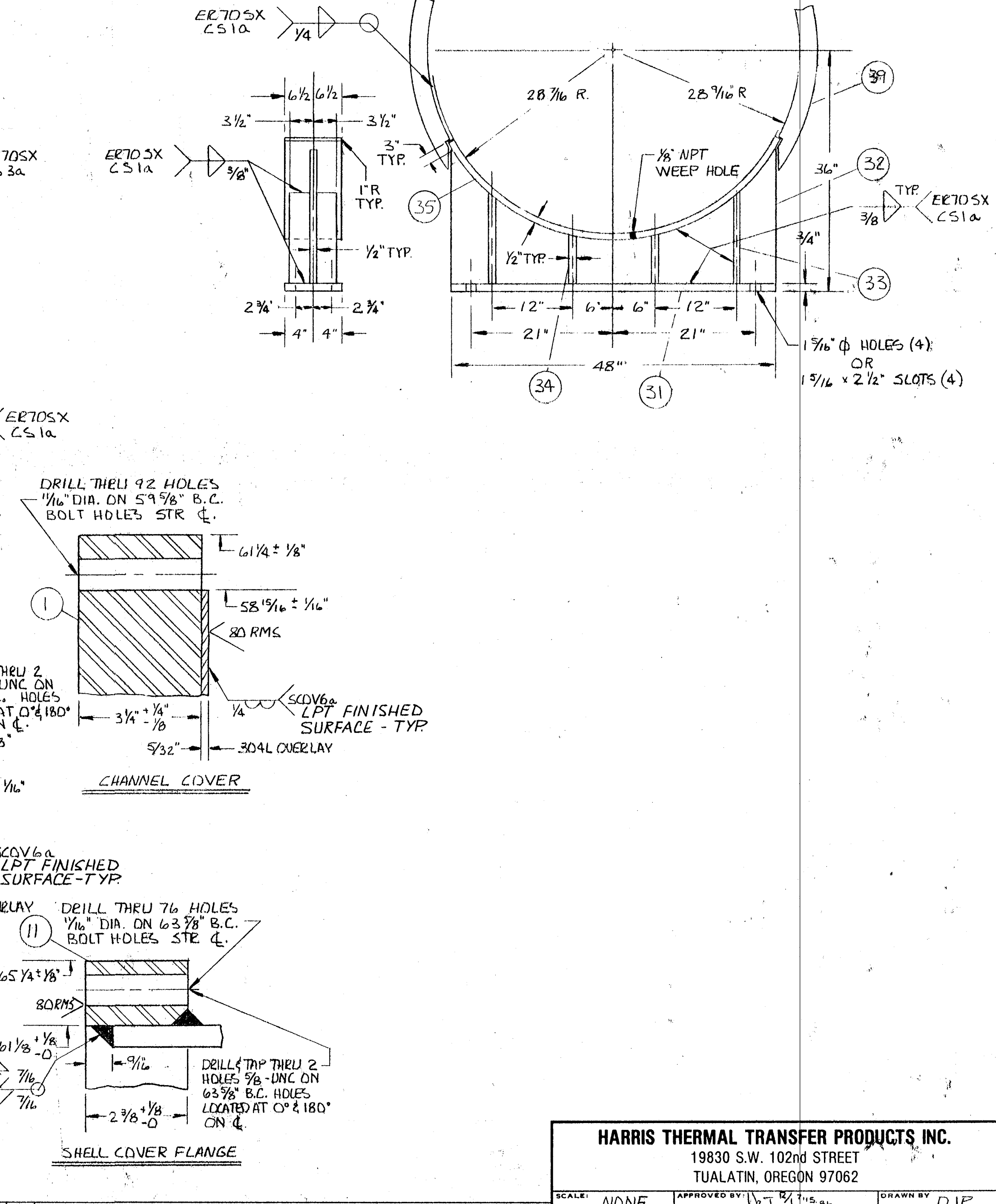
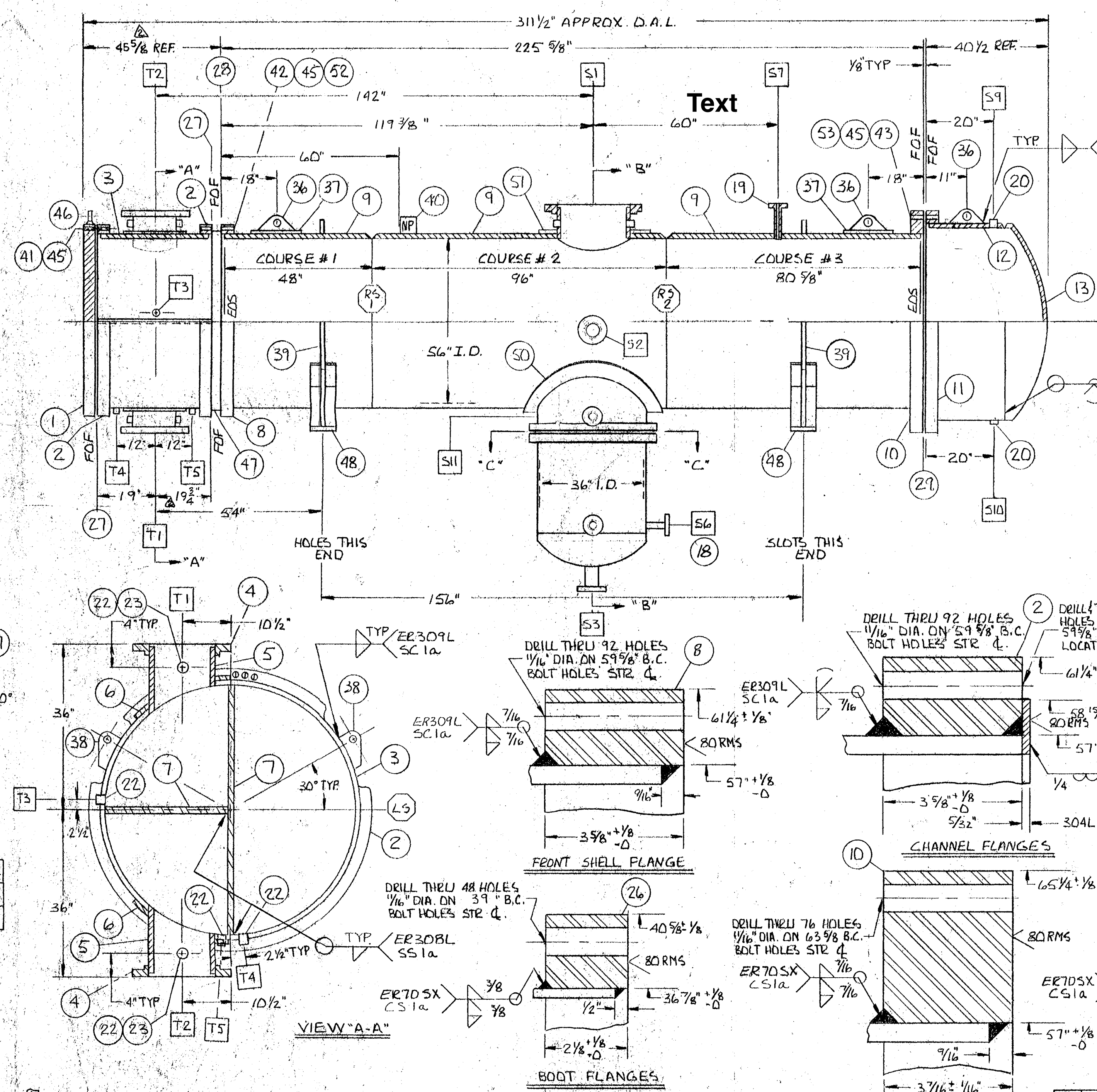
