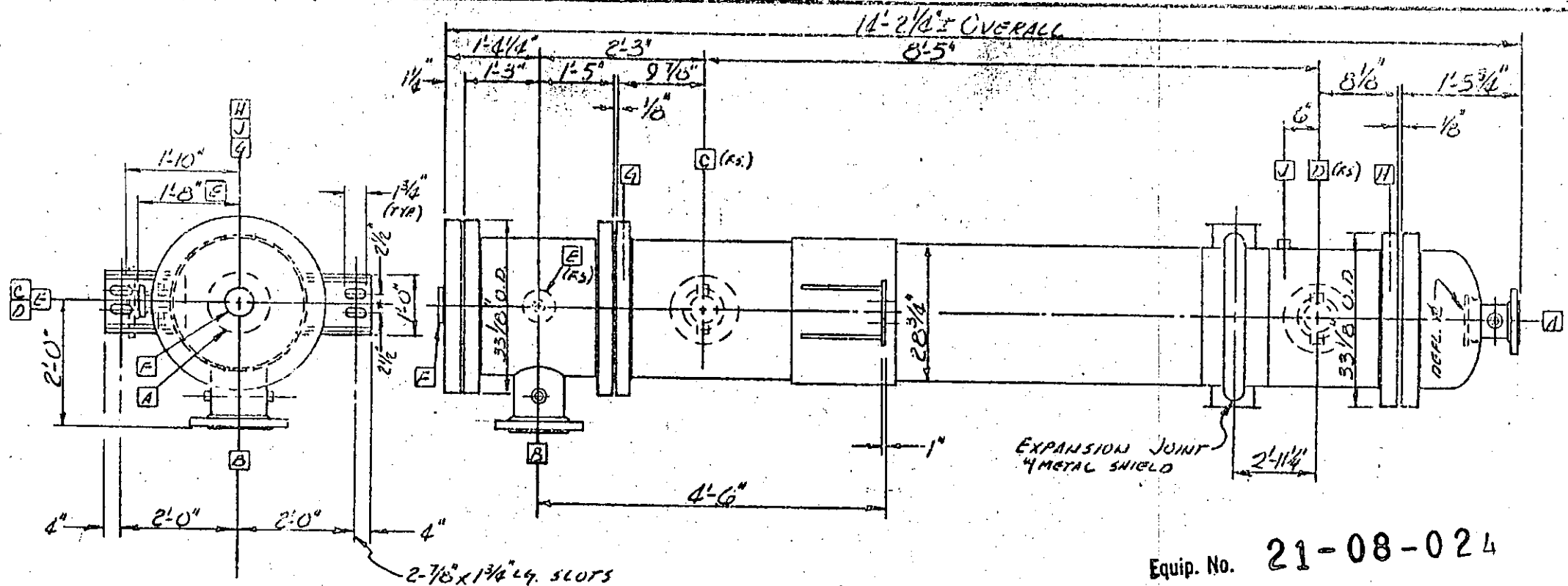




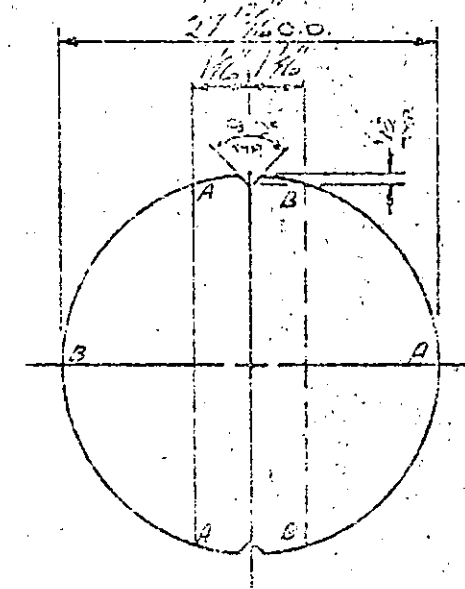
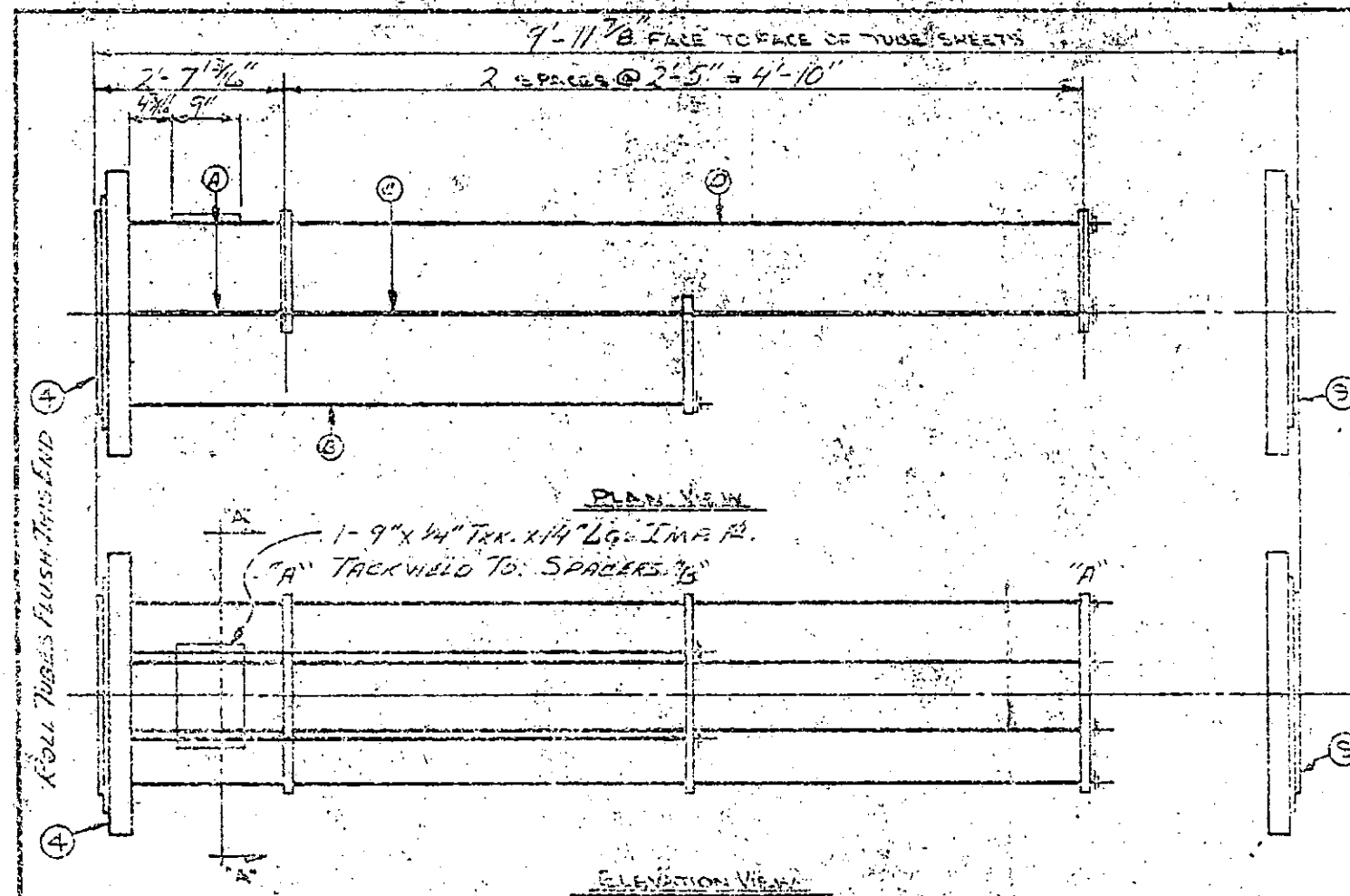
Equip. No. **21-08-024**
 CLIENT EQUIP. NO. 21-08-024
 FOR: HOUSTON CHEMICAL CO.
 BEAUMONT, TEXAS

NOTE 1
 H-A TO FURNISH STUDS, NUTS &
 GASKETS FOR NOZZLE "B".

