Tank Inspector(s) _J. Martin (STI #AC 32455) and M. Emert_____

Name Plate/Construction **Circumference:** 37.75'

● Steel ○ Stainless Steel ○ Plastic ○ Aluminum ○ Fiberglass

Build Date _2000_ Manufacturer _Palmer Manufacturing and Tank_____

Build Stnd: ○ API-650 ○ API-12C ○ API-12F ○ UL-142 ○ Re-Erected ○ Unknown

Date Last External _____ Date Last Internal _____

Name Plate Data _____

Dia/Width: _12.00_ ft Must be <=30 ft

Height: _42.00_ ft Must be <=50 ft

Length: _____ft

Capacity: _35,291_ GAL

STI Not applicable for tanks over 50,000 Gal.

Product Service __Basestock____

Specific Gravity ____1.00_____

☐ Ambient ☒ Heated

☐ Refrigerated

Operating Temperature __170_ F

STI Not applicable for heated tanks over 200°F

Tank Description

● Vertical ○ Horizontal ○ Box ○ Tote ○ Other _____

Foundation: ○ Grade ○ Ringwall ● Concrete Pad ○ Saddles ○ Skids ○ Other

Bottom: ● Welded ○ Riveted ○ Bolted ○ N/A Year Installed:_____

○ No Coating ○ Thin Coating ○ Thick Coating

☐ Pan Type ☐ Cathodic Protection ☐ Double Bottom ☐ Leak Detection

Shell: ● Welded ○ Riveted ○ Bolted ○ Combination

☐ Lap welded ☐ Insulated ☐ Double Wall ☐ Containment Vessel

Horizontal Tank Heads: ○ Flat ○ Hemispherical ○ Dish

Roof: ● Cone ○ Flat ○ Geo-Dome ○ Dome ○ Open/None ○ N/A

Roof Access: ○ Spiral Stair ○ Radial Stair ● Catwalk ○ Ladder ○ None

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Company: AGP
Location: Hastings, NE

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Date: 07-14-2021
Tank: DVOP 11

1. Spill Control

○ None

○ Containment AST ○ Dbl Wall/Bottom ○ Dike Area ○ Remote Impound ● in Building

2. CRDM (Continuous Release Detection Method)

○ None

● **RPB (Release Prevention Barrier)**

Type ● Concrete Pad ○ Liner ○ Steel Plate ○ Other _____

○ **Double Wall/Bottom** with Interstitial Space

○ OK ○ Not OK ○ Not Checked

○ **Elevated**

3. AST Category

Category _1_

1 Any Tank with Both Spill Control and CRDM

2 Single wall AST in contact with ground NO CRDM Has Spill Control

3 Single wall AST in contact with ground has CRDM NO Spill Control

Vertical AST on concrete pad CRDM has NO Spill Control

Single/Double wall AST Has CRDM NO Overfill Protection

4. Venting

☐ Open vents not elevated 12 feet ☒ Open vents not vented outside building

☐ Uses long bolted Manway as emergency vent ☐ Vapor recovery system

Primary Vent ● Open ○ Pressure/Vacuum ○ Pressure Size: _8.00”_____

Secondary Vent ○ Open ○ Pressure/Vacuum ○ Pressure Size: _____

Emergency Vent ○ Open ○ Pressure/Vacuum ○ Pressure Size: _____

Interstice Vent ○ Open ○ Pressure/Vacuum ○ Pressure Size: _____

5. Comments

The tank was located inside a building. The open vent was not vented outside the building.

The tank had an 8-inch open vent.

1. Foundation — *Concrete Pad*

Anchorage: ○ No Anchors ○ Cable Tie Downs ● Anchor Bolts
Number of Anchors: _4_ Size of Bolt (in) _1.00_ Height (in) _14.00_
Thickness of top plate (In) _0.526_ Thickness of side plate (In) _0.520_

Ringwall/Pad Dimensions: Distance from Bottom extension to edge (in) _5.00_ Min 6.00 Max
Distance from top surface to grade (in) _23.00_ Min _26.00_ Max

Support Dimensions: Number of supports: __ Space between Supports (in) __
Size of supports (in): __ Height of supports (in): __
○ No Pad Plate ○ Pad Plate ○ Stitch welded pad plate ○ Seal welded pad plate

2. Undesirable Foundation Conditions

☐ Grade against tank ☐ Washout ☐ Voids under tank ☐ Hairline Cracks in concrete
☐ Large Cracks in concrete (>1/8") ☐ Exposed rebar ☐ Discontinuous Ringwall
☐ Corrosion of supports ☐ Anchor Bolt Corrosion ☐ Bottom extension corrosion

3. Undesirable Area Conditions

☐ Obvious settlement ☐ Water Against tank ☐ Drainage toward tank ☐ Excessive debris
☐ Vegetation by tank ☐ Moss under bottom ☐ No Containment Dike/Wall
☐ Damaged Containment Dike/Wall ☐ Product residue ☐ Wet Product by Tank

4. Comments

The tank was located inside a building.

1. External Tank Shell ***Welded***

☐ Seams Covered ☐ Rivets Unsealed ☐ Rivets Sealed ☐ Rivets Welded
☐ No Pad Plates Under Shell Brackets ☐ No Ice shields on All Item <2" ☐ Foam System

2. Coating Conditions ○ Like New ● Good ○ Fair ○ Poor ○ No Coating

☐ Peeling ☐ Cracking ☐ Thinning ☐ Rust Stained ☐ Primer Only ☐ Areas not Coated

Insulation Conditions ○ Like New ○ Good ○ Fair ○ Poor
○ Sprayed ○ Corrugated/ Banded ○ Smooth Metal ☐ Areas Removed
☐ Tears ☐ Damaged ☐ Holes ☐ Penetrations Not Sealed ☐ Wet under Insulation

3. Undesirable Shell Conditions

☐ Weld Seam Corrosion ☐ Weld Pinholes ☐ Arc Strikes ☐ Weld Porosity ☐ Weld Slag
☐ Weld Cracks ☐ Weld Undercut ☐ Lack of Fusion ☐ Holes in Shell ☐ Gouges in Shell
☐ Inactive Corrosion ☐ Active Corrosion ☐ Surface Corrosion ☐ Corrosion Damage
Deepest Shell Corrosion Found: __ Height above Grade __ ☐ Needs Evaluation

4. Shell Distortion and Buckling

☐ Peaking ☐ Banding ☐ Lower Shell Distortion ☐ Upper Shell Distortion ☐ Torn Plate
☐ Distortion around Nozzles/Repairs ☐ Minor Buckles ☐ Major Buckles ☐ Sharp Creases

5. Possible Improper Construction Practices List Items Below

☐ Square Corner Inserts/Pads ☐ Lap Patches ☒ Unreinforced Penetration ☐ Split Repad
☒ No Telltale Hole in Repad ☐ Plugged Telltale Hole in Repad ☒ Improper Weld Space
☐ Insufficient Reinforcement ☐ Undersize Insert ☐ Cover Plate Thin ☐ Flange Thin
The repads of Shell Items C, L, and M did not have telltale holes.
The weld spacing of Shell Items C and G did not meet API standards.
Shell Items A, H, I, and J were over 2 inches in diameter and did not have repads.

6. Ground cables Quantity _1_

☐ None Found ☐ Not Attached ☐ Broken ☐ Improper Attachment

7. Level Gauge **Manufacturer** _DP Harp_ **Product Height:** __ FT

☐ Float with Gauge ☐ Target Board ☒ Electronic ☐ Floats, Cables Guides not Attached
☐ Not Working ☐ Conduit damaged ☐ Needs Service

8. Top Angle Wind Girder

☐ None ☐ Toe In ☒ Toe Out ☐ Corrosion ☐ TA Weld Size Greater than 3/16”
☐ Damaged Welds ☐ Buckled ☐ Coating Failure ☐ Holds Water ☐ Buckled

Top Angle: Vertical (in) _2.50_ Horizontal (in) _2.50_ Thickness (in) _0.262_
Wind girder: Vertical (in) __ Horizontal (in) __ Thickness (in) __
Distance from Top of Tank (in): __

9. Shell Vents and Overflows

☒ None ☐ Indicator Holes ☐ Screens Missing/Damaged ☐ Over Stairway ☐ Geo Dome
Number of Vents: __ Size (in): __ Distance from roof (in): __
Number of Overflows: __ Size (in): __ Distance from roof (in): __

10. Comments

The coating on the external shell and appurtenances was in good condition.

