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API-653 Inspection Report

Modified for Out-of-Service Inspection of Fertilizer Tanks

Helena Agri-Enterprises, LLC

Casey, Illinois

October 9, 2020

Tank # 3
Illinois Tank Permit # AC93062282
38’ Diameter x 32’ High Tank
Carbon Steel Construction
32% Nitrogen Solution

Inspector’s Signature

Richard A. Buntt
Inspector, Heartland Tank Services, Inc.
API Certification No.:32743
Report No.: HTS-20-306

Reviewed & Approved by:

C.H. Brooks
President, Heartland Tank Services, Inc.

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1.0 EXECUTIVE SUMMARY

An API-653 tank inspection modified for the storage of fertilizer was conducted in accordance with client criterion for Non-Destructive Examination (NDE) that included visual and Ultrasonic Thickness (UT) examinations. The inspection was conducted in accordance with the requirements of the API-653 standards to collect data to evaluate the tank's mechanical integrity and fitness for continued service. Neither radiograph nor soil reports were available at the time of the inspection. Complete tank information is depicted on the Tank Data page, section 2.0.

Ultrasonic Thickness (UT) examinations of tank components (shell, roof, and floor) were completed on all accessible surfaces. UT measurements were performed on the tank's shell plates in six (6) locations according to a consistent test pattern. On the lower courses, every sheet was numbered and tested. On the upper courses, four (4) sheets on each course were numbered and tested. On the roof plates, a single measurement was taken in the center of each plate. The roof was divided into quadrants and the lowest measurement of each quadrant is recorded. On the floor plates, five (5) UT measurements were taken. The sheet numbers and locations are depicted in the appendices, section 5.0.

Summary Conclusions:

- The tank shell is fit for continued service:
  - Shell UT readings are above API minimum thickness requirements.
  - Weld joints are in full configuration and good condition with minor corrosion present.
- The tank roof is fit for continued service:
  - Roof UT readings are above API minimum thickness requirements.
  - Roof weld joints are in full configuration and good condition with minor corrosion present.
- The tank floor is fit for continued service:
  - Floor UT readings are above API minimum thickness requirements.
  - Floor weld joints are in full configuration and good condition with minor corrosion present.
- RECOMMENDED MAXIMUM TANK FILL HEIGHT IS 31' WITH 32% NITROGEN SOLUTION. **This recommended tank fill height is not the recommended fill height for a liner. Follow liner manufacturer's recommendations for maximum liner fill height. **

Summary Recommendations:

- **To meet API Specifications**
  - None.
- **Discretionary recommendations**
  - Owner may consider repairing thinning external paint on roof plates to prevent future corrosion damage.
  - Prior to liner install, Owner may consider repairing internal coating on sump to prevent corrosion damage.
  - Keep external chime area free of gravel and foliage to prevent corrosion damage from occurring.

Next inspection intervals based on Helena Agri-Enterprises, LLC's inspection intervals:

- UT Thickness 10/09/2030
- Internal 10/09/2030
- External 10/09/2030

<u>NOTE:</u> The Fertilizer Institute recommends five-year inspection intervals.

2.0 TANK DATA

Tank #:	3	***Diameter:***	38’
Illinois Tank Permit #:	AC93062282	***Height/Length:***	32’
Client:	Helena Agri-Enterprises, LLC	***Corr. Allowance:***	0.000
Location:	Casey, IL	***Joint Efficiency:***	0.85
Inspection Date:	10/09/2020	***Specific Gravity:***	1.33
Type Inspection:	Out-of-Service	***Plate Spec:***	Unknown
Test Methods:	UT, Visual	***Course 1 t:***	0.312
Manufacturer:	Skinner Tank	***Course 2 t:***	0.250
Year Built:	1998	***Course 3 t:***	0.250
Const. Code:	API-650	***Course 4 t:***	0.250
Capacity @ 31’:	262,979 gallons	***Course 5 t:***	N/A
Shell Construction:	Butt Welded	***Course 6 t:***	N/A
Roof Type:	Fixed / Cone	***Course 7 t:***	N/A
Foundation:	Earthen in a concrete dike	***Roof / Head 1 t:***	0.187
Product:	32% Nitrogen Solution	***Bttm / Head 2 t:***	0.250
Recommended Tank Fill Height:	31’		

3.0 INSPECTION RESULTS

3.1 *Foundation:*

3.1.1 The tank was constructed on an earthen foundation in a concrete dike. The foundation was observed to be in good condition.

3.1.1.1 The concrete dike was not inspected and is not included in this inspection report.

3.1.2 A settlement survey was completed from the inside of the tank. Beginning at the highest point, moving clockwise, eight (8) equally spaced measurements were performed around the circumference of the tank. Results reveal a planar tilt is present of 1.080" but is within the parameters of the API Specifications and fit for continued service.

3.2 *Shell:*

3.2.1 UT readings were performed on all shell courses on the tank. A weld joint efficiency of 0.85 and a specific gravity of 1.33 were used in the minimum thickness calculations. Results reveal all shell courses to be above API minimum thickness requirements. The tank shell is fit for continued service.

3.2.2 Calculation results from this inspection reveal the maximum fill height to be 32'. However, to keep product below the internal rafters, the RECOMMENDED MAXIMUM FILL HEIGHT IS 31' WITH 32% NITROGEN SOLUTION.
**This recommended tank fill height is not the recommended fill height for a liner. Follow liner manufacturer's recommendations for maximum liner fill height. **

3.2.3 A visual examination revealed the external shell plates and weld joints to be in good condition with minor corrosion damage present.

3.2.4 Visual examination of the internal shell plates and weld joints found the condition to be good with minor corrosion damage present.

3.2.5 The internal and external chime welds, or where the tank shell and floor meet, were visually examined and found to be in good condition with minor corrosion present.

3.2.6 The external coating was visually examined and found to be in good condition.

3.3 *Appurtenances:*

3.3.1 The tank is equipped with:

- One (1) 4" inlet nozzle.
- One (1) 4" suction nozzle.
- One (1) 24" shell manway.

3.3.2 Welds on all nozzles and manway were visually examined. The nozzles, manway neck, and reinforcement pads were UT tested. Welds were found to be in good condition with minor corrosion present. The nozzles and manway were found to have proper reinforcement pads and threaded tell-tale holes for testing as required by API Specifications. Nozzles and manway are fit for continued service.

3.4 *Roof:*

3.4.1 The plates on the roof are lap welded. One UT reading was performed in the center of each roof plate. Results reveal all roof plates to be above API minimum thickness requirements and fit for continued service.

3.4.2 Roof plate welds joints were visually examined and found to be in good condition with minor corrosion present.

3.4.3 The tank is equipped with one (1) 8" vent. Vent is equipped with a proper screen to prevent debris from entering roof vent and restricting airflow during the filling and emptying processes.

3.4.4 The roof of the tank is equipped with one (1) 20" manway and an 8" gauge port. Welds on manway and gauge port were visually examined and found to be in good condition.

3.4.5 The external coating on the roof was visually examined and found to be thinning.

3.5 *Floor:*

3.5.1 The plates on the floor are lap welded. UT readings were completed on all floor plates. Results reveal all floor plates to be above API minimum thickness requirements and fit for continued service.

3.5.2 Floor plates were visually examined and found to be in good condition with minor corrosion present.

3.5.3 Floor weld joints were visually examined and found to be in good condition with minor corrosion present. A vacuum test was not performed on floor weld joints due to the presence of internal coating.

3.5.4 UT readings were taken on the sump bottom plate and sidewall in six (6) locations. Results reveal the lowest reading to be 0.501 on sump bottom plate and 0.498 on sump sidewall. Readings are above API minimum thickness requirements. Sump is fit for continued service.

3.6 *Ancillary Equipment:*

3.6.1 Access to the tank roof was made by way of a spiral stairway or landing to an adjacent tank welded to the shell. The stairway and landing are equipped with proper handrails for safety as required by OSHA. Welds on stairway, landing, handrails, and attachments were visually examined and found to be in good condition. The external coating was found to be in good condition. Spiral stairway and landing are fit for continued service.