DESIGN DATA			NOZZLE DATA					GENERAL NOTES	CERTIFIED CORRECT FOR FABRICATION			
	SHELL	TUBES	MARK	SIZE	RATING	FACING	SERVICE	1. DESIGN & CONSTRUCTION SHALL BE IN ACCORDANCE WITH: (A) SECTION VIII 1974 EDITION OF THE ASME CODE, DIV. I & SO STAMPED (B) TEMA "B" <i>BY NATIONAL BOARD</i> (C) CUST. SPEC'S.	BY: <i>J. D. Hawkin</i>	DATE: 10/21/75		
DESIGN PRESS (MAWP)	75 PSI	75 PSI	A	6"	150#	R.F.*	INLET	2. ALL BOLT HOLES TO STRADDLE RS. 3. SPOT X-RAY CHANNEL & SHELL. 4. ONE SPARE SET OF GASKETS REQ'D. 5. CHLORIDE CONTENT SHALL NOT EXCEED 25PPM FOR TEST WATER ON SPN. STL. PARTS 6. Near white blast/SSPC-SP10 on all carbon stl. nozzles, flanges, supports & channel cover and apply one coat of inorganic zinc rich primer (PPG #UC-46745 & 46) 3 mils min. D.F.T. 1st coat to be high solids epoxy (PPG #UC-46545) light gray 5 mils min. D.F.T. Top coat to be Aquapon (PVC #A-UC-46840 & B-UC-46842) WHITE 2 MILS MIN. D.F.T.	CUST.: SCIENTIFIC DESIGN			
TEST PRESS.	115 PSI	115 PSI	B	16"	150#	R.F.*	OUTLET		DEST.: BEAUMONT, TEXAS			
DESIGN TEMPERATURE	340°F	280°F	C	6"	150#	R.F.	INLET		CUST. P.O.: 1607-009			
CORROSION ALLOWANCE	1/16"	—	D	3"	150#	R.F.	OUTLET		ITEM: E-1120			
NUMBER OF PASSES	1	1	E	1"	150#	R.F.*	B.W. CWN.		SERVICE: REGENERATOR REBOILER			
TUBE SURFACE (EFF.)	971	SQ. FT.	F	1"	150#	R.F.*	VENTY BLIND	*125 RMS FINISH ON FACE OF FLG.	SERIAL: 1822			
TUBES: 391 - 1" φ x 16.8 IN. (AVG) SH-242-304			G	1/2"	—	N.P.T.	VENTY PLUG		FILE: 291-75			
ESTIMATED WEIGHT EACH			H	1/2"	—	N.P.T.	DRAIN PLUG		HUGHES-ANDERSON ENGINEERING CORP. TULSA, OKLAHOMA			
DRY WGT 8,700 LBS	WBT 12,200 LBS		J	3/4"	3,000#	N.P.T.	VENTY PLUG	DRAWING TITLE OUTLINE DIMENSIONAL				
			NOZZLES A,B,C,D EQUIPPED WITH 2-3/4" 6,000# CPLGX. (PLUGGED)					WORK ORDER 1822				
								NUMBER REQ'D. ONE				
								DR. KEN				
								DATE 10/16/75				
								SIZE 28"X10"				
								DRAWING NUMBER				
								1822-01				
								CK JIM				
								SCALE NONE				
								TYPE BCL				

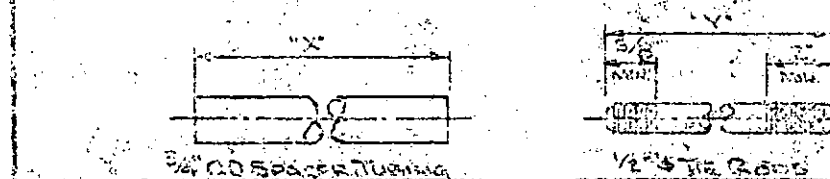
Q Rev. OVERALL LENGTH 10/19/75 KEN Q Rev. CUST. DWG'S 11/11/75 KEN Q Delete Nozzle Cplg. / CUST 12/2/75 Q Gpm. Rev. / CUST 12/23/75 KEN Q Rev. Size "J" / CUST. 2/2/76 KEN 08
 Q Rev. EXPANSION JOINT LOCATION 3-16-76 STAGE Q Rev. Note # C / CUST 3/20/76 KEN Q Rev. Note # 6 5/15/76 KEN

#100289



VIEW "A-A" BAFFLES
 2 REQ'D. COR. AAA - 1/2" TRK.
 1 REQ'D. COR. BBB - 1/2" TRK.

