PITTSBURG TANK & TOWER GROUP
MAINTENANCE DIVISION Since 1919

1 Watertank Place
PO Box 1849
Henderson, KY 42419
P: (270) 826-9000
F: (270) 767-6912
www.pttg.com

SimplexGrinnell #458 & JCI
9520 10th Avenue South, Suite 100
Seattle, WA 98108
RE: Western State Hospital; Lakewood, WA
400,000 Gallon STP
August 4, 2018
Ms. Melissa Fraser
Systems Integrity Representative
(206) 291-1439
Job No. 318298-B

If you would like to speak with Patrick Heltsley concerning this report, call (270) 826-9000, Ext. 4601

For additional copies of this report, call (270) 826-9000, Ext. 4601

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Photo shows the tank is secured with fencing. There is no signage on the fence. We recommend posting **No Trespassing** sign.

Photo shows the condition of the foundation. AWWA D100-11; 12.7.1 Height aboveground states, “The tops of the concrete foundations shall be a minimum of 6” above the finished grade, unless otherwise specified.” We recommend clearing any dirt, debris and other loose gravel away from the tank foundation, down to a minimum 6” below top of foundation. This should be done by a local excavating company.

Photo shows the condition of the foundation. NFPA 22-2018; 12.2.1.2 states, "… the junction of the tank bottom and the top of the concrete foundation shall be tightly sealed to prevent water from entering the base." We recommend repairing any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking/grouting around the base of the tank to foundation connection to prevent water from entering under the tank, then sealing the foundation with a sealant.

Photo shows the tank has no grounding system. We recommend electrically grounding the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780-2017; 5.4 Metal Towers and Tanks.

Photo shows the condition of the tank site. **Notice the vegetation growth around the tank foundation.** This could lead to deterioration of the structural components of the tank. OSHA 1910.176(c) states, “Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.” We recommend removing the vegetation from around the tank foundation. This should be done by others.

Photo shows the condition of one (1) of the six (6) anchor bolts. AWWA D100-11; 3.8.1.1 Required anchorage states, “For ground-supported flat-bottom reservoirs and standpipes, mechanical anchorage shall be provided when the wind or seismic loads exceed the limits for self-anchored tanks.” We recommend cleaning the area around the anchor bolts, tightening the anchor nuts, then tack welding the circumference of the nut-to-base plate connections and bolt-to-nut connections to reinforce.

Photo shows the condition of the shell. Currently there is no drain valve. We recommend installing a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank and a splash pad to direct water away from the foundation. Splash pad to be installed by owner.

Photo shows the condition of the 24” primary shell manway. The following is required for the tank to be in compliance with AWWA D100-11; 7.4.4 Shell manholes, NFPA 22-2018; 14.7.2.1.1 and OSHA 1910.146(c)(2) Confined spaces.

We recommend:

Install davit arm on primary shell manway
Install 30” secondary shell manway 180º from primary manway
Post **Confined Space Entry** signs
Install maintenance free galvanized steel bolts

Photos show the condition of the 2” stub overflow pipe. We recommend extending the overflow down the exterior to grade with same size pipe, complete with standoffs every 10' on center, an elbow at the base fitted with a flapper valve and screen to prevent the ingress of contaminants into the water supply, and a splash pad to direct the water away from the tank foundation. Splash pad to be installed by owner.

Photos show the 8” overflow pipe system, which is equipped with a flapper valve as required by AWWA D100-11; 7.3 Overflow.

Shell access ladder in above photos is seriously deteriorated. OSHA 1910.23 (b)(10) states, “Any ladder with structural or other defects is immediately tagged “Dangerous: Do Not Use” or with similar language in accordance with § 1910.145 and removed from service until repaired in accordance with § 1910.22(d), or replaced;… ” We recommend replacing the existing ladder with an OSHA compliant shell access ladder complete with standoffs every 10' on center, a cable type ladder safety device, a lockable ladder guard to prevent un-authorized access and posting a **Fall Protection Required** sign.

This ladder should be replaced on an emergency basis.

