Inspection Report for:

Colina Bay Subdivision

Water Treatement Plant

15,000 Gallon
Hydropneumatic Tank

Site Address:

16836 Caravaggio Loop
Montverde, Florida 34756
Lake County

Prepared by:

Bolivar Engineering LLC
6721 Woody Court
Leesburg, FL 34748

Report Date: January 31, 2021

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Declarations

- In accordance with Florida Department of Environmental Protection Chapter 62-555.350 of the Florida Administrative Code, *finished-drinking- water storage tanks, including conventional hydropneumatic tanks with an access manhole but excluding bladder or diaphragm-type hydro-pneumatic tanks without an access manhole, shall be cleaned at least every five years to remove biogrowths, calcium or iron/manganese deposits, and sludge from inside the tanks; and shall be inspected for structural and coating integrity at least every five years by personnel under the responsible charge of a professional engineer licensed in Florida.*

- The inspection and testing of the hydropneumatic water storage tank was performed in conjunction with RCM Utilities LLC. RMC Utilities LLC was responsible for cleaning the tank and for placing the system back in service.

- The inspection was limited to visual observations and random steel thickness measurements using the DMS Go+ Ultrasonic Thickness Gauge as supplied by GE Inspection Technologies.

- This inspection does not "certify" the tank. Neither pressure testing nor weld x-rays were performed.

- Recommendations for Maximum Operating Pressure are based on ASME formulas for thickness and pressure calculations. Calculations are based on minimum thickness measurements found during random testing and other estimated variables. Maximum Operating Pressures are estimates only and are not to be taken as absolute.

- The information contained herein is believed to be as true and accurate as could be obtained from these observations and the information and material supplied to us. No other assurance or warranty is expressed or implied.

Janet M. Bolivar, P.E.
Florida Registration No. 73878
Date: 1/28/2021

Tank Description

- The inspection of the hydropneumatic tank at Colina Bay Subdivision took place on Monday, January 25, 2021. Personnel present included: Charlie Smith, Ian Reed and James Creech of RCM Utilities, and Janet Bolivar of Bolivar Engineering.

- The tank is a horizontal cylindrical hydropneumatic tank supported by two steel saddles on concrete pads.

- The diameter of the tank is approximately 8'-0" and has a shell length of 37'0".

- The manufacture of the tank and the year the tank was built are unknown. The capacity of the tank is approximately 15,000 gallons.

- The interior of the tank is coated with a white color paint material. The type of coating is unknown.

- The exterior of the tank is coated with a beige color paint material. The type of coating material is unknown.

Observations

- The shell manhole is oval in shape and held in place against a sidewall extension with a bracket on the tank exterior. The brackets and support bolt (s) holding the covers in place are in good condition.

- The tank did not appear to have been dented, bent, twisted, cracked, or otherwise seriously damaged. A scratch along the shell was observed, but was painted over. No water leakage was observed.

- This hydropneumatic tank does have pressure relief valve.

- The exterior coating of the hydropneumatic tank was in good condition. There were no signs of corrosion. According to Tania Thollebeke, the tank has recently been painted.

- The steel saddles are in good condition, showing no signs of corrosion.

- The interior coating of the tank was in good/fair condition. There are areas along the inside shell where the protective coating is nonexistent and surface rust is present. However, the structural integrity of the hydropneumatic tank was found to be in good condition.

- It appears that the tank was originally constructed of 3/8" (0.375") thick steel.

- The hydropneumatic pressure tank (HPT) did not contain a manufacturer's nameplate or ASME Code Stamp and it is unknown if the tank was constructed and tested to meet ASME standards. Therefore, based upon the requirements of ASME Section VIII and the minimum steel thickness measurements for the tank's shell, the maximum allowable working pressure is calculated as follows:

    - Assumptions:
        - Calculations based upon a HPT with Longitudinal Stress (Circumferential Joints:
        - Maximum Allowable Stress Value (S) for Grade 70 Steel: 17,500 psi
        - Joint Efficiency (E): Shell (Butt- Welded Joints, Not examined) = 0.70

      Shell:

      P= Maximum Allowable Working Pressure (PSI)

      t= Minimum Measured Steel Thickness (0.369 inches)

      R= Calculated Outside Radius (48 inches)

Internal Pressure Formula (Outside Dimensions):
Cylindrical Shell

$$P = \frac{(S)(E)(t)}{R - 0.4(t)} = \frac{(17{,}500)(0.70)(0.369)}{48 - 0.4(0.369)} = 94 \text{ psi}$$

The operating pressure should remain below the maximum allowable pressure of 94 psi.

- After the inspection and cleaning, RCM Utilities disinfected the tank. The gasket was put in place and the manhole was secured.

Recommendations

- The structural integrity of the hydropneumatic tank was in good condition. Since it is unknown if the hydropneumatic tanks is an ASME Code certified pressure vessel, the operating pressure should remain below the calculated maximum allowable working pressure (MAWP) of 94 psi.

- The interior coating of the hydropneumatic tank was in good/fair condition with some corrosion observed around the fittings and some welds. Although these deficiencies do not affect the structural integrity of the tank nor the quality of the water, the protective coating and the steel will continue to deteriorate under the harsh wet chlorine conditions. To prevent further corrosion and extend the life of the tank, sandblasting and recoating the interior surface of the tank is recommended.

