NEVADA NATIONAL SECURITY SITE

Water Tank Refurbishments

Refurbish 17 Water Tanks At NNSS

PERFORMANCE SPECIFICATION

Document No. **02851-SPC-01**
Revision A

April 29, 2024

This document has been reviewed by a DC/RO and has been determined to be UNCLASSIFIED, not UCNI, and contains no CUI based on current classification guidance. This review does not constitute a review for CUI outside of classification guidance and does not constitute clearance for Public Release.

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TABLE OF CONTENTS

SECTION 011000:
GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Objective. The Nevada National Security Site (NNSS) currently has 17 Water Tanks which require rehabilitation and modifications. The 17 water tanks require rehabilitation, sandblasting, coating, corrective maintenance, and other refurbishments. New OSHA and NFPA requirements require upgrades to 17 existing water tanks in accordance with recent tank inspections. Tank Inspection Reports for 17 inspected tanks are refenced to this Specification. The objectives of Tank Inspection Reports were to:

- Perform field inspections and assess structural integrity of each tank.
- Assess condition of protective coatings present.
- Review safety compliance of tank ladders and access.
- Review sanitary protection equipment.
- Provide recommendations for rehabilitation.

B. Tank Priorities for Rehabilitation.

1. Area 23 Mercury North Tank, 1,500,000 Gallons
2. Area 23 Mercury South Tank, 1,500,000 Gallons
3. Area 12 North Tank, 317,000 Gallons
4. Area 12 South Tank, 500,000 Gallons
5. Area 5 Well 4 and 4A North Tank, 150,000 Gallons
6. Area 5 Well 4 and 4A South Tank, 150,000 Gallons
7. Area 6 Well C-1 North Tank, 50,000 Gallons
8. Area 6 Well C-1 South Tank, 50,000 Gallons
9. Area 6 CP North Tank, 317,000 Gallons
10. Area 6 CP South Tank, 500,000 Gallons
11. Area 5 Well 5A Booster Tank, 50,000 Gallons
12. Area 18 Hilltop Tank, 48,000 Gallons
13. Area 25 Well J-11 Tank, 50,000 Gallons
14. Area 25 Well J-12 Tank, 50,000 Gallons
15. Area 18 Well 8 Tank, 63,000 Gallons
16. Area 5 North Tank, 250,000 Gallons
17. Area 5 South Tank, 250,000 Gallons

C. Tank Characteristics

Tank Priorities for Rehabilitation						
Tank Priority	**Tank Name**	**Asset Number**	**Date Installed**	**Tank Diameter**	**Tank Height**	**Tank Capacity**
1	Area 23 Mercury North	9013731	1996	80	42	1,500,000
2	Area 23 Mercury South	9013717	1965	80	40.50	1,500,000
3	Area 12 North	9013730	1964	60	16	317,000
4	Area 12 South	9013729	1987	60	24	500,000
5	Area 5 Well 4/4A North	9013722	1995	42.50	16	150,000
6	Area 5 Well 4/4A South	9013721	1995	42.50	16	150,000
7	Area 6 Well C1 North	9013721	1987	22	22	50,000
8	Area 6 Well C1 South	9013723	1996	22	21	50,000
9	Area 6 CP North	9013726	1965	60	16	317,000
10	Area 6 CP South	9013725	1990	74	16	500,000
11	Area 5 Well 5A Booster	9013719	1982	20	24	50,000
12	Area 18 Hilltop	9013731	1965	16	32	48,000
13	Area 25 Well J-11	9013734	1958	31	27	50,000
14	Area 25 Well J-12	9013735	1960	18	18	50,000
15	Area 18 Well 8 Booster	9013732	1967	22	24	63,000
16	Area 5 North	28395	2005	34	38	250,000
17	Area 5 South	28394	2005	34	38	250,000

1.2 PRIORITY #1. SCOPE OF WORK AREA 23 MERCURY NORTH TANK, 1,500,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**

- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows condition of one (1) of fifty-one (51) anchor bolts. AWWA D100, 2011, Paragraph 3.8.1.1 states, *"For ground-supported flat-bottom reservoirs and standpipes, mechanical storage shall be provided when the wind or seismic loads exceed the limits for self-anchored tanks."* Subcontractor shall clean areas around anchor bolts and then tighten the jam nuts to specifications.

F. Photo on Page 6 of the Tank Inspection Report shows condition of shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad to direct water away from the foundation.

G. Photo on Page 8 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall replace the 24" manway with 30" manway, post a **Confined Entry** sign, and install maintenance free galvanized steel bolts.

H. Photo on Page 9 of the Tank Inspection Report shows the 12" overflow pipe system, which appears to be in good condition. Subcontractor shall evaluate the 12" overflow pipe system. Report any findings for Contractor-Acceptance.

I. Photos on Page 10 of the Tank Inspection Report show the shell access ladders are 16" wide but are not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent

unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

J. Photo on Page 11 of the Tank Inspection Report shows the condition of the shell access standoff platform, which is equipped with an anti-skid floor and a 43" high OSHA compliant handrail system, complete with an intermediate rail and toe board. Subcontractor shall install a swing gate at the access standoff platform.

K. Photo on Page 12 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

L. Photo on Page 13 of the Tank Inspection Report shows 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall install an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with intermediate rail, toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

M. Photo on Page 14 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post a **Confined Space Entry** sign.

N. Photo on Page 15 of the Tank Inspection Report shows the condition of the 24" secondary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Entry** sign, and install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at the secondary roof hatch.

O. Photos on Page 16 of the Tank Inspection Report show the existing 12" tank roof vent, which appears to be in good condition. Subcontractor shall inspect the roof vent and report any findings for Contractor-Acceptance.

P. Photo on Page 17 of the Tank Inspection Report show the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating and report any findings for Contractor-Acceptance.

Q. Photo on Page 18 of the Tank Inspection Report shows the primary interior access ladder is 16" wide but is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a clear width of 16: (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install anti-skid rung covers and a cable type ladder safety device on the primary interior access ladder.

R. Top photo on Page 19 of the Tank Inspection Report 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. Subcontractor shall evaluate roof lap seams and roof-to-rim angle connection. Report any findings for Contractor-Acceptance.

S. Photos on Page 20 of the Tank Inspection Report show the rafter-to-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate interior roof connections. Report any findings for Contractor-Acceptance.

T. Top photo on Page 21 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the support column baseplate-to-floor connection, which appears to be in good condition. Subcontractor shall evaluate roof and floor connections. Report any findings for Contractor-Acceptance.

U. Photos on Page 22 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

V. Photo on Page 24 of the Tank Inspection Report shows a suction pipe on the interior of the tank, which is equipped with properly sized anti-vortex plate to prevent formation of a vortex. Subcontractor shall evaluate the anti-vortex plate. Report any findings for Contractor-Acceptance.

W. Photos on Page 25 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm). Subcontractor shall evaluate the tank interior after pressure washing. Report any findings for Contractor-Acceptance.

1.3 PRIORITY #2. SCOPE OF WORK AREA 23 MERCURY SOUTH TANK, 1,500,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base*

of the tank." Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 6 of the Tank Inspection Report shows condition of shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad to direct water away from the foundation.

F. Photo on Page 8 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall replace the 24" manway with 30" manway, post a **Confined Entry** sign, and install maintenance free galvanized steel bolts.

G. Photo on Page 9 of the Tank Inspection Report shows the 12" overflow pipe system, which appears to be in good condition. Subcontractor shall evaluate the 12" overflow pipe system. Report any findings for Contractor-Acceptance.

H. Photos on Page 10 of the Tank Inspection Report show the shell access ladders are 16" wide but are not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photo on Page 11 of the Tank Inspection Report shows the condition of the shell access standoff platform, which is equipped with an anti-skid floor and a 43" high OSHA compliant handrail system, complete with an intermediate rail and toe board. Subcontractor shall install a swing gate at the access standoff platform.

J. Photo on Page 12 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

K. Photo on Page 13 of the Tank Inspection Report shows 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall install an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with intermediate rail, toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

L. Photo on Page 14 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100,

Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post a **Confined Space Entry** sign.

M. Photo on Page 15 of the Tank Inspection Report shows the condition of the 24" secondary roof hatch. Roof openings on this tank require the following to be incompliance with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Entry** sign, and install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at the secondary roof hatch.

N. Photos on Page 16 of the Tank Inspection Report show the existing 12" tank roof vent, which appears to be in good condition. Subcontractor shall inspect the roof vent and report any findings for Contractor-Acceptance.

O. Photo on Page 17 of the Tank Inspection Report shows the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating and report any findings for Contractor-Acceptance.

P. Photo on Page 18 of the Tank Inspection Report shows the primary interior access ladder is 16" wide but is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a clear width of 16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install anti-skid rung covers and a cable type ladder safety device on the primary interior access ladder.

Q. Top Photo on Page 19 of the Tank Inspection Report 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. Subcontractor shall evaluate roof lap seams and roof-to-rim angle connection. Report any findings for Contractor-Acceptance.

R. Photos on Page 20 of the Tank Inspection Report show the rafter-to-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate interior roof connections. Report any findings for Contractor-Acceptance.

S. Top photo on Page 21 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the support column baseplate-to-floor connection, which appears to be in good condition. Subcontractor shall evaluate roof and floor connections. Report any findings for Contractor-Acceptance.

T. Photos on Page 22 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

U. Photo on Page 24 of the Tank Inspection Report shows a suction pipe on the interior of the tank, which is equipped with properly sized anti-vortex plate to prevent formation of a vortex. Subcontractor shall evaluate the anti-vortex plate. Report any findings for Contractor-Acceptance.

V. Photos on Page 25 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm). Subcontractor shall evaluate the tank interior after pressure washing. Report any findings for Contractor-Acceptance.

1.4 PRIORITY #3. SCOPE OF WORK AREA 12 NORTH TANK, 317,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant. Report any findings for Contractor-Acceptance.

D. Photo on Page 4 of the Tank Inspection Report shows the tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and appears to be in good condition. Subcontractor shall lightning protection. Report any findings for Contractor-Acceptance.

E. Photo on Page 5 of the Tank Inspection Report shows the condition of the existing drain valve, which is not equipped with a locking device or splash pad. Subcontractor shall install a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post **Confined Space Entry** sign.

G. Photos on Page 7 of the Tank Inspection Report show the condition of the 6" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain.

Subcontractor shall install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

H. Photos on Page 8 of the Tank Inspection Report show the shell access ladder, which is only 15" wide but is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install 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 in accordance with OSHA-2036, and anti-skid rung covers. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photos on Page 9 of the Tank Inspection Report show the condition of the liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall replace the liquid level indicator system, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows the tank roof edge is not equipped with a required handrail system for fall protection as required by OSHA 1910.28(b)(1)(i), which states, *"The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4-feet or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall install an OSHA compliant 42" high handrail system, complete with intermediate rail, toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

K. Photo on Page 11 of the Tank Inspection Report shows the condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install 30" secondary hatch 180° from primary roof hatch and post **Confined Space Entry** sign. Subcontractor shall also install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center and a cable type ladder safety device at primary and secondary roof hatches.

L. Photos on Page 12 of the Tank Inspection Report show the condition of the 8" tank 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.** Subcontractor shall replace the existing roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the tank exterior coating system, which appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system and report any findings for Contractor-Acceptance.

N. Top photo on Page 14 of the Tank Inspection Report shows 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. Subcontractor shall evaluate the interior roof connections and report any findings for Contractor-Acceptance.

O. Photos on Page 15 of the Tank Inspection Report show the rafter-to-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate all rafter connections and report any findings for Contractor-Acceptance.

P. Top photo on Page 16 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the column support baseplate-to-floor connection, which appears to be in good condition. Subcontractor shall evaluate all column to rafter connections and report any findings for Contractor-Acceptance.

Q. Photo on Page 17 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2° F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of Subcontractor design of a tank mixing system and an electrical system by others to support a proposed tank mixing system.

R. Photos on Page 18 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

S. Photos on Page 20 of the Tank Inspection Report show the condition of the interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with a biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm). Subcontractor shall evaluate the interior coating system after cleanings and report any findings for Contractor-Acceptance.

1.5 PRIORITY #4. SCOPE OF WORK AREA 12 SOUTH TANK, 500,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and in compliance with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified."* Subcontractor shall clear any dirt, debris, and other loose gravel away from the tank foundation, down to a minimum of 6" below top of foundation. Subcontractor shall complete this work with a local excavation company.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete tank foundation with commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks,"* and appears to be in good condition. Subcontractor shall inspect the lightning protection system. Replace any damaged electrical grounding components.

E. Photo on Page 5 of the Tank Inspection Report shows the condition of the shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device on the valve to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank drain to direct water away from the tank foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a secondary shell manway 180° from primary manway, post a **Confined Space Entry** sign, and install maintenance free galvanized steel bolts.

G. Photos on Page 7 of the Tank Inspection Report show the condition of the 6" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain. Install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

H. Photos on Page 8 of the Tank Inspection Report show the shell access ladder is 24" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I Photo on Page 9 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

J. Photos on Page 10 of the Tank Inspection Report show the tank roof edge is equipped with a 43" high compliant 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The tank handrail system is equipped with an intermediate rail and toe-board. Subcontractor shall inspect the existing handrail system and report any findings for Contractor-Acceptance.

K. Photo on Page 11 of the Tank Inspection Report shows the condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a 30" secondary roof hatch 180° from primary roof hatch and post **Confined Space Entry** sign. Subcontractor shall also install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at primary and secondary roof hatches.

L. Photos on Page 12 of the Tank Inspection Report show the existing tank roof vent, which appears to be in good condition. Subcontractor shall inspect the roof vent. Report any findings for Contractor-Acceptance.

M. Top photo on Page 14 of the Tank Inspection Report shows the interior roof lap seams which appear to be in good condition. Bottom photo shows the interior roof-to-trim angle connection appears to be in good condition. Subcontractor shall evaluate roof lap seams and interior roof-to-trim angle connection. Report any findings for Contractor-Acceptance.

N. Photos on Page 15 of the Tank Inspection Report show the rafter-to-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate the connections and report any findings for Contractor-Acceptance.

O. Top photo on Page 16 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Subcontractor shall evaluate the column and report any findings for Contractor-Acceptance.

P. Photo on page 17 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2°F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of a Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

Q. Photos on Page 18 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

R. Photos on Page 20 of the Tank Inspection Report show the tank interior coating system. The overall tank interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and then evaluate tank interior coatings. Submit any findings for Contractor-Acceptance.

1.6 PRIORITY #5. SCOPE OF WORK AREA 5 WELLS 4 AND 4A NORTH TANK, 150,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.

- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the condition of the tank foundation. AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified."* Subcontractor shall clear any dirt, debris, and other loose gravel away from the tank foundation, down to a minimum of 6" below top of foundation. Subcontractor shall complete this work with a local excavation company.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete tank foundation with commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation to prevent water from entering under the tank. Then Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*," and appears to be in good condition. Subcontractor shall inspect the lightning protection system for proper electrical grounding for lightning protection. Replace any damaged electrical grounding components.

E. Photo on Page 5 of the Tank Inspection Report shows the condition of the anchor bolts. AWWA D100, 2011, Paragraph 3.8.1.1, *"Required Anchorage, "*states, *"For ground-supported flat-bottom reservoirs and standpipes, mechanical storage shall be provided when the wind or seismic loads exceed the limits for self-anchored tanks."* Subcontractor shall clean areas around anchor bolts, tighten anchor nuts, then tack-weld the circumference of the nut-to-base plate connections and bolt-to-nut connections to reinforce.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device on the valve to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank drain to direct water away from the tank foundation.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The primary shell manway complies with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall inspect the primary shell manway to verify it complies with AWWA D100. NFPA 22, and OSHA 1910.146 requirements.

H. Photo on Page 8 of the Tank Inspection Report shows the condition of the 24" secondary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall replace the 24" manway with a 30" secondary shell manway.

I. Photos on Page 9 of the Tank Inspection Report show the condition of the 12" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain. Subcontractor shall install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

J. Photos on Page 10 of the Tank Inspection Report show the shell access ladder is 16" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036, and a **Fall Protection Required** sign at the base of the ladder.

K. Photo on Page 11 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

L. Photo on Page 12 of the Tank Inspection Report shows 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The tank is equipped with 42" high handrails to the left and right of the access ladder. Subcontractor shall extend the handrails around the circumference of the tank roof, complete with an intermediate rail, toe board and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

M. Photo on Page 13 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Space Entry** sign.

N. Photo on Page 14 of the Tank Inspection Report shows the condition of the 24" secondary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Space Entry** sign. Subcontractor shall also install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at the secondary roof hatch.

O. Photos on Page 15 of the Tank Inspection Report show the existing 12" tank roof vent, which appears to be in good condition. Subcontractor shall inspect the roof vent and report any findings for Contractor-Acceptance.

P. Photos on Page 16 of the Tank Inspection Report show the condition of the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system. Submit any findings for Contractor-Acceptance.

Q. Photo on Page 17 of the Tank Inspection Report shows the condition of the primary interior access ladder. The ladder is 16" wide but is not equipped with anti-skid rungs.

Subcontractor shall install anti-skid rung covers and a cable safety device on the primary access ladder.

R. Top photo on Page 18 of the Tank Inspection Report shows the interior roof lap seams which appear to be in good condition. Bottom photo shows the interior roof-to-trim angle connection, which appears to be in good condition. Subcontractor shall evaluate roof lap seams and interior roof-to-trim angle connection. Submit findings for Contractor-Acceptance.

S. Photos on Page 19 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

T. Photo on Page 21 of the Tank Inspection Report shows a suction pipe on the interior of the tank, which is equipped with a properly sized anti-vortex plate to prevent formation of a vortex. Subcontractor shall inspect the anti-vortex plate. Submit any findings for Contractor-Acceptance.

U. Photos on Page 22 of the Tank Inspection Report show the tank interior coating system. The overall tank interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and then evaluate the tank interior coatings. Submit any findings for Contractor-Acceptance.

1.7 PRIORITY #6. SCOPE OF WORK AREA 5 WELLS 4 AND 4A SOUTH TANK, 150,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the condition of the foundation. AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall 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 completed by a local excavation company. Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant. Report any findings for Contractor-Acceptance.

D. Photo on Page 4 of the Tank Inspection Report shows the tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and appears to be in good condition. Subcontractor shall inspect tank foundation. Report any findings for Contractor-Acceptance.

E. Photo on Page 5 of the Tank Inspection Report shows the condition of one (1) of the sixteen (16) anchor bolts. AWWA D-100, 2011, Paragraph 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-anchoring tanks."* Subcontractor shall clean the area around the anchor bolts, tighten the anchor nuts, then tack weld the circumference of the nut-to-baseplate connections and bolt-to-nut connections to reinforce.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the shell. Currently, there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the 24" primary shell manway, which is compliant with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install maintenance free galvanized steel bolts as a preventative measure and post **Confined Space Entry** sign.

H. Photo on Page 8 of the Tank Inspection Report shows the condition of the 24" secondary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall replace the 24" manway with a 30" manway and post **Confined Space Entry** sign.

I. Photos on Page 9 of the Tank Inspection Report show the condition of the 12" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain. Subcontractor shall install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

J. Photos on Page 10 of the Tank Inspection Report show the shell access ladder is 16" wide but is not equipped with anti-skid rung covers. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

K. Photo on Page 11 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of*

suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained." Subcontractor shall install a liquid level indicator, complete with target board and float.

L. Photo on Page 12 of the Tank Inspection Report shows the tank roof edge is not equipped with a required handrail system for fall protection as required by OSHA 1910.28(b)(1)(i), which states, *"The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4-feet or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The tank is equipped with 42" high handrails to the left and right of the access ladder. Subcontractor shall extend the handrails around the circumference of the tank roof, complete with an intermediate rail, a toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

M. Photo on Page 13 of the Tank Inspection Report shows the condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Space Entry** sign.

N. Photo on Page 14 of the Tank Inspection Report shows the condition of the 24" secondary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Space Entry** sign. Subcontractor shall also install an OSHA compliant interior access ladder complete with standoffs every 10' on-center, and a cable type access ladder safety device at the secondary roof hatch.

O. Photos on Page 15 of the Tank Inspection Report show the existing 12" tank roof vent, which appears to be in good condition. Subcontractor shall inspect the roof vent. Report any findings for Contractor-Acceptance.

P. Photos on Page 16 of the Tank Inspection Report show the exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system and report any findings for Contractor-Acceptance.

Q. Photo on Page 17 of the Tank Inspection Report shows the primary interior access ladder is 16" wide but is not equipped with anti-skid rungs and 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 OSHA 1910.145 and removed from service until repaired in accordance with OSHA 1910.22(d) or replaced.*" Subcontractor shall install 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 shall be replaced on an emergency basis.**

R. Top photo on Page 18 of the Tank Inspection Report 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. Subcontractor shall evaluate roof lap seams and interior roof-to-trim angle connection and submit any findings for Contractor-Acceptance.

S. Photos on Page 19 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

T. Photo on Page 21 of the Tank Inspection Report shows a suction pipe on the interior of the tank, which is equipped with a properly sized anti-vortex plate to prevent formation of a vortex. Subcontractor shall inspect the anti-vortex plate. Submit any findings for Contractor-Acceptance.

U. Photos on Page 22 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and then evaluate the tank interior coatings. Report any findings for Contractor-Acceptance.

1.8 PRIORITY #7. SCOPE OF WORK AREA 6 WELL C1 NORTH TANK, 50,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair 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, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows the condition of the shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad to direct water away from the foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post a **Confined Space Entry** sign.

G. Photos on Page 7 of the Tank Inspection Report shows the 8" overflow pipe system, which is equipped with a flapper valve as required by AWWA D100, 2011, Paragraph 7.3, *"Overflow."* Subcontractor shall install a screen over the existing overflow pipe elbow. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

H. Photos on Page 8 of the Tank Inspection Report show the shell access ladder is 18" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photo on Page 9 of the Tank Inspection Report shows the condition of the liquid level indicator. Due to the condition of the indicator, Subcontractor shall replace the existing liquid level indicator, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows 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 or more above a lower level is protected by one or more of the following: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The tank is equipped with 42" high handrails to the left and right of the access ladder. Subcontractor shall extend the handrails around the circumference of the tank roof, complete with intermediate rail, a toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

K. Photo on Page 11 of the Tank Inspection Report shows existing condition of the 30" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a 30" secondary hatch 180° from primary roof hatch and shall post a **Confined Space Entry** sign.

L. Photos on Page 12 of the Tank Inspection Report show the condition of the 6" tank 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.** Subcontractor shall replace the existing roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the tank exterior coating system, which appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system. Submit any findings for Contractor-Acceptance.

N. Photo on Page 14 of the Tank Inspection Report shows the primary interior access ladder is 18" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers and a cable-type ladder safety device on the primary interior access ladder.

O. Top photo on Page 15 of the Tank Inspection Report 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. Subcontractor shall evaluate the tank roof. Submit any findings for Contractor-Acceptance.

P. Photos on Page 16 of the Tank Inspection Report show the rafter-to-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate all connections and submit any findings for Contractor-Acceptance.

Q. Top photo on Page 17 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the support column baseplate-to-floor connection. Notice the baseplate is welded to the floor. Should the floor settle, the roof and structure could be damaged. Subcontractor shall disconnect the support column baseplate from the floor and install guides on the sides of the plate to ensure it stays in place.

R. Photo on page 18 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2°F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Submit recommendations for Contractor-Acceptance on Subcontractor design of a new tank mixing system and an electrical system by others to support a tank mixing system.

S. Photos on Page 19 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

T. Photos on Page 21 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and then evaluate the condition of tank interior coatings. Submit any findings for Contractor-Acceptance.

1.9 PRIORITY #8. SCOPE OF WORK AREA 6 WELL C1 SOUTH TANK, 50,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair 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, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks."*

E. Photo on Page 5 of the Tank Inspection Report shows the condition of one (1) of the twenty-one (21) anchor bolts. AWWA D100, 2011, Paragraph 3.8.1.1 states, *"For ground-supported flat-bottom reservoirs and standpipes, mechanical storage shall be provided when the wind or seismic loads exceed the limits for self-anchored tanks."* Subcontractor shall clean areas around anchor bolts, tighten the anchor nuts, then tack-weld the circumference of the nut-to-base plate connections and bolt-to-nut connections to reinforce.

F. Photo on Page 6 of the Tank Inspection Report shows the existing drain valve, which appears to be in good condition. Subcontractor shall install drain valve insulation with aluminum cover. Tank shall drain to finished grade. Subcontractor shall install fittings to the drain valve to drain to ground with an air gap. Contractor will install a concrete splash pad under the new tank drain to direct water away from the tank foundation.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The primary shell manway complies with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall inspect the primary shell manway to verify it complies with AWWA D100. NFPA 22, and OSHA 1910.146 requirements.

H. Photo on Page 8 of the Tank Inspection Report shows condition of the 24" secondary shell manway, which complies with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install maintenance free galvanized steel bolts.

I. Photos on Page 9 of the Tank Inspection Report show the condition of 10" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain. Subcontractor shall install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

J. Photos on Page 10 of the Tank Inspection Report show the shell access ladder is 18" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

K. Photo on Page 11 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly*

maintained." Subcontractor shall install a liquid level indicator, complete with target board and float.

L. Photo on Page 12 of the Tank Inspection Report shows 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The tank is equipped with 43" high handrails to the left and right of the access ladder. Subcontractor shall extend the handrails around the circumference of the tank roof, complete with intermediate rail, a toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

M. Photo on Page 13 of the Tank Inspection Report shows the condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post a **Confined Space Entry** sign.

N. Photo on Page 14 of the Tank Inspection Report shows the condition of the 24" secondary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post a **Confined Space Entry** sign.

O. Photos on Page 15 of the Tank Inspection Report show the existing 12" tank roof vent, which appears to be in good condition. Subcontractor shall evaluate the roof vent and submit any findings for Contractor-Acceptance.

P. Photos on Page 16 of the Tank Inspection Report show the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system. Submit any findings for Contractor-Acceptance.

Q. Photo on Page 17 of the Tank Inspection Report shows the primary interior access ladder is 16" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers and a cable-type ladder safety device on the primary interior access ladder.

R. Photo on Page 18 of the Tank Inspection Report shows the secondary interior access ladder is 16" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers and a cable-type ladder safety device on the secondary interior access ladder.

S. Top photo on Page 19 of the Tank Inspection Report 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. Subcontractor shall evaluate the tank interior roof. Submit any findings for Contractor-Acceptance.

T. Photos on Page 20 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

U. Photo on page 22 of the Tank Inspection Report shows a suction pipe on the tank interior. NFPA 22, 2018, Paragraph 14.2.13.1 states, *"The discharge outlet for every suction tank shall be equipped with an anti-vortex plate assembly."* Subcontractor shall install an elbow to the existing suction pipe in the down direction and install a properly sized anti-vortex plate on the elbow to prevent formation of a vortex.

