

FIELD WELDING SCHEDULE

BHEL, HEEP, HARDWAR	PROJECT : 2X800MW MAHAN STPP	HXE/10868/FWS
	DRG.NO. : HXE/10868/FWS	SH. 01 OF 11

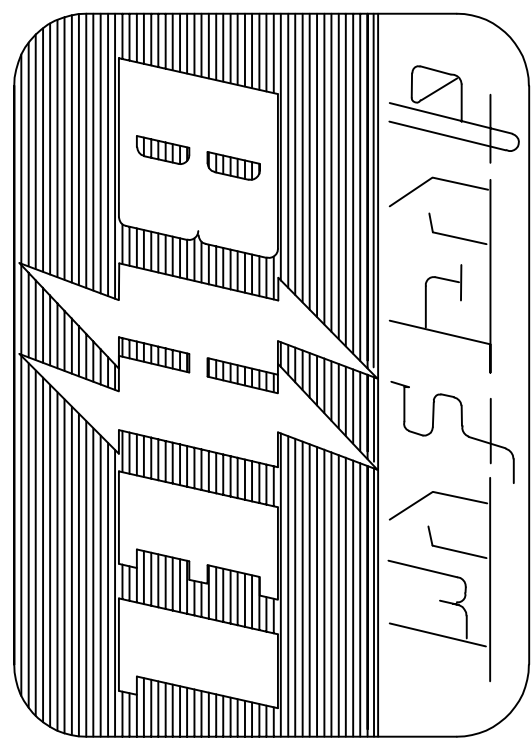
GENERAL REQUIREMENTS:-

1. CORRECTNESS OF ALIGNMENT BETWEEN VARIOUS PARTS SHOULD BE ENSURED BEFORE TACK WELDING. FINAL WELDING SHALL BE DONE BY STEP BACK METHOD AND IF REQUIRED SUPPORTS/FIXTURES MAY BE USED SO AS TO ENSURE MINIMUM DEFORMATION OF PARTS.
2. ONLY QUALIFIED WELDERS ARE TO BE EMPLOYED.
3. VISUAL INSPECTION OF ALL WELD SEAMS IS TO BE CARRIED OUT ACCORDING TO BHEL STANDARD HW0620099. CLASSIFICATION GROUP.

<i> CS/BK FOR PRESSURE PARTS/SEALING JOINTS.

<ii> CS/CK FOR STIFFENERS, GUSSETS, BAFFLES ETC.
4. ALL WELD SEAMS SHALL BE PROPERLY GROUND AND SUBJECTED TO NON-DESTRUCTIVE EXAMINATION ACCORDING TO BHEL STANDARD HW0850199, PART-10. EXAMINATION GRADE <CSR> AS INDICATED IN SH.02 TO SH. 09. THE WELDS NOT SPECIFICALLY INDICATED IN DRAWINGS SHALL BE SUBJECTED TO MINIMUM 10% DPT.
5. NO PREHEATING AND POST WELD HEAT TREATMENT IS REQUIRED. <EXCEPT PRE HEATING REQUIRED FOR SL. NO. 32>
6. TOTAL WEIGHT OF DEPOSITED METAL = 5600 kg. <approx>

	DESIGN DEPTT. HEAT EXCHANGER ENGG.			AGREED DEPTT. WELDING TECHNOLOGY			REVISIONS			
	NAME	SIGN.	DATE	NAME	SIGN.	DATE				
WORKED- BY	A PANDEY	-Sd-	14-06-24				REV. NO.	00		
CHECKED BY	DK YADAV	-Sd-	14-06-24				SIGN.			
APPROVED BY	N PRAKASH	-Sd-	14-06-24				DATE			

HEAT EXCH. ENGG.  
HARDWAR

# FIELD WEDDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP

FWs NO.: HXE/10868/FWS

REV. NO.: 00

## PACKAGE : CONDENSER

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## FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP

FWS NO.	:	HXE/10868/FWS
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REV. NO. : 00

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## PACKAGE : CONDENSER

NO.	DRG.NO.FOR WELD LOCATION & IDENTIFICATION MARK	MATL. SPEC.	DIMENSIONS			PROCESS OF WELDING	TYPE OF WELD	ELECTRODE FILLER SPEC.	WPS. NO.	MIN. PREHEAT TEMP.:C	HEAT TREATMENT		NDT METHOD QUANTAM		REF.	
			SIZE OF WELD (mm)	LENGTH OF WELD (M)	QTY.OF FILLER METAL IN kg.						TEMP.	HOLD ING TIME	RT/UT	DPT	SPEC. NO.	ACC NORM REF.
01	01603870024C237 LP Heater Support Argmt.	IS: 2062	10	0.70	0.50	SMAW (SHIELD METAL ARC WELDING)	BUTT	E-7018	CS11294	NIL	NA	NA	-	10%	HW0850199	4
02	-- DO --	-- DO --	5	0.80	0.40	-- DO --	-- DO --	-- DO --	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
03	-- DO --	--DO--	8	3.48	1.75	-- DO --	FILLET	-- DO --	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
04	-- DO --	--DO--	10	28.0	11	-- DO --	-- DO --	--DO--	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
05	-- DO --	--DO--	16	6.0	6.03	-- DO --	-- DO --	--DO--	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
06	-- DO --	--DO--	28	0.654	2.01	-- DO --	-- DO --	--DO--	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
07	-- DO --	--DO--	32	23.458	92.5	-- DO --	-- DO --	--DO--	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
01	11601470032E237 / 11601470033E237 Side Wall (TS/GS)	IS: 2062	8	7.0	9.27	SMAW (SHIELD METAL ARC WELDING)	FILLET	E-7018	CS11294	NIL	NA	NA	--	10%	HW0850199	4
02	-- DO --	--DO--	12	21.8	17.88	-- DO --	-- DO --	-- DO --	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4
03	-- DO --	--DO--	16	21	23.55	-- DO --	BUTT	--DO--	-- DO --	-- DO --	NA	NA	10%	10%	-- DO --	3
04	-- DO --	--DO--	20	0.15	0.66	-- DO --	-- DO --	--DO--	-- DO --	-- DO --	NA	NA	--	10%	-- DO --	4

FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP  
PACKAGE : CONDENSER

FWS NO :HXE/10868/FWS  
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SL. NO.	DRG.NO.FOR WELD LOCATION & IDENTIFICATION MARK	MATL. SPEC.	DIMENSIONS			PROCESS OF WELDING	TYPE OF WELD	ELECTRODE FILLER SPEC.	WPS. NO.	MIN. PREHEAT TEMP. °C	HEAT TREATMENT		NDT METHOD QUANTAM		REFERENCE		
			SIZE OF WELD (mm)	LENGTH OF WELD (M)	QTY. OF FILLER METAL IN Kg.						TEMP.	HOLD ING TIME	RT/UT	DPT	SPEC. NO.	ACC NORM REF. (CSR)	
01	01603770029E237 FRONT W/BOX HINGE ARRANGMENT	IS: 2062	8T	8	2.7	SMAW (SHIELD METAL ARC WELDING)	FILLET	E-7018	CS11294	NIL	NA	NA	10%	10%	HW0850199	4	
02	- DO -	- DO -	20T	2.07	4.01	- DO -	- DO -	-DO-	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
03	- DO -	- DO -	20B	2.07	4.53	- DO -	BUTT	-DO-	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
04	- DO -	- DO -	25B	2.8	8.09	- DO -	- DO -	-DO-	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
05	- DO -	- DO -	32B	12.04	41.29	- DO -	- DO -	- DO -	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
06	- DO -	- DO -	32B	24.08	82.59	- DO -	- DO -	- DO -	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
01	01603770030E237 REAR W/BOX HINGE ARRANGMENT	IS: 2062	8T	8	2.7	SMAW (SHIELD METAL ARC WELDING)	FILLET	E-7018	CS11294	NIL	NA	NA	10%	10%	HW0850199	4	
02	- DO -	- DO -	20T	2.07	4.01	- DO -	- DO -	-DO-	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
03	- DO -	- DO -	20B	2.07	4.53	- DO -	BUTT	-DO-	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
04	- DO -	- DO -	25B	2.8	8.09	- DO -	- DO -	-DO-	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
05	- DO -	- DO -	32B	12.04	41.29	- DO -	- DO -	- DO -	- DO -	- DO -	NA	NA	-	10%	- DO -	4	
06	- DO -	- DO -	32B	24.08	82.59	- DO -	- DO -	- DO -	- DO -	- DO -	NA	NA	-	10%	- DO -	4	

FIELD WELDING SCHEDULE

PROJECT : 2X800 MW MAHAN

PACKAGE : CONDENSER

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SL. NO.	DRG. NO. FOR WELD LOCATION & IDENTIFICATION MARK	MATL. SPEC.	DIMENSIONS		PROCESS OF WELDING	TYPE OF WELD	ELECTRODE FILLER SPEC.	WPS. NO.	MIN. PREHEAT TEMP. °C	HEAT TREATMENT		NDT METHOD QUANTAM		REF.			
			SIZE OF WELD (mm)	LENGTH OF WELD (M)						QTY.OF FILLER METAL IN Kg.	TEMP.	HOLD ING TIME	RT/UT	DPT	SPEC. NO.	ACC NORM REF.	ZONE
01	01602870076E237 Shell Internal Detail	IS: 2062	16 T	656	853	SMAW	FILLET	E-7018	CS11294	NIL	NA	NA	-	10%	HW0850199	3	C11
02	- DO -	IS: 2062 IS: 1570	4 T	280	26.3	TIG	- DO -	ER 70S	CS110114	- DO -	NA	NA	-	10%	- DO -	3	K8
03	- DO -	IS: 6911, WITH PIPE IS: 3589	5 T	50	7	SMAW	- DO -	E-309cb	AS11127	- DO -	NA	NA	-	10%	- DO -	3	D16
04	- DO -	IS: 6911	5 T	91	12	- DO -	- DO -	- DO -	- DO -	NA	NA	NA	-	10%	- DO -	3	D14
05	- DO -	IS: 6911 IS: 2062	5 T	91	12	- DO -	- DO -	- DO -	- DO -	NA	NA	NA	-	10%	- DO -	3	D14
06	- DO -	IS: 6911, WITH IS: 3589	6 T	101	21	- DO -	- DO -	E-7018	CS11294	- DO -	NA	NA	-	10%	- DO -	3	D14
07	- DO -	IS: 2062	8 T	11	7.5	- DO -	- DO -	- DO -	- DO -	NA	NA	NA	-	10%	- DO -	3	B15
08	- DO -	IS: 2062	6 T	28	12	- DO -	- DO -	- DO -	- DO -	NA	NA	NA	-	10%	- DO -	3	K13
09	- DO -	IS: 2062	10 T	684	371	- DO -	- DO -	- DO -	- DO -	NA	NA	NA	-	10%	- DO -	3	C11, C13
10	- DO -	IS: 2062	12 T	86	128	- DO -	- DO -	E-7018	CS11294	- DO -	NA	NA	-	10%	- DO -	3	C15
11	- DO -	- DO -	20 T	46	101	- DO -	BUTT	E-7018	- DO -	- DO -	NA	NA	-	10%	- DO -	3	C15
12	- DO -	IS: 1570	12 T	93	67.2	- DO -	- DO -	E-7018	- DO -	- DO -	NA	NA	-	10%	- DO -	3	K4
13	- DO -	IS: 1570	44 T	61	422	- DO -	- DO -	- DO -	CS 112186	125°C	NA	NA	10% U.T.	10%	- DO -	3	G3
14	- DO -	IS: 2062	40 T	25	75	- DO -	- DO -	- DO -	CS 11294	NIL	NA	NA	-	10%	- DO -	3	B15

## FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP  
PACKAGE : CONDENSER

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## FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP  
PACKAGE : CONDENSER

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## FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP  
PACKAGE : CONDENSER

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## FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP  
PACKAGE : CONDENSER

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## FIELD WELDING SCHEDULE

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PACKAGE : CONDENSER

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## FIELD WELDING SCHEDULE

PROJECT : 2X800MW MAHAN STPP  
PACKAGE : CONDENSER

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# FIELD WELDING SCHEDULE

## FOR 800 MW GENERATOR PIPING

SL. NO.	PIPE SIZE (ODXTK)	TYPE OF JOINT	MAT. SPEC.	SIZE OF WELD	NO. OF WELD JOINTS	QTY. OF FILLER MAT. PER WELD (in Kg)	WPS NO.	REMARK
1	141.3X3.4	BUTT	ASME SA 106, GR B	4Λ	3	0.078	CS110114	
2	114.3X3.05	„	„	4Λ	45	0.057	„	
3	88.9X3.05	„	„	4Λ	21	0.044	„	
4	73X3.05	„	„	4Λ	34	0.036	„	
5	60.3X3.91	„	„	4Λ	85	0.039	„	
6	48.3X2.77	„	„	3Λ	6	0.022	„	
7	33.4X2.77	„	„	3Λ	62	0.015	„	
8	26.7X2.87	„	„	3Λ	8	0.013	„	
9	21.3X2.77	„	„	3Λ	3	0.009	„	
10	17.1X2.31	„	„	3Λ	3	0.006	„	
11	13.7X2.24	„	„	3Λ	24	0.005	„	
12	168.3X3.41	„	ASME A312, TP321	4Λ	14	0.078	SS11179	
13	114.3X3.05	„	„	4Λ	1	0.057	„	
14	48.3X2.77	„	„	3Λ	12	0.022	„	
15	33.4X2.77	„	„	3Λ	7	0.015	„	
16	21.3X2.77	„	„	3Λ	6	0.009	„	
17	141.3X3.4	FILLET	ASME SA 106, GR B	4V	8	0.057	CS110114	
18	114.3X3.05	„	„	4V	8	0.041	„	
19	88.9X3.05	„	„	4V	4	0.032	„	
20	73X3.05	„	„	4V	4	0.026	„	
21	60.3X3.91	„	„	4V	8	0.028	„	
22	48.3X2.77	„	„	3V	8	0.012	„	
23	33.4X2.77	„	„	3V	12	0.008	„	
24	168.3X3.41	„	ASME A312, TP321	4V	40	0.057	SS11179	
25	114.3X3.05	„	„	4V	4	0.041	„	
26	48.3X2.77	„	„	3V	6	0.012	„	
27	33.4X2.77	„	„	3V	6	0.008	„	

### **NOTE:**

1. Location for weld: As per piping layout drawing
2. Electrode filler material specification:
  - For carbon steel piping- ER70S-G
  - For stainless steel piping- ER347
3. NDT requirement: As per HW0850199
4. Process of weld: TIG

Prepared By: Pratibha Gupta

Checked by: Manju Azad

Approved by: R L Vyas

**FIELD WELDING SCHEDULE**  
**FOR 800 MW H<sub>2</sub> COOLER PIPING**

SL. NO.	PIPE SIZE (ODXTK)	TYPE OF JOINT	MAT. SPEC.	SIZE OF WELD	NO. OF WELD JOINTS	QTY. OF FILLER MAT. PER WELD (in Kg)	WPS NO.	REMARK
1	168.3X3.4	BUTT	ASME SA 106, GR B	4Λ	50	0.093	CS110114	
2	33.4X2.77	„	„	3Λ	22	0.015	„	
3	21.3X2.77	„	„	3Λ	25	0.009	„	
4	17.1X2.31	„	„	3Λ	13	0.006	„	
5	13.7x2.24	„	„	3Λ	5	0.005	„	
6	168.3X3.4	FILLET	„	4V	10	0.068	„	
7	33.4X2.77	„	„	3V	8	0.008	„	

**NOTE:**

1. Location for weld: As per piping layout drawing
2. Electrode filler material specification:
  - For carbon steel piping- ER70S-G
  - For stainless steel piping- ER347
3. NDT requirement: As per HW0850199
4. Process of weld: TIG

Prepared By: Pratibha Gupta

Checked by: Manju Azad

Approved by: R L Vyas

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Ref.Drawing No>  
  
Sign & Date  
  
Inventory No>

FIRST ANGLE PROJECTION															( ALL DIMENSIONS ARE IN mm )										FORM DG 38(B)						
00089-90001-3 DRAWING No.																															
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM LXW	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION																	
				TYPE	SIZE																										
1.	LP CASING UPPER PART 01074058000	DETAIL F	720X20	F	∇ 20	CS,CK CSR-1	1	1.13	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC G-G	560X20	F	∇ 20	-DO-	1	0.880	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC E-E	9656X20	F	∇ 20	-DO-	1	15.16	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
			9656X8	F	∇ 8	-DO-	-DO-	2.43	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
2.	COMPENSATOR FOR CASING GUIDE 11077558000	SEC A-A	5052X12	F	∇ 12	ISO 5817-B CSR-2(4)																									
	4713X5		F	∇ 5	-DO-	-DO-	3.57	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																	
	4336X10		F	∇ 10	-DO-	-DO-	0.462	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																	
	ITEM 1 11077556000	SEC A-A	10053X12	F	∇ 12	-DO-	-DO-	1.70	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
			9425X8	F	∇ 8	-DO-	-DO-	5.68	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
			8039X10	F	∇ 10	-DO-	-DO-	2.36	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
	ITEM 2 11077558100	SEC A-A																													
3.	LP CASING ASS. 01074458000	VIEW Y	(3.14XDXW)	B		BS,CSR-3																									
	-DO-		2			0.172	AA10455	AA10455	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																		
	ITEM 37 21074458600	DETAIL C	279.14X3.2	B		-DO-	-DO-	0.15	AA10455	AA10455	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
	ITEM 34 31074458300																														
				-GMS No./- C B O M-			STATUS OF_DRG	TYPE OF PRODUCT STEAM TURBINE																							
				ACREED DEPT			NAME	SIGN	DATE	OR																					
				WT			S.K.THAKUR	sd/-	21.11.16	NAME OF CUSTOMER/PROJECT																					
				GRADE OF UNTOL. DIM								NAME		SIGN	DATE	NO. OF VAR															
				M/CG.- AA0230208 m								DRN	JAIVEER	sd/-	24.09.2016																
				WELDING-CLASS 'B' OF AA0621104								CHD	M MITTAL	sd/-	24.09.2016																
				GAS CUTTING-TABLE 3 OF AA0621101								APPD	D.K.RAY	sd/-	22.11.2016																
REV		DATE	ALTERED		REV		DATE	ALTERED		DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.		ITEM No.	NO. OF ITEMS														
CHECKED		CHECKED		CHECKED		CHECKED		CODE 4011	—	—		—	—	—	—																
												TITLE :				CARD CODE	DRAWING NO.		7	22	23	24									
												FIELD WELDING SCHEDULE					3-10005-58000														
																SHEET No. 01		No. OF SHEETS 09													