Photo shows the tank is not equipped with a liquid level indicator. NFPA 22-2018; 14.1.8* Water-Level Gauge states, “A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained.” We recommend installing a liquid level indicator, complete with target board and float.

Photos show the tank roof edge is not equipped with a required handrail system for fall protection. OSHA 1910.28(b)(1)(i) states, "...the employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4 feet (1.2 m) or more above a lower level is protected from falling by one or more of the following: 1910.28(b)(1)(i)(A) Guardrail systems."
We recommend installing an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with intermediate rail, toeboard and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

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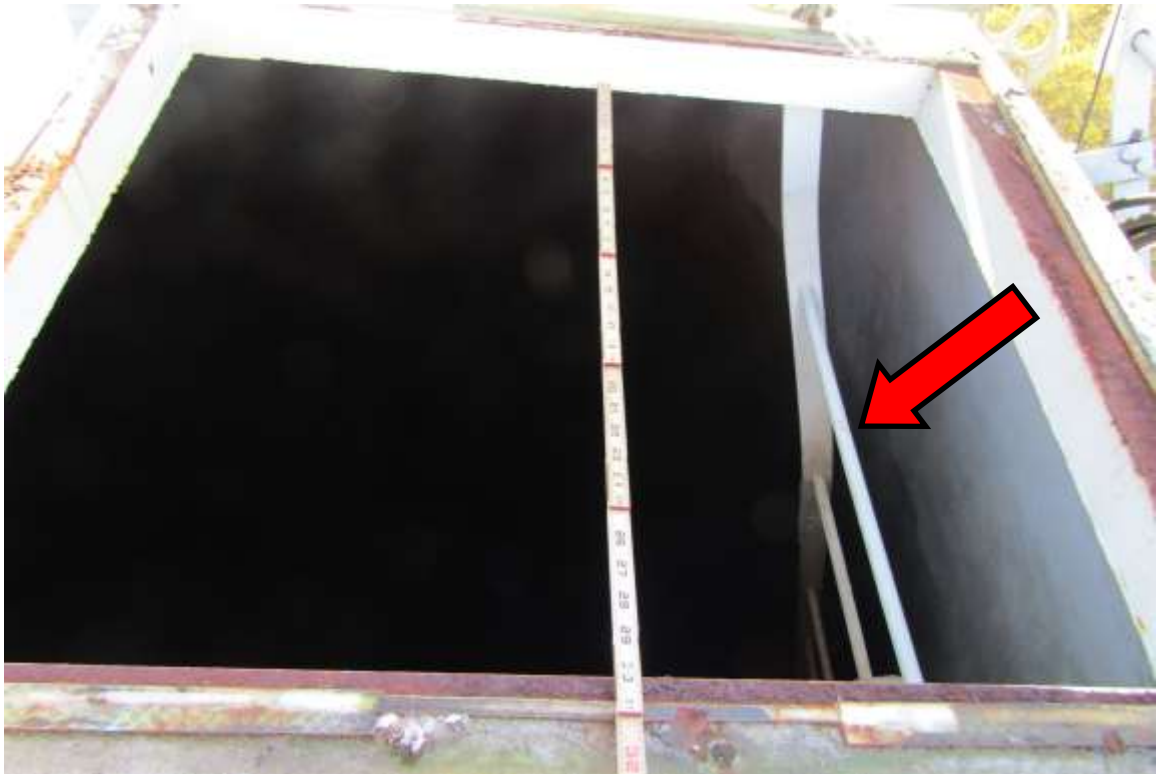


Photo shows the condition of the 30” primary roof hatch. AWWA D100-11; 7.4.3.1 states, “The opening shall have a curb at least 4 in. (102 mm) high, and the cover shall have a downward overlap of at least 2 in. (51 mm).” Roof openings on this tank require the following to be in compliance with AWWA D100-11; 7.4.3 Roof openings and OSHA 1910.146(c)(2) Confined spaces.

