

# Addendum No. 1

## Hunter Creek 4.0 MG Water Tank

4900 Ross Drive, Washoe County, NV

PWP Number WA-2008-411

Contract Number: 0809-63

August 29, 2008

The following information is by reference incorporated into the bid document for the above-referenced project. The bid date and time remains the same. Bids shall be opened 2:00 p.m., Wednesday, September 10, 2008.

### Answers to Questions from Bidders:

#### A. Bid Item 14a,,14b

1. Bid Item 14b is an acceptable Tank Alternate for this project. Contract Bidders are expected to select Bid Item 14a, Welded Steel Tank, or 14b, Pre-stress Concrete Tank, but not both. No credit for perceived reduction in maintenance cost or improved service life for Pre-stressed Concrete Tank will be applied.
2. A separate grading plan is not needed for the Alternate Tank Design or Construction. The 6" thick concrete floor slab for the Pre-stressed Concrete Tank will replace the 6" of sand under the Welded Steel Tank. All other improvements remain the same.

#### B. Maximum 50% Subcontractor Requirement.

For the Hunter Creek 4.0 MG Water Tank Project, there are no requirements limiting the amount of work provided by subcontractors. Subcontractors are to be proficient in the work performed and diligent in the execution of the work.

#### C. Time constraints for the project to be completed by June 27, 2008

The project is a high priority item for the TMWA water system. The project needs to be completed for the 2009 summer demands and completed within the 2008-09 Fiscal Year ending June 30, 2008.

1. The contractor will be expected to provide all necessary material and equipment deliveries, and all necessary labor forces and work scheduling to complete the project by June 27, 2008.
2. The contract time requirement includes 20 weather days within the schedule.
3. The Contractor will be required to provide a schedule prior to mobilization indicating completion by June 27, 2008 with 20 weather days.

D. Type 2 AC Mix Design:

Contractor shall submit a Mix Design conforming to Section 200.02.02 Plantmix and Roadmix Aggregate for Type 2, and Section 201.02-III, PG 64-22 or Section 201.02-IV, PG 64-28NV Performance Graded Asphalt Cements, and conforming to the following:

1. The contractor shall submit in writing a mix design based on the Marshall Method, and prepared in accordance with the Asphalt Institute Manual, Series No. 2 (MS-2). This shall include a job-mix formula with single values for:
  - a. The percentage of aggregate passing each specified sieve.
  - b. The optimum bitumen ratio (to the nearest 0.1 pound) in pounds per 100 pounds of dry aggregate.
2. The optimum asphalt cement content shall be determined as the average of the contents yielding maximum unit weight, maximum stability, and 4 percent air voids. The mixture shall be analyzed to prevent harsh or tender mixtures, or mixes with excessive flow. The mix design shall meet the following requirements:
  - a. Marshall stability, 1,800 pounds minimum.
  - b. Voids, total mix, 3-5 percent.
  - c. Marshall flow (0.1 inches), 8-20.
  - d. Minimum voids in Mineral Aggregate, 15 percent.

E. Tank Specifications

There are two acceptable tank construction systems for this project. The Welded Steel Tank, AWWA D100-05, is the project tank, and the Pre-stressed Concrete Tank, AWWA D-110-04, Type I or Type III, is an acceptable alternate. The specifications for the Welded Steel Tank is Section 13411, and the specifications for the Pre-stress Concrete Tank is Section 03314 should the contractor choose that alternate.

F. Alternate Extra Work, Items 19, 20, 21, 22, & 23

Note 5 of the Notes to Bid schedule is to state that TMWA may choose to award on the basis of Items 1 thru 18, or Items 1 thru 23. Items 19 thru 23 are estimated quantities to increase the useable tank size from 4.0 M-Gal to 5.0 M-Gal.

1. The tank increase is proposed to be from 192' diameter to 215' diameter with increases in Tank Base, Foundation Ring Wall, Steel Flooring, Walls, Roof and Columns to accommodate the increase in diameter.
2. All other tank design features such as elevations, ladder, hatches, manways and interior tank piping, will remain the same.
3. Items 19, 21, 22, & 23 are other increases required to accommodate to tank diameter increase.

G. The Electrical Specifications are shown on the Electrical Plans.

H. The Landscape Specifications are shown on the Landscape Plans.

**Addendum to Improvement Plans:**

Improvement Plans

Sheet C0

Washoe County Building Permit, Deferred Items

Item 5. Add: Elephant Foot structural failure shall be part of the structural design.

Item 7 Add: Dust Control Plan shall be provided by Contractor and approved by Washoe County Health Department prior to issuance of Building Permit.

Sheet C7

Add Four 12" Edge Vents to top of tank with 24 mesh stainless steel screen.

Sheet C8

Add 12" Diameter Edge Vent Detail

Sheet D5

Revise Pedestal Detail

Add 6" x 48" Slot in pedestal pad for conduits

Electrical Plans

Sheet E-01

Add note "All Flood-Lights for Emergency Service or Facility Intrusion".

Revise Note 2. "The Lights will only be energized during emergency or intrusion situations".

Note 13 Existing Conduit P-001:

If existing underground 2" conduit P-001 from the facilities shop to outdoor electrical board is not rigid galvanized steel, then contractor to abandon said conduit after removing its wire, then install new conduit run that is underground with 3" Schedule 40 PVC.

Note 14 Existing Conduit running from outdoor electrical board to the De-chlorination shed:

Remove all wire, abandon conduit in place, at both ends where conduit emerges from beneath grade. Cut conduit back at least six (6) inches (field confirm with TMWA), install a cap, and provide stainless steel tag indicating conduit destination.

Note 15 Conduit to be used for project:

(A) Install PVC-Coated RGS for underground installations within 5 feet of foundation, concrete slab penetrations, below pull boxes.

(B) Install Schedule 40 PVC where underground runs will be over 5 feet from buildings or where run under concrete slab.

(C) Install RGS in outdoor locations that are above grade, including wet and damp locations.

Note 16 Wire to be used for project:

At all locations, install THHN/THWN, copper wire that is 600V rated. Jacket colors shall be Black, Red, and Blue for 208V power, Black and Red for 120V power, Yellow for 120V Control, and Blue for 24VDC Control.

