


**HAZARDOUS WASTE STORAGE INSTALLATION
CERTIFICATION STATEMENT**

V-402 TANK

I, Thomas W. Roberts Jr., P.E., have reviewed the installation of a tank system located at The Dow Chemical, Michigan Operations, Environmental Operations Facility, in Midland, Michigan. My duties were to review and certify the written assessment for the V-402, as required by the Resource Conservation and Recovery Act (RCRA) regulation(s), specifically 40 CFR 265.192, paragraphs (a)(1); (a)(2), (a)(5), (b), (d), and (e); and 265.193 paragraphs (b), (c), (d), (e)(2-Partial) and (f).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

AECOM Technical Services, Inc.

By:  _____
Thomas W. Roberts Jr., P.E.

Senior Civil Engineer
Title

58637

Registration Number

27777 Franklin Road, Suite 2000
Southfield, MI 48034

Address



ASSESSMENT OF HAZARDOUS WASTE
TANK V-402

In accordance with the rules promulgated under the Michigan Public Act 64, Rule 615 which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act specifically 40 CFR 265.192, paragraphs (a)(1); (a)(2), (a)(5), (b), (d), and (e); and 265.193 paragraphs (b), (c), (d), (e)(2-Partial) and (f), the following assessment of Tank V-402 is presented attesting that the tank system has sufficient structural integrity and is acceptable for storing of hazardous wastes.

GENERAL INFORMATION

Owner: Dow Chemical U.S.A
Environmental Operations Business
34 Building
Midland, MI 48667

Location: 703 Tank Farm
Dow Chemical, Michigan Division

Tank Designation: [V-402]

DESIGN STANDARDS

Tank: ASME Code for Pressure Vessels, Section VIII, Division 1
2015 Edition

Secondary Containment: Unknown

Ancillary Equipment: ANSI B31.3

HAZARDOUS CHARACTERISTICS OF THE WASTE

Tank V-402 is used as a temporary storage vessel for organic or other liquid waste streams. The waste streams enter V-402 via overhead piping systems of a different size and types of pipe. The contents of Tank V-402 are pumped through an overhead 2" stainless steel pipe to the Dow Chemical 32 Incinerator for treatment. Tank V-402 stores wastes for less than one year.

The composition of the hazardous waste is provided in Table 1 below:

TABLE 1

CHEMICAL FAMILIES

Hydrocarbons
Alcohols

CHEMICAL FAMILIES (CONT'D.)

Ethers
Thiols
Sulfides
Aldehydes
Ketones
Carboxylic Acids & Derivatives
Sulfonic Acids & Derivatives
Amines & Derivatives
Amides & Derivatives
Benzene & Derivatives
Organic Halides
Organic Salts
Water
High Molecular Weight Organics
Aqueous Solutions

- Acids
- Alkalis
- Inorganic Salts
- Organic Salts
- Fluorine and compounds containing fluorides

Chemicals and chemical families specifically excluded from storage in Vessel V-402 are as follows:

Phosphoric and phosphorous acids (>85%)
Phosgene

The average liquid specific gravity is 0.8 – 1.4.

The average pH is 5.61 – 13.5.

The tank system, including the tank, ancillary equipment and secondary containment, is compatible with the contained hazardous waste.

This vessel is constructed of 316 stainless steel. Assuming its integrity is verified periodically by a Dow Chemical internal testing program, the metal should last 20+ years because the corrosion rate is 0.02 mils/year.

The ancillary equipment consists of stainless steel and stainless steel piping and a stainless steel pump. Stainless steel materials show essentially zero corrosion at the operating conditions and should last indefinitely.

This analysis does not take into account any additional chemicals not listed in the table above.

EXTERNAL CORROSION PROTECTION

Because all tank system metal components are above ground and therefore are not in contact with soil or water, a corrosion potential assessment by a corrosion expert is not required to determine the corrosion potential of the soil environment surrounding the system.

DOCUMENTATED AGE OF THE TANK SYSTEM

The tank was built in 2017. Installation of the tank and ancillary equipment was completed in June, 2017.

TANK INFORMATION

Tank V-402 is a cylindrical stainless steel tank supported in the vertical position by four (4) steel support legs. General information regarding the tank is as follows:

PRESSURE VESSEL DESIGN DATA

Internal Design Pressure, psig	25 & Full Vacuum
Design Temperature, deg F	400
Hydrostatic Test Pressure, psig	71
Longitudinal Joint Efficiency	85
Post Weld Tear Treatment	No
Radiographic	RT-3

GENERAL DATA

Head Plate Material, ASME	SA-240-S32205
Shell Plate Material, ASME	SA-240-S32205
Lining Material	N/A
Nozzle Neck Material, ASME	SA-790-S32205

Flange Material, ASME	SA-182-F51/F60
Bolting Material, ASTM	SA-193-B7 Fluoropolymer Coated
Nut Material, ASTM	SA-194-2H Fluoropolymer Coated
Gasket Material	Kammprofile W/ 316L S.S. Grooved Core & Flexible Graphite Soft Facing Layers On Each Side
Weight Empty, Lbs. (Estimated)	30,559
Weight Full of Liquid, Lbs.	225,129
Diameter, ft-in	13'-0"
Length (Str. Side) ft-in	12'-9"
Volume Gross, Gal.	15,450
Volume Operating, Gal.	15,450
Shell Nominal Thickness, in.	0.375
Heads Nominal Thickness, in.	0.625
Corrosion Allowance, in.	0.0313
Insulation	1.5" Mineral Wool

OPERATING PARAMETERS

Pressure	Atmospheric – 10 psig
Temperature	35°F - 125°F
pH	5.61 -13.5
Nitrogen Blanket	Yes
Agitated	Yes
Recirculation	Yes – as needed to prevent freezing

The tank conforms to ASME Code for Pressure Vessels, Section VIII, Division 1, 2015 Edition, to provide safe containment of the above described hazardous waste.

Tank venting is provided to prevent excessive pressure or vacuum build-up due to maximum emptying, filling, thermal inbreathing and outbreathing rates. 4" by 6" Leser spring operated conventional relief valve set at 10 PSIG. During filling the tank is vented through a 2" stainless steel pipe which goes to the kiln or in the event of an outage, to a carbon absorption unit.

Tank V-402 is equipped with a double level alarm. If the vessel reaches 78% of its full capacity, or if the high level switch trips, a high level alarm is activated in 703 Tank Farm control room and the inlet valves are automatically closed. At 95% of full capacity a high high level alarm is activated.

The tank is stainless steel with 1.5" mineral wool insulation.

The tank foundation will maintain the load of a full tank. The foundation is a reinforced concrete mat. The tank is anchored to the mat to prevent dislodgement.

ANCILLARY EQUIPMENT INFORMATION

The ancillary equipment generally includes a pump, pipe, fittings, and flanges that are used to contain the hazardous waste while in transit.

The pipe and fittings used for the piping system are constructed of 2, 1 and 1-1/2 inch stainless steel. The pump is a stainless steel Goulds Centrifugal pump.

The ancillary equipment conforms to the latest ANSI B31.3 codes to provide safe containment of the above described hazardous wastes.

TANK SECONDARY CONTAINMENT INFORMATION

The secondary containment system, is a part of the 703 Tank Farm, and is constructed to prevent any migration of wastes or accumulated liquid out of the system to soil or groundwater, consists of a reinforced, on-grade concrete slab with containment walls (diking). The old V-402 tank's foundation was cut out and a new concrete foundation was poured and tied into the existing tank farm system. The containment system surrounds the tank completely and covers all surrounding earth likely to come into contact with the waste if released from the tank. All construction joints are caulked and were found to be in good condition at the time of inspection, but should be re-inspected at regular intervals. The interior concrete wall and floor joints of the secondary containment are caulked with SEMSTONE 805 High Performance Coating.

The concrete secondary containment is lined with VERSAFLEX FSS 45DC polyurea coating.

The secondary containment's slab is sloped to a sump which collects liquids resulting from potential leaks, or spills. Spilled or leaked waste and accumulated precipitation is removed from the concrete sump within twenty-four (24) hours.

The V-402 Tank is located within the 703 Tank farm which provides total containment in excess of 112,000 gallons, or 725% of the V-402 storage tank volume. The secondary containment also has sufficient volume to contain the largest waste tank volume in the containment. The containment system also has sufficient volume to contain precipitation from a 25-year, 24-hour rainfall event.

The walls and floors also have sufficient strength and thickness to prevent failure due to pressure gradients, physical contact with the waste to which it is exposed, climatic conditions and the stress of daily operation. The foundation is capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system and capable of preventing failure due to settlement, compression or uplift.

ANCILLARY EQUIPMENT SECONDARY CONTAINMENT INFORMATION

There is no secondary containment provided for the majority of the ancillary equipment distributing the flow of hazardous waste from its point of generation to the storage tank. This piping is above ground piping which is visually inspected on a daily basis in accordance with 40 CFR 265.193(f).

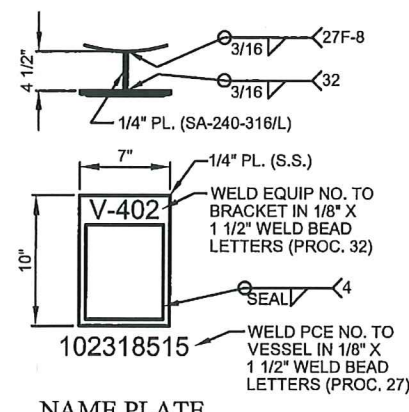
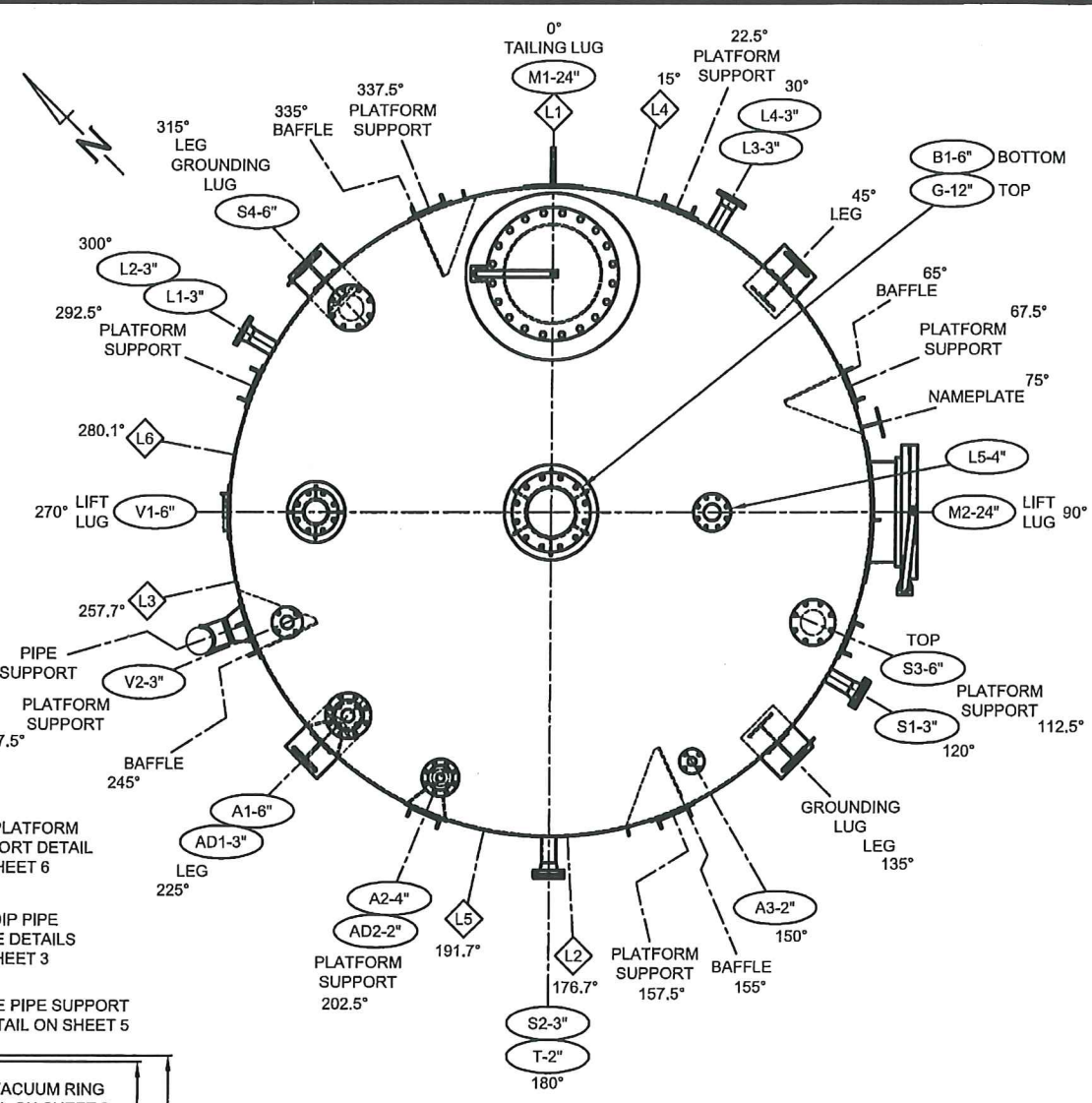
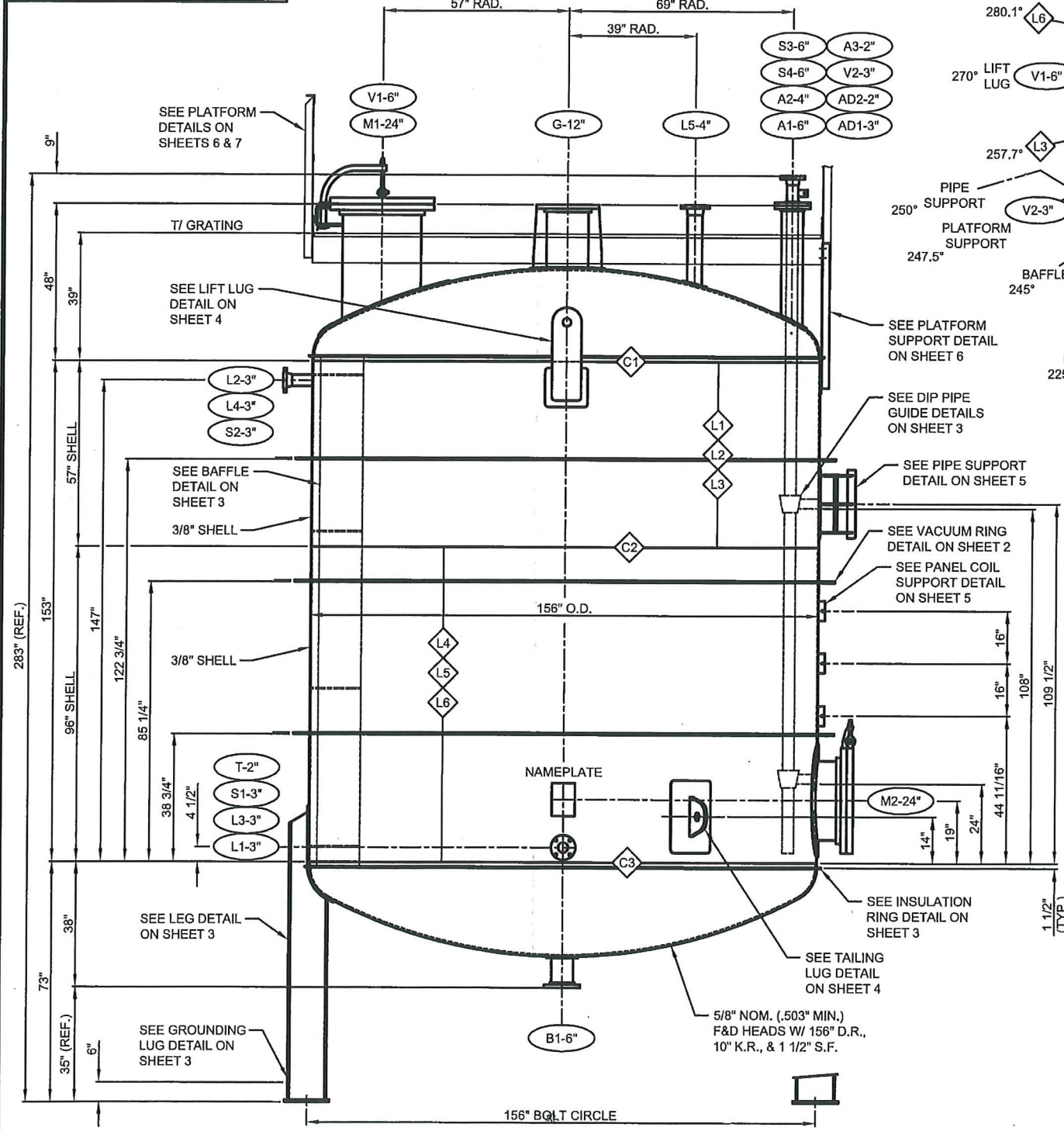
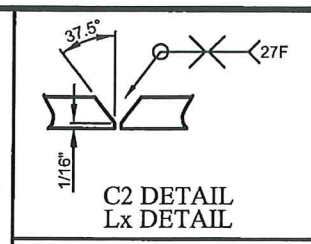
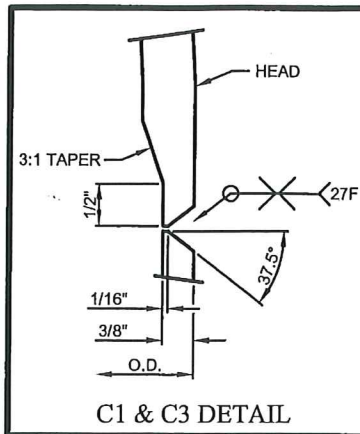
INSTALLATION OF TANK SYSTEM

