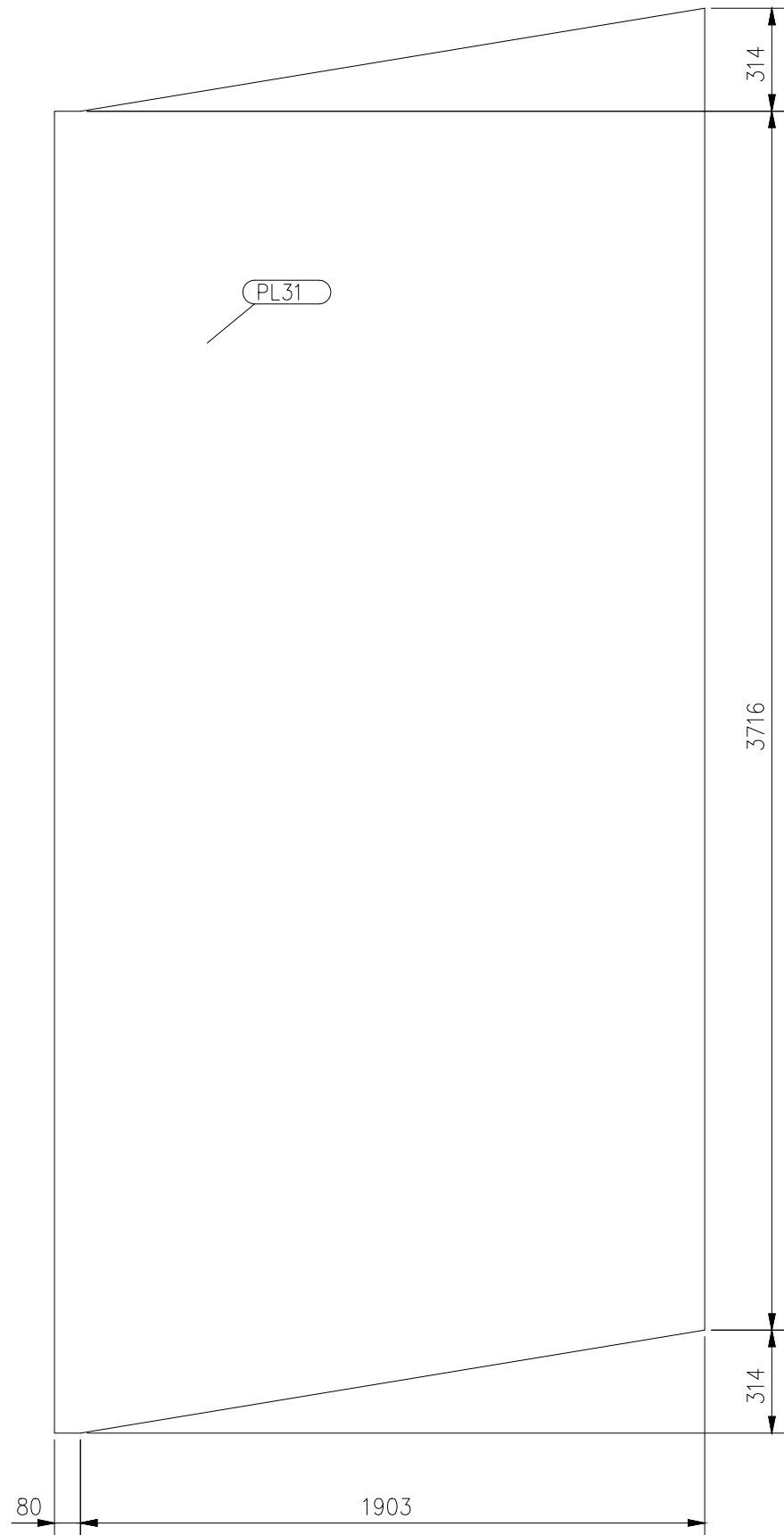
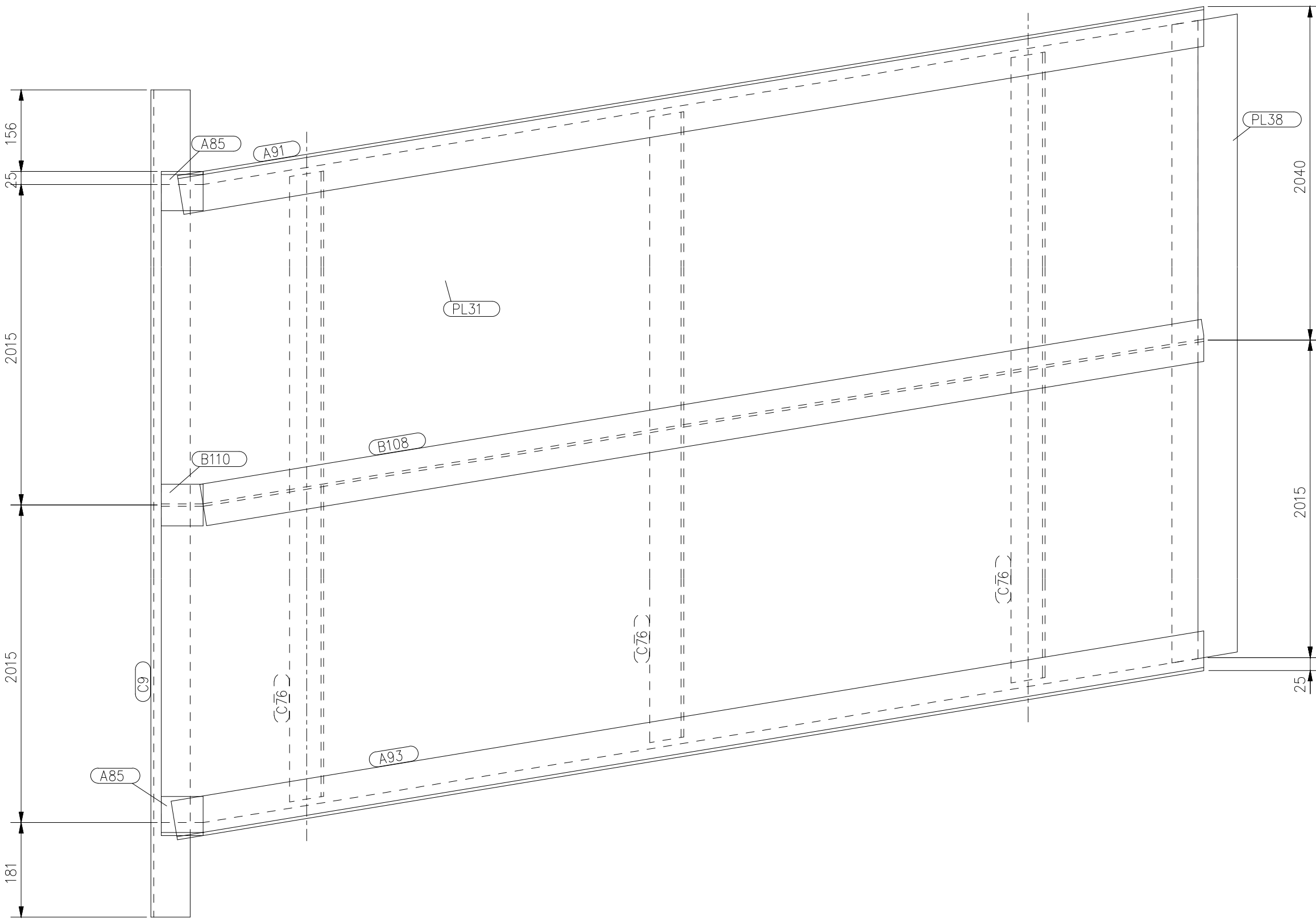
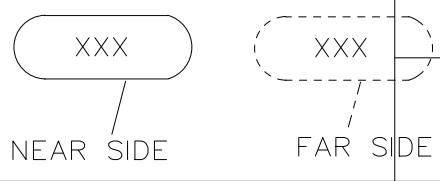
Brush painting is accepted, if recommended by the Paint suppliers. The covering capacity of paints specified is only approximate. The paints and Rust Preventive fluid shall be procured from BHEL's approved suppliers. ** Values are indicative.

1-48-012-44764
DRAWING NO.

