

107488
FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

Manufactured and certified by:		Howe-Baker Engineers, Inc. 8521 FM 850 Tyler, Texas 75705	
Manufactured for:		(Name and address of Manufacturer) Nucor Corp. Lisa Bay, Trinidad	
3 Location of installation:		(Name and address of Purchaser) Nucor Corp. Lisa Bay, Trinidad	
4 Type:		Desulfurizer V-101 3150	
(Horiz., vert., or sphere)		(Tank, separator, jkt. vessel, heat exch., etc.)	
N/A		D17VOO1A 1665 1997	
(CRN)		(Drawing No.) (Nat'l Bd. No.) (Year Built)	
5 ASME Code, Section VIII, Div. 1		1995 A95 N/A	
Edition and Addenda (date)		Code Case No. Special Service per UG-120(d)	

Items 6 - 11 inclusive to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6 Shell (a) No. of course(s): 1 (b) Overall length (ft & in.): 8'-0"

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Norm.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	45"	8'-0"	SA516-70		0.622	0.062	1	Spot	85%	1	Spot	85%	N/A	N/A

7 Heads: (a) SA516-70 PWHT N/A (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.
(b) SA516-70 PWHT N/A (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Top	0.5	0.062	N/A	N/A	2:1	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
(b)	Bottom	0.5	0.062	N/A	N/A	2:1	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A

If removable, bolts used (describe other fastening) N/A
(Mat'l Spec. No., Grade, size, No.) 2128 Type of jacket N/A Jacket Closure N/A
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions: N/A If bolted, describe or sketch.

9 MAWP 212 N/A psi at max. temp. 800 N/A ° F Min. design metal temp. 0 ° F at 212 psi
(internal) (external) (internal) (external)10 Impact test NO
(Indicate yes or no and the component(s) impact tested)

11 Hydro., pneu., or comb. test pressure 445 Proof test N/A

Items 12 and 13 to be completed for tube sections. N/A

12 Tubesheet: Stationary (Mat'l Spec. No.) Dia., in. (subject to press.) Nom. Thk., in. Corr. Allow. in. Attachment (welded or bolted)

Floating (Mat'l Spec. No.) Dia., in. Nom. thk., in. Corr. Allow. in. Attachment

13 Tubes: (Mat'l Spec. No., Grade or Type) (O.D., in.) Nom. thk., in. or gauge Number Type (Straight or U)

Items 14 - 18 inclusive to be completed for inner chambers of jacketed vessels or channels or heat exchangers. N/A

14 Shell (a) No. of course(s) (b) Overall length (ft & in.):

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Norm.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1														
2														

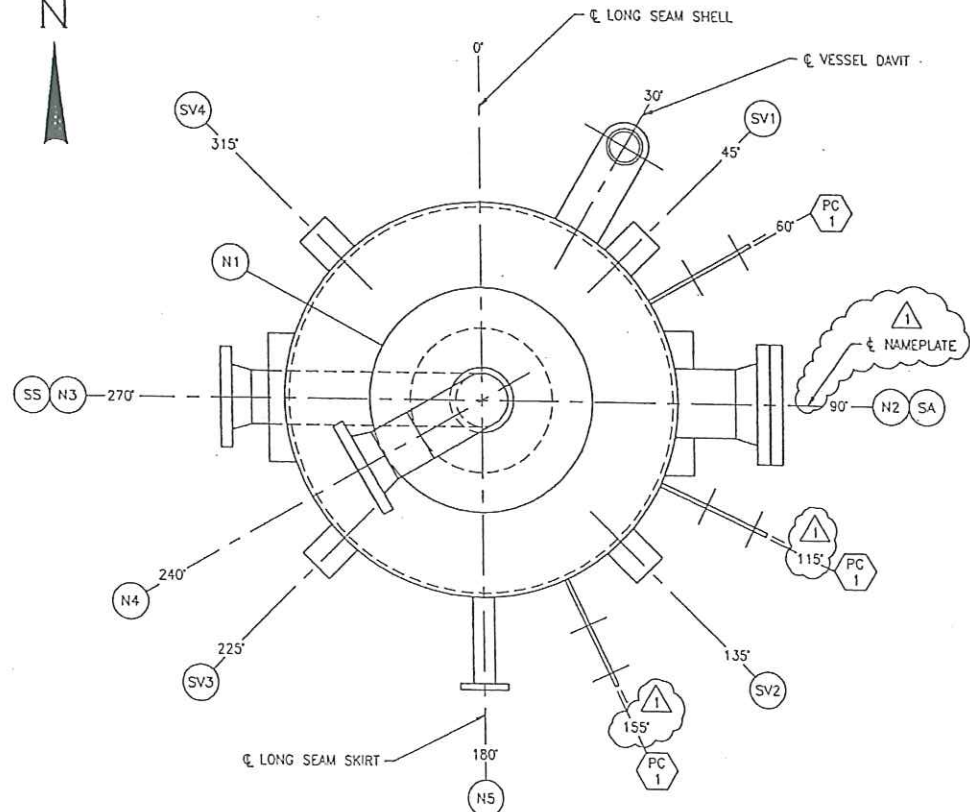
15 Heads: (a) (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.
(b) (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)														
(b)														