We recommend:

Replace 30 primary hatch cover with a 2” overlapping cover
Install 30” secondary hatch 180° from primary roof hatch
Post **Confined Space Entry** signs
Install lock on primary hatch

We further recommend installing OSHA compliant interior access ladders complete with standoffs every 10' on center, and cable type ladder safety devices at the primary and suggested secondary roof hatches.

**In cold climates it’s up to the owner’s discretion on placement of internal ladders.*

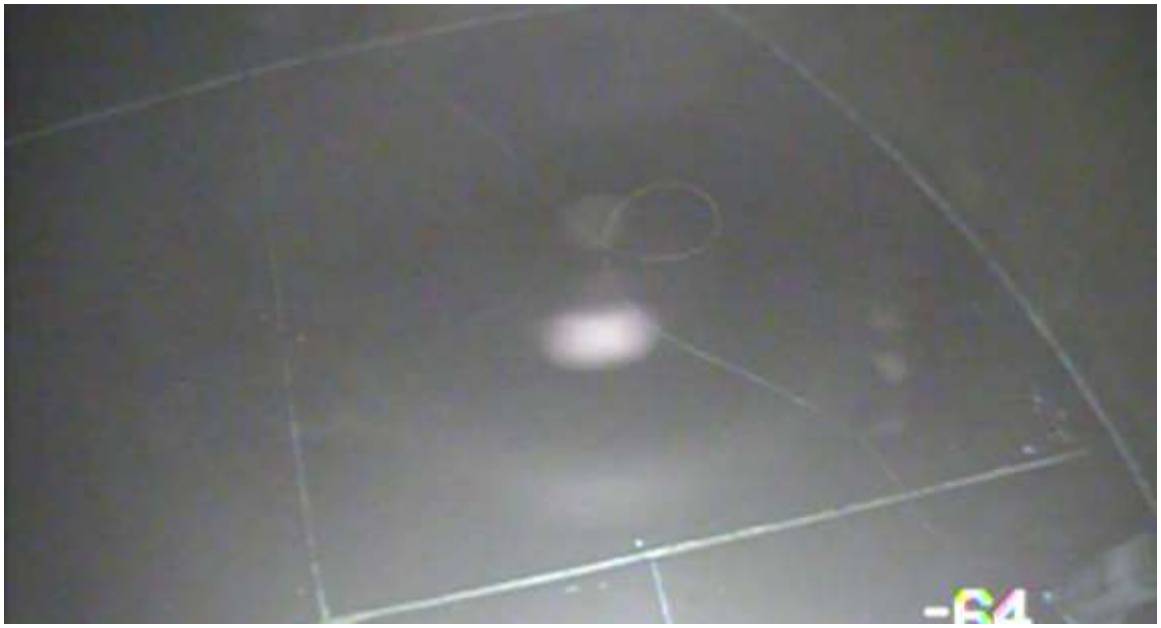
Photos show the condition of the existing 25" roof vent. NFPA 22-2018; 4.15.5 states, "The screen or perforated plate shall be protected against the accumulation of sleet." This vent is allowing the ingress of rain and wind-borne contaminants into the water system. **An improperly vented tank may cause external pressure to act on the tank which can cause buckling even at low pressure differential.** We recommend replacing the existing roof vent with a vacuum-pressure, frost proof vent and screen.

This work should be performed on an emergency basis.

