

Attachment 2

Gulf Sulphur Services Ltd., LLLP

Tank Inspection Program

April 2014

Revision 4

Gulf Sulphur Services Ltd., LLLP

Tank Inspection Program

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Gulf Sulphur Services Ltd., LLLP Tank Inspection Program

Gulf Sulphur Services Ltd., LLLP ("the Company") hereby establishes this Tank Inspection Program effective August 1, 2004.

1. General

The Company Shall:

- 1.1. Execute the elements of this inspection program in full.
 - 1.1.1. All deviations from this plan shall include a written justification including any interim actions taken to ensure the intent of the sections deviated from is satisfied.
 - 1.1.2. All deviations shall be reviewed and approved by a member of the GSS senior leadership team.
- 1.2. Establish inspection schedules for: Routine Visual, Non-Invasive Roof, In-Service, and Out-of-Service inspections for each tank based on the corrosion history of the tank. The inspection schedules shall be adjusted as necessary depending on corrosion rates, however the initial interval for each tank shall be:
 - 1.2.1. Hourly Visual Inspections: Hourly
 - 1.2.2. Monthly Visual Inspections: Monthly
 - 1.2.3. Non-invasive roof inspection: Bi-annually
 - 1.2.4. In-Service External Inspections: Every five years
 - 1.2.5. Out-of-Service Internal inspections: Every ten years
- 1.3. Ensure that all tanks are inspected according to the schedule requirements.
- 1.4. Prioritize tank inspections by using sound risk management principles.
- 1.5. Establish a controlled master file, either hardcopy or electronic, for each tank within GSS.
- 1.6. Ensure personnel performing inspections are knowledgeable of the facility operations, the tank, and characteristics of the product stored.
- 1.7. Establish and annually review an Emergency Response Plan to ensure that any leak or spill is contained and proper notifications are made promptly.
- 1.8. Utilize the most current revision of *API-653: Tank Inspection, Repair, Alteration, and Reconstruction*, or its comparable alternate, as a detailed guideline and source of information for managing tank inspections and maintenance.
- 1.9. Maintain awareness on the importance of roof plate integrity and damage mechanisms for sulfur tanks.
 - 1.9.1. Roof plate integrity is important to assure effectiveness of the built-in steam smothering systems installed on each individual tank.

**Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program**

- 1.9.2. Roof plate corrosion typically originates from the outside, due to water penetrating the skin and saturating the insulation and roof plates.
 - 1.9.2.1. The most susceptible area is the plate within 10 feet of the roof-to shell joint, along the peripheral of the tank roof.
 - 1.9.2.2. Any areas of interest identified on a roof skin, especially in the most susceptible areas, should be investigated and mitigated with a sense of urgency.
- 1.10. Investigate, repair, or mitigate any areas of interest identified during tank roof inspections.
 - 1.10.1. Personnel shall not approach areas of interest by traversing the roof of the affected tank. Alternate means of access, such as a manlift, shall be employed until the integrity of the roof can be ensured.
 - 1.10.2. Within two weeks of original identification of an area of interest, the roof skin shall be removed from the area of interest to allow for a direct visual and ultrasonic inspection of the roof plate. The ultrasonic thickness measurements shall be compared to the most recent inspection and a permanent repair plan shall be developed and scheduled based on the necessary scope of repairs.
 - 1.10.2.1. It is critical that the roof skin be patched or permanently installed at all times to ensure prevention of water ingress.
 - 1.10.2.2. A permanent, water-proof skin shall be installed if:
 - 1.10.2.2.1. The direct visual inspection does not identify any required repairs to the roof plate, or
 - 1.10.2.2.2. The repairs are non-critical and will be scheduled more than 6 months in the future.
 - 1.10.2.3. Any tank that has a temporary roof skin patch installed shall be scheduled for a monthly non-invasive roof inspection.
 - 1.10.3. Holes identified in roof skin shall be patched as soon as practical. The affected roof area shall be barricaded and the tank shall be monitored continuously until the patch is in place.
 - 1.10.4. The Facility Manager shall use all reasonable efforts to either temporarily patch, or permanently repair, all holes identified in the roof plate within 48 hours of discovery. The tank shall be monitored continuously until the patch or permanent repair is in place. If a temporary patch is utilized, the Tank shall be scheduled for weekly visual roof inspections until a permanent repair is in place.
 - 1.10.4.1. Acceptable temporary patch material shall be sheet steel with a minimum thickness of 12 Gauge (0.100").

Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program

- 1.10.4.2. Acceptable methods of temporary patch attachment shall be by welding unless mechanical fastening or industrial adhesive are approved by an engineer.

2. Inspections

- 2.1. All tanks shall be periodically inspected according to their individual inspection schedules as recorded in their master file.

2.1.1. Hourly Visual Inspections

- 2.1.1.1. Visual inspections shall be performed hourly by site personnel. All observations shall be recorded on the Hourly Tank Inspection Sheet, which is attached hereto as Appendix A.
- 2.1.1.2. A new Hourly Tank Inspection sheet shall be started by the operator each day by filling in the Terminal name and date.
- 2.1.1.3. Completed Hourly Tank Inspection sheets shall be filed electronically or in a secured onsite location and maintained for a minimum of one year.
- 2.1.1.4. It is the responsibility of the site operations manager to ensure the inspections are completed, signed off, filed, and all observations are addressed with a documented follow-up.

2.1.2. Monthly Visual Inspections

- 2.1.2.1. Inspections shall be performed monthly.
- 2.1.2.2. Inspections shall be performed by site operations personnel with at least 12 months experience at the terminal.
- 2.1.2.3. Form 1, or a substantially similar equivalent, shall be used by the inspector to ensure a thorough inspection is completed.
- 2.1.2.4. Any areas of interest noted during the inspection shall be recorded on the inspection form.
 - 2.1.2.4.1. The site operations manager is responsible to implement repairs as required.
 - 2.1.2.4.2. Any areas of concern that are not addressed with a repair plan must be documented in writing, by the manager, including a technical justification prepared by an engineer as to why the repairs are not necessary.
- 2.1.2.5. The manager shall sign off on the inspection after attaching all repair documentation and technical justifications for acceptance of any existing area of interest.
- 2.1.2.6. Completed Monthly Visual Inspection sheets shall be filed in the tank's master file.

2.1.3. Non-invasive roof inspection

**Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program**

- 2.1.3.1. Inspections shall be performed bi-annually.
- 2.1.3.2. Inspections shall be performed by Company personnel knowledgeable about analyzing results from the inspection methodology used or a suitable third party.
- 2.1.3.3. The inspection method shall be non-invasive, meaning the roof skin should not be compromised to identify areas of interest on the roof plate.
- 2.1.3.4. The preferred non-invasive inspection is Pulsed Eddy Current (PEC) measurements to quantify roof plate thickness through the insulation. Other processes that provide a condition assessment more detailed than a visual inspection may be used at the discretion of GSS management.
- 2.1.3.5. The inspection shall include sufficient measurements in locations comparable to prior measurement locations to develop an accurate corrosion rate on the roof plates. Each operation should create an inspection map for each tank roof to ensure measurements are comparable.
- 2.1.3.6. The inspector shall issue a report that details each tank and any areas of interest identified.
 - 2.1.3.6.1. The site Operations Manager is responsible to implement repairs as required.
 - 2.1.3.6.2. Any areas of concern that are not addressed with a repair plan must be documented in writing by the Manager, including a technical justification prepared by an engineer as to why the repairs are not necessary.
- 2.1.3.7. The Manager shall sign off on the report after attaching any repair documentation or technical justifications for acceptance of any areas of interest not addressed. All documentation shall be entered into the tank's master file.
- 2.1.4. In-Service External Inspections
 - 2.1.4.1. Inspections shall be performed every five years unless otherwise established in the tank's master file.
 - 2.1.4.2. It is the responsibility of the site operations manager to budget and schedule in-service inspections such that they are performed prior to the due date for each tank.
 - 2.1.4.3. Inspections shall be performed by an independent API certified inspector.
 - 2.1.4.4. At a minimum, the inspection shall include:
 - 2.1.4.4.1. The requirement of API-653 as applicable to each individual tank.

Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program

- 2.1.4.4.2. Sufficient ultrasonic thickness measurements in locations comparable to prior inspections to develop an accurate corrosion rate on the shell. Each operation should create a UT map for each tank shell to ensure measurements are comparable.
- 2.1.4.4.3. Sufficient ultrasonic thickness measurements in locations comparable to prior UT and select PEC inspection locations to develop an accurate corrosion rate on the roof plates. Each operation should create a UT map for each tank roof to ensure measurements are comparable. At a minimum, measurement locations shall include:
 - 2.1.4.4.3.1. One measurement shall be taken every three to six feet circumferentially, within 10 feet of the roof to shell joint.
 - 2.1.4.4.3.2. One measurement shall be taken every three to six feet radially, from the shell to the center of the roof.
 - 2.1.4.4.3.3. Additional measurements shall be taken in areas of interest identified during visual and non-destructive roof inspections. These additional measurements shall not be separated by more than 10" in any direction throughout the area of interest.
- 2.1.4.4.4. An assessment of the integrity of the skin designed to protect the insulation from wind and water. Additional inspection of the shell and roof shall be focused in areas where the skin shows evidence of being compromised.
- 2.1.4.5. The inspector shall issue a report detailing the condition of the tank, all required repairs, and any other recommendations. The inspector shall include the requisite API-653 checklist in their final report.
 - 2.1.4.5.1. The site Operations Manager is responsible to implement repairs as required.
 - 2.1.4.5.2. Any areas of concern that are not addressed with a repair plan must be documented in writing by the Manager, including a technical justification prepared by an engineer as to why the repairs are not necessary.
- 2.1.4.6. The Manager shall sign off on the inspection after attaching all repair documentation and technical justifications for acceptance of any recommendations not addressed. All documentation shall be entered into the tank's master file.
- 2.1.5. Out-of-Service Internal Inspections
 - 2.1.5.1. Inspections shall be performed every ten years unless otherwise established in the tank's master file.

Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program

- 2.1.5.2. It is the responsibility of the site operations manager to budget and schedule out-of-service inspections such that they are performed prior to the due date for each tank.
- 2.1.5.3. Inspections shall be performed by an independent API certified inspector.
- 2.1.5.4. At a minimum, the inspection shall include:
 - 2.1.5.4.1. The requirement of API-653 as applicable to each individual tank.
 - 2.1.5.4.2. Sufficient ultrasonic thickness measurements in locations comparable to prior inspections to develop an accurate corrosion rate on the shell. Each operation should create a UT map for each tank shell to ensure measurements are comparable.
 - 2.1.5.4.3. Sufficient ultrasonic thickness measurements in locations comparable to prior inspections to develop an accurate corrosion rate on the floor plates. Each operation should create a UT map for each tank floor to ensure measurements are comparable.
 - 2.1.5.4.4. Sufficient ultrasonic thickness measurements in locations comparable to prior UT and select PEC inspection locations to develop an accurate corrosion rate on the roof plates. Each operation should create a UT map for each tank roof to ensure measurements are comparable. At a minimum, measurement locations shall include:
 - 2.1.5.4.4.1. One measurement shall be taken every three to six feet circumferentially, within 10 feet of the roof to shell joint.
 - 2.1.5.4.4.2. One measurement shall be taken every three to six feet radially, from the shell to the center of the roof.
 - 2.1.5.4.4.3. Additional measurements shall be taken in areas of interest identified during visual and non-destructive roof inspections. These additional measurements shall not be separated by more than 10" in any direction throughout the area of interest.
- 2.1.5.5. An assessment of the integrity of the skin designed to protect the insulation from wind and water. Additional inspection of the shell and roof shall be focused in areas where the skin shows evidence of being compromised.
- 2.1.5.6. The inspector shall issue a report detailing the condition of the tank, all required repairs, and any other recommendations. The inspector shall include the requisite API-653 checklist in their final report.

Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program

- 2.1.5.6.1. The site Operations Manager is responsible to implement repairs as required.
- 2.1.5.6.2. Any areas of concern that are not addressed with a repair plan must be documented in writing, by the manager, including a technical justification prepared by an engineer as to why the repairs are not necessary.
- 2.1.5.7. The Manager shall sign off on the inspection after attaching all repair documentation and technical justifications for acceptance of any recommendations not addressed. All documentation shall be entered into the tank's master file.
- 2.2. Inspection intervals for in-service and out-of-service inspections shall be calculated for each individual tank, and documented in the tank's master file. Variables to consider in calculation of the inspection interval should include:
 - 2.2.1. A calculated corrosion rate for the tank shell plates, applied to the measured current thickness, to ensure a remaining thickness sufficient to meet design code requirements through the next inspection date.
 - 2.2.2. A calculated corrosion rate for the tank roof plates, applied to the measured current thickness, to ensure a remaining thickness greater than 0.090" in any 100 in² area prior to the next inspection date.
 - 2.2.3. A calculated corrosion rate for the tank floor plates, applied to the measured current thickness, to ensure a sufficient remaining thickness through the next inspection date. Note: Floor plates shall not be used as a factor to determine in-service inspection intervals.
 - 2.2.4. Changes to the tank product or operating conditions that may affect the calculated corrosion rates.
 - 2.2.5. Changes to the tank integrity protection systems, such as: insulation, insulation skin coverings, coatings, cathodic protection, etc.
 - 2.2.6. At no point shall either in-service external or out-of-service internal inspection intervals be extended beyond the limits outlined in API-653.

3. Required Documentation

Each individual tank's master file shall contain at a minimum, the following:

3.1. Construction Records

- 3.1.1. Nameplate information.
- 3.1.2. Construction and as-built drawings, as available.
- 3.1.3. Specifications.
- 3.1.4. Construction completion report.
- 3.1.5. Results of any material tests and analyses.

