

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 O'Neal's Welding & Fabrication, Inc. FM624 4 1/2 mi. W. of Hwy. 77 Robstown, Tex.  
(Name and address of manufacturer) 78380

2. Manufactured for Hoechst Celanese P.O. Box 428 Bishop, Texas 78343  
(Name and address of purchaser)

3. Location of Installation Hoechst Celanese Bishop, Texas  
(Name and address)

#90747

4. Type Horizontal S/O 909 None S/O 909 None 1990  
(Horse or 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 1989  
Year

1989 None 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 shells of heat exchangers

6. Shell: SA516-70 .500 .125 3'-6" 19'-11 3/4"  
(Matl. (Spec. No., Grade)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft & in.)) (Length (Overall) (ft & in.))

7. Seams: Single Spot .85 None  
(Long. (Dbl., Sngl.)) (R.T. (Spot or Full)) (Eff. (%)) (H.T. Temp. (F))

None Single Spot 2  
(Time) (Girth (Dbl., Sngl.)) (R.T. (Spot, Partial, or Full)) (No. of Courses)

8. Heads: (a) Matl. N/A (Spec. No., Grade) (b) Matl. N/A (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)										
(b)										

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

9. Type of Jacket N/A Proof Test \_\_\_\_\_

10. Jacket Closure N/A If bnr, give dimensions \_\_\_\_\_ If bolted, describe or sketch.  
(Describe as ogee & weld, bar, etc.)

11. MAWP 170 psi at max. temp. 500 °F. Min. design metal temp. 32 °F at 285 psi.  
Hydro., pneu., or comb. test press. 255 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: SA182-F304 42" 3 11/16" .0" Welded  
(Stationary Matl. (Spec. No., Gr.)) (Diam. (in.) (Subject to pressure)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Attach (Welded, Bolted))

Floating Matl. (Spec. No., Gr.) Diam. (in.) Nom. Thk. (in.) Corr. Allow. (in.) Attach

13. Tubes: SA789 .750 .065 1259 Straight  
(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: SA240-304 1.000" .0" 3'-6" 2'-11 7/8"  
(Matl. (Spec. No., Grade)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft & in.)) (Length (Overall) (ft & in.))

15. Seams: Single Full 100 None  
(Long. (Dbl., Sngl.)) (R.T. (Spot or Full)) (Eff. (%)) (H.T. Temp. (F))

None Single Full 1  
(Time) (Girth (Dbl., Sngl.)) (R.T. (Spot, Partial, or Full)) (No. of Courses)

16. Heads: (a) Matl. N/A (Spec. No., Grade) (b) Matl. N/A (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)										
(b)										

If removable, bolts used (describe other fastenings) SA193-B7 & SA194-2H 5/8" 88 PC's  
(Matl., Spec. No., Gr., Size, No.)

17. MAWP 616 psi at max. temp. 400 °F. Min. design metal temp. 32 °F at 616 psi.  
Hydro., pneu., or comb. test press. 1072 psi.

## Form U-1 (Back)

## 18 Nozzles, Inspection and Safety Valve Openings.

Purpose (Under, Outlet, Drain, etc.)	No.	Size or Size	Type	Matl	Num Tbs	Reinforcement Matl	How Attached	Location
A PSV	1	1" 100#	RFWN	SA106-B	.250		Welded	Shell
B N/A	1	14" 150#	RFWN	SA106-B	.500	SA516-70	Welded	Shell
C Process	1	18" 150#	RFWN	SA240-304	.500	SA240-304	Welded	Channel
D Water	1	14" 150#	RFWN	SA106-B	.500	SA516-70	Welded	Shell
E Process	1	18" --	RFWN	SA240-304	.500	SA240-304	Welded	Channel
G-Q Draws	11	4" 150#	RFWN	SA106-B	.437		Welded	Shell
R Vent	1	1" 150#	RFWN	SA106-B	.250		Welded	Shell

19 Supports: Skirt No Lugs No Legs No Other 2 Saddles Attached Shell-Welded  
(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: Exempt from impact tests per UCS 66-A & UHA-51  
(Name of part, item number, title, name and identifying stamp)

Customer Item# HE 2956

Shell and tube sides designed for full vacuum at 200°F

## 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. 18938 expires Sept. 6 1992  
 Date 6-29-90 Co. name O'Neal's Welding & Fabrication Signed [Signature]  
(Manufacturer) (Representative)

## CERTIFICATE OF SHOP INSPECTION

Vessel constructed by O'Neal's Welding & Fabrication, Inc. at FM 624 Robstown, Texas

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 Texas and employed by Commercial Union Insurance Company of Boston, Mass.

