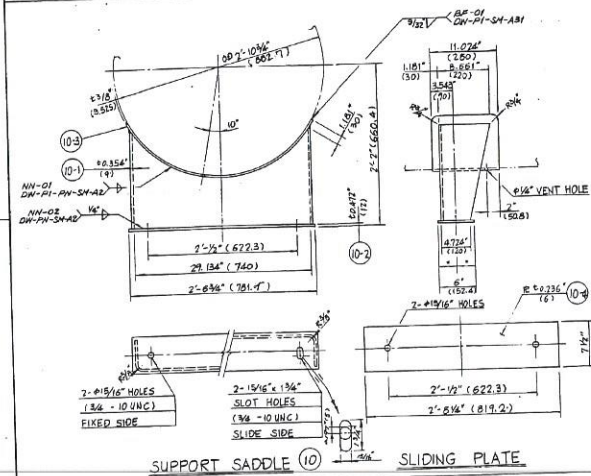
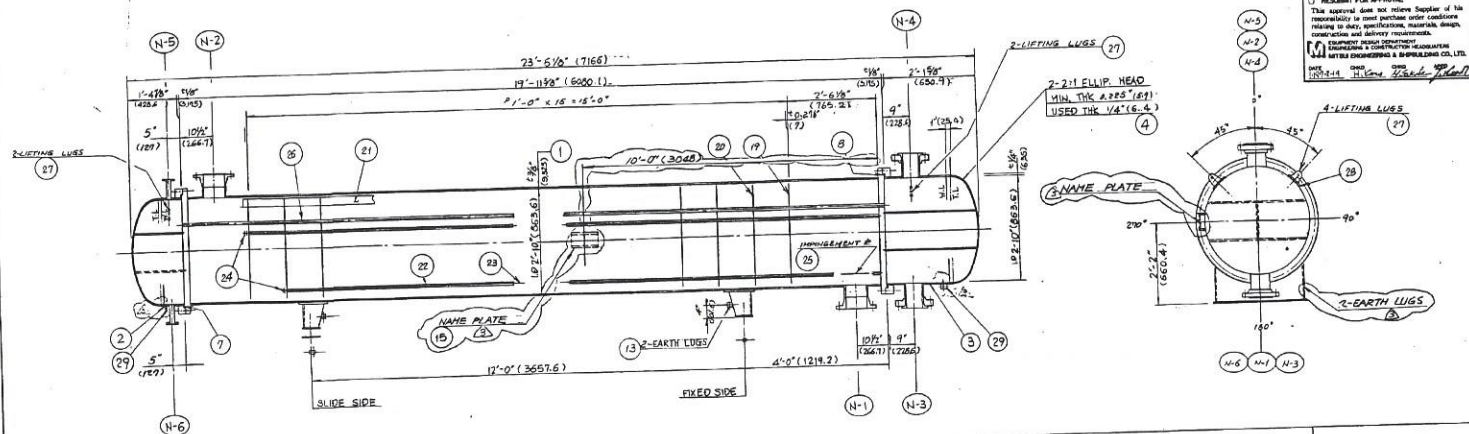
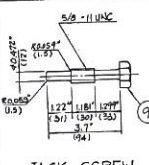
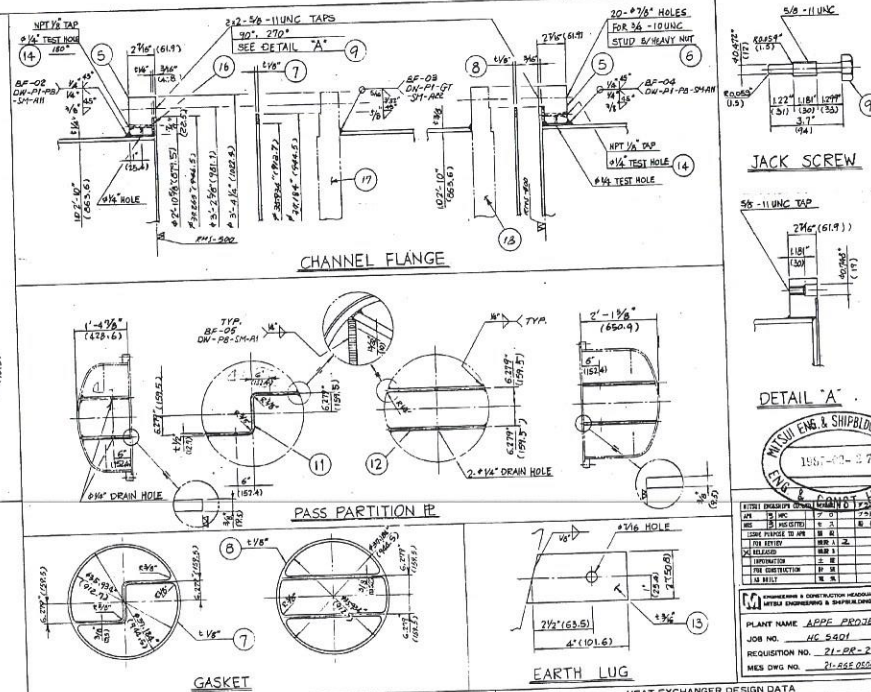
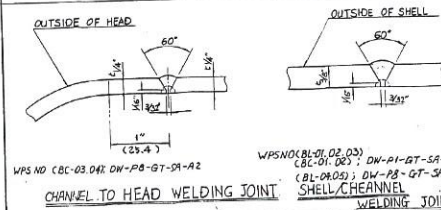
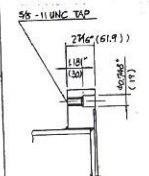