V. Photos on Page 23 of the Tank Inspection Report show the tank interior coating system. The overall tank interior coating system appears to be in good condition. Subcontractor shall evaluate the tank interior coatings. Submit any findings for Contractor-Acceptance.

1.10 PRIORITY #9. SCOPE OF WORK AREA 6 CP NORTH TANK, 317,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows the 8" flange. Currently, there is no drain valve. Subcontractor shall install a frost proof drain valve on the flange/threaded connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and shall post **Confined Space Entry** sign.

G. Photos on Page 7 of the Tank Inspection Report show the condition of the 6" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain. Subcontractor shall install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

H. Photo on Page 8 of the Tank Inspection Report shows the shell access ladder 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" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install 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 in accordance with OSHA-2036, and anti-skid rung covers. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photo on Page 9 of the Tank Inspection Report shows the tank is not equipped with liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows the tank roof edge is not equipped with a required handrail system for fall protection as required by OSHA 1910.28(b)(1)(i), which states, *"The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4-feet or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall install an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with intermediate rail, toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

K. Photo on Page 11 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install 30" secondary hatch 180° from primary roof hatch and post **Confined Space Entry** sign. Subcontractor shall also install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center and a cable type ladder safety device at primary and secondary roof hatches.

L. Photos on Page 12 of the Tank Inspection Report show condition of the existing 8" tank 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.** Subcontractor shall replace the roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system and report any findings for Contractor-Acceptance.

N. Top photo on Page 14 of the Tank Inspection Report shows 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. Subcontractor shall evaluate interior roof seams and angle connection and report any findings for Contractor-Acceptance.

O. Photos on Page 15 of the Tank Inspection Report show the rafter-to-support column, and rafter to shell connections, which appear to be in good condition. Subcontractor shall evaluate rafter connections and report any findings for Contractor-Acceptance.

P. Top photo on Page 16 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the interior roof-to-rim angle connection, which appears to be in good condition. Subcontractor shall evaluate column connections and report any findings for Contractor-Acceptance.

Q. Photo on Page 17 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2° F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

R. Photos on Page 18 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

S. Photos on Page 20 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank exterior with a biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm). Subcontractor shall evaluate the interior coating system and report any findings for Contractor-Acceptance.

1.11 PRIORITY #10. SCOPE OF WORK AREA 6 CP SOUTH TANK, 500,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the tank is not secured with fencing. Fence installation shall be completed by others. Subcontractor shall post a **No Trespassing sign and Warning, Tampering with This Facility is a Federal Offense sign. US Code Title 42, Section 300i-1. Subcontractor shall engage a third-party Fence Subcontractor for fence installation.**

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall clear any dirt, debris, and other loose gravel away from the tank foundation, down to a minimum of 6" below the top of foundation. **Subcontractor shall complete this work with a local excavating company.**

D. Photo on Page 4 of the Tank Inspection Report shows the condition of the foundation. Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection

to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant. Subcontractor shall insert sacrificial cathodic protection rods radially every 15' beneath the floor of the tank.

E. Photo on Page 5 of the Tank Inspection Report shows the tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*," and appears to be in good condition. Subcontractor shall inspect and test the lightning protection system and report any findings for Contractor-Acceptance.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post **Confined Space Entry** sign.

H. Photo on Page 8 of the Tank Inspection Report shows the condition of the 8" overflow pipe system. AWWA D100, 2011, Paragraph 7.3, *"Overflow," states, "An internal overflow is defined as an overflow with piping inside the tank container. The consequences of an overflow failure , which can empty the tank contents, shall be considered when an internal overflow is provided."* Subcontractor shall replace the internal overflow system with a properly sized exterior overflow system, complete with a weir box on the interior, standoffs every 10' on-center extended to grade, an elbow fitted with a flapper valve and screen to prevent ingress of contaminants. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

I. Photo on Page 9 of the Tank Inspection Report shows the shell access ladder is 16" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

J. Photos on Page 10 of the Tank Inspection Report show the condition of the liquid level indicator. Subcontractor shall repair the existing liquid level indicator, replacing damaged parts as needed, then adjusting and calibrating the unit. Subcontractor shall replace the sticker on the target board.

K. Photos on Page 11 of the Tank Inspection Report show the tank roof edge is not equipped with a required handrail system for fall protection as required by OSHA 1910.28(b)(1)(i), which states, *"The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4-feet or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall install an OSHA compliant 42" high handrail system around the circumference of tank roof, complete with intermediate rail, toe board, and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

L. Photo on Page 12 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a lock on the primary hatch and shall post **Confined Space Entry** sign.

M. Photo on Page 13 of the Tank Inspection Report shows the primary interior access ladder. The ladder is 16" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers and a cable-type ladder safety device on the primary interior access ladder.

N. Photo on Page 14 of the Tank Inspection Report shows condition of the 24" secondary roof hatch. Subcontractor shall install an OSHA compliant interior access ladder at secondary roof hatch, complete with standoffs every 10' on-center, and a cable type ladder safety device at the secondary roof hatch. Subcontractor shall install a **Confined Space Entry** sign.

O. Photos on Page 15 of the Tank Inspection Report show condition of the existing 18" tank 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.** Subcontractor shall replace the roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

P. Top photo on Page 16 of the Tank Inspection Report shows the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system and report any findings for Contractor-Acceptance. However, the bottom photo shows water is ponding on the roof, causing deterioration of the paint and metal. Subcontractor shall perform hand tool cleaning of all ponding water areas. Then, Subcontractor shall apply a commercial epoxy adhesive filler, as needed, to prevent ponding of water.

Q. Top photo on Page 17 of the Tank Inspection Report shows 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. Subcontractor shall evaluate the interior roof seams and connections and report any findings for Contractor-Acceptance.

R. Photos on Page 18 of the Tank Inspection Report show the rafter-to-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate all rafter connections and report any findings for Contractor-Acceptance.

S. Top photo on Page 19 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the support column baseplate-to-floor connection, which is disconnected from the floor and equipped with guides on the sides of the plate to ensure it stays in place and appears to be in good condition. Subcontractor shall evaluate column connections and report any findings for Contractor-Acceptance.

T. Photo on Page 20 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2° F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

U. Photos on Page 21 of the Tank Inspection Report show no sediment in the tank. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

V. Photos on Page 22 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall evaluate the interior coating system and report any findings for Contractor-Approval.

1.12 PRIORITY #11. SCOPE OF WORK AREA 5 WELL 5A BOOSTER TANK, 50,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the condition of the tank foundation. AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified."* Subcontractor shall clear any dirt, debris, and other loose gravel away from the tank foundation, down to a minimum of 6" below top of foundation. Subcontractor shall complete this work with a local excavation company.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall trim the fiberboard back to where it contacts the tank base. After this is complete, allowing for a clean edge, Subcontractor apply caulk and grout around the base to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

D. Photo on Page 5 of the Tank Inspection Report shows condition of one (1) of twelve (12) anchor bolts. AWWA D100, 2011, Paragraph 3.8.1.1 states, *"For ground-supported flat-*

bottom reservoirs and standpipes, mechanical storage shall be provided when the wind or seismic loads exceed the limits for self-anchored tanks." Subcontractor shall clean areas around anchor bolts, tighten the anchor nuts, then tack-weld the circumference of the nut-to-base plate connections and bolt-to-nut connections to reinforce.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device on the valve to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank drain to direct water away from the tank foundation.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall inspect the primary shell manway to verify it complies with AWWA D100. NFPA 22, and OSHA 1910.146 requirements. Subcontractor shall install a secondary shell manway 180° from primary manway, post a **Confined Space Entry** sign, and install maintenance free galvanized steel bolts.

H. Photos on Page 8 of the Tank Inspection Report show condition of the 6" overflow pipe system. Subcontractor shall disconnect the overflow pipe from the underground drain. Subcontractor shall install an air-break, complete with flapper valve and screen to prevent ingress of contaminants into the water supply. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

I. Photo on Page 9 of the Tank Inspection Report shows the shell access ladder is 16" wide but is not equipped with anti-skid rungs. Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

J. Photo on Page 10 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

K. Photo on Page 11 of the Tank Inspection Report shows the tank roof edge is equipped with a 43" high compliant 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The tank handrail system is equipped with an intermediate rail and toe board. Subcontractor shall evaluate the existing handrail system and report any findings for Contractor-Acceptance.

L. Photo on Page 12 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a 30" secondary roof hatch 180° from primary roof hatch. **Post Confined Space Entry** sign. Subcontractor shall install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at primary and secondary roof hatch.

M. Photos on Page 13 of the Tank Inspection Report show the condition of the existing 24" tank 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.** Subcontractor shall replace the existing roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

N. Photos on Page 14 of the Tank Inspection Report show the condition of the tank exterior coating system, which appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system. Submit any findings for Contractor-Acceptance.

O. Photo on Page 15 of the Tank Inspection Report shows the interior roof, which appears to be in good condition. Subcontractor shall evaluate the tank interior roof. Submit any findings for Contractor-Acceptance.

P. Photos on Page 17 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

Q. Photos on Page 19 of the Tank Inspection Report show the tank interior coating system. The overall tank interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and then evaluate tank interior coatings. Submit any findings for Contractor-Acceptance.

1.13 PRIORITY #12. SCOPE OF WORK AREA 18 HILLTOP TANK, 48,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base*

of the tank." Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows the existing drain, which appears to be in good condition. Subcontractor shall inspect the tank drain and report any findings for Contractor-Acceptance.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post **Confined Space Entry** sign.

G. Photos on Page 7 of the Tank Inspection Report show the condition of the 4" overflow pipe system, which is equipped with a flapper valve as required by AWWA D100, 2011, Paragraph 7.3. Subcontractor shall install frost proof insulation on the overflow pipe and flapper valve assembly. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

H. Photos on Page 8 of the Tank Inspection Report show the shell access ladder, which is 24" wide but is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install anti-skid rung covers and replace the notched safety rail climb with a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photos on Page 9 of the Tank Inspection Report show the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows the tank roof edge is equipped with a 43" high compliant handrail system for fall protection as required by OSHA 1910.28(b)(1)(i), which states, *"The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4-feet or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* The handrail system is equipped with an intermediate rail and toe board. Subcontractor shall evaluate the handrail system for OSHA compliance and report any findings for Contractor-Acceptance.

K. Photo on Page 11 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a 30" secondary hatch 180° from primary roof hatch and post **Confined Space Entry** Sign. Subcontractor shall also install an OSHA compliant

interior access ladder, complete with standoffs every 10' on-center and a cable type ladder safety device at primary and secondary roof hatches.

L. Photos on Page 12 of the Tank Inspection Report show the condition of the existing 4" tank 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.** Subcontractor shall replace the roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the tank exterior coating system, which appears to be in good condition. Subcontractor shall evaluate the exterior coating system. Report any findings for Contractor-Acceptance.

N. Photos on Page 14 of the Tank Inspection Report show the interior roof, which appears to be in good condition. Subcontractor shall evaluate the interior roof and report any findings for Contractor-Acceptance.

O. Photos on Page 15 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

P. Photo on Page 17 of the Tank Inspection Report shows a suction pipe on the tank interior. NFPA 22, 2018, Paragraph 14.2.13.1 states, *" The discharge outlet for every suction tank shall be equipped with an anti-vortex plate assembly."* Subcontractor shall install an elbow to the existing suction pipe in the down direction and shall install a properly sized anti-vortex plate on the elbow to prevent formation of a vortex.

Q. Photos on Page 18 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall evaluate the tank interior coating and report any findings for Contractor-Acceptance.

1.14 PRIORITY #13. SCOPE OF WORK AREA 25 WELL J-11 TANK, 50,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage**.
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the area around the tank foundation is properly graded and in compliance with AWWA D100, 2011, Paragraph 12.7.1, *"Height Aboveground*." NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows condition of the shell. Currently there is no drain valve. Subcontractor shall install a frost proof drain valve near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad to direct water away from the foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post **Confined Space Entry** sign.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the overflow pipe system. AWWA D100, 2011, Paragraph 7.3, *"Overflow," states, "An internal overflow is defined as an overflow with piping inside the tank container. The consequences of an overflow failure , which can empty the tank contents, shall be considered when an internal overflow is provided."* Subcontractor shall replace the internal overflow system with a properly sized exterior overflow system, complete with a weir box on the interior, standoffs every 10' on-center extended to grade, an elbow fitted with a flapper valve and screen to prevent ingress of contaminants. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

H. Photo on Page 8 of the Tank Inspection Report shows the shell access ladder, which is only 15" wide, is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install an OSHA compliant shell access ladder, complete with standoffs every 10' on-center, anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photo on Page 9 of the Tank Inspection Report shows the tank is not equipped with liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall

install an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with intermediate rail, toe board and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

K. Photo on Page 11 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install 30" secondary hatch 180° from primary roof hatch and post **Confined Space Entry** signs. Subcontractor shall also install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at the secondary roof hatch.

L. Photo on Page 12 of the Tank Inspection Report shows condition of the existing 18" tank 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.** Subcontractor shall replace the roof with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall pressure wash the tank exterior with a 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). Then, Subcontractor shall perform spot priming and apply one (1) finish coat of acrylic paint. Subcontractor shall evaluate the exterior coating and report any findings for Contractor-Acceptance.

N. Photo on Page 14 of the Tank Inspection Report shows the primary interior access ladder is only 15" wide and is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a clear width of 16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install an OSHA compliant interior access ladder complete with standoffs every 10' on-center, anti-skid rung covers, and a cable type ladder safety device at the primary roof hatch.

O. Top photo on Page 15 of the Tank Inspection Report 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. Subcontractor shall evaluate roof lap seams and roof-to-rim angle connection. Report any findings for Contractor-Acceptance.

P. Photos on Page 16 of the Tank Inspection Report show the rafter-support column and rafter-to-shell connections, which appear to be in good condition. Subcontractor shall evaluate interior roof connections. Report any findings for Contractor-Acceptance.

Q. Top Photo on Page 17 of the Tank Inspection Report shows the center support column, which appears to be in good condition. Bottom photo shows the support column baseplate-to-floor connection, which appears to be in good condition. Subcontractor shall evaluate roof and floor connections. Report any findings for Contractor-Acceptance.

R. Photo on page 18 of the Tank Inspection Report shows an inlet/outlet pipe on the tank interior. A temperature difference as little at 1-2°F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

S. Photos on Page 19 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

T. Photos on Page 21 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psi at 3.0 gpm). Subcontractor shall evaluate the tank interior after pressure washing. Report and findings for Contractor-Acceptance.

1.15 PRIORITY #14. SCOPE OF WORK AREA 25 WELL J-12 TANK, 50,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall trim the fiberboard back to where it contacts the tank base. After completion, allowing for a clean edge, apply caulk/grout around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows condition of the existing drain valve, which is not equipped with a locking device or splash pad. Subcontractor shall install a frost proof cover near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad to direct water away from the foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install a davit arm on primary shell manway. Subcontractor shall install 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post **Confined Space Entry** sign.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the overflow pipe system. AWWA D100, 22011, Paragraph 7.3, "Overflow," states, *"An internal overflow is defined as an overflow with piping inside the tank container. The consequences of an overflow failure, which can empty the tank contents, shall be considered when an internal overflow is provided."* Subcontractor shall replace the internal overflow system with a properly sized exterior overflow system, which will be complete with a weir box on the interior, standoffs every 10' on-center extended to grade, an elbow fitted with a flapper valve and screen to prevent the ingress of contaminants. Contractor will provide a concrete splash pad to direct water away from the tank foundation.

H. Photos on Page 8 of the Tank Inspection Report show the shell access ladder is only 13" wide and is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install an OSHA compliant shell access ladder, complete with standoffs every 10' on-center, anti-skid rung covers, a cable-type ladder safety device, and a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

I. Photo on Page 9 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows the tank roof edge is not equipped with required handrail system. 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 or more above a lower level is protected by one or more of the following: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall install an OSHA compliant 42" high handrail system, complete with intermediate rail, toe board and a swing gate at the junction of the shell-to-roof access ladder and tank roof.

K. Photo on Page 11 of the Tank Inspection Report shows the condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a 30" secondary hatch 180° from primary roof hatch and shall post a **Confined Space Entry** sign. Subcontractor shall install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at the secondary roof hatch.

L. Photo on Page 12 of the Tank Inspection Report shows condition of the 12" tank 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.** Subcontractor shall replace

the roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the tank exterior coating system. Subcontractor shall pressure wash the tank exterior with biodegradable detergent injection (Minimum 3,500 psi at 3.0 gpm). Then, Subcontractor shall remove all loose rust and scale with wire brushes and hand scrapers in accordance with SSPC #2 (hand tool cleaning) and spot prime the tank. Then, Subcontractor shall apply one (1) finish coat of aluminum paint.

N. Photo on Page 14 of the Tank Inspection Report shows the interior access ladder is not equipped with anti-skid rungs and is only 13" wide. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps and cleats have a minimum clear width of 16" (measured before installation of ladder safety systems) for fixed ladders."* **Notice the interior access ladder is equipped with a cage safety device. This would restrict access in the case of an emergency.** Subcontractor shall install 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.

O. Top photo on Page 15 of the Tank Inspection Report shows the condition of the interior roof. **Notice the rust forming in the crevice at the roof lap seams.** Subcontractor shall seal seams using Sikaflex® 1a on all unwelded interior lap seams to prevent failure of a new interior liner. This work shall be performed in conjunction with application of a 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.** Subcontractor shall seal the seams using Sikaflex® 1a around the circumference of this connection to prevent failure of a new interior liner. This work shall be performed in conjunction with application of a new interior liner.

P. Photo on page 16 of the Tank Inspection Report shows an inlet/outlet pipe on the tank interior. A temperature difference as little at 1-2°F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

Q. Photos on Page 17 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

R. Photo on Page 19 of the Tank Inspection Report shows the tank interior coating system. Subcontractor shall sandblast all interior areas to SSPC-SP10 (near white), apply one (1) stripe coat of epoxy primer to weld seams, then apply two (2) full coats of epoxy to the entire tank to achieve 8 to 10 mils of total dry film thickness.

1.16 PRIORITY #15. SCOPE OF WORK AREA 18 WELL 8 TANK, 63,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.

- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage**.
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation existing condition is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.7, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. Subcontractor shall repair 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, Subcontractor shall seal the foundation with a sealant.

D. Photo on Page 4 of the Tank Inspection Report shows the tank has no tank grounding system. Subcontractor shall electrically ground the tank for lightning protection as required by OSH Act of 1970 Section 5 and NFPA 780, 2017, Paragraph 5.4, *"Metal Towers and Tanks*."

E. Photo on Page 5 of the Tank Inspection Report shows the condition of the existing 10" drain valve, which is not equipped with a locking device or splash pad. Subcontractor shall install a frost proof cover near the shell-to-floor connection, complete with a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash block to direct water away from the foundation.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the 24" primary shell manway. The following is required for the tank to comply with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install 30" secondary shell manway 180° from primary manway. Subcontractor shall install maintenance free galvanized steel bolts and post **Confined Space Entry** sign.

G. Photos on Page 7 of the Tank Inspection Report show the condition of the 6" overflow pipe system, which appears to be in good condition. Subcontractor shall inspect the 6" overflow pipe system. Report any findings for Contractor-Acceptance. Contractor will install a concrete splash block under the tank overflow drainpipe to direct water away from the tank foundation.

H. Photos on Page 8 of the Tank Inspection Report show the shell access ladder is 24" wide but is not equipped with anti-skid rungs. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install anti-skid rung covers, a cable-type ladder safety device, a lockable ladder guard to prevent unauthorized

access in accordance with OSHA-2036 and a **Fall Protection Required** sign at the base of the ladder.

I. Photo on Page 9 of the Tank Inspection Report shows the condition of the liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Due to the condition of the indicator, Subcontractor shall replace the existing liquid level indicator, complete with target board and float.

J. Photo on Page 10 of the Tank Inspection Report shows the tank roof edge is equipped with a 43" high compliant handrail system for fall protection. The handrail system is equipped with an intermediate rail and toe board. 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 or more above a lower level is protected by one or more of the following: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall inspect the handrail system and report any findings for Contractor-Acceptance.

K. Photo on Page 11 of the Tank Inspection Report shows condition of the 24" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall install a 30" secondary hatch 180° from primary roof hatch and shall post a **Confined Space Entry** sign. Subcontractor shall install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center, and a cable type ladder safety device at primary and secondary roof hatches.

L. Photos on Page 12 of the Tank Inspection Report show the condition of the 8" tank 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.** Subcontractor shall replace the roof vent with a vacuum-pressure, frost proof vent and screen**. This work shall be performed on an emergency basis.**

M. Photos on Page 13 of the Tank Inspection Report show the condition of the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the tank exterior coating system and report any findings for Contractor-Acceptance.

N. Photo on page 15 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2°F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

O. Photos on Page 16 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

P. Photos on Page 18 of the Tank Inspection Report show the tank interior coating system. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and then evaluate the condition of tank interior coatings. Submit any findings for Contractor-Acceptance.

1.17 PRIORITY #16. SCOPE OF WORK AREA 5 NORTH TANK, 250,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.
- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Foundation Condition. On Page 5, the Corr Tech Tank Inspection Report reported the tank foundation has minor cracks and spalls around the tank. There is one spot with ground separating from the concrete between foundation sections. The chime grout is intact, with several areas of general corrosion. There is one area where the grout is separating from the foundation. AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Photo 15 shows tank foundation typical section. Photo 16 shows foundation grout separating. Photo 17 shows small spall on tank foundation. Photo 18 shows typical anchor bolt connection. The anchor bolts are free from major corrosion and are all engaged. Photo 19 shows corrosion on chime plate. Photo 20 shows chime plate with minor corrosion and minor spalling for foundation. Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant. Report any findings for Contractor-Acceptance.

C. Anchor Bolts. Photo 18 of the Tank Inspection Report shows the condition of one (1) of thirty-six (36) anchor bolts. AWWA D-100, 2011, Paragraph 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-anchoring tanks."* Subcontractor shall clean the area around the anchor bolts, tighten the anchor nuts, then tack weld the circumference of the nut-to-baseplate connections and bolt-to-nut connections to reinforce.

D. Manholes. Manhole Condition on Page 5 of the Corr Tech Tank Inspection Report shows two 30" diameter manholes (primary and secondary) on opposite sides of the lower shell. The hatch bolts have corrosion and there is corrosion staining on both manholes. There are no signs of leaks, which complies with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Photo 6 shows a shell manhole. Photo 7 shows shell manhole with corrosion on bolts. Photo 8 shows second shell manhole. Photo 10 shows second shell manhole with

corrosion on bolts. Photo 7:12 shows secondary shell hatch. Subcontractor shall install maintenance free galvanized steel bolts on both manholes as a preventative measure and post **Confined Space Entry** sign at each manhole.

E. Lightning Protection. Photo 24 on the Corr Tech Tank Inspection Report shows the grounding wire for the lightning protection system is intact. Photo 22 of the Tank Inspection Report shows the control box is intact and tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and appears to be in good condition. Subcontractor shall inspect the existing lightning protection system. Report any findings for Contractor-Acceptance.

F. Drain Valve. The Corr Tech Tank Inspection Report shows the existing 4" drain valve is not equipped with a locking device or splash pad. Subcontractor shall install a locking device to prevent unauthorized draining of the tank. Contractor will install a tank drain concrete splash pad to direct water away from the foundation.

G. Ladder. The Corr Tech Tank Inspection Report shows a ladder with a locked anti-climb and safety cage. Both the ladder and safety cage are free from bends and warps. There is minor corrosion staining on the ladder rung to rail connections. There is no safety climb. Subcontractor shall install anti-skid rung covers on the ladder.

H. Overflow Pipe. Page 6 of the Corr Tech Tank Inspection Report describes the condition of the 6" overflow pipe. It has an interior weir box, and the pipe extends down the exterior of the tank where it discharges onto rocks next to the tank. The overflow pipe has a flapper cover installed. Photo 2 shows the overflow. Photo 3 shows the overflow discharge onto rocks. Photo 4 shows the overflow with flapper valve. Photo 5 shows the interior overflow pipe with no screen. The 6" overflow pipe system is equipped with a flapper valve as required by AWWA D100, 2011, Paragraph 7.3, *"Overflow."* Subcontractor shall install a fine or coarse screen over the overflow pipe at flapper valve. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

I. Shell Exterior Coating. Page 6 of the Corr Tech Tank Inspection Report describes the condition of the shell exterior coating system. Minor chalking has formed on the coating system. There is less than 1% corrosion on the shell. The shell is free from major corrosion or adhesion loss. Photo 25 shows shell plating intact. Photo 27 shows minor pin-point corrosion on lower shell. Subcontractor shall evaluate the exterior coating system and report any findings for Contractor-Acceptance.

J. Roof Hatch. Page 6 of the Corr Tech Tank Inspection Report describes the condition of the roof hatch. A hatch is installed at the edge of the roof near the shell ladder. It has a gasket installed along the top of the neck and is free from unsealed penetrations. The hinges showed no significant corrosion or damage. Photo 30 shows open hatch next to ladder. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Space Entry** Signs. Subcontractor shall install an interior ladder with safety climb system. Subcontractor shall comply with OSHA 1910.28(b)(9)(i)(B), which states, "*A safety climb system shall be installed on any ladder that is 20-feet long or more. For new fixed ladders erected after November 19, 2018, the employer must equip the ladder with a ladder safety or personal fall arrest system."* Subcontractor shall install a cable type safety climb system, complete with standoffs every 10' on-center. Install interior ladders at primary and secondary roof hatches.

K. Roof Vent. Page 6 of the Corr Tech Tank Inspection Report describes the condition of the roof vent. There is a roof vent located near the center of the roof. The roof plates extend past the shell walls, with screening underneath as an additional venting system. There are coarse and fine screens intact and free from significant corrosion. Photo 32 shows the roof vent. Photo 33 shows the roof vent to roof connection. Photo 34 shows fine and coarse screen intact. Subcontractor shall evaluate the existing roof vent. Report any findings for Contractor-Acceptance.

L. Shell Access Ladder. Photos on Page 10 of the Corr Tech Tank Inspection Report show the shell access ladder is 16" wide. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install a cable-type ladder safety device, a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder. Subcontractor shall evaluate the roof vent. Report any findings for Contractor-Acceptance.

