

1. Manufactured by ENGINEERS & FABRICATORS, INC. HOUSTON, TEXA
 2. Manufactured for The M.W. Kellogg Company New York, New York
 (Name and address of Purchaser)

98865

3. Type Horiz Kind Ht Exch Vessel No. (S-14019) (Mfrs' Serial) (State & State No.) Nat'l Bd. No. 889 Yr. Built 1966
 (Horiz. or Vert.) (Tank, Jacketed, Heat Exch.)

Items 4-9 incl. to be completed for single wall vessels (such as air tanks), jackets of jacketed vessels, or shells of heat exchangers.

SHELL: Material SA-240-T304 T.S. 75,000 Nominal Thickness 3/4 in. Corrosion Allowance - in. Diam. 3 ft. 1 1/2 in. Length 23 ft. 4 in.
 (Kind & Spec. No.) (Fig. or F.B. & lowest T.S.)

4A. SHELL COVER: Matl. _____ T.S. _____ Nominal Thickness _____ in. Corrosion Allowance _____ in. Diam. _____ ft. _____ in. Length _____ ft. _____ in.
 (Kind & Spec. No.) (Fig. or F.B. & lowest T.S.)

5. SEAMS: Long Dbl Butt S.R. No. _____ X.R. Spot Sectioned No Efficiency 85 %
 (Welded, Dbl., Single, Lap, Butt) (Yes or No) (Spot or Complete) (Yes or No)
 Girth Dbl Butt, B.II. S.R. No. _____ X.R. Spot Sectioned No No. of Courses 3

6. HEADS: (a) Material _____ T.S. _____ (b) Material _____ T.S. _____
 Location (Top, bottom, ends) Thickness Crown Radius Knuckle Radius Elliptical Ratio Conical Apex Angle Hemispherical Radius Flat Diameter Side to Pressure (Convex or Concave)
 (a) _____
 (b) _____

If removable, bolts used _____ Other fastening _____
 (Material, Spec. No., T.S., Size, Number) (Describe or Attach Sketch)

7. STAYBOLTS: _____ If hollow _____ Attachment _____ Pitch _____ X _____ Diam. _____
 (Material) (Size of Hole) (Threaded, Welded) (Horiz.) (Vert.) (Nominal)

8. JACKET CLOSURE: _____
 (Describe as ogee & weld, bar, etc. If bar, give dimensions. If bolted, describe or sketch.)

9. Constructed for Int. pressure of 130 psi. Max. Temp. 260 °F. Subzero _____ °F. Hydrostatic Test 195 psi.
 (Ext.)

Items 10 and 11 to be completed for tube sections.

10. TUBE SHEETS: Stationary. Material SA-240-T430 Diam. 4 5/8 in. Thickness 3-5/8 in. Attachment Welded
 (Kind & Spec. No.) (Subject to Pressure) (Welded, Bolted)
 Floating. Material SA-240-T430 Diam. 4 5/8 in. Thickness 3-5/8 in. Attachment Welded

11. TUBES: Material SA-268T430 O.D. 3/4 in. Thickness #16 BWG or gage. Number 1245 Type Straight
 (Kind & Spec. No.) (Straight or U)

Items 12-15 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

12. CHANNEL "A" Material SA-240-T304 T.S. 75,000 Nominal Thickness 3/4 in. Corrosion Allowance - in. Diam. 3 ft. 2 1/2 in. Length 3 ft. 4-3/4 in.
 (Kind & Spec. No.) (Fig. or F.B. & lowest T.S.)

12A CHANNEL "B" Material SA-240T304 T.S. 75,000 Nominal Thickness 3/4 in. Corrosion Allowance - in. Diam. 3 ft. 2 1/2 in. Length 3 ft. 4-3/4 in.
 (Kind & Spec. No.) (Fig. or F.B. & lowest T.S.)

