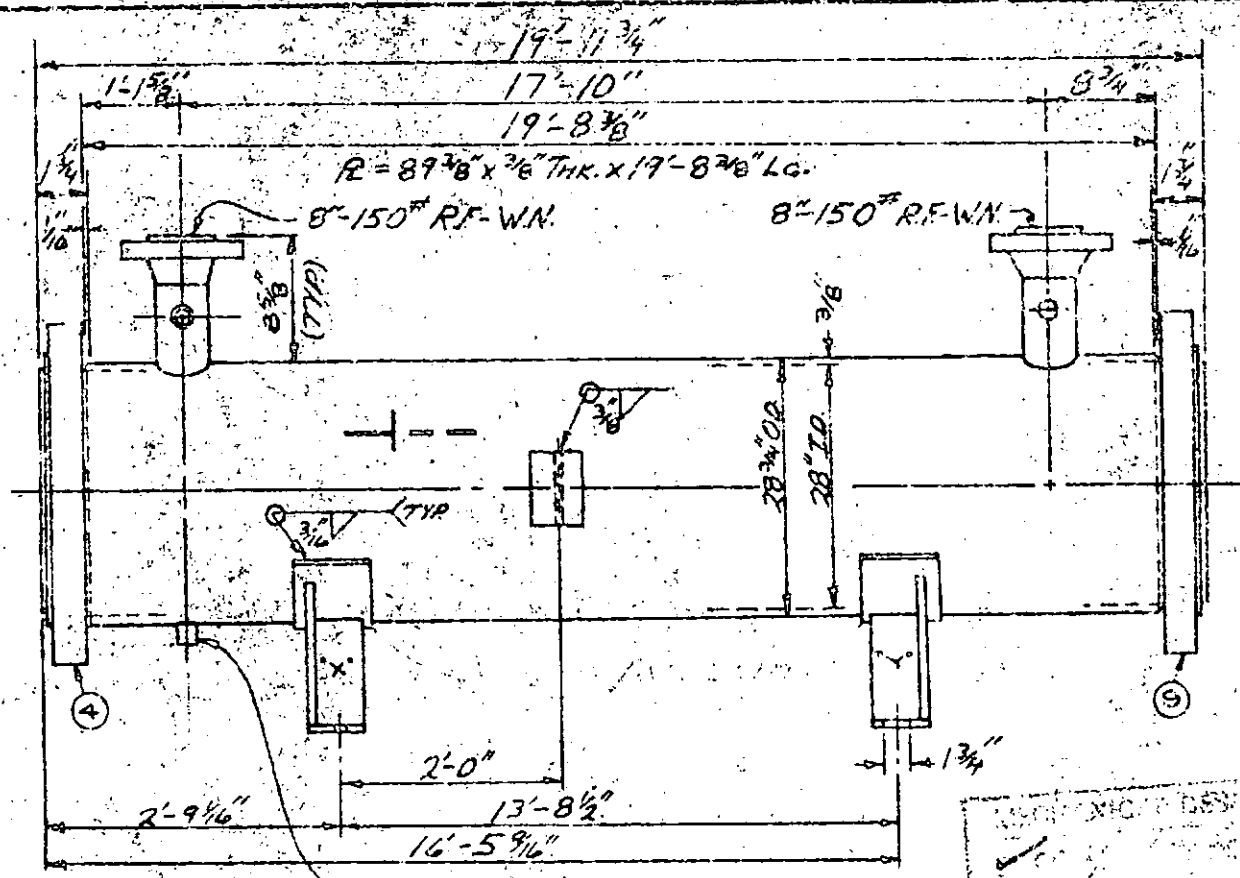




- [illegible]

* [1-REQD W2-7B "4 HOLES MKD (X).
1-REQD W2-7A "X 13/16" SLOTS MKD (Y).

