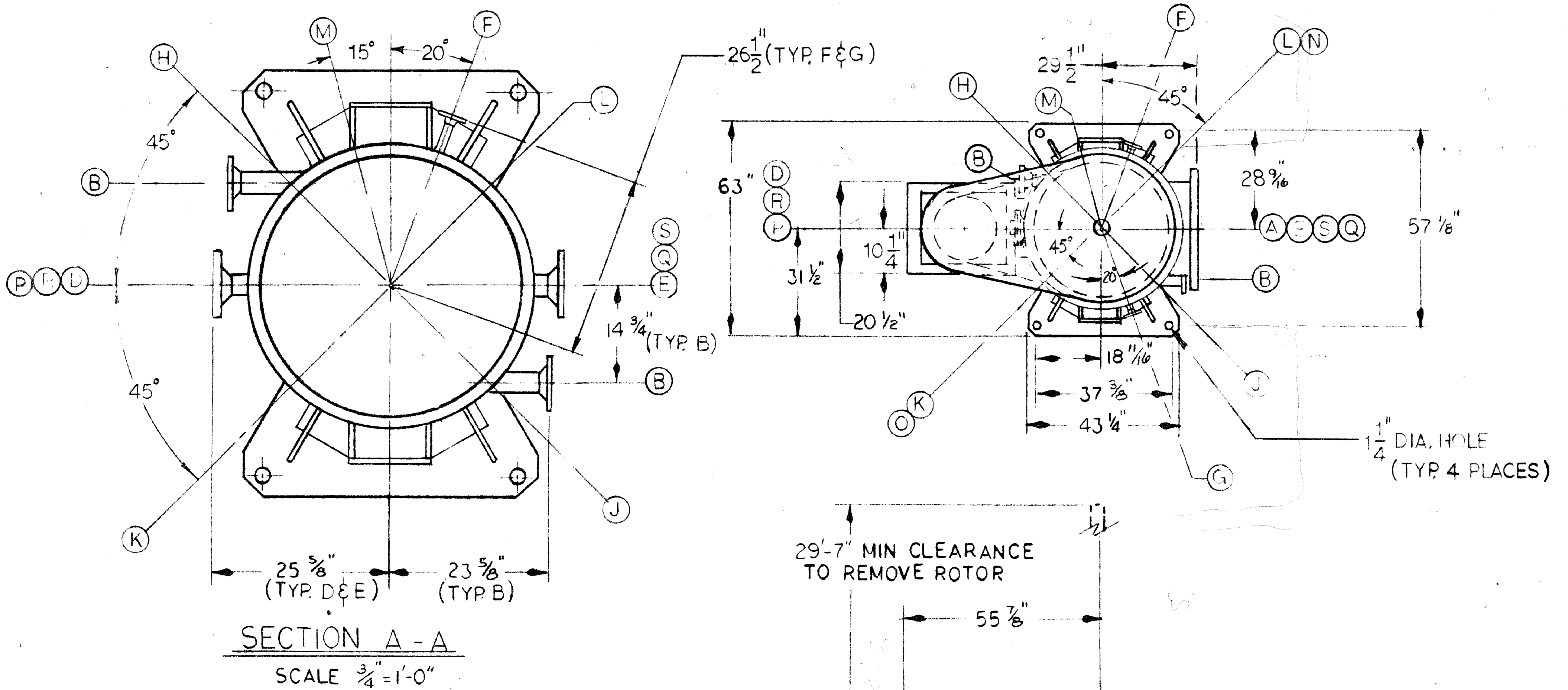


DUNSMAN-MANSELL, INC. CHARLOTTE 378



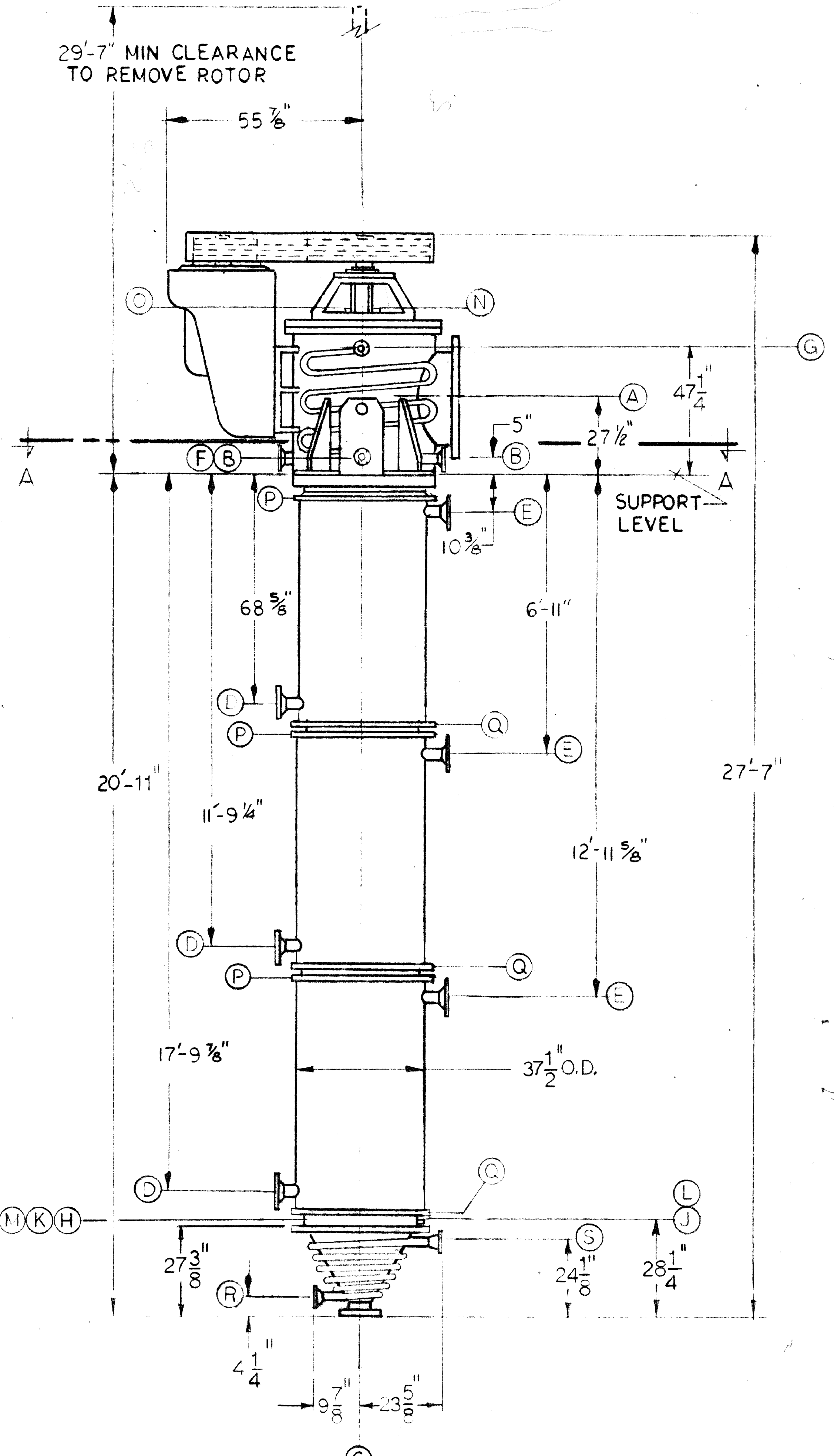
SECTION A-A
SCALE 3/4" = 1'-0"

GENERAL NOTES:

- HEATING SURFACE 150.7 SQ. FT.
- MAXIMUM ALLOWABLE WORKING PRESSURE:
PROCESS AREA: FULL VACUUM TO ATMOSPHERIC
THERMAL SECTION JACKETS: 200 PSIG @400°F & 100 PSIG @650°F
ASME CODE STAMPED THERMAL JACKETS.
SEPARATOR & CONE TRACING: 200 PSIG @400°F & 100 PSIG @650°F
- CORROSION ALLOWANCE
A. SHELL (HEATING & PROCESS SIDE) 1.5 MM
B. JACKET (HEATING MEDIUM SIDE) 1.5 MM
C. TRACING (HEATING MEDIUM SIDE) 1.5 MM
- WEIGHTS:
UNIT FLOODED 27,900 LBS.
UNIT EMPTY 20,000 LBS.
ROTOR & BEARING HOUSING ASSEMBLY 5,500 LBS.
- FOR CORRECT NOZZLE ORIENTATION, SEE TOP VIEW AND SECTION "A-A".

As-Built

"As Built" Drawing Package
As Built



CAUTION !!!
SILICONE GREASE OR OIL
MUST NOT BE USED DURING
MANUFACTURE, ASSEMBLY,
TESTING OR SHIPPING.

NOZ	QTY	SERVICE	DESCRIPTION	REMARKS
S	1	STEAM INLET	1/2" 300# ANSI R.F.	MATING FLANGE NOT FURNISHED
R	1	CONDENSATE OUTLET	1/2" 300# ANSI R.F.	MATING FLANGE NOT FURNISHED
Q	3	JACKET DRAIN	1/4" FEMALE PIPE THD.	PLUGGED
P	3	JACKET VENT	1/4" FEMALE PIPE THD.	PLUGGED
O	1	SEAL COOLANT OUTLET	3/8" NPT	PLUGGED (TO BE REMOVED)
N	1	SEAL COOLANT	3/8" NPT	PLUGGED (TO BE REMOVED)
M	1	PURGE INLET	3/8" NPT	PLUGGED (TO BE REMOVED)
L	1	COOLANT OUTLET	3/8" NPT	PLUGGED (TO BE REMOVED)
K	1	COOLANT INLET	3/8" NPT	PLUGGED (TO BE REMOVED)
J	1	LUBRICANT OUTLET	3/8" NPT	PLUGGED
H	1	LUBRICANT INLET	3/8" NPT	PLUGGED (TO BE REMOVED)
G	1	STEAM INLET	1/2" 300# ANSI R.F.	MATING FLANGE NOT FURNISHED
F	1	CONDENSATE OUTLET	1/2" 300# ANSI R.F.	MATING FLANGE NOT FURNISHED
E	3	STEAM INLET	3" 300# ANSI R.F.	MATING FLANGE NOT FURNISHED
D	3	CONDENSATE OUTLET	3" 300# ANSI R.F.	MATING FLANGE NOT FURNISHED
C	1	PRODUCT OUTLET	6" 150# ANSI R.F.	MATING FLANGE NOT FURNISHED
B	2	PRODUCT INLET	3" 150# ANSI R.F.	MATING FLANGE NOT FURNISHED
A	1	VAPOR OUTLET	36" 150# ANSI R.F.	MATING FLANGE NOT FURNISHED
NOZZLE SCHEDULE				

Luwa Corporation
 CHARLOTTE, N. C.
 THIS DRAWING IS THE PROPERTY OF LUWA CORP. AND IS LOANED FOR CONFIDENTIAL USE ONLY AND SHOULD BE RETURNED TO LUWA CORP. AT THE END OF THE PROJECT.
 APPR. JWP
 CK. BY DWM
 DR. BY W.W.
 SCALE 3/8" = 1'-0"
 DWG. NO. SO15497-1C
 TITLE EVAPORATOR TYPE 1
 LN-1400
 REV. A

BILL OF MATERIALS

MK	Q	DESCRIPTION	MATERIAL	REMARKS
100	2	PL 3/4" x 60" x 105 11/16"	HASTELLOY C-22	
101	2	PL 3/4" x 12" x 105 11/16"	HASTELLOY C-22	
102	2	PL 5/8" x 37 1/2" x 37 1/2"	HASTELLOY C-22	
103	1	PL 1" x 37 1/2" x 37 1/2"	HASTELLOY C-22	
104	2	PL 1/4" x 68" x 115 11/16"	SA-516-70	
B/M CONT ON SHT 2				

GENERAL NOTES

- FLANGE BOLT HOLES TO STRADDLE CENTERLINES PARALLEL TO VESSEL CENTERLINES UNLESS NOTED OTHERWISE.
- THE PURCHASER REQUIRES SHOP INSPECTION OF THE SECTIONS. OFFENHAUSER SHALL NOTIFY THE PURCHASER AT LEAST THREE (3) WORKING DAYS PRIOR TO THE PERFORMANCE OF ALL SPECIFIED TEST.
- PAINT: CARBON STEEL ONLY—SANDBLAST TO NEAR WHITE SSPC-SP10 PRIMER DUPONT 347-Y-LINE GANICIN INORGANIC ZINC.4 MILS D.F.T.
- THE TOP & MIDDLE SECTIONS ARE TO BE SHIPPED SEPARATELY AND ENDS SHALL BE PROTECTED BY PLYWOOD COVERS SECURELY FASTENED.