13. SEAMS: Long Dbl Butt S.R. No. _____ X.R. Spot Sectioned No Efficiency 85 %
 (Welded, Dbl., Single, Lap, Butt) (Yes or No) (Spot or Complete) (Yes or No)
 Girth Dbl Butt S.R. No. _____ X.R. Spot Sectioned No No. of Courses 1 each

14. HEADS: (a) Material SA-240-T304 T.S. 75,000 (b) Material SA-240-T304 T.S. 75,000 (c) Material _____ T.S. _____

Location	Thickness	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a) CHANNEL "A"	<u>3/4"</u>	-	-	<u>2:1</u>	-	-	-	<u>Concave</u>
(b) CHANNEL "B"	<u>3/4"</u>	-	-	<u>2:1</u>	-	-	-	<u>Concave</u>
(c) Floating								

If removable, bolts used (SA-193-B7 125,000 1-1/8" 44) (b) SA-193-B7 125,000 1-1/8" 44
 (Material, Spec. No., T.S., Size, Number)

(c) _____ Other fastening _____
 (Describe or Attach Sketch)

15. Constructed for Int. pressure of 440 psi. Max. Temp. 285 °F. Subzero _____ °F. Hydrostatic Test 660 psi.
 (Ext.)

Items below to be completed for all vessels where applicable.

16. SAFETY VALVE OUTLETS: Number _____ Size _____ Location In Line

17. NOZZLES:

Purpose (Inlet, Outlet, Drain)	Number	Diam. or Size	Type	Material	Thickness	Reinforcement Material	How Attached
<u>Inlet, Outlet</u>	<u>2 w/stub ends</u>	<u>16"</u>	<u>LI</u>	<u>SA-181-1</u>	<u>2 1/2"</u>	<u>SA-240-T304</u>	<u>Welded</u>
<u>INlet, Outlet</u>	<u>2 w/stub ends</u>	<u>8"</u>	<u>LI</u>	<u>SA-181-1</u>	<u>1-1/8"</u>	<u>SA-312-T304</u>	<u>Welded</u>
<u>Various</u>	<u>1 w/blind</u>	<u>2"</u>	<u>LJ</u>	<u>SA-181-1</u>	<u>3/4"</u>	<u>SA-240-T304</u>	<u>Welded</u>

18. INSPECTION Manholes, No. _____ Size _____ Location _____
 OPENINGS: Handholes, No. _____ Size _____ Location _____
 Threaded, No. 10 Size 3/4 Location Nz Nks, CCy1 SA-182-F304 Welded

19. SUPPORTS: Skirt No Lugs _____ Legs _____ Other 2 Saddles Attached Welded to Shell
 (Yes or No) (Number) (Number) (Describe) (Where & How)

20. REMARKS: ITEM: 106-C SHIFT EFFLUENT BFW HEATER
 SHELL SIDE: Boiler Feedwater TUBE SIDE: Shift Effluent
 (Brief description of purpose of the vessel, as Air Tank, After Cooler, Jacketed Cooler, etc. State contents of each part.)

98865

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

Date 6-28 19 66 Signed ENGINEERS FABRICATORS, INC. By Lil Segler
Lil Segler

Certificate of Authorization Expires 12-31-67

CERTIFICATE OF SHOP INSPECTION

VESSEL MADE BY ENGINEERS & FABRICATORS, INC., AT HOUSTON, TEXAS

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of Texas and employed by Hartford Steam Boiler Inspection and Insurance Company of Hartford, Conn.

have inspected the pressure vessel described in this manufacturer's data report on 6-28 1966, and state that to the best of my knowledge and belief, the manufacturer has constructed this pressure vessel in accordance with the applicable sections of the ASME Boiler and Pressure Vessel Code.

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 6-28 19 66
J. M. Westmeyer Inspectors Signature Commissions National Board #5883
Nat'l Board or State and No.

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 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 the applicable sections of the ASME Boiler and Pressure Vessel Code. 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 _____ 19 _____

Inspectors Signature Commissions _____
Nat'l Board or State and No.

164 381

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THE M. W. KELLOGG COMPANY
 a division of Pullman Incorporated
 FABRICATION DIVISION
 COMMENTS NONE
 AS NOTED
 COMMENTS NONE OR COMMENTS AS NOTED DO NOT RELIEVE THE VENDOR FROM FURNISHING MATERIAL TO CONFORM TO ORDER.
 COMMENTS AS NOTED REQUIRE YOU TO PROCEED ACCORDINGLY AND TO SUBMIT REVISED DRAWINGS FOR RECORD PURPOSES.
 BY *Jhr Park* DATE MAR 9 1968