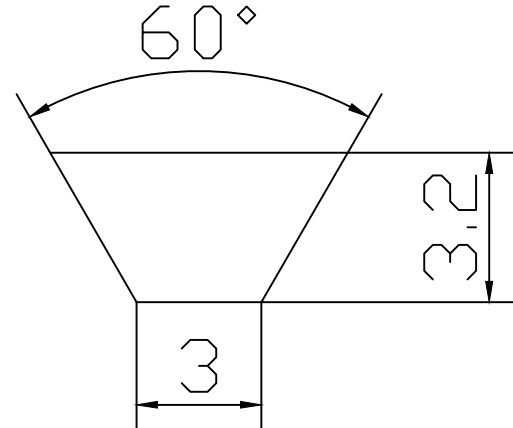
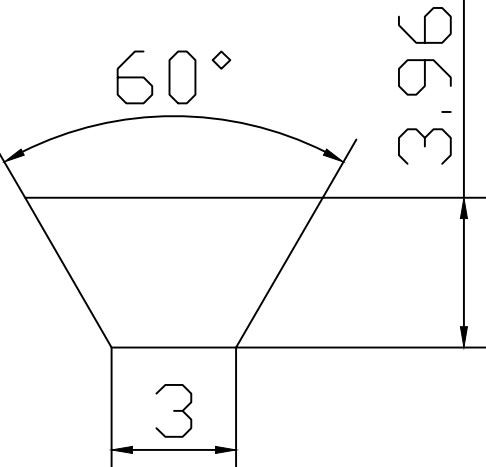
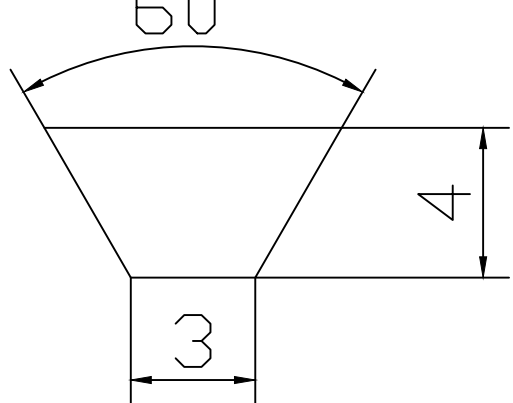
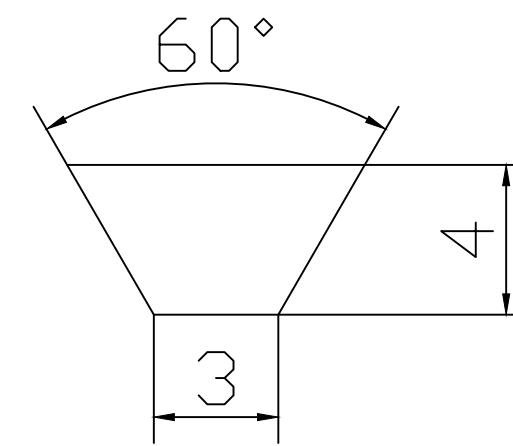
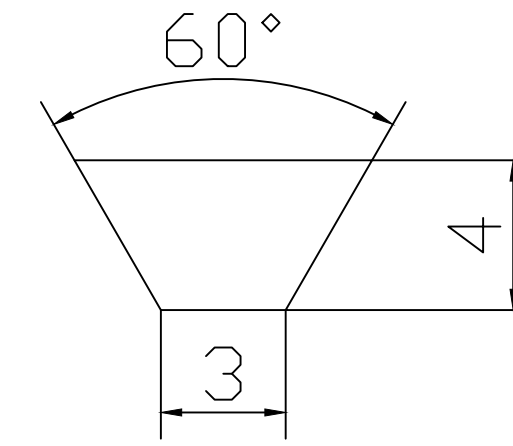
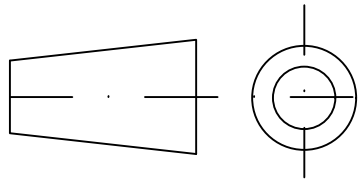
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Inventory No

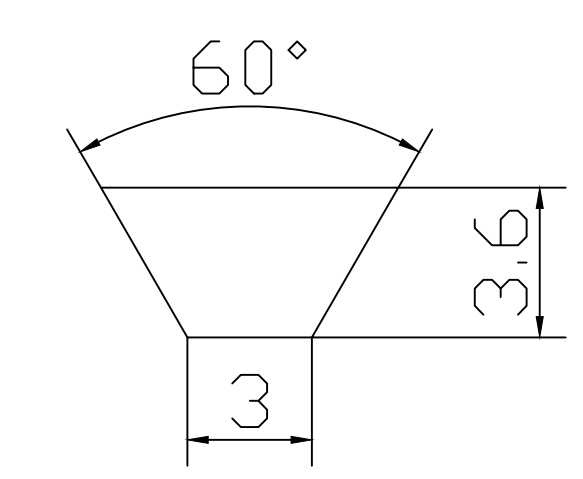
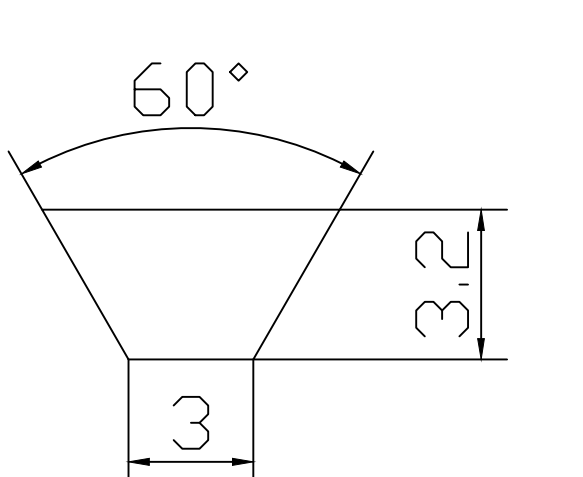
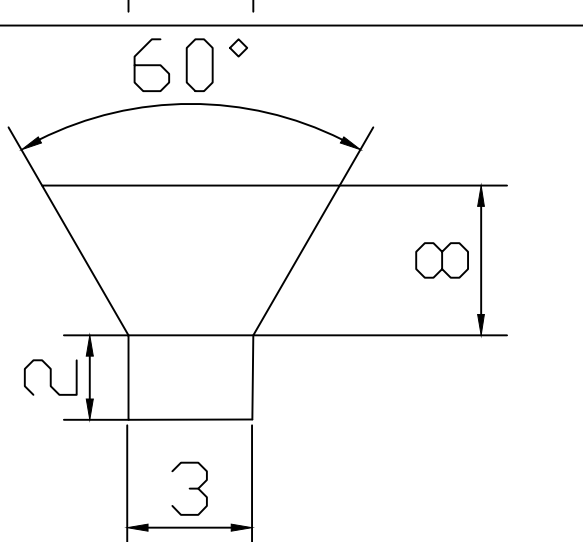
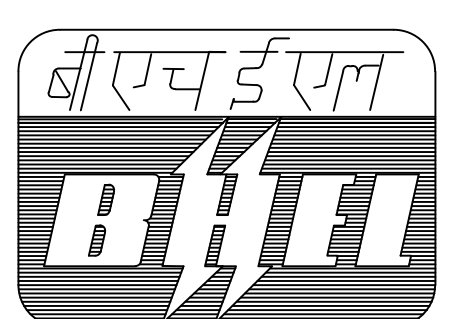
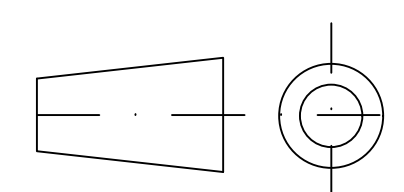
FIRST ANGLE PROJECTION															( ALL DIMENSIONS ARE IN mm )										FORM DG 38(B)						
00089-90001-3															DRAWING No.																
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM (LXW)	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION																	
				TYPE	SIZE																										
	ITEM 35 21074458400	DETAIL X	279.14X3.2	B		BS CSR-3	2	0.15	AA10455	AA10455	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
	ITEM 36 21074458500	VIEW Z	279.14X3.2	B	-DO-	-DO-	4	0.30	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		VIEW Y	358.9X3.96	B		BS CSR-3	2	0.18	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		ITEM 38 21074458700	MAIN VIEW	279.14X4	B		-DO-	4	1.13	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
	VIEW Y		279.14X4	B	-DO-	-DO-	2	0.56	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
	01074458000	SEC V-V	558X4	B		CS,CK,CSR-3	1	0.13	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC W-W	840X4	B		CS,CK,CSR-3	-DO-	0.20	AA10455	AA10455	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC G-G	558X4	B	-DO-	CS,CK,CSR-3	-DO-	0.13	AA10455	AA10455	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC H-H	1320X12	F	∇12	CS,CK,CSR-3	1	0.75	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
				1080X5	F	∇5	-DO-	-DO-	0.10	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
				-GMS No./- C B O M-		STATUS OF DRG		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT																							
				ACREED DEPT		NAME										SIGN		DATE													
NOTE :- F = FILLET WELD, B = BUTT WELD SCE = SURFACE CRACK EXAMINATION. WELD CLASSIFICATION GROUP ACC. TO HW0620099. WELDING TEST SCOPE ACC. TO HW0850199.				GRADE OF UNTOL. DIM		WT		S.K.THAKUR		sd/-		21.11.16																			
				M/CG.- AA0230208 m																											
				WELDING-CLASS 'B' OF AA0621104																											
				GAS CUTTING-TABLE 3 OF AA0621101																											
REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	DEPT	STE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.		ITEM No.	NO. OF ITEMS															
		CHECKED			CHECKED			CHECKED	CODE	4011																					
										TITLE :				CARD CODE	DRAWING NO.																
										FIELD WELDING SCHEDULE					3-10005-58000																
														SHEET No. 02		No. OF SHEETS 09															