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299

- NOTES:
- 01. FOR GENERAL NOTES REFER PAGE NO.41 (REF.41) OF DUCT CONSTRUCTION MANUAL
REF. 121 FOR CONSTRUCTION DETAIL
 - 02. THIS DRAWING TO BE READ ALONG WITH ASSEMBLY DRAWING 1-48-012-44767

PART MARK LEGEND



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6	C9	ISMC150 4392			150100350000		73.786		
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VARIANT NUMBER	SNO	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO VAR NO	MATERIAL CODE MATERIAL SPECN	UNIT DI	UNIT WEIGHT QUANTITY	GS ZONE

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	Bharat Heavy Electricals Ltd. UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014			
	DEPT DUCT CODE 124	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE NTS
	WEIGHT (Kg) 690.193	REF TO ASSY / OLD DWG		
	TITLE TRANSITION DUCT WALL		DRAWING NO : 1-48-012-44764	
		REV		

DU NO: 12 DU QTY: 2



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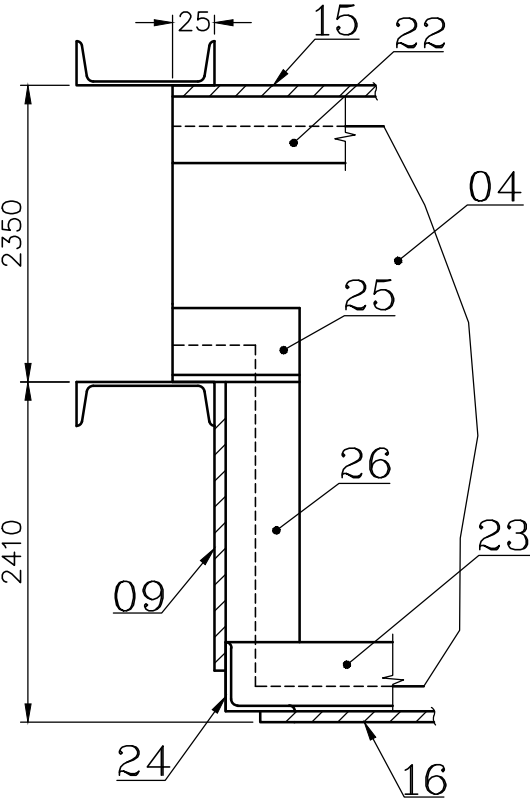
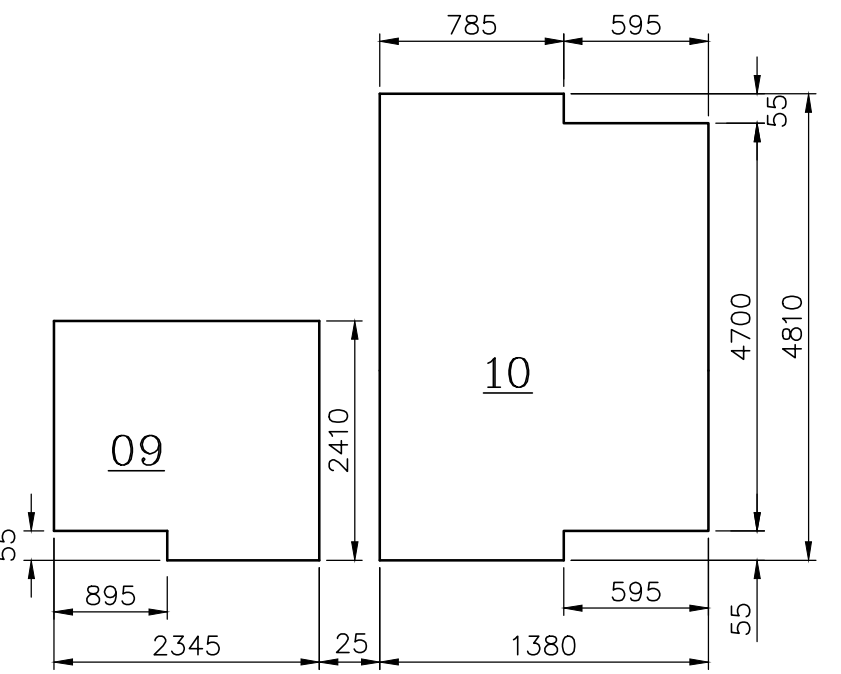
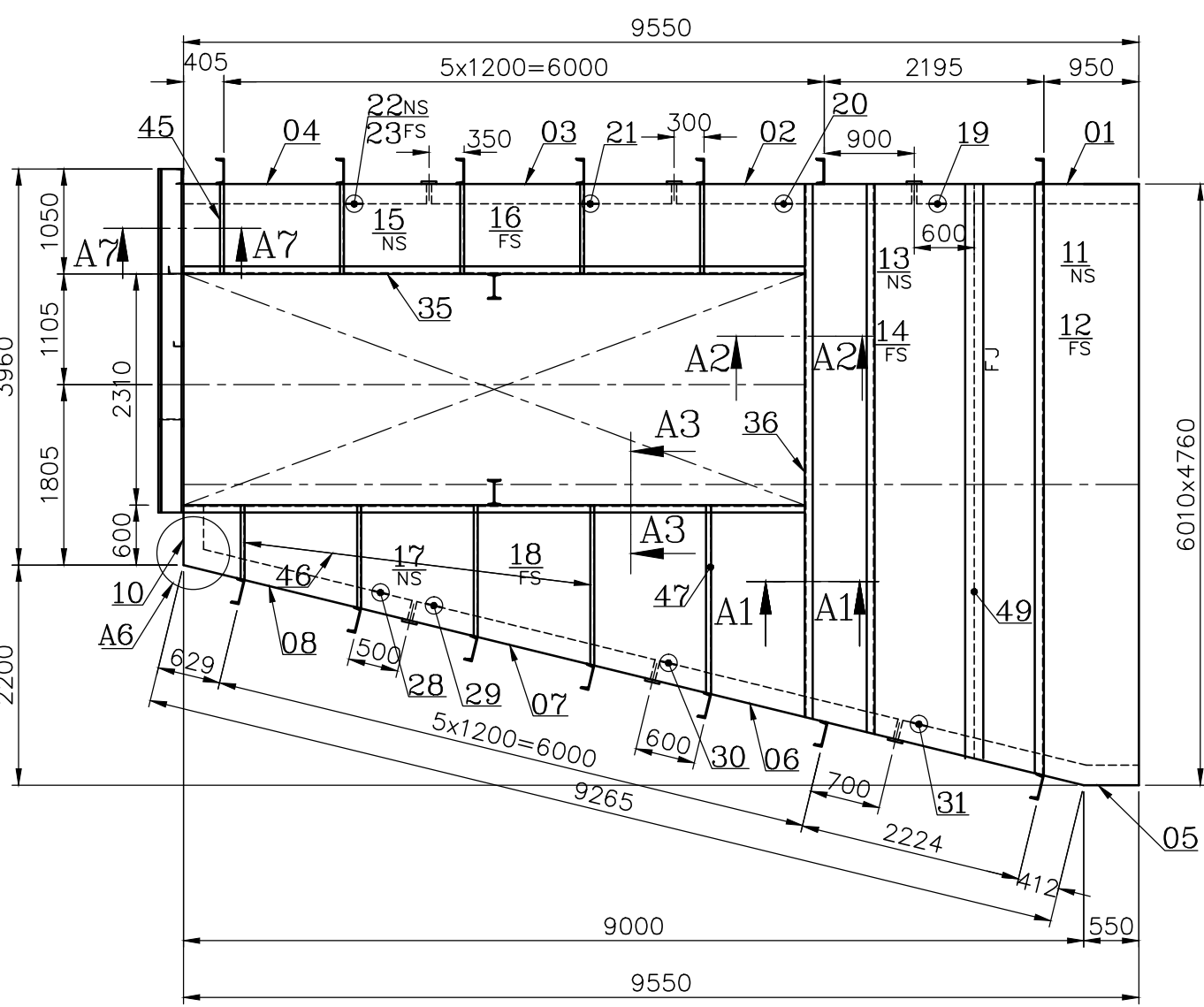
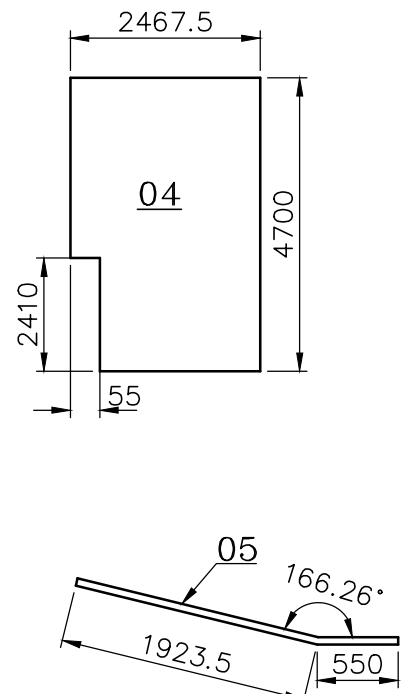
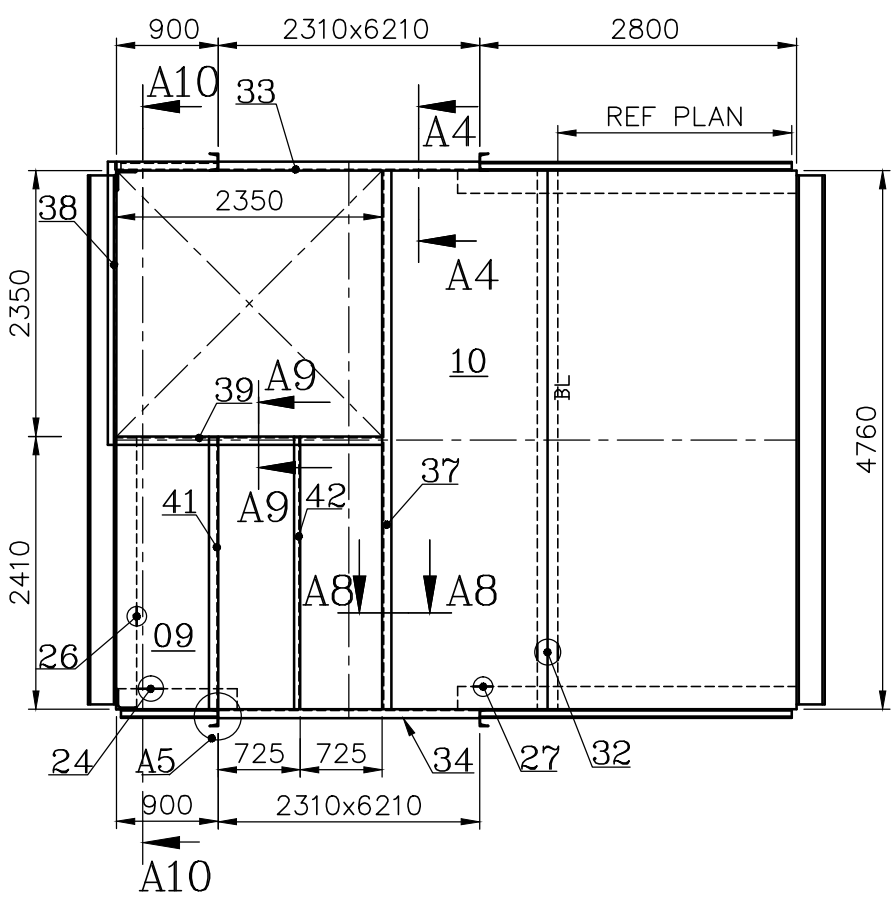
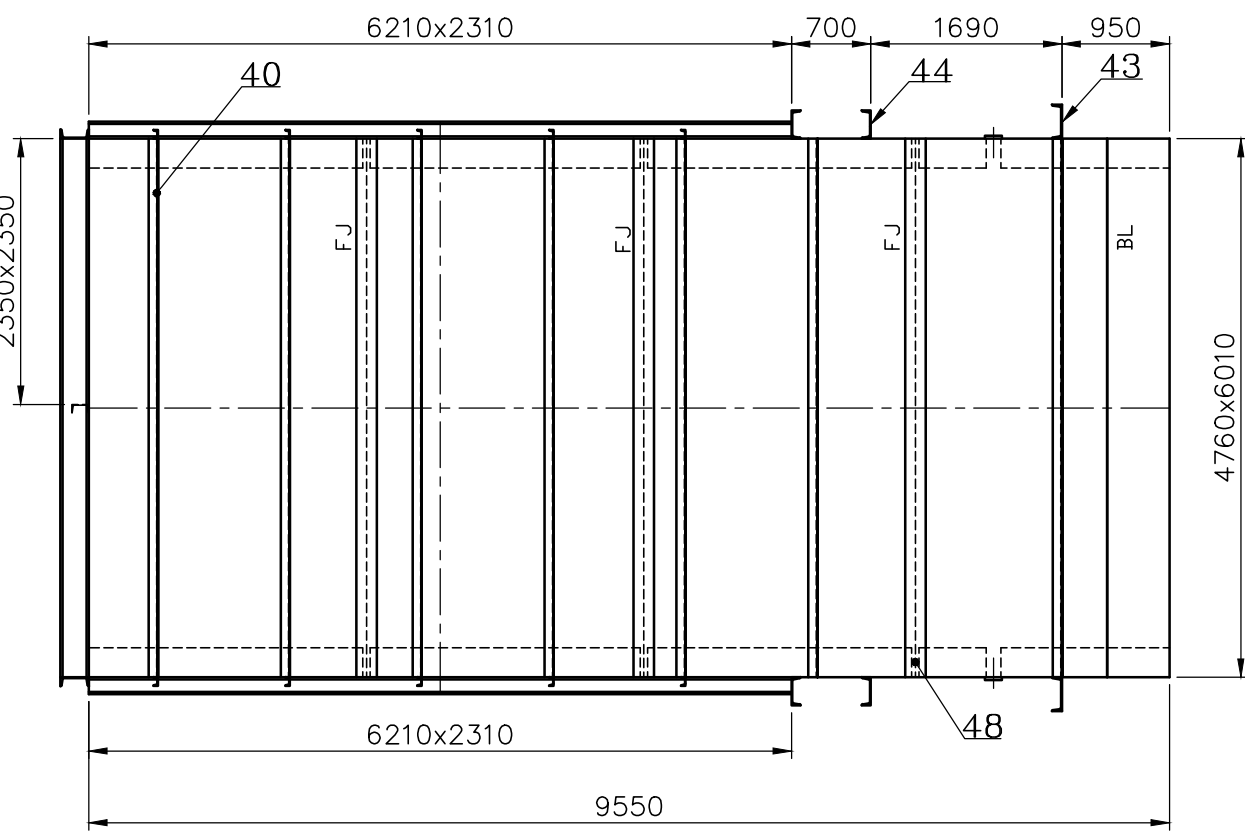
01. FOR GENERAL NOTES REFER PAGE NO. 41 (REF:41) OF DUCT CONSTRUCTION MANUAL.
REF121 FOR CONSTRUCTION DETAIL.

