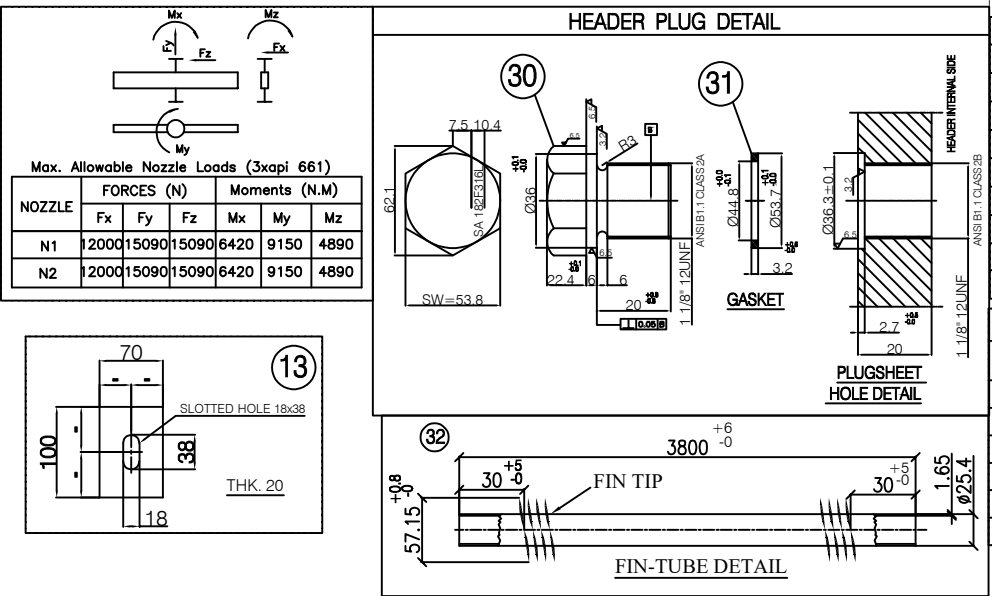
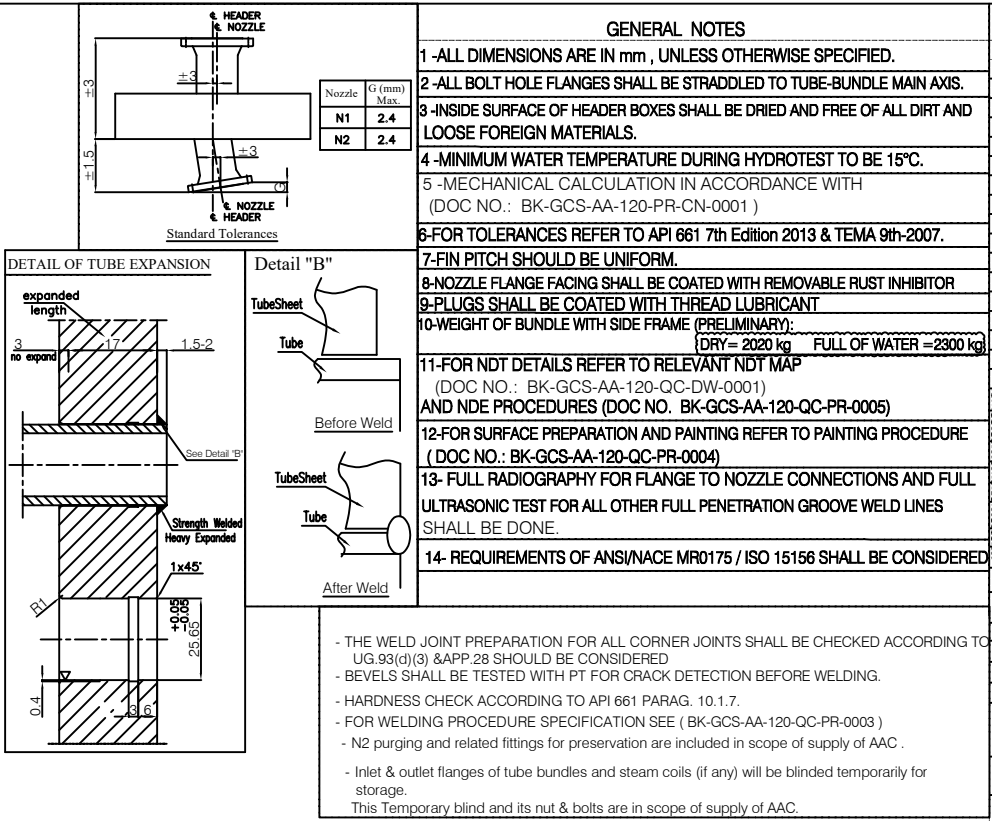
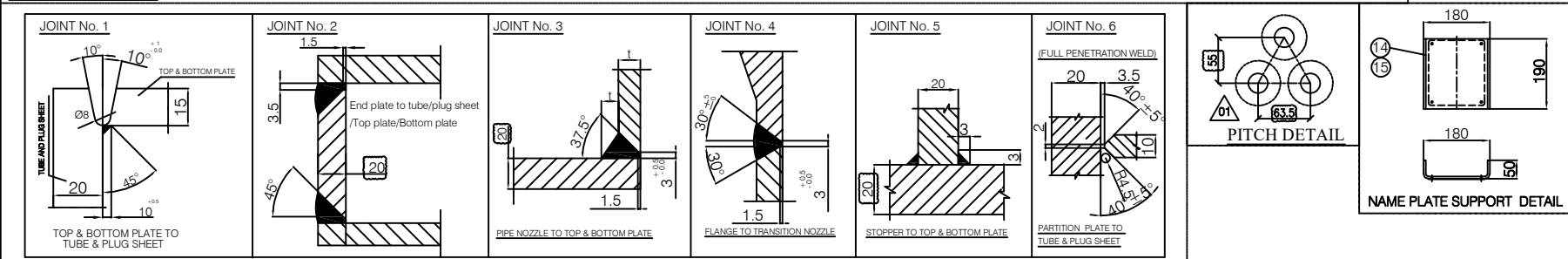