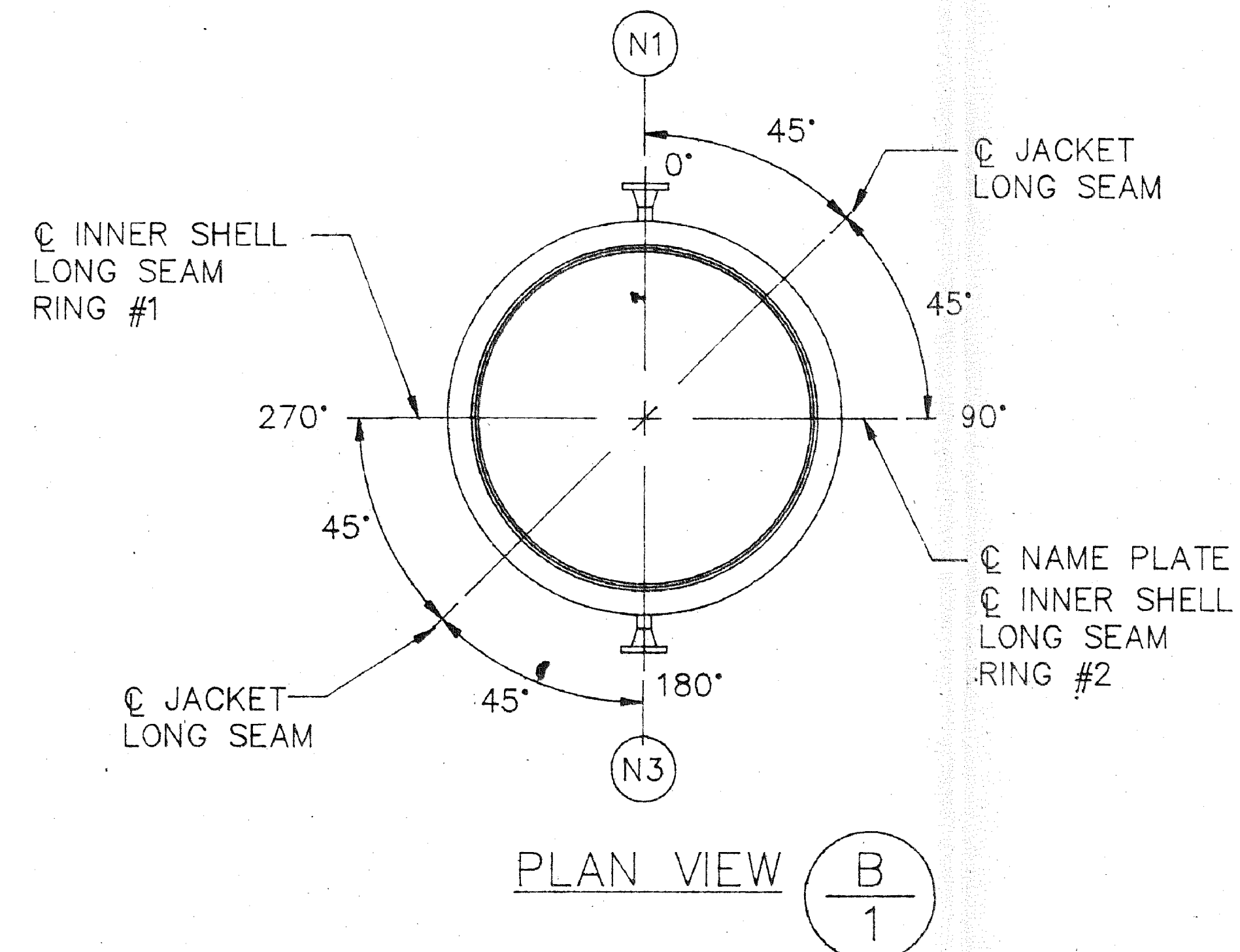
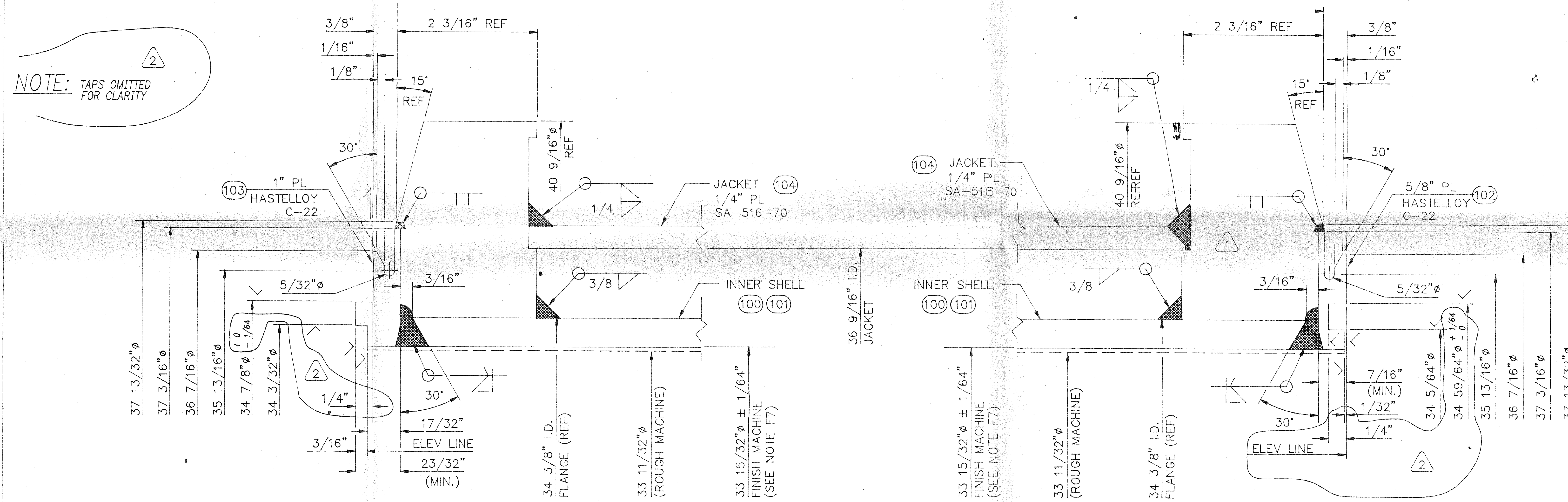
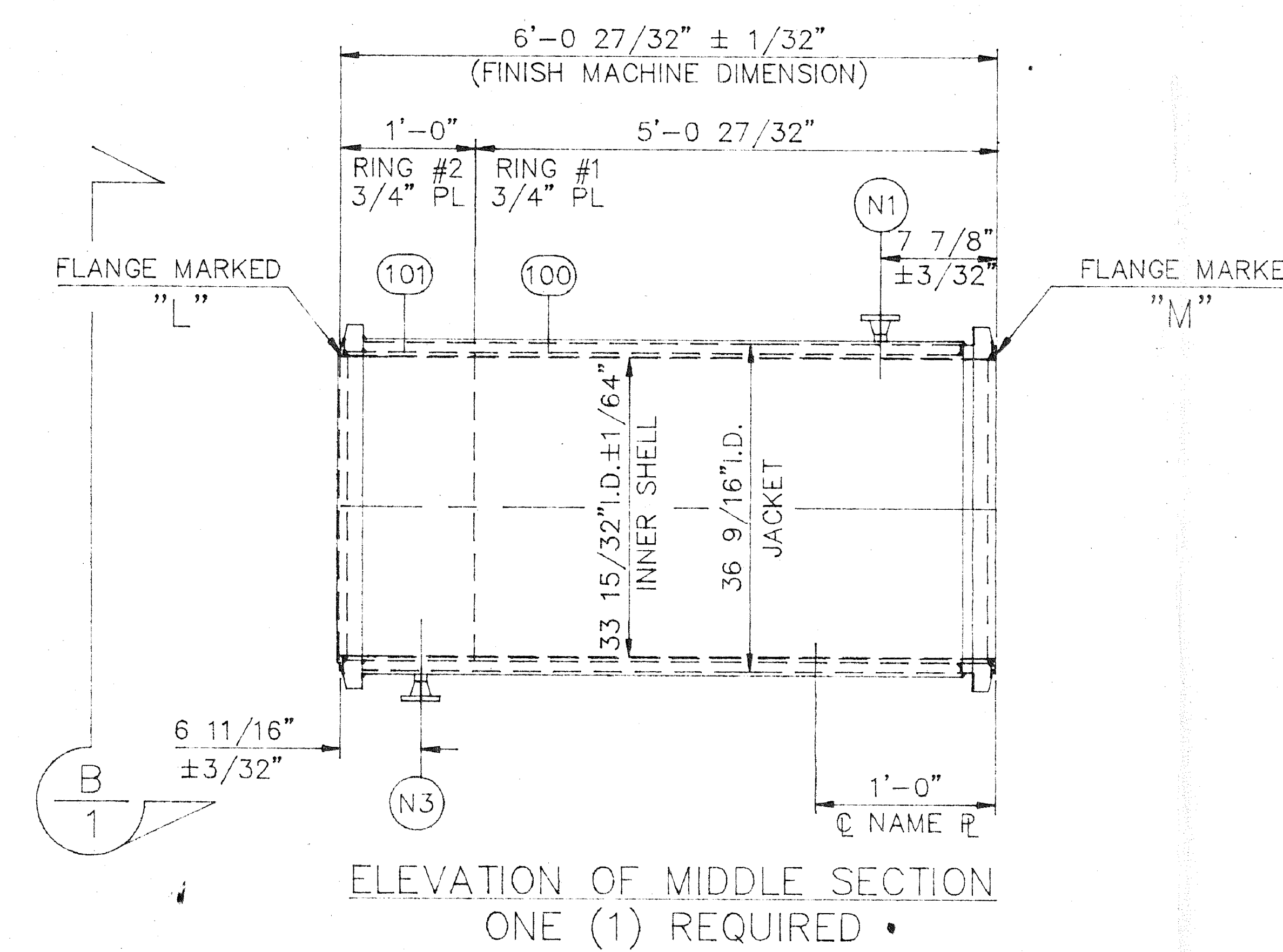
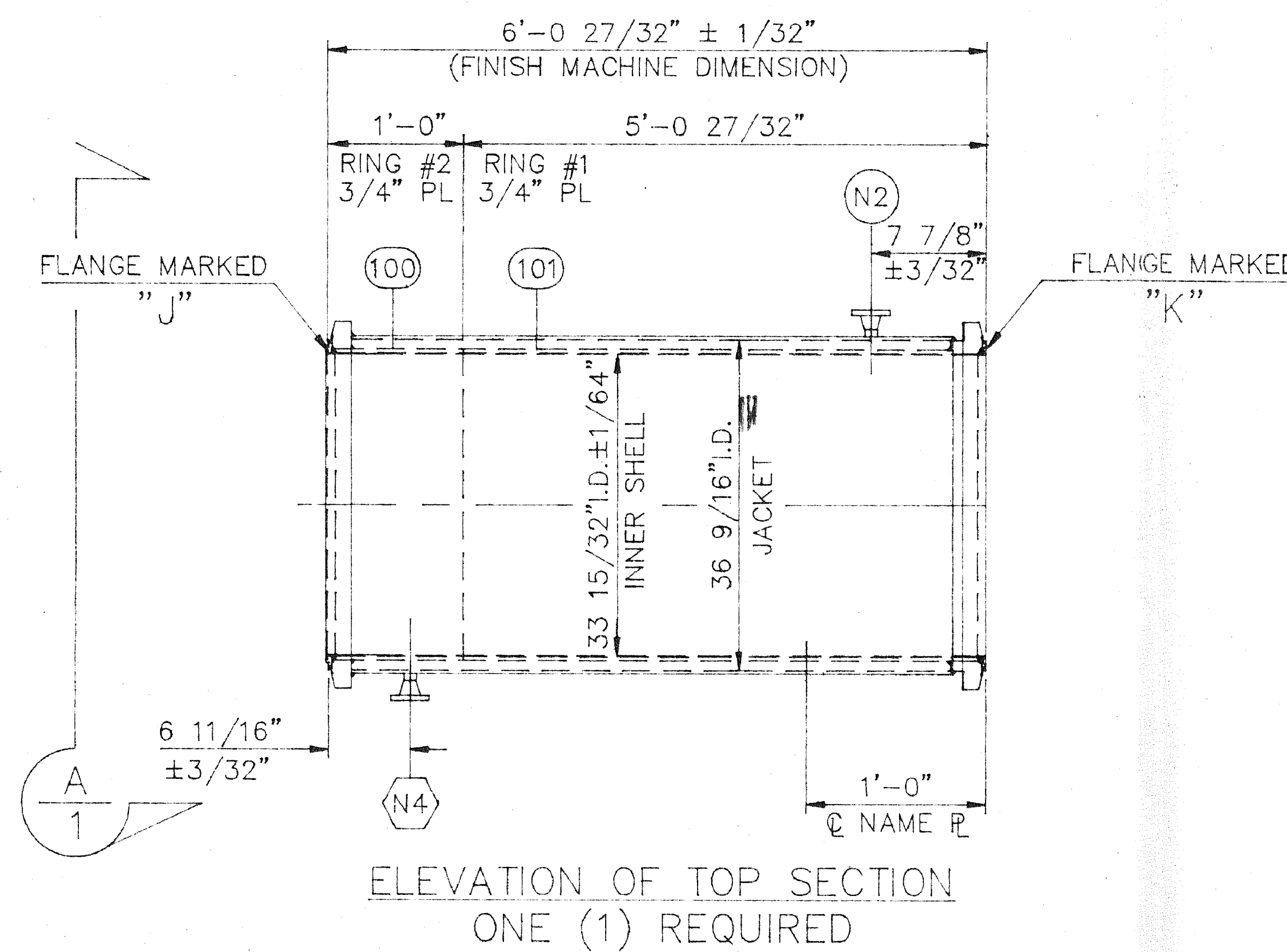
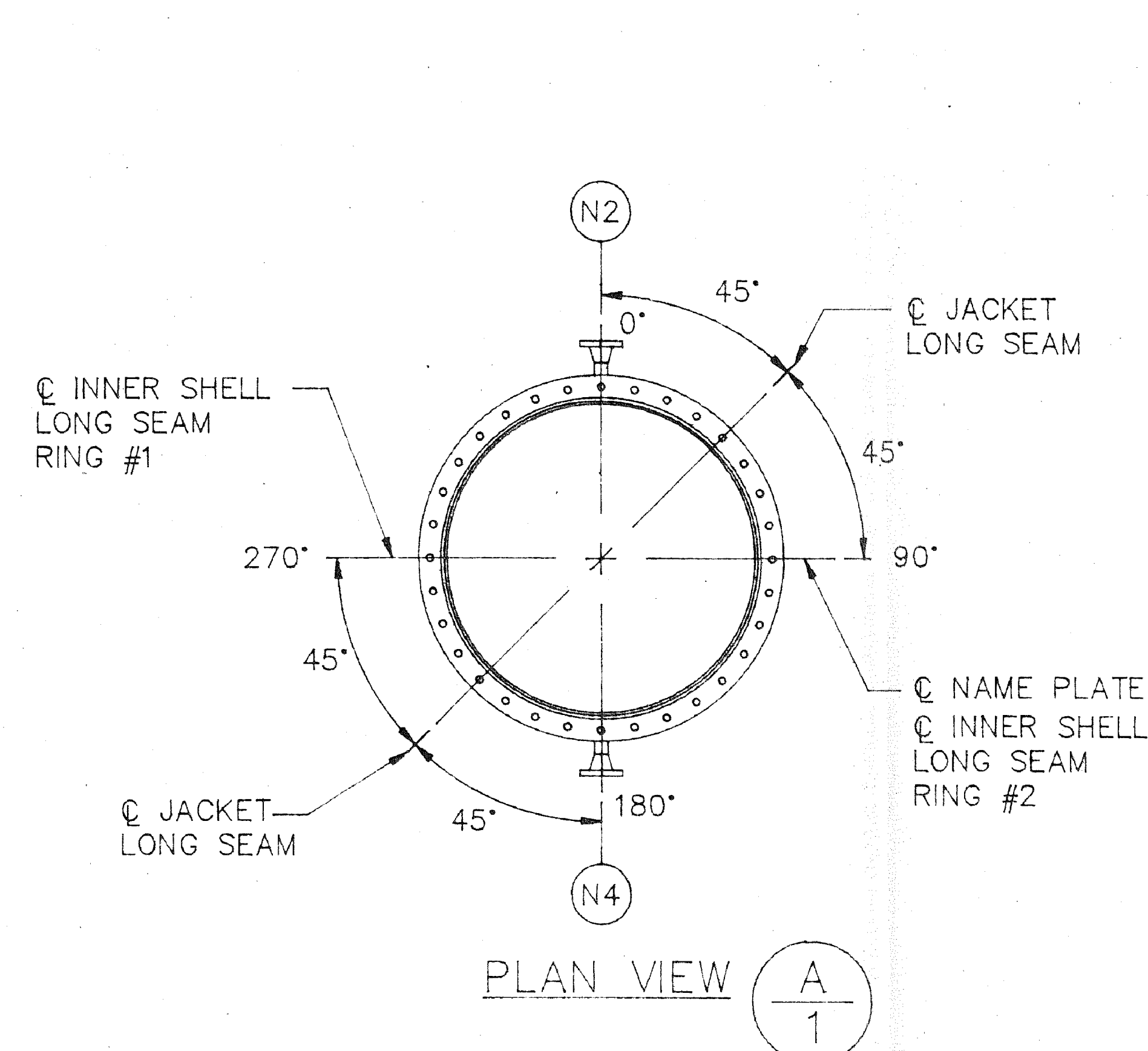
DESIGN DATA