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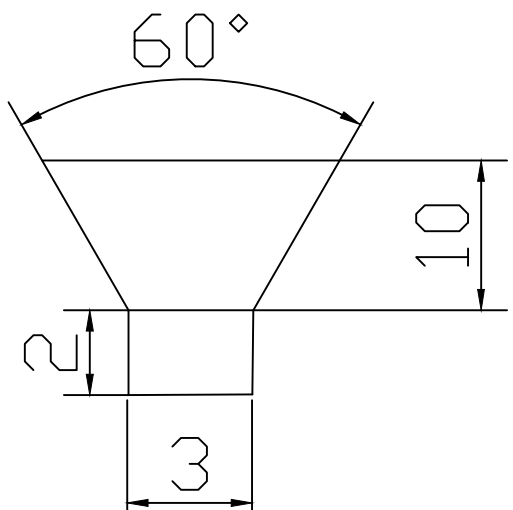
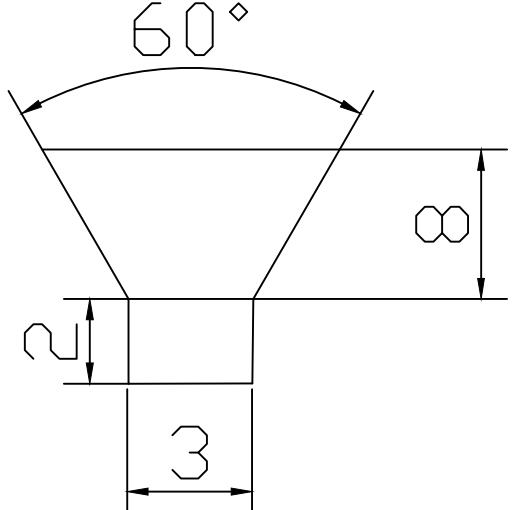
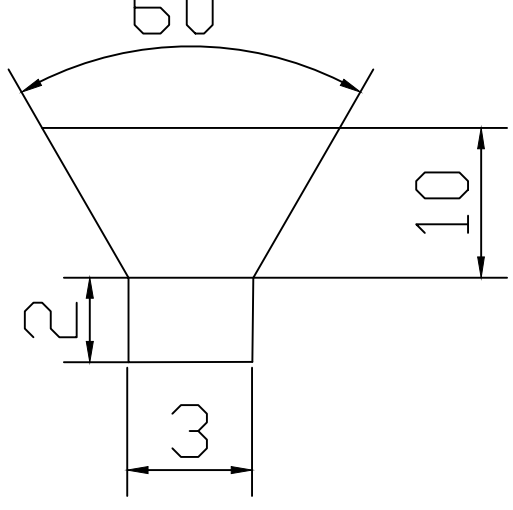
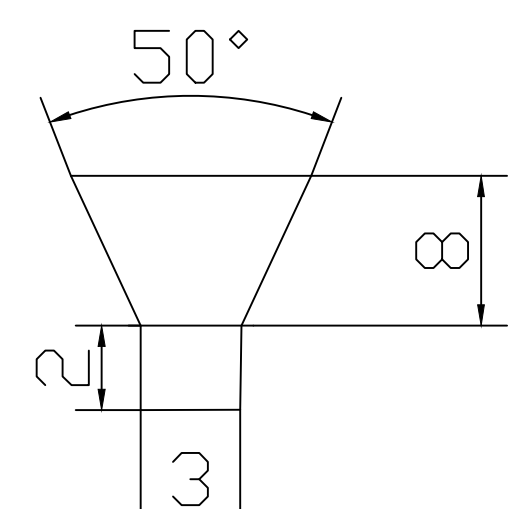
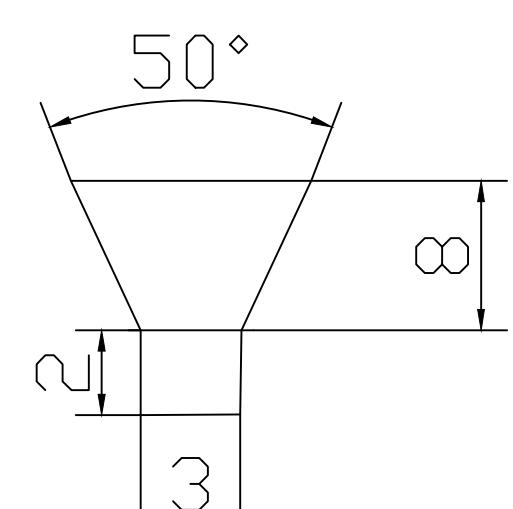
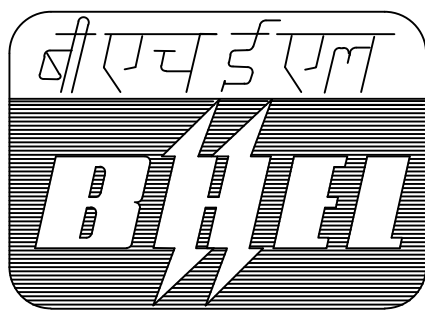
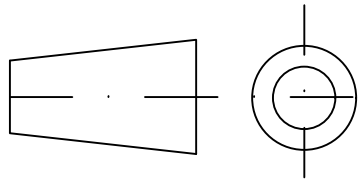
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Sign & Date  
  
Inventory No

FIRST ANGLE PROJECTION															( ALL DIMENSIONS ARE IN mm )										FORM DG 38(B)						
00089-90001-3 DRAWING No.																															
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM (LXW)	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION																	
				TYPE	SIZE																										
		SEC H <sub>1</sub> -H <sub>1</sub>	880X12	F	▽ 12	CS,CK CSR-3(2)	1	0.50	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
			720X5	F	▽ 5	-DO-	1	0.07	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC H <sub>2</sub> -H <sub>2</sub>	880X12	F	▽ 12	-DO-	1	0.50	AA10119	AA10455	E7018	100°C LOCALLY	NO POST HEAT	SMAW	CS11294																
			720X5	F	▽ 5	-DO-	-DO-	0.07	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL E1	520X20	F	▽ 20	-DO-	1	0.816	AA10119	AA10119	E7018	100°C LOCALLY	NO POST HEAT	SMAW	CS11294																
		SEC E <sub>2</sub> -E <sub>2</sub>	480X20	F	▽ 20	-DO-	-DO-	0.75	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC G <sub>1</sub> -G <sub>1</sub>	362X9	F	▽ 9	-DO-	-DO-	0.05	AA10119	AA10455	E7018	100°C LOCALLY	NO POST HEAT	SMAW	CS11294																
		SEC O-O	8000X13.5	F	▽ 13.5	-DO-	-DO-	5.72	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC Y-Y	15520X30	F	▽ 30	-DO-	-DO-	54.82	-DO-	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL V <sub>1</sub>	480X20	F	▽ 20	-DO-	-DO-	0.75	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC K <sub>1</sub> -K <sub>1</sub>	1440X20	F	▽ 20	-DO-	-DO-	2.26	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC K2-K2	800X13.5	F	▽ 13.5	-DO-	-DO-	0.57	AA10119	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL A	719X3.6	B		-DO-	-DO-	0.10	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL-B	719X3.6	F	▽ 3.6	-DO-	-DO-	0.03	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		SEC U-U	559X9	F	▽ 9	-DO-	-DO-	0.29	AA10455	AA10119	E7018	100°C LOCALLY	NO POST HEAT	SMAW	CS11294																
			719X3.2	B		-DO-	-DO-	0.08	AA10455	AA10455	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
4.	11076858000 LP EXTRACTION A1	MAIN VIEW	4493X10	B		BS,BK UT AS PER CSR-3	1	2.36	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
				-GMS No./- C B O M-			STATUS OF DRG		TYPE OF PRODUCT STEAM TURBINE OR NAME OF CUSTOMER/PROJECT																						
				AGREED DEPT		NAME		SIGN								DATE															
NOTE :- F = FILLET WELD, B = BUTT WELD SCE = SURFACE CRACK EXAMINATION. WELD CLASSIFICATION GROUP ACC. TO HW0620099. WELDING TEST SCOPE ACC. TO HW0850199.				GRADE OF UNTOL. DIM			WT		S.K.THAKUR		sd/-		21.11.16		 BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR		NAME		SIGN		DATE		NO. OF VAR 73 74								
				M/CG.- AA0230208 m									DRN				JAIVEER		sd/-		24.09.2016										
				WELDING-CLASS 'B' OF AA0621104									CHD				M MITTAL		sd/-		24.09.2016										
				GAS CUTTING-TABLE 3 OF AA0621101									APPD				D.K.RAY		sd/-		22.11.2016										
REV	DATE	ALTERED		REV	DATE	ALTERED		REV	DATE	ALTERED		DEPT STE				SCALE		WEIGHT (KG)		REF. TO ASSY. DRG.		ITEM No.		NO. OF ITEMS 75 77							
		CHECKED				CHECKED				CHECKED		CODE 4011																			
											TITLE : FIELD WELDING SCHEDULE		CARD CODE		DRAWING NO. 3-10005-58000		SHEET No. 03		No. OF SHEETS 09												

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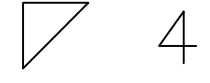
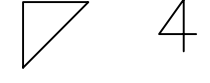
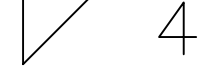
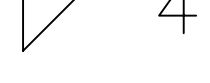

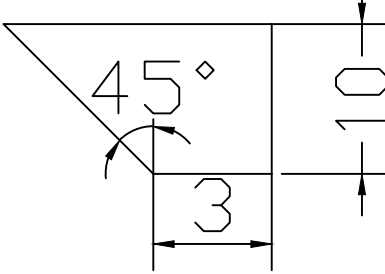
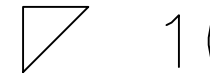
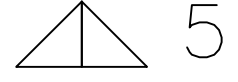
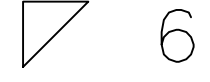


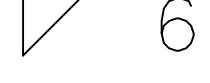

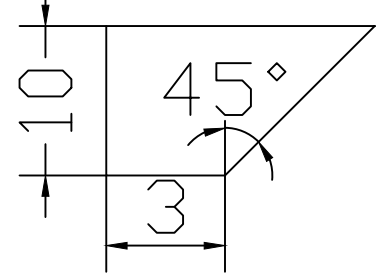
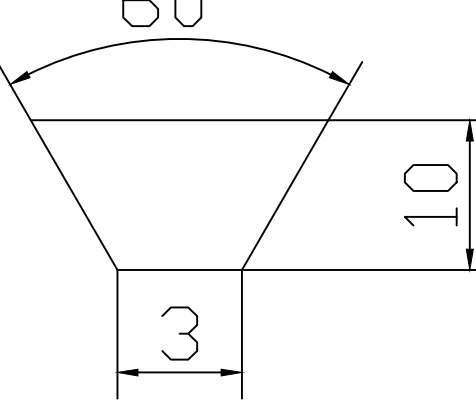


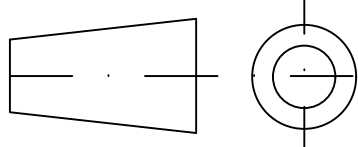
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Sign & Date  
  
Inventory No>

FIRST ANGLE PROJECTION															( ALL DIMENSIONS ARE IN mm )										FORM DG 38(B)				
00089-90001-3															DRAWING No.														
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM (LXW)	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION															
				TYPE	SIZE																								
	LP EXCTRACTION A1		17970X12	B		BS,BK UT AS PER CSR-3 PT AS PER CSR-1	1	13.22	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294														
5.	11076958000	MAIN VIEW	4493X10	B		-DO-	-DO-	2.36	-DO-	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294														
	LP EXCTRACTION A2		17970X12	B		-DO-	-DO-	13.22	-DO-	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294														
6.	01077058000	VIEW PIPE SECTION A3/1	4807X10	B		BS,BK UT AS PER CSR-3 CS,BK UT AS PER CSR-1	-DO-	2.52	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294														
	LP EXTRACTION A3		1917X10	B		-DO-	-DO-	1.00	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294														
		VIEW PIPE SECTION A3/2	4807X10	B	-DO-	-DO-	-DO-	2.52	AA10401	AA10401	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294														
					-GMS No./- C B O M-			STATUS OF_DRG	TYPE OF PRODUCT STEAM TURBINE																				
				ACREED DEPT			NAME	SIGN	DATE	OR																			
				WT			S.K.THAKUR	sd/-	21.11.16	NAME OF CUSTOMER/PROJECT																			
NOTE :- F = FILLET WELD, B = BUTT WELD SCE = SURFACE CRACK EXAMINATION. WELD CLASSIFICATION GROUP ACC. TO HW0620099. WELDING TEST SCOPE ACC. TO HW0850199.				GRADE OF UNTOL. DIM						 BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR			NAME		SIGN		DATE		NO. OF VAR										
				M/CG.- AA0230208 m									DRN	JAIVEER	sd/-	24.09.2016													
				WELDING-CLASS 'B' OF AA0621104									CHD	M MITTAL	sd/-	24.09.2016													
				GAS CUTTING-TABLE 3 OF AA0621101									APPD	D.K.RAY	sd/-	22.11.2016													
REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.		ITEM No.	NO. OF ITEMS													
		CHECKED			CHECKED			CHECKED	CODE 4011																				
										TITLE : FIELD WELDING SCHEDULE			CARD CODE	DRAWING NO. 3-10005-58000			75 77												
													SHEET No. 04		No. OF SHEETS 09		22 23 24												

