00 91 02 ADDENDUM NUMBER 02

Owner: Town of Summerfield

Project: Water System Improvements – Elevated Storage Tank Package

Project No.: SMF24162

Addendum No. 2

Addendum Date: May 4, 2026

The following additions, deletions, modifications, or clarifications shall be made to the appropriate portions of the Contract Documents. Offerors must acknowledge receipt of this Addendum in the space provided on the Bid Form.

ARTICLE 1 – ADDENDUM

1.01 Amend the Contract Documents

A. Make the additions, modifications, or deletions to the Contract Documents described in this Addendum.

1.02 Acknowledge Addenda

A. Acknowledge receipt of this Addendum in the Bid Form submitted for this Project. Failure to acknowledge receipt of this addendum in the Bid Form may render the Bid as non-responsive and serve as the basis for rejecting the Bid.

ARTICLE 2 – SPECIFICATIONS

2.01 Section 00 01 10 “Table of Contents”

A. Division 00 Procurement and Contracting Requirements, Page 1.

1. Add row “00 91 02 Addendum Number 02”

2.02 Section 01 50 00 “Temporary Facilities and Controls”

A. 1.01 Summary, Page 1.

1. Edit paragraph 1.01.A as follows:

a. “Provide temporary facilities, including storage sheds, workshops, and other facilities needed to complete the Work.”

B. 1.02 Documentation, Page 1.

1. Remove subparagraph 1.02.A.2 and all its sub entities.

C. 1.05 Job Conditions, Page 2.

1. Remove paragraph 1.05.D.

2. Add the following as paragraph