- CONSTRUCTION TO BE IN ACCORDANCE WITH THE ASME CODE SECTION VIII, DIV 1, YEAR 1989 (INCLUDING 1990 LATEST ADDENDA.) STAMPING REQUIRED; PARTIAL NATIONAL BOARD REGISTRATION: NOT REQD.
- DESIGN PRESSURE VESSEL @ TEMP JACKET @ TEMP.
INTERNAL VAC TO ATM. @ 400°F STEAM
200 PSIG @ 400°F

- RADIOGRAPHY: RT-1 INNER SHELL LONG & GIRTH SEAMS.
- ALL WELDS TO BE EXAMINED BY LIQUID PENETRANT EXAMINATION.
- HYDROSTATIC TEST PRESSURE VESSEL: NONE
HYDROSTATIC TEST PRESSURE JACKET: 323 PSIG
- INSPECTION BY: COMMERCIAL UNION AND CUSTOMER

FABRICATION NOTES

- OFFENHAUSER TO RECEIVE THE TOP AND MIDDLE SECTIONS AND PERFORM THE FOLLOWING WORK.
- REPLACE THE INNER SHELL AND SHELL FLANGE FACE AND JACKET WITH NEW MATERIAL.
- REMOVE JACKET. REMOVE NOZZLES IN JACKET. RE-INSTALL NOZZLES AFTER MACHINING OF FLANGE FACES.
- REMOVE SHELL FLANGES MARKED "J" "K" "L" "M" AND REPLACE FLANGE FACING. MACHINE AS SHOWN.
- REMOVE BAFFLES BETWEEN INNER SHELL AND JACKET. DO NOT REPLACE BAFFLES.
- INNER SHELL DIAMETER OUT-OF-ROUNDNESS BEFORE MACHINING. DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM INSIDE DIAMETER AT ANY CROSS SECTION SHALL NOT EXCEED 0.167" OF THE SECTION UNDER CONSIDERATION.
- MACHINE INNER SHELL INSIDE DIAMETER AS SHOWN AND IF REQUIRED POLISH TO A 32 RMS FINISH AFTER MACHINING.
- BREAK ALL SHARP CORNERS.



TOLERANCES: (EXCEPT AS NOTED)

FRACTION - ± 1/64"
.00 - ± .01"
.000 - ± .005"
ANGLES - ± 1/2"
FINISH - ± 64

± 1/64" CONCENTRICITY
± .015" PERPENDICULARITY
± .010" PARALLELISM

CATEGORY	WPS NUMBERS
PRESSURE ENVELOPE	A P44-20; P44-38; P1-46; P1-31
B	
C	P1-P44-4
D	
ATTACHMENTS	P44-17; P154; P1-P44-4; P1-P44-18
SUPPORTS	

WELDING PROCEDURES

SHOP NOTE: CAUTION

6'-0 27/32" ± 1/32" IS OVERALL FINISHED MACHINE DIMENSION. SET HASTELLOY FACING, ITEM 102, 103, & 200 TO ALLOW SUFFICIENT MACHINING OF FLANGE FACE.

CERTIFIED FOR FABRICATION
BY: JAL DATE: 6/23/92

NO.	REVISIONS	MADE BY	CHK'D BY	DATE
2	REV. AS BUILT	BW	JAL	10/12/93
1	REV. AS BUILT	BW	JAL	11/18/92

OFFENHAUSER COMPANY
HOUSTON TEXAS

CUSTOMER: RUBICON INC.
PURCHASE ORDER NO.: 92-21068
PROJECT NO.: TDI EVAPORATOR MIDDLE SECTION
LOCATION: GEISMAR, LOUISIANA

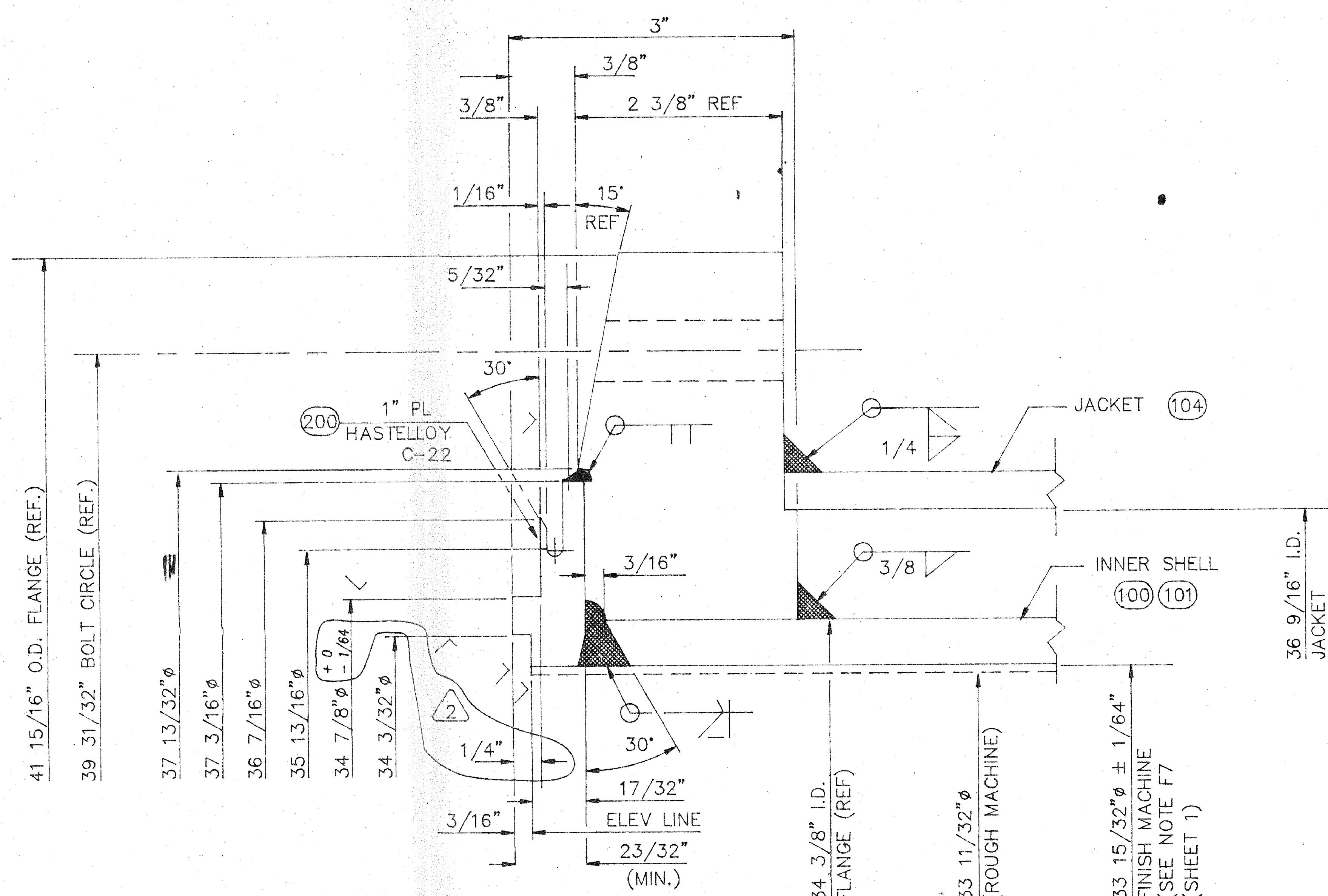
DESCRIPTION: TOP & MIDDLE SECTION TDI EVAPORATOR