FINAL DESIGN



REQ'D. REQ'D.	"X"	REQ'D. REQ'D.	"Y"
(A) 4	2'-5 1/16"	(A) 4	2'-6 1/16"
(B) 2	4'-10 1/16"	(B) 2	5'-1 1/4"
(C) 4	2'-4 1/2"		
(D) 2	4'-9 1/2"		

- NOTES**
1. DRILL 1/8" DIA. HOLES FOR TUBES.
 2. DRILL 9/16" DIA. HOLES FOR TIE RODS.
 3. DEBURR ALL TUBE HOLES.
 4. REMOVE ALL SHARP CORNERS ON BAFFLES.

500# 1607 3-26-76 *UP*

ITEM # E-1120

HUGHES-ANDERSON ENGINEERING CORP. TULSA, OKLAHOMA			
DRAWING TITLE BUNDLE DETAIL			
WORK ORDER 1822		NUMBER REQ'D. ONE	
DR. STEVE	DATE 3-8-76	SIZE 28x10	DRAWING NUMBER
CX 1/16"	SCALE NONE	TYPE BSL	1822-09

#100289

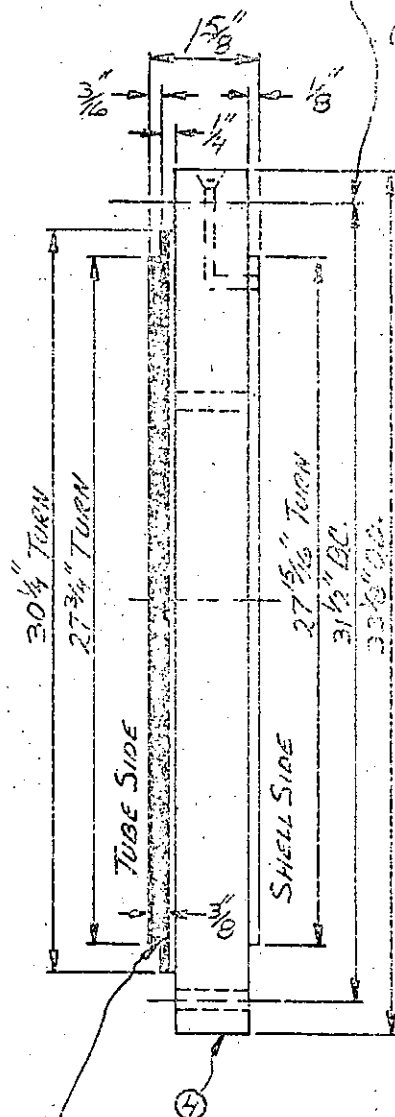
DRILL 3/11" DEEP & BOTTOM TAP
FOR 6 - 1/2" Ø TIE RODS ON
SHELL SIDE ONLY.
DO NOT DRILL THRU!

DRILL 32-7/8" HOLES FOR
3/4" Ø STUDS TO STR. ES.
(D.S. = 3.0875")