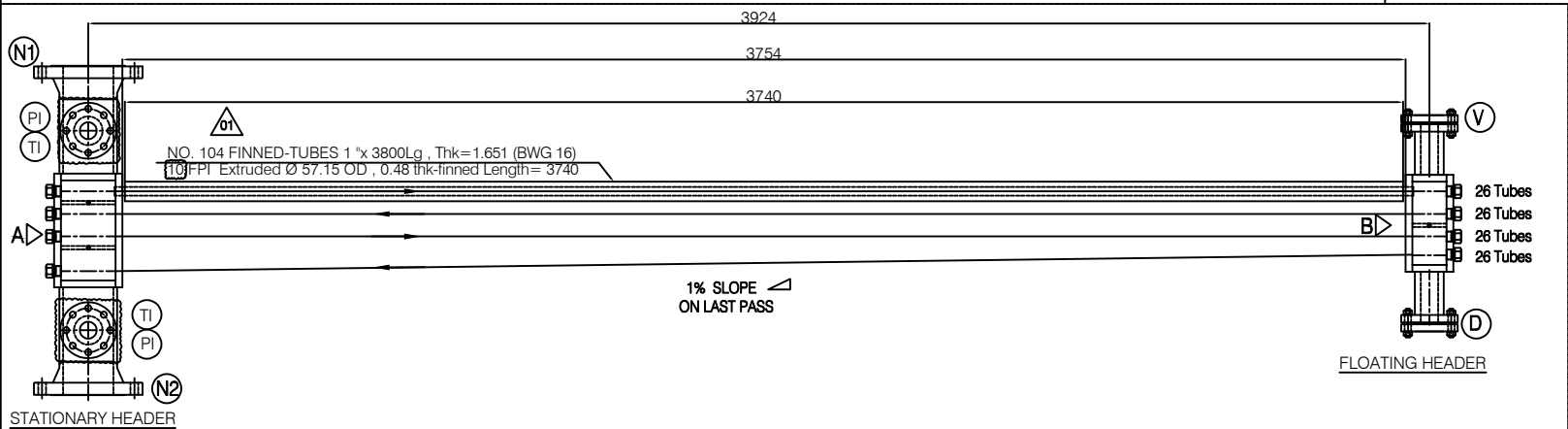
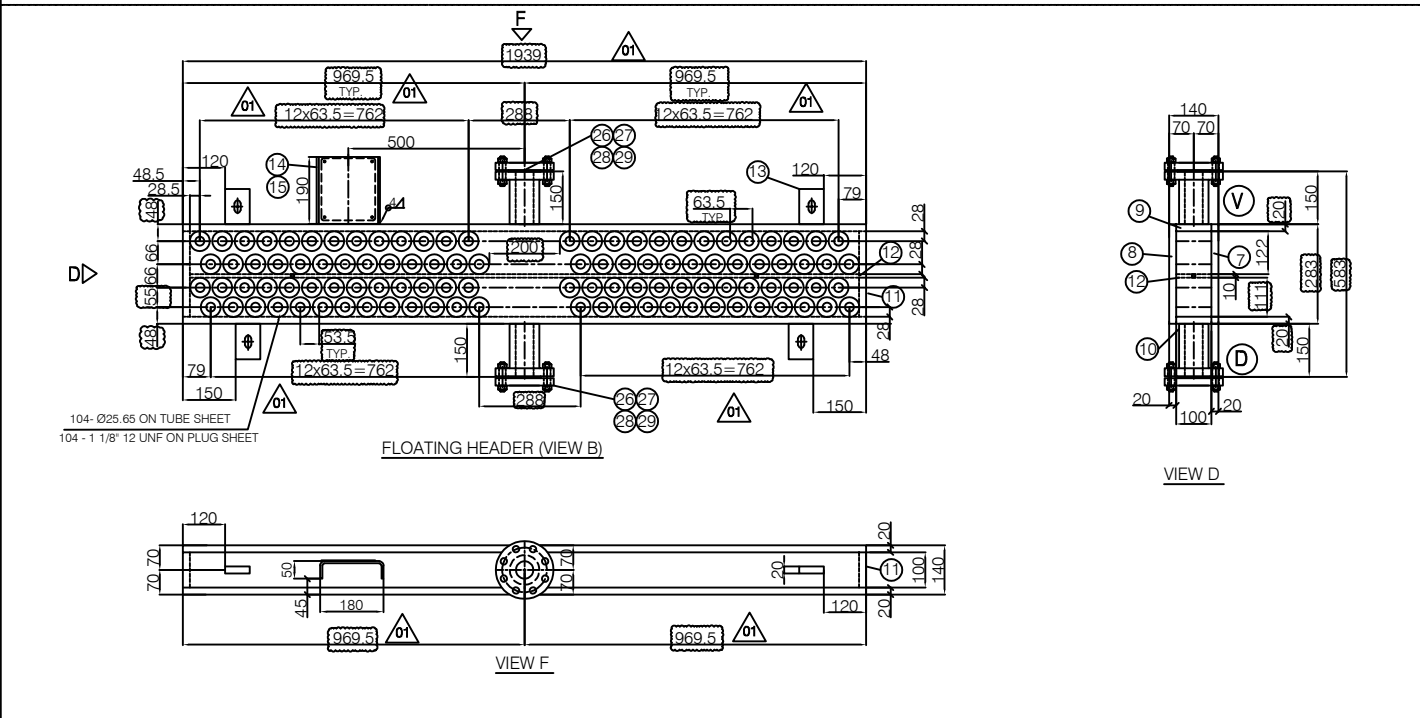
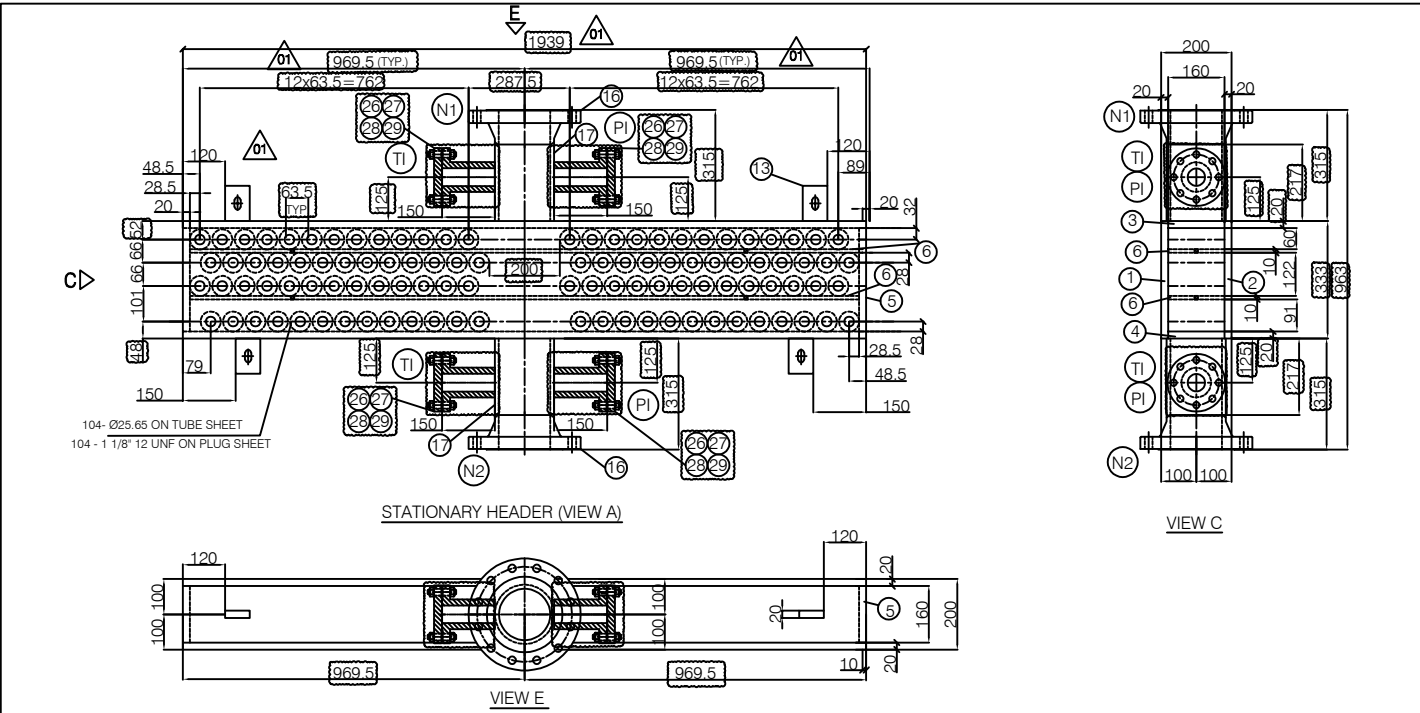