SHOP ORDER NO.: 3445
DRAWING NO.: 92-3445

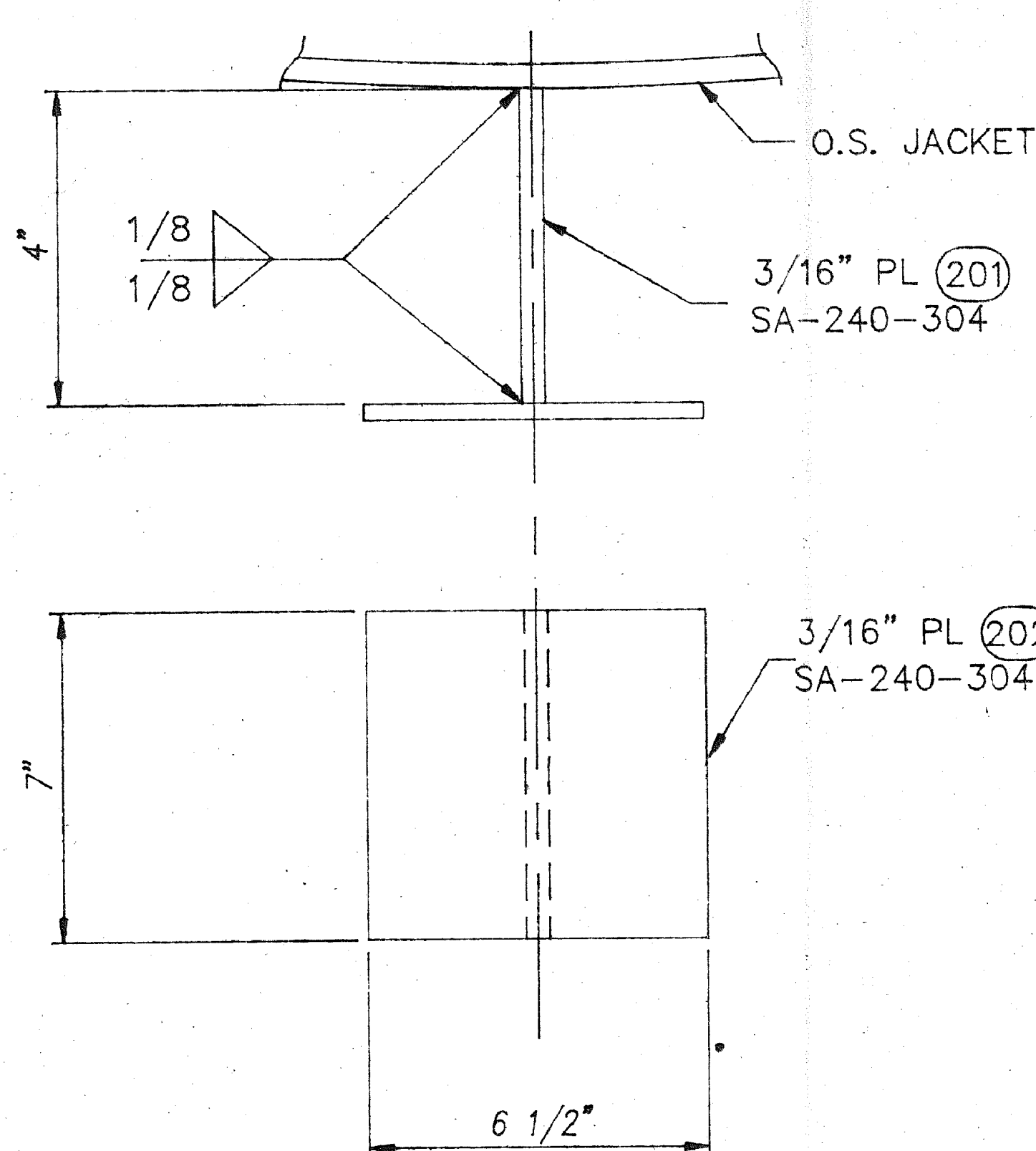
ITEM NO.: GE-506
SCALE: NONE QUANTITY: AS NOTED SHEET 1 OF 2 REV. 2
DRAWN BY: DLS CHK'D BY: GMB DATE: 6-16-92

BILL OF MATERIALS

MK	Q	DESCRIPTION	MATERIAL	REMARKS
200	1	PL 1" x 37 1/2" x 37 1/2"	HASTELLOY C-22	
201	2	PL 3/16" x 4" x 7"	SA-240-304	
202	2	PL 3/16" x 6 1/2" x 7"	SA-240-304	
203	2	CODE NAME PLATE		



DETAIL FLANGE FACE FOR FLANGE MARKED "J"
FINISH = 32



DETAIL NAME PLATE BRACKET
TWO (2) REQUIRED

NATIONAL BOARD NO.: NONE		CERTIFIED BY	
OFFENHAUSER COMPANY HOUSTON TEXAS		OFFENHAUSER COMPANY HOUSTON TEXAS	
U W PART.	VESSEL	JKT/COIL	
S/O NO. 3445	MAWP(INT) ● PSIG	▲ PSIG	
DWG NO. 92-3445	DES.TEMP. 650 °F	■ °F	
ITEM NO. GE-506	MDMT 0 °F 15 PSIG	°F ° PSIG	
CAPACITY	HYDROTEST PSIG	323 PSIG	
WT. EMPTY	YEAR BUILT 1992	MFR'S S.NO. 3445	
	PROJECT: TDI EVAPORATOR		
	P.O.NO.: 92-21068		

NAME PLATE STAMPING

- = VAC. TO ATM.
- ▲ = STEAM 200 PSIG.
- = STEAM 400F

NATIONAL BOARD NO.: NONE		CERTIFIED BY	
OFFENHAUSER COMPANY HOUSTON TEXAS		OFFENHAUSER COMPANY HOUSTON TEXAS	
U W PART.	VESSEL	JKT/COIL	
S/O NO. 3445	MAWP(INT) ● PSIG	▲ PSIG	
DWG NO. 92-3445	DES.TEMP. 650 °F	■ °F	
ITEM NO. GE-506	MDMT 0 °F 15 PSIG	°F ° PSIG	
CAPACITY	HYDROTEST PSIG	323 PSIG	
WT. EMPTY	YEAR BUILT 1992	MFR'S S.NO. 3445	
	PROJECT: TDI EVAPORATOR		
	P.O.NO.: 92-21068		

NAME PLATE STAMPING

- = VAC. TO ATM.
- ▲ = STEAM 200 PSIG.
- = STEAM 400F

CERTIFIED FOR FABRICATION
BY: JAL DATE: 6/23/92

NO.	REVISIONS	MADE BY	CHK'D BY	DATE
2	REV. AS BUILT	BW	JAL	10/12/93
1	REV. AS BUILT	BW	JAL	11/18/92

OFFENHAUSER COMPANY HOUSTON TEXAS		PRINT RECORD	
CUSTOMER: RUBICON INC.		DATE	FOR NO.
PURCHASE ORDER NO.: 92-21068			
PROJECT NO.: TDI EVAPORATOR MIDDLE SECTION			
LOCATION: GEISMAR, LOUISIANA			
DESCRIPTION: TOP & MIDDLE SECTION TDI EVAPORATOR		SHOP ORDER NO.: 3445	
ITEM NO.: GE-506		DRAWING NO.: 92-3445	
SCALE: NONE	QUANTITY: AS NOTED	SHEET	REV.
DRAWN BY: DLS	CHK'D BY: GMB	DATE: 6-18-92	2 OF 2

BILL OF MATERIALS

MK	Q	DESCRIPTION	MATERIAL	REMARKS
100	1	3/4" PL x 72" x 105 1/16"	HASTELLOY C-22	ROLL TO 34 9/16"
101	1	3/8" PL x 72" x 155 1/16"	SA-516-70	
102	1	5/8" PL x 37 1/2" x 37 1/2"	HASTELLOY C-22	
103	1	1" PL x 37 1/2" x 37 1/2"	HASTELLOY C-22	
104	1	1/8" PL x 7" x 9 1/2"	SA-516-70	
105	2	1 1/8" x 1 1/8" x 80" LG.	SA-36	ROLL E.W. TO 34 9/16"

GENERAL NOTES

- FLANGE BOLT HOLES TO STRADDLE CENTERLINES PARALLEL TO VESSEL CENTERLINES UNLESS NOTED OTHERWISE.
- THE PURCHASER REQUIRES SHOP INSPECTION OF THE SECTIONS. OFFENHAUSER SHALL NOTIFY THE PURCHASER AT LEAST THREE (3) WORKING DAYS PRIOR TO THE PERFORMANCE OF ALL SPECIFIED TEST.
- PAINT: CARBON STEEL ONLY--SANDBLAST TO NEAR WHITE SSPC-SP10 PRIMER DUPONT 347-Y-LINE GANICIN INORGANIC ZINC.
- THE BOTTOM SECTIONS IS TO BE SHIPPED AND ENDS SHALL BE PROTECTED BY PLYWOOD COVERS SECURELY FASTENED.

DESIGN DATA

- CONSTRUCTION TO BE IN ACCORDANCE WITH THE ASME CODE SECTION VIII, DIV 1, YEAR 1992 (INCLUDING 1992 LATEST ADDENDA.) STAMPING REQUIRED: PARTIAL NATIONAL BOARD REGISTRATION: NOT REQ.
- DESIGN PRESSURE VESSEL @ TEMP JACKET @ TEMP.
INTERNAL VAC TO ATM. @ 400°F STEAM 200 PSIG @ 400°F

- RADIOGRAPHY: RT-1 INNER SHELL LONG & GIRTH SEAMS.
- ALL WELDS TO BE EXAMINED BY LIQUID PENETRANT EXAMINATION.
- HYDROSTATIC TEST PRESSURE VESSEL: NONE
HYDROSTATIC TEST PRESSURE JACKET: 323 PSIG
- INSPECTION BY: COMMERCIAL UNION AND CUSTOMER

FABRICATION NOTES

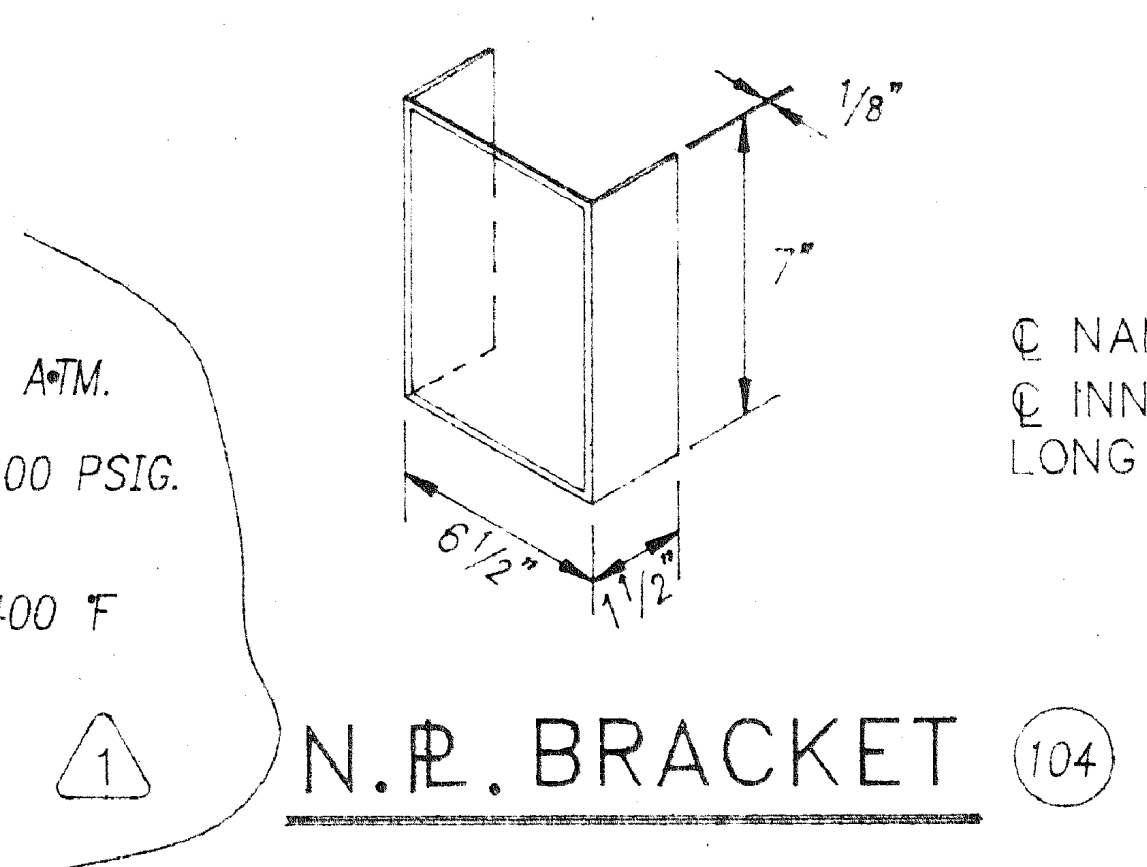
- OFFENHAUSER TO RECEIVE THE BOTTOM SECTIONS AND PERFORM THE FOLLOWING WORK.
- REMOVE NOZZLES IN JACKET MK "N1 & N3". RE-INSTALL NOZZLES IN NEW BTM. SECTION AFTER MACHINING OF FLANGE FACES.
- REMOVE SHELL FLANGES MARKED "P" & "N". REPLACE FLANGE FACING MACHINE AS SHOWN. THAN INSTALL FLANGES ON NEW BTM. SECTION AS SHOWN.
- REMAINDER OF OLD BTM. SECTION WILL BE SCRAPPED.
- INNER SHELL DIAMETER OUT-OF-ROUNDNESS BEFORE MACHINING. DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM INSIDE DIAMETER AT ANY CROSS SECTION SHALL NOT EXCEED 0.167" OF THE SECTION UNDER CONSIDERATION.
- MACHINE INNER SHELL INSIDE DIAMETER AS SHOWN AND IF REQUIRED POLISH TO A 32 RMS FINISH AFTER MACHINING.
- HARDNESS READINGS ARE TO BE TAKEN ON C-22 PLATE PRIOR TO ROLLING AND AFTER ROLLING & HAZ AFTER WELDING TO DETERMINE SOLUTION ANNEALING REQUIREMENTS.
- ATTACH TWO 12" x 6" RUN-OFF TABS AT LONG SEAM. PLATES ARE TO BE WELDED AT SAME TIME AS LONG SEAM.
- BREAK ALL SHARP CORNERS.

