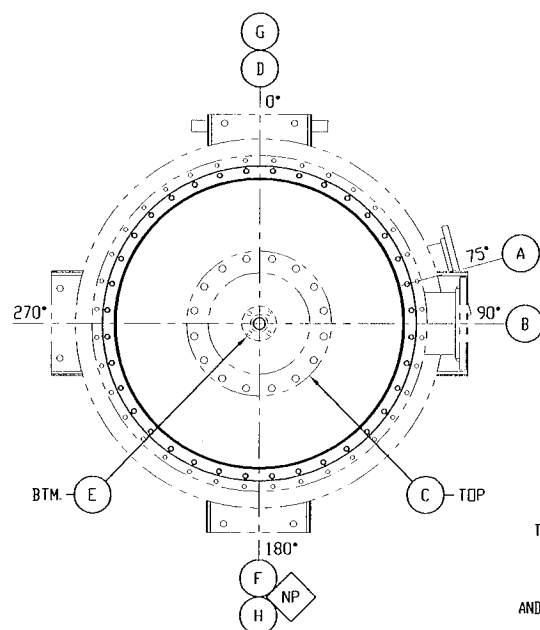
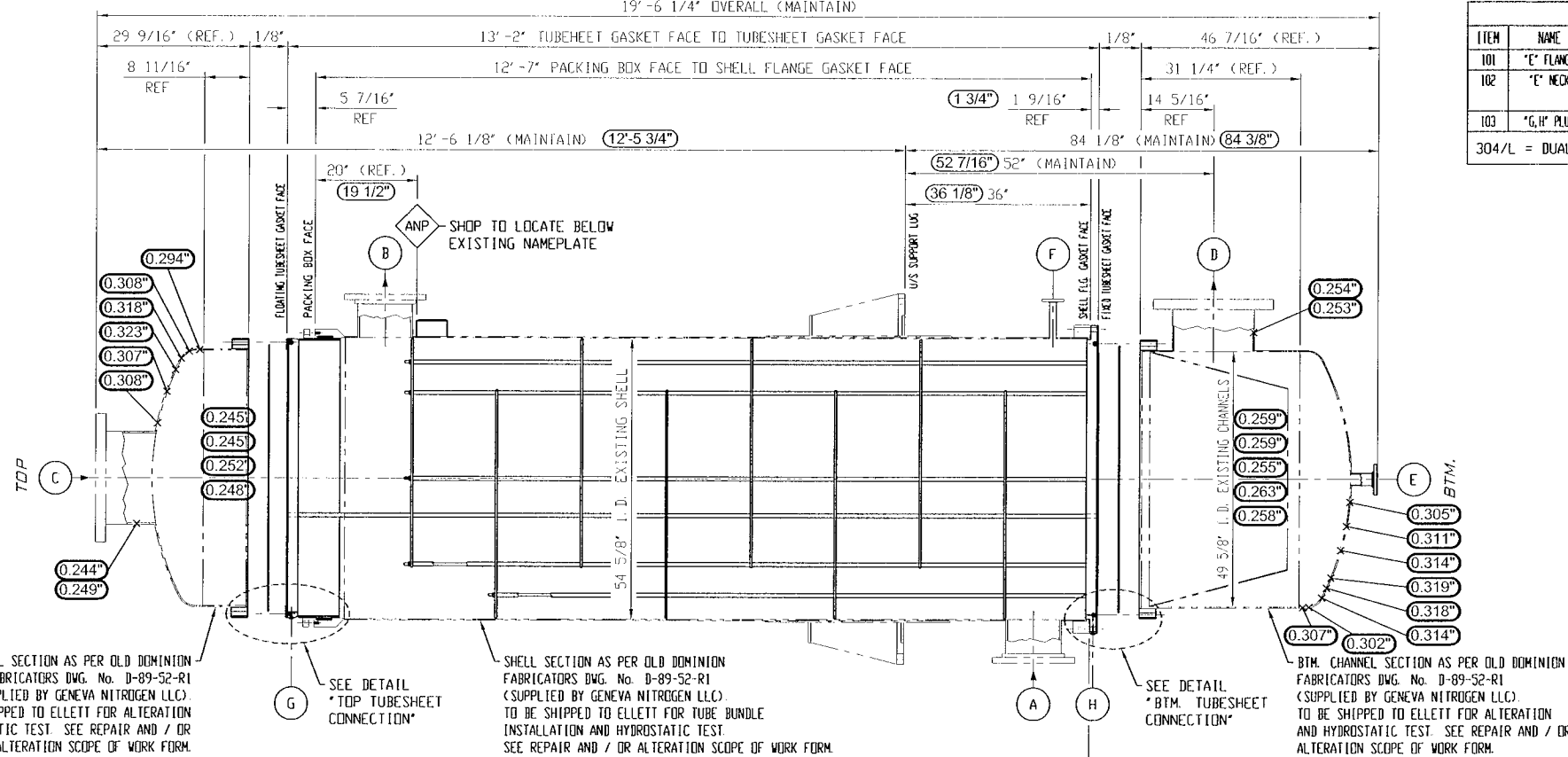