1. Internal Tank Shell *Welded*

☐ Product Build-Up ☒ Product Residue ☐ Lower Shell Coated ☐ Entire Shell Coated
☐ Shell Not Inspected ☐ Shell Welds Not Inspected

2. Undesirable Shell Conditions

☐ Weld Seam Corrosion ☐ Weld Pinholes ☐ Weld Porosity ☐ Weld Slag ☐ Weld Cracks
☐ Weld Undercut ☐ Lack of Fusion ☐ Arc Strikes ☐ Holes in Shell ☐ Gouges in Shell
☐ Weld Burrs ☐ Minor Shell Corrosion ☐ Shell Corrosion Damage
Deepest Shell Corrosion Found: __ Height above Bottom __ ☐ Needs Evaluation

5. Possible Improper Construction Practices List Items Below

☐ Lap Patches ☐ Item Penetrates but Not Welded ☐ Hot Tap ☐ Drilled Hole for Coupling
☐ No Pads on Gauge Pole Supports ☐ No Pads on Datum Plate Supports ☐ Undercut
☐ Incomplete Shell Weld ☐ Lack-of-Fusion ☐ Cracked Weld ☐ Welds Not Visible

5. Internal Piping and Supports

☐ No Pads on Pipe Supports ☐ Pipe Support Welded to Both Pipe and Bottom
☐ Inadequate Pipe Supports ☐ Corrosion on Piping ☐ Broken Welds ☐ No Diffuser
☐ No Suction Trough ☐ Center Suction / Fill ☐ Has Floating Suction Line

6. Comments

There was product residue on the internal shell.

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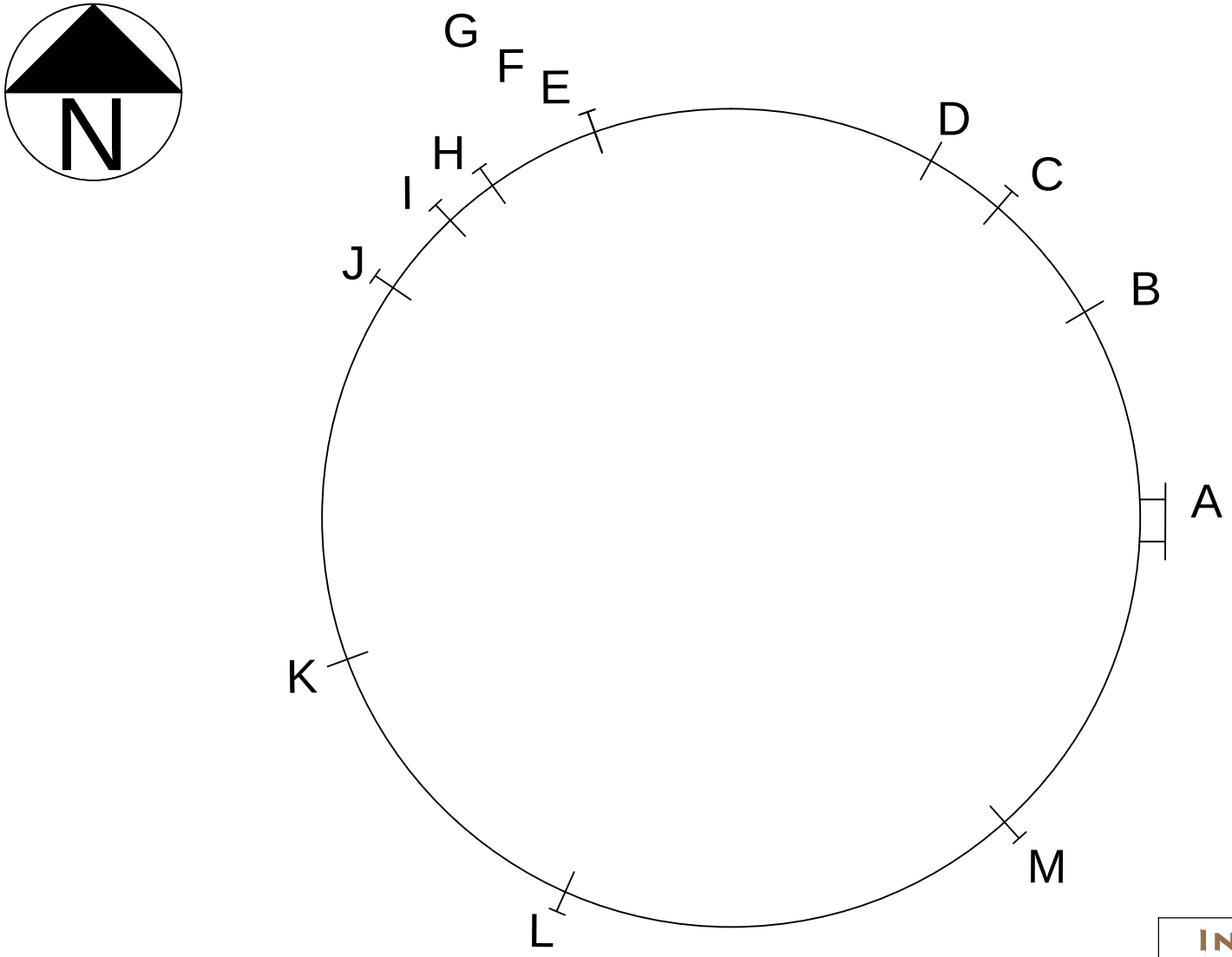
Date: 7/14/2021
Tank: DVOP 11

* A B C D E F G H

Height is measured from bottom to the centerline of the item. Weld spaces are measured toe-to-toe of the welds.

ID	Size	TT hole	Shape*	Description	Location	Height	Repad/Insert			Neck Thicknesses				Weld Space	To**
							Width	Height	t	Top	Bottom	Left	Right		
A	24.00			Manway	0.00	30.00				0.399				16.50	CW
B	0.75			Coupling	3.20	30.00								28.00	CW
C	2.00		A	Nozzle	5.20	6.00	10.00	10.00	0.243	0.216				1.50	CW
D	0.75			Coupling	6.40	24.00								23.00	CW
E	3.00			Nozzle	11.50	Ring 7									
F	0.75			Coupling	11.50	24.00								12.00	G
G	4.00	1	C	Nozzle	11.50	6.00	10.00	10.00	0.247					0.00	CW
H	4.00			Nozzle	13.20	32.00				0.241				28.75	CW
I	4.00			Nozzle	14.00	20.00				0.242				17.00	CW
J	4.00			Nozzle	15.30	8.00				0.232				5.25	CW
K				Catwalk	21.00										
L	8.00		A	Nozzle w/ Mixer	25.80	36.00	26.00	26.00	0.249	0.293				23.75	CW
M	2.00		A	Nozzle	32.70	9.00	10.00	10.00	0.249	0.216				3.50	CW
N															
O															
P															
Q															
R															
S															
T															
U															
V															
W															
X															
Y															
Z															
AA															
BB															

** TS=Tombstone or low type repad, CW=Cornerweld, HW= Horz. weld, VW=Vertical Weld, R#=Repad of Item #, #=Weld of Item#, PB=Pan Bottom weld



Couplings/Other
Nozzles
Manway
Ladder
Catwalk/Platform
Stairs

INSERV TANK SERVICES

			Job No:	652131
			Tank Num:	DVOP 11
			Date:	07-14-2021
Customer:	AGP			
Location:	Hastings, NE			
	Diameter:	12.00	Height:	42.00
	Drawn by:	A Frye	Rev:	

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Company: AGP
Location: Hastings, NE

Job ID: 652131
Date: 7/14/2021
Tank: DVOP 11

Course	Height (in)	Shell Material	Joint Type*	Shell Thicknesses (in)		
				Bottom	Middle	Top
1	69.00		BW	0.250	0.246	0.246
				0.250	0.250	0.249
				0.249	0.248	0.250
				0.250	0.249	**0.244**
2	69.00		BW	0.248	**0.247**	**0.247**
3	68.75		BW	**0.247**	**0.247**	**0.247**
4	68.75		BW	**0.250**	**0.250**	0.251
5	68.75		BW	0.248	**0.246**	**0.246**
6	69.00		BW	0.248	0.249	**0.244**
7	68.50		BW	0.250	**0.248**	**0.248**
8						
9						
10						

* Joint Type: BW= Butt Weld, LW= Lap Weld, LR# = Lap Riveted (num of rivets), BR= Riveted Butt joint (Num Rivets on one side), BLT=Bolted

Total Height: 40.15 Feet

Minimum Thickness written in **Blue Font**

Enter Vertical seam Location in CCW order from Start point.

