



- GENERAL NOTES:**
- UDN EXISTING NOZZLE QTY, SIZES, AND WELD DETAILS WILL BE REFLECTED ON THE "AS BUILT" DWG.
  - SHIP LOOSE ITEMS TO BE PALETTIZED AND SHRINK WRAPPED WITH ITEM TAG #'S
  - AVOID DIRECT CONTACT WITH ANY TYPE OF LIQUID/CHEMICAL TO GASKET SURFACES.
  - EXISTING MANWAY BLIND TO BE REPLACED WITH NEW

- FABRICATION NOTES:**
- ALL FLANGE BOLT HOLES TO STRADDLE TRUE VESSEL CENTER LINES
  - CLEAN VESSEL THOROUGHLY AND PROTECT ALL OPENINGS FOR SHIPMENT
  - LENGTHS SHOWN IN B. D. M. FOR REFERENCE ONLY. DRAWING DIMENSIONS TAKE PRECEDENCE
  - MINIMUM FILLET WELD SIZES SHALL BE 1/4" UDN
  - \*ELEVATION DETAILS ARE FOR ELEVATION CLARITY ONLY. SEE ORIENTATION VIEW FOR TRUE ORIENTATION.
  - LENGTHS SHOWN IN B. D. M. FOR REFERENCE ONLY. DRAWING DIMENSIONS TAKE PRECEDENCE

MARK	QTY	SIZE	RATE	TYPE	SCH.	SERVICE	OS PROJ.	IS PROJ.	ATT TYPE	THK. / WIDTH REPAD	A - B - C WELD SIZE	FLG	NECK	PAD	COVER	BOLTS	GASKET	OTHER	
N7	1	4	150	WN	STD	NEW SERVICE	8	-	E	1.00	2	.375	.625	-	4	5	6	-	-
N6	1	4	150	WN	STD	NEW SERVICE	8	-	E	1.00	2	.375	.625	-	4	5	6	-	-
N5	2	3	150	WN	STD	NEW SERVICE LEVEL	SEE ELEV.	-	E	1.00	2	.375	.625	-	8	9	10	-	-
N4	1	4	150	WN	STD	RELIEF VENT	8	-	E & DETAIL 2	1.00	3	.375	.625	-	4	5	6	-	16
N3	1	4	150	WN	STD	NEW SERVICE DRAIN	8	-	E	1.00	2	.375	.625	-	4	5	6	-	-
N2	1	24	150	WN	STD	NEW SERVICE OUTLET	10	-	E	1.00	7.25	.375	.625	-	11	12	13	-	-
N1	1	16	150	WN	STD	NEW SERVICE INLET	10	-	E	1.00	7.25	.375	.625	-	1	2	3	-	-
EM	1	18	150	LWN	NOTE 1	EXISTING MANWAY	NOTE 1	-	E	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1	-	-	-	7	-
E3	1	2.5	NPT	CPLG	-	EXISTING SERVICE	NOTE 1	-	H	-	-	NOTE 1	-	-	-	-	-	-	-
E2	1	.75	NPT	CPLG	-	EXISTING SERVICE	NOTE 1	-	H	-	-	NOTE 1	-	-	-	-	-	-	-
E1	1	2	300	WN	NOTE 1	EXISTING SERVICE	NOTE 1	-	D	-	-	NOTE 1	-	-	-	-	-	-	-

SCHEDULE OF OPENINGS

BILL OF MATERIAL

REVISIONS	DATE	BY	REFERENCES
C	6/3/10	REM	-
B	5/24/10	REM	-
A	5/20/10	REM	-

**VESSEL INFORMATION:**  
(FROM ORIGINAL DATA REPORT / PLATE / STAMPING)

MANUFACTURER: BETHLEHEM STEEL  
YEAR BUILT: 1948  
CONSTRUCTION CODE: ASME  
ADDENDA: -  
SERIAL No.: BSC0945  
VESSEL TAG No.: -  
NATIONAL BOARD No.: 708  
RADIOGRAPH % / JOINT EFFICIENCY:  
(GIRTH SEAMS) - 0.80  
(LONG SEAMS) - 0.80  
HEAT TREATMENT:  
(GIRTH SEAMS) NONE  
(LONG SEAMS) NONE  
THICKNESSES:  
(HEADS) .764 ELLIP. OR HEMI.  
(SHELL) .96  
CORROSION ALLOWANCE: -  
PRESSURES / TEMPERATURES  
MAWP 200 PSI @ 650 °F  
MDMT - °F @ - PSI  
VACUUM PRESSURE - PSI  
HYDRO TEST PRESSURE 400 PSI  
CONSTRUCTION SAFETY FACTOR S1 RATIO  
MATERIALS:  
SHELLS: SA-212 GR B  
HEADS: SA-212 GR B  
RE-PADS: -  
FLANGES: -  
PIPE NOZZLES: -  
CAPACITY / WEIGHT & SERVICE  
U.S. GALLONS/WEIGHT 30K 79,000  
ORIGINAL SERVICE PROPANE STORAGE  
NOTES / REMARKS

