



PetroChem

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**INTERNAL / EXTERNAL AND ULTRASONIC
POST REPAIR TANK INSPECTION REPORT
FOR
BENGAL PIPELINE COMPANY
TANK 125
JACKSON, LOUISIANA
JUNE 13, 2013
DECEMBER 2, 2013 (POST REPAIR)
AND
APRIL 21, 2014 (FINAL INSPECTIOn)**

INTRODUCTION

Bengal Pipeline Company contracted with TÜV SÜD PetroChem Inspection Services, to provide inspection services for Tank 125.

This report documents the findings and provides an evaluation of the inspection results per the applicable criteria of API Standard 653.

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SUITABILITY FOR SERVICE

Tank 125 is suitable for service according to the applicable criteria of API Standard 653 because the following conditions have been met:

- A) The repair recommendations of this report have been implemented.
- B) The safe fill height recommendations of this report are adhered to.

INSPECTION INTERVAL SUMMARY

BOTTOM: Since the bottom is internally lined, the next inspection should be conducted within 20 years and no later than June 2033 (ref. API 653, Para. 4.4.5 and Para 6.4.2). A thin-film lining is sufficient (20 mils or less). The lining was selected and installed for a minimum 20 year service life and it is compatible with the product stored.

SHELL: The next Visual (VT) external inspection should be conducted within 5 years and no later than June 2018 (ref. API 653, Para. 6.3.2.1). This calculation is based on the formula $RCA/4N$ (where RCA is the difference between the measured shell thickness and the minimum required thickness in mils, and N is the shell corrosion rate in mils per year).

Shell corrosion rate calculations indicate the next Ultrasonic Thickness (UT) inspection should be performed within 15 years and no later than June 2028 (ref. API 653, Para. 6.3.3.2). This calculation is based on the formula $RCA/2N$ (where RCA is the difference between the measured shell thickness and the minimum required thickness in mils, and N is the shell corrosion rate in mils per year).

SAFE FILL HEIGHT: Shell thickness calculations indicate the safe fill height of 51.00 feet can be utilized with product specific gravities up to 1.00 (ref. API 653, Para. 4.3.3.1). These calculations do not take into account operational restrictions imposed by such items as any internal or external floating roof, internal pressure, overflow vents, etc.

Philip Myers
P.E. #3408

Date

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Tank: 125	Project No.: 722814132

1. TANK DESCRIPTION

GENERAL:	
TANK NUMBER:	125
OWNER:	Bengal Pipeline Company
DESIGN STD:	API 650
TANK LOCATION:	Jackson, Louisiana
MANUFACTURER:	Chicago Bridge and Iron Company
PRODUCT:	Crude Oil
NORMAL OPER. TEMP.:	Ambient
CATHODIC PROT.:	Yes
NAMEPLATE PRESENT:	Yes
BREAKOUT TANK (DOT):	Yes
DIMENSIONS:	
DIAMETER:	160.00 ft
HEIGHT:	51.00 ft
MAX. GROSS CAPACITY:	182,634 bbls (Calculated to top angle)
GEOMETRY:	
FOUNDATION:	Concrete Ringwall
BOTTOM:	Lap Welded (New Bottom 2013)
SHELL:	Butt Welded
WEATHERSHIELD:	Geodesic Dome
FLOATING ROOF:	Aluminum Honeycomb (2013)
PRIMARY SEAL:	Mechanical Shoe (2013)
DATES:	
YEAR BUILT:	1971 (Repaired/Altered 1998)
LAST INSPECTION:	Data Not Available
ACCESS:	
WEATHERSHIELD:	Spiral Stairway
FLOATING ROOF:	Access Hatch
COATINGS:	
BOTTOM:	White Thin Film Epoxy
SHELL:	External - White Paint
WEATHERSHIELD:	None
FLOATING ROOF:	None

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2. INSPECTION REPORT

2.1 FOUNDATION INSPECTION

ITEM 116 / COND. CODE 4: The survey found the tank to be out of level by 0.24 inch. API 653 calculation for deflection of this tank is 0.13 inch. API 653 maximum deflection permitted for this tank is calculated to be 1.28 inches. Differential settlement calculations for this tank do not exceed the API allowable (ref. API 653, Annex B, Para. B.3.2).

ITEM 13 / COND. CODE 4: The internal survey did not reveal any edge settlement per API 653, Annex B, Section B.3.4.

ITEM 5 / COND. CODE 4: The concrete ringwall was found to be in acceptable condition.

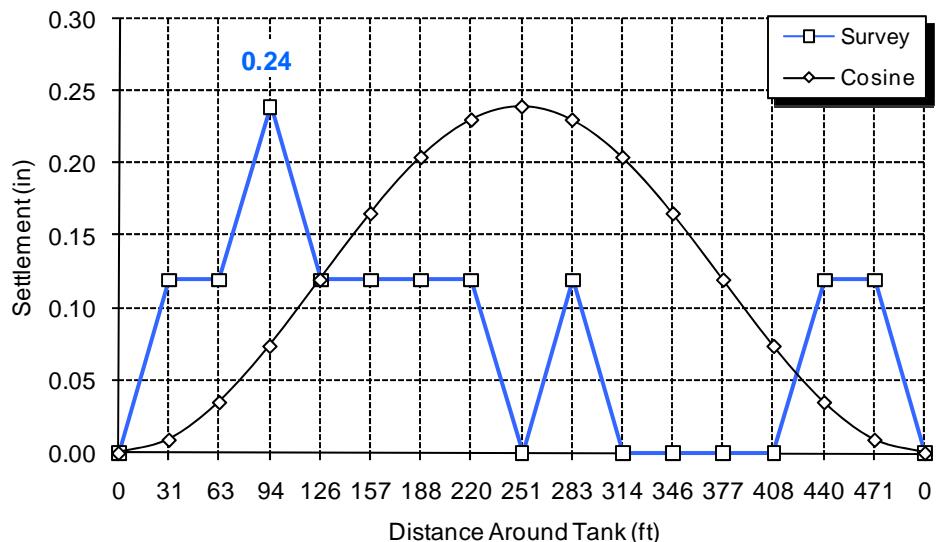
ITEM 11 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEM 11 / COND. CODE 3 (Post Repair Inspection December 2, 2013) / ITEM 11 / COND. CODE 4 (Final Inspection April 21, 2014): The moisture barrier was deteriorated (disbonding). Consideration should be given to installing an appropriate moisture barrier to seal against water intrusion under the tank bottom.

POST REPAIR: A new moisture barrier was installed and found to be acceptable.
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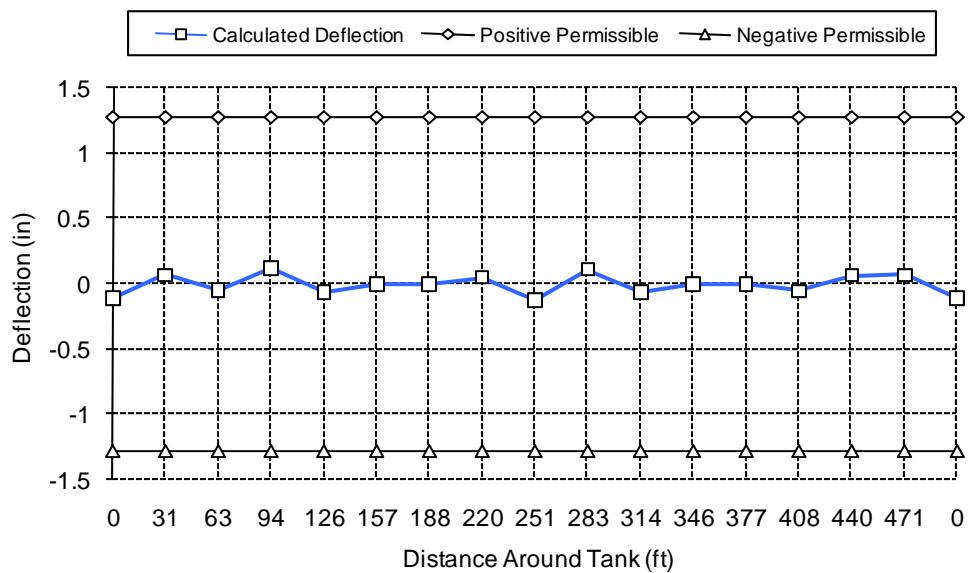
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2.1.1 FOUNDATION SETTLEMENT EVALUATION

**Shell Settlement (Survey Data)
Vs.
Planar Settlement (Cosine Curve)**



Differential Settlement Evaluation





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2.1.2 FOUNDATION SETTLEMENT SURVEY TABLE

The survey was conducted counterclockwise from the reference Shell Manway A located at Station 0.0. The circumferential distance between the readings is 31.40 feet.

Point No.	Distance from Shell (ft.)														
	Shell	1	2	3	4	5	6	10	20	30	40	50	60	70	Center
	Rod Readings (ft.)														
1	3.510	3.540	3.570	3.580	3.610	3.600	3.600	3.720	3.990	4.310	4.580	4.780	5.100	5.330	5.580
2	3.520	3.520	3.560	3.590	3.600	3.620	3.640	3.760	4.030	4.360	4.630	4.830	5.140	5.450	---
3	3.520	3.520	3.530	3.550	3.630	3.650	3.670	3.770	4.100	4.440	4.700	5.020	5.280	5.490	---
4	3.530	3.540	3.560	3.580	3.600	3.630	3.700	3.790	4.160	4.430	4.740	5.040	5.310	5.540	---
5	3.520	3.520	3.540	3.580	3.660	3.680	3.680	3.910	4.250	4.550	4.870	5.110	5.340	5.510	---
6	3.520	3.550	3.560	3.580	3.590	3.590	3.620	3.770	4.060	4.380	4.800	5.090	5.300	5.550	---
7	3.520	3.540	3.540	3.570	3.610	3.650	3.660	3.790	4.050	4.360	4.630	4.990	5.250	5.600	---
8	3.520	3.530	3.550	3.590	3.610	3.630	3.660	3.750	4.000	4.270	4.570	4.860	5.190	5.470	---
9	3.510	3.510	3.540	3.570	3.630	3.610	3.600	3.710	4.180	4.400	4.710	4.990	5.270	5.480	---
10	3.520	3.530	3.530	3.540	3.570	3.580	3.630	3.740	4.200	4.460	4.690	4.980	5.200	5.500	---
11	3.510	3.510	3.520	3.530	3.570	3.590	3.610	3.710	4.220	4.470	4.630	4.930	5.130	5.480	---
12	3.510	3.510	3.520	3.550	3.580	3.600	3.650	3.720	4.260	4.470	4.740	4.910	5.140	5.350	---
13	3.510	3.510	3.520	3.540	3.560	3.580	3.610	3.680	4.160	4.410	4.670	4.880	5.100	5.340	---
14	3.510	3.520	3.540	3.550	3.550	3.530	3.540	3.660	3.890	4.180	4.460	4.760	4.970	5.220	---
15	3.520	3.520	3.550	3.550	3.580	3.570	3.560	3.670	3.950	4.210	4.510	4.740	4.990	5.300	---
16	3.520	3.530	3.550	3.590	3.620	3.610	3.610	3.730	3.950	4.150	4.570	4.730	5.020	5.250	---

2.1.3 FOUNDATION PHOTOGRAPHS

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001 Deteriorated Moisture Barrier



002 Deteriorated Moisture Barrier



003 Deteriorated Moisture Barrier

2.1.4 POST REPAIR FOUNDATION PHOTOGRAPHS

PAGE 10 OF 136



001 Deteriorated Moisture Barrier

2.1.5 FINAL FOUNDATION PHOTOGRAPHS

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001 New Moisture Barrier



002 New Moisture Barrier

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2.2 BOTTOM INSPECTION

ITEM 109 / COND. CODE 2 (Initial Inspection June 13, 2013) / ITEM 109 / COND. CODE 4 (Post Repair Inspection December 2, 2013): Magnetic Flux Leakage (MFL) scanning revealed seventy-three (73) indications grouped into thirty-four (34) areas of soil side metal loss with a remaining thickness of 0.250 inch or below. These areas should be repaired by fabricating and installing patch plates. Areas to be repaired by patch plates should have minimum 12-inch x 12-inch x 0.25-inch carbon steel patches installed using approved welding and NDE procedures per API 653 guidelines. Vacuum Box (LT/BT) testing should be performed on all weld repairs. NOTE: MFL was performed in the areas sandblasted in a "Wagon Wheel" shape per Client request. All indications were ground flush to perform UT prove-up.

POST REPAIR: A new bottom and annular ring were installed and found to be acceptable. All required NDE was performed by Capitol Ultrasonics & CAPE. The bottom was coated with SW DuraPlate UHS/B62W210.

Since the bottom is internally lined, the next inspection should be conducted within 20 years and no later than June 2033 (ref. API 653, Para. 4.4.5 and Para 6.4.2). A thin-film lining is sufficient (20 mils or less). The lining should be selected and installed for a minimum 20 year service life and it should be compatible with the product stored.

ITEM 107 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEM 107 / COND. CODE 4 (Post Repair Inspection December 2, 2013): There is general topside corrosion throughout the tank bottom ranging 0.010 inch to 0.030 inch deep. This condition limited Magnetic Flux Leakage (MFL) and Ultrasonic (UT) thickness inspections.

POST REPAIR: A new bottom and annular ring were installed and found to be acceptable. All required NDE was performed by Capitol Ultrasonics & CAPE.
--

There were four (4) coupons cut in the bottom (ref. Bottom Reduction). This is provided as information only.

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ITEM 118 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEM 118 / COND. CODE 4 (Post Repair Inspection December 2, 2013): Magnetic Particle (MT) inspection was performed on the internal shell-to-bottom weld and sump weld and revealed two (2) weld defects (pinholes) in the internal shell-to-bottom weld. One (1) weld defect is located between Bottom Plates 156 and 158 and the other is located on the lap weld adjacent to the internal shell-to-bottom weld between Bottom Plates 81 and 114. Consideration should be given to repairing these areas using approved welding and NDE procedures per API 653 guidelines.

POST REPAIR: A new bottom and annular ring were installed and found to be acceptable. All required NDE was performed by Capitol Ultrasonics & CAPE.
--

There are areas of lining failure where the bottom plates were sandblasted. Consideration should be given to repairing these areas and performing a low voltage holiday test.

POST REPAIR: The bottom was coated with SW DuraPlate UHS/B62W210.

Most of the bottom plates have curvature (bulge up) approximately 1 inch to 1.50 inches. This limited the operation of the Magnetic Flux Leakage (MFL) inspection. This is provided as information only.

ITEM 141 / COND. CODE 2 (Initial Inspection June 13, 2013) / ITEM 141 / COND. CODE 4 (Post Repair Inspection December 2, 2013): The gauge pole is welded to reinforcing plates that are welded to the shell and to a bearing plate that is welded to the tank bottom. This results in the gauge pole being rigidly connected to the bottom. Consideration should be given to modifying these details to prevent stress on the bottom plates.

POST REPAIR: The gauge pole was removed at the time of the post repair inspection.

ITEM 112 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEM 112 / COND. CODE 4 (Post Repair Inspection December 2, 2013): There is corrosion on the floating roof leg striker plates. The corrosion has been arrested with the thin film epoxy lining. This is provided as information only.

POST REPAIR: The striker plates were removed with the installation of the new bottom. All required NDE was performed by Capitol Ultrasonics & CAPE.

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2.2.1 PERIOD UNTIL NEXT INSPECTION

Nominal Bottom Plate Thickness (inches)	0.312	inch
Maximum Underside Corrosion Depth	0.157	inch
Maximum Internal Corrosion Depth	0.080	inch
Minimum Remaining Thickness at Next Inspection (MRT)	0.100	inch
Year of Inspection (Yi)	2013	year
Year of Construction (Yc)	1971	year
Minimum Remaining Thickness from Underside Corrosion after Repairs (RT _{bc})	0.250	inch
Minimum Remaining Thickness from Internal Corrosion after Repairs (RT _{ip})	0.250	inch
Underside Corrosion Rate (UP _r)	0.0015	inch/yr
Internal Corrosion Rate (StP _r)	0.0015	inch/yr

$$O_r = \frac{(\min RT_{bc} \text{ or } RT_{ip}) - MRT}{StP_r + UP_r}$$

**Since a thin film coating is installed after repairs
(expected life of coating must be equal or exceed this interval)**

(Internal corrosion rate (StP_r) = 0)
(MRT @ next inspection = 0.100 inch)