Report on June 13 & 29, 1990 have inspected the pressure vessel described in this Manufacturer's Data Report 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 June 29, 1990 Signed [Signature] Commissions TX 1021  
(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 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 O'Neal's Welding & Fabrication, Inc. FM624 4 1/2 mi. W. of Hwy. 77 Robstown, Tex.  
(Name and address of manufacturer) 78380

2. Manufactured for Hoechst Celanese P.O. Box 428 Bishop, Texas 78343  
(Name and address of purchaser)

3. Location of installation Hoechst Celanese Bishop, Texas  
(Name and address)

4. Type Horizontal S/O 909 None S/O 909 None 1990  
(Horse or vert. tank) (Mfr's serial No.) (CRN) (Drawing) (Nat'l Bld 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 1989  
Year

1989 None 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 shells of heat exchangers

6. Shell: SA516-70 .500 .125 3'-6" 19'-11 3/4"  
Matl (Spec No., Grade) Nom Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft & in.) Length (Overall) (ft & in.)

7. Seams: Single Spot .85 None  
Long (Dbl., Sngl.) R.T. (Spot or Full) Eff. (%) H.T. Temp. (F)

None Single Spot 2  
Time Girth (Dbl., Sngl.) R.T. (Spot, Partial, or Full) No. of Courses

8. 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)										
(b)										

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

9. Type of Jacket N/A Proof Test \_\_\_\_\_

10. Jacket Closure N/A If bar, give dimensions \_\_\_\_\_ If bolted, describe or sketch.  
(Describe as ogee & weld, bar, etc.)

11. MAWP 170 psi at max. temp. 500 °F. Min. design metal temp. 32 °F at 285 psi.  
Hydro., pneu., or comb. test press. 255 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: SA182-F304 42" 3 11/16" .0" Welded  
Stationary Matl (Spec No., Gr.) Diam. (in.) (Subject to pressure) Nom Thk. (in.) Corr. Allow. (in.) Attach (Welded, Bolted)

SA789 .750 .065 1259 Straight  
Floating Matl (Spec No., Gr.) Diam. (in.) Nom Thk. (in.) Corr. Allow. (in.) Attach  
Type (Straight or "U")

13. Tubes: SA789 .750 .065 1259 Straight  
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: SA240-304 1.000" .0" 3'-6" 2'-11 7/8"  
Matl (Spec No., Grade) Nom Thk. (in.) Corr. Allow. (in.) Diam I.D. (ft & in.) Length (Overall) (ft & in.)

15. Seams: Single Full 100 None  
Long (Dbl., Sngl.) R.T. (Spot or Full) Eff. (%) H.T. Temp. (F)

None Single Full 1  
Time Girth (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)										
(b)										

If removable, bolts used (describe other fastenings) SA193-B7 & SA194-2H 5/8" 88 PC's  
(Matl., Spec No., Gr., Size, No.)

17. MAWP 616 psi at max. temp. 400 °F. Min. design metal temp. 32 °F at 616 psi.  
Hydro., pneu., or comb. test press. 1072 psi.

## Form U-1 (Back)

## 18. Nozzles, Inspection and Safety Valve Openings

Purpose (Inlet, Outlet, Drain, etc.)	No.	Size (Inches)	Type	Matl	Num Ths	Reinforcement Matl	How Attached	Location
A PSV	1	1"300#	RFWN	SA106-B	.250		Welded	Shell
Water	1	1"150#	RFWN	SA106-B	.500	SA516-70	Welded	Shell
E Process	1	1"18"		SA240-304	.500	SA240-304	Welded	Channel
G-Q Draws	11	4"150#	RFWN	SA106-B	.437		Welded	Shell
R Vent	1	1"150#	RFWN	SA106-B	.250		Welded	Shell

19 Supports: Skirt No Lugs No Legs No Other 2 Saddles Attached Shell-Welded  
(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: Exempt from impact tests per UCS 66-A & UHA-51  
(Name of part, item number, mfg's name and identifying stamp)

Customer Item# HE 2956

Shell and tube sides designed for full vacuum at 200°F

## 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. 18938 expires Sept. 6, 1992  
 Date 6-29-90 Co. name O'Neal's Welding & Fabrication Signed J. C. McIntire  
(Manufacturer) (Representative)

## CERTIFICATE OF SHOP INSPECTION

Vessel constructed by O'Neal's Welding & Fabrication, Inc. at FM 624 Robstown, Texas

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 Texas and employed by Commercial Union Insurance Company of Boston, Mass.

have inspected the pressure vessel described in this Manufacturer's Data Report on June 13 & 29, 1990, 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 June 29, 1990 Signed [Signature] Commissions TX 1021  
(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)