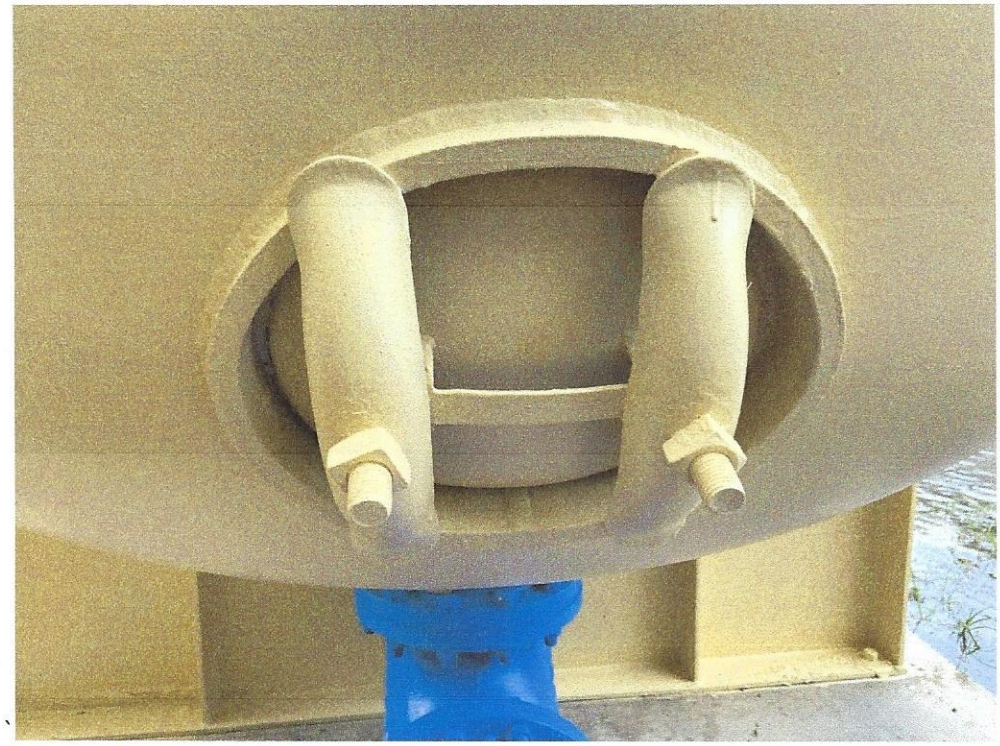
- Interior and exterior sand blasting and coating shall be performed by persons experienced in tank renovations and shall be done in accordance with ASME and AWWA standards.

- This tank should be re-inspected again in 5 years to comply with the Florida Department of Environmental Protection Regulation Chapter 62-555.350 of the Florida Administrative Code. This code requires that *"finished-drinking- water storage tanks, including conventional hydropneumatic tanks with an access manhole but excluding bladder or diaphragm-type hydropneumatic tanks without an access manhole, shall be cleaned at least every five years to remove biogrowths, calcium or iron/manganese deposits, and sludge from inside the tanks; and shall be inspected for structural and coating integrity at least every five years by personnel under the responsible charge of a professional engineer licensed in Florida."*

Photographs (Exterior and Interior)