20 Years

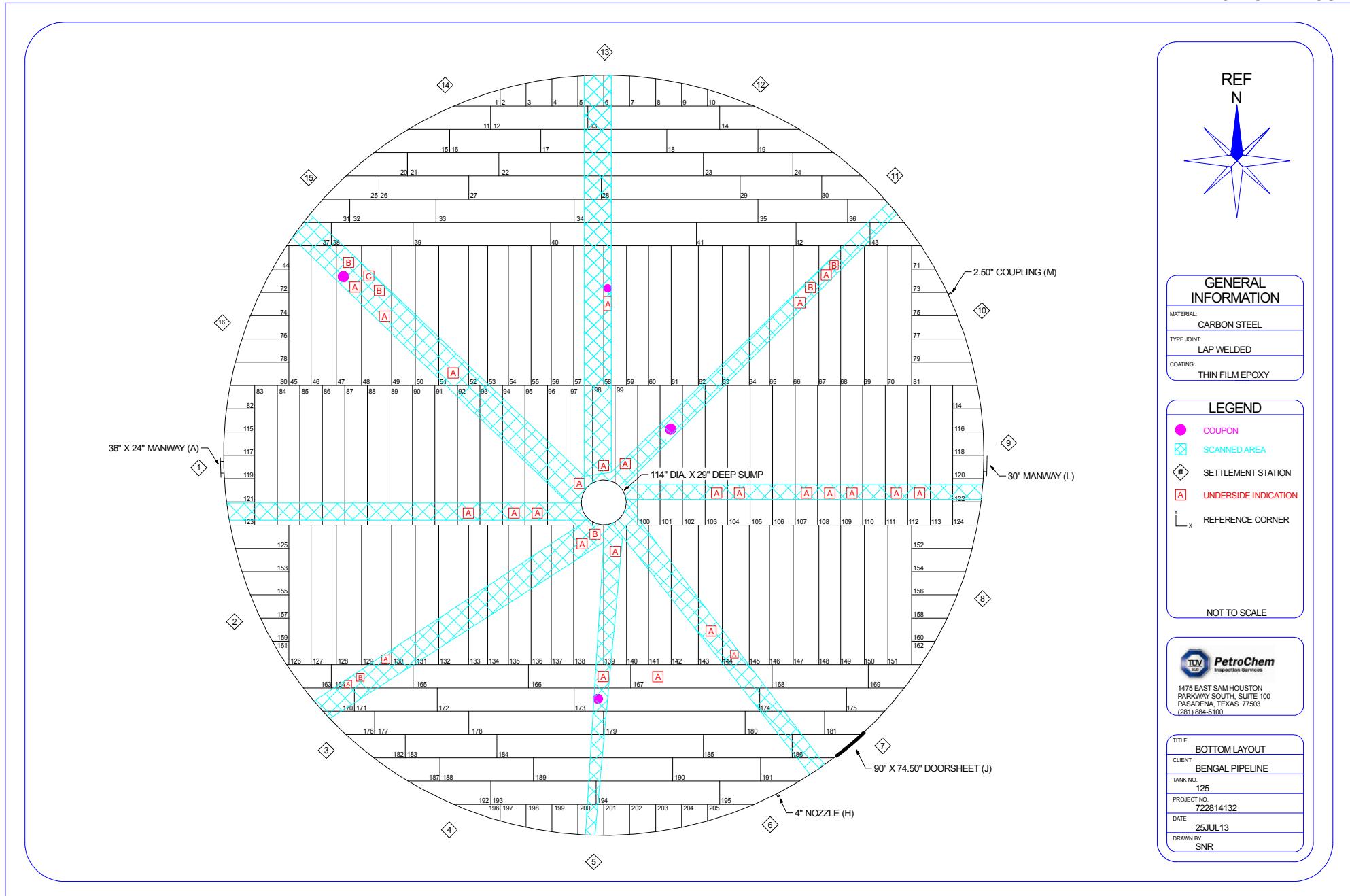
Bottom Plates

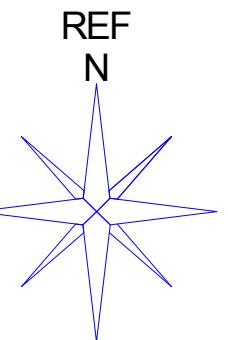
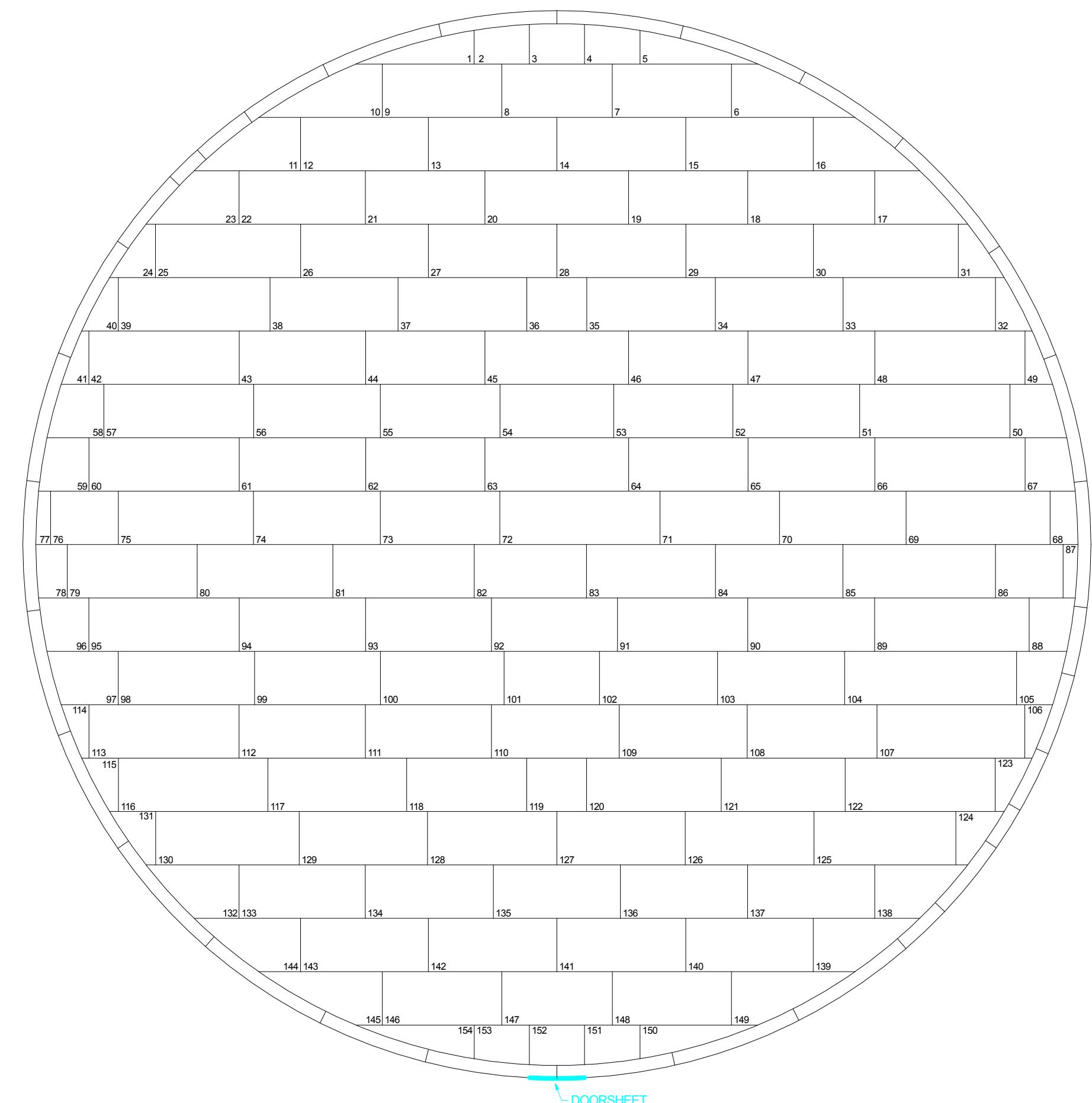
Inspection Threshold Value	0.250 inch
Repair Threshold Value	5/16 inch (New Floor)
Minimum Remaining floor thickness after repairs	5/16 inch (Nominal)

Annular Ring

Repair Threshold Value	3/8 inch (New Annular Ring)
Minimum Remaining floor thickness after repairs	3/8 inch (Nominal)

2.2.2 BOTTOM LAYOUT





GENERAL INFORMATION

MATERIAL:
CARBON STEEL
TYPE JOINT:
LAP WELDED
COATING:
THIN FILM EPOXY

LEGEND

NOT TO SCALE



1475 EAST SAM HOUSTON
PARKWAY SOUTH, SUITE 100
PASADENA, TEXAS 77503
(281) 884-5100

TITLE

POST BOTTOM LAYOUT

CLIENT

BENGAL PIPELINE COMPANY

TANK NO.

125

PROJECT NO.

72281432

DATE

17FEB14

DRAWN BY

CMT

DOORSHEET

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2.2.4 TABLES

TABLE A
SIGNIFICANT FINDINGS

BOTTOM PLATES	INTERNAL	UNDERSIDE
Nominal bottom plate thickness	0.312	
Minimum allowable bottom plate thickness per client	0.250	
Total number of <u>areas</u> of significant metal loss	34	
Number of recordable indications	0	73
Number of holes located and measured	0	0
Lowest remaining thickness	0.232	0.155
Maximum depth of corrosion	0.080	0.157
Number of areas within the critical zone	0	0
Lowest remaining thickness resolved was 0.155 inch on Bottom Plate 139, Indication A.		

WELDS	VISUAL	VAC BOX	MAG PARTICLE
LAP WELD indications	0	N/A	0
SHELL-TO-BOTTOM WELD indications	0	N/A	2
SUMP WELD indications	0	N/A	0

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TABLE B
BOTTOM REDUCTION
 (in inches)

Southwest (SW) reference corner unless otherwise indicated.

PLATE NO./ID	PIT DEPTH	REMAINING THICKNESS	X LOCATION	Y LOCATION	INT	US	COMMENTS
					(# IND)		
47A	---	0.240	49-54	240-253	---	2	
B	---	0.230	38	273	---	1	
C	---	---	22	279	1	---	Coupon
48A	---	0.250	52	211	---	1	
B	---	0.215-0.235	24-34	224-235	---	4	
C	---	0.250	18	245	---	1	
51A	---	0.235-0.250	37-42	68-72	---	2	
58A	---	0.240-0.245	19-24	223-233	---	3	
B	---	---	11	240	1	---	Coupon
66A	---	0.250	31	220	---	1	
B	---	0.250	33	241	---	1	
67A	---	0.230	28-32	248-255	---	3	
B	---	0.230	8-12	261-264	---	2	
92A	---	0.235	36-43	28-33	---	2	
94A	---	0.235-0.245	23-36	31-42	---	6	
95A	---	0.230-0.240	17	23-27	---	2	
97A	---	0.225-0.250	40-46	127-134	---	3	
98A	---	0.230-0.250	36-42	212-215	---	2	NE
99A	---	0.230-0.250	21-38	116-151	---	5	
101A	---	---	29	269	1	---	Coupon
103A	---	0.240	21	70	---	1	
104A	---	0.230-0.250	5-13	60-65	---	3	
107A	---	0.250	6-12	58-70	---	3	
108A	---	0.250	12	72	---	1	
109A	---	0.240	9	62	---	1	
111A	---	0.245	23	60	---	1	
112A	---	0.240	17	60	---	1	
129A	---	0.250	47	14	---	1	
138A	---	0.235	8	335	---	1	
B	---	0.240	29	325	---	1	
139A	---	0.155-0.230	9-17	306-326	---	7	
143A	---	0.250	18-31	162-171	---	2	
144A	---	0.240	37	94	---	1	



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TABLE B
BOTTOM REDUCTION
 (in inches)

Southwest (SW) reference corner unless otherwise indicated.

NOTES:							
US = UNDERSIDE	CZ = CRITICAL ZONE	LW = LAP WELD	MD = MECHANICAL DAMAGE				
INT = INTERNAL	IND = INDICATIONS	CW = CORNER WELD	NE = NORTHEAST REF. CORNER				
LAM = LAMINATION	CP = COUPON						
PLATE NO./ID	PIT DEPTH	REMAINING THICKNESS	X LOCATION	Y LOCATION	INT (# IND)	US	COMMENTS
164A	---	0.240-0.245	138-142	29-35	---	2	
B	---	0.235	158	38	---	1	
166A	---	0.235-0.240	275-280	27-33	---	3	
167A	---	0.235-0.245	47-53	23-26	---	2	
173A	---	---	30	22	1	---	Coupon



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TABLE C
SUMP ULTRASONIC THICKNESS READINGS
(in inches)

Sump Wall Readings

READING NO/ID	NORTH	EAST	SOUTH	WEST
1	0.317	0.317	0.312	0.318
2	0.320	0.315	0.315	0.317
3	0.323	0.316	0.310	0.316
4	0.322	0.312	0.311	0.317

Average: 0.316

Minimum: 0.310

Sump Bottom Readings

LOCATION	READING 1	READING 2
North	0.317	0.316
East	0.313	0.314
South	0.317	0.319
West	0.318	0.319
Center	0.312	0.313

Average: 0.316

Minimum: 0.312

2.2.5 BOTTOM PHOTOGRAPHS

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001 Overview of Bottom



002 Indications



003 Indications



004 Indications

2.2.5 BOTTOM PHOTOGRAPHS

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005 Weld Defect in Internal Shell-to-Bottom Weld



006 Weld Defect in Lap Weld



007 Gauge Pole Rigidly Supported



008 Gauge Pole Welded to Bottom

2.2.5 BOTTOM PHOTOGRAPHS

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009 Gauge Pole Welded to Shell



010 Sump

2.2.6 POST REPAIR BOTTOM PHOTOGRAPHS

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001 New Annular Ring



002 New Annular Ring



003 New Annular Ring



004 New Annular Ring

2.2.6 POST REPAIR BOTTOM PHOTOGRAPHS

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005 New Sump



006 New Sump



007 New Piping Support



008 New Anti-Rotation

2.2.7 FINAL BOTTOM PHOTOGRAPHS

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001 Overview of Bottom



002 Overview of Bottom



003 Overview of Bottom



004 Overview of Bottom

2.2.7 FINAL BOTTOM PHOTOGRAPHS

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005 Overview of Bottom



006 New Sump



007 New Sump



SHERWIN-WILLIAMS.

The Sherwin-Williams Company
Protective & Marine Division
7471 Tom Drive
Baton Rouge, La 70806

Colonial Pipeline Company
Attn: Stephen Seales
Jackson, LA. Tank Farm

May 18, 2014
Re: 20yr Inspection Interval/API 653-Colonial Pipeline Tank #125

Stephen,

This letter is being sent as confirmation regarding the internal liner of Colonial Tank #125 in relation to API 653/API's 20yr inspection interval guideline. During the application of the internal liner (SW DuraPlate UHS/B62W210), Sherwin-Williams representatives observed application of the system at hold points to ensure the system was applied in accordance with the manufacturers specification/product data sheet.

During our observations data/information was collected. All observations conducted by Sherwin-Williams were documented to ensure integrity of the applied liner system meeting requirements issued by the manufacturers specification. Per completion of the system, based on observations/inspections made at critical hold points, the system has been installed per manufacturers specification thus is in compliance with API 653/API's 20yr inspection interval.

Jeb M. Rush
Sherwin-Williams Company
Protective & Marine Division
Coatings Specialist
NACE #34589

(225) 803-5490
Swrep6567@sherwin.com

Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
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2.3 SHELL INSPECTION

Shell thickness calculations indicate the safe fill height of 51.00 feet can be utilized with product specific gravities up to 1.00 (ref. API 653, Para. 4.3.3.1). These calculations do not take into account operational restrictions imposed by such items as any internal or external floating roof, internal pressure, overflow vents, etc.

Course	Year Original Construction	Year Thickness Measured	Assumed Nominal Thickness* (in.)	2013 Measured Thickness (in.)	Shell Course Corrosion Rate (in./yr.)	Remaining Corrosion Allowance (in.)
1	1971	2013	1.125	1.135	-0.000238	0.223
2	1971	2013	1.063	1.011	0.001238	0.227
3	1971	2013	0.781	0.782	-0.000024	0.193
4	1971	2013	0.625	0.605	0.000476	0.138
5	1971	2013	0.438	0.435	0.000071	0.085
6	1971	2013	0.344	0.327	0.000405	0.094
7	1971	2013	0.313	0.322	-0.000214	0.212

- * The above calculations are based on the average measured thicknesses and assumed nominal thicknesses. Remaining life could not be determined on courses where the actual thicknesses were greater than or equal to the past thickness readings.

The next Visual (VT) external inspection should be conducted within 5 years and no later than June 2018 (ref. API 653, Para. 6.3.2.1). This calculation is based on the formula $RCA/4N$ (where RCA is the difference between the measured shell thickness and the minimum required thickness in mils, and N is the shell corrosion rate in mils per year).

Shell corrosion rate calculations indicate the next Ultrasonic Thickness (UT) inspection should be performed within 15 years and no later than June 2028 (ref. API 653, Para. 6.3.3.2). This calculation is based on the formula $RCA/2N$ (where RCA is the difference between the measured shell thickness and the minimum required thickness in mils, and N is the shell corrosion rate in mils per year).

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ITEMS 20, 31 & 50 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEMS 20, 31 & 50 / COND. CODE 3 (Post Repair Inspection December 2, 2013) / ITEMS 20, 31 & 50 / COND. CODE 4 (Final Inspection April 21, 2014): The external shell has coating failure (chalky) and mildew. The top side of the wind girder has coating failure with surface rust and corrosion. The underside of the wind girder has coating failure and mildew. The coating beneath the stair treads was sandblasted. Consideration should be given to properly cleaning and re-coating the entire shell.

POST REPAIR: The wind girder was cleaned and re-coated. Additional drainage holes were installed in areas that were needed.
--

ITEM 51 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEM 51 / COND. CODE 3 (Post Repair Inspection December 2, 2013) / ITEMS 20, 31 & 50 / COND. CODE 4 (Final Inspection April 21, 2014): There is ponding on the wind girder. Consideration should be given to properly cleaning the affected areas.

POST REPAIR: The wind girder was cleaned and re-coated. Additional drainage holes were installed in areas that were needed.
--

ITEMS 17 & 19 / COND. CODE 3 (Initial Inspection June 13, 2013) / ITEMS 17 & 19 / COND. CODE 4 (Post Repair Inspection December 2, 2013): Magnetic Particle (MT) inspection was performed on the external shell-to-bottom weld and wind girder-to-shell weld. There are fifty plus (50+) weld defects (undercut, pinholes and porosity) in the external shell-to-bottom weld and seventy plus (70+) weld defects (corrosion and pinholes) in the wind girder-to-shell weld. These areas have been marked on the tank. Consideration should be given to repairing these areas using approved welding and NDE procedures per API 653 guidelines.

POST REPAIR: A new bottom was installed and found to be acceptable. The wind girder-to-shell weld defects were repaired and found to be acceptable. All required NDE was performed by Capitol Ultrasonics & CAPE.
--

ITEM 150 / COND. CODE 4: The internal shell was found to be in acceptable condition. The lower 12 inches of the internal lining was removed for inspection purposes. Consideration should be given to properly cleaning and re-lining these areas.

POST REPAIR: . The lower internal shell was coated with SW DuraPlate UHS/B62W210.
--

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There are four (4) evenly spaced 4 inch holes on the top of Course 7. These appear to be overflow vents with no screens. A mechanical shield and screen should be installed over these openings to prevent water and birds from entering the tank.

POST REPAIR: The 4 inch holes were plugged with threaded covers and found to be acceptable.

ADDITIONAL POST REPAIRS: A new datum plate was installed on the internal shell.



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2.3.1 SHELL THICKNESS CALCULATIONS

The minimum acceptable shell plate thickness for tanks with a diameter equal to or less than 200 feet is calculated as follows (API 653, Para. 4.3.3.1):

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

Where:

- S** = See Table = Allowable Stress (psi)
- D** = 160.00 = Nominal Diameter of Tank (ft.)
- G** = 1.00 = Highest Specific Gravity of Contents
- H** = See Table = Product Height (ft.)
- E** = See Table = Joint Efficiency

Course	Course Height (ft.)	Product Height (ft.)	Joint Efficiency	Allowable Stress (psi)	Average Thickness (in.)	Required Thickness (in.)	Meets Required Thickness
1	7.04	51.00	0.85	23,600	1.135	1.037	Y
2	7.42	43.96	0.85	23,600	1.011	0.891	Y
3	7.38	36.54	0.85	26,000	0.782	0.669	Y
4	7.04	29.17	0.85	26,000	0.605	0.530	Y
5	7.04	22.13	0.85	26,000	0.435	0.398	Y
6	7.42	15.08	0.85	26,000	0.327	0.265	Y
7	7.67	7.67	0.85	26,000	0.322	0.125	Y

Shell thickness calculations indicate the safe fill height of 51.00 feet can be utilized with product specific gravities up to 1.00 (ref. API 653, Para. 4.3.3.1). These calculations do not take into account operational restrictions imposed by such items as any internal or external floating roof, internal pressure, overflow vents, etc.

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2.3.2 TABLES

TABLE A
SHELL ULTRASONIC THICKNESS READINGS
 (in inches)

Course 1

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	1.134	1.144	1.125	1.120	1.140	1.145	1.134	1.140
2	1.133	1.141	1.140	1.124	1.129	1.130	1.143	1.137
3	1.127	1.140	1.136	1.120	1.133	1.140	1.156	1.137

Avg.: 1.135

Min.: 1.120

Course 2

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	0.997	1.029	1.011	1.029	1.010	1.025	0.986	1.012
2	0.983	1.041	1.010	1.002	1.025	0.990	0.999	1.011
3	0.981	1.035	0.998	1.014	1.014	1.036	1.015	1.009

Avg.: 1.011

Min.: 0.981

Course 3

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	0.804	0.762	0.795	0.782	0.791	0.784	0.781	0.781
2	0.800	0.752	0.767	0.785	0.789	0.787	0.794	0.776
3	0.790	0.767	0.781	0.780	0.779	0.785	0.779	0.780

Avg.: 0.782

Min.: 0.752

Course 4

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	0.601	0.602	0.599	0.602	0.598	0.594	0.615	0.609
2	0.602	0.607	0.612	0.600	0.612	0.600	0.614	0.613
3	0.600	0.605	0.610	0.593	0.614	0.594	0.610	0.617

Avg.: 0.605

Min.: 0.593



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TABLE A
SHELL ULTRASONIC THICKNESS READINGS
 (in inches)

Course 5

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	0.435	0.433	0.429	0.427	0.419	0.431	0.445	0.439
2	0.437	0.439	0.436	0.428	0.425	0.436	0.456	0.451
3	0.434	0.438	0.428	0.425	0.429	0.430	0.444	0.444

Avg.: 0.435

Min.: 0.419

Course 6

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	0.332	0.326	0.329	0.320	0.333	0.332	0.316	0.331
2	0.334	0.327	0.331	0.323	0.331	0.334	0.322	0.327
3	0.332	0.314	0.330	0.319	0.329	0.332	0.321	0.325

Avg.: 0.327

Min.: 0.314

Course 7

RDGS	DROP 1	DROP 2	DROP 3	DROP 4	DROP 5	DROP 6	DROP 7	DROP 8
1	0.318	0.322	0.320	0.318	0.321	0.340	0.324	0.318
2	0.324	0.332	0.324	0.314	0.319	0.334	0.322	0.324
3	0.323	0.315	0.319	0.312	0.309	0.332	0.321	0.320

Avg.: 0.322

Min.: 0.309

2.3.3 SHELL PHOTOGRAPHS

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001 Overview of Tank



002 Overview of Tank



003 Overview of Tank



004 Overview of Tank

2.3.3 SHELL PHOTOGRAPHS

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005 Nameplate



006 Tank ID



007 Weld Defect in External Shell-to-Bottom Weld



008 Weld Defect in External Shell-to-Bottom Weld

2.3.3 SHELL PHOTOGRAPHS

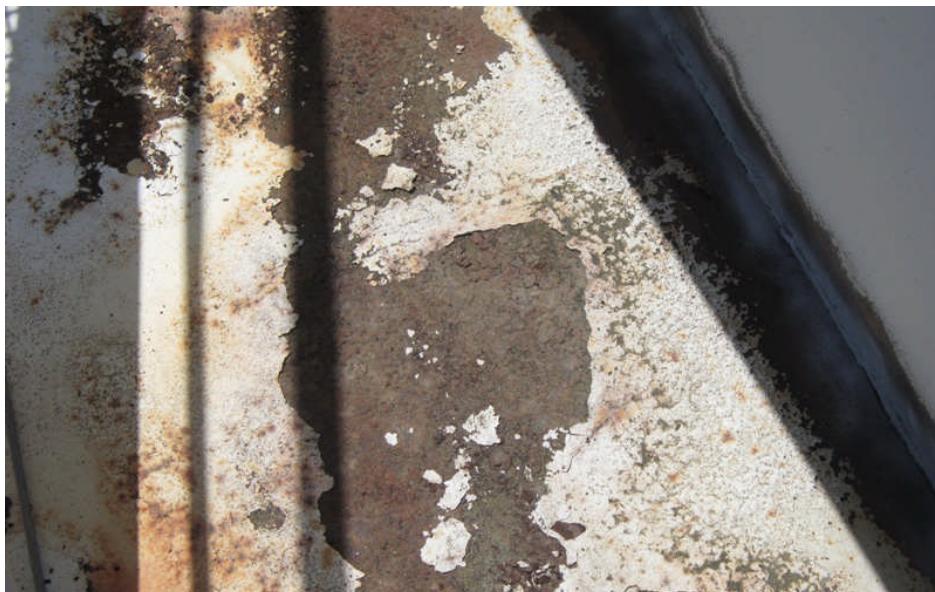
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009 Weld Defect in External Shell-to-Bottom Weld