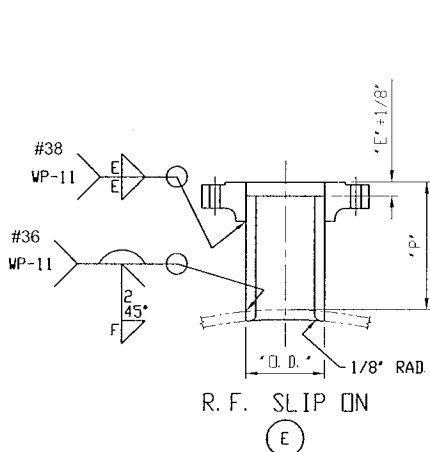


PLAN
TRUE ORIENTATION

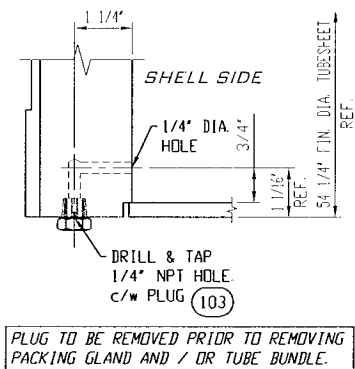


ELEVATION
SCALE: 3/4" = 1'-0"

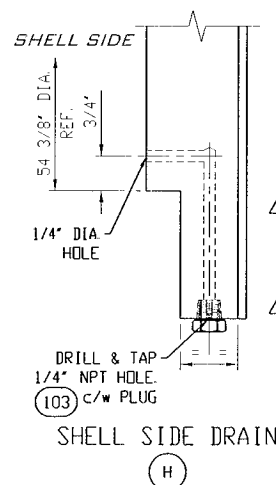
REPLACEMENT UNIT, MAINTAIN DIMENSIONS.



R. F. SLIP ON



SHELL SIDE VENT



SHELL SIDE DRAIN

In accordance with

N. B. N. (TUBE BUNDLE) 659

R NUMBER (CHANNELS) 2

1) ASME Section VIII, Div. 1, 2004 Edition
2) Registration: National Board (S/S); Repair and Alteration (T/S)
3) TEMA Class "C"
4) Customer's Specification: ERS SPECIFICATION No. 2005-09-HE-001 (Rev. 1)
5) Customer's Drawings: OLD DOMINION FABRICATORS INC. No. 01-89-52-R1

1) Shell side data report and National Board Number required.
Tube side repair and alteration, "R" Number required.

2) Pre-1999 Addenda allowable stresses used.