7/2" HOLE

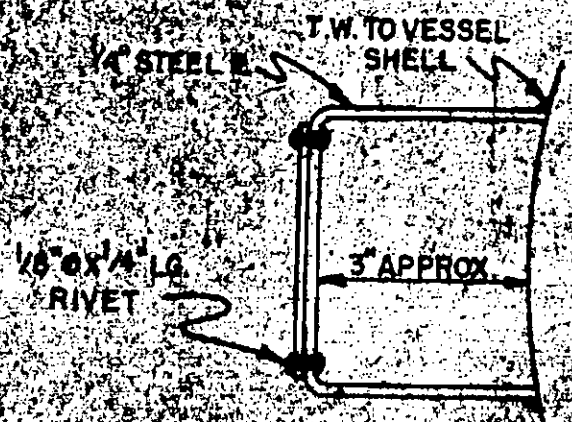
5"



NATIONAL BOARD NO. **839**
 SERIAL NO. **S-14019**
 MAX. WORKING PRESS.:
 SHELL SIDE **130** PSI
 TUBE SIDE **440** PSI
 MAX. TEMPERATURE:
 SHELL SIDE **260** °F
 TUBE SIDE **285** °F
 DATE _____
 ITEM **106-C**

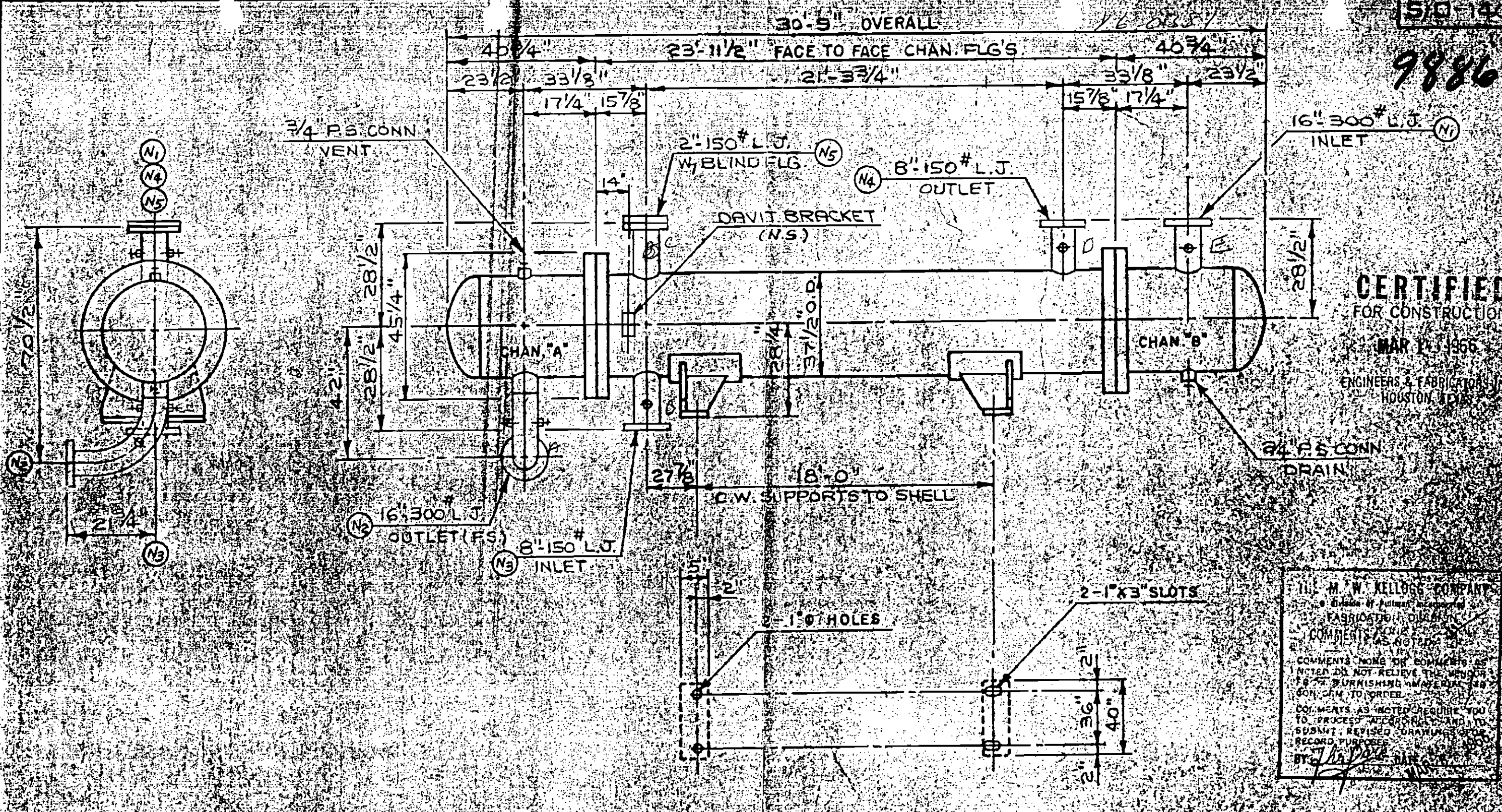
CUST. M.W. KELLOGG CO.
 CUST. P.O. NO. 5376-C20-106