1	36.30	**11**		**21**		**31**	
2		**12**		**22**		**32**	
3		**13**		**23**		**33**	
4		**14**		**24**		**34**	
5		**15**		**25**		**35**	
6		**16**		**26**		**36**	
7		**17**		**27**		**37**	
8		**18**		**28**		**38**	
9		**19**		**29**		**39**	
10		**20**		**30**		**40**	

Second Course offset _____
Third Course offset _____

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Location: Hastings, NE

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Date: 07-14-2021
Tank: DVOP 11

1. Tank Roof *Cone*

☐ No Access ☒ Limited Access ☐ Access Not Safe ☐ No Safety Tie Off

Slope, Run 24 inches Rise (in): 3.00

2. Coating Conditions

○ Like New ● Good ○ Fair ○ Poor ○ No Coating

☐ Peeling ☐ Cracking ☐ Thinning ☐ Primer Only ☐ Areas Not Coated

Insulation Conditions ○ Like New ○ Good ○ Fair ○ Poor

○ Sprayed ○ Corrugated/ Banded ○ Smooth Metal ☐ Areas Removed

☐ Tears ☐ Damaged ☐ Holes ☐ Penetrations Not Sealed ☐ Wet under Insulation

3. Undesirable Roof Conditions

☐ Weld Seam Corrosion ☐ Weld Pinholes ☐ Weld Cracks ☐ Holes in Roof

☐ Inactive Corrosion ☐ Active Corrosion ☐ Surface Corrosion ☐ Corrosion Damage

☐ No Safety Bars on >30” Openings Thinnest RWT Found: 0.248” ☐ Needs Evaluation

4. Roof Distortion and Buckling

☐ Excessive Waviness ☐ Areas Holding Water ☐ Settlement of Support Structure

☐ Torn Plates ☐ Sharp Creases ☐ Roof Joint Not Frangible (3/16”)

5. Vents and settings

List vent sizes and settings below

☒ Open Vents ☐ Pressure/Vacuum Vents ☐ Peripheral Vents ☐ Flame Arrestor

☐ Missing/Damaged Screens ☐ Vents Need Service ☐ Less than 8” Center Vent with IFR

The tank had an 8-inch open vent. The open vent extended to the lower level of the tank.

The open vent was not vented outside the building.

6. Comments

The coating on the external roof and appurtenances was in good condition.

1. Internal Tank Roof

○ Structurally Supported ● Self Supporting (No Structure)

Record column radius location and number of columns

Center	Bay 1	Bay 2	Bay 3	Bay 4
Radius 0				
Number 0				

2. Column Type, Size and Conditions

○ Structural Steel ○ Steel Pipe ○ Both Types

Dimensions (in)	Center Column	Outer Columns
Size of Members		

☐ Welded ☐ Riveted ☐ Bolted ☐ Bowed ☐ Twisted ☐ Out-of-Plumb ☐ Damaged
☐ Corroded ☐ Broken Welds ☐ No Drain Hole in Pipe

3. Column Base Type, Size and Conditions

○ H-Shaped ○ T-Shaped ○ Flat Plate

Dimensions (in)	Center Base	Outer Bases
Size of Members		
Bearing Plate		

☐ Welded ☐ Riveted ☐ Bolted ☐ Damaged ☐ Welded to Bottom ☐ No Guide Clips
☐ Insufficient Guide Clips ☐ Corroded ☐ No Bearing Plate ☐ Not Seal Welded

4. Rafter Conditions

☐ Bowed ☐ Twisted ☐ Hanging ☐ Sagging ☐ Corroded ☐ Damaged ☐ Not Radial

5. Roof Conditions

☐ Hole ☐ Corroded ☐ Un-Capped Opening ☐ Entire Underside Coated

6. Comments

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Roof Nozzles and Appurtenances (Measure one and give quantity for peripheral vents)

	Type	Size	Radius*	Comment
A	Nozzle	8.00 "	0.00'	
B	Nozzle	6.00 "	5.00'	
C	Coupling	2.00 "	5.00'	
D	Nozzle	6.00 "	4.50'	
E	Nozzle	6.00 "	4.00'	
F	Manway	20.00 "	4.50'	
G	Nozzle	6.00 "	3.50'	
H	Nozzle	6.00 "	4.00'	
I	Nozzle	6.00 "	4.50'	
J	Nozzle	6.00 "	5.00'	
K				
L				

Estimate Radius from Center

Roof plate thickness readings

Measure thickness every 10 feet.

Quadrant	Center	10'	20'	30'	40'	50'	60'	70'	80'	90'	Shell
North	0.248	0.249									
South											
East											
West											

Quadrant											
North											
South											
East											
West											

Minimum Thickness written in **Blue Font**

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1. Tank Bottom

☐ Annular Ring ☒ Water Washed ☐ Blasted ☒ Product Residue ☐ Dirt/Debris
☐ Heavy Rust Scale ☐ Standing Water ☐ Heavy Product (Not Inspected)

2. Undesirable Bottom Conditions

See Layout and X,Y Sheet for locations

☐ Lap Seam Corrosion ☐ Cornerweld Corrosion ☐ Weld Pinholes ☐ Weld Cracks
☐ Gouges ☐ Inactive Corrosion ☐ Active Corrosion ☐ Welds Not Inspected
☐ Isolated Pitting ☐ Areas of Pitting ☐ Hole(s)

Topside Thresholds: Inner Plates: 0.050" **Sketch Plates:** 0.050" **Critical Zone:** 0.040"
Deepest Pitting found: None **Plate Number:** __ **General Pitting:** __

There were no topside pits detected below the thresholds. A 20-year inspection interval was used.

3. Coating Conditions

● None ○ Thin ○ Thick

Coating Thickness __ mils ☐ Peeling ☐ Cracking ☐ Holidays ☐ Blistered
__ # Areas Removed ☐ Needs Further Testing ☐ Needs Repair ☐ Needs Replacement

4. Inspection Methods

See Layout and X,Y Sheet for locations

● Ultrasonic Edge Scrubs Thickness Range: 0.230-0.260" Thinnest Area Found: _____
☒ MFL 99 % of Bottom ☐ Isolated Corrosion ☐ Areas of Corrosion
Soilside Thresholds: Inner Plates: 0.200" **Sketch Plates:** 0.200" **Critical Zone:** 0.210"
Thinnest Area Found: 0.220" **Plate Number:** 1 **General Loss:**__
○ Vacuum Box ☐ Lap Seams ☐ Pad Plates ☐ Patch Plates ☐ Leaks Found
○ MT/PT ☐ Cornerweld ☐ Lap Seams ☐ Pad Plates ☐ Patch Plates ☐ Cracks Found

There were no areas of soilside corrosion below the thresholds. A 20-year inspection interval was used.

5. Sump

(thicknesses on UES Sump form) Quantity: 1

☐ Hole ☐ Corrosion ☐ Coated ☐ Water/Product ☐ Patched ☐ Not Inspected

6. Settlement

Measure on Survey Page

☐ Humps ☐ Sags ☐ Edge Settlement >3/8" Per Foot ☐ Needs Evaluation

A settlement survey was not performed.