010 Coating Failure and Corrosion on Wind Girder



011 Coating Failure and Corrosion on Wind Girder



012 Corrosion on Wind Girder

2.3.3 SHELL PHOTOGRAPHS

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013 Scale on Wind Girder



014 Coating Failure and Corrosion on Underside of Wind Girder



015 Weld Defects on Wind Girder-to-Shell Weld



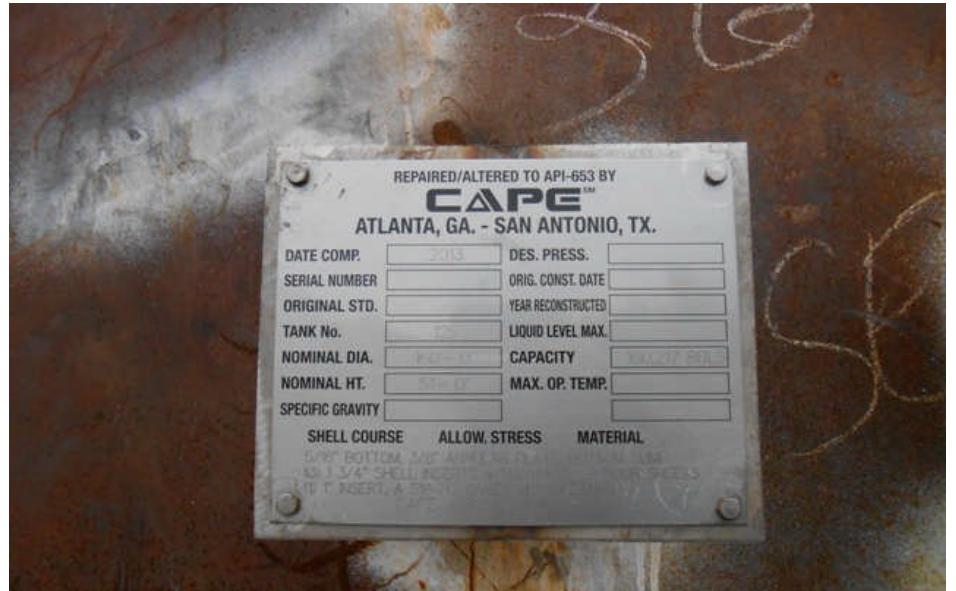
016 Weld Defects on Wind Girder-to-Shell Weld

2.3.4 POST REPAIR SHELL PHOTOGRAPHS

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001 Overview of Tank



002 Nameplate



003 Coating Failure on Shell



004 Coating Failure on Top Side of Wind Girder

2.3.4 POST REPAIR SHELL PHOTOGRAPHS

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005 Coating Failure on Top Side of Wind Girder



006 Coating Failure on Top Side of Wind Girder



007 Coating Failure on Underside of Wind Girder



008 Coating Failure on Underside of Wind Girder

2.3.4 POST REPAIR SHELL PHOTOGRAPHS

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009 Coating Failure on Underside of Wind Girder



010 External Shell-to-Bottom Weld Repairs



011 External Shell-to-Bottom Weld Repairs



012 Wind Girder-to-Shell Weld Repairs

2.3.4 POST REPAIR SHELL PHOTOGRAPHS

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013 Wind Girder-to-Shell Weld Repairs



014 Wind Girder-to-Shell Weld Repairs



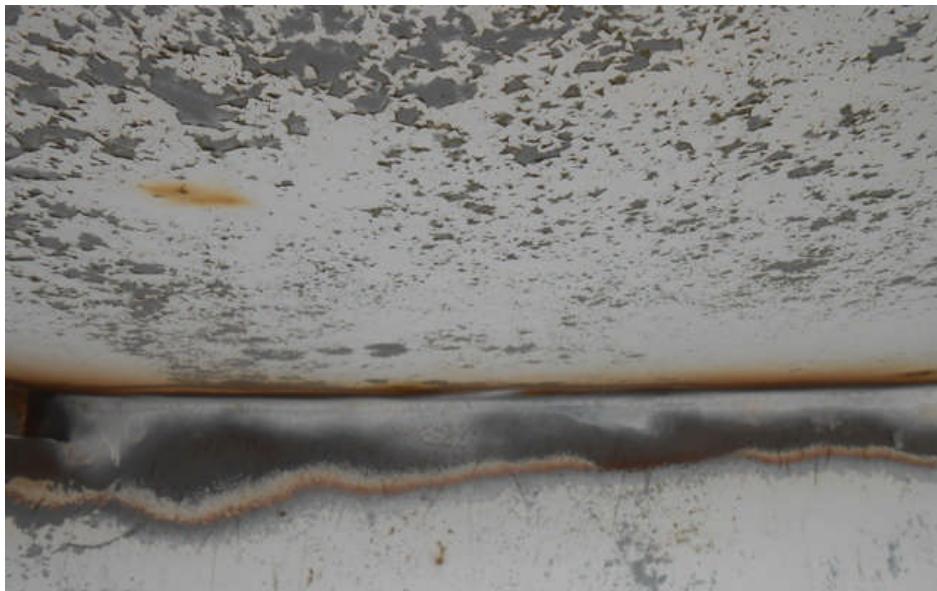
015 Wind Girder-to-Shell Weld Repairs



016 Wind Girder-to-Shell Weld Repairs

2.3.4 POST REPAIR SHELL PHOTOGRAPHS

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017 Wind Girder-to-Shell Weld Repairs



018 New Threaded Covers



019 New Datum Plate

2.3.5 FINAL SHELL PHOTOGRAPHS

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001 Overview of Tank



002 Overview of Tank



003 Overview of Tank



004 Overview of Tank

2.3.5 FINAL SHELL PHOTOGRAPHS

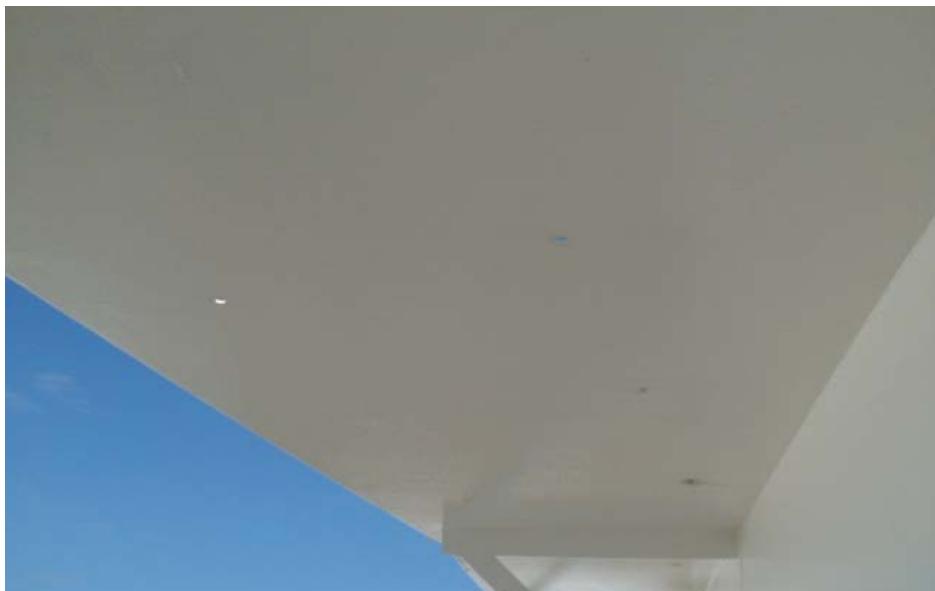
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005 Nameplate



006 Coating Data



007 Underside of Wind Girder



008 Wind Girder

2.3.5 FINAL SHELL PHOTOGRAPHS

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009 Wind Grider



010 Wind Grider



011 Additional Drain Hole



012 Additional Drain Hole

2.3.5 FINAL SHELL PHOTOGRAPHS

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013 Wind Girder

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2.4 NOZZLE AND APPURTENANCE INSPECTION

ITEM 33 / COND. CODE 2 (Initial Inspection June 13, 2013) / ITEM 33 / COND. CODE 4 (Post Repair Inspection December 2, 2013): The weld spacing between the shell-to-bottom weld and the reinforcing plates of Manways A and L is less than that required by the current edition of API 650, Para. 5.7.3. The weld spacing between the shell-to-bottom weld and the neck of Coupling M is less than that required by the current edition of API 650, Para. 5.7.3. Visual (VT) inspection of these items did not reveal any anomalies. These details have been present for an extended period of time and no immediate corrective action is required.

POST REPAIR: Manways A and L have been replaced with new Manways and thickened inserts. Coupling M was removed and a shell insert was installed. All required NDE was performed by Capitol Ultrasonics & CAPE.

ITEM 33 / COND. CODE 2 (Initial Inspection June 13, 2013) / ITEM 33 / COND. CODE 4 (Post Repair Inspection December 2, 2013): Manway A has a reinforcing plate that does not meet the minimum size requirements of API 650 (ref. Table 5-6b, Columns 5 and 6). However, per our calculations, this nozzle is adequately reinforced (ref. API 650, Section 5.7.2 and API 620, Section 5.16). This detail has been present for an extended period of time and no immediate corrective action is required.

POST REPAIR: Manway A was replaced with a new Manway and thickened insert. All required NDE was performed by Capitol Ultrasonics & CAPE.

ITEM 33 / COND. CODE 2 (Initial Inspection June 13, 2013) / ITEM 33 / COND. CODE 4 (Post Repair Inspection December 2, 2013): The centerline elevation of Manway A does not meet the requirements of API 650 Table 5.6b, Columns 8c or 9c. This detail has been present for an extended period of time and no immediate corrective action is required.

POST REPAIR: Manway A was replaced with a new Manway and thickened insert. All required NDE was performed by Capitol Ultrasonics & CAPE.



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ITEM 33 / COND. CODE 2 (Initial Inspection June 13, 2013) / ITEM 33 / COND. CODE 4 (Post Repair Inspection December 2, 2013): Coupling M (2.50 inch coupling) does not have a reinforcing plate as suggested by API 650, Para. 5.7.2.1 which states that, "Openings in tank shells larger than required to accommodate a NPS 2 flanged or threaded nozzle shall be reinforced." A reinforcing plate should be installed around this nozzle neck.

POST REPAIR: Coupling M was removed and a shell insert was installed. All required NDE was performed by Capitol Ultrasonics & CAPE.

ADDITIONAL POST REPAIR: A new doorsheet was installed.

New ground clips were installed.

2.4.1 NOZZLE AND APPURTENANCE TABLE

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Item	Description	Pipe Size (in.)	Station (ft)	CL Elev. (in.)	Reinforcing Plate				Ext Neck Proj (in.)	Int Neck Proj (in.)	Neck Thick (in.)	Flng Thick (in.)	Cover Thick (in.)	Tell-tale	Weld Space (in.)	Comments
					Width (in.)	Height (in.)	Thick (in.)	Shape								
A	Manway	36x24	0.00	30	76	52	1.116	A	5.50	---	1.011	0.735	0.840	Y	2.50	1, 3, 4 (Replaced)
B	Foam Line	6	39.80	---	---	---	---	---	---	---	---	---	---	---	---	---
C	Roof Drain	4	50.00	---	---	---	---	---	---	---	---	---	---	---	---	---
D	Stairway	---	61.60	---	---	---	---	---	---	---	---	---	---	---	---	Bottom
E	Platform	---	128.20	---	---	---	---	---	---	---	---	---	---	---	---	---
F	Digital Gauge	---	133.80	---	---	---	---	---	---	---	---	---	---	---	---	---
G	Roof Drain	4	146.00	---	---	---	---	---	---	---	---	---	---	---	---	---
H	Nozzle	4	159.10	6	16	12	1.169	D	3.50	---	0.315	0.935	1.028	Y	Flush	
I	Foam Line	6	166.00	---	---	---	---	---	---	---	---	---	---	---	---	---
J	Doorsheet	---	188.20	38.50	90	74.50	---	---	---	---	---	---	---	---	---	---
K	Roof Drain	4	229.80	---	---	---	---	---	---	---	---	---	---	---	---	---
L	Manway	30	248.40	35	80	66	1.193	A	5.50	---	0.665	0.735	0.915	Y	2.25	1 (Replaced)
M	Coupling	2.50	285.20	6.50	---	---	---	---	---	---	---	---	---	---	4.25	1, 6 (Removed)
N	Foam Line	6	291.60	---	---	---	---	---	---	---	---	---	---	---	---	---
O	Roof Drain	4	313.60	---	---	---	---	---	---	---	---	---	---	---	---	---
P	Cathodic Protection Ground	---	376.30	---	---	---	---	---	---	---	---	---	---	---	---	---
Q	Roof Drain	4	397.30	---	---	---	---	---	---	---	---	---	---	---	---	---
R	Foam Line	6	417.30	---	---	---	---	---	---	---	---	---	---	---	---	---
S	Roof Drain	4	481.00	---	---	---	---	---	---	---	---	---	---	---	---	---
T	Ground Clip	---	134.50	---	---	---	---	---	---	---	---	---	---	---	---	---

Stations are measured in feet counterclockwise from Manway A.

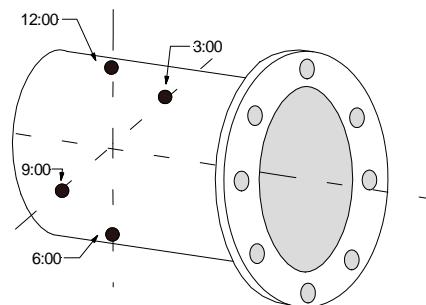
Shape												
-------	--	--	--	--	--	--	--	--	--	--	--	--

COMMENTS

1-Inadequate weld spacing	2-Inadequate repad thickness	3-Inadequate repad dimensions	4-Inadequate centerline elevation	5-Less than 90° intersection w/ weld
6-No reinforcing plate	7-Square-cornered repad	8-Inadequate neck thickness	9-Plugged telltale hole	10-No telltale hole

NOZZLE ULTRASONIC NECK THICKNESS READINGS

READING LOCATION	NOZZLE A	NOZZLE H	NOZZLE L
12:00	1.030	0.316	0.712
3:00	1.011	0.350	0.730
6:00	1.051	0.336	0.665
9:00	1.079	0.315	0.719
Avg.:	1.043	0.329	0.707
Min:	1.011	0.315	0.665



2.4.2 POST REPAIR NOZZLE AND APPURTENANCE TABLE

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Item	Description	Pipe Size (in.)	Station (ft)	CL Elev. (in.)	Reinforcing Plate				Ext Neck Proj (in.)	Int Neck Proj (in.)	Neck Thick (in.)	Flng Thick (in.)	Cover Thick (in.)	Tell-tale	Weld Space (in.)	Comments
					Width (in.)	Height (in.)	Thick (in.)	Shape								
A	Manway	36	0.00	42	96	83.5	1.185	F	6	---	0.514	0.980	1.047	---	Flush	Thickened insert
B	Foam Line	6	39.80	---	---	---	---	---	---	---	---	---	---	---	---	---
C	Roof Drain	4	50.00	---	---	---	---	---	---	---	---	---	---	---	---	---
D	Stairway	---	61.60	---	---	---	---	---	---	---	---	---	---	---	---	Bottom
E	Ground Clip	---	71.65	---	---	---	---	---	---	---	---	---	---	---	---	---
F	Platform	---	128.20	---	---	---	---	---	---	---	---	---	---	---	---	---
G	Digital Gauge	---	133.80	---	---	---	---	---	---	---	---	---	---	---	---	---
H	Roof Drain	4	146.00	---	---	---	---	---	---	---	---	---	---	---	---	---
I	Manway	36	157.75	42	96	83.5	1.833	F	6	---	0.515	0.979	1.023	---	Flush	Thickened insert
J	Foam Line	6	166.00	---	---	---	---	---	---	---	---	---	---	---	---	---
K	Doorsheet	---	188.20	38.50	90	74.50	---	---	---	---	---	---	---	---	---	---
L	Ground Clip	---	197.40	---	---	---	---	---	---	---	---	---	---	---	4.5	4.5
M	Roof Drain	4	229.80	---	---	---	---	---	---	---	---	---	---	---	---	---
N	Manway	36	248.10	42	96	83.5	1.817	F	6	---	0.514	0.911	1.025	---	Flush	Thickened insert
O	Insert	---	285.20	---	24	24	1.164	K	---	---	---	---	---	---	---	Flush
P	Foam Line	6	291.60	---	---	---	---	---	---	---	---	---	---	---	---	---
Q	Roof Drain	4	313.60	---	---	---	---	---	---	---	---	---	---	---	---	---
R	Ground Clip	---	322.00	---	---	---	---	---	---	---	---	---	---	---	4.5	4.5
S	Cathodic Protection Ground	---	376.30	---	---	---	---	---	---	---	---	---	---	---	---	---
T	Roof Drain	4	397.30	---	---	---	---	---	---	---	---	---	---	---	---	---
U	Foam Line	6	417.30	---	---	---	---	---	---	---	---	---	---	---	---	---
V	Ground Clip	---	447.15	---	---	---	---	---	---	---	---	---	---	---	4.5	4.5
W	Roof Drain	4	481.00	---	---	---	---	---	---	---	---	---	---	---	---	---

Stations are measured in feet counterclockwise from Manway A.