NATIONAL BOARD NO.: NONE	
CERTIFIED BY OFFENHAUSER COMPANY HOUSTON TEXAS	
U PART:	VESSEL JKT/COIL PSIG PSIG
S/O NO. 4090	MANP(EXT) PSI PSI
DWG NO. 93-4090	DES.TEMP. 650 °F °F
ITEM NO. GE-506	HYDROTEST 0 °F 15 PSIG °F °F PSIG
CAPACITY	YEAR BUILT 1993 MFR'S S.NO. 93-4090
WT. EMPTY	PROJECT: TDI EVAPORATOR
	P.O.NO.: 93-25358

NAME PLATE STAMPING

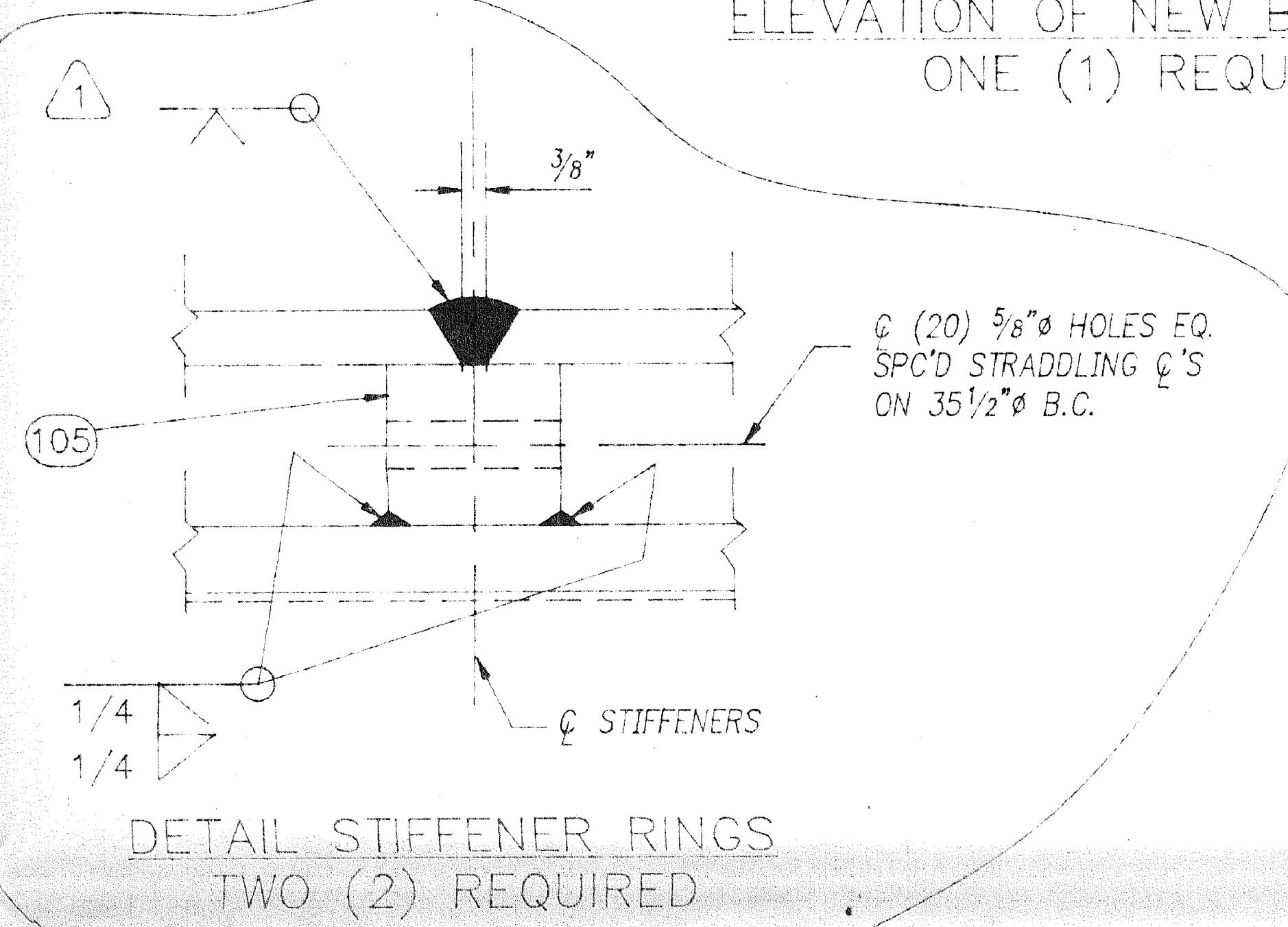
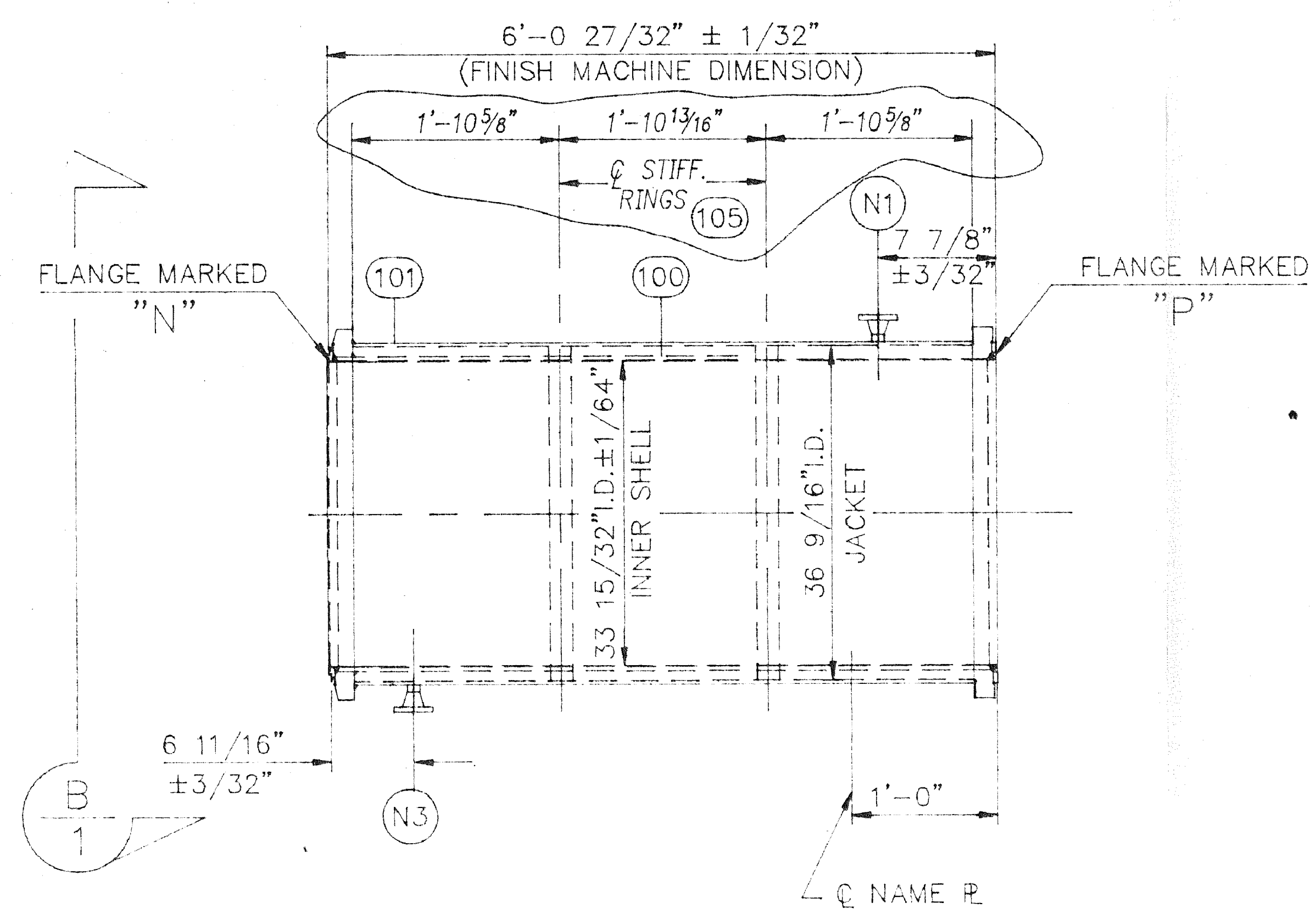
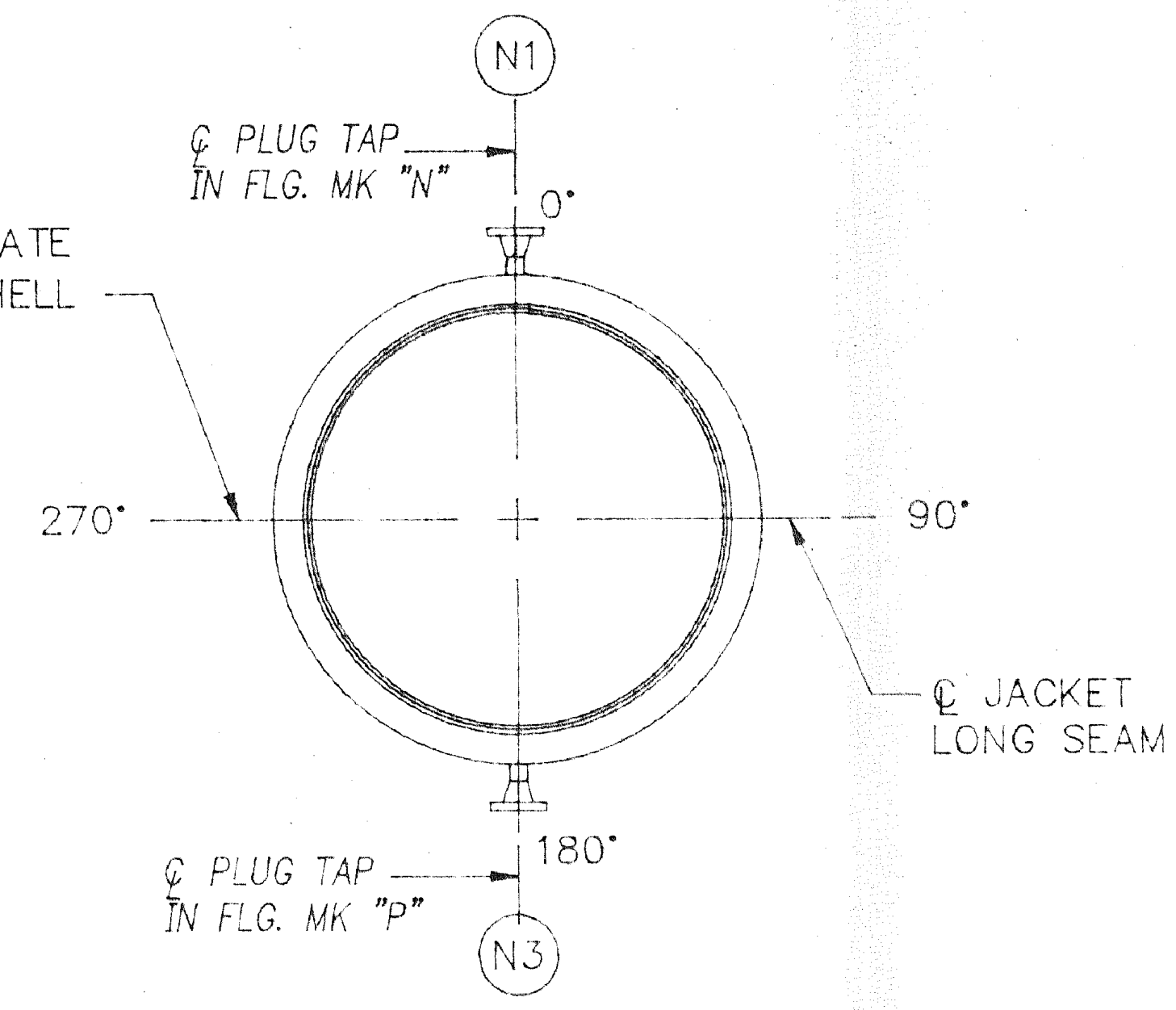
CATEGORY	WPS NUMBERS
PRESSURE ENVELOPE	A P44-20; P44-38; P1-46; P1-31
	B
	C P1-P44-4
	D
ATTACHMENTS	P44-17; P154; P1-P44-4; P1-P44-18
SUPPORTS	