3.6.2 Roof support column and rafters were visually examined and are in good condition. Center pole readings were taken at two feet (2'), four feet (4'), and six feet (6'). Low readings for each location, respectively, were: 0.308, 0.304, and 0.311.

3.6.2.1 The center pole is free hanging. This issue should be resolved during liner installation due to the column requiring a spool for the liner.

4.0 RECOMMENDATIONS

4.1 *Foundation:*

4.1.1 Keep external chime area free of gravel and foliage to prevent corrosion damage from occurring.

4.2 *Shell:*

Maintain the recommended maximum tank fill height of 31' with 32% Nitrogen Solution.
**This recommended tank fill height is not the recommended fill height for a liner. Follow liner manufacturer's recommendations for maximum liner fill height. **

4.3 *Appurtenance:*

4.3.1 None.

4.4 *Roof:*

4.4.1 Owner may consider repairing thinning external paint on roof plates to prevent future corrosion damage.

4.5 *Floor:*

4.5.1 Prior to liner install, Owner may consider repairing the internal coating on sump to prevent corrosion damage.

4.6 *Ancillary Equipment:*

4.6.1 None.

4.7 *Next inspection due based on Helena Agri-Enterprises, LLC's inspection intervals:*

4.7.1 Next internal inspection is due by 10/09/2030.

4.7.2 Next external inspection is due by 10/09/2030.

4.7.3 Next UT inspection is due by 10/09/2030.

4.7.4 Governing component limiting life on the tank is the shell.

NOTE: The Fertilizer Institute recommends five-year inspection intervals.

5.0 APPENDICES

Engineering Calculations

Settlement Survey

Thickness Measurement Record

Inspection Drawings

Inspection Photographs

Certifications & Inspection Warranty

Tank Shell Minimum Thickness and Remaining Life Calculations Date 10/09/2020

File No.	Report No.	Client	Tank No.	Temp. (degF)	Initials
4474	HTS-20-306	Helena Agri-Enterprises, LLC	3		Charlie McCluskey

SHELL MINIMUM THICKNESS CALCULATIONS

$$tmin = \frac{2.6(H-1)DG}{SE}$$

Where:

H = The height above the bottom of the course of study to the maximum liquid level height of the product, in ft. For corroded or pitted areas, H = the height from the bottom of the corroded or pitted area to the maximum liquid level height of the product, in ft.

tmin = The calculated minimum acceptable shell thickness, in inch (cannot be less than 0.10 inch for any course). The minimum acceptable shell thickness allowed by API-653 and STI-SP001 for tank size, in inch .

D = Nominal diameter of tank, in ft.

G = Highest specific gravity of the contents (including test water if tank will, or may, be tested in the future).

S = Maximum allowable stress, in psi. For welded tanks; use the smaller of 0.80Y of 0.429T for bottom and second course or the smaller of 0.88Y or 0.472T for all other courses. For riveted tanks; S = 21000 psi. For STI Tank Inspections S = 26000 psi (E = 1)

Y = Specified minimum yield strength of the plate, in psi; use 30000 psi if not known (N/A for riveted tanks).

T = The smaller of the specified minimum tensile strength of the plate or 80000 psi; use 55000 psi if not known (N/A for riveted tanks).

E = Original joint efficiency for the tank. For welded tanks; use API-653, Table 2-1 ; use E = 1.0 when evaluating the retirement thickness in a corroded plate, when away from welds or joints by at least the greater of one inch or twice the plate thickness. For riveted tanks; use E = 1.0 for shell plates greater than 1 inch away from rivets; use the value of E from API-653 Table 2-1 when within 1 inch of rivets. For STI Tank Inspections E = 1 where S = 26000 psi.

D (ft) 38 G 1.33 E 0.85 Fill Height (ft) 32.0

	Material	Crs H (ft)	H (ft)	S (psi)	tmin (inch)
Course 1	Unknown	8	32.0	23600	0.203
Course 2	Unknown	8	24.0	23600	0.151
Course 3	Unknown	8	16.0	26000	0.100
Course 4	Unknown	8	8.0	26000	0.100

Tank Shell Minimum Thickness and Remaining Life Calculations Date 10/09/2020

File No.	Report No.	Client	Tank No.	Temp. (degF)	Initials
4474	HTS-20-306	Helena Agri-Enterprises, LLC	3		Charlie McCluskey

SHELL REMAINING LIFE CALCULATIONS

Ca = tact-tmin = Remaining Corrosion Allowance (inch)
Cr = tprev-tact / Y = Corrosion Rate (inch/Yr)
RL = Ca / Cr = Remaining Life (year)
Y = 22 = Tank age (year)

Where:

Ca = Remaining corrosion allowance of the shell course under consideration, in inch.

Cr = Corrosion rate of the shell course under consideration, in inch per year.

FHc = Calculated fill Height = (SEtact/2.6DG+1) + (product height below course of interest), in ft.

tact = Minimum thickness measurement of the shell course under consideration, as recorded at the time of inspection, in inch.

tmin = minimum required thickness of shell course, at the maximum allowable fill height, in inch.

tprev = previous thickness measurement of shell course under consideration, as recorded at last inspection or nominal thickness if no previous thickness measurements, in inch.

RL = Estimated remaining life of the shell course under consideration, in year.

Y = Time span between thickness readings or age of the tank if nominal thickness is used for tprev, in year.

	tprev	tact	tmin	Ca	Cr	RL	FHc
Course 1	0.312	0.296	0.203	0.093	0.0007	128	46.19
Course 2	0.250	0.237	0.151	0.086	0.0006	146	45.18
Course 3	0.250	0.246	0.100	0.146	0.0002	803	58.37
Course 4	0.250	0.245	0.100	0.145	0.0002	638	66.20

AST ATMOSPHERIC STORAGE TANK FIXED ROOF EVALUATION
MINIMUM THICKNESS, REMAINING LIFE, PRESSURE CALCULATIONS

Date: 10/09/2020

File No	Report No	Client	Inspector	Tank No	Temp(degF)
2311	HTS-20-306	Helena Agri-Enterprises, LLC	Charlie McCluskey	3	

Where;
Ca = remaining corrosion allowance of the tank component under consideration, in inch (t act - t min).
Cr = corrosion rate of the tank component under consideration, in inch per year (t prev - t act / Y).
oz = unit of measurement, (weight, in ounces, per square inch), (16 oz per pound)
psi = unit of measurement, (weight, in pounds, per square inch)
RL = estimated remaining life of the tank component under consideration, in year (Ca / Cr).
t act = actual thickness measurement of the tank component under consideration, as recorded at the time of inspection, in inch.
t min = minimum required thickness of tank component, at the design MAWP at the design temperature (200 degF for atm AST's), in inch (greater of psi/wt or 0.090").
t nom = design nominal thickness of tank component under consideration, in inch.
t prev = previous thickness measurement of the tank component under consideration, as recorded at last inspection or nominal thickness if no previous thickness measurements, in inch.
t yn = thickness of the tank component under consideration at the next inspection at twice the calculated corrosion rate, in inch (t act - (2*Cr*Yn).
wt = weight of plate per cubic inch.
wc = unit of measurement, (height, in inch, of water column bearing on 1 Sq.Inch area), (27.7 wc per pound)
Y = time span between thickness readings or age of the tank component if tnom is used for tprev, in year.
Yn = estimated time span to next inspection of the tank component under consideration, in year.

