



# **200KG Reservoir**

## **Tyrone Townsite**

**Report of Findings**

**From the**

**Diving Operations**

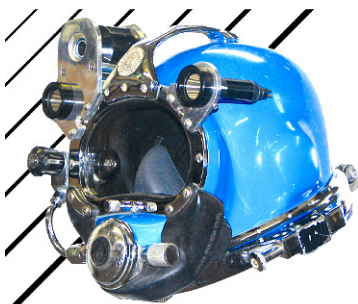
**Conducted on**

**May 23, 2019**

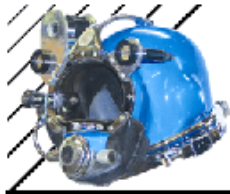
**by**

**Liqui Vision  
Technology**

**DIVING SERVICES**







## Underwater Inspection of 200KG Reservoir

May 23, 2019

Roger Groves  
Tyrone Townsite  
P.O. Box 570  
Tyrone, NM 88065

Following is the report of findings during the underwater work conducted on your reservoir.

It will focus on issues of concern or areas that need attention. In order to see a complete and detailed inspection, please view each video.

Color images of all plumbing fixtures, components and areas of concern were taken via underwater digital camera. The images should give you a clear view of the conditions described. The video may give you another view and a clearer understanding of any area that you may wish to look at more closely.

### **METHODOLOGY:**

*Disinfection of All Equipment With 200ppm+ Chlorine Solution Immediately Prior to Entering System:* This process prevents contamination of the water supply. All LVT equipment was properly disinfected prior to entering the potable water system.

*Full-Time Voice Communication between surface and Diver:* The system allowed for constant communication between the diver, and all surface personnel. In addition, customers were able to communicate with the diver at any time. For purposes of a more efficient inspection, cleaning, and repair program, that enabled the diver to immediately discuss any observations he made inside the reservoir.

*Full-Time Live High Resolution Color Video:* Allowed for constant viewing of the diver's work and observations. This also enabled the district personnel to view what the diver in the reservoir was witnessing.

# 200KG Reservoir

## **TERMINOLOGY:**

When describing the features or areas of interest inside the reservoir, an image number is placed next to the description that corresponds with the inspection findings. The diagram is shown in a view looking from the top down. The entry hatch is referred to as the 12:00 o'clock position.

Following the diagram are pictures of the pertinent areas of the reservoir and the locations where the pictures were taken. Each picture is described and numbered.

The standards used to evaluate the condition of the reservoir include: Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces – SSPC-Vis 2-82 & ASTM D 610-85  
NACE Standard RP0196-96 & RP0388-2001 or Condition of Concrete In-service – ACI 201.1R-92.

# 200KG Reservoir

## OVERVIEW OF RESERVOIR INSPECTED:

<b>Customer Name:</b>	Tyrone Townsite	<b>Reservoir Name:</b>	200KG Reservoir
Manager:	Roger Groves	Construction:	92' Elevated Tower
Job Number:	NM30690R1T1	Capacity (gal.):	200,000
Date of Inspection:	May 23, 2019	Diameter or L x W:	36'
Report Writer:	Matt Wallace	Height:	32'
Diver:	Nik Salas	Floor Square FT:	1,017.8
Tender:	Chris Westphal	Date Built:	1976

**N/A** –not applicable **Excellent** (Ex.) –like new condition, no repairs needed. **Good** – Cosmetic only problems, repairs if wanted. **Fair**-Minor problems, repairs needed, not immediate. **Poor** –Major problems, structural or like, immediate repairs needed.

### 1. Rust Grades

Grades	% of Surface Rusted	Description
10	0% - 0.01%	No rusting or less than 0.01% of surface rusted
9	0.01% - 0.03%	Minute rusting, less than 0.03% of surface rusted
8	0.03% - 0.1%	Few isolated rust spots, less than 0.1% of surface rusted
7	0.1%- 0.3%	Less than 0.3% of surface rusted
6	0.3% - 1%	Extensive rust spots, but less than 1% of surface rusted
5	1% - 3%	Rusting to the extent of 3% of surface rusted
4	3% - 10%	Rusting to the extent of 10% of surface rusted
3	10% - 16%	Approximately one sixth of the surface rusted (16%)
2	16% - 33%	Approximately one third of the surface rusted (33%)
1	33% - 50%	Approximately one half of the surface rusted (50%)
0	50% - 100%	Approximately 100% of the surface rusted