M. Handrails. Page 6 of the of the Corr Tech Tank Inspection Report shows handrails are installed around the perimeter of the tank, and from the ladders to the center of the roof. No corrosion or damage was noted on the railing structure. Photo 28 shows ladder landing on roof. Photo 29 shows overview of the tank roof. Photo 31 shows guardrails around 100% of roof. 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 or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* OSHA 1910.23(a)(2) states, *"All railings shall be equipped with a self-closing swing gate."* Subcontractor shall install a self-closing swing gate at the rail opening. Subcontractor shall inspect the handrail system. Report any findings for Contractor-Acceptance

N. Interior Roof Structure. Page 4 of the of the Corr Tech Tank Inspection Report shows the roof is a stainless-steel structure with roof rafters supporting roof plates. There is no visible bowing or deformation of the roof plates or visible corrosion. Photo 35 of the Tank Inspection Report shows the interior tank roof. Photo 36 of the Tank Inspection Report shows roof rafters and roof plates. Subcontractor shall evaluate the interior roof structure. Report any findings for Contractor-Acceptance.

O. Interior Roof Coating. Page 5 of the of the Corr Tech Tank Inspection Report shows the roof plates are uncoated stainless-steel. Photo 00:18 shows roof access hatch and roof rafters. Photo 00:25 shows overview of roof rafters and vent. Subcontractor shall evaluate interior roof coating. Report any findings for Contractor-Acceptance.

P. Shell Structure. Page 5 of the of the Corr Tech Tank Inspection Report shows the condition of the shell structure. No visible bowing or deformation were noted. No metal loss was observed. Subcontractor shall evaluate shell structure. Report any findings for Contractor-Acceptance.

Q. Interior Shell Coating. Page 5 of the of the Corr Tech Tank Inspection Report shows the condition of the shell coating. There is moderate sediment staining along the shell in the fluctuation zone. The shell is free from significant corrosion or coating loss. Photo 00:54 shows sediment staining on shell in fluctuation zone. Photo 5:33 shows tank interior view. Photo 5:12 shows shell walls with intact coating. Photo 5:56 shows pipe penetration in lower shell. Subcontractor shall evaluate interior shell coating. Report any findings for Contractor-Acceptance.

R. Liquid Level Indicator. Tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

S. Interior Floor Structure. Page 5 of the of the Corr Tech Tank Inspection Report shows the condition of the floor structure. No bowing or settlement was noted on the floor. There was no apparent corrosion on the floor plates or seams. Subcontractor shall evaluate interior floor structure. Report any findings for Contractor-Acceptance.

T. Sediment. There is a sporadic dusting of sediment no more than ¼" deep over most of the floor before a cleanout was performed. Photo 4:50 of the Corr Tech Tank Inspection Report shows a minor dusting of sediment on tank floor. Coating is intact and free from corrosion. Photo 4:53 shows an outlet pipe with sediment ring and dusting of sediment. Photo 37 shows tank walls and floor, with hanging cathodic protection system. Photo 38 shows hanging cathodic protection system. Subcontractor shall pressure wash the tank interior with biodegradable detergent injection (minimum 3,500 psig at 3.0 gpm) and evaluate tank interior coatings. If required, Subcontractor shall prepare a recommendation to improve the tank cathodic protection system for Contractor-Acceptance.

U. Interior Floor Coating. The floor plates and seams had no significant corrosion. No adhesion loss was observed. Photo 6:56 of the Corr Tech Tank Inspection Report shows floor inlet pipe with sediment ring. Photo 8:28 shows debris on floor of tank. Subcontractor shall evaluate interior floor coating. Report any findings for Contractor-Acceptance.

V. Piping. Page 5 of the Corr Tech Tank Inspection Report shows the condition of piping. There are separate inlet and outlet pipes on the floor of the tank that both have sediment rings. There are two inlet/outlet pipes along the shell wall. Photo 5:24 shows an inlet pipe and shell wall condition on the tank interior. A temperature difference as little at 1-2° F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of a Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

1.18 PRIORITY #17. SCOPE OF WORK AREA 5 SOUTH TANK, 250,000 GALLONS

A. General Work.

- Work includes abrasive blasting, cleaning, and painting of tank surfaces as required.
- If required, repaint tank interior with a 2-coat epoxy system.
- NNSS will provide potable water for tank fills, hydrotesting, and disinfection.
- Tank Subcontractor shall prepare As-Built drawings.
- Environmental permitting is not required.
- If required, Subcontractor shall install new weather-stripping on roof access hatches.
- If required, Subcontractor shall install **Fall Protection Signage, Confined Space Signage, Tampering Warning Signage, and Trespassing Signage.**
- Subcontractor shall inspect lock down bolts securing the tanks to the foundations. Secure any loose bolts and replace damaged bolts and connections with those that maintain the structural design of the tanks.

- Subcontractor shall prepare recommendations for Contractor-Acceptance of a SCADA tank level control system.
- Subcontractor shall install a minimum of two tank water temperature gauges.

B. Photo on Page 2 of the Tank Inspection Report shows the area around the tank foundation is properly graded and complies with AWWA D-100, 2011, Paragraph 12.7.1, *"Height Aboveground,"* which states, *"The tops of concrete foundations shall be a minimum of 6" above the finished grade, unless otherwise specified.* Subcontractor shall inspect grading and condition of tank foundation and report any findings for Contractor-Acceptance.

C. Photo on Page 3 of the Tank Inspection Report shows the condition of the foundation. NFPA 22, 2018, Paragraph 12.2.1.2 states, *"The junction of the tank bottom and the top of concrete foundation shall be tightly sealed to prevent water from entering under the base of the tank."* Subcontractor shall repair any cracks and spalling in the concrete with a commercial non-shrinking grout, caulking and grouting around the base of the tank to foundation connection to prevent water from entering under the tank. Then, Subcontractor shall seal the foundation with a sealant. Report any findings for Contractor-Acceptance.

D. Photo on Page 4 of the Tank Inspection Report shows the tank is electrically grounded for lightning protection as required by OSH Act of 1970 Section 5 and appears to be in good condition. Subcontractor shall inspect the existing lightning protection system. Report any findings for Contractor-Acceptance.

E. Photo on Page 5 of the Tank Inspection Report shows the condition of one (1) of thirty-six (36) anchor bolts. AWWA D-100, 2011, Paragraph 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-anchoring tanks."* Subcontractor shall clean the area around the anchor bolts, tighten the anchor nuts, then tack weld the circumference of the nut-to-baseplate connections and bolt-to-nut connections to reinforce.

F. Photo on Page 6 of the Tank Inspection Report shows the condition of the existing 4" drain valve, which is not equipped with a locking device or splash pad. Subcontractor shall install a locking device to prevent unauthorized draining of the tank. Contractor will install a concrete splash pad under the new tank overflow drain to direct water away from the tank foundation.

G. Photo on Page 7 of the Tank Inspection Report shows the condition of the 30" primary shell manway, which complies with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install maintenance free galvanized steel bolts as a preventative measure and post **Confined Space Entry** sign.

H. Photo on Page 8 of the Tank Inspection Report shows the condition of the 30" secondary shell manway, which complies with AWWA D100, 2011, Paragraph 7.4.4, *Shell Manholes,"* NFPA 22, 2018, Paragraph 14.7.2.1.1, and OSHA 1910.146 (c) (2), *Confined Spaces*." Subcontractor shall install maintenance free galvanized steel bolts as a preventative measure and post **Confined Space Entry** sign.

I. Photos on Page 9 of the Tank Inspection Report show the condition of the 6" overflow pipe system, which is equipped with a flapper valve as required by AWWA D100, 2011, Paragraph 7.3, *"Overflow."* Subcontractor shall install a new screen on the existing overflow pipe elbow. Contractor will install a concrete splash block under the outlet of the overflow pipe to direct water away from the tank.

J. Photos on Page 10 of the Tank Inspection Report show the shell access ladder is 16" wide. OSHA 1910.23(b)(4) states, *"Ladder rungs, steps, and cleats have a minimum clear width of ….16" (measured before installation of ladder safety systems) for fixed ladders…."* Subcontractor shall install a cable-type ladder safety device, a lockable ladder guard to prevent unauthorized access in accordance with OSHA-2036. Subcontractor shall install a **Fall Protection Required** sign at the base of the ladder.

K. Photo on Page 11 of the Tank Inspection Report shows the tank is not equipped with a liquid level indicator. NFPA 22, 2018, Paragraph 14.1.8 states, *"A water-level gauge of suitable design shall be provided. It shall be carefully installed, adjusted, and properly maintained."* Subcontractor shall install a liquid level indicator, complete with target board and float.

L. Photo on Page 12 of the Tank Inspection Report shows the tank roof edge is equipped with a 38" high compliant handrail system for fall protection as required by OSHA 1910.28(b)(1)(i), which states, *"The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4-feet or more above a lower level is protected by one or more of the* following*: 1910.28(b)(1)(i)(A), "Guard Rail Systems."* Subcontractor shall inspect the handrail system. Report any findings for Contractor-Acceptance

M. Photo on Page 13 of the Tank Inspection Report shows the condition of the 36" primary roof hatch. Roof openings on this tank require the following to comply with AWWA D-100, Paragraph 7.4.3, *"Roof Openings,"* and OSHA 1910.146(c)(2), *"Confined Spaces."* Subcontractor shall post **Confined Space Entry** Signs. Subcontractor shall also install an OSHA compliant interior access ladder, complete with standoffs every 10' on-center and a cable type ladder safety device at primary and secondary roof hatches.

N. Photos on Page 14 of the Tank Inspection Report show the existing roof vent, which appears to be in good condition. Subcontractor shall inspect the roof vent. Report any findings for Contractor-Acceptance.

O. Photos on Page 15 of the Tank Inspection Report show the tank exterior coating system. The overall exterior coating system appears to be in good condition. Subcontractor shall evaluate the exterior coating system and report any findings for Contractor-Acceptance.

P. Photo on Page 16 of the Tank Inspection Report shows interior roof, which appears to be in good condition. Subcontractor shall evaluate the interior roof and report any findings for Contractor-Acceptance.

Q. Photo on Page 17 of the Tank Inspection Report shows a fill pipe on the tank interior. A temperature difference as little at 1-2° F, is an indication of thermal stratification and 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 biofilm, changes in pH and dissolved oxygen. Prepare recommendations for Contractor-Acceptance of a Subcontractor design of a new tank mixing system and an electrical system by others to support a proposed tank mixing system.

R. Photos on Page 18 of the Tank Inspection Report show sediment and debris on the tank interior before a cleanout was performed. Subcontractor shall prepare a recommendation of a new passive tank cathodic protection system for Contractor-Acceptance.

S. Photos on Page 20 of the Tank Inspection Report show the tank interior coating system. The overall interior coating system appears to be in good condition. Subcontractor shall evaluate the interior coating system. Report any findings for Contractor-Acceptance.

1.19 CODES AND STANDARDS

A. Code Abbreviations. The following code abbreviations refer to this Performance Specification.

1. AISC, American Institute of Steel Construction
2. ANSI, American National Standards Institute
3. API, American Petroleum Institute
4. ASTM, American Society for Testing and Materials
5. AWWA, American Water Works Association
6. AWS, American Welding Society
7. CPSA, Consumer Product Safety Act
8. NFPA, National Fire Protection Association
9. NSF, National Sanitation Foundation
10. SSPC, Society for Protective Coatings
11. NAC, Nevada Administrative Code
12. DAR, Division of Administrative Rules
13. UL, Underwriters Laboratories Inc
14. MUTCD, Manual on Uniform Traffic Control Devices
15. OSHA, Occupational Safety and Health Administration
16. NACE, National Association of Corrosion Engineers International
17. NIOSH, National Institute for Occupational Safety and Health
18. NIST, National Institute of Standards and Technology

B. Reference Codes and Standards. The following codes and standards apply.

1. AISC, American Institute of Steel Construction, AISC 303, *Code of Standard Practice for Structural Steel Buildings and Bridges,* 2022
2. API Standard 650, *Welded Steel Tanks for Oil Storage,* 2020
3. API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction,* 2014
4. NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,* 2015
5. NFPA 22, *Standard for Water Tanks for Private Fire Protection*, 2013
6. 10 CFR Part 851, *Worker Safety and Health Program*
7. FM Global Property Loss Prevention Data Sheets, 3-2, *Water Tanks for Fire Protection,* 2021
8. MSTS Company Directive (CD) CD-2120.017, *MSTS Fire Protection Program*
9. Department of Energy (DOE) DOE-STD-1066, *Fire Protection,* 2023
10. DOE Order 420.1C, *Facility Safety – DOE Directives,* 2012
11. ANSI 29.4, *Exhaust Systems, Abrasive Blasting Operations-Ventilation and Safe Practice,* 2011
12. ASTM A36, *Standard Specification for Carbon Structural Steel,* 2019
13. ASTM A666, *Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar,* 2023
14. ASTM A276, *Standard Specification for Stainless Steel Bars and Shapes*, 2015
15. ASTM A283, *Low and Intermediate Tensile Strength Carbon Steel Plates,* 2017
16. ASTM A793, *Standard Specification for Rolled Steel Plate, Stainless Steel,* 2023
17. ASTM A500, *Carbon Steel Structural Tubing*, 2017
18. ASTM A53, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless,* 2022
19. ASTM A312, *Standard Specification for Seamless and Welded Austenitic Stainless-Steel Pipes,* 2017
20. ASTM D520, *Standard Specification for Zinc Dust Pigment*, 2019
21. ASTM D2200, *Standard Methods of Evaluating Degree of Rusting on Painted Surfaces,* 2017

22. ASTM D4417, *Standard Test Methods for Field Measurement of Surface-Profile of Blast-Cleaned Steel*, 2021
23. ASTM D5402, *Solvent Resistant Rub Test*, 2019
24. ASTM E337, *Standard Practice Test Method for Measuring Humidity with a Psychrometer*, 2023
25. ASTM F593, *Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs,* 2017
26. ASTM F594, *Standard Specification for Stainless Steel Nuts*, 2023
27. AWWA D100, *Welded Carbon Steel Tanks for Water*, 2011
28. AWWA D102, *Coating Steel Water-Storage Tanks*, 2011
29. AWWA C652, *Disinfection of Water Storage Facilities*, 2019
30. AWS D1.1/D1.1M, *Structural Welding Code-Steel*, 2020
31. CPSA, Part 1303, *Banning of Lead-Containing Paint, and Certain Consumer Products Banning Lead-Containing Paint,* 2023
32. OSHA 1910.27/ANSI A14.3, *Fixed Ladders*, 2023
33. OSHA 1915.35, *Painting,* 2023
34. OSHA 1926.502, *Fall Protection Systems Criteria and Practices*, 1926
35. OSHA 2036, *Walking-Working Surfaces and Personal Protective Equipment (Fall Protection Systems),* 2017
36. EPA 524.2, *Measurement of Purgeable Volatile Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry,* 2023
37. NACE TPC-2, *Coatings and Linings for Immersion Service,* 1998
    a. *Chapter 1, Safety*
    b. *Chapter 2, Surface Preparation*
    c. *Chapter 3, Curing*
    d. *Chapter 4, Inspection*
38. NACE Standard RP-0188, *Standard Recommended Practice-Discontinuity (Holiday) Testing of Protective Coatings,* 2003
39. NACE Standard RP-0287, *Field Measurement of Surface Profile of Abrasive, Blast-Cleaning Steel Surfaces Using a Replica Tape*, 2016
40. NACE Standard RP-0288, *Standard Recommended Practice, Inspection of Linings on Steel and Concrete,* 2004
41. *Reduction of Lead in Drinking Water Act,* 2011
42. SSPC-SP-2, *Hand Cleaning Tool for Steel and Concrete,* 2018
43. SSPC-SP-3, *Power Tool Cleaning for Steel and Concrete,* 2018
44. SSPC-PA-1, *Shop, Field, and Maintenance Painting for Steel and Concrete,* 2016
45. SSPC-PA-2, *Measurement of Dry Film Thickness with Magnetic Gauges for Steel and Concrete,* 2022
46. SSPC-PA-3, *Guide to Safety in Paint Application for Steel and Concrete,* 1995
47. SSPC-Guide 12, *Guide for Illumination of Industrial Painting Project*, 2023
48. SSPC-VIS-1, *Pictorial Surface Preparation Standards for Painting Steel Surfaces*, 2023
49. SSPC-Paint Specification 36, *Two-Component Weatherable Aliphatic Polyurethane Topcoat, Performance-Based for Steel and Concrete,* 2020
50. SSPC-SP-5/NACE 1, *White Metal Blast Cleaning for Steel and Concrete,* 2006
51. SSPC-SP-6/NACE 3, , *Commercial Blast Cleaning for Steel and Concrete,* 2022
52. SSPC-SP-7/NACE 4, *Brush-Off Blast Cleaning for Steel and Concrete,* 2006
53. *SSPC-SP-10/NACE 2, Near-White Metal Blast Cleaning for Steel and Concrete,* 2016
54. NAC Chapter 445A, *Water Controls*, and all applicable codes and standards it invokes, adopted 1997 (NAC 445A latest edition is 2018)
55. NSF 61*, Drinking Water system Components-Health Effects,* 2019
56. ANSI/AWS B2.1, *Standard Welding Procedure Specification (SWPS) for Shielded Metal Arc Welding of Carbon Steel, 1/8 through 1-1/2 inch Thick*, 2018

1.20 ACRONYMS AND ABBREVIATIONS

ACI	American Concrete Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ARCH	Architectural
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BSDW	Nevada Bureau of Safe Drinking Water
CD	Compact Disc
CFM	Cubic Feet per Mnute
CFR	Code of Federal Regulations
CPS	Cathodic Protection System
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specification Institute
DC	Direct Current
DOE	U.S. Department of Energy
ºF	Degrees Fahrenheit
FAR	Federal Acquisition Regulation
FM	Factory Mutual Global
GFCI	Ground Fault Current Interrupter
gpm	gallons per minute
GUI	Graphical User Interface
IBC	International Building Code
I & C	Instrumentation and Control
ICS	Inside Coating System
IFC	International Fire Code
IP	Internet Protocol
ISA	International Society of Automation
IFC	Issue for Construction
MCL	Maximum Contaminant Levels
mph	miles per hour
MSDS	Material Safety Data Sheets
Msl	mean sea level
MSTS	Mission Support and Test Services, LLC., Defined as Contractor within this specification
NAC	Nevada Administrative Code
NACE	National Association of Corrosion Engineers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation

NNSS	Nevada National Security Site
OCS	Outside Coating System
OS&Y	Outside Screw & Yoke (Gate Valve)
OSHA	Occupational Safety and Health Administration
PPE	Personnel Protective Equipment
ppm	parts per million
PQR	Procedures Qualifications Records
psf	pounds per square foot
psi	pounds per square inch
Psig	pounds per square inch, gauge
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAP	Quality Assurance Program or Plan
QC	Quality Control
QG	Quality Grade
STR	Subcontractor's Technical Representative
SNT-TC	Society for Non-destructive Testing - Training Certification
SSPC	Society for Protective Coatings
TBD	To Be Determined
UL	Underwriters Laboratory
VOC	Volatile Organic Compounds
WPS	Welding Procedure Specifications

1.21 EXISTING UTILITIES

A. Existing Utilities. Underground waterlines and underground power lines are in the project work area and will be provided for subcontractor use at no cost. Utility requirements beyond existing capability must be provided by Subcontractor.

B. Subcontractor shall locate, mark, and prevent damage to known utilities. If Subcontractor damages existing utilities and property, Subcontractor will repair damage at no cost to the Government.

C. Fire water service shall be maintained throughout construction. Contractor (MSTS) will provide temporary bypass waterlines as required to maintain service to effected areas.

D. Existing Utility Interruptions. Do not interrupt utilities serving facilities occupied by Government or others unless permitted under the following conditions and then after arranging to provide temporary utility services according to requirements indicated.
   1. Subcontractor shall notify STR not less than 10-days in advance of proposed utility interruptions.
   2. STR will approve all proposed utility interruptions.

1.22 SUBCONTRACTOR USE OF PREMISES

A. Conduct of Operations. Subcontractor shall conduct normal operations in conformance with Mission Support and Test Services (MSTS) requirements provided by the STR.

B. No signs or advertisements shall be displayed on the construction site or within the Mercury Compound unless approved by the STR.

C. Smoking is not permitted within any NNSS building or within 25-feet of entrances, operable-windows, and outdoor air intakes.

D. Government Use of Site Facilities. Subcontractor shall conduct operations to ensure the least inconvenience to the Government.

E. On-site work hours. Subcontractor shall perform work during normal business working hours of 7 a.m. to 5 p.m., Monday through Thursday.

1. Subcontractor work on Fridays, Saturdays, Sundays, Federal holidays, early morning, or at night may not be performed without prior approval by the STR. Subcontractor shall submit requests for work outside of normal business hours to the STR for approval at least 72-hours in advance of the work.

F. Subcontractor Use of Site.

1. General. Subcontractor shall have limited use of the site.
2. Limited site access includes the work area outlined by the STR.
3. Access to the non-work areas will require 14-day advanced notification to arrange for government escorts.
4. Subcontractor shall not disturb the project site beyond the work area approved by the STR.
5. Subcontractor shall conduct all work within 30-feet of all water tanks.
6. Driveways and Entrances. Subcontractor shall always keep driveways, access roads, and entrances serving premises clear and available to Government, Government employees, and emergency vehicles. Subcontractor shall not use these areas for parking or storage of materials. Subcontractor shall schedule deliveries to minimize use of driveways and entrances.
7. Subcontractor shall limit site disturbance, including earthwork and clearing of vegetation, to 30-feet beyond tank perimeter, but not beyond the work area approved by the STR.

G. Security and Protection Facilities Installation.

1. Environmental Protection. Subcontractor shall provide protection, operate temporary facilities, and conduct construction to comply with environmental regulations to minimize air, water, and subsoil contamination.
2. Equipment Cleaning. Prior to moving equipment into the Project Area, Subcontractor shall ensure all equipment is free from soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Subcontractor shall ensure all equipment has been pressure-washed and is free from exotic species prior to construction. Equipment shall be considered free from soil, seeds, and other debris when a visual inspection does not disclose such material. Disassembly of equipment components and specialized inspection tools is not required.
3. Tree and Plant Protection. N/A.
4. Pest Control. N/A.
5. Site Enclosure Fence. N/A.
6. Security Enclosure and Lockup. N/A.
7. Temporary Enclosures: N/A

H. Subcontractor Storage Area. Equipment and material shall be stored at the work site as approved by the STR.
1. Preservation of Natural Features. N/A.
2. Hauling Restrictions. Subcontractor vehicles shall enter through Gate 100.
3. Housekeeping.
   a. Always keep project area neat, and in safe condition. Store and use equipment, tools, and materials in a manner that does not present a safety hazard.
   b. Immediately remove all trash and rubbish. Do not allow rubbish to accumulate. MSTS will provide onsite RORO containers for collection of rubbish and will dispose of containers at frequent intervals during progress of work.
   c. MSTS will dispose of waste materials generated on site.
   d. MSTS will provide and maintain Port-O-Johns for use of Subcontractor personnel.
   e. Subcontractor must install and maintain secondary spill containment as required.

1.23 PHOTO DOCUMENTATION

A. Photography and video recording are not allowed.

1.24 FIRE AND LIFE SAFETY

A. Subcontractor shall conduct one 15-minute *"toolbox"* safety meeting per week. Safety meetings shall be conducted by a foreman or supervisor and shall be attended by all construction personnel at the worksite. Topics shall coincide with work scheduled for the following week. Document and submit meeting minutes to the STR within three workdays after the meeting.

B. Comply with the requirements of NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations.*
1. Store and handle hazardous materials in accordance with manufacturers and OSHA 29 CFR 1926, Subpart D, Requirements. Maintain MSDS/Safety Data Sheets (SDS) for each chemical.
2. Subcontractor shall immediately report spills of hazardous materials to the STR.
3. Subcontractor shall maintain a spill emergency response kit.
4. Subcontractor shall train employees how to respond to a spill and how to use the emergency response kit.

C. Noise and Acoustics Management.
1. Noise Control. N/A.
2. Repetitive and/or intermittent, high-level noise shall be permitted only during daytime.
3. Do not exceed the following dB(A) limitations at 50-feet.

Sound Level in dB(A)	Time Duration of Impact Noise
70	More than 12 minutes in any hour
80	More than 3 minutes in any hour

4. Maximum permissible construction equipment noise levels at 50-feet.

EARTHWORK	dB(A)	MATERIALS HANDLING	dB(A)
Compressors	75	Pneumatic Tools	80
Pumps	75	Saws	75
Generators	75	Vibrators	75

1.25 COMMENCEMENT OF WORK

A. Subcontractor shall commence work in accordance with terms and conditions of the contract.

1.26 EXAMINATION OF THE SITE

A. All bidders are urged to visit the job site and examine existing conditions before submitting bids. All bidders will be held to have the same knowledge concerning the site and the existing conditions as if they inspected the job site. Refer to FAR 52.236-27, *Construction Site Visit.*

1.27 SUBCONTRACTOR ABBREVIATIONS

A. Subcontractor shall submit to the STR, a list of Subcontractor Abbreviations used in Subcontractor Construction Specifications and Subcontractor documents.

1.28 ACCIDENT PREVENTION

A. Description. The work in this section consists of establishing and implementing an effective accident prevention program to provide a safe environment for all personnel and visitors.

B. Subcontractor shall require all personnel, and visitors to wear hardhats, and other personal protective equipment. Subcontractor shall always maintain personnel protective equipment in good repair.

1.29 SUBMITTALS

A. Accident Prevention Plan. At the Preconstruction Conference, Subcontractor shall submit an Accident Prevention Plan for approval. A generic plan is not acceptable. The Plan shall be written to comply with OSHA and project requirements, including, but not limited to the following:
   1. Name and qualifications of responsible supervisor to implement the safety program.
   2. First aid and rescue procedures. Subcontractor shall provide current certification for first aid and CPR training of designated individuals.
   3. The Plan shall include initial and continuing safety training.
   4. The Plan shall outline each phase of the work, to include hazards associated with each major phase, and the methods proposed to provide for property protection and safety to personnel, and Subcontractor employees. The Plan shall identify work included in each phase with a Job Hazard Analysis (JHA) and a Job Safety Analysis (JSA).
   5. The Plan shall include Subcontractor provisions for emergency situations, such as explosions, fires, power outages, and windstorms. The Plan shall consider the nature of construction, site conditions, and the degree of exposure of persons and property.
   6. Subcontractor's Plan shall identify the nearest locations of medical facilities for emergencies.

7. Supplemental hazard specific plans may be required in accordance with 29 CFR 1926 or 1910.

B. Safety Meetings and Reports. As a minimum, Subcontractor shall conduct 15-minute *"toolbox safety meetings"* weekly. Safety meetings shall be conducted by a foreman and shall be attended by all Subcontractor construction personnel at the worksite. Submit a report of safety meetings and inspections. Subcontractor shall document *"toolbox safety meetings"* in daily logs.