ROOF PLATES - REMAINING LIFE

Y	t prev (inch)	t act (inch)	t min (inch)	Cr (inch/Yr)	Ca (inch)	RL
22	0.187	0.182	0.090	0.00023	0.092	405

ROOF MAXIMUM ALLOWABLE INTERNAL PRESSURE

Material Category	wt	Yn	tyn	psi	oz.	wc
CS/Crom. Stl	0.2833	5	0.180	0.051	0.815	1.414

STORAGE TANK FLOOR EVALUATION
MINIMUM REMAINING THICKNESS (MRT) CALCULATIONS

Date 10/09/2020

File No	Report No	Client	Inspector	Tank No	Temp (degF)
1794	HTS-20-306	Helena Agri-Enterprises, LLC	Charlie McCluskey	3	

Liner	CP Protec	50mil Liner	RPB	Ca	Shell tmin	Shell tnom	D	H	S
No	No	No	No			0.312	38.000	32.000	

Where;
Ca = corrosion allowance, in (inch).
MRT = minimum remaining thickness at the end of interval Or. This value must meet the requirements of Table 4-1 and sections 2.4.7.4 and 2.4.8.
Or = In-service interval of operation (years to next internal inspection) not to exceed that allowed by 4.4.2.
RTbc = minimum remaining thickness from bottom side corrosion after repairs.
RTip = minimum remaining thickness from internal corrosion after repairs.
StPr = maximum rate of corrosion not repaired on the top side. StPr = 0 for coated areas of the bottom. The expected life of the must equal or exceed Or to use StPr = 0.
tmin = minimum allowable thickness in accordance with requirements of Table 4-1 and sections 2.4.7.4 and 2.4.8.
to = bottom plate original thickness.
UPr = maximum rate of corrosion on the bottom side. To calculate the corrosion rate, use the minimum remaining thickness after repairs. Assume a linear rate based on the age of the tanks.
D = nominal diameter of tank, in (ft),
H =Height, in (ft), from the bottom of the 1st shell course to the maximum allowable fill height
S=Stresses are calculated from 2.6(H-1)DG/SE.

GENERAL PLATES-AFTER INSPECTION / REPAIRS

Age	to	RTbc	RTip	UPr	StPr	Or	MRT	tmin	Results
22	0.250	0.220	0.220	0.00136	0.00136	5	0.206	0.100	ACCEPTABLE

PLATES IN CRITICAL ZONE (3") - AFTER INSPECTION / REPAIRS

Age	to	RTbc	RTip	UPr	StPr	Or	MRT	tmin	Results
22	0.250	0.222	0.222	0.00127	0.00127	5	0.209	0.100	ACCEPTABLE

AST STORAGE TANK EVALUATION

Nozzle/Pipe Remaining Life Calculations

Report No	Client	Inspector	Vessel	Date
HTS-20-306	Helena Agri-Enterprises, LLC	Charlie McCluskey	3	10/09/2020

Minimum Thickness Determinations:

a) The following pipe minimum thicknesses are based on the current in-house engineering standards, which take into consideration, pressures, structural integrity and localized corrosion allowance.

Size (inch)	<2	3	4	6	8	10	12	>12
tmin (inch)	0.080	0.100	0.100	0.125	0.125	0.156	0.188	0.188

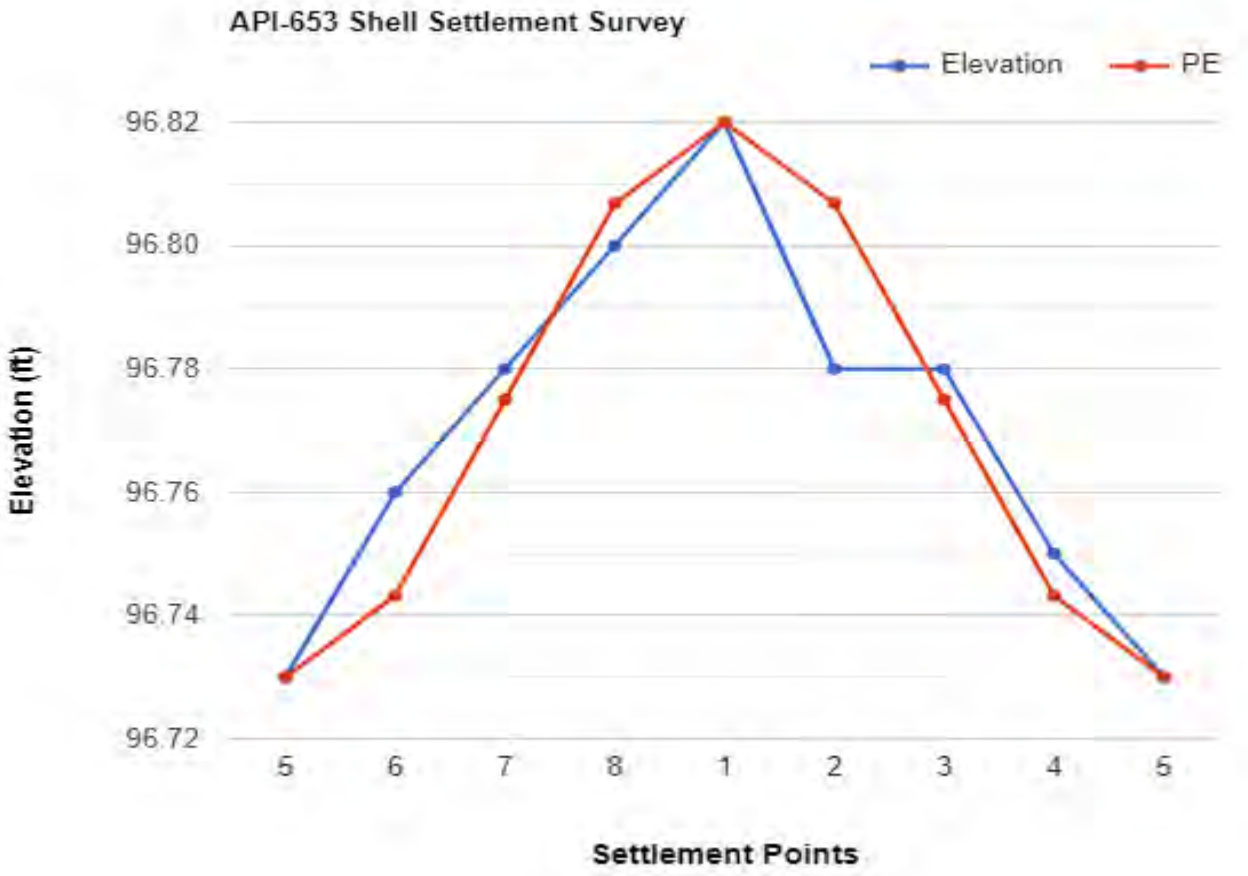
Nozzle Remaining Life Calculations:

CML	Age (year)	Comp.Disc. (inch)	Size (inch)	tprev (inch)	tact (inch)	tmin (inch)	Ca (inch)	Cr (inch/Yr)	RL (year)
052	22	24" MW	24.000	0.500	0.497	0.188	0.309	0.00014	2266
053	22	4" Nozzle	4.000	0.337	0.311	0.100	0.211	0.00118	179
054	22	4" Nozzle	4.000	0.337	0.289	0.100	0.189	0.00218	87

API-653 APPENDIX B SHELL SETTLEMENT EVALUATION

(para. B.2.2.4)

Report No	Client	Inspector	Vessel	Date
HTS-20-306	Helena Agri-Enterprises, LLC	Charlie McCluskey	3	10/09/2020



	Base Elev	Max Elev	ΔElev		
FT	96.730	96.820	0.090	R^2 =	0.949
IN	1160.760	1161.840	1.080		

API-653 APPENDIX B SHELL SETTLEMENT EVALUATION

Report No.: HTS-20-306

D	H	Roof Type	L	1st Crs Plt Spec	Y	E
38	32	F	14.92	Unknown	30000	29000000

Where:
D = Tank Diameter, in ft
H = Tank Height, in ft
Roof Type: F = fixed, O = Open
L = Arc length between measurement points, in ft (32' max) (greatest dist. allowed based on even # of points)
Y = Yield strength of shell 1st course , in pounds per Sq.Inch (psi)
E - Young's modulus, in pounds per Sq.Inch (psi)
θ = Angle theta at elevation point, in degrees
PE = Predicted elevation, in ft
Ui = Measured out-of-plane settlement in relation to a cosine curve, in ft
Si = Deflection, in ft, (out-of-plane distortion)
Smax = Maximum allowed deflection, in ft, (out-of-plane distortion)

Smax =((L^2*Y*11)/2*(E*H)) = **0.040**

Point	*Elevation*	*θ*	*PE*	*Ui*	*Si*	*Results*
1	96.820	0	96.820	0.000	0.017	SAT
2	96.780	45	96.807	-0.027	-0.029	SAT
3	96.780	90	96.775	0.005	0.015	SAT
4	96.750	135	96.743	0.007	0.004	SAT
5	96.730	180	96.730	0.000	-0.012	SAT
6	96.760	225	96.743	0.017	0.014	SAT
7	96.780	270	96.775	0.005	0.000	SAT
8	96.800	315	96.807	-0.007	-0.009	SAT

Point 1 begins on the Northeast side of the tank. Consecutive readings follow a clockwise pattern around the tank.