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Ref.Drawing No>  
  
Sign & Date  
  
Inventory No>

FIRST ANGLE PROJECTION															( ALL DIMENSIONS ARE IN mm )										FORM DG 38(B)						
00089-90001-3 DRAWING No.																															
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM (LXW)	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION																	
				TYPE	SIZE																										
7.	SHEATING FOR EXTRACTION A3 LPI 01078058000	DETAIL D	2056X4	F		4	BS,BK CSR-3	1	0.13	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			1280X4	F		4	-DO-	-DO-	0.08	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			1120X4	F		4	-DO-	-DO-	0.07	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			600X4	F		4	-DO-	-DO-	0.04	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			943X4	F		4	-DO-	-DO-	0.06	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
		DETAIL G	2671X10	F			-DO-	-DO-	1.676	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			4713X10	F	-DO-		-DO-	-DO-	2.95	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
		DETAIL J	1508X10	F	-DO-		BS,BK,CSR-3	-DO-	0.95	AA10401	AA10109	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			3268X10	F		10	BS,BK,CSR-3	-DO-	1.29	AA10119	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
		SECTION E-E	1508X5	F		5	-DO-	-DO-	0.30	AA10119	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			200X6	F		6	-DO-	-DO-	0.40	-DO-	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			1440X6	F		6	-DO-	-DO-	0.20	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			1058X6	F		6	-DO-	-DO-	0.15	AA10455	AA10119	E7018	100° LOCALLY	NO POST HEAT	SMAW	CS11294															
		DETAIL H	1760X6	F		6	-DO-	-DO-	0.25	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			1200X6	F		6	-DO-	-DO-	0.17	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			2671X10	F			BS,BK,CSR-3	-DO-	1.67	AA10109	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
		DETAIL K	14834X10	B			-DO-	-DO-	10.21	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
		DETAIL M	275X10	B	-DO-		-DO-	-DO-	0.19	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
		DETAIL I	3600X7	F		7	-DO-	-DO-	1.09	AA10401	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
			8400X7	F		7	-DO-	-DO-	1.61	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294															
NOTE :- F = FILLET WELD, B = BUTT WELD SCE = SURFACE CRACK EXAMINATION. WELD CLASSIFICATION GROUP ACC. TO HW0620099. WELDING TEST SCOPE ACC. TO HW0850199.					GRADE OF UNTOL. DIM		-GMS No./- C B O M-		STATUS OF DRG		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT																				
					M/CG.- AA0230208 m		ACREED DEPT	NAME	SIGN	DATE																					
					WELDING-CLASS 'B' OF AA0621104		WT		S.K.THAKUR	sd/-	21.11.16	BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR																			
					GAS CUTTING-TABLE 3 OF AA0621101																										
REV		DATE	ALTERED		REV		DATE	ALTERED		DEPT STE		SCALE		WEIGHT (KG)		REF. TO ASSY. DRG.		ITEM No.		NO. OF ITEMS											
			CHECKED						CHECKED		CODE 4011				---		---		---		---										
										TITLE : FIELD WELDING SCHEDULE					CARD CODE		DRAWING NO. 3-10005-58000														
																	SHEET No. 05					No. OF SHEETS 09									



DRAWING NO.

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Ref.Drawing No&amp;gt

Sign & Date

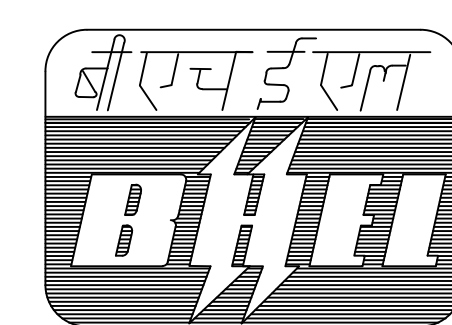
Inventory No.

NOTE :-  
F = FILLET WELD, B = BUTT WELD  
SCE = SURFACE CRACK EXAMINATION.  
WELD CLASSIFICATION GROUP ACC. TO  
HW0620099.  
WELDING TEST SCOPE ACC. TO  
HW0850199.

GRADE OF UNTOL. DIM
M/CG.— AA0230208 m
WELDING—CLASS 'B' OF AA0621104
GAS CUTTING—TABLE 3 OF AA0621101

GMS No./		C B O M	STATUS OF DRG U
AGREED DEPT	NAME	SIGN	DATE
WT	S.K.THAKUR	sd/-	21.11.16

TYPE OF PRODUCT      STEAM TURBINE  
OR  
NAME OF CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.  
RANIPUR, HARDWAR

	NAME	SIGN	DATE	NO. OF VAR ____ 73 74
DRN	JAIVEER	sd/-	24.09.2016	
CHD	M MITTAL	sd/-	24.09.2016	
APPD	D.K.RAY	sd/-	22.11.2016	

REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED
		CHECKED			CHECKED			CHECKED

DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
CODE 4011		—	—	—	—	75 77

TITLE :  
FIELD WELDING SCHEDULE

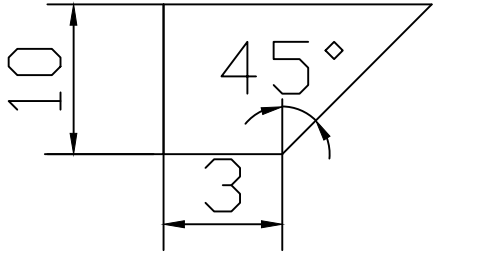
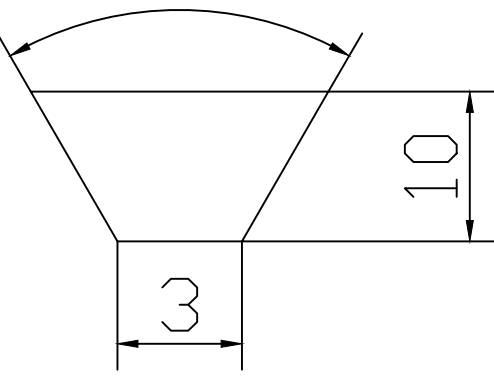
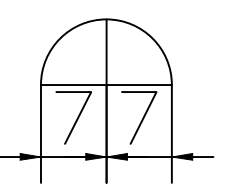
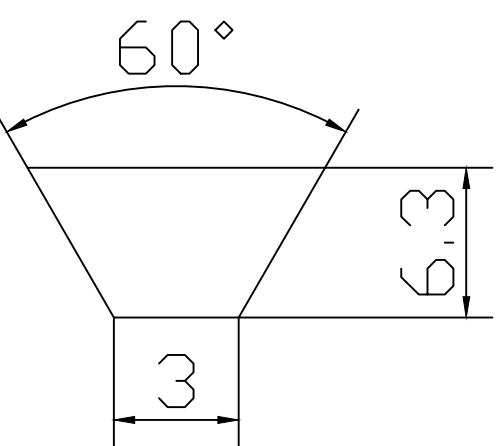
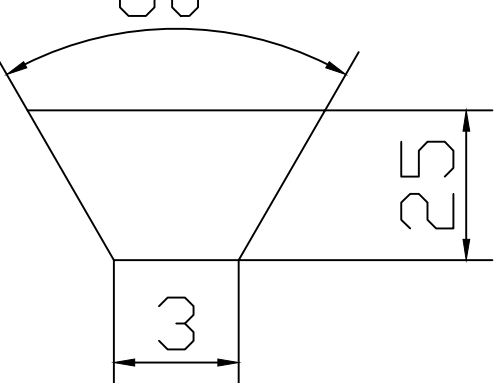
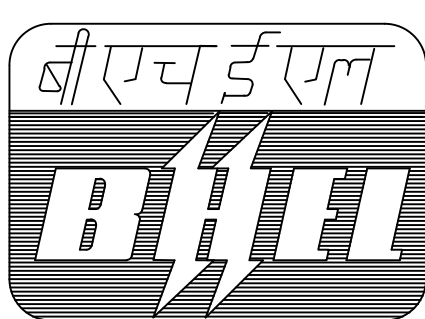
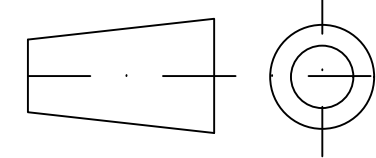
CARD CODE	DRAWING NO.	
	3-10005-58000	
	7	22 23 24

