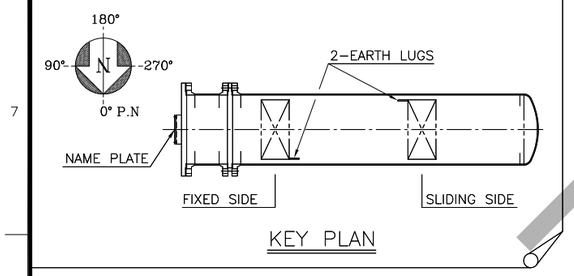
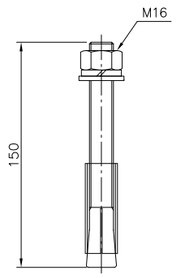
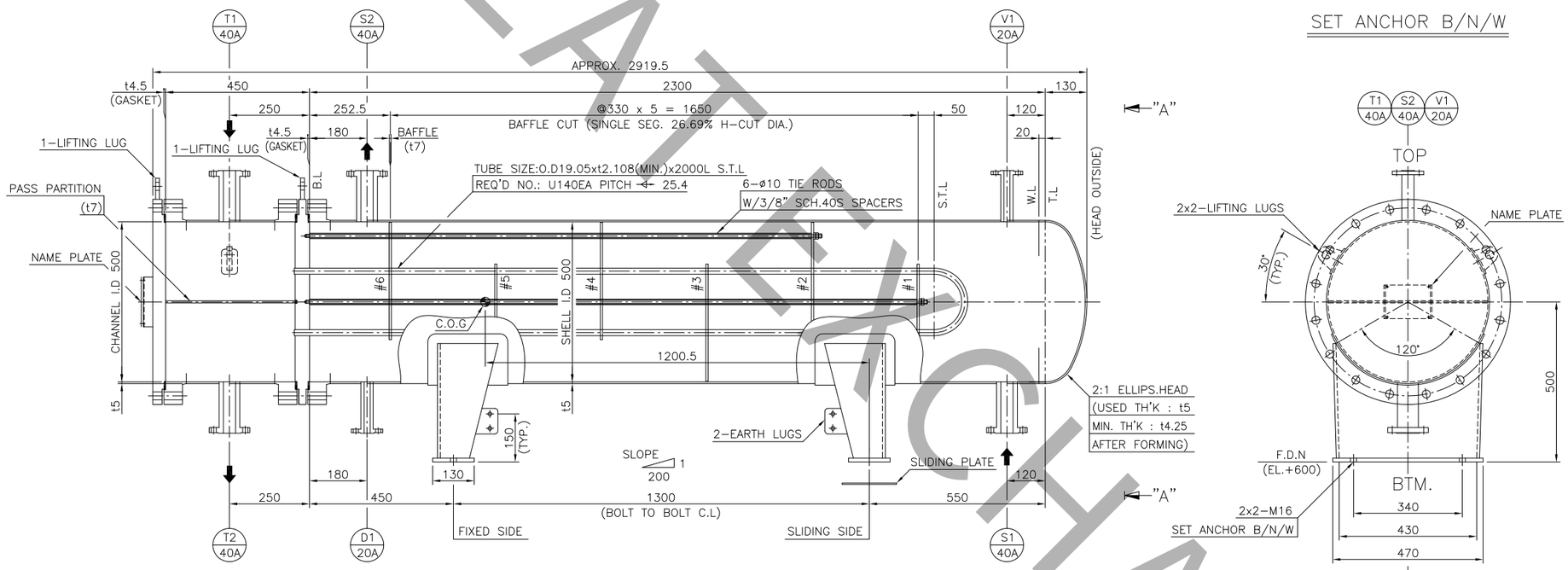


KEY PLAN



SET ANCHOR B/N/W



ELEVATION

VIEW "A"-"A"

GENERAL NOTE

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES ARE TO STRADDLE THE NORTH/SOUTH AND VERTICAL CENTER LINES.
3. NOZZLE PROJECTIONS ARE FROM CENTER LINE OF H/EX.
4. INTERNAL WELD SURFACE OF INSTRUMENT NOZZLE TO BE FULLY FLUSHED.
5. FLANGES THAT ARE INTENDED FOR USE WITH SPIRAL WOUND GASKET SHALL HAVE FLANGE SURFACE FINISH OF 125 uRa MINIMUM TO 250 uRa WITH SERRATION.
6. GASKET MATERIAL : SPIRAL WOUND GASKET (t4.5)
   - FILLER : FLEXIBLE GRAPHITE
   - HOOP : 304 S.S
   - INNER RING : 304 S.S
7. REINFORCING PAD SHALL BE PROVIDED FOR ALL NOZZLES OF 2" AND ABOVE AND PROVIDED WITH A NPT 1/8" TELL-TALE HOLE W/GREASE.
8. B.L MEANS GASKET CONTACT SURFACE OF TUBE SHEET.
9. ALL NOZZLE&SADDLE SHALL BE INSTALLED PERPENDICULAR TO THE CENTER LINE.
10. ALLOWABLE PRESSURE DROP FOR TUBE SIDE : 0.3 Kg/cm2G
11. SPARE PART FOR GIRTH FLANGE & BLIND NOZZLE FLANGE - GASKET : 100%, BOLT/NUT : 10%(MIN.2SETS)
12. OVER DESIGN MARGIN : 10% OF FLOW RATE AND DUTY.