WELDING SEAM LINE



JACK SCREW



DETAIL "A"



4	STRENGTH PROOFING	コンクリート	コンクリート	コンクリート	コンクリート
5	4PM	4PM	4PM	4PM	4PM
6	5PM	5PM	5PM	5PM	5PM
7	6PM	6PM	6PM	6PM	6PM
8	7PM	7PM	7PM	7PM	7PM
9	8PM	8PM	8PM	8PM	8PM
10	9PM	9PM	9PM	9PM	9PM
11	10PM	10PM	10PM	10PM	10PM
12	11PM	11PM	11PM	11PM	11PM
13	12AM	12AM	12AM	12AM	12AM
14	1AM	1AM	1AM	1AM	1AM
15	2AM	2AM	2AM	2AM	2AM
16	3AM	3AM	3AM	3AM	3AM
17	4AM	4AM	4AM	4AM	4AM
18	5AM	5AM	5AM	5AM	5AM
19	6AM	6AM	6AM	6AM	6AM
20	7AM	7AM	7AM	7AM	7AM
21	8AM	8AM	8AM	8AM	8AM
22	9AM	9AM	9AM	9AM	9AM
23	10AM	10AM	10AM	10AM	10AM
24	11AM	11AM	11AM	11AM	11AM
25	12PM	12PM	12PM	12PM	12PM
26	1PM	1PM	1PM	1PM	1PM
27	2PM	2PM	2PM	2PM	2PM
28	3PM	3PM	3PM	3PM	3PM
29	4PM	4PM	4PM	4PM	4PM
30	5PM	5PM	5PM	5PM	5PM
31	6PM	6PM	6PM	6PM	6PM
32	7PM	7PM	7PM	7PM	7PM
33	8PM	8PM	8PM	8PM	8PM
34	9PM	9PM	9PM	9PM	9PM
35	10PM	10PM	10PM	10PM	10PM
36	11PM	11PM	11PM	11PM	11PM
37	12AM	12AM	12AM	12AM	12AM
38	1AM	1AM	1AM	1AM	1AM
39	2AM	2AM	2AM	2AM	2AM
40	3AM	3AM	3AM	3AM	3AM
41	4AM	4AM	4AM	4AM	4AM
42	5AM	5AM	5AM	5AM	5AM
43	6AM	6AM	6AM	6AM	6AM
44	7AM	7AM	7AM	7AM	7AM
45	8AM	8AM	8AM	8AM	8AM
46	9AM	9AM	9AM	9AM	9AM
47	10AM	10AM	10AM	10AM	10AM
48	11AM	11AM	11AM	11AM	11AM
49	12PM	12PM	12PM	12PM	12PM
50	1PM	1PM	1PM	1PM	1PM
51	2PM	2PM	2PM	2PM	2PM
52	3PM	3PM	3PM	3PM	3PM



MITSUBISHI ENGINEERING & CONSTRUCTION HEADQUARTERS
 2-1-1, SHIBUYA 1-CHOME, SHIBUYA-KU, TOKYO 100, JAPAN
 TEL: 03-3493-1111 FAX: 03-3493-1112

