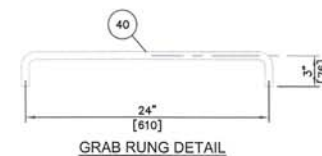
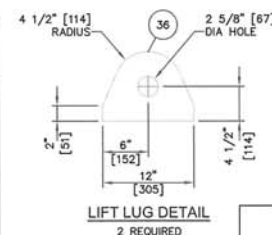
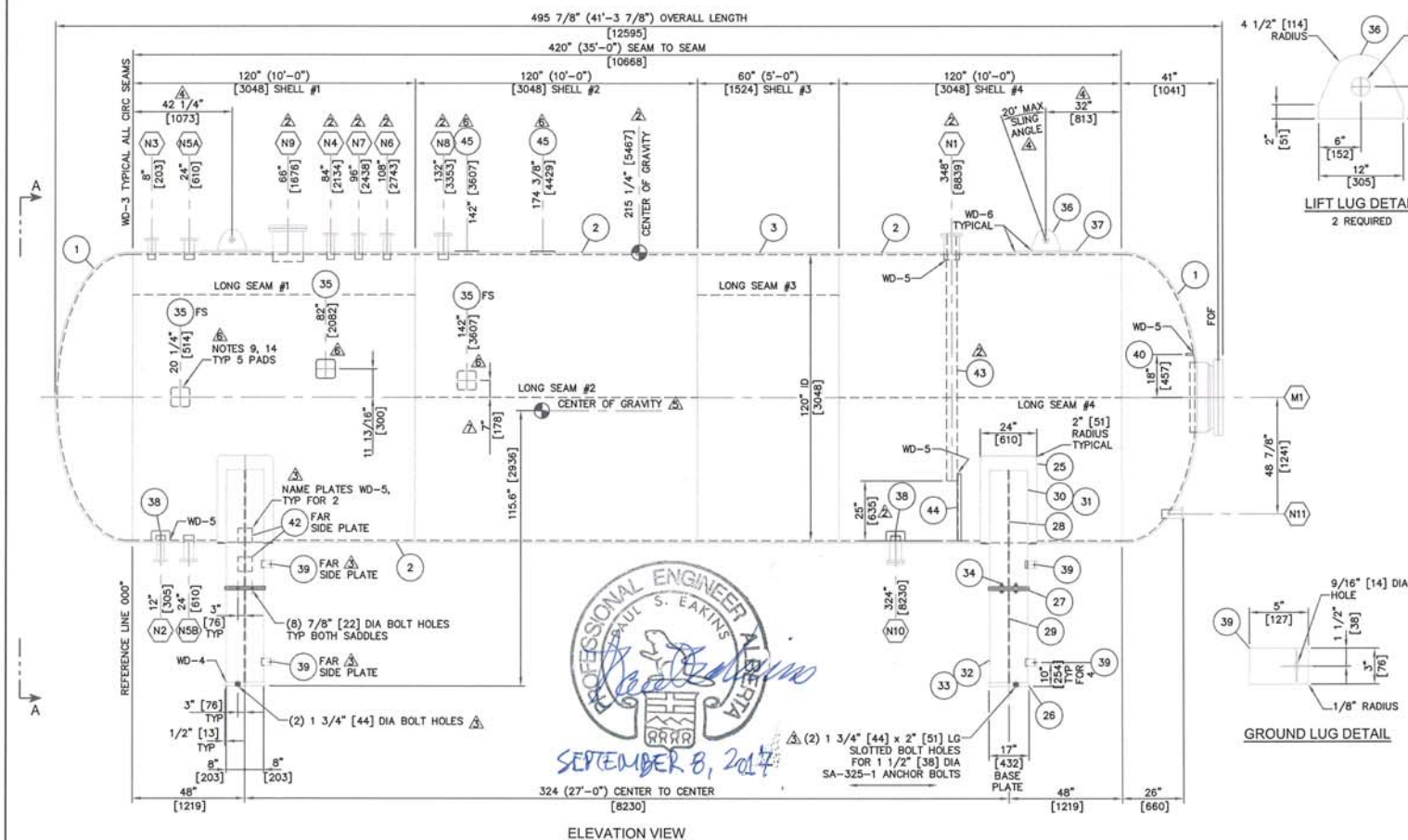
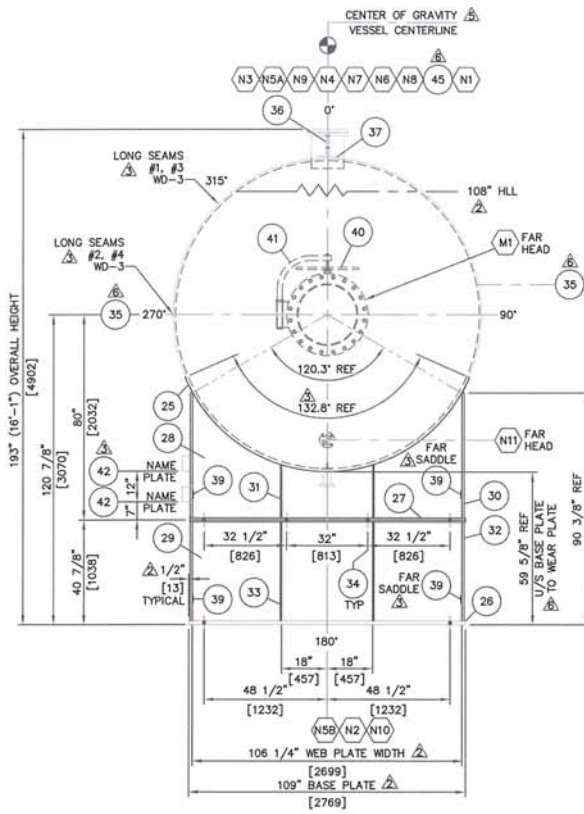