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Date: 7/14/2021
Tank: DVOP 11

MinThickness 0.257 **Max Thickness** 0.260 **AVG Thickness** 0.259

Enter plate thicknesses

Plate	t	Plate	t	Plate	t	Plate	t	Plate	t
1	0.260	41		81		121		161	
2	0.257	42		82		122		162	
3		43		83		123		163	
4		44		84		124		164	
5		45		85		125		165	
6		46		86		126		166	
7		47		87		127		167	
8		48		88		128		168	
9		49		89		129		169	
10		50		90		130		170	
11		51		91		131		171	
12		52		92		132		172	
13		53		93		133		173	
14		54		94		134		174	
15		55		95		135		175	
16		56		96		136		176	
17		57		97		137		177	
18		58		98		138		178	
19		59		99		139		179	
20		60		100		140		180	
21		61		101		141		181	
22		62		102		142		182	
23		63		103		143		183	
24		64		104		144		184	
25		65		105		145		185	
26		66		106		146		186	
27		67		107		147		187	
28		68		108		148		188	
29		69		109		149		189	
30		70		110		150		190	
31		71		111		151		191	
32		72		112		152		192	
33		73		113		153		193	
34		74		114		154		194	
35		75		115		155		195	
36		76		116		156		196	
37		77		117		157		197	
38		78		118		158		198	
39		79		119		159		199	
40		80		120		160		200	

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Job ID: **652131**
Date: 7/14/2021
Tank: DVOP 11

A total of ________ areas of Topside pitting were found. ________ of those were below thresholds.
A total of ________ areas of Soilside corrosion were found. ________ of those were below thresholds.

Min RWT 0.250 **Max Pit Depth** 0.000

Enter topside and soilside indications (Type S=Soilside, T=Topside, B=Both Solside and Topside, G=Gouge, D=Dent, H=Hole)

Plate	Type	Topside Depth	Soilside RWT	Critical Zone	X	Y	Ref Corner	Comments
								No indications were found
								below the thresholds

Note: All soilside repair plates are 12 by 12 inches unless otherwise noted.
Isolated Topside pits can be puddle welded or patched.

TS = Tombstone shaped

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Date: 7/14/2021
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UES Thickness Scrubs

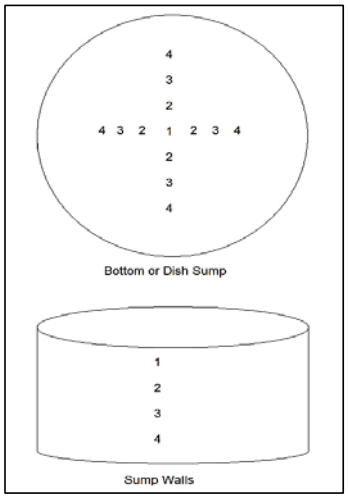
MinThickness 0.220 **Max Thickness** 0.260

Enter Ultrasonic Edge Scrub thicknesses (UES) 12"x12" at each station

Station	Min	Max	Station	Min	Max	Station	Min	Max
1	0.250	0.260	11			21		
2	0.220	0.260	12			22		
3	0.240	0.260	13			23		
4	0.250	0.260	14			24		
5	0.250	0.260	15			25		
6	0.250	0.260	16			26		
7	0.250	0.260	17			27		
8	0.250	0.260	18			28		
9			19			29		
10			20			30		

Sump Inspection

Size: 36"x12"

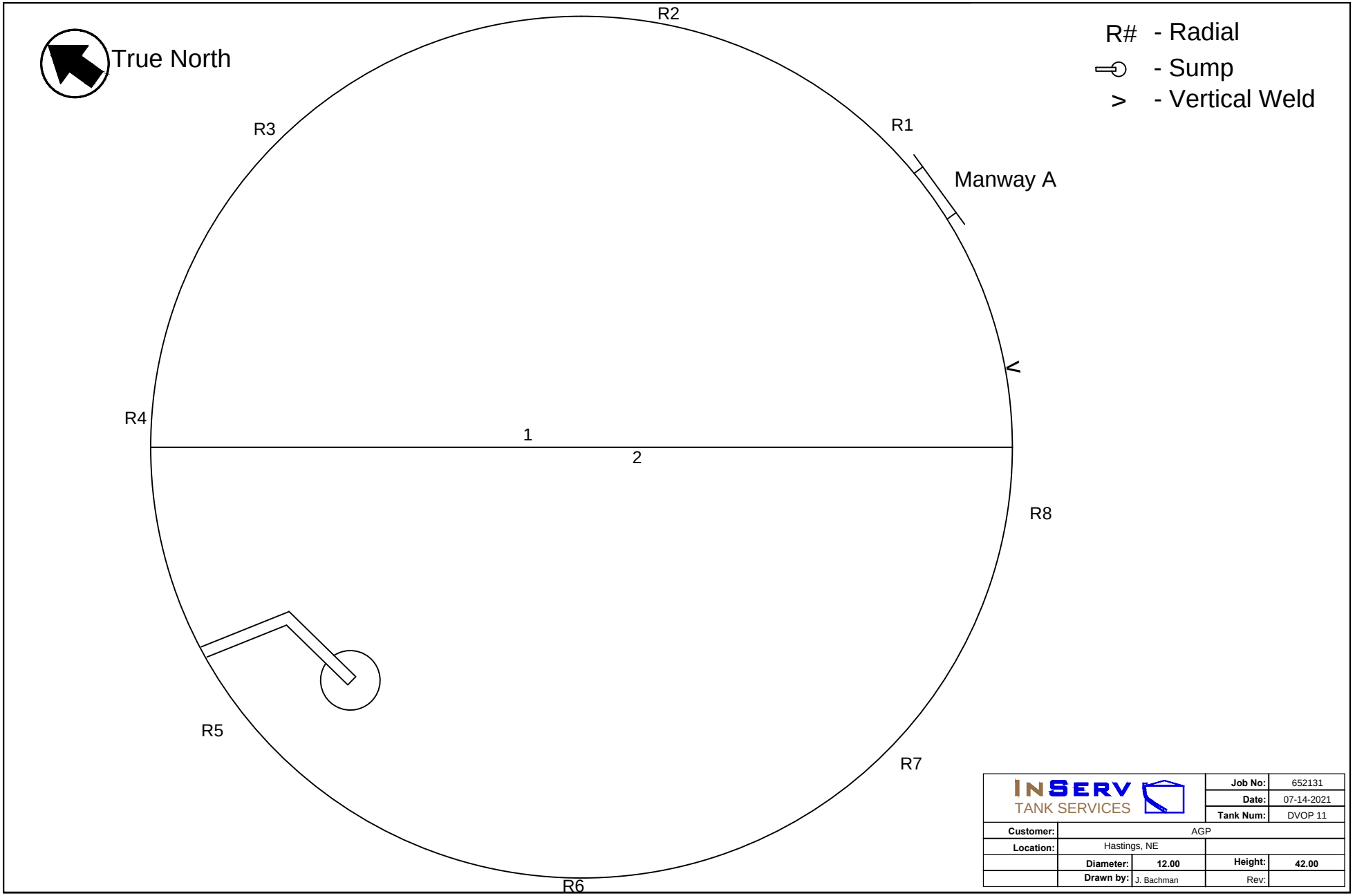


	Center	North	South	East	West
1	0.256				
2		0.264	0.265	0.259	0.261
3		0.258	0.260	0.261	0.259
4		0.265	0.262	0.262	0.260

Bottom or Dish Sump

	North	South	East	West
1	0.262	0.262	0.260	0.256
2	0.254	0.262	0.260	0.259
3	0.259	0.259	0.257	0.259
4	0.257	0.259	0.259	0.256

Sump side walls



INSERV TANK SERVICES			Job No:	652131
			Date:	07-14-2021
			Tank Num:	DVOP 11
Customer:	AGP			
Location:	Hastings, NE			
	Diameter:	12.00	Height:	42.00
	Drawn by:	J. Bachman	Rev:	

Summary

The tank was located inside a building. The open vent was not vented outside the building. The open vent extended to the lower level of the tank.

The tank had an 8-inch open vent. **A UL tank of this size would require a 10-inch emergency pressure vent per UL 142, Table 8.1.**

The coating on the external shell and appurtenances was in good condition. **This should be monitored at future inspections.**

The repads of Shell Items C, L, and M did not have telltale holes. **Consideration should be given to drilling and tapping telltale holes in the repads, pressure testing the neck and repad welds.**

The weld spacing of Shell Items C and G did not meet API standards. **Since the tank shell is 0.5 inches or less in thickness, no corrective action is required.**

Shell Items A, H, I, and J were over 2 inches in diameter and did not have repads. **Since the shell thickness is over twice the required thickness no action is required.**

There was product residue on the internal shell.