SHEET No. 06	No. OF SHEETS 09
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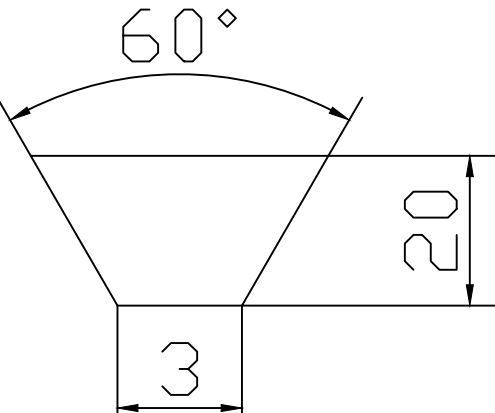
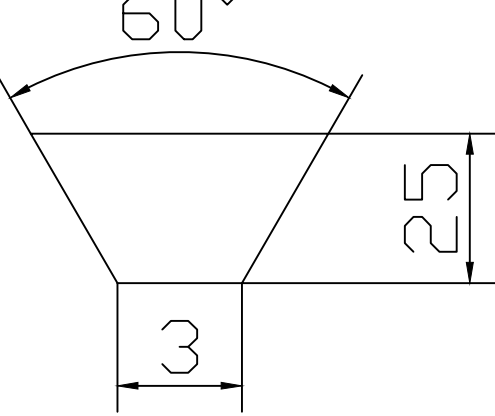
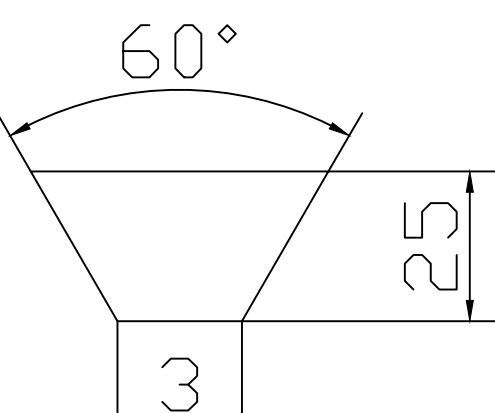
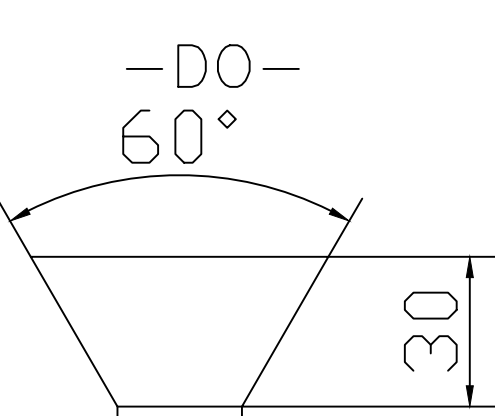
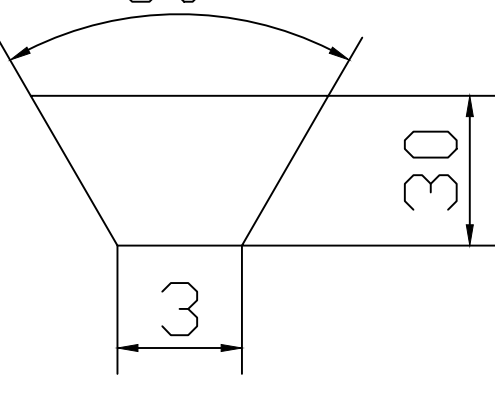
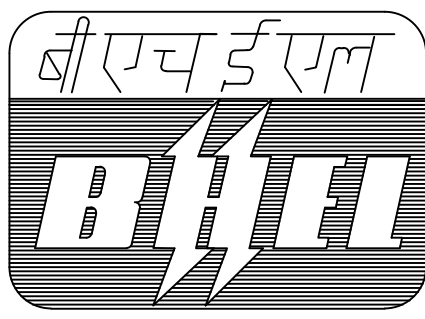
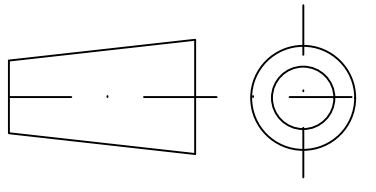
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Ref.Drawing No>  
  
Sign & Date  
  
Inventory No

FIRST ANGLE PROJECTION																( ALL DIMENSIONS ARE IN mm )				FORM DG 38(B)											
00089-90001-3																DRAWING No.															
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM (LXW)	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION																	
				TYPE	SIZE																										
		DETAIL F	2671X10	F		BS,BK,CSR-3	1	1.68	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL L	4713X10	F	-DO-	-DO-	-DO-	2.95	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL M	275X10	B		-DO-	-DO-	0.19	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL K	14834X10	B	-DO-	-DO-	-DO-	10.21	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		MAIN VIEW SHEATING SUPPORT FOR ITEM 9,10	3511X10	F	▽ 10	BS,BK,CSR-3	-DO-	1.40	AA10455	AA10119	E7018	100° LOCALLY	NO POST HEAT	SMAW	CS11294																
		FOR ITEM 11,12	4000X10	F	▽ 10	BS,BK,CSR-3	-DO-	1.57	AA10455	AA10119	E7018	100° LOCALLY	NO POST HEAT	SMAW	CS11294																
	CROSS OVER PIPE  01071358000	SECTION J1-J1	528X7	F		BS,BK,CSR-2	-DO-	0.32	HW10568	HW10568	E7018 A1	100-150°C LOCALLY	NO POST HEAT	SMAW	AS112159																
		DETAIL X1	689X25	F	▽ 25	-DO-	-DO-	1.90	AA10119	AA10455	E7018	100° LOCALLY	NO POST HEAT	SMAW	CS11294																
		DETAIL X2	689X6.3	B		-DO-	-DO-	0.23	AA10455	HW10570	E7018 A1	100-150°C LOCALLY	NO POST HEAT	SMAW	AS112159																
		DETAIL L5	6283X25	B		-DO-	-DO-	21.5	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294																
		DETAIL H	1127X25	B	-DO-	-DO-	-DO-	3.9	HW10568	AA10455	E7018 A1	100-150°C LOCALLY	NO POST HEAT	SMAW	AS112159																
						-GMS No./- C B O M-		STATUS OF_DRG	TYPE OF PRODUCT STEAM TURBINE																						
				ACREED DEPT		NAME	SIGN	DATE	OR																						
				WT		S.K.THAKUR	sd/-	21.11.16	NAME OF CUSTOMER/PROJECT																						
NOTE :- F = FILLET WELD, B = BUTT WELD SCE = SURFACE CRACK EXAMINATION. WELD CLASSIFICATION GROUP ACC. TO HW0620099. WELDING TEST SCOPE ACC. TO HW0850199.				GRADE OF UNTOL. DIM				 BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR								NAME		SIGN		DATE		NO. OF VAR									
				M/CG.- AA0230208 m												DRN	JAIVEER	sd/-	23.09.2016	73 74											
				WELDING-CLASS 'B' OF AA0621104												CHD	PRADEEP	sd/-	23.09.2016												
				GAS CUTTING-TABLE 3 OF AA0621101												APPD	D.K.RAY	sd/-	22.11.2016												
REV	DATE	ALTERED		REV	DATE	ALTERED		REV	DATE	ALTERED		DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.		ITEM No.	NO. OF ITEMS												
		CHECKED				CHECKED				CHECKED		CODE 4011								75 77											
												TITLE : FIELD WELDING SCHEDULE				CARD CODE	DRAWING NO. 3-10005-58000				22 23 24										
																SHEET No. 07		No. OF SHEETS 09													

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FIRST ANGLE PROJECTION										( ALL DIMENSIONS ARE IN mm )										FORM DG 38(B)	
00089-90001-3 DRAWING No.																					
SL. NO.	DRAWING NO.	LOCATION OF WELD	WELD SEAM (LXW)	WELD DETAILS		WELD CLASS & CSR	NO. OF WELD PER UNIT	QTY. OF WELD METAL IN Kg. (APPROX.)	MATERIAL SPECIFICATION		ELECTRODE	PRE-HEAT TREAT.	POST-HEAT TREATMENT	PROCESS OF WELD AND SPECIFICATION							
				TYPE	SIZE																
9.	CROSS OVER PIPE  01071358000	DETAIL K3	6283X20	B		BS,BK,CSR-2	1	14.35	AA10401	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		DETAIL H1	1127X25	B		-DO-	-DO-	3.9	AA10455	AA10455	ER7018-6	NO PRE HEAT	NO POST HEAT	GTAW	CS110114						
		SECTION G1-G1	3040X10	F	▽ 10	BS,BK,CSR-2	-DO-	1.2	AA10401	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		DETAIL T	1280X10	F	▽ 10	BS,BK,CSR-2	-DO-	0.50	AA10401	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		DETAIL U	3040X10	F	▽ 10	BS,BK,CSR-2	-DO-	1.20	AA10401	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		DETAIL K2	6283X25	B		BS,BK,CSR-2	-DO-	21.5	AA19341	AA10119	E7018	100-150 °C LOCALLY	NO POST HEAT	SMAW	CS11294						
		DETAIL H2	1127X25	B		-DO-	-DO-	3.85	HW10568	AA10455	E7018 A1	100-150 °C LOCALLY	NO POST HEAT	SMAW	AS112159						
		DETAIL P1	8168X30	B		-DO-	-DO-	39.08	AA10119	AA10119	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		SECTION A-A	1200X10	F	▽ 10	-DO-	-DO-	0.50	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		DETAIL Y	7075X20	F	▽ 20	-DO-	-DO-	11.10	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
			7075X9	F	▽ 9	-DO-	-DO-	2.25	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
		10.	CASING FRAME SECTION  01072458000	SECTION E2-E2	692X17.5	F	▽ 17.5	BS,BK,CSR-1	-DO-	1.02	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294				
				SECTION E1-E1	692X17.5	F	▽ 17.5	BS,BK,CSR-1	-DO-	1.02	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294				
SECTION C1-C1	3760X10			F	▽ 10	BS,BK,CSR-1	-DO-	2.06	-DO-	-DO-	E7018	NO PRE HEAT	NO POST HEAT	SMAW	CS11294						
Ref.Drawing No>					-GMS No./- C B O M-		STATUS OF DRG	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT													
	ACREED DEPT		NAME	SIGN	DATE																
					WT		S.K.THAKUR	sd/-	21.11.16	 BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR											
	GRADE OF UNTOL. DIM																				
	M/CG.- AA0230208 m																				
WELDING-CLASS 'B' OF AA0621104										DRN		NAME	SIGN	DATE	NO. OF VAR						
GAS CUTTING-TABLE 3 OF AA0621101										CHD		M MITTAL	sd/-	24.09.2016							
												APPD		D.K.RAY	sd/-	22.11.2016	73 74				
Sign & Date	REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.		ITEM No.	NO. OF ITEMS				
			CHECKED			CHECKED			CHECKED	CODE 4011		—	—	—		—		75 77			
Inventory No										TITLE :			CARD CODE	DRAWING NO.			7 22 23 24				
										FIELD WELDING SCHEDULE				3-10005-58000							
														SHEET No. 08		No. OF SHEETS 09		SIZE A3			