Sheet E-02

Revisions to Pull-box PTB-1

Revisions to Circuit P-002 & 003 Wire

Revisions to Signal Circuits S-002 & S-008 Wire

Revisions to Notes 1., 4., 5., & 11.

Sheet E-03

Replace Detail 2 with Drawing E-09

Revisions to Detail 3 Standard & Light

Light Pole to be Spaulding Lighting Round Tapered Aluminum Shaft, Model RTA-30-80-B-TA-GR.

Sheet E-04

Revisions to Detail 8, Tank Hatch Detail (Typ. 2)

Revised Conduit Locations; ES-4, ES-9, & ES-16 Locations.

Coordinate location & mounting of tank equipment with TMWA prior to installation.

Conduit Boxes and Fittings inside tank must be PVC or Stainless Steel.

Revisions to Detail 9, Antenna Installation, East Building

No Roof Penetration

1 5/8" Strut on Fascia

2" Weather Head

2" GRC Mast

Stub into building, grout or caulk

Sheet E-05

Revisions to Detail 12

Demolition Plan

Construction Drawings

Notes 1., 4., & 5.

Add Sheet E-09, Typical Lightpole Base Detail

Landscape Plans

Sheet L 0

Irrigation

Relocation of 2" Irrigation Line

Replace approximately 400 lf of 2" PVC Irrigation line south of the tank grading, from the access road to westerly of the west limits of work.

Existing Irrigation Line to be abandoned and capped.

Irrigation Line Connections

All PVC Cuts are to have cut-burrs removed, edges beveled, and surface sanded

All connections to be connected with IPS P70 Primer and IPS 2711 Heavy Body Gray Glue, or TMWA approved equal.

### **Addendum to Technical Specifications.**

Section 09872, Steel Reservoir Interior Coating and Exterior Painting

Paragraph 2.4, Exterior Paint Material

Second paragraph: The color of the top coat shall be selected by Owner. The approved color for the tank wall is Tnemec 110GN Clover, or equal. The knuckle and roof area color is Tnemec 111GN, Envy, or equal. Final samples shall be submitted for approval by TMWA. Use of a prequalified supplier matching the approved color is acceptable.

Section 13411, Welded Steel Water Storage Tank

Paragraph 1.5, Design Information

Item 1.5.5 Minimum depth above overflow funnel and below roof rafters – 1.0 Feet.

Paragraph 2.1, 2.3, and 2.5

2006 International Building Code, ASCE 7-05

**Attachments:** The plan sheets are set up to print on 11" x 17" paper. This is the minimum size necessary to be readable. They also can be adjusted to print on full size plan sheets. If you don't have a plotter, you can have them printed by a printer. The plan sheets are placed as individual files for download.

Improvement Plans Sheets C0, C7, C8, D5

Electrical Plans E-01, E-02, E-03, E-04, E-05, E-06, E-07, E-08, E-09 (E-01 through E-09)

Technical Specifications, Page 09872-7, Pages 13411-1 & 13411-2

**WELDED STEEL WATER STORAGE TANK**  
**SECTION 13411**

1.0 GENERAL

1.1 Work Included

Furnish all labor, materials, equipment and incidentals necessary to erect and partially coat one new 4.0 million gallon welded steel water storage tank conforming with AWWA D100-05 specifications, including all accessories and appurtenances as shown on the Drawings and as specified herein.

1.2 Referenced Specifications

All design, work and material furnished shall comply with the latest revisions of the following standards, except as herein modified:

1.2.1 ASTM - American Society for Testing and Materials

1.2.2 "Standard Specifications for Public Works Construction" (Orange Book), 2004 Edition, or latest Edition

1.2.3 AWWA - American Water Works Association, "AWWA Standard for Welded Carbon Steel Tanks for Water Storage" (D100-05).

1.2.4 Truckee Meadows Water Authority Construction & Design Standards.

1.3 Submittals

The Contractor shall submit complete design calculations and shop drawings for review by the Engineer prior to erection and/or construction of any part of the tank. The design calculations and shop drawings shall be stamped and signed by a Registered Professional Civil or Structural Engineer licensed in the State of Nevada. Design calculations and shop drawings shall be submitted in accordance with Section 01300 "Submittal Procedure" of the Technical Specifications. The Engineer's approval of shop drawings or schedules shall apply in a general sense only and will not relieve the Contractor from responsibility for deviations from the Contract Drawings or Specifications, unless such deviation is specifically approved in writing by the Engineer. Responsibility for agreement of drawings with job dimensions and conditions, and for correction of errors in shop drawings with schedules, shall rest with the Contractor.

1.4 Final Shop Drawings: Upon final approval of the tank shop drawings by the Engineer, the Contractor shall furnish to the Owner one set of mylar originals of the shop drawings with the final corrections and any revisions incorporated therein.

1.5 Design Information: The Water Tank Design shall incorporate the features as follows:

1.5.1	Inside Tank Diameter	192.0	Feet
1.5.2	Normal Maximum Water Depth near Wall	19.0	Feet
1.5.3	Overflow Level	20.0	Feet

- 1.5.4 Maximum Overflow Water Depth 21.0 Feet
- 1.5.5 ~~Free-Board Max.~~ Minimum Overflow Depth 1.0 Feet  
above overflow funnel and below roof rafters.  
(Addendum No. 1)