AST Storage Tank Evaluation

AST Component Inspection Data

Report No	Client	Inspector	Vessel	Date
HTS-20-306	Helena Agri-Enterprises, LLC	Charlie McCluskey	3	10/09/2020

Component Thickness Measurements in (inch)

CML	*Component*	*Location*	*tml-1*	*tml-2*	*tml-3*	*tml-4*	*tml-5*	*tml-6*	*Minimum*
001	Shell Crs 1	Plt 1	0.302	0.307	0.311	0.305	0.308	0.310	0.302
002	Shell Crs 1	Plt 2	0.306	0.305	0.306	0.304	0.306	0.312	0.304
003	Shell Crs 1	Plt 3	0.308	0.296	0.305	0.310	0.310	0.312	0.296
004	Shell Crs 1	Plt 4	0.315	0.310	0.316	0.311	0.304	0.310	0.304
005	Shell Crs 1	Plt 5	0.313	0.308	0.311	0.311	0.308	0.307	0.307
006	Shell Crs 1	Plt 6	0.305	0.309	0.308	0.315	0.303	0.309	0.303
007	Shell Crs 2	Plt 7	0.252	0.253	0.253	0.251	0.247	0.252	0.247
008	Shell Crs 2	Plt 8	0.248	0.254	0.246	0.251	0.249	0.251	0.246
009	Shell Crs 2	Plt 9	0.248	0.250	0.249	0.250	0.247	0.253	0.247
010	Shell Crs 2	Plt 10	0.244	0.248	0.248	0.251	0.252	0.248	0.244
011	Shell Crs 2	Plt 11	0.241	0.241	0.246	0.237	0.246	0.244	0.237
012	Shell Crs 2	Plt 12	0.251	0.248	0.252	0.251	0.250	0.254	0.248
013	Shell Crs 3	North	0.247	0.249	0.249				0.247
014	Shell Crs 3	South	0.250	0.249	0.246				0.246
015	Shell Crs 3	East	0.249	0.250	0.252				0.249
016	Shell Crs 3	West	0.249	0.247	0.252				0.247
017	Shell Crs 4	North	0.251	0.248	0.245				0.245
018	Shell Crs 4	South	0.253	0.250	0.251				0.250
019	Shell Crs 4	East	0.249	0.251	0.250				0.249
020	Shell Crs 4	West	0.250	0.246	0.249				0.246
021	Roof	Q1	0.183						0.183
022	Roof	Q2	0.182						0.182
023	Roof	Q3	0.185						0.185
024	Roof	Q4	0.183						0.183
025	Floor	Plt 25	0.234	0.242	0.243	0.234	0.249		0.234
026	Floor	Plt 26	0.223	0.239	0.237	0.248	0.229		0.223
027	Floor	Plt 27	0.232	0.239	0.233	0.238	0.237		0.232
028	Floor	Plt 28	0.237	0.243	0.230	0.229	0.234		0.229
029	Floor	Plt 29	0.234	0.234	0.226	0.225	0.238		0.225
030	Floor	Plt 30	0.227	0.240	0.235	0.248	0.235		0.227
031	Floor	Plt 31	0.232	0.237	0.231	0.224	0.232		0.224
032	Floor	Plt 32	0.230	0.224	0.234	0.234	0.235		0.224
033	Floor	Plt 33	0.224	0.224	0.233	0.235	0.228		0.224
034	Floor	Plt 34	0.220	0.231	0.239	0.234	0.237		0.220

035	Floor	Plt 35	0.224	0.239	0.237	0.231	0.225	0.224
036	Floor	Plt 36	0.226	0.235	0.236	0.229	0.231	0.226
037	Floor	Plt 37	0.235	0.243	0.239	0.225	0.228	0.225
038	Floor	Plt 38	0.233	0.229	0.226	0.231	0.235	0.226
039	Floor	Plt 39	0.225	0.227	0.224	0.229	0.222	0.222
040	Floor	Plt 40	0.237	0.227	0.227	0.228	0.242	0.227
041	Floor	Plt 41	0.237	0.234	0.230	0.232	0.230	0.230
042	Floor	Plt 42	0.229	0.237	0.229	0.224	0.236	0.224
043	Floor	Plt 43	0.236	0.234	0.236	0.236	0.239	0.234
044	Floor	Plt 44	0.235	0.228	0.227	0.235	0.238	0.227
045	Floor	Plt 45	0.239	0.234	0.238	0.234	0.232	0.232
046	Floor	Plt 46	0.222	0.239	0.233	0.240	0.240	0.222
047	Floor	Plt 47	0.227	0.242	0.225	0.236	0.233	0.225
048	Floor	Plt 48	0.223	0.228	0.224	0.238	0.227	0.223
049	Floor	Sump BP	0.501	0.509	0.505			0.501
050	Floor	Sump SW	0.509	0.498	0.511			0.498
051	Floor	Center Pole	0.308	0.304	0.311			0.304

API-653 STORAGE TANK EVALUATION

Nozzle Inspection Data

Report No	Client	Inspector	Vessel	Date
HTS-20-306	Helena Agri-Enterprises, LLC	Charlie McCluskey	3	10/09/2020

Nozzle Thickness Measurements in (inch)

Components with Vert. Axis: tml-1 N., tml-2 E., tml-3 S., tml-4 W. (Drawing N.)

Component with Horz. Axis:tml-1 Top, tml-2 Side, tml-3 Bttm., tml-4 Side (Clock Wise)