# **STANDARD FIELD QUALITY PLAN**

**FOR**

## **LP (LOW PRESSURE) PIPING (Erection)**



**BHARAT HEAVY ELECTRICALS LIMITED**

**Doc. No. AA/CQ/SFQP/SCA/PP/02**

**Rev No. 00**

**Date: 06/08/18**






**STANDARD FIELD QUALITY PLAN  
FOR  
LP PIPING  
(Erection)**

**Doc. No. AA/CQ/SFQP/SCA/PP/02    Rev No.00    Date: 06/08/18**

**PREPARED BY**    **Task Force Committee**  
**(Ref No. AA/CQ/A/0029 , dated 31/05/18)**

**ISSUED TO: PS- Regions**

Prepared by	Task Force	Name (Shri.)	Designation /Division
	Convener	Umesh Kumar Gautam	Sr. Engineer/ CQ & BE
	Members	S S Sahu	AGM/ Quality-PSSR
		N Kamalakannan	DGM/ Quality-PSSR
		Sumanta Chatterjee	AGM/ Quality-PSER
		Arup Ratan Paul	Engineer/ Quality-PSER
		Siva Prasad Ch (Co-opted)	Dy Manager/ Yermarus site/ PSSR
		K Viswam (Co-opted)	Manager/ Quality-PSSR
		Siddhartha Sharma	Dy Manager/ Wanakbori PSWR
		C Vaithianathan (Co-opted)	AGM/ Quality-Piping Centre
		C Saravanan (Co-opted)	SDGM/ Engg-Piping Centre
		R Seshagiri (Co-opted)	DGM/ Engg-Piping Centre
		Vivekananda Yellu	Dy Manager/ Quality- Piping Centre
		P Kondapa Naidu (Co-opted)	Dy Manager/ Engg.- Piping Centre
		Ms J Nanthini (Co-opted)	Sr Engineer/Quality- Piping Centre
V Karthikeyan (Co-opted)		Dy Engineer/ Quality- Piping Centre	
Reviewed & Issued by	 Chairman	J Ravisankar	



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Doc. No.:  
**AA/CQ/SFQP/SCA/PP/02**

REV. No.: **00**

Date:

PAGE: **01 OF 01**

<u>Sl. No.</u>	<u>Description</u>	<u>No. of Pages</u>
1	Status of Revisions	1
2	Authorization for different categories of checks	1
3	Statement of Checks	9
4	Documents referred in Field Quality Plan	1
5	Log Sheets : L-00,L-01,L-02 & L-03	4
6	Protocol	1
7	Feedback on Field Quality Plan	1



STANDARD FIELD QUALITY PLAN  
FOR  
**LP PIPING**  
( ERECTION )

SFQP NO.  
AA/CQ/SFQP/SCA/PP/02

REV. NO.:00

SHEET 1 / 1 SHEET

**STATUS OF REVISIONS**

REVISION NO.	DATE OF REVISION	DETAILS OF REVISION
00 (1 <sup>st</sup> Issue)	06/08/18	Made first time as SFQP by the task force. Reference taken from FQPs of different supercritical projects of all regions.



## STATEMENT OF CHECKS

SFQP NO.  
AA/CQ/SFQP/SCA/PP/02

REV. No.: 00

SHEET: **1** OF **10**

**Capacity / Type** :

**System** : **LP PIPING**

**Sub-System** : **LP PIPING**

**Area** : **ERECTION**

- \* For checks where log sheets are not called for, suitable records shall be maintained in the form of log book / protocols.
- \* As an evidence of having carried out the work satisfactorily, a general purpose log sheet L-00 shall be maintained for all the checks.
- \* Abbreviations used in the column "Type of Check" are :
  - R : Record Verification
  - M : Measurement
  - V : Visual
  - T/R : Test/Record
  - V/R : Visual /Record



**STANDARD FIELD QUALITY PLAN  
FOR  
LP PIPING  
STATEMENT OF CHECKS**

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No. 00

DATE 06.08.18

SHEET: **2 OF 10**

SYSTEM: PIPING

SUB-SYSTEM: **LP Piping**

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
<b>A</b>	<b>STORAGE &amp; PRESERVATION:</b>							
A.01	Receipt, Storage, Preservation and Handling at site.	V		C	As per reference doc.	SPH Instructions	-	
<b>B.</b>	<b>Check the availability of latest revision of the following documents:</b>  Lay out drawing Erection drawings Hanger arrangement schedule WPS & EWS Valves and Fittings schedule and datasheet Valve Actuator data sheet Insulation schedule Final Painting schedule Note: PEM/ customer approved painting schedule as applicable,	V	-	C	100%	100%	-	
<b>C.</b>	<b>Check for the following in LP Piping of all the systems:</b>							
C.01	Dimensions of pipes	M	Tape	B	100%	Drawing	Log book	
C.02	Edge preparation (wherever required), weld end diameter of pipes.	M	-	B	100%	Drawing	Log book	
C.03	Orientation and location of attachment welding, if any in pipes.	V	-	C	100%	Drawing	Log book	
C.04	Location and disposition of terminal points of pipes, wherever applicable.	M	Piano wire/ Tape	C	100%	Drawing	Log book	



**STANDARD FIELD QUALITY PLAN  
FOR  
LP PIPING  
STATEMENT OF CHECKS**

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No.00

DATE. 06.08.18

SHEET: **3 OF 10**

SYSTEM: PIPING

SUB-SYSTEM: **LP Piping**

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
C.05	Completion of supporting structure for piping, wherever required.	V	-	B	100%	Drawing	Log book	
C.06	Completion of supports	V	-	C	100 %	Drawing	Log book	
C.07	Elevation, disposition and slope of pipelines	M	Water level	B	100 %	Drawing	Log book	
C.08	Verticality of pipe lines, wherever required	M	Plumb bob/ Tape	B	100 %	Drawing	Log book	
C.09	Welder's Performance Qualification records	V/ R	-	A	100 %	Welding Manual	Log book	
C.10	Adoption of Correct procedure, approved electrodes and methods.	V/ R	-	B	100 %	Welding Manual / FWS	Log book	
C.11	Cleanliness of Pipe, edge preparation, free from rust, dust, oil, grease etc.	V	-	B	100 %	Welding Manual	Log book	
C.12	Ensure end cap of pipe is remain closed during Storage & erection, End cap remove only during final fit up with connecting pipe	V	-	B	100 %		Log book	
C.13	Air blasting / Steam blowing of fuel oil lines for thorough cleaning.	V		B	100 %		Log book	
C.14	Fit-up of joints, orientation and alignment of piping	V/ M	Tri square/ Scale	B	100 %	Drawing / FWS	Log book	
C.15	Completion of welding & NDE, Pre heating and post heating	V	-	A	As per FWS	Drawing / FWS	Log book & Test report	



# STANDARD FIELD QUALITY PLAN

## FOR LP PIPING STATEMENT OF CHECKS

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No.00

DATE. 06.08.18

SHEET : 4 OF 10

SYSTEM: PIPING

SUB-SYSTEM: LP Piping

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
C.16	Wherever applicable, check for wrapping & Coating material of underground piping as given below:							
C.16.01	Check for the quality of wrapping and coating material	R		B	100%	AWWA C203	Protocol/ Test report	One sample to be taken for petrol solubility test
C.16.02	Check for surface preparation quality	V		C	100%	AWWA C203	Logbook	
C.16.03	Holiday test	V/M	Holiday tester	A	100 %	IS:10221/Tech. Spec. & No. defect	Test Report	
C.16.04	Adhesion test	V/M	Knife	A	As per IS:10221	IS:10221/Tech. Spec. & No. defect	Protocol	
C.17	Wherever applicable, check for special internal coating like PU/Glass flake etc.					AWWA C203	Protocol/ Test report	
C.17.01	Check for the quality of wrapping and coating material	R		B	100%	AWWA C206-97	Logbook	
C.17.02	Check for surface preparation quality	V		C	100%	AWWA C206-97	Test Report	
C.17.03	Holiday test	V/M	Holiday tester	A	100 %	IS:10221/Tech. Spec. & No. defect	Protocol	
C.17.04	Adhesion test	V/M	Knife	A	As per IS:10221	IS:10221/Tech. Spec. & No. defect		
C.18	Hydraulic test/ Air leak test as applicable.	T/M	Pressure gauge/ Hyd. Pump	A	100%	No Leakage	L – 01/ Protocol	





# STANDARD FIELD QUALITY PLAN

SFQP No.  
AA/CQ/SFQP/SCA/PP/02

FOR  
**LP PIPING**

STATEMENT OF CHECKS

REV No. 00

DATE. 06.08.18

SHEET: 5 OF 9

SYSTEM: LP Piping

SUB-SYSTEM:  
**ROTATING  
EQUIPMENTS**

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
C.19	Ensure removal of temporary supports.	V		B	100%			
C.20	Painting wherever applicable.	V/ M	DFT gauge	B	100%	Tech. Spec.	L-04	
<b>D</b>	<b>ROTATING EQUIPMENTS (INCLUDING ALL PUMPS, MOTORS AND FILTERS):</b>							
	Check availability of all components as per drg	V		C	100%	Drg.		
D.01	Check the foundation for the following, a) Dimension b) Elevation & Level c) Foundation bolt's pocket size & spacing d) Cleanliness	M/V	Tape, Dumpy level & Water level	B	100%	G.A. / Foundation Drawing/	Log book	
D.02	Assembly check for free rotation and direction of rotation.	V	-	B	100%	Drg./OEM manual	Log book	
D.03	Leveling & alignment check.	M	Dial gauge & Feeler gauge	A	100%	Drg./OEM manual	L-03	
D.04	IR value of Motor winding	M	Megger	C	100%	- Drg./OEM manual	Log book	



# STANDARD FIELD QUALITY PLAN

SFQP No.  
AA/CQ/SFQP/SCA/PP/02

REV No. 00

DATE: 06.08.18

SHEET: 6 OF 10

FOR  
**LP PIPING**

STATEMENT OF CHECKS

SYSTEM: LP Piping

SUB-SYSTEM:  
**ROTATING  
EQUIPMENTS**

CHARACTERISTICS / ITEM		TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
<b>E</b>	<b>INSTRUMENTS:</b>							
E.01	Proper location & mounting of instruments.	V		C	100 %	Approved Layout drawing / P&ID	Log book	
E.02	Calibration and its validity of instruments.	T		B	100 %	Calibration TC	Test certificate	
<b>F</b>	<b>WELDING:</b>							
F.01	Welders' qualification.	T		A	100 %	WPS / Welding Manual	WQR	
F.02	Welding of valve end to pipeline and pipe line joints.	V		B	100 %	Drawing / Welding Manual		
F.03	Non-destructive examination of welds.	T/V		A	100 %	NDE Manual/ FWS	Logbook	