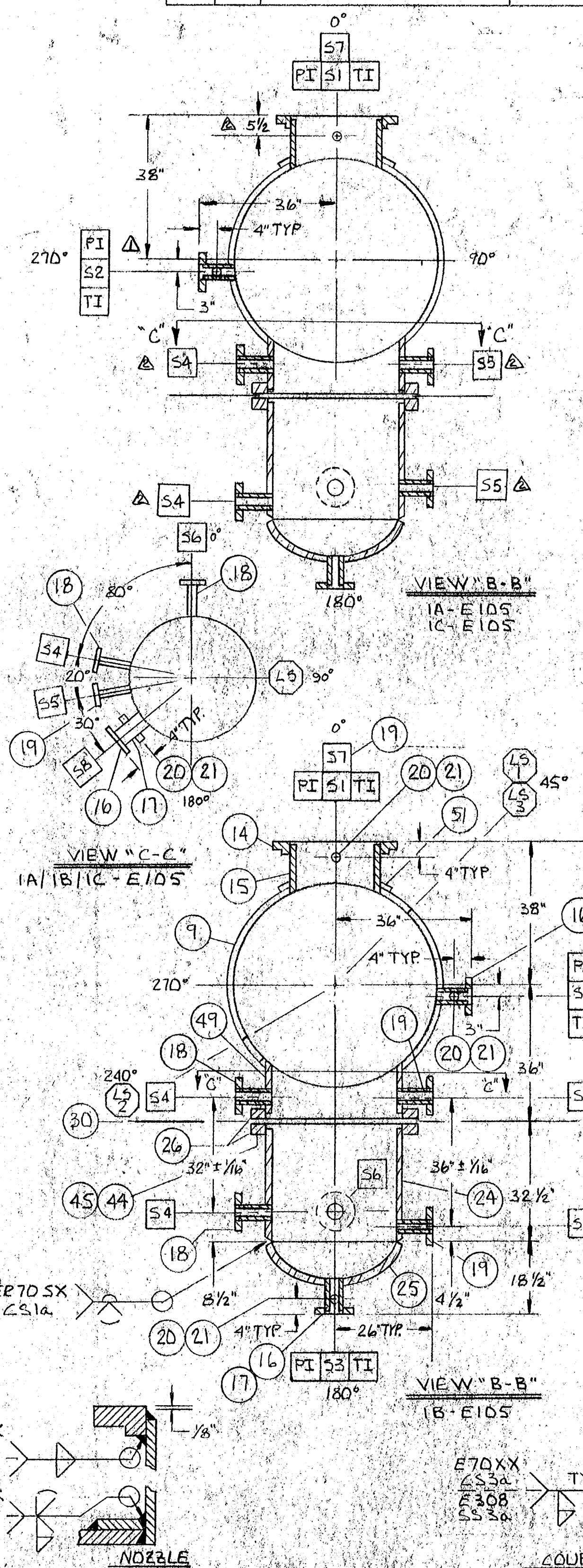