ENGINEERS & FABRICATORS, INC.
 HOUSTON, TEXAS



EFCD
 ENGINEERS & FABRICATORS, INC.
 HOUSTON, TEXAS
 NATIONAL BOARD
 NAME PLATE
 2-7-66
 NP 14018

98865



CERTIFIED
FOR CONSTRUCTION

MAR 14 1966

ENGINEERS & FABRICATORS, INC.
HOUSTON, TEXAS

THE M. W. KELLOGG COMPANY
FABRICATOR DESIGN
COMMENTS AS NOTED
COMMENTS NONE OR COMMENTS AS NOTED DO NOT RELIEVE THE VENDOR FROM FURNISHING MATERIALS FOR THE ORDER
COMMENTS AS NOTED REQUIRE YOU TO PROCEED ACCORDINGLY AND TO SUBMIT REVISED DRAWINGS FOR RECORD PURPOSES
BY: *[Signature]* DATE: 3/14/66

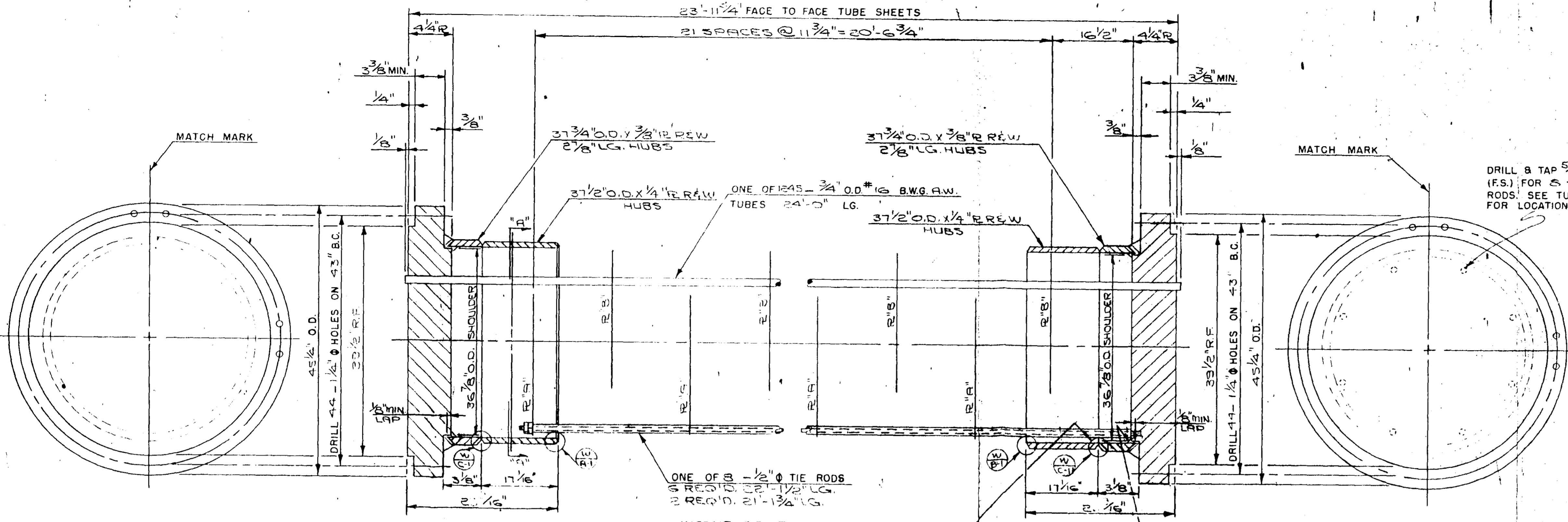
SUPPLEMENTARY NOTES
FIG. NO. 14019 3/4" P.S. CONN (N.S.) FS AS SHOWN