DRILL & TAP FOR 1-1/2" NPT.
USE 1/2" Ø HOLE

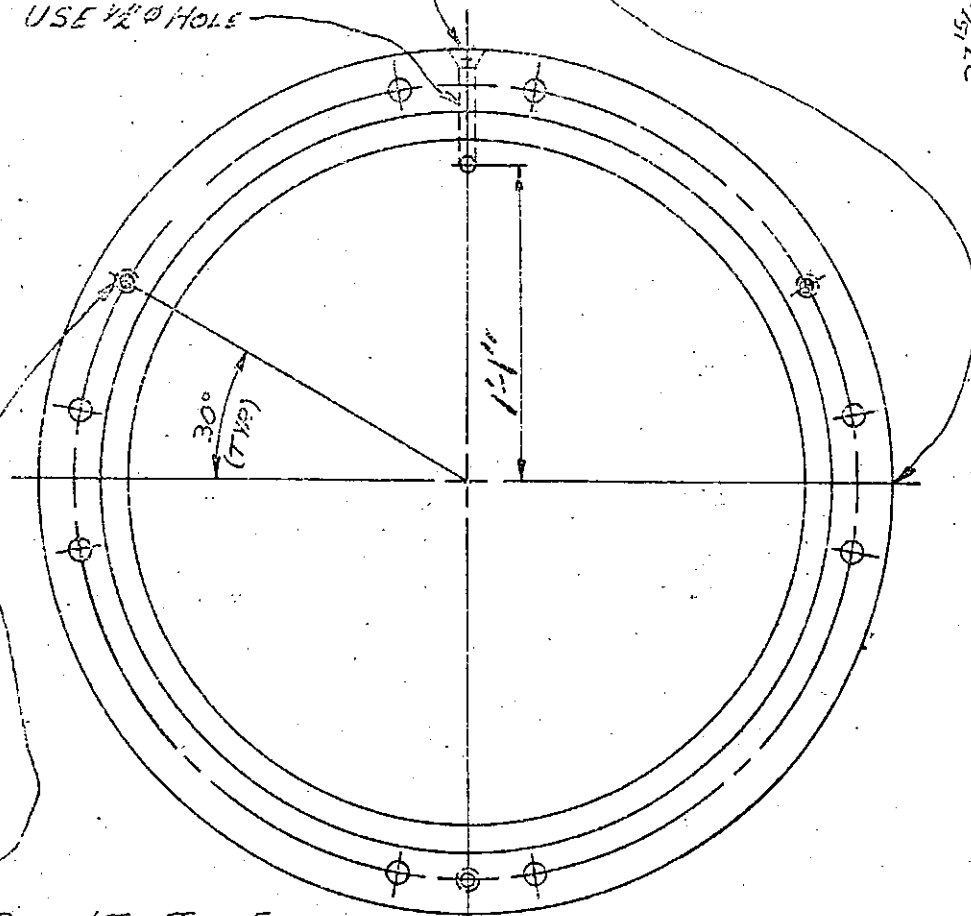
MATCH MARKS

JOB #1607
ITEM #E-1120



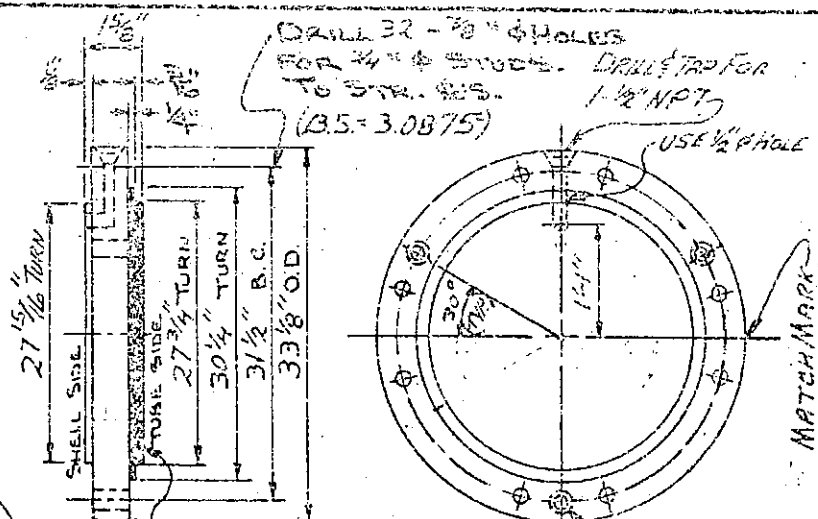
DRILL & TAP THRU FOR
3-5/8" JACKSCREWS ON B.C..