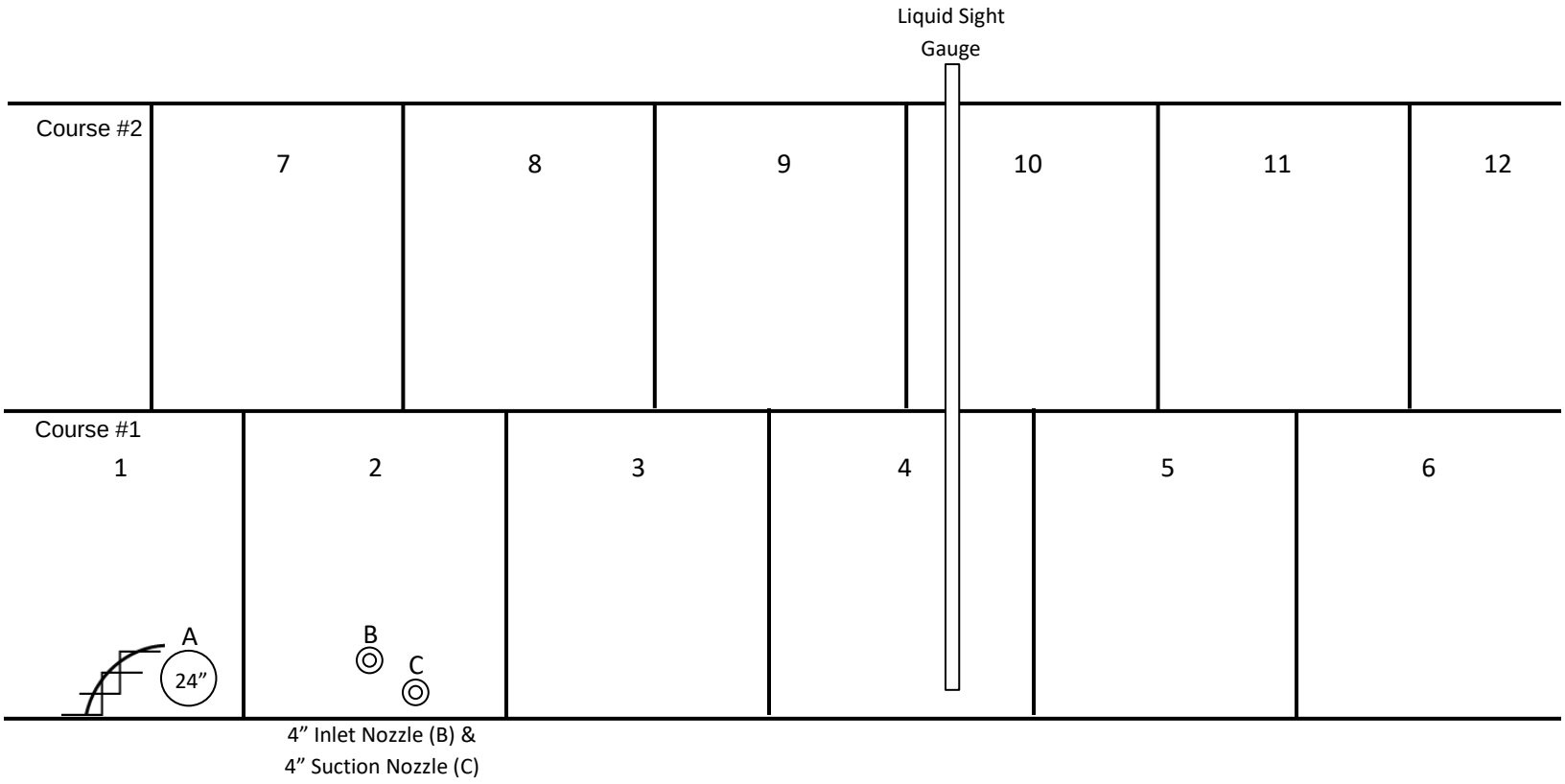
CML #	*Comp. ID*	*Size*	*Location*	*Service*	*tml-1*	*tml-2*	*tml-3*	*tml-4*	*Minimum*
052	24" MW	24.000	A	Manway	0.500	0.497	0.500	0.509	0.497
053	4" Nozzle	4.000	B	Inlet	0.313	0.317	0.314	0.311	0.311
054	4" Nozzle	4.000	C	Suction	0.289	0.317	0.316	0.314	0.289

Customer: Helena Agri-Enterprises, LLC	**City, State:** Casey, IL	**Tank #:** 3
Diameter: 38’	**Height**: 32’	**Date of Inspection:** 10/19/2020

Drawing is not to scale

SHELL CML LOCATIONS

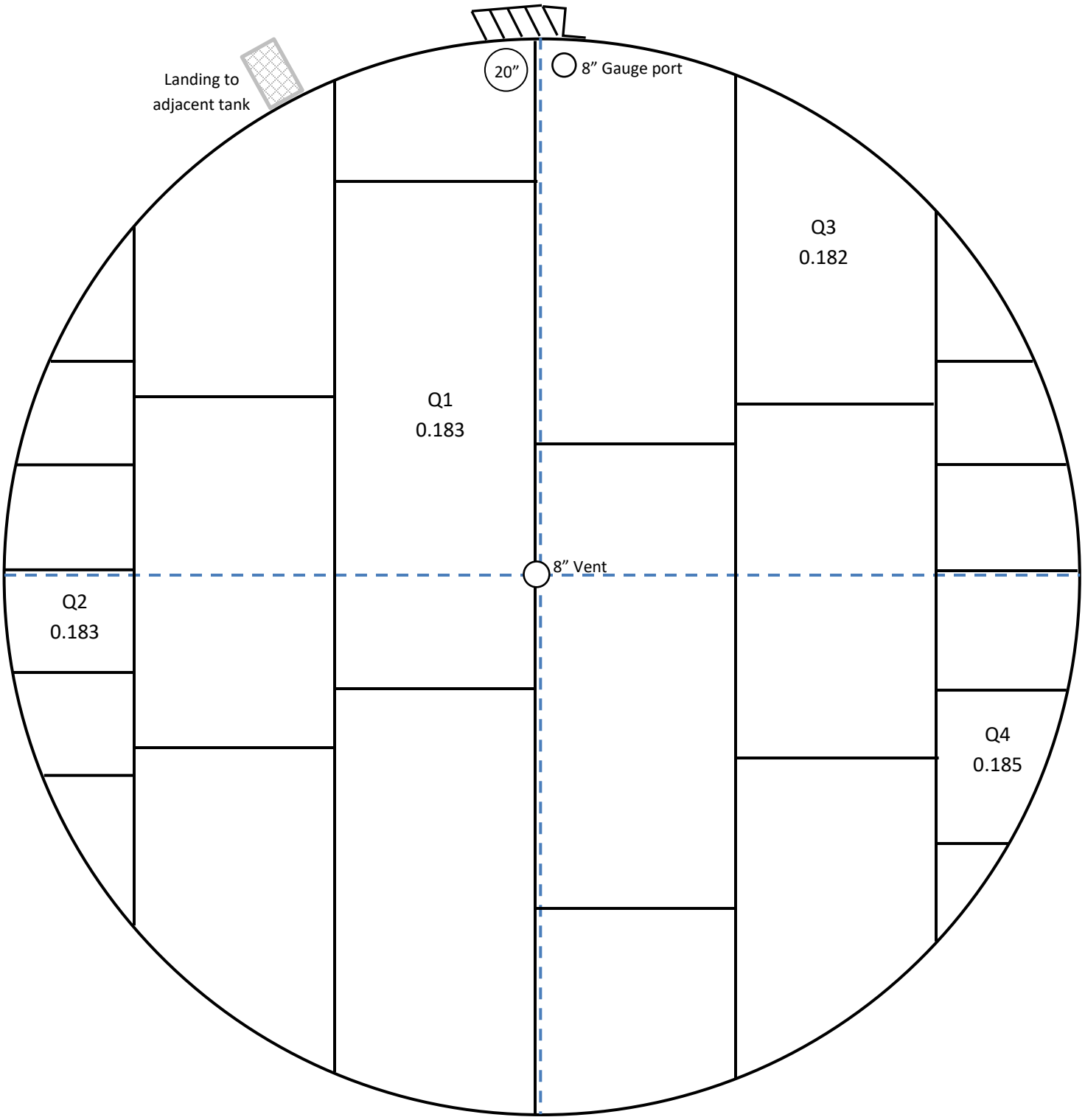
COURSE	NORTH	SOUTH	EAST	WEST
4	17	18	19	20
3	13	14	15	16



Customer: Helena Agri-Enterprises, LLC	**City, State:** Casey, IL	**Tank #:** 3
Diameter: 38’	**Height**: 32’	**Date of Inspection:** 10/19/2020