MATERIALS & PART LIST FOR ONE BUNDLE (AE-2101)					
NO	DESCRIPTION	MATERIAL	QTY	REMARK	WEIGHT
1	S. TUBESHEET	SA-240 TP316L	1	NACE MR 0175	84
2	S. PLUGSHEET	SA-240 TP316L	1	NACE MR 0175	82
3	S. TOP PLATE	SA-240 TP316L	1	NACE MR 0175	48
4	S. BOTTOM PLATE	SA-240 TP316L	1	NACE MR 0175	48
5	S. END PLATES	SA-240 TP316L	2	NACE MR 0175	15.5
6	S. PARTITION PLATE	SA-240 TP316L	2	NACE MR 0175	48
7	F. TUBESHEET	SA-240 TP316L	1	NACE MR 0175	81
8	F. PLUGSHEET	SA-240 TP316L	1	NACE MR 0175	79.5
9	F. TOP PLATE	SA-240 TP316L	1	NACE MR 0175	81
10	F. BOTTOM PLATE	SA-240 TP316L	1	NACE MR 0175	81
11	F. END PLATES	SA-240 TP316L	2	NACE MR 0175	8
12	F. PARTITION PLATE	SA-240 TP316L	1	NACE MR 0175	15
13	STOPPER	SA-240 TP316L	8	NACE MR 0175	9
14	NAME PLATE	SA-240 TP304	1		
15	NAME PLATE SUPPORT	SA-240 TP316L	1		2
16	FLANGE 6" W.N. RF, #300, SCH. 80S	SA 182F316L-NACE MR0175	2	ASME B16.5	38
17	NOZZLE PIPE 6", SCH 80S X217 L	SA312TP316L-NACE MR0175	2	ASME B36.19	118.5
18	DELETED	-	-	-	-
19	DELETED	-	-	-	-
20	DELETED	-	-	-	-
21	DELETED	-	-	-	-
22	DELETED	-	-	-	-
23	DELETED	-	-	-	-
24	DELETED	-	-	-	-
25	DELETED	-	-	-	-
26	FLANGE 2" LWN, RF, #300 L=150, THK=18.6	SA 182F316L-NACE MR0175	8	ASME B16.5	42
27	GASKET FOR FLG 2" RF #300	SS S 17316 SPIRAL WOUND WITH SS316 INNER & OUTER RINGS	8	ASME B16.20	-
28	BLIND FLANGE 2", RF, #300	SA 182F316L-NACE MR0175	8	ASME B16.5	8
29	STUD BOLT & 2HEX NUTS 5/8" UNC x 90 Lg.	SA 188-B8M/SA194-8M	48 Set	ASME B18.2	7
30	HEXAGONAL PLUG 1 1/8" 12UNF x 20 L	SA 182F316L-NACE MR0175	208	ASME B1.1	55
31	PLUG GASKET THK 3.2	FLAT SOLID METAL SS316L	208	Hardness HRC < 82	-
32	FINNED TUBE, 1", Thk = 1.651, TYPE: EXTRUDED LENGTH FINNED / TUBE = 3740 / 3800	SA-213 TP316L NACE MR0175 ALUMINUM 1060-O	104	SEAMLESS TUBE SB221 FOR AL TUBE	836