	SHEAR(N)	MOMENT(N-m)	SHEAR(N)	MOMENT(N-m)
WIND	989	495	989	495
SEISMIC	SHEAR(N)	MOMENT(N-m)	SHEAR(N)	MOMENT(N-m)
	6,648	3,324	10,163	5,082
	EMPTY		OPERATING	

LOADING DATA

MARK NO.	NO REQ'D	SIZE	RATING	TYPE	FACING	SCH.	DESIGNATION	FROM C.L	REMARK
V1	1	20A	ASME 150#	LWN	R.F	–	SHELL SIDE VENT	410	
D1	1	20A	ASME 150#	LWN	R.F	–	SHELL SIDE DRAIN	410	
T2	1	40A	ASME 150#	LWN	R.F	–	ULTRA CONCENTRATION WATER OUTLET	410	
T1	1	40A	ASME 150#	LWN	R.F	–	ULTRA CONCENTRATION WATER INLET	410	
S2	1	40A	ASME 150#	LWN	R.F	–	COOLING WATER OUTLET	410	
S1	1	40A	ASME 150#	LWN	R.F	–	COOLING WATER INLET	410	

NOZZLE SCHEDULE

MATERIAL SPECIFICATION

SHELL / PAD		FLANGE	
CHANNEL / PAD		-SHELL SIDE	
CHANNEL HEAD		-TUBE SIDE	
TUBESHEEET		FLOATING	
SHELL FLANGE		-SHELL SIDE	
CHANNEL FLANGE		-TUBE SIDE	
BACKING DEVICE		STUD BOLT/NUT	
TUBE		-SHELL COVER	
BAFFLE OR SUPPORT		-STATIONARY	
IMPINGEMENT		-CHANNEL COVER	
PASS PARTITION PLATE		-FLOATING	
TIE ROD		-SHELL SIDE	
BAFFLE SPACER		-TUBE SIDE	
SADDLE / PAD		GASKET	
NOZZLE NECK		-SHELL COVER	
-SHELL SIDE		-SHELL	
-TUBE SIDE		-CHANNEL	
LIFTING LUG		-CHANNEL COVER	
PULLING EYE BOLT/PLUG		-FLOATING	
EXPANSION JOINT		-SHELL SIDE	
SLIDING PLATE		-TUBE SIDE	
BOSS & PLUG		ANCHOR BOLT/2NUTS	