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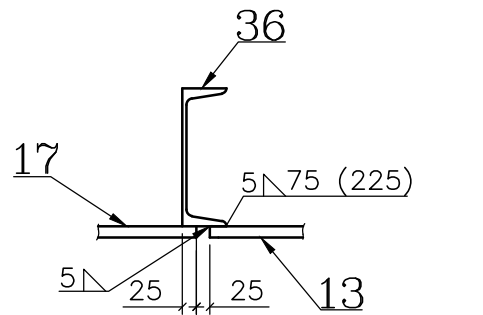
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						IS2062 E250A		4
	34	ISMC 250 2460				150100340000		84.130
						IS2062 E250A		1
	33	ISMC 250 3360				150100340000		114.910
						IS2062 E250A		1
	32	PLATE 5 150x4600				150110290000		27.080
						IS2062 E250A		1
	31	ISA 75X75X6 2484.5				150130050000		16.890
						IS2062 E250A		2
	30	ISA 75X75X6 2497				150130050000		16.980
						IS2062 E250A		2
	29	ISA 75X75X6 2497				150130050000		16.980
						IS2062 E250A		2
	28	ISA 75X75X6 2342.5				150130050000		15.920
						IS2062 E250A		2
	27	ISA 75X75X6 615				150130050000		4.180
						IS2062 E250A		2
	26	ISA 75X75X6 2330				150130050000		15.840
						IS2062 E250A		1
	25	ISA 75X75X6 105				150130050000		0.710
						IS2062 E250A		4
	24	ISA 75X75X6 895				150130050000		6.080
						IS2062 E250A		1
	23	ISA 75X75X6 2448.5				150130050000		16.650
						IS2062 E250A		1
	22	ISA 75X75X6 2478.5				150130050000		16.850
						IS2062 E250A		1
	21	ISA 75X75X6 2447				150130050000		16.640
						IS2062 E250A		2
	20	ISA 75X75X6 2397				150130050000		16.300
						IS2062 E250A		2
	19	ISA 75X75X6 2243.5				150130050000		15.250
						IS2062 E250A		2
	18	PLATE 5 2068x6205				150110290000		318.980
						IS2062 E250A		1
	17	PLATE 5 2068x6205				150110290000		318.980
						IS2062 E250A		1
	16	PLATE 5 845x6205				150110290000		205.790
						IS2062 E250A		1
	15	PLATE 5 845x6260				150110290000		207.620
						IS2062 E250A		1
	14	PLATE 5 1632.5x5678				150110290000		351.050
						IS2062 E250A		1
	13	PLATE 5 1632.5x5678				150110290000		351.050
						IS2062 E250A		1
	12	PLATE 5 1632.5x5950				150110290000		375.580
						IS2062 E250A		1
	11	PLATE 5 1632.5x5950				150110290000		375.580
						IS2062 E250A		1
	10	PLATE 5 1380x4810				150110290000		257.960
						IS2062 E250A		1
	09	PLATE 5 2345x2410				150110290000		221.810
						IS2062 E250A		1
	08	PLATE 5 4700x2286.5				150110290000		421.800
						IS2062 E250A		1
	07	PLATE 5 4700x2475				150110290000		456.570
						IS2062 E250A		1
	06	PLATE 5 4700x2475				150110290000		456.570
						IS2062 E250A		1
	05	PLATE 5 4700x2473.5				150110290000		456.290
						IS2062 E250A		1
	04	PLATE 5 4700x2467.5				150110290000		449.680
						IS2062 E250A		1
	03	PLATE 5 4700x2425				150110290000		447.350
						IS2062 E250A		1
	02	PLATE 5 4700x2375				150110290000		438.120
						IS2062 E250A		1
	01	PLATE 5 4700x2232.5				150110290000		411.840
						IS2062 E250A		1
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT WEIGHT
					VAR NO	MATERIAL SPECN	DI	QUANTITY