Gulf Sulphur Services Ltd., LLLP
Tank Inspection Program

3.2. Inspection History

3.2.1. Final reports from all inspections performed. Hourly inspections must be maintained on site for a minimum of one year, after which they may be discarded. At a minimum, each master inspection file shall include:

3.2.1.1. Condition of all components inspected.

3.2.1.2. All measurements taken, including measurement location.

3.2.1.3. Recommendations for repair.

3.2.2. Repairs completed following each inspection.

3.2.2.1. Note: Repairs performed following inspections may be omitted from this section if included in the Repair/Alteration History section at the discretion of the Operations Manager.

3.2.3. Technical justifications for repair recommendations that were not completed.

3.3. Repair / Alteration History

3.3.1. Repairs performed on tank and all appurtenances.

3.3.2. Alterations made to the tank and all appurtenances.

3.3.3. Service changes to the tank, including but not limited to: product(s) contained, operating temperature, or operating pressure/level

3.4. Spills / Incidents

3.4.1. The current Spill Prevention Plan, reviewed at least annually.

3.4.2. Details on all spills and incidents that may contain:

3.4.2.1. Date, time, and type of incident.

3.4.2.2. Any injuries or off-site impacts.

3.4.2.3. Interactions with and notifications to affected agencies.

3.4.2.4. Root Cause or Failure Analyses including recommended corrective actions.

Appendix A: Hourly Tank Inspection

Terminal:

Date:

Hour	Done By:	OBSERVATIONS	Signature
5:00 AM	Day Operator		
6:00 AM	Day Operator		
7:00 AM	Operator		
8:00 AM	Day Operator		
9:00 AM	Day Operator		
10:00 AM	Day Operator		
11:00 AM	Maintenance		
12:00 PM	Day Operator		
1:00 PM	Day Operator		
2:00 PM	Day Operator		
3:00 PM	Day Operator		
4:00 PM	Day Operator		
5:00 PM	Night Operator		
6:00 PM	Night Operator		
7:00 PM	Night Operator		
8:00 PM	Night Operator		
9:00 PM	Night Operator		
10:00 PM	Night Operator		
11:00 PM	Night Operator		
12:00 AM	Night Operator		
1:00 AM	Night Operator		
2:00 AM	Night Operator		
3:00 AM	Night Operator		
4:00 AM	Night Operator		

Gulf Sulphur Services Ltd., LLLP

Monthly Visual Tank Inspection

Form # 1

SAMPLE

April, 2014
Revision 4

Gulf Sulphur Services Ltd., LLLP
Routine Visual Inspection Form #1

1. Routine Visual Inspection Checklist

Time / Date _____

Inspector _____

Tank Location _____

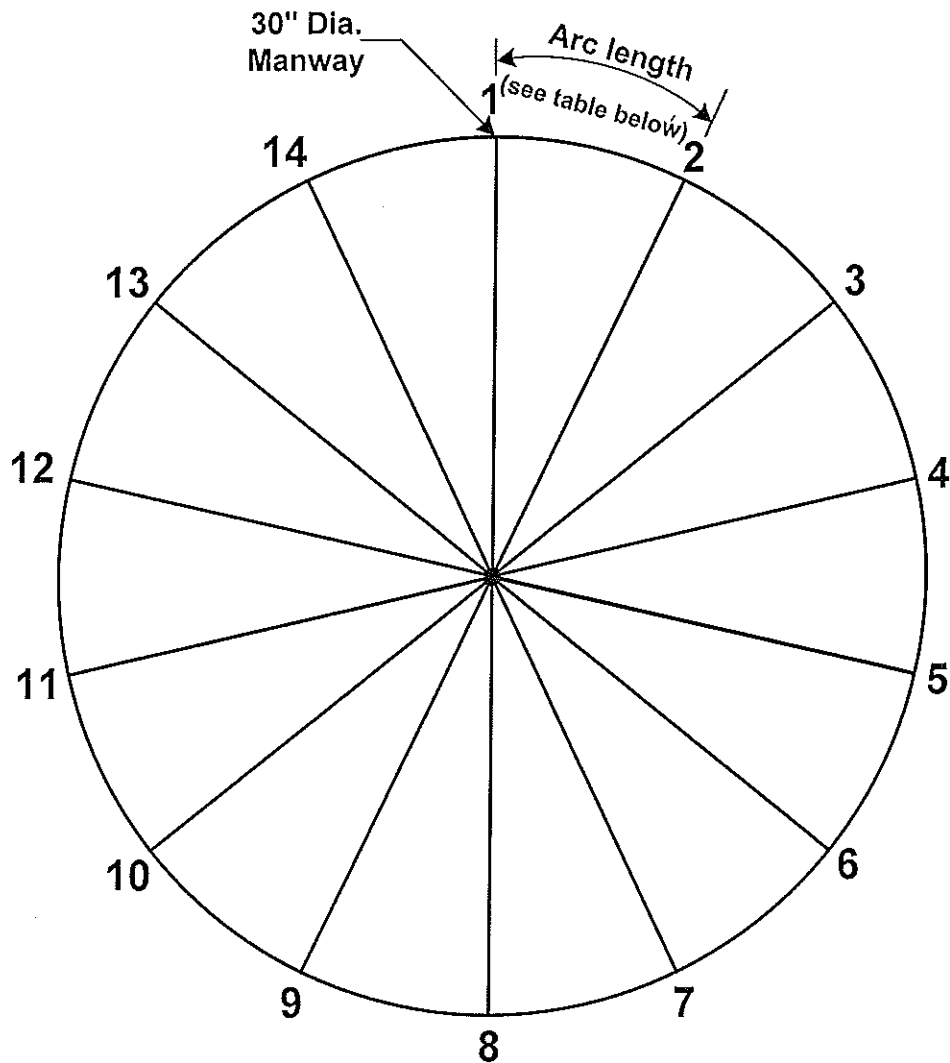
Tank # _____

Item / Description		Inspection Completed	Comments
1	LEAKS		
	a Visually check for signs of leakage around foundation, on shell, and on roof. Note location.		
2	TANK DISTORTION		
	a If shell is visible, check for signs of bulging and dimpling. Check around piping nozzles and manways where visible.		
3	FOUNDATION CONDITION		
	a Check condition of concrete ringwall foundation.		
	b Visually check that runoff rainwater from the shell drains away from the tank.		
	c Visually check that dike walls are in good condition with no leaks or erosion (if any).		
	d Check operating conditions of dike drains, if any. Dike valves should be closed.		
4	CORROSION		
	a Visually inspect insulation cover on shell for any signs of weepage or discoloration.		
	b Visually inspect insulation cover on roof for any signs of weepage or discoloration. <u>DO NOT</u> approach any areas that show signs of weepage or discoloration as the roof plate may be compromised. Note these areas on the attached tank location guide and notify the operation manger.		
5	VENTS		
	a Visually inspect that vents are clear, covers are in place and in good working condition.		
6	PAINT		
	a Visually check painted surfaces for discoloration and rust.		

Item / Description		Inspection Completed	Comments
7	INSULATION		
	a Visually check shell and roof for any gaps or tears in the insulation and protective sheeting. Note location.		
8	PIPING AND NOZZLES		
	a Visually inspect piping and nozzles for signs of distortion and stress. Note location.		
9	HOUSEKEEPING		
	a Inspect the tank area for buildup of trash or vegetation.		
10	GROUNDING		
	a Visually check that ground wire is attached to tank shell.		
11	CATHODIC PROTECTION		
	a If cathodic protection system is present, take readings.		
12	WALKWAYS AND PLATFORMS		
	a Visually inspect that walkways and platforms are in good working condition.		
13	NOTES / DRAWINGS		
14	MANAGER NOTES / APPROVAL		
Manager Notes: <div style="height: 100px; border: 1px solid black; margin-top: 5px;"></div>			
Manager Approval: _____		Date: _____	
Maintenance required: <input type="checkbox"/> YES <input type="checkbox"/> NO			

Gulf Sulphur Services Ltd., LLLP
Routine Visual Inspection Form #1

TANK LOCATION GUIDE



	81 ft dia. tank	99 ft dia. tank	130 ft dia. tank
Arc Length	18.2 ft. approx.	22.2 ft. approx.	29.2 ft. approx.

Tank Coating and Roof Plate Corrosion Study

In December 2013 Gulf Sulphur Services installed an anti-corrosive coating called ElastiKote® 1000 on the external roof plate for Tanks 7 and 8 at the Hooker's Point terminal in Tampa, Florida. This document outlines the inspection criteria that will be used to assess the performance of the coatings on a sulfur tank roof.

Tank Roof Coating Assessments:

The roof coatings will be evaluated annually based on NACE criteria at three defined locations on each Tank 7 and 8. These locations will be documented to ensure repeatability at their initial inspection in January 2015. The inspections will require removal and reinstallation of the insulation and protective insulation skin. Due to the potential of water ingress at the inspection locations, they will be a focus area on monthly inspections to ensure integrity of the replaced/patched skin.

The coating assessments will be maintained in each tank's electronic file so as to be available for a comprehensive analysis on performance of the coatings for sulfur tank roofs. Initial reports from these assessments should be expected following the next five-year API 653 In-Service (external) inspection in or around 2018.

Roof Plate Corrosion Study:

In addition to assessing the performance of the coating on the outside of the tank roofs, evaluations of the roof plate thickness will also be performed. Tanks 2 and 3, which have not been coated, will be used as "control tanks" for corrosion rate comparison. The corrosion rates will be calculated based on Pulsed Eddy Current (PEC) readings taken bi-annually on Tanks 2, 3, 7 and 8. The PEC readings will be validated against Ultrasonic Thickness (UT) measurements taken in the same areas during each tank's API 653 in-service inspections.

The Roof Plate Corrosion Study will be used to evaluate the effectiveness of ElastiKote® 1000 to significantly reduce the rate of corrosion of the roof plate on our sulfur tanks. Coating the outside of the roofs on tanks 7 and 8 will limit corrosion in the event water penetrates the protective skin. The lack of coating on control tanks 2 and 3 will allow them to be a "control" as all four tanks are in identical service.

The results of the Roof Plate Corrosion Study should be expected following a full five-year API 653 In-Service (external) inspection interval for each tank.

The methodology and thickness measurement maps for each tank are included in the attached appendices.

The timeline of events for the roof plate corrosion study is shown in the table below. These dates may change based on the results of subsequent inspections and corrosion analysis.

Tank #	UT Baseline (Test 1)	PEC Baseline (Test 1)	PEC Test #2	PEC Test #3	UT Test #2	PEC Test #4
HP Tank 2	Mar 2014	Mar 2014	Mar 2016	Mar 2018	Mar 2019	Mar 2020
HP Tank 3	Mar 2014	Mar 2014	Mar 2016	Mar 2018	Mar 2019	Mar 2020
HP Tank 7	Mar 2014	Mar 2014	Mar 2016	Mar 2018	Mar 2019	Mar 2020
HP Tank 8	Mar 2014	Mar 2014	Mar 2016	Mar 2018	Mar 2019	Mar 2020

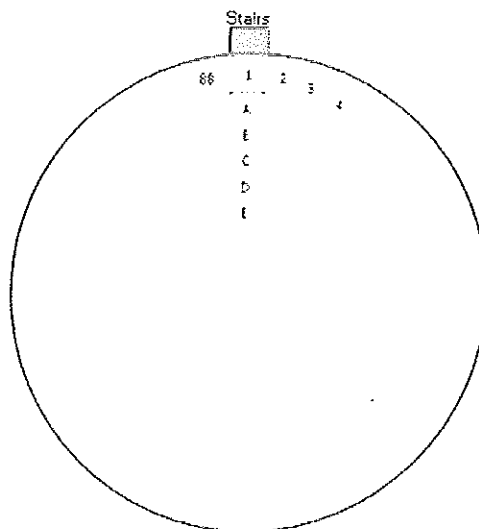
A corrosion rate analysis shall be performed comparing each set of UT or PEC measurement data for an individual tank. This analysis shall be performed within 2 months of issuance of the finalized inspection report. This data shall be extrapolated to ensure sufficient roof thickness ($>0.090''$) in any 100 in² area will remain through the next scheduled inspection date.

Appendix A: PEC Inspection Mapping

Each Pulsed Eddy Current Inspection will include measurements taken around the circumference.

Circumference Inspection

The tanks were measured into 5 or 6' increments (depending on the sheeting size) around the circumference, and the shots were taken moving inward toward the center in 1 foot increments; i.e. A is 1 foot, B is 2 feet, etc.