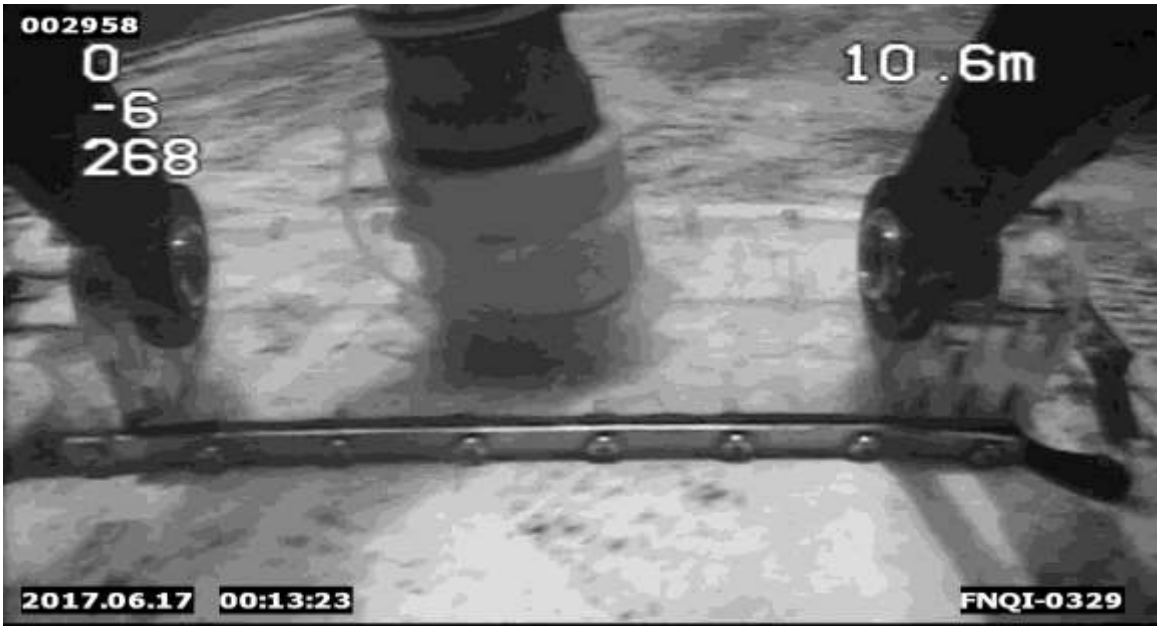
Photos show the tank exterior coating system. We recommend pressure washing the tank exterior with biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm) then removing all loose rust and scale with wire brushes and hand scrapers in accordance with SSPC#2 (hand tool cleaning), spot priming and applying one (1) finish coat of acrylic paint.

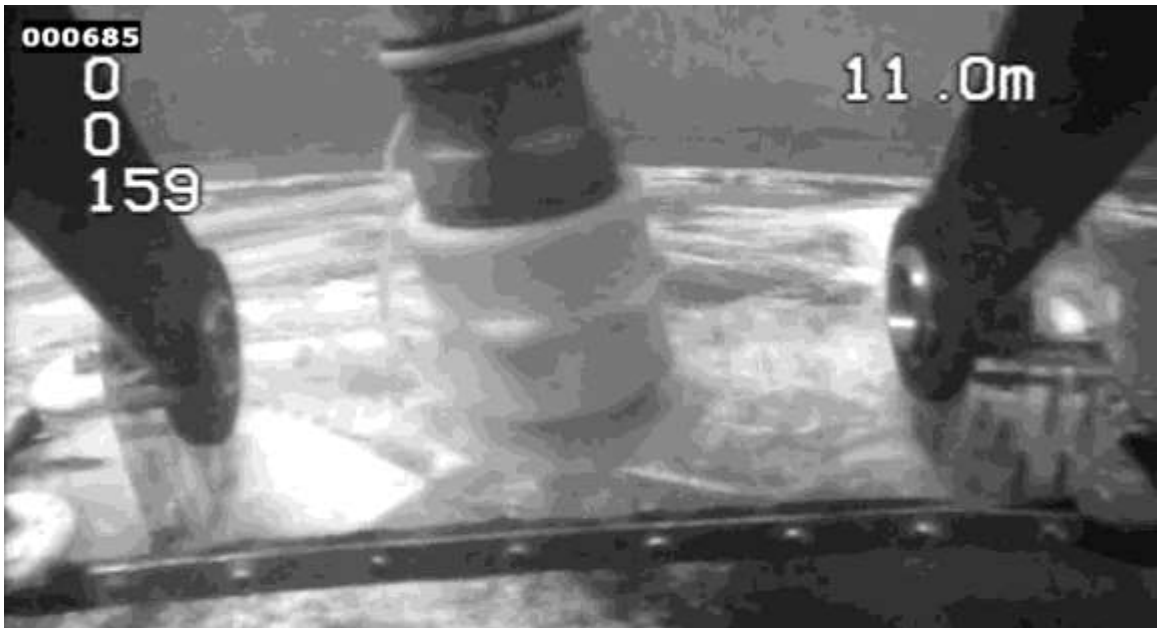
Top photo shows the condition of the interior roof. Notice the rust forming at the roof lap seams. We recommend seam sealing using Sikaflex® 1a on all unwelded interior roof lap seams to prevent failure of a new interior liner. This work is to be performed in conjunction with application of new interior liner.