CONNECTION SCHEDULE												
MARK	QTY	SIZE	SCH	CLASS & TYPE	SERVICE	MINIMUM PROJECTION		WELD SIZE			WELD DETAIL	BOM ITEM NO.
						INSIDE	OUTSIDE	A	B	C		
N1	1	4"	1.31"	150 RF HB	INLET	—	8"	3/8"	—	—	2	10
N2	1	2"	.53"	150 RF LWN	OUTLET c/w VORTEX BREAKER	FLUSH	8"	3/8"	—	—	1	5
N3	1	2"	.53"	150 RF LWN	EQUALIZATION LINE	—	8"	3/8"	—	—	2	6
N4	1	2"	.53"	150 RF LWN	NITROGEN PURGE	—	8"	3/8"	—	—	2	6
NSA, NSB	2	3"	.62"	150 RF LWN	LG	1 1/8"	8"	3/8"	—	—	2	8
N6	1	3"	.62"	150 RF LWN	PSV	1 1/8"	8"	3/8"	—	—	2	8
N7	1	2"	.53"	150 RF LWN	PIT	—	8"	3/8"	—	—	2	6
N8	1	2"	.53"	150 RF LWN	PG	—	8"	3/8"	—	—	2	6
N9	1	10"	1.63"	150 RF HB	VENT c/w BLIND	3/8"	10"	3/8"	—	—	2	11, 15, 20, 21
N10	1	3"	1.02"	150 RF HB	DRAIN c/w BLIND	FLUSH	8"	3/8"	—	—	1	9, 14, 18, 19
N11	1	2"	.88"	150 RF HB	PURGE	—	AS SHOWN	3/8"	—	—	2	7
M1	1	24"	2.63"	150 RF V2	MANWAY c/w BLIND AND DAMT	1 1/4"	AS SHOWN	3/8"	—	—	2	12, 16, 22, 23



CANADIAN REGISTRATION NUMBER				
7	17-09-05	ASBUILT	4	CS
6	17-06-11	ADD ITEMS 35, 45 SUPPORT PADS	4	PJD...
5	17-06-08	ADD SUPPORT PAD, COG	4	PJD...
4	17-06-03	REVISE LOCATION, WELD, ANGLE OF LIFT LUGS	4	PJD...
3	17-05-24	REVISE WD-6, NOTE 13, ADD WEAR PL ANGLE	3	PJD...
2	17-04-27	REVISED, ISSUED FOR APPROVAL	2	CF
1	17-03-15	REVISED, ISSUED FOR APPROVAL	1	PJD...
0	17-03-14	REVISED, ISSUED FOR APPROVAL	0	PJD...
REV BY	DATE	REVISION	CALC REV	BY
CLIENT:				
DATE: 17-03-08 AQUEOUS AMMONIA BULLET (116G-8000)				
JOB NO: V-17090 120" ID x 35'-0" S/S				
DRAWN BY: LC 150 PSIG / FV AT -49" F / 140" F				
CHECKED BY: PJD... DWG NO: SHEET 1 OF 2				
APP BY: JT 5166				