The coating on the external roof and appurtenances was in good condition. **This should be monitored at future inspections.**

A visual inspection was performed on the tank bottom to locate topside pits 0.050 inches deep and deeper in the bottom plates and 0.040 inches deep and deeper in the critical zone (within three inches of the shell) for a 20-year inspection interval. There were no pits detected below the thresholds. **No action is required.**

A Magnetic Flux Leakage (MFL) scan was performed on approximately 99 percent of the tank bottom at a remaining wall threshold of 0.200 inches thick in the bottom plates and 0.210 inches thick in the critical zone (within three inches of the shell) for a 20-year inspection interval. There were no areas of soilside corrosion below the thresholds. The lowest readings were 0.210 inches and located on Bottom Plate 1. No action is required.

Ultrasonic Edge Scrubs (UES) were performed around the entire circumference of the tank. The thicknesses ranged from 0.220 to 0.260 inches. No corrosion below the threshold were found.

The flat-bottom sump was 36 inches in diameter and 12 inches deep. The thicknesses ranged from 0.256 to 0.265 inches in the bottom of the sump and from 0.254 to 0.262 inches in the side wall. No corrosion was detected. There was product residue in the bottom of the sump.

An ultrasonic thickness reading was taken at random on each bottom plate. The thickness readings were 0.257 and 0.260 inches.

A settlement survey was not performed.

Inserv utilizes certified inspectors (STI and API-653) to perform small tank inspections in compliance with industry standards such as SP001 and API-653. The tank was categorized and inspection intervals determined per STI's SP001, 5th Edition, Table 5.5.

Tank DVOP 11 had a capacity of 35,291 gallons, a containment area and a CRDM (RPB, concrete pad), making it a Category 1 tank. The tank still requires periodic inspections by the owner's inspector per SP001. **The next inspection required by is an internal inspection due in 2041.**

STI-INTERNAL

INSERV
INTEGRATED SERVICE COMPANY LLC

Company: AGP
Location: Hastings, NE

Job ID: 652131
Date: 7/14/2021
Tank: DVOP 11

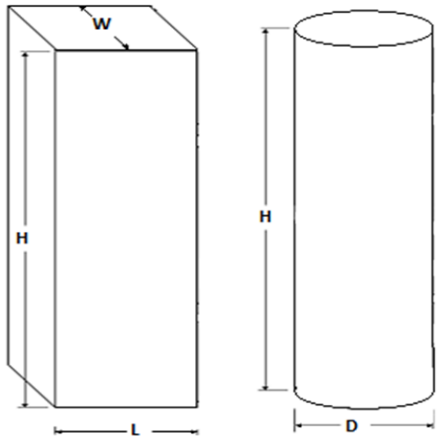
Vertical Tank Thickness and Venting

(Not under pressure, Hydraulic head pressure only)

Inputs:

No		Rectagular Tank?
No		Elevated Tank
No		Stainless Steel Tank
42.00	(ft) H	Tank Height
12.00	(ft) D	Tank Diameter
0.70	E	Joint efficiency (use 1 for butt weld, 0.70 for lap welds)
23600	S	Allowable stress (Use 23600 if unknown steel)
62.4	lb/cf	Density of product (use 62.4 for water if unknown)
42	(ft) Hp	Height of product when full (inside tank shell)
0.244	(in) Tsm	Measured minimum thickness on shell
0.248	(in) Trm	Measured minimum thickness on roof
0.155		

5.98 (ft) Ri Inside radius



Tank Properties

35292.70	Gal	Tank Capacity
1130.97	sq ft	Wetted area per UL-142
18.20	P	Internal Hydraulic Pressure (P= H(lbs/cf)/144)

Shell Circumferential Stress (longitudinal Joint) Note:1

0.167 (in) Tsl — Required thickness = 12*P*Ri/(S*E-0.6*P) or 0.167 inches min per UL-142

Shell Longitudinal Stress (Circumferential Joint) Note: 1

0.167 (in) Tsc — Required thickness = 12*P*Ri/(S*E-0.4*P) or 0.167 inches min per UL-142

Required Venting

4.00	(in)	**Minimum Normal Vent per UL142 Table 8.2 Note:3**
10.00	(in)	**Minimum Emergency Vent per UL142 Table 8.1 Note:4**

Shell Thickness evaluation per STI-SP001 4th Ed. Section10

0.167	(in) Tsr	Required shell thickness Maximum of Tsl and Tsc
0.244	(in) Tsm	Measured thickness

Shell Thickness is Okay all Categories	0.1253	75% of required thickness
Shell Thickness is Okay Category 1	0.0835	50% of required thickness
Shell Thickness is Okay Category 1	0.0418	25% of required thickness

Roof Thickness evaluation per STI-SP001 4th Ed. Section10

0.123	(in) Trr	Required roof thickness
0.248	(in) Trm	Measured roof thickness

Roof Thickness is Okay all Categories	0.0923	75% of required thickness
Roof Thickness is Okay Category 1	0.0615	50% of required thickness
Roof Thickness is Okay Category 1	0.0308	25% of required thickness

Note: 1 ASME Boiler and Pressure Vessel Code Division I, Section 8 (1986)
Note: 2 STI SP001 4th edition
Note: 3 UL-142 8th edition July 11, 2002 Tables 15.1, 8.1, 8.2

Inserv Inspection and Consulting Services LLC
1900 N. 161st E. Ave. Tulsa, OK 74116
Tel: (918) 234-4150
www.INSERVUSA.com

Bottom Corrosion Analysis

Per API 653 4th Edition April 2009 4.4.5

In the bottom corrosion analysis the following equations and variables are used.

$$Or = \frac{Min(RTbc, RTip) - MRT}{StPr + UPr} \qquad StPr = \frac{To - RTip}{Age} \qquad UPr = \frac{To - RTbc}{Age}$$

T_o	(in)	Original nominal bottom thickness
Age	(yrs)	Age of Bottom Plates (May vary over bottom)
MRT	(in)	Minimum bottom thickness allowed after interval (per API 653 Table 4.4)
		0.100 inches Bare steel or Thin coating no containment
		0.050 inches Thick reinforced coating (>0.050") and no containment
		0.050 inches bare steel or any coating with leak detection and containment
RT_{ip}	(in)	Remaining Thickness after repair of topside pitting.
RT_{bc}	(in)	Remaining Thickness after repair of soilside corrosion.
StP_r	(in/yr)	Maximum Topside corrosion rate after repair
UP_r	(in/yr)	Maximum Soilside corrosion rate after repair
O_r	(yrs)	Calculated inspection interval based on thresholds and repairs.

Notes:

1. Critical Zone is defined as bottom area within 3 inches of the shell.
2. MRT in the critical zone is lesser of 1/2 bottom plate thickness (not including corrosion allowance) or the 1/2 the ring 1 shell thickness.
3. If an Annular ring is required by design or use, it is evaluated per API 653 4.4.6.
4. If the bottom is coated StP_r is 0 (API RP652).
5. If the bottom has Cathodic Protection (CP), UP_r is 0 (API RP 651).
6. Patch plates are evaluated for soilside corrosion with UP_r minimum of RT_{ip} or RT_{bc} plus the thickness of the patch plate.

INTERNAL

INSERV
INTEGRATED SERVICE COMPANY LLC

Company: AGP
Location: Hastings, NE

Job ID: 652131
Date: 7/14/2021
Tank: DVOP 11

Bottom Corrosion Analysis

Per API 653 4th Edition April 2009 4.4.5

Calculated thresholds with no coating and no cathodic protection.

No — Does Tank have Annular ring?

2021	(YYYY)	Year of inspection
20	(YY) O_{rd}	Inspection Interval
None	=	Coating type
No	=	Leak Detection & Containment
No	=	Cathodic Protection (CP)

	Include ?	Year Built	Nominal Thickness (T_o)	Topside Threshold (in)	Soilside Threshold (in)
Inner Plates	Yes	2000	0.250	0.050	0.200
Sketch Plates	Yes	2000	0.250	0.050	0.200
Critical zone	Yes	2000	0.250	0.040	0.210

MRT based on type coating, LD&C and Critical zone.

0.100	MRTi	Inner plate minimum allowable thickness
0.100	MRTs	Sketch plate minimum allowable thickness
0.125	MRTa	Critical Zone minimum allowable thickness

Age of Plates

21	AgeI
21	AgeS
21	AgeCZ

Actual Thresholds, Minimum Thicknesses and Repair Thresholds (inches)

Topside Inspection Values (values in inches)

	* Inspection Threshold Used	Max Pit depth Found	Repair Threshold used	Topside RWT after Repair	
Inner Plates	0.050	0.010	No Repair	Rtipi	0.240
Sketch Plates	0.050	0.010	No Repair	RTipS	0.240
Critical zone	0.040	0.010	No Repair	RTiCZ	0.240

* Inspection threshold for topside pitting should be rounded up to nearest 0.005 inches.