TOTAL WEIGHT APPROX. = 1609 kg

TOTAL NO. OF TYPICAL BUNDLES = 3

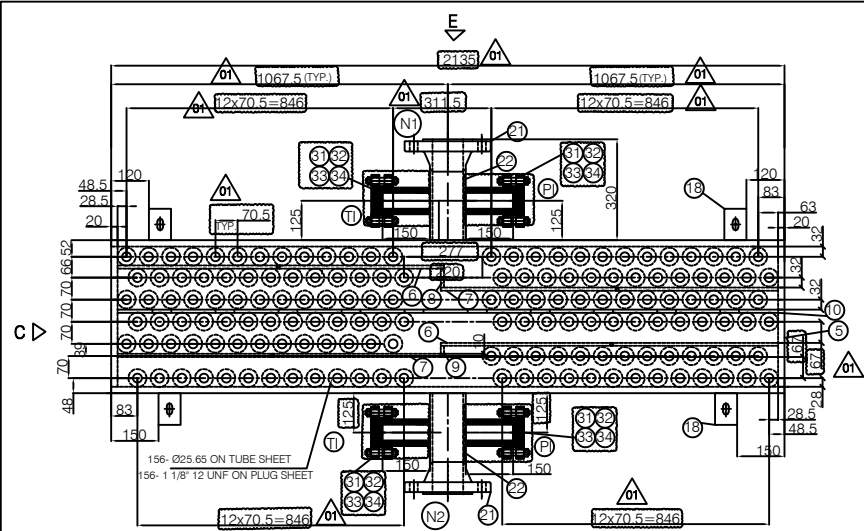
DESIGN DATA	
CODE	API 661 2013/ASME SEC.VIII DIV.1 2017
TYPE OF DRAFT	INDUCED
DESIGN PRESSURE	barg 22
DESIGN TEMPERATURE	°C 155
TEST PRESSURE	barg 28.6
CORROSION ALLOWANCE	mm 0
HEADER P.W.H.T.	NO
JOINT EFFICIENCY FACTOR	0.85 SEE NOTE 13
JOINT EFFICIENCY FACTOR FOR STIFFENER/STAY PLATE	0.6