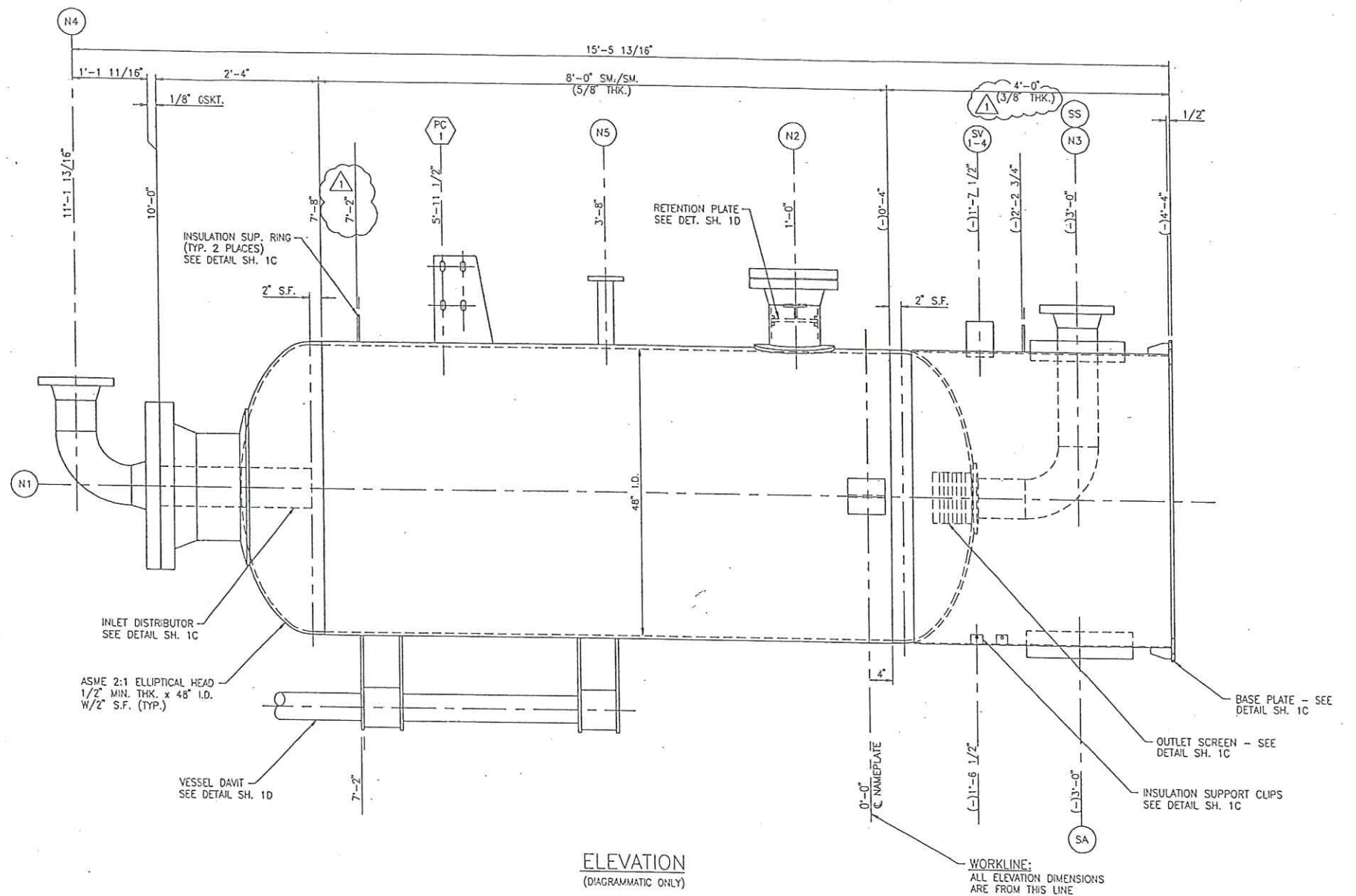
If removable, bolts used (describe other fastening) (Mat'l Spec. No., Grade, size, No.)