2.0 GENERAL DESIGN REQUIREMENTS

- 2.1 Structure Classification and Importance Factors: Per Table 1604.5 of the ~~2003~~ 2006 International Building Code: (Addendum No. 1)
  - 2.1.1 This structure is an essential facility (Category IV structure).
  - 2.1.2  $I_E = 1.5$ ;  $I_W = 1.15$ .
- 2.2 Environment: The lowest one day mean ambient temperature for purpose of design shall be 0° F. No additional thickness for corrosion will be required and no cathodic protection will be required.
- 2.3 Seismic Design: Determination of seismic design forces shall be per Section 1622 of the ~~2003~~ 2006 International Building Code (IBC) and Section 9.14 of ASCE ~~7-02~~ (7-05). (Addendum No. 1)
  - 2.3.1 Use of the design and detailing requirements of AWWA D100-96 is permitted as modified by the provisions of IBC 1622.1 and Section 9.14.7.3.7.1. of ASCE ~~7-02~~ 7-05. (Addendum No. 1)
  - 2.3.2 Seismic Use Group: III; Seismic Design Category: D; Function F-III.
  - 2.3.3 The following parameters shall be used for seismic design:
    - i. Site Class: C.
    - ii.  $S_s = 1.50g$ ;  $S_1 = 0.60g$ .
  - 2.3.4 The structure shall be designed for vertical seismic acceleration per Section 13 of AWWA D100-05 and Section 9.14.7.3.7.1b of ASCE ~~7-02~~ (7-05).  
**Addendum No. 1**
- 2.4 Subsurface Conditions: Subsurface conditions, design bearing capacities, and other pertinent data are discussed in Section 02010 of the Technical Specifications.
- 2.5 Wind Loading: The tank shall be designed for wind loading in accordance with AWWA D100-05, Section 1609 of the ~~2003~~ 2006 IBC, and Section 6 of ASCE ~~7-02~~ (7-05). The highest calculated wind pressure shall be used for design. (Addendum No. 1)
  - 2.5.1 Exposure Category: C
  - 2.5.2 Basic Wind Speed: 105 mph (3 second gust for use in IBC and ASCE 7 equations).
- 2.6 Snow Load: The reservoir shall be designed for a 30-pound per square foot (psf) snow load on the horizontal projection of the reservoir's roof.
- 2.7 Roof Geometry: Reservoir shall have a 3-foot radius knuckle with a roof pitch of 3/4 inch in 12 inches.
- 2.8 Tank Materials: Materials shall be in accordance with Section 2 of AWWA D100-05 or Section 14 of same reference.
- 2.9 Shell Thickness: Shell thickness shall be in accordance with Section 3 of AWWA D100-05 or Section 14 of same reference.

- 2.10 Floor Welds: Floor may be either butt welded or lap welded in accordance with AWWA D100-05, however, floor shall bear evenly on the tank base.

3.0 WATER STORAGE RESERVOIR ACCESSORIES

The Contractor shall furnish the following accessories for the reservoir in accordance with Section 7 of AWWA D100.

- 3.1 Outside ladder: The ladder shall have side rails, not less than 2 by 3/8 inches, with a spacing between side rails of 16 inches, and rungs not less than 3/4 inch round or square, spaced 12 inches on centers. The ladder shall be equipped with a safety cage and intermediate landing platform, with guard rails, as shown on the Drawings. A roof guard rail shall be installed as shown on the Drawings.
- 3.2 Manways: Two (2) circular shell manways with a minimum diameter of 36 inches, opening to the inside. The manway opening shall be adequately reinforced to account for all possible loading conditions. Manway locations shall be as shown on the improvement plans.
- 3.3 Roof Hatches: Two roof hatches with water-tight gaskets are required. One shall be located near the outside ladder and shall have a minimum opening dimension of 36 inches with 4-inch minimum neck height. A second shall be located at the opposite side of the tank as shown on the drawings. It shall be 24-inches in diameter with 4-inch minimum neck height.

The hatches shall be provided with suitable hinges and hasps to permit locking. The hatches shall have a curb at least 4 inches high, and the cover shall overlap it at least 2 inches.

- 3.4 Inlet/Outlet and Tank Drain Pipes: Inlet/outlet and tank drain shall be constructed out of shop fabricated, fusion-bonded epoxy coated Standard Weight steel pipe; diameter shall be as shown on the Drawings. The inlet/outlet and drain shall be equipped with a 6-inch high removable silt stop as shown on the Plans. Steel pipe shall be lined and coated as stated in Section 02540 of the Technical Specifications.
- 3.5 Overflow: The overflow shall be constructed out of shop fabricated, fusion-bonded epoxy coated Standard Weight steel pipe, diameter as shown on the Drawings. It shall be stubbed into the tank, welded to the overflow funnel, and welded to the tank with reinforcing plate. The overflow piping shall run down the outside of the tank and shall be connected to the tank as required as determined by manufacturer.
- 3.6 Inside Ladder: No inside ladder is required.
- 3.7 Roof Vents: Size, number, and location of roof vents shall be determined by manufacturer.
- 3.7.1 Tank Roof Center Vent shall be 36" AST-Vent, 84" exterior diameter, built by Advance Tank Construction, Wellington, CO 80549. Vent body, head and pallets are aluminum. Bolts & nuts are stainless steel.
- 3.7.2 When the protective screens become frosted over, or blocked by insects, a pressure or vacuum pallet lifts to relieve the excess forces. When normal air flow is restored, the pallet returns to its original position.

- 3.7.3 Vents shall be designed to pass air at a maximum fill rate of 4200 cfm, and maximum draining rate of 8900 cfm, without developing excessive pressure within the tank. One of these vents shall be at the center of the tank as detailed on the plans. Air velocity through the vents shall not exceed 10 fps.
- 3.7.4 Inaccessible areas of the vents shall be coated as specified in Section 09872.
- 3.7.5 Screens used for venting air must be constructed of a stainless steel that is not susceptible to damage by corrosion and must not be less than 22, nor more than 24 mesh per inch.
- 3.7.6 Vents shall have a locking mechanism to prevent access to the tank.
- 3.8 Foundation: Concrete ring foundation shall be designed as shown on the Plans and in accordance with Sections 02010, 02290, 02311, 02315, 03051, 03100, 03200, 03300 and 03345 of the Technical Specifications. All requirements of ACI 301 are applicable to all concrete work.
- 3.9 Liquid Level Indicator Sleeve Pipe: Liquid level indicator sleeve pipe shall be constructed and installed as detailed on the plans. This facility shall be coated as specified in Section 09872.
- 3.10 Cathodic Monitoring Station: Cathodic monitoring and test station shall be furnished and installed, as shown on the plans.
- 4.0 ERECTION, INSPECTION, AND WELD TESTS
- 4.1 General: The reservoir shall be erected in accordance with Section 10 of AWWA D100. All inspection and tests of welding shall be completed before application of paint and protective coatings. All welders shall be qualified by ASME requirement in all positions. Inspection shall be in strict accordance with Section 11 of AWWA D100.
- 4.1.1 Only welders certified per TMWA's welding procedures, Section 9.4.3 TMWA Standards, shall perform any welding on the project. Only proper welding equipment in good working order shall be used.
- 4.1.2 All welders shall have successfully completed a qualification test performed annually according to TMWA's welding procedures for each specific welding procedure. Additionally, the welders shall have proof of qualifications and shall be required to present such proof when requested.
- 4.2 Weld Inspection: Inspection of welded tank shell joints shall be by radiographic testing in accordance with AWWA D100. The Contractor shall provide and pay for the radiographic testing. Testing shall be accomplished by a "third party" testing firm or laboratory acceptable to the Engineer. All radiographic test results shall become the property of the Owner after acceptance of the structure.
- All radiographic testing shall be accomplished in the presence of the Company Representative. Any testing accomplished without the Company Representative being present shall be redone at the Contractor's expense. The X rays and certified reports of the X-ray tests with detailed interpretation shall be forwarded to the Company Representative. Any welds found to be defective, shall be chipped out, re-welded, X-