WELDING PROCEDURES



- = VAC. TO ATM.
- ▲ = STEAM 200 PSIG.
- = STEAM 400 F

NAME PLATE @ INNER SHELL LONG SEAM

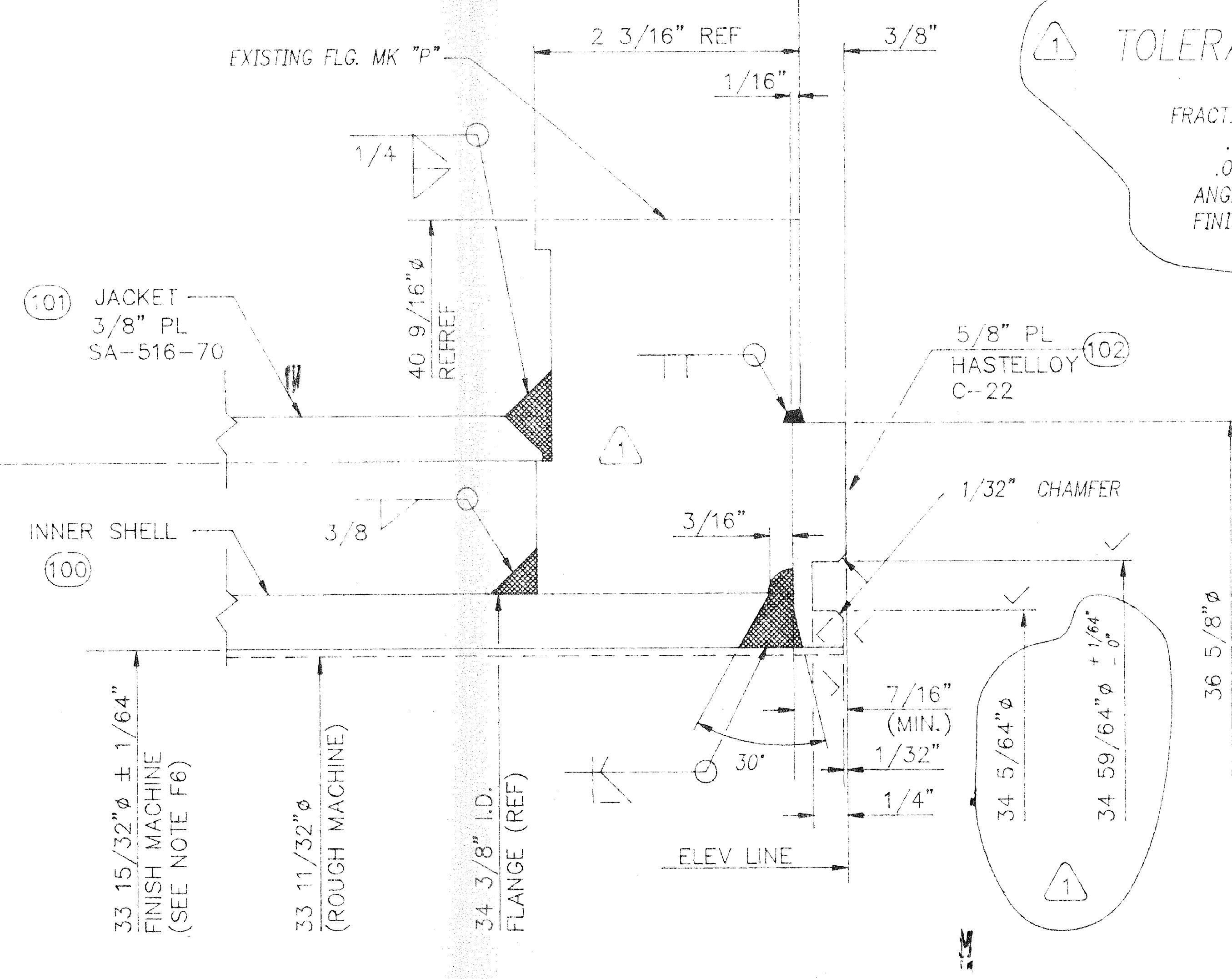
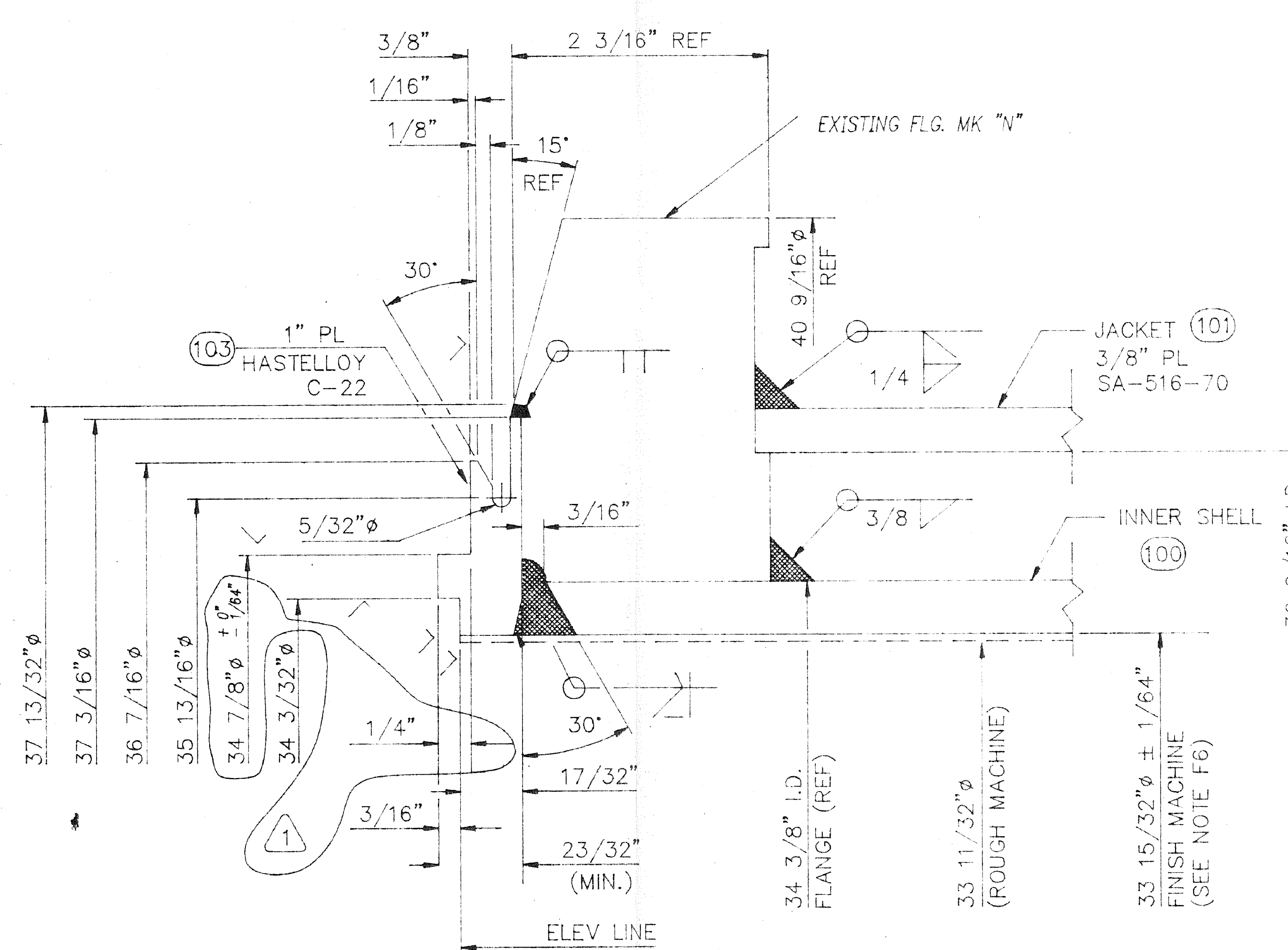


SHOP NOTE: CAUTION

6'-0 27/32" ± 1/32" IS OVERALL FINISHED MACHINE DIMENSION. SET HASTELLOY FACING, ITEM 102 & 103 TO ALLOW SUFFICIENT MACHINING OF FLANGE FACE.

TOLERANCES: (EXCEPT AS NOTED)

- FRACTION - ± 1/64"
- .00 - ± .01"
- .000 - ± .005"
- ANGLES - ± 1/2"
- FINISH - ± 64"
- ± 1/64" CONCENTRICITY
- ± .015" PERPENDICULARITY
- ± .010" PARALLELISM



CERTIFIED FOR FABRICATION
BY: JAL DATE: 3/15/93

NO.	REVISIONS	MADE BY	CHK'D BY	DATE
1	REV. AS BUILT	BW	JAL	10/12/93
2	FOR FABRICATION	BW	JAL	3/15/93

OFFENHAUSER COMPANY HOUSTON TEXAS PRINT RECORD DATE FOR NO.

CUSTOMER: RUBICON INC.

PURCHASE ORDER NO.: 93-25358

PROJECT NO.: TDI EVAPORATOR

LOCATION: GEISMAR, LOUISIANA

DESCRIPTION: 34 9/16" OD. x 6'-0 27/32" ± 1/32" FLG. FACE TO FLG. FACE TDI EVAPORATOR BOTTOM SECTION & NOTS

SHOP ORDER NO.: 4090

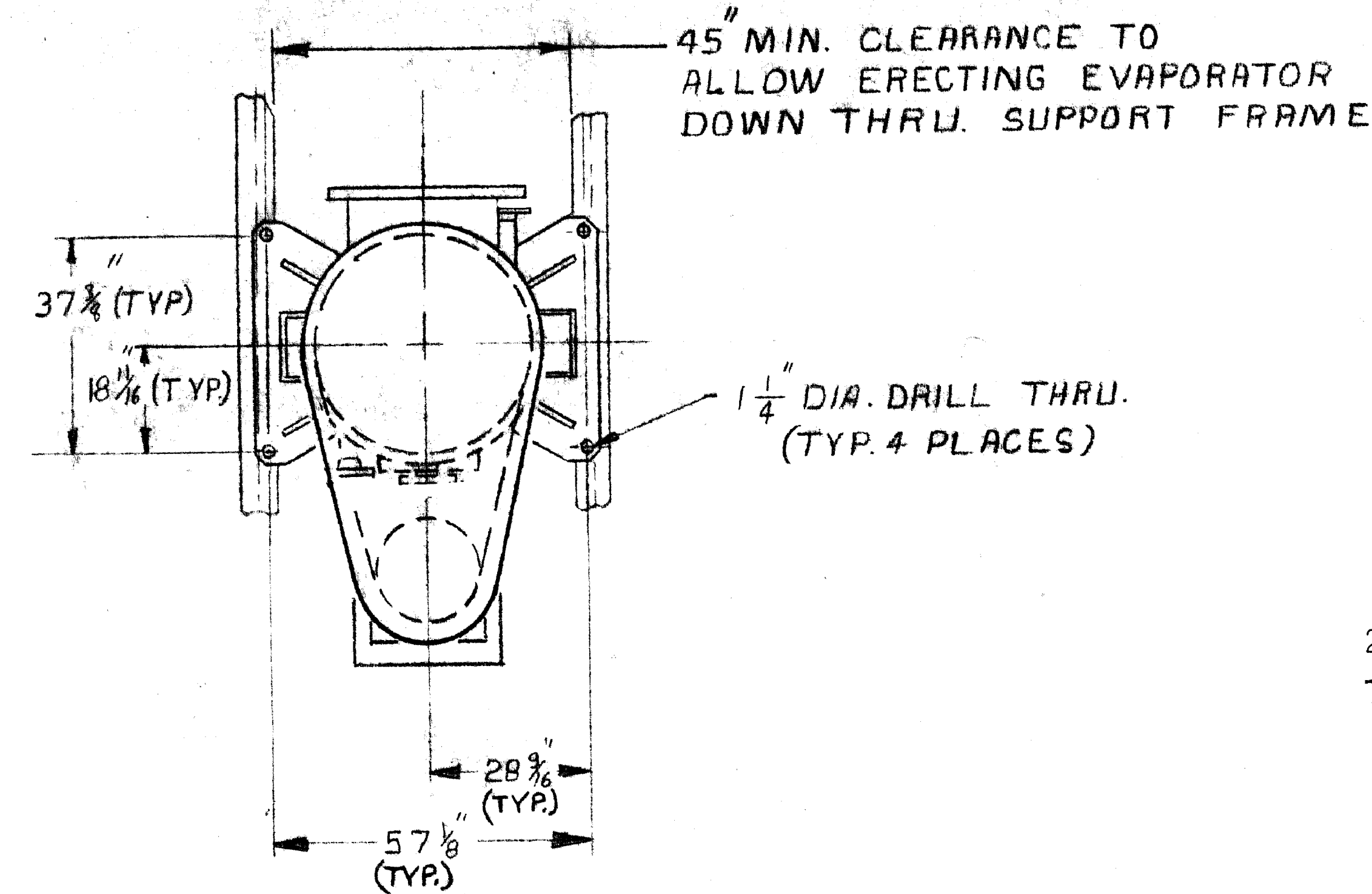
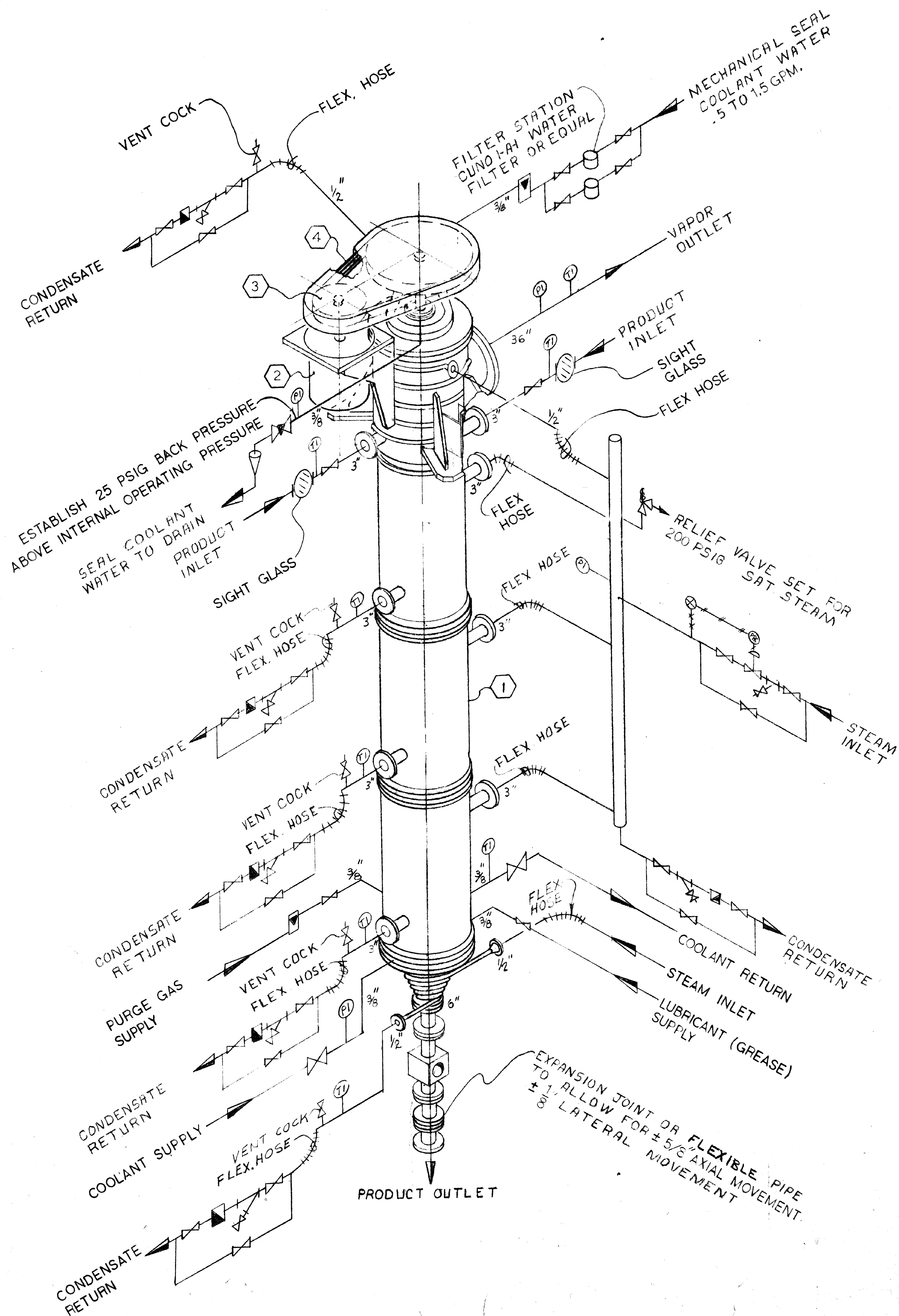
DRAWING NO.: 93-4090