Design Pressure Internal	75 psig	50 psig
Design Pressure External	-	-
Design Temperature	100°F	400°F
Corrosion Allowance	0.0625"	0.045" (EXCLUDING TUBES)
Type of Heads	-	F & D
Stress Relief	-	-
Radiograph	SPOT UW-11(b), U-11(a) on Item #301	SPOT UW-11(b)
Joint Efficiency	1.0 UW-12(a)	0.85 UW-12(b)
Hydrostatic Test Pressure	113 psig	86 psig
Hydrostatic Test Temperature	60°F - 100°F	60°F - 100°F
M.A.W.P.	75 psig @ 100°F	50 psig @ 400°F
Minimum Design Metal Temp.	-20°F @ 75 psig	-20°F @ 50 psig
No Impact Test Per	UAS-5(d)(1)(a), UNF-65	UAS-5(d)(1)(a), UNF-65
Number of Passes	1	1
Contents	COOLING WATER	PROCESS GAS
Specific Gravity of Contents	1.0	1.0

1) SHELL: 1/4" THK. - SA-240-304L
2) CHANNELS: 0.250" NOM. THK. - SA-240-304L
3) CHANNEL HEADS: 0.250" MIN. THK. F & D HEAD - SA-240-304L.

- 1) All bolt holes shall straddle major centre lines.
- 2) Clean and drain before shipment.
- 3) All welds shall be made using approved welding procedures.
- 4) No splatter or arc strikes on unit.
- 5) No centre punch marks on unit.

- 1) Surfaces exposed to exchanger contents, if vapor, or condensate, shall be free of gouges, deep scratches, pits, cracks or other surface defects. Shop shall avoid crevices, holes, pockets, weld craters, depressions, etc.
- 2) Test gaskets for shop fabricated flanges and all flanges larger than 18" shall be of the same size, material and type as the service gaskets.
- 3) The water used for hydrostatic testing shall be clean tap water with chloride content not to exceed 150 ppm. Following the hydrotest, the water shall be drained and the exchanger dried.
- 4) Threads of external studs and nuts shall be lubricated with a high temperature thread lubricant such as FUL-PROD C-102.
- 5) All flange face and machined surfaces shall be coated with an easy removable rust preventative such as RUST-BAN 326.
- 6) All openings shall be covered securely with blind flanges or plugs of suitable design, and the unit shall be made air tight for shipment.

1) The P.O. No., Equip. No., and the shipping weight shall be prominently marked with paint in legible block letters (at least 3 inches high) on the side of the exchanger

2) Stamp on outer edge of tubesheets: 659 CERTIFIED BY
PART S. N. 43624
YEAR 2006

2908 SQ. FT.

WEIGHTS

Tube Bundle Assembly:	10,972 LBS.	
Complete Unit - Empty:	16,740 LBS. (SCALED)	

Tube Bundle Assembly:	10,972 LBS.	
Complete Unit - Empty:	16,740 LBS.	(SCALED)

D	16"	1	150	FFSD	TUBE SIDE - OUTLET	-
C	18"	1	150	FFSD	TUBE SIDE - INLET	-
B	10"	1	150	FFSD	SHELL SIDE - OUTLET	-
A	10"	1	150	FFSD	SHELL SIDE - INLET	-
MK.	SIZE	NO	RTG FLANGE	TYPE	SERVICE	REMARKS
EXISTING SHELL / CHANNEL NOZZLES (SHOWN FOR REF. ONLY)						

EXISTING SHELL / CHANNEL NOZZLES (SHOWN FOR REF. ONLY)

H	1/4"	1	3000	NPT	-	-	-	-	-	-	-	-	-	-	-	-	SHELL SIDE - DRAIN	C/W PLUG	103
G	1/4"	1	3000	NPT	-	-	-	-	-	-	-	-	-	-	-	-	SHELL SIDE - VENT	C/W PLUG	103
E	2"	1	150	RFSD	101	2 3/8"	90 DEG	102	-	-	-	-	-	-	1/4"	1/4"	TUBE SIDE - DRAIN	-	
MK	SIZE	NO	RTG	TYPE	ITEM	O. D.	P. ITEM	MIN. ITEM	THK.	WID. ITEM	R	E	F				SERVICE	REMARKS	
				FLANGE			NECK	LAP RING		RE-PAID			WELD						

SCHEDULE OF NOZZLES

ALL GASKET FACES: 125-250 RMS, SPIRAL SERRATION (U. N. D.)