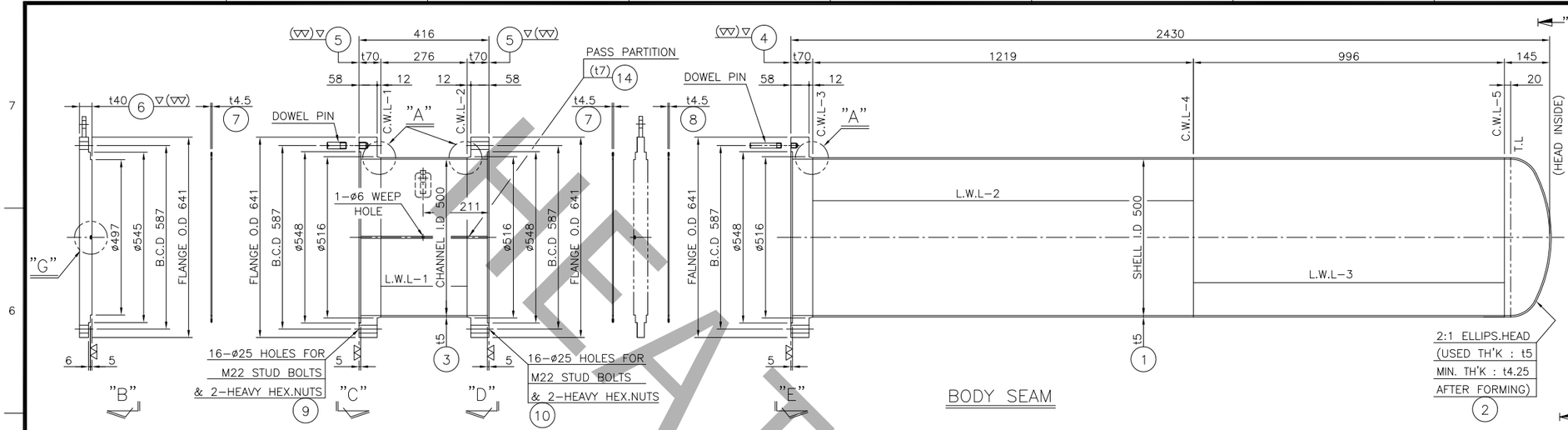
DESIGN DATA

CODE :			NATION REGULATION		
SURFACE AREA(EFF.) M^2			TEMA CLASS		
NO. OF SHELLS			TYPE		
	SHELL SIDE	TUBE SIDE		SHELL SIDE	TUBE SIDE
FLUID NAME			CORR. ALLOW. mm		
LIQUID DENSITY (IN/OUT) kg/m3			NO. OF PASS mm		
DESIGN PRESS. Kg/cm²G(MPaG)			M.D.M.T °C		
DESIGN TEMP. (IN/OUT) °C			INSULATION		
OPER. PRESS. Kg/cm²G(MPaG)			WIND VELOCITY		
OPER. TEMP. (IN/OUT) °C			SEISMIC ZONE		
HYDRO.TEST PRESS. Kg/cm²G(MPaG)			PAINT		
PNEUMATIC TEST PRESS. Kg/cm²G(MPaG)			TUBE SIZE :		
M.A.W.P&M.A.P Kg/cm²G(MPaG)			TUBE LAYOUT :		
P.W.H.T			BAFFLE SEG. :		
JOINT EFF.(SHELL/HEAD) %			TUBE TO TUBESHEET JOINT :		
RADIOGRAPHIC(SHELL/HEAD)			IMPINGEMENT PLATE : NO EXPANSION JOINT : NO		

WEIGHT & CAPACITY (ESTIMATED)

ERECTION	935	KG	BUNDLE WEIGHT	420	KG
EMPTY WEIGHT	935	KG	TOTAL OPERATING WEIGHT	1,440	KG
WEIGHT INSULATION & FIRE PROTECTION	–	KG	TOTAL FULL OF WATER WEIGHT	1,450	KG

HEAT EXCHANGER



BODY SEAM

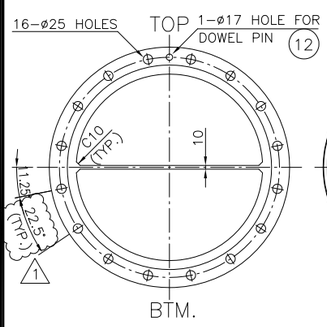
BILL OF MATERIAL

(1) SET TO BE MANUFACTURED

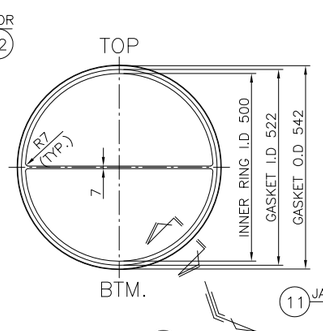
PART NO.	NAME OF PART	MATERIAL	Q'TY FOR 1 SET	SPARE	UNIT	REMARKS
1	SHELL	A240-304	1		EA	t5
2	SHELL HEAD	A240-304	1		EA	t5 (2:1 ELLIPS.)
3	CHANNEL SHELL	A240-304	1		EA	t5
4	SHELL FLANGE	A965-F304	1		EA	t70
5	CHANNEL FLANGE	A965-F304	2		EA	t70
6	CHANNEL COVER	A965-F304	1		EA	t40
7	GASKET	SEE NOTE "1"	2	2	EA	t4.5
8	GASKET	SEE NOTE "1"	1	1	EA	t4.5
9	STUD B/2-HEAVY HEX.NUTS	A193-B7/A194-2H	16	2	SETS	M22x180L
10	STUD B/2-HEAVY HEX.NUTS	A193-B7/A194-2H	16	2	SETS	M22x250L
11	JACK BOLT	304 S.S	6		EA	M16x85L
12	DOWEL PIN	304 S.S	1		EA	ø16x50L
13	DOWEL PIN	304 S.S	1		EA	ø16x150L
14	PASS PARTITION	A240-304	1		EA	t7
15	LIFTING LUG	A240-304	2		EA	t16
16	REINF.PAD	A240-304	2		EA	t5
17	LIFTING LUG	A240-304	2		EA	t12

NOTE

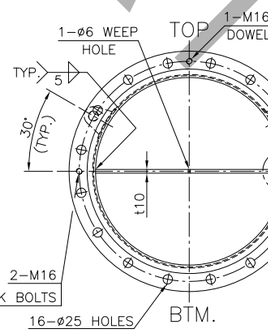
1. GASKET MATERIAL : SPIRAL WOUND GASKET (t4.5)
   - FILLER : FLEXIBLE GRAPHITE
   - HOOP : 304 S.S
   - INNER RING : 304 S.S
   - RIB : DOUBLE METAL JACKETED PTFE FILLER (304 S.S)



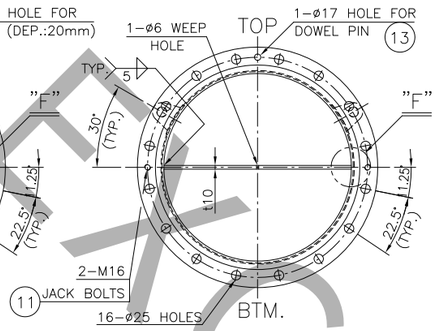
SECTION "B"
(CHANNEL COVER)