Drawing is not to scale

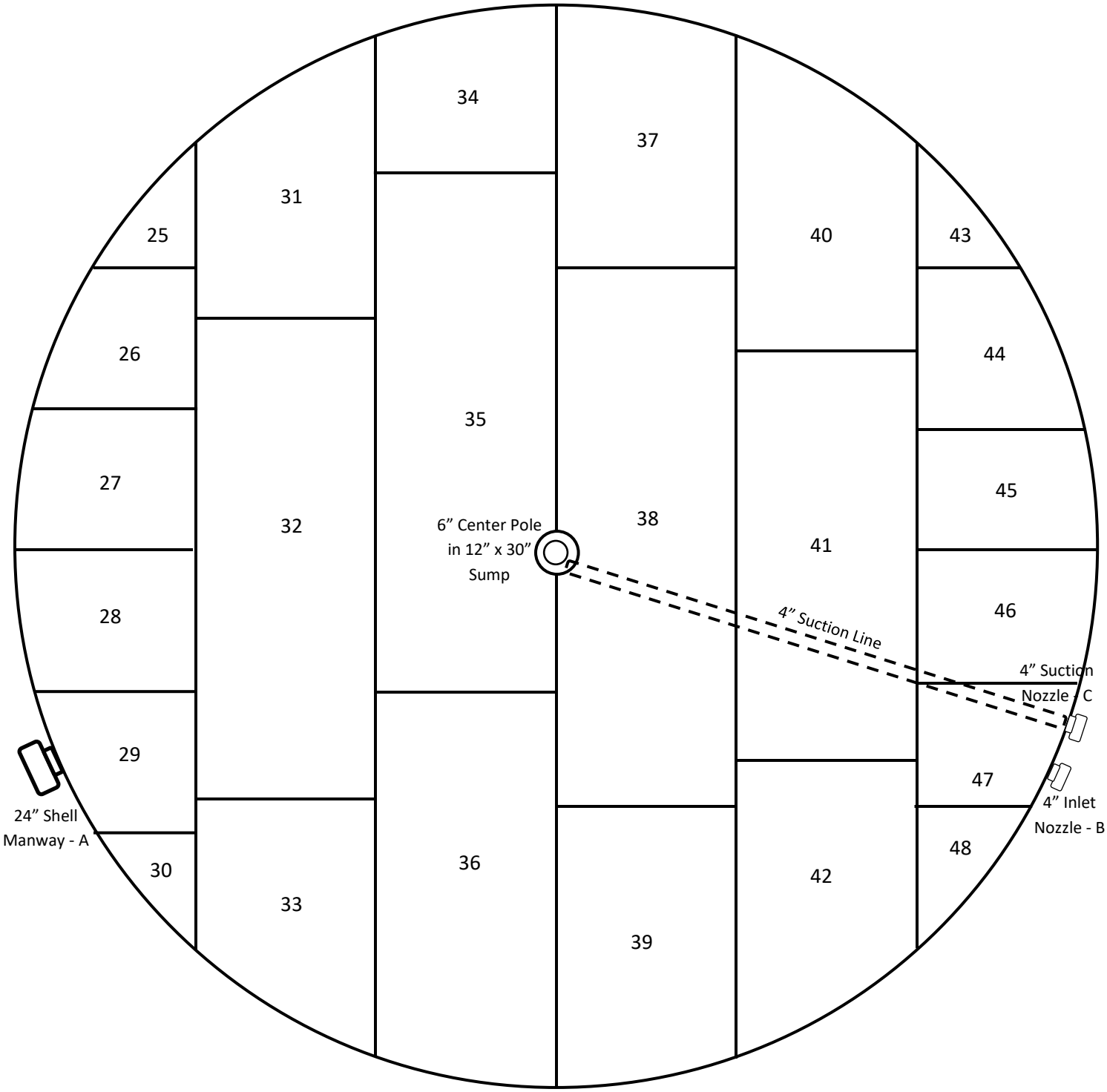
ROOF CML LOCATIONS
West



Customer: Helena Agri-Enterprises, LLC	**City, State:** Casey, IL	**Tank #:** 3
Diameter: 38’	**Height**: 32’	**Date of Inspection:** 10/19/2020