rayed again, and retested in accordance with applicable provision of AWWA Standards D100, all at the Contractor's expense.

If preheating of the base metal is required per Section 10.3 of AWWA D100, then it shall be accomplished by using an external heat source acceptable to the Engineer. The heat generated from the welding process shall not be accepted as adequate preheating.

Mill Test reports of the tank shell material shall be furnished. All welds attaching shell nozzles, manholes, vents, etc. shall be examined for cracks by either magnetic particle or the dye-penetrant methods. The tank shell to bottom weld shall be tested by the penetrating oil method and the completed joint shall be visually inspected.

- 4.3 Procedure Submittal: Bolt torques and welding procedures shall be submitted as part of the design package. These procedures shall be complied with during the erection of the tank.
- 4.4 Appendix C Design: If Appendix C design is used, all specified additional inspections, welding procedure qualification, and testing shall be provided by the Contractor at the Contractor's expense.
- 4.5 Hydrostatic Testing: The tank shall be hydrostatically tested per AWWA D100 (latest edition) specifications by the Contractor. Water for the test shall be supplied by the Owner at no cost to the Tank Contractor. Test water shall be disposed of by the Owner at not cost to the Tank Contractor.
- 4.6 Disinfection: The Water Tank must be disinfected before being put into service for the first time and after being entered for cleaning, repair, or painting. The disinfection must be conducted in accordance with AWWA C652. The disposal of any heavily chlorinated water that results from the process of disinfection must be coordinated with the Division of Environmental Protection. Before the structure is placed into operation after disinfection, two (2) samples of water in the structure, taken at least 24 hours apart, must indicate that any concentration of coliform bacteria in the structure meets primary standards.
- 4.7 Painting and Protection Coatings: The interior and exterior of the tank will be coated. Inaccessible surface areas within the reservoir, associated piping, and appurtenances shall be coated and painted as specified in Section 09872 of the Technical Specifications, "Steel Reservoir Interior Coating and Exterior Painting." The inlet/outlet pipe and tank drain pipe shall be lined and coated as specified in AWWA D102-78, Section 3.2.
- 4.8 Tank Foundation: The teservoir foundation shall be prepared and constructed as specified in Section 02290 of the Technical Specifications, "Tank Foundation Preparation."

END OF SECTION

**STEEL RESERVOIR INTERIOR COATING AND EXTERIOR PAINTING**  
**SECTION 09872**

1.0 GENERAL

1.1 Work Included

- 1.1.1 Furnish all labor, materials, equipment and incidentals necessary for installing interior coating systems as specified herein.
- 1.1.2 Work to be performed includes application of protective coatings to interior surfaces of the tank(s).

1.2 Reference Specifications and Standards

All work and material furnished shall comply with the latest revisions of the following standards, except as herein modified:

- 1.2.1 ASTM – American Society for Testing and Materials
- 1.2.2 NACE – National Association of Corrosion Engineers
- 1.2.3 SSPC – Steel Structures Painting Council
- 1.2.4 AWWA – American Water Works Association
- 1.2.5 Manufacturer's application guidelines for the specific coating system selected.
- 1.2.6 Truckee Meadows Water Authority Construction & Design Standards

1.3 Contractor

The Contractor shall be a licensed Painting and Decorating Contractor in the State of Nevada.

1.4 Pre-Coating Conference

A Pre-Coating Conference shall be scheduled by the Contractor prior to the start of blasting and coating operations. The purpose of this conference is to establish a working understanding between the parties and to discuss schedule, methods, inspection, etc.

1.5 Quality Assurance

- 1.5.1 General: Quality assurance procedures and practices shall be utilized to monitor all phases of surface preparation, application, and inspection throughout the duration of the project. Procedures or practices not specifically defined herein may be utilized, provided they meet recognized and acceptable professional standards and are approved by the Project Representative.