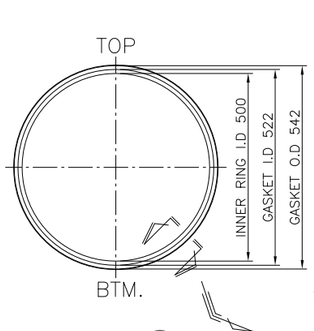
GASKET (7)



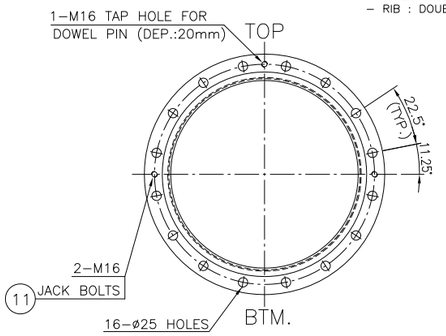
SECTION "C"



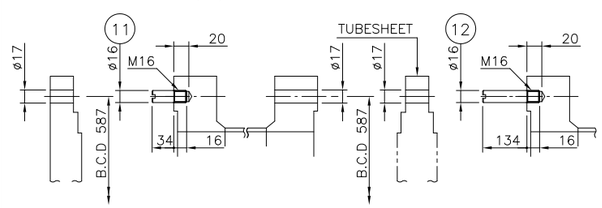
SECTION "D"



GASKET (8)

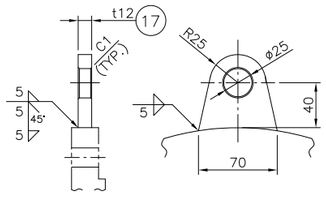


SECTION "E"

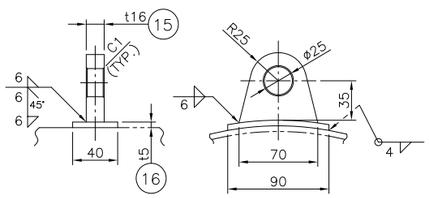


DOWEL PIN (12)(13)
"( )" DIM. FOR NO.13 ONLY

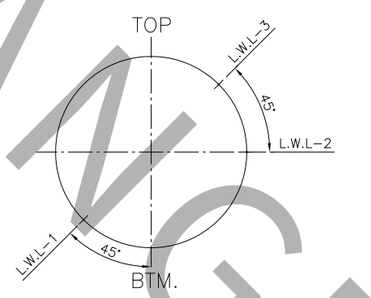
DOWEL PIN HOLE



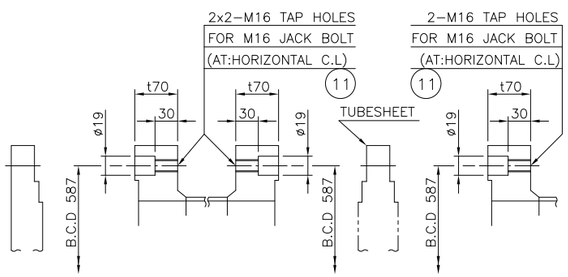
LIFTING LUG
(AT:CHANNEL COVER : 1 EA)
(AT:TUBESHEET : 1 EA)



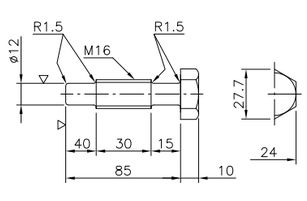
LIFTING LUG
(AT:CHANNEL SHELL : 2 EA)



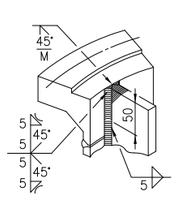
SEAM PLAN
(VIEW "A"-"A")



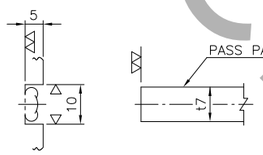
JACK BOLT HOLE



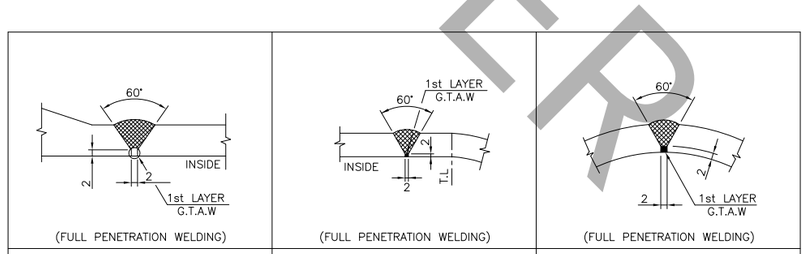
JACK BOLT (11)



DETAIL OF "F"



DETAIL OF "G"