NOZZLE DATA					
MARK	QTY.	SIZE	FLANGE	SCH/THK	SERVICE
N1	1	6"	RATING 300# FACE	ANSI B16.5 W.N.	80S INLET
N2	1	6"	RATING 300# RF/SMOOTH	ANSI B16.5 W.N.	80S OUTLET
T1	2	2"	RATING 300# RF/SMOOTH	ANSI B16.5 L.W.N.	18.6 T1 (WITH BLIND)
P1	2	2"	RATING 300# RF/SMOOTH	ANSI B16.5 L.W.N.	18.6 P1 (WITH BLIND)
V	1	2"	RATING 300# RF/SMOOTH	ANSI B16.5 L.W.N.	16.6 VENT (WITH BLIND)
D	1	2"	RATING 300# RF/SMOOTH	ANSI B16.5 L.W.N.	16.6 DRAIN (WITH BLIND)

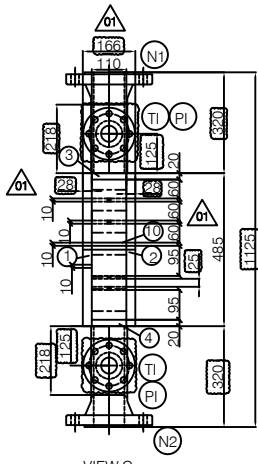
REFERENCE DOCUMENT		DOCUMENT No.
Name Plate Drawing		BK-GCS-AA-120-ME-DW-0011
General Arrangement Drawing		BK-GCS-AA-120-ME-DW-0001
Side Frame Drawing		BK-GCS-AA-120-ME-DW-0003
NDE Procedure		BK-GCS-AA-120-QC-PR-0005
PROCESS DATA SHEET FOR AE-2101 (A/B/C)		BK-GCS-AA-120-PR-DS-0001
WPS & PQR		BK-GCS-AA-120-QC-PR-0003

Maximum Dimensional Tolerance for Rotation of Nozzle Flanges as per EN 13480 :		
NOZZLE SIZE	Up to 6 inch	Over 6 inch
Tol. for Dim.(a)	±2 mm	±3 mm

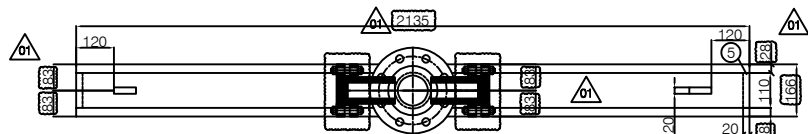
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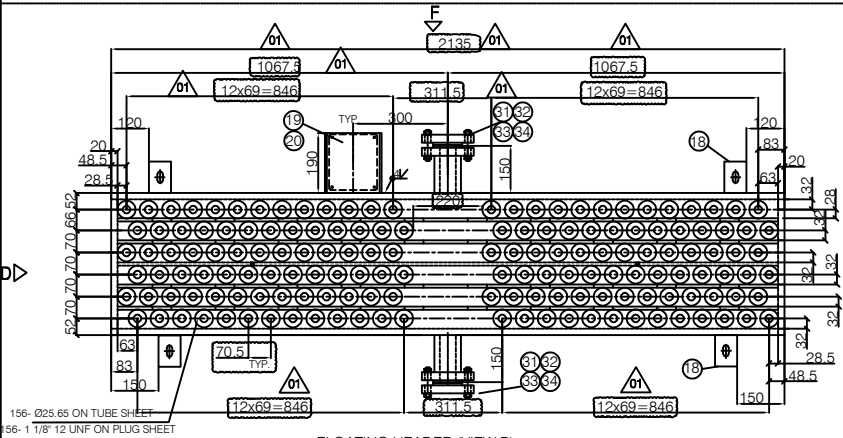
STATIONARY HEADER (VIEW A)



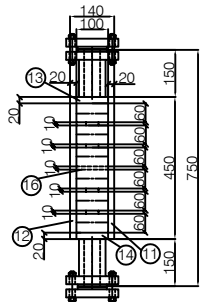
VIEW C



VIEW E



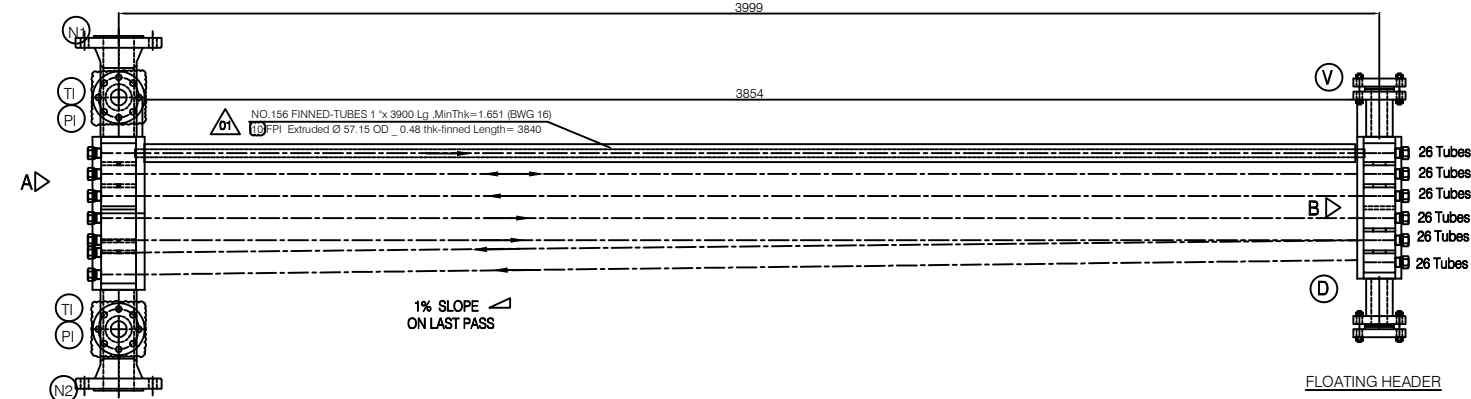
FLOATING HEADER (VIEW B)