Project: Carver Greenfield
Sludge Dehydration & BRS
Contract No. 1
City: County Sanitary District #2
Owner: Foster Wheeler
Contractor: Brinderson Corporation
Subcontractor: American Fabricators, Inc.
Subcontract No. 6306
Suppliers' Purchase Agreement No. American Fabricators, Inc.
Contract Drawing Reference: 1A/1B/1C-E105
Description of Location: within the facility where installation is intended

51	1	PAD, REINFORCING S1	SA516-70			3/4" R x 2 3/4" (24 1/8" I.D.)
52	2	SCREWS, JACKING	GRADE 5			5/8" UNC x 8" LG. SQ. HEAD FLAT TIP
53	2	SCREWS, JACKING	GRADE 5			5/8" UNC x 7" LG. SQ. HEAD FLAT TIP

NO.	REQ'D	DESCRIPTION	MATL.	DWG	SHT	REMARKS * INCLUDED SPARES
26	2	FLANGE, BOOT, S11	SA516-70			2 1/4" R x 40 3/8" x 1/8" DIA.
27	4	GASKET, METAL JACKED	304			1/8" THK. 58 7/8" O.D. x 57 1/8" I.D. NON-ASBESTOS
28	2	GASKET, METAL DRL JKT'D	180N			1/8" THK. ARMCO 58 7/8" O.D. x 57 1/8" I.D. NON-ASBESTOS
29	2	GASKET, METAL DRL JKT'D	180N			1/8" THK. ARMCO 62 3/8" O.D. x 61 1/8" I.D. NON-ASBESTOS
30	2	GASKET, METAL DRL JKT'D	180N			1/8" THK. ARMCO 62 3/8" O.D. x 61 1/8" I.D. NON-ASBESTOS
31	2	BASE, SUPPORT	SA-36			3/4" R 8" x 48"
32	2	WEB, SUPPORT	SA-36			1/2" R 20" x 48" w/38 1/16" R.
33	8	RIBS, SUPPORT	SA-36			1/2" R 3" x 13" LG.
34	8	RIBS, SUPPORT	SA-36			1/2" R 3" x 7" LG.
35	2	PLATE, VWEAR	SA-36			1/2" R 13" x 66" LG. w/28 1/16" R
36	3	LUG, LIFTING	SA-36	18372	HAC	1" R HARRIS STANDARD
37	2	PAD, REINFORCING	SA-36			1/2" R 6" x 14" w/1" R ON CORNERS
38	2	LUG, LIFTING	SA-36			1/2" R HARRIS STANDARD
39	2	RING, STIFFENING	SA-36			1/2" x 3 1/2" FLAT BAR ROLLED TO: 57 1/8" I.D.
40	1	NAME PLATE	SS			HARRIS STANDARD
41	92	STUDS - CHANNEL CVR.	SA193-B7			5/8" UNC x 9" LG.
42	92	STUDS - CHANNEL/SHELL	SA193-B7			5/8" UNC x 13" LG.
43	76	STUDS - SHELL CVR.	SA193-B7			5/8" UNC x 8" LG.
44	48	STUDS - BOOT	SA193-B7			5/8" UNC x 6 1/2" LG.
45	60	NUTS	SA194-24			5/8" UNC HEAVY HEX
46	1	LUG, LIFTING	CS			PAD EYE #5 CROSBY
47	1	ASSEMBLY TUBE BUNDLE	18372H	DI		
48	8 sets	BOLTS, ANCHOR	SA193-B8			1" UNC x 2 1/2" LG. HEX w/ NUT & 2 FLAT WASHERS
49	1	NOZZLE S11	SA516-70			3/8" R 36" I.D. (11 1/4") x 14" LG.
50	1	PAD, REINFORCING S11	SA516-70			3/8" R x 4" (36 7/8" I.D.)