REORIENTATION VIEW A-A

### DESIGN NOTES

DESIGN & FABRICATE TO: ASME SECTION VIII, DIVISION 1, 2015 EDITION  
MAXIMUM ALLOWABLE WORKING PRESSURE - INTERNAL: 150 PSIG [1034 kPaG]  
- EXTERNAL: 15 PSIG [103 kPaG]

DESIGN TEMPERATURE: 140 °F [60°C]  
MINIMUM DESIGN METAL TEMPERATURE (MDMT): -49 °F [-45°C] AT 150 PSIG [1034 kPaG]  
IMPACT TESTS: EXEMPT PER UCS-66b, UCS-66g, UCS-68c, STUDS PER FIG UCS-66 NOTE C.  
PRODUCTION IMPACT TESTS ARE NOT REQUIRED BECAUSE FILLER METALS AND BASE METALS ARE EXEMPT PER UCS-67a3 AND FILLER METALS HAVE BEEN CLASSIFIED BY THEIR MANUFACTURER THROUGH IMPACT TESTING PER THE APPLICABLE SFA SPECIFICATION AT THE MDMT.

IF IMPACT TESTS ARE REQUESTED BY CLIENT (NOTE G): HEAD AND SHELL MATERIAL SHALL BE IMPACT TESTED PER UG-84d AT -49 °F. THE AVERAGE IMPACT ENERGY SHALL BE 15 FT-LBS (10 FT-LBS MIN). VESSEL (PRODUCTION) IMPACT TESTS OF CATEGORY A AND B WELDS IN THIS MATERIAL SHALL BE PER UG-84d AT -49 °F. THE AVERAGE IMPACT ENERGY SHALL BE 15 FT-LBS (10 FT-LBS MIN).

PWMT PER UCS-56: YES, 1150°-1200° F [621°-648° C] FOR 1 HOUR MINIMUM AFTER PWMT VESSEL SHALL HAVE THE FOLLOWING STENCILED ON BOTH SIDES IN 6\"

RADIOGRAPHY: FULL PER UW-11a (RT-1), BEFORE AND AFTER PWMT

JOINT EFFICIENCY - LONG SEAMS AND CIRC SEAMS: 100%  
ULTRASONIC: 100% NOZZLE TO SHELL WELDS AND ALL NOZZLE WELDS, BEFORE AND AFTER PWMT

MPI: 100% BEVELLED EDGES AND BACK GOUNGED AREAS BEFORE WELDING BEFORE AND AFTER PWMT, 100% MPI (WMT) ALL PROCESS WETTED WELDS (INCLUDING INTERNAL WELDS), AREAS OF TEMPORARY ATTACHMENTS, SADDLES TO VESSEL WELDS, ALL EXTERNAL AND INTERNAL ATTACHMENT WELDS INCLUDING REINFORCING PADS AND NOZZLE WELDS BETWEEN NOZZLE AND REINFORCING PAD, ALL LIFT LUG ATTACHMENT WELDS.

HARDNESS TEST: BRINELL HARDNESS TEST PER ASTM A833 (BM, WM, HAZ) ONE ON EACH CIRCUMFERENTIAL WELD, ONE ON EACH LONGITUDINAL WELD, NOZZLE NECK AND NOZZLE ATTACHMENT WELD AND EACH REPRESENTATIVE INTERNAL ATTACHMENT WELD, ON INTERNAL AND EXTERNAL SURFACE OF THE WELD, WHERE ACCESSIBLE (AFTER PWMT - MAX HBW 200, MIN HBW 140).

HYDROSTATIC TEST PRESSURE: 195 PSIG [1344 kPaG] PER UG99(b) DURATION 1 HOUR

CORROSION ALLOWANCE: 1/8\"

FABRICATION WEIGHT: 60,436 LBS [27,414 KG]

ERECTION WEIGHT: 60,436 LBS [27,414 KG]

EMPTY WEIGHT: 60,436 LBS [27,414 KG]

OPERATING WEIGHT: 181,818 LBS [82,473 KG]

TEST WEIGHT: 249,937 LBS [113,371 KG]

AIR TEST REPADS AND SUPPORT PADS AT 15 PSIG (103 kPaG) AFTER PWMT

AND PRIOR TO HYDROSTATIC AS PER SECTION 5.5.9 OF CTS0601.

