

**INSPECTION
REPORT
FOR THE
EASTFIELD SLOPES CONDO. ASSOC.
WATER TREATMENT PLANT
HYDROPNEUMATIC TANK**

PWS ID. No.: 6294856

**9529 Fieldview Circle
Thonotosassa, Hillsborough County, Florida**

Prepared by:



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May 15, 2024

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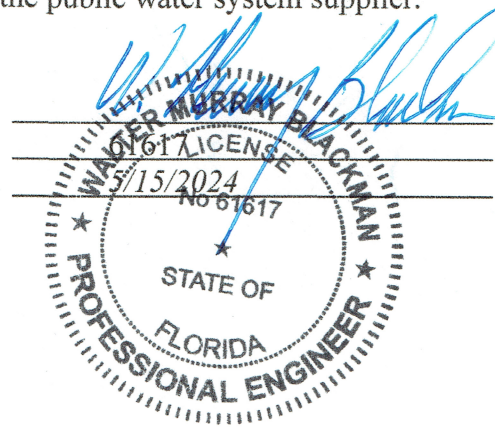
CERTIFICATIONS

ENGINEER:

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This inspection report describes the structural and coating integrity of the finished water storage tank through visual observations and non-destructive testing performed on the date(s) listed on the cover page. As the Professional Engineer responsible for preparation of this report, the undersigned certifies that the information contained in this report is true and correct to the best of his knowledge, the report was prepared in accordance with sound engineering principles, and the recommendations and schedules have been discussed with the public water system supplier.

Signature of Engineer:
Florida Registration No.:
Date:



INTRODUCTION

In accordance with Chapter 62-555.350(2) of the Florida Administrative Code, *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 checked at least annually to ensure that hatches are closed and screens are in place; 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 once ever five years by personnel under the responsible charge of a professional engineer licensed in Florida.*

Cleaning, inspection and testing of the Hydropneumatic Pressure Tank (HPT) was performed by AT Environmental and DNM Engineering & Associates, Inc.

TANK DESCRIPTION:

Manufacturer:	Unknown
Year Built:	Unknown
ASME Code Stamp:	No
Design Pressure:	75 psi (assumed for Non-ASME Code)
Overall Length:	350 inches
Diameter:	96 inches
Nominal Volume:	10,000 Gallons
Construction:	(2) Ellipsoidal Bell Head Ends and Steel Plate Constructed Cylindrical Shell with butt-welded joints (seams)

PRE-INSPECTION

The following summarizes the procedures implemented prior to inspection of the hydropneumatic pressure tank:

- The site manager issued precautionary boil water notices to residents and visitor areas in advance of tank inspection.
- Closed the HPT isolation valves and opened the drain valve to empty the HPT.
- The HPT's access manway fasteners were removed and the manway cover opened.
- The interior of the HPT was cleaned utilizing a pressure washer to remove biogrowths, calcium or iron/manganese deposits, sand and/or sludge from the interior of the HPT.

VISUAL INSPECTION

The following summarizes the noted observations during the visual inspection of the exterior and interior of the hydropneumatic pressure tank:

Hydropneumatic Pressure Tank Exterior

- The exterior structure of the hydropneumatic tank was in overall good condition. There were no signs of deteriorated welds, pitting or structural damage.
- The exterior coating was observed to be in good condition with no signs of blistered paint or corrosion.

Hydropneumatic Pressure Tank Interior

- The interior epoxy coating of the HPT was observed to be in poor condition with severe corrosion, pitting, metal delamination and weld separation.

NONDESTRUCTIVE TESTING

The following summarizes the equipment and measurements of the HPT's exterior paint coating; steel thickness of the tank's shell and bell head ends; and interior epoxy coating of the tank:

Hydropneumatic Tank's Exterior Paint Coatings

- The HPT's exterior paint coating was examined for dry film thickness using the Defelsko, PosiTest® FM Coating Thickness Gauge.
- A total of 20 dry film thickness readings were taken along the exterior perimeter of the HPT's shell and bell head ends. The readings ranged from 14.0 to 22.0 mils with an average of 16.8 mils. All of the exterior coating readings were above the recommended minimum dry film thickness of 4.0 mils.

Hydropneumatic Pressure Tank's Steel Thickness

- The exterior of the HPT was examined for steel thickness using the Defelsko, PosiTector® UTG Ultrasonic Thickness Gauge.
- A total of 24 Ultrasonic Thickness Measurements (UTM) were taken along the exterior perimeter of the HPT's shell and bell head ends. The UTM readings ranged from 0.300 to 0.366 inches with an average of 0.312 inches on the bell head ends of the HPT. The UTM readings ranged from 0.255 to 0.298 inches with an average of 0.267 inches along the perimeter of the HPT's shell.

- Based upon the requirements of ASME Section VIII and the minimum steel thickness measurements for the HPT's bell head ends and 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): Ellipsoidal Bell Head (One Piece) = 0.85
Shell (Butt-Welded Joints, Not Examined) = 0.70

Bell Head Ends:

P = Maximum Allowable Working Pressure (PSI)

t = Minimum Measured Steel Thickness (0.300 Inches)

D = Measured Outside Diameter (96 inches)

Internal Pressure Formula (Outside Dimensions): 2:1 Ellipsoidal Head

$$P = \frac{(2)(S)(E)(t)}{D - 1.8(t)} = \frac{(2)(17,500)(0.85)(0.300)}{96 - 1.8(0.300)} = \underline{\underline{93 \text{ psi}}}$$

Shell:

P = Maximum Allowable Working Pressure (PSI)

t = Minimum Measured Steel Thickness (0.255 Inches)

R = Calculated Outside Radius (48 inches)

*Internal Pressure Formula (Outside Dimensions):
Cylindrical Shell*

$$P = \frac{(S)(E)(t)}{R - 0.4(t)} = \frac{(17,500)(0.70)(0.255)}{48 - 0.4(0.255)} = \underline{\underline{65 \text{ psi}}}$$

The operating pressures should remain below both the calculated maximum allowable working pressure (MAWP) of 65 psi.

Hydropneumatic Tank's Interior Epoxy Coating

- The hydropneumatic tank's interior epoxy coating was not examined for dry film thickness as the interior was observed to void of coating and have severe corrosion, pitting, metal delamination and weld separation.

SUMMARY & RECOMMENDATIONS

The structural integrity, exterior paint coating, and interior epoxy coating of Hydropneumatic Pressure Tank (HPT) associated with the Eastfield Slopes Condominium Association water plant located in Thonotosassa, Hillsborough County, Florida was inspected on May 15, 2024.

- The structural integrity of the hydropneumatic tank was in poor condition, with no interior epoxy coating, severe corrosion, pitting, metal delamination and weld separation. It is our recommendation that the hydropneumatic tank be replaced with an ASME Code certified pressure vessel of the same gross volume in order to prevent a potential catastrophic tank failure.



Exterior of the Hydropneumatic Tank (HPT)



Interior of the HPT



Interior of the HPT