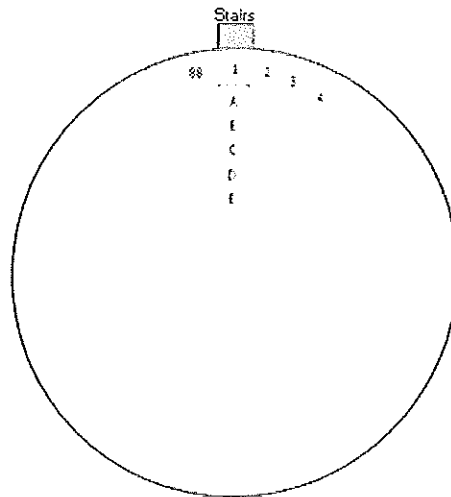


Appendix B: Tank 2 – Thickness Measurement Map

Gulf Sulfur Service - Hookers Point

Tank 2 - Outer Edge

Nominal Thickness : 0.25"
 Sheeting Type : Older Galv-Alum and new patches
 Axial Grid : 1 foot
 Circ. Grid : 6 foot
 Data File name : Tank 2 - Outer Edge Rev 2.dat
 Ref. Point(s) : C28, E58
 Used Probe : V1.0
 Probe Setting : V10W4G10NF
 Operator(s) : Bill Schmidt
 Date of examination : 1/23/2014



Result in %

	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	
AWT	A	B	C	D	E	F	G	H	I	J	
1	74	66	62	X	X						N
2	D	D	D	D	D						
3	D	D	D	D	D						
4	D	D	D	D	D						
5											
6											N
7											N
8	X	X	X	X	X						N
9											
10	100	94	103	96	82	X					
11											
12	87	86	75	97	98						
13						108					
14	X	X	96	98	X	89	X	96			
15						93					
16	X	V	V	85	88						
17											
18	X	X	91	X	80	85					
19											
20	X	X	X	X	98						
21											
22	X	91	X	94	96						
23											
24	100	99	98	X	104						
25											

Page 4 of 20

73											
74	93	93	84	92	93	82					
75	X	73	90	87	88	84	79	86	91	81	
76	76	71	88	80	74	83	80	87	77	79	
77	90	X	85	95	88	99	99	89	78	77	
78	87	94	96	93	X	95	88	86	89	96	
79											
80	X	X	66	83	91	X	89	87	X	93	
81											
82	86	X	86	69	88	85	73	97	84	82	
83	66	67	58	88	X	X	100	91	94		
84	75	76	101		101	102	101				N
85				X							
86	81	87	91	91	88						
87											
88	X	X	X	X	100	100					N

Colors legend in
%

45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	>104
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	---------	------

N	Row with new metal sheeting
X	Unreliable signal
	Pipe
Q	support
B	Bridge abutment
D	Decking
V	Vent

Appendix C: Tank 3 – Thickness Measurement Map

Gulf Sulfur Services - Hookers Point

Tank 3 - Outer edge

Nominal Thickness : 0.25 "
 Sheeting Type : Galv-alum
 Axial Grid : 12"
 Circ. Grid : 5'
 Data File name : Hookers - Tank 3.dat
 Ref. Point(s) : D43
 Used Probe : P1.5
 Probe Setting : P15W5G10F
 Operator(s) : Bill Schmidt
 :
 Date of examination : 3/18/2014

Result in %

AWT	A	B	C	D	E	F	G
1	87	109	96	97	87	94	87
2	83	109	92	98	95	94	94
3							
4	86	116	92	95	95	92	93
5	84	114	97	93	94	93	94
6	85						
7							
8	93	93	93	93	93	94	96
9	91	94	98	97	99	100	106
10	87	93	97	94	96	96	95
11							
12							
13							
14	117	115	97	97	100	96	96
15	89	97	131	120	110	103	126
16	85	87	87	101	127	98	97
17	88	90	89	89	87	93	123
18	92	91	90	92	89	91	88
19	88	89	90	89	91	90	90
20	90	88	87	97	95	90	91
21	110	122	108	105	113	128	121
22							
23							
24	93	94	102	105	92	89	91

Diagonal beam

Beam

25	91	95	93	122	94	88	89
26	91	92	95	97	122	91	90
27							
28							
29	97	95	94	94	99	96	100
30	96	94	94	96	97	95	96
31							
32							
33							
34	91	96	113	95	95	94	95
35	94	93	128	98	98	95	104
36	93	92	97	103	100	96	96
37	94	94	96	125	111	96	97
38							
39							
40	93	91	96	96	97	113	97
41	95	91	95	93	96	96	110
42							
43							
44							
45	95	95	97	94	94	93	95
46							
47							
48							
49	100	97	93	93	94	99	95
50	102	112	97	100R	92	93	108
51	98	117	95	93	94	98	113
52							
53							
54	P	P	131	94	96	94	97
55	162	P	P	92	91	93	92
56	P	P	P				
57	P	96	113	95	89	93	93
58							
59							
60	95	121	135	94	96	95	94
61	91	94	118	96	95	95	94
62							
63	94	93	113	97	97	95	102
64	B	93	100	98	88	97	93
65	94	96	93	95	89	97	91
66							
67							
68							
69	H	97	94	94	92	94	93
70	113	95	90	93	93	96	96
71	107	95	93	95	95	95	95

Diagonal beam

72							
73	100	95	94	94	96	94	94
74	103	96	96	100	104	99	102
75	95	95	91	93	95	95	95
76	95	96	94	93	96	96	95
77							
78							
79	98	94	93	95	99	124	90
80	110	114	119	118	148	115	131
81	95	95	96	94	119	90	91
82							
83							
84	96	93	101	89	93	91	91
85	98	115	96	90	92	91	95
86	123	102	124	101	101	100	112
87	87	86	88	87	105	89	90
88	90	89	90	89	91	113	92
89	91						
90	V	93	90	92	90	90	88
91	V	V	90	90	93	91	97
92	123	99	101	103	113	119	130
93	87	89	90	90	117	95	90
94	86	88	89	114	91	89	89
95	83	91	119	91	88	90	91
96	88	117	90	89	88	91	90
97	98	90	91	89	90	90	89
98							
99	86	90	88	96	91	90	88
100	84	90	87	89	92	91	88
101	88	89	88	88	92	90	85
102	90	85	85	87	87	95	121
103	88	92	91	113	130	92	107
104							
105	95	91	90	91	91	91	93
106	87	89	91	89	91	93	89
107							
108							
109	86	90	96	99	94	93	103
110	86	88	89	91	92	90	93
111	87	87	87	90	91	85	87
112	83	87	91	111	103	102	96
113							
114	96	91	97	93	94	96	93
115	95	91	96	94	102	95	96
116	118	114	112	116	121	117	128
117							
118	93	92	94	94	93	98	97

Beam

Diagonal Beam

Diagonal Beam

Beam

119	95	99	97	97	96	97	100	Beam
120	125	108	112	105	117	120	120	
121	86	87	89	91	92	93	98	
122	92	94	92	96	99	100	104	
123								
124								
125	88	87	92	90	91	92	93	
126	87	89	91	89	91	90	91	
127								
128								
129								
130	90	91	90	90	92	89	87	
131	88	90	88	91	89	90	93	
132								
133								
134	87	89	93	90	91	90	91	
135	88	90	92	92	90	90	91	
136								
137								
138								
139	94	94	96	94	98	96	125	Beam
140	100	99	103	99	115	120	123	
141	V	119	92	94	95	96	96	
142								
143								
144	94	94	96	95	96	92	95	
145	111	98	98	103	111	114	120	Beam
146	109	148	115	112	128	130	126	Beam
147	97	96	100	103	95	95	95	
148	90	92	94	99	120	96	97	
149	90	92	95	97	96	124	99	
150	88	96	96	95	97	102	113	Diagonal Beam
151	105	94	96	93	98	97	125	
152								
153								
154	96	96	95	94	95	98	107	
155	103	95	99	97	92	109	110	
156	126	96	96	95	101	105	95	
157								
158								
159	93	96	112	97	96	92	95	
160	92	98	95	113	96	96	98	
161	91	94	98	123	97	99	96	
162								
163								
164	91	95	93	96	97	106	94	
165	93	97	99	97	98	130	98	

166	92	95	98	96	96	132	96	Beam
167								
168								
169	98	105	109	108	104	105	145	
170	89	97	100	95	96	98	108	
171	91	97	97	95	96	96	111	
172								
173								
174	99	94	95	93	96	94	95	Beam
175	101	104	109	105	104	99	105	
176	96	98	103	100	105	109	105	
177	96	94	96	95	95	95	100	
178								
179								
180	95	94	98	94	97	95	97	
181	95	94	98	95	96	95	97	
182								
183								
184	96	94	95	95	97	96	96	
185	99	94	98	95	93	97	96	
186								
187	92	95	95	94	96	99	122	Diagonal Beam
188	97	114	119	99	96	96	115	
189	95	94	94	97	102	113	105	
190	98	95	97	99	98	100	99	
191	93	94	95	96	97	122	97	
192	93	94	95	97	99	123	98	
193								
194	92	93	95	97	122	96	98	
195	89	93	97	96	98	97	98	
196	96	97	95	109	95	96	96	
197								
198	97	95	119	95	97	95	95	
199	V	V	120	107	108	109	110	Beam
200	V	V	88	115	94	93	96	
201	124	90	89	89	111	98	95	
202								
203								
204	87	88	91	88	90	88	87	
205	111	120	129	120	114	106	112	
206	90	89	92	91	91	90	98	
207								
208								
209								
210	88	90	127	98	91	91	94	Beam
211	100	128	125	120	108	112	114	
212	115	93	90	91	93	91	100	

213							
214							
215	91	89	89	91	89	90	90
216	92	90	89	91	92	90	91
217	101	104	138	122	115	128	127
218	91	88	88	89	87	113	99
219	90	87	90	106	105	96	97
220	90	93	113	97	99	96	94
221	94	97	99	94	95	96	94
222							
223							
224							
225	92	95	93	95	97	96	94
226	93	94	94	95	98	96	95
227							
228							
229	91	94	96	96	98	123	95
230	91	94	94	97	98	121	97
231	94	94	93	96	94	106	97
232							
233							
234	93	98	93	97	98	96	146
235	107	96	94	103	99	96	109
236	B	93	93	96	P	93	123

Beams

Colors legend in
%

45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	>104
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V	Vent	P	Pipe	100R	Reference Point
B	Bridge Attachment	H	Handrail		Reading influenced by attachment

Appendix D: Tank 7 – Thickness Measurement Map

Gulf Sulfur Services - Hookers Point

Tank 7 - Outer Edge

Nominal Thickness : 0.25"
 Sheeting Type : None - uninsulated
 Axial Grid : 1 ft
 Circ. Grid : 1 ft
 Data File name : Tank 7 - Outer Edge.dat
 Ref. Point(s) : B
 Used Probe : P1.5
 Probe Setting : P15W5G10NF
 Operator(s) : Bill Schmidt
 Date of examination : 3/28/2014

Result in %

AWT	A	B	C	D	E	F	G	H	I	J
1	100	93	91	113	128	X	X			
	H									
5	H	88	87	98	96	99	115			
	H									
10	H	111	B	140	149	120	114			
	H									
15	H	81	82	93	107	95	103			
	H									
20		96	97	101	85	90	100	108		
25		85	81	101	93	93	103	93		
30		98	100	90	87	122	117	85		
35		93	101	87	98	95	91	96		
40		95	100R	97	87	95	96	94		
44						98	103	111		
45	109	114	85	85	84	80	80	82	87	91
46						83	81	87		
47						86	81	86		
48							84			
49										
50	122	114	111	115	122	116	99			
55	81	85	87	99	114	121	111			

60	84	95	93	101	119	114	120
61	76	75	78	S	98		
62	74	S	80	94			
63	73	72	81	83	87	84	78 98
64	71	73	86	87			
65	70	72	92	99	100	100	88
66	71	73	88				
67	84	83	94				
68							
69	95	108					
70	75	80	93	105	103	99	92
71	70	72	92				
72	69	70	86	101			
73	S	112	S	110			
74	112	110					
75	103	94	P	P	100	94	103
76							
79	80	84	89	97	87		
80	70	75	87	85	92	101	99
81	70	80	90				
82	75	74	85	87			
83	79	72	85	89			
84	91	89	96				
85	72	76	96	103	110	114	118
86	96	99	77	92	91	96	103
87	V	V	81	94	97	102	105
88	75	79	91	101			D
89	84	91	98	D			D
90	105	98	99	107	111	111	116
91							
95	98	108	107	104	93	92	107
96							
100	98	105	95	94	95	99	105
101							
105	125	120	93	98	101	97	104
106							
110	93	84	104	93	105	104	101
111							
115	110	115	89	89	103	103	102
116							
120	92	90	99	89	102	100	98
121							
125	194	108	102	101	103	107	99
126							
130	108	92	105	113	126	108	107
131							
135	89	89	105	104	103	105	101

140	93	87	86	86	96	127	96
145	95	95	103	125	103	128	97
150	97	103	105	97	115	117	105
153	105	112	115	144	167	144	104
154	86	81	86	109	105		
155	80	68	78	104	110	103	101
156	81	73	89	96			
157	83	79	92				
158	95	94	95				
159							
160	82	90	85	89	98	98	102
161	106	V	90	89	101		
162	V	V	108				
163	82	86	92				
164	88	88	89				
165	96	109	94	95	94	97	101
170	100	99	91	105	109	94	101
175	114	105	129	109	110	110	116
180	123	101	105	113	115	100	99
185	100	103	107	102	96	92	99
192	92	98	105	110	105	100	101
195	85	93	91	99	102	103	105
200	120	131	100	99	108	108	103
205	98	110	107	103	100	103	101
210	88	100	103	122	120	121	111
215	112	103	127	120	114	105	101
218		121					
219		82					
220	96	83	94	104	101	106	107
221		95					
222							
223					103	107	100 103 107

224						82	89	85	82	85
225	95	124	88	90	109	83	88	85	84	83
226						85	88	86	84	86
227						91	100	111	106	108
230	99	98	104	105	103	85	89			
235	101	99	102	103	104	104	98			
240	V	V	91	102	96	102	102			
245	90	115	92	96	100	104	94			
250	110	111	130	125	102	105	107			
255	96	103	105	113	118	109	109			
260	125	126	128	103	103	97	99			
265	105	115	100	110	109	106	100			
270	107	104	116	122	116	107	96			
275	104	100	115	108	115	116	111			
280	97	94	89	104	102	109	121			
284		86								
285	87	74	90	90	95	104	103			
286	94	76	88							
287	95	80	85							
288	82	77	91							
289	83	77	91							
290	94	97	95	90	102	113	125			
291	81	84	95							
292	77	85								
293	76	87	107	114	89	98	94			
294	83	84	83	116	84	91	91			
295	88	81	82	118	88	97	93			
296	77	78	84	105	91					
297	76	73	77	103	77	100	96			
298	H	75	82	96	82	97				
299	H	99	103	110						
300	H	96	103	106	98	127	140			
301	H	90	115	106	98					
302	H	84	86	95	87	94				
303	H	84	83	95	93					

304	H	85	85	91	87		
305	H	89	88	88	85	85	100

Colors legend in
%

45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	>104
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V
B
P

Vent
Bridge Attachment
Pipe

T
X
S

Triple
plates
Unreliable signal
Support

H
D
C

Handrail support
Double plates
Hatch cover

Appendix E: Tank 8 – Thickness Measurement Map

Gulf Sulfur Services - Hookers Point Tank 8 - Outer Edge

Nominal Thickness : 0.25"
 Sheeting Type : Aluminum - New
 Axial Grid : 1 ft
 Circ. Grid : 1 ft
 : Tank 8 - Outer
 Data File name : Edge.dat
 Ref. Point(s) : I43
 Used Probe : P1.5
 Probe Setting : P15W5G10NF
 Operator(s) : Bill Schmidt
 Date of examination : 3/28/2014