Installation of the tank system by Dow Chemical followed written procedures as outlined in the project specifications and in accordance with manufacturer's instructions. These procedures include inspection of the system for the presence of weld breaks, punctures, scrapes of protection coatings, cracks, corrosion, misalignment, incorrect elevations, improper alignment or any other structural damage or inadequate construction or installation.

TIGHTNESS TEST

The tank was tested for tightness in June of 2017. Testing was performed in accordance with written procedures. Checks were made prior to the initiation of testing and during the actual test. See attached documentation of hydrotest results. The ancillary equipment was pneumatically tested for tightness after installation according to Dow procedures.

END OF ASSESSMENT



4554
 CERTIFIED BY:
 GLADWIN TANK MFG. INC.
 U MAWP-S.S. 42 PSI AT 400 °F
 MAWP-EXT. FV PSI AT 400 °F
 W MDMT -20 °F AT 42/FV PSI
 RT-3 MAWP- - PSI AT - °F
 MAWP-EXT. - PSI AT - °F
 MDMT - °F AT - PSI
 SERIAL NO. 3243 YEAR 2017
 SHELL THK. .375 IN.
 HEAD THK. .625 IN.
 JKT SHELL THK. - IN.
 JKT HEAD THK. - IN.
 P.O. NO. 4505018580
 DWG. NO. -
 TEST PRESSURE 71 PSIG
 EMPTY WEIGHT 25,000 LBS
 SHELL MAT. SA-240-S32205
 HEAD MAT. SA-240-S32205
 OWNER EQUIP. NO. V-402
 OWNER I.D. NO. 102318515



THIS VESSEL CONFORMS TO THE LATEST ASME UNFIRED PRESSURE VESSEL CODE AND UNDER NO CIRCUMSTANCES SHALL THE SAFETY DEVICES BE SET AT GREATER THAN THE MAXIMUM ALLOWABLE WORKING PRESSURE.

PRESSURE VESSEL DATA	
DESIGN CODE	ASME SECT VIII, DIV. 1, 2015 EDITION
ASME STAMP	YES
EQUIPMENT NUMBER	V-402
MFG JOB NUMBER	3243
MFG SERIAL NUMBER	3243
INTERNAL DESIGN PRESSURE (PSI)	25
INTERNAL DESIGN TEMP (°F)	400
EXTERNAL DESIGN PRESSURE (PSI)	FV
EXTERNAL DESIGN TEMP (°F)	400
OPERATING PRESSURE (PSI)	0 - 10
OPERATING TEMP (°F)	35 - 125
MAWP INTERNAL (PSI)	42
MAWP EXTERNAL (PSI)	FV
MAP (NEW & COLD) (PSI)	55
STRENGTH LIMITING PART	BOTTOM HEAD
MDMT (°F) @ MAWP (PSI)	-20 @ 42/FV
INTERNAL CORROSION (IN.)	.0313
EXTERNAL CORROSION (IN.)	-
SHOP HYDRO PER UG-99(c)(PSI)	71
FIELD HYDRO PER UG-99(b)(PSI)	60
MINIMUM HYDRO TEMP (°F)	50
SPECIFIC GRAVITY	1.5
POST WELD HEAT TREATMENT	NONE
STRESS RELIEF PER UCS-79	NO
IMPACT TESTING	NO PER UHA-51(d)
LETHAL SERVICE	NO
RADIOGRAPHY	RT-3
JOINT HEADS	85%
SHELL EFF.	85% CIRC SEAMS, 85% LONG. SEAMS
PLATE NOZZLES	100%
OPERATING WEIGHT (LBS)	225,129
FULLY DRESSED EMPTY WEIGHT (LBS)	30,559
LIFT WEIGHT (LBS)	23,007
TEST WEIGHT (LBS)	152,683
SHIPPING WEIGHT (LBS)	25,000
FULL VOLUME (GALLONS)	15,450
HIGH LIQUID LEVEL	100% FULL
WIND DESIGN	ASCE 7-10, 125 MPH, I=1.15, EXP. C, RISK III
SEISMIC DESIGN	ASCE 7-10, SITE CLASS D, I=1.5, Ss=7.5%, S1=3.6%, R=2.0, TL=12, RISK III
INSULATION THICKNESS	1 1/2" MINERAL WOOL (BY OTHERS)
INTERIOR BLAST	NONE
EXTERIOR BLAST / PAINT	PER G16S-0202-10, RAL 7035 (C.S. ATTACHMENTS ONLY, EXCEPT LEGS)
PLATFORM BLAST / PAINT	GALVANIZED PER G16S-0205-01 & G16S-0205-03
FIRE PROOFING	PER G16S-8020-00 (LEGS ONLY, BY OTHERS)
PRIMARY VESSEL MATERIALS (SEE DETAIL SHEETS FOR ADD'L INFORMATION)	
HEADS	SA-240-S32205
SHELL	SA-240-S32205
FLANGES	SA-182-F51/F60
NOZZLES	SA-790-S32205
PLT. NOZZLES	SA-240-S32205
FITTINGS	SA-815-S32205
VACUUM RINGS	SA-479-316/L
LEGS	SA-36
LIFT / TAIL LUGS	SA-240-316/L
BOLTING	SA-193-B7 / SA-194-2H
	FLOUROPOLYMER COATED
	GASKETS KAMMPROFILE W/ 316L S.S.
	GROOVED CORE & FLEXIBLE GRAPHITE
	SOFT FACING LAYERS ON EACH SIDE
FOUNDATION LOADS AT BASEPLATE	
SEISMIC SHEAR (LBS) / SEISMIC MOMENT (FT-LBS)	1,562 / 28,324
WIND SHEAR (LBS) / WIND MOMENT (FT-LBS)	4,180 / 71,725

CERTIFIED - ASME RELEASED FOR FABRICATION
 PLATING SIGNATURE: *[Signature]*
 FABRICATOR DATE: 4-20-2017
 Q.C. MANAGER

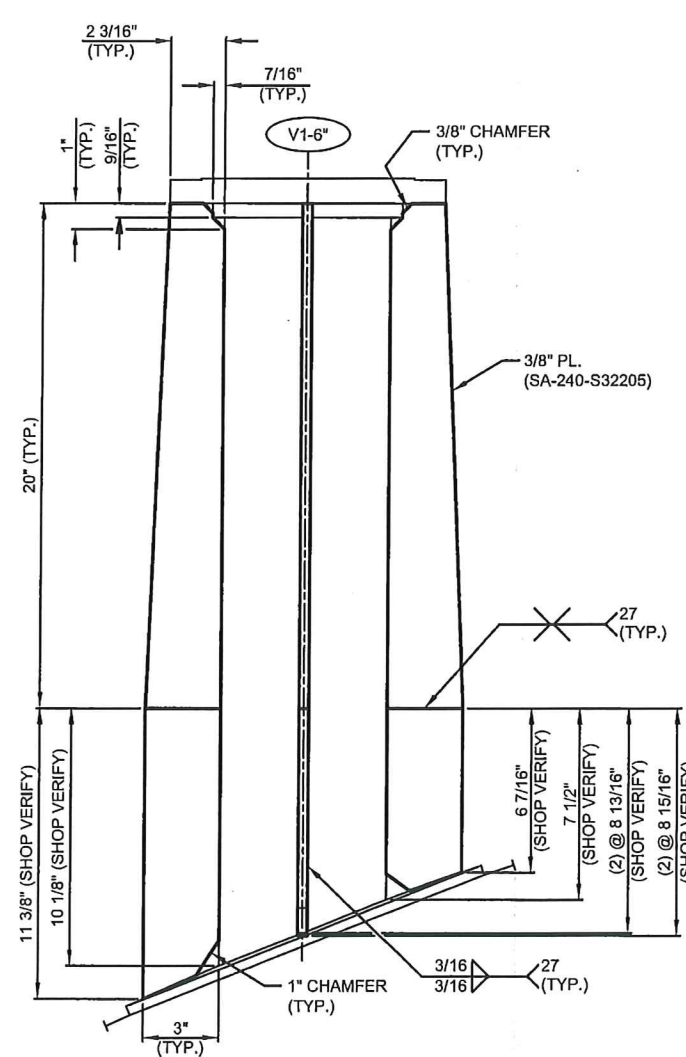
REV	BY/CHK	DATE	DESCRIPTION
Δ	KP/KP	4/20/17	CERTIFIED FINAL ISSUE
Δ	KP/KP	2/7/17	REVISED LEG PAD
Δ	KP/KP	1/23/17	REVISED NOZZLE ORIENTATIONS AS INDICATED
Δ	KP/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
Δ	KP/KG	12/12/16	ISSUED FOR APPROVAL

GLADWIN
 MANUFACTURING

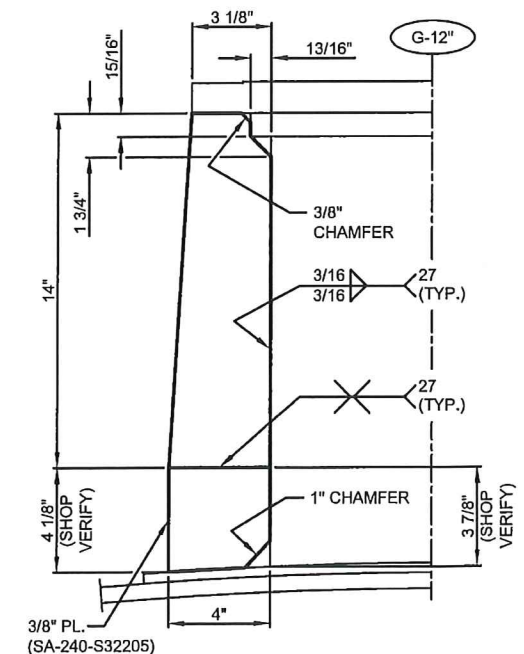
Gladwin Tank Mfg., Inc.
 207 Industrial Drive, Gladwin MI, 48624 PH: 989-426-4768
 www.gladwintank.com FAX: 989-426-2777

DRAWN: K. PALMER SCALE: 1:20 OWNER I.D.: 102318515
 CHECKED: K. GRAKAUSKAS NCD NO.: 16343 ITEM NO.: V-402
 WASTE TANK P.O. NO.: 4505018580
 DOW CHEMICAL COMPANY 3243 1 OF 7