### 2. Concrete Deformities

Unable to Evaluate	Good Condition	Cracks	Blistering	Chalking	De-Lamination	Pitting	Popouts	Scaling	Spalling	Warping
UE	GC	CK	BL	CH	DL	PT	PO	SC	SP	WA

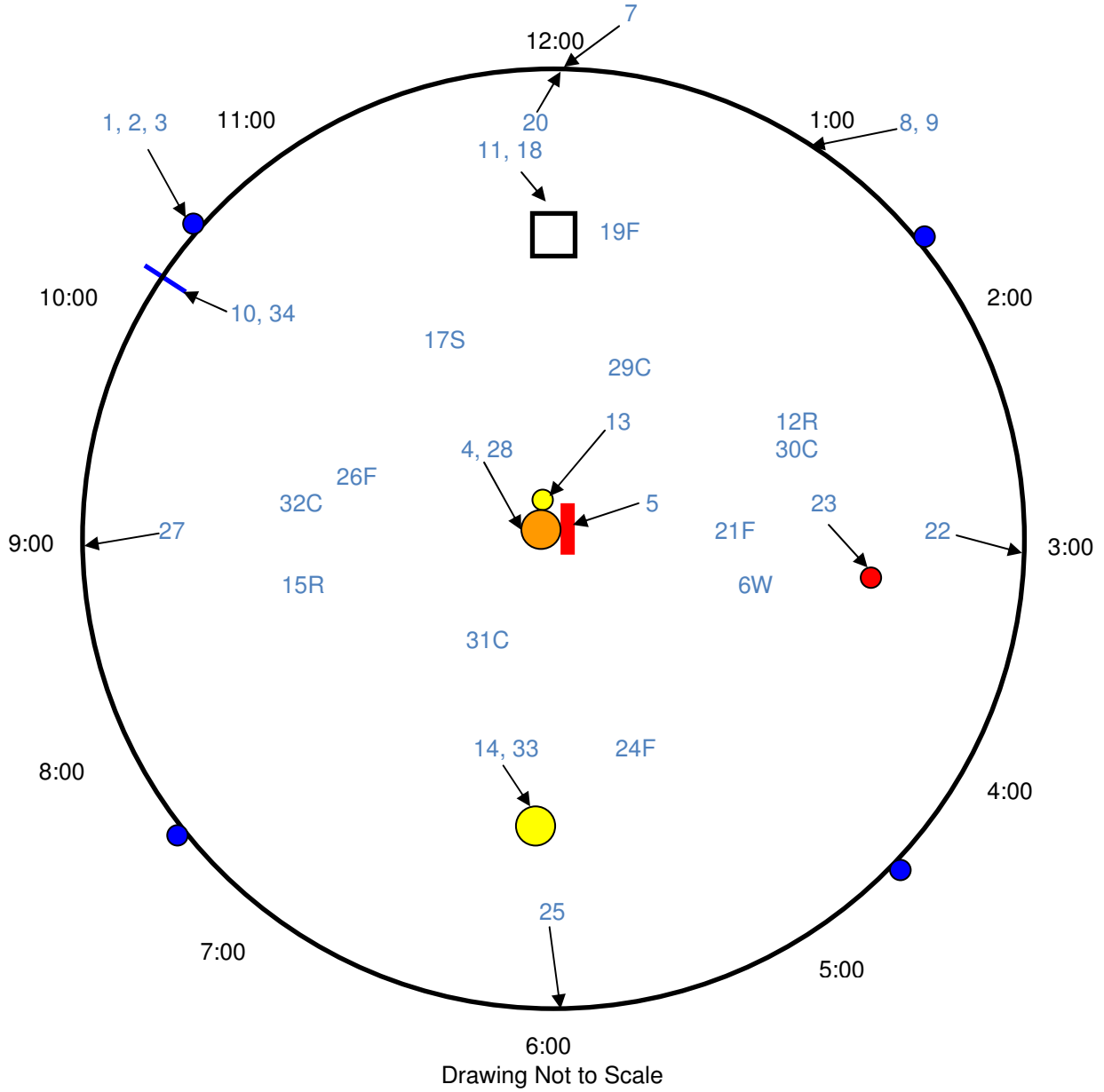
## 200KG Reservoir

### RECOMMENDATIONS:

<b>Recommendation</b>	<b>Estimated Time - Hrs.</b>
Repair and/or install fine mesh screens on exterior vents to limit the risk of bugs and other matter from entering the reservoir.	1.0
Install weather stripping on entry hatch to limit the risk of bugs and other matter from entering the reservoir.	1.0
Clean the walls in order to remove the accumulated sediment, to give a better idea of the severity of coating problems noted on the walls and allow for easier and better repairs. On next cleaning cycle.	Please contact our sales office for an estimate.
Perform a regular cleaning, inspection and repair cycle every 2-3 years in order to ensure superior water quality and proper maintenance of coating condition and appurtenances is performed.	Please contact our sales office for an estimate.