### GENERAL NOTES

- QUALITY CONTROL PROGRAM NUMBER: AQP-1521
- WELDING PROCEDURE REGISTRATION NUMBER: WP-3269.2
- CAPACITY: 3038 FT<sup>3</sup> [86.0 M<sup>3</sup>]
- SERVICE: AQUEOUS AMMONIA
- EXPOSED INSIDE OR OUTSIDE EDGES OF NOZZLES OR OPENINGS SHALL BE CHAMFERED OR ROUNDED PER UG-76c.
- SURFACE PREPARATION: SANDBLAST TO SSPC SP10
- PRIME AND PAINT - SYSTEM NCI:  
1 COAT OF CARBOGUARD 553  
1 COAT OF CARBOCRYL 3359 DTM
- ALL BOLT HOLES TO STRADDLE CENTERLINES.
- WEAR PLATES AND REPADS TO HAVE A 1/4\"
- WEAR HOLE AT THE LOWEST POINT.
- CLEAN AND COVER ALL OPENINGS FOR SHIPMENT.
- USE WELDING PROCEDURE SPI-13 REV 3 FOR ALL TACK WELDS.
- VORTEX PRODUCTION SERVICES LTD. APEGA PERMIT TO PRACTICE 09525.
- CRN DRAWING:  
5166-1 REV 6  
5166-2 REV 6  
5166SCORE-R4
- ALL PADS AND BRACKETS TO BE ATTACHED WITH CONTINUOUS FILLET WELDS 1/4\"
- ALL NDE TO BE PERFORMED AFTER PWMT AND PRIOR TO HYDROTEST.
- THE TOE OF ANY 2 ADJACENT WELDS TO BE SEPARATED BY 50mm MINIMUM.

### MATERIAL NOTES

- PLATE TO BE 100% UT EXAMINED PER SA-578 S1.1 TO ACCEPTANCE LEVEL C.
- CARBON EQUIVALENT FOR PRESSURE-RETAINING PLATES SHALL BE LESS THAN 0.43:  
C = 0.23 WT.%  
S = 0.003 WT.%  
V = 0.015 WT.%  
V + C = 0.02 WT.%  
P = 0.012 WT.%  
C + P = 0.015 WT.%
- TENSILE STRENGTH LESS THAN OR EQUAL TO 70 KSI.
- 100% WMT EXAMINATION OF THE FORMED HEADS PER CTS 0601.
- HEADS TO HAVE PHOTOMICROGRAPH AFTER FINAL FORMING HEAT TREATMENT TO PROVE GRAIN SIZE NO 5 OR FINER, AS DETERMINED IN ACCORDANCE WITH ASTM E-112.
- CUSTOMER PO CM141250.
- THIS ORDER REQUIRES PRODUCTION IMPACT TESTING AS PER THE DESIGN NOTE ABOVE.
- MATERIAL FOR ITEMS 36 AND 37 MUST HAVE AN ACTUAL YIELD STRESS OF 45 KSI MINIMUM.

### BILL OF MATERIALS

ITEM	QTY	COMMENT	DESCRIPTION	MATERIAL
1	2	HEAD	PLATE - 120\"	SA-516-70N
2	3	SHELL #1, #2, #4	PLATE - 120\"	SA-516-70N
3	1	SHELL #3	PLATE - 120\"	SA-516-70N
4				
5	1	N2	FLANGE - 2\"	SA-350-LF2 CL1
6	4	N3, N4, N7, N8	FLANGE - 2\"	SA-350-LF2 CL1
7	1	N11	FLANGE - 2\"	SA-350-LF2 CL1
8	3	N5A, N5B, N6	FLANGE - 3\"	SA-350-LF2 CL1
9	1	N10	FLANGE - 3\"	SA-350-LF2 CL1
10	1	N1	FLANGE - 4\"	SA-350-LF2 CL1
11	1	N9	FLANGE - 10\"	SA-350-LF2 CL1
12	1	M1	FLANGE - 24\"	SA-350-LF2 CL1
13				
14	1	N10	BLIND FLANGE - 3\"	SA-350-LF2 CL1
15	1	N9	BLIND FLANGE - 10\"	SA-350-LF2 CL1
16	1	M1	BLIND FLANGE - 24\"	SA-350-LF2 CL1
17				
18	1	N10	GASKET - 3\"	316 SS
19	4	N10	STUDS - 5/8\"	SA-320-L7M
20	1	N9	GASKET - 10\"	316 SS
21	12	N9	STUDS - 7/8\"	SA-320-L7M
22	2	M1	GASKET - 24\"	316 SS
23	20	M1	STUDS - 1 1/4\"	SA-320-L7M
24				
25	2	WEAR PLATE	PLATE - 3/8\"	SA-516-70N
26	2	BASE PLATE	PLATE - 1 1/2\"	SA-516-70N
27	4	BREAK BASE PLATE	PLATE - 3/4\"	SA-516-70N
28	2	WEB PLATE	PLATE - 1/2\"	SA-516-70N
29	2	WEB PLATE	PLATE - 1/2\"	SA-516-70N
30	4	SIDE PLATE	PLATE - 7/8\"	SA-516-70N
31	8	RIB PLATE	PLATE - 1/2\"	SA-516-70N
32	4	SIDE PLATE	PLATE - 7/8\"	SA-516-70N
33	8	RIB PLATE	PLATE - 1/2\"	SA-516-70N
34	16	BOLTING	BOLT - 3/4\"	SA-325-GR5
35	3	SUPPORT PAD	PL-1/4\"	SA-516-70N
36	2	LIFT LUG	PLATE - 1 1/2\"	SA-516-70N
37	2	REPAD	PLATE-3/4\"	SA-516-70N
38	1	VORTEX BREAKER	PLATE -1/4\"	SA-516-70N
39	1	GROUND LUG	FLAT BAR - 3/8\"	SA-36 / 44W
40	1	MANWAY GRAB BAR	ROUND BAR - 3/4\"	SA-36 / 44W
41	1	M1	STANDARD 24\"	SA-36 / 44W
42	2	NAME PLATE	STANDARD NAME PLATE AND BRACKET	SS / SA-36
43	1	STINGER	PIPE - 4\"	SA-333-GR6
44	1	STINGER SUPPORT	PLATE - 3/8\"	SA-516-70N
45	2	SUPPORT PAD	PL-1/4\"	SA-516-70N
46				