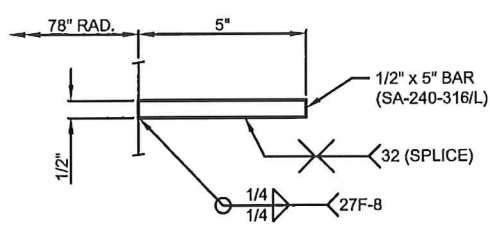
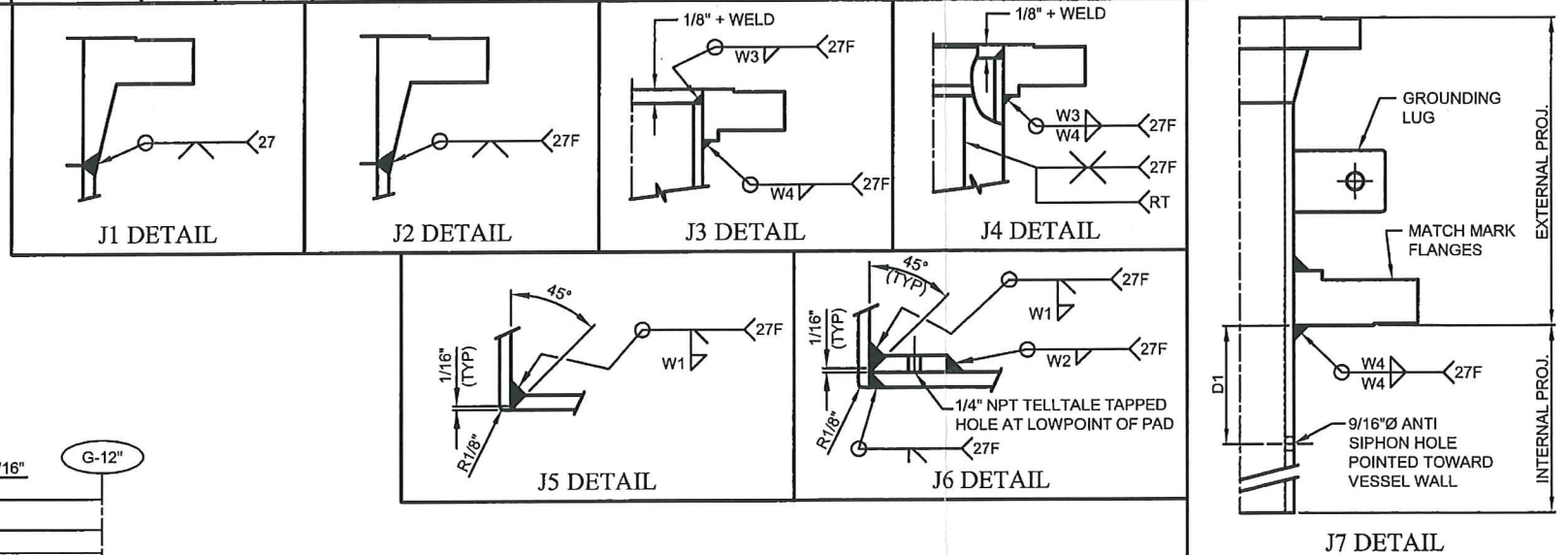
SERVICE	MARK	SIZE	QUAN	FLANGE			NECK			REPAD			BLIND/HIGH HUB		BOLTING				GASKETS		JOINT FIG.		WELDS					PROJECTIONS			MARK	SIZE	COMMENT		
				MATERIAL	RATING	TYPE	MATERIAL	TH'KN	LENGTH	MATERIAL	THK. x WIDTH	O.D.	MATERIAL	HH BORE	BOLTS	STUDS	DESCRIPTION	NUTS	SERV	SHIP	FLANGE	NECK	W1	W2	W3	W4	D1	CENTERLINE	EXTERNAL	INTERNAL					
PROCESS INLET HOST	A1	6"	1	SA-182-F51/F60	150#	RFSO	SA-790-S32205	SCH. 80S	37 5/16"	SA-240-S32205	3/8" x 1 1/2"	10 1/2"	SA-182-F51/F60	6" x 3"	-	-	8	3/4" x 4"	16	1	-	J3	J6	3/8"	3/8"	7/16"	7/16"	-	HEAD	SEE ELEV.	FLUSH	A1	6"	-	
PROCESS INLET DIP PIPE	AD1	3"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	204 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	J2	J7	-	-	-	3/8"	39"	HEAD	9"	198"	AD1	3"	-	
RECIRCULATION LINE HOST	A2	4"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	35 5/16"	SA-240-S32205	3/8" x 1 1/2"	8"	SA-182-F51/F60	4" x 2"	-	-	8	5/8" x 3 3/4"	16	1	-	J2	J6	5/16"	3/8"	-	-	-	HEAD	SEE ELEV.	FLUSH	A2	4"	-	
RECIRCULATION LINE DIP PIPE	AD2	2"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	204 1/2"	-	-	-	-	-	-	-	-	-	-	-	-	J1	J7	-	-	-	3/8"	39"	HEAD	9"	198"	AD2	2"	-	
N2 INLET	A3	2"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	35 1/4"	-	-	-	-	-	-	-	-	-	-	-	-	J1	J5	1/4"	-	-	-	-	HEAD	SEE ELEV.	FLUSH	A3	2"	-	
PROCESS OUTLET	B1	6"	1	SA-182-F51/F60	150#	RFSO	SA-790-S32205	SCH. 80S	10 1/2"	SA-240-S32205	3/8" x 1 1/2"	9 3/4"	-	-	-	-	-	-	-	-	-	J3	J6	3/8"	3/8"	7/16"	7/16"	-	HEAD	SEE ELEV.	FLUSH	B1	6"	-	
AGITATOR	G	12"	1	SA-182-F51/F60	150#	RFSO	SA-790-S32205	SCH. XH	20 1/2"	SA-240-S32205	3/8" x 5"	22 3/4"	-	-	-	-	-	-	-	-	-	J3	J6	3/8"	3/8"	1/2"	5/8"	-	HEAD	SEE ELEV.	FLUSH	G	12"	SEE GUSSET DETAIL	
DP LEVEL	L1-L4	3"	4	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	6 3/4"	-	-	-	-	-	-	-	-	-	-	-	-	J2	J5	5/16"	-	-	-	-	87"	9"	FLUSH	L1-L4	3"	-	
RADAR	L5	4"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	23 9/16"	SA-240-S32205	3/8" x 1 1/2"	7 3/4"	-	-	-	-	-	-	-	-	-	J2	J6	5/16"	3/8"	-	-	-	HEAD	SEE ELEV.	FLUSH	L5	4"	-	
TOP HEAD MANWAY	M1	24"	1	SA-182-F51/F60	150#	RFSO	SA-240-S32205	COMMENT	SA-240-S32205	3/8" x 9"	44"	SA-182-F51/F60	-	-	20	1 1/4" x 7"	40	1	-	-	-	J4	J6	3/8"	3/8"	3/8"	1/2"	-	HEAD	SEE ELEV.	FLUSH	M1	24"	3/8" PL. x 9 15/16" x 74 1/4"	
SHELL MANWAY	M2	24"	1	SA-182-F51/F60	150#	RFSO	SA-240-S32205	COMMENT	SA-240-S32205	3/8" x 5"	34"	SA-182-F51/F60	-	-	20	1 1/4" x 7"	40	1	-	-	-	J4	J6	3/8"	3/8"	3/8"	1/2"	-	87"	9"	FLUSH	M2	24"	3/8" PL. x 36 11/16" x 74 1/4"	
SHELL SPARE	S1/S2	3"	2	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	6 3/4"	-	-	-	SA-182-F51/F60	-	-	4	5/8" x 3 3/4"	8	1	-	-	J2	J5	5/16"	-	-	-	87"	9"	FLUSH	S1/S2	3"	-		
HEAD SPARE	S3/S4	6"	2	SA-182-F51/F60	150#	RFSO	SA-790-S32205	SCH. 80S	37 5/16"	SA-240-S32205	3/8" x 1 1/2"	10 1/2"	SA-182-F51/F60	-	-	8	3/4" x 4"	16	1	-	-	J3	J6	3/8"	3/8"	7/16"	7/16"	-	HEAD	SEE ELEV.	FLUSH	S3/S4	6"	-	
TEMPERATURE	T	2"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	7"	-	-	-	-	-	-	-	-	-	-	-	-	J1	J5	1/4"	-	-	-	87"	9"	FLUSH	T	2"	-		
RELIEF	V1	6"	1	SA-182-F51/F60	150#	RFSO	SA-790-S32205	SCH. 80S	32 1/4"	SA-240-S32205	3/8" x 4"	15 1/4"	-	-	-	-	-	-	-	-	-	-	J3	J6	3/8"	3/8"	7/16"	7/16"	-	HEAD	SEE ELEV.	FLUSH	V1	6"	SEE GUSSET DETAIL
VENT	V2	3"	1	SA-182-F51/F60	150#	RFWN	SA-790-S32205	SCH. 80S	35 5/16"	SA-240-S32205	3/8" x 1 1/2"	7"	-	-	-	-	-	-	-	-	-	-	J2	J6	5/16"	3/8"	-	-	-	HEAD	SEE ELEV.	FLUSH	V2	3"	-



NOZZLE V1-6" GUSSET DETAIL
SCALE: 6X
(1 REQ'D)



NOZZLE G-12" GUSSET DETAIL
SCALE: 6X
(6 REQ'D)
(LOCATED @ 0°, 60°, 120°, 180°, 240°, & 300°)



VACUUM RING DETAIL
SCALE: 8X
(3 REQ'D)

- GENERAL NOTES:**
- ALL NOZZLE BOLT HOLES ARE TO STRADDLE THE MAJOR VESSEL CENTERLINES UNLESS SPECIFICALLY NOTED OTHERWISE.
 - ALL NOZZLE GASKET SURFACES REQUIRE A SERRATED SURFACE FINISH OF 125 TO 250 RMS.
 - BREAK ALL SHARP EDGES.
 - ALL C.S. IS TO BE SA-36(MIN) UNLESS NOTED OTHERWISE.
 - COMPRESSED AIR/SOAP SUDS TEST EACH REINFORCING PAD AND PLUG ALL 1/4" NPT TELLTALE HOLES WITH CORNING 732 RTV PRIOR TO SHIPPING.
 - NOTIFY OWNERS INSPECTION REP 3 DAYS PRIOR TO HYDROTEST.
 - REFERENCE THE FOLLOWING GLOBAL SPECS FOR VESSEL TOLERANCES:
G8S-8005-04 (FLANGE FACE TOLERANCES)
G9G-1000-02A & B (TOLERANCES FOR VERTICAL VESSELS)
G9G-1000-03 (ANGULAR AND ROTATIONAL NOZZLE TOLERANCES)
G9G-3005-01 (TOLERANCES OF FLG. GASKET FACES IN FINAL CONDITION)
 - M1 & M2 TO BE SHIPPED WITH HYDRO GASKET INSTALLED, MARKED AS APPROPRIATE, AND SERVICE GASKETS SHIPPED LOOSE. ALL NOZZLES WITH BLINDS OR DIP PIPES SHALL BE SHIPPED WITH SERVICE GASKETS INSTALLED, HARDWARE TORQUED, AND MARKED AS APPROPRIATE.

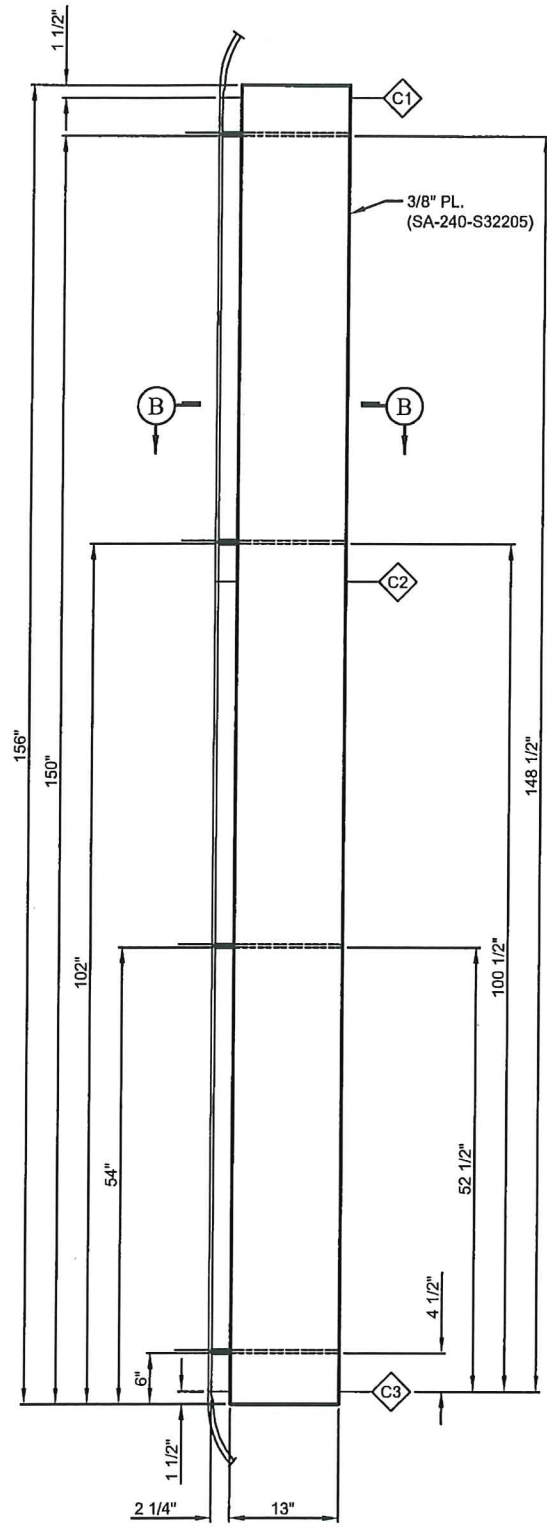
REV	BY/CHK	DATE	DESCRIPTION
1	KPI/KP	4/20/17	CERTIFIED FINAL ISSUE
2	KPI/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
3	KPI/KG	12/12/16	ISSUED FOR APPROVAL

GLADWIN
TANK MANUFACTURING

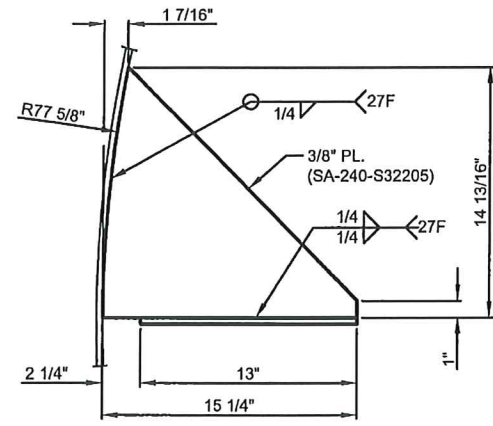
Gladwin Tank Mfg., Inc.
207 Industrial Drive, Gladwin MI, 48624 PH: 989-426-4768
www.gladwintank.com FAX: 989-426-2777