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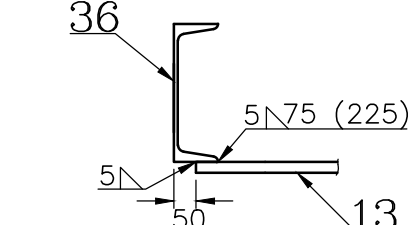
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					
 355-053		Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014			
		DRN	NAME EOL/KUMAR/KP	SIGNATURE	DATE 04-11-14
		CHD	RAMANA		04-11-14
		APPD	SHANMUGAM		04-11-14
REF TO ASSY / OLD DWG					
DEPT DU	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE N.T.S	WEIGHT (Kg) 11520.510	
CODE 124					
TITLE T DUCT				DRAWING NO : 1-48-202-42835	



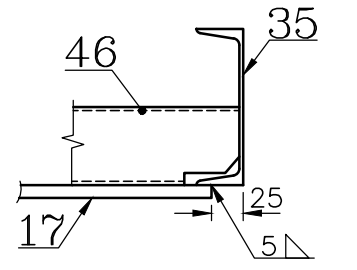
SECTION-A10-A10



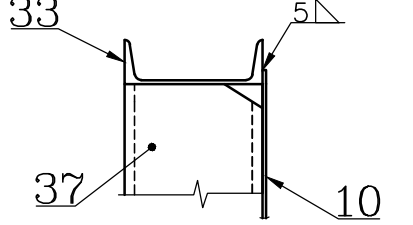
SECTION—A1—A1



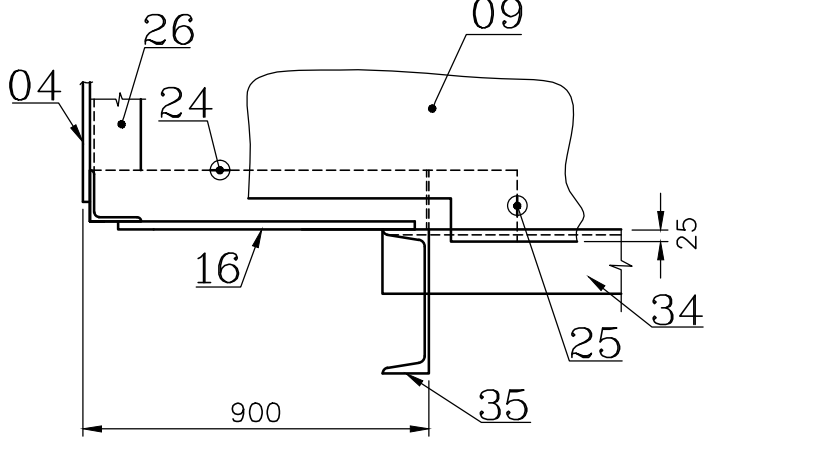
SECTION-A2-A2



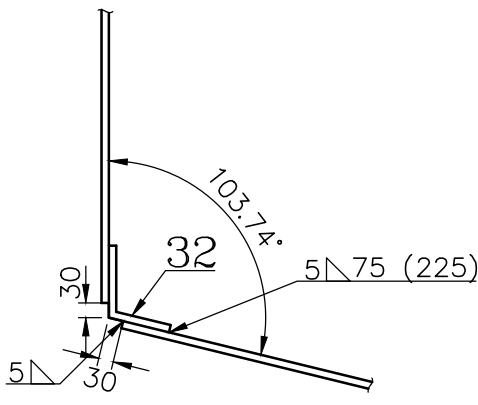
SECTION-A3-A3



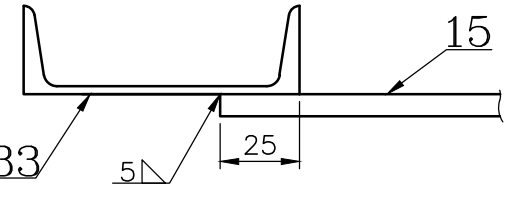
SECTION-A4-A4



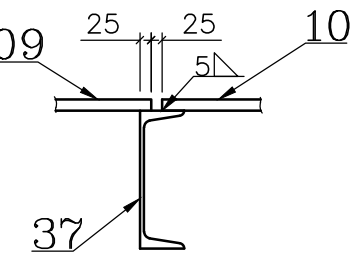
DETAIL-A5



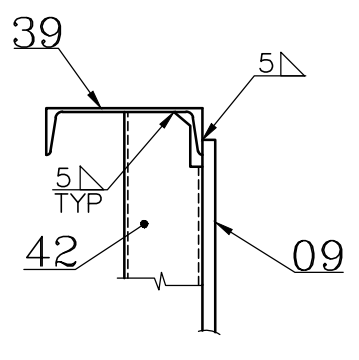
DETAIL—A6



SECTION-A7-A7



SECTION-A8-A8



SECTION—A9—A9

49	PLATE 5 C.T.S. 125x5750			150110290000	28.210	
				IS2062 E250A	2	
48	PLATE 5 125x4700			150110290000	23.050	
				IS2062 E250A	6	
47	ISM 100 1841			150100030000	17.600	
				IS2062 E250A	2	
46	ISM 75 C.T.S 4700			150100360000	33.550	
				IS2062 E250A	2	
45	ISM 75 852			150100360000	6.080	
				IS2062 E250A	10	
44	ISM 250 5415			150100340000	185.190	
				IS2062 E250A	2	
43	ISM 300 5828			150100060000	211.550	
				IS2062 E250A	2	
42	ISM 100 2410			150100030000	23.040	
				IS2062 E250A	1	
41	ISM 150 C.T.S. 2410			150100350000	40.480	
				IS2062 E250A	1	
40	ISM 250 4676			150100340000	159.910	
				IS2062 E250A	14	
39	ISM 150 2350			150100350000	39.480	
				IS2062 E250A	1	
38	ISM 150 2505			150100350000	42.080	
				IS2062 E250A	1	
37	ISM 250 4760			150100340000	162.790	
				IS2062 E250A	1	
36	ISM 250 5264			150100340000	180.020	
				IS2062 E250A	2	

REV 01	DATE	ALTERED :
		CHD & APPD :
ZONE		

NOTE:

01. FOR GENERAL NOTES REFER PAGE NO. 41 (REF:41) OF DUCT CONSTRUCTION MANUAL.
REF121 FOR CONSTRUCTION DETAIL.

DESPATCH TABLE

SL. NO.	DESCRIPTION	DU NO.	NO. OFF.	ITEM NO. NO.OFF							
				01	13	19	23	24	37		
1	HOPPER WALL	134	1	1	2	2	1	1	1		
2	HOPPER WALL	135	1	02	14	25	26	27	38		
3	HOPPER WALL	136	1	1	2	1	1	1	1		
4	HOPPER WALL	137	1	03	15	20	21	28			
5	HOPPER WALL	138	1	1	2	2	1	1	1		
6	HOPPER WALL	139	1	04	16	19	23	24	37		
7	HOPPER WALL	140	1	1	2	2	1	1	1		
8	HOPPER WALL	141	1	05	17	25	26	27	38		
9	HOPPER WALL	142	1	1	2	1	1	1	1		
10	HOPPER WALL	143	1	06	18	20	21	28			
11	HOPPER WALL	144	1	1	2	2	1	1	1		
12	HOPPER WALL	145	1	07	29	30	35	39			
				1	1	1	1	4			
				08	31	32	39	40			
				1	1	1	2	2			
				09	22	33	34	36	41		
				1	1	1	1	1	4		
				10	29	30	35	39			
				1	1	1	1	4			
				11	31	32	39	40			
				1	1	1	2	2			
				12	22	33	34	36	41		
				1	1	1	1	1	4		