Soilside Inspection Values (values in inches)

	Inspection Threshold Used	Min Thickness Found	Repair Threshold used	Soilside RWT after Repair	
Inner Plates	0.200	0.220	No Repair	Rtbci	0.220
Sketch Plates	0.200	0.210	No Repair	RTbcS	0.210
Critical zone	0.210	0.220	No Repair	RTbcCZ	0.220

Repair Analysis for full inspection interval

	Patch Plate thickness		Top side Corr. Rate (StP_r)	Soilside Corr. Rate (UP_r)	Calculated Interval O_r (years)
Inner Plates	0.250	OK	0.0005	0.0014	**20.00**
Sketch Plates	0.250	OK	0.0005	0.0019	**20.00**
Critical zone	0.250	OK	0.0005	0.0014	**20.00**

Next Internal inspection due in 2041

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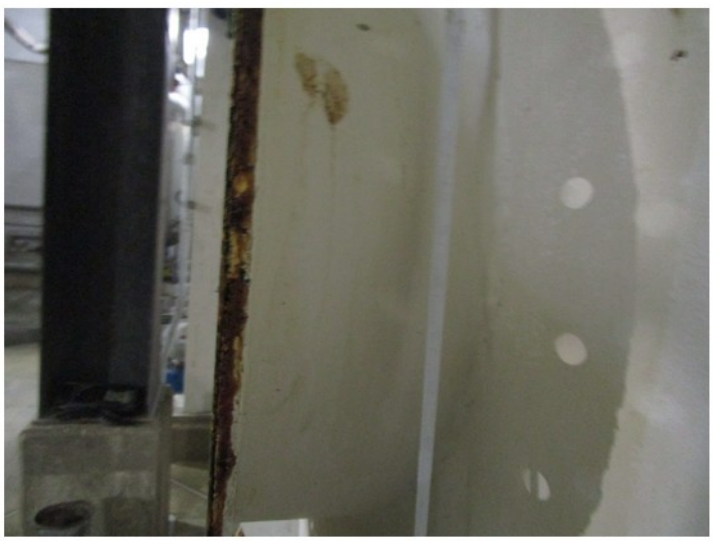

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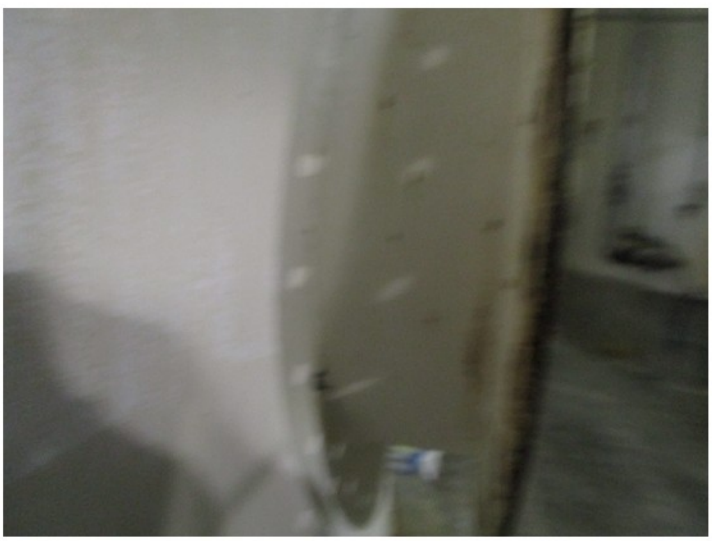

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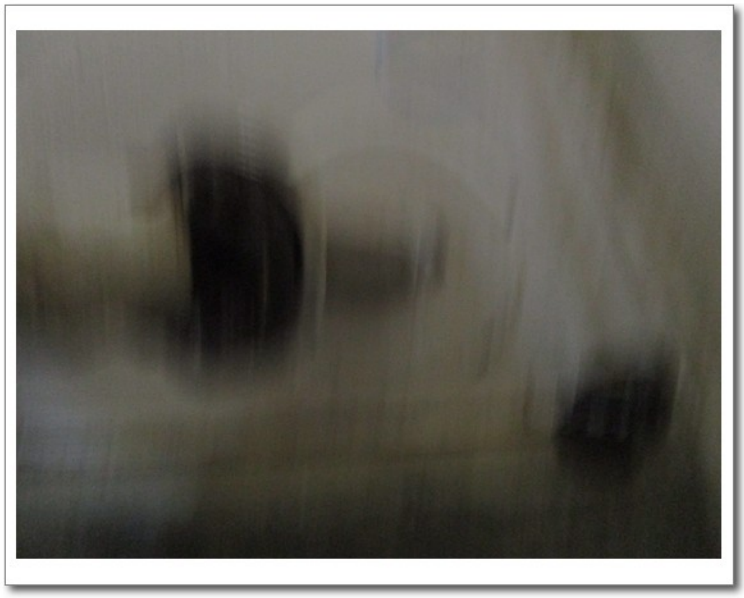

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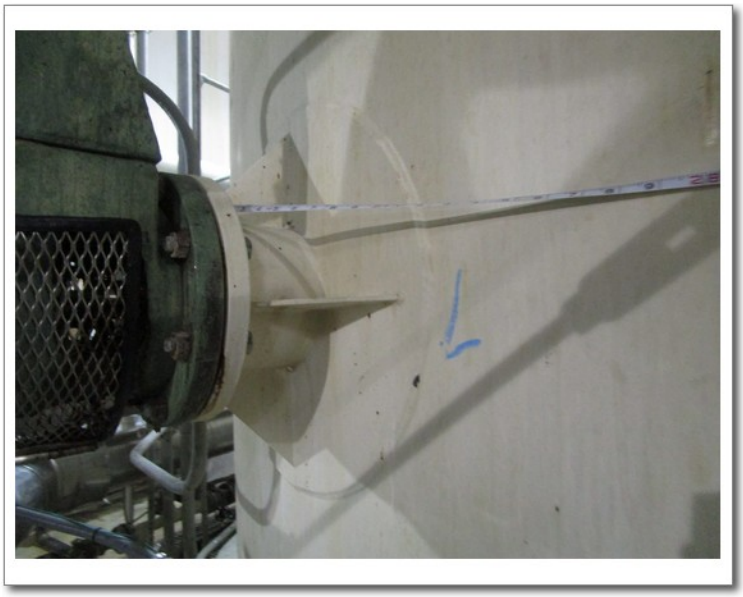

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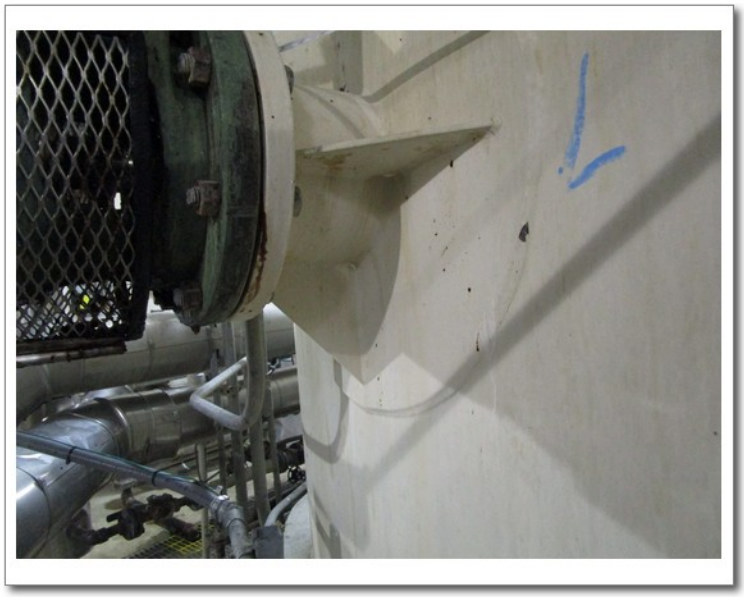