- 1.5.2 Materials: All materials furnished by the Contractor shall be subject to inspection by the Project Representative. All coating materials, solvents, thinners, etc., to be used on the project shall be submitted to the Engineer for approval. The Contractor shall be held strictly to the true intent of the Specifications in regard to quality of materials, workmanship, and diligent execution of the Contract.
- 1.5.3 Work performed in Absence of Inspection: Work performed in the absence of prescribed inspection may be required to be removed and replaced under the proper inspection, and the entire cost of removal and replacement, including the cost of all TMWA-furnished materials thus removed, shall be borne by the Contractor, regardless of whether the work removed is found to be defective or not. Work covered up without acceptance by the Project Representative, shall, upon order of the Project Representative, be uncovered to the extent required, and the Contractor shall similarly bear the entire cost of performing all the work and furnishing all the materials necessary for the removal of the covering and its subsequent replacement as directed and approved by the Project Representative.
- 1.5.4 Testing: The Project Representative will make such tests as he deems necessary to assure the work is being accomplished in accordance with the requirements of the Contract. In the event such tests reveal noncompliance with the requirements of the Contract, the Contractor shall bear the cost of such corrective measures deemed necessary by the Project Representative, as well as the cost of subsequent retesting. It is understood and agreed the making of tests shall not constitute an acceptance of any portion of the work, nor relieve the Contractor from compliance with the terms of the Contract.
- 1.5.5 Surface Preparation: Surface preparation will be based upon comparison with: "Pictorial Surface Preparation Standards for Painting Steel Surfaces: SSPC-Vis 1 ASTM Designation D220, NACE Standard TM-01-70 and as described below. Anchor profile for prepared surfaces shall be measured by using a nondestructive instrument such as a Keane-Tater Surface Profile Comparator or Testex Press-O-Film System. The Contractor shall provide said instrument for measuring anchor profile.
- 1.5.6 Application: No coating shall be applied: When the surrounding air temperature or the temperature of the surface to be coated is below the minimum temperature allowed by the manufacturer's recommendations for paint application; to wet or damp surfaces or in rain, snow, fog, or mist; when the temperature is less than 5 degrees F above the dew point; or when it is expected the air temperature will drop below the minimum temperature allowed by the manufacturer's recommendations for paint application or less than 5 degrees F above the dew point within eight hours after application of coating. Dew point shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychrometric Tables or equivalent.

If above conditions are prevalent, coating application shall be delayed or postponed until conditions are favorable. The day's coating application shall be

completed in time to permit the film sufficient drying time prior to damage by atmospheric conditions.

1.5.7 Thickness and Holiday Checking: Thickness of coatings and paint will be checked with a nondestructive, magnetic-type thickness gauge. An instrument such as a Tooke Gage will be used if a destructive tester is deemed necessary. Coating integrity of all interior coated surfaces shall be tested with an approved inspection device. Holiday detectors shall not exceed the voltage recommended by the manufacturer of the coating system. For thickness between 10 and 20 mils a non-sudsing type wetting agent shall be added to the water prior to wetting the detector sponge. No pinholes or other irregularities will be permitted in the final coating.

1.5.8 Inspection Devices: The Contractor shall furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness of coatings and paints. The Contractor shall also furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of thickness gauges. Dry film thickness gauges and holiday detectors shall be available at all times until final acceptance of application. Inspection devices shall be operated by, or in the presence of the Project Representative with location and frequency basis determined by the Project Representative.

Acceptable devices for ferrous metal surfaces include, but are not limited to K-D "Bird-Dog" and Tinker-Razor M-1 Holiday Detectors for coatings to 20 mils dry film thickness. Inspection devices shall be operated in accordance with the manufacturer's instructions.

1.5.9 Warranty Inspection: Warranty inspection shall be conducted during the eleventh month following completion of all coating and painting work. All personnel present at the Pre-Coating Conference shall be present at this inspection. All defective work shall be repaired in strict accordance with this specification and to the satisfaction of the Project Representative. The meeting and any defect repairs which may follow shall be considered non-compensable and incidental to the Work.

1.5.9.1 Notification: TMWA will establish the date for the inspection at least 30 days in advance. If an inspection date has not been established within twelve months after the coating and painting work was completed, the first anniversary inspection shall be considered waived and the Contractor's warranty statement shall be voided. TMWA will drain the reservoir and Contractor shall provide, at his own expense, suitable lighting and ventilation for the inspection.

1.5.9.2 Inspection: The entire interior coating system will be visually inspected by the Project Representative. All defective coating as well as damaged or rusting spots of the tank shall be satisfactorily repaired by and at the sole expense of the Contractor and in a timely manner. All repaired areas shall then be electrically tested as specified herein.

- 1.5.9.3 Inspection Report: The Project Representative will prepare and deliver to the Contractor an inspection report covering the first anniversary inspection, setting forth the number and type of failures observed, the percentage of the surface area where failure has occurred and the names of the persons making the inspection.
- 1.5.9.4 Schedule: Upon completion of inspection and receipt of Inspection Report as noted herein, TMWA will establish a date for the Contractor to proceed with the remedial work. Any delay on the part of the Contractor to meet the schedule established by TMWA shall constitute breach of this Contract and TMWA may proceed to have defects remedied as outlined in the General Terms and Conditions for this project.
- 1.5.9.5 Remedial Work: Any location where coating or paint has peeled, bubbled, or cracked and any location where rusting is evident shall be considered to be a failure of the system. The Contractor shall make repairs at all points where failures are observed by removing the deteriorated coating or paint, cleaning of the surface and recoating or repainting with the same system. If the area of failure exceeds 25 percent of the total coated or painted surface, TMWA may require that the entire coating or paint system be removed and reapplied in accordance with the original specification.
- 1.5.9.6 Costs: All costs for Contractor's inspection and all costs for defect repair shall be borne by the Contractor and in figuring his bid, the Contractor shall include an appropriate amount for testing and repair as no additional allowance will be paid by TMWA for said inspection and repair.

## 1.6 Safety and Health Requirements

- 1.6.1 General: Ventilation, electrical grounding, and care in handling coatings, paints, solvents, and equipment are important safety precautions during coating and painting projects. Contractor shall comply with safety requirements set forth by regulatory agencies applicable to the construction industry and manufacturer's printed instructions and appropriate technical bulletins and manuals. The Contractor shall provide and require the use of personal protective life-saving equipment for persons working in or about the project site.
- 1.6.2 Access Facilities and Ventilation: All ladders, scaffolding, and rigging shall be designed for their intended uses. Ladders and scaffolding shall be erected where requested by the Project Representative to facilitate inspection and be removed by the Contractor to locations requested by the Project Representative. Where ventilation is used to control hazardous exposure, all equipment shall be explosion-proof. Ventilation shall reduce the concentration of air contaminant to the degree a hazard does not exist. Air circulation and exhausting of solvent vapors shall be continued until coatings have fully cured. Forced air ventilation during blast cleaning and coating application operations is mandatory.

- 1.6.3 Head and Face Protection and Respiratory Devices: Equipment shall include protective helmets, which shall be worn by all persons while in the vicinity of the work.