**BILL OF MATERIALS (ALTERATIONS)**

MK	QTY	MATERIAL	SERVICE	DESCRIPTION
1	1	SA-105	FLANGE	16" CL 150# RFWN X SCH STD. BORE
2	1	SA-106-B	PIPE NECK	16" X SCH STD X 7' LONG BDE
3	1	SA-516-70	RE-PAD	1" THK. X 38.5" OD X 16" ID ROLLED TO A 54" RADIUS
4	4	SA-105	FLANGE	4" CL 150# RFWN X SCH STD. BORE
5	4	SA-106-B	PIPE NECK	4" X SCH STD X 6' LONG BDE
6	4	SA-516-70	RE-PAD	1" THK. X 10.625" OD X 6.625" ID ROLLED TO A 54" RADIUS
7	1	SA-105	BLIND	18" CL 150# RFBF
8	2	SA-105	FLANGE	3" CL 150# RFWN X SCH STD. BORE
9	2	SA-106-B	PIPE NECK	3" X SCH STD X 24" LONG BDE
10	2	SA-516-70	RE-PAD	1" THK. X 7.5" OD X 3.5" ID
11	1	SA-105	FLANGE	24" CL 150# RFWN X SCH STD. BORE
12	1	SA-106-B	PIPE NECK	24" X SCH STD X 7' LONG BDE
13	1	SA-516-70	RE-PAD	1" THK. X 38" OD X 16" ID ROLLED TO A 54" RADIUS
14				DELETED
15				DELETED
16	4	SA-36	GUSSET	1.375" X 2 1/8" X 6 1/4" LONG (DETAIL 2)

1. DESIGN / ALTERATION NOTES: \* SIGNIFIES ITEM/S RE-RATED DESIGN, FABRICATION, AND INSPECTION TO BE IN ACCORDANCE WITH THE ASME SECTION VIII, DIV.1 & NBIC 2007 CODE WITH LATEST ADD. "R" STAMP REQUIRED

2. DESIGN DATA: (PER ORIGINAL MANUFACTURERS DATA REPORT)

DESIGN PRESSURE (INT.) - PSIG @ - °F  
DESIGN PRESSURE (EXT.) - PSIG @ - °F  
MAWP: 200 PSIG LIMITED BY: -  
M.D.M.T - °F @ - PSIG  
CHARPY IMPACT REQUIREMENTS: -  
DESIGN LIQUID LEVEL: -  
CORROSION ALLOWANCE: HEADS 0 SHELL 0 NOZZLES 0  
RADIOGRAPHY: - FOR A JOINT EFF. OF: 80  
SHELL CAT. A: (LONG SEAMS) -  
SHELL CAT. B: (CIRC. SEAMS) -  
HEAD TO SHELL SEAMS: -  
HEAD CAT. A: -  
SHOP HYDRO TEST @ 400 PSIG NEW AND COLD (HORIZONTAL POS.)  
P.W.H.T. NONE  
WIND SPEED - EXPOSURE - IMP. -  
SEISMIC -

3. ESTIMATED WEIGHTS & CAPACITY:  
FAB. WEIGHT EMPTY 79,000 LBS FULL H2O - LBS  
ESTIMATED SHIPPING WEIGHT 39.5 TONS  
CAPACITY 30K US GALLONS

4. MATERIALS OF CONSTRUCTION: (NEW MATERIALS)

SHELLS: -  
HEADS: -  
RE-PADS: SA-516-70  
FLANGES: SA-105  
PIPE NOZZLES: SA-106-B  
WELD FITTINGS: SA-234-WPB  
STUDS: SA-193-B7  
NUTS: SA-194-2H

5. PREPARATION & PAINT: N/A (INTERNAL)  
SURFACE PREP PRIME COAT INTERMEDIATE COAT TOP COAT (ALUMINUM)

PREPARATION & PAINT: (EXTERNAL) TEF STD.  
SURFACE PREP PRIME COAT INTERMEDIATE COAT TOP COAT (ALUMINUM)

6. WELDING PROCEDURES:

HEAD / SHELL: -  
SHELL / SHELL: -  
FLANGE TO PIPE: SMAW/FCAW/GMAW S-1-1,M-1-1,TF-1-1  
NOZZLE NECK TO VESSEL: SMAW/FCAW/GMAW S-1-1,M-1-1,TF-1-1  
COUPLINGS: -  
SUPPORTS: -  
MISC: GMAW M-1-1

PROJECT / LOCATION: - JOB NO.: - ITEM NO.: -

CUSTOMER: ONEOK

P.O. NO.: - DATE: - USER: -

SCALE: NONE

DRAWN BY: REM CHECKED BY: SRL APPROVED BY: GAH

DATE: 5/20/10 DATE: DATE:

CERTIFIED BY: REM DATE: -

DESCRIPTION: BULK STORAGE TANK  
106" ID X 62'-3" S/S HORIZ. VESSEL  
ELEVATION & GENERAL ARRANGEMENT

DRAWING NO.: D-10-183 SHT. 1 OF LATER REV. C

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