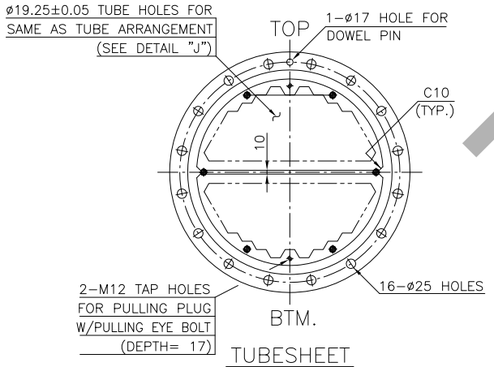
EXCHANGER

TEMA EXCHANGER

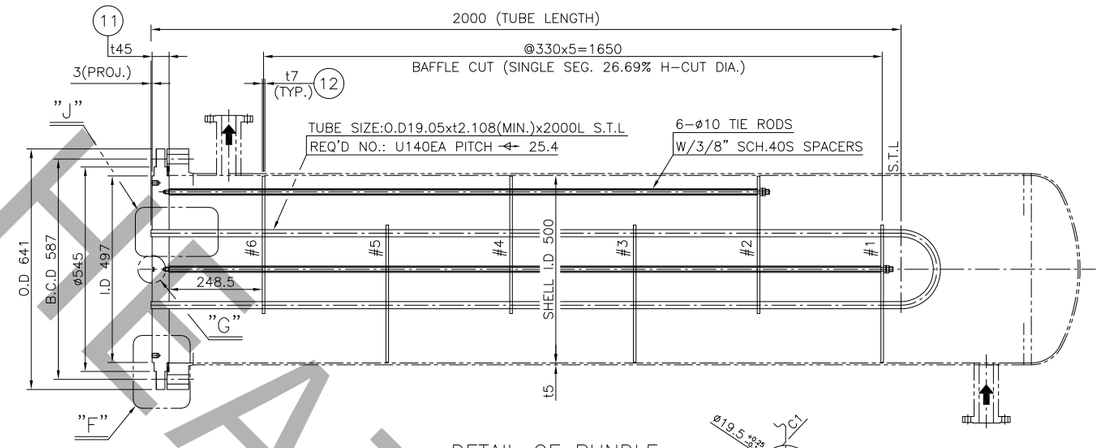
BILL OF MATERIAL

(1) SET TO BE MANUFACTURED

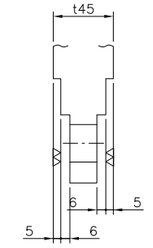
PART CODE		MATERIAL	Q'TY FOR 1 SET			REMARKS
PART NO.	NAME OF PART		Q'TY	SPARE	UNIT	
1	TUBE	A213-TP304	18		EA	O.D19.05xt2.108(AVG.)x4094.3L
2	TUBE	A213-TP304	19		EA	O.D19.05xt2.108(AVG.)x4163.4L
3	TUBE	A213-TP304	18		EA	O.D19.05xt2.108(AVG.)x4232.5L
4	TUBE	A213-TP304	17		EA	O.D19.05xt2.108(AVG.)x4301.6L
5	TUBE	A213-TP304	16		EA	O.D19.05xt2.108(AVG.)x4370.8L
6	TUBE	A213-TP304	15		EA	O.D19.05xt2.108(AVG.)x4439.9L
7	TUBE	A213-TP304	14		EA	O.D19.05xt2.108(AVG.)x4509.0L
8	TUBE	A213-TP304	11		EA	O.D19.05xt2.108(AVG.)x4578.1L
9	TUBE	A213-TP304	8		EA	O.D19.05xt2.108(AVG.)x4647.2L
10	TUBE	A213-TP304	4		EA	O.D19.05xt2.108(AVG.)x4716.3L
11	TUBE SHEET	A965-F304	1		EA	t45
12	BAFFLE	A240-304	3		EA	t7
13	BAFFLE	A240-304	3		EA	t7
14	TIE ROD	A479-304	4		EA	R.B10x1935.5L
15	TIE ROD	A479-304	2		EA	R.B10x1605.5L
16	SPACER	A312-TP304	2		EA	3/8" SCH.40Sx578.5L
17	SPACER	A312-TP304	8		EA	3/8" SCH.40Sx653L
18	SPACER	A312-TP304	4		EA	3/8" SCH.40Sx248.5L
19	SPACER	A312-TP304	10		EA	3/8" SCH.40Sx323L



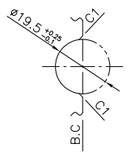
TUBESHEET
(VIEW "A"-"A")



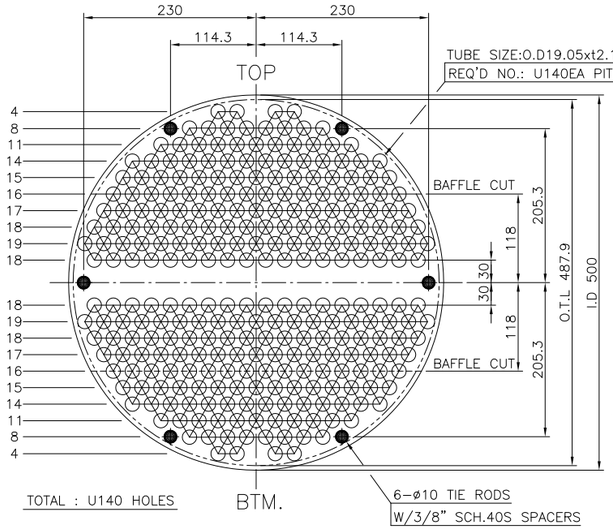
DETAIL OF BUNDLE



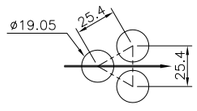
DETAIL OF "F"