3/8" THK. 304 SS. OVERLAY

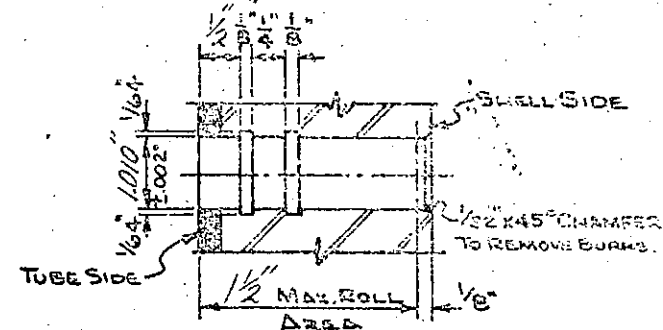


1. OVERLAY TO BE 309L 2ND PASS
& 308L REMAINDER & IN ACC-
ORDANCE W/ PROCEDURE
UCL-43(308L-1-AH)

2. HEAT TREAT FOR 1 1/4" HR. @ 1100°F.
3. CHEM. ANALYSIS OF ALL OVERLAY REQ'D..
STATIONARY TUBE SHEET



3/8" THK. 304 SS.
OVERLAY
FLUORING TUBE SHEET
TUBE LAYOUT IS SAME AS
STATIONARY TUBE SHEET.
(OMIT TIE RODS.)



DETAIL "A"

NOTE: Equip. No. 21-08-024
DRILL & REAM TUBE HOLES TO 1.010" ±.002"
FOR 391 - 1" "O.D. TUBES ON 1/4" Δ PPT.
PITCH @ 27 1/2" TUBE CIRCLE GROOVE TUBE
HOLES PER DETAIL "A".

HUGHES-ANDERSON ENGINEERING CORP.
TULSA, OKLAHOMA

DRAWING TITLE TUBE SHEET DETAILS			
WORK ORDER 1822		NUMBER REQ'D ONE	
DR. STEVE	DATE 3-5-76	SIZE 28"x10"	DRAWING NUMBER
CR. [Signature]	SCALE NONE	TYPE BEL	1822-08

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

1. Manufactured by Hughes-Anderson Engr. Corp. Tulsa, Oklahoma
(Name and address of manufacturer)
2. Manufactured for Scientific Design Co. New York, New York
(Name and address of purchaser)
3. Location of Installation Houston Chemical Beaumont, Texas
(Name and address)
4. Type Vert. Vessel No. 1822 1822-01-13
(Horiz., or vert. tank) (Mfr's Serial No.) (CRN) (Drawing)
451 Year Built _____
(Nat'l Bld No.)
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 _____ and Addenda to _____ and Code Case no. 1177-7
(Year) (Date)
Special service per UG-120(d) _____
Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: U.S. Bellows Exp. Joint Per Dwg. #3939

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

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

6. Shell: Material SA-516-70 Nominal Thickness 3/8 in. Corrosion Allowance 1/16 in.
(Spec. No., Grade)
Diam. 2 ft 4-3/8 in. Length 8 ft 10-1/4 in.

CERTIFICATE OF 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.

Date 8-2-76 Signed Hughes-Anderson Engr. Corp. Bill J.
(Manufacturer) (Representative)
"U" Certificate of Authorization No. 11979 expires December 31, 19 76

CERTIFICATE OF SHOP INSPECTION

Vessel made by Hughes-Anderson Engr. Corp. at Tulsa, Oklahoma
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 Illinois and employed by Commercial Union Ins. Co. of Boston, Mass. have inspected the pressure vessel described in this Manufacturers' Data Report on 9-3-76 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 Manufacturers' 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 9-3-76
Signed C. L. Cooney Commissions NB #5745
(Inspector) (Nat'l Board, State, Province and No.)

CERTIFICATE OF COMPLIANCE FOR FIELD WORK

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.

Date _____ Signed _____ by _____
(Manufacturer) (Representative)
"U" Certificate of Authorization No. _____ expires _____, 19 _____

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 Manufacturers' 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 Manufacturers' 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 (BACK)

7. Seams: Longitudinal Db1. Butt R.T. Spot Efficiency 85 %
 (Welded, Db1, Sngl. Lap, Butt) (Spot or Full)

H.T. Temp _____ F Time _____ Girth Db1. Butt
 (Welded, Db1, Sngl. Lap, Butt)

R.T. Spot No. of Courses 3
 (Spot, Partial, or Full)

8. Heads: (a) Material _____ (Spec. No., Grade) (b) Material _____ (Spec. No., Grade)

Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio
(a) _____	_____	_____	_____	_____	_____
(b) _____	_____	_____	_____	_____	_____

Conical Apex Angle _____ Hemispherical Radius _____ Flat Diameter _____ Side to Pressure (Convex or Concave) _____

(a) _____
 (b) _____

If removable, bolts used (describe other fastenings) _____ (Material, Spec. No., Gr., Size, No.)