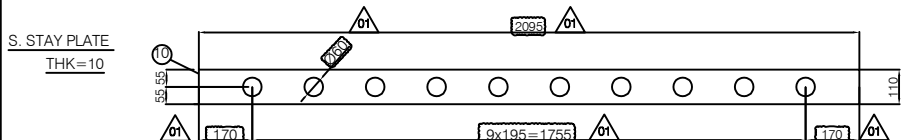
VIEW D



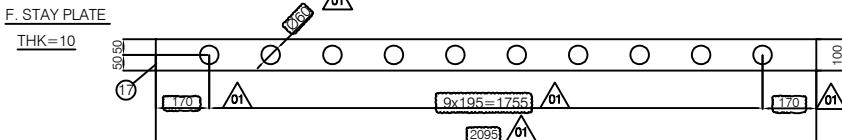
VIEW F



FLOATING HEADER



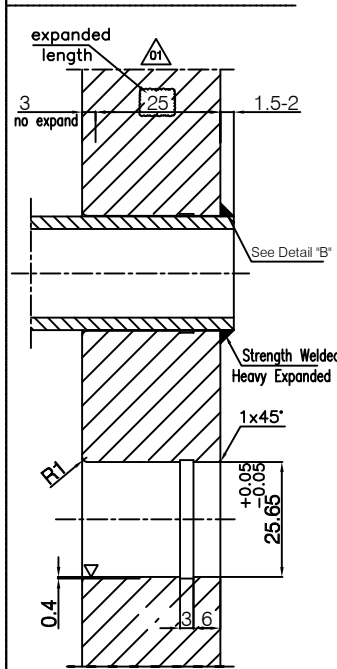
S. STAY PLATE
THK=10



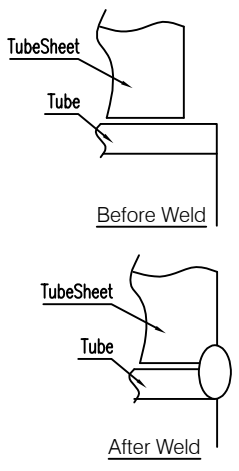
F. STAY PLATE
THK=10

Note : Drilling of holes shall be done before final welding of stayplate.
Inside surface of holes shall be tested with PT after drilling .

DETAIL OF TUBE EXPANSION



Detail "B"



GENERAL NOTES

- 1-ALL DIMENSIONS ARE IN mm , UNLESS OTHERWISE SPECIFIED.
- 2-ALL BOLT HOLE FLANGES SHALL BE STRADDLED TO TUBE-BUNDLE MAIN AXIS.
- 3-INSIDE SURFACE OF HEADER BOXES SHALL BE DRIED AND FREE OF ALL DIRT AND LOOSE FOREIGN MATERIALS.
- 4-MINIMUM WATER TEMPERATURE DURING HYDROTEST TO BE 15°C.
- 5-MECHANICAL CALCULATION IN ACCORDANCE WITH (DOC NO.: BK-GCS-AA-120-PR-CN-0001)
- 6-FOR TOLERANCES REFER TO API 661 7th Edition 2013 & TEMA 9th-2007.
- 7-FIN PITCH SHOULD BE UNIFORM.
- 8-NOZZLE FLANGE FACING SHALL BE COATED WITH REMOVABLE RUST INHIBITOR
- 9-PLUGS SHALL BE COATED WITH THREAD LUBRICANT
- 10-WEIGHT OF BUNDLE WITH SIDE FRAME (PRELIMINARY):
[DRY = 2900kg FULL OF WATER = 3345 kg]
- 11-FOR NDT DETAILS REFER TO RELEVANT NDT MAP
(DOC NO.: BK-GCS-AA-120-QC-DW-0001)
AND NDE PROCEDURES (DOC NO. BK-GCS-AA-120-QC-PR-0005)
- 12-FOR SURFACE PREPARATION AND PAINTING REFER TO PAINTING PROCEDURE
(DOC NO.: BK-GCS-AA-120-QC-PR-0004)
- 13- FULL RADIOGRAPHY FOR FLANGE TO NOZZLE CONNECTIONS AND FULL ULTRASONIC TEST FOR ALL OTHER FULL PENETRATION GROOVE WELD LINES SHALL BE DONE.
- 14- REQUIREMENTS OF ANS/NACE MR0175 / ISO 15156 SHALL BE CONSIDERED

- THE WELD JOINT PREPARATION FOR ALL CORNER JOINTS SHALL BE CHECKED ACCORDING TO UG 93(d)(b) & APP.28 SHOULD BE CONSIDERED
- BEVELS SHALL BE TESTED WITH PT FOR CRACK DETECTION BEFORE WELDING.
- HARDNESS CHECK ACCORDING TO API 661 PARAG. 10.1.7.
- FOR WELDING PROCEDURE SPECIFICATION SEE (BK-GCS-AA-120-QC-PR-0003)
- N2 purging and related fittings for preservation are included in scope of supply of AAC .
- Inlet & outlet flanges of tube bundles and steam coils (if any) will be blinded temporarily for storage.
- This Temporary blind and its nut & bolts are in scope of supply of AAC.