 AS BUILT LEGEND

 - AS BUILT

t - THICKNESS

--- - WELDERS MAP (IDENTIFICATION)

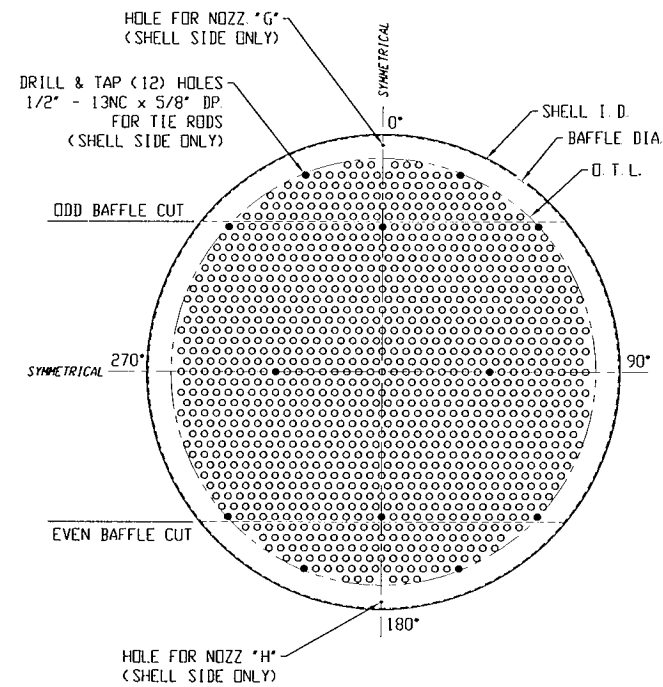
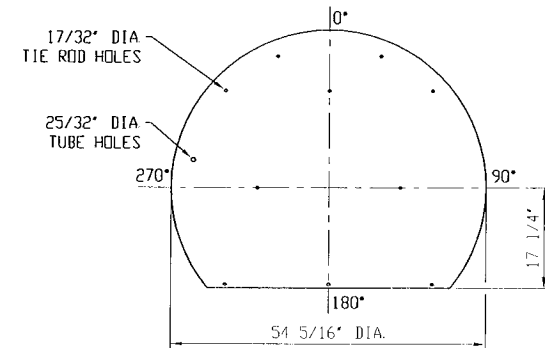
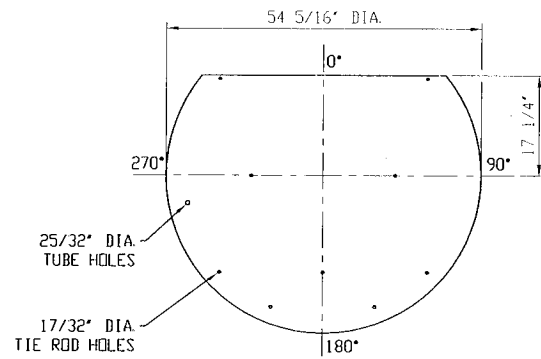
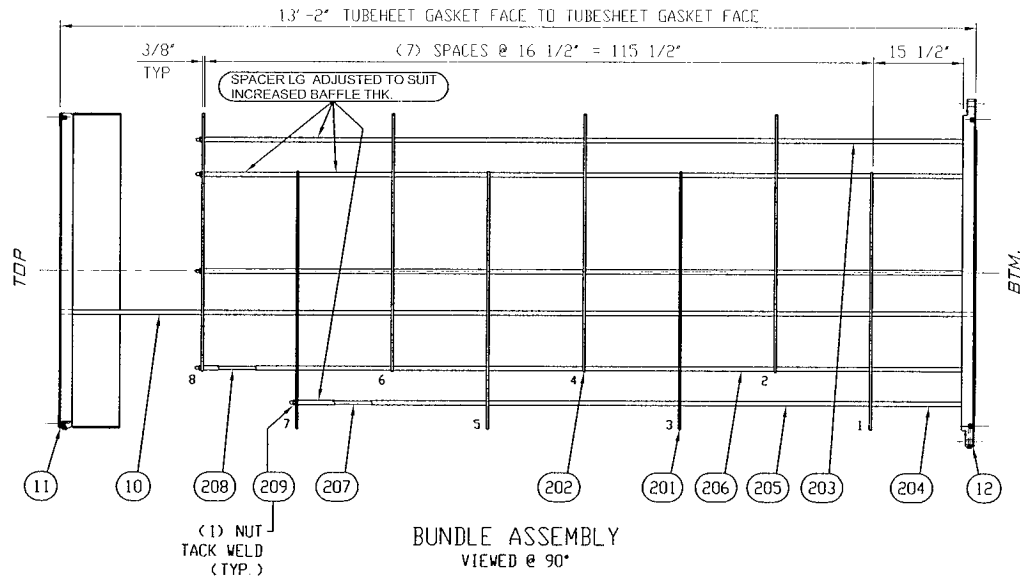
THIS DRAWING MUST BE WORKED IN CONJUNCTION WITH
THE REPAIR AND/OR ALTERATION SCOPE OF WORK FORM.