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299

36	PLATE 6 125X1897			152110920000	11.169		
35	PLATE 6 125X3612			IS2062E250A 152110920000	2 21.266		
34	ISMC 100X50 1028			IS2062E250A 150100030000	2 9.828		
33	ISMC 100X50 1737			IS2062E250A 150100030000	2 16.606		
32	ISMC 125X65 2445			IS2062E250A 150100020000	2 32.030		
31	ISMC 150X75 3154			IS2062E250A 150100350000	2 52.987		
30	ISMC 200X75 3862			IS2062E250A 150100380000	2 86.123		
29	ISMC 200X75 4571			IS2062E250A 150100380000	2 101.933		
28	ISMC 100X50 1409			IS2062E250A 150100030000	2 13.470		
27	ISMC 100X50 2288			IS2062E250A 150100030000	2 21.873		
26	ISMC 150X75 3211			IS2062E250A 150100350000	2 53.945		
25	ISMC 200X75 4134			IS2062E250A 150100380000	2 92.188		
24	ISMC 200X75 5102			IS2062E250A 150100380000	2 113.775		
23	ISMC 300X90 5980			IS2062E250A 150100060000	2 217.074		
22	ISA 75X75X6 462			IS2062E250A 150130050000	2 3.142		
21	ISA 75X75X6 312			IS2062E250A 150130050000	2 2.122		
20	ISA 75X75X6 110			IS2062E250A 150130050000	4 .748		
19	ISA 75X75X6 50			IS2062E250A 150130050000	4 .340		
18	PLATE 6 150X1882			IS2062E250A 152110920000	2 13.296		
17	PLATE 6 150X2552			IS2062E250A 152110920000	2 18.030		
16	PLATE 6 150X2634			IS2062E250A 152110920000	2 18.609		
15	PLATE 6 150X1875			IS2062E250A 152110920000	2 13.247		
14	PLATE 6 150X2546			IS2062E250A 152110920000	2 17.987		
13	PLATE 6 150X2623			IS2062E250A 152110920000	2 18.531		
12	PLATE 6 2162X1798			IS2062E250A 152110920000	1 100.920		
11	PLATE 6 2275X3513			IS2062E250A 152110920000	1 285.507		
10	PLATE 6 2238X5169			IS2062E250A 152110920000	1 460.512		
9	PLATE 6 2162X1798			IS2062E250A 152110920000	1 100.846		
8	PLATE 6 2275X3513			IS2062E250A 152110920000	1 285.507		
7	PLATE 6 2237.5X5169			IS2062E250A 152110920000	1 460.410		
6	PLATE 6 1742X1837			IS2062E250A 152110920000	1 82.072		
5	PLATE 6 2281X4050			IS2062E250A 152110920000	1 317.470		
4	PLATE 6 2413X6350			IS2062E250A 152110920000	1 595.147		
3	PLATE 6 1734X1836			IS2062E250A 152110920000	1 81.597		
2	PLATE 6 2274X4051			IS2062E250A 152110920000	1 316.496		
1	PLATE 6 2402X6350			IS2062E250A 152110920000	1 592.446		

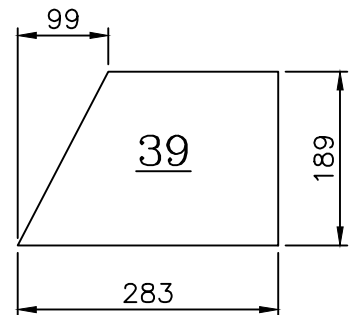
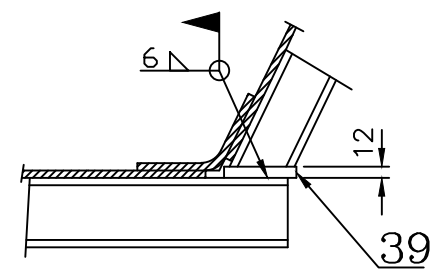
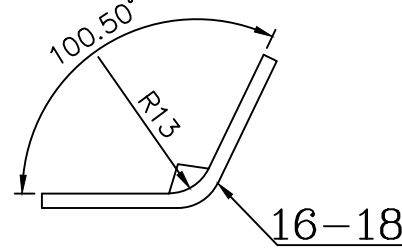
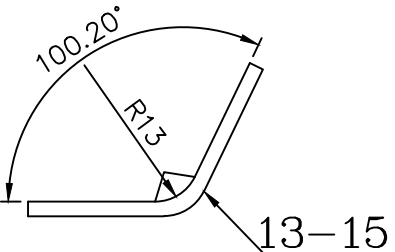
CAUTION: The information in this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way without the prior written consent of the company.		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		DRN EOL/KUMAR CHD R.C.Gautam APPD A.S.Vasukumar		SIGNATURE DATE 06.01.2016 06.01.2016 06.01.2016	
DEPT DU CODE 124		ALL DIMENSIONS ARE IN MM		PROJECTION SCALE N.T.S		WEIGHT (Kg) 5726.924	
TITLE HOPPER				DRAWING NO : 1-48-372-43476			

SECTION-A1 A1

41	PLATE 12 121X159			150111320000	1.808		
40	PLATE 12 146X194			IS2062E250A 150111320000	8 2.145		
39	PLATE 12 189X283			IS2062E250A 150111320000	4 4.157		
38	PLATE 6 125X1960			IS2062E250A 152110920000	12 11.540		
37	PLATE 6 125X4175			IS2062E250A 152110920000	2 24.586		

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	MATERIAL CODE	MATERIAL SPECN	A/C/P	UNIT	UNIT WEIGHT	GS	ZONE
							DI		QUANTITY		

VIEW-P



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96039-202-87-2

ON DRAWING

03

02

01

09

08

07

06

05

04

11

18

16

12

10

17

15

5980

4x1200x4800

200

300

600

400

4760x6010

FL1

6x855=5000

850

01

01

01

DESPATCH TABLE

SL. NO.	DESCRIPTION	DU NO.	NO. OFF	ITEM NO. NO.OFF			
1	DUCT WALL	190	1	01 13 15 17	1	1	
2	DUCT WALL	191	1	02 15 17	1	1	
3	DUCT WALL	192	1	03 13 15	1	2	
4	DUCT WALL	193	1	04 13 15 17	1	2 1	
5	DUCT WALL	194	1	05 15 17	1	2 1	
6	DUCT WALL	195	1	06 13 15	1	1 2	
7	DUCT WALL	196	2	07 10 14 16	1	2 1	
8	DUCT WALL	197	2	08 11 16 18	1	2 2 1	
9	DUCT WALL	198	2	09 12 14 16 18	1	2 1 1	

FLANGE DETAILS

FLANGE NO.	REF	D	X	A	B	W	S	E	F	N
FL1	REF111	4760	806	2	1828	6010	1028	2	1828	26

NOTE:

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO TP 023 0299

FOR GENERAL NOTES REFER PAGE NO. 41 (REF:41) OF DUCT CONSTRUCTION MANUAL. REF121 FOR CONSTRUCTION DETAIL.

18	PLATE 5 125x4700			150110290000		23.050		
				IS2062 E250A		4		
17	PLATE 5 125x5950			150110290000		29.190		
				IS2062 E250A		4		
16	ISMC 250 4676			150100340000		159.910		
				IS2062 E250A		8		
15	ISMC 300 5926			150100060000		215.110		
				IS2062 E250A		11		
14	ISA 75X75X6-4910			150130050000		33.380		
				IS2062 E250A		4		
13	ISA 75X75X6-6010			150130050000		40.860		
				IS2062 E250A		4		
12	ISA 75X75X6 1778.5			150130050000		12.090		
				IS2062 E250A		4		
11	ISA 75X75X6 2197			150130050000		14.940		
				IS2062 E250A		4		
10	ISA 75X75X6 1978.5			150130050000		13.450		
				IS2062 E250A		4		
09	PLATE 5 4700x1767.5			150110290000		326.060		
				IS2062 E250A		2		
08	PLATE 5 4700x2175			150110290000		401.230		
				IS2062 E250A		2		
07	PLATE 5 4700x1967.5			150110290000		362.950		
				IS2062 E250A		2		
06	PLATE 5 5950x2077.5			150110290000		485.170		
				IS2062 E250A		1		
05	PLATE 5 5950x1565			150110290000		365.480		
				IS2062 E250A		1		
04	PLATE 5 5950x2267.5			150110290000		529.540		
				IS2062 E250A		1		
03	PLATE 5 5950x2167.5			150110290000		506.190		
				IS2062 E250A		1		
02	PLATE 5 5950x2075			150110290000		484.590		
				IS2062 E250A		1		
01	PLATE 5 5950x1667.5			150110290000		389.420		
				IS2062 E250A		1		
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO VAR NO	MATERIAL CODE MATERIAL SPECN	A/C/P DI	QUANTITY ZONE