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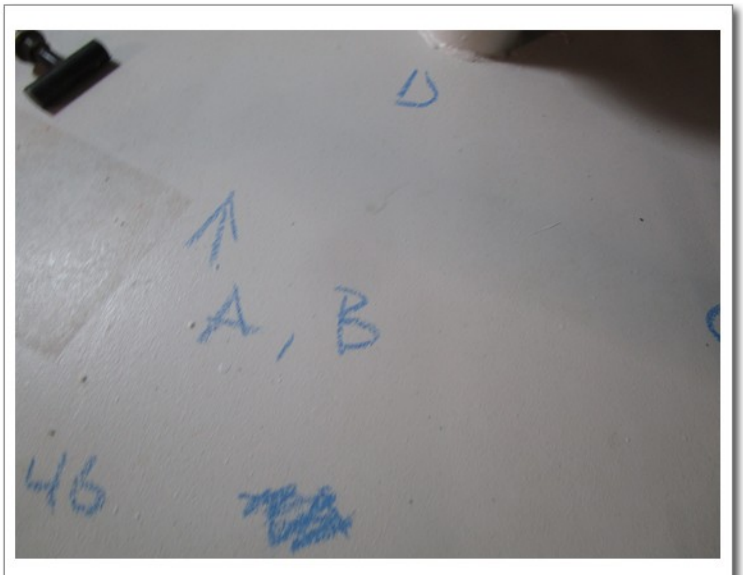

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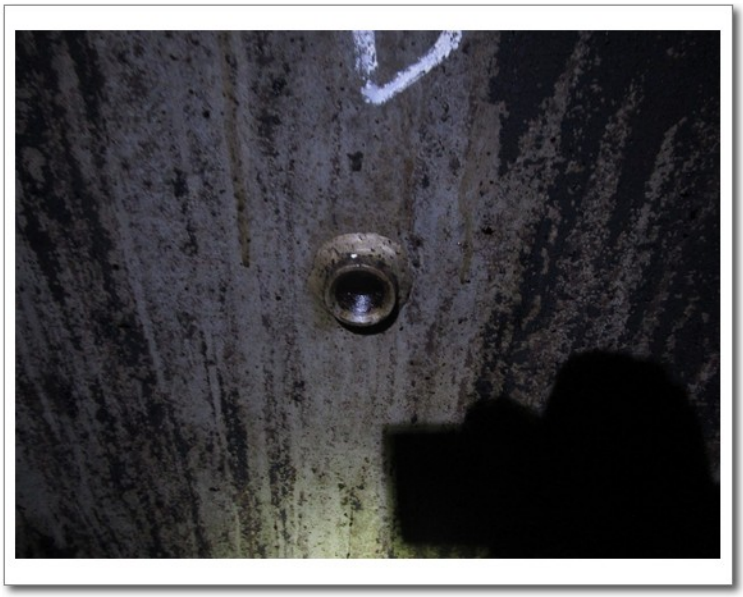

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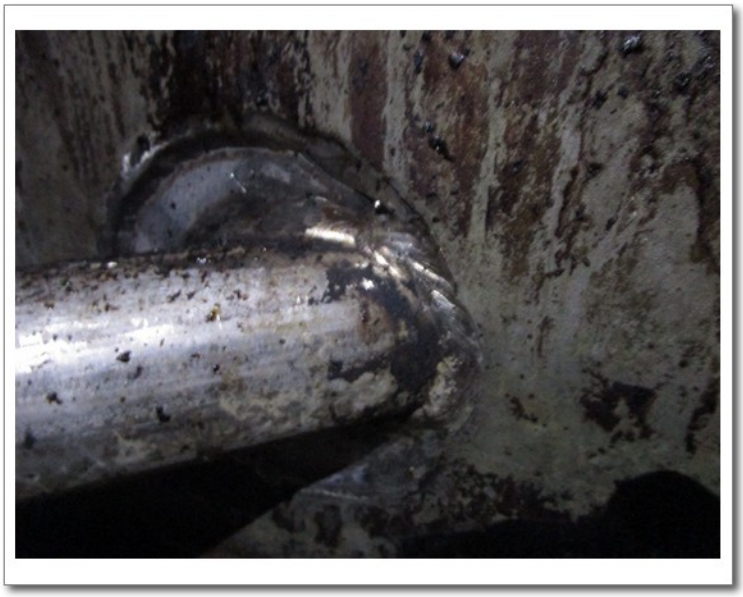

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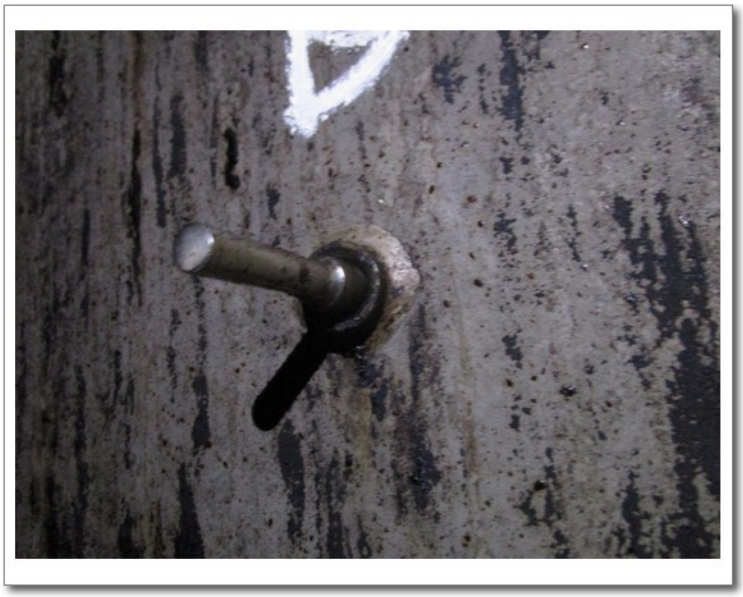

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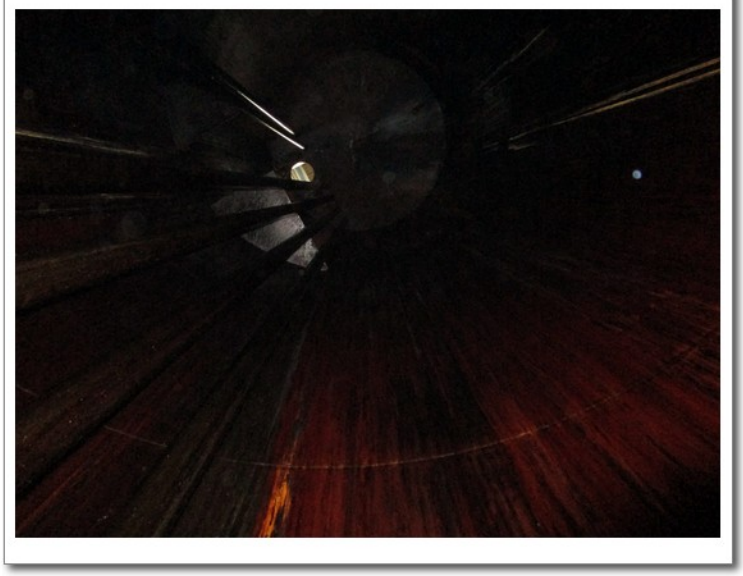

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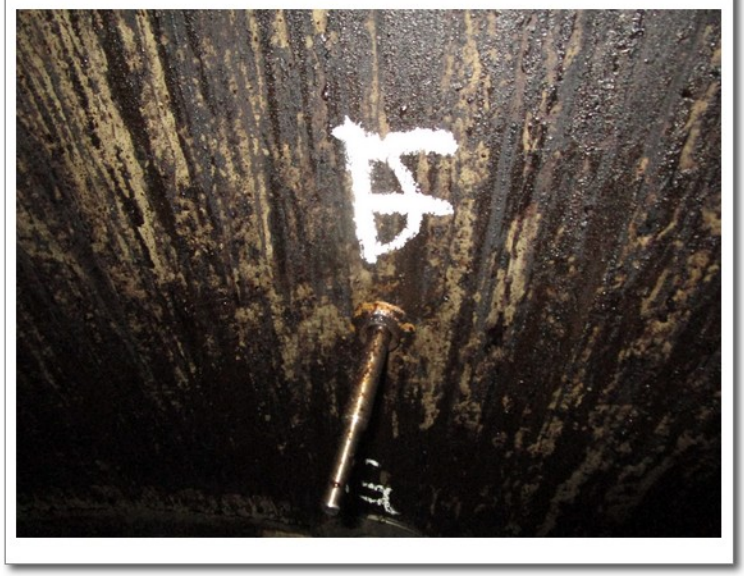