1.30 QUALIFICATION OF EMPLOYEES

A. Subcontractor shall ensure employees are physically qualified to perform assigned duties in a safe manner, including operators of vehicles and equipment. Subcontractor shall provide operating instructions for all equipment.

B. Subcontractor shall not allow employees to work if their ability or alertness is impaired because of drugs, fatigue, intoxication, or other conditions that may expose themselves or others to injury.

C. Accident Reporting. Subcontractor shall report all accidents to the STR as soon as possible and shall assist the STR with accident investigation.

D. First Aid Facilities. Subcontractor shall provide adequate First Aid Facilities for the number of employees and appropriate to the hazards associated with types of construction performed at the project site.

E. Emergency Instructions. Post telephone numbers and reporting instructions for ambulance, physician, hospital, fire department, and police in conspicuous locations at the work site.

1.31 PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. Subcontractor shall require employees working at or visiting the site to wear personnel protective equipment (PPE).

B. PPE must meet requirements of applicable ANSI standards. PPE shall conform to OSHA 29 CFR 1926, Subpart E.

C. A hard hat use area shall be designated by Subcontractor. Subcontractor shall post Hard hat area signs in a manner satisfactory to the STR.

D. Subcontractor shall require all employees working on or visiting the site to wear hard hats and other necessary PPE. PPE shall be serviceable. As a minimum, Subcontractor shall maintain two sets of personal protective equipment for each employee.

1.32 HAZARDOUS MATERIALS

A. All Subcontractors shall cleanup, mitigate and remediate, if necessary, unauthorized discharges of hazardous materials or non-hazardous chemical and biological products released from vehicles or stationary sources. Response shall be consistent with guidelines established by DOE Regulations provided to Subcontractor by the STR. If a spill, or leak occurs, Subcontractor shall notify the STR as soon as possible, without impeding the cleanup.

1.33 PRECONSTRUCTION CONFERENCE

A. Refer to Federal Acquisition Regulation (FAR) 52.236-26.

1.34 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in Specification Sections.
   1. MSTS Transmittal Form. All submittals shall be transmitted via electronic email using MSTS transmittal forms. Subcontractor shall use forms provided by the STR. No action will be taken on a submittal item unless accompanied by the MSTS transmittal form.
   2. Submittal List. A submittal list is attached to the end of this Specification. The intent is to provide an overall summary of submittal requirements and not a comprehensive list. The requirements of the individual Specification Sections, and Terms and Conditions of the Contract apply regardless of items on the submittal list.

B. Preconstruction Conference Submittals. The following items shall be submitted a minimum of one week prior to the Preconstruction Conference. If these documents have not been received one week prior to the scheduled Pre-Construction Conference, the conference will be cancelled. Contractor will not issue Notice to Proceed. The STR will consider other contractual remedies. Work shall not commence until the STR issues a written Notice to Proceed. STR will notify Subcontractor of the date of the Preconstruction Conference.
   1. Subcontractor shall provide a letter designating the Project Superintendent.
   2. Subcontractor shall provide a construction schedule.
   3. Subcontractor shall provide a comprehensive breakdown of the Schedule of Values.
   4. Subcontractor shall provide an Accident Prevention Plan.
   5. Subcontractor shall provide a list of lower-tier Subcontractors for this project.
   6. Subcontractor shall provide a written statements from lower-tier Subcontractors certifying compliance with applicable labor standard clauses (SF-1413).
   7. Subcontractor shall provide satisfactory evidence of liability insurance coverage and workman's compensation for Subcontractor and lower-tier Subcontractors.
   8. Subcontractor shall provide Certificates of Employee Competency.
   9. Waste Management Plan. N/A.
   10. Subcontractor shall provide a Quality Control Plan.
   11. Subcontractor shall provide an Indoor Air Quality (IAQ) Management Plan.
   12. Subcontractor shall provide a Commissioning Plan.

1.35 PRODUCT DATA AND SAMPLE SHEETS

A. Product Data. An epoxy high solids system 75-125 mils to the interior surfaces of both tanks in compliance with Safe Water Drinking Act and SDWA Compliant System. Product Data Submittal shall include one digital file.

B. Samples. Submit two (2) color samples, 4" x 6" in size, of actual paint finish color selected on steel. Submit samples on the MSTS Transmittal Form. Submittal shall include one digital file (.PDF or .TIF) and physical samples of actual material.

C. Product Data. A 2-coat enamel paint system shall be designed for exterior steel surfaces. Product Data Submittal shall include one digital file.

D. For submittals specified above, forward submittals to the STR at least 15-days before the need for approval.

E. After approving submittals, STR will return one copy to Subcontractor. If submittals are not approved, STR will return all copies to Subcontractor with reasons for rejection. Subcontractor shall resubmit as required. Any work performed before STR approval shall be at Subcontractor's risk.

1.36 APPROVED EQUALS

A. Refer to FAR 52.211-6. If an item in this solicitation is identified as *"brand name or equal"* or lists more than 3 manufacturers, the purchase description reflects the characteristics and level of quality that will satisfy Government needs. The salient physical, functional, or performance characteristics that *"equal"* products must meet are specified in the Specification Section.

B. For each item proposed as an *"approved equal,"* submit supporting data, including.
1. Drawings and samples as appropriate.
2. Comparison of the characteristics of the proposed item with that specified.
3. Changes required in other elements of the work because of the substitution.
4. Name, address, and telephone number of vendor.
5. Manufacturer's literature regarding installation, operation, and maintenance, including schematics for electrical and hydraulic systems, lubrication requirements,and parts lists. Describe availability of maintenance service, and state source of replacement materials.

C. Request for approval of *'or equal substitution'* means.
1. Subcontractor investigated the proposed item and determined that it is *equal* or superior in all respects to that specified.
2. Subcontractor shall provide the same warranties for the proposed item as for the item specified.
3. Subcontractor determined that the proposed item is compatible with interfacing items.
4. Subcontractor shall coordinate installation of an approved item and make all changes required in other elements of the work because of the substitution.
5. Subcontractor waives all claims for additional expenses that may be incurred from the substitution.

D. *Approved equals* will be evaluated and approved during the submittal process.

1.37 PROGRESS SCHEDULES

A. As soon as possible after Notice of Award and before beginning work, Subcontractor shall submit a progress schedule. STR will review the progress schedule. Submit four copies of progress schedule (normally in bar chart form) showing estimated starting and completion dates for each part of the work. The first progress payment will not be issued until an acceptable progress schedule is submitted. The following information must accompany submission of progress schedules prior to processing any pay application.

B. Daily and weekly progress reports during construction as part of the administration process.

C. Schedule of Values. Breakdown each lump-sum item into component work activities used in the schedule, for which progress payments may be requested. The Schedule of Values will form the basis for payment. The work activities broken out within the Schedule of Values shall be integrated into and made a logical part of the construction baseline schedule submitted under this Specification. The total costs for the component work activities shall equal the contract price for that lump-sum item. The STR may request data to verify accuracy of dollar values. The STR will provide a sample Schedule of Values to Subcontractor.

1.38 TEMPORARY SERVICES

A. Description. A temporary water source to supplement tanks under refurbishment will not be required as long as one tank is drained and refurbished at a time.

B. Hazard Control. Take all necessary precautions to prevent fire during construction. Subcontractor shall provide ventilation during use of volatile or noxious substances (EPA 524.2).

1.39 PROJECT CLOSEOUT

A. Description. The work in this Section consists of final cleanup, closeout submittals, final inspection procedures and safety precautions.

B. Cleaning. Remove all tools, equipment, surplus materials, and rubbish. At time of final inspection, project shall be thoroughly clean and ready for use.

C. Substantial Completion and Final Inspection. Subcontractor shall submit written certification the project is substantially complete. Request a final inspection from the STR in writing. The STR or designee will conduct a final inspection within 10-days of receipt of request or at a mutually agreeable time.

D. If the work is determined to be substantially complete, following the final inspection, the STR will prepare a Punch List and issue a Letter of Substantial Completion.

E. If the work is not determined to be substantially complete following the final inspection, the STR will notify Subcontractor in writing. Subcontractor shall request a new final inspection after completing the work. Re-inspection costs may be charged against Subcontractor in accordance with the Inspection of Construction contract clause.

F. Subcontractor shall complete the Punch List within 5-calendar days, weather permitting.

G. If Subcontractor completes all items of work on the Punch List and all contractually required items, STR will issue Letter of Final Acceptance of Work.

H. If Subcontractor fails to complete the work within the time frame, the STR may correct the work with an appropriate reduction in contract price or charge for re-inspection costs in accordance with the Inspection of Construction contract clause.

I. Acceptance of Work. After all deficiencies have been corrected, STR will issue a Letter of Acceptance. A Release of Claims document must be executed and submitted to the STR before final payment can occur.

1.40 WARRANTY

A. Construction warranty shall be based on date of Substantial Completion.

B. Provide warranty information of all products installed organized by Division. All contact information, extents and conditions shall be clearly noted. Subcontractor shall provide a date of Substantial Project Completion.

C. Information shall include operation and maintenance manuals for each material under warranty.

D. All materials shall be new and in new condition upon acceptance at the job site.

1.41 MOBILIZATION

A. This work consists of moving personnel, equipment, material, and incidentals to and from the project. Mobilization also includes funding and procurement of permits from Nevada Department of Environmental Quality. Subcontractor shall fund insurance, and bonds.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011001

SECTION 012700:
DEFINITION OF CONTRACT LINE ITEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The intent of this Section is to explain inclusions and exclusions in the contract and the limits or cut-off points where one item ends, and another begins.

B. If no contract line item exists for a portion of the work, include the costs in a related item.

PART 2 - PRODUCTS (NOT USED)

~~PART 3 - EXECUTION~~ (NOT USED)

~~3.1 CONTRACT LINE ITEMS - BASE BID~~

~~A. Contract Line-Item No. 1, General Requirements.~~
~~1. This item consists of all preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site. General requirements include work to be performed or cause cost to be incurred prior to beginning work on the various items of the base contract. These include, but are not limited to, per diem costs, bonds, project meetings, Quality Control Plan, Accident Prevention Plan, and project supervision. This item also includes Subcontractor demobilization from site after completion of the work of this contract to the satisfaction of the STR.~~
~~2. Measurement for payment will be on a lump sum basis as a single item of work.~~
~~3. Payment will be made at the contract lump sum price.~~

~~B. Contract Line-Item No. 2, Structural Inspection.~~
~~1. This item consists of the inspection, non-destructive testing, and reporting of the structural condition of 17 water tanks by a professional structural engineer registered in the state of Nevada as specified in Section 055000, *Metal Inspection and Fabrication*, and in accordance with all other requirements stated or implied in contract documents, drawings, and specifications.~~
~~2. Payment will be made at the contract lump sum price.~~

~~C. Contract Line-Item No. 3, Sandblast and Recoat Tank Interior.~~
~~1. This item consists of the surface preparation, sandblasting, cleaning, and coating of exposed interior surfaces; caulking of truss and ceiling plate seams; and ceiling plate laps of the tanks as specified in Section 099700, *Recoating Steel Water Tank*, also in accordance with requirements in contract documents, drawings, and specifications. Subcontractor shall use AmTech-DuraChem-580-PW coating system or equivalent in accordance with the Safe Drinking Water Act.~~

END OF SECTION 012700

SECTION 013216:
CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section consists of construction schedule requirements including, but not limited to the following:
   1. Schedule of Values.
   2. Construction schedule requirements.
   3. Construction schedule updates.

B. Purpose. The purpose of the construction schedule is to ensure adequate planning, coordination, scheduling, and reporting during execution of the work by Subcontractor. The construction schedule will assist Subcontractor and STR monitor progress of the work, evaluate proposed changes, and process monthly Subcontractor progress payments.

1.2 SUBMITTALS

A. Schedule of Values. After contract award and before the Preconstruction Conference, Subcontractor shall submit a Schedule of Values based on the contract price schedule.

B. Construction schedule. After contract award and before the Preconstruction Conference, Subcontractor shall submit a schedule large enough to show the schedule of the entire construction period.

C. Construction schedule updates. On or before the 7th day preceding the progress payment request date, submit estimates of the percent completion of each schedule activity, and necessary project data.

D. Construction schedule revisions. For each construction schedule revision, submit a revised schedule demonstrating how Subcontractor shall incorporate a modification, change, delay, or Contractor request.

PART 2 - PRODUCTS

2.1 SCHEDULE OF VALUES

A. Breakdown each lump-sum item into component work activities used in the Schedule, for which progress payments may be requested. The work activities broken out within the Schedule of Values shall be integrated into and made a logical part of the construction baseline schedule submitted under this specification. The total costs for the component work activities shall equal the contract price for that lump-sum item. The STR may request data to verify accuracy of dollar values. Do not include mobilization, general condition costs, overhead, or profit as a separate item.

B. Do not break down unit price items. Use only the contract price for unit price items.

C. The total cost of all items shall equal the contract price. The Schedule of Values will form the basis for progress payments. An acceptable Schedule of Values shall be agreed upon by the Subcontractor and STR before the first progress payment is processed.

2.2 CONSTRUCTION SCHEDULE

A. Subcontractor shall prepare a list of all activities required to complete the work. Identify critical paths.

PART 3 - EXECUTION

3.1 CONSTRUCTION SCHEDULE UPDATES

A. Progress meeting updates. Provide updated schedule information before each weekly progress meeting.

B. Construction schedule revisions. If it appears the accepted construction schedule no longer represents actual progress of the work, the STR will request, and the Subcontractor shall submit, a revision to the construction schedule. Subcontractor may also request reasonable revisions to the currently accepted construction schedule if Subcontractor's work planning is revised.

END OF SECTION 013216

SECTION 013300:
SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work in this Section consists of submittal requirements before and during construction.

1.2 SUBMITTAL AND APPROVAL PROCEDURES

A. All submittals shall be sent to the STR. The STR will be designated after award. Contact the STR for name and submittal procedures.

B. Upon receipt by the STR, allow 7-working days for original submittals and 5-working days for re-submittals.

1.3 PROJECT SUBMITTALS

A. The following list summarizes submittals required for the technical specifications of this contract. Omission from this list does not alleviate Subcontractor from supplying the appropriate submittals.
   1. Blasting and Cleaning Plan. This submittal shall include a description of the proposed blasting abrasive, and how Subcontractor employees and other personnel, will be kept safe. Subcontractor shall list applicable OSHA requirements for abrasive materials and methods. Subcontractor shall state how he will comply with all OSHA requirements. Subcontractor shall discuss tank cleaning methods, and disposal of blast abrasive, and removed interior and exterior coatings. Subcontractor shall specify methods to keep the site clean and free from debris. Subcontractor shall submit a Blasting and Cleaning Plan prior to the Preconstruction Conference.
   2. Interior Coating Plan. Subcontractor Interior Coating Plan shall comply with AWWA D102. Submit product data, material safety data sheets, color samples, and National Sanitation Foundation (NSF) Standard NSF 61 compliance data for interior coatings. Include manufacturer's voltage requirements for holiday testing. Include coating applicator's qualifications and references. Subcontractor's applicator shall be qualified to apply specified materials with completion of training in the use of the coating material OR is skilled and experienced in the application of coating-materials similar to specified materials. Include methods and equipment to control temperature, humidity, and ventilation to achieve curing time. Submit the Plan before the Preconstruction Conference.
   3. Exterior coating and surface preparation submittals shall include removal of all dirt, debris, chalk, and contaminants in accordance with SSPC-SP-1.
   4. Manufacturer's Data. Subcontractor shall submit Manufacturer's Data for manufactured items and assemblies prior to the Preconstruction Conference.
   5. Coating Compatibility Certificates. From manufacturers of stripe and finish coatings in Section 099700, *Recoating-Steel Water Tank*, to be applied over shop primers, Subcontractor shall submit certifications shop primers are compatible with stripe coat and finish coat. Certification Submittals are required prior to the Preconstruction Conference.
   6. Product data for proposed weather-stripping material. This submittal is required prior to the Preconstruction Conference.
   7. Disinfection and Sampling Plan. Subcontractor shall provide disinfection submittals as required in Section 099700, *Recoating-Steel Water Tank.* Submittal is required prior to the Preconstruction Conference.

8. Subcontractor shall submit welder's qualifications and certificates to install the ladder and cage, guardrail, manway, and perform structural repair work required, following completion of the structural tank inspection.
9. During the construction period, Subcontractor shall submit a Report to confirm the scope of metal fabrication work required to refurbish the tank.
10. Subcontractor shall submit product data for welding products, steel plate and miscellaneous repair materials, as required by the Tank Inspection Report.
11. Subcontractor shall submit test reports for wet film thickness, dry film thickness and holiday testing. Submittal is required during the construction period.

1.4 SUBMITTAL PROCEDURES

A. Identify and incorporate information in each submittal file.
   1. MSTS Transmittal Forms. All material submittals shall be transmitted with MSTS Transmittal Forms. No action will be taken on a material submittal item unless accompanied by an MSTS Transmittal Form.
      a. Complete the Subcontractor's section on the form.
      b. Provide a signature on the form where indicated.
      c. Attach all related documents.
   2. Subcontractor may provide submittals electronically or in hard copy.

B. Identification.
   1. Submittal number shall use a sequential number (for example: 001). Re-submittals shall include an alphabetic suffix after another decimal point (for example: 001.A).

C. Re-submittals.
   1. Prepare re-submittals using the same process to prepare initial submittals.
   2. Note date and content of previous submittal.
   3. Note date and content of revision in the title block on the CM-16 and clearly indicate the extent of revision.
   4. Re-submit submittals until they are marked as *"Approved"* or *"Approved with notations."*

D. Use for Construction. Use only final submittals with mark indicating *"Approved" or "Approved with notations."* Subcontractor shall ensure all notations have been incorporated and shall keep one copy of the final approved submittal on site during construction.

PART 2 - PART 2 – PRODUCTS (NOT USED)

PART 3 - PART 3 – EXECUTION (NOT USED)

END OF SECTION 013300

SECTION 014000:
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified. These services do not relieve Subcontractor from responsibility for compliance with Contract Document requirements. The quality of all work shall be the responsibility of Subcontractor.
   1. Specified tests, inspections, and related actions do not limit Subcontractor's other quality assurance and control procedures that facilitate compliance with the Contract Document requirements.

1.2 CONFLICTING REQUIREMENTS

A. Reference Standards. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to STR for a decision before proceeding.

B. Minimum Quality Levels. The quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quality specified, or it may exceed the minimum within reasonable limits. Refer uncertainties to STR for a decision before proceeding.

1.3 SUBMITTALS

A. Quality Control Plan.
   1. After contract award and before the Preconstruction Conference, submit for approval a Subcontractor Quality Control Plan that shall include the following:
      a. A list of personnel responsible for quality control and assigned duties.
      b. Names, qualifications, and descriptions of laboratories to perform sampling and testing, and samples of proposed report forms.
      c. Methods of performing, documenting, and enforcing quality control of all work.

B. Subcontractor Quality Control Daily Reports. Subcontractor shall submit reports showing all inspections and tests on the first workday following the date covered by the report. Quality Control Supervisor shall utilize the forms attached at the end of this Specification.

C. Test Reports.
   1. Test reports shall be completed by the person performing the test.
   2. Use the Daily Test Report Information Sheet Form attached to the Specification.

1.4 QUALITY ASSURANCE

A. Subcontractor’s Quality Control Supervisor may also perform duties of Project Superintendent.

B. Subcontractor's Applicator, and Installer Qualifications. A firm or individual experienced in applying, installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Professional Engineer Qualifications. A professional engineer who is legally qualified to practice in jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. For this project, requirements to design ladder, ladder cage and any structural repairs or improvements to the tank. Engineering services are defined as services performed for inspections and tank refurbishment.

D. Testing Agency Qualifications. An independent agency with the experience, qualifications, and capability to conduct the testing and inspections indicated; and with additional qualifications specified in individual Sections, and is acceptable to the STR.
   1. All measuring devices, laboratory equipment, and instruments shall be calibrated at established intervals against certified standards. Upon request, measuring and testing devices shall be made available for use by the STR for verification tests.

1.5 QUALITY CONTROL (QC)

A. Subcontractor is responsible for all QC testing and inspections. Subcontractor shall inspect and test work as required to ensure that the quality of materials, workmanship, construction, finish, and functional performance comply with specifications and drawings.
   1. Subcontractor shall engage a qualified testing agency to perform quality-control services.
   2. Subcontractor shall submit an appropriate report for each quality-control service.

B. Testing Agency Responsibilities. Cooperate with the STR and Subcontractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify STR and Subcontractor promptly of deficiencies observed in the work during performance of its services.
   2. Determine the location from which test samples will be taken and which in-situ tests shall be conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit 3 copies of the certified written report of each test, inspection, and similar quality-control service through Subcontractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements, or approve, or accept any portion of the work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PROJECT SPECIFIC INSPECTION AND TEST REQUIREMENTS

A. Section 055000, *Metal Inspection and Fabrication.*
   1. Inspection and non-destructive testing of the steel tank exterior and interior for structural integrity.

B. Section 099700, *Recoating-Steel Water Tank.*
   1. Subcontractor shall test for soluble salts in accordance with NACE/SSPC, *Joint Surface Preparation Standard Draft.*

2. Subcontractor shall inspect and test the profile to ensure the sandblasted metal surface has adequate profile for the paint to adhere to steel as required to ensure compliance with SSPC-SP-2, SSPC-SP-3, and SSPC-SP-10.
3. Subcontractor shall test air temperature, surface temperature of the steel, and relative humidity.
4. Subcontractor shall test for wet film thickness, dry film thickness, and holidays.
5. Subcontractor shall perform bacteriological testing following disinfection and re-filling of recoated tank prior to placement into service after completion of work.
6. Subcontractor shall test for Volatile Organic Compounds following re-filling the recoated tank prior to placing the tank into service.
7. Subcontractor shall perform a Warranty Inspection.

END OF SECTION 014000

SECTION 055000:
METAL INSPECTION AND FABRICATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work in this Section includes the inspection, non-destructive testing, engineering analysis and reporting of the structural condition of each water tank by a professional engineer registered in the state of Nevada. The professional engineer shall specialize in inspection service and shall have five years of experience in inspection of steel structures.

B. This section includes design and steel work or aluminum work to fabricate and install items listed below. Subcontractor shall estimate separate costs for steel and aluminum. MSTS will select items for construction based on funding available.

C. Work in this section shall include replacement of rafter bolts and tank weather-stripping, if required

D. Related Requirements.
1. Section 099700, *Recoating-Steel Water Tank.*

E. Coordination.
1. Coordinate selection of shop primers with topcoats to be applied over them. Comply with recoating material manufacturers' written recommendations to ensure shop primers are compatible with one another.
2. Coordinate installation of new metal fabrications to be anchored to existing structures.
3. Provide setting drawings, templates, and directions to install new tank anchorages. Deliver materials to project site in time for installation.

1.2 SUBMITTALS

A. Subcontractor Structural Tank Inspector Qualifications. Subcontractor shall provide documentation that the Structural Inspector is a professional engineer, registered in the state of Nevada, is specialized in inspection service, and has at least five years of experience in inspection of welded steel potable water tanks.

B. Structural Tank Inspection and Engineering Report.
1. Subcontractor shall perform inspection services and non-destructive testing of the steel tank exterior, and interior, in accordance with AWWA M42, including:
   a. Minimum information required by Appendix C, Sections A-1, A-2, and A-3.
   b. Observe non-destructive testing and measure pitting in the steel and other damage to bolts, welds, parts, and fittings that are a part of the tank.
   c. Produce a drawing and list to document and locate all damage, including measurements of depth, size, and character of damage found. Subcontractor shall use photographs as required.
2. Analysis shall include.
   a. Interpretation of field observations and measurements.
   b. Design of repairs.
   c. Analysis of portions of the structure impacted by repairs.

3. Subcontractor’s Structural Tank Inspection Report shall include:

a. Repair recommendations and details.
b. Specific tank locations requiring repairs.
c. Detailed repair materials, strengths, and methods which comply with AWWA D100.
d. Subcontractor's Nevada Registered Structural Engineer shall stamp and seal the Final Structural Tank Inspection Report.

C. Welder's qualifications and certificates for any repair work (if required following inspection). Certificates must be current.

D. Shop Drawings. Shop drawings shall include fabrication and installation details for all metal work items. Drawings shall include plans, elevations, sections, and details of metal fabrications and their connections. Drawings shall include all steel material designations, dimensions and lengths, camber or shape and accessories such as weld sizes, lengths, locations, spacing and bolt sizes, washers, nuts, and locations. Subcontractor shall provide shop drawings of all fabricated and manufactured items.

E. Product Data. Subcontractor shall provide product data for the following items:
1. Metal shapes, plate, bars, tubes, rods, bolts, nuts, rungs and other new work.
2. Welding products including electrodes.
3. Weather-stripping materials.

F. Manufacturer's Data. Provide manufacturer's data for all manufactured items, assemblies, or products.

G. Coating Compatibility Certificates. Provide certification that shop primers are compatible with stripe, prime and finish coats used to recoat the tank.

1.3 QUALITY ASSURANCE

A. All design, welding and materials shall be in accordance with AWWA D100, *Standard for Welded Steel Tanks for Water Storage*. Where tolerances, stresses, details, and modifications are not limited or provided by the AWWA Standard, the applicable sections of the following American Petroleum Institute (API) Standards shall apply:
1. API Standard 650, *Welded Steel Tanks for Oil Storage.*
2. API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction.*

B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M, *Structural Welding Code-Steel.*

C. Installer Certifications or Qualifications.
1. Subcontractor installer of a product or fabrication shall have technical qualifications, experience, trained personnel, and facilities to perform the specified work.

D. Design Requirements. Publications listed below form a part of this specification.
1. OSHA 1910.27/ANSI A14.3, *Fixed Ladders.*
2. American Water Works Association (AWWA) D100, *Welded Steel Tanks for Water Storage.*
3. *Code of Standard Practice for Structural Steel Buildings and Bridges*, American Institute of Steel Construction (AISC 303).

E. Criteria for Manufactured Items.
1. Provide certification the manufacturer currently manufactures the item submitted as a principal product.

2. Provide certification the Subcontractor's installer, or supplier of a service, has technical qualifications, experience, trained personnel, and facilities to perform the specified work.

1.4 FIELD CONDITIONS

A. Field Measurements. Verify tank dimensions and other construction contiguous with metal fabrications with field measurements before fabrication. No additional compensation will be made to Subcontractor for items that have to be modified, cut, or replaced because of inadequate dimensions used to order or fabricate items.

1.5 SAFETY AND HEALTH REQUIREMENTS

A. Fall Protection. When working on the top of the water tank, Subcontractor shall ensure all personnel have fall protection that meets the requirements of OSHA 1926.502.