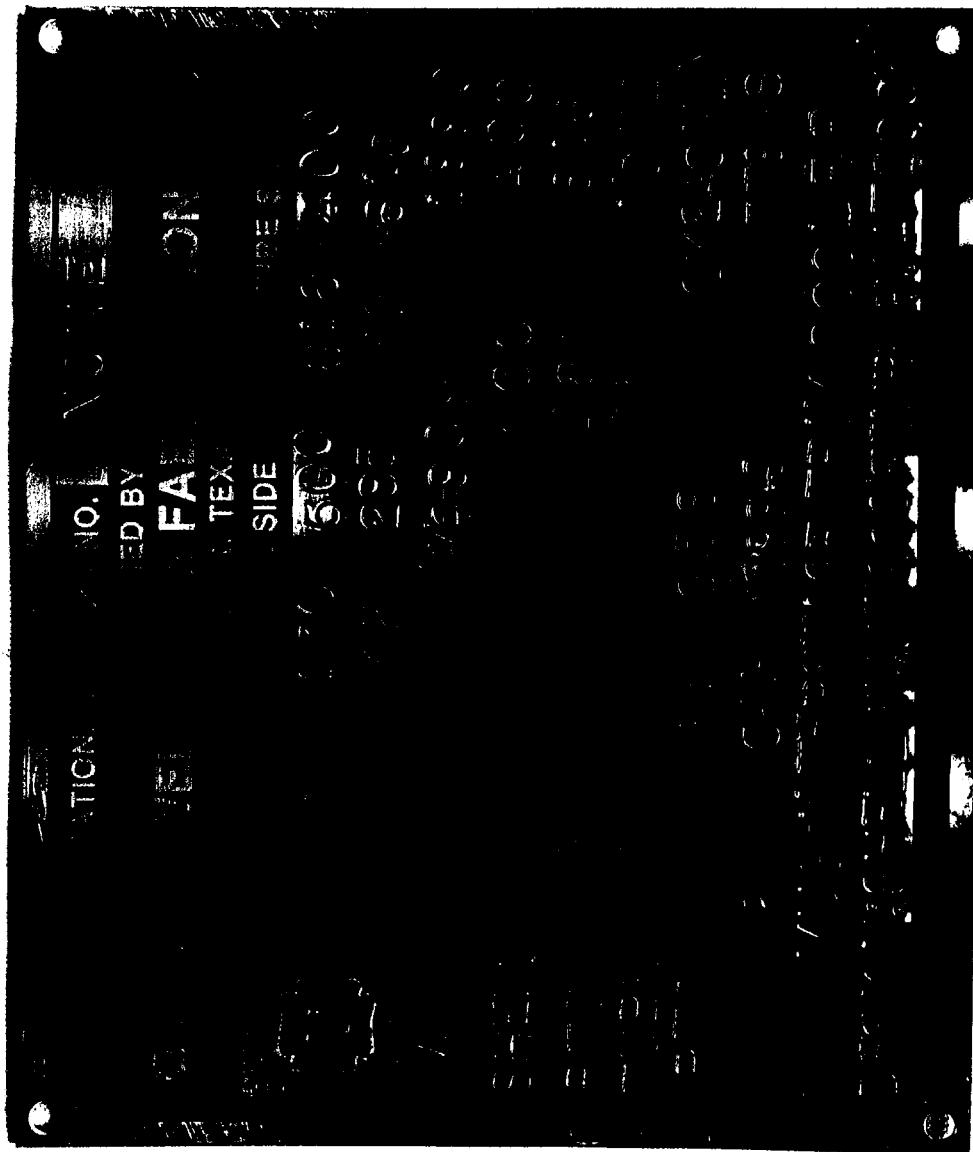
## CERTIFICATE OF FIELD ASSEMBLY INSPECTION