Drawing is not to scale

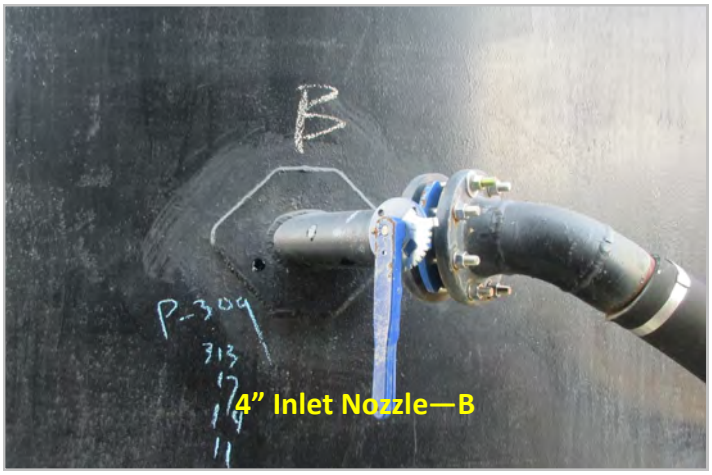
FLOOR CML LOCATIONS
West



Helena Agri-Enterprises, LLC—Casey, IL Tank 3

Manufacturer's Nameplate

24" Shell Manway—A



4" Inlet Nozzle—B

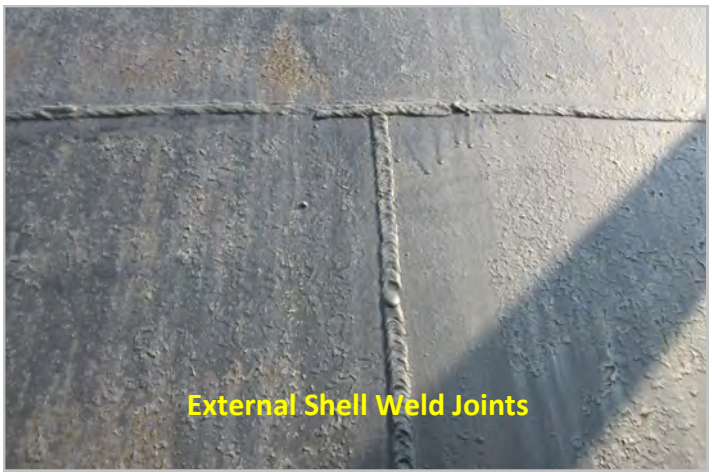
4" Suction Nozzle—C

Liquid Sight Gauge

Floor Lip Extension

Floor Lip Extension

External Shell Weld Joints



External Shell Weld Joints

External Horizontal Shell Weld Joint, Stairs

Stairway landing

Stairway landing, 20" Roof Manway, 8" Gauge Port

20" Roof Manway

8" Gauge Port

Adjoining landing

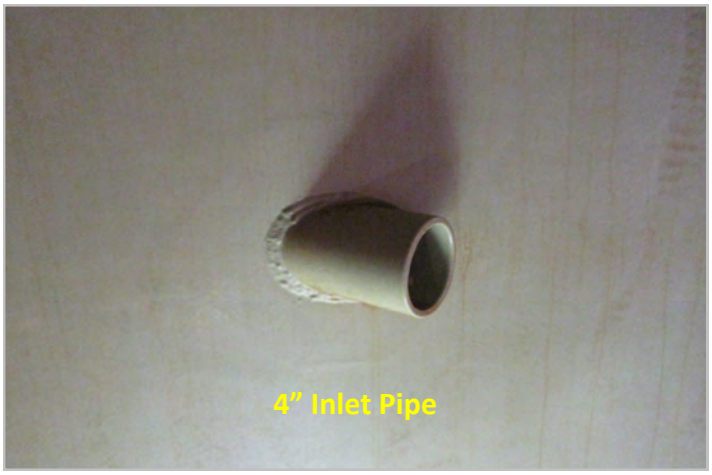
8” Roof Vent

Roof plates

Roof Plates

Roof Plates

24” Shell Manway



4” Inlet Pipe

4” Suction Pipe

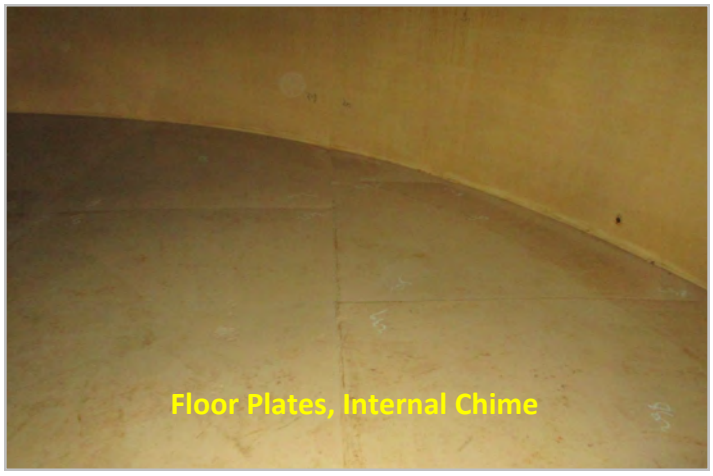
4” Suction Pipe

4” Suction Pipe into 12” x 30” Sump

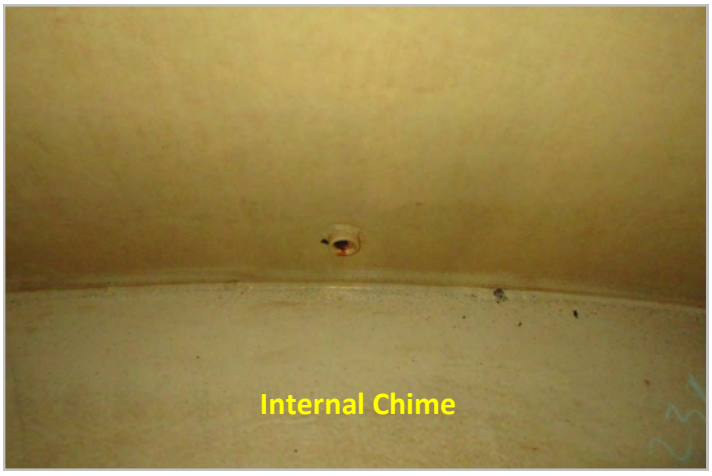
Internal Shell Weld Joints

Internal Shell Weld Joints

Internal Shell Weld Joints



Floor Plates, Internal Chime



Internal Chime

6” Center Pole

Center Pole, Roof Rafters

AMERICAN PETROLEUM INSTITUTE
Individual Certification Programs: ICP™

API Individual Certification Programs

verifies that

Charles Curtis McCluskey

has met the requirements for API certification

API-653 Aboveground Storage Tank Inspector

Certification Number *93629*

Original Certification Date *January 31, 2020*

Current Certification Date *January 31, 2020*

Expiration Date *January 31, 2023*

Manager, Individual Certification Programs

ICP

2015-027 | PDF


NLPA Special Inspector - Level 2C
NLPA 631 & SNT-TC-1A
has been successfully completed by
Richard Buntt
DATE: 04/04/19
Authorized NLPA Instructor
T.R.Consulting, Inc
5351 Setters Way
CO Sprgs CO 8091
(719) 359-8467
#CO-0046-08-2C


NLPA Special Inspector - Level 2C
NLPA 631 & SNT-TC-1A
has been successfully completed by
Michael Buntt
DATE: 04/04/19
Authorized NLPA Instructor
T.R.Consulting, Inc.
5351 Setters Way
CO Sprgs CO 80919
(719) 359-8467
#CO-0047-08-2C


NLPA Special Inspector - Level 1C
NLPA 631 & SNT-TC-1A
has been successfully completed by
Jerry Pickens
DATE: 04/04/19
Authorized NLPA Instructor
T.R.Consulting, Inc
5351 Setters Way
CO Sprgs CO 8091
(719) 359-8467
#IL-0086-15-1C


NLPA Special Inspector - Level 1
NLPA 631 & SNT-TC-1A
has been successfully completed by
Dennis Dixon
DATE: 04/04/19
Authorized NLPA Instructor
T.R.Consulting, Inc.
5351 Setters Way
CO Sprgs CO 80919
(719) 359-8467
#OK-0085-15-1C

CONFINED SPACE SAFETY

29 CFR Part 1926.1207
has been successfully completed by

Jerry Pickens

DATE: 03/31/20

T.R. Consulting, Inc.
5351 Setters Way

CO Springs CO 80919
(719) 359-8467

AUTHORIZED INSTRUCTOR #OK20033118

CONFINED SPACE SAFETY

29 CFR Part 1926.1207
has been successfully completed by

Michael Buntt

DATE: 03/31/20

T.R. Consulting, Inc.
5351 Setters Way

CO Springs CO 80919
(719) 359-8467

AUTHORIZED INSTRUCTOR #OK20033117

CONFINED SPACE SAFETY

29 CFR Part 1926.1207
has been successfully completed by

Dennis Dixon

DATE: 03/31/20

T.R. Consulting, Inc.
5351 Setters Way

CO Springs CO 80919
(719) 359-8467

AUTHORIZED INSTRUCTOR #OK20033107

CONFINED SPACE SAFETY

29 CFR Part 1926.1207
has been successfully completed by

Richard Buntt

DATE: 03/31/20

T.R. Consulting, Inc.
5351 Setters Way

CO Springs CO 80919
(719) 359-8467

AUTHORIZED INSTRUCTOR #OK20033103

TR Consulting
5351 Setters Way
Colorado Springs, CO 80919

Colorado Springs CO Phone: (719) 359-8467
Los Angeles CA Phone: (213) 787-6800
Central Facsimile Number: (310) 844-7240
http://www.trconsultinggroup.com

03/31/2020

Mr. Chris Brooks
Heartland Tank Services
P.O. Box 3668
Englewood, CO 80155-3668

Re: Training conducted 31 March, 2020 at your facility in Oklahoma City, OK.

Dear Mr. Brooks,

First let me thank you for giving T.R. Consulting, Inc. the opportunity to assess your company's safety training needs, listen to your safety goals, and develop and implement a training program to meet those goals. As such, the following training programs were completed on Tuesday March 31st of this year:

- Lock Out/Tag Out in accordance with 29 CFR Part 1910.147
- HAZCOM/GHS in accordance with 29 CFR 1910.1200
- Bloodborne Pathogens in accordance with 29 CFR 1910.1030
- Confined Space Safety in accordance with the requirements of 29 CFR Part 1926.1207
- Ladder Safety in accordance with 29 CFR Parts 1926.1053 and 1910.27
- Aerial Lifts in accordance with 29 CFR 1910.67
- Fire Protection/Extinguishers in accordance with 29 CFR 1910.157
- Hand and Power Tool Safety in accordance with 29 CFR 1926.300
- Process Safety Management – Contractor Responsibilities 29 CFR 1910.119
- Excavation/Trenching Safety – Trenching/Shoring in accordance with 29 CFR 1926.650
- Spill Prevention/Response – 29 CFR 1910.120 Appendix C
- Heat Stress Prevention

The following Heartland Tank Services employees completed the above-listed training programs:

Chris Brooks	Juan Carlos Paredes	Jesus Herrera	Elizabeth Jenkins
Mario Romero	Dennis Dixon	Terry Cuthbertson	Michael Buntt
Richard Buntt	Salvador Villagran	Luis Corral	Jerry Pickens
Jose Trejo Macias	Cesar Romero	Diego Romero Ceja	Ramon Sanchez Luque

Thank you again for the opportunity to address your company's safety program needs. I look forward to working with you in the future.

Sincerely,

T.R. Consulting, Inc.

Tony Rieck (Tony)
President/CEO
TR/bfc

TR Consulting
5351 Setters Way
Colorado Springs, CO 80919

Colorado Springs CO Phone: (719) 359-8467
Los Angeles CA Phone: (213) 787-6800
Central Facsimile Number: (310) 844-7240
http://www.trconsultinggroup.com

04/01/2020

Mr. Chris Brooks
Heartland Tank Services
P.O. Box 3668
Englewood, CO 80155-3668

Re: Training conducted 01 April, 2020 at your facility in Oklahoma City, OK.