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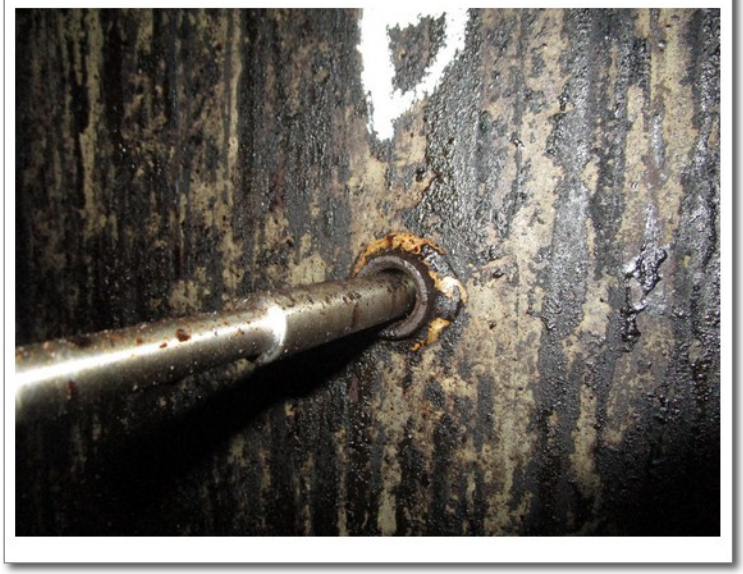

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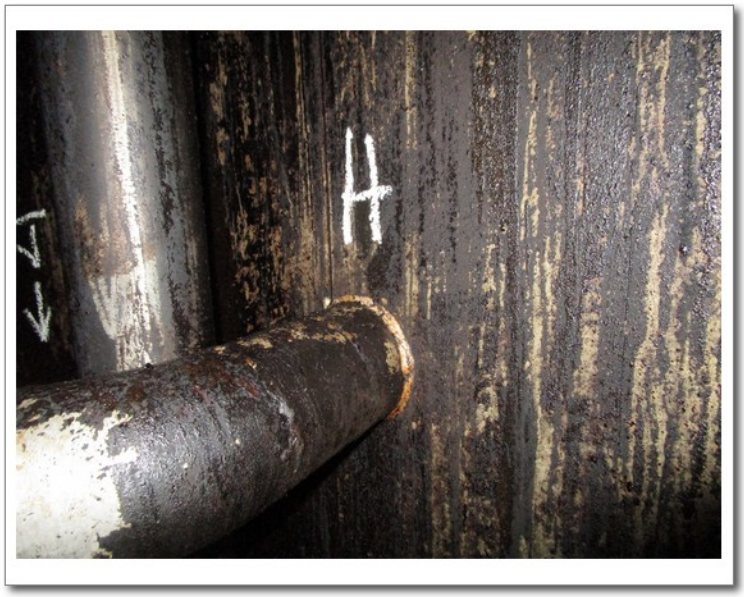

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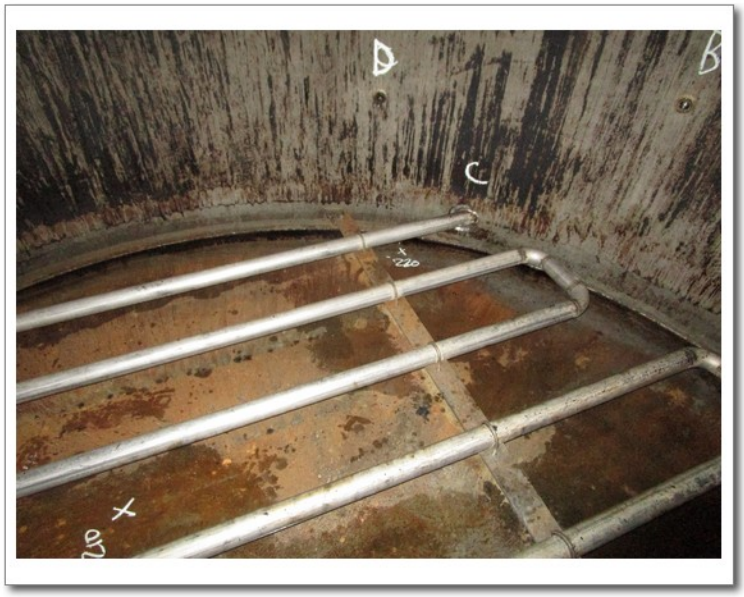

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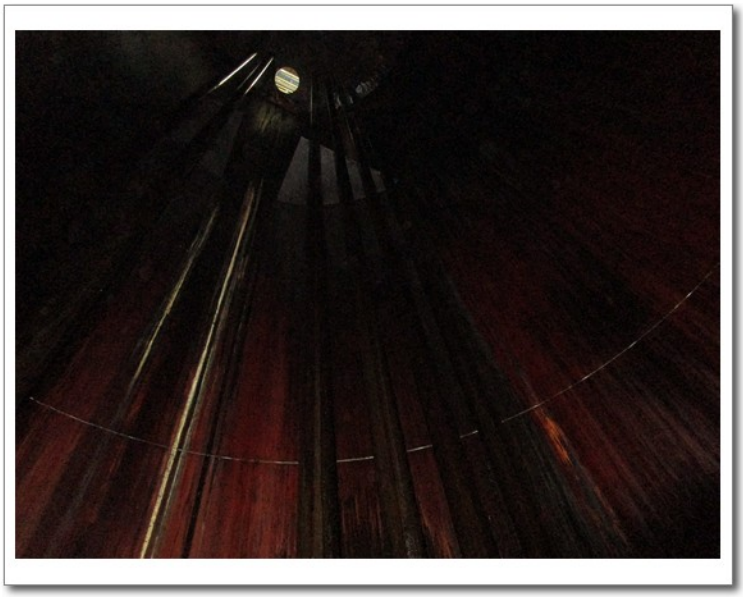

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Dear Mr. Martin:

Congratulations on passing STI SP001 Adjunct online certification course. Below is your STI Inspector identification card and certificate. We suggest that you print this page and:

- Cut out and laminate the ID card
- Frame the certificate

If you have any questions about this or any field related inspection, please feel free to call Joseph Mentzer, STI Project Engineer, at (224) 286-6469.

STI SPFA

Issue Date:
08/23/2019

STI/SPFA
Aboveground Tank Inspector
Certification Program
847/438-8265

Name: **James Martin**
STI Inspector No: **AC 44355**
Expires: **August 23, 2024**

The person to whom this card has been issued has met the requirements to attain the STI SP001 Adjunct Certification for API 653 Inspectors. This certificate is dependent on an active API 653 certification.

CERTIFICATION

Steel Tank Institute

James Martin

STI Inspector No: **AC 44355**

Expires: **August 23, 2024**

The person whose name appears on this certificate has met all of the requirements to attain the STI SP001 Adjunct Certification for API 653 Inspectors. This certification is dependent on an active API 653 certification.

Joseph Mentzer, P.E.
Steel Tank Institute

STI SPFA

The official status of this certificate can be verified at www.steeltank.com.

Issue Date:
08/23/2019

AMERICAN PETROLEUM INSTITUTE
Individual Certification Programs: ICP™

API Individual Certification Programs

verifies that

James William Martin

has met the requirements for API certification

API-653 Aboveground Storage Tank Inspector

Certification Number *32455*

Original Certification Date *April 30, 2008*

Current Certification Date *April 30, 2020*

Expiration Date *April 30, 2023*

Manager, Individual Certification Programs

ICP

ULTRASONIC TESTING

THIS ACKNOWLEDGES THAT

James Martin

HAS SUCCESSFULLY COMPLETED THE REQUIREMENTS OF INSERV INSPECTION AND CONSULTING SERVICES LLC
QUALIFICATION AND CERTIFICATION OF NDE PERSONNEL WRITTEN PRACTICE REFERENCING ASNT-TC-1A

LEVEL II

DECEMBER
9TH 2020

x

SIGNED, Authorized NDT Level III

INSERV
INTEGRATED SERVICE COMPANY LLC