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 \_\_\_\_\_

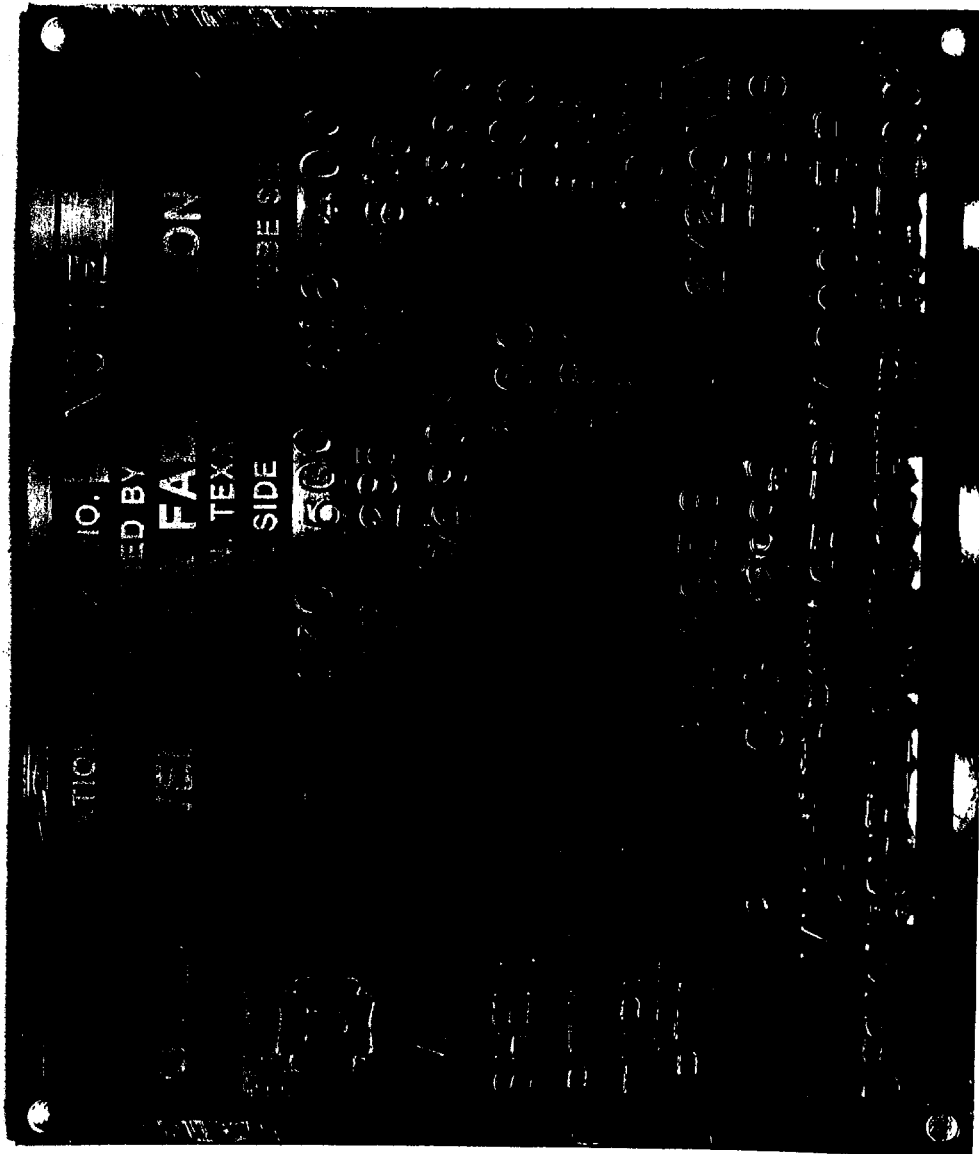
of \_\_\_\_\_ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items \_\_\_\_\_, not included in the certificate of shop inspection, have been inspected by me and that, to the best of my knowledge and belief, the 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.

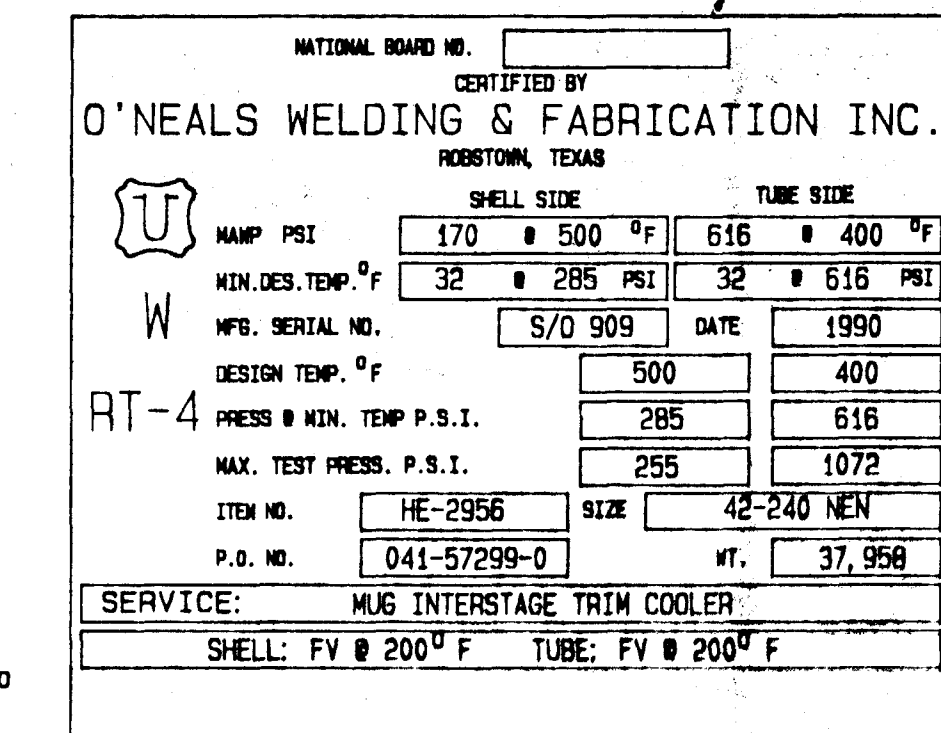
Date \_\_\_\_\_ Signed \_\_\_\_\_ Commissions \_\_\_\_\_  
(Authorized Inspector) (Nat'l Board (incl. endorsements), State, Prov., and No.)