Bottom photo shows the condition of the interior roof-to-rim angle connection. Notice the rust forming in the crevice between the roof and rim angle. We recommend seam sealing using Sikaflex® 1a around the circumference of this connection to prevent failure of a new interior liner. This work is to be performed in conjunction with application of new interior liner.



Photos show sediment in the tank interior prior to the performance of the tank clean out.





Photos show the tank interior during the performance of the tank clean out.

Photo shows a suction pipe on the interior of the tank. NFPA 22-2018; 14.2.13.1 states, " The discharge outlet for every suction tank shall be equipped with an anti-vortex plate assembly." We recommend installing a properly sized anti-vortex plate on the suction pipe to prevent formation of a vortex.

Photo shows the condition of the tank floor. If buckling is present we recommend stabilizing the floor by pumping grout to the underneath side of the floor where the buckling is occurring in compliance with NFPA 25-2017; 9.4.1. This will be done by installing couplings in the tank floor, pumping grout at 15# psi, filling the voided areas to prevent any further buckling, then vacuum testing the floor. Any defective seams will be repaired by welding.

Photos show the condition of the interior coating system. We recommend sand-blasting all rusted and abraded interior areas to SSPC-SP10 (near white), and brush blasting all remaining interior areas to SSPC-SP7; then applying one (1) spot coat of epoxy primer to all areas sandblasted to #10, stripe coating all weld seams, and applying epoxy to the entire tank, to achieve 8 to 10 mils of total dry film thickness. Total mil thickness will include a combination of the existing and new coating.

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STANDPIPE INSPECTION REPORT

JOB NO: 318298-B INSPECTOR: Christian Costello (LJ)

TANK OWNER: Western State Hospital

OWNER'S REPRESENTATIVE: SimplexGrinnell #458 & JCI; Ms. Melissa Fraser

TITLE: Systems Integrity Representative

MAILING ADDRESS: 9520 10th Avenue South, Suite 100, Seattle, WA 98108

PHYSICAL ADDRESS: 9520 10th Avenue South, Suite 100, Seattle, WA 98108

E-MAIL: Melissa.fraser@jci.com

CITY, STATE: Seattle, WA ZIP: 98108 COUNTY: Pierce County

TELEPHONE: (206) 291-1439 FAX: (206) 291-1500

LOCATION OF TANK: Western State Hospital; 9601 Steilacoom Blvd. SW, Lakewood, WA 98498

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9520 10th Avenue South, Suite 100
Seattle, WA 98108
August 4, 2018
Ms. Melissa Fraser
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ORIGINAL CONTRACT NO: Not Provided YEAR BUILT: Not Provided

ORIGINAL MANUFACTURER: Not Provided CAPACITY: 400,000 Gallon

DATE OF LAST INSPECTION: Not Provided TYPE: Fire Protection

DIAMETER: 40'-0" HEIGHT: 43'-0"

OVERFLOW: 2" INLET: Not Provided

TYPE CONSTRUCTION: WELDED: X RIVETED: BOLTED:

ACCOUNT EXECUTIVE: Bobbie Shelton

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Testing	Exterior	Interior
Lead	Paint Sample	Negative
Adhesion	A-3 @ 7.0 mils	A-1 @1.6 mils

Mil Thickness Testing								
Roof	14.3	15.7	14.6	11.4	14.4	12.5	17.8	15.3
	14.5	13.0						
Ring 6	16.1	15.4						
Ring 5	12.7	5.1						
Ring 4	11.0	15.1						
Ring 3	10.1	9.0						
Ring 2	9.5	12.7						
Ring 1	29.2	23.2	17.7	18.0	21.7	13.2	15.7	15.9
	18.3	19.5	19.7	28.1				