# 200KG Reservoir

## Reservoir Diagram



	Entry Hatch		Overflow		Support Column / Base
	Common Inlet/Outlet		Man Entry		Liquid Level Indicator
	Air Vent		Drain		

## 200KG Reservoir

Image #1

*Exterior Lower Ladder 10:30*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Exterior Lower Ladder appeared to be in good condition with a minor amount of corrosion.



Image #2

*Support Column Base 10:30*

**Condition:**  
Concrete Deform<sup>3</sup> CK.

**Description:**  
32"x48" Support Column Base appeared to be in fair condition with a moderate amount of cracking.





## 200KG Reservoir

Image #3

*Support Leg 10:30*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
24" Support Leg appeared to be in fair condition with a moderate amount of corrosion.



Image #4

*Inlet / Outlet Center*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
48" Inlet / Outlet appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #5

*Man Way Center*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
18"x12" Man Way appeared to be in good condition with a minor amount of corrosion.



Image #6

*Lower Wall 3:00*

**Condition:**  
Rust Grade<sup>1</sup> 9.

**Description:**  
Lower Wall appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #7

*Exterior Upper Ladder 12:00*

**Condition:**  
Rust Grade<sup>1</sup> 9.

**Description:**  
Exterior Upper Ladder appeared to be in good condition with a minor amount of corrosion.



Image #8

*Catwalk 1:00*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Catwalk appeared to be in fair condition with a moderate amount of corrosion.



## 200KG Reservoir

Image #9

*Exterior Wall 1:00*

**Condition:**  
Rust Grade<sup>1</sup> 9.

**Description:**  
Exterior Wall appeared to be in good condition with a minor amount of corrosion.



Image #10

*Liquid Level Indicator Reader Board 10:15*

**Condition:**  
Rust Grade<sup>1</sup> 7.

**Description:**  
Liquid Level Indicator Reader Board appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #11

*Entry Hatch 12:00*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
28" Entry Hatch appeared to be in good condition with a minor amount of corrosion.



Image #12

*Roof 3:00*

**Condition:**  
Rust Grade<sup>1</sup> 9.

**Description:**  
Roof appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #13

*Vent Center*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
12" Vent appeared to be in good condition with a minor amount of corrosion. No fine mesh screen was observed.



Image #14

*Overflow 6:00*

**Condition:**  
Rust Grade<sup>1</sup> 9.

**Description:**  
12" Overflow appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #15

*Roof 9:00*

**Condition:**  
Rust Grade<sup>1</sup> 9.

**Description:**  
Roof appeared to be in good condition with a minor amount of corrosion.



Image #16

*Diver*



## 200KG Reservoir

Image #17

*Sediment*

**Description:**

1" of sediment was removed from reservoir floor.



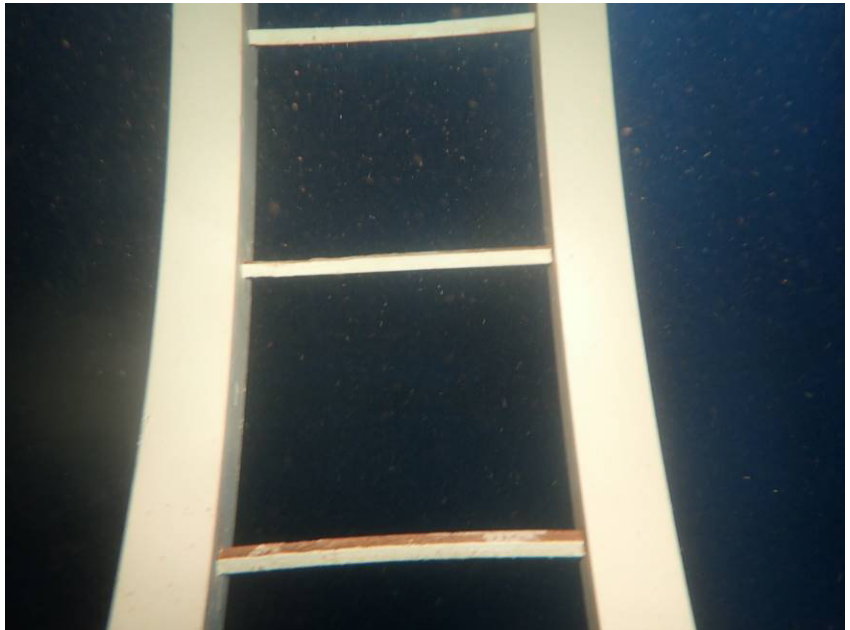
Image #18

*Interior Ladder 12:00*

**Condition:**  
Rust Grade<sup>1</sup> 7.

**Description:**

Interior Ladder appeared to be in good condition with a minor amount of corrosion.