DETAIL DRAWINGS
BEM-14019 BEM-B-14019 G-14019 NP-14019 SSD-14019 W-100 (REV. 10) D-1180 DB-14019

GENERAL NOTES
DO NOT PAINT PROVIDE ALL OPENINGS FOR SHIPMENT EST. NO. 24,000
DESIGN CONDITIONS
CODE: ASME DESIGN PRESS. 130 TEST PRESS. 185 HAMMER TEST 17 DESIGN TEMP. 260 NO. OF PARTS ONE CORROSION ALLOW. 1/8"
STAMP YES
SHELL 130 TUBES 440 P.S. 660 P.S. 660 P.S. 285 P.S. 285
ONE REQ'D. AS SHOWN

REVISIONS
1010 PREVIOUS PRINTS (A) 2/10/66

ENGINEERS & FABRICATORS, INC. HOUSTON, TEXAS
CUSTOMER: THE M. W. KELLOGG COMPANY NAME: SHIFT EFFLUENT BRW WETTER 5376 CEDAR ST. HOUSTON, TEXAS 77030 5376 CEDAR ST. HOUSTON, TEXAS 77030 5613
DATE: 3-21-66 NO. OF 14019



FRONT TUBE SHEET
REAM & GROOVE TUBE SHEET PER DETAIL "A"
SEE TUBE LAYOUT

BACK TUBE SHEET
REAM & GROOVE TUBE SHEET PER DETAIL "A"
SEE TUBE LAYOUT

INCONEL 82 OR 182 WELD. OYE CHECK
INSPECT ROOT & FINISH PASSES. FULL
X-RAY & DYE CHECK AFTER HEAT
TREAT (TYPICAL BOTH ENDS)