Result in
%

AWT	A	B	C	D	E	F	G	H	I	J
1	74	73	74	75	85	87	97	112	89	89
2	H	82	84	87	98	95	104	121	86	88
3	H	94	101	105	107	123	122	104	83	86
4	H	86	88	89	88	C	C	108	84	85
5	H	81	102	104	115	97	108	103	122	104
6	H	79	92	103	110	95	105	111	115	89
7	H	74	85	92	90	87	91	111	105	90
8	H	72	77	85	85	88	88	95	109	88
9										
10	97	101	97	95	96	94	100	120	101	111
15	101	93	104	88	101	95	104	109	109	110
20	88	90	90	86	86	86	85	107	96	88
25	127	V	105	107	110	111	107	114	85	79
30	88	81	80	80	80	80	81	104	108	90
35	85	81	80	81	80	81	81	92	101	87
40	82	78	79	79	79	104	105	99	94	93
45	82	77	78	88	78	90	101	104	100	96
50	90	88	91	97	97	95	103	103	100R	91

51					101	99	105	100	103	94
52					92	96	98	93	97	96
53					89	103	95	97	95	96
54					89	104	95	96	97	94
55	89	103	95	94	90	95	93	94	93	96
60	111	120	117	96	98	107	94	96	93	99
65	90	96	98	94	98	102	100	99	97	92
70	98	91	96	94	98	98	98	100	96	97
75	92	96	91	93	99	98	99	96	95	94
80	104	112	111	103	95	97	96	95	92	93
85	97	101	104	101	99	99	111	113	123	124
90	120	125	143	126	118	105	109	109	104	106
95	101	100	104	100	100	104	104	102	110	96
96	96	98	99	105	103	105	111	117	126	110
100	90	91	99	98	107	97	90	93	97	91
105	93	94	91	92	105	92	95	105	100	100
110	83	91	89	89	91	90	87	90	86	95
115	105	105	104	86	93	92	88	87	89	88
120	90	84	91	84	86	88	88	91	93	89
125	84	84	87	80	74	78	91	88	88	97
130	83	81	80	100	95	84	88	89	89	90
135	83	81	80	92	82	88	84	89	93	88
139	88	79	79	108	84	87	84	84	100	92
140	123	113	113	130						
145	98	101	109	114	115	122	122	129	123	117
150	83	81	83	85	89	89	89	89	90	91
155	82	83	82	83	83	82	82	82	82	99

160	83	84	83	84	85	85	83	86	85	85
164	92	83	84	83	84	84	88	94	96	111
165	112	115	122							
170	101	114	104	91	94	99	96	92	88	87
175	80	77	76	78	79	87	79	82	86	86
180	84	83	83	80	105	79	86	96	89	91
185	88	82	82	103	88	91	90	90	90	96
190	81	80	82	112	92	93	89	91	92	92
195	92	93	91	90	96	95	101	96	95	96
200	79	86	90	91	92	95	97	93	97	96
205	114	84	115	93	93	91	90	96	85	91
210	82	79	85	80	89	97	86	91	95	81
215	99	95	88	85	91	77	77	94	95	88
220	111	83	81	82	79	76	79	80	105	85
225	98	89	93	105	89	87	85	107	115	87
230	91	98	92	102	92	87	86	114	105	100
235	95	79	80	82	83	81	79	115	96	90
240	88	78	77	77	79	78	80	101	103	87
245	80	77	76	75	75	76	77	96	86	89
250	84	82	88	97	92	90	85	95	93	96
255	93	79	79	78	85	94	95	95	90	94
260	85	78	76	76	76	76	78			
261	80	74	75	75	74	74	76			
262	82	78	77	79	79	79	81			
263	98	91	96	93	89	91	101			
264	85	74	74	74	75	76	80			

265	89	104	111	114	115	119	123
266	89	112	109	128	123	126	129
267	82	94	93	90	93	91	90
268	H	93	93	91	99	105	97
269	H	80	95	87	91	97	98
270	H	73	73	73	73	73	86
271	H	71	70	73	73	73	81
272	H	70	70	73	75	77	85
273	H	93	93	114	110	111	128
274	H	72	70	73	71	73	98
275	H	74	77	74	74	75	109
276	H	73	76	77	72	74	95
277	H	72	75	72	72	74	90
278	H	80	84	81	79	81	91
279	B	C	C	C	75	89	102
280	B	C	C	C	75	92	97
281	B	C	C	C	74	88	95
282	B	C	C	C	96	97	115
283	B	77	74	77	78	99	115
284	B	77	77	75	76	85	112
285	B	77	77	76	76	87	99
286	B	76	75	73	74	89	109

Colors legend
in %

45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	>104
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V
B
P

Vent
Bridge
Attachment
Pipe

C
X
S

Hatch cover
Unreliable signal
Support

H

Handrail support



PRODUCT DATA SHEET

ElastiKote® 1000

Part Number
10-RF-WH-05
10-RF-WH-50
10-RF-BL-05
10-RF-BL-50
10-RF-SI-05
10-RF-SI-50
10-RF-LG-05
10-RF-LG-50

Rev. 4-5-2013
1 of 4

DESCRIPTION

ElastiKote® 1000 is a flexible, high performance, watertight, puncture resistant ready-to-use single component fluid-applied styrene ethylene butylene styrene (SEBS) liquid resin used in the restoration of roof substrates such as:

EPDM	EIFS	Hypalon®	KEE (Elvaloy®)	Spray Polyurethane Foam
PVC	TPO	Galvanized Metal	Plywood	Concrete
Kynar	Granular Surfaced APP Modified- Bitumen	Smooth Surfaced Coal Tar Pitch BUR	Granular Surfaced SBS Modified Bitumen	Smooth Surfaced Asphalt BUR

Although ElastiKote 1000 can be used on asphalt roof substrates, the recommended protocol is ElastiKote 1000 SB and 1000 XP. For further information refer to those Product Data Sheets. ElastiKote 1000 having a Solar Reflective Index of 108 enables the owner to maximize energy savings. To promote long lasting protection, ElastiKote 1000 is formulated to minimize ozone and UV radiation degradation vulnerability. ElastiKote 1000 is available in white, black, silver, light gray, clear, and custom colors in 5-gallon pails or 50-gallon (net by weight) drums.

PRODUCT CERTIFICATIONS

ElastiKote LLC Certification

ElastiKote 1000 @ 21 dry mils (inclusive of reinforcement scrim) passed UL 580 Tests for Uplift Resistance of Roof Assemblies. ElastiKote 1000 passed at 318.5 psf. This test simulates hurricane force winds from above and below the roof deck.



ElastiKote 1000 is classified by Underwriters Laboratories Inc. to ANSI/UL 790 Test for Fire Resistance of Roof Coating Materials.



Miami-Dade County Product Control Division has issued an NOA for ElastiKote 1000. The product is also listed in the Florida Building Code List of Approved Products.

ElastiKote 1000 is also listed in the Florida Power & Light list of Building Envelope Reflective Roofing Approved Technologies for their residential and commercial rebate programs.



Registered to
ISO 9001:2008

ElastiKote 1000 is manufactured in our ISO 9001:2008 Registered facility located in Smithville, Ohio. ISO 9001 is an International Quality Standard.



ElastiKote 1000 is Energy Star listed and far exceeds the LEED® Solar Reflective Index (SRI) requirement.



ElastiKote 1000 is in the Texas Department of Insurance listing of Products Qualifying for Impact Resistance Roofing Credits. ElastiKote 1000 passed UL 2218 Impact Resistance of Prepared Roofing Materials. Passed Class 4, the most severe hail simulation.



The Cool Roof Rating Council lists ElastiKote 1000.

www.elastikote.com

Toll free (800) 992-1053

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TECHNICAL INFORMATION

Unless otherwise stated, results are per ASTM D 6083 laboratory testing.

¹Fully cured sample per laboratory testing

²Tested with ElastiKote 1000, refer to the ElastiKote 1000 SB & XP Product Data Sheets for recommended protocol results

* Colors not guaranteed against color shift

PHYSICAL PROPERTIES	
Physical State	Viscous liquid
Viscosity @ 77° F, cps	5,000 +/-500
VOC	< 250 g/l
Solar Reflectance Index (white only)	108
FILM PROPERTIES	
Initial Tensile Strength @ 73° F, psi	1502
Tear Resistance lb/in	208
Initial Elongation @ 73° F, %	1069 (2 weeks cure time)
Initial Elongation @ 73° F, % fully cured	¹ 1240
Permeance, perms	2.7 (2 weeks cure time)
Permeance, perms, fully cured	¹ 0.08
Water Swelling, Mass %	0
Wet Adhesion to concrete, pli	7.5
Wet Adhesion to EIFS, pli	7.96
Wet Adhesion to EPDM, pli	3.4
Wet Adhesion to galvanized metal, pli	6.1
Wet Adhesion to Hypalon, pli	7.0
Wet Adhesion to KEE, pli	2.1
Wet Adhesion to Kynar coated metal, pli	8.6
Wet Adhesion to PVC, pli	6.8
Wet Adhesion to Spray Polyurethane Foam, pli	3.4
Wet Adhesion to TPO, pli	10.5
Wet Adhesion to granular surfaced SBS Modified Bitumen, pli	² 5.4
Wet Adhesion to smooth surfaced asphalt BUR, pli	² 2.8
Wet Adhesion to smooth surfaced Coal Tar Pitch BUR, pli	² 2.5
Fungi Resistance, rating	0
FILM PROPERTIES AFTER 1000 HOURS ACCELERATED WEATHERING	
Elongation @ 73° F, %	1029
Low Temperature Flex	Pass
Appearance after 1000 hrs accelerated weathering	Pass
Wind Driven Rain	Pass

Roof Restoration-Project Overview

For specific detailed information refer to the ElastiKote material substrate specification.

Storage and Handling

Maintain materials in their original unopened containers with all labels intact and legible. Store containers on pallets in a protected area. Store in areas where maximum temperature does not exceed 90°F and at a minimum of 40°F. Never store drums in an open environment without using proper protective moisture proof covering as condensation or rain, under certain conditions, may infiltrate and contaminate the drum contents through the "bung" and ring areas. KEEP OUT OF REACH OF CHILDREN. KEEP AWAY FROM FLAME OR ANY OTHER SOURCE OF IGNITION. For additional safety & health information, refer to the MSDS for this product.

Roof Inspections

Inspections may include a pre-application technical field evaluation for determination of the acceptability of the substrate. An adhesion test may be required to ensure compatibility with the existing target substrate. At the conclusion of the project a final inspection may be conducted.

Applicator Qualifications

All ElastiKote certified applicators are thoroughly trained by the Manufacturer in all aspects of use and application of materials. Certification credentials are issued upon completion of training activities.

Surface Preparation

Surface must be dry, clean, and free from dirt, loose rust and foreign substances. Certain surfaces may require power washing starting @ range up to 3750-4000 psi for metal and decreasing psi depending on substrate and/or conditions. Utilize wire brushing to remove loose mill scale, biomass, expended paint or coatings, corrosion or any other loose or foreign particulate. Certain surfaces may require abrading, scraping, or pickling to ensure proper adhesion. Certain surfaces must be cleaned and primed with a Manufacturer approved product. Existing target surface will dictate need for implementation of abrading and priming procedures.

Tools & Equipment

Follow personal protective equipment requirements as listed on material MSDS. Utilize appropriate OSHA safety equipment. Drum and/or pail 4" wide heat bands or heat exchanger, wet mil gauge, infrared thermometer, digital moisture meter, and paddle type mixer are required. Use a smooth-medium (1/4" - 3/8" nap) roller if rolling. Spray application is the preferred method for all sprayable materials. Use a Graco 733, Graco 833, (3 gpm output & displacement pump of 3500 psi) or similar equipment with appropriate tips. Use tarpaulins or other durable materials to protect adjacent areas from damage.

Material Preparation

All ElastiKote 1000 topcoats/basecoats must be properly heated and stirred prior to either spray or roller application. To maximize product performance and ease of application, always heat the product to a temperature range of between 80°F and 120°F with 4" wide heat bands or heat exchanger. When using spray type application methods, it is especially important to heat product to ensure proper viscosity for maximum performance of applied product in both warm and cold weather. Attempting to spray ElastiKote 1000 at the low end of the temperature range of around 90°F has been found to result in "webbing". Typical minimum ElastiKote 1000 temperature for spraying is greater than 90°F. Spray pump cavitation caused by suction leaks (or from worn seals) will allow air into the product causing pinholes. It is acceptable to install product at 80°F when using roller or brush applications.

Material Heating Guide

*ElastiKote 1000 application temperature (top)															
**Target substrate temperature (bottom)															
*120	110	100				95		90		85		80			
**40	50	60	70	80	90	100	110	120	130	140	150	160			

To work efficiently, keep two or three 5-gallon pails or two 50-gallon drums heating and/or stirring ahead of crew. Heating a 5-gal pail from 70°F to 100°F with one 4" wide heat band on max (#10 setting) should take approximately 10 minutes. Heating a 50-gallon drum from 70°F to 100°F when using a heat exchanger should take between 20 - 30 minutes. Heating a 50-gallon drum from 70°F to 100°F with two 4" wide bands heaters on max (#10 setting) should take approximately 30 - 40 minutes.

Stir entire heated material container (summer & winter) thoroughly prior to application. Always mix (stir) from bottom to top using a paddle type mixer at a minimum of 20 minutes for a 50-gallon drum and 5 minutes for a 5-gallon pail. Be diligent that paddle sweeps actual bottom of container. Do not over mix (or allow air bubbles) as this will result in pinholes.