PLANT NAME APPE PROJECT

REQ NO. HC 5401

JOB NO. 21-BR-2103

MES DWG NO. 21-BR-0006-01

DESIGN DATA			
STAMP		☒ MEQD	☐ NOT MEQD
RE SIDE	WEIGHT		
W	TUBE (INCHES)		
85 PSIG	FAB. / ASSY	16000 Lb/	
50 PSIG	OPERATING	23300 Lb	
212 F	TEST	23300 Lb	
40 F	RADIOGRAPHED (RTI)		
120 F	☐ FULL	☒ SPOT (9-5)	☐ NO
PER JOINT EFFICIENCY	STREIL STEEL (A55)		
4000 PSI	TUBE SIZE (A55)		
SIG	TUBE SPEC.	SIZE, 001", BWG 4 (AVE)	
0	LENGTH:	20'-0" (STRO) 4"	
0	GASKET: V=1501 OR EQ.		
YES ☒ NO	PULSATION: T=3	PERMISSIBLE 1	
PRINT: BY A & B BENTLEY INDUSTRIES			
SIGNED: DR. J. A. HILL			

REQ'D HQ : 1
SURFACE AREA : 2451 ft²
CAPACITY : 1057 GAL.

NOTE

1. WELD TOLERANCES ARE AS FOLLOWS

A). HEAD, SHELL	B). PIPE, ELBOW WN. FLANGE	C). SHELL & NOZZLE

2. GASKET CONTACT SURFACE FINISHES SHALL CONFORM TO ANSI B16.5 AND THE FOLLOWING.

GASKET TYPE	FINISH RMS	TOOL RADIUS	FEED/REVOLUTION
V #1501	500	1/16"	1/32"

3. EXPANSION JOINT DESIGN TEMPERATURE (°F)

	SHELL SIDE	TUBE SIDE
CASE - 1 (OPER.)	95.0	115.3
COOLING WATER	69.0	99.6

[illegible][illegible][illegible]

E-504

FORM U-1 MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS
as required by the provisions of the ASME Code rules, Section VIII, Division 1

E - 504

1. Manufactured and certified by DOOSAN MANUFACTURING CO., LTD. BYUENG JUM PLANT ; #465-2
(name and address of manufacturer)
BYUENGJUM-R1, TAEAN-MYUN, I-WASUNG-GUN, KYUNGGI-DO, 170 KOREA

2. Manufactured for MITSUI ENGINEERING & SHIPBUILDING CO., LTD. ; TOKYO JAPAN
(name and address of purchaser)

3. Location of Installation ADVANCED POLYPRO RESINS, INC.,
6600 EAST FIFTEEN MILE ROAD STERLING HEIGHTS, MICHIGAN 48077, U.S.A.
(name and address)

4. Type: HORIZ. H/E U104-53 N/A GC-HI-1-05407 REV.3 60 1987
(horiz. or vert., tank) (mfr's serial no.) (CRN) (drawing no.) (Net't. 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 Code, Section VIII, Division 1: 1983 EDITION
(year)

W-185-ADDLND N/A N/A
(addenda (date)) (Code Case no.) (special service per UG 120(d))

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

Shell: SA-516 GR.60 .375" .0625" 2'-10" 19'-11"
(mat'l (spec. no., grade)) (nom. thickness (in.)) (corr. allow. (in.)) (dia. ID (ft. & in.)) (length (overall) (ft. & in.))

7. Seams: SNGL. BUTT WLD. SPOT 85 N/A N/A SNGL. BUTT WLD. SPOT 3
(long. (tbl., segl.)) (RT (spot or full)) (left (°)) (RT temp. (°F)) (time) (grth (tbl., segl.)) (RT (spot, partial, or full)) (no. of courses)

8. Heads: (a) N/A (b) N/A
(mat'l (spec. no., grade)) (mat'l (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)	N/A									
(b)	N/A									

If removable, bolts used (describe other fastenings): N/A
(mat'l, spec. no., gr. size, no.)

9. Type of jacket: N/A Proof test N/A

10. Jacket closure: N/A If bar, give dimensions: N/A If bolted, describe or sketch N/A
(describe as ogee & weld, bar, etc.)