MATERIAL LIST					
1	1	COVER, CHANNEL	SA516-70		3/4" R x 61 1/4" x 1/8" DIA.
2	2	FLANGE, CHANNEL	SA516-70		3/8" R x 61 1/4" x 1/8" O.D. x 57 1/8" - O I.D.
3	1	SHELL, CHANNEL	SA240-304L		7/16" R 56" I.D. (177 1/16") x 37 5/8"
4	2	FLANGE, T1 T2	SA182F-304L		FLANGE 14" - 150# REF SLIP-ON
5	2	NOZZLE, T1 T2	SA312-304L		PIPE 14" SCH STD x 16" LG
6	2	PLATE, REINFORCING T1 T2	SA240-304L		3/8" R x 24" O.D. x 14 1/8" I.D.
7	2	PARTITIONS, PASS	SA240-304L		7/16" R 10 5/8" x 38" 1 @ 27 3/32" x 38"
8	1	FLANGE, FRONT SHELL	SA516-70		3/4" R x 61 1/4" x 1/8" DIA.
9	3	SHELL	SA516-70		7/16" R x 56" I.D. (177 1/16") 10 48" LG. 10 96" LG. 10 80 5/16"
10	1	FLANGE, REAR SHELL	SA516-70		3/2" R x 65 1/2" x 1/8" O.D. x 57 1/8" - O I.D.
11	1	FLANGE, SHELL COVER	SA516-70		2 1/2" R x 65 1/2" x 1/8" O.D. x 61 1/8" x 1/8" - O I.D.
12	1	SHELL, COVER	SA516-70		7/16" R 61" O.D. (190 1/4") x 21 5/8" LG.
13	1	HEAD, SHELL COVER	SA516-70		2 1/2" SE 61" O.D. x 1 1/2" ST. FLG. x 78" NOM. x 289 MIN.
14	1	FLANGE, S1	SA105		FLANGE 24" - 150# REF SLIP-ON
15	1	NOZZLE, S1	SA55-B		PIPE 24" SCH STD x 13" LG.
16	3	FLANGE, S2 S3 S8	SA105		FLANGE 4" - 150# REF SLIP-ON
17	3	NOZZLE, S2 S3 S8	SA53-B		PIPE 4" SCH. (20, 52, 53) x 12" LG., 53 & 12" LG.
18	3	FLANGE, S4 S6	SA105		LONG WN. 1 1/2" - 150# SCH 40 x 12" LG.
19	3	FLANGE, S5 S7	SA105		LONG WN. 1" - 150# SCH 40 x 12" LG.
20	6	COUPLING, S9 S10 T1	SA105		CPLG 1" - 6000# 2 w/ RD PLUG - 6" LG.
21	4	COUPLING, T1	SA105		CPLG 3/4" - 6000#
22	5	COUPLING, T1 T3 T4 T5	SA182F-304L		CPLG 1" - 6000# 3 w/ RD PLUG - 6" LG.
23	2	COUPLING, T1	SA182F-304L		CPLG 3/4" - 6000#
24	1	SHELL, BOOT	SA516-70		3/8" R 36" I.D. (11 1/4") x 32" LG.
25	1	HEAD, BOOT	SA516-70		2 1/2" SE 36" I.D. x 1 1/2" ST. FLG. x 224 MIN. x 3/8" NOM.