TYPE 430 WELD. BACK CHIP TO SOUND
METAL FROM INSIDE BEFORE MAKING
1/4\"/>

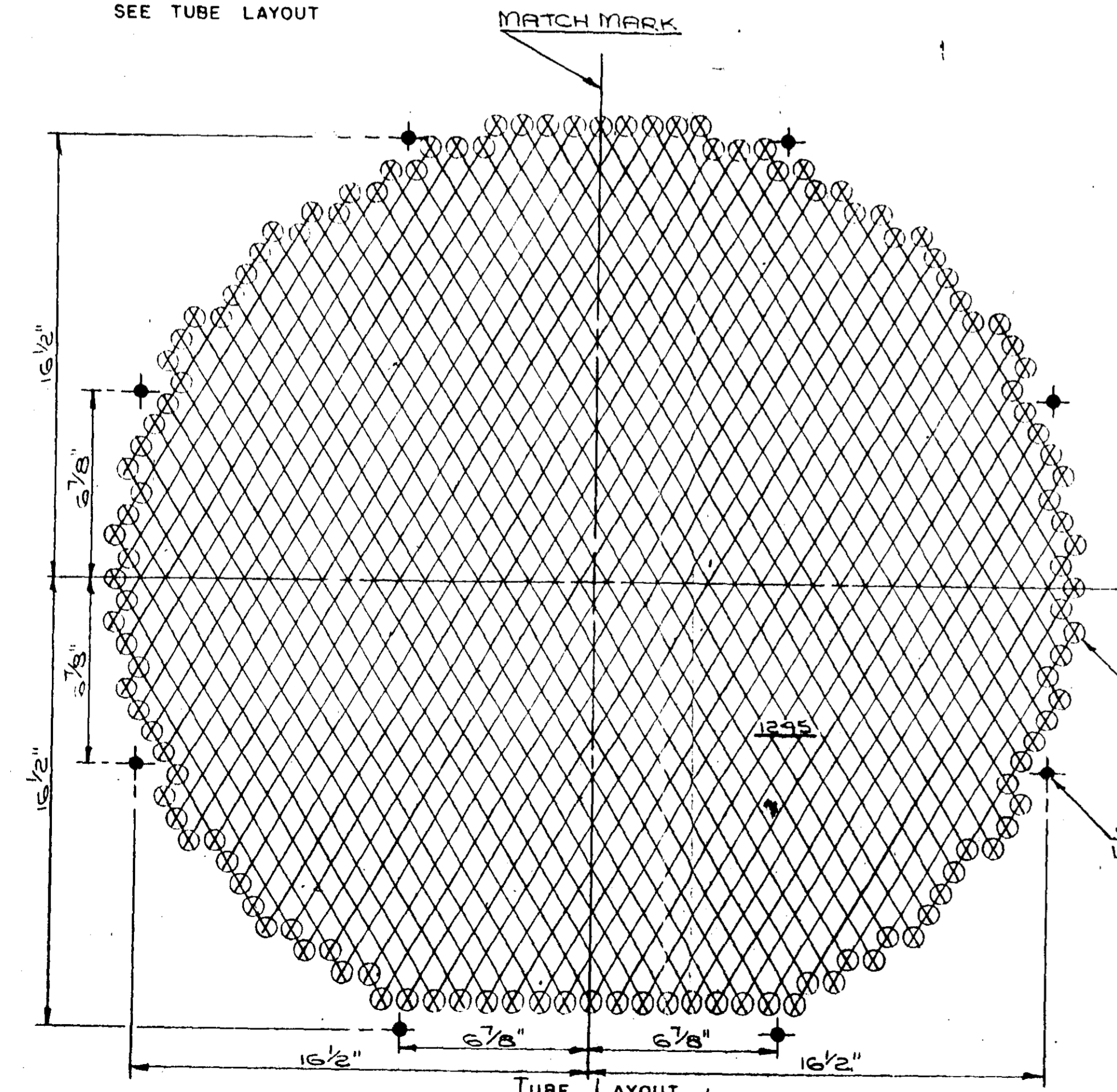
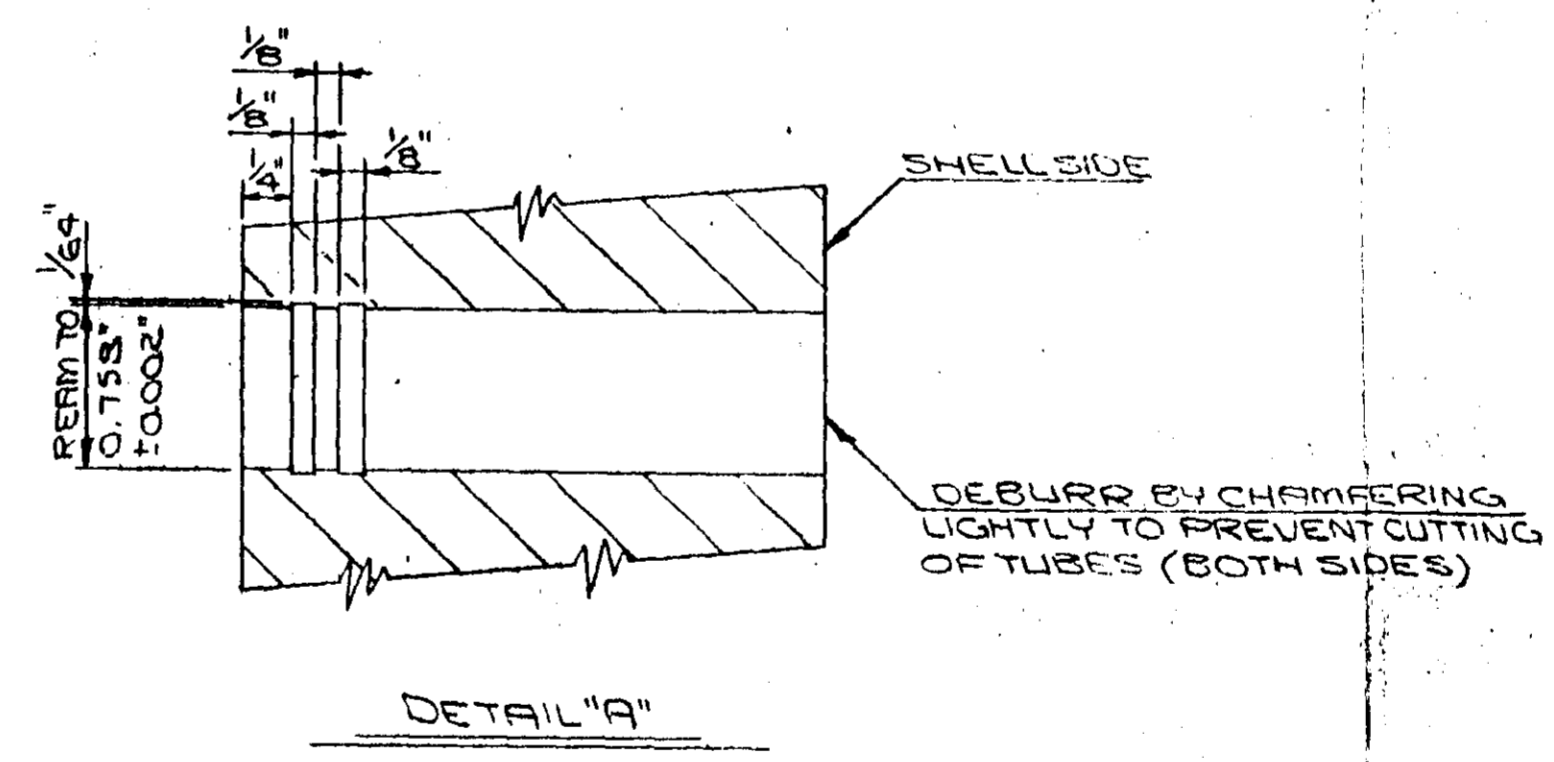
DRILL & TAP 5/8\"/>