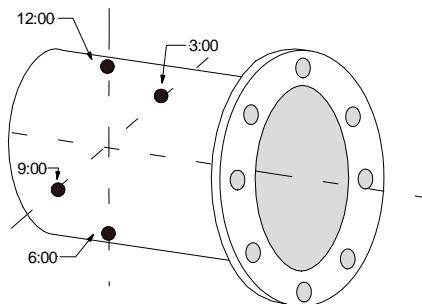
Shape	A	B	C	D	E	F	G	H	I	J	K	L
-------	---	---	---	---	---	---	---	---	---	---	---	---

COMMENTS

1-Inadequate weld spacing	2-Inadequate repad thickness	3-Inadequate repad dimensions	4-Inadequate centerline elevation	5-Less than 90° intersection w/ weld
6-No reinforcing plate	7-Square-cornered repad	8-Inadequate neck thickness	9-Plugged telltale hole	10-No telltale hole

NOZZLE ULTRASONIC NECK THICKNESS READINGS

READING LOCATION	NOZZLE A	NOZZLE I	NOZZLE N
12:00	0.516	0.516	0.516
3:00	0.514	0.518	0.515
6:00	0.516	0.519	0.517
9:00	0.515	0.515	0.514
Avg.:	0.515	0.517	0.516
Min:	0.514	0.515	0.514



COURSE 1 VERTICAL WELD SEAM LOCATIONS (ft.):

1 14.55	2 45.96	3 77.40	4 108.83	5 140.25	6 171.68	7 203.12	8 234.55	9 265.97
	10 297.50	11 328.85	12 360.27	13 391.70	14 423.14	15 454.57	16 486.00	

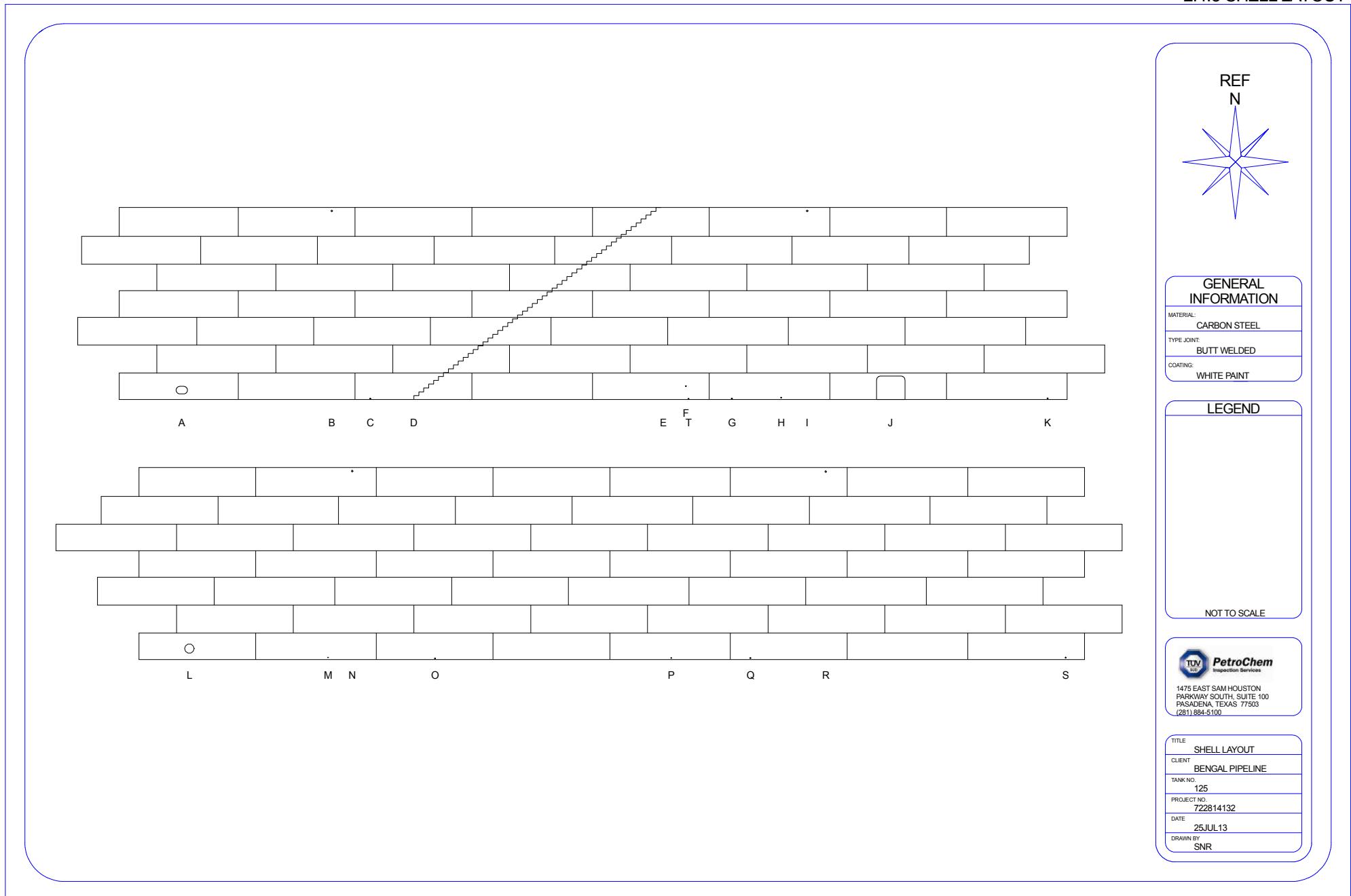
COURSE 2 VERTICAL WELD SEAM LOCATIONS:

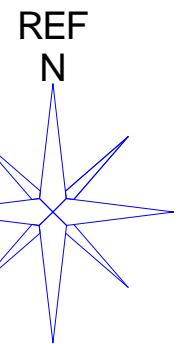
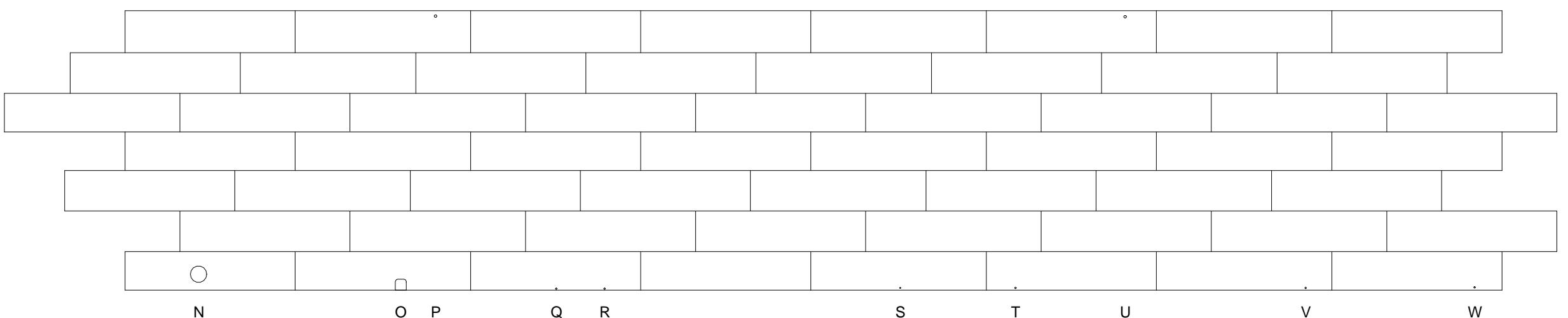
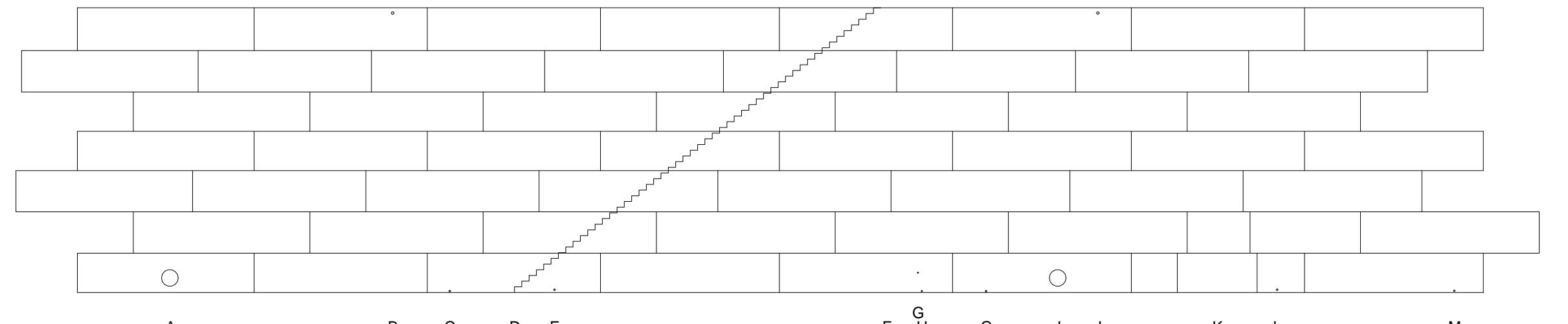
1 25.00	2 56.50	3 87.90	4 119.35	5 150.75	6 182.15	7 213.60	8 245.00	9 276.50
	10 307.90	11 339.35	12 370.75	13 402.20	14 433.60	15 465.03	16 496.50	

VERTICAL WELD OFFSET FOR COURSES 3, 4, etc.

3 4.0	4 14.55	5 25.00	6 4.0	7 14.55
----------	------------	------------	----------	------------

*All weld seams are measured in feet counterclockwise from Manway A





GENERAL INFORMATION

MATERIAL:
CARBON STEEL
TYPE JOINT:
BUTT WELDED
COATING:
WHITE PAINT

LEGEND

NOT TO SCALE



1475 EAST SAM HOUSTON
PARKWAY SOUTH, SUITE 100
PASADENA, TEXAS 77503
(281) 884-5100

TITLE
SHELL LAYOUT

CLIENT
BENGAL PIPELINE

TANK NO.
125

PROJECT NO.
722814132

DATE
25JUL13

DRAWN BY
SNR

2.4.5 NOZZLE AND APPURTEANCE PHOTOGRAPHS

PAGE 57 OF 136



001 Manway A



002 Manway A Internal



003 Bottom of Stairway D



004 Platform E

2.4.5 NOZZLE AND APPURTEANCE PHOTOGRAPHS

PAGE 58 OF 136



005 Digital Gauge F



006 Nozzle H



007 Nozzle H Internal



008 Doorsheet J

2.4.5 NOZZLE AND APPURTEANCE PHOTOGRAPHS

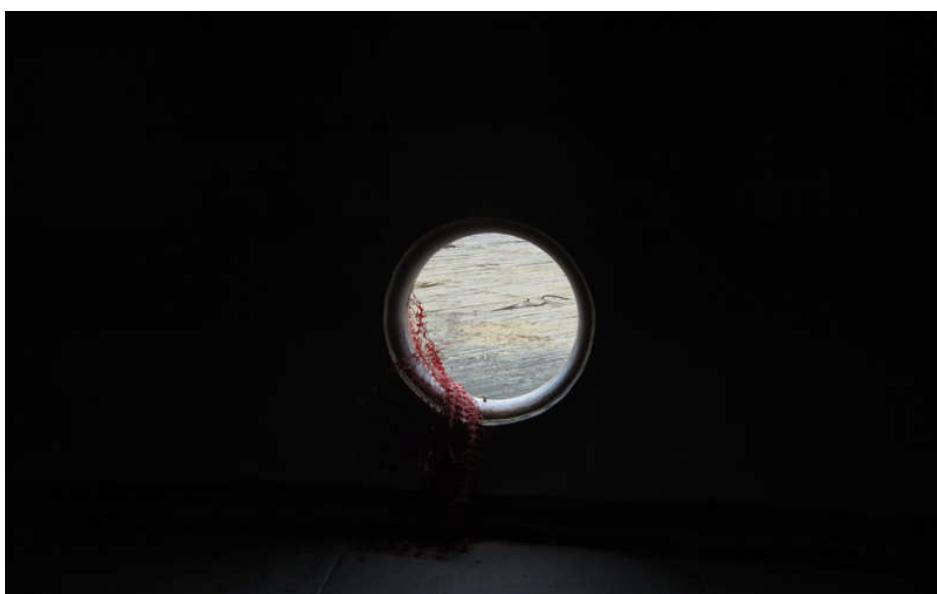
PAGE 59 OF 136



009 Doorsheet J Internal



010 Manway L



011 Manway L Internal



012 Coupling M

2.4.5 NOZZLE AND APPURTEANCE PHOTOGRAPHS

PAGE 60 OF 136



013 Coupling M Internal



014 Cathodic Protection Ground P



015 Ground Clip T



016 Cathodic Protection Test Station

2.4.5 NOZZLE AND APPURTENANCE PHOTOGRAPHS

PAGE 61 OF 136



017 Spiral Stairway

2.4.6 POST REPAIR NOZZLE AND APPURTEANCE PHOTOGRAPHS

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001 New Manway A



002 New Manway A Internal



003 New Manway L



004 New Manway L Internal

2.4.6 POST REPAIR NOZZLE AND APPURTENANCE PHOTOGRAPHS

PAGE 63 OF 136



005 Coupling M Replaced with Shell Insert



006 Coupling M Replaced with Shell Insert Internal



007 New Doorsheet



008 New Doorsheet Internal

2.4.6 POST REPAIR NOZZLE AND APPURTENANCE PHOTOGRAPHS

PAGE 64 OF 136



009 New Ground Clip

New Doorsheet Internal

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

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001 Manway A



002 Foam Line B



003 Foam Line B



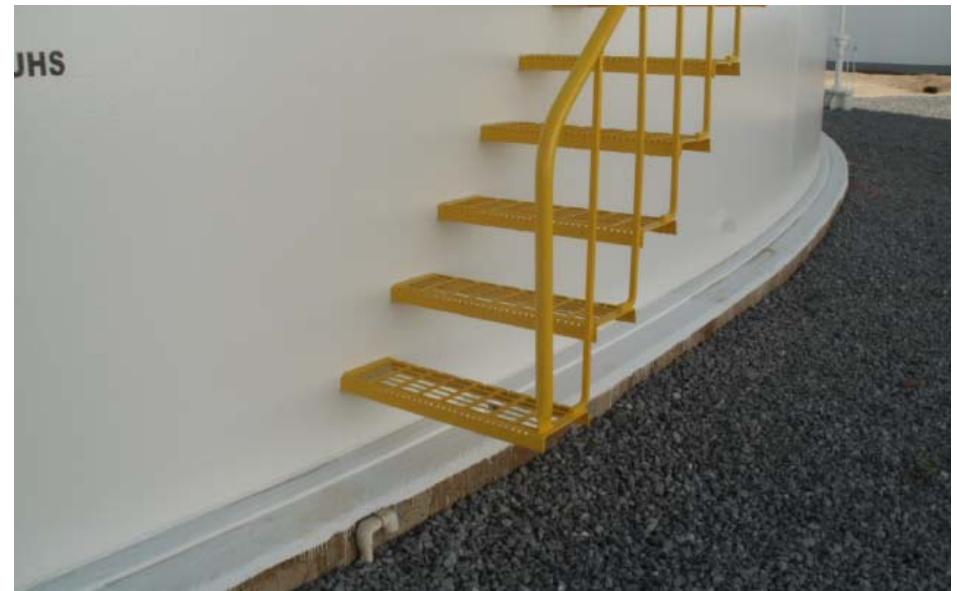
004 Roof Drain C

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

PAGE 66 OF 135



005 Roof Drain C



006 Bottom of Stairway D



007 Ground Clip E



008 Platform F

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

PAGE 67 OF 135



009 Digital Gauge G



010 Roof Drain H



011 Roof Drain H



012 Manway I

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

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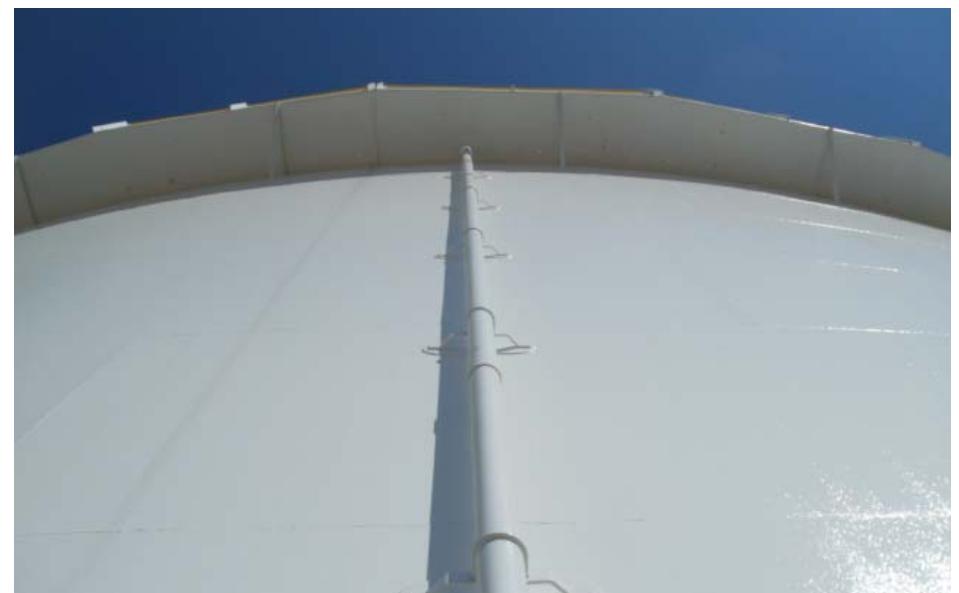
013 Foam Line J



014 Doorsheet K and Ground Clip L



015 Roof Drain M



016 Roof Drain M

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

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017 Manway N



018 Insert O



019 Foam Line P



020 Foam Line P

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

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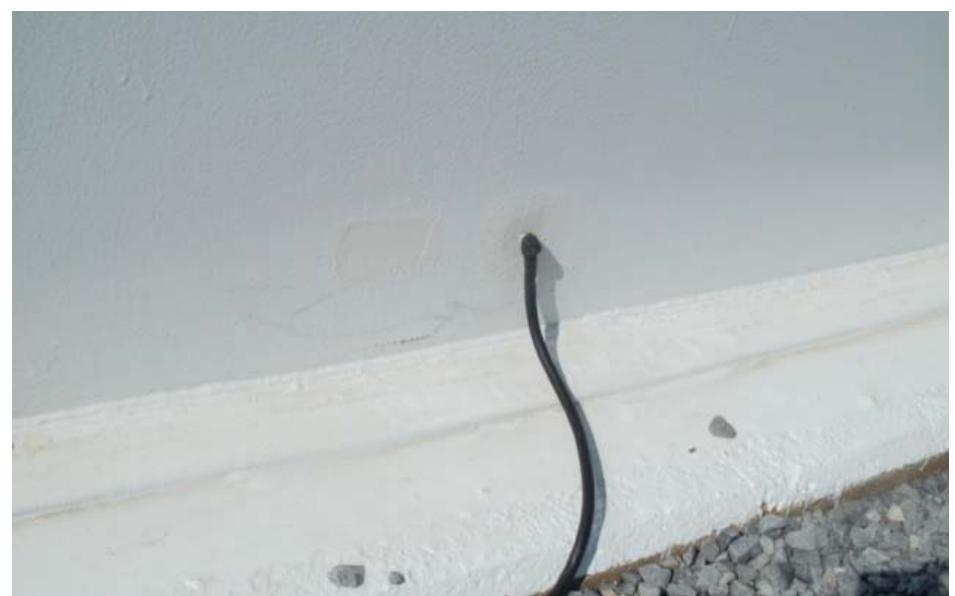
021 Roof Drain Q



022 Roof Drain Q



023 Ground Clip R



024 Cathodic Protection Ground S

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

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025 Roof Drain T



026 Roof Drain T



027 Foam Line U



028 Foam Line U

2.4.7 FINAL NOZZLE AND APPURTENANCE PHOTOGRAPHS

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029 Ground Clip V



030 Roof Drain W



031 Roof Drain W



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2.5 WEATHERSHIELD INSPECTION

The geodesic dome was found to be in acceptable condition.

2.5.1 WEATHERSHIELD PHOTOGRAPHS

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001 Overview of Geodesic Dome



002 Access Hatch



003 Nozzles



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2.6 FLOATING ROOF INSPECTION

The floating roof was removed at the time of inspection. A new floating roof is to be installed per Client.

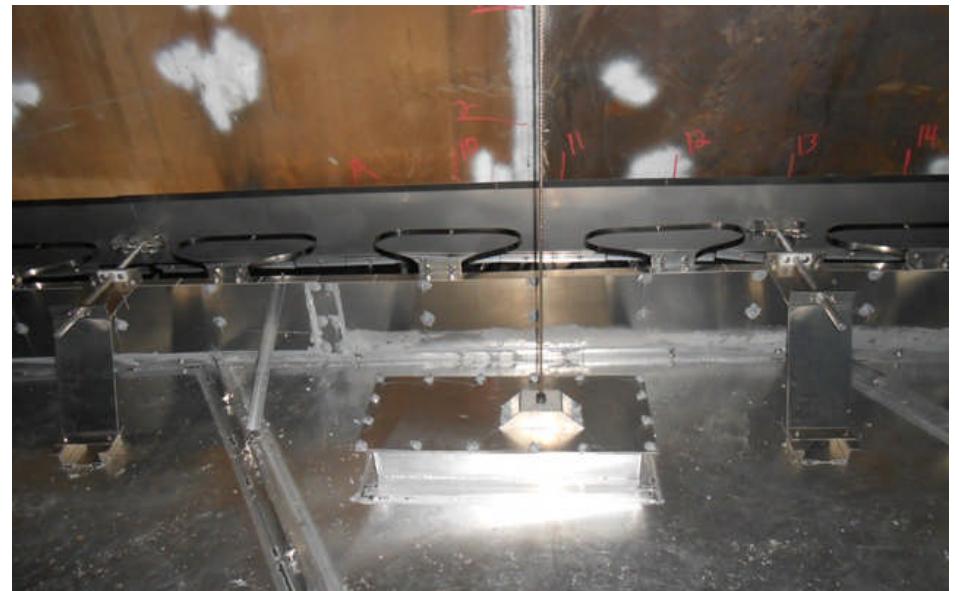
POST REPAIR: A new aluminum honeycomb floating roof and mechanical shoe primary seal were installed and found to be acceptable. Visual (VT) inspection of the primary seal did not reveal any seal gaps or vapor barrier damage, tears, or rips.