DRAWN: K. PALMER SCALE: 1:20 OWNER I.D.: 102318515
CHECKED: K. GRAKAUSKAS NCD NO.: 16343 ITEM NO.: V-402
WASTE TANK P.O. NO.: 4505018580
DOW CHEMICAL COMPANY 3243 2 OF 7

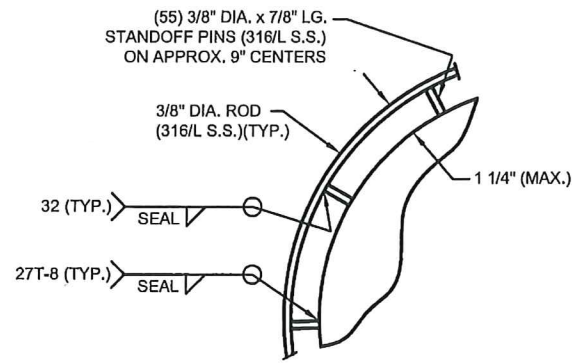
CERTIFIED - ASME RELEASED FOR FABRICATION
SIGNATURE: *[Signature]*
DATE: 4-20-2017



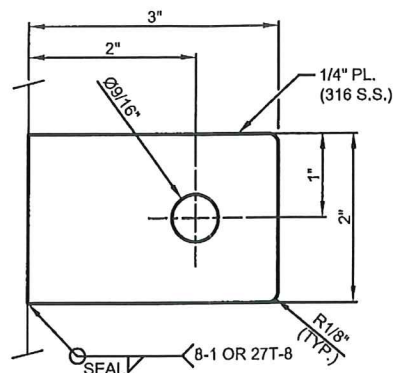
BAFFLE DETAIL
SCALE: 2X
(4 REQ'D)



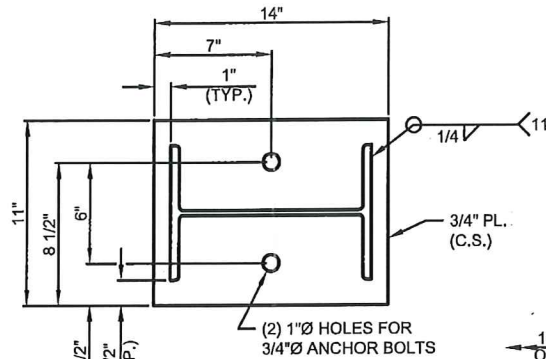
SECTION B-B
SCALE: 4X



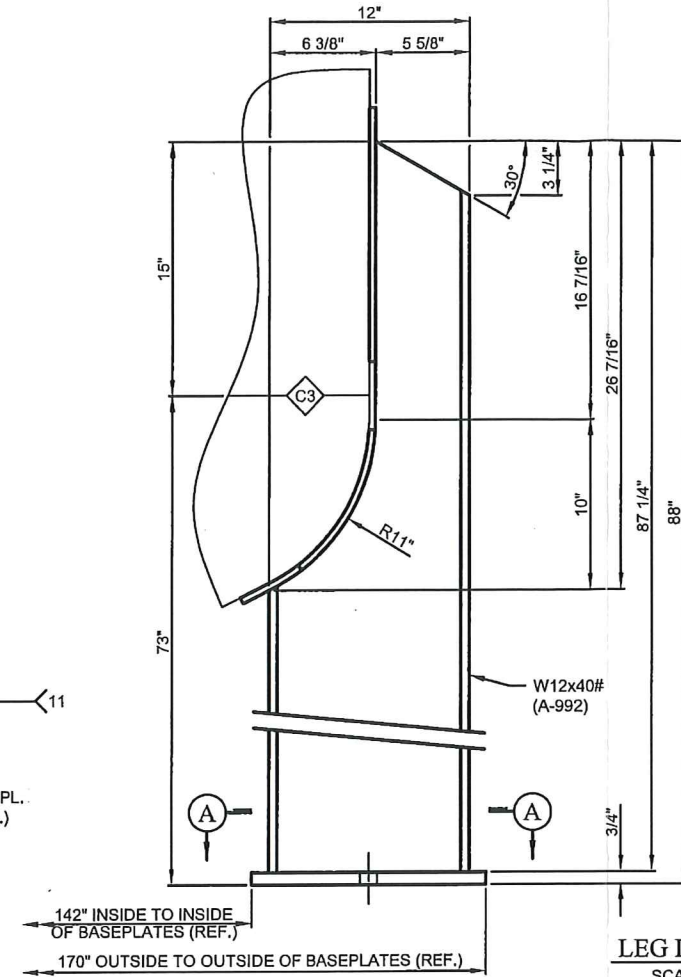
INSULATION TIE RING DETAIL
(2 REQ'D)



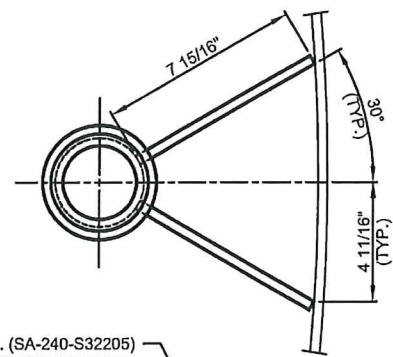
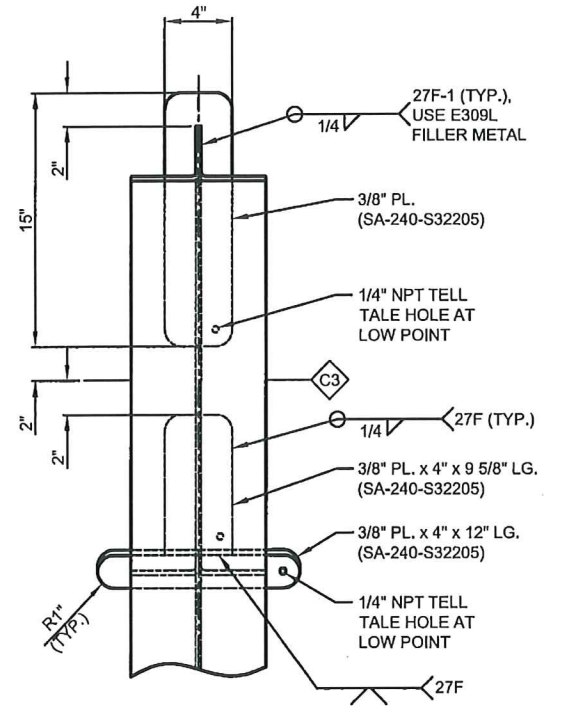
GROUNDING LUG DETAIL
SCALE: NONE
(4 REQ'D)
(DO NOT PAINT)



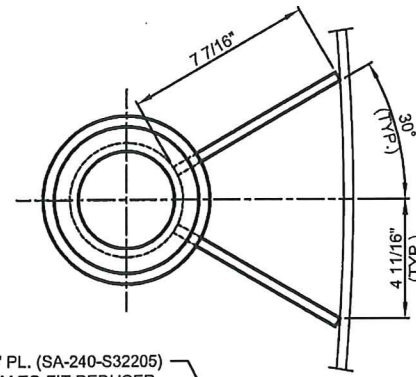
SECTION A-A
SCALE: 4X



LEG DETAIL
SCALE: 4X
(4 REQ'D)



2" DIP PIPE GUIDE DETAIL
SCALE: 6X
(2 REQ'D)

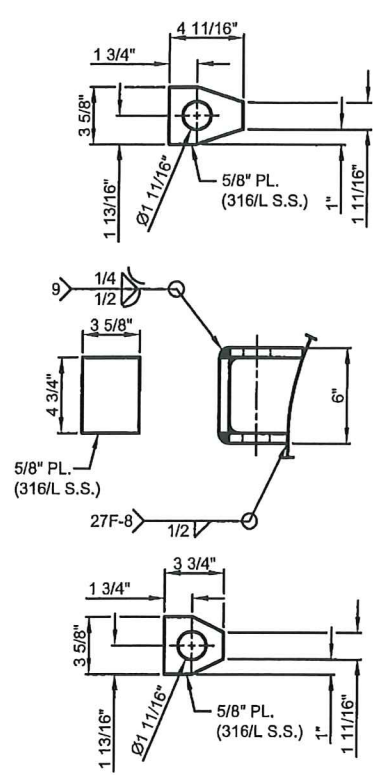


3" DIP PIPE GUIDE DETAIL
SCALE: 6X
(2 REQ'D)

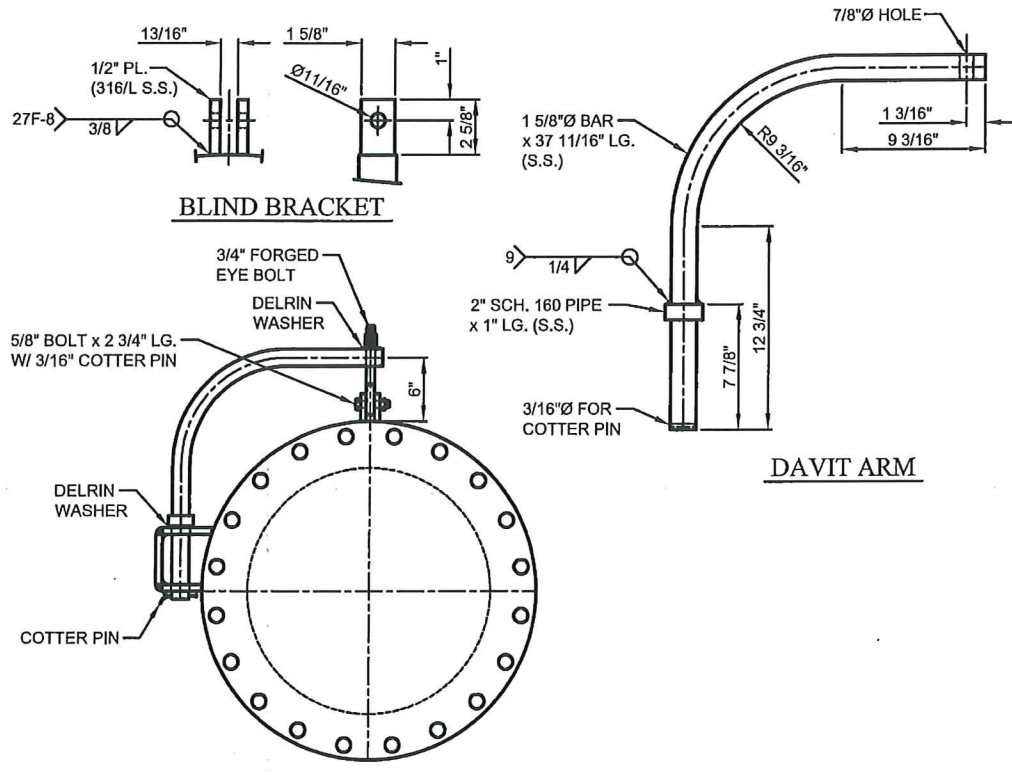
CERTIFIED - ASME RELEASED FOR FABRICATION
 PLATING
 FABRICATOR
 Q.C. MANAGER
 SIGNATURE: *[Signature]*
 DATE: 4-20-2017

REV	BY/CHK	DATE	DESCRIPTION
△	KP/KP	4/20/17	CERTIFIED FINAL ISSUE
△	KP/KP	2/7/17	REVISED LEG PAD
△	KP/KP	1/23/17	ADDED DIMENSION
△	KP/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
△	KP/KG	12/12/16	ISSUED FOR APPROVAL

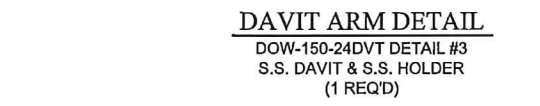
Gladwin Tank Mfg., Inc. 207 Industrial Drive, Gladwin MI, 48624 PH : 989-426-4768 www.gladwintank.com FAX : 989-426-2777		
DRAWN: K. PALMER CHECKED: K. GRAKAUSKAS	SCALE: 1:20 NCED NO.: 16343	OWNER I.D.: 102318515 ITEM NO.: V-402 P.O. NO.: 4505018580
WASTE TANK DOW CHEMICAL COMPANY		3243 3 OF 7