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REV 01

DATE 09.06.15

ALTERED : MAASI

CHD & APPD : RCG

ZONE

ITEM NO 13&14 REMOVED

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd

UNIT: HIGH PRESSURE BOILER PLANT

TIRUCHIRAPALLI – 620014

DRN

NAME EOL/KUMAR/NM

SIGNATURE

DATE 02-11-14

CHD

RAMANA

02-11-14

APPD

SHANMUGAM

02-11-14

DEPT DU

ALL DIMENSIONS ARE IN MM

PROJECTION

SCALE N.T.S

WEIGHT (Kg) 8957.240

REF TO ASSY / OLD DWG

TITLE DUCT

DRAWING NO : 2-48-202-53096

REV 01

1

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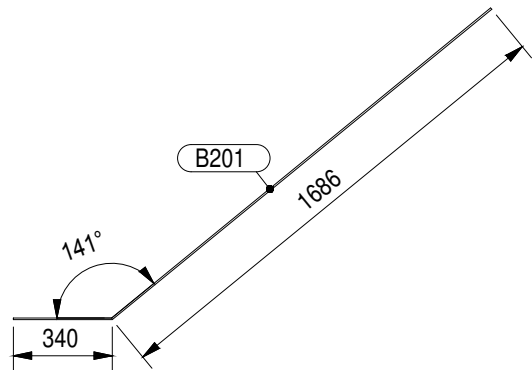
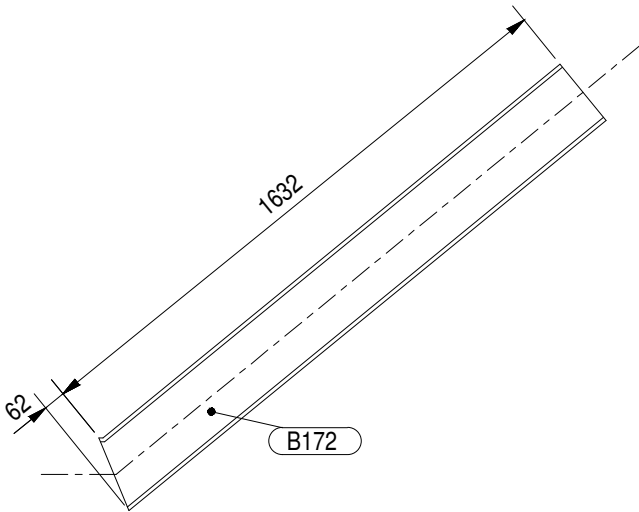
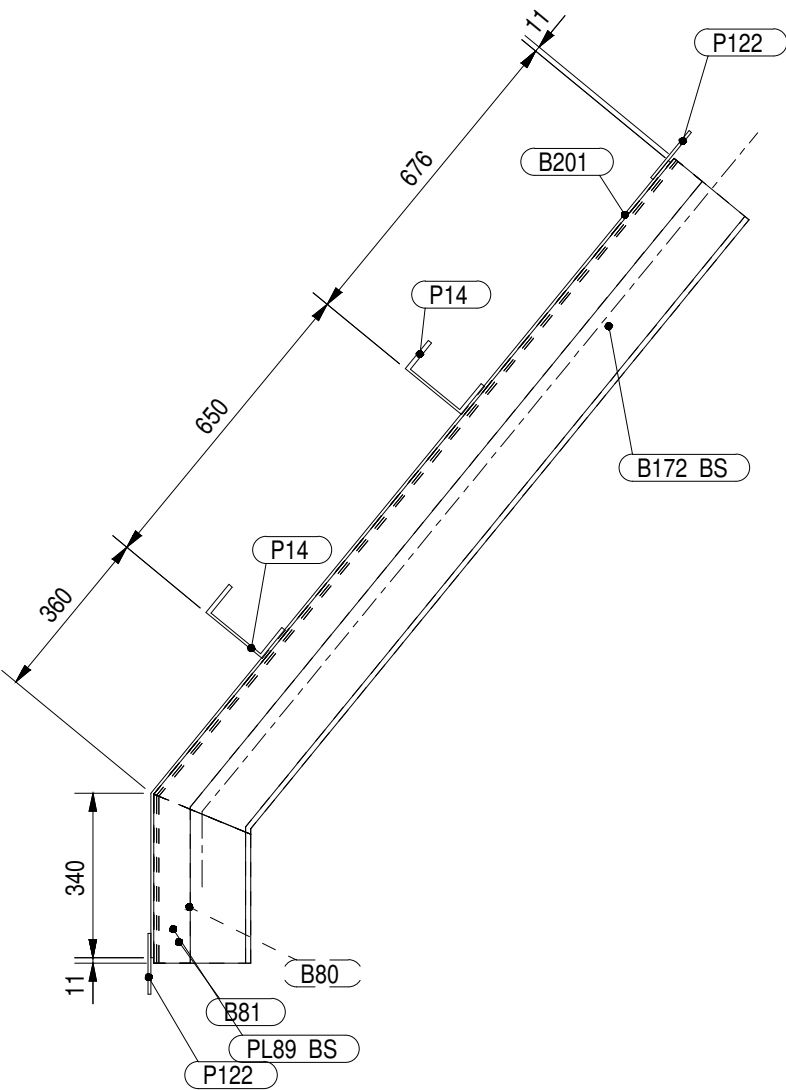
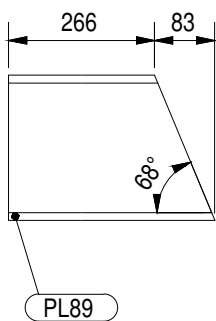
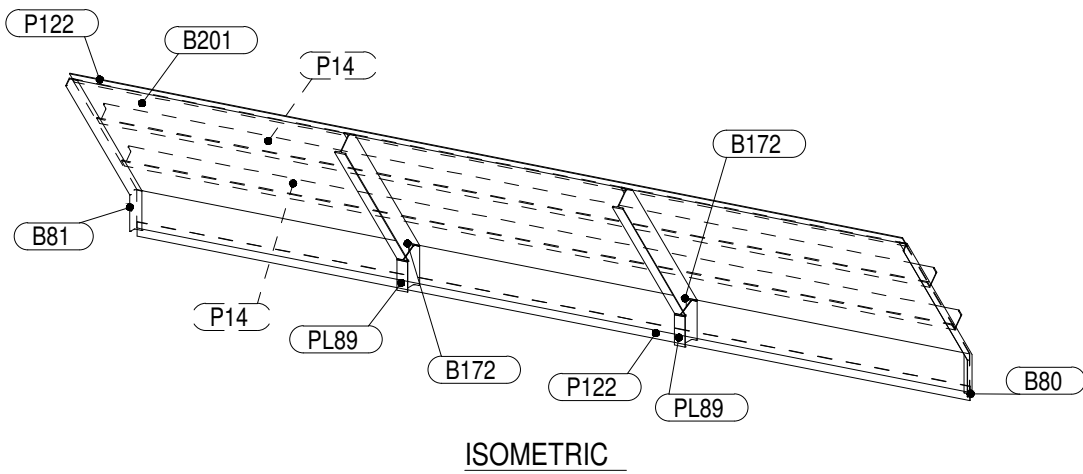
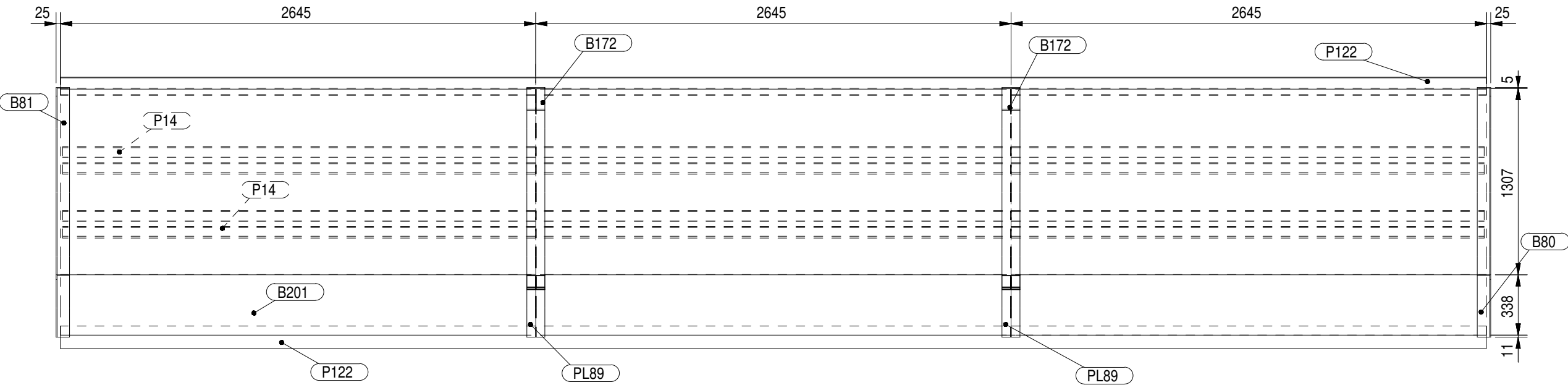
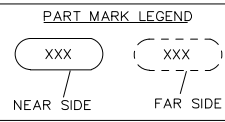
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8