1.6 LEAD CONTENT OF FIXTURES

A. Any new fixture or other item introduced to the tank that will contact drinking water cannot have more than 0.25% leaded content, in accordance with the *Reduction of Lead in Drinking Water Act,* 2011.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design. Subcontractor shall engage a qualified professional structural engineer, as defined in Section 014000, *Quality Requirements*. Professional Structural Engineer shall design ladder, ladder cage, roof rafters, and manway, if funding is approved for the work.

B. Structural performance of roof rafters and their connections shall withstand effects of gravity loads and the following loads and stresses within limits and under conditions indicated by the structural engineer.
1. Uniform Load = 100 pounds-force per square foot.
2. Concentrated Load = 200 pound-force applied to an area = 1 square foot.
3. Locate concentrated loads to create maximum stress.
4. Do not assume uniform and concentrated loads act concurrently.

C. Thermal Movements. Subcontractor shall allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
1. Temperature Change = 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), on material surfaces.

2.2 NEW APPURTENANCES AND REPAIRS

A. Materials shall comply with AWWA D100.

2.3 METALS

A. Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications in the completed work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Round Bars. ASTM A36.

C. Stainless-Steel Sheet, Strip, and Plate. ASTM A240 or ASTM A666, Type 304, or Type 316.

D. Stainless-Steel Round Bars and Shapes. ASTM A276, Type 304, or Type 316.

E. Rolled-Steel Floor Plate. ASTM A786, rolled from plate complying with ASTM A36, or ASTM A283, Grade C or D.

F. Rolled-Stainless-Steel Floor Plate. ASTM A793.

G. Steel Tube. ASTM A500, cold-formed steel tube.

H. Steel Pipe. ASTM A53, steel and hot-dipped welded and seamless pipe.

I. Stainless-Steel Tube and Pipe. ASTM A312, Type 304 or Type 316, cold-worked stainless-steeltube, and pipe.

2.4 FASTENERS

A. Stainless-Steel Bolts and Nuts. Regular hexagon-head annealed stainless-steel bolts, ASTM F593, with hex nuts, ASTM F594, Alloy Group 2 and, where required, washers, Alloy Group 2.

2.5 WELDING ELECTRODES

A. E70-1X electrodes, qualified for welding.

2.6 CORROSION PROTECTION

A. Shop Primer for Bare Steel. Primer shall be formulated for exterior exposure and for use on clean or bare metal and compatible with coating system materials specified in Section 099700, *Recoating-Steel Water Tank.*

B. Shop Primer for Galvanized Steel or Fasteners. Primer shall be formulated for use over zinc-coated metal and shall be compatible with coating system materials specified in Section 099700, *Recoating-Steel Water Tank.*

2.7 ROOF ACCESS HATCH WEATHER-STRIPPING

A. Furnish on the existing 24-inch roof hatch, weather-stripping between the lid and frame. Weather-stripping shall be edge-trim, 1/8-inch neoprene gasket or other approved equal, preventing the entry of water, dust, insects into the tank.

2.8 METAL FINISHES

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines. Finished surfaces shall blend into surrounding surfaces.

2.9 PRIMING

A. Shop prime steel items not indicated to be galvanized.

1. Shop prime with primers coordinated to be compatible with stripe, prime and finish coat materials, specified in Section 099700, *Recoating-Steel Water Tank.*

B. Preparation for Shop Priming. Prepare surfaces to comply with requirements indicated below:
1. SSPC-SP-3, *Power Tool Cleaning.*

C. Shop Priming. Apply shop primer to comply with SSPC-PA-1, *Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel, for Shop Painting.*
1. Stripe painting adds cost but ensures hard-to-reach areas, such as crevices, inside corners, and welds, are thoroughly coated and sharp edges which are vulnerable to chipping and are where the film may be thinner due to surface tension, receive adequate coverage.
2. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 STRUCTURAL TANK INSPECTION, ENGINEERING ANALYSIS AND REPORT

A. Subcontractor shall perform a tank inspection after abrasive cleaning of interior and exterior surfaces. Subcontractor inspector shall be responsible for all personal accident prevention equipment and procedures. Inspector shall follow Subcontractor's work safety procedures for confined space.

3.2 STRUCTURAL REPAIRS

A. Tank repair methods shall be in accordance with AWWA D100.

3.3 FABRICATION, GENERAL

A. Shop Assembly. Pre-assemble items in the shop to greatest extent possible. Disassemble units only as required for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32-inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form, roll, or shape rafters with radius to match existing rafters and satisfy tank roof support requirements.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and straight edges.

F. Weld corners and seams continuously to comply with the following:
1. Use materials and methods to minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and the contour of the welded surface matches that of the adjacent surface.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

H. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

I. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

J. Provide for anchorage of type indicated, coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

K. Fabricate miscellaneous angles, plates, and shapes from steel of sizes to match existing strength, as indicated by Subcontractor Structural Inspection Report and in accordance with the following:
   1. Provide mitered and welded units at corners.
   2. Provide connection of angles, plates, and shapes to allow for expansion and control-joints for temperature changes.
   3. Strengthen deteriorated steel sections by welding new steel materials to competent remaining materials, after demolition of rusted or damaged sections.

3.4 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement. Perform cutting, fitting and placement as required to install metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip-galvanized after fabrication and are for bolted, welded, or screwed field connections.

C. Field-Welding.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and the contour of the welded surface matches the adjacent surface.

D. Fastening to In-Place Construction. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide through-bolts, welds, and other connectors.

3.5 REPAIRS

A. Rafters.
   1. Materials. Make repairs with materials listed in this Section or as recommended by Subcontractor’s Structural Engineer and approved by the Contracting Officer.

2. Repairs. Subcontractor shall repair rafter cross-section deficiencies by methods outlined in Subcontractor's Structural Inspection Report.

B. Connections.
1. Materials. Make repairs with materials listed in this Section.
2. Repairs. Connections supporting rafter ends shall be bolted or welded to plates or clip angles which are attached to the tank wall or center support column. Deficiencies of materials or connections shall be repaired as identified in Subcontractor's Structural Inspection Report.

3.6 ROOF ACCESS HATCH WEATHER-STRIPPING

A. Remove existing weather-stripping as required.

B. Install new weather-stripping, ensuring a complete seal between the hatch lid and frame, in accordance with manufacturer's instructions.

3.7 SALVAGED MATERIALS

A. Unless otherwise directed by the STR, remove salvaged materials from existing tanks.

END OF SECTION 055000

SECTION 099700:
RECOATING-STEEL WATER TANK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work in this Section includes abrasive sandblasting, cleaning, and recoating of 17 water tanks on interior and exterior tank surfaces. Work includes, but is not limited to interior walls, roof framing, roof plates, column, floor plates, interior piping, existing manways, and overflow pipe.

B. Work in this section includes cleaning and recoating of exterior tank surfaces. Work includes, but is not limited to exterior tank walls, roof framing, access hatches, manways, exterior piping, and guardrails.

C. Work includes a warranty dive inspection as specified in Paragraph 1.10 below.

D. Related Requirements:
1. Section 055000, *Metal Inspection and Fabrication.*

1.2 CODES AND STANDARDS

A. Surface-preparation, coating and painting of interior and exterior surfaces and inspection shall conform to the applicable requirements of the Steel Structures Painting Council (SSPC), NACE International, ASTM, AWWA and manufacturer's printed instructions. Refer to Section 014200.B.

B. Contracting Officer decision shall be final as the interpretation and conflict between any of the referenced specifications and standards contained herein.

1.3 SUBCONTRACTOR EXPERIENCE

A. Subcontractor shall have five years practical experience and successful history in the application of specified product to surfaces of steel water tanks. Upon request, Subcontractor shall furnish a list of references and job completions.

B. Upon request, Subcontractor shall submit a written statement by the coating manufacturer stating the Subcontractor is familiar with the materials specified and has workers capable of performing the work specified herein.

C. Subcontractor personnel performing the work shall be knowledgeable and shall have required experience and skill to perform the work for this project, in accordance with SSPC-PA-1.

1.4 QUALITY ASSURANCE

A. General. Subcontractor shall use quality assurance practices to monitor surface preparation, application, and inspection throughout the duration of the project. Practices not specifically defined herein may be used provided they meet recognized and accepted professional standards as approved by STR.

B. Surface Preparation. Surface preparation shall be based upon comparison with SSPC-VIS-1, *Pictorial Surface Preparation Standards for Painting Steel Surfaces*; ASTM D2200, *Standard Methods of Evaluating Degree of Rusting on Painted Surfaces,* ASTM

D4417, Method A and Method C or NACE Standard RP-0287. In all cases, written standards shall take precedence over visual standards. In addition, Subcontractor shall use NACE Standard RP-0178, and the Visual Comparator to verify surface preparation of welds.

C. Application. No coating or paint shall be applied when:
1. The surrounding air temperature is below the minimum surface temperature for the products specified herein.
2. Rain, snow, fog, or mist is present.
3. The surface temperature is less than 5º F above the dew point.
4. The air temperature may drop below the minimum temperature for the products specified within six hours after application of coating. Dew point shall be measured by a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychometric Tables.
5. If any of the above conditions are prevalent, Subcontractor shall delay coating until conditions are favorable. The day's coating shall be completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions.

D. Inspection. Subcontractor shall provide references to the MSTS Contracting Officer for approval to retain an independent NACE-certified inspector for this project. Subcontractor shall fund unbiased inspection services. As a minimum, Subcontractor's inspector shall inspect the surface prior to abrasive blasting, after abrasive blasting, but prior to application of coating materials, and between subsequent coats of material. Final inspection shall occur after completion of all coating applications, but prior to placing the tank in service. Subcontractor shall ensure sufficient scaffolding and rigging are in place to allow Subcontractor's inspector to conduct required inspections.

E. Thickness and Holiday Thickness Checking. Subcontractor's independent NACE-certified inspector shall check thickness of coatings and paint with a non-destructive, magnetic-type thickness gauge, as per SSPC-PA 2, *Measurement of Dry Film Thickness with Magnetic Gauges.* References in PA-2, which allow 80% of the minimum thickness specified, are not acceptable. Subcontractor's inspector shall use an instrument such as a Tooke Gauge, if STR determines a destructive test is required.

Subcontractor's inspector shall check the integrity of interior-coated-surfaces below the high-water mark with a low voltage holiday detector in accordance with NACE Standard RP-0188. Non-destructive holiday detector shall not exceed 67.5 volts, nor shall the destructive holiday detector exceed the voltage recommended by the coating system manufacturer.

Subcontractor shall mark and repair all pinholes and holidays in accordance with manufacturer's printed recommendations and retested. No pinholes or other irregularities shall be permitted in the final coating.

F. Inspection Devices. Until final acceptance of coating is accepted, Subcontractor's NACE-certified inspector shall furnish inspection devices in good working condition to detect holidays and measure dry film thickness of coating and paint. Subcontractor's NACE-certified inspector shall also furnish U.S. Department of Commerce, National Bureau of Standards-certified thickness calibration plates, and plastic shims, depending on the thickness gauge used. Platers and shims shall test the accuracy of dry film thickness gauges and certified instrumentation to test the accuracy of holiday detectors. Dry film gauges and holiday detectors shall always be made available to STR, and Subcontractor's inspectors until final acceptance of application. Holiday detection devices shall be

operated in the presence of the STR or inspector. Subcontractor shall furnish wet film thickness gauges to provide quality control of the paint thickness during application.

G. Warranty Inspection. Subcontractor's warranty inspection shall be conducted, at no cost to the government during the eleventh month, after acceptance of all coating and painting work. Subcontractor shall notify the STR 30-days prior to the inspection. The STR must be present at the inspection. The warranty inspection shall be performed while the tank is on-line by a diving company certified to perform inspections of water storage tanks. Subcontractor shall submit a written report of inspection findings to the STR within three working days of the inspection completion date. All defective work shall be repaired in accordance with this specification and to the satisfaction of the MSTS STR at no cost to the Government.

H. Subcontractor shall have copies of SSPC specifications referenced in this section available at the job site. Subcontractor shall provide SSPC-VIS-1 for a visual sandblasting standard.

I. All coating materials and thinners in contact with potable water shall meet NSF 61 for use in potable water storage tanks.

J. Materials of each coating system shall be those of a single manufacturer.

1.5 PRODUCT DELIVERY, STORAGE & HANDLING

A. Materials shall be delivered to the job site in original sealed containers. Materials shall be marked with the manufacturer's name, product name, product number, and lot number. Materials shall not be used until the STR, or Subcontractor's inspector has inspected the contents and obtained data from information on containers or label. Materials exceeding storage life recommended by the manufacturer shall be rejected.

B. All coatings and paints shall be stored in enclosed structures to protect them from weather and excessive heat or cold, as specified by manufacturer. Subcontractor shall store flammable coatings and paints to conform with State and Federal safety codes for flammable coatings and paint materials. Coatings and paints shall be protected from freezing or excessive heat.

C. Subcontractor shall store abrasives used for blast cleaning off the ground and shall protect abrasives from moisture and the elements.

1.6 DEFINITIONS

A. American Water Works Association (AWWA).
1. AWWA M42, *Manual of Water Supply Practices-Steel Water Storage Tanks*.
2. AWWA D102, *Coating Steel Water-Storage Tanks*.
3. AWWA C652, *Disinfection of Water-Storage Facilities*.

B. National Association of Corrosion Engineers International (NACE).
1. NACE SP-0188, *Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates*.

C. Society for Protective Coatings (SSPC).
1. SSPC-AB-1, *Mineral and Slag Abrasives*, 2019.
2. SSPC-AB-3, *Ferrous Metallic Abrasives*, 2017.
3. SSPC-Guide 6, *Guide for Containing Debris Generated During Paint Removal Operations*, 2021.
4. SSPC-PA-1, *Shop, Field, and Maintenance Painting of Steel*.

5. SSPC-PA-2, *Procedure for Determining Conformance to Dry Coating Thickness Requirements*.
6. SSPC-SP-1, *Solvent Cleaning*.
7. SSPC-SP-2, *Hand Tool Cleaning*.
8. SSPC-SP-3, *Power Tool Cleaning*.
9. SSPC-SP-10/NACE No. 2, *Near White Blast Cleaning*.
10. SSPC-VIS-1, *Dry Abrasive Blasting*.

1.7 SUBMITTALS

A. Blasting and Cleaning Plan. Subcontractor's Plan shall include a description of the proposed blasting abrasives, methods, and personnel safety procedures. The Plan shall list applicable OSHA requirements for abrasives and methods. The Plan shall address Subcontractor compliance methods with OSHA requirements. The Plan shall include Subcontractor clean-up and disposal methods of blast abrasives and disposal of removed interior and exterior coatings. The Plan shall specify Subcontractor's methods to keep the site clean and free from debris.

B. Subcontractor's Interior Coating Plan shall comply with AWWA D102.
   1. Subcontractor's Interior Coating Plan shall include product data, material safety data sheets, color samples, and NSF 61 compliance data for coatings.
      a. The Plan shall include mixing instructions, thinning recommendations, percent solids, spread rate, volatile organic compound (VOC) composition, application instructions, allowable accelerators, application restrictions such as minimum and maximum surface temperatures, dew point and relative humidity limitations, unit weight per gallon, drying time, pot life, and safety precautions.
      b. The Plan shall include manufacturer's voltage requirements for holiday testing.
      c. The Plan shall include coating applicator's qualifications and references.
      d. Subcontractor's applicator shall be qualified to apply specified materials by showing completed training in the use of coating material on similar projects.
      e. The Plan shall include Subcontractor's methods and equipment to be used to control temperature and humidity to ensure ventilation achieves curing time.

C. Subcontractor shall submit wet film thickness, dry film thickness, and holiday testing reports to the STR.

D. Tank Disinfection Plan. Subcontractor's Tank Disinfection Plan shall provide proposed tank disinfection procedures.

E. Subcontractor shall submit a Warranty Inspection Report.

1.8 PROJECT CONDITIONS

A. Spent abrasive contaminated with old coating shall be stored in sealed containers onsite, until disposal. Subcontractor shall separate the tank interior coating waste from the tank exterior coating waste. Because the tank has been abrasion-blasted within the last ten years, the Government is satisfied that spent abrasive contaminated with old coating will be non-hazardous. Therefore, Subcontractor shall base all costs for disposal of waste material on non-hazardous waste disposal costs.

B. Subcontractor shall provide instruments to measure air temperature, surface temperature of the steel, and relative humidity. Take and record measurements at the actual location of the work before each workday begins, every 4-hours thereafter, and when noticeable weather changes occur.

C. No painting shall be applied when the following conditions occur or are expected to occur within 8-hours after application.
   1. Ambient air temperature is below manufacturer-recommended temperatures for the coating material.
   2. Relative humidity exceeds manufacturer's recommendations.

D. Environmental conditions may be modified using dehumidification or heating equipment to bring ambient conditions within acceptable limits. When heaters are used, locate the heaters outside the tank with hot air ducted into the tank.

1.9 SAFETY AND HEALTH REQUIREMENTS

A. General. In accordance with requirements set forth by regulatory agencies applicable to the construction industry, Subcontractor shall provide and require use of personal protective lifesaving equipment for Subcontractor personnel working at the project site. Subcontractor personnel shall comply with provisions outlined in SSPC-PA-3, *A Guide to Safety in Paint Application.*

B. Head and Face Protection and Respiratory Devices. Equipment shall include protective helmets which shall be worn by all persons in the vicinity of the work. In addition, workers performing sandblasting shall wear eye and face protection devices and air purifying half-mask or mouthpiece respirators with appropriate filters. Barrier-creams shall be used on any exposed areas of skin. When coatings are applied inside the tank, all persons exposed to toxic vapors shall wear air-supplied helmets. Blasting nozzlemen shall wear eye and face protection devices and air-supplied helmets which meet OSHA requirements.

C. Ventilation. Where ventilation is used to control hazardous exposure, all equipment shall be explosion-proof. Ventilation shall reduce the concentration of air contaminants to eliminate hazards. Continue air circulation to exhaust solvent vapors until coatings have fully cured. Ventilation fan capacity shall exceed 300-cfm per gallon of coating applied per hour or as recommended by paint manufacturer. Ventilate during application of coating material and continue ventilation until coating is completely cured as recommended by the paint manufacturer or 7-days, whichever is greater. Ventilation equipment shall be arranged so that fumes heavier than air can be exhausted from the tank bottom.

D. Sound Levels. When occupational noise exposure exceeds maximum allowable sound levels, Subcontractor shall provide and require the use of approved ear protection devices.

E. Illumination. Subcontractor shall provide adequate illumination when work is in progress, including explosion-proof lights and electrical equipment. When required by the STR, Subcontractor shall provide additional illumination and required supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the STR.

F. Temporary Ladders and Scaffolding. Temporary ladders and scaffolding shall conform to applicable safety requirements. They shall be erected where requested by the STR or inspector to facilitate inspection. Subcontractor shall move temporary ladders and scaffolding to locations requested by STR or inspector.

G. Confined Space. Subcontractor shall comply with confined space entry requirements in Section 013600, *Accident Prevention*.

H. Fall Protection. Subcontractor shall provide fall protection for all employees that meets the requirements of OSHA 1926.502.

1.10 CLOSEOUT SUBMITTALS

A. Furnish two 1-quart representative samples of each type of coating for subsequent analysis should premature coating failure occur, and 1-gallon of each type coating for touch-up.

B. The painting schedule of interior coating systems shall list coating manufacturers, vendor's names, phone numbers, product names, product phone numbers, the application sequence, number of coats, color names, and color numbers.

1.11 WARRANTY

A. Subcontractor shall provide the Government with a one (1) year warranty for tank interior coatings. The one-year warranty will be extended until completion of the warranty inspection and all remedial work as identified in Paragraph 1.12 below.

1.12 WARRANTY INSPECTION

A. Subcontractor shall provide a warranty inspection by an independent diving company specializing in potable water tank inspection during the eleventh month after completion of all coating work. Complete the inspection in accordance with AWWA M42, *Steel Water-Storage Tanks*, Section 9, and Appendix C. The diving Subcontractor shall be a NACE Level III- certified inspector to confirm the condition of the coating. Subcontractor shall establish the inspection date and arrange for the inspection. Subcontractor shall notify the STR 30-days in advance of the inspection and provide the STR with the name of the inspection company. The STR has the right to request another dive company if the STR determines a conflict of interest.

B. Subcontractor shall cover all costs of the inspection.

C. Certified divers shall provide an inspection report, photos, and video to the STR. The report shall list all failures observed, and repairs required.

D. Subcontractor shall make all repairs required by the inspection report at no additional cost to the Government.

PART 2 - PRODUCTS

2.1 ABRASIVE BLASTING GRIT

A. All abrasives shall be dry, clean, free from oil, grease, dirt, chemicals, and other contaminants that may interfere with adhesion of coating. Particle size of the abrasives used shall produce a sufficient surface profile in accordance with manufacturer's recommendations.

B. All expendable abrasives shall meet the minimum requirements of SSPC-AB-1, and all abrasives shall meet the requirements of Class A (SSPC-AB-1) for silica content (crystalline silica less than 1% by weight before blasting).

C. Shot, garnet, slag, or alternative abrasives shall meet the requirements of SSPC-AB-3.

D. Copper slag or grit (i.e., Nevada Black, Best Grit) shall not be allowed under any circumstance.

2.2 RINSING AGENTS

A. Subcontractor shall use rinsing agents to remove grease and soluble salts from metal surfaces and to inhibit development of flash rust prior to applying coatings. Salient characteristics of rinsing agents are as follows:
   1. Agents are water soluble additives.
   2. Agents are biodegradable, non-toxic, non-hazardous.
   3. Agents are phosphate and acid-free.
   4. Agents are non-flammable.
   5. Agents shall remove all salts and contaminants including oil, grease, and blast residues.

2.3 TANK INTERIOR COATING SYSTEM-WETTED AREAS

A. High-Build, Polyling-Epoxy System.
   1. Surface Preparation Prior to Abrasive Blast Cleaning. Weld flux and spatter shall be removed by power tool cleaning. Sharp projections shall be ground to a smooth contour. All welds shall be ground to a smooth contour as per NACE Standard RP-0178, and herein.
   2. Surface Preparation. SSPC-SP-10, *Near-White Metal Blast Cleaning.* Anchor profile shall be 1.5 to 2.5 mils per ASTM D4417, Method C or NACE Standard RP-0287.
   3. Coating System. DuraChem-580, Polyling-Epoxy System, or equivalent.
   4. Total dry film thickness shall be a minimum of 75 mils per SSPC-PA-2, dry film inspection standards, with exceptions noted in this specification.

2.4 CAULKING

A. Caulking applies to truss and ceiling plate seams, and ceiling plate laps. Salient characteristics of caulk.
   1. Generic Product Type. One-component polyurethane based non-sag elastomeric sealant.
   2. Certified to NSF Standard 61 for potable water.

2.5 TANK EXTERIOR COATING SYSTEM

A. Tank Exterior Coating System applies to surfaces the Subcontractor abrasive blast cleans to a minimum of commercial blast clean and the preparation for abrasive blast cleaning. Weld flux and spatter shall be removed by power tool cleaning. Sharp projections shall be ground to a smooth contour. All welds shall be ground to a smooth contour in accordance with NACE Standard RP-0178 and herein. Surface Preparation shall meet SSPC-SP-6, *Commercial Blast Cleaning.* Anchor profile shall be 1.5 to 2.0 mils in accordance with ASTM D4417, Method C or NACE Standard RP-0287.

B. Exterior enamel coating system shall have a minimum Dry Film Thickness (DFT) = 10 mils. Exterior tank coating system shall be designed for exterior steel water tank applications.

C. Exterior Coating System. A prime coat with DFT = 3.0 to 5.0 mils. Follow with an intermediate coat with additional DFT = 4.0 to 6.0 mils. Follow with a finish coat containing a UV blocker additive with additional DFT = 3.0 to 5.0 mils. Total Exterior Coating System DFT = 10.0 to 16.0 mils.

D. Thinners. Thinners shall be manufactured by the manufacturer supplying the coating system and shall be approved by the manufacturer of the coating system used.

E. Interior Roof Lap Joints. Interior roof lap joints shall be sealed with an approved caulking system.

2.6 SURFACE PREPARATION-GENERAL

A. All surface preparation, coating and painting shall conform to applicable standards of the Steel Structures Painting Council, NACE International and manufacturer's printed instructions. Materials applied to the surface prior to the approval of the STR or inspector shall be removed and re-applied to the satisfaction of the STR at the expense of Subcontractor.

B. All work shall be performed by skilled craftsmen qualified to perform work comparable with the best standards of practice. Continuity of personnel shall be coordinated with the STR.

C. Subcontractor shall provide a supervisor at the work site during cleaning and application operations. The supervisor shall have the authority to sign change orders, coordinate work and make decisions pertaining to the fulfillment of the contract.

D. Dust, dirt, oil, grease, or any foreign matter that will affect the adhesion or durability of the coating or paint shall be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.

E. Coating and painting systems include surface preparation, prime coating, and finish coatings. Unless otherwise approved in writing by the STR, prime coating shall be field applied. Where prime coatings are shop applied, Subcontractor shall instruct suppliers to provide the prime coat compatible with the specified finish coat. Any off-site work which does not conform to this specification, is subjected to damage during transportation, construction, and installation, shall be thoroughly cleaned and touched-up in the field as directed by the STR or inspector. Subcontractor shall use repair procedures which ensure the complete protection of all adjacent primers. Specified repair method and equipment may include wire-brushing, hand or power tool cleaning, or dry air blast cleaning. To prevent injury to surrounding painted surfaces, blast cleaning may require use of lower air pressure, smaller nozzles, abrasive blast particles, and shorter blast nozzle distances from surface shielding and masking. If damage is too extensive or uneconomical to touch-up, the entire item shall be blasted and then coated or painted as directed by the STR.

F. Subcontractor coating and painting equipment shall be designed for application of materials specified and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air. STR will approve Subcontractor equipment.

G. Application of the first coat shall follow immediately after surface preparation, cleaning, and stripe coat, if applicable, before rust bloom occurs or the same day, whichever is less. Any cleaned areas not receiving first coat within this period shall be re-cleaned prior to application of first coat. Use of de-humidification equipment shall be reviewed by the STR and coating material manufacturer prior to deviating from this provision.

H. Prior to assembly, all surfaces made inaccessible after assembly shall be prepared as specified herein and shall receive the coating or paint system specified.