During abrasive blasting operations, nozzlemen shall wear air-supplied helmets and all other persons who are exposed to blasting dust shall wear filter-type respirators and safety goggles. The Contractor shall provide one set of filter-type respirators and safety goggles to be used by TMWA personnel. The Contractor shall provide one air-supplied mask to be used by TMWA personnel.

All of the above-mentioned devices shall be kept in good working order.

- 1.6.4 Grounding: Blasting, spray, and air hoses shall be grounded to prevent accumulation of charges of static electricity.

- 1.6.5 Illumination: Spark-proof artificial lighting shall be provided for all work in confined spaces. Light bulbs shall be guarded to prevent breakage. Lighting fixtures and flexible cords shall comply with the requirements of NFPA 70 "National Electric Code" for the atmosphere in which they will be used.

Whenever required by the Project Representative, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the Project Representative.

- 1.6.6 Toxicity/Explosivity: The solvents used with specified protective coatings may produce vapors that are toxic and/or explosive at low concentrations. The maximum concentration of vapor shall be kept below the lower explosion limit (LEL) maximum safe concentration for eight-hour exposure.

- 1.6.7 Protective Clothing: Coating and paint materials may be irritating to the skin and eyes. When handling and mixing paints, workmen shall wear protective clothing required by OSHA and/or recommended by the paint manufacturer.

- 1.6.8 Fire: During mixing and application of paints, all flames, welding, and smoking shall be prohibited in the vicinity. Appropriate type fire extinguishers shall be kept nearby.

- 1.6.9 Sound Levels: Whenever the occupational noise exposure exceeds the maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protective devices for all persons exposed to the noise, including TMWA personnel.

## 2.0 MATERIALS

### 2.1 General

Materials specified in this section are those which have been evaluated for the specific service. Products of Carboline Company, Tnemec Company, Inc., and Sherwin Williams Company, Inc. are pre-qualified by TMWA as acceptable and equal. Standard products of manufacturers other than those specified will be accepted when it is proved to the satisfaction of the Project Representative that they are equal in composition, durability, usefulness, and convenience for the purpose intended. Substitutions will be considered provided the following minimum conditions are met:

- 2.1.1 The proposed coating or paint system shall have a dry film thickness equal to or greater than that of the specified system.
- 2.1.2 The proposed coating or paint system shall employ an equal or greater number of separate coats.
- 2.1.3 The proposed coating or paint system shall employ coatings or paints of the same generic type.
- 2.1.4 All requests for substitution shall carry full descriptive literature and directions for applications, along with complete information on generic type, nonvolatile content by volume and a list of 10 similar projects, all at least three years old, where the coatings or paints have been applied to similar exposure.
- 2.1.5 If the above-mentioned data appears to be in order, the Project Representative may require that the Contractor provide certified laboratory data sheets showing the results of complete spectrographic and durability tests performed on the proposed substitute. Tests shall be performed by an independent testing laboratory satisfactory to the Project Representative and all costs incurred in the testing program shall be borne by the Contractor. In any case, the Project Representative shall be sole and final judge of the acceptability of any proposed substitution.

## 2.2 Delivery and Storage

- 2.2.1 All materials shall be brought to the jobsite in the original sealed containers. They shall not be opened or used until the Project Representative has physically inspected the contents and obtained necessary data from information printed on containers or labels. Materials exceeding storage life recommended by the manufacturer shall be rejected.
- 2.2.2 Flammability, toxicity, allergenic properties, and any other characteristic requiring field precautions shall be identified and specific safety practices shall be stipulated. Material Safety Data Sheets (MSDS) shall be present at the jobsite at all times for all materials stored or used on site.
- 2.2.3 All coating, paint, and disinfection materials shall be stored in enclosed structures to protect them from weather and excessive heat or cold. Flammable coatings and paints must be stored to conform with city, county, state, and federal safety codes for flammable coating and paint materials. At all times coatings and paints shall be protected from freezing.
- 2.2.4 Contractor shall use products of same manufacturer for all coats.

## 2.3 Interior Coating Materials

Interior coating materials shall conform to the requirements of local and state air pollution regulatory agencies, and comply with the requirements of NSF61. Products containing perchloroethylene or trichloroethylene will not be permitted.

The interior of the tank shall be coated with epoxy coating. Epoxy coatings shall meet the requirements of AWWA Standard D102-06, Inside Paint System No. 1. TMWA has prequalified the following products as acceptable and equal:

- 2.3.1 Primer, Tnemec series N140 Pota Pox Polyamidoamine Epoxy (beige primer); Topcoat series N140 Pota Pox Polyamidoamine Epoxy (color white).
- 2.3.2 Carboline Carbogard 891AS as primer (tint primer) and Topcoat (color white).
- 2.3.3 Primer, Sherwin Williams B62,W940 (tint primer); Topcoat also B62-W940 (color white).
- 2.3.4 Primer, ICI/Devoe Coatings Bar-Rust 233H NSF certified epoxy, buff (233H1642); Topcoat, white (233H3501).

#### 2.4 Exterior Paint Materials

Exterior paint materials shall consist of an epoxy prime coat and a polyurethane topcoat, along with a clear coat for graffiti protection (finish coat). All paint systems shall conform to the requirements of local and state air pollution regulatory agencies.

The color of the top coat shall be selected by Owner. The approved color for the tank wall is Tnemec 110GN Clover, or equal. The knuckle and roof area is ~~to be slightly darker shade of the same color~~ **(Tnemec 111GN, Envy, or equal)**. Final samples shall be submitted for approval by TMWA. Use of a prequalified supplier matching the approved color is acceptable.

The Owner has prequalified the following products as acceptable and equal:

- 2.4.1 Tnemec series 161 Polyamide Epoxy (primer); Top Coat Tnemec series 175; Finish Coat Endura-Shield Clear series 76-763 Aliphatic Acrylic Polyurethane (tint).
- 2.4.2 Carboline Carbogard 888 (primer) and Carbothane 133HB (top coat); Finish Coat 133HB (clear).
- 2.4.3 Sherwin Williams B67A5 (primer); Topcoat Corothane II B65-200; Finish Coat Corothane II B65-200 (clear).

The exterior surface is to be painted with two different colors approved by the Owner. One color shall be for all surfaces, including appurtenances, below the tank knuckle. A second color shall be for the roof surface and the knuckle surface, including all appurtenances above the knuckle.