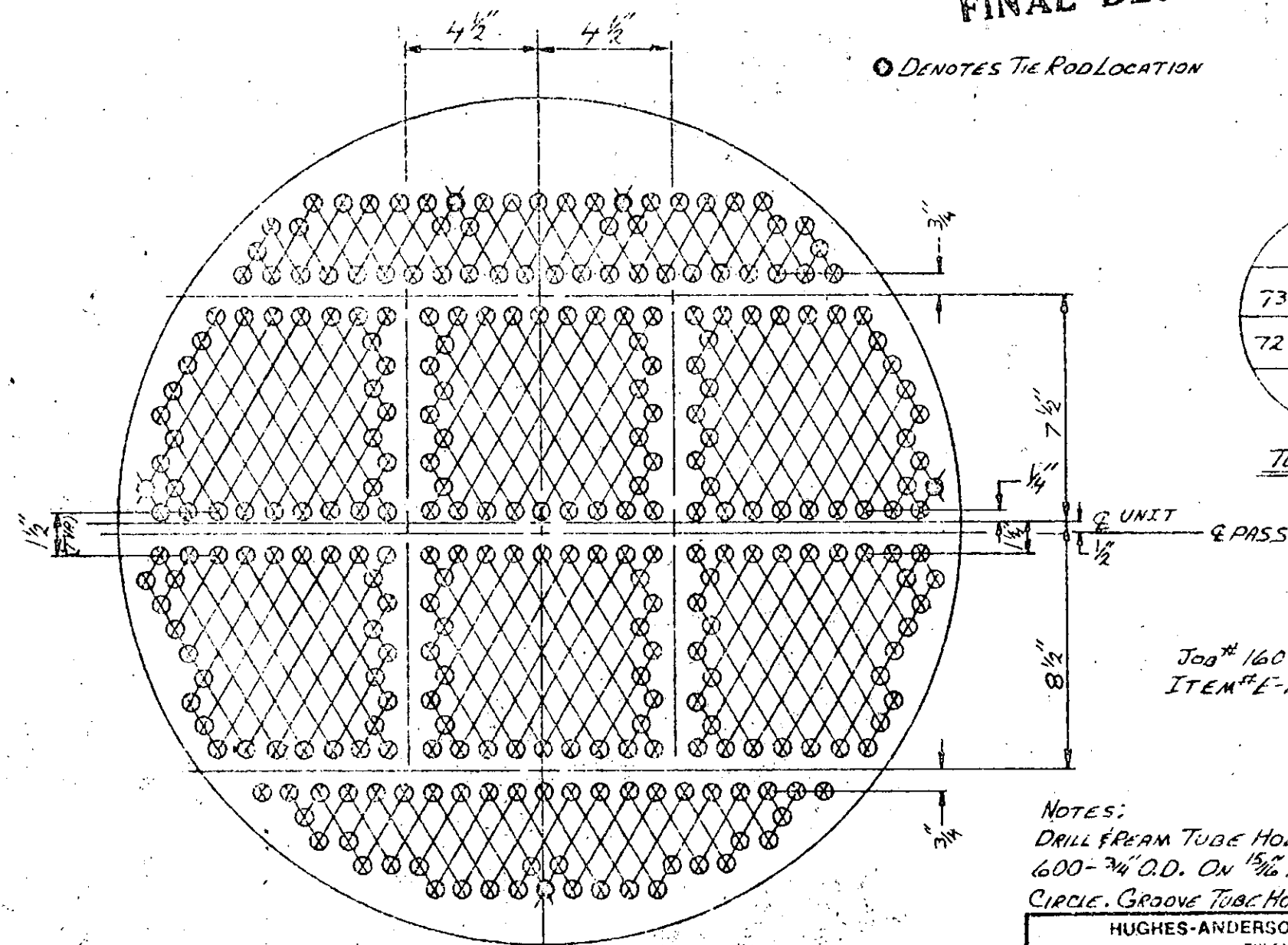
Equip. No. 21-08-026
3-24-76 105

HUGHES-ANDERSON ENGINEERING CORP.			
TULSA, OKLAHOMA			
DRAWING TITLE SHELL DETAILS			
WORK ORDER 1823		NUMBER REG. ONE	
DR STEVE	DATE 2-19-76	SIZE 28" 20"	DRAWING NUMBER
CK RUP	SCALE NONE	TYPE AFM	1823-03

622001#

FINAL DESIGN

○ DENOTES TIE ROD LOCATION



Job # 1607
ITEM # E-1404

NOTES:
DRILL FROM TUBE HOLES TO .758" ± .002" FOR
600-3/4" O.D. ON 15/16" Δ PITCH & 27 1/2" TUBE
CIRCLE. GROOVE TUBE HOLES PER DETAIL Dwg 1823-07

HUGHES-ANDERSON ENGINEERING CORP. TULSA, OKLAHOMA			
DRAWING TITLE <i>TUBE LAYOUT</i>		NUMBER REQ'D <i>ONE</i>	
WORK ORDER <i>1823</i>	DATE <i>2-17-76</i>	SIZE <i>28" x 20"</i>	DRAWING NUMBER
DR. <i>STEVE</i>	SCALE <i>NONE</i>	TYPE <i>AFM</i>	<i>1823-07</i>

VIEW FROM SHELL SIDE OF NO. 4 TUBE SHEET

622001 #

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 New York, New York
(Name and address of purchaser)
3. Location of Installation Houston Chemical Beaumont, Texas
(Name and address)
4. Type Horiz. Vessel No. 1823 1823-01-14
(Horiz., or vert. tank) (Mfr's Serial No.) (CRN) (Drawing)
452 Year Built 1976
(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. _____
(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: _____

(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 1/8 in.
(Spec. No., Grade)
Diam. 2 ft 4-3/4 in. Length 19 ft 8-3/8 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 Johnson
(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 9-16- 19 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 9-16-76
Signed C. R. 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.)