CERTIFIED
AS
BUILT
DATE: 08/21/06
SIGNED: *[Signature]*

CERTIFIED
FOR
CONSTRUCTION
DATE: 02/08/06
SIGNED: *RL*

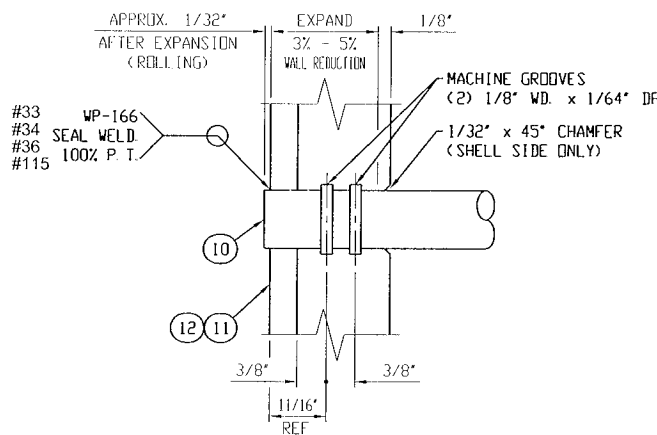
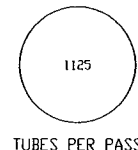
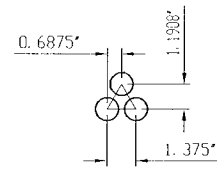
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A	02/08/06	C.O.	AS NOTED / CERTIFIED FOR CONSTRUCTION
REV.	DATE	BY	REVISIONS
CUSTOMER PURCHASE ORDER No:			THIS DRAWING IS COPYRIGHTED AND IS THE PROPERTY OF ELLETT INDUSTRIES LTD.. THE INFORMATION THEREIN MAY NOT BE USED IN LENT, NOR REPRODUCED WITHOUT WRITTEN PERMISSION.
2156			
GENEVA NITROGEN LLC			3" DIA. 11' CUTLER CEMENTER TUBE BUNDLE REPLACEMENT / CHANNEL ALTERATION
PROJECT: MONTICATI NITRIC ACID PLANT OREM, UTAH, U.S.A.			
EQUIP NO: E-388			
 ELLETT Industries Ltd. - Port Coquillam, B.C.			
ELLETT JOB No	DRAWN: C.O. #2 DATE: 01/05/06	SCALE: N.T.S. U.N.D.	DRAWING NUMBER
43624	CHECKED: A.S.K. DATE: 01/14/06		H4-1908-1
	APPROVED: B.S. DATE: 02/23/06		SHEET 1 OF 3
			REV. B

Parts List				
ITEM	NAME	QTY	DESCRIPTION	MATERIAL
10	TUBES	1125	3/4" O.D. x 16 BWG (0.065") AVG. WALL TUBE x 158" LG., TUBES SHALL BE ULTRASONIC TESTED	SB-523 R60702 SMLS (ANL)
201	ODD BAFFLE	4	3/8" x 44 7/16" x 54 5/16"	304/L S.S.T'L
202	EVEN BAFFLE	4	3/8" x 44 7/16" x 54 5/16"	304/L S.S.T'L
203	SPACER	2	3/4" O.D. x 16 BWG TUBE x 32" LG.	304/L S.S.T'L
204	SPACER	10	3/4" O.D. x 16 BWG TUBE x 15 1/2" LG.	304/L S.S.T'L
205	SPACER	12	3/4" O.D. x 16 BWG TUBE x 32 5/8" LG.	304/L S.S.T'L
206	SPACER	56	3/4" O.D. x 16 BWG TUBE x 16 1/8" LG.	304/L S.S.T'L
207	TIE ROD	2	1/2" DIA. R/BAR x 116 1/2" LG.	304/L S.S.T'L
208	TIE ROD	10	1/2" DIA. R/BAR x 133" LG.	304/L S.S.T'L
209	TIE ROD NUT	12	1/2" - 13NC HEX NUT	304/L S.S.T'L