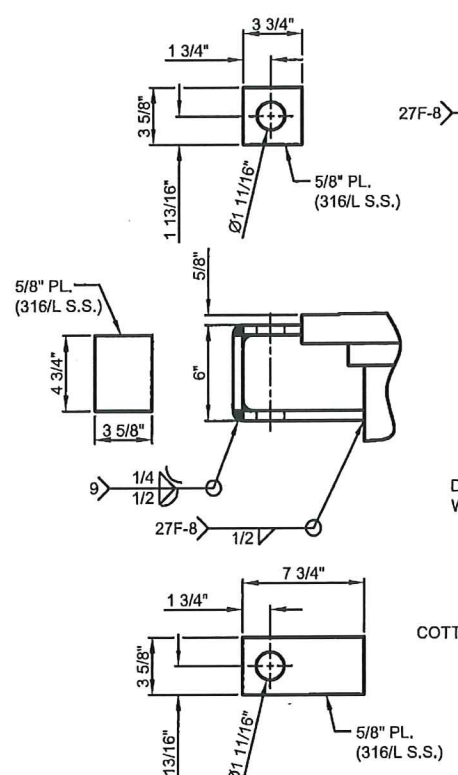
HOLDER



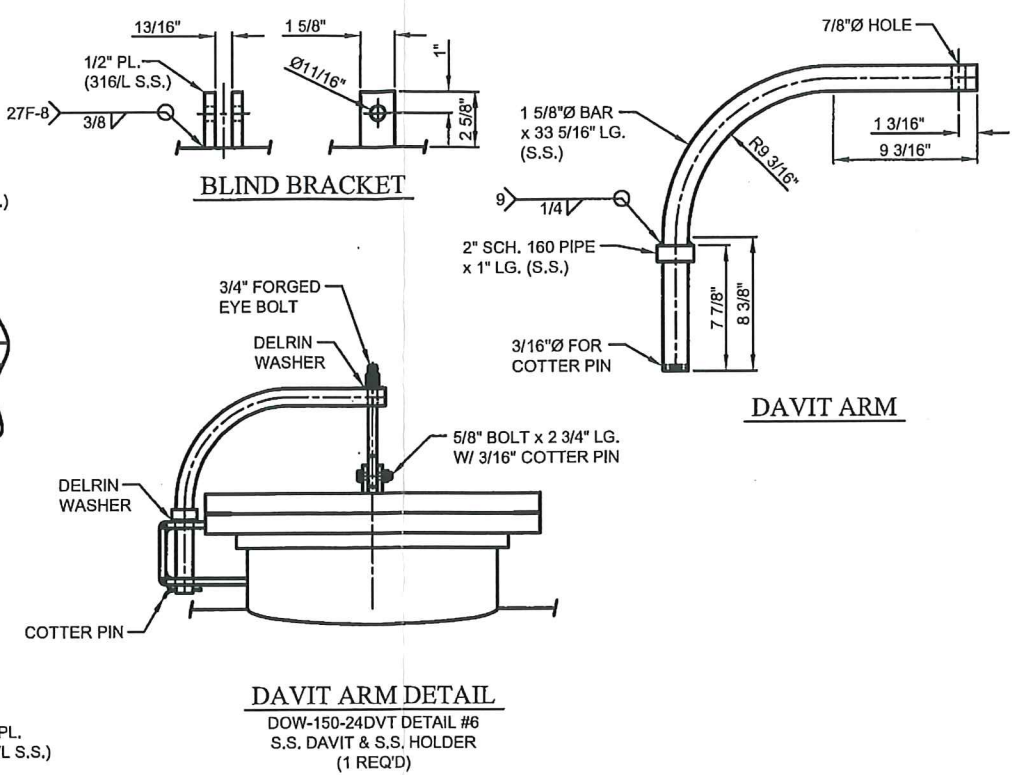
DAVIT ARM



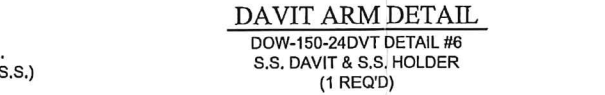
DAVIT ARM DETAIL
DOW-150-24DVT DETAIL #3
S.S. DAVIT & S.S. HOLDER
(1 REQ'D)



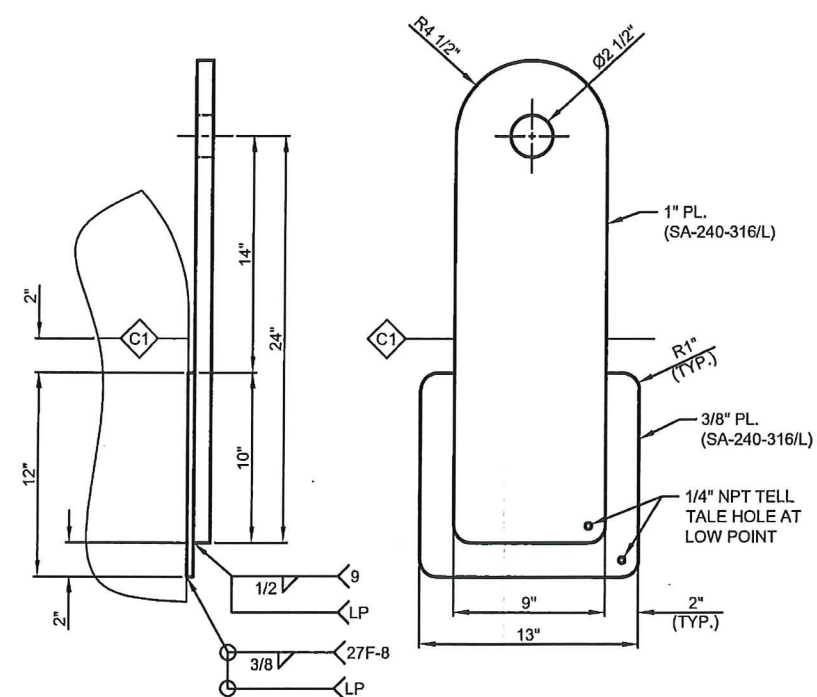
HOLDER



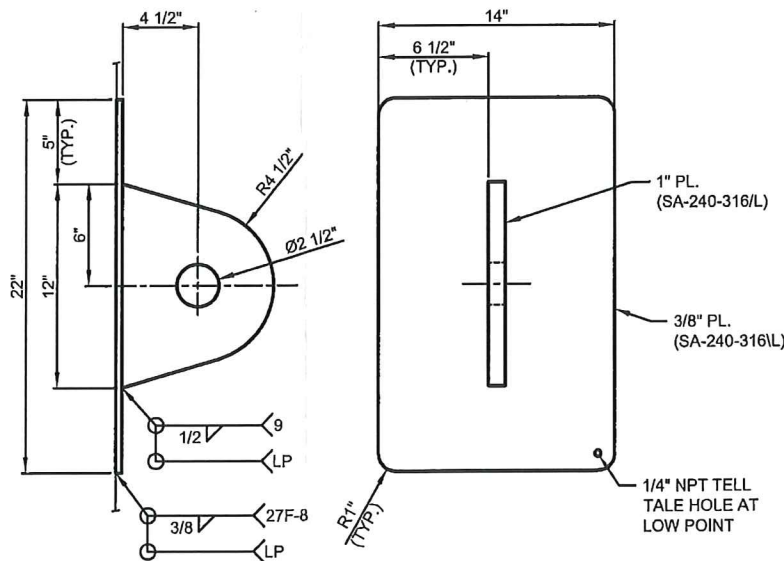
DAVIT ARM



DAVIT ARM DETAIL
DOW-150-24DVT DETAIL #6
S.S. DAVIT & S.S. HOLDER
(1 REQ'D)



LIFT LUG DETAIL
SCALE: 4X
(2 REQ'D)



TAILING LUG DETAIL
SCALE: 4X
(1 REQ'D)

CERTIFIED - ASME RELEASED FOR FABRICATION
 PLATING
 FABRICATOR
 Q.C. MANAGER
 SIGNATURE: *[Signature]*
 DATE: 4-20-2017

REV	BY/CHK	DATE	DESCRIPTION
1	KP/KP	4/20/17	CERTIFIED FINAL ISSUE
2	KP/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
3	KP/KG	12/12/16	ISSUED FOR APPROVAL

GLADWIN

Gladwin Tank Mfg., Inc.
 207 Industrial Drive, Gladwin MI, 48624 PH : 989-426-4768
 www.gladwintank.com FAX : 989-426-2777
 DRAWN: K. PALMER SCALE: 1:20 OWNER I.D.: 102318515
 CHECKED: K. GRAKAUSKAS NCED NO.: 16343 ITEM NO.: V-402
 WASTE TANK P.O. NO.: 4505018580
 DOW CHEMICAL COMPANY 3243 4 OF 7

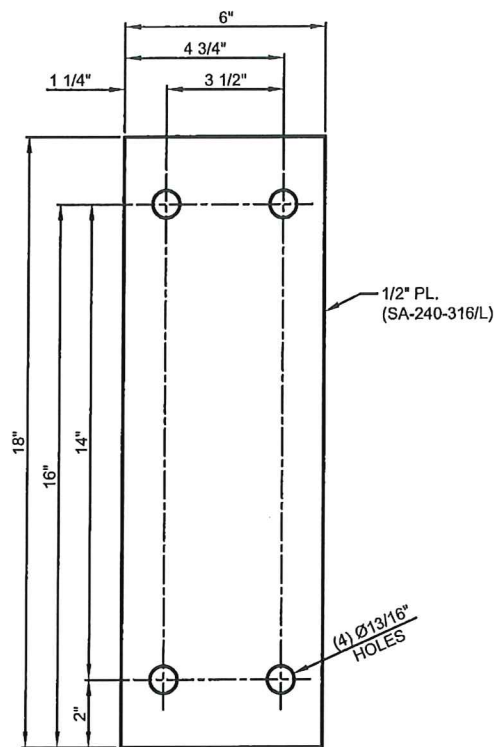
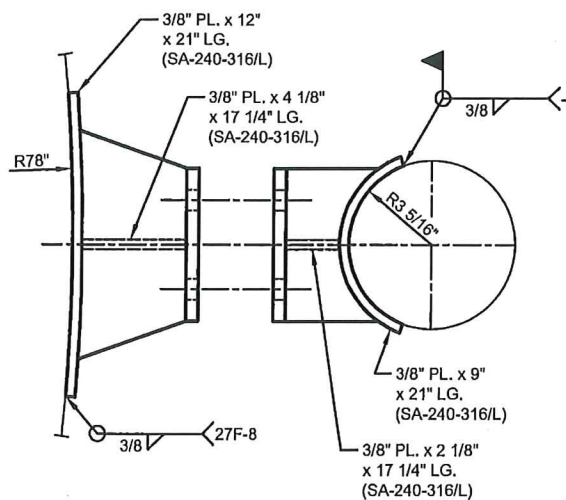
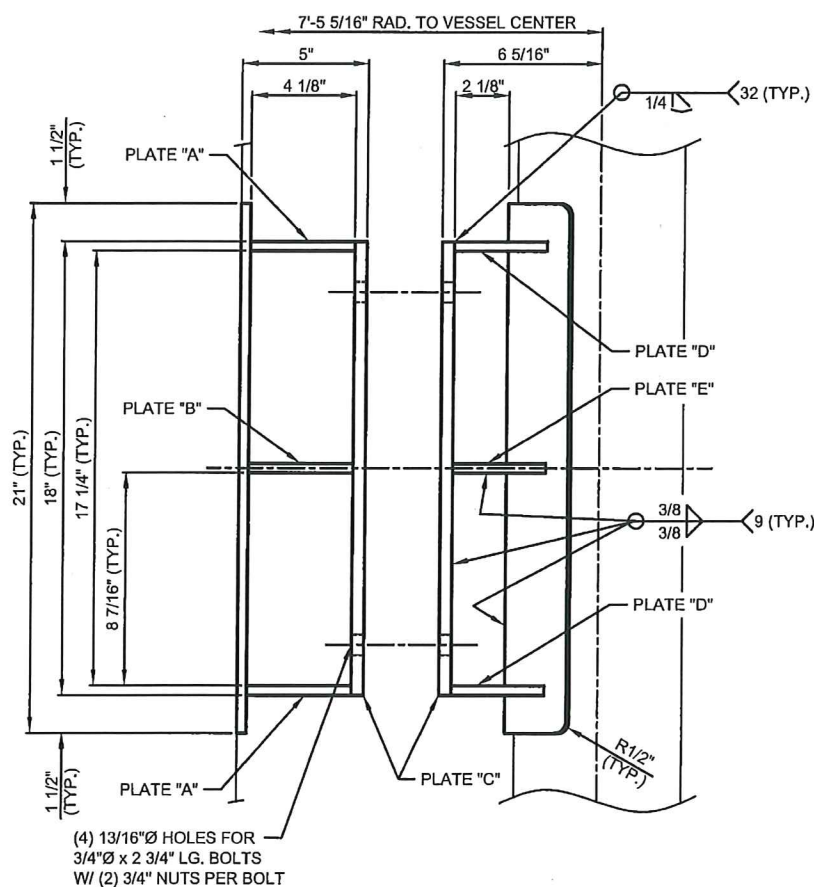


PLATE "C" DETAIL
SCALE: 8X
(2 REQ'D)



PIPE SUPPORT DETAIL
SCALE: 6X
(1 REQ'D)

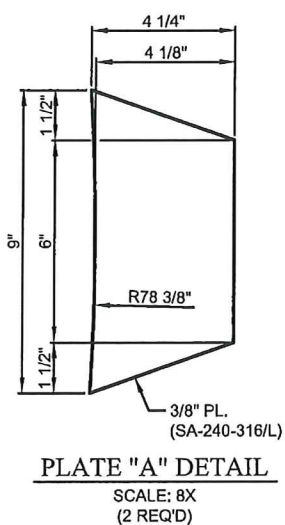


PLATE "A" DETAIL
SCALE: 8X
(2 REQ'D)

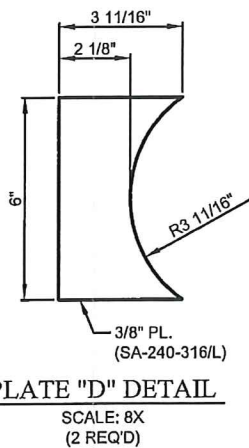


PLATE "D" DETAIL
SCALE: 8X
(2 REQ'D)

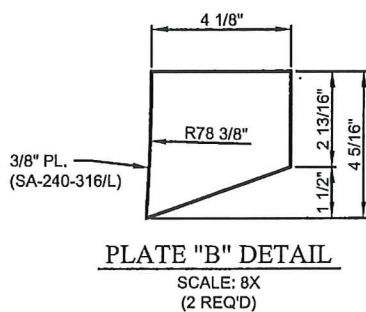


PLATE "B" DETAIL
SCALE: 8X
(2 REQ'D)