# 90747



# 90747





- ### GENERAL NOTES
1. ALL BOLT HOLES TO STRADDLE NORMAL CENTER LINES.
  2. PROTECT MACHINED SURFACES AND THREADED CONNECTIONS WITH RUST PREVENTATIVE.
  3. DRAIN AND CLEAN ALL EQUIPMENT BEFORE SHIPPING.
  4. ALL NOZZLE FLANGES TO BE ANSI STANDARD UNLESS NOTED.
  5. ALL W/IN FLANGE BORES TO MATCH NOZZLE NECKS.
  6. ALL NOZZLES 1" DIA. AND SMALLER TO HAVE (2) 1/4"x 1" GUSSET AT 90°
  7. TUBES TO BE ROLLED AND SEAL WELDED.
  8. RE-PADS TO HAVE 1/4" NPT.

<p><b>SHELL SIDE MATERIAL</b> ✓</p> <p>SHELL: SA-516-70</p> <p>PIPE: SA-106-B</p> <p>FLANGES: SA-105</p> <p>COUPLINGS: SA-105</p> <p>BAFFLES: SA-36</p> <p>THERODS: C.S.</p> <p>SPACERS: C.S.</p> <p>GASKETS: N/A</p> <p>BOLTING: N/A</p> <p>SUPPORTS: SA-36</p> <p>RE-PADS: SA-516-70</p>	<p><b>TUBESIDE MATERIAL</b> ✓</p> <p>SHELL: SA-240-304 ✓</p> <p>CHANN COVER: SA-105 W/SA-240-304</p> <p>S.S. CLAD (1/4" THK) ON PROCESS SIDE.</p> <p>PIPE: SA-312-TP304</p> <p>FLANGES: SA-182-F304/SA-105</p> <p>COUPLINGS: 182-F304</p> <p>TUBESHEET: 182-F304</p> <p>TUBES: SAF-2205 ✓</p> <p>GASKETS: MJAF</p> <p>REPAIR: SA-193-87/SA-194-2H</p> <p>RE-PADS: SA-240-304</p>
--	--

DESIGN DATA ~ CONSTRUCT TO ASME CODE SECT. VIII DIV.I A-90  
TUBE SIDE

DESIGN 615 PSIG @ 400 F° W/ 0 C.A. & FULL VACUUM @ 200° F  
M.A.W.P. 616 PSIG (LIMITED BY TEMA FLGS.)  
RADIOGRAPHY FULL P.W.H.T. NO HYDROTEST 1072 PSIG  
JOINT EFFICIENCIES: 100% SHELL N/A HEAD

SHELL SIDE

DESIGN 150 PSIG @ 500 F° W/ .125 C.A. & FULL VACUUM @ 200° F.

M.A.W.P. 170 PSIG (LIMITED BY ANSI FLGS.)

RADIOGRAPHY SPOT P.W.H.T. NO HYDROTEST 255 PSIG

JOINT EFFICIENCIES: .85 SHELL N/A HEAD

WEIGHTS: EMPTY 37,958 FULL OF WATER 53,458

# 90747

F2	2"	150# RFWN w/ BLD	SCH 160	17"	FLUSH w/ BLIND	
F1	2"	150# RFWN w/ BLD	SCH 160	17"	FLUSH w/ BLIND	
A	1"	150# RFWN	SCH 160	26 1/2"		VENT
G-Q	4"	150# RFWN w/ BLD	SCH 120	29 1/2"		DRAIN w/BLD
E	18"		1/2" PL	29 1/2"	24 5/8" DIA. x 1 1/4"	PROCESS
D	14"	150# RFWN	XS	29 1/2"	18" DIA. x 3/8"	WATER
C	18"		1/2" PL	29 1/2"	24 5/8" DIA. x 1 1/4"	PROCESS
B	14"	150# RFWN	XS	29 1/2"	18" DIA. x 3/8"	WATER
A	1"	300# RFWN	SCH 160	29 1/2"		PSV
MK	SIZE	FLANGE	NOZZLE	CL PROJ	PAD	SERVICE

SCHEDULE OF NOZZLES

O'NEAL'S  
WELDING & FABRICATION INC.