107488

U		1665	
212		800	
W	0	AT	212
RI-3	5150		1937
NO	SPOT		745
48" L	3" O	SA516	70
5/8"			1/16
2:1	1/2" MIN	SA516	70
2:1	1/2" MIN	SA516	70
DESULFURIZER V-101			
HOWE-BAKER ENGINEERS INC			



ORIENTATION



ELEVATION
(DIAGRAMMATIC ONLY)

MARK	NO.	SERVICE	SIZE	RATING	TYPE	BORE	WALL	LG. NECK	MAT'L.	OD & THK	MAT'L.	REINFORCING PAD	PROJECTION	WELD DETAIL	WELD SIZE	REMARKS			
SV1-4	4	SKIRT VENT	4.00	--	PIPE	4.02	.237	24	SA106-B	--	--		5	.625	7	--	.25	--	
SS	1	SKIRT SLEEVE	16.00	--	PIPE	15.25	.375	3.375	SA106-B	--	--		2	1.125	7	--	.25	--	
SA	1	SKIRT ACCESS	18.00	--	PIPE	17.25	.375	4.5	SA106-B	--	--		2	2.25	7	--	.25	--	
N5	1	SAMPLE	1.50	0300	RFLN	1.50	0.625	14	SA105	--	--		11.5	.50	5	--	.375	--	
N4	1	INLET	6.00	0300	RFLN	5.76	.432	9	SA106-B	--	--		SEE DETAIL	--	2	--	--	--	CONSTR. NOTE 17
N3	1	OUTLET	6.00	0300	RFLN	5.76	.432	33	SA106-B	0.625x11.63	SA516-70	SEE DETAIL	GRIND FLUSH	2	8	.375	.438	--	CONSTR. NOTE 17
N2	1	CATALYST DUMP	8.00	0300	RFLN	7.81	.406	9	SA106-B	0.625x13.63	SA516-70	SEE DETAIL	GRIND FLUSH	2	8	.375	.438	--	CONSTR. NOTE 17
N1	1	CATALYST-FILL/MANWAY	18.00	0300	RFLN	16.87	.562	10	SA106-B	0.625x26.00	SA516-70	SEE ELEV.	SET FLUSH	2	8	.375	.438	--	CONSTR. NOTE 16 & 17

REVISIONS				DESIGN DATA				CUSTOMER COMMENTS STAMP					
NO.	DESCRIPTION	BY	CHK	APV	DATE	DESIGN PER	ASME SEC. VIII DIV. 1 1995 ADD. STAMP APPLIED	YES	107488 Howe-Baker Engineers, Inc. TYLER, TEXAS THIS DRAWING AND ALL DESIGN DETAILS AND DATA HEREON IS THE SOLE PROPERTY OF HOWE-BAKER ENGINEERS, INC. OF TYLER, TEXAS AND SHALL NOT BE REPRODUCED IN ANY MANNER OR USED FOR ANY PURPOSE WHATSOEVER EXCEPT BY WRITTEN PERMISSION OF HOWE-BAKER ENGINEERS, INC. DESCRIPTION DESULFURIZER V-101 48" I.D. x 8'-0" SM./SM. CUSTOMER NUCOR CORP. LISAS BAY TRINIDAD SCALE: 1" = 1'-0" DRAWN LT 4-21-97 W.O. NO. CHECK CK 4-21-97 DWG. NO. APVD TS 4-22-97 D17V001B1				
0	ISSUED FOR FABRICATION	LT	CK	TS	4-22-97	SERIAL NO.	107488	NATIONAL B.O. NO.					107488
1	REVISED PER AS BUILT CHANGES	LT	CK	TS	7-22-97	DESIGN PRESS.	185 PSIG @ 800 °F EXT. - PSIG @ - °F						
						OPER. PRESS.	185 PSIG @ 750 °F EXT. - PSIG @ - °F						
				CORROSION ALLOWANCE: HOS 1/16" SHELL 1/16" NOZZ. 1/16"									
				MAX. ALLOW. STRESS @ 800 °F HOS. 12000 SHELL 12000									
				HYDRO PRESSURE INTERNAL 445 STRESS MULTIPLIER 1.369									
				RADIOGRAPHY: HEADS SPOT SHELL SPOT									
				JOINT EFF.: HEAD LONG SEAM SWLS SHELL LONG SEAM 85%									
				HEAD CIR. SEAM NA SHELL CIR. SEAM 85%									
				FLANGE RATING 302 COUPLING RATING 3020									
				SHELL MATL. SPEC. SA516-70 HEAD MATL. SPEC. SA516-70									
				FLANGE MATL. SPEC. SA105 CPLG. MATL. SPEC. SA105									
				PIPE MATL. SPEC. SA106-B BW FIT. MATL. SPEC. SA224-WPB									
				REPAID MATL. SPEC. SA516-70 STRUC. MATL. SPEC. SA36									
				RF GSK. MATL. SPEC. 304 SS FLG. STUD SPEC. SA193-B7									
				RF GSK. DESC. 1/8" FLEXITALL W/304SS FLEXITE SUPER OR EQ. FILLER									
				RF GSK. SPEC. 1/8" FLEXITALL W/304SS FLEXITE SUPER OR EQ. FILLER									
				RF GSK. DESC.									
				POST WELD HEAT TREAT NO									
				WIND CODE ANSI/ASCE 7-B8 SEISMIC CODE ANSI/ASCE 7-B8									
				(120 MPH) (ZONE 3)									