DRAWING NO:
2-48-208-62358


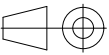
FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299

- NOTES:**
01. FOR GENERAL NOTES REFER PAGE NO.41 (REF.41) OF DUCT CONSTRUCTION MANUAL
REF. 121 FOR CONSTRUCTION DETAIL
02. THIS DRAWING TO BE READ ALONG WITH ASSEMBLY DRAWING 1-48-208-44748



1	B80	ISA75X75X6 2043			150130050000		13.892	1	
					IS2062E250A				
2	B81	ISA75X75X6 2043			150130050000		13.892	1	
					IS2062E250A				
3	B172	ISMB200 1395			150090120000		35.425	2	
					IS2062E250A				
4	B201	PLATE 6 7935.0x2021.0			152110920000		756.307	1	
					IS2062E250A				
5	P14	ISMC150 7911			150100350000		132.905	2	
					IS2062E250A				
6	P122	PLATE 6 7935.0x125.0			152110920000		46.718	2	
					IS2062E250A				
7	PL89	ISMB200 349			150090120000		8.852	2	
					IS2062E250A				

VARIANT NUMBER	S.NO	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO VAR NO	MATERIAL CODE MATERIAL SPECN	A/C/P DI	UNIT QUANTITY	OS	ZONE
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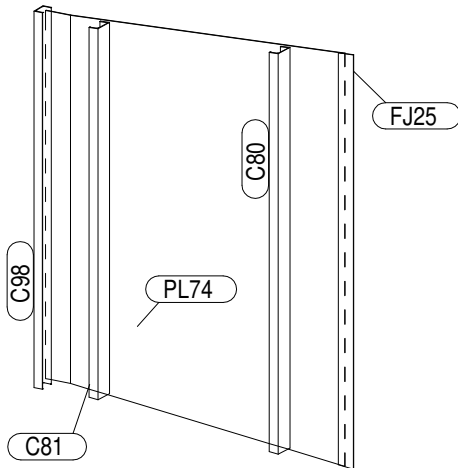
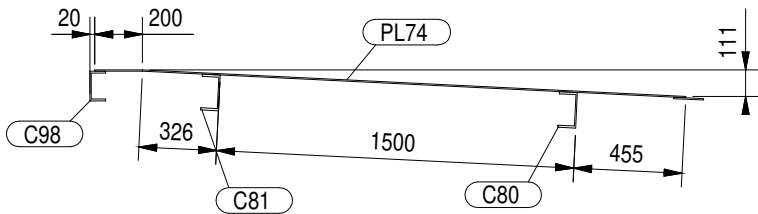
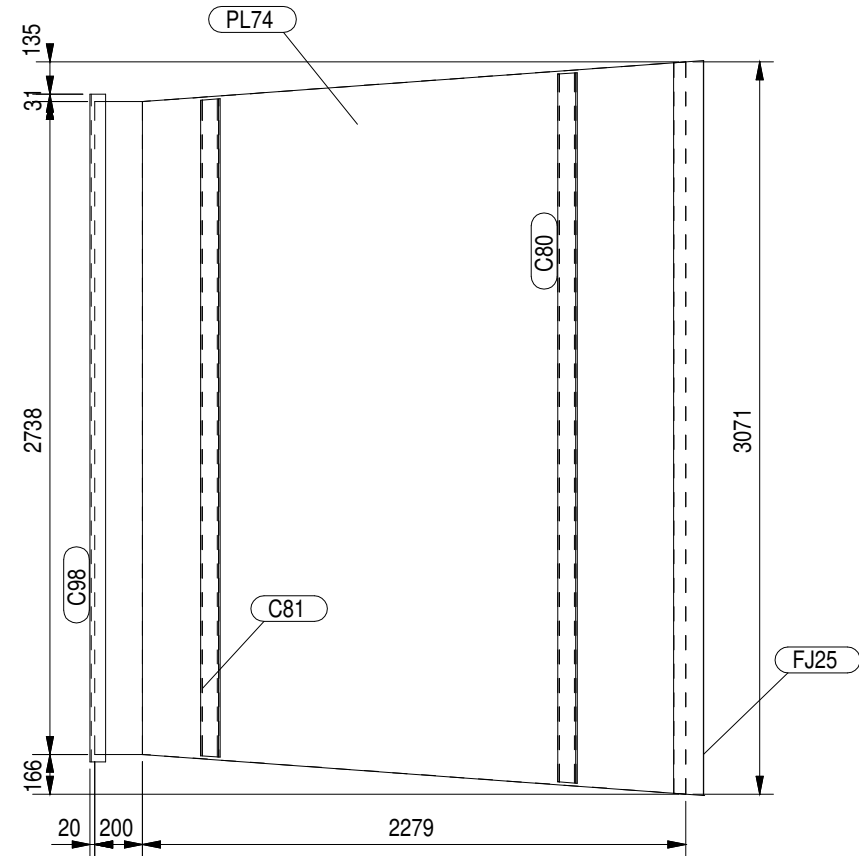
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT											
	 Bharat Heavy Electricals Ltd. UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014					DRN	NAME SSM	SIGNATURE	DATE			
						CHD	RCG		12.10.2018			
						APPD	BMK		13.10.2018			
	DEPT DUCT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG						
	CODE 124			NTS	1231.889							
TITLE										DRAWING NO : 2-48-208-62358		REV
ELBOW DUCT WALL												

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299

3-48-112-C8184
DRAWING NO:

NOTES:

01. FOR GENERAL NOTES REFER PAGE NO.41 (REF.41) OF DUCT CONSTRUCTION MANUAL
REF. 121 FOR CONSTRUCTION DETAIL
02. THIS DRAWING TO BE READ ALONG WITH ASSEMBLY DRAWING 2-48-112-62261



ISOMETRIC

PART MARK LEGEND	
XXX	XXX
NEAR SIDE	FAR SIDE

VARIANT NUMBER	S.NO	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	GS	ZONE
						VAR NO	MATERIAL SPECN	A/C/P	DI	QUANTITY		
1	C80		ISMC 150 2980				150100350000			50.071		
							IS2062E250A			1		
2	C81		ISMC 150 2762				150100350000			46.394		
							IS2062E250A			1		
3	C98		ISMC 125 2800				150100020000			36.680		
							IS2062E250A			1		
4	FJ25		PLATE 6 3082.0x125.0				152110920000			18.091		
							IS2062E250A			1		
5	PL74		PLATE 6 3071.0x2482.0				152110920000			337.940		
							IS2062E250A			1		

DU NO: 4 DU QTY: 4

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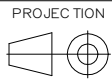
TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd.
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DEPT
DUCT
CODE
124

ALL DIMENSIONS
ARE IN MM



SCALE
NTS

WEIGHT (Kg)
489.176

REF TO ASSY / OLD DWG

TITLE

TRANSITION DUCT WALL

DRAWING NO :

3-48-112-C8184

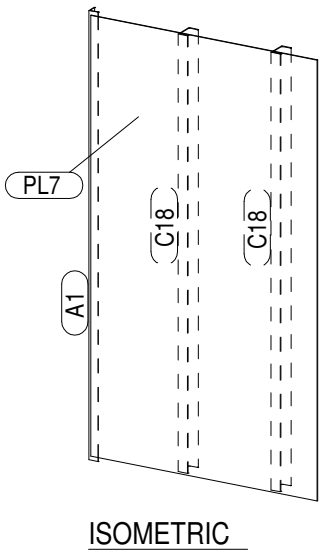
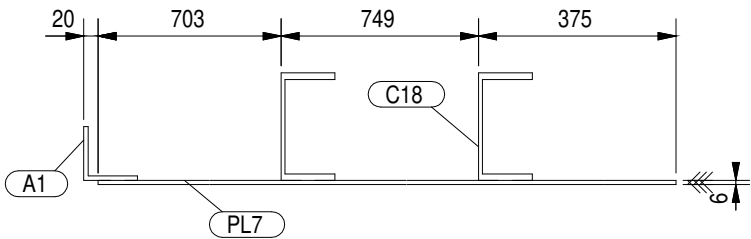
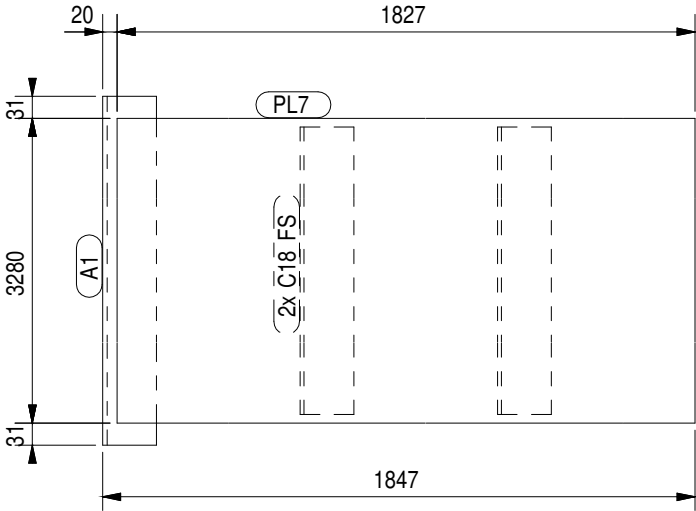
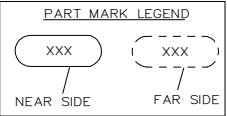
REV