DRAWN BY: KEN	CHECKED BY:	APP'D BY: <i>SR</i>	ITEM NO.
DATE: 3/30/90	DATE:	DATE: 4/23/90	HE-2956
DESCRIPTION:			SHEET 1 OF 2
CUSTOMER: HOECHST CELANESE CORP			QWS. NO. 6/0 000 REV D

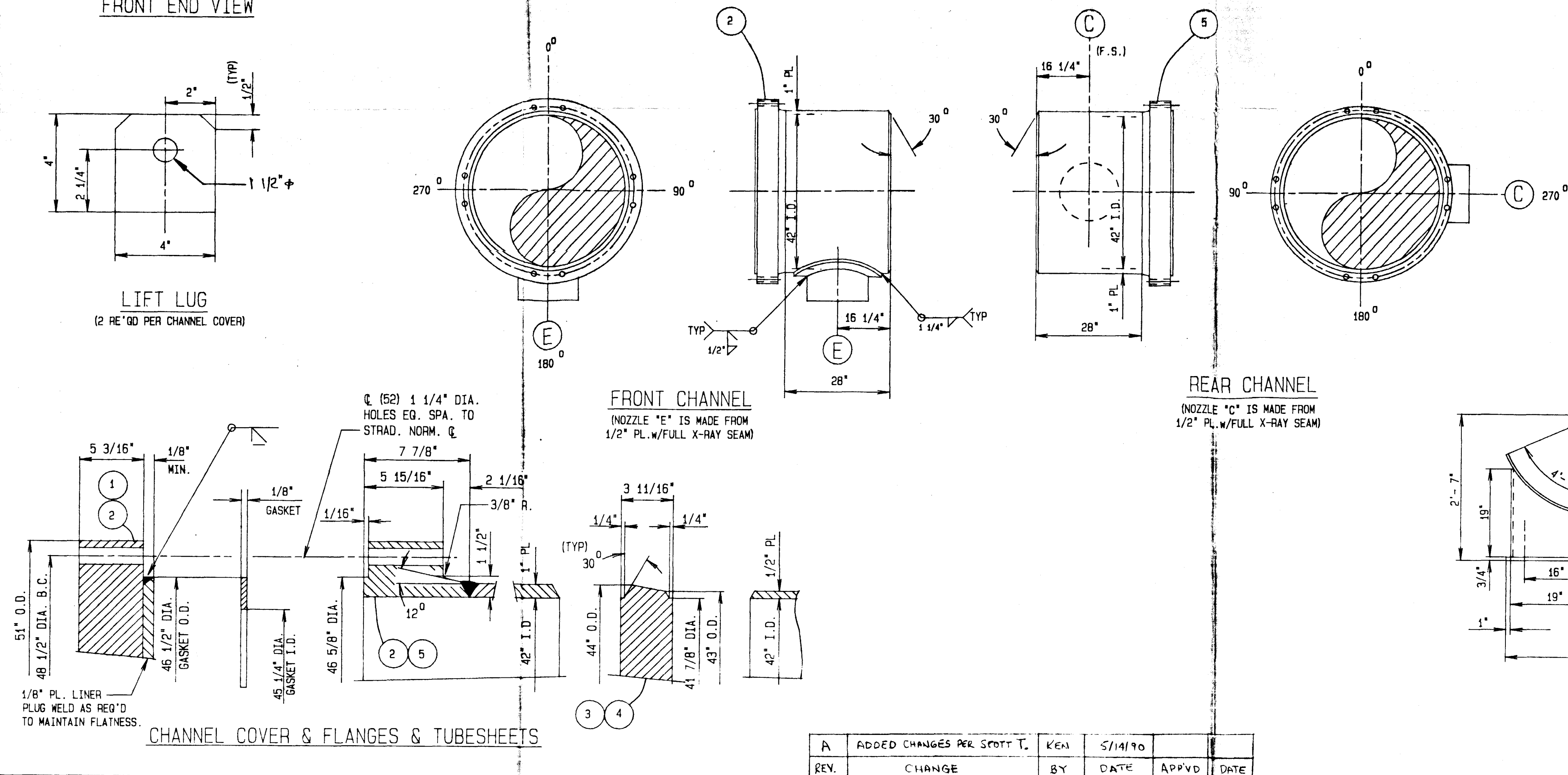
RECEIVED  
CITY OF LOS ANGELES  
OFFICE OF THE CITY CLERK  
JAN 6 1990