1. PROTECT NAME PLATE AND ALL FLANGE FACES BEFORE BLASTING AND PAINTING.
2. PAINTING SHALL CONFORM TO ALL MANUFACTURERS RECOMMENDATIONS REGARDING THINNING, MIXING, CURING, STORAGE, AND APPLICATION METHOD.
3. INSULATION: ☐ NO ☒ YES, THICKNESS = 5'
4. SURFACE PREPARATION: ☐ NO ☒ YES, SSPC-SP-6
5. PAINT: ☐ NO ☒ YES, REF. HOWE-BAKER SPECIFICATION 1620
PRIME, DFT = CARBOLINE CARBO ZINC 11 OR EQUAL (2.0 MILS DFT.)
(UNINSULATED SURFACES ONLY)
INTERMEDIATE, DFT = NONE
FINISH, DFT = NONE

1. FLANGE BOLT HOLES TO STRADDLE NORMAL VESSEL CENTERLINES UNLESS NOTED OTHERWISE.
2. WORKLINE TO BE CENTER PUNCHED INSIDE AND OUTSIDE.
3. EACH NOZZLE OR MANWAY REINFORCING PAD OR SEGMENT THEREOF SHALL HAVE ONE 1/4" NPT TEST HOLE. FILL TEST HOLE WITH HEAVY GREASE AFTER HYDROTEST.
4. TOLERANCES PER HOWE-BAKER STANDARD DRAWINGS B110-01 AND A110-02.
5. PERMISSIBLE OUT OF ROUNDNESS OF CYLINDRICAL AND CONICAL SHELLS SHALL NOT EXCEED 1% OF THE NOMINAL DIAMETER. THIS TOLERANCE SHALL BE INCREASED TO 2% WHEN THE CROSS-SECTION PASSES THROUGH OR WITHIN ONE I.D. OF A FITTING.
6. MAXIMUM ALLOWABLE MISALIGNMENT OF BUTT JOINTS IS LIMITED TO:

SECTION THICKNESS	JOINT CATEGORY	A	BCD
UP TO 1/2"		1/4t	1/4t
1/2" TO 3/4"		1/8"	1/4t
3/4" TO 1 1/2"		1/8"	3/16"
1 1/2" TO 2"		1/8"	1/8t
OVER 2"	LESSER OF 1/16t OR 3/8"	1/8t OR 3/4"	
7. MAXIMUM ALLOWABLE OFFSETS BETWEEN PLATES/HEADS OF DIFFERING THICKNESSES IS THE LESSER OF 1/8" OR 1/4t (THINNER PART).
8. ALL OFFSETS OF BUTT WELDED JOINTS SHALL BE BLENDED WITH A 3:1 TAPER.
9. CHECK APPLICABLE WELD PROCEDURE FOR PREHEAT REQUIREMENTS.
10. UNWELDED EDGES OF PENETRATIONS INSIDE THE VESSEL SHALL BE ROUNDED OR CHAMFERED.
11. BUTT JOINT EDGES ARE TO BE SMOOTH AND UNIFORM AND BE FREE OF LOOSE SCALE AND SLAG.
12. PRESSURE RETAINING WELDS WHICH ARE COVERED BY PRESSURE PARTS SHALL BE GROUND SMOOTH FOR THE WELD COVERED. FOR NON-PRESSURE PARTS COVERING PRESSURE RETAINING WELDS, THE WELDS MAY BE GROUND SMOOTH OR THE NON-PRESSURE PART COPED AROUND THE WELD.
13. TACK WELDS ARE TO BE REMOVED OR THEIR ENDS GROUND SMOOTH WHEN INCORPORATED INTO THE FINAL WELD.
14. TO ASSURE WELD GROOVES ARE COMPLETELY FILLED THE FOLLOWING WELD REINFORCEMENT MAY BE USED:

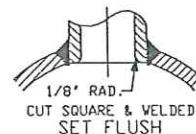
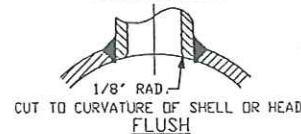
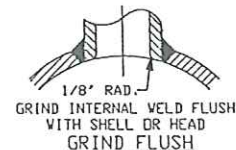
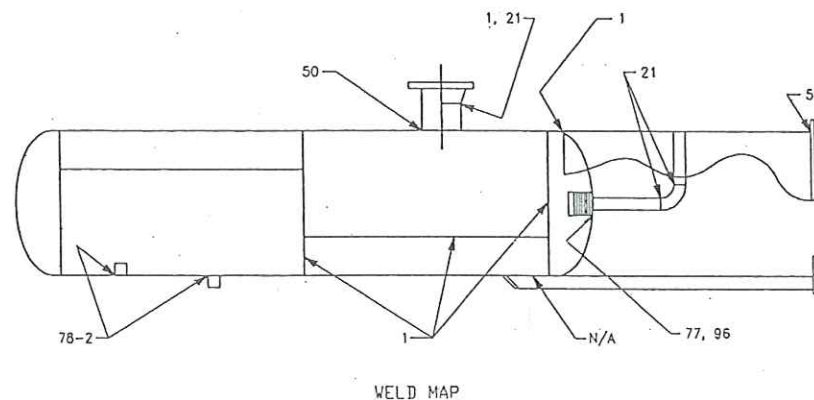
MAXIMUM WELD REINFORCEMENT: NOMINAL MATERIAL THICKNESS	PIPE AND TUBE WELDS	OTHER WELDS
LESS THAN 3/32"	3/32"	1/32"
3/32" TO 3/16" INCL.	1/8"	1/16"
3/16" TO 1/2" INCL.	5/32"	3/32"
1/2" TO 1" INCL.	3/16"	3/32"
1" TO 2" INCL.	1/4"	1/8"
15. FURNISH NOZZLE 'N1' WITH STUDS, NUTS AND GASKET.
16. FURNISH NOZZLE 'N2' WITH BLIND FLANGE, STUDS, NUTS AND GASKET.
17. FLANGE RAISED FACE TO HAVE 125 Ra MIN. - 250 Ra MAX. SURFACE FINISH.

[illegible]

APPLICABLE SPECIFICATIONS FOR THIS VESSEL

SHIPPING LIST

- (1) - 48' I.D. x 8'-0" SM./SM. VESSEL
(1) - 8'-300# 1/8" THK. FLEXITALLIC GASKET
(1) - 18'-300# 1/8" THK. FLEXITALLIC GASKET

[illegible]

NAMEPLATE DATA			
		CERTIFIED BY <u>H.B. NO. 1655</u> <u>HOVE-BAKER ENGINEERS, INC.</u>	
		<u>212</u> PSI AT <u>800</u> °F. MINIMUM DESIGN METAL TEMP. <u>0</u> °F.	
V RT-3		AT <u>212</u> PSI SERIAL NO. <u>3150</u>	
		 YEAR BUILT <u>1927</u>	
FWHT <u>NO</u> X-RAY <u>SPOT</u> TEST <u>445</u>			
SIZE <u>48" L</u>		DIA. <u>8"-0"</u> S.S. <u>CONC. ALLOY</u> 1/16"	
SHELL <u>TYPE 5/8"</u>		MAT'L <u>SAS16-70</u>	
TOP HEAD <u>TYPE 2:1</u>		THK. <u>1/2"</u> MIN. MAT'L <u>SAS16-70</u>	
BOTTOM HEAD <u>TYPE 2:1</u>		THK. <u>1/2"</u> MIN. MAT'L <u>SAS16-70</u>	
ITEM NO. <u>DESULFURIZER</u>		V-101	
P.O. NO.			
NO.			