HARRIS THERMAL TRANSFER PRODUCTS INC.			
19830 S.W. 102ND STREET TUALATIN, OREGON 97062			
SCALE: NONE	APPROVED BY: [Signature]	DRAWN BY: DJP	REVISED: 7-11-86
DATE: 4-21-86	DESIGN: 4-30-86	REV: 2	
SHELL AND CHANNEL ASSEMBLY			
BRINDERSON			
1A/1B/1C-E105			
DRAWING NUMBER: 18372H-D2			

2	1/6/87	26	AS BUILT
ANCHOR BOLTS WERE 4" LG., #36 WAS 3/4" THK.			

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

12

- Manufactured and certified by Harris Thermal Transfer Products, P. O. Box 339, Tualatin, OR 97062
(Name and address of manufacturer)
2. Manufactured for Brinderson Corp., 19700 Fairchild, Irvine, CA 92715-2513
(Name and address of purchaser)
3. Location of installation Los Angeles County Sanitation District, Carson, CA 90745
(Name and address)
4. Type Horizontal H-x 18372C-E105 18372H-C1 1141 1987
(Horiz. or vert. tank) (Mfg's serial No.) (CRNI) (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 1983
Year

W 85

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 sheets of heat exchangers

6. Shell: SA516 GR 70 .4375" .125" C.S. 4'-8" 18'-9.625"
(Mat'l. (Spec. No., Grade)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft & in.)) (Length (Overall) (ft & in.))
7. Seams: Double Butt N/A 70 N/A
(Long. (Dbl., Sngl.)) (R.T. (Spot or Full)) (Eff. (%)) (H.T. Temp. (°F))
- Double Butt N/A 3
(Time) (Grth (Dbl., Sngl.)) (R.T. (Spot, Partial, or Full)) (No. of Courses)
8. Heads: (a) Mat'l. SA516 GR 70 (b) Mat'l. _____
(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)
End	.289"	.125"			2:1				Concave

If removable, bolts used (describe other fastenings) (76) 5/8" SA-193 B7 Studs w/ SA-194 2H Nuts
(Mat'l. Spec. No., Gr., Size, No.)

9. Type of Jacket _____ Proof Test _____
10. Jacket Closure _____ If bar, give dimensions _____ If bolted, describe or sketch.
(Describe as ogee & weld, bar, etc.)
11. MAWP Full Vacuum & 86 psi at max. temp. 200 °F. Min. temp. (when less than -20° F) _____ °F.
Hydro. ~~XXXXXX~~ test press. 129 psi.

Items 12 and 13 to be completed for tube sections

12. Tubesheets: SA240 T-304L 56" 3" .06" Bolted
(Stationary Mat'l. (Spec. No., Gr.)) (Diam. (in.) (Subject to pressure)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Attach. (Welded, Bolted))
- SA240 T-304L 56" 3" .06" Attach.
(Floating Mat'l. (Spec. No., Gr.)) (Diam. (in.)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Attach.)
13. Tubes: SA249 T-304 .750" #16 BWG 2452 Straight
(Mat'l. (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 T304L .4375" .03" 4'-8" 3'-2"
(Mat'l. (Spec. No., Grade)) (Nom. Thk. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft & in.)) (Length (Overall) (ft & in.))
15. Seams: Double Butt N/A 70 N/A
(Long. (Dbl., Sngl.)) (R.T. (Spot or Full)) (Eff. (%)) (H.T. Temp. (°F))
- N/A N/A 1
(Time) (Grth (Dbl., Sngl.)) (R.T. (Spot, Partial, or Full)) (No. of Courses)
16. Heads: (a) Mat'l. SA240 T304L (b) Mat'l. _____
(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)
End	2.5"	.03"						61.25"	

If removable, bolts used (describe other fastenings) (92) 5/8" SA193 B7 Studs w/ SA-194 2H Nuts
(Mat'l. Spec. No., Gr., Size, No.)

