



**Town of Carmel
60 McAlpin Avenue
Mahopac, NY 10541
RE: Clapboard Ridge; Mahopac, NY
500,000 Gallon GST
March 25, 2019
Mr. Rich Franzetti
Engineer
(845) 628-1500 x181
Job No. 319099-I**

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

Paint • Repair • Dismantle • Inspect • Reinsulate • Tanks Raised, Lowered, and Moved
New and Used Tanks



Photo shows the tank is secured with fencing. We recommend posting a **Warning, Tampering With This Facility is a Federal Offense** (US code title 42, section 300i-1) sign and **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. 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.

We further recommend inserting sacrificial cathodic protection rods radially every 15' beneath the floor of the tank.



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**.



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 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 18" x 24" primary shell manway. The following is required for the tank to be in compliance with **AWWA D100-11; 7.4.4 Shell manholes** and **OSHA 1910.146(c)(2) Confined spaces**.

We recommend:

Install 30" secondary shell manway 180° from primary manway
Post **Confined Space Entry** signs



Photo shows the condition of the 12" stub overflow pipe. **NFPA 22-2018; 14.6.3** states, "Where dripping water or a small accumulation of ice is not objectionable...The pipe shall be extended with a slight downward pitch to discharge beyond the tank or balcony and away from the ladders and shall be adequately supported." 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.*



Shell access ladder in above photos is not equipped with anti-skid rungs, and is only 15" wide. **OSHA 1910.23(b)(4)** states, "Ladder rungs, steps, and cleats have a minimum clear width of... 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders,..." We recommend installing 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 unauthorized access and posting a **Fall Protection Required** sign at the base of the ladder.



Photo shows the tank is not equipped with a liquid level indicator. We recommend installing a float-type liquid level indicator.



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.



Photo shows the condition of the 25" x 35" primary roof hatch. 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:

Install 30" secondary hatch 180° from primary roof hatch
Post **Confined Space Entry** signs

We further recommend installing an **OSHA** compliant interior access ladder complete with standoffs every 10' on center, and a cable type ladder safety device at the suggested secondary roof hatch.

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



Primary interior access ladder in above photo is not equipped with anti-skid rungs and is seriously deteriorated. **Notice the missing rungs.** 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 installing an OSHA compliant interior access ladder complete with standoffs every 10' on center, and a cable type ladder safety device at the primary roof hatch.

This ladder should be replaced on an emergency basis.

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



Photos show the condition of the existing 14" roof vent. **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 interior roof lap seams, which appear to be in good condition.

Bottom photo shows the interior roof-to-rim angle connection, which appears to be in good condition.