2.6.1 POST REPAIR FLOATING ROOF PHOTOGRAPHS

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001 Partial View of Floating Roof



002 Partial View of Floating Roof



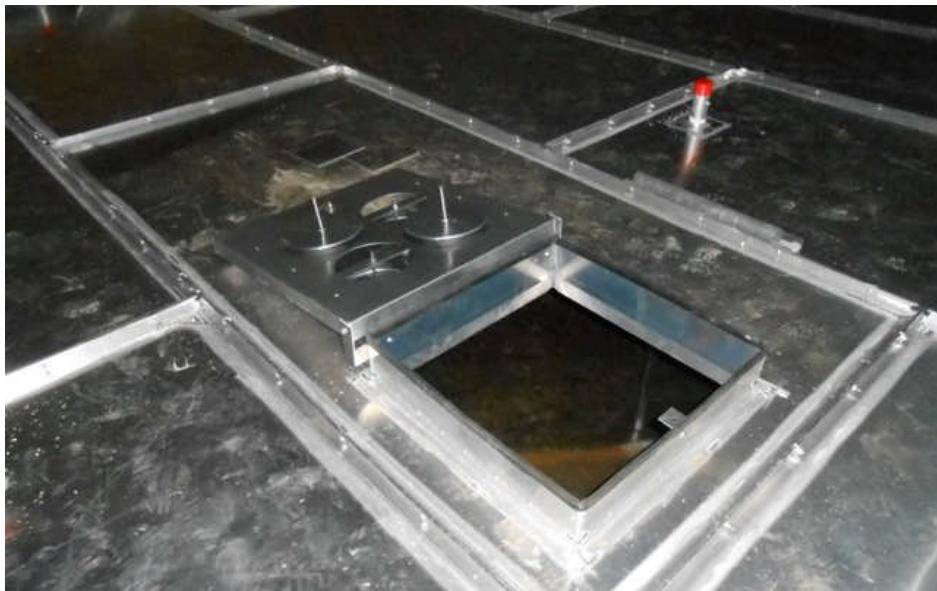
003 Underside of New Floating Roof



004 Primary Seal

2.6.1 POST REPAIR FLOATING ROOF PHOTOGRAPHS

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005 Access Hatch



006 Access Hatch



007 Floating Roof Nozzle



008 Floating Roof Nozzle

2.6.1 POST REPAIR FLOATING ROOF PHOTOGRAPHS

PAGE 78 OF 136



009 Anti-Rotation



010 Floating Roof Leg



011 Floating Roof Leg

File Only

Colonial Pipeline Company
Floating Roof Out of Service Inspection
Form No. ENV-8006
Record Retention Requirement: 10 Years

722814132

Facility: Baton Rouge Facility Tank No: 125

Tank Inspection Date(s):

Initial: _____ Performed by: _____
Post Repair: 4-8-11 Performed by: Chris Williams

Tank Out of Service Date: _____

Tank Return to Service Date: _____

Item No.	Requirement	Meets requirement: (Y/N/NA)	If not, provide explanation and corrective action taken to repair prior to returning to service.
All floating roof tank types and service (Respond to items 1-2)			
1	Primary Seal - There are no holes, tears, or other openings in the secondary seal or the seal fabric. There are no gaps between the tank seal and tank shell.	yes	
2	Secondary Seal - There are no holes, tears, or other openings in the secondary seal or the seal fabric. There are no gaps between the tank seal and tank shell.	yes	
Only aluminum internal floating roof tanks or domed external floaters in gasoline, dual or transmix service (Respond to items 3-10)			
3	Deck - There no standing product or indication of problems with deck panels, sheets, or seams.	yes	
4	Sample Well (funnel) shall have a slit fabric cover that covers at least 90 percent of the opening.	yes	
5	Access Hatches: are covered, gasketed, and bolted (closed and secured) except when they are in use.	yes	
6	Gauge-Hatch/Sample Wells are covered, gasketed, and bolted (closed and secured) except when they are in use.	yes	
7	Automatic bleeder vents and pressure/vacuum breakers are equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports	yes	
8	Roof Leg (3-in. Diameter)/Fixed: Caps and gaskets are in place in and in good working order.	yes	
9	Column Wells: Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.	N/A	
10	Deck Drain: equipped with cork assembly or cap.		
Only External floating roof tanks in gasoline, dual or transmix service (Respond to items 11-17)			
11	Access Hatches: are covered, gasketed (if required), and bolted (closed and secured) except when they are in use.	N/A	
12	Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, are covered, gasketed (if required), and bolted (closed and secured) except when they are in use.	N/A	
13	Automatic bleeder vents and pressure/vacuum breakers are equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports	N/A	
14	Roof Leg or Hanger Well/Adjustable: Legs are in good working order and any required emission controls are in place and good working order (e.g. socks).	N/A	
15	Gauge float well: is covered and bolted except when they are in use and equipped with a gasket (if required).	N/A	
16	Unslotted Guide-Pole is equipped with a cap, a gasketed sliding cover, a sleeve, and a float. 17 Slotted Guide-Pole is equipped with a cap and a gasketed sliding cover.	N/A	
17	Slotted Guide-Pole is equipped with a cap and a gasketed sliding cover.	N/A	

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2.6.3 FLOATING ROOF INSPECTION CHECKLIST

✓	#	DESCRIPTION	COMMENTS
Y	1	Describe external condition of floating roof.	<ul style="list-style-type: none"> • Acceptable
Y	2	Describe type and condition of primary seal.	<ul style="list-style-type: none"> • Mechanical shoe • Acceptable
N	3	Describe type and condition of secondary seal.	<ul style="list-style-type: none"> • N/A
Y	4	Conduct Visual Inspection of plates and welds, or bolts and fasteners, with special attention to product interface areas.	<ul style="list-style-type: none"> • Acceptable
Y	5	Inspect roof support legs, sleeves, and pins. Record sizes and locate on layout.	<ul style="list-style-type: none"> • 3 inch to 4 inch bolted sleeves • 0.25 inch bolts • Acceptable
N	6	Inspect roof drain system.	<ul style="list-style-type: none"> • N/A
N	7	Inspect pontoons for water, product, residue, and vapors. Check for presence of lock-down attachments on pontoon covers. Hammer test aluminum pontoons.	<ul style="list-style-type: none"> • N/A
N	8	Inspect ladder assembly.	<ul style="list-style-type: none"> • N/A
Y	9	Inspect floating roof nozzles and appurtenances. Locate on layout.	<ul style="list-style-type: none"> • Acceptable
Y	10	Inspect vacuum breaker system. Record size and locate on layout.	<ul style="list-style-type: none"> • Vents on cover of access hatch • Acceptable

NOTE: Y/N Column denotes whether item in description column was performed, measured, or observed.

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Internal Floating Roofs

Seal Gap Measurement of Primary Metallic Shoe or Liquid-Mounted Seals*

Inspector: Emily Seals Tank Dia. (ft.): 160.00

Any location where gap exceeds 1.5 inch (Y/N)? N

Accumulated area of seal gaps: 0.00 in²/ft dia. Less than 10 in²/ft dia. (Y/N)? Y

Any holes, tears or openings in shoe, seal fabric or seal envelope (Y/N)? N

Gap (in.)	Length (in.) or (ft)	Drawing
A. <u>0.00</u>	<u>0.00</u>	
B. <u>0.00</u>	<u>0.00</u>	
C. <u>0.00</u>	<u>0.00</u>	
D. <u>0.00</u>	<u>0.00</u>	
E. <u>0.00</u>	<u>0.00</u>	
F. <u>0.00</u>	<u>0.00</u>	
G. <u>0.00</u>	<u>0.00</u>	

- Whenever the seal gap is 1/8 in. or more, measure the gap and circumferential distance and show location of gap on drawing. Calculate seal gap measurements by summing the product of the gap and length for each gap (corrected to square inches) and divide by tank diameter.

* This inspection meets requirements under the following regulations: 40 CFR Section 60, Subparts Ka, Kb, and QQQ; Section 61, Subpart Y; Section 63, Subparts F and G, R, and CC; and TX Reg. V.

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3. INITIAL BENGAL PIPELINE COMPANY EXTERNAL CHECKLIST

ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
TANK SITE			
1	Vegetation or debris exists inside tank dike area.	4	Acceptable
2	Flammable materials are located inside tank dike area.	4	Acceptable
3	Site drainage run-off water drains away from tank, piping and manifolds.	4	Acceptable
4	Dike drain valve (in place and operational).	4	Acceptable
FOUNDATION			
5	Type of tank foundation present: A) Concrete ring, B) Concrete pad, C) Earthen pad, D) Gravel/crushed rock foundation, E) Structurally supported.	4	A) Concrete Ringwall
6	Concrete ring drains free of debris.	N/A	
7	Concrete ring beveled away from tank.	4	Acceptable
8	Concrete ring free of cracks, breaks, spalling, exposed rebar, etc.	4	Acceptable
9	Earthen pads eroded due to water running off the tank.	4	Acceptable
10	Water diversion at bottom edge projection.	N/A	
11	Moisture barrier condition: (Bottom edge projection to concrete ring).	3	Areas of deterioration Reference 2.1 Foundation Summary
12	Indications of bottom leakage.	4	Acceptable
13	Identify and dimension all areas of tank external edge settlement: (in accordance with API Standard 653).	4	Acceptable Reference 2.1 Foundation Summary
14	Cavities or holes around / under tank perimeter.	4	Acceptable
15	Check tank isolation valve for signs of leakage operability and for condition.	N/A	
16	Edge projection (corroded or pitted, thinning, deformed, obstructed).	4	Acceptable
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with <u>current</u> API 650 / 653 standards with <u>no damage or failure noted</u> . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 1: Item is out of compliance with <u>current</u> API 650 / 653 standards with <u>damage or failure noted</u> . Item must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 0: Item contains major damage / failure which is out of compliance with API 650 / 653 standards and is an immediate safety hazard .			
Note: Condition Codes 0 requires immediate attention and customer notification. Additionally, Condition Codes 1, 2, & 3 require full detail. Explanation (and photographs if item or condition is accessible).			

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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
SHELL-TO-BOTTOM WELD(EXTERIOR)			
17	Check exterior shell-to-bottom weld condition.	3	Weld defects Reference 2.3 Shell Summary
18	Identify all signs of product leakage (exterior).	4	Acceptable
19	Perform magnetic particle inspection of exterior shell-to bottom weld.	3	Weld defects Reference 2.3 Shell Summary
SHELL EXTERIOR (GENERAL)			
20	Paint or coating condition: (blistering, thinning, cracks, or discolored).	4	Acceptable
21	Tank shell condition (deformations, corrosion, pitting).	4	Acceptable
22	Tank shell seam weld condition.	4	Acceptable
23	Rivet condition (worn, corroded, loose rivet sealer, leaking).	N/A	
24	Perform UT thickness readings on shell as outlined in CP technical specification	4	Acceptable
25	Indications of leakage around manways, nozzles, flanges, valves and appurtenances (including reinforcements, bolting, gaskets, seals, and mixers).	4	Acceptable
26	Roof drain valve in proper position and foam wedge properly installed.	4	Acceptable
27	Roof drain leakage.	N/A	
28	Temperature indicators: (corrosion, mechanical damage).	N/A	
29	Auto gauge system condition (corrosion, mechanical damage).	N/A	
30	Welds on stairways and / or ladders, stringers: (corrosion, broken).	4	Acceptable
31	Stairway and / or ladder condition (coating for paint failure).	4	Acceptable
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with <u>current</u> API 650 / 653 standards with no damage or failure noted . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 1: Item is out of compliance with <u>current</u> API 650 / 653 standards with damage or failure noted . Item must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 0: Item contains major damage / failure which is out of compliance with API 650 / 653 standards and is an immediate safety hazard .			
Note: Condition Codes 0 requires immediate attention and customer notification. Additionally, Condition Codes 1, 2, & 3 require full detail. Explanation (and photographs if item or condition is accessible).			

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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
SHELL NOZZLES EXTERIOR (GENERAL)			
32	Document nozzle / manway information on the nozzle and appurtenance table.	4	Acceptable
33	Evaluate nozzle(s) / manway(s) acceptability to current API 650/653 guidelines.	2	Inadequate weld spacing - Manways A and L and neck of Coupling M. Inadequate repad dimensions - Manway A. Inadequate centerline - Manway A. No reinforcing plate - Coupling M. Reference 2.4 Nozzle and Appurtenance Summary
CONE ROOF ACCESS STRUCTURE		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
34	Wind girder, supports, handrail condition (corrosion, weld failure).	N/A	
35	Platform condition (corrosion, broken)	N/A	
36	Safety drop bar of safety chain: present and operational / condition.	N/A	
CONE ROOF (GENERAL)			
37	Roof plate condition (Corrosion, pitting, coating failure, standing water).	N/A	
38	Perform UT thickness readings on roof as outlined in CP technical specification"	N/A	
39	Scaffold support is present and is in good condition.	N/A	
40	Level alarm (mechanical damage).	N/A	
41	Visually inspect high and high-high level alarms for damage.	N/A	
42	Emergency overflow screens: (clean and free of debris).	N/A	
CONE ROOF APPURTEANCES			
43	Manway, nozzles, appurtenances, condition.	N/A	
44	Protective grating or safety net, properly installed (if applicable).	N/A	
45	Identify pressure / vacuum vents (quantity and sizes).	N/A	
46	Pressure / vacuum vent pallet assembly seals: (weathering).	N/A	
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with <u>current</u> API 650 / 653 standards with no damage or failure noted . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 1: Item is out of compliance with <u>current</u> API 650 / 653 standards with damage or failure noted . Item must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 0: Item contains major damage / failure which is out of compliance with API 650 / 653 standards and is an immediate safety hazard .			
Note: Condition Codes 0 requires immediate attention and customer notification. Additionally, Condition Codes 1, 2, & 3 require full detail. Explanation (and photographs if item or condition is accessible).			

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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
CONE ROOF APPURTEANCES (CONT...)			
47	Pressure / vacuum vents screens, (clean and free of debris).	N/A	
48	Evaluate tank venting capacity and document results. Does current venting capacity meet API 2000.	N/A	
49	Gauge hatch: (clean, operates freely, and seal properly).	N/A	
ALUMINUM DOME ROOF ACCESS STRUCTURE		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
50	Wind girder, supports, handrail condition (corrosion, weld failure).	4	Acceptable
51	Standing water, paint failure.	4	Acceptable
52	Stairway and ladder condition.	4	Acceptable
53	Safety drop bar or safety chain present and operational / condition.	4	Acceptable
54	Gauge platform condition (corrosion, broken).	4	Acceptable
ALUMINUM DOME ROOF (GENERAL)			
55	Check perimeter flashing for damage.	4	Acceptable
56	Evidence of leaking panels: (water spots on internal floater).	N/A	Floating roof removed at time of inspection
57	Deterioration of skylight: (crazing caused by UV light, cracked).	4	Acceptable
58	Panel caulking and seals (entire roof).	4	Acceptable
59	Rain gutters: (damaged or broken).	4	Acceptable
60	Dome overhang screens in place and in good condition.	4	Acceptable
ALUMINUM DOME ROOF APPURTEANCES			
61	Access hatch (secured in place and in good condition).	4	Acceptable
62	Protective grating or safety net: Properly installed (if applicable).	N/A	
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with <u>current</u> API 650 / 653 standards with <u>no damage or failure noted</u> . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 1: Item is out of compliance with <u>current</u> API 650 / 653 standards with <u>damage or failure noted</u> . Item must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 0: Item contains major damage / failure which is out of compliance with API 650 / 653 standards and is an immediate safety hazard .			
Note: Condition Codes 0 requires immediate attention and customer notification. Additionally, Condition Codes 1, 2, & 3 require full detail. Explanation (and photographs if item or condition is accessible).			

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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
EXTERNAL FLOATING ROOF		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
63	Tightness of rim and column seals.	N/A	
64	Seal gap measurement on file.	N/A	
65	Condition of roof plates / welds (corrosion, paint failure, leaks, debris on roof).	N/A	
66	Clearance from obstruction above the top of shell.	N/A	
67	Indications of vertical grooving from seal protrusions.	N/A	
68	Emergency overflow screens: (clean and free of debris).	N/A	
EXTERNAL FLOATING ROOF - APPURTEANCES			
69	Floating roof support legs: (corrosion, pitting, bending, damaged).	N/A	
70	Condition of roof leg sleeves: (cracking, thinning, buckling).	N/A	
71	Roof leg pins: (corrosion, sticking, missing).	N/A	
72	Condition of roof leg reinforcement pads (cracking, buckling).	N/A	
73	All roof legs at the same level.	N/A	
74	Roof drain sump condition (clean and free of debris).	N/A	
75	Anti-rotation device condition (corrosion, wear, aligned).	N/A	
76	Report gauge well size and type: (solid, slotted).	N/A	
INTERNAL FLOATING ROOF			
77	Levelness / condition of floating roof.	N/A	Reference 2.6 Floating Roof Summary
78	Signs of product on the floating roof (may indicate loss of flotation).	N/A	Reference 2.6 Floating Roof Summary
79	Binding of shell column or columns.	N/A	Reference 2.6 Floating Roof Summary
80	Damage or slack in anti-rotation cable.	N/A	Reference 2.6 Floating Roof Summary
81	Damage from missing floating roof support legs.	N/A	Reference 2.6 Floating Roof Summary
82	Seal damage.	N/A	Reference 2.6 Floating Roof Summary
83	Damage to ladder or column wells and covers.	N/A	Reference 2.6 Floating Roof Summary
84	Bonding static cable attached and in good condition.	N/A	Reference 2.6 Floating Roof Summary
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with <u>current</u> API 650 / 653 standards with no damage or failure noted . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 1: Item is out of compliance with <u>current</u> API 650 / 653 standards with damage or failure noted . Item must be addressed prior to issuance of Post-Repair Inspection Report.			
CODE 0: Item contains major damage / failure which is out of compliance with API 650 / 653 standards and is an immediate safety hazard .			
Note: Condition Codes 0 requires immediate attention and customer notification. Additionally, Condition Codes 1, 2, & 3 require full detail. Explanation (and photographs if item or condition is accessible).			

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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL FLOATING DECK (GENERAL)		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
85	Indication of rubbing by seals.	N/A	Reference 2.6 Floating Roof Summary
86	Indications of vertical grooving from seal assembly protrusions.	N/A	Reference 2.6 Floating Roof Summary
87	Check for possible causes of damage to the seal.	N/A	Reference 2.6 Floating Roof Summary

INTERNAL FLOATING ROOF APPURTENANCES

88	Manway covers: (secured in place and in good condition).	N/A	Reference 2.6 Floating Roof Summary
89	Gauge hatch: (clean, operates freely, seals properly).	N/A	Reference 2.6 Floating Roof Summary
90	Floating roof support legs: (corrosion, pitting, bending, damaged).	N/A	Reference 2.6 Floating Roof Summary
91	Condition of floating roof leg sleeves: (cracking, thinning, buckling).	N/A	Reference 2.6 Floating Roof Summary
92	Floating roof leg pins: (corrosion, sticking, missing) Note: if access is impaired, note detail under inspector comments.	N/A	Reference 2.6 Floating Roof Summary
93	Condition of floating roof leg reinforcement pads: (cracking, buckling). Note: if access is impaired, note detail under inspector comments.	N/A	Reference 2.6 Floating Roof Summary
94	All floating roof legs at the same level.	N/A	Reference 2.6 Floating Roof Summary
95	Missing floating roof support legs.	N/A	Reference 2.6 Floating Roof Summary
96	Anti-rotation device condition (corrosion, wear, aligned).	N/A	Reference 2.6 Floating Roof Summary
97	Report gauge pole size and type: (solid, slotted).	N/A	Reference 2.6 Floating Roof Summary

CONDITION CODE DEFINITIONS

CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required

CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.

CODE 2: Item is out of compliance with current API 650 / 653 standards with **no damage or failure noted**. Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.

CODE 1: Item is out of compliance with current API 650 / 653 standards with **damage or failure noted**. Item must be addressed prior to issuance of Post-Repair Inspection Report.

CODE 0: Item contains **major** damage / failure which is out of compliance with API 650 / 653 standards and is an **immediate safety hazard**.

Note: Condition Codes 0 requires immediate attention and customer notification. Additionally, Condition Codes 1, 2, & 3 require full detail. Explanation (and photographs if item or condition is accessible).