#### 2.5 Contractors Selected System

All of the coating systems listed above are acceptable to TMWA. However, the prime coat, intermediate coat (if any), and the top coat for the interior or exterior system shall consist of paint from the same manufacturer. The use of one manufacturer's product for

one coat and another manufacturer's product as another coat in the same interior or exterior paint system will not be allowed.

"Paint out" samples shall be supplied to and approved by the Project Representative prior to ordering any exterior primer or finish if requested by TMWA. All primers and top coats shall bear the same batch numbers. Batch numbers shall not be mixed.

### 3.0 EXECUTION

#### 3.1 General

- 3.1.1 All surface preparation, coating, and paint application shall conform to applicable standards of the Steel Structures Painting Council and the manufacturer's printed instructions. Material applied prior to approval of the surface by the Project Representative shall be removed and reapplied to the satisfaction of the Project Representative at the expense of the Contractor.
- 3.1.2 All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice. Continuity of personnel shall be maintained and transfers of key personnel shall be coordinated with the Project Representative.
- 3.1.3 The Contractor shall provide a supervisor to be at the work site during cleaning and application operations. The supervisor shall have the authority to sign change orders, coordinate work, and make other decisions pertaining to the fulfillment of their contract.
- 3.1.4 Contractor shall provide adequate sanitary facilities for all Contractor personnel. No existing facilities will be available to the Contractor.
- 3.1.5 Dust, dirt, oil, grease, or any foreign matter which will affect the adhesion or durability of the finish shall be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.
- 3.1.6 The Contractor's 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. Contractor's equipment shall be subject to approval of the Project Representative.
- 3.1.7 Application of the first coat shall follow immediately after surface preparation and cleaning within an eight-hour working day. Any cleaned areas not receiving first coat within an eight-hour period shall be recleaned prior to application of first coat.

#### 3.2 Surface Preparation, General

- 3.2.1 Specifications: The latest revision of the following surface preparation specifications of the Steel Structures Painting Council shall form a part of this

specification. (Note: An element of surface area is defined as any given square inch of surface.)

- 3.2.1.1 Solvent Cleaning (SSPC-SP1) – 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.
- 3.2.1.2 Hand Tool Cleaning (SSPC-SP2) – Removal of loose rust, loose mill scale, and other detrimental foreign matter present to degree specified by hand chipping, scraping, sanding, and wire brushing.
- 3.2.1.3 Power Tool Cleaning (SSPC-SP3) – Removal of loose rust, loose mill scale, and other detrimental foreign matter present to degree specified by power wire brushing, power impact tools, or power sanders.
- 3.2.1.4 Commercial Blast Cleaning (SSPC-SP6 – NACE-3) – Blast cleaning until at least two-thirds of each element of surface area is free of all visible residue.
- 3.2.1.5 Brush-off Blast Cleaning (SSPC-SP7 – NACE-4) – Blast cleaning to remove loose rust, loose mill scale, and other detrimental foreign matter present to the degree specified.
- 3.2.1.6 Near-White Blast Cleaning (SSPC-SP10 – NACE-2) – Blast cleaning to near-white metal cleanliness, until at least 95 percent of each element of surface area is free of all visible residues.
- 3.2.1.7 White Metal Blast (SSPC-SP5 – NACE-1) -- A White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter.
- 3.2.2 Chipping and Grinding: Slag and weld metal accumulation and spatters not previously removed by the Fabricator, Erector, or Installer shall be removed by chipping and grinding. All sharp edges shall be peened, ground, or otherwise blunted as required by the Project Representative.
- 3.2.3 Field Blasting: Field blast cleaning for all surfaces shall be by dry method unless otherwise directed. Particle size of abrasives used in blast cleaning shall be that which will produce a 2.0 mil (.002") surface profile or in accordance with recommendations of the manufacturer of the specified coating or paint system to be applied, subject to approval of the Project Representative.
- 3.2.4 Abrasives: Abrasive used in blast cleaning operations shall be new, washed, graded, and free from contaminants which would interfere with adhesion of coatings and paints and shall not be reused unless specifically approved by the Project Representative.

- 3.2.5 Protection of existing coatings: During blast cleaning operations, caution shall be exercised to ensure existing coatings and paints are not exposed to abrasion from blast cleaning.
- 3.2.6 Cleanup: The Contractor shall keep the area of his work in a clean condition and shall not permit blasting materials to accumulate as to constitute a nuisance or hazard to the prosecution of the work or the operation of the existing facilities. Spent abrasives and other debris shall be removed as required to maintain a clean working environment.
- 3.2.7 Surface Cleaning: Blast cleaned surfaces shall be cleaned prior to application of specified coatings or paints via a combination of blowing with clean dry air, brushing/brooming and/or vacuuming. Air hose for blowing shall be at least ½" in diameter and shall be equipped with a shut-off device.
- 3.2.8 Welds: All welds, when required, shall be neutralized with a suitable chemical compatible with the specified coating or paint materials.
- 3.2.9 Water Blast Cleaning: Water blast cleaning (hydroblasting) may be used as approved by the Project Representative. Pressures shall be those recommended by the Contractor and approved by the Project Representative to effectively perform removal of loose, peeling/flaking paint or coating.
- 3.3 Surface Preparation, Specific
- 3.3.1 Interior Surfaces of Reservoir: Surface shall be abrasively blast cleaned to "Near-White Blast Cleaning" in conformance to Steel Structures Painting Council Surface Preparation Specification SSPC-SP10.
- 3.3.2 All Exterior Surface of Reservoir, Including Appurtenances: Surfaces shall be abrasively blast cleaned to "Commercial Blast Cleaning" in conformance to Steel Structures Painting Council Surface Preparation Specification SSPC-SP6-82 to obtain a 2 mil blast profile.
- 3.4 Application, General
- 3.4.1 Specification: Coating and paint application shall conform to the requirements of the Steel Structures Painting Council Paint Application Specification SSPC-PA1, latest revision, for "Shop, Field, and Maintenance Painting" and the manufacturer of the coating and paint materials printed literature and as specified herein.
- 3.4.2 Thinning: Thinning shall only be permitted as recommended by the manufacturer and approved by the Project Representative.
- 3.4.3 Application: Each application of coating and paint shall be applied evenly, free of brush marks, sage, runs, and there shall be no evidence of poor workmanship. Care shall be exercised to avoid lapping on glass or hardware. Coating and paint shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.