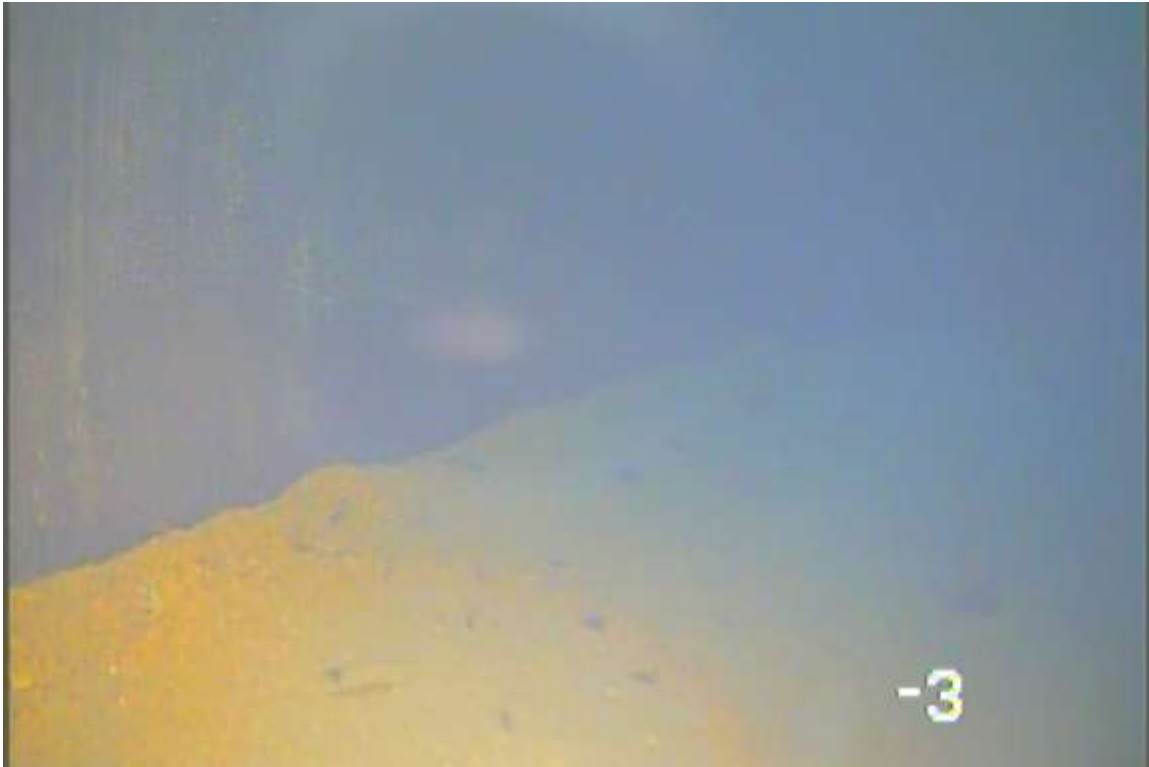
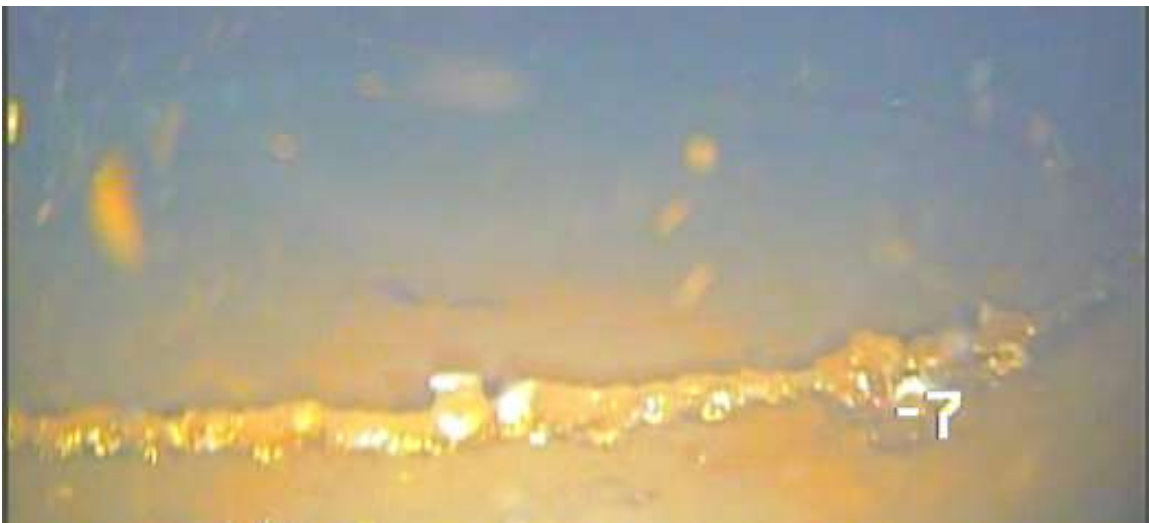


Photo shows the tank interior. A temperature difference between the water in the top and bottom of a tank, even as little as 1-2 degrees Fahrenheit, is an indication of thermal stratification and the tank water not being completely mixed. Incomplete mixing would result in short-circuiting, and localized increase in water age would develop inside the tank. This typically leads to water quality problems, such as loss of residual, DBP spikes, HPC spikes, bacteria regrowth, formation of bio-film, changes in pH and dissolved oxygen. We recommend installing a mixing system. Electrical work to be done by others if required.



Photos show sediment in the tank. We recommend performing a dry interior cleanout in order to prevent contamination issues associated with excessive sediment buildup.

This work should be performed on an emergency basis.

**Please note price for interior cleanout is based on removing 1" – 3" of sediment. Any additional accumulation discovered will be removed in the amount of \$300 per hour. In the event the tank has to be drained, tank will need to be drained by the owner, prior to our arrival.*

We further recommend installing a passive cathodic protection system.

Due to amount of sediment and debris, a robotic in-service cleanout can not be performed.



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.