ITEM NO.: GE-506

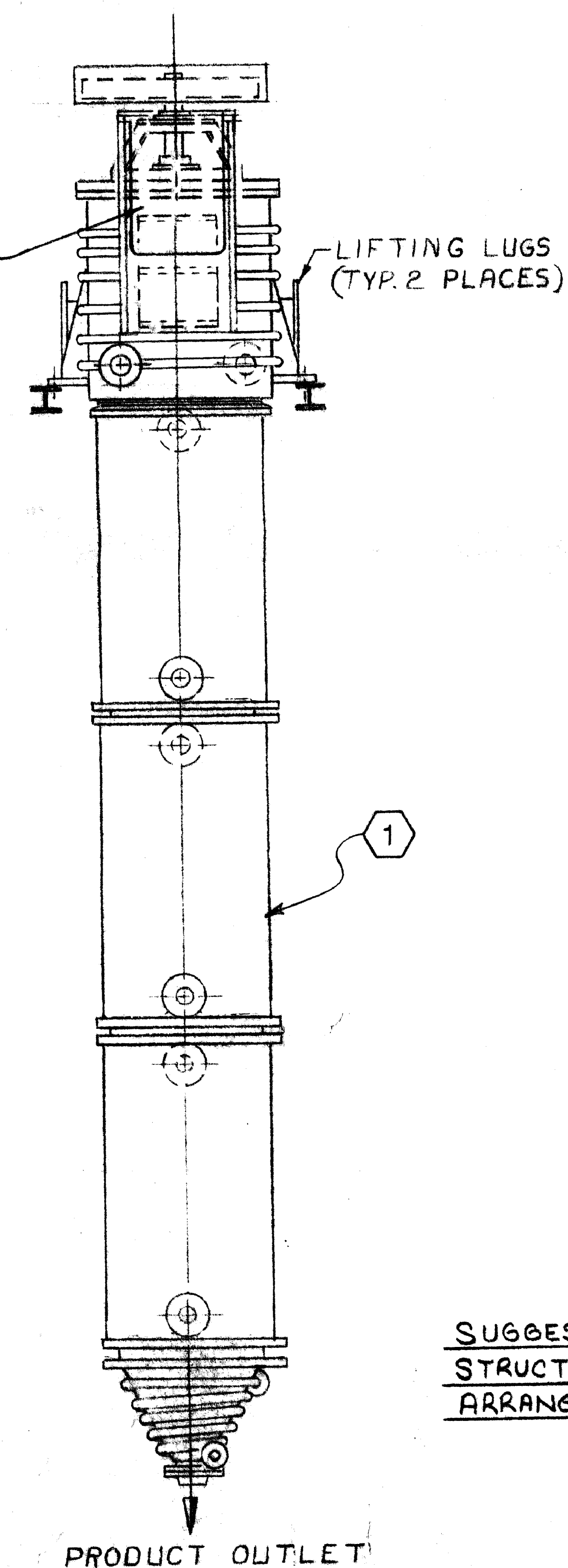
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DRAWN BY: BW CHK'D BY: JAL DATE: 3/10/93 1 OF 1

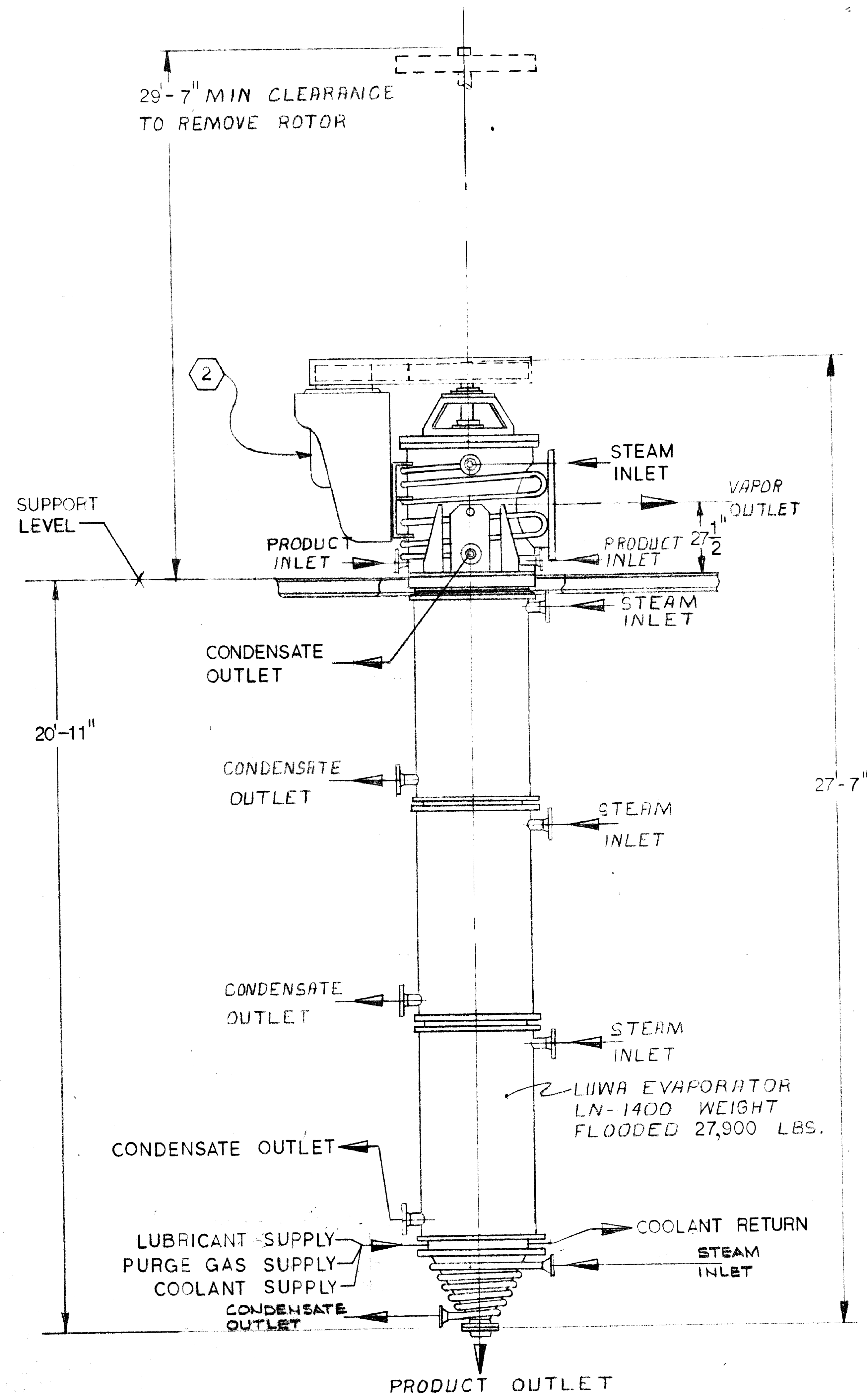
**SUGGESTED PIPING SCHEMATIC
FOR LN 1400**



ROTOR DRIVE MOTOR:
20 HP, 900 RPM, FRAME 324 TD,
230/460V, 3PH, 60 HZ
CLASS I, GROUP D/ CLASS II,
GROUP F & G, DIV. I,
EXPLOSION PROOF



SUGGESTED STRUCTURAL ARRANGEMENT



NOTES:

1. SEE DRAWING NO. SO 15497-1C FOR CORRECT NOZZLE ORIENTATION AND DIMENSIONS.
2. NUMBERS IN HEXAGON REFER TO LUWA BILL OF MATERIAL NUMBERS.
3. ONLY EQUIPMENT NOTED BY B/M NUMBERS FURNISHED BY LUWA OTHER EQUIPMENT FURNISHED BY CUSTOMER.

"As Built" Drawing Package
As Built

REV.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB
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FORM R-1, REPORT OF WELDED REPAIR OR ALTERATION
as required by the provisions of the National Board Inspection Code

1. Work performed by Fabex, Inc. 0-199-UB
(name of repair or alteration organization) (P.O. no., job no., etc.)
Flanacher Rd. Zachary, La. 70791
(address)

2. Owner Rubicon, Inc.
(name)
Geismar, La.
(address)

3. Location of installation Rubicon, Inc.
(name)
Geismar, La.
(address)

4. Unit identification: Pressure vessel Name of original manufacturer BUSS-SMS GMBH
(boiler, pressure vessel)

5. Identifying nos.: 1400/28LL 349 10256 N/A 1986
(mfr's. serial no.) (original National Board no.) (jurisdiction no.) (other) (year built)

6. Description of work: The I.S. of vessel was bored .125". Then a .250" plate (SA-240-316L)
(use back, separate sheet, or sketch if necessary)
was rolled and inserted as a liner for said vessel. The liner covers the full length
of shell section: and was welded at end seams and plug welded at various locations
with (E-316L) electrode. The said vessel was then rebored where approx. .0625" of
said liner was removed.

None Pressure test, if applied N?A psi

7. Replacement Parts. Attached are Manufacturers' Partial Data Reports properly identified and signed by Authorized Inspectors for the following items of this report:

N/A

8. Remarks:

N/A

DESIGN CERTIFICATION

The undersigned certifies that the statements made in this report are correct and that the design changes described in this report conform to the requirements of the National Board Inspection Code.

ASME Certificate of Authorization no. 13,974 to use the U symbol expires 5-19- 1992

Date 6-13, 1990 Fabex, Inc. Signed Mike Carlin
(name of organization) (authorized representative)

CERTIFICATE OF REVIEW OF DESIGN CHANGE

The undersigned, holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency issued by the state or province of La. and employed by Commercial Union Ins. Co.

of Boston, Mass. has examined the design change as described in this report and verifies that to the best of his knowledge and belief such change complies with the applicable requirements of the National Board Inspection Code. By signing this certificate, neither the undersigned nor his employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage or loss of any kind arising from or connected with this inspection, except such liability as may be provided in a policy of insurance which the undersigned's insurance company may issue upon said object and then only in accordance with the terms of said policy.

Date 6-13, 1990 Signed E.L. Willis Commissions NB7729, LA870
(Authorized Inspector) (National Board (incl. endorsements), state, prov., and no.)

CONSTRUCTION CERTIFICATION

The undersigned certifies that the statements made in this report are correct and that all construction and workmanship on this Alteration conform to the National Board Inspection Code.
(repair or alteration)

Certificate of Authorization no. 13,974 to use the U symbol expires 5-19- 1992

Date 6-13, 1990 Fabex, Inc. Signed Mike Carlin
(repair or alteration organization) (authorized representative)

CERTIFICATE OF INSPECTION

The undersigned, holding a valid Commission Issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency issued by the state or province of La. and employed by Commercial Union Ins. Co.

of Boston, Mass. has inspected the work described in this report on 6/8, 1990 and state that to the best of my knowledge and belief this work has been done in accordance with the National Board Inspection Code. By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage or loss of any kind arising from or connected with this inspection, except such liability as may be provided in a policy of insurance which the undersigned's insurance company may issue upon said object and then only in accordance with the terms of said policy.