MATERIALS & PART LIST FOR ONE BUNDLE(AE-2102)

NO	DESCRIPTION	MATERIAL	QTY	REMARK	WEIGHT
1	S. TUBESHEET	SA-240 TP316L	1	NACE MR 0175	213
2	S. PLUGSHEET	SA-240 TP316L	1	NACE MR 0175	210
3	S. TOP PLATE	SA-240 TP316L	1	NACE MR 0175	37
4	S. BOTTOM PLATE	SA-240 TP316L	1	NACE MR 0175	37
5	S. END PLATES	SA-240 TP316L	2	NACE MR 0175	16
6	S. PARTITION PLATE	SA-240 TP316L	2	NACE MR 0175	18.5
7	S. PARTITION PLATE	SA-240 TP316L	2	NACE MR 0175	18.5
8	S. PARTITION PLATE	SA-240 TP316L	1	NACE MR 0175	0.5
9	S. PARTITION PLATE	SA-240 TP316L	1	NACE MR 0175	0.25
10	S. STAY PLATE	SA-240 TP316L	1	NACE MR 0175	18
11	F. TUBESHEET	SA-240 TP316L	1	NACE MR 0175	133
12	F. PLUGSHEET	SA-240 TP316L	1	NACE MR 0175	134
13	F. TOP PLATE	SA-240 TP316L	1	NACE MR 0175	33
14	F. BOTTOM PLATE	SA-240 TP316L	1	NACE MR 0175	33
15	F. END PLATES	SA-240 TP316L	2	NACE MR 0175	13.5
16	F. PARTITION PLATE	SA-240 TP316L	1	NACE MR 0175	16.5
17	F. STAY PLATE	SA-240 TP316L	4	NACE MR 0175	65
18	STOPPER	SA-240 TP316L	8	NACE MR 0175	9
19	NAME PLATE	SA-240 TP304	1		-
20	NAME PLATE SUPPORT	SA-240 TP304	1		2
21	FLANGE 4" W.N. RF, #800, SCH. 80S	SA 182F316L NACE MR0175	2	ASME B16.5	38
22	NOZZLE PIPE 4", SCH 80S X216L	SA 182F316L NACE MR0175	2	ASME B36.19	10
23	DELETED				
24	DELETED				
25	DELETED				
26	DELETED				
27	DELETED				
28	DELETED				
29	DELETED				
30	DELETED				
31	FLANGE 2" LWN RF, #600 L=150, THK=16.6	SA 182F316L NACE MR0175	6	ASME B16.5	20
32	GASKET FOR FLG 2" RF #300	S.S. TP316 SPRING WOUND WITH SS316 INNER & OUTER RINGS	6	ASME B16.20	-
33	BLIND FLANGE 2" RF, #600	SA 182F316L NACE MR0175	6	ASME B16.5	1
34	STUD BOLT & 2HEX. NUTS 5/8" UNC x 110 Lg.	SA 193-88W/SA194-8M	48	ASME B18.2	13
35	HEXAGONAL PLUG 1 1/8" 12UNF X28 L	SA 182F316L NACE MR0175	312	ASME B1.1	65
36	PLUG GASKET THK 3.2	FLAT SOLID METAL SS316L	312	Hardness HRC ≤ 82	-
37	FINNED TUBE, 1", THK=1.651, TYPE: EXTRUDED LENGTH FINNED / TUBE= 3840 / 3800	SA-213 TP316L NACE MR0175 ALUMINUM 1060-O	156	SEAMLESS TUBE SB221 FOR AL FIN	1073

TOTAL WEIGHT APPROX. = 2321 kg

TOTAL NO. OF TYPICAL BUNDLES = 3

DESIGN DATA

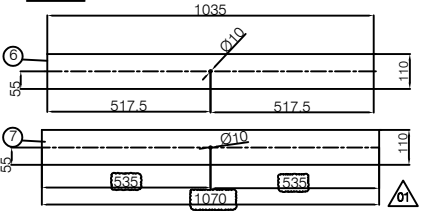
CODE	API 661 2013/ASME SEC.VIII DIV.1 2017
TYPE OF DRAFT	INDUCED
DESIGN PRESSURE	barg 62
DESIGN TEMPERATURE	°C 175
TEST PRESSURE	barg 80.6
CORROSION ALLOWANCE	mm 0
HEADER P.W.H.T.	NO
JOINT EFFICIENCY FACTOR	0.85 SEE NOTE 13
JOINT EFFICIENCY FACTOR FOR STIFFENER/STAY PLATE	0.8