2.7 SURFACE PREPARATION

A. The latest revision of the following surface preparation specifications of the Steel Structures Painting Council (SSPC) shall form part of this specification. The summaries listed below are for informational purposes. Consult the actual SSPC specification for full detail.
   1. SSPC-SP-1, *Solvent Cleaning.* Removal of oil, grease, soil, and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods which involve a solvent or cleaning action.
   2. SSPC-SP-2, *Hand Tool Cleaning.* Removal of loose rust, loose mil scale and other detrimental foreign matter to a degree specified by hand chipping, scraping, sanding, and wire-brushing.
   3. SSPC-SP-3, *Power Tool Cleaning.* Removal of loose rust, loose mil scale and other detrimental foreign matter by power wire-brushing, power impact tools or power sanders.
   4. SSPC-SP-5, *White Metal Blast Cleaning* and NACE No. 1. Air blast cleaning to a gray-white uniform metallic color until each element of surface area is free from all visible residues.
   5. SSPC-SP-6, *Commercial Blast Cleaning* and NACE No. 3. Air blast cleaning until at least two-thirds of each element of surface area is free from all visible residues.
   6. SSPC-SP-7, *Brush-Off Blast Cleaning* and NACE No. 4. Air blast cleaning to remove loose rust, loose mil scale and other detrimental foreign matter to a degree specified.
   7. SSPC-SP-10, *Near-White Metal Blast Cleaning* and NACE No. 2. Air blast cleaning until at least 95% of each element of surface area is free from all visible residues.
   8. SSPC-SP-11, *Power Tool Cleaning to Bare Metal.* SSPC-SP-11 differs from SSPC-SP-3 in that it requires more thorough cleaning and a surface profile not less than 1-mil.

B. Subcontractor shall remove by chipping and grinding, slag, weld metal accumulation and spatters not removed by Subcontractor Steel Tank Fabricator. Subcontractor shall peen, ground-smooth, or blunt all sharp edges as required by the STR. Subcontractor shall grind and finish welds, and edges prior to solvent cleaning and abrasive blasting. Welds shall be prepared in accordance with NACE Standard RP-0178 for all interior and exterior surfaces.
   1. Butt Welds shall be ground smooth and free from all defects, designation “D”.
   2. Lap Weld shall be ground smooth and blended, designation “D”.
   3. Fillet Welded Tee Joint shall be ground smooth and blended, designation “D”.

C. Subcontractor shall use the dry method to perform field blast cleaning for all surfaces unless otherwise directed. Blast nozzles shall be venturi-type nozzles with a minimum nozzle pressure = 90 psi.

D. Particle size of abrasives used in blast cleaning shall be that which will produce a 1.5 - 2.5 mil (37.5 microns - 65.0 microns) surface profile or in accordance with manufacturer’s recommendations of the specified coating or paint system to be applied.

E. If the profile of the blasted steel exceeds the profile specified above, Subcontractor shall take following actions:
   1. Re-blast the surface using a finer aggregate to produce the required profile.
   2. Apply a thicker prime coat, given limitations of products applied, to cover the blast profile.

F. Abrasive material used in blast cleaning operations shall be new, washed, graded and free from contaminants that would interfere with adhesion of coating or paint. Abrasives shall not be reused.

G. During blast cleaning operations, Subcontractor shall exercise caution to ensure existing coatings and paint are not exposed to abrasion from blast cleaning.

H. Subcontractor shall maintain the work area in clean condition. Subcontractor shall not permit blasting materials to accumulate, to create a nuisance, or safety hazard.

I. Blast cleaned surfaces shall be cleaned prior to application of specified coatings or paint. All surfaces shall be free from dust, dirt, and other residue resulting from the abrasive blasting operation. No coatings or paint shall be applied over damp surfaces.

J. All welds shall be neutralized with a suitable chemical compatible with the specified coating or paint.

K. Subcontractor shall repair pitted areas on the tank interior by filling with Tnemec Series 63-1500 Epoxy Filler and Surfacer, or by welding. Epoxy filler shall be feathered smooth. Filler shall be applied prior to the application of the finish coat. No protrusions or spatter shall be allowed. Pits deeper than 1/8" shall be filled by welding.

L. Specific Surface Preparation. Surface preparation for the specific system shall be as noted in Specification Sections, *Tank Exterior, and Interior Coating Systems.*

2.8 NON-VISIBLE CONTAMINANTS

A. Chloride, sulfate, and ferrous ion (Fe^{2+}) tests shall be performed on the interior metal portions of the tank after sandblasting but prior to coating application. The maximum allowable limit of non-visible contaminants is:
   1. Limit of Chlorides is 30 milligrams per square meter or 3 micrograms per square centimeter.
   2. Limit of Sulfates is 100 milligrams per square meter or 10 micrograms per square centimeter.
   3. Limit of Ferrous ions (Fe^{2+}) is 50 milligrams per square meter or 5 micrograms per square centimeter.

B. If testing shows amounts present in the test solution to be greater than the limits listed herein, Subcontractor shall clean the surface of the entire tank interior with a 5,000-psi water blast with fine entrained abrasive until the levels in the test solutions are below the maximum acceptable level. Alternate cleaning methods may be allowed with prior approval of the STR. Surface shall be re-blasted as specified in TP-3411 and TP-3412 at no additional cost to the Government.

C. Subcontractor shall provide a written statement from the paint manufacturer stating that the maximum acceptable levels are not less than those listed herein. Results of testing shall be provided to the STR before any coatings are applied.

D. When exterior coats shall be applied on subsequent days, or when the shroud is dropped between coats, the previously applied coat of paint shall be thoroughly pressure-washed to remove any fallout and salt that settled on the surface.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. All materials shall be lead-free as defined by the Consumer Product Safety Act, Part 1303.

B. Any zinc dust pigment contained in any zinc-rich material shall meet the requirements of ASTM D520 Type III, for zinc content and purity.

C. All materials for the interior wetted portion of the tank shall meet NSF 61 for potable water contact.

D. All high gloss clear coat products shall incorporate the use of a fugitive dye to aid in the proper application and coverage of such coats.

E. All catalyzed polyurethane products shall comply with SSPC Paint Specification Number 36, Performance Level 3.

F. Inorganic zinc-rich primers shall not be utilized as a permanent part of the interior coating system on this project. Inorganic zinc-rich pre-primers shall be completely blasted and removed prior to installing the coating system on the interior water compartment. All surface preparation shall be to the degree specified herein.

3.2 MATERIAL PREPARATION

A. Mix and thin materials according to manufacturer's latest printed instructions.

B. Do not use materials beyond manufacturer's recommended shelf life.

C. Do not use mixed materials beyond manufacturer's recommended pot life.

3.3 CLEANING AND ABRASIVE BLAST CLEANING

A. Before cleaning, leave caps or seals of pipe openings in place to prevent entry of foreign matter until all surfaces are ready for the first coat.
   1. Tank Interior Surfaces. Clean all surfaces as specified below. Dry blast interior surfaces only. Blast equipment and air supply shall provide a pressure of not less than 90 psi at the blast generator. The air supply shall be sufficiently free from oil and moisture so that no visible residue appears on the finish-blasted surface. For tank interior surfaces, remove dirt, debris, chalk, and contaminants in accordance with SSPC-SP-1. Abrasive blast clean to a minimum Near White Metal Blast Clean and create 3.5 to 5.0 mils of dense angular anchor profile in accordance with NACE No. 2, and SSPC-SP-10. *'Near White'* is defined as blast cleaning until at least 95 percent of each square inch of surface area is free from all visible residues. Subcontractor shall test for soluble salts in accordance with NACE/SSPC, *Joint Surface Preparation Standard.* Remove excess soluble salts by thorough rinsing with potable water at pressures between 2,500 psi and 7,500 psi. Follow this by testing for soluble salts again and repeat the procedures as required to get the level below maximum allowable thresholds. Measure the depth of corrosion pitting to confirm the required filling procedures for the specified coating system are acceptable.
   2. Tank Exterior Surfaces. Subcontractor shall remove dirt, debris, chalk, and contaminants in accordance with SSPC-SP-1. Smooth and non-porous coatings must be mechanically abraded to create approximately 1 to 2 mils of dense angular anchor profile so the new coating can obtain acceptable mechanical adhesion to the existing

coating. Remove all loose coatings, rust, and debris in accordance with SSPC-SP-2 and SP-3. Test for soluble salts in accordance with NACE/SSPC, *Joint Surface Preparation Standard.* Remove excess soluble salts by thorough rinsing with potable water at pressures between 2,500 psi and 7,500 psi. Follow this by testing for soluble salts again and repeat the procedures as required to lower the level below maximum allowable thresholds.

B. During and after blasting, remove all scale, sand, rust, grit, and sediment, and clean inside surfaces by brushing. Blow surfaces with clean dry air, brooming, and vacuuming.

3.4 COATING APPLICATION

A. Apply coatings prior to the formation of flash rust per NACE No. 2/SSPC-SP-10. If any finish-blasted surface rusts before priming, re-blast as necessary. Clean finish-blasted surfaces of all dust before applying coatings. The STR will approve blasted sections before Subcontractor applies the stripe and finish coats. For painting exteriors of tanks, match Frazee Color #213-Travatan.

B. Subcontractor shall meet the requirements of SSPC-PA-1.
   1. Protect fixtures such as liquid level indicators and pump control equipment with coverings. Protect surfaces not to be coated. Recoat or repaint spattered surfaces as required to produce a finish satisfactory to the STR.
   2. Follow manufacturer's recommendations for maximum and minimum times to recoat.
   3. Apply coatings in accordance with manufacturer’s instructions.
   4. Employ strict quality control measures. Subcontractor shall provide equipment for the following tests:
      a. Wet Film Thickness. As work progresses, use a wet film gauge at least once every 100 square feet of surface coated.
      b. Dry Film Thickness. Follow procedures outlined in SSPC-PA-2, *Measurement of Dry Paint Thickness with Magnetic Gauges*. Subcontractor shall furnish nondestructive gauges to measure dry film thickness. Subcontractor shall furnish U. S. Department of Commerce, National Institute of Standards and Technology (NIST), certified calibration plates to test the accuracy of the dry film thickness gauge. Subcontractor shall obtain at least one dry film measurement per 100 square feet of surface painted. Apply additional coats to attain specified minimum dry film thickness.
      c. Holiday Testing. Subcontractor shall perform holiday testing in accordance with NACE SP-0188. Notify the STR 24-hours in advance of holiday testing. Perform holiday testing under supervision of the STR. Subcontractor shall perform holiday testing on 100 percent of flat plate interior wetted surfaces. Subcontractor shall follow equipment instructions for testing. Mark holidays for repair, then retest after completion of repair work.
      d. Accessibility. To facilitate inspection, Subcontractor shall erect and move temporary ladders and scaffolding to STR-requested locations.

3.5 CURING

A. Curing time, accelerators, temperature, and humidity control shall be in accordance with manufacturer's recommendations. Tank cannot be tested, disinfected, or placed into service until curing time has elapsed. Use power ventilation during curing period. During curing, record temperature readings hourly, and adjust curing time in accordance with manufacturer's recommendations.

3.6 EXTERIOR TANK WORK

A. During exterior tank work, it is critical that all old coatings are picked up and stored in containers onsite. The contents of the containers will be disposed of as specified in Subsections 1.22.H and 1.32.A., and 1.8A of this Specification.

3.7 REASSEMBLY

A. Subcontractor shall reconnect all controls, valves, and other disconnected equipment. If the gasket on the shell manway was damaged when the cover was removed, supply and install a new gasket. Remove all temporary caps and seals.

3.8 TANK DISINFECTION

A. Approval to begin. Subcontractor shall not begin disinfecting water contact surfaces or fill water storage tanks until given approval by the STR. Before approval for disinfection and filling of the tank can be granted, the following actions shall be completed and approved by the STR: thickness testing, holiday testing, and curing.

B. Disinfection. Comply with AWWA C652, with the following exception: Subcontractor shall not deliver water used in the disinfection process to the potable water distribution system. Disinfection shall be performed after protective coatings have been applied to interior surfaces and have been allowed to thoroughly cure. All interior surfaces shall be thoroughly washed with a solution with minimum chlorine content of 50-ppm. Chlorine solution accumulated at tank bottom shall be drained to waste. Rinsing with clean water is not required. Subcontractor shall select and submit Method 1, 2 or 3 for disinfection. STR will approve the Subcontractor-selected method.

C. Subcontractor shall submit a statement he disinfected the tank in accordance with AWWA C652, Method 1, 2, or 3.

D. Water disposal. Subcontractor shall dispose of chlorinated water discharged from the storage tank on the ground. Subcontractor shall not allow disposed chlorinated water to enter steams or bodies of water per Nevada Water Quality Board Rule R317. Subcontractor shall coordinate water disposal method with the STR.

3.9 WATER SAMPLING AND TESTING

A. After Subcontractor fills the re-coated tank with potable water, the STR will take a water sample for bacteriological testing. The STR will submit test samples to a laboratory certified by the Nevada Bureau of Safe Drinking Water (BSDW). The STR will take samples in the presence of Subcontractor. If tests do not meet the Nevada Safe Drinking Water Standards, Subcontractor shall re-disinfect the tank until standards are met.

B. After filling the re-coated tank, the STR will take water samples for VOC testing. The STR will submit VOC test samples to a laboratory certified by the Nevada Bureau of Safe Drinking Water. STR will take samples in the presence of Subcontractor. If tests do not meet Nevada Safe Drinking Water Standards, Subcontractor shall drain the tank. This shall allow tank coatings to cure until VOC standards are met.

1. Subcontractor shall not place the re-coated tank into service until the tank has passed all tests and has been approved by the STR. The Government will fund all bacteriological and VOC sampling and testing. After the tank has reached *"full cure"* as specified by the coating manufacturer, VOC tests shall be performed on the tank interior coating system. The STR will collect samples for testing. Tests shall be

performed in accordance with EPA 524.2, Revision 4, *Measurement of Purgeable Volatile Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry,* 2023.

C. Total VOC concentration shall not exceed 100 ppb/100 micrograms per liter for 24-hour and 72-hour intervals.

D. If VOC limits cited herein are exceeded, Subcontractor shall take all required actions to reduce total VOC concentration to the level specified herein. This includes, but is not limited to continuing forced air ventilation, steam cleaning the structure, and rinsing the structure with clean potable water.

3.10 CLEAN-UP

A. Subcontractor shall contain and collect all abrasive blast material and paint chips, both new and used, to prevent contact with the ground. Subcontractor shall comply with SSPC-Guide 6. This material will be placed in MSTS-provided containers and disposed of by MSTS.

B. Upon completion of the work, Subcontractor shall remove all staging, scaffolding and containers from the site or shall destroy them in a manner approved by the Contracting Officer. Subcontractor shall remove coatings, paint spots or oil stains on adjacent surfaces. Subcontractor shall clean the project site. Subcontractor shall clean, repair, or refurbish all damage to surfaces resulting from the work of this section to the satisfaction of the Contracting Officer at no cost to the Government.

3.11 SUBMITTALS

A. Subcontractor shall submit a written work plan describing in detail all phases of coating operations. Subcontractor Work Plan shall address work sequencing, surface preparation, coating application, recoat and cure time projections. The plan shall address how Subcontractor will control, test, and evaluate each step. The plan shall provide detailed procedures, including manufacturer's instructions, to repair defects in the coating film such as runs, drips, sags, holidays, or overspray. The plan shall address safety measures, work scheduling based on expected weather condition extremes, and record keeping.

3.12 MEASUREMENT AND PAYMENT

A. Tank painting shall be measured on a lump sum basis. Payment for interior and exterior painting shall be at the unit price shown on the bid schedule, which shall be full compensation for interior and exterior coating of steel water storage tanks. This includes materials, coating systems, surface preparation, application, inspection, testing, disinfection, and placing the tank into service.

END OF SECTION 099700

SUBCONTRACTOR QUALITY CONTROL DAILY REPORT

REPORT NO. SHEET 1 OF

PROJECT				CONTRACT NO.	DATE
TANK #				SUBCONTRACTOR REPRESENTATIVE AT JOB SITE	
WEATHER (Rain, Snow, Cloudy, Windy, etc.)	RAINFALL Inches	TEMPERATURE MAX.	MIN.	GROUND CONDITIONS (Dry, Damp, Wet, Frozen,etc.)	

1. PRIME SUBCONTRACTOR

NO. EMPLOYEES BY JOB CATEGORIES	Hours	HEAVY EQUIPMENT ON JOB	NO. UNITS	HRS. WORKING		
				YES	NO	Comments

WORK PERFORMED BY PRIME CONTRACTOR

MATERIALS DELIVERED	OFFICIAL VISITORS TO SITE

2. SUBCONTRACTOR,_____: If more than one subcontractor, use copies of following page.

NO. EMPLOYEES BY JOB CATEGORIES	Hours	HEAVY EQUIPMENT ON THE JOB	NO. UNITS	HOURS WORKING		
				YES	NO	Comments

WORK PERFORMED BY SUBCONTRACTOR

3. SPECIFIC INSPECTIONS (Inspections performed, results, and corrective actions)

4. TESTING: Check if any testing was performed today. Complete and Attach Test Report Information Sheets.
Type and Location of Testing: _____

5. VERBAL INSTRUCTION RECEIVED FROM GOVERNMENT ON CONSTRUCTION DEFICIENCIES OR RE-TESTING

6. REMARKS

7. CERTIFICATION

I certify that the above report is complete and correct and that I, or my authorized representative, have inspected all work performed this day by the prime subcontractor and each lower-tier subcontractor and determined that all materials, equipment, and workmanship are in strict compliance with the plans and specifications except as noted above.

SUBCONTRACTOR WORK CONTINUED:	CONTRACT NO.	REPORT NO. ____ SHEET___OF ___

2A SUBCONTRACTOR

NO. EMPLOYEES BY JOB CATEGORIES	Hours	HEAVY EQUIPMENT ON JOB	NO. UNITS	HRS. WORKING		
				YES	NO	Comments

WORK PERFORMED BY SUBCONTRACTOR:

2B SUBCONTRACTOR

NO. EMPLOYEES BY JOB CATEGORIES	Hours	HEAVY EQUIPMENT ON JOB	NO. UNITS	HRS. WORKING		
				YES	NO	Comments

WORK PERFORMED BY SUBCONTRACTOR

2C SUBCONTRACTOR

NO. EMPLOYEES BY JOB CATEGORIES	Hours	HEAVY EQUIPMENT ON JOB	NO. UNITS	HRS. WORKING		
				YES	NO	Comments

WORK PERFORMED BY SUBCONTRACTOR

2D SUBCONTRACTOR

NO. EMPLOYEES BY JOB CATEGORIES	Hours	HEAVY EQUIPMENT ON JOB	NO. UNITS	HOURS WORKING		
				YES	NO	COMMENT

WORK PERFORMED BY SUBCONTRACTOR

DAILY TEST REPORT INFORMATION SHEET

CONTRACT NO._____REPORT NO. _____

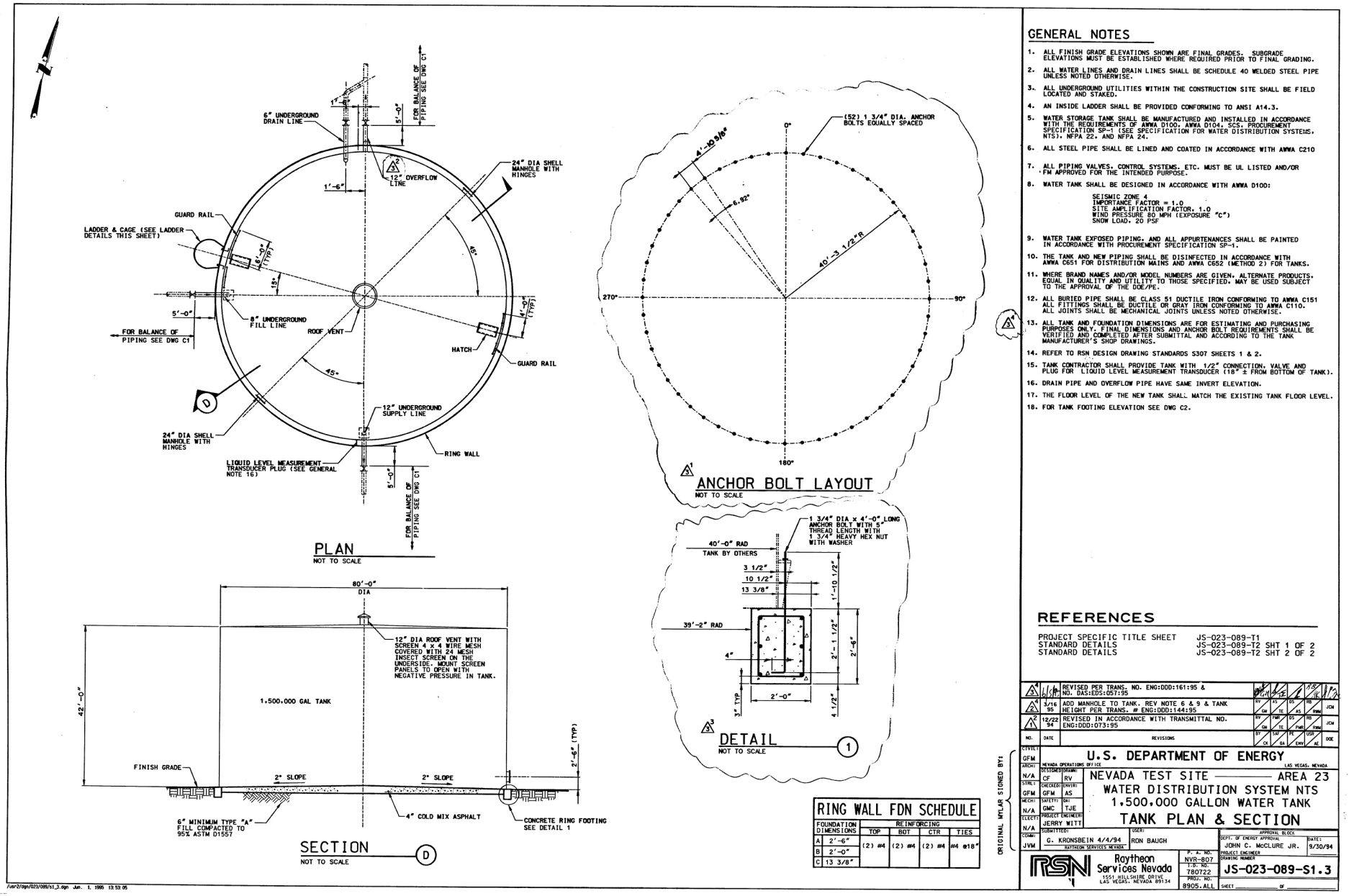
SHEET___OF

1. Individual Performing Inspection or Test
2. Testing Laboratory; Name Phone #:
Address:
3. Description of Work and Test Method
4. Location of Samples and Tests or Inspections
5. Specification Section
6. Inspection Date
7. Test Results and Interpretations of Test Results:
8. Comments or Professional Opinion About Compliance of Inspected Work or Tested Work with contract Document Requirements:
9. Recommendations:
10. Corrective Actions Taken:

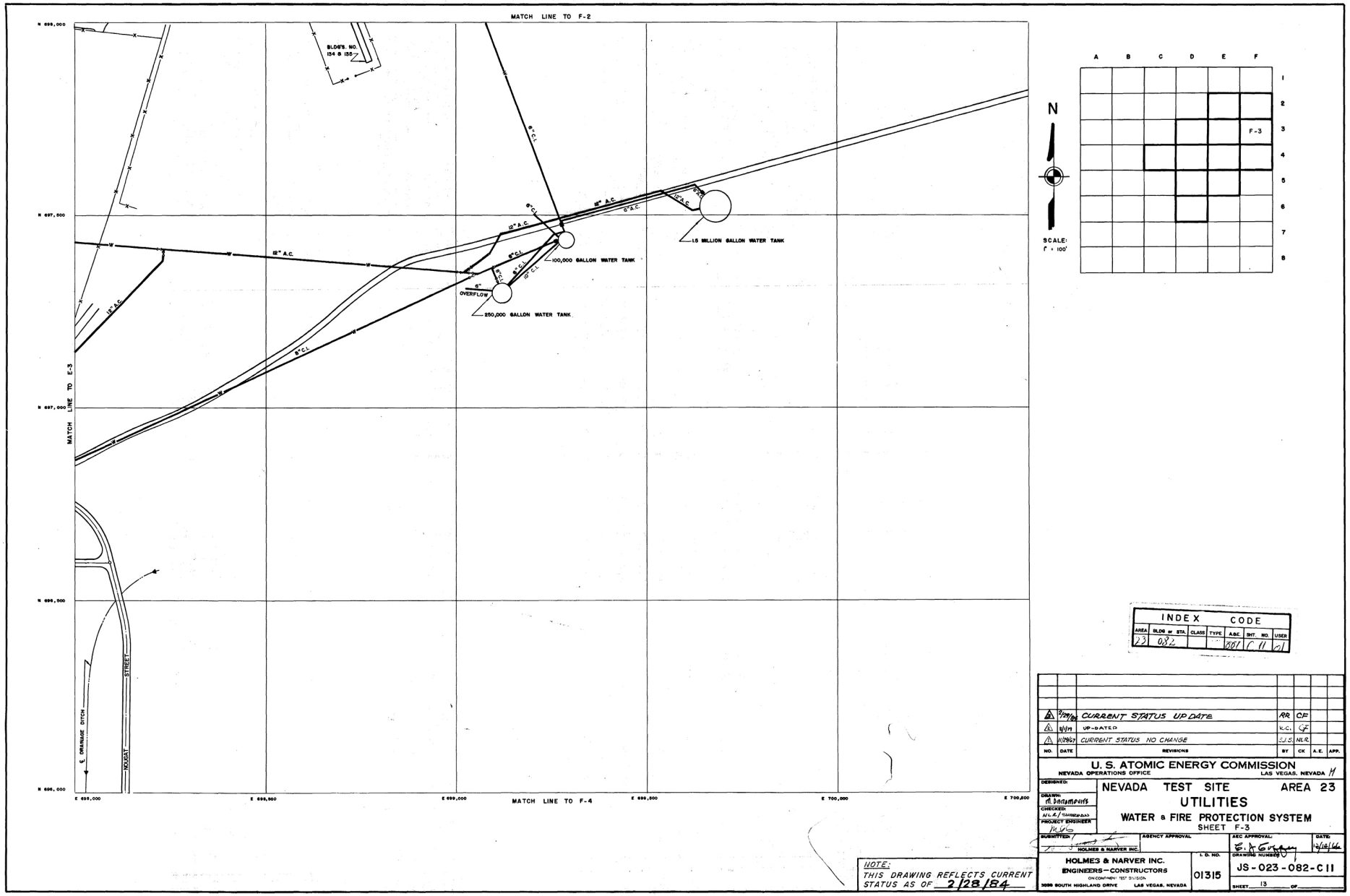
CERTIFICATION:
I certify that the above testing report is complete and correct and that all testing performed this day for thiscontract is in strict compliance with the plans and specifications except as noted above.

