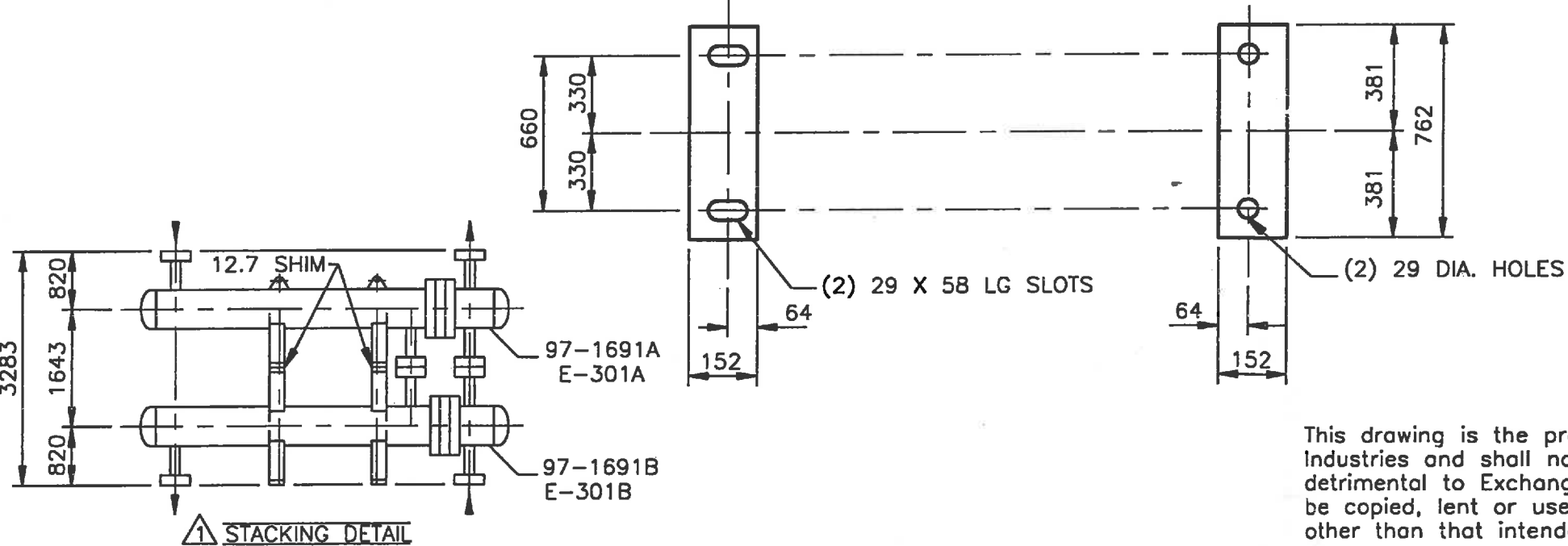


APPROVED
FOR CONSTRUCTION

A 3575.32
JAN. 19. 1998

NOZZLE SCHEDULE					
MARK	SIZE	RATING	TYPE	SCH.	SERVICE
T1	4	1500	RTJWN	XH	CHANNEL INLET
T2	4	1500	RTJWN	XH	CHANNEL OUTLET
S1	10	300	RFWN	80	SHELL INLET
S2	8	300	RFWN	XH	SHELL OUTLET



This drawing is the property of Exchanger Industries and shall not be used in any way detrimental to Exchanger Industries nor shall be copied, lent or used for any purpose other than that intended.

- REVISIONS
- 1 PER CUST. APPV'L & FAX SEP/29/97
 - 2 PER CUST. APPV'L OCT/20/97
 - 3 PER E.I. & CUST APPV'L NOV. 4/97 DCR NI-007221
 - 4 PER E.I. NOV 19/97 DCR A-007239
 - 5 PER E.I. DEC 15 /97 DCR B-007289

CUSTOMER: TITAN PROJECTS LTD.
 FOR: MURPHY OIL, CACTUS LAKE, SASK.
 P.O. NO.: 39804
 TEMA TYPE: BEU
 SIZE: 838-6096
 SERVICE: THERMAL EMULSION/BFW EXCHANGER