C U S T O M E R C O M M E N T S S T A M P

107488

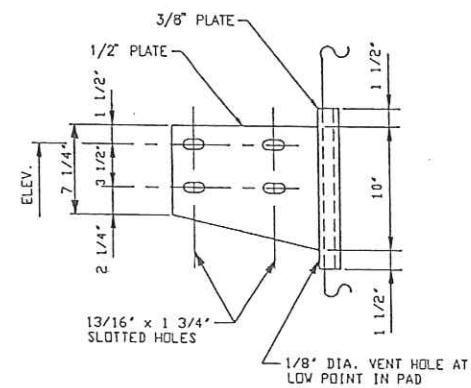
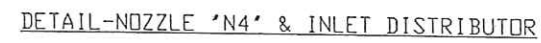
Howe-Baker
TYLER, TEXAS **Engineers, Inc.**

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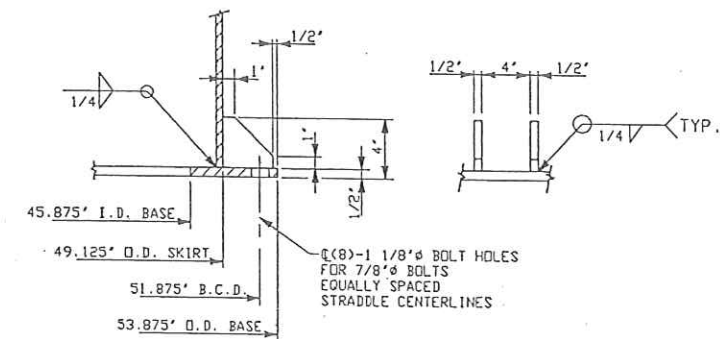
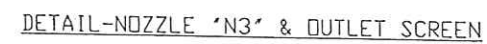
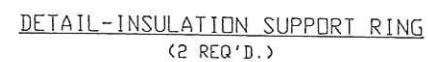
DESCRIPTION	DESULFURIZER V-101 48" I.D. x 8'-0" SM./SM.
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CUSTOMER	NUCOR CORP. LISAS BAY TRINIDAD
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SCALE : FULL			W.O. NO. NONE	
DRAWN	LT	4-21-97	MRP NO. NONE	
CHECK	CK	4-21-97	DWG. NO.	REV.
APVD	TS	4-22-97	D17V001A	1



DETAIL-PLATFORM CLIPS
(CLIPS MARKED 'PC-1')
(3 REQ'D.)



DETAIL-BASE PLATE



REVISONS						
NO.	DESCRIPTION	BY	CHK	APV	DATE	
0	ISSUED FOR FABRICATION	LT	CK	TS	4-22-97	

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION
D54V001A	GENERAL NOTES
D54V001B	ELEVATION AND ORIENTATION
D54V001D	VESSEL DAWIT & RETENTION PLATE

Howe-Baker
TYLER, TEXAS **Engineers, Inc.**

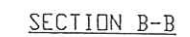
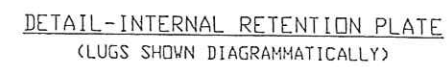
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DESCRIPTION
DESULFURIZER V-101 48" I.D. x 8'-0" SM./SM.

CUSTOMER
NUCOR CORP. LISAS BAY TRINIDAD

SCALE	W.O. NO.	None
DRAWN LT 4-21-97	MRP NO.	None
CHECK CK 4-21-97	DWG. NO.	
APVD TS 4-22-97	D17V001C	0



REVISIONS					
DESCRIPTION		BY	CHK	APV	DATE
0	ISSUED FOR FABRICATION	LT	CK	TS	9-22-97
REFERENCE DRAWINGS					
NUMBER	DESCRIPTION				
D54V001A	GENERAL NOTES				
D54V001B	ELEVATION AND ORIENTATION				
D54V001C	MISCELLANEOUS DETAILS				