DRILL 3/16\"/>

TUBE BUNDLE
(ONE E.O.D.)

P.W.H.T. NOTE

1. HEAT TUBE SHEET & HUB ASSEMBLY TO 1425-1475°F
 2. HOLD 4 HOURS
 3. SLOW COOL @ 50-75°F PER HOUR TO 1100°F
 4. FAST AIR COOL FROM 1100°F TO ROOM TEMPERATURE.
- MAGNAFLUX ROOT & FINISHING PASSES OF BOTH SIDES OF 430 WELDS PRIOR TO HEAT TREAT, AS WELL AS INSIDE WELDS AFTER HEAT TREAT & OUTSIDE WELDS AFTER HYDROTEST. ALL NOZZLES & ATTACHMENTS TO BE WELDED TO THE TYPE 304 SECTION PRIOR TO HEAT TREAT. CLOSING WELD TO BE DYE-CHECKED & SPOT X-RAYED. WELD SLAG TO BE REMOVED PRIOR TO HEAT TREAT BY SAND BLASTING OR GRINDING.



TUBE LAYOUT
SCALE 1/4\"/>

0 REQ'D.	23 1/4\"/>
84 REQ'D.	11 1/2\"/>
2 REQ'D.	28 1/8\"/>
6 REQ'D.	16 3/8\"/>

3/4\"/>

132 SPACERS REQ'D.

THE M. W. KELLOGG COMPANY
a division of Fuhrer Incorporated
FABRICATION DIVISION
COMMENTS AS NOTED
COMMENTS HERE OR COMMENTS AS NOTED DO NOT RELIEVE THE VENDOR FROM FURNISHING MATERIAL TO CONFORM TO DRAWING.
COMMENTS AS NOTED REQUIRE YOU TO PROCEED AS SHOWN AND TO SUBMIT REVISED DRAWINGS TO RELEVANT DEPARTMENT.
BY: *[Signature]* DATE: 9/9/66

LONG HUBS	STNLS STL ASME SA-240 TP-304
TUBES	SMLS. STNLS. STL. ASME SA-240 TP-304
TUBE SHEETS	STNLS. STL. ASME SA-240 TP-304
SHORT HUBS	STNLS. STL. ASME SA-240 TP-304
BAFFLES	STNLS. STL. ASME SA-240 TP-304
TIE RODS	TP-304 STNLS. STL.
TIE ROD NUTS	DD
SPACERS	DD
PART	SPECIFICATION

MATERIAL LIST

(EFOO)

ENGINEERS & FABRICATORS, INC.
HOUSTON, TEXAS

NAME TUBE SHEETS, TUBE LAYOUT & BUNDLE	
DRAWN BY JE	JOB NO. 9813
DATE 2-16-66	ITEM NO. 106-C

98865