**SHELL/TUBE EXCHANGER
 OUTLINE DRAWING**

NO. OF EXCHANGERS REQ'D: ONE

DWN TDW CKD GG ITEM E-301A

EXCHANGER INDUSTRIES
 CALGARY, ALBERTA

DWG NO. 97-1691A
 SHEET 1 OF 15

MATERIAL LIST

CONSTRUCTION NOTES

- (1) CONSTRUCTION TO BE PER ASME CODE SECTION VIII DIVISION 1 1995, 1996 ADDENDA, TEMA CLASS "R" 1988 EDITION 1991 ERRATA AND CUSTOMER SPECIFICATION.
- (2) ALL BOLT HOLES TO STRADDLE CENTER LINES UNLESS NOTED OTHERWISE.
- (3) CODE STAMP REQ'D: YES (PROVINCE OF SASKATCHEWAN & ALBERTA).
- (4) IMPACT TESTING: REQ'D ON CHANNEL TEMA FLG & NOZZLE STUB MAT'L ONLY. PLATE EXEMPT PER UCS-66(a). SHELL SIDE & TUBES EXEMPT PER UG-20(f).
△
- (5) STRESS RELIEVE: "U" BENDS @ 593°C FOR 30 MINS. △
 CHANNEL @ 621°C 2 HR. 30 MINS.
- (6) RADIOGRAPHY: UW11(a), RT1 (CHANNEL), SPOT (SHELL).
- (7) WELD PROCEDURES: M-6A, C-2, SA-A-11, M-46, A-39, M-6B, C-3, SA-A-12, M-57 & A-10
- (8) PAINT: a) COMMERCIAL SANDBLAST COMPLETE UNIT TO SSPC-SP6.
 b) PRIMER COAT COMPLETE UNIT WITH ONE COAT OF GREEN VALSPAR 13-F-12 INORGANIC ZINC (2-3 MILS) DFT.
- (9) INSULATION: BY OTHERS

DESIGN CONDITIONS	SHELL SIDE	CHANNEL SIDE
DESIGN PRESSURE	2399kPa (348PSI)	14940kPa (2167PSI)
EXTERNAL PRESSURE	-	△ -
DESIGN TEMPERATURE	220°C (428°F)	220°C (428°F)
MDMT	△ 0°C (32°F)	△ 0°C (32°F)
C&H MAWP	-	-
C&H MAWP LIMITED BY	-	-
HYDRO TEST PRESSURE	3599kPa (522PSI)	22410kPa (3251PSI)
CORROSION ALLOWANCE	3.2mm (0.125")	△ 1.6mm (0.0625")
N&C MAX. PRESS.	-	-
N&C M.P. LIMITED BY	-	-
SHOP HYDRO TEST PRESS.	3599kPa (522PSI)	22410kPa (3251PSI)
NUMBER OF PASSES	ONE	△ FOUR
SURFACE AREA	254.9 SQ.M (2743.4 SQ.FT) PER SHELL	
SHIPPING WEIGHT	△ 16874kgs (37200lbs) EACH UNIT	
WEIGHT FULL OF WATER	△ 20729kgs (45700lbs) EACH UNIT	
BUNDLE WEIGHT	△ 7711kgs (17000lbs) EACH UNIT	
CAPACITY	△ 3.86 CU.M (136.4 CU.FT) EACH UNIT	

LINE	PART	MATERIAL
TUBE BUNDLE		
37	TUBESHEET	SA-266-4N&IT
38	TUBES	SA-179
39	BAFFLE/SUPPORT PLATES	SA-283-C
40	IMPACT PLATE	SA-283-C
41	TIE-ROD	H.R. STEEL
42	SPACER	SA-214
43	TIE-ROD NUT	CARBON STEEL
GASKETS		
44	CHANNEL	SOLID IRON
45	SHELL	SOLID IRON
46	FLOATING HEAD	-
47	CHANNEL NOZZLE	304S.S. SPIRAL WOUND
48	SHELL NOZZLE	304S.S. SPIRAL WOUND
49		
50		

LINE	PART	MATERIAL
CHANNEL		
	COVER/HEAD	SA-516-70N △
2	TEMA FLANGE	SA-350-LF2
3	CYLINDER	SA-516-70N △
4	NOZZLE FLANGE	SA-350-LF2
5	NOZZLE NECK	SA-266-4N&IT △
6	NOZZLE REINFORCEMENT PAD	---
7	COUPLING/THREDOLET/PLUG	---
8	PASS PLATE	SA-516-70N △
9	STUDBOLTS	SA-193-B7
10	NUTS	SA-194-2H
11		
12		
SHELL		
13	TEMA FLANGE	SA-105N
14	CYLINDER	SA-516-70N
15	COVER/HEAD	SA-516-70N
16	CONE	---
	NOZZLE FLANGE	SA-105N
18	NOZZLE NECK	SA-106-B
19	NOZZLE REINFORCEMENT PAD	SA-516-70N
20	COUPLING/THREDOLET/PLUG	---
21	SUPPORT WRAPPER PLATE	---
22	SUPPORT	SA-516-70N
23	STUDBOLTS	SA-193-B7
24	NUTS	SA-194-2H
25		
26		
27		
FLOATING HEAD		
28	FLANGE	---
29	DISH	---
30	PASS PLATE	---
31	STUDBOLTS	---
32	NUTS	---
33		
34		
35		
36		

MATERIAL NOTES

ALBERTA BOILERS SAFETY ASSOCIATION
PROVINCE OF ALBERTA
SAFETY CODES ACT

A 3575.32

REG. No. _____
 DWG. No. 97-1691 A/B

Design Press. kPa	Design Temp. °C
S.S. 2399	0/220
T.S. 14940	6/220

ACCEPTED

Yr. 98 Mo. 01 Day 19 Signed *[Signature]*
 B. C. Dezel, P. Eng.
 Design Survey Engineer

REVISIONS
△ PER CUST. APPV'L & FAX SEP/29/97

MATERIALS & DESIGN CONDITIONS

NO. OF EXCHANGERS REQ'D: TWO

DWN TDW | CKD GG | ITEM E-301A/B

EXCHANGER INDUSTRIES
 CALGARY, ALBERTA

DWG NO. 97-1691A/B

SHEET 1B OF 15