LAYOUT DATA

TUBE HOLES	Quantity: 1125
Tube Dia: 3/4"	
Hole Dia: 0.758" ±0.002	
Pattern: TRIANGULAR	
Pitch: 1 3/8"	
Passes: 1	
TIE RODS	Quantity: 12
Diameter: 1/2"	
LAYOUT	
Shell I.D.: 54 5/8"	
O.T.L.: 49.0906"	
Baffle Dia: 54 5/16"	
BAFFLES	
Type: SGL SEG	
Rotation: -	
Cut: 18.4%	



- TUBE TO TUBESHEET INSTALLATION PROCEDURE
- 1) ROLL EXPAND 3% - 5% WALL REDUCTION
 - 2) SEAL WELD
 - 3) P.T. INSPECT PER UNF-58(b)
 - 4) TUBE WALL REDUCTION CALCULATIONS ARE REQUIRED ON THE FIRST FIVE (5) TUBES AND A RANDOM CHECK OF 10% OF THE TOTAL TUBES. DOCUMENTATION OF TUBE WALL REDUCTION TESTING IS REQUIRED

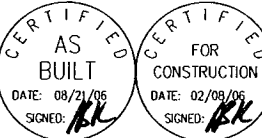
TUBE TO TUBESHEET (TYP.)