## 200KG Reservoir

Image #19

Floor 12:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Floor appeared to be in good condition with a minor amount of corrosion.

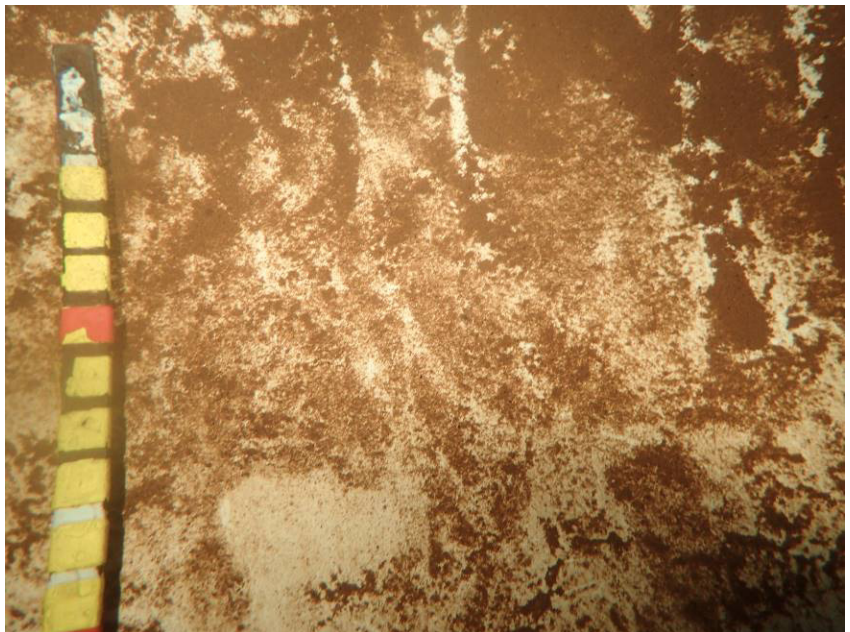


Image #20

Wall 12:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Wall appeared to be in good condition with a minor amount of corrosion. Sediment was observed on wall.



## 200KG Reservoir

Image #21

Floor 3:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Floor appeared to be in good condition with a minor amount of corrosion.

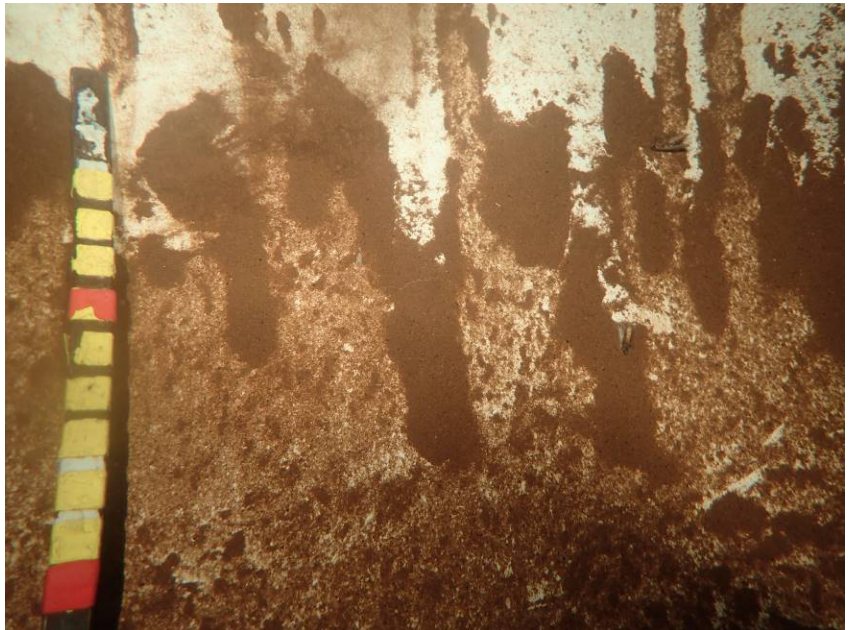


Image #22

Floor 3:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Floor appeared to be in good condition with a minor amount of corrosion. Sediment was observed on wall.