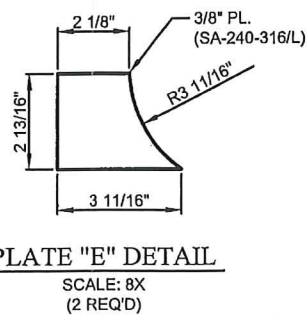
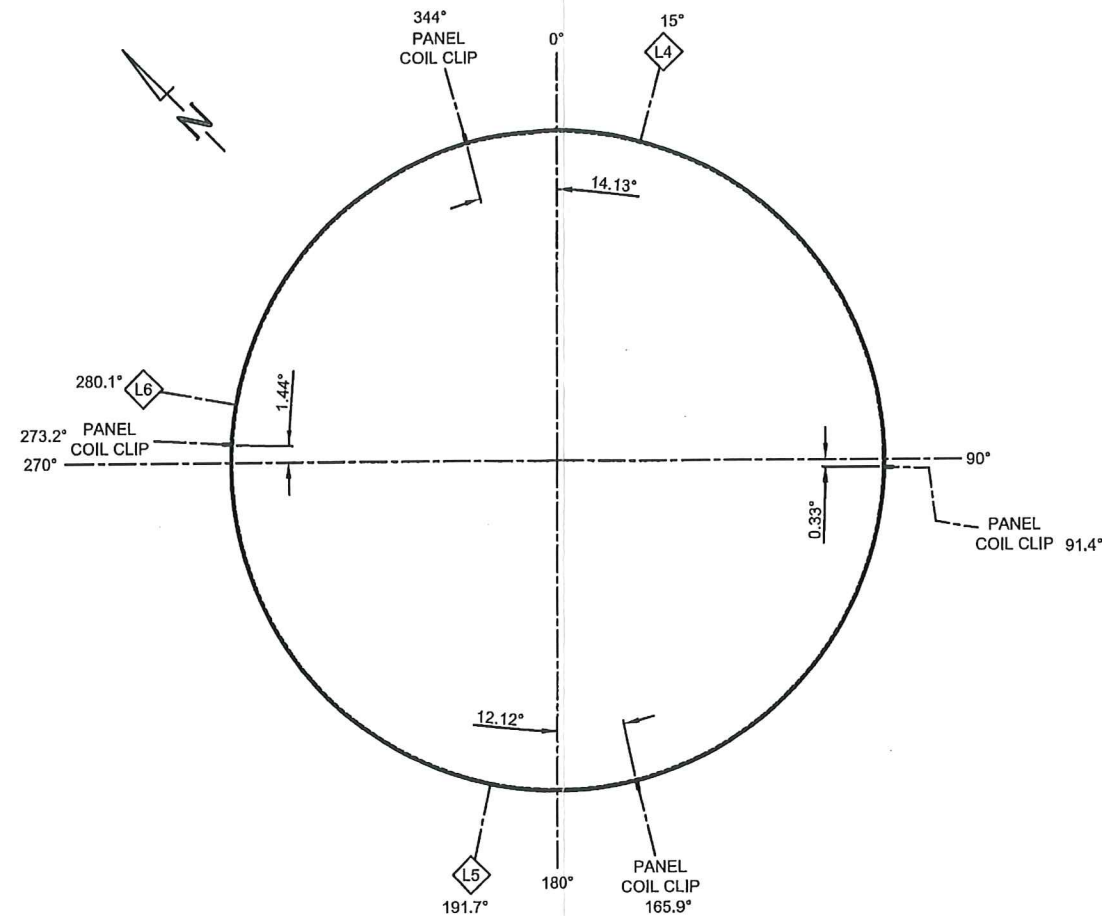
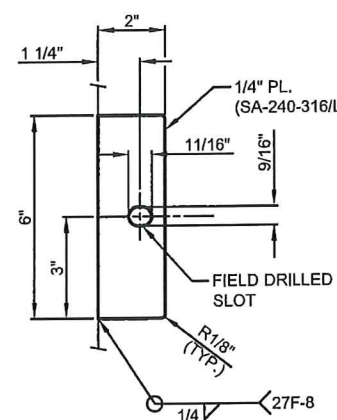


PLATE "E" DETAIL
SCALE: 8X
(2 REQ'D)



PANEL COIL SUPPORT DETAIL
SCALE: 1X
(1 REQ'D)

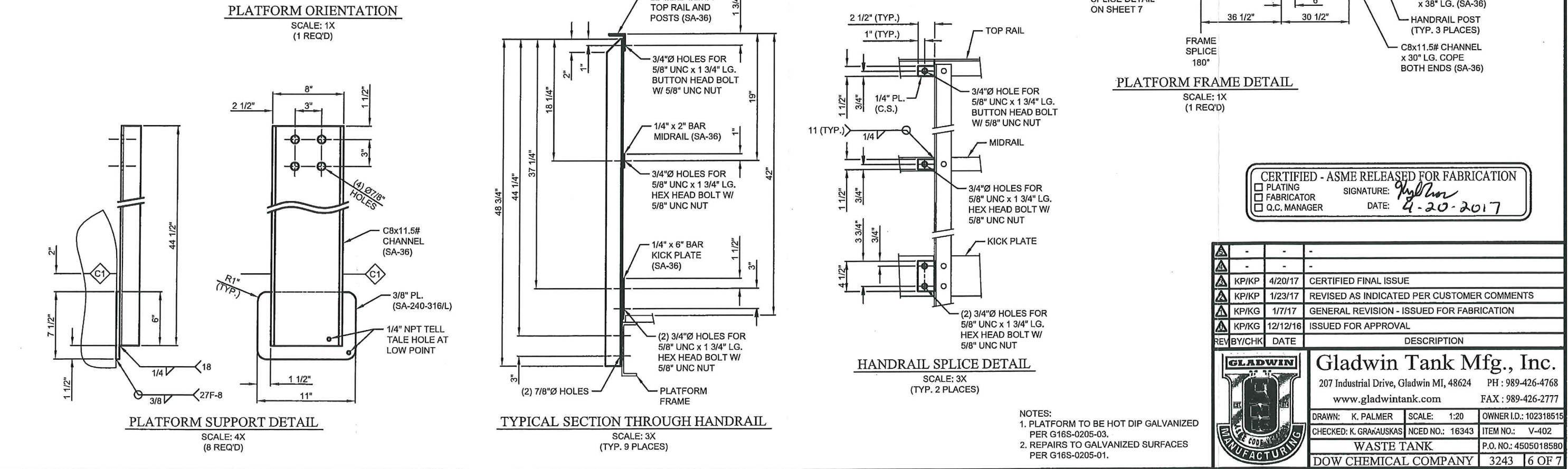
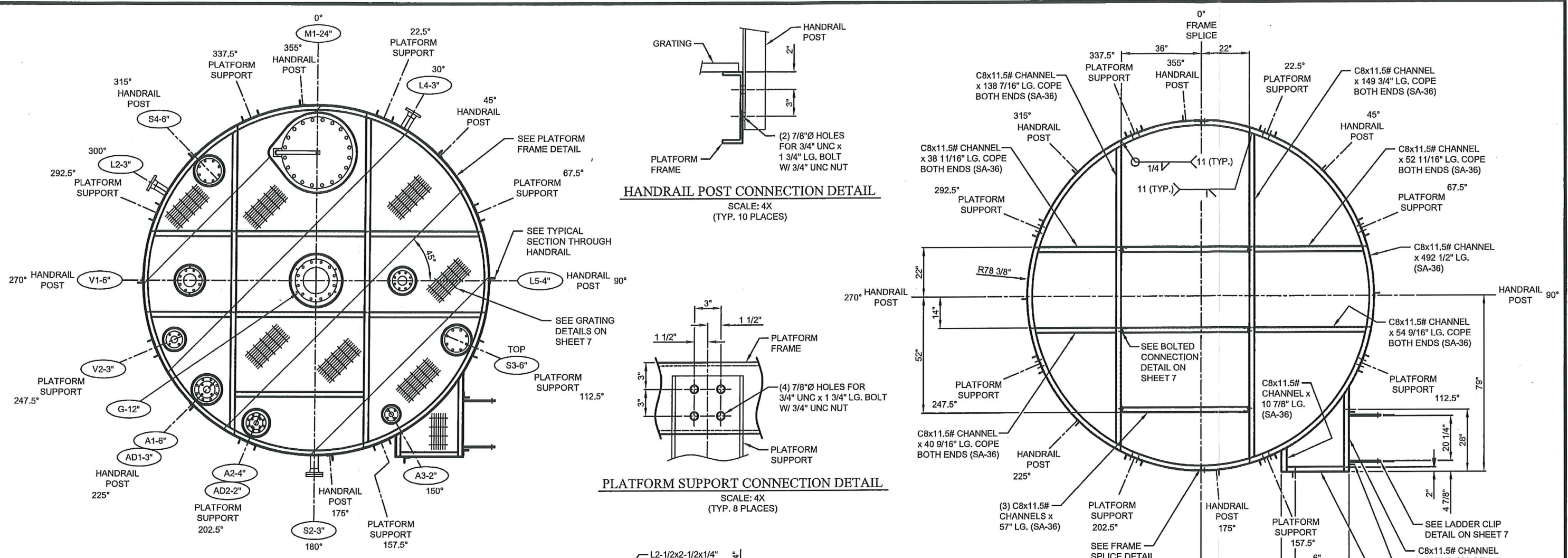


PANEL COIL CLIP DETAIL
SCALE: 8X
(12 REQ'D)

CERTIFIED - ASME RELEASED FOR FABRICATION
 PLATING
 FABRICATOR
 Q.C. MANAGER
 SIGNATURE: *[Signature]*
 DATE: 4-20-2017

REV	BY/CHK	DATE	DESCRIPTION
△	-	-	-
△	KP/KP	4/20/17	CERTIFIED FINAL ISSUE
△	KP/KP	2/7/17	REVISED PIPE SUPPORT
△	KP/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
△	KP/KG	12/12/16	ISSUED FOR APPROVAL

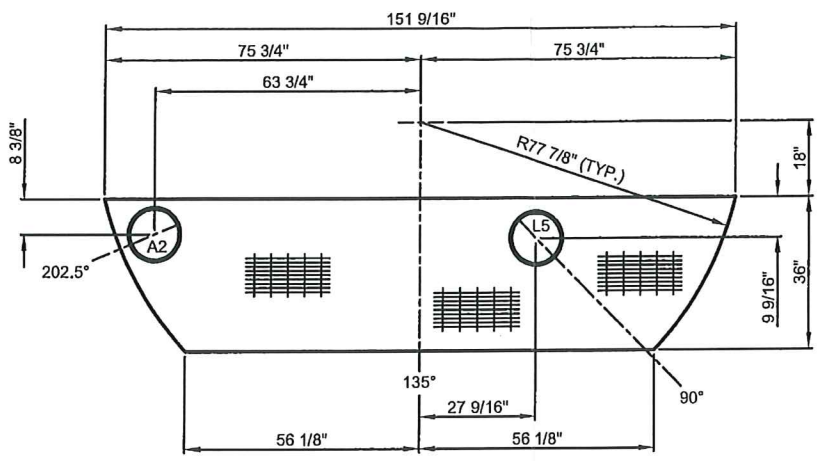
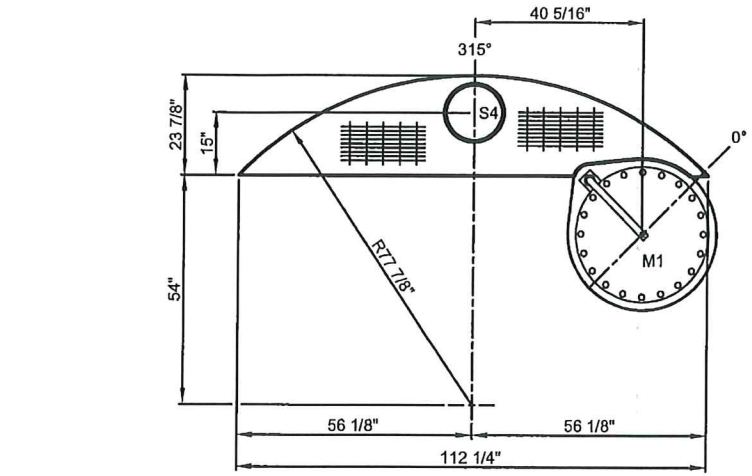
GLADWIN TANK COIL SUPPORT MANUFACTURING			Gladwin Tank Mfg., Inc. 207 Industrial Drive, Gladwin MI, 48624 PH : 989-426-4768 www.gladwintank.com FAX : 989-426-2777
DRAWN: K. PALMER CHECKED: K. GRAKAUSKAS	SCALE: 1:20 NCED NO.: 16343	OWNER I.D.: 102318515 ITEM NO.: V-402 P.O. NO.: 4505018580	WASTE TANK DOW CHEMICAL COMPANY



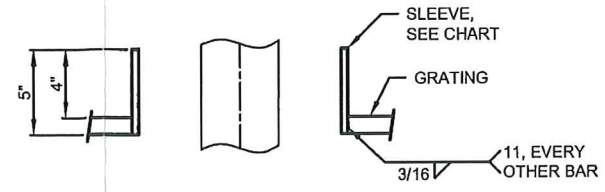
CERTIFIED - ASME RELEASED FOR FABRICATION
 SIGNATURE: *K. Palmer*
 DATE: 4-20-2017

REV	BY/CHK	DATE	DESCRIPTION
1	KP/KP	4/20/17	CERTIFIED FINAL ISSUE
2	KP/KP	1/23/17	REVISED AS INDICATED PER CUSTOMER COMMENTS
3	KP/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
4	KP/KG	12/12/16	ISSUED FOR APPROVAL

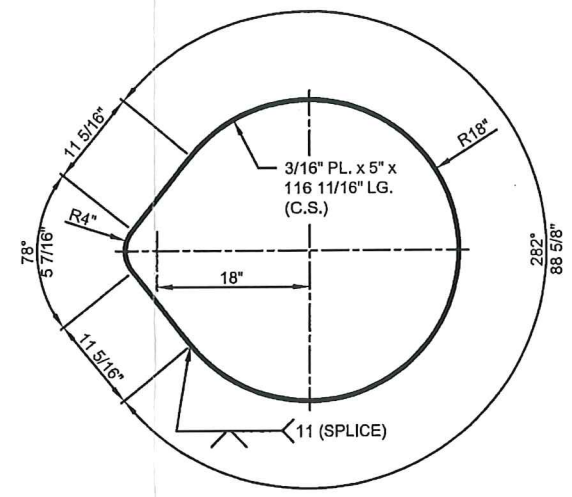
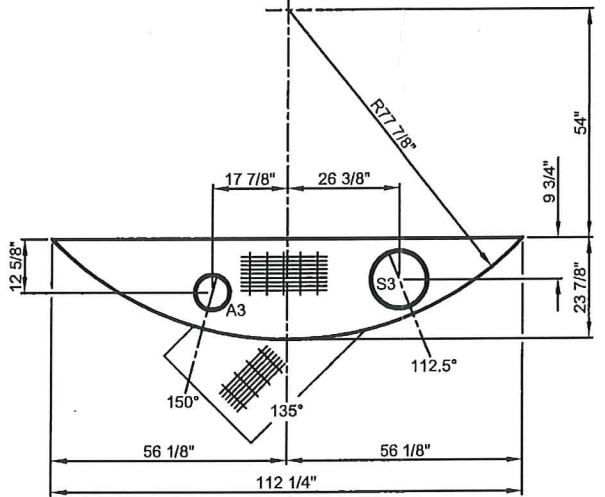
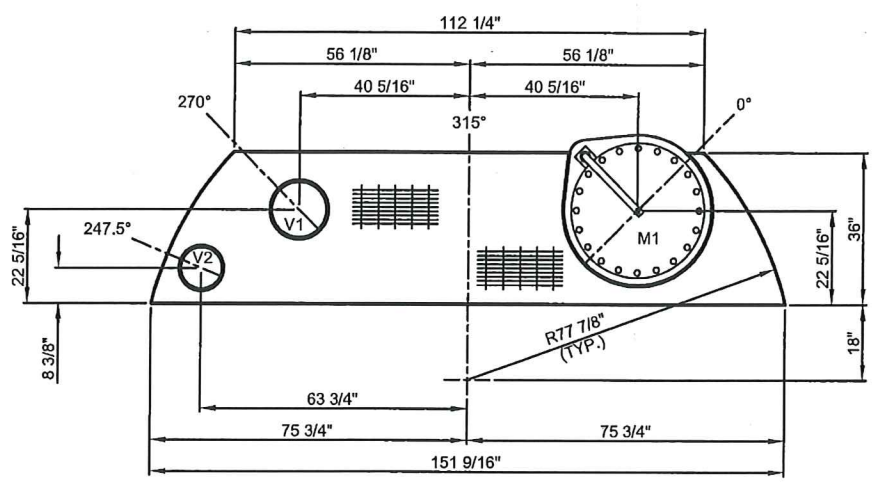
GLADWIN TANK MFG., INC.	
207 Industrial Drive, Gladwin MI, 48624	PH: 989-426-4768
www.gladwintank.com	
OWNER I.D.: 102318515	SCALE: 1:20
CHECKED: K. GRAY/AUSKAS	NCED NO.: 16343
WASTE TANK	
P.O. NO.: 4505018580	
DOW CHEMICAL COMPANY	
3243	6 OF 7