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4. INITIAL BENGAL PIPELINE COMPANY INTERNAL CHECKLIST

ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
SUMP			
98	Locate bottom sump and isolate: (cones and marker tape if not already completed).	4	Acceptable
99	Describe sump type condition (Modified, false bottom, dish/bowl, etc.) details include physical dimensions (include photographs, drawings, etc.).	4	114" dia. x 29" deep cylinder style bowl Reference 2.2 Bottom Summary
100	Perform magnetic particle examination on all sump welds (including sump-to-bottom weld).	4	Acceptable Reference 2.2 Bottom Summary
101	Ultrasonically scan sump bottom and wall (utilize 6" grid pattern). Record lowest UT reading per grid in sump UT form. Note: normal thickness, defect type and location on sump drawing.	4	Acceptable
102	Note all bottom couplings and fittings and check for soundness.	4	Acceptable
103	Check sump cover condition.	4	Acceptable
104	Check accessible fill/drain line for corrosion or structural damage.	4	Acceptable
105	Check water draw lines for corrosion or other anomalies.	N/A	
TANK BOTTOM (RECTANG. PLATES, SKETCH PLATES)			
106	Record minimum floor plate thickness requirements (determined by the customer).	4	Recording criteria: 0.250 Nominal bottom plate thickness: 0.312 Nominal sketch plate thickness: 0.312
107	Visually inspect floor plate surface condition.	2	Seventy-three (73) indications Reference 2.2 Bottom Summary
108	Visually inspect floor plate lap welds: (for reportable indications or other anomalies)	N/A	Bottom plates lined
109	MFL scan of accessible tank floor plates (with UT prove-up of all indications).	2	Wagon wheel shape per Client. Reference 2.2 Bottom Summary
110	Perform vacuum box inspection of tank bottom lap welds.	N/A	
PATCH / STRIKER PLATES			
111	Reinforcement pads under all clips, brackets and supports / condition.	N/A	
112	Floating roof leg striker plate condition (pitting, cutting, dimpling).	3	Corrosion arrested by lining Reference 2.2 Bottom Summary
CONDITION CODE DEFINITIONS			
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CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with current API 650 / 653 standards with no damage or failure noted . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
PATCH / STRIKER PLATES (CONT...)			
113	Fixed roof column bearing plate condition (corrosion, weld failure).	N/A	
114	Fixed roof column lateral clips (align tank columns).	N/A	
TANK SETTLEMENT			
115	Identify and dimension all areas of tank bottom (bulges, depressions, settlement).	4	Acceptable
116	Perform a tank floor settlement survey (if required).	4	Acceptable Reference 2.1 Foundation Summary
TANK SHELL-TO-BOTTOM WELD (INTERNAL)			
117	Tank shell-to-bottom weld condition.	4	Acceptable
118	Perform magnetic particle inspection of internal shell-to-bottom weld.	3	Weld defects Reference 2.2 Bottom Summary
119	Perform vacuum box inspection of tank internal shell-to-bottom weld.	N/A	
120	Identify all signs of product leakage.	4	Acceptable
INTERNAL APPURTENANCES/ COLUMNS			
121	Type of column, size and number (pipe, structural).	N/A	
122	Check columns for plumbness, bending or distortion.	N/A	
123	Condition of structural columns (check for corrosion, scale, breaking of tack welds).	N/A	
INTERNAL APPURTENANCES/ FLOATING SUCTION LINE			
124	Visual inspection of internal piping and connection condition (corrosion, cracking).	N/A	
125	Visual inspection of piping supports and pads: (structurally adequate, weld failure).	N/A	
126	Determine condition / length of swing line: N/A	Length: N/A	Pontoon Dia./Length: N/A
CONDITION CODE DEFINITIONS			
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CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL APPURTEANCES/ FLOATING ROOF DRAIN			
127	Type and condition: (cutting or dragging on tank bottom).	N/A	
128	Internal piping and connection condition (corrosion, cracking).	N/A	
129	Check for obstructions that pipe could catch on.	N/A	
130	Swing line hold-down cable: (damaged or loose).	N/A	
131	Swing line safety hold-down chains: (corrosion, weak links).	N/A	
INTERNAL APPURTEANCES/ HEATING COILS			
132	Visual inspection of heater rack (for broken welds and bending of the sliding rails).	N/A	
133	Measure and record length of the heater and the track.	N/A	
INTERNAL APPURTEANCES/ MIXERS			
134	Tank mixer shaft and propeller condition.	N/A	
INTERNAL APPURTEANCES/ DIFFUSER SYSTEM			
135	Wear plate under elbow-down fill nozzles: (erosion, corrosion, broken welds).	N/A	
136	Impact area above elbow-up fill nozzles: (erosion, distortion, broken welds).	N/A	
137	Check diffuser condition (for signs of distortion, erosion, broken welds).	N/A	
138	Inspect air spargers on bottom of lube oil tanks (for plugging and damaged or broken threaded joints).	N/A	
INTERNAL APPURTEANCES/ DATUM PLATE			
139	Check datum plate condition (ensure it is seal welded to shell).	N/A	
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL APPURTENANCES/ GAUGE SYSTEM (non-radar system only)			
140	Check auto gauge system condition.	N/A	
INTERNAL APPURTENANCES/ GUIDE POLE / LADDER			
141	Inspect assembly for condition.	2	Welded to bottom and shell Reference 2.2 Bottom Summary
INTERNAL APPURTENANCES/ ANTI-ROTATION SYSTEMS			
142	Check for signs of damage to the system.	N/A	
143	Check condition of reinforcement pads.	N/A	
144	Identify type and number of anti-rotation systems.	Type:	Number:
INTERNAL APPURTENANCES/ NOZZLES & MANWAY			
145	Shell nozzle condition.	4	Acceptable Reference 2.4 Nozzle and Appurtenance Summary
146	Hot tap nozzles (sealed internally).	N/A	
147	Check for possible causes of damage to the seal.	N/A	
148	Visually inspect all welds.	N/A	
149	Inspect all welds by magnetic particle inspection (if accessible).	N/A	
INTERIOR SHELL			
150	Visually inspect the internal shell surface for corrosion and pitting. (Perform shell corrosion analysis per CP technical specification if required).	4	Acceptable
151	Visually inspect the internal shell weld seams: (corrosion, pitting, undercut or other weld anomaly).	N/A	
152	Visual inspection of rivets: (check for corrosion, pitting, or looseness).	N/A	
153	Record number and pattern or rivets or bolts.	N/A	Number: Pattern:
FLOATING ROOF			
154	Type of floating roof.	N/A	Reference 2.6 Floating Roof Summary
155	Visually inspect floating roof legs: (bending, thinning or buckling).	N/A	Reference 2.6 Floating Roof Summary
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
FLOATING ROOF PRIMARY MECHANICAL SHOE SEAL			
156	Inspect seal condition, hanger, shoes, (system vapor barrier, attachment hardware).	N/A	Reference 2.6 Floating Roof Summary
FLOATING ROOF PRIMARY FOAM LOG SEAL			
157	Inspect seal fabric, foam, hardware.	N/A	Reference 2.6 Floating Roof Summary
FLOATING ROOF SECONDARY SEAL			
158	Type of rim mounted secondary seal:	N/A	Reference 2.6 Floating Roof Summary
159	Check for mechanical damage, corrosion (wear on tip contact with shell).	N/A	
ALUMINUM PONTOON FLOATING ROOF			
160	Check floating roof condition (rips, tears, buckled members, broken or missing parts and oxidation).	N/A	
161	Inspect pontoons and pontoon support details"	N/A	
162	Check manway latches for workability and ensure that all opening manways are self closing (should it open during service).	N/A	
163	If the floating roof is equipped with drains, check that all drains have working closures and bottom side tubes are below the product level.	N/A	
164	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
ALUMINUM FULL CONTACT FLOATING ROOF			
165	Check floating roof condition (rips, tears, buckled member, broken or missing parts, product in panels).	N/A	
166	Check manway latches for workability and ensure that all opening manways are self-closing (should it open during service).	N/A	
167	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
CONDITION CODE DEFINITIONS			
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CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL STEEL FLOATING ROOF			
168	Inspect float wells.	N/A	
169	Inspect manway and vents.	N/A	
170	Visually inspect for signs of corrosion or pitting on top and product side surfaces.	N/A	
171	Visually inspect all welds.	N/A	
172	Inspect floating roof sump and floating roof sump welds.	N/A	
173	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
EXTERNAL STEEL FLOATING ROOF			
174	Inspect float wells.	N/A	
175	Inspect manway and vents.	N/A	
176	Visually inspect for signs of corrosion or pitting on top and product side surfaces.	N/A	
177	Visually inspect all welds.	N/A	
178	Inspect floating roof sump and floating roof sump welds.	N/A	
179	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
180	Check the condition of rolling ladder. (Grounding cable, track condition)	N/A	
STEEL CONE FIXED ROOF (As visually inspected from the tank bottom)			
181	Check rafter condition.	N/A	
182	Check girder condition.	N/A	
183	Visually check underside of roof plates for holes, scale build-up and pitting.	N/A	
184	Visually check all rafter clips	N/A	
ALUMINUM DOME FIXED ROOF			
185	Check dome roof support details for signs of damage or malfunction.	4	Acceptable
186	Check roof for pinholes, tears, or other damage to the aluminum skin.	4	Acceptable
CONDITION CODE DEFINITIONS			
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5. FINAL INSPECTION PIPELINE COMPANY EXTERNAL CHECKLIST

ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
TANK SITE			
1	Vegetation or debris exists inside tank dike area.	4	Acceptable
2	Flammable materials are located inside tank dike area.	4	Acceptable
3	Site drainage run-off water drains away from tank, piping and manifolds.	4	Acceptable
4	Dike drain valve (in place and operational).	4	Acceptable
FOUNDATION			
5	Type of tank foundation present: A) Concrete ring, B) Concrete pad, C) Earthen pad, D) Gravel/crushed rock foundation, E) Structurally supported.	4	A) Concrete Ringwall
6	Concrete ring drains free of debris.	N/A	
7	Concrete ring beveled away from tank.	4	Acceptable
8	Concrete ring free of cracks, breaks, spalling, exposed rebar, etc.	4	Acceptable
9	Earthen pads eroded due to water running off the tank.	4	Acceptable
10	Water diversion at bottom edge projection.	N/A	
11	Moisture barrier condition: (Bottom edge projection to concrete ring).	4	Acceptable
12	Indications of bottom leakage.	4	Acceptable
13	Identify and dimension all areas of tank external edge settlement: (in accordance with API Standard 653).	4	Acceptable
14	Cavities or holes around / under tank perimeter.	4	Acceptable
15	Check tank isolation valve for signs of leakage operability and for condition.	N/A	
16	Edge projection (corroded or pitted, thinning, deformed, obstructed).	4	Acceptable
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
SHELL-TO-BOTTOM WELD(EXTERIOR)			
17	Check exterior shell-to-bottom weld condition.	4	Acceptable Reference 2.3 Shell Summary
18	Identify all signs of product leakage (exterior).	4	Acceptable
19	Perform magnetic particle inspection of exterior shell-to bottom weld.	4	Acceptable Reference 2.3 Shell Summary
SHELL EXTERIOR (GENERAL)			
20	Paint or coating condition: (blistering, thinning, cracks, or discolored).	4	Acceptable
21	Tank shell condition (deformations, corrosion, pitting).	4	Acceptable
22	Tank shell seam weld condition.	4	Acceptable
23	Rivet condition (worn, corroded, loose rivet sealer, leaking).	N/A	
24	Perform UT thickness readings on shell as outlined in CP technical specification	4	Acceptable
25	Indications of leakage around manways, nozzles, flanges, valves and appurtenances (including reinforcements, bolting, gaskets, seals, and mixers).	4	Acceptable
26	Roof drain valve in proper position and foam wedge properly installed.	4	Acceptable
27	Roof drain leakage.	N/A	
28	Temperature indicators: (corrosion, mechanical damage).	N/A	
29	Auto gauge system condition (corrosion, mechanical damage).	N/A	
30	Welds on stairways and / or ladders, stringers: (corrosion, broken).	4	Acceptable
31	Stairway and / or ladder condition (coating for paint failure).	4	Acceptable
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
SHELL NOZZLES EXTERIOR (GENERAL)			
32	Document nozzle / manway information on the nozzle and appurtenance table.	4	Acceptable
33	Evaluate nozzle(s) / manway(s) acceptability to current API 650/653 guidelines.	4	Acceptable
CONE ROOF ACCESS STRUCTURE		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
34	Wind girder, supports, handrail condition (corrosion, weld failure).	N/A	
35	Platform condition (corrosion, broken)	N/A	
36	Safety drop bar of safety chain: present and operational / condition.	N/A	
CONE ROOF (GENERAL)			
37	Roof plate condition (Corrosion, pitting, coating failure, standing water).	N/A	
38	Perform UT thickness readings on roof as outlined in CP technical specification"	N/A	
39	Scaffold support is present and is in good condition.	N/A	
40	Level alarm (mechanical damage).	N/A	
41	Visually inspect high and high-high level alarms for damage.	N/A	
42	Emergency overflow screens: (clean and free of debris).	N/A	
CONE ROOF APPURTENANCES			
43	Manway, nozzles, appurtenances, condition.	N/A	
44	Protective grating or safety net, properly installed (if applicable).	N/A	
45	Identify pressure / vacuum vents (quantity and sizes).	N/A	
46	Pressure / vacuum vent pallet assembly seals: (weathering).	N/A	
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
CONE ROOF APPURTEANCES (CONT...)			
47	Pressure / vacuum vents screens, (clean and free of debris).	N/A	
48	Evaluate tank venting capacity and document results. Does current venting capacity meet API 2000.	N/A	
49	Gauge hatch: (clean, operates freely, and seal properly).	N/A	
ALUMINUM DOME ROOF ACCESS STRUCTURE		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
50	Wind girder, supports, handrail condition (corrosion, weld failure).	4	Acceptable
51	Standing water, paint failure.	4	Acceptable
52	Stairway and ladder condition.	4	Acceptable
53	Safety drop bar or safety chain present and operational / condition.	4	Acceptable
54	Gauge platform condition (corrosion, broken).	4	Acceptable
ALUMINUM DOME ROOF (GENERAL)			
55	Check perimeter flashing for damage.	4	Acceptable
56	Evidence of leaking panels: (water spots on internal floater).	4	Acceptable
57	Deterioration of skylight: (crazing caused by UV light, cracked).	4	Acceptable
58	Panel caulking and seals (entire roof).	4	Acceptable
59	Rain gutters: (damaged or broken).	4	Acceptable
60	Dome overhang screens in place and in good condition.	4	Acceptable
ALUMINUM DOME ROOF APPURTEANCES			
61	Access hatch (secured in place and in good condition).	4	Acceptable
62	Protective grating or safety net: Properly installed (if applicable).	N/A	
CONDITION CODE DEFINITIONS			
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CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
EXTERNAL FLOATING ROOF		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
63	Tightness of rim and column seals.	N/A	
64	Seal gap measurement on file.	N/A	
65	Condition of roof plates / welds (corrosion, paint failure, leaks, debris on roof).	N/A	
66	Clearance from obstruction above the top of shell.	N/A	
67	Indications of vertical grooving from seal protrusions.	N/A	
68	Emergency overflow screens: (clean and free of debris).	N/A	
EXTERNAL FLOATING ROOF - APPURTEANCES			
69	Floating roof support legs: (corrosion, pitting, bending, damaged).	N/A	
70	Condition of roof leg sleeves: (cracking, thinning, buckling).	N/A	
71	Roof leg pins: (corrosion, sticking, missing).	N/A	
72	Condition of roof leg reinforcement pads (cracking, buckling).	N/A	
73	All roof legs at the same level.	N/A	
74	Roof drain sump condition (clean and free of debris).	N/A	
75	Anti-rotation device condition (corrosion, wear, aligned).	N/A	
76	Report gauge well size and type: (solid, slotted).	N/A	
INTERNAL FLOATING ROOF			
77	Levelness / condition of floating roof.	4	Acceptable, Reference 2.6 Floating Roof Summary
78	Signs of product on the floating roof (may indicate loss of flotation).	4	Acceptable, Reference 2.6 Floating Roof Summary
79	Binding of shell column or columns.	N/A	
80	Damage or slack in anti-rotation cable.	4	Acceptable, Reference 2.6 Floating Roof Summary
81	Damage from missing floating roof support legs.	4	Acceptable, Reference 2.6 Floating Roof Summary
82	Seal damage.	4	Acceptable, Reference 2.6 Floating Roof Summary
83	Damage to ladder or column wells and covers.	N/A	
84	Bonding static cable attached and in good condition.	4	Acceptable, Reference 2.6 Floating Roof Summary
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL FLOATING DECK (GENERAL)		Note: The access structure and remaining inspections should be terminated if access / roof structure is determined unsafe.	
85	Indication of rubbing by seals.	4	Acceptable, Reference 2.6 Floating Roof Summary
86	Indications of vertical grooving from seal assembly protrusions.	4	Acceptable, Reference 2.6 Floating Roof Summary
87	Check for possible causes of damage to the seal.	4	Acceptable, Reference 2.6 Floating Roof Summary
INTERNAL FLOATING ROOF APPURTENANCES			
88	Manway covers: (secured in place and in good condition).	4	Acceptable, Reference 2.6 Floating Roof Summary
89	Gauge hatch: (clean, operates freely, seals properly).	4	Acceptable, Reference 2.6 Floating Roof Summary
90	Floating roof support legs: (corrosion, pitting, bending, damaged).	4	Acceptable, Reference 2.6 Floating Roof Summary
91	Condition of floating roof leg sleeves: (cracking, thinning, buckling).	4	Acceptable, Reference 2.6 Floating Roof Summary
92	Floating roof leg pins: (corrosion, sticking, missing) Note: if access is impaired, note detail under inspector comments.	4	Acceptable, Reference 2.6 Floating Roof Summary
93	Condition of floating roof leg reinforcement pads: (cracking, buckling). Note: if access is impaired, note detail under inspector comments.	4	Acceptable, Reference 2.6 Floating Roof Summary
94	All floating roof legs at the same level.	4	Acceptable, Reference 2.6 Floating Roof Summary
95	Missing floating roof support legs.	4	Acceptable, Reference 2.6 Floating Roof Summary
96	Anti-rotation device condition (corrosion, wear, aligned).	4	Acceptable, Reference 2.6 Floating Roof Summary
97	Report gauge pole size and type: (solid, slotted).	4	Acceptable, Reference 2.6 Floating Roof Summary
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
CODE 2: Item is out of compliance with current API 650 / 653 standards with no damage or failure noted . Item requires further Engineering evaluation and must be addressed prior to issuance of Post-Repair Inspection Report.			
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6. POST REPAIR BENGAL PIPELINE COMPANY INTERNAL CHECKLIST

ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
SUMP			
98	Locate bottom sump and isolate: (cones and marker tape if not already completed).	4	Acceptable
99	Describe sump type condition (Modified, false bottom, dish/bowl, etc.) details include physical dimensions (include photographs, drawings, etc.).	4	Acceptable Reference 2.2 Bottom Summary
100	Perform magnetic particle examination on all sump welds (including sump-to-bottom weld).	4	Acceptable Reference 2.2 Bottom Summary
101	Ultrasonically scan sump bottom and wall (utilize 6" grid pattern). Record lowest UT reading per grid in sump UT form. Note: normal thickness, defect type and location on sump drawing.	4	Acceptable
102	Note all bottom couplings and fittings and check for soundness.	4	Acceptable
103	Check sump cover condition.	4	Acceptable
104	Check accessible fill/drain line for corrosion or structural damage.	4	Acceptable
105	Check water draw lines for corrosion or other anomalies.	N/A	
TANK BOTTOM (RECTANG. PLATES, SKETCH PLATES)			
106	Record minimum floor plate thickness requirements (determined by the customer).	4	Recording criteria: 0.250 Nominal bottom plate thickness: 0.312 Nominal sketch plate thickness: 0.312
107	Visually inspect floor plate surface condition.	4	Acceptable Reference 2.2 Bottom Summary
108	Visually inspect floor plate lap welds: (for reportable indications or other anomalies)	4	Acceptable Reference 2.2 Bottom Summary
109	MFL scan of accessible tank floor plates (with UT prove-up of all indications).	4	Acceptable Reference 2.2 Bottom Summary
110	Perform vacuum box inspection of tank bottom lap welds.	N/A	
PATCH / STRIKER PLATES			
111	Reinforcement pads under all clips, brackets and supports / condition.	4	Acceptable Reference 2.2 Bottom Summary
112	Floating roof leg striker plate condition (pitting, cutting, dimpling).	4	Acceptable Reference 2.2 Bottom Summary
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
PATCH / STRIKER PLATES (CONT...)			
113	Fixed roof column bearing plate condition (corrosion, weld failure).	N/A	
114	Fixed roof column lateral clips (align tank columns).	N/A	
TANK SETTLEMENT			
115	Identify and dimension all areas of tank bottom (bulges, depressions, settlement).	4	Acceptable
116	Perform a tank floor settlement survey (if required).	4	Acceptable Reference 2.1 Foundation Summary
TANK SHELL-TO-BOTTOM WELD (INTERNAL)			
117	Tank shell-to-bottom weld condition.	4	Acceptable
118	Perform magnetic particle inspection of internal shell-to-bottom weld.	4	Acceptable Reference 2.2 Bottom Summary
119	Perform vacuum box inspection of tank internal shell-to-bottom weld.	N/A	
120	Identify all signs of product leakage.	4	Acceptable
INTERNAL APPURTENANCES/ COLUMNS			
121	Type of column, size and number (pipe, structural).	N/A	
122	Check columns for plumbness, bending or distortion.	N/A	
123	Condition of structural columns (check for corrosion, scale, breaking of tack welds).	N/A	
INTERNAL APPURTENANCES/ FLOATING SUCTION LINE			
124	Visual inspection of internal piping and connection condition (corrosion, cracking).	N/A	
125	Visual inspection of piping supports and pads: (structurally adequate, weld failure).	N/A	
126	Determine condition / length of swing line: N/A	Length: N/A	Pontoon Dia./Length: N/A
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL APPURTEANCES/ FLOATING ROOF DRAIN			
127	Type and condition: (cutting or dragging on tank bottom).	N/A	
128	Internal piping and connection condition (corrosion, cracking).	N/A	
129	Check for obstructions that pipe could catch on.	N/A	
130	Swing line hold-down cable: (damaged or loose).	N/A	
131	Swing line safety hold-down chains: (corrosion, weak links).	N/A	
INTERNAL APPURTEANCES/ HEATING COILS			
132	Visual inspection of heater rack (for broken welds and bending of the sliding rails).	N/A	
133	Measure and record length of the heater and the track.	N/A	
INTERNAL APPURTEANCES/ MIXERS			
134	Tank mixer shaft and propeller condition.	N/A	
INTERNAL APPURTEANCES/ DIFFUSER SYSTEM			
135	Wear plate under elbow-down fill nozzles: (erosion, corrosion, broken welds).	N/A	
136	Impact area above elbow-up fill nozzles: (erosion, distortion, broken welds).	N/A	
137	Check diffuser condition (for signs of distortion, erosion, broken welds).	N/A	
138	Inspect air spargers on bottom of lube oil tanks (for plugging and damaged or broken threaded joints).	N/A	
INTERNAL APPURTEANCES/ DATUM PLATE			
139	Check datum plate condition (ensure it is seal welded to shell).	4	Acceptable Reference 2.3 Shell Summary
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL APPURTENANCES/ GAUGE SYSTEM (non-radar system only)			
140	Check auto gauge system condition.	N/A	
INTERNAL APPURTENANCES/ GUIDE POLE / LADDER			
141	Inspect assembly for condition.	4	Acceptable Reference 2.2 Bottom Summary
INTERNAL APPURTENANCES/ ANTI-ROTATION SYSTEMS			
142	Check for signs of damage to the system.	N/A	
143	Check condition of reinforcement pads.	N/A	
144	Identify type and number of anti-rotation systems.	Type:	Number:
INTERNAL APPURTENANCES/ NOZZLES & MANWAY			
145	Shell nozzle condition.	4	Acceptable Reference 2.4 Nozzle and Appurtenance Summary
146	Hot tap nozzles (sealed internally).	N/A	
147	Check for possible causes of damage to the seal.	N/A	
148	Visually inspect all welds.	N/A	
149	Inspect all welds by magnetic particle inspection (if accessible).	N/A	
INTERIOR SHELL			
150	Visually inspect the internal shell surface for corrosion and pitting. (Perform shell corrosion analysis per CP technical specification if required).	4	Acceptable
151	Visually inspect the internal shell weld seams: (corrosion, pitting, undercut or other weld anomaly).	N/A	
152	Visual inspection of rivets: (check for corrosion, pitting, or looseness).	N/A	
153	Record number and pattern or rivets or bolts.	N/A	Number: Pattern:
FLOATING ROOF			
154	Type of floating roof.	4	Aluminum Honeycomb Reference 2.6 Floating Roof Summary
155	Visually inspect floating roof legs: (bending, thinning or buckling).	4	Acceptable Reference 2.6 Floating Roof Summary
CONDITION CODE DEFINITIONS			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
FLOATING ROOF PRIMARY MECHANICAL SHOE SEAL			
156	Inspect seal condition, hanger, shoes, (system vapor barrier, attachment hardware).	4	Acceptable Reference 2.6 Floating Roof Summary
FLOATING ROOF PRIMARY FOAM LOG SEAL			
157	Inspect seal fabric, foam, hardware.	N/A	Reference 2.6 Floating Roof Summary
FLOATING ROOF SECONDARY SEAL			
158	Type of rim mounted secondary seal:	N/A	Reference 2.6 Floating Roof Summary
159	Check for mechanical damage, corrosion (wear on tip contact with shell).	N/A	
ALUMINUM PONTOON FLOATING ROOF			
160	Check floating roof condition (rips, tears, buckled members, broken or missing parts and oxidation).	N/A	
161	Inspect pontoons and pontoon support details"	N/A	
162	Check manway latches for workability and ensure that all opening manways are self closing (should it open during service).	N/A	
163	If the floating roof is equipped with drains, check that all drains have working closures and bottom side tubes are below the product level.	N/A	
164	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
ALUMINUM FULL CONTACT FLOATING ROOF			
165	Check floating roof condition (rips, tears, buckled member, broken or missing parts, product in panels).	N/A	
166	Check manway latches for workability and ensure that all opening manways are self-closing (should it open during service).	N/A	
167	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
CONDITION CODE DEFINITIONS			
CODE 4: Acceptable / Item is in full API 650 / 653 compliance / No action required			
CODE 3: Pertinent suggestions and / or recommendations only. Item is in full compliance with API 650 / 653 standards.			
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ITEM NO.	DESCRIPTION	CONDITION CODE	INSPECTION COMMENTS
INTERNAL STEEL FLOATING ROOF			
168	Inspect float wells.	N/A	
169	Inspect manway and vents.	N/A	
170	Visually inspect for signs of corrosion or pitting on top and product side surfaces.	N/A	
171	Visually inspect all welds.	N/A	
172	Inspect floating roof sump and floating roof sump welds.	N/A	
173	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
EXTERNAL STEEL FLOATING ROOF			
174	Inspect float wells.	N/A	
175	Inspect manway and vents.	N/A	
176	Visually inspect for signs of corrosion or pitting on top and product side surfaces.	N/A	
177	Visually inspect all welds.	N/A	
178	Inspect floating roof sump and floating roof sump welds.	N/A	
179	Check the condition of all floating roof leg assemblies to the floating roof.	N/A	
180	Check the condition of rolling ladder. (Grounding cable, track condition)	N/A	
STEEL CONE FIXED ROOF (As visually inspected from the tank bottom)			
181	Check rafter condition.	N/A	
182	Check girder condition.	N/A	
183	Visually check underside of roof plates for holes, scale build-up and pitting.	N/A	
184	Visually check all rafter clips	N/A	
ALUMINUM DOME FIXED ROOF			
185	Check dome roof support details for signs of damage or malfunction.	4	Acceptable
186	Check roof for pinholes, tears, or other damage to the aluminum skin.	4	Acceptable
CONDITION CODE DEFINITIONS			
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7. INITIAL NDE INSPECTION

7.1 NDE INSPECTION SCOPE

Nondestructive Examinations (NDE) were conducted to evaluate the physical characteristics of the tank:

EXAMINATIONS	
Ultrasonic	UT
Magnetic Flux Leakage (MFL)	MFE 2412
Visual	VT
Magnetic Particle	MTy

7.2 BOTTOM EXAMINATION

The bottom plates were examined utilizing the following methods:

<input checked="" type="checkbox"/>	Magnetic Flux Leakage (MFL)				
<input checked="" type="checkbox"/>	Ultrasonic Testing (UT) of MFL indications only				
<input type="checkbox"/>	UT readings				
<input type="checkbox"/>	Bottom plates:	readings per plate			
<input type="checkbox"/>	X-pattern:	readings every	ft.	Direction:	
<input checked="" type="checkbox"/>	Visual Testing (VT)				
<input type="checkbox"/>	Other:				

Areas restricted from MFL examination:

<input checked="" type="checkbox"/>	Shell-to-bottom weld and plate-to-plate lap welds		
<input type="checkbox"/>	Roof support column(s)	<input type="checkbox"/>	Floating roof supports
<input type="checkbox"/>	Near and under autogauge base	<input checked="" type="checkbox"/>	Near the sump(s)
<input type="checkbox"/>	Under internal piping	<input type="checkbox"/>	Other:
<input type="checkbox"/>	Gauge Pole(s)		

Bottom plate examination comments: UT was performed in a wagon wheel pattern.

MFL revealed thirty-four (34) areas of soil side metal loss. VT revealed topside pitting. Reference 2.2 Bottom Summary and 2.24 Bottom Reduction Table B.

The bottom lap welds were examined utilizing the following methods:

<input type="checkbox"/>	Vacuum Box Bubble Test (LT/BT)		
<input checked="" type="checkbox"/>	VT		
<input type="checkbox"/>	Other:		

Areas restricted from LT/BT and VT examination:

<input type="checkbox"/>	Roof support column(s)	<input type="checkbox"/>	Floating roof supports
<input type="checkbox"/>	Autogauge base	<input type="checkbox"/>	Under internal piping
<input type="checkbox"/>	Near sump(s)	<input type="checkbox"/>	Other

Bottom lap weld examination comments: VT was limited due to lining. Reference 2.2

Bottom Summary

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The shell-to-bottom weld was examined utilizing the following methods:

- | | | |
|-------------------------------------|--------------------------------|-------|
| <input checked="" type="checkbox"/> | Magnetic Particle Testing (MT) | |
| <input type="checkbox"/> | LT | Type: |
| <input checked="" type="checkbox"/> | VT | |
| <input type="checkbox"/> | Eddy Current (ET) | |
| <input type="checkbox"/> | Liquid Penetrant (PT) | |
| <input type="checkbox"/> | Other: | |

Shell-to-bottom weld examination comments: MT revealed two (2) weld defects.

Reference 2.2 Bottom Summary and 6 Magnetic Particle Inspection Report

The sump(s) were examined utilizing the following methods:

- | | | |
|-------------------------------------|-------------------------------|--|
| <input checked="" type="checkbox"/> | UT Readings | |
| <input checked="" type="checkbox"/> | VT | |
| <input checked="" type="checkbox"/> | Other: Magnetic Particle (MT) | |

Sump examination comments: MT did not reveal any recordable indications.

Reference 2.2 Bottom Summary and 6 Magnetic Particle Inspection Report

7.3 SHELL EXAMINATION

The shell plates were examined utilizing the following methods:

- | | | | | |
|-------------------------------------|-------------------------------|---------------------------|---------------------|-------|
| <input checked="" type="checkbox"/> | UT Readings | | | |
| <input type="checkbox"/> | Vertical shell drops: | readings per course along | | drops |
| <input checked="" type="checkbox"/> | Along stairway: | 10 | readings per course | |
| <input type="checkbox"/> | Course 1 plates: | | readings per plate | |
| <input checked="" type="checkbox"/> | VT | | | |
| <input checked="" type="checkbox"/> | Other: Magnetic Particle (MT) | | | |

Shell plate examination comments: MT revealed fifty-plus (50+) weld defects in the external shell-to-bottom weld and seventy-plus (70+) weld defects in the shell-to-wind girder weld. Reference 2.3 Shell Summary and 6 Magnetic Particle Inspection Report

7.4 NOZZLE EXAMINATION

The nozzles were examined utilizing the following methods:

- | | | | |
|---|------------------------|---|--------------------------|
| <input checked="" type="checkbox"/> | UT Readings | | |
| <input checked="" type="checkbox"/> | Shell nozzles: | 4 | readings per nozzle neck |
| <input type="checkbox"/> | Fixed Roof nozzles: | | readings per nozzle neck |
| <input type="checkbox"/> | Floating Roof nozzles: | | readings per nozzle neck |
| One (1) reading was taken per flange, reinforcing plate, and cover, where applicable. | | | |
| <input checked="" type="checkbox"/> | VT | | |
| <input type="checkbox"/> | Other: | | |

Nozzle examination comments: VT did not reveal any indications. Reference 2.4 Nozzle and Appurtenance Summary



Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
Location: Jackson, Louisiana	Page: 108 of 136
Tank: 125	Project No.: 722814132

7.5 WEATHERSHIELD ROOF EXAMINATION

The fixed roof plates were examined utilizing the following methods:

<input type="checkbox"/> UT Readings
<input type="checkbox"/> Roof plates: readings per plate
<input type="checkbox"/> X-pattern: readings every ft. Direction:
<input checked="" type="checkbox"/> VT
<i>Fixed Roof examination comments: Reference 2.5 Weathershield Summary</i>

Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
Location: Jackson, Louisiana	Page: 109 of 136
Tank: 125	Project No.: 722814132

8. POST REPAIR NDE INSPECTION

8.1 NDE INSPECTION SCOPE

Nondestructive Examinations (NDE) were conducted to evaluate the physical characteristics of the tank:

EXAMINATIONS	
Visual	VT

8.2 BOTTOM EXAMINATION

The bottom plates were examined utilizing the following methods:

<input type="checkbox"/>	Magnetic Flux Leakage (MFL)
<input type="checkbox"/>	Ultrasonic Testing (UT) of MFL indications only
<input type="checkbox"/>	UT readings
<input type="checkbox"/>	Bottom plates: readings per plate
<input type="checkbox"/>	X-pattern: readings every ft. Direction:
<input checked="" type="checkbox"/>	Visual Testing (VT)
<input type="checkbox"/>	Other:

Areas restricted from MFL examination:

<input type="checkbox"/>	Shell-to-bottom weld and plate-to-plate lap welds
<input type="checkbox"/>	Floating roof supports
<input type="checkbox"/>	Near and under autogauge base
<input type="checkbox"/>	Near the sump(s)
<input type="checkbox"/>	Under internal piping
<input type="checkbox"/>	Other:
<input type="checkbox"/>	Gauge Pole(s)

Bottom plate examination comments: A new bottom and annular ring were installed.

All required NDE was performed by Capitol Ultrasonics & CAPE. These items were found to be in acceptable condition. Reference 2.2 Bottom Summary

The bottom lap welds were examined utilizing the following methods:

<input type="checkbox"/>	Vacuum Box Bubble Test (LT/BT)
<input checked="" type="checkbox"/>	VT
<input type="checkbox"/>	Other:

Areas restricted from LT/BT and VT examination:

<input type="checkbox"/>	Floating roof supports
<input type="checkbox"/>	Under internal piping
<input type="checkbox"/>	Other

Bottom lap weld examination comments: The lap welds were found to be in acceptable condition. Reference 2.2 Bottom Summary

Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
Location: Jackson, Louisiana	Page: 110 of 136
Tank: 125	Project No.: 722814132

The shell-to-bottom weld was examined utilizing the following methods:

<input type="checkbox"/>	Magnetic Particle Testing (MT)
<input type="checkbox"/>	LT Type:
<input checked="" type="checkbox"/>	VT
<input type="checkbox"/>	Eddy Current (ET)
<input type="checkbox"/>	Liquid Penetrant (PT)
<input type="checkbox"/>	Other:

Shell-to-bottom weld examination comments: The internal shell-to-bottom weld was found to be in acceptable condition. Reference 2.2 Bottom Summary

The sump(s) were examined utilizing the following methods:

<input type="checkbox"/>	UT Readings
<input checked="" type="checkbox"/>	VT
<input type="checkbox"/>	Other:

Sump examination comments: A new sump was installed and found to be in acceptable condition. Reference 2.2 Bottom Summary

8.3 SHELL EXAMINATION

The shell plates were examined utilizing the following methods:

<input type="checkbox"/>	UT Readings
<input type="checkbox"/>	Vertical shell drops:
<input type="checkbox"/>	readings per course along
<input type="checkbox"/>	drops
<input type="checkbox"/>	Along stairway:
<input type="checkbox"/>	readings per course
<input type="checkbox"/>	Course 1 plates:
<input type="checkbox"/>	readings per plate
<input checked="" type="checkbox"/>	VT
<input type="checkbox"/>	Other:

Shell plate examination comments: The shell was found to be in acceptable condition and is scheduled to be re-coated at a later date. Reference 2.3 Shell Summary

8.4 NOZZLE EXAMINATION

The nozzles were examined utilizing the following methods:

<input type="checkbox"/>	UT Readings
<input type="checkbox"/>	Shell nozzles:
<input type="checkbox"/>	4
<input type="checkbox"/>	readings per nozzle neck
<input type="checkbox"/>	Fixed Roof nozzles:
<input type="checkbox"/>	readings per nozzle neck
<input type="checkbox"/>	Floating Roof nozzles:
<input type="checkbox"/>	readings per nozzle neck
One (1) reading was taken per flange, reinforcing plate, and cover, where applicable.	
<input checked="" type="checkbox"/>	VT
<input type="checkbox"/>	Other:

Nozzle examination comments: Manways A and L were replaced and Coupling M was removed. These items were found to be in acceptable condition. Reference 2.4 Nozzle and Appurtenance Summary

Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
Location: Jackson, Louisiana	Page: 111 of 136
Tank: 125	Project No.: 722814132

8.5 WEATHERSHIELD ROOF EXAMINATION

The fixed roof plates were examined utilizing the following methods:

<input type="checkbox"/>	UT Readings						
<input type="checkbox"/>	Roof plates:		readings per plate				
<input type="checkbox"/>	X-pattern:		readings every		ft.	Direction:	
<input checked="" type="checkbox"/>	VT						
<i>Fixed Roof examination comments: Reference 2.5 Weathershield Summary</i>							

8.6 FLOATING ROOF EXAMINATION

The floating roof plates were examined utilizing the following methods:

<input type="checkbox"/>	UT Readings						
<input type="checkbox"/>	Roof plates:		readings per plate				
<input type="checkbox"/>	Pontoons:		readings per pontoon				
<input type="checkbox"/>	X-pattern:		readings every		ft.	Direction:	
<input checked="" type="checkbox"/>	VT						
<i>Floating Roof examination comments: The new floating roof was found to be in acceptable condition. Reference 2.6 Floating Roof Inspection</i>							

Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
Location: Jackson, Louisiana	Page: 112 of 136
Tank: 125	Project No.: 722814132

9. MAGNETIC PARTICLE INSPECTION REPORT

LOCATION OF WELD					
<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> External	<input checked="" type="checkbox"/> Bottom	<input checked="" type="checkbox"/> Shell	<input type="checkbox"/> Nozzle	<input type="checkbox"/> Roof
ITEM TO BE EXAMINED					
<input type="checkbox"/> Lap Weld	<input type="checkbox"/> Butt Weld	<input checked="" type="checkbox"/> Other: Fillet			
Details: Magnetic Particle (MT) inspection was performed on the internal and external shell-to-bottom weld, sump welds and the wind girder-to-shell-weld.					
MAGNETIZING PROCESS					
<input checked="" type="checkbox"/> Continuous	<input type="checkbox"/> Residual	<input type="checkbox"/> AC	<input type="checkbox"/> HWDC	<input type="checkbox"/> FWDC	
TYPE OF EXAMINATION					
<input type="checkbox"/> Yoke	<input checked="" type="checkbox"/> Direct	<input type="checkbox"/> Nunchucks clamps, headstocks, etc.	<input type="checkbox"/> Indirect	coil, cable wrap, etc.	
EQUIPMENT					
<input type="checkbox"/> Blacklight BIB-150P	<input type="checkbox"/> A/C Yoke B-300	S/N: _____			
MAGNETIC PARTICLE USED					
<input checked="" type="checkbox"/> Wet	<input type="checkbox"/> Dry	<input checked="" type="checkbox"/> Visible	<input type="checkbox"/> Fluorescent		
Batch No.: _____	12508K	Color: _____	Black	<input checked="" type="checkbox"/> White Contrast	
PARTICLE APPLICATION METHOD					
Prepared Bath Bulb, bath, spray, etc.	Magnetic Strength _____				10 lbs amp/turns, lifting force (10 lbs.)
MAGNETIZATION DIRECTION VERIFIED					
<input checked="" type="checkbox"/> Pie Gauge	<input type="checkbox"/> Castrol Strips	<input type="checkbox"/> Other _____			
SIGNIFICANT FINDINGS					
<input checked="" type="checkbox"/> Total Number of Indications: _____	70+ see following page(s)	<input type="checkbox"/> No Recordable Indications			
ACCEPTANCE CRITERIA					
<input checked="" type="checkbox"/> per Procedure	<input type="checkbox"/> per Client	<input type="checkbox"/> Other: _____			
PERMANENT RECORD OF INDICATION					
<input type="checkbox"/> N/A	<input type="checkbox"/> Sketch	<input checked="" type="checkbox"/> Photo	<input type="checkbox"/> Tape	<input type="checkbox"/> Film	
PERSONNEL					
Inspector: _____	Chad Hudgins	Level	II	Date: 6-13-2013	
Reviewed by: _____				Date: _____	
<input type="checkbox"/> Repair(s) Completed and Re-examined (if applicable)					
Inspector: _____	Level _____	Date: _____			
Reviewed by: _____		Date: _____			

Owner: Bengal Pipeline Company	Date: June 13, 2013, December 2, 2013, and April 21, 2014
Location: Jackson, Louisiana	Page: 113 of 136
Tank: 125	Project No.: 722814132

10. EQUIPMENT

10.1 ULTRASONIC

MODEL		SERIAL NO.	
TRANSDUCER	SERIAL NO.	FREQUENCY	SIZE
Dual	B12626	7.5 MHz	0.375 inch
CALIBRATION BLOCK		SERIAL NO.	
5 Step Calibration Block		05-8571	

10.2 MAGNETIC FLUX LEAKAGE

MODEL	SERIAL NO.	THRESHOLD
MFE-2412	070	50

10.3 LEVEL

TYPE	MODEL
Self-Leveling Laser	40-6515

10.4 PIT GAUGE

The pit gauge utilized was a W.R. Thorpe Co. standard pipe pit gauge.