17. MAWP 153 psi at max. temp. 150 °F. Min. temp. (when less than -20° F) _____ °F.
Hydro. ~~XXXXXX~~ test press. 230 psi.

Form U-1 (Back)

18. Nozzles, Inspection and Safety Valve Openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
Outlet	1	36"	Special	SA516/GR 70	.375	SA516 GR 70	Welded	Shell
Vapor In	1	24"	150# RF	SA53B/SA105	.375	SA516 GR 70	Welded	Shell
H ₂ O In & Out	2	14"	150# RF	SA312/SA182F304L	.375	SA240 T304L	Welded	Channel
Vapor/Liq. Out	2	4"	150# RF	SA53B/SA105	.438	None	Welded	Shell/Boot
LSLL	1	4"	150# RF	SA53B/SA105	.438	None	Welded	Boot
Instrument	3	1 1/2"	150# RF	SA105 LWN	.145	None	Welded	Boot
Instrument	3	1"	150# RF	SA105 LWN	.133	None	Welded	Boot/Shell
Vent/Drain	5	1"	CPLG	SA105	6000#	None	Welded	Head/Channel
Temperature	6	1"	CPLG	SA105	6000#	None	Welded	Misc.
Pressure	6	3/4"	CPLG	SA105	6000#	None	Welded	Misc.

19. Supports: Skirt No Lugs 2 Legs Other (2) Saddles Attached Welded to Shell
 (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: _____
 (Name of part, item number, mfg's name and identifying stamp)

Floating Tubesheet Head - 55" OD x .625 nominal SA-516 GR 70 2:1 semi-elliptical.
Boot bolted to outlet, 3/8" SA-516 GR 70 Shell, 36" ID x .224 minimum
2:1 semi-elliptical head. Bolted with (48) 5/8" dia. SA193B7 Studs w/SA194-2H Nuts.
Safety valves located elsewhere in system.

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. 476 expires Jan. 31 1989
 Date 5/16/87 Co. name Harris Thermal Transfer Prods. Signed [Signature]
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by Harris Thermal Transfer Products at Tualatin, OR 97062

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 Oregon and employed by Department

of Commerce have inspected the pressure vessel described in this Manufacturer's Data Report on 5/16, 1987, 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 5/28/87 Signed [Signature] Commissions NB-2019-10463
 (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. endorsement(s), State, Prov., and No.)

Project
Owner
Engineer
Contractor
Subcontractor
Subcontract No.
Suppliers Purchase Agreement No.
Manufacturer's Name
Contract Drawing Reference
Applicable Specification
Description of Location
within the facility,
where installation is
intended