CERTIFIED FOR CONSTRUCTION  
O'NEAL'S WELDING & FABRICATION  
BY [Signature]  
DATE MAY 16 1990

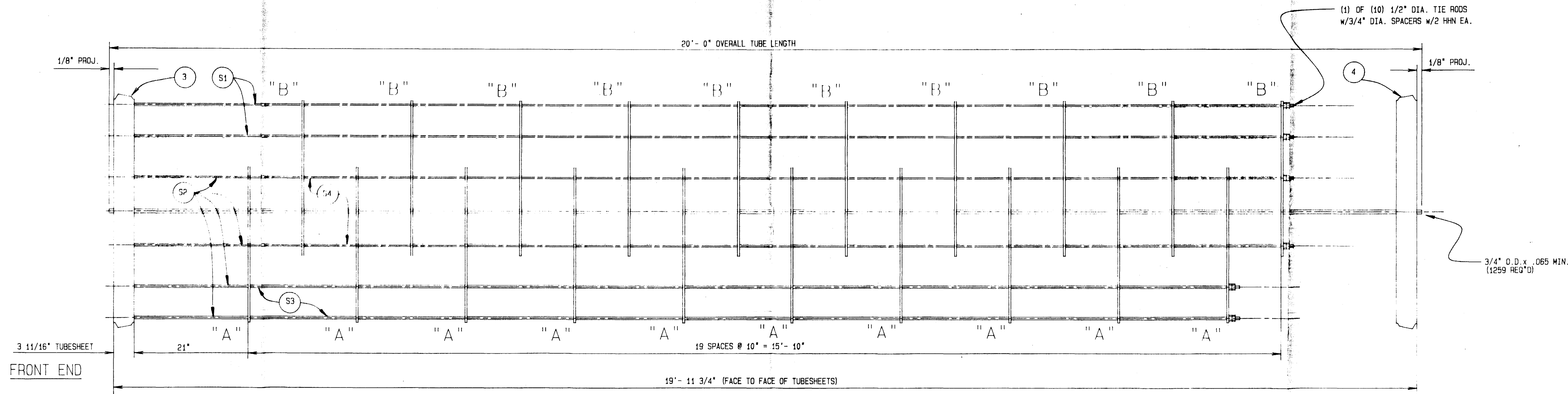
REVISED

OTHER:

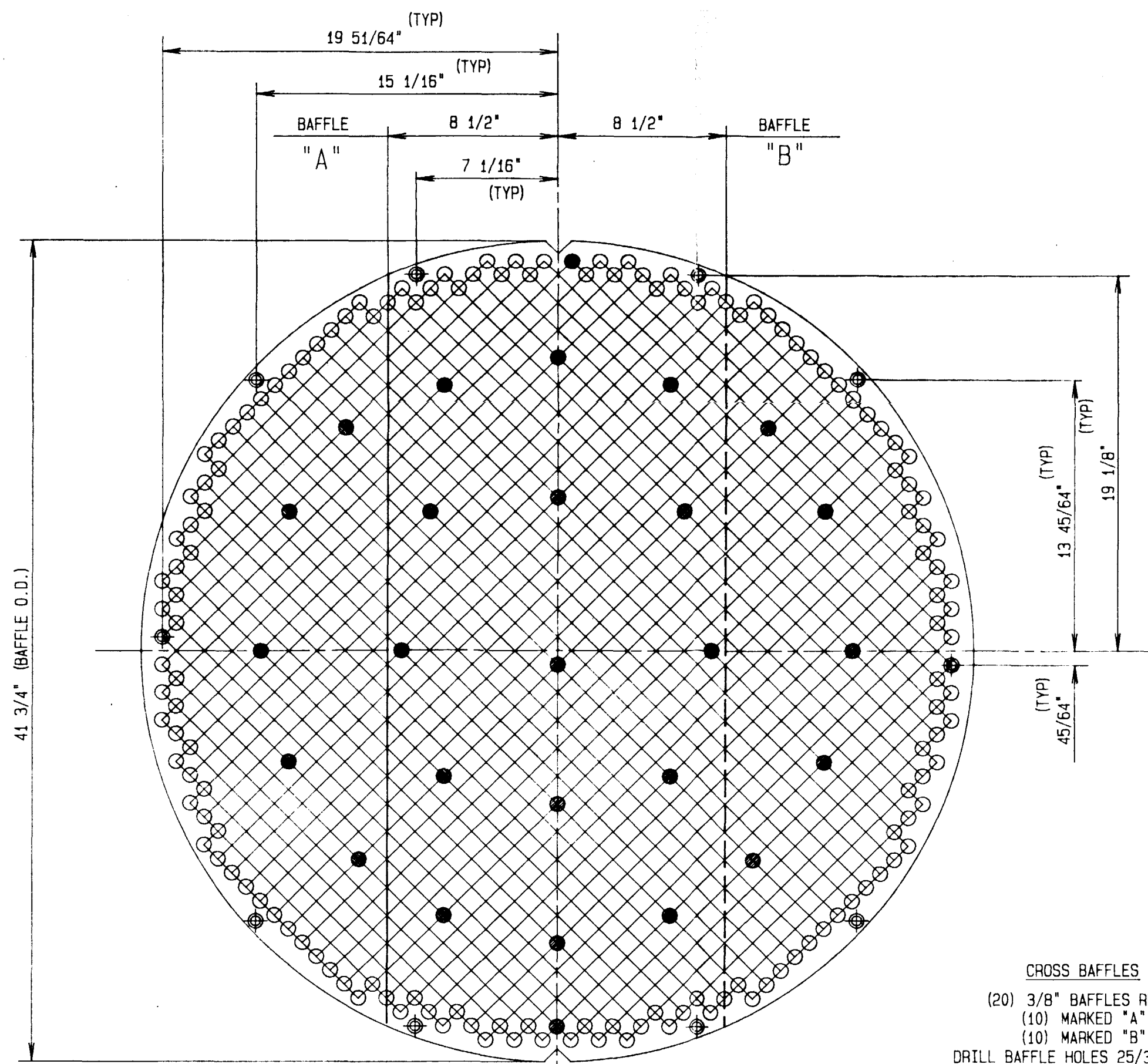
SEC 7 EXT







BUNDLE TOP VIEW

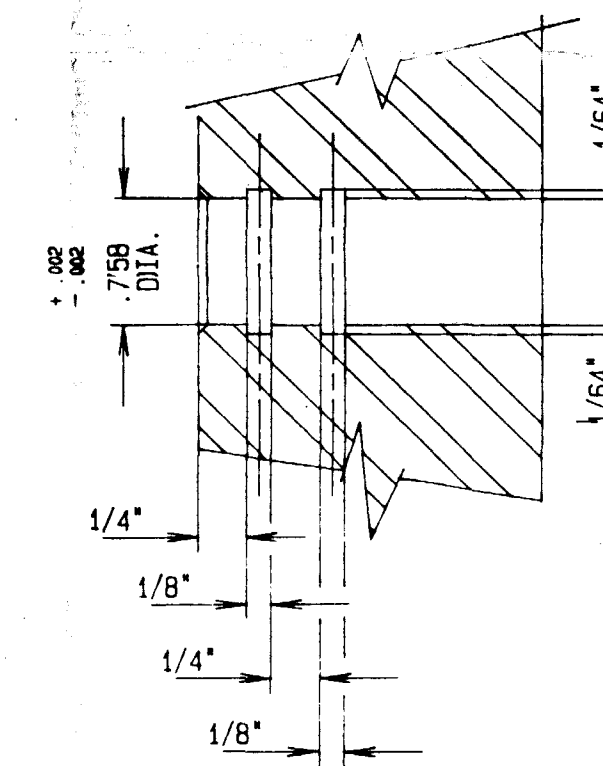


TUBESHEET & BAFFLE LAYOUT

CROSS BAFFLES  
(20) 3/8" BAFFLES REQ'D  
(10) MARKED "A"  
(10) MARKED "B"  
DRILL BAFFLE HOLES 25/32" DIA.  
ON 1" SQUARE PITCH  
FOR (1259) 3/4" DIA. TUBES \*

\* NOTE: A TOTAL OF 1286 TUBE HOLES IN TUBESHEET.  
27 HOLES MARKED \* ARE FOR CLEANING.  
DRILL AND TAP THESE HOLES (FROM TUBESIDE) FOR  
1/2" N.P.T. & INSTALL 304 S.S. PIPE PLUGS.  
PROVIDE HOLES IN TUBESHEETS AND BAFFLES.

TIE ROD & SPACER SCHEDULE		
TIE RODS		
1/2" DIA		
REQ'D	LENGTH	
7	17'- 9 1/2"	
3	16'- 11 1/2"	
SPACERS		
3/4" DIA.		
S1	3	2'- 7"
S2	7	21"
S3	54	19 5/8"
S4	76	9 5/8"



TUBE GROOVE DETAIL

TUBES TO BE ROLLED AND SEAL WELDED  
TO TUBESHEET

# 90747

CERTIFIED FOR CONSTRUCTION  
O'NEAL'S WELDING & FABRICATION  
BY: [Signature]  
DATE: APR 24 1990

O'NEAL'S WELDING & FABRICATION INC.			
DRAWN BY: KEN	CHECKED BY:	APP'D BY: [Signature]	ITEM NO. HE-2956
DATE: 3/30/90	DATE:	DATE: 4/2/90	SHEET 2 OF 2
DESCRIPTION:		CUSTOMER: HOECHST CELANESE	
DWG. NO. S/O 909		REV.	