Exterior of Tank

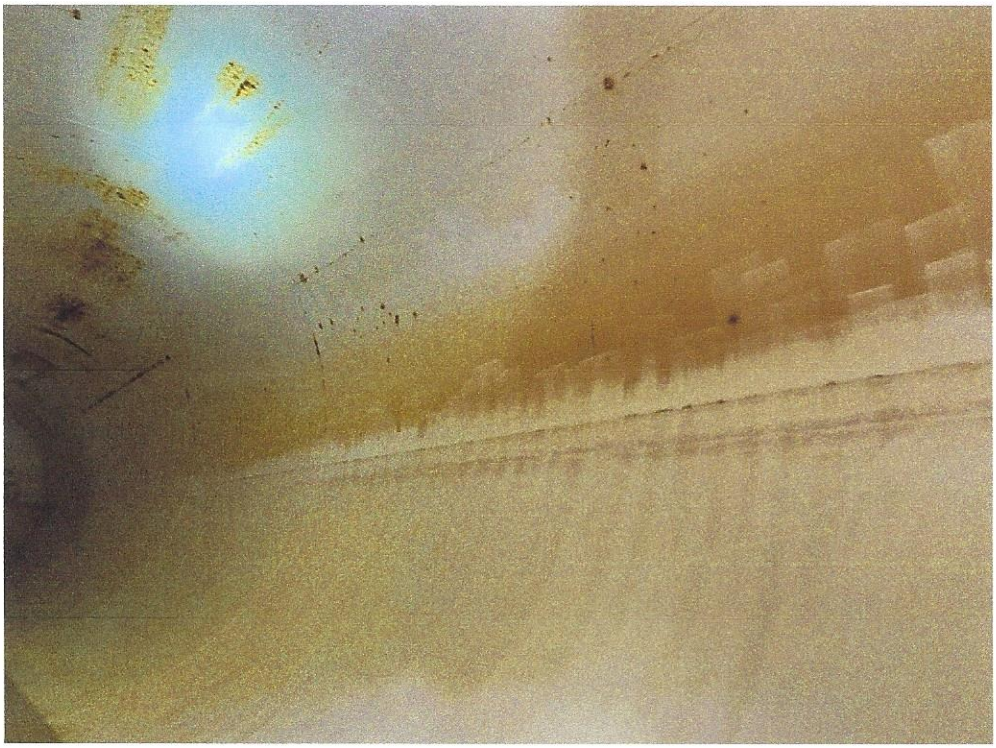
Exterior of Tank



Access Manhole

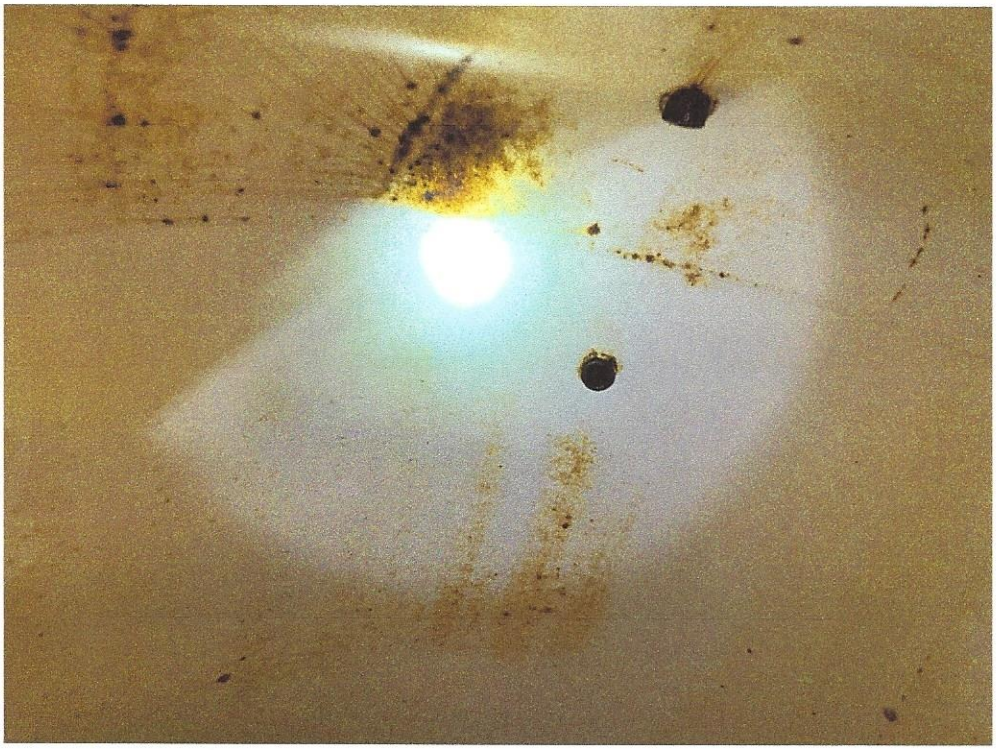
Steel Saddles

Interior of the tank



Interior of the Tank

Interior of the Tank



Corrosion spots noted around fittings

Ultrasonic Thickness Measurements

The Ultrasonic testing of the steel plate thickness was performed utilizing a DMS Go+ Ultrasonic thickness gauge as supplied by GE Inspection Technologies.

The results of the measurements are located on the following page.

File Header

P.C. File Name :	COLINA BAY.dmsdr
Gauge File Name :	COLINA BAY.dmsdr
Description :	15,000 GALLON
HYDRO TANK	
Memo Comment :	
Creation Date :	1/24/2021
Date Last Saved :	1/1/1997

Probe :	FH2E	Cal. Stnd. :	
Temp. Comment :			
Inspector :	JANET BOLIVAR	Company :	BOLIVAR ENGR LLC
Instrument Type :	DMS Go	Instrument S.N. :	GOPLS18050015

Min. Alarm Val. :	0.000	Max. Alarm Val. :	0.000
% Loss Alarm Val. :	0.00	% Growth Alarm Val. :	0.00
Abs. Loss Alarm Val. :	0.000	Abs. Growth Alarm Val. :	0.000
Units :	INCH	Velocity (in/us) :	0.2271

File Statistics

Number of Readings :	44	Number of Empties :	1
Number of Obstructs :	0	Number of Attachments :	10
Range :	0.067	Mean :	0.383
Median :	0.366	Standard Deviation :	0.014
Minimum Value :	0.332		
Minimum Value Loc. :	3		
Maximum Value :	0.399		
Maximum Value Loc. :	40		
Minimum Value Alarms :	0	Maximum Value Alarms :	0
Percent Loss Alarms :	0	Percent Growth Alarms :	0
Absolute Loss Alarms :	0	Absolute Growth Alarms :	0
% and Abs. Loss Alarms :	0	% and Abs. Growth Alarms:	0

	1
1	0.394
2	0.357
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