## 200KG Reservoir

Image #23

*Drain 3:05*

**Condition:**  
Rust Grade<sup>1</sup> 6.

**Description:**  
3" Drain appeared to be in fair condition with a moderate amount of corrosion.

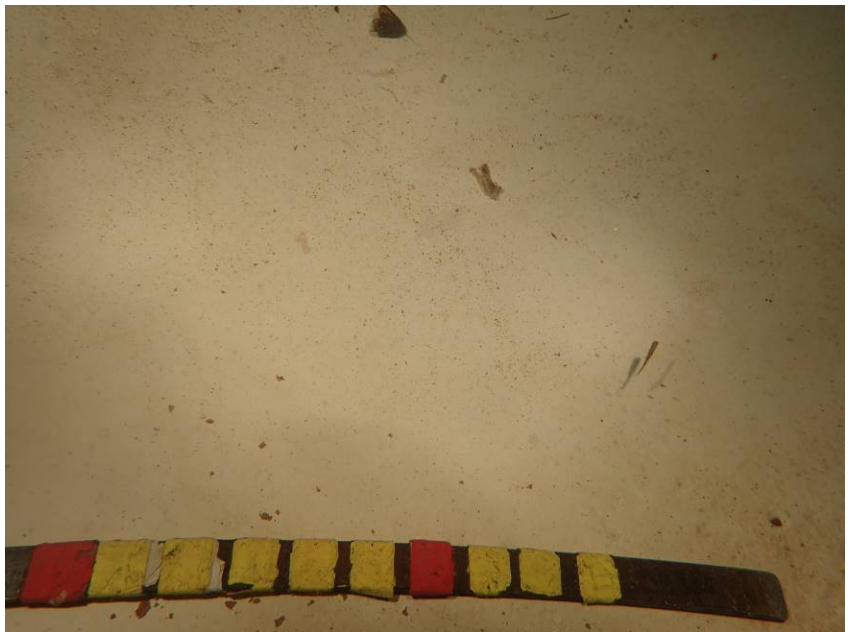


Image #24

*Floor 6:00*

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Floor appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #25

Wall 6:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Wall appeared to be in good condition with a minor amount of corrosion. Sediment was observed on wall.

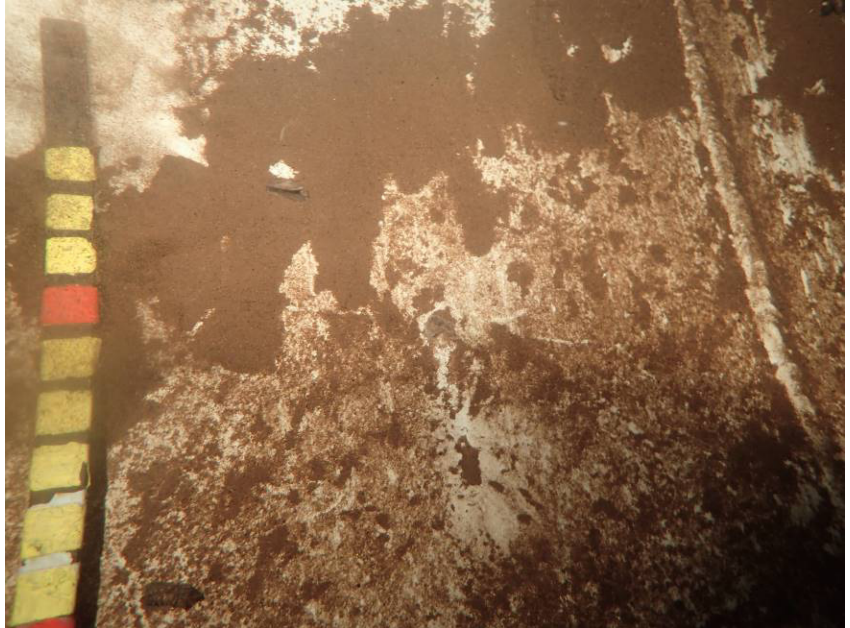
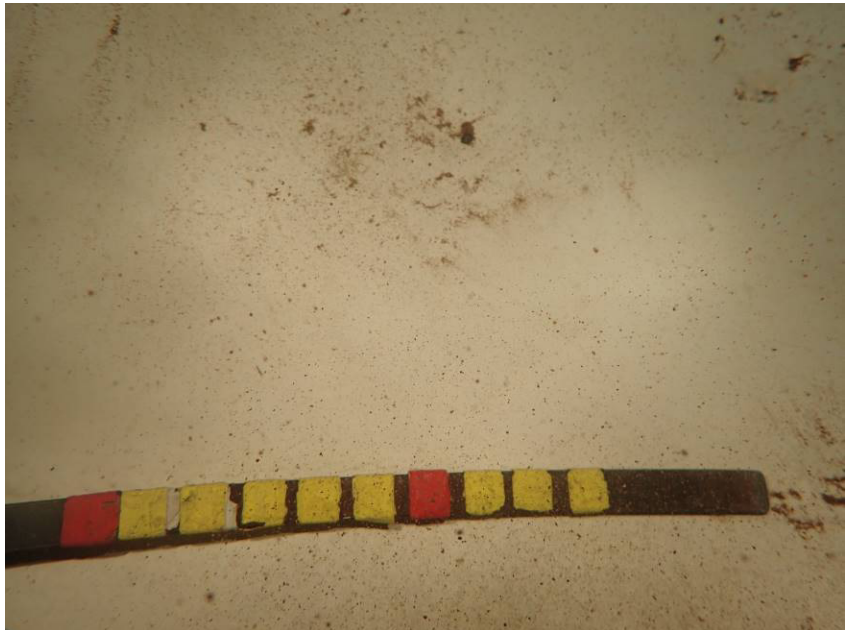