AS BUILT LEGEND

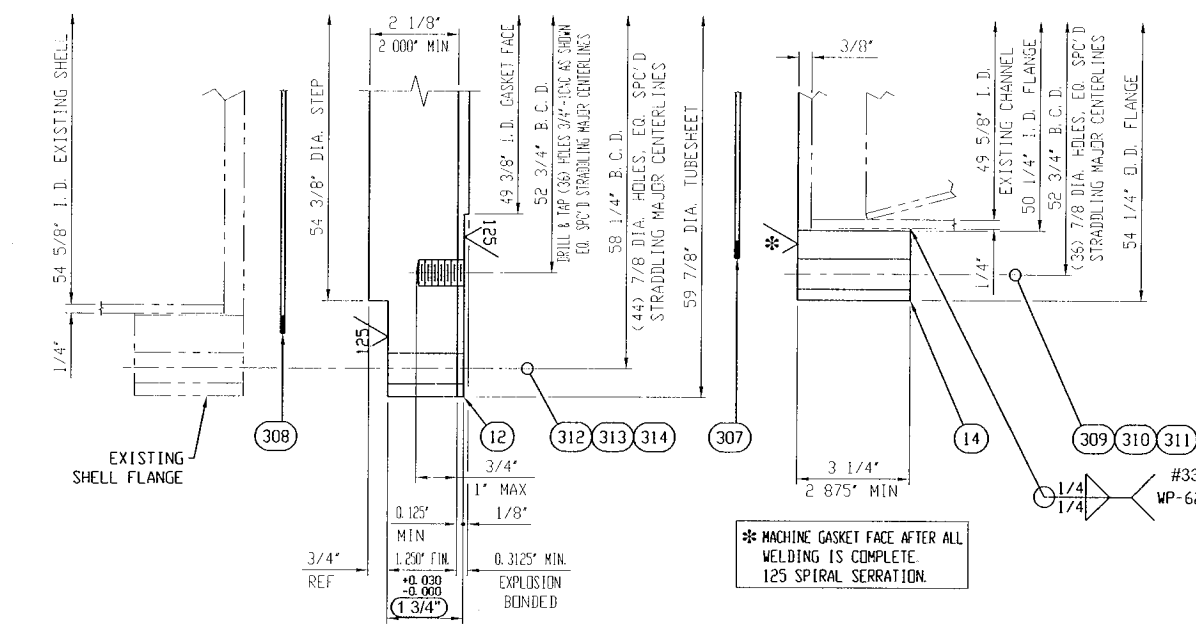
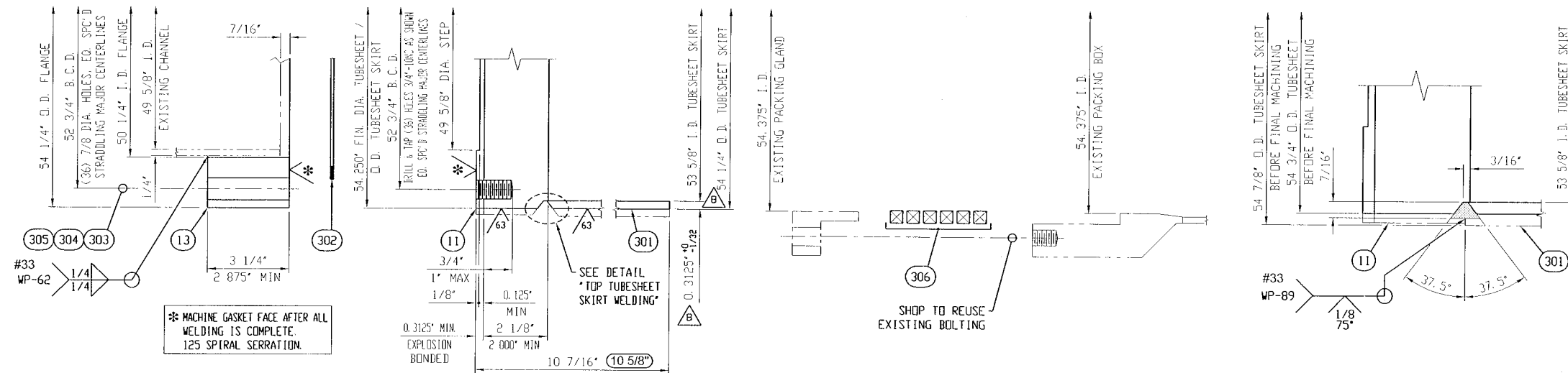
AS BUILT

WELDERS MAP (IDENTIFICATION)

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B	08/21/06	A.S.K.	AS NOTED / AS BUILT LEGEND ADDED / CERTIFIED AS BUILT
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REV.	DATE	BY	REVISIONS
CUSTOMER PURCHASE ORDER No: 2156			
THIS DRAWING IS COPYRIGHTED AND IS THE PROPERTY OF ELLETT INDUSTRIES LTD.. THE INFORMATION THEREIN MAY NOT BE USED, LENT, NOR REPRODUCED WITHOUT WRITTEN PERMISSION.			
GENEVA NITROGEN, INC. 54 5/8" O.D. COOLER CONDENSER TUBE BUNDLE REPLACEMENT / CHANNEL ALTERATION			
PROJECT: MONTECATINI NITRIC ACID PLANT DREM, UTAH, U.S.A.			
EQUIP No.: E-388			
ELLETT Industries Ltd. - Port Coquitlam, B.C.			
ELLETT JOB No.	DRAWN: C.D.	DATE: 01/05/06	SCALE: N.T.S.
43624	CHECKED: A.S.K.	DATE: 01/14/06	DRAWING NUMBER: H4-1908-2
	APPROVED: [Signature]	DATE: 01/23/06	SHEET 2 OF 3