622001#

FORM U-1 (BACK)

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

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

R.T. Spot No. of Courses 2
(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 80 psi at max. temp. 170 F Min. temp. (when less than -20 F) _____ F. Hydrostatic ~~XXXXXX~~ test pressure 120 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: Stationary—Material SA-515-70 Diam. 28-1/4 in.
(Spec. No., Gr.) (Subject to pressure)

Nominal Thickness 1-3/4* in. Corrosion Allowance 0 in. Attachment Welded
(Welded, Bolted)

~~XXXXXX~~ Material SA-515-70 Diam. 28-1/4 in.
(Spec. No., Gr.)

Nominal Thickness 1-3/4* in. Corrosion Allowance 0 in.

Attachment Welded

13. Tubes: Material SA-249-304 O.D. 3/4 in. Nominal Thickness 16 (Avg) ~~XXXX~~ gauge
(Spec. No., Gr.)

Number 600 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 1 ft in.

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

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

R.T. Spot 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	Elliptical Ratio
---------------------------------	----------------------	------------------------	-----------------	-------------------	---------------------

(a) End	<u>2-5/8" @</u>	<u>0</u>	_____	_____	_____
(b) End	<u>.0694"</u>	<u>0</u>	_____	_____	_____

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

(a) _____	_____	<u>29-3/4"</u>	_____
(b) _____	_____	_____	_____

If removable, bolts used (describe other fastenings) SA-193-B7; 125,000#; 3/4"; 40
(Material, Spec. No., Gr., Size, No.)

17. Constructed for max. allowable working pressure 75 psi at max temp. 190 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	<u>1</u>	<u>6"-150#</u>	<u>RF-WN</u>	<u>SA-312-304</u>	<u>Sch. 40S</u>	<u>None</u>	<u>Welded</u>
Chan Out	<u>1</u>	<u>6"-150#</u>	<u>RF-WN</u>	<u>SA-312-304</u>	<u>Sch. 40S</u>	<u>None</u>	<u>Welded</u>
Shell In	<u>1</u>	<u>8"-150#</u>	<u>RF-WN</u>	<u>SA-53-B</u>	<u>X-STG.</u>	<u>None</u>	<u>Welded</u>
Shell Out	<u>1</u>	<u>8"-150#</u>	<u>RF-WN</u>	<u>SA-53-B</u>	<u>X-STG.</u>	<u>None</u>	<u>Welded</u>

20. Inspection Openings:

Manholes No. _____ Size _____ Location _____

Handholes No. _____ Size _____ Location _____

Threaded No. _____ Size _____ Location _____

21. Supports: Skirt _____ Lugs _____ Legs _____ Other 2-Saddles
(Yes or no) (No.) (No.) (Describe)

Attached Welded To Shell
(Where and how)

22. Remarks: Reabsorber Water Cooler

* Includes 3/8" Thk. 304 S.S. Overlay on Tube Side

(*) Includes 1/8" Thk. SA-240-304 S.S. Liner.

10 in. FOREIGN PRINT FILE
 HOUSTON CHEMICAL COMPANY.
 DIVISION OF
 PPG INDUSTRIES, INC.
 BEAUMONT, TEXAS 77704
 JOB NO. SA-240-304 DATE 3/24/77 P.O. 1657-00
 DEPT. SA-240-304 EQPT. NO. 21-08-026
 VENDOR Angela Anderson
 FR 2:1
 Side to Pressure Reabsorb. Water
 Concave Cooler E-1404

HUGHES ANDERSON ENGINEERING CORP

REABSORBER WATER COOLER

U

W
RT-3

CU

EXAM. SERIAL NO. 452

ITEM NO. E-1404

EXAM. NO. 1607-009

SERIAL NO. 1823

SIZE 28" X 20"

TYPE AEM

SURFACE 2315

RY SPOT: CHANNELS & SHELL

ALT

DATE 9-76

GROUP TEST PRESS 120

TEST PRESS 115

SHELL MAWP 80

PSI AT 170

TEST PRESS 120

TUBES MAWP 75

PSI AT 190

TEST PRESS 115

TUBES 810-3/4" Q.D. X 16BWG X 20'-0" SA-249-304

600
Tubes

#1002
N 4