Determine "on site" the proper application temperature for efficient and quality assuring best practice product installation. Temperature selection can vary. Selection will be impacted by existing ambient air temperature, target roof substrate temperature, specific roof slope and size, and the type and size of selected spray pump and spray tip to be used. Always synchronize the heating process of the material to be installed with target substrate temperature. When target substrate is equal (very hot during the summer) or in excess of the product application temperature, always adjust the product temperature before application. If applied product becomes too hot from the combination of preparation heating and exposure to extreme heat of target substrate, the product will run or "sag" resulting in low and unacceptable millage thickness.

ElastiKote® 1000

4 of 4

Application

Apply product using appropriate spray equipment (preferred method) or product may be rolled with a smooth-medium nap roller or soft brush at ambient temperatures above 40°F (4°C). Remove all filters from spray unit or spray guns. Use heavy-duty (XHD) tips without a diffuser or atomizer bar. Tip sizes range from 625 to 633 and 725 to 733. Tips may need to be adjusted depending on slope and product. Hold spray wand during application no higher than 12 inches from target substrate with 50% overlap and allow product to "FLOW" AND "SELF-LEVEL". Always spray at a straight "up and down" or 90° angle to enhance performance. Always remix product after any application work stoppage of 20 minutes or more to ensure critical additives stay in suspension.

Minimum Suggested Coverage Rate

Target surface dictates actual rate. Refer to guidelines in the Elastikote material substrate specification.

Apply in two coats at a minimum of 21 wet mils per coat (1.5 gallons per 100 sq ft per coat) for low slope surfaces.

The combined two (2) coats result in a finished coating @ a minimum of 21 dry mils.

Vertical surfaces typically take 3 coats @ 14 wet mils per coat to properly build final millage.

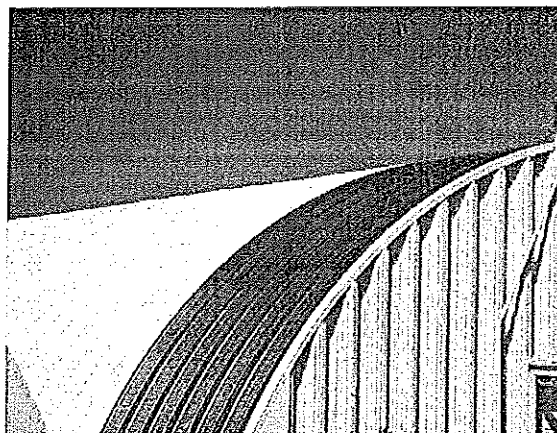
Drying Time

2-4 hours (typical) in optimal weather conditions before recoating.

4-6 hours (typical) in non-optimal weather conditions before recoating.

Clean-Up

Clean equipment, brushes, rollers, and tools using Regular Mineral Spirits.

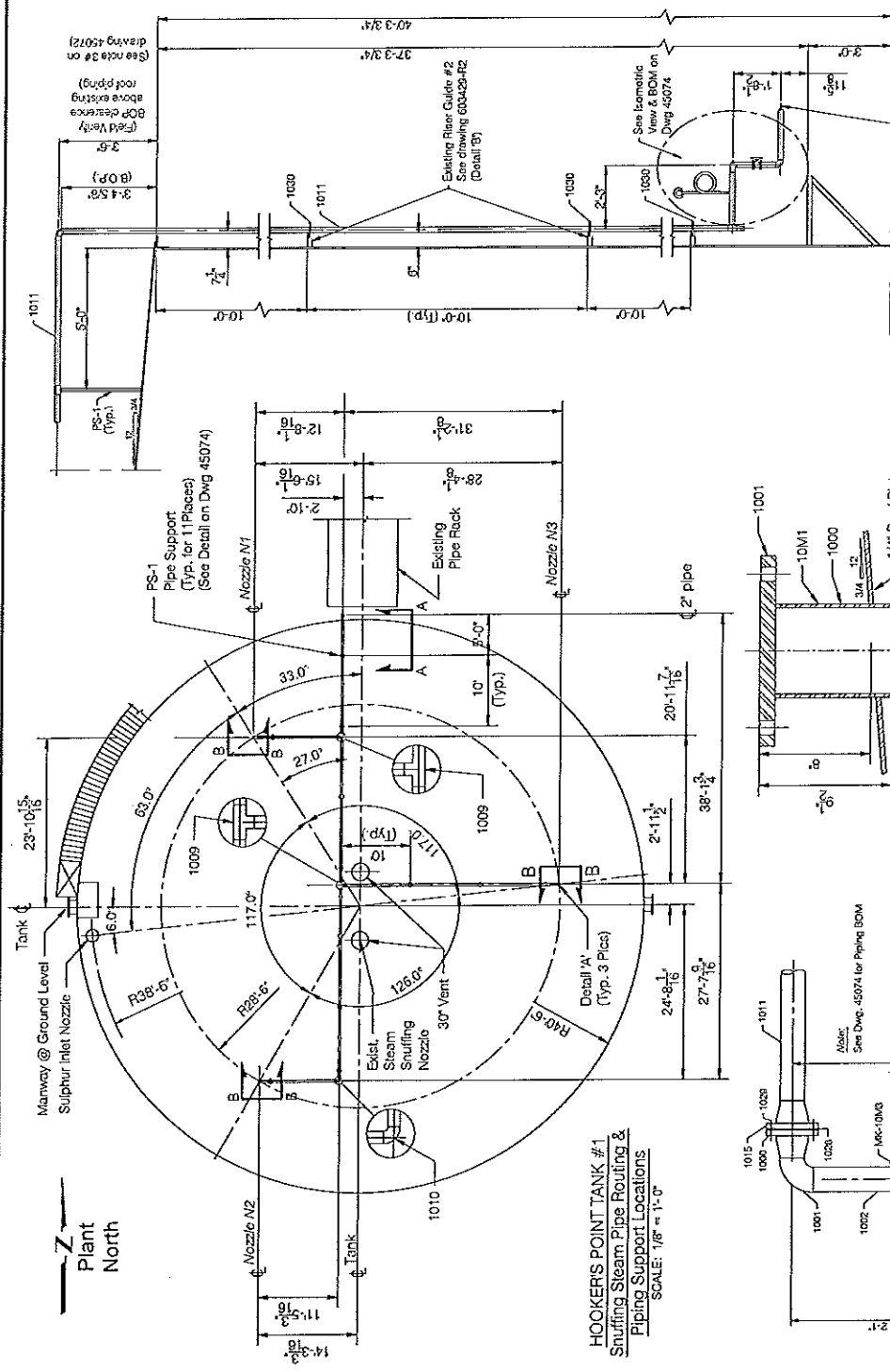


Hookers Point - Steam Smothering System Upgrades

Tank Number	Required Changes	Complete? (Yes/No)	Completion Date	Estimated Completion
Tank 1	See attachment 1 - Increase size of supply line from 1.5" to 2", nozzles from 1 to 3 nozzles	No		6/30/2014
Tank 2	See attachment 1 - Increase size of supply line from 1.5" to 2", nozzles from 1 to 3 nozzles	No		6/30/2014
Tank 3	See attachment 1 - Increase size of supply line from 1.5" to 2", nozzles from 1 to 3 nozzles	Yes	4/22/2014	
Tank 4	See attachment 1 - Increase size of supply line from 1.5" to 2", nozzles from 1 to 3 nozzles	No		6/30/2014
Tank 5	See attachment 1 - Increase size of supply line from 1.5" to 2", nozzles from 1 to 3 nozzles	No		6/30/2014
Tank 6	See attachment 1 - Increase size of supply line from 1.5" to 2", nozzles from 1 to 3 nozzles	No		6/30/2014
Tank 7	See Attachment 2 - Increase size of supply line to 3", nozzles from 1 to 3 nozzles, vent size from 10" to 16"	Yes	2/1/2014	
Tank 8	See Attachment 2 - Increase size of supply line to 3", nozzles from 1 to 3 nozzles, vent size from 10" to 16"	Yes	12/15/2013	

Notes for Tank #1 Snuffling Steam Piping

- The existing 1 1/2" Snuffling Steam Piping from the 10-in at the 2" line in the pipe rack to the single Steam Snuffling Nozzle on the roof is to be replaced with 2" piping.
- The lean point for the new 2" snuffling steam line is at the same location as the existing 1 1/2" steam line.
- The 2" snuffling steam piping should be run horizontally on tank roof without any change in elevation so as to connect with the flanges on the 3 steam snuffling nozzles as shown in View "B-B" on Dwg 45074. This should result in the CL of the 2" pipe being located approximately 3'-6" above the top of the tank shell as shown in View "A-A". If there are piping or other obstructions interfering with the routing, proceed as follows:
 - If routing the 2" steam snuffling piping per note 3 results in hitting existing piping on the tank roof, contact Hookers Point Site Manager to determine whether to modify existing piping or the new 2" steam snuffling piping.
 - If the new 2" snuffling piping on the tank roof needs to be raised to avoid interference with existing piping, raise the piping as needed and utilize two 45° BW elbows at each Snuffling Steam Roof Nozzle as shown in View "C-C".
 - If the new 2" snuffling piping on the tank roof can be routed per note 3 from the 3 steam nozzles to the south edge of the tank but is obstructed by sulphur piping at the south edge of the roof, then obtain Site Manager's approval on how to route the 2" steam piping around or over the obstruction in order to tie in to the vertical run of 2" snuffling steam piping up the side of the tank.
- Location of the following items shown in the isometric view on Dwg 45074 are to be discussed and confirmed with Site Manager before installation to ensure adequate accessibility for Operator:
 - Pressure Gauge Item 1021
 - 1 1/2" Ball Valve used as "Tank-Tap"
 - Salvaged Ball Valve and Quick-Connect Hose Fitting
- The existing 3" Snuffling Steam Nozzle (Item 1003) on Tank #1's former Center Vent #2 shall be removed by contractor and given to Site Manager for use as a spare. Contractor shall install a 4" blind flange to cover the original 4" nozzle opening on Center Vent #2.



10-in @ 2" steam line where existing 1 1/2" snuffling line ties in on pipe rack.

VIEW "A-A"
Scale: 1/2" = 1'-0"

6" - Tank Roof Nozzles - N1, N2 & N3
Detail "A"
(3" = 1'-0")

Description of Material

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	TANK ROOF NOZZLE	
1004	3	PIPE 6" SCH 40 X 8 1/2"	A33 OR B SMLS
1003	3	6" 150# R.F. S.O. LUG	AUG

6" - Tank Roof Nozzles - N1, N2 & N3
Section "B-B"
(1-1/2" = 1'-0")
See Detail "1"
Dwg 45074

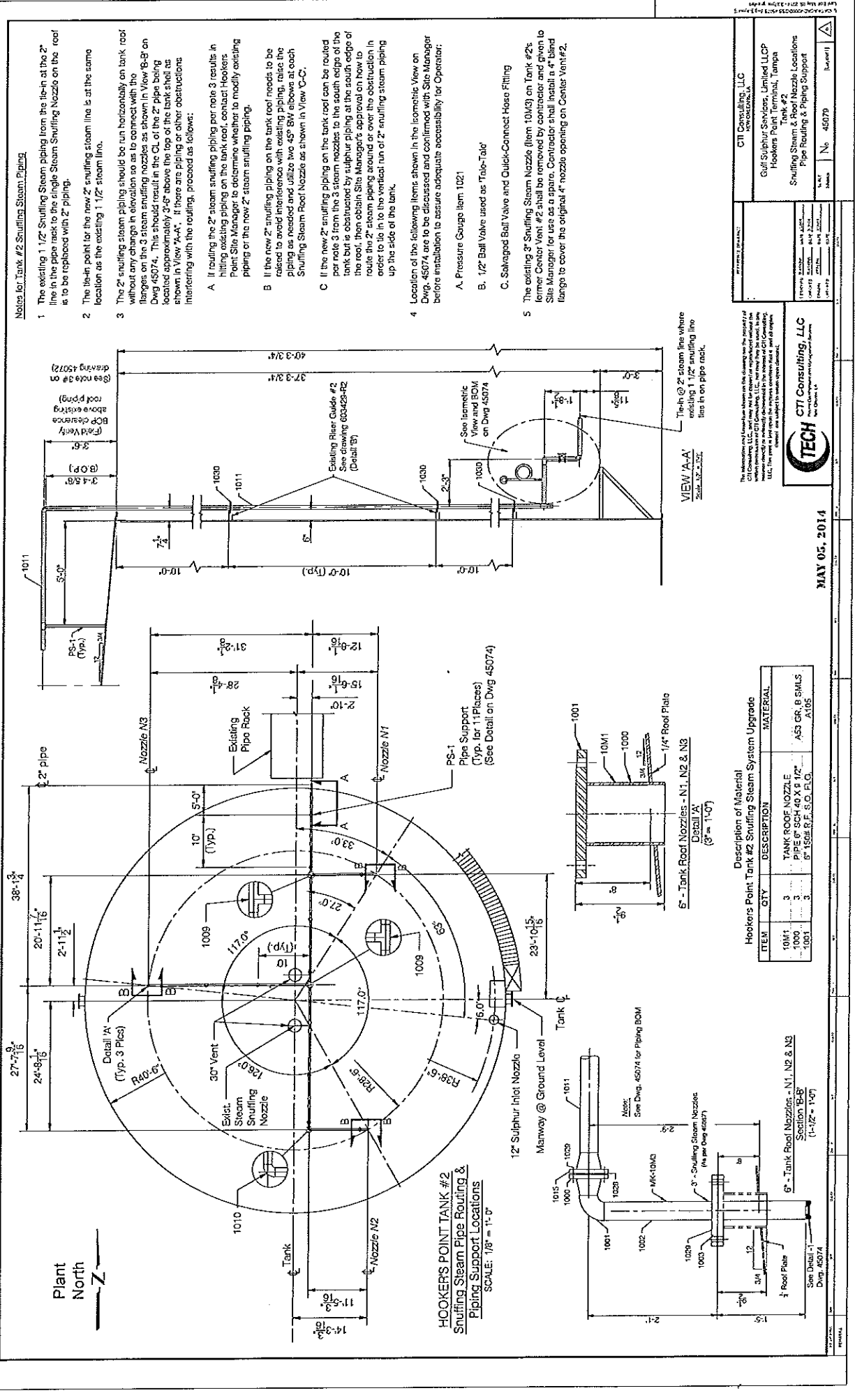
The undersigned hereby certifies that the drawing and the project of all work shown herein were prepared by or under the direct supervision of a duly Licensed Professional Engineer, and that he is a duly Licensed Professional Engineer in the State of Texas, License No. 10000, and that he is the author of the design and the design of the work shown herein.