AMERICAN PETROLEUM INSTITUTE
INDIVIDUAL CERTIFICATION PROGRAMS

API Individual Certification Programs

certifies that

Fausto Alejandro Maldonado

has met the requirements to be a certified

API-653 Above Ground Storage Tank Inspector

Certification Number

25916

Original Certification Date

April 30, 2004

Current Certification Date

April 30, 2013

Expiration Date

April 30, 2016

Tina Briskin

Manager, Individual Certification Programs





PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Alejandro Maldonado

Employee Number: 074877

Certification Level: II

Method: Magnetic Particle
(Yoke Only)

Examination:

Basic:

General: 92.5

Practical: 95

Specific: 97.5

Average: 95

Education:

High School: Colegio Brasil
(Quito, Ecuador)

Date: 05/1979

College: Javeriana Poly Sch. of Eng.
(Quito, Ecuador)

Date: 08/1999

Training:

Conducted By:	Date:	Training Hours:
Sattler Consultants	02/2004	8 UTT, 13 MT

Experience:

Employer:	Date:	Years / Months Experience:
HMT	11/2002-11/2006	4 years-UTT
PetroChem Inspection Services	11/2006-Present	5 years 6 months-UTT, MT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ron Hayden - ASNT Level III

Date of hire: 11/13/2006

Date: 05/11/2012

Recertification Due: 05/11/2015



PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Alejandro Maldonado

Employee Number: 074877

Certification Level: II

Method: Ultrasonics – Limited
(Digital Thickness Only)

Examination:

Basic:

General: 84

Practical: 80

Specific: 93

Average: 85.6

Education:

High School: Colegio Brasil
(Quito, Ecuador)

Date: 05/1979

College: Javeriana Poly Sch. of Eng.
(Quito, Ecuador)

Date: 08/1999

Training:

Conducted By:	Date:	Training Hours:
Sattler Consultants	02/2004	8 UTT, 13 MT

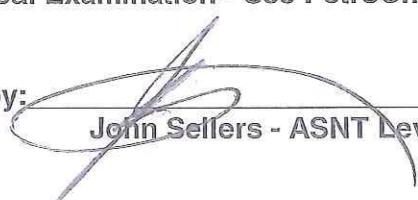
Experience:

Employer:	Date:	Years / Months Experience:
HMT	11/2002-11/2006	4 years-UTT
PetroChem Inspection Services	11/2006-Present	5 years 6 months-UTT, MT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:



John Sellers - ASNT Level III

Date of hire: 11/13/2006

Date: 05/10/2012

Recertification Due: 05/10/2015



AMERICAN PETROLEUM INSTITUTE
INDIVIDUAL CERTIFICATION PROGRAMS

API Individual Certification Programs

certifies that

Emily Ruth Seals

has met the requirements to be a certified

API-653 Above Ground Storage Tank Inspector

Certification Number **44083**

Original Certification Date *May 31, 2012*

Current Certification Date *May 31, 2012*

Expiration Date *May 31, 2015*

Tina Briskin

Manager, Individual Certification Programs





PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Emily Seals

Employee Number: 937968

Certification Level: II

Method: Magnetic Particle
(Yoke Only)

Examination:

Basic:

General: 90

Practical: 99

Specific: 92.5

Average: 93.83

Education:

High School: Barber's Hill HS
(Barber's Hill, TX)

Date: 05/2000

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
LAMCO & Associates	12/2007	40-Rad Safety
San Jacinto College	03/2008	16-PT, 24-MT
San Jacinto College	03/2009	40-UT

Experience:

Employer:	Date:	Years / Months Experience:
Acuren Inspection	07/2007-08/2010	3 years 1 month-MT, PT, UTT
PetroChem Inspection Services	08/2010-Present	3 years-MT, PT, UTT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden – Corporate Level III

Date of hire: 08/16/2010

Date: 08/22/2013

Recertification Due: 08/22/2016



PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Emily Seals

Employee Number: 937968

Certification Level: II

Method: Liquid Penetrant

Examination:

Basic:

General: 85

Practical: 98

Specific: 90

Average: 91

Education:

High School: Barber's Hill HS
(Barber's Hill, TX)

Date: 05/2000

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
LAMCO & Associates	12/2007	40-Rad Safety
San Jacinto College	03/2008	16-PT, 24-MT
San Jacinto College	03/2009	40-UT

Experience:

Employer:	Date:	Years / Months Experience:
Acuren Inspection	07/2007-08/2010	3 years 1 month-MT, PT, UTT
PetroChem Inspection Services	08/2010-Present	3 years-MT, PT, UTT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden – Corporate Level III

Date of hire: 08/16/2010

Date: 08/22/2013

Recertification Due: 08/22/2016



PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Emily Seals

Employee Number: 937968

Certification Level: II

Method: Ultrasonic - Limited
(Digital Thickness Only)

Examination:

General: 88

Basic:

Practical: 83

Specific: 90

Average: 87

Education:

High School: Barber's Hill HS
(Barber's Hill, TX)

Date: 05/2000

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
LAMCO & Associates	12/2007	40-Rad Safety
San Jacinto College	03/2008	16-PT, 24-MT
San Jacinto College	03/2009	40-UT

Experience:

Employer:	Date:	Years / Months Experience:
Acuren Inspection	07/2007-08/2010	3 years 1 month-MT, PT, UTT
PetroChem Inspection Services	08/2010-Present	3 years-MT, PT, UTT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden – Corporate Level III

Date of hire: 08/16/2010

Date: 08/22/2013

Recertification Due: 08/22/2016



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Iqvshfwru

Surilh

IFS

Krp hsadjh

IqvshfwruVvdwv

Yhulifdwlrq

IFS

Glhfvru| Vhdufk

Frqwdfw

) Ihgedfn

^ Edfn wr Uhvxow

IqvshfwruVvdwv Uhvxow

Name: Williams, Glen Harrell

Program	Cert. ID	Exp.Date	Status
API 570	36950	01/31/2016	Recertified
API 653	1880	11/30/2016	Recertified

FrqghfwZ lk DSL

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PetroChem

PHYSICAL EXAMINATION RECORD

Name: Williams Clay F S.S. No: 458-04-7420
(Last) (First) (M.I.)

How do you rate your general health?

Excellent _____
 Good _____
Fair _____

Do you feel that you are physically capable of performing
your assigned inspection activities? Yes / No

Explanation for "NO" answer: _____

I certify that the above statements are true and complete to the best of my knowledge.

Signature: SL WLL Date: 6-12-14**VISION**

1. Snellen Far Distance Exam (20/20 required)
(If Applicable)

RIGHTLEFT

Uncorrected _____

20/20 -1 20/20 -1

Corrected _____

2. Jaeger Near Distance Exam (J-2 required (1) eye)
(If ASME VT certification, J-1 (1) eye is required)

J-1J-2

Uncorrected _____

Corrected _____

J1 J1

3. Gray Scale

> 20 X✓ < 20 X

Uncorrected _____

> 20 X✓ < 20 X

Corrected _____

Acceptable

4. Distinguish Primary Colors/ Dist. Contrast Yes / No Yes Method Pseudo Iso Plates

5. The above Visual requirements have been met Yes / No Yes

Signature of Eye Examiner (title): C860. Date: 12 June 2014Printed Name Cat Staelin turnaround logistics Expiration: 12 June 2015

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Sandra Barnes PetroChem Inspection Services, Inc. (400-16204)
Meetings | Webcasts | My Profile | Company Admin | Log Out

PetroChem

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Company Profile
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Operator Qualifications (OQ)
Promote My Company

Search Results + Add New Employee

1 Total Records Page 1

Employee	ISNetwork ID	Job Title	Status	Location	Edit	Delete
Glen Harrell Williams	ISBN-00571605	API Field Inspector	Active	Houston Tanks		

FULL-TIME

1 Total Records Page 1

Last Login: 03/04/2014 7:57 AM

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PetroChem

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Bobby L. Tyler

Employee Number: 866804

Certification Level: II

Method: Ultrasonics - Limited
(Digital Thickness Only)

Examination:

Basic:

General: 92

Practical: 90.95

Specific: 93.3

Average: 92.08

Education:

High School: GED
(TX)

Date: 07/1973

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
Tuboscope	10/1988	16-MT, 40-UT, 40-Thread Gauge 64-Basic Inspection

Experience:

Employer:	Date:	Years / Months Experience:
Tuboscope	08/1984-04/2006	18 years - MT, UT
PetroChem Inspection Services	05/2006-Present	6 years 8 months – MT, UT, PT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

A handwritten signature in black ink, appearing to read "Ronald J. Hayden".

Ronald J. Hayden - Corporate Level III

Date of hire: 05/01/2006

Date: 01/08/2013

Re-Certification Due: 01/08/2016



PetroChem

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Bobby L. Tyler

Employee Number: 866804

Certification Level: II

Method: Liquid Penetrant

Examination:

Basic:

General: 95

Practical: 80

Specific: 97.5

Average: 90.83

Education:

High School: GED
(TX)

Date: 07/1973

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
Tuboscope	10/1988	16-MT, 40-UT, 12-PT40-Thread Gauge 64-Basic Inspection

Experience:

Employer:	Date:	Years / Months Experience:
Tuboscope	08/1984-04/2006	18 years - MT, UT
PetroChem Inspection Services	05/2006-Present	6 years 11 months – MT, UT, PT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden - Corporate Level III

Date of hire: 05/01/2006

Date: 04/16/2013

Re-Certification Due: 04/16/2016



PetroChem

PERSONNEL CERTIFICATION RECORD PER SNT-TC-1A 2011 EDITION

Name: Bobby L. Tyler

Employee Number: 866804

Certification Level: II

Method: Magnetic Particle
(Yoke Only)

Examination:

Basic:

General: 77.5

Practical: 75

Specific: 90

Average: 80.8

Education:

High School: GED – State of Texas

Date: 07/73

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
Tuboscope	10/1998	16 MT, 40 UT, 40 Thread Gauge 60 Basic Inspection

Experience:

Employer:	Date:	Years / Months Experience:
Tuboscope	08/84 – 04/06	18 yrs. – MT, UT
PetroChem Inspection	05/06 – Present	7 yrs. 4 mos. – MT, UT, PT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden - Corporate Level III

Date of hire: 05/01/06

Date: 10/29/13

Recertification Due: 10/29/16

CERTIFICATE OF QUALIFICATION

NO: PI-10022

**MFL FLOOR SCANNER OPERATOR
and
U.T. DEFECT SIZING - TANK BOTTOM PITS**

Bobby Tyler

Name

Petrochem Inspection Services

Company

C-MFE-0 MFL/C – UT – 03 UT A Scan

Company Procedure No:

has successfully performed a practical examination for a MFL Floor Scanner / Operator Qualification and U.T. Defect Sizing using the equipment listed below.

Essential Equipment Qualification Variables - Scanning

- Main Scanner: MFE 2412 S/N 065
- Edge Scanner: _____
- Hand Scanner: _____
- Other: _____

Essential Equipment Qualification Variables - Sizing

- Flaw Detector: USN 5 OL S/N 00HPNL
- Transducer: 375/7.5 mhz
- Other: _____

Essential Test Variables - Defect Detection - Un-coated Plate

- Detection of 30% deep and deeper pits/pit clusters (top and bottom side) with no coating on 250 mil thick steel test plate
- Accurate sizing of said pits/pit clusters to within +/- 20 mils on all but one (+/-30 mils allowed on one)
- Detection of 30% deep and deeper pits/pit clusters (top and bottom side) with a 250 mil coating on 250 mil thick steel test plate

Examination Administration

Date: 02/02/07Test Administrator: Lee Sweeten

*Shell Global Solutions Inc. (US) and Pro-Inspect, Inc. are not responsible for the onsite workmanship of this certificate holder.
Pro-Inspect, Inc. is responsible for his/her proficiency in completing this examination successfully.*



PetroChem

PERSONNEL CERTIFICATION RECORD PER SNT-TC-1A 2011 EDITION

Name: Brandon Benoit

Employee Number: 737868

Certification Level: II

Method: Magnetic Particle
(Yoke Only)

Examination:

General: 85

Basic:

Specific: 92.5

Practical: 95

Average: 90.8

Education:

High School: GED
(MS)

Date: 11/2005

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
HMT Inspection	06/2007	40-UTT
PetroChem Inspection Services	01/2009	40-SLOFEC
PetroChem Inspection Services	07/2012	16-PT, 24-MT

Experience:

Employer:	Date:	Years / Months Experience:
HMT Inspection	06/2007-03/2008	10 months-UTT
PetroChem Inspection Services	03/2008-Present	4 years 6 months-UTT, PT, MT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden - Corporate Level III

Date of hire: 03/11/2008

Date: 09/20/2012

Recertification Due: 09/20/2015



PetroChem

PERSONNEL CERTIFICATION RECORD PER SNT-TC-1A 2011 EDITION

Name: Brandon Benoit

Employee Number: 737868

Certification Level: II

Method: Liquid Penetrant

Examination:

Basic:

General: 88

Practical: 92.5

Specific: 92.5

Average: 91

Education:

High School: GED
(MS)

Date: 11/2005

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
HMT Inspection	06/2007	40-UTT
PetroChem Inspection Services	01/2009	40-SLOFEC
PetroChem Inspection Services	07/2012	16-PT, 24-MT

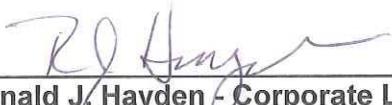
Experience:

Employer:	Date:	Years / Months Experience:
HMT Inspection	06/2007-03/2008	10 months-UTT
PetroChem Inspection Services	03/2008-Present	4 years 5 months-UTT, PT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:


Ronald J. Hayden - Corporate Level III

Date of hire: 03/11/2008

Date: 08/10/2012

Recertification Due: 08/10/2015



PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2001 EDITION**

Name: Brandon Benoit

Employee ID: 737868

Certification Level: II

Method: Ultrasonics - Limited
(Digital Thickness Only)

Examination:

Basic:

General: 93.3

Practical: 93

Specific: 100

Average: 95.4

Education:

High School: GED
(MS)

Date: 11/05

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
HMT Inspection	06/07	40 UT

Experience:

Employer:	Date:	Years/Months Experience:
HMT Inspection	06/07-03/08	10 UTL
PetroChem Inspection Services	03/08 – Present	3 yrs., 3 mos. - UTL

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Date of hire: 03/11/08

Certified by: _____ **Date:** 06/03/11

Jared Williams - ASNT Level III

Recertification Due: 06/03/14



PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Chad Hudgins

Employee Number: 149726

Certification Level: II

Method: Magnetic Particle
(Yoke Only)

Examination:

General: 95

Basic:

Practical: 93.75

Specific: 95

Average: 94.5

Education:

High School: GED
(TX)

Date: 03/2007

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
LAMCO & Associate	05/2010	40-Radiation Safety
PetroChem Inspection Services	12/2010	16-PT, 8-PMI-XRF
PetroChem Inspection Services	10/2011	7-UTT
PetroChem Inspection Services	07/2012	24-MT

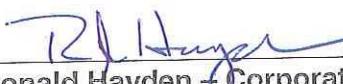
Experience:

Employer:	Date:	Years / Months Experience:
PetroChem Inspection Services	06/2010-Present	2 years 5 months-UTT, MT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:


Ronald Hayden - Corporate Level III

Date of hire: 06/14/2010

Date: 11/27/2012

Recertification Due: 11/27/2015



PetroChem
Inspection Services

**PERSONNEL CERTIFICATION RECORD
PER SNT-TC-1A 2011 EDITION**

Name: Chad Hudgins

Employee Number: 149726

Certification Level: II

Method: Liquid Penetrant

Examination:

Basic:

General: 75

Practical: 83.5

Specific: 97.5

Average: 85.33

Education:

High School: GED
(TX)

Date: 03/2007

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
LAMCO & Associate	05/2010	40-Radiation Safety
PetroChem Inspection Services	12/2010	16-PT, 8-PMI-XRF
PetroChem Inspection Services	10/2011	7-UTT
PetroChem Inspection Services	07/2012	24-MT

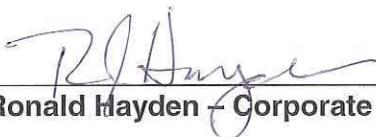
Experience:

Employer:	Date:	Years / Months Experience:
PetroChem Inspection Services	06/2010-Present	2 years 7 months-UTT, MT, PT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:


Ronald Hayden - Corporate Level III

Date of hire: 06/14/2010

Date: 02/06/2013

Recertification Due: 02/06/2016



PERSONNEL CERTIFICATION RECORD PER SNT-TC-1A 2011 EDITION

Name: Chad Hudgins

Employee Number: 149726

Certification Level: II

Method: Ultrasonics - Limited
(Digital Thickness Only)

Examination:

General: 84

Practical: 85

Specific: 86.7

Average: 88.6

Education:

High School: GED
(TX)

Date: 03/07

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
LAMCO & Associate	05/10	40 Radiation Safety
PetroChem Inspection Services	12/10	16 PT, 8 PMI-XRF
PetroChem Inspection Services	10/11	7 UTT

Experience:

Employer:	Date:	Years / Months Experience:
PetroChem Inspection Services	06/10-Present	1 yr. 5 mos. – UTT, RT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Date of hire: 06/14/10

Certified by:

Date: 11/09/11

Ronald J. Hayden - Corporate Level III

Re-Certification Due: 11/09/14



PetroChem

PERSONNEL CERTIFICATION RECORD PER SNT-TC-1A 2011 EDITION

Name: Rosemary Lopez

Employee Number: 515678

Certification Level: II

Method: Magnetic Particle
(Yoke Only)

Examination:

Basic:

General: 95

Practical: 99.5

Specific: 87.5

Average: 94.0

Education:

High School: Master's Senior HS
(Houston, TX)

Date: 03/2008

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
The Ocean Corporation	07/2009	70-MT, 55-PT, 105-UT, 90-ET, 40-VT, 90-RT

Experience:

Employer:	Date:	Years / Months Experience:
PetroChem Inspection Services	08/2009-Present	3 years-UTT, MT

The above individual has successfully completed the prescribed training in accordance
with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Certified by:

Ronald J. Hayden - Corporate Level III

Date of hire: 08/06/2009
Date: 09/04/2012

Recertification Due: 09/04/2015



PetroChem

PERSONNEL CERTIFICATION RECORD PER SNT-TC-1A 2011 EDITION

Name: Rosemary Lopez

Employee Number: 515678

Certification Level: II

Method: Ultrasonics - Limited
(Digital Thickness Only)

Examination:

General: 88

Basic:

Specific: 93.3

Practical: 95

Average: 92.1

Education:

High School: Master's Senior HS
(Houston, TX)

Date: 03/08

College:

Date:

Training:

Conducted By:	Date:	Training Hours:
The Ocean Corporation	07/09	70 MT, 55 PT, 105 UT, 90 ET, 40 VT, 90 RT

Experience:

Employer:	Date:	Years / Months Experience:
PetroChem Inspection Services	08/09-Present	2 yrs. 2 mos. - UTT

The above individual has successfully completed the prescribed training in accordance with PetroChem Inspection Services written procedures.

Physical Examination - See PetroChem Inspection Services certification records.

Date of hire: 08/06/09

Certified by:

Ronald J. Hayden - Corporate Level III

Date: 10/04/11

Recertification Due: 10/04/14

12. WARRANTY

TÜV SÜD PetroChem Inspection Services, Inc. (“Company”) has performed inspection services on equipment designated by Bengal Pipeline Company (owner/operator) and has evaluated its condition based on observations and measurements made by Company’s inspectors. While our evaluation accurately describes the condition of the equipment at the time of inspection, the owner/operator must independently assess the inspection information/report provided by Company and any conclusions reached by owner/operator and any action taken or omitted to be taken are the sole responsibility of the owner/operator. With respect to inspection and testing, Company warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Company shall re-perform the service to the same extent and on the same conditions as the original service.

Company makes no warranty, express or implied, with regard to goods or services provided by Company other than those warranties set forth herein. The preceding paragraph sets forth the exclusive remedy for claims based on failure or of 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 OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY, nor shall Company 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 equipment inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Company 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 Company or any associated damage to facilities, down-time costs or claims of other damages.