11. MAWP: 85PSIG at max. temp. 140°F Min. temp.: N/A Hydro. ~~press. test~~ test press.: 128 PSIG
(psi) (°F) (when less than -20°F) (psi)

Items 12 and 13 to be completed for tube sections

12. Tubesheets: SA-105+SA-240GR.304 33.875" I.D. 1.750" .0625"+0" WELDED
(stationary mat'l (spec. no., gr.) dia. (in.) subject to pressure) (nom. thickness (in.)) (corr. allow. (in.)) (attachment (welded, bolted))

N/A N/A N/A N/A
(floating mat'l (spec. no., gr.) (dia. (in.)) (nom. thickness (in.)) (corr. allow. (in.))

13. Tubes: SA-213 GR. TP304 1" .083" 476 STRAIGHT
(mat'l (spec. no., gr.) (OD (in.)) (nom. thickness (in. or gauge)) (psi) (type (straight or U))

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

14. Shell: SA-240 GR.304 .250" NONE 2'-10" L-L: 1'-4" R-L: 2'-1"
(mat'l (spec. no., gr.) (nom. thickness (in.)) (corr. allow. (in.)) (dia. ID (ft. & in.)) (length (overall) (ft. & in.))

15. Seams: SNGL. BUTT WLD. SPOT 85 N/A N/A SNGL. BUTT WLD. SPOT L:1, R:1
(long. (tbl., segl.)) (RT (spot or full)) (left (°)) (RT temp. (°F)) (time) (grth (tbl., segl.)) (RT (spot, partial, or full)) (no. of courses)

16. Heads: (a) SA-240 GR.304 (b) SA-240 GR.304
(mat'l (spec. no., grade)) (mat'l (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)	L-END	.225"	NONE	N/A	N/A	2:1	N/A	N/A	N/A	CONCAVE
(b)	R-END	.225"	NONE	N/A	N/A	2:1	N/A	N/A	N/A	CONCAVE

If removable, bolts used (describe other fastenings): N/A
(mat'l, spec. no., gr. size, no.)

17. MAWP: 85PSIG at max. temp. 212°F Min. temp.: N/A Hydro. ~~press. test~~ test press.: 128 PSIG
(psi) (°F) (when less than -20°F) (psi)

Items on reverse side to be completed for all vessels where applicable

FORM U-1 (back)

E-504

18. Nozzles, inspection and safety valve openings:

Purpose (inlet, outlet, drain, etc.)	Number	Dia. or Size	Type	Mat'l.	Nom Thickness	Reinforcement Material	How Attached	Location
CCW IN	1	8"	CL150H LG	SA-106GR	B .500"	INTEGRAL	WELDED	-
RCCW OUT	1	8"	CL150H LG	SA-106GR	B .500"	INTLGRAL	WELDED	-
PCW IN	1	6"	CL150H LG	SA-312GR	TP304 .280"	INTEGRAL	WELDED	-
PCW OUT	1	6"	CL150H LG	SA-312GR	TP304 .280"	INTEGRAL	WELDED	-
VENT & DRAIN	2	3/4"	CL150H WN	SA-182GR	F304 .375"	INTLGRAL	WELDED	-

19. Supports: Skirt NO Lugs N/A Legs N/A Other SADDLE Attached WELDED TO SHELL
(yes or no) (no) (no) (describe) (where and how)

20. Remarks: Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: N/A
(name of part, item number, mfr's name and identifying stamp)

* INSP. OPENING : UG-46(a)

* BOLTED TYPE BODY FLG : SA-105, BOLTING MAT'L: SA-193RB7, 3/4"-10NCx1.6.3125"; 40EA

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. 18148 expires 12/15, 19 88
 Date 3/25/87 Name DOOSAN MANUFACTURING CO., LTD. Signed [Signature] (S.W. LEL)
(manufacturer) (representative)

CERTIFICATE OF SHOP INSPECTION #465-2 BYUENGJUM-RI TALAN-MYUN

Vessel constructed by DOOSAN MFG. CO., LTD. BYUENGJUM PLANT, UHwasung-gun, KYUNGGI-DO, 170 KOREA

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the state or province of TEXAS and employed by THE HARTFORD STEAM BOILER I & I COMPANY

of HARTFORD CONN. have inspected the pressure vessel described in this Manufacturers' Data Report on MAR. 25, 19 87, 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 3/25/87 Signed [Signature] Commissions N.B#10440
(Authorized Inspector) (Nat'l Bd. (incl. endorsements) state, prov. and no.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE (N/A)

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 Name Signed
(assembler that certified and constructed field assembly) (by representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION (N/A)

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and 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 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 Signed Commissions
(Authorized Inspector) (Nat'l Bd. (incl. endorsements) state, prov. and no.)