Image #26

Floor 9:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Floor appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #27

Wall 9:00

**Condition:**  
Rust Grade<sup>1</sup> 8.

**Description:**  
Wall appeared to be in good condition with a minor amount of corrosion. Sediment was observed on wall.

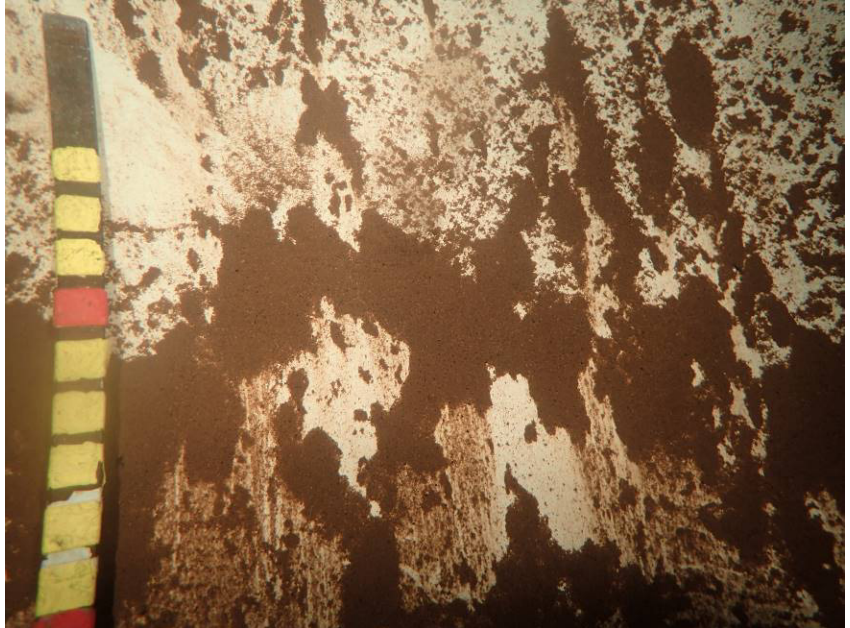
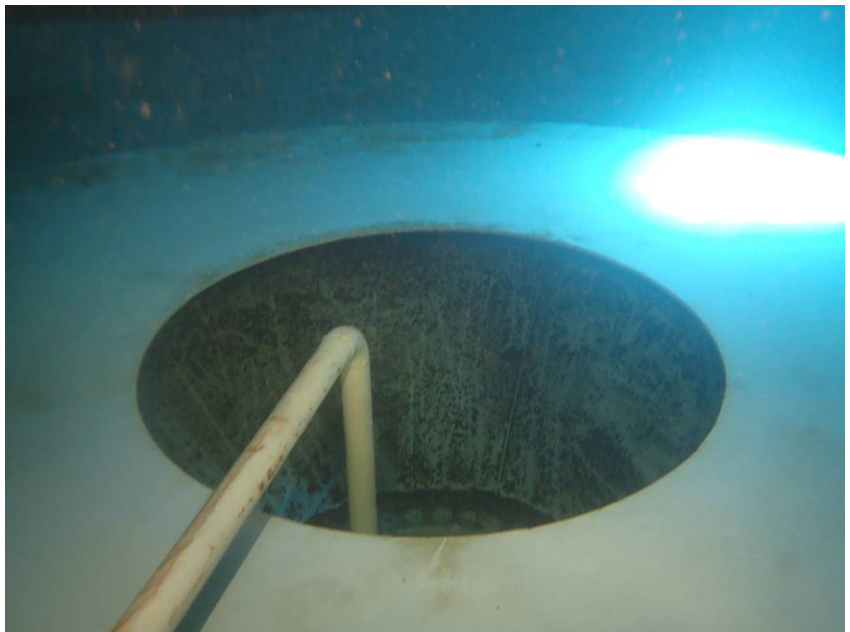