Dear Mr. Brooks,

First let me thank you for giving T.R. Consulting, Inc. the opportunity to assess your company's safety training needs, listen to your safety goals, and develop and implement a training program to meet those goals. As such, the following training programs were completed on Wednesday April 01st of this year:

- Scaffold User in accordance with the requirements of 29 CFR Parts 1926.451 & 1910.28
- Rigging Material Handling in accordance with 29 CFR 1926.251
- Electrical Safety Awareness in accordance with 29 CFR 1926.400 & Assured Grounding/GFCI
- Personal Protective Equipment in accordance with 29 CFR Parts 1910.132, 1910.133, 1910.135, 1910.136 & 1910.138
- Respiratory Protection in accordance with 29 CFR 1910.134
- Noise Exposure in accordance with 29 CFR 1910.95
- Fall Protection in accordance with 29 CFR Part 1926.500-503
- Hydro Blasting Safety in accordance with ASTM E1575

The following Heartland Tank Services employees completed the above-listed training program:

Chris Brooks	Juan Carlos Paredes	Jesus Herrera	Elizabeth Jenkins
Mario Romero	Dennis Dixon	Terry Cuthbertson	Michael Buntt
Richard Buntt	Salvador Villagran	Luis Corral	Jerry Pickens
Jose Trejo Macias	Cesar Romero	Diego Romero Ceja	Ramon Sanchez Luque

Thank you again for the opportunity to address your company's safety program needs. I look forward to working with you in the future.

Sincerely,

T.R. Consulting, Inc.

Tony Rieck (Tony)
President/CEO
TR/bfc

J.A. KING

PRECISION MEASUREMENT PROFESSIONALS

Certificate Of Calibration and Traceability

Certificate #: OKC-53389-1042676-1

Calibration Performed By:

J.A. King

1100 SE 66th Street

Oklahoma City, OK 73149

Toll Free: 800-327-7727

For:

Heartland Tank Services, Inc

5200 South Hattie Ave.

Oklahoma City, OK 73129

P. O. Number: Maritza Rodriguez

Procedure No.:	ICP-164 Coating. Film. and Ultrasonic Thickness Gages	**Performed At:**	J.A. King & Co.
Tolerance:	Manufacturer's Specifications	**Equipment ID:**	77630
Temp./RH:	74.4 F / 45.3%	**Manufacturer:**	Dakota Ultrasonics
Cal Interval:	12 Month(s)	**Model Number:**	MVX
Cal Date:	06/16/2020	**Serial Number:**	77630
Cal Due Date:	06/16/2021	**Description:**	Ultrasonic Thickness Gauge
Calibration Result:	Pass	**Capacity x Resolution:**	0.1 to 4 x 0.001 in
Technician:	Chandler, Dante T	**Department:**	N/A

Remarks: In Tolerance - Meets The Manufacturer's Published Specifications.

Thickness

Description	Nominal	Tolerance -	Tolerance +	Results	As Found	As Left	Units
Thickness Measurement	0.100	0.099	0.101	P	0.100	0.100	in
Thickness Measurement	0.200	0.199	0.201	P	0.200	0.200	in
Thickness Measurement	0.500	0.499	0.501	P	0.499	0.499	in
Thickness Measurement	1.000	0.999	1.001	P	1.001	1.001	in
Thickness Measurement	2.000	1.999	2.001	P	2.000	2.000	in

P=Passed "As Found/As Left" **A=Out of Tolerance "As Found"** **F=Out of Tolerance "As Found/As Left"** **R=Report of Actual Value**

Standards Used To Calibrate Equipment

Traceability#	I.D.	Description	Last Cal.	Cal. Due Date
44525-8691-1	ALI-O-048	Gage Block Set 36 pcs.	06/13/2019	06/23/2020

Certification Done and Authorized By: **Chandler, Dante T Calibration Technician** (6/16/2020 17:14:51 UTC)

J.A. KING

PRECISION MEASUREMENT PROFESSIONALS

Certificate Of Calibration and Traceability

Certificate #: OKC-53689-996085-1

Calibration Performed By:
J.A. King
1100 SE 66th Street
Oklahoma City, OK 73149
Toll Free: 800-327-7727

For:
Heartland Tank Services, Inc
5200 South Hattie Ave.
Oklahoma City, OK 73129
P. O. Number: Credit Card

Procedure No.:	ICP-164 Coating. Film. and Ultrasonic Thickness Gages	**Performed At:**	J.A. King & Co.
Tolerance:	± 0.001 in	**Equipment ID:**	77518
Temp./RH:	72 F / 47%	**Manufacturer:**	Dakota Ultrasonics
Cal Interval:	12 Month(s)	**Model Number:**	MVX
Cal Date:	06/23/2020	**Serial Number:**	77518
Cal Due Date:	06/23/2021	**Description:**	Ultrasonic Thickness Gauge
Calibration Result:	Pass	**Capacity x Resolution:**	0.025 to 9.999 x 0.001 in
Technician:	Perry, Lawrence D	**Department:**	N/A

Remarks: In Tolerance - Meets The Manufacturer's Published Specifications.

Thickness

Description	Nominal	Tolerance -	Tolerance +	Results	As Found	As Left	Units
Thickness Measurement	0.100	0.099	0.101	P	0.101	0.101	in
Thickness Measurement	0.250	0.249	0.251	P	0.249	0.249	in
Thickness Measurement	0.500	0.499	0.501	P	0.500	0.500	in
Thickness Measurement	1.000	0.999	1.001	P	1.000	1.000	in
Thickness Measurement	2.000	1.999	2.001	P	2.001	2.001	in

P=Passed "As Found/As Left" **A=Out of Tolerance "As Found"** **F=Out of Tolerance "As Found/As Left"** **R=Report of Actual Value**

Standards Used To Calibrate Equipment

Traceability#	I.D.	Description	Last Cal.	Cal. Due Date
OKC-47897-8743-1	ALI-O-060B	Gage Block Set 81 pcs.	10/17/2019	07/17/2020

This instrument has been processed and calibrated in accordance with the J. A. King Quality Assurance manual and is traceable to the International System of Units (SI) via national metrology institutes (e.g., NIST) that are signatories to the CIPM Mutual Recognition Arrangement. Reported uncertainties are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2. Statements of compliance, where applicable, are based upon the test results falling within the specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced, except in full without the written permission of J. A. King. Calibration due dates appearing on the Certificate of Calibration and label are determined by the customer and do not imply continued conformance to specifications. The J. A. King Quality Management system complies with the requirements of ISO/IEC 17025. View our Scope of Accreditation at www.jaking.com.

Certification Done and Authorized By: **Perry, Lawrence D Calibration Technician** (6/23/2020 14:24:9 UTC)

Corporate Office
PO Box 3668
Englewood, CO 80155-3668

800.774.3230
303.773.3230
Fax: 800.774.3201

INSPECTION WARRANTY

Heartland Tank Services, Inc. has evaluated the condition of this tank based on the observations and measurements made by the Heartland Tank Services, Inc. inspector. While our evaluation accurately describes the condition of the tank at the time of inspection, the tank owner/operator must independently assess the inspection information/report provided by Heartland Tank Services, Inc. and any conclusions reached by the tank owner/operator and any action taken or omitted are the sole responsibility of the owner/operator. With respect to the inspection and testing, Heartland Tank Services, Inc. warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Heartland Tank Services, Inc. shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the exclusive remedy for claims based on failure or defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS OR PURPOSE SHALL APPLY, nor shall Heartland Tank Services, Inc. be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Heartland Tank Services, Inc. be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Heartland Tank Services, Inc. or any associated damage to facilities, down-time costs or claims of other damages.

For further information regarding this report, please contact our office at 1-800-774-3230.

Thank you for your business!