Parts List				
ITEM	NAME	QTY	DESCRIPTION	MATERIAL
11	TOP TUBESHEET	1	2 1/8" (2.000" MIN.) x 54 3/4" NOM. DIA. (54.250" FIN. DIA.), c/w 0.3125" MIN. EXPLOSION BONDED CLADDING (SB-551 R60702 (ANV.))	SA-240-304/L
12	BTM. TUBESHEET	1	2 1/8" (2.000" MIN.) x 59 7/8" FIN. DIA., c/w 0.3125" MIN. EXPLOSION BONDED CLADDING (SB-551 R60702 (ANV.))	SA-240-304/L
13	TOP CHANNEL FLANGE	1	3 1/4" (2.875" MIN.) x 54 1/4" FIN. O.D. x 50 1/4" FIN. I.D.	SA-182-F304/L
14	BTM. CHANNEL FLANGE	1	3 1/4" (2.875" MIN.) x 54 1/4" FIN. O.D. x 50 1/4" FIN. I.D.	SA-182-F304/L
301	TOP TUBESHEET SKIRT	1	5/8" x 170 7/16" x 8 3/16" (INCL. TRIM) (ROLL TO 53 5/8" I.D.)	SA-240-304/L
302	TOP CHANNEL GASKET	1	1/8" x 51 7/8" O.D. x 50 7/8" I.D.	GYLON BLUE GUARD 3400
303	TOP CHANNEL STUDS	36	3/4" - 10NC x 5 3/4" LG. STUDS	SA-193-B8 CL. 1
304	TOP CHANNEL NUTS	36	3/4" - 10NC HEAVY HEX NUTS	SA-194-8
305	TOP CHANNEL WASHERS	36	3/4" SAE FLAT WASHERS	S.S.T'L
306	PACKING	6	1/2" SQ. x 173" LG.	TEFLON IMPREGNATED WOVEN ROPE
307	BTM. CHANNEL GASKET	1	1/8" x 51 7/8" O.D. x 50 7/8" I.D.	GYLON BLUE GUARD 3400
308	SHELL GASKET	1	1/8" x 56 1/4" O.D. x 55 1/4" I.D.	GYLON BLUE GUARD 3400
309	BTM. CHANNEL STUDS	36	3/4" - 10NC x 5 3/4" LG. STUDS	SA-193-B8 CL. 1
310	BTM. CHANNEL NUTS	36	3/4" - 10NC HEAVY HEX NUTS	SA-194-8
311	BTM. CHANNEL WASHERS	36	3/4" SAE FLAT WASHERS	S.S.T'L
312	BTM. TUBESHEET STUDS	44	3/4" - 10NC x 7" LG. STUDS	SA-193-B8 CL. 1
313	BTM. TUBESHEET NUTS	88	3/4" - 10NC HEAVY HEX NUTS	SA-194-8
314	BTM. TUBESHEET WASHERS	88	3/4" SAE FLAT WASHERS	S.S.T'L
315	"ANP" BRACKET	1	3/16" x 3" x 5 1/2"	SA-240-304/L
316	"ANP" BRACKET	1	3/16" x 7" x 5 1/2"	S.S.T'L
317	"ANP" NAMEPLATE	1	STD. ELLETT NAMEPLATE (ALTERATION)	S.S.T'L

304/L = DUAL CERTIFICATION REQUIRED

AS BUILT LEGEND
 - AS BUILT
 # - WELDERS MAP (IDENTIFICATION)

THIS DRAWING MUST BE WORKED IN CONJUNCTION WITH THE REPAIR AND / OR ALTERATION SCOPE OF WORK FORM.

CERTIFIED AS BUILT
 DATE: 08/21/06
 SIGNED: [Signature]

CERTIFIED FOR CONSTRUCTION
 DATE: 02/08/06
 SIGNED: [Signature]

REV.	DATE	BY	REVISIONS
B	08/21/06	A.S.K.	AS NOTED / AS BUILT LEGEND ADDED / CERTIFIED AS BUILT
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CUSTOMER PURCHASE ORDER No: 2156			
GENEVA NITROGEN, LLC			
PROJECT: MONTECATINI NITRIC ACID PLANT, DREH, UTAH, U.S.A.			
EQUIP No: E-388			
ELLETT Industries Ltd. - Port Coquitlam, B.C.			
ELLETT JOB No	DRAWN	DATE	SCALE
43624	C.O. 2/1/06	01/06/06	N.T.S.
	CHECKED	DATE	
	A.S.K.	01/04/06	
	APPROVED	DATE	
	[Signature]	08/23/06	
	ENGINEER		
DRAWING NUMBER	REV.		
H4-1908-3	B		
SHEET 3 OF 3			