**STANDARD FIELD QUALITY PLAN  
FOR  
LP PIPING  
STATEMENT OF CHECKS**

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No. 00

DATE. 06.08.18

**SHEET: 7 OF 10**

SYSTEM: LP Piping

SUB SYSTEM: TANKS & VESSELS/  
STRAINERS connected to LP piping

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
<b>G.</b>	<b>HEAT EXCHANGERS/ TANKS &amp; VESSELS/ STRAINERS:</b>							
G.01	Check for correct location, orientation, elevation and level.	M	Tape/ Water level	A	100 %	Drawing	Log book	
G.02	Internal cleanliness of equipment.	V	-	B	100 %	No foreign material		
G.04	Ensure correct size & grade of fasteners are used and tightened to required torque value.	V/M	Torque wrench	B	100 %	Drawing/ OEM manual	Log book	
G.05	Ensure correct size & grade of gaskets are used in flange joints wherever applicable.	V		B	100 %	Drawing/ OEM manual		

**STANDARD FIELD QUALITY PLAN****FOR  
LP PIPING  
STATEMENT OF CHECKS**

SYSTEM: LP Piping

SUB-SYSTEM: **METALLIC  
EXPANSION JOINTS**

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No. 00

DATE. 06.08.18

SHEET : 8 OF 10

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
<b>H</b>	<b>Metallic EXPANSION JOINTS:</b>							
H.01	Ensure before installation the adjoining pipes shall be cleaned and free from sharp edges/ objects.	V		C	100%			
H.02	Ensure that the space between the adjoining Pipe's flanges match with preset value of Metallic expansion Bellow for proper fit.	M	Tape	B	100%	Drawing	Log book	
H.03	Ensure that the Expansion Bellow is protected from falling objects, weld spatter & cutting operation.	V		B	100%			
H.04	Ensure correct size & grade of fasteners are used and tightened to required torque value.	V/ M	Torque wrench	B	100%	Drawing	Log book	
H.05	Ensure locking of expansion joints (equalizing rods) during flood test Note: Ensure ME joints are not subjected to hydro test.	V		B	100%	Drawing		



STANDARD FIELD QUALITY PLAN  
FOR  
LP PIPING  
STATEMENT OF CHECKS

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No. 00

DATE. 06.08.18

SHEET : 9 OF 10

SYSTEM: LP Piping

SUB-SYSTEM: Valve

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
I	<b>ALL TYPES OF VALVES:</b>							
I.01	Identification of the valves for class, size & location.	V		B	100%	Valve Schedule / Drawing	Log book	
I.02	Cleanliness of pipelines / valve before fixing / welding.	V		B	100%			
I.03	Direction of flow (arrow mark) is as per the flow direction indicated on the valve body except for safety valve.	V		C	100%			
I.04	Availability of supports for valves and pipelines.	V		C	100%	Drawing	Log book	
I.05	Ensure that gland packing, gaskets & washers are put back in valve and also ensure bolts and studs are fitted and tightened properly.	V		B	100%	Drawing		
I.06	Matching of valve end and pipe before welding.	V		B	100%	Drawing		
I.07	Ensure valve is kept fully open and valve seat is protected before welding.	V		C	100%	Installation Manual		
I.08	Parallelism of the matching flange in case of flanged joints.	V		C	100%	Installation Manual		
I.09	Smooth opening and closing of valves.	V		B	100%		Log book	



**STANDARD FIELD QUALITY PLAN  
FOR  
LP PIPING  
STATEMENT OF CHECKS**

SFQP No. AA/CQ/SFQP/SCA/PP/02

REV No. 00

DATE. 06.08.18

**SHEET : 10 OF 10**

SYSTEM: **LP Piping**

SUB-SYSTEM: **Valve**

S.NO	CHARACTERISTICS / ITEM	TYPE OF CHECK	INSTRUMENT	CLASS	QUANTUM / FREQUENCY OF CHECK	REFERENCE DOCUMENT/ ACCETANCE STANDARD	FORMAT OF RECORD	REMARKS
<b>J</b>	<b>VALVE ACTUATOR:</b>							
J.01	Identification of the actuator for location.	V		C	100%	Valve Actuator Data Sheet		
J.02	Ensure actuator is firmly supported and free from vibration.	V		B	100%			
J.03	Size and correctness of power and control cables and proper sealing of unused cable entries.	V		C	100%	Drawing		
J.03	Earthing connection of the motor.	M	Megger	C	100%	Drawing		
J.04	Laying and proper termination of power & control cables.	V		C	100%	Cable schedule		
J.05	Smooth opening and closing of valves with actuator, Proper oil level in Gear Box	V		A	100%		Log book	
J.06.	Availability of hand wheel, motor/manual operation engaging level, Junction box gaskets etc.	V		C	100%			



FIELD QUALITY PLAN  
FOR  
**LP PIPING**  
( ERECTION )

SFQP NO:  
AA/CQ/SFQP/SCA/PP/02

REV. NO.: 00

SHEET 1 / 1 SHEET

**DOCUMENTS REFERRED IN FIELD QUALITY PLAN**

SL.NO.	Reference Document	Issuing Authority
	Welding Manual NDE Manual Heat Treatment Manual Erection drawings FWS	CQ&BE CQ&BE CQ&BE PC Chennai PC Chennai





## RECORD OF QUALITY CHECKS

SHEET NO. OF RFQP	CHECK NO.	RESULTS ACHIEVED OK / NOT OK	DRAWING / DOCUMENT REFERENCE	FORMAT OF RECORD	CHECKED BY SIGN. & DATE	ACCEPTED BY SIGN. & DATE	REMARKS

**Note:** Any protocol made is to be numbered & mentioned in “Format of Record” column.

		SYSTEM	SUB-SYSTEM	AREA	SFQP no. AA/CQ/SFQP/SCA/PP/02
PROJECT					REV. NO. : 00
UNIT NO.					LOG SHEET NO. : <b>L-00</b>
RATING					PAGE <b>1</b> OF <b>1</b>



INSTRUMENT REGN.NO.

DATE OF INSPECTION

DRAWING / DOCUMENT NO.

**PAINTING PROTOCOL**

SL NO	SYSTEM DESCRIPTION	EXISTING PAINTING-DFT (microns), If Applicable	SURFACE PREPARATION AFTER REMOVAL OF TEMPORARY SUPPORTS	PAINTING COLOR CODE	BAND (If Applicable)	FINAL PAINTING- DFT (micron)	REMARKS

All dimensions are in microns.

			NAME	SIGNATURE / DATE	SFQP NO. AA/CQ/SFQP/SCA/PP/02
PROJECT		INSPECTED BY			REV. NO.: 00
UNIT NO.		CLEARED BY			LOG SHEET NO.: L-03
RATING		CUSTOMER			PAGE 1 OF 1



INSTRUMENT REGN.NO.

DATE OF INSPECTION

DRAWING / DOCUMENT REF.

**HYDRAULIC TEST OF PIPING****REQUIREMENTS:**

Design Pressure : Kg / cm<sup>2</sup> (g)

Working Pressure : Kg / cm<sup>2</sup> (g)

Hydraulic Test Pressure : Kg / cm<sup>2</sup> (g)

Statutory Code Requirement (if any) :

Reference Document :

Circuits included in the test :

Temperature of the water in the system :

**OBSERVATION:**

Date of Filling :

Date of hydraulic test :

Temperature of the water in the system : .....° C

Hydraulic test Pressure : Kg / cm<sup>2</sup> (g)

Holding time : Minutes

Test Witnessed by :

**REMARKS:**

**Hydraulic test of Piping system at the test pressure of..... Kg / cm<sup>2</sup> (g) carried out on ..... and found satisfactory. The piping system is cleared for further operation.**

			NAME	SIGNATURE & DATE	SFQP NO: AA/CQ/SFQP/SCA/PP/02
PROJECT		INSPECTED BY			REV.NO.
UNIT NO.		CLEARED BY			LOG SHEET NO.: L-01
RATING		CUSTOMER			PAGE 1 OF 1



INSTRUMENT REGN.NO.

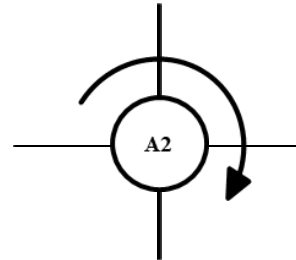
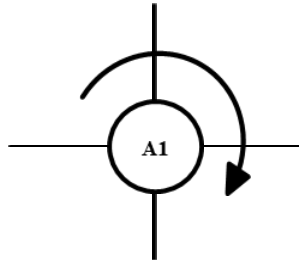
DIAL GAUGE/SLEEP GAUGE &  
INSIDE MICRO METER

DATE OF INSPECTION

DRAWING / DOCUMENT REF.

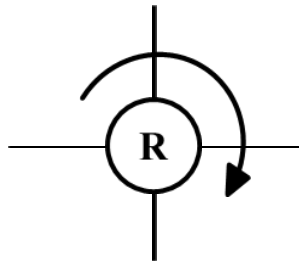
### PUMP ALIGNMENT READING

(Ref value)



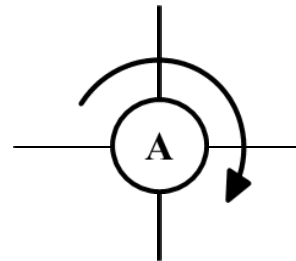
(Ref value)

(Ref value)



$(A1-A2)/2$

0.00



(RADIAL)

(AXIAL)

**Distance Between Coupling Halves :-  
Remarks (if any)**

Note: For small pumps, one axial reading is  
sufficient instead of two axial readings  
(All Dimensions are in MM.)

			NAME	SIGNATURE & DATE	SFQP NO. AA/CQ/SFQP/SCA/PP/02
PROJECT		CHECKED BY			REV. NO. 00
UNIT		ACCEPTED BY			Log Sheet: L-02
RATING		CUSTOMER			PAGE 1 OF 1



INSTRUMENT REG. NO./TAG

DATE OF INSPECTION

DRAWING / DOCUMENT REF.

**PROTOCOL**

			NAME	SIGNATURE & DATE	SFQP NO. AA/CQ/SFQP/SCA/PP/02
PROJECT		INSPECTED BY			REV.NO.: 00
UNIT NO.		CLEARED BY			PROTOCOL NO..
RATING		CUSTOMER			PAGE:



## FEEDBACK ON FIELD QUALITY PLAN

**In the Field Quality Plan (FQP), following Checks / Log sheets may be added / rewritten / deleted (cannot be carried out / not required) due to reasons as mentioned below:**

[illegible]