NOZZLE DATA

MARK	QTY.	SIZE	RATING	FLANGE	FACE	TYPE	SCH/THK	SERVICE
N1	1	4"	800#	RF/SMOOTH	ANSI B16.5 W.N.	80S		INLET
N2	1	4"	800#	RF/SMOOTH	ANSI B16.5 W.N.	80S		OUTLET
TI	2	2"	800#	RF/SMOOTH	ANSI B16.5 L.W.N.	16.6		TI (WITH BLIND)
PI	2	2"	800#	RF/SMOOTH	ANSI B16.5 L.W.N.	16.6		PI (WITH BLIND)
V	1	2"	800#	RF/SMOOTH	ANSI B16.5 L.W.N.	16.6		VENT (WITH BLIND)
D	1	2"	800#	RF/SMOOTH	ANSI B16.5 L.W.N.	16.6		DRAIN (WITH BLIND)

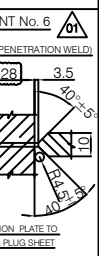
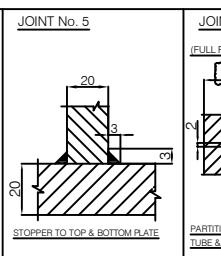
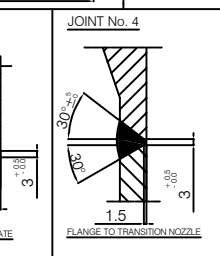
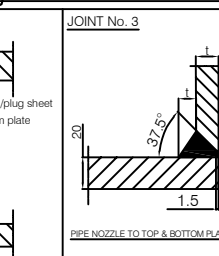
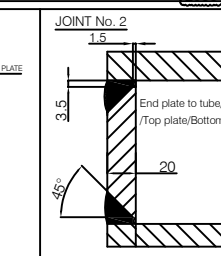
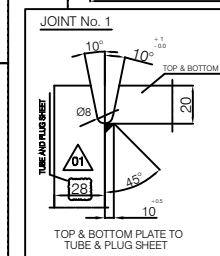
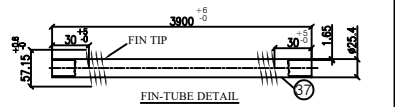
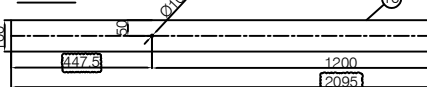
S. PARTITION PLATE

THK=10

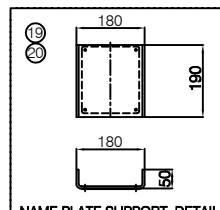
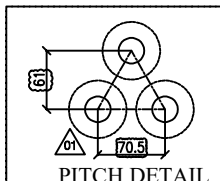
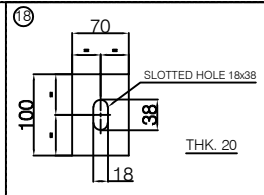
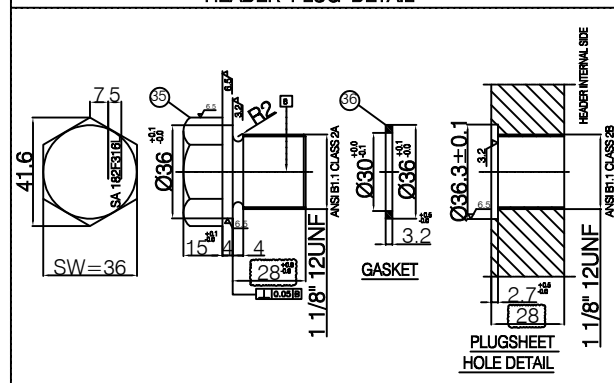


F. PARTITION PLATE

THK=10



HEADER PLUG DETAIL



REV.	DATE	BY	DATE	BY	DATE
V01	Nov.24	APC		AMC	
V00	Aug.24	IPA		AMC	
REV.	DATE	P.O.I.S	PREP.	CHK.	APP.
PROJECT NAME:	BINAK OILFIELD DEVELOPMENT/SURFACE FACILITIES GAS & GAS-CONDENSATE PIPELINES				
PROJECT NO.:	971020				
EPC CONTRACTOR:	HIRGAN ENERGIY - DESIGN & INSPECTION COMPANIES				
EPD/EPC CONTRACTOR (GC):	PETROIRAN DEVELOPMENT COMPANY				
DRAWING TITLE:	Tube Bundle Drawing				
SCALE	SIZE	DRAWING NO.	SHEET NO.	REV.	
*****	A3	BK-GCS-AA-120-ME-DW-0002	2 OF 2	V01	



BINAK OILFIELD DEVELOPMENT SURFACE FACILITIES GAS COMPRESSOR STATION

DATE SCALE DRAWING BY CHECKED BY PROJECT ENG.

NO CONSTRUCTION PERMITTED UNLESS DRAWING APPROVED

APPROVED FOR CONSTRUCTION BY: DATE:

BUDGET REF. LOCATION SIZE CLASS SERIAL NO. SHEET REVISION

VENDOR LOGO:
AAC
Project No: 17208

ITEM AE-2102