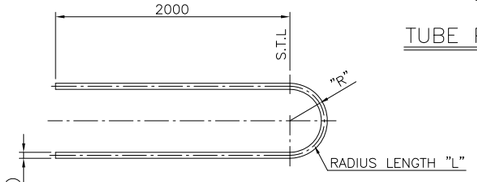
BAFFLE HALF HOLE
(DETAIL OF "I")



TUBE ARRANGEMENT

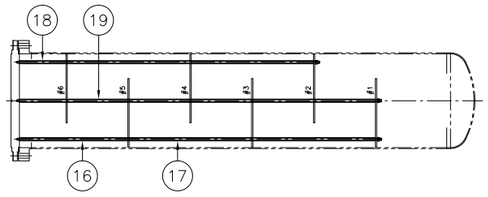


TUBE PITCH

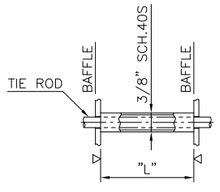


PART NO.	"R"	"L"	TOTAL LENGTH	Q'TY
1	30	94.3	4094.3	18
2	52	163.4	4163.4	19
3	74	232.5	4232.5	18
4	96	301.6	4301.6	17
5	118	370.8	4370.8	16
6	140	439.9	4439.9	15
7	162	509.0	4509.0	14
8	184	578.1	4578.1	11
9	206	647.2	4647.2	8
10	228	716.3	4716.3	4

U-TUBE LENGTH

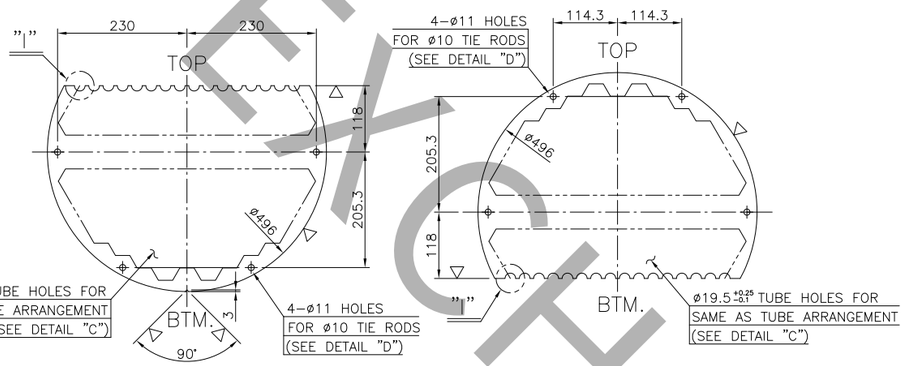


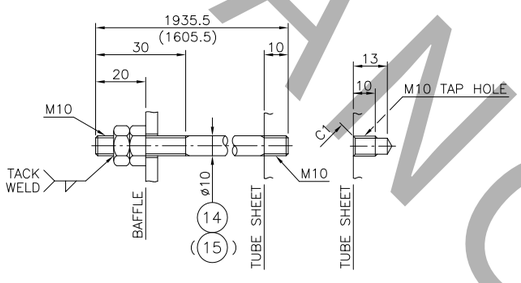
<SIDE VIEW>

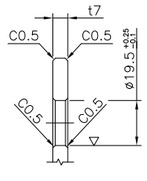


PART NO.	"L"	Q'TY
16	578.5	2
17	653	8
18	248.5	4
19	323	10

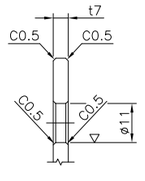
SPACER



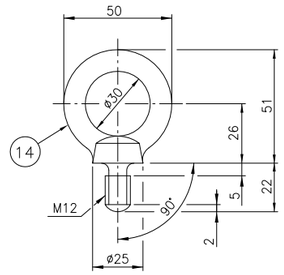




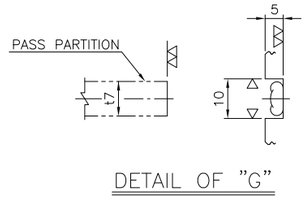
DETAIL OF "C"

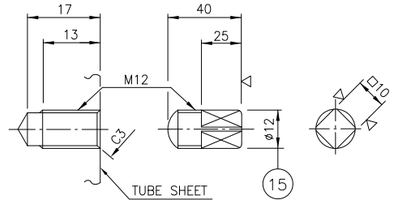


DETAIL OF "D"