Ultrasonic Thickness Testing								
Roof	.180	.187	.172	.163	.148	.175	181	.176
	.159	.163						
Ring 6	.228	.214						
Ring 5	.212	.242						
Ring 4	.226	.227						
Ring 3	.238	.246						
Ring 2	.287	.291						
Ring 1	.334	.372	.374	.373	.371	.359	.361	.373
	.363	.387	.378	.406				

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2	Post a No Trespassing sign.		X			
3	Clear any dirt, debris and other loose gravel away from the tank foundation, down to a minimum 6" below top of foundation. This should be done by a local excavating company.					X
4	Repair any cracks and spalling in the concrete with a commercial non-shrinking grout.					X
	Caulk/Grout around the base of the tank to foundation connection.					X
	Seal the foundation with a sealant.					X
5	Electrically ground the tank.		X	X		
6	Remove the vegetation from around the tank foundation. This should be done by others.			X		
7	Clean the area around the anchor bolts, tighten the anchor nuts to specifications, then tack weld on the circumference of the nut-to-base plate connections and bolt-to-nut connections.					X
8	Install a frost proof drain valve near the shell-to-floor connection, complete with a locking device and a splash pad. Splash pad to be installed by owner.		X			
9	Install davit arm on primary shell manway.		X	X		
	Install 30" secondary shell manway 180° from primary manway.		X	X		
	Post Confined Space Entry signs on primary and secondary shell manways.			X		
	Install maintenance free galvanized steel bolts on primary and secondary shell manway.					X
10	Extend the overflow down the exterior to grade with same size pipe, complete with standoffs every 10' on center, an elbow fitted with a flapper valve and screen, and a splash pad. Splash pad to be installed by owner.		X			
12	Replace the existing exterior shell access ladder with a compliant ladder complete with standoffs every 10' on center. This ladder should be replaced on an emergency basis.	X		X		
	Install a cable type ladder safety device on exterior shell access ladder.			X		
	Install a lockable ladder guard on exterior shell access ladder.					X

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13	Install a liquid level indicator complete with a target board and float.		X			
14	Install a compliant 42" high handrail system around the circumference of the tank roof, complete with intermediate rail, toeboard and a swing gate at the junction of the shell-to-roof access ladder and tank roof.			X		
15	Replace 30" primary hatch cover with a 2" overlapping cover.		X			
	Install 30" secondary roof hatch 180° from primary hatch.		X			
	Post Confined Space Entry signs on primary and secondary roof hatches.			X		
	Install lock on primary roof hatch.					X
	Install compliant interior access ladders complete with standoffs every 10' on center at the primary and suggested secondary roof hatches. *In cold climates it's up to the owner's discretion on placement of internal ladders.*			X		
	Install cable type ladder safety devices on primary and secondary interior access ladders.			X		
16	Replace the existing roof vent with a vacuum-pressure, frost proof vent and screen. This work should be performed on an emergency basis.	X			X	
17	Pressure wash the tank exterior with biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm) then remove all loose rust and scale with wire brushes and hand scrapers in accordance with SSPC#2 (hand tool cleaning), spot prime and apply one (1) finish coat of acrylic paint.					X
18	Seam seal all un-welded interior roof lap seams using Sikaflex® 1a.					X
	Seal the circumference of the interior roof-to-rim angle connection using Sikaflex® 1a.					X
21	Install a properly sized anti-vortex plate on the suction pipe.		X			X

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22	Stabilize the floor by pumping grout to the underneath side and repair any defective seams by welding as needed.		X		X	
23	Sandblast all rusted and abraded interior areas to SSPC-SP10 (near white), and brush blast all remaining interior areas to SSPC-SP7; then apply one (1) spot coat of epoxy primer to all areas sandblasted to #10, stripe coat all weld seams, and apply one (1) full coat of epoxy to the entire tank, to achieve 8 to 10 mils of total dry film thickness. Total mil thickness will include a combination of the existing and new coating.					X