TECH
CTI Consulting, LLC
Professional Engineer
No. 10000

MAY 05, 2014

CTI Consulting, LLC
Gulf Shores Services, Limited LCCP
Hookers Point Terminal, Tampa
Snuffling Steam & Roof Nozzle Locations
Pipe Routing & Piping Support

No. 45078



Notes for Tank #2 Snuffling Steam Piping

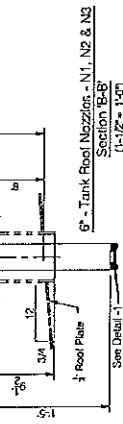
- The existing 1 1/2" Snuffling Steam Piping from the tie-in at the 2" line in the pipe rack to the single Steam Snuffling Nozzle on the roof is to be replaced with 2" piping.
- The tie-in point for the new 2" snuffling steam line is at the same location as the existing 1 1/2" steam line.
- The 2" snuffling steam piping should be run horizontally on tank roof without any change in elevation so as to connect with the flanges on the 3" steam snuffling nozzles as shown in View B-B on Dwg 45074. This should result in the CL of the 2" pipe being located approximately 3'-6" above the top of the tank shell as shown in View A-A. If there are piping or other obstructions interfering with the routing, proceed as follows:
 - If routing the 2" steam snuffling piping per note 3 results in hitting existing piping on the tank roof, contact Hookers Point Site Manager to determine whether to modify existing piping or the new 2" steam snuffling piping.
 - If the new 2" snuffling piping on the tank roof needs to be raised to avoid interference with existing piping, raise the piping as needed and utilize two 45° 8W elbows at each Snuffling Steam Roof Nozzle as shown in View C-C.
 - If the new 2" snuffling piping on the tank roof can be routed per note 3 from the 3" steam nozzles to the south edge of the tank but is obstructed by sulphur piping at the south edge of the roof, then obtain Site Manager's approval on how to route the 2" steam piping around or over the obstruction in order to tie in to the vertical run of 2" snuffling steam piping up the side of the tank.
- Location of the following items shown in the Isometric View on Dwg. 45074 are to be discussed and confirmed with Site Manager before installation to ensure adequate accessibility for Operator:
 - Pressure Gauge Item 1021
 - 1/2" Ball Valve used as "Tie-Off"
 - Salvaged Ball Valve and Quick-Connect Hose Fitting
- The existing 3" Snuffling Steam Nozzle (Item 1003) on Tank #2's former Center Vent #2 shall be removed by contractor and given to Site Manager for use as a spare. Contractor shall install a 4" blind flange to cover the original 4" nozzle opening on Center Vent #2.

Tie-in @ 2" steam line where existing 1 1/2" snuffling line lies in on pipe rack.

VIEW 'A-A'
Scale: 1/8" = 1'-0"

Description of Material

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	TANK ROOF NOZZLE	AS5 GR. B SMLS
1000	3	PIPE 6" SCH 40 X 8 1/2"	AS5 GR. B SMLS
1001	3	PIPE 1/2" SCH 40 X 1/2"	AS5 GR. B SMLS



Detail B-B
(1-1/2" = 1'-0")

Detail A-A
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Detail C-C
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Detail D-D
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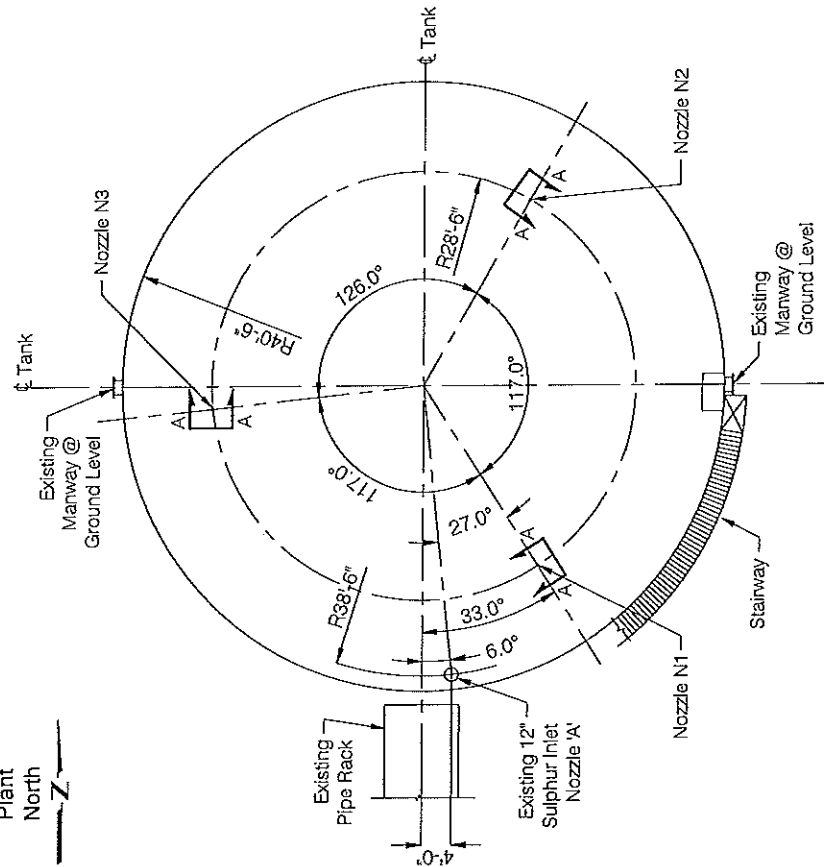
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North
Z

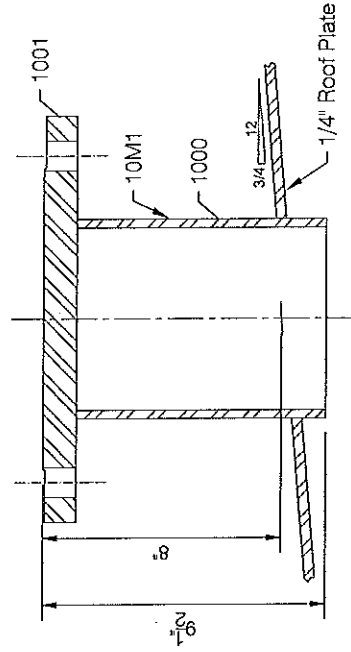


HOOKER'S POINT TANK #3 Snuffing Steam Roof Nozzle Additions

SCALE: 1/8" = 1'-0"

Description of Material- Hookers Point Tank #3 Snuffing Steam System Upgrade

ITEM	QTY	DESCRIPTION	MATERIAL
10M1	3	TANK ROOF NOZZLE	
1000	3	PIPE 6" SCH 40 X 9 1/2"	A53 GR. B SMLS
1001	3	6" 150# R.F. S.O. FLG.	A105



6" - Tank Roof Nozzles - N1, N2 & N3
Section 'A-A'
(6" = 1'-0")

Notes:

- Contractor to verify roof nozzles, N1, N2, & N3 will not hit outer roof rafters before cutting 6" holes in roof plate.
- The forty outer roof rafters are 9" apart.
- Existing 12" sulphur inlet nozzle 'A' is centered between two outer roof rafters.
- New nozzle N1 is located 27" c/w from existing 12" inlet nozzle 'A' (9" / rafter times 3 rafters = 27.0")
- New nozzle N2 is located 117" c/w from nozzle N1 (9" / rafter times 13 rafters = 117.0")
- New nozzle N3 is located 126" c/w from nozzle N2 (9" / rafter times 14 rafters = 126.0")

The undersigned hereby certifies that the foregoing is a true and correct copy of the original as submitted to the undersigned for review and approval. The undersigned further certifies that the undersigned is a duly licensed Professional Engineer in the State of Florida, and is duly qualified to prepare and seal such drawings. The undersigned further certifies that the undersigned is not providing any services to the undersigned in connection with the preparation and sealing of this drawing. The undersigned further certifies that the undersigned is not providing any services to the undersigned in connection with the preparation and sealing of this drawing.

TECH
PRELIMINARY
FEB 20, 2014

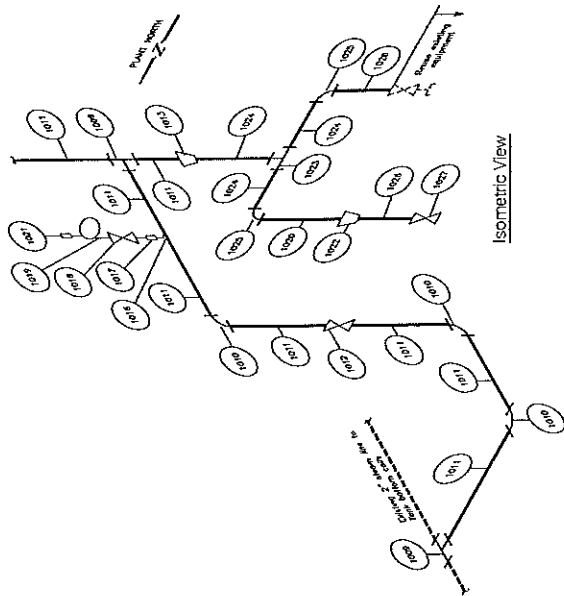
CTI Consulting, LLC
10000 N. 15th Ave., Suite 100
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Phone: 813.288.1111
Fax: 813.288.1112
Email: info@cticonsulting.com

CTI Consulting, LLC 10000 N. 15th Ave., Suite 100 Tampa, FL 33613 Phone: 813.288.1111 Fax: 813.288.1112 Email: info@cticonsulting.com	CTI Consulting, LLC 10000 N. 15th Ave., Suite 100 Tampa, FL 33613 Phone: 813.288.1111 Fax: 813.288.1112 Email: info@cticonsulting.com
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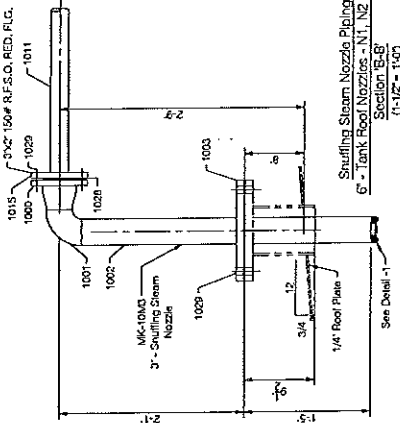
Project No.	45072
Sheet No.	11

DESCRIPTION OF MATERIALS - HOOKERS POINT TANK 43 SNUFFING STEAM PIPING & NOZZLES

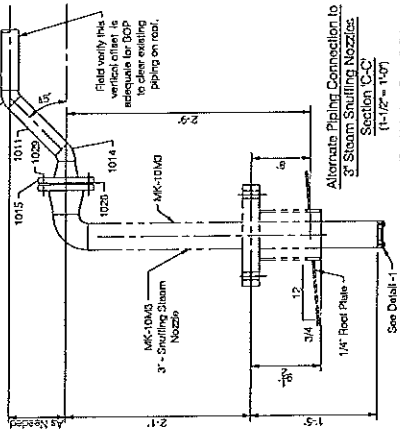
ITEM	QTY	DESCRIPTION	MATERIAL
1000	3	SNUFFING STEAM NOZZLE	A105
1001	3	3" STD. WELD NUT FLG.	A105
1002	3	3" STD. WELD NUT FLG.	A105
1003	3	3" STD. WELD NUT FLG.	A105
1004	3	3" STD. WELD NUT FLG.	A105
1005	3	3" STD. WELD NUT FLG.	A105
1006	3	3" STD. WELD NUT FLG.	A105
1007	3	3" STD. WELD NUT FLG.	A105
1008	3	3" STD. WELD NUT FLG.	A105
1009	3	3" STD. WELD NUT FLG.	A105
1010	3	3" STD. WELD NUT FLG.	A105
1011	3	3" STD. WELD NUT FLG.	A105
1012	3	3" STD. WELD NUT FLG.	A105
1013	3	3" STD. WELD NUT FLG.	A105
1014	3	3" STD. WELD NUT FLG.	A105
1015	3	3" STD. WELD NUT FLG.	A105
1016	3	3" STD. WELD NUT FLG.	A105
1017	3	3" STD. WELD NUT FLG.	A105
1018	3	3" STD. WELD NUT FLG.	A105
1019	3	3" STD. WELD NUT FLG.	A105
1020	3	3" STD. WELD NUT FLG.	A105
1021	3	3" STD. WELD NUT FLG.	A105
1022	3	3" STD. WELD NUT FLG.	A105
1023	3	3" STD. WELD NUT FLG.	A105
1024	3	3" STD. WELD NUT FLG.	A105
1025	3	3" STD. WELD NUT FLG.	A105
1026	3	3" STD. WELD NUT FLG.	A105
1027	3	3" STD. WELD NUT FLG.	A105
1028	3	3" STD. WELD NUT FLG.	A105
1029	3	3" STD. WELD NUT FLG.	A105
1030	3	3" STD. WELD NUT FLG.	A105
1031	3	3" STD. WELD NUT FLG.	A105
1032	3	3" STD. WELD NUT FLG.	A105
1033	3	3" STD. WELD NUT FLG.	A105



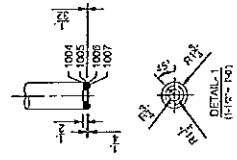
Isometric View



Snuffing Steam Nozzle Piping at 6\"/>



Alternate Piping Connection to 3\"/>



DETAIL - 1
(1-1/2\"/>

FEB 14, 2014

TECH
Engineering & Construction Services
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Houston, TX 77001
Phone: 281.221.1111
Fax: 281.221.1112
Email: info@tech-engineering.com