9. Type of Jacket _____ Proof Test _____

10. Jacket Closure _____ If bar, give dimensions _____
 (Describe as ogee & weld, bar, etc.)

If bolted, describe or sketch _____

11. Constructed for max. allowable working pressure 75 psi at max. temp. 340 F Min. temp. (when less than -20 F) _____ F. Hydrostatic ~~XXXXXX~~ test pressure 115 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: Stationary—Material SA-515-70* Diam. 29-3/4 in.
 (Spec. No., Gr.) (Subject to pressure)

Nominal Thickness 1-5/8 in. Corrosion Allowance 0 in. Attachment Welded
 (Welded, Bolted)

Floating—Material SA-515-70* Diam. 29-3/4 in.
 (Spec. No., Gr.)

Nominal Thickness 1-5/8 in. Corrosion Allowance 0 in.
 Attachment Welded

13. Tubes: Material SA-249-304 O.D. 1" in. Nominal Thickness 16 BWG or gauge
 (Spec. No., Gr.)

Number 391 Type Straight
 (Straight or "U")

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

14. Shell: Material SA-240-304 Nominal Thickness 3/8 in. Corrosion Allowance 0 in.
 (Spec. No., Gr.)

Diam. 2 ft 4-3/4 in. Length 2 ft 6-3/4 in.

15. Seams: Longitudinal Db1. Butt R.T. Spot Efficiency 85 %
 (Welded, Db1, Sngl. Lap, Butt) (Spot or Full)

H.T. Temp _____ F Time _____ Girth _____
 (Welded, Db1, Sngl. Lap, Butt)

R.T. _____ No. of courses 1
 (Spot, Partial, or Full)

16. Heads: (a) Material SA-515-70 (b) Material SA-240-304
 (Spec. No., Grade) (Spec. No., Grade)

Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Side to Pressure (Convex or Concave)
(a) <u>Top</u>	<u>1-9/16"</u>	<u>0"</u>	_____	_____	_____
(b) <u>Bottom</u>	<u>.0735"</u>	<u>0"</u>	_____	_____	_____

Conical Apex Angle _____ Hemispherical Radius _____ Flat Diameter _____ Side to Pressure (Convex or Concave) _____

(a) _____ 29-3/4" Flat _____
 (b) _____ Concave _____

If removable, bolts used (describe other fastenings) SA-193-B7; 3/4"; 32 Db1. Butt Welded
 (Material, Spec. No., Gr., Size, No.)

17. Constructed for max. allowable working pressure 75 psi at max. temp. 280 F Min. temp. (when less than -20 F) _____ F. Hydrostatic ~~XXXXXX~~ test pressure 115 psi.

Items below to be completed for all vessels where applicable

18. Safety Valve Outlets: Number _____ Size _____ Location _____

19. Nozzles:

Purpose (Inlet, Outlet, Drain)	Number	Diam. or Size	Type	Material	Nominal Thickness	Reinforcement Material	How Attached
Chan In	1	6"-150#	RF-SO	SA-312-TP304	Sch. 40S	None	Welded
Chan Out	1	16"-150#	RF-SO	SA-240-TP304	1/2"	None	Welded
Shell In	1	6"-150#	RF-WN	SA-53-B	Sch. 80	None	Welded
Shell Out	1	3"-150#	RF-WN	SA-53-B	Sch. 80	None	Welded

20. Inspection Openings:

Manholes No. _____ Size _____ Location _____

Handholes No. _____ Size _____ Location _____

Threaded No. _____ Size _____ Location _____

21. Supports: Skirt _____ Lugs Two Legs _____ Other _____
 (Vas or no) (No.) (No.) (Describe)

Attached Weld To Shell (Where and how)

22. Remarks: Regenerator Reboiler

Length Does Not Include Expansion Joint

* Includes 3/8" Thk. 304 S.S. Overlay

Includes 1/8" Thk. 304 S.S. Liner

PRINT FILE
 CHEMICAL COMPANY
 DIVISION OF
 INDUSTRIES, INC.
 SALMON, TEXAS 77704

DATE 3/26/77 P.O. 1607009
 EOPT. NO. 21-08-024
Thyler Anderson

FOR E1120 Regenerator Reboiler

100289