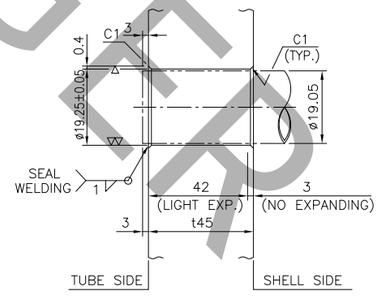


PULLING EYE BOLT



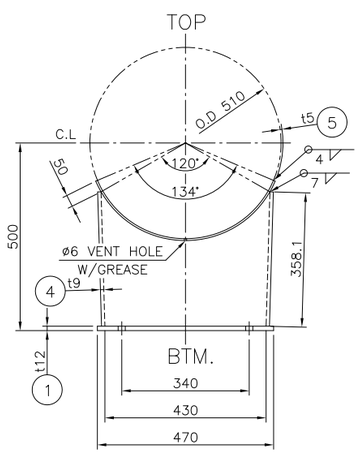


PULLING PLUG

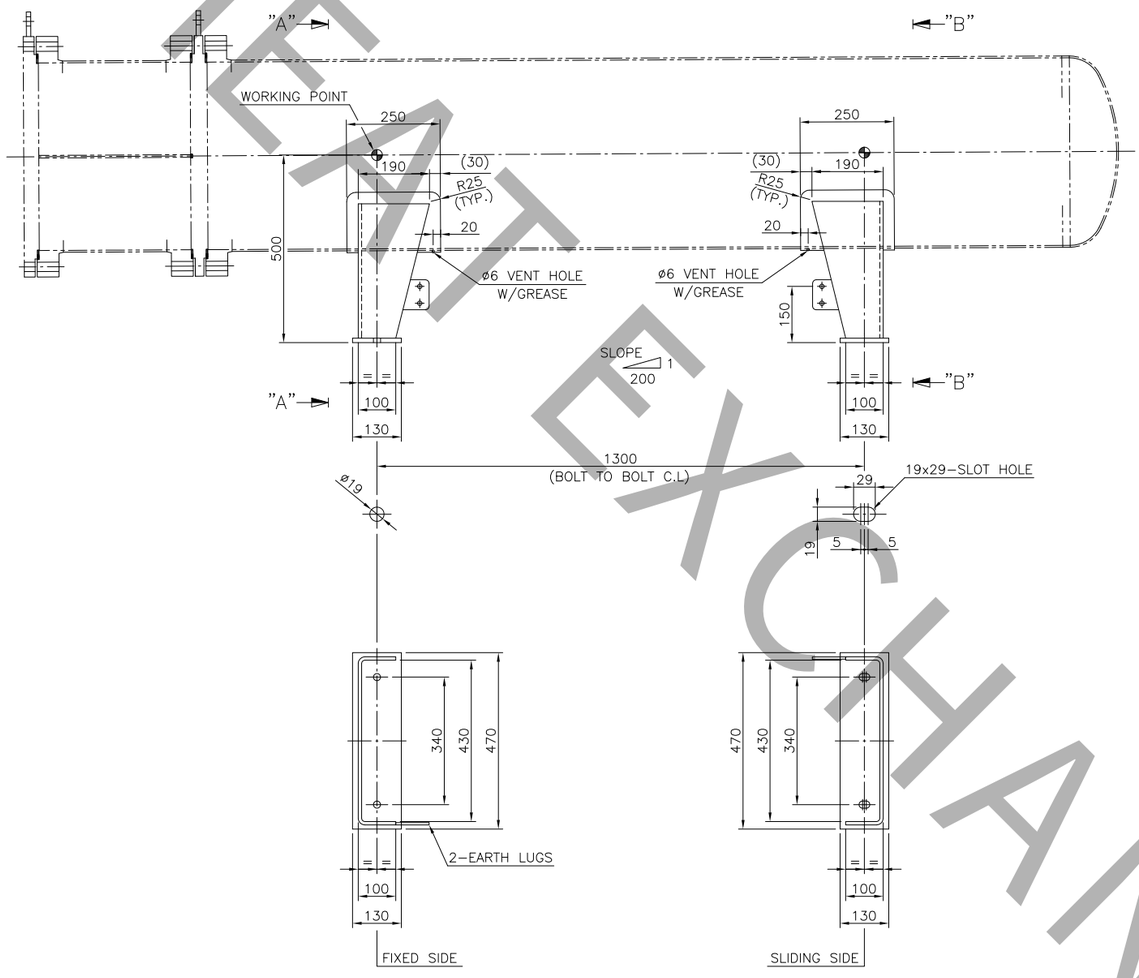


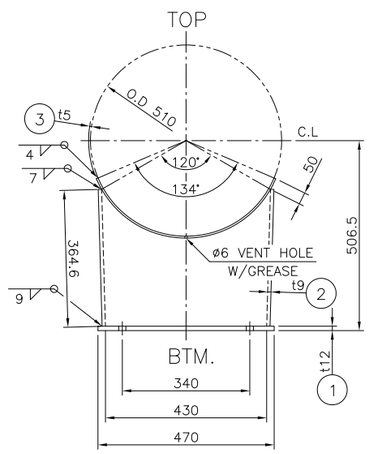
DETAIL OF "J"