- 3.4.4 Protection: Protective coverings or drop cloths shall be used to protect floors, fixtures, equipment, prepared surface, and applied coatings or paints. Personnel entering reservoir or walking on exterior roof of reservoir shall take precautions to prevent damage or contamination of coated or painted surfaces. Care shall be exercised to prevent coating or paint from being spattered onto surfaces which are not to be coated or painted. Surfaces from which such material cannot be removed satisfactorily shall be repainted or recoated as required to produce a finish satisfactory to the Project Representative.
- 3.4.5 All material shall be applied as specified herein.
- 3.4.6 Welds: All welds and irregular surfaces specified by the Project Representative shall receive a brush coat of the specified product prior to application of each complete coat.

### 3.5 Application and Quality Control, Cold-Applied Coating System

- 3.5.1 Interior Surfaces of Reservoir: Surfaces shall receive the epoxy coating system listed below:
  - 3.5.1.1 Epoxy – after completion of surface preparation as specified, all surfaces shall receive two coats of coating specified under 2.3, "Interior Coating Materials". Each coat shall have a total dry film thickness of 5 mils minimum and 6 mils maximum. Total dry film of the completed system shall be a minimum of 10 mils (.010).
- 3.5.2 Exterior Floor Plate Concrete Ringwall Joint Area: The perimeter of the exterior floor plate shall be caulked where it bears on the concrete ringwall with a caulking product meeting the requirements of Federal Standard TT-S-00230C. The cost of installation of this product shall be included in the cost of the exterior painting system.
- 3.5.3 Quality Control
  - 3.5.3.1 All coating components shall be mixed in exact proportions specified by the manufacturer. Care shall be exercised to ensure all materials are removed from containers during mixing and metering operations.
  - 3.5.3.2 All coatings shall be thoroughly mixed, utilizing an approved slow-speed power mixer until all components are thoroughly combined and are of a smooth consistency. Coatings shall not be applied beyond pot-life limits specified by manufacturer.
  - 3.5.3.3 Thinners shall be added to coating materials only as required in accordance with manufacturer's printed literature and in the presence of the Project Representative.
  - 3.5.3.4 Application shall be by airless spray method except as otherwise specified. Drying time between coats shall be strictly observed as stated in manufacturer's printed instructions.

- 3.5.3.5 When two or more coats are specified, each coat shall contain sufficient approved color additive to act as an indicator of coverage or the coats must be of contrasting color.
- 3.5.3.6 Care shall be exercised during spray operations to hold the spray nozzle perpendicular and sufficiently close to surfaces being coated to avoid excessive evaporation of volatile constituents and loss of material into the air or the bridging of cracks and crevices. All overspray shall be removed as directed by the Project Representative.
- 3.5.3.7 Upon completion of coating operations, holiday detection shall be performed, using the specified (in Section 1.5.8) low voltage instrument. Repair and retesting shall be performed as specified under 1.5 Quality Assurance.
- 3.5.3.8 All mixing, thinning, application, and holiday detection of coatings shall be performed in the presence of the Project Representative or his designated representative.
- 3.5.3.9 A time element equivalent to 7 to 14 days curing time at 70 degree F and 50 percent relative humidity shall be allowed before placing the epoxy coating system into service.

### 3.6 Painting of Exterior Surfaces

- 3.6.1 Prime Coat: After completion of surface preparation as previously specified herein, all bare metal shall receive an epoxy prime coat. Dry film thickness shall be not less than 4 mils nor greater than 6 mils.
- 3.6.2 Top Coat and Graffiti Coating: The primer shall be clean, dry, and show no evidence of oxidation, after which all exterior surfaces shall receive an acrylic polyurethane enamel top coat. The total dry film thickness of the top coat shall be not less than 3 mils nor greater than 5 mils. An additional, 3-5 mils of a graffiti resistant clear coat polyurethane shall be applied to the entire exterior surface.

The total dry film thickness of the entire two-coat system shall be not less than 7 mils nor greater than 11 mils at any point in the painted surface above twelve feet. The total dry film thickness of the entire three-coat system shall not be less than 10 mils nor greater than 16 mils at any point in the painted surface below twelve feet or either side of the ladder. Contractor shall comply with the drying times recommended by the manufacturer prior to application of additional coats, primer or top coat.

- 3.6.3 Quality Control: All provisions of Section 3.5 shall apply to work performed under this section.
- 3.6.4 Color Scheme: The color scheme for the interior and exterior coating systems shall be as specified in the material sections of these specifications (2.2 and 2.3).

3.6.5 Inspection: Upon completion of painting operations, inspection shall be performed as specified herein.

### 3.7 Disinfection

Disinfection of interior surfaces will be performed by TMWA after the tank interior is painted in its entirety and has been washed down with clean potable water. Wash down is the responsibility of the Contractor and is to be coordinated with the project manager. The Contractor is not responsible for any disinfection work under this contract.

After the tank interior is cured, the tank is filled with water and the water is retained in the tank for 5 days. The water retained in the tank is tested on the sixth day by a properly certified laboratory for the presence of volatile organic chemicals. The results of the tests are submitted to and approved by the Washoe County Division Health Department.

### 4.0 CLEANUP

Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site. Coating or paint spots upon adjacent surfaces shall be removed and the entire jobsite cleaned. All damage to surfaces resulting from the work of this section shall be cleaned, repaired, or refinished to the complete satisfaction of the Project Representative at no cost to TMWA.

### 5.0 OMISSIONS

Care has been taken to delineate herein those surfaces to be coated and painted. However, if coating or painting requirements have been inadvertently omitted from this section, or any other section of the specifications, it is intended that all metal surfaces, unless specifically exempted herein, shall receive a first-class protective coating or paint equal to that given the same type surface pursuant to these specifications.

END OF SECTION