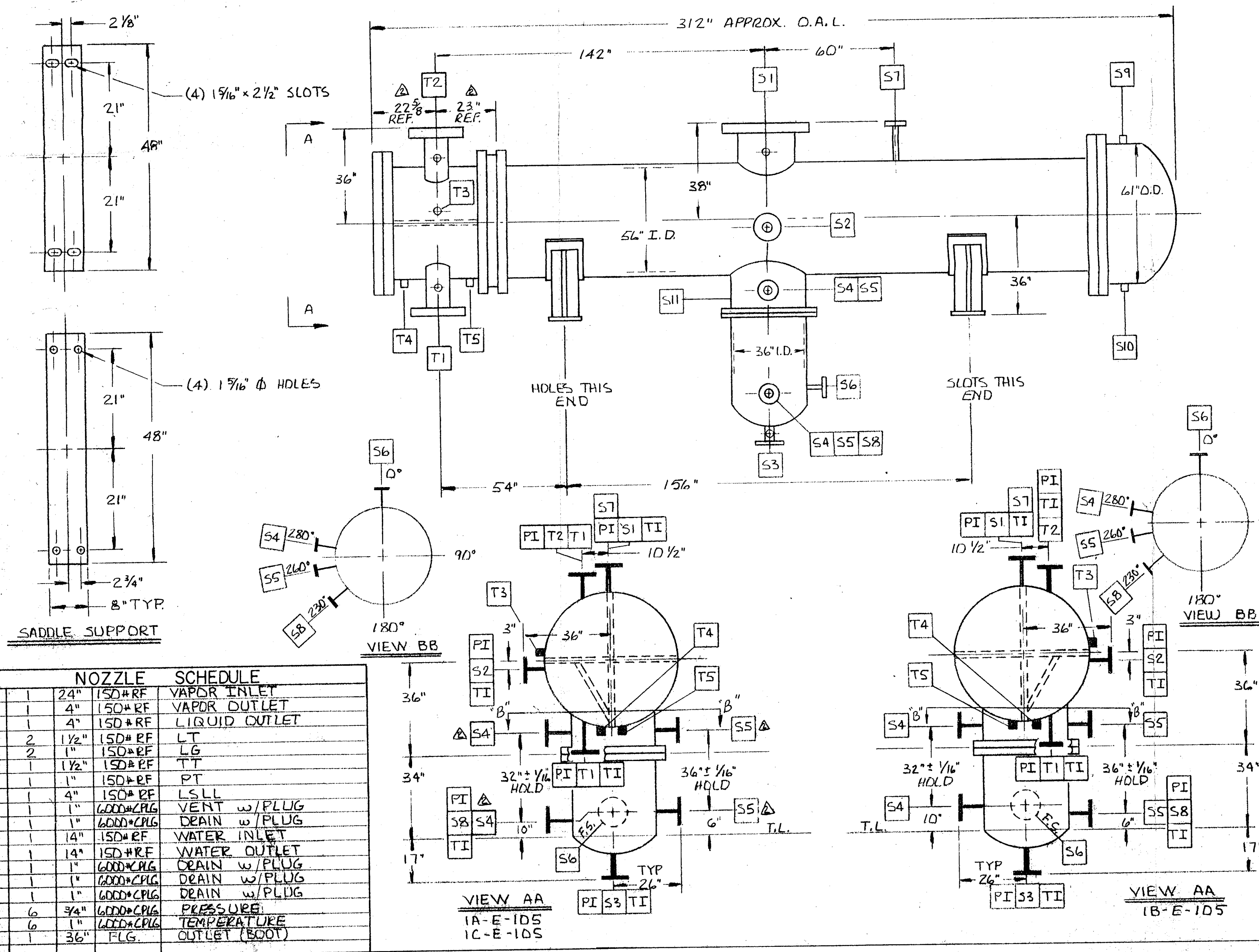
Carver Greenfield
Sludge Dehydration & ERS
Contract No. 1
L.A. County Sanitary District #2
Foster Wheeler
Brinderson Corporation
American Fabricators, Inc.
6306
American Fabricators, Inc.

DESIGN DATA

CODE - AMSE SECT VIII DIV I	W-85	STAMP - TJ
TEMA - B	NAT	BD NO -
DESIGN CONDITIONS	SHELLSIDE	TUBESIDE
MAWP	86 PSI & FV	153 PSI
TEMPERATURE	200°F	150°F
PASSES	1	4
HYDROTEST	129 PSI	230 PSI
CORROSION ALLOW	1/8 C.S.	OVERLAY .03 SS
RADIOGRAPHY	NA	NA
PWHT	NA	NA
MATERIALS	C.S.	304L
GASKETS	SHELLSIDE: ARMCO IRON ORL JCKT'ED NON-ASB. TUBESIDE: 35304 JACKETED - NON-ASBESTOS	
SURFACE PREP & PAINT	*	

WEIGHTS	EXCHANGER EMPTY -	54,200 #
	FULL OF WATER -	75,100 #
	BUNDLE ONLY -	28,000 #

NOTES - 1/8" NPT WEEP HOLES REQUIRED IN ALL REINFORCING PLATES.
* ALL EXTERIOR CS SURFACES - "NEAR-WHITE" SANDBLAST & PRIME PAINT W/ PORTER ZINC LOCK 351 @ 2.5 MILS



REFERENCE NUMBER	DRAWINGS TITLE
18372H-D1	TUBE BUNDLE
D2	SHELL AND CHANNEL ASSEMBLY
A1	GASKET - FLTG. HEAD
A2	" - CHAN. & COVER
A3	" - SHELL
A4	" - COVER
A5	" - BOOT
A6	LIFT LUG - VESSEL
A7	LIFT LUG - FLTG. HEAD

HARRIS THERMAL TRANSFER PRODUCTS INC			
19830 SW TETON AVENUE TUALATIN, OREGON 97062			
SCALE NONE	APPROVED BY UZT 4-30-86	DRAWN BY DJP	
DATE 4-9-86	UZT 4-30-86	CHECKED BY UZT	
VAPOR CONDENSER			
BRINDERSON	DWG NO	REV	
1A/1B/1C-E105	18372H-C1	2	