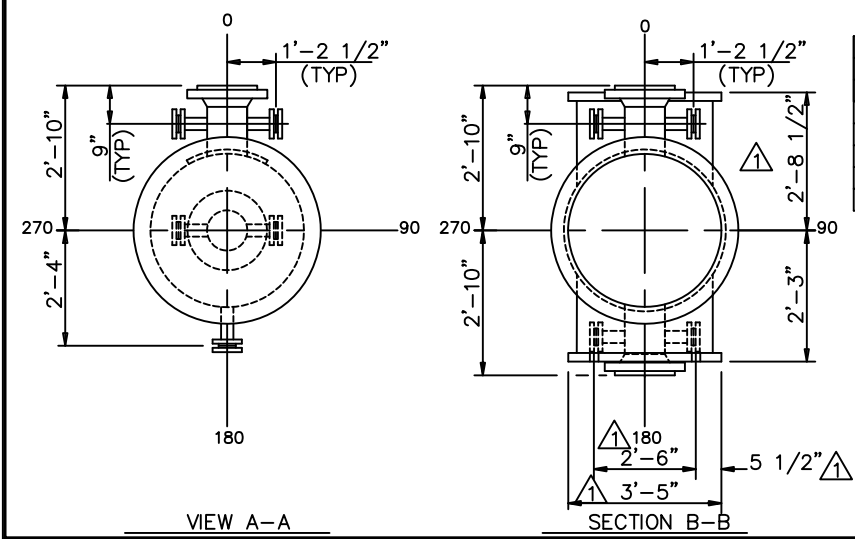
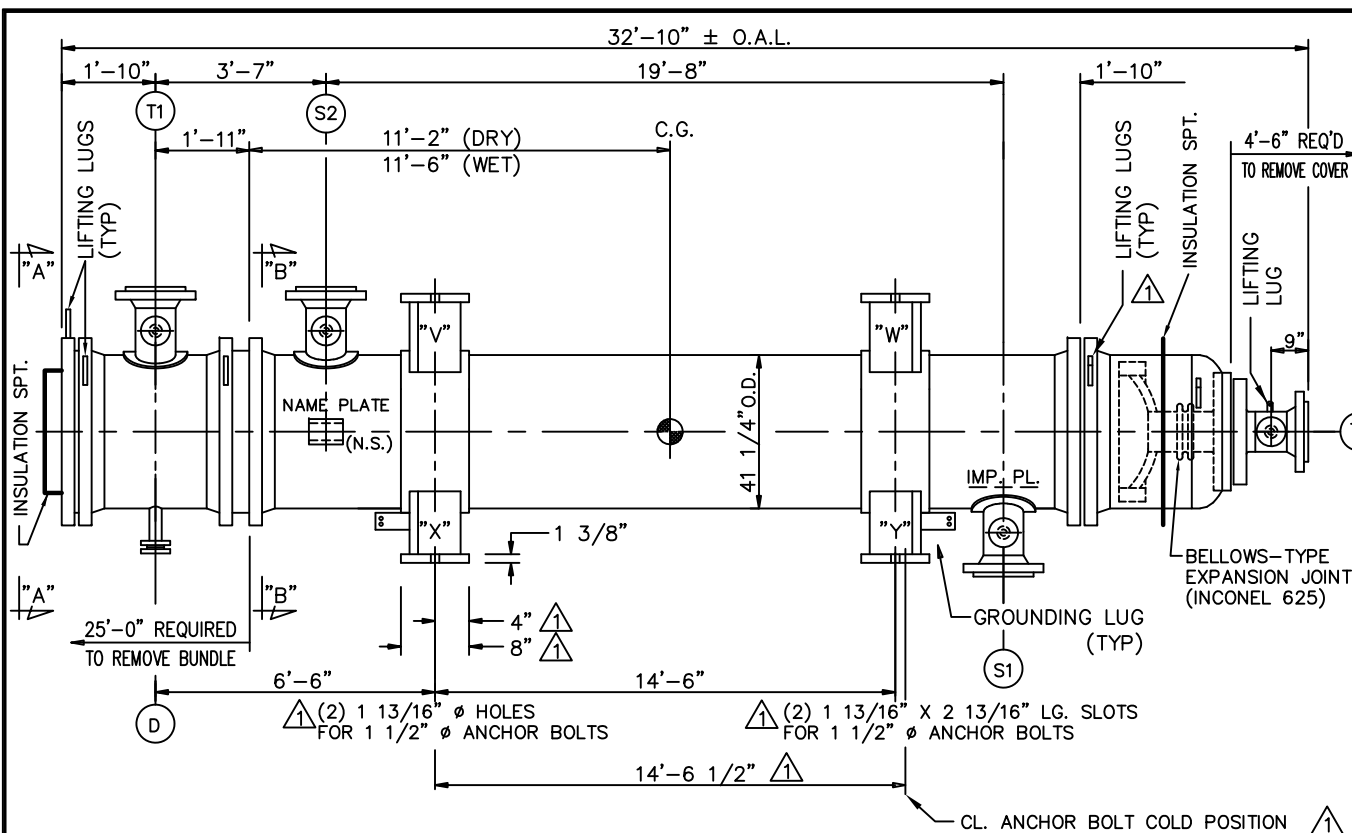