BILL OF MATERIAL						
(1) SET TO BE MANUFACTURED						
PART CODE		MATERIAL	Q'TY FOR 1 SET			REMARKS
PART NO.	NAME OF PART		Q'TY	SPARE	UNIT	
1	BASE PLATE	A240-304	2		EA	t12
2	SUPPORT PLATE	A240-304	1		EA	t9
3	REINF.PAD	A240-304	1		EA	t5
4	SUPPORT PLATE	A240-304	1		EA	t9
5	REINF.PAD	A240-304	1		EA	t5
6	EARTH LUG	A240-304	2		EA	t6
7	SLIDING PLATE	A240-304	1		EA	t4



VIEW "A"–"A"

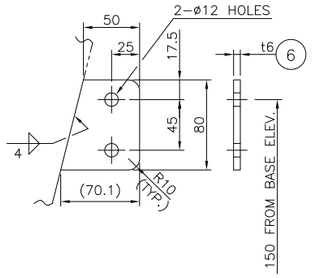




VIEW "B"–"B"

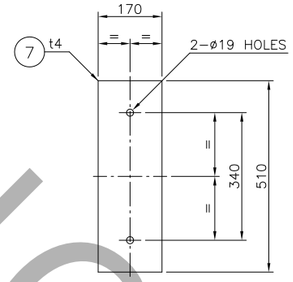
	APPROVED
	APPROVED WITH COMMENT
	NOT APPROVED
	REVIEWED WITHOUT ANY COMMENT
	REVIEWED WITH ANY COMMENT
	NOT RETURN
RECEIVED :	
ORIGINATOR	PROJECT
RETURNED :	

C & B INDUSTRIAL CO.,LTD.



EARTH LUG

DETAIL OF SADDLE



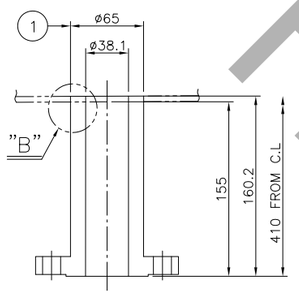
SLIDING PLATE

HEAT EXCHANGER

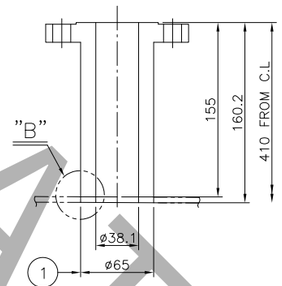
BILL OF MATERIAL

(1) SET TO BE MANUFACTURED

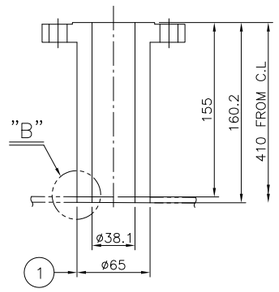
	PART CODE		MATERIAL	Q'TY FOR 1 SET			REMARKS
	PART NO.	NAME OF PART		Q'TY	SPARE	UNIT	
S1	1	NOZZLE FLANGE	A182-F304	1		EA	ASME 150# 40A LWN,RF
S2	1	NOZZLE FLANGE	A182-F304	1		EA	ASME 150# 40A LWN,RF
T1	1	NOZZLE FLANGE	A182-F304	1		EA	ASME 150# 40A LWN,RF
T2	1	NOZZLE FLANGE	A182-F304	1		EA	ASME 150# 40A LWN,RF
D1	1	NOZZLE FLANGE	A182-F304	1		EA	ASME 150# 20A LWN,RF
V1	1	NOZZLE FLANGE	A182-F304	1		EA	ASME 150# 20A LWN,RF



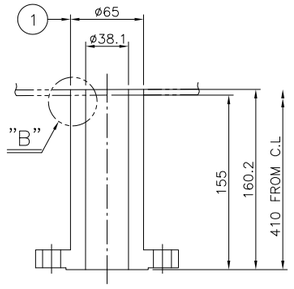
DETAIL OF S1 40A



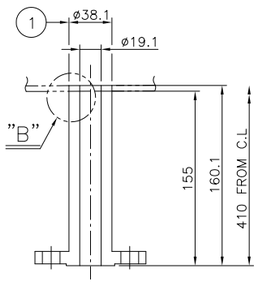
DETAIL OF S2 40A



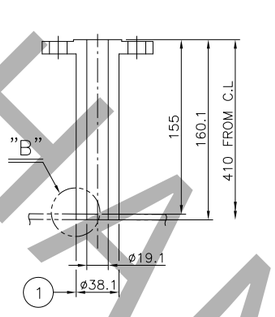
DETAIL OF T1 40A



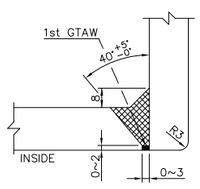
DETAIL OF T2 40A



DETAIL OF D1 20A



DETAIL OF V1 20A



(FULL PENETRATION WELDING)

DETAIL OF "A"

HEAT EXCHANGER