Image #28

Inlet / Outlet Center

**Condition:**  
Rust Grade<sup>1</sup> 7.

**Description:**  
Inlet / Outlet appeared to be in good condition with a minor amount of corrosion.



## 200KG Reservoir

Image #29

*Ceiling 12:00*

**Condition:**  
Rust Grade<sup>1</sup> 3.

**Description:**  
Ceiling appeared to be in good condition with a minor amount of corrosion.



Image #30

*Ceiling 3:00*

**Condition:**  
Rust Grade<sup>1</sup> 4.

**Description:**  
Ceiling appeared to be in fair condition with a moderate amount of corrosion.



## 200KG Reservoir

Image #31

*Ceiling 6:00*

**Condition:**  
Rust Grade<sup>1</sup> 4.

**Description:**  
Ceiling appeared to be in fair condition with a moderate amount of corrosion.

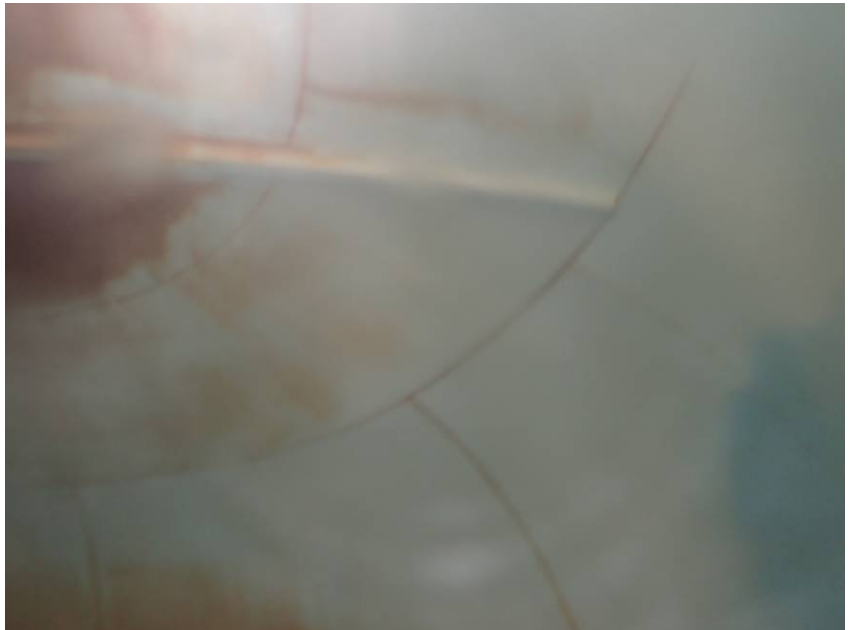


Image #32

*Ceiling 9:00*

**Condition:**  
Rust Grade<sup>1</sup> 4.

**Description:**  
Ceiling appeared to be in fair condition with a moderate amount of corrosion.



## 200KG Reservoir

Image #33

*Overflow 6:00*

**Condition:**  
Rust Grade<sup>1</sup> 4.

**Description:**  
Overflow appeared to be in fair condition with a moderate amount of corrosion.

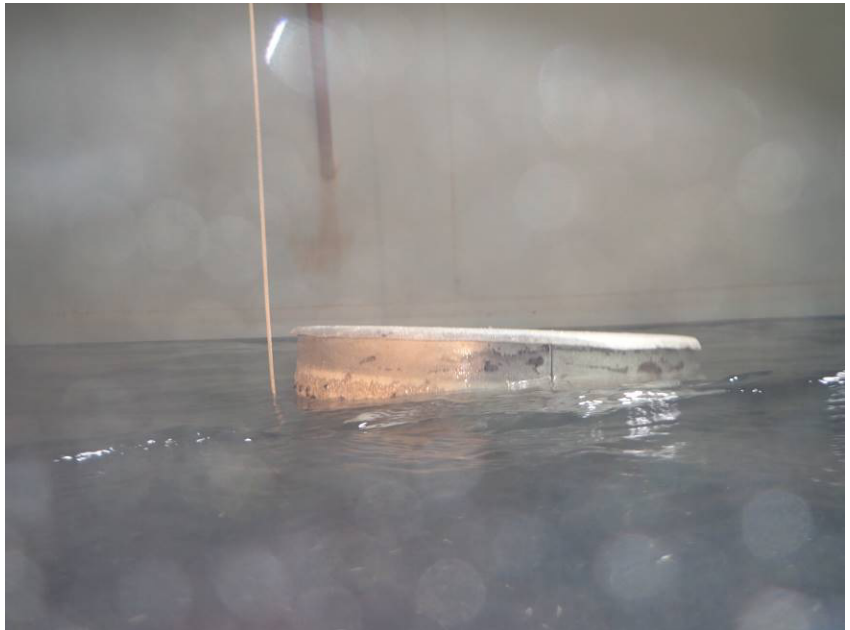


Image #34

*Liquid Level Indicator Float 10:15*

**Condition:**  
Rust Grade<sup>1</sup> 7.

**Description:**  
Liquid Level Indicator Float appeared to be in good condition with a minor amount of corrosion.







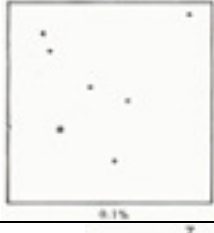
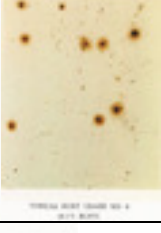
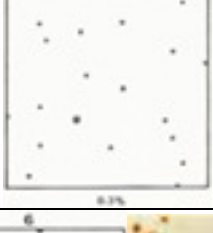


# 200KG Reservoir

## REFERENCES:

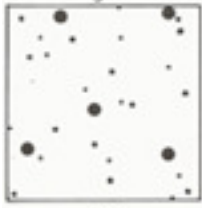
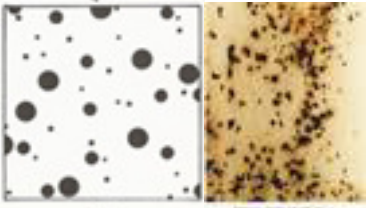

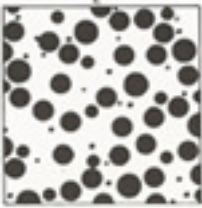
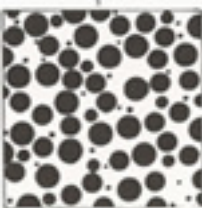
### Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces – SSPC-Vis 2-82 & ASTM D 610-85 (1989)

The graphical representations show examples of area percentages, which may be helpful in rust grading. The use of photographic reference standards requires the following precautions:

1. Some finishes are stained by rust. This staining must not be confused with the actual rusting involved.
2. Accumulated dirt or other material may make accurate determination of the degree of rusting difficult.
3. Certain types of deposited dirt that contain iron or iron compounds may cause surface discoloration that should not be mistaken for corrosion.
4. It must be realized that failure may vary over a given area and discretion must therefore be used in applying these reference standards.
5. In evaluating surfaces, consideration shall be given to the color of the finish coating, since failures will be more apparent on a finish that shows color contrast with rust, such as white, than on a similar color, such as iron oxide finish.
6. The photographic reference standards are not required for use of the rust-grade scale since the scale is based upon the percent of the area rusted and any method of assessing area rusted may be used to determine the rust grade.

Rust Grades	Description	Graphical Representation
10	No rusting or less than 0.01% of surface rusted	Unnecessary
9	Minute rusting, less than 0.03% of surface rusted	 
8	Few isolated rust spots, less than 0.1% of surface rusted	 
7	Less than 0.3% of surface rusted	
6	Extensive rust spots, but less than 1% of surface rusted	 

## 200KG Reservoir

5	Rusting to the extent of 3% of surface rusted	 <p style="text-align: center; font-size: small;">3%</p>
4	Rusting to the extent of 10% of surface rusted	 <p style="text-align: center; font-size: small;">10%</p>
3	Approximately one sixth of the surface rusted (16%)	 <p style="text-align: center; font-size: small;">16%</p>
2	Approximately one third of the surface rusted (33%)	 <p style="text-align: center; font-size: small;">33%</p>
1	Approximately one half of the surface rusted (50%)	 <p style="text-align: center; font-size: small;">50%</p>
0	Approximately 100% of the surface rusted	Unnecessary