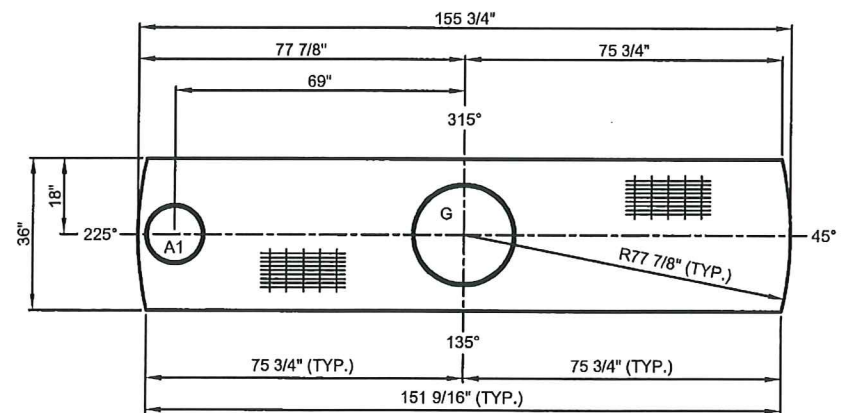
OPENING	SLEEVE	MATERIAL
A1, S3, S4, V1	14" STD. WT. PIPE	C.S.
A2, L5	12" STD. WT. PIPE	C.S.
A3	8" STD. WT. PIPE	C.S.
G	24" STD. WT. PIPE	C.S.
M1	SEE DETAIL	C.S.
V2	10" STD. WT. PIPE	C.S.



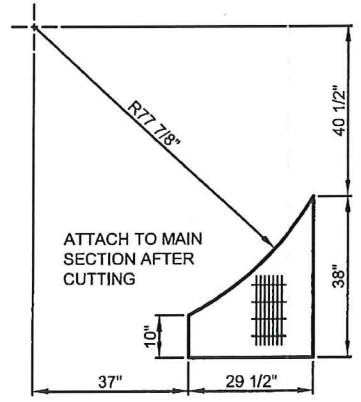
NOZZLE OPENING DETAIL
SCALE: 4X



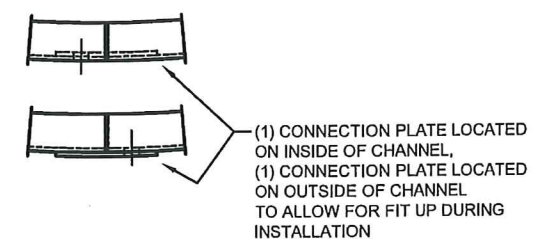
M1 OPENING DETAIL
SCALE: 2X



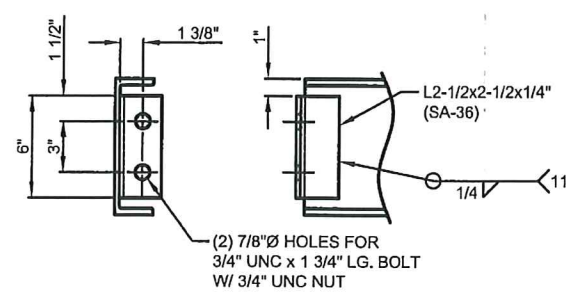
ALL GRATING SECTIONS:
1" x 3/16" GRATING (C.S.)
CONNECT EACH SEGMENT W/
MINIMUM OF (6) LINDAPTER 3/8
GRATE FAST LGF037 CLAMPS.
BAND ALL GRATING EDGES W/
1/8" x 1" BAR.



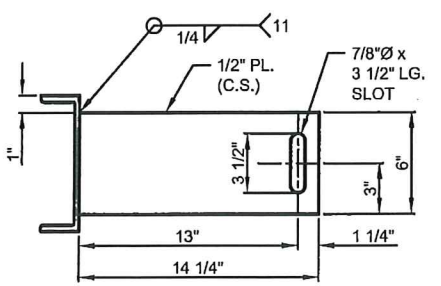
GRATING DETAILS
SCALE: 1X



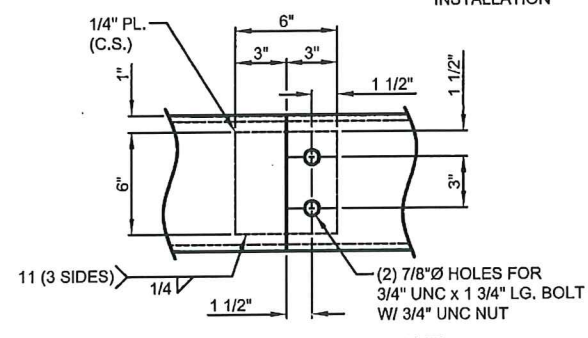
CERTIFIED - ASME RELEASED FOR FABRICATION
SIGNATURE: *[Signature]*
DATE: 4-20-2017



BOLTED CONNECTION DETAIL
SCALE: 4X
(TYP. 6 PLACES)



LADDER CLIP DETAIL
SCALE: 4X
(2 REQ'D)



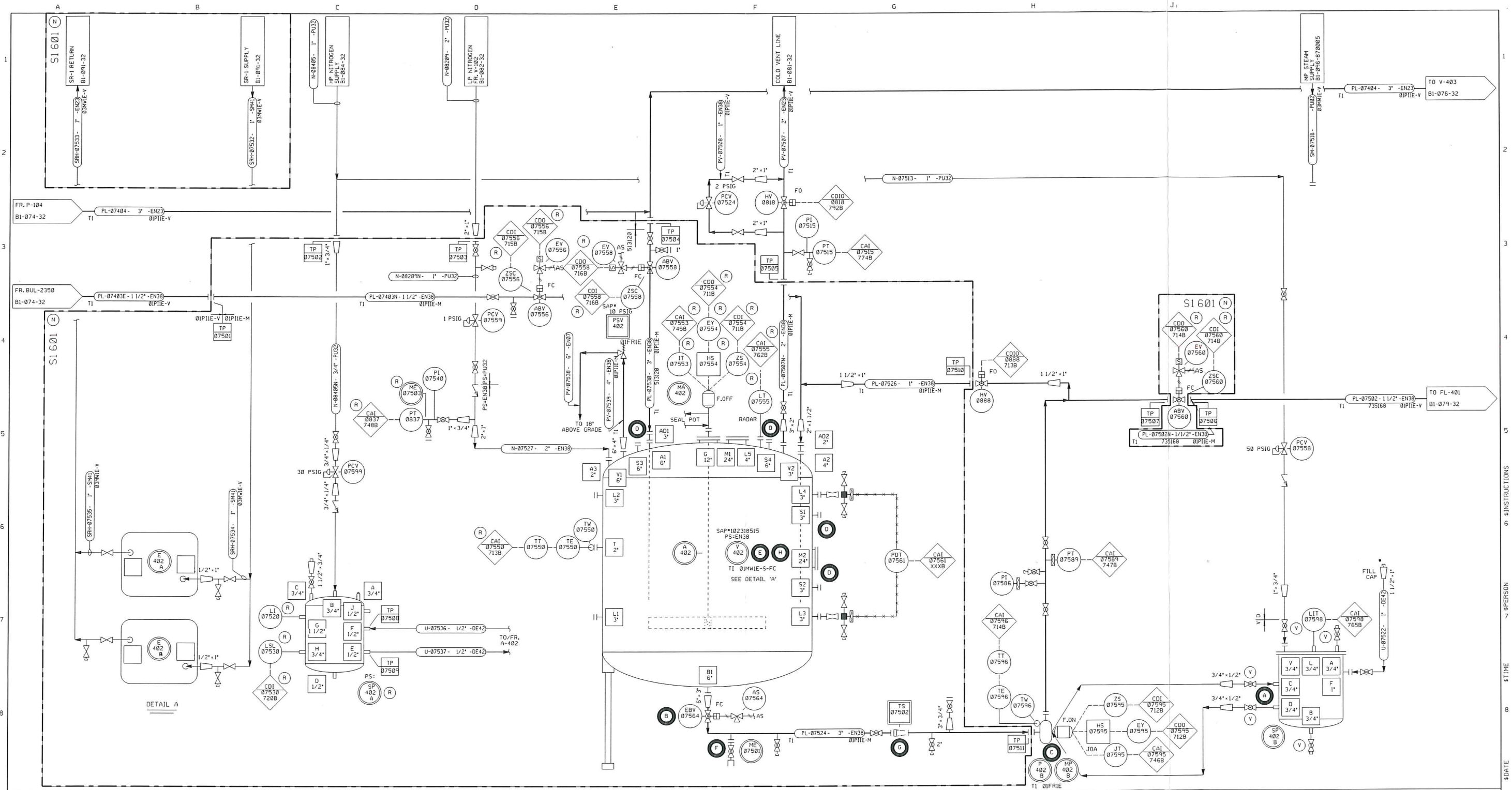
FRAME SPLICE DETAIL
SCALE: 4X
(TYP. 2 PLACES)

REV	BY/CHK	DATE	DESCRIPTION
△	-	-	-
△	KP/KP	4/20/17	CERTIFIED FINAL ISSUE
△	KP/KP	1/23/17	REVISED AS INDICATED PER CUSTOMER COMMENTS
△	KP/KG	1/7/17	GENERAL REVISION - ISSUED FOR FABRICATION
△	KP/KG	12/12/16	ISSUED FOR APPROVAL

GLADWIN
EST. 1974
MANUFACTURING

Gladwin Tank Mfg., Inc.
207 Industrial Drive, Gladwin MI, 48624 PH: 989-426-4768
www.gladwintank.com FAX: 989-426-2777

DRAWN: K. PALMER SCALE: 1:20 OWNER I.D.: 102318515
CHECKED: K. GRAKAUSKAS NCED NO.: 16343 ITEM NO.: V-402
WASTE TANK P.O. NO.: 4505018580
DOW CHEMICAL COMPANY 3243 7 OF 7



- (A) PUMP SUPPLIER TO PROVIDE SEAL POT AND INTERCONNECTING TUBING.
- (B) EBV OPERATED BY AIR SWITCHES LOCATED AT SE CORNER OF CONTAINMENT DIKE.
- (C) PUMP HAS 3" - 300* RF INLET AND 1 1/2" - 300* RF OUTLET.
- (D) SPARE NOZZLE. BLIND FLANGED FOR FUTURE USE.
- (E) SR-1 IS SUPPLIED THROUGH PANEL COILS FOR FREEZE PROTECTION ON V-402.
- (F) LINE USED FOR PROCESS CLEAN OUT.
- (G) TEMPORARY CONICAL STRAINER (OR WITCHES HAT) PLACED IN LINE BETWEEN BALL VALVE AND 4"X3" REDUCER WITH REMOVABLE SPOOL PIECE.
- (H) FIRE CREDIT TAKEN FOR PSV-402 BY INSULATION AND JACKETING ON V-402. INSULATION IS MINERAL WOOL AND JACKETING ON VESSEL IS STAINLESS STEEL AS INDICATED BY "S" ON INSULATION CLASS. JACKETING ON PIPING AROUND VESSEL IS ALUMINUM AS INDICATED BY "M" IN INSULATION CLASS.
- (N) UNLESS OTHERWISE NOTED ALL MOD I/O ON THIS DRAWING IS ON SYSTEM B.
- LAST LINE NO. USED: 07539
- LAST INST. NO. USED: 07599
- UNLESS OTHERWISE NOTED, ALL ITEMS ON THIS DRAWING ARE: EXISTING
- UNLESS OTHERWISE NOTED, ALL BRANCH CONNECTIONS ON THIS DRAWING ARE: 3/4"

REV. MARK	REVISION	BY	CHK	APP	DATE	REV. MARK	REVISION	BY	CHK	APP	DATE	DRAWING ISSUE RECORD		DESIGNED	STATUS	PLANT NO.
01	1ST PASS FOR JN-64872.	RRK			10/11/16	F	GENERAL REVISIONS PER AS-BUILT.	NRK			06/27/08					
02	2ND PASS FOR JN-64872.	LJM			11/08/16	H	GENERAL REVISIONS PER AS-BUILT.	LJM			05/12/09					
03	3RD PASS FOR JN-64872.	LJM	GCT		01/16/16	H	GENERAL REVISIONS PER AS-BUILT.	NRK			12/17/09					
04	4TH PASS FOR JN-64872.	LJM	GCT		01/16/17	I	GENERAL REVISIONS PER AS-BUILT.	KSJ			01/31/11					
05	5TH PASS FOR JN-64872.	LJM	GCT		02/01/17	J	GENERAL REVISIONS PER AS-BUILT.	RAM			08/22/12					
						K	GENERAL REVISIONS PER AS-BUILT.	RAM			10/05/12					
						L	GENERAL REVISIONS PER AS-BUILT.	KPC			10/29/12	1	05	S1601-64872	02/06/17	
						M	GENERAL REVISIONS PER AS-BUILT.	LJM			08/23/13					
						N	GENERAL REVISIONS PER AS-BUILT.	NRK			09/11/13					
E	GENERAL REVISIONS PER AS-BUILT.	SR			05/04/07	N	GENERAL REVISIONS PER AS-BUILT.									