_____
Signature of Inspector

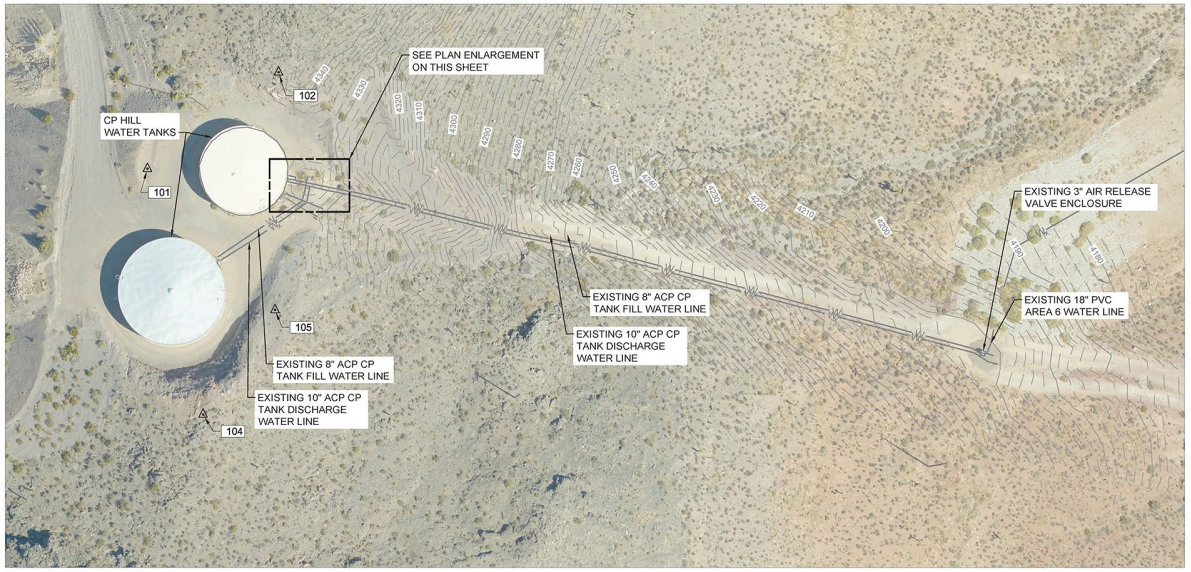
3.13 DRAWINGS



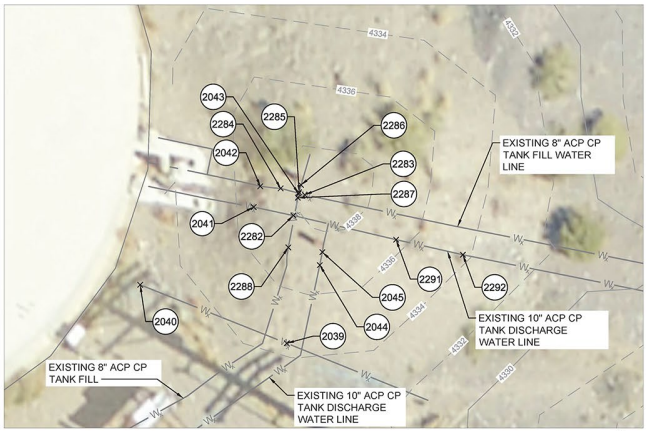
Mercury South Tank Plan and Section



Mercury South Tank Site Plan



1 EXISTING CONDITIONS PLAN ALIGNMENT AREA 1
SCALE: 1"=40'



2 EXISTING CONDITIONS TANK MANIFOLD AREA ENLARGEMENT
SCALE: 1"=5'

SITE SURVEY NOTES:

1. HORIZONTAL BEARINGS REFER TO NAD27 NEVADA STATE PLANE CENTRAL ZONE, US SURVEY FOOT. VERTICAL DATUM REFERS TO THE NATIONAL GEODETIC VERTICAL DATUM OF (NGVD29)

LEGEND

- 4200 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- W EXISTING WATER LINE

SURVEY CONTROL POINTS				
NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	796006.93	677374.95	4332.98	WLCP1
102	796074.26	677466.78	4345.56	WLCP2 PK
104	795835.32	677413.88	4371.07	WLCP4 PK
105	795908.36	677464.21	4343.86	WLCP5 PK

POINT TABLE - UTILITY INVESTIGATORY POTHOLE				
NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
2039	795984.14	677485.13	4332.54	TOP 4 IN WATER LINE
2040	795989.25	677472.31	4332.80	TOP 4 IN WATER LINE
2041	795996.04	677482.24	4335.21	TOP 10 IN WATER LINE
2042	795997.86	677482.82	4335.28	TOP 10 IN WATER LINE
2043	795997.20	677486.17	4335.11	TOP 10 IN WATER LINE
2044	795990.97	677488.02	4335.36	TOP 10 IN WATER LINE
2045	795992.10	677488.25	4335.47	TOP 10 IN WATER LINE
2282	795995.30	677485.71	4335.26	TOP 10 IN WATER LINE
2283	795997.11	677486.71	4335.08	TOP 8 IN WATER LINE
2284	795997.68	677484.60	4335.08	TOP 8 IN WATER LINE
2285	795997.33	677486.21	4335.09	TOP 8 IN TEE
2286	795997.97	677486.38	4335.06	TOP 8 IN WATER LINE
2287	795996.86	677486.10	4333.66	TOP 8 IN WATER LINE
2288	795992.51	677485.27	4333.66	TOP 8 IN WATER LINE
2291	795993.20	677494.69	4335.22	TOP 10 IN WATER LINE
2292	795991.88	677500.54	4333.08	TOP 10 IN TO REDUCER

no.	date	by	ckd	description
0	11/14/18	SDK	KNR	ISSUED FOR CONSTRUCTION
1	06/25/20	SDK	KNR	AS BUILT PER RED LINED DRAWINGS