Date 6/13, 1990 Signed E.L. Willis Commissions NB#7729 LA-870
(Authorized Inspector) (National Board (incl. endorsements), state, prov., and no.)

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by Buss-SMS GmbH, Kaiserstraße 13-15, D-6308 Butzbach, West-Germany
(Name and address of manufacturer)
2. Manufactured for Rubicon Inc., Geismar, Louisiana
(Name and address of purchaser)
3. Location of installation Rubicon Inc., Geismar, Louisiana
(Name and address)
4. Type Vertical Jacketed 1400/28-U N.A. 030-12-030-2-A 349 1986
(Horiz. vert., tank) (Mfg's serial No.) (CRN) (Drawing) (Nat'l. Bd. No.) (Year built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME Boiler and Pressure Vessel Code. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1. 1983
Year
- Summer 1985 N.A. N.A.
Addenda (date) Code Case No. Special service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, or sheets of heat exchangers

6. Shell: SA516 Gr 60 0.394 in. N.A. 3 ft. 0.772 in. 5 ft. 7.40 in.
Mat'l (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (Overall) (ft. & in.)
7. Seams: Welded Single Butt Spot 85% N.A.
Long. (Dbl., Sngl.) R.T. (Spot or Full) Eff. (%) H.T. Temp. (F)
- N.A. N.A. N.A. 1
Time Girth (Dbl., Sngl.) R.T. (Spot, Partial, or Full) No. of Courses

8. Flanges: (a) Mat'l. SA 105 (b) Mat'l. SA 105
(Spec. No., Grade) (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	<u>Top</u>	<u>2.165 in.</u>	<u>none</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>3 ft. 5.929 in.</u>	<u>N.A.</u>
(b)	<u>Bottom</u>	<u>2.165 in.</u>	<u>none</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>3 ft. 4.551 in.</u>	<u>N.A.</u>

If removable, bolts used (describe other fastenings) N.A.
(Mat'l. Spec. No., Gr. Size No.)

9. Type of Jacket Type 1 acc. Appendix 9 Proof Test N.A.
10. Jacket Closure acc. Fig. 9-5 (d-2) and (g-3) If bar, give dimensions N.A. If bolted, describe or sketch.
(Describe as ogee & weld. bar, etc.)
11. MAWP 200 / 100 psi at max. temp. 400 / 650 °F. Min. temp. (when less than -20° F) N.A. °F.
Hydro., pneu., or comb. test press. 323 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: N.A. N.A. N.A. N.A. N.A.
Stationary Mat'l (Spec. No., Gr.) Diam. (in.) (Subject to pressure) Nom. Thk. (in.) Corr. Allow. (in.) Attach. (Welded, Bolted)
- N.A. N.A. N.A. N.A. N.A.
Floating Mat'l (Spec. No., Gr.) Diam. (in.) Nom. Thk. (in.) Corr. Allow. (in.) Attach.
13. Tubes: N.A. N.A. N.A. N.A. N.A.
Mat'l (Spec. No., Gr.) O.D. (in.) Nom. Thk. (in. or Gauge) Number Type (Straight or U)

Items 14-17 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers

14. Shell: SA516 Gr 60 + SA240 316L 0.768 in. none 2 ft. 9.465 in. 5 ft. 5.433 in.
Mat'l (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (Overall) (ft. & in.)
15. Seams: Welded double butt Spot 85% N.A.
Long. (Dbl., Sngl.) R.T. (Spot or Full) Eff. (%) H.T. Temp. (F)
- N.A. Welded double butt Spot 1
Time Girth (Dbl., Sngl.) R.T. (Spot, Partial, or Full) No. of Courses
16. Heads: (a) Mat'l. N.A. (b) Mat'l. N.A.
(Spec. No., Grade) (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>
(b)	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>

If removable, bolts used (describe other fastenings) N.A.
(Mat'l. Spec. No., Gr. Size No.)

17. MAWP Vac. / atm. psi at max. temp. 650 °F. Min. temp. (when less than -20° F) N.A. °F.
Hydro., pneu., or comb. test press. N.A. psi.

Form U-1 (Back)

18. Nozzles, Inspection and Safety Valve Openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Dim. or Size	Type	Matl.	Nom. Thk.	Reinforcement Mtd.	How Attached	Location
Inlet	1	3" 300#	WN Flg.	SA106 Gr B	0.299 in.	N.A.	welded	jacket
Outlet	1	3" 300#	WN Flg.	SA106 Gr B	0.299 in.	N.A.	welded	jacket

19. Supports: Skirt No Lugs N.A. Legs N.A. Other N.A. Attached N.A.
(Yes or no) (No) (No) (Describe) (Where and how)

20. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: N.A.

(Name of part, item number, mfr's name and identifying stamp)

Item 11 1) steam heated 2) oil heated

N.A. - not applicable

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

"U" Certificate of Authorization No. 12,221 expires April 30th, 19 89
 Date 12th Jan. 1987 Co. name Buss-SMS GmbH Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by Buss-SMS GmbH at D-6308 Butzbach

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of North Carolina and employed by Lloyd's Register Industrial Services (Insurance) Inc.

of New York have inspected the pressure vessel described in this Manufacturer's Data Report on 12th January, 19 87, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this

pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in the Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 12th Jan. 1987 Signed [Signature] Commissions N.B. 10256 N.C. 1126
(Authorized Inspector) (Nat'l Board, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the field assembly construction of all parts of this vessel conforms with the requirements of Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code.

"U" Certificate of Authorization No. _____ expires _____, 19 ____
 Date _____ Co. name _____ Signed _____
(Assembler that certified and constructed field assembly) (By Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____

of _____ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the

certificate of shop inspection, have been inspected by me and that, to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____ psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ Commissions _____
(Authorized Inspector) (Nat'l Board, State, Province and No.)

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by Buss-SMS GmbH, Kaiserstraße 13-15, D-6308 Butzbach, West-Germany
(Name and address of manufacturer)

2. Manufactured for Rubicon Inc., Geismar, Louisiana
(Name and address of purchaser)

3. Location of installation Rubicon Inc., Geismar, Louisiana
(Name and address)

4. Type Vertical Jacketed 1400/28-M N.A. 030.18.0M.2.1 350 1986
(Horiz. or Vert. tank) (Mfr's serial No.) (CRN) (Drawing) (Mat'l Bd. No.) (Year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME Boiler and Pressure Vessel Code. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 1983
Year

Summer 1985 N.A. N.A.
Addenda (date) Code Case No. Special service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, or sheets of heat exchangers

6. Shell: SA516 Gr 60 0.394 in. none 3 ft. 0.772 in. 5 ft. 7.40 in.
Mat'l (Spec No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft & in.) Length (Overall) (ft & in.)

7. Seams: Welded Single butt Spot 85% N.A.
Long (Dbl., Sngl.) R T (Spot or Full) Eff. (%) H T Temp. (F)

N.A. N.A. N.A. 1
Time Girth (Dbl., Sngl.) R T (Spot, Partial, or Full) No. of Courses

8. Flanges (a) Mat'l. SA105 (b) Mat'l. SA 105
(Spec No., Grade) (Spec No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	<u>Top</u>	<u>2.165 in.</u>	<u>none</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>3 ft. 4.551 in.</u>	<u>N.A.</u>
(b)	<u>Bottom</u>	<u>2.165 in.</u>	<u>none</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>3 ft. 4.551 in.</u>	<u>N.A.</u>

If removable, bolts used (describe other fastenings) N.A.
(Mat'l. Spec No. Gr. Size No.)

9. Type of Jacket Type 1 acc. Appendix 9 Proof Test N.A.

10. Jacket Closure acc. Fig. 9-5 (d-2) and (g-3) If bar, give dimensions N.A. If bolted, describe or sketch.

11. MAWP 200 / 100 psi at max. temp. 400 / 650 °F. Min. temp. (when less than -20°F) N.A. °F.
Hydro., pneu., or comb. test press. 323 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: N.A. N.A. N.A. N.A. N.A.
Stationary Mat'l (Spec No., Gr.) Diam. (in.) (Subject to pressure) Nom. Thk. (in.) Corr. Allow. (in.) Attach. (Welded, Bolted)

N.A. N.A. N.A. N.A. N.A.
Floating Mat'l (Spec No., Gr.) Diam. (in.) Nom. Thk. (in.) Corr. Allow. (in.) Attach.

13. Tubes: N.A. N.A. N.A. N.A. N.A.
Mat'l (Spec No., Gr.) O.D. (in.) Nom. Thk. (in. or Gauge) Number Type (Straight or U-bend)

Items 14-17 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers

14. Shell: SA516 Gr 60 + SA240 316L 0.768 in. none 2 ft. 9.465 in. 5 ft. 5.433 in.
Mat'l (Spec No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft & in.) Length (Overall) (ft & in.)

15. Seams: Welded double butt Spot 85% N.A.
Long (Dbl., Sngl.) R T (Spot or Full) Eff. (%) H T Temp. (F)

N.A. Welded double butt Spot 1
Time Girth (Dbl., Sngl.) R T (Spot, Partial, or Full) No. of Courses

16. Heads: (a) Mat'l. N.A. (b) Mat'l. N.A.
(Spec No., Grade) (Spec No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>
(b)	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>

If removable, bolts used (describe other fastenings) N.A.
(Mat'l. Spec No. Gr. Size No.)

17. MAWP Vac. / adm. psi at max. temp. 650 °F. Min. temp. (when less than -20°F) N.A. °F.
Hydro., pneu., or comb. test press. N.A. psi.

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by Buss-SMS GmbH, Kaiserstraße 13-15, D-6308 Butzbach, West-Germany
(Name and address of manufacturer)
2. Manufactured for Rubicon Inc., Geismar, Louisiana
(Name and address of purchaser)
3. Location of installation Rubicon Inc., Geismar, Louisiana
(Name and address)
4. Type Vertical Jacketed 1400/28-L N.A. 030.24.0M.2.1 3.5A 1986
(Horiz. or vert. tank) (Mfr's serial No.) (CRN) (Drawing) (Nat'l Bd No.) (Year built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME Boiler and Pressure Vessel Code. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 1983
Year
- Summer 1985 N.A. N.A.
Addenda (date) Code Case No. Special service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, or sheets of heat exchangers

6. Shell: SAS16 6160 0.394 in. none 3ft. 0.772 in. 5ft. 7.48 in.
Matl (Spec No., Grade) Nom. Thk (in.) Corr. Allow. (in.) Diam I.D. (ft & in.) Length (Overall) (ft & in.)
7. Seams: Welded single butt Spot 85% N.A.
Long (Dbl., Sngl.) R.T. (Spot or Full) Eff. (%) H.T. Temp (F.)
- N.A. N.A. N.A. 1
Time Grth (Dbl., Sngl.) R.T. (Spot, Partial, or Full) No. of Courses

8. Heads: (a) Matl. SA 105 (b) Matl. SA 105
(Spec No., Grade) (Spec No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	<u>Top</u>	<u>2.165 in.</u>	<u>none</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>3ft. 4.551 in.</u>	<u>N.A.</u>
(b)	<u>Bottom</u>	<u>2.165 in.</u>	<u>none</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>3ft. 4.551 in.</u>	<u>N.A.</u>

If removable, bolts used (describe other fastenings) N.A.
(Matl. Spec No., Gr. Size No.)

9. Type of Jacket Type 1 acc. Appendix 9 Proof Test N.A.
10. Jacket Closure acc. Fig. 9-5 (d-2) and (g-3) If bar, give dimensions N.A. If bolted, describe or sketch.
11. MAWP 200 / 100 psi at max. temp. 400 / 650 °F. Min. temp. (when less than -20° F) N.A. °F.
 Hydro., pneu., or comb. test press. 323 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: N.A. N.A. N.A. N.A. N.A.
Stationary Matl (Spec No., Gr.) Diam (in.) (Subject to pressure) Nom. Thk (in.) Corr. Allow (in.) Attach (Welded, Bolted)
- N.A. N.A. N.A. N.A. N.A.
Floating Matl (Spec No., Gr.) Diam (in.) Nom. Thk (in.) Corr. Allow (in.) Attach
13. Tubes: N.A. N.A. N.A. N.A. N.A.
Matl (Spec No., Gr.) O.D. (in.) Nom. Thk (in. or Gauge) Number Type (Straight or U)

Items 14-17 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers

14. Shell: SAS16 6160 + SA240 304L 0.768 in. none 2ft. 9.465 in. 5ft. 5.433 in.
Matl (Spec No., Grade) Nom. Thk (in.) Corr. Allow (in.) Diam I.D. (ft & in.) Length (Overall) (ft & in.)
15. Seams: Welded double butt Spot 85% N.A.
Long (Dbl., Sngl.) R.T. (Spot or Full) Eff. (%) H.T. Temp (F.)
- N.A. Welded double butt Spot 1
Time Grth (Dbl., Sngl.) R.T. (Spot, Partial, or Full) No. of Courses
16. Heads: (a) Matl. N.A. (b) Matl. N.A.
(Spec No., Grade) (Spec No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>
(b)	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>	<u>N.A.</u>

If removable, bolts used (describe other fastenings) N.A.
(Matl. Spec No., Gr. Size No.)

17. MAWP Vac. / atm. psi at max. temp. 650 °F. Min. temp. (when less than -20° F) N.A. °F.
 Hydro., pneu., or comb. test press. N.A. psi.