THE DOW CHEMICAL COMPANY

MICHIGAN OPERATIONS MIDLAND, MICHIGAN

32 INCINERATOR 32 BLDG.

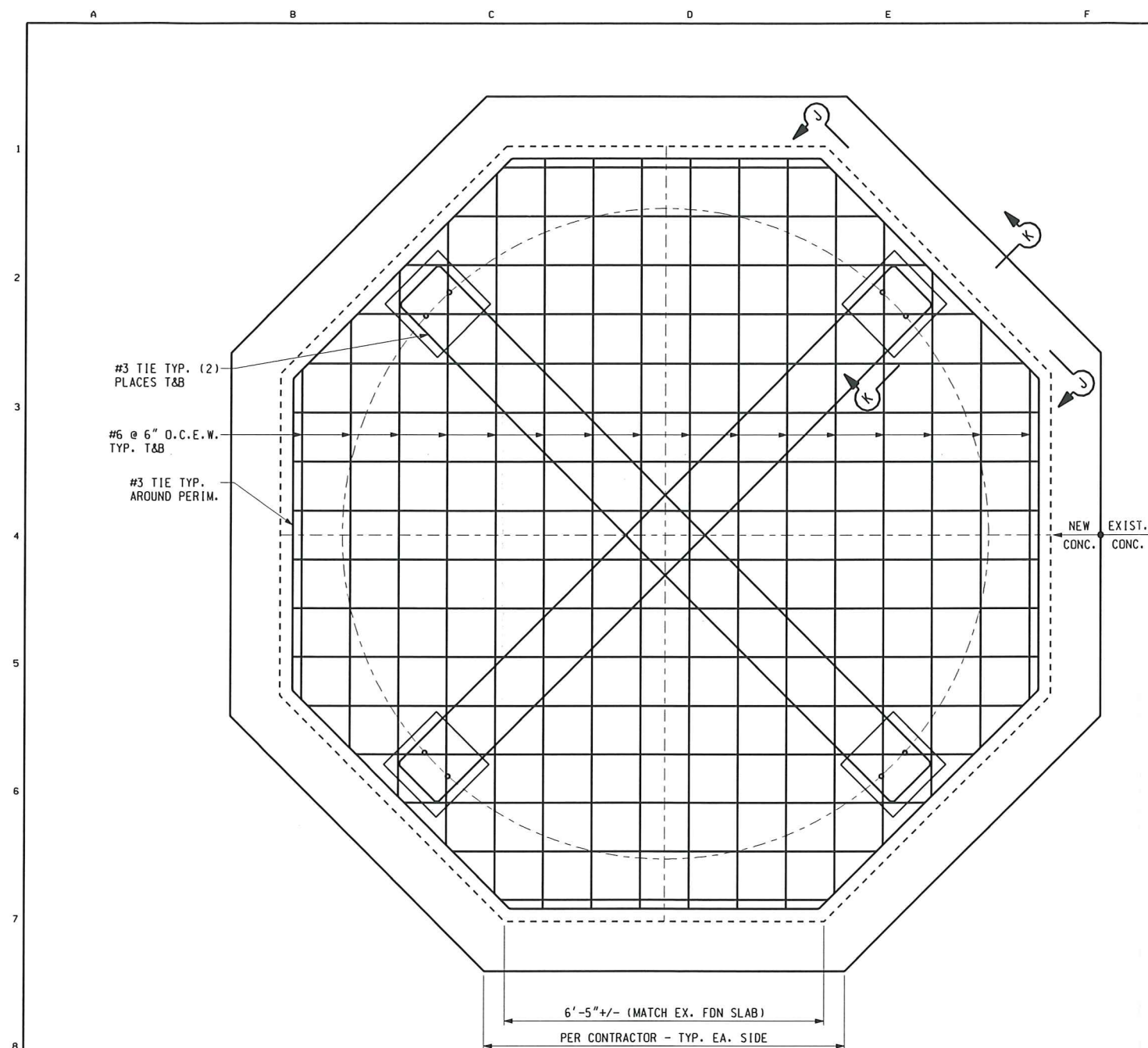
COLD TAR STORAGE

V-402

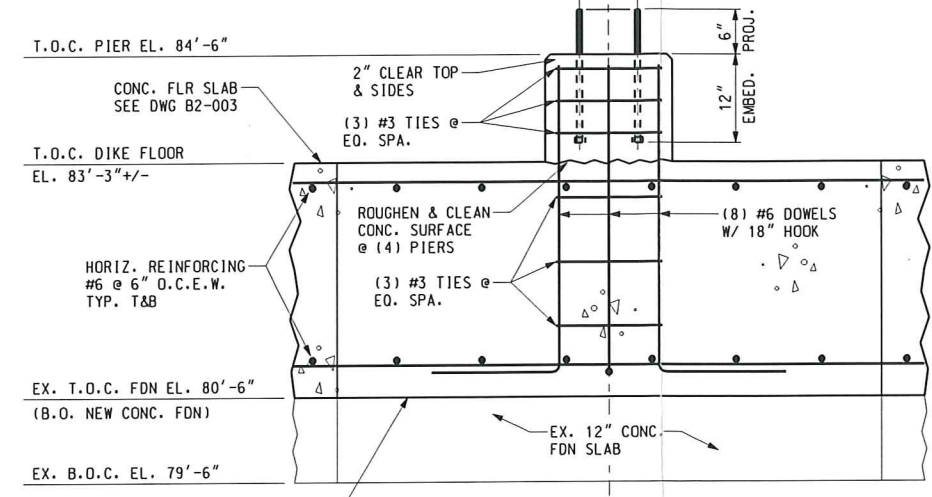
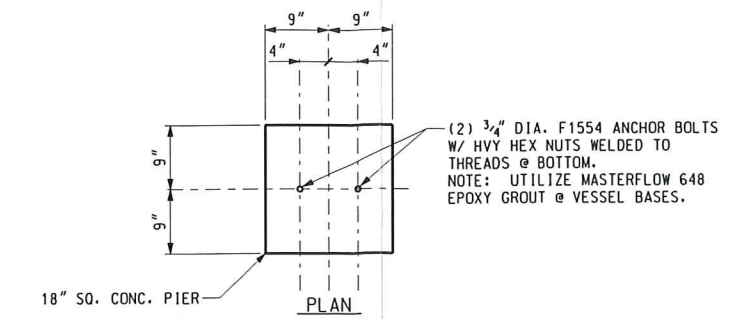
PIPING AND INSTRUMENT DIAGRAM

PROJECT NUMBER: 32 SCALE: B1-075-64872 REV. 05

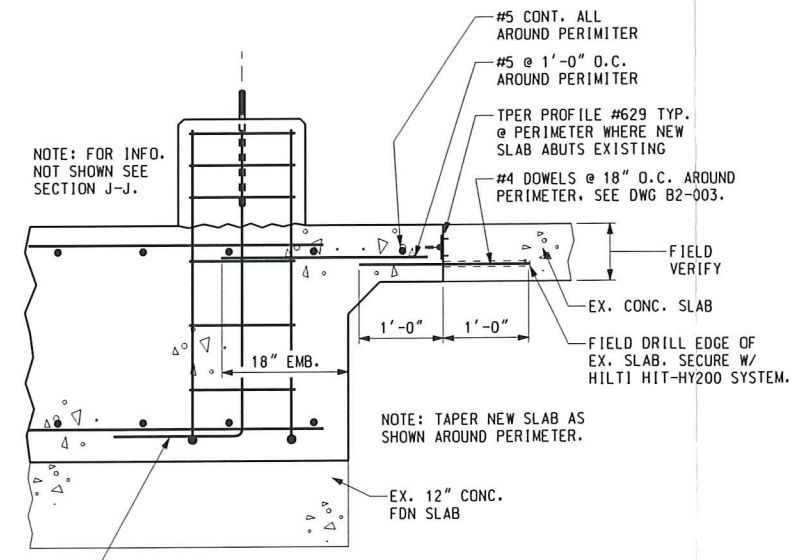
FILE NAME: P10



FOUNDATION / SLAB PLAN
3/4" = 1'-0"



SECTION J-J
1" = 1'-0"



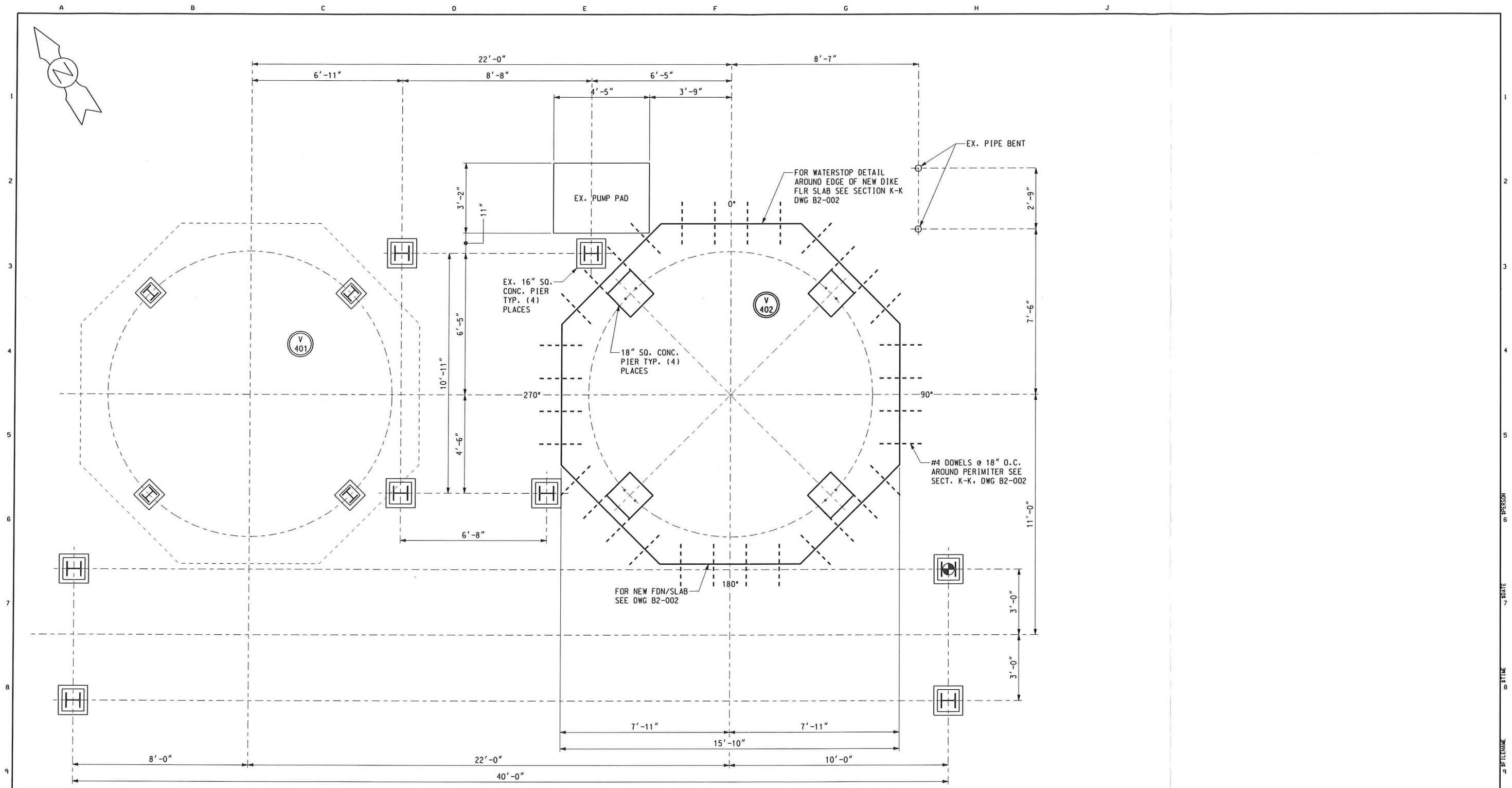
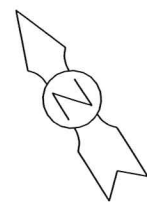
SECTION K-K
1" = 1'-0"

GENERAL NOTES:
1. FOR ALL GENERAL NOTES, SEE DWG B2-001-64872.

REV. MARK	REVISION	BY	CHK	APP	DATE	REV. MARK	REVISION	BY	CHK	APP	DATE	DRAWING ISSUE RECORD		DESIGNED	DATE	STATUS	PLANT NO.	THE DOW CHEMICAL COMPANY	
														L. PATTERSON	01/17			MICHIGAN OPERATIONS	
														R. GILLETTE	01/17			MIDLAND, MICHIGAN	
														L. PATTERSON	01/17			703 TANK FARM	
														L. PATTERSON	01/17				
														PROJ. ENGR.	12/16				
														A. HURLEY	12/16				
														M. SEKELSKY	12/16				
1	0																	64872	SCALE NOTED
																		B2-002-64872	REV.
																		2	CON

DATE OF ISSUE

INSTRUCTIONS



GENERAL NOTES:

- FOR ALL GENERAL NOTES, SEE DWG B2-001.

REV. MARK	REVISION	BY	CHK	APP	DATE	REV. MARK	REVISION	BY	CHK	APP	DATE	DRAWING ISSUE RECORD		DESIGNED	DATE	STATUS	PLANT NO.	THE DOW CHEMICAL COMPANY	
														L. PATTERSON	12/16			MICHIGAN OPERATIONS	MIDLAND, MICHIGAN
														R. GILLETTE	12/16			EVO	703 TANK FARM
														L. PATTERSON	01/17			V-402 UPGRADE FOUNDATION PLAN	
														L. PATTERSON	01/17			SCALE 1/2"=1'-0" UN	
														R. MURLEY	12/16			64872	B2-003-64872
														M. SEKELSKY	12/16			2	STL

OF PERSON
 OF TITLE
 OF FLENUM
 INSTRUCTIONS