NOZZLE SCHEDULE				
MK	QT	DESCRIPTION	PROCESS	AUXILIARIES
S1	1	14" 300# RF WN	INLET	*
S2	1	14" 300# RF WN	OUTLET	*
T1	1	14" 300# RF WN	INLET	*
T2	1	14" 300# RF WN	OUTLET	*
D	1	2" 300# RF LWN	DRAIN	w/ BLIND FLANGE
* (2) 2" 300# RF LWN w/ BLIND				

CERTIFIED CORRECT FOR FABRICATION

BY: _____ DATE: _____

1			
2	11/5/09	REV'D. AS NOTED PER CUST.	DH/DM
3	9/14/09	REV'D. PER EEC	SM/DM
NO.	DATE	REVISIONS	

DESIGN DATA	SHELL	TUBE
DESIGN PRESSURE PSIG	440	335
VACUUM PRESSURE PSIG	FV AT 350°F	FV AT 350°F
SHOP TEST PRESSURE PSIG	610	470
FIELD TEST PRESSURE PSIG	605	470
M.A.W.P. (H & C) PSIG	463	360
LIMITED BY	FLOATING HEAD	CHANNEL COVER
M.A.W.P. (N & C) PSIG	466	360
LIMITED BY	BODY FLANGE	CHANNEL COVER
DESIGN TEMP. Deg.F.	360	500
MDMT Deg. F.	-20	-20
CORROSION ALLOWANCE	1/8"	1/8"
NUMBER OF PASSES	1	1
RADIOGRAPHY	FULL RT-1	FULL RT-1
HEAT TREAT REQUIRED	YES	YES

ESTIMATED WEIGHTS, LBS.		
DRY: 40000	BUNDLE: 22500	WET: 54600

SPECIFICATIONS
 ASME CODE SECTION VIII, DIVISION 1, 2007 ED., 2008 ADD. (STAMP: YES).
 TEMA CLASS R, API-660, FRONTIER FEP AND BURNS & McDONNELL
 SPECIFICATIONS APPLY
 NATIONAL BOARD REGISTRATION REQUIRED.

MATERIAL		
CHANNEL:	SA-516-70N (HIC)	FLTG HD CVR: SA-516-70N (HIC)
SHELL:	SA-516-70N (HIC)	SHELL CVR: SA-516-70N (HIC)
TUBESHEETS:	SA-350-LF2 CL1	CHAN. CVR: SA-350-LF2 CL1
BAFFLES:	SA-516-70	EXP. JT.: INCONEL 625 LCF GR 1
TUBES:	SA-179	NOTE: ALL CARBON STEEL MATERIAL IN CONTACT WITH PROCESS FLUIDS SHALL BE HIC RESISTANT AND FULLY KILLED

GENERAL NOTES
 ALL BOLT HOLES TO STRADDLE NATURAL CENTER LINES.
 INSULATION: 4" BOTH SIDES (BY OTHERS)
 GASKETS: GIRTH FLANGES 1/8" CS CMGC
 INTERNAL GASKETS: 1/8" CS CMGC
 (2) SPARE SETS OF GASKETS REQUIRED & 10% SPARE BOLTING
 TUBE-TUBESHEET JOINT: STRENGTH WELDED & ROLLED
 PAINT: SEE PAINT MAP DWG X-7704-A2
 THIS ITEM X-7704 (20-E-0825 A) IS THE BOTTOM SHELL OF A STACK OF 3 EXCHANGERS. SEE DRAWING X-7706-A2 FOR STACKING ARRANGEMENT
 SHELLSIDE AND TUBESIDE OF EXCHANGER IS IN AES SERVICE (FEP 10-2-1 AND FEP 10-2-3)

CUSTOMER: FRONTIER REFINING, INC. c/o BURNS & McDONNELL
 P.O. NO.: 090065PO
 ITEM NO.: 20-E-0825 A
 SERVICE: SECOND STAGE REACTOR FEED/EFFLUENT EXCHANGER
 SHIP TO: CHEYENNE, WYOMING

ASSEMBLY AND SPECIFICATIONS FOR

ONE 40-288 A E T



Energy Exchanger
 1844 No. Garnett Rd. • Tulsa, Okla. 74116

DWN. BY DN	DATE 8-12-09	CKD. BY MD
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DWG. NO.	REV
X-7704-A	2