NEVADA NATIONAL NNSS SECURITY SITE

KANSAS CITY NSC National Security Campus

BURNS McDONNELL
FACILITY ENGINEERING SERVICES
9400 WARD PARKWAY
KANSAS CITY, MO. 64114
816-333-9400

date	detailed
JUNE 2018	D. MUETING
designed	checked
S. KLINGELE	K. ROBERTS

NEVADA NATIONAL SECURITY SITE - AREA 6
CP HILL WATERLINE REPLACEMENT

EXISTING CONDITIONS PLAN ALIGNMENT AREA 1

project	contract
106283	-

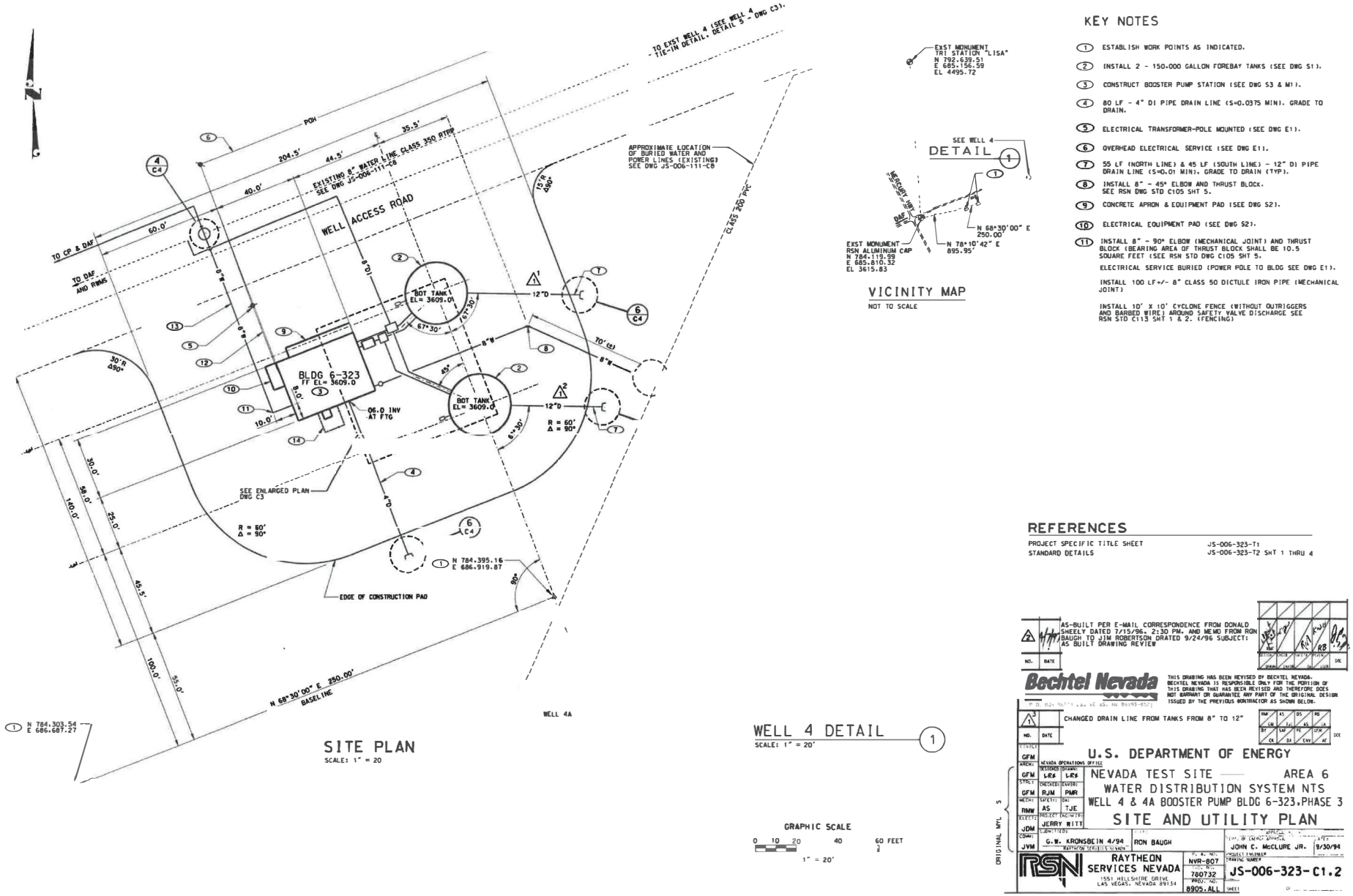
sheet number C-001 – rev. 1

sheet of sheets

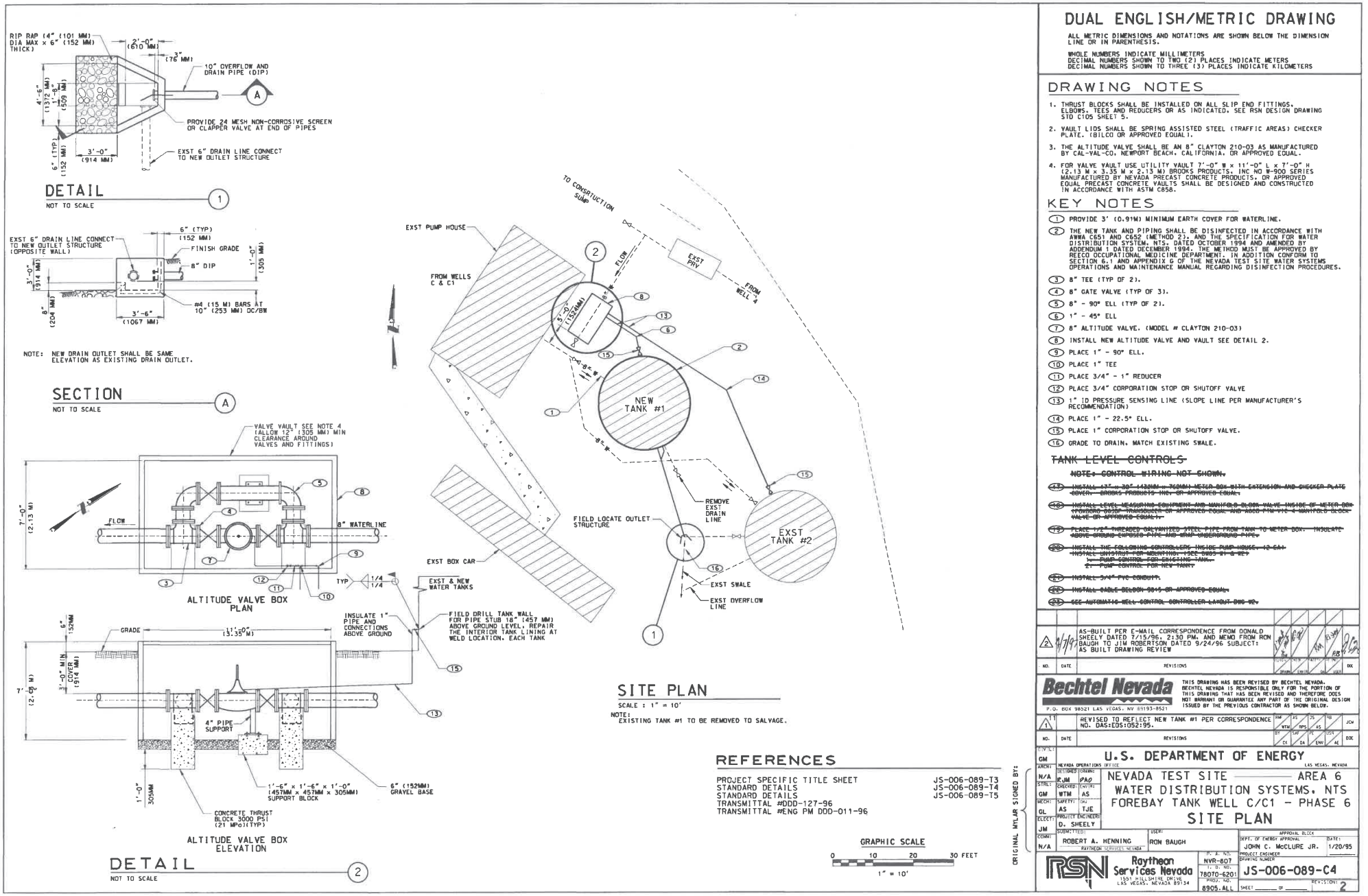
106283 C-001.DWG

I:\BMCD\DFS\CLIENTS\ANFINNSA\NNSS\106283_CPWATERLINE\DESIGN\CIVIL\SHEETS\106283 C-001.DWG 6/19/2020 1:21 PM DMUETING

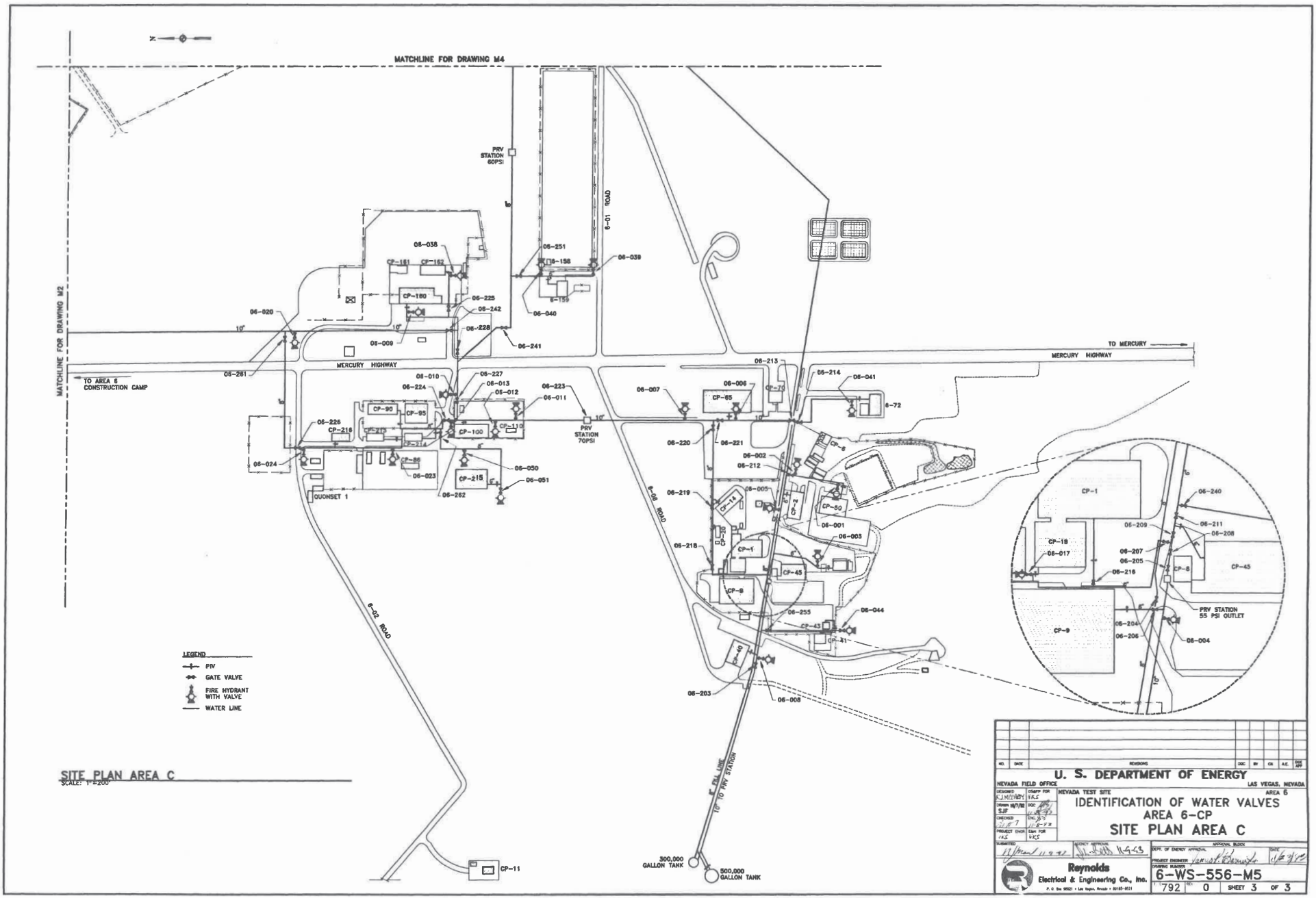
CP South Tank Site Plan



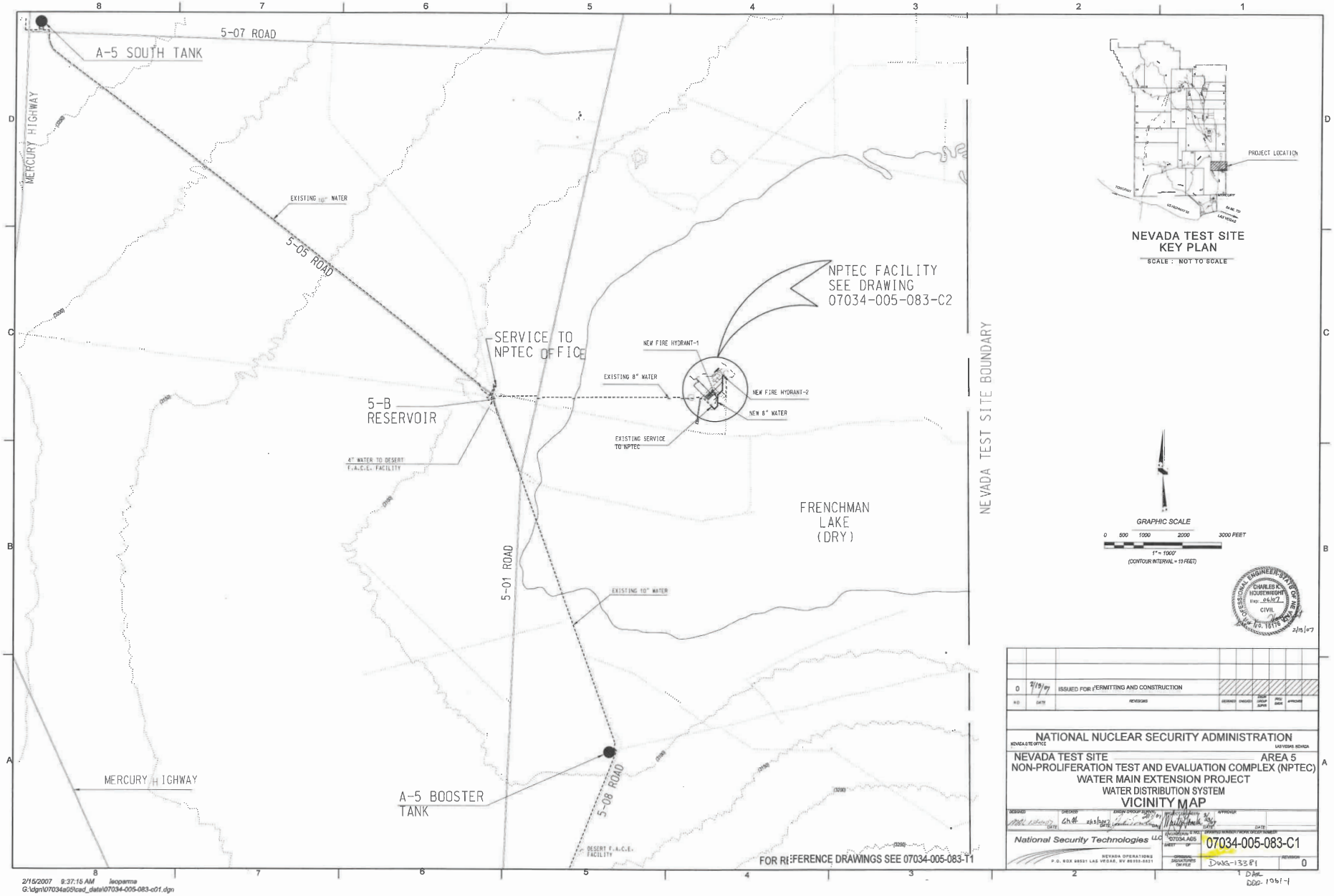
Well 4 and 4A Tank Site Plan



C1 North and South Tank Site Plan

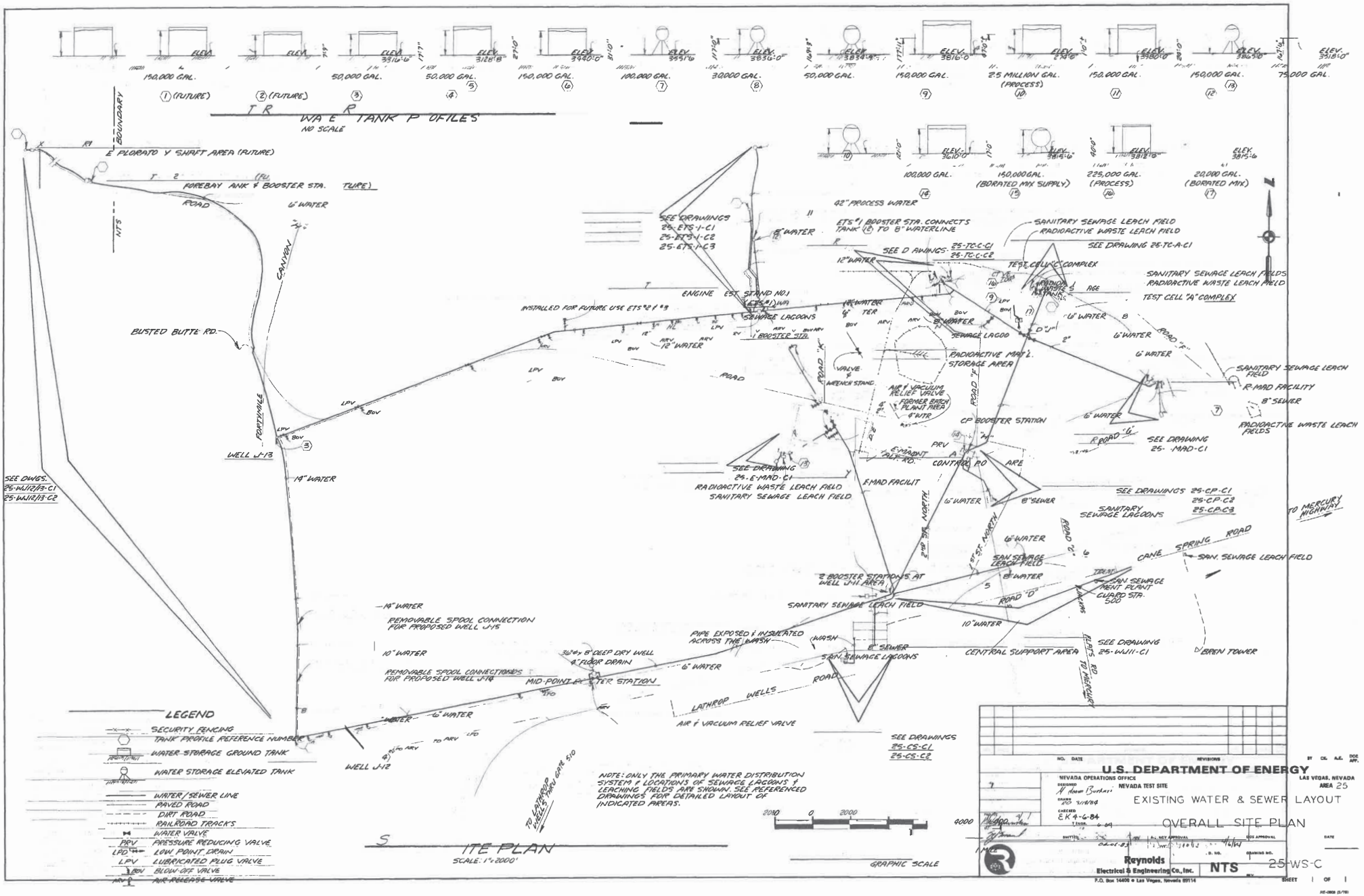


CP North and South Tank Site Plan

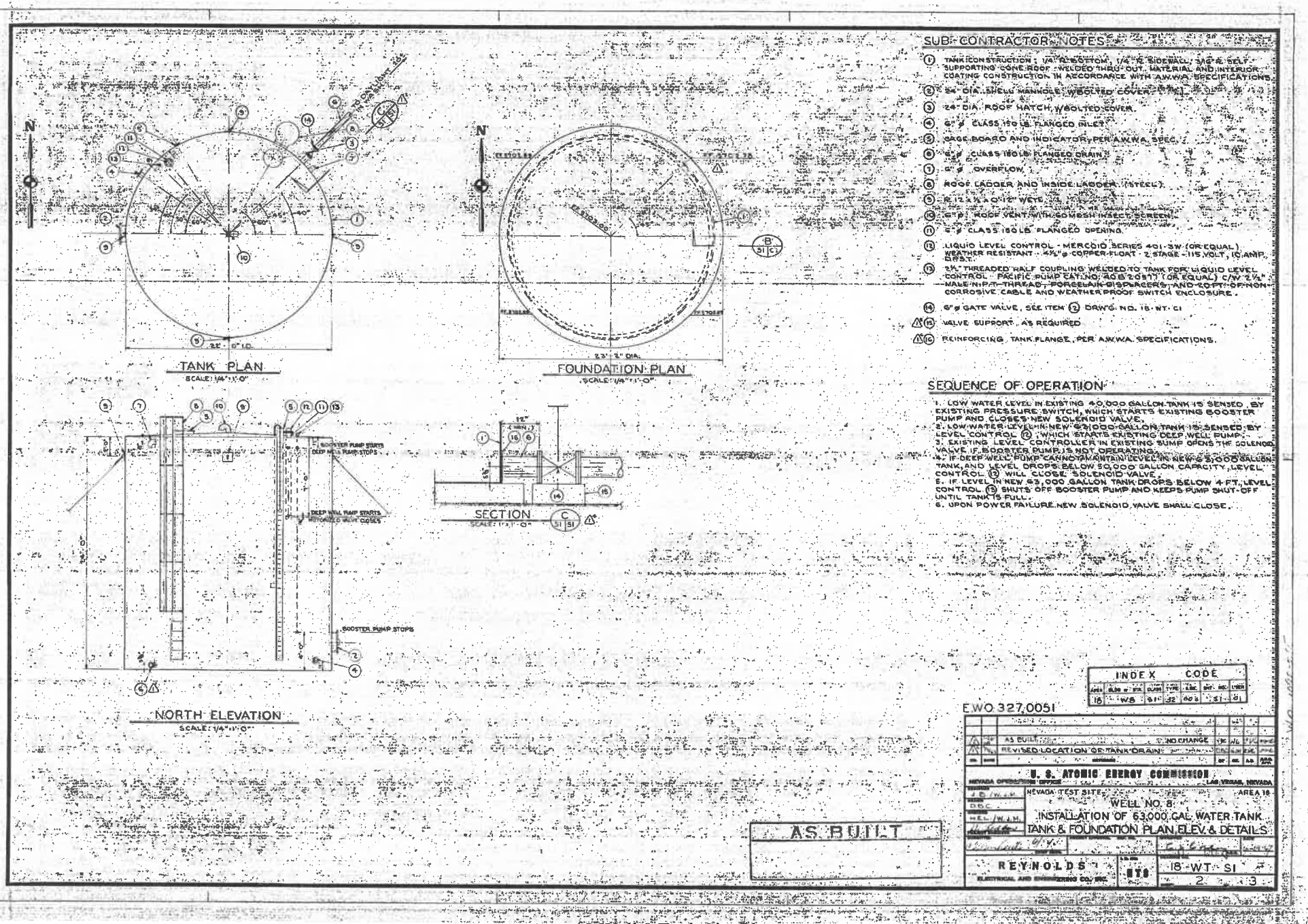


Well 5A Booster Tank Site Plan

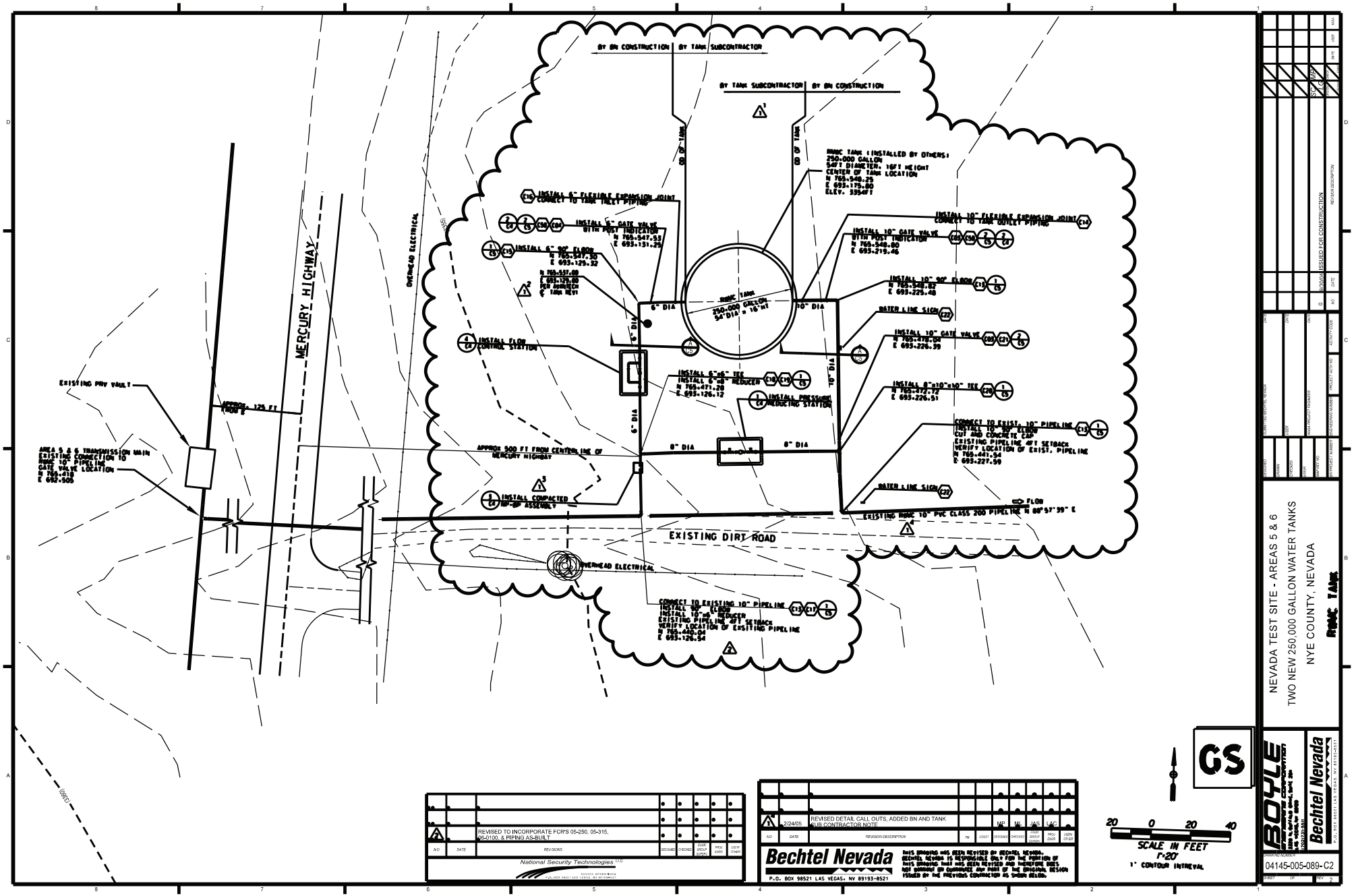
DETAIL 2 M-2
4" OVERFLOW-OVER
4" DRAIN - UNDER
PIPE LINE STA 20+80 APPROX.
4" VENT
6" SCH. 80
FROM WELL NO.8
THRUST BLOCK 4'x 8'x 2' THK.
2" GATE VALVE 300 S 1000 OWG
THRUST BLOCK 4'x 6'x 2' THK.
ADAPTOR - 12" STEEL TO 12" TRANSITE.
12" SCH 80
12" TRANSITE CL-150
TO C.P. DIST. SYSTEM
2"-300# COUPLINGS FOR PRESS. SW.
DETAIL 1 M-2
NO SCALE
6 LEVEL CONTROL
4" FILL TO WATER RESERVOIR
25' OR TO SUIT TO CLEAR TEMP. PUMPS
RELIEF VALVE DISCHARGE TO RESERVOIR
PUMP HOUSE - SEE DWG. 019-082-31
3'-0" CUBE CONCRETE PAD. ENCASE PIPE
WELL HEAD FLANGE
6" 300# W.N.FLGS.
PROVIDE FLANGED PIPE SPOOL
FOR PIPING SEE DETAIL
DEEP WELL PUMP & WELL NO.8
PLAN
DRILL HOLE TO SUIT FOR POWER CABLE.
DRILL HOLE TO SUIT FOR DRAW DOWN PIPING.
DRILL 1 1/8" Ø HOLE FOR 1" Ø BOLT x 5" LG. 4 PLACES, EACH FLG. 15 3/4" B.C.
SECTION C
CUT CASING AND BEVEL FOR WELDING TO 300 lb. WELD NECK FLG.
6 5/8" O.D. PIPE CASING.
8" x 5 1/2" x 1" THK. ST'L PLATES WELD TO CASING AND FLANGE - BOTH SIDES - 4 REQ'D.
DRILL 2" Ø HOLE, EACH PLATE.
18" O.D. x 6 5/8" I.D STEEL PLATE WELD TO 6 5/8" O.D. CASING.
18" O.D. x 13 3/8" I.D. STEEL PLATE WELD TO 13 3/8" O.D. WELL CASING
13 3/8" O.D. WELL CASING - EXISTING.
NOTE: FABRICATE WELL HEAD FLG. AS REQ'D TO SUIT EXISTING CASING
DETAIL 7
SCALE 3/16" = 1"
1200 TO PUMP
TO SUIT
WATER RESERVOIR BERM
PLAN
ELEVATION
DETAIL 6
NO SCALE
FOR REF. DWGS SEE 019-082 M2
ILLUMINATED TARGET
TANK LEVEL GAGE BOARD
4 GUY WIRES, (TYP.)
10,000 GALLON WATER STORAGE TANK
BOT. FLG
TANK
WELD 1" x 1/8" STEEL DRIP LEG TO L - ALL AROUND TANK
1/4" MAX. CLEAR
I.D. FIELD
O.D. FIELD
3" WELDOLET
6" LAYER OF OILED SAND UNDER TANK
DRAIN VALVE, 2"
TANK GR. EL. 5980±
2"x4" GUARD RAILS
VIEW D
AS-BUILT NOTE: ALL NOTES WERE COMPLIED WITH.
AS-BUILT
HOLMES & NARVER, INC.
Engineers - Constructors
2/1/65
INDEX CODE
AREA | BLDG or STA. | CLASS | TYPE | A.&E. | SHT NO. | USER
18 | CP | 51 | 65 | 002 | M3 | 01
AS-BUILT, REVISED DETAIL 2 & VIEW D, ADDED A.B. NOTE.
DELETED DETAIL 2 CHGED. DET 3 TO 2 REV. NEW DET 2 COMPLETELY. REV. VIEW D REV. DET. 1
NO. | DATE | REVISIONS | BY | CK | A.E. | APP.
U. S. ATOMIC ENERGY COMMISSION
NEVADA OPERATIONS OFFICE
LAS VEGAS, NEVADA
NEVADA TEST SITE
PAHUTE MESA
WATER DISTRIBUTION SYSTEM
DETAILS
DESIGNED:
DRAWN: Redmon
CHECKED:
PROJECT ENGINEER
SUBMITTED: HOLMES & NARVER INC.
AGENCY APPROVAL
AEC APPROVAL:
DATE: 2-3-64
HOLMES & NARVER INC.
ENGINEERS - CONSTRUCTORS
SOUTH HIGHLAND DRIVE, LAS VEGAS, NEVADA
I. D. NO. 183425
DRAWING NUMBER 019-082-M3.2
SHEET ___ OF ___
DIETERICH-POST CLEARPRINT



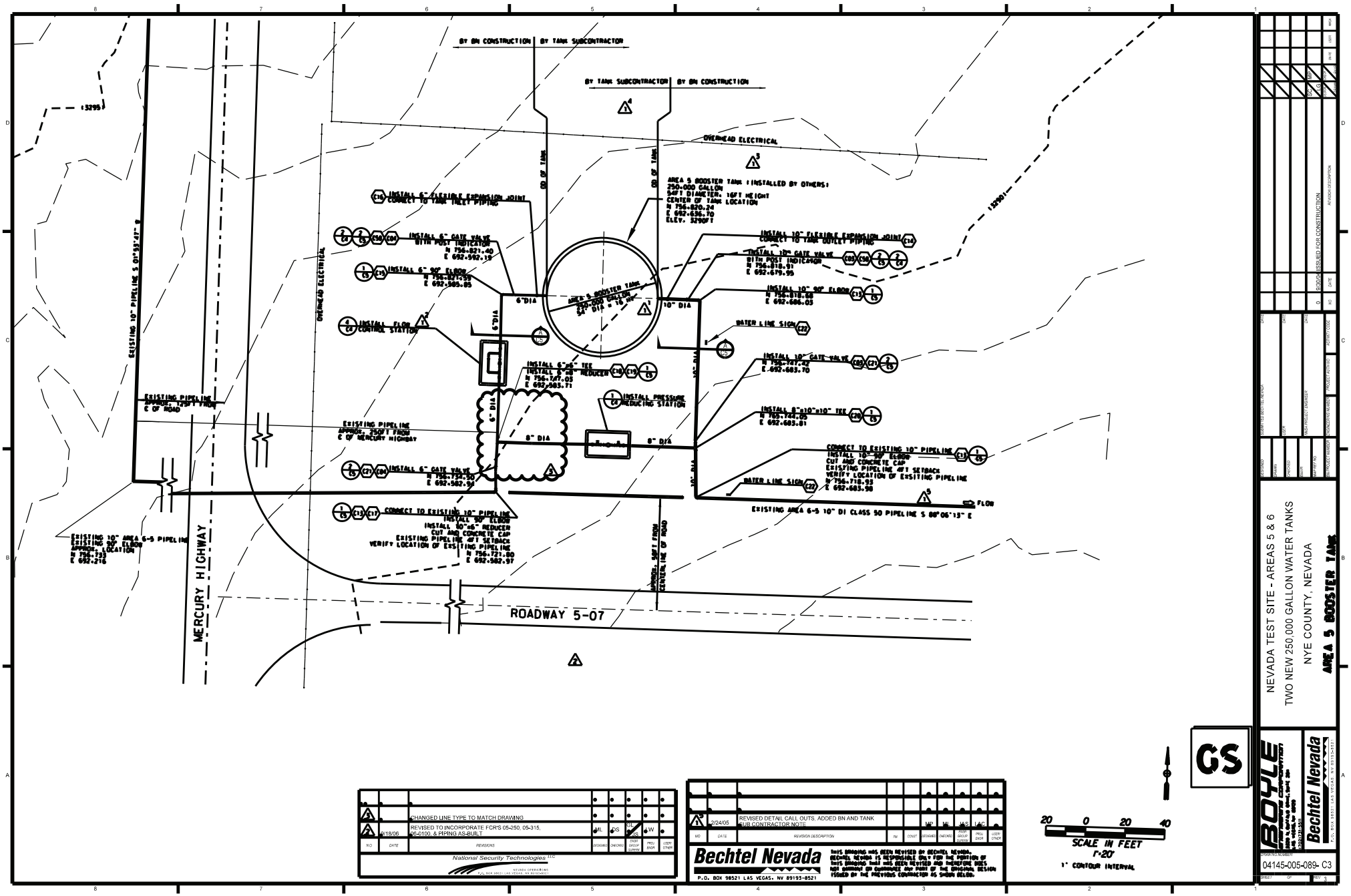
Well J-11 and J-12 Tank Site Plan



Area 18 Well 8 Tank Site Plan

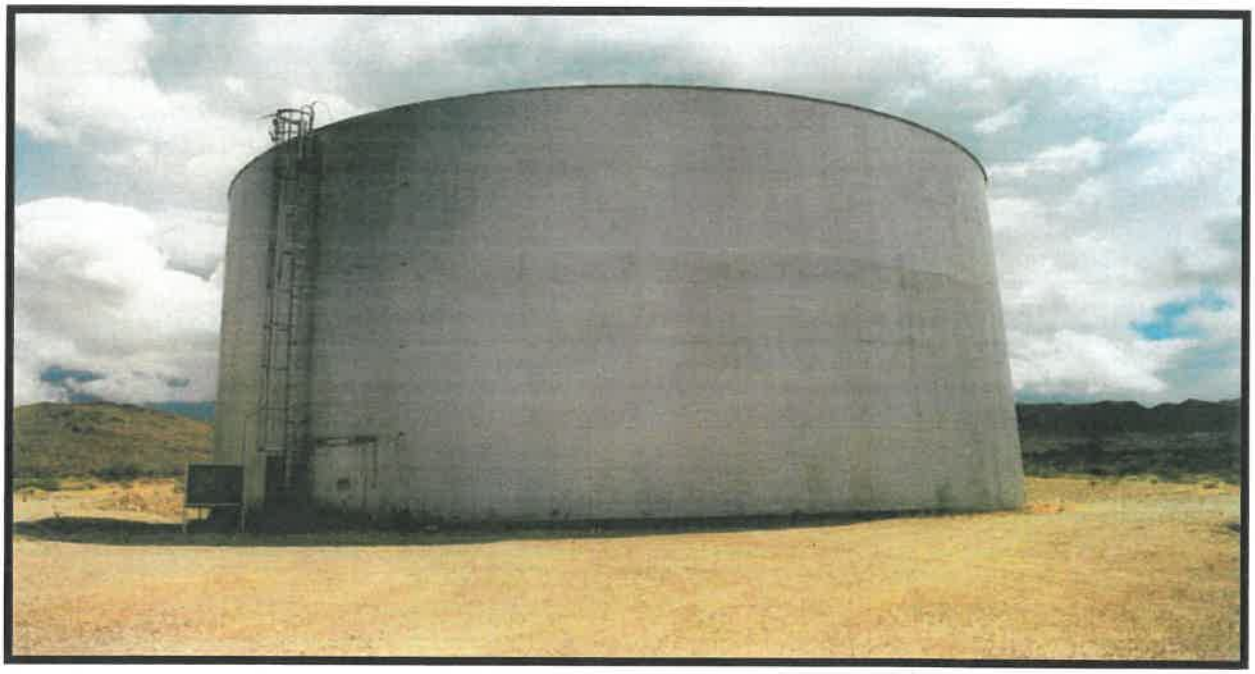


Area 5 North Tank Site Plan

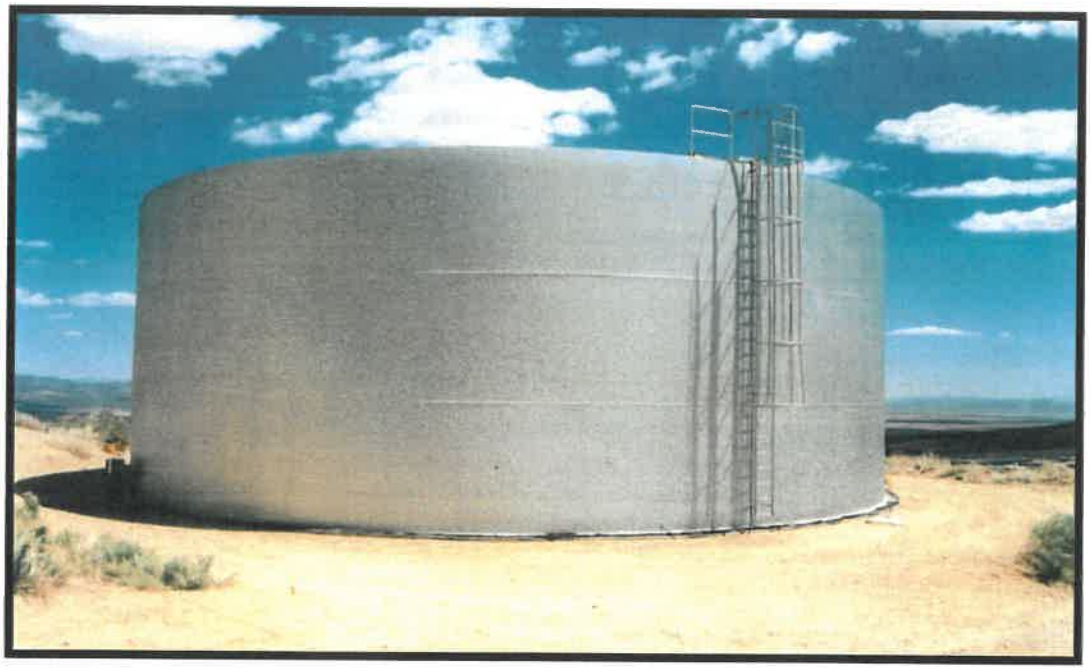


Area 5 South Tank Site Plan

Mercury Water Tank

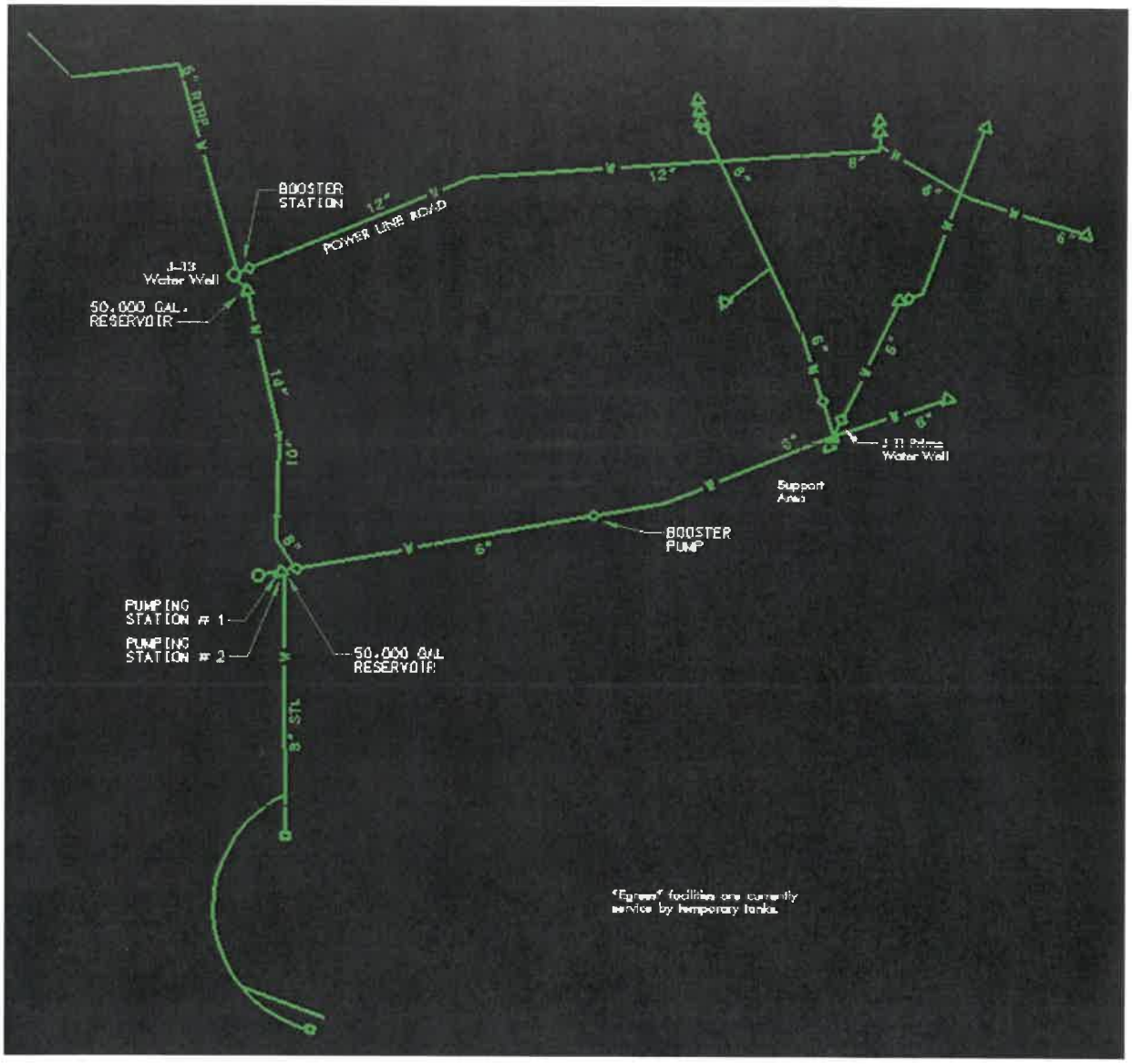


Area 23 Mercury Tank Site Plan

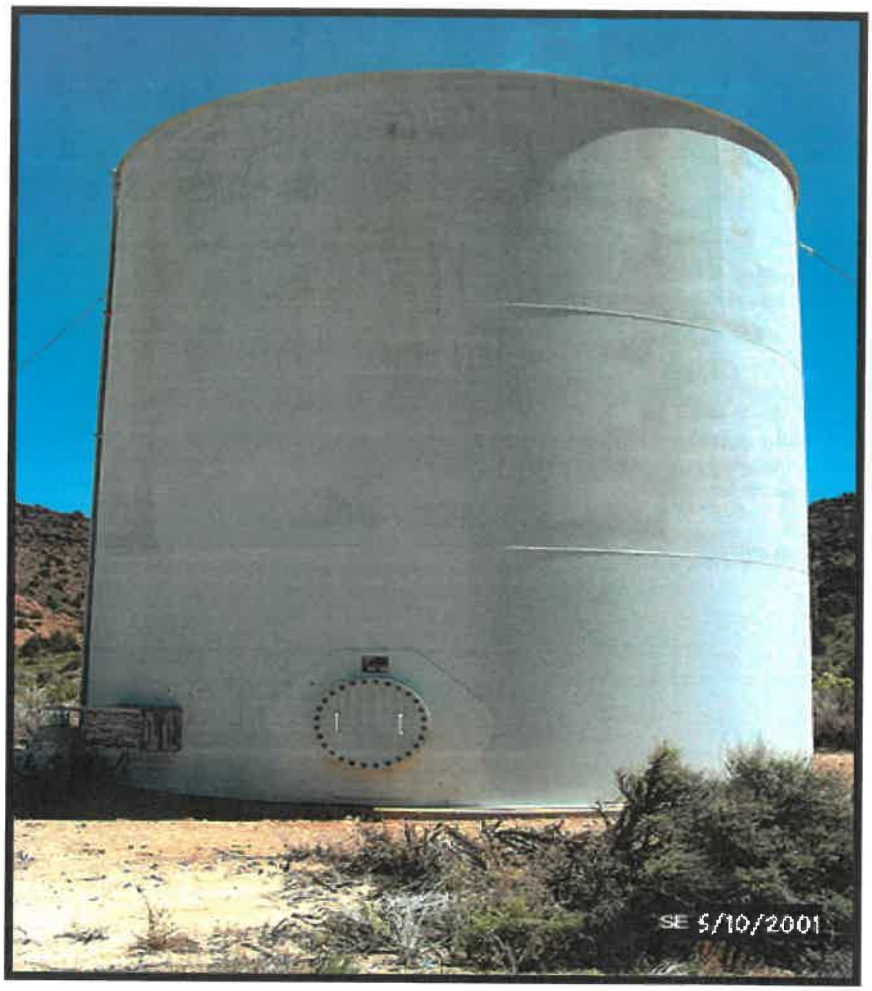


Area 12 Tank, 500,000 Gallons

Area 6 Well C1 North & South Tanks



Area 25 Well J-11 and J-12 Tank Site Plan



Area 18 Well 8 Tank 63,000 Gallons

Area 18 Well 8 Tank Site Plan