GROUND STORAGE INSPECTION REPORT

JOB NO: 319099-I INSPECTOR: Brian Alsup (CE)
TANK OWNER: Town of Carmel
OWNER'S REPRESENTATIVE: Mr. Rich Franzetti
TITLE: Engineer
MAILING ADDRESS: 60 McAlpin Avenue Mahopac, NY 10541
PHYSICAL ADDRESS: 60 McAlpin Avenue Mahopac, NY 10541
E-MAIL: rjf@ci.carmel.ny.us
CITY, STATE: Mahopac, NY ZIP: 10541 COUNTY: Putnam County
TELEPHONE: (845) 628-1500 x181 FAX: Not Provided
LOCATION OF TANK: Clapboard Ridge Mahopac, NY 10541

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ORIGINAL CONTRACT NO: Not Provided YEAR BUILT: Not Provided
ORIGINAL MANUFACTURER: Not Provided CAPACITY: 500,000 Gallon
DATE OF LAST INSPECTION: Not Provided TYPE: Potable
DIAMETER: 46'-0" HEIGHT: 40'-0"
OVERFLOW: 12" Stub INLET: Not Provided
TYPE CONSTRUCTION: WELDED: X RIVETED: BOLTED:
ACCOUNT EXECUTIVE: Nick Nation

Testing	Exterior	Interior
Lead	Negative	Negative

Mil Thickness Testing								
Roof	6.5	1.3	2.6	6.0	1.7	1.0	8.0	8.0
	8.5							
Shell 5	5.3	4.7						
Shell 4	5.7	9.2						
Shell 3	4.7	4.4						
Shell 2	4.2	4.9						
Base	6.8	5.6	2.8	3.6	5.9	9.3	4.5	6.0
	4.7	8.0						

Ultrasonic Thickness Testing								
Roof	0.249	0.248	0.251	0.248	0.249	0.269	0.259	0.257
	0.258							
Shell 5	0.241	0.240						
Shell 4	0.259	0.258						
Shell 3	0.265	0.266						
Shell 2	0.332	0.333						
Base	0.394	0.390	0.389	0.399	0.387	0.385	0.391	0.408
	0.377	0.387						

Page #	Work Proposed	Critical Deficiency	NON-Critical Deficiency	OSHA	Structural	Preventive Maintenance
2	Post a Warning, Tampering With This Facility is a Federal Offense (US code title 42, section 300i-1) sign.		X			
	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
	Insert sacrificial cathodic protection rods radially every 15' beneath the floor of the tank.					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	Install a frost proof drain valve near the shell-to-floor connection, complete with a locking device and a splash pad. <i>Splash pad to be installed by owner.</i>		X			
8	Install 30" secondary shell manway 180° from primary manway.		X	X		
	Post Confined Space Entry signs on primary and secondary shell manways.			X		
9	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. <i>Splash pad to be installed by owner.</i>		X			
10	Replace the existing exterior shell access ladder with a compliant ladder complete with standoffs every 10' on center.			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
	Post Fall Protection Required sign at base of exterior shell access ladder.			X		
11	Install a float-type liquid level indicator.		X			

Page #	Work Proposed	Critical Deficiency	NON-Critical Deficiency	OSHA	Structural	Preventive Maintenance
12	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		
13	Install 30" secondary roof hatch 180° from primary hatch.		X	X		
	Post Confined Space Entry signs on primary and secondary roof hatches.			X		
	Install a compliant interior access ladder complete with standoffs every 10' on center at the suggested secondary roof hatch. <i>In cold climates it's up to the owner's discretion on placement of internal ladders.</i>			X		
	Install a cable type ladder safety device on suggested secondary interior access ladder.			X		
14	Replace the existing primary interior access ladder with a compliant ladder complete with standoffs every 10' on center. <i>This ladder should be replaced on an emergency basis. In cold climates it's up to the owner's discretion on placement of internal ladders.</i>	X		X		
	Install a cable type ladder safety device on primary interior access ladder.			X		
15	Replace the existing roof vent with a vacuum-pressure, frost proof vent and screen. <i>This work should be performed on an emergency basis.</i>	X			X	
16	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	Install a mixing system. Electrical work to be done by others if required.		X			
19	Perform a dry interior cleanout, up to 3" of sediment. <u>Due to amount of sediment and debris, a robotic in-service cleanout can not be performed.</u> <i>This work should be performed on an emergency basis.</i> Additional accumulation will be \$300 per hour to remove. In the event the tank has to be drained, it should be drained by the owner prior to our arrival.	X				
	Install a passive cathodic protection system.					X

Page #	Work Proposed	Critical Deficiency	NON-Critical Deficiency	OSHA	Structural	Preventive Maintenance
20	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