SEPTEMBER 8, 2017

DATE	REVISION	CALC	REV	BY	APP
7-17-09-05	ASBUILT		4	CS	JT
6-17-06-11	ADD NOTE 16, ITEM 45, REVISE NOTE B,H, BOM		4	P.J.D.	JT
5-17-06-08	ADD NOTE H, ITEM 35, COG		4	P.J.D.	JT
4-17-06-03	ADD NOTES F, G, FIX NAME PLATES, ITEM 37		4	P.J.D.	JT
3-17-05-24	REVISE WD-6, NOTE 13, ADD WEAR PL ANGLE		3	P.J.D.	JT
2-17-04-27	REVISED, ISSUED FOR APPROVAL		2	CF	JT
1-17-03-15	REVISED, ISSUED FOR APPROVAL		1	P.J.D.	JT
0-17-03-14	REVISED, ISSUED FOR APPROVAL		0	P.J.D.	JT

### SCORE PROJECTS INC.

3814 - 47 AVENUE, STETTLER, AB T0C 2L0  
TELEPHONE: (403) 742-2266 FAX: (888) 317-7460

CLIENT:	AQUEOUS AMMONIA BULLET (116C-8000)
DATE:	17-03-08
JOB NO:	V-17090
DRAWN BY:	LC
CHECKED BY:	P.J.D.
APP BY:	JT
DWG NO:	SHEET 2 OF 2
REV	7

SUNCOR TAG: 116C-8000

CERTIFIED BY

ASME U

SCORE PROJECTS INC. 403-742-2266

YEAR BLT [2017] SERIAL NO [U-17090]

VESSEL TYPE [304mm x 106mm AMMONIA BULLET]

M.A.W.P. [1034] KPA AT [60] °C

M.D.M.T. [45] °C AT [1034] KPA

SHELL TK [22.22] mm HEAD TK [20.32] mm

CRN [N4618.2] CA [3.18] mm

MAEWPP 103 KPSI VOLUME 86 m<sup>3</sup>

MAILING ADDRESS BOX 1889 STETTLER ALBERTA T0C 2L0

SUNCOR TAG: 116C-8000

CERTIFIED BY

ASME U

SCORE PROJECTS INC. 403-742-2266

YEAR BLT [2017] SERIAL NO [U-17090]

VESSEL TYPE [304mm x 106mm AMMONIA BULLET]

M.A.W.P. [690] PSI AT [60] °F

M.D.M.T. [49] °F AT [1060] PSI

SHELL TK [0.878] IN HEAD TK [0.808] IN

CRN [N4618.2] C.A. [0.125] IN

MAEWPP 16 PSI VOLUME 3.038 FT<sup>3</sup>

MAILING ADDRESS BOX 1889 STETTLER ALBERTA T0C 2L0

NAME PLATE DETAIL A

METRIC

NAME PLATE DETAIL A

IMPERIAL