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299

DRAWING NO:
3-48-112-C8213

NOTES:

01. FOR GENERAL NOTES REFER PAGE NO.41 (REF.41) OF DUCT CONSTRUCTION MANUAL
REF. 121 FOR CONSTRUCTION DETAIL
02. THIS DRAWING TO BE READ ALONG WITH ASSEMBLY DRAWING 2-48-112-62264



ISOMETRIC

VARIANT NUMBER	S.NO	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	GS	ZONE
						VAR NO	MATERIAL SPECN		DI	QUANTITY		
	1	A1	ISA75X75X6 3342				150130050000			22.719		
							IS2062E250A			1		
	2	C18	ISMC 150 3256 0				150100350000			54.701		
							IS2062E250A			2		
	3	PL7	PLATE 6 3280.0x1827.0				152110920000			282.250		
							IS2062E250A			1		

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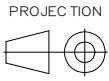
TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd.
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DEPT
DUCT
CODE
124

ALL DIMENSIONS
ARE IN MM



SCALE
NTS

WEIGHT (Kg)
414.370

REF TO ASSY / OLD DWG

TITLE

BRANCH DUCT WALL

DRAWING NO :

3-48-112-C8213

REV

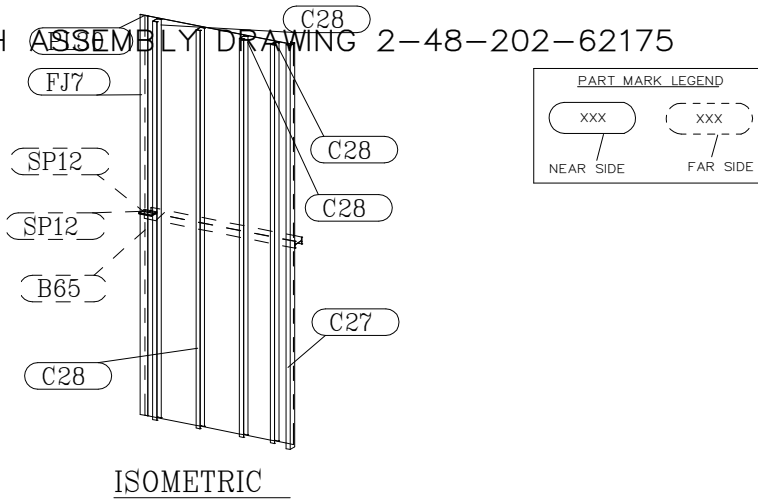
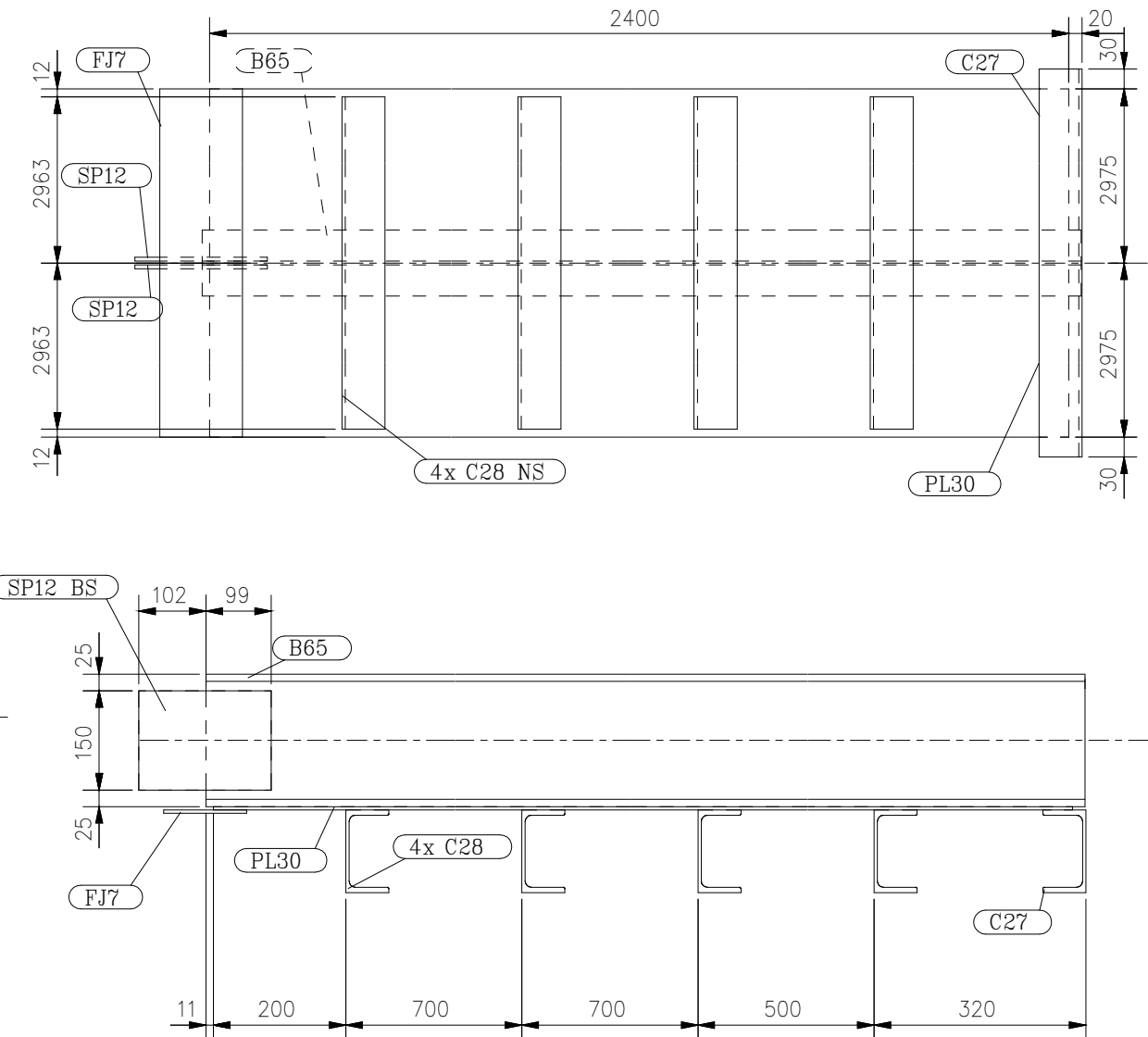
DU NO: 33 DU QTY: 1

3-48-202-C7935
DRAWING NO:

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299

NOTES:

01. FOR GENERAL NOTES REFER PAGE NO.41 (REF.41) OF DUCT CONSTRUCTION MANUAL
REF. 121 FOR CONSTRUCTION DETAIL
02. THIS DRAWING TO BE READ ALONG WITH ASSEMBLY DRAWING 2-48-202-62175



	1	B65	ISMB 200 2430				150090120000			61.709		
							IS2062E250A			1		
	2	C27	ISMC 125 6010				150100020000			78.731		
							IS2062E250A			1		
	3	C28	ISMC 125 5926 0				150100020000			77.631		
							IS2062E250A			4		
	4	FJ7	PLATE 5 5950.0x125.0				150110290000			29.192		
							IS2062E250A			1		
	5	PL30	PLATE 5 5950.0x2400.0				150110290000			560.490		
							IS2062E250A			1		
	6	SP12	PLATE 6 200.0x150.0				152110920000			1.413		
							IS2062E250A			2		
VARIANT NUMBER	S.NO	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	GS	ZONE
						VAR NO	MATERIAL SPECN		DI	QUANTITY		

DU NO: 60 DU QTY: 2

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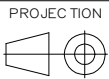
TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd.
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DEPT
DUCT
CODE
124

ALL DIMENSIONS
ARE IN MM



SCALE
NTS

WEIGHT (Kg)
1043.471

REF TO ASSY / OLD DWG

TITLE

STRAIGHT DUCT WALL

DRAWING NO :

3-48-202-C7935

REV