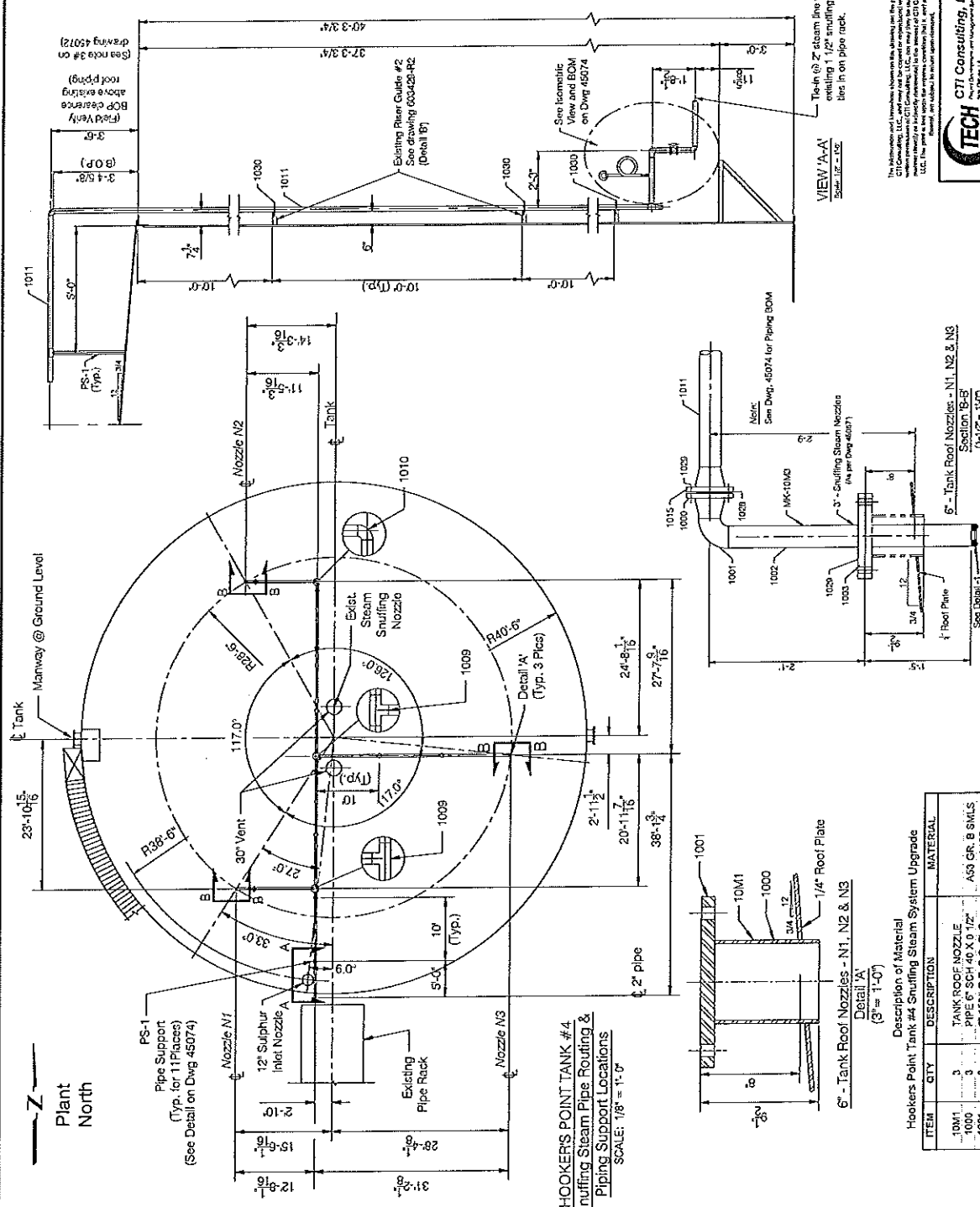
CTI Consulting, LLC
Tank #3
Snuffing Steam System
Piping Detailing & Engineering
No. 45074

CTI Consulting, LLC
Gulf Sulphur Services, United LLC
Hookers Point Terminal, Tampa
Tank #3
Snuffing Steam System
Piping Detailing & Engineering
No. 45074

CTI Consulting, LLC
Gulf Sulphur Services, United LLC
Hookers Point Terminal, Tampa
Tank #3
Snuffing Steam System
Piping Detailing & Engineering
No. 45074

Notes for Tank #4 Snuffing Steam Piping

- The existing 1 1/2" Snuffing Steam piping from the tie-in at the 2" line in the pipe rack to the single Steam Snuffing Nozzle on the roof is to be replaced with 2" piping.
- The tie-in point for the new 2" snuffing steam line is at the same location as the existing 1 1/2" steam line.
- The 2" snuffing steam piping should be run horizontally on tank roof without any change in elevation so as to connect with the flanges on the 3 steam snuffing nozzles as shown in View B-B on Dwg 45074. This should result in the CL of the 2" pipe being located approximately 3'-0" above the top of the tank shell as shown in View A-A. If there are piping or other obstructions interfering with the routing, proceed as follows:
 - If routing the 2" steam snuffing piping per note 3 results in hitting existing piping on the tank roof, contact Hookers Point Site Manager to determine whether to modify existing piping or the new 2" steam snuffing piping.
 - If the new 2" snuffing piping on the tank roof needs to be raised to avoid interference with existing piping, raise the piping as needed and utilize two 45° BW elbows at each Snuffing Steam Roof Nozzle as shown in View C-C.
 - If the new 2" snuffing piping on the tank roof can be routed per note 3 from the 3 steam nozzles to the south edge of the tank but is obstructed by sulphur piping at the south edge of the roof, then obtain Site Manager's approval on how to route the 2" steam piping around or over the obstruction in order to tie in to the vertical run of 2" snuffing steam piping up the side of the tank.
- Location of the following items shown in the Isometric View on Dwg. 45074 are to be discussed and confirmed with Site Manager before installation to assure adequate accessibility for Operator:
 - Pressure Gauge Item 1021
 - 1/2" Ball Valve used as "Tie-In" Valve
 - Salvaged Ball Valve and Quick-Connect Hose Fitting
- The existing 3" Snuffing Steam Nozzle (Item 10M3) on Tank #4s former Center Vent #2 shall be removed by contractor and given to Site Manager for use as a spare. Contractor shall install a 4" blind flange to cover the original 4" nozzle opening on Center Vent #2.

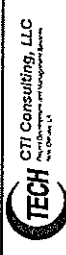


HOOKERS POINT TANK #4
Snuffing Steam Pipe Routing &
Piping Support Locations
SCALE: 1/8" = 1'-0"

6" - Tank Roof Nozzles - N1, N2 & N3
Detail A
(3" = 1'-0")

Description of Material		
ITEM	QTY	DESCRIPTION
10M1	3	TANK ROOF NOZZLE
10M3	3	PIPE 6" SCH 40 X 9' 0"
10M5	3	6" 150# R.F. S.O. F.G.
		MATERIAL
		AS5 GR. B SHLS.
		A105

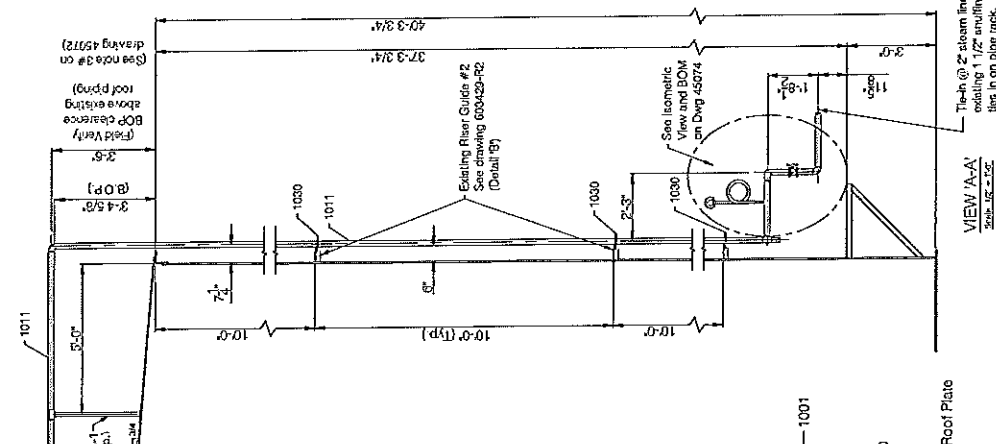
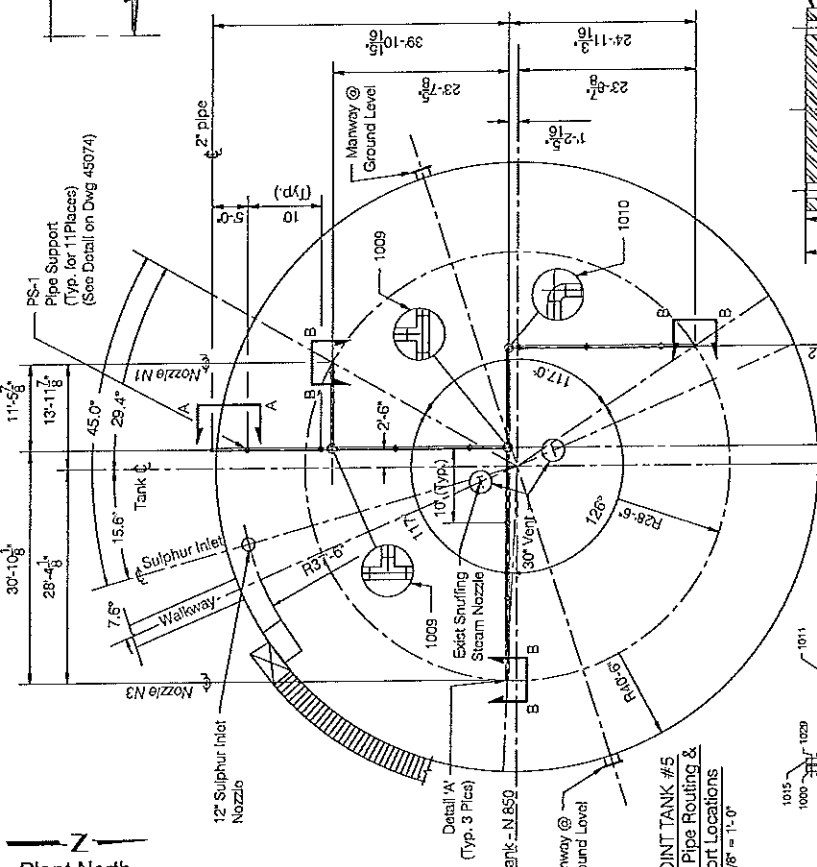
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MAY 05, 2014

CTT Consulting, LLC	
Gulf Sulphur Services, United LLC	
Hookers Point Terminal, Tampa	
Tank #4	
Snuffing Steam & Roof Nozzle Locations	
Pipe Routing & Piping Support	
PROJECT NO.	45074
DATE	05/05/14
BY	CTT
CHECKED	CTT
APPROVED	CTT
SCALE	AS SHOWN
NO.	45077
DATE	05/05/14

Plant North



- Notes for Tank #5 Snuffling Steam Piping**
- The existing 1 1/2" Snuffling Steam Piping from the 10-in at the 2" line in the pipe rack to the single Steam Snuffling Nozzle on the roof is to be replaced with 2" piping.
 - The tie-in point for the new 2" snuffling steam line is at the same location as the existing 1 1/2" steam line.
 - The 2" snuffling steam piping should be run horizontally on tank roof without any change in elevation so as to connect with the flanges on the 3" steam snuffling nozzles as shown in View B-B on Dwg 45074. This should result in the CL of the 2" pipe being located approximately 2'-6" above the top of the tank shell as shown in View A-A. If there are piping or other obstructions interfering with the routing, proceed as follows:
 - If routing the 2" steam snuffling piping per note 3 results in hitting existing piping on the tank roof, contact Hookers Point Sita Manager to determine whether to modify existing piping or the new 2" steam snuffling piping.
 - If the new 2" snuffling piping on the tank roof needs to be raised to avoid interference with existing piping, raise the piping as needed and utilize two 45° BW elbows at each Snuffling Steam Roof Nozzle as shown in View C-C.
 - If the new 2" snuffling piping on the tank roof can be routed per note 3 from the 3" steam nozzles to the south edge of the tank but is obstructed by sulphur piping at the south edge of the roof, then obtain Sita Manager's approval on how to route the 2" steam piping around or over the obstruction in order to tie in to the vertical run of 2" snuffling steam piping up the side of the tank.
 - Location of the following items shown in the Isometric View on Dwg. 45074 are to be discussed and confirmed with Sita Manager before installation to assure adequate accessibility for Operator:
 - Pressure Gauge Item 1021
 - 1/2" Ball Valve used as "Tide-Tide"
 - Salvaged Ball Valve and Quick-Connect Hose Fitting
 - The existing 3" Snuffling Steam Nozzle (Item 1043) on Tank #5's former Center Vent #2 shall be removed by contractor and placed to Sita Manager for use as a spare. Contractor shall install a 4" blind flange to cover the original 4" nozzle opening on Center Vent #2.

Description of Material

ITEM	QTY	DESCRIPTION	MATERIAL
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1001	3	6" 150# R.F. S.O. FLG	A106

6" - Tank Roof Nozzles - N1, N2 & N3
Detail A'
(3" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
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6" - Tank Roof Nozzles - N1, N2 & N3
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6" - Tank Roof Nozzles - N1, N2 & N3
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(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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1001	3	6" 150# R.F. S.O. FLG	A106
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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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1001	3	6" 150# R.F. S.O. FLG	A106
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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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1001	3	6" 150# R.F. S.O. FLG	A106
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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
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6" - Tank Roof Nozzles - N1, N2 & N3
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(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
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(1-1/2" = 1'-0")

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6" - Tank Roof Nozzles - N1, N2 & N3
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(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
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6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

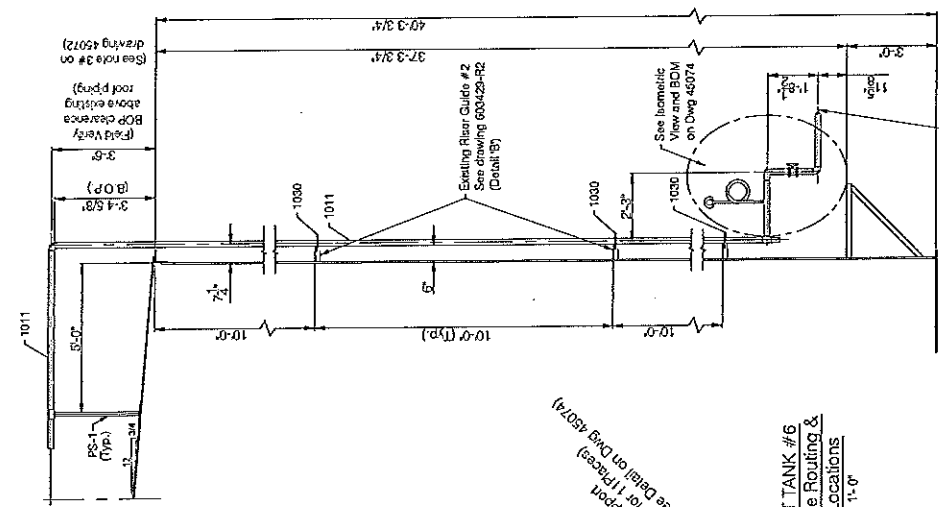
6" - Tank Roof Nozzles - N1, N2 & N3
Section B-B'
(1-1/2" = 1'-0")

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	6" 150# R.F. S.O. FLG	A106
1000	3	PIPE 6" SCH 40 X 8 FT	A53 GR. B, SMLS
1041	3	TANK ROOF NOZZLE	A53 GR. B, SMLS

<p>6" - Tank Roof Nozzles - N1, N2 & N3</p> <p>Section B-B'</p> <p>(1-1/2" = 1'-0")</p>	<p>ITEM</p> <p>QTY</p> <p>DESCRIPTION</p> <p>MATERIAL</p>
<p>1001</p> <p>3</p> <p>6" 150# R.F. S.O. FLG</p> <p>A106</p>	<p>1000</p> <p>3</p> <p>PIPE 6" SCH 40 X 8 FT</p> <p>A53 GR. B, SMLS</p>
<p>1041</p>	

Notes for Tank #6 Snuffing Steam Piping

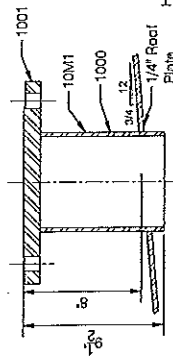
- The existing 1 1/2" Snuffing Steam piping from the tie-in at the 2" line in the pipe rack to the single Steam Snuffing Nozzle on the roof is to be replaced with 2" piping.
- The tie-in point for the new 2" snuffing steam line is at the same location as the existing 1 1/2" steam line.
- The 2" snuffing steam piping should be run horizontally on tank roof without any change in elevation so to connect with the longies on the 3" steam snuffing nozzles as shown in View B-B on Dwg. 45074. This should result in the CL of the 2" pipe being located approximately 3'-5" above the top of the tank shell as shown in View A-A. If there are piping or other obstructions interfering with the routing, proceed as follows:
 - If routing the 2" steam snuffing piping per note 3 results in hitting existing piping on the tank roof, contact Hookers Point Site Manager to determine whether to modify existing piping or the new 2" steam snuffing piping.
 - If the new 2" snuffing piping on the tank roof needs to be raised to avoid interference with existing piping, raise the piping as needed and utilize two 65# 304/316 elbows at each Snuffing Steam Roof Nozzle as shown in View C-C.
 - If the new 2" snuffing piping on the tank roof can be routed per note 3 from the steam nozzles to the south edge of the tank but is obstructed by Sulphur piping at the south edge of the roof, then obtain Site Manager's approval on how to route the 2" steam piping around or over the obstruction in order to tie in to the vertical run of 2" snuffing steam piping up the side of the tank.
- Location of the following items shown in the isometric view on Dwg. 45074 are to be discussed and confirmed with Site Manager before installation to assure accessibility for Operator:
 - Pressure Gauge Item 1021
 - 1/2" Ball Valve used as "Isolation"
 - Salvaged Ball Valve and Quick-Connect Hose Fitting
- The existing 3" Snuffing Steam Nozzle (Item 10M3) on Tank #6's former Center Vent #2 shall be removed by contractor and given to Site Manager for use as a spare. Contractor shall install a 4" blind flange to cover the original 4" nozzle opening on Center Vent #2.

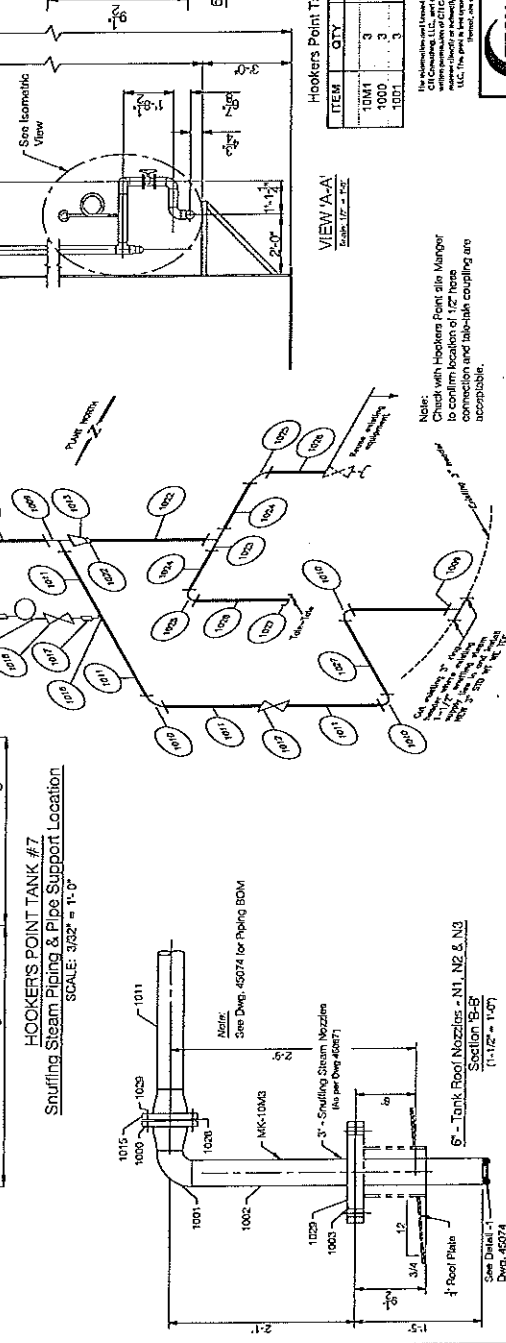


VIEW A-A
Z=10'-0" (1'-0")

Thin (2") steam line where existing 1 1/2" snuffing line ties in on pipe rack.

**HOOKERS POINT TANK #6
Snuffing Steam Pipe Routing &
Piping Support Locations**
SCALE: 1/8" = 1'-0"





ITEM	QTY	DESCRIPTION
10M1	3	TANK ROOF
1000	1	PIPE 6" SCH 40
1001	3	6" 150E R.F.

The information and line-item shown on the drawing is for informational purposes only. The information is not to be used for any other purpose. The information is not to be used for any other purpose. The information is not to be used for any other purpose.

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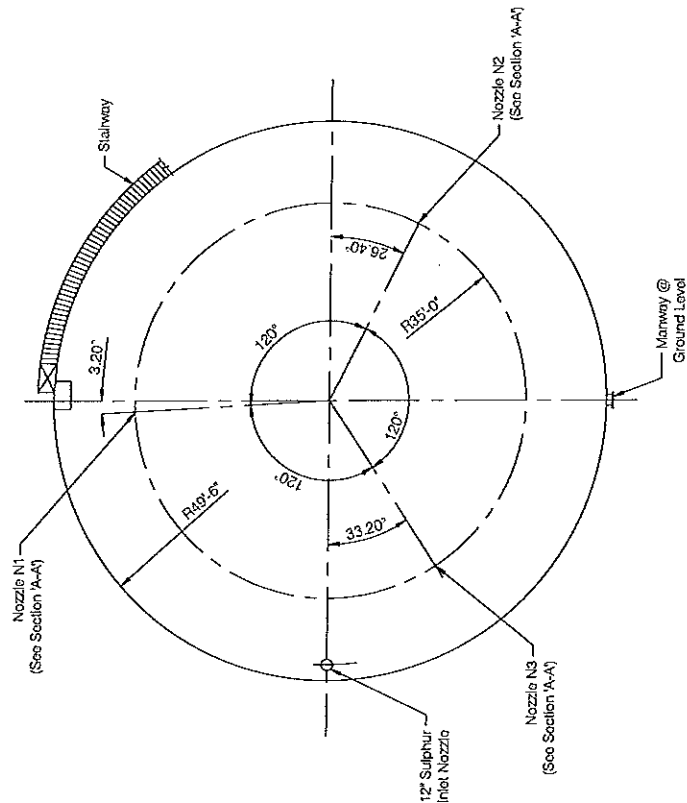
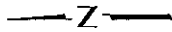
MAY 05, 2014

Isometric View

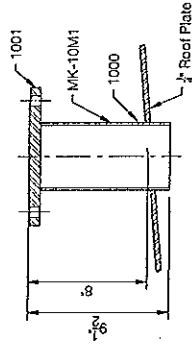
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75	75</				

Plant
North



HOOKER'S POINT TANK #8
Snuffing Steam Roof Nozzle Additions
SCALE: 3/32" = 1'-0"



4" - Tank Roof Nozzles - N1, N2 & N3
Section 'A-A'
(3" = 1'-0")

Note:

Contractor to verify roof nozzles. N1, N2, & N3 will not hit
outer roof rafters before cutting 4" holes in roof plate.

Description of Material - Hooker's Point Tank #8 Snuffing Steam System Upgrade

ITEM	QTY	DESCRIPTION	MATERIAL
1001	3	TANK ROOF NOZZLE	
1000	3	PIPE, 4" SCH 40 X 0.312"	A33 GR. B DMLS
1001	3	4" 10W PLT, S.O. P.L.C.	A192

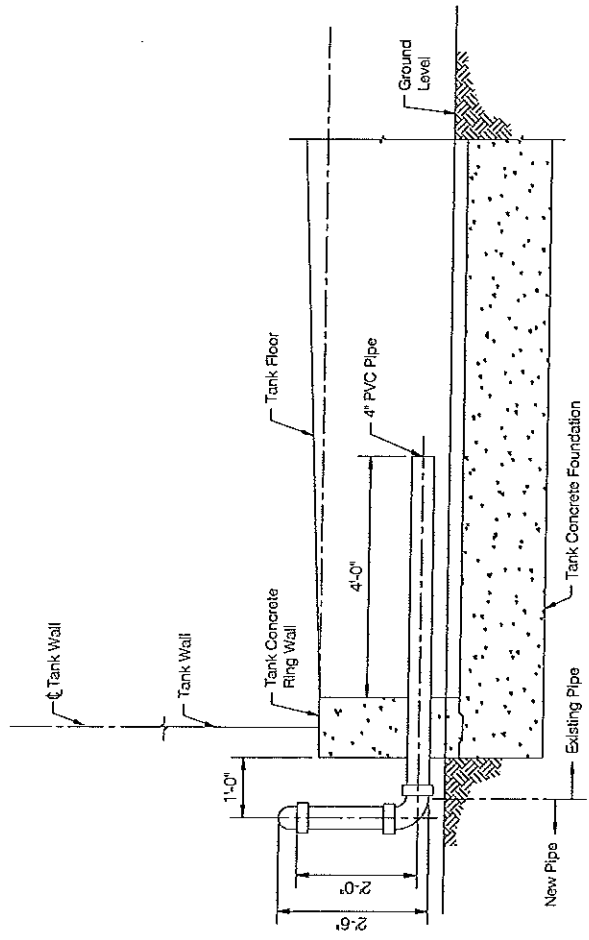
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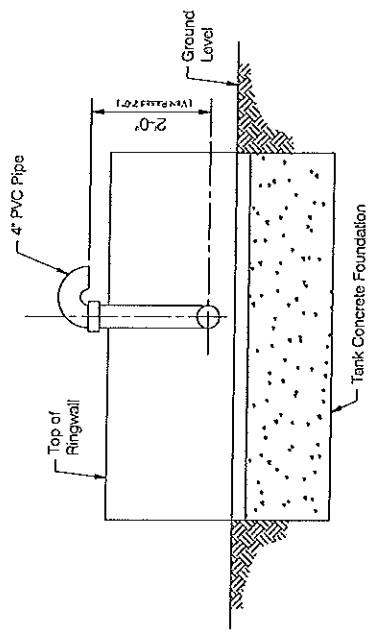
PRELIMINARY
NOV 20, 2013

CTI Consulting, LLC	11111 11111
Gulf Sulphur Services, Limited LLC	11111 11111
Hooker's Point Terminal, Tampa	11111 11111
Tank #8 - Snuffing Steam System	11111 11111
Roof Nozzle Additions	11111 11111
11111 11111	11111 11111
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NOTES:
1. Notes



4" PVC Tank Vent Pipe
SCALE: 1" = 1'-0"



Side View

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TECH
CTI Consulting, LLC
New Orleans, LA

FEB 13, 2014

CTI Consulting, LLC
Gulf Sulphur Services, Limited LLC
Hookers Point Terminal, Tampa
Basin Existing 4" PVC
Tank Vent 2'-0" Elevation
No. 45076

1/2" = 1'-0" 1/4" = 1'-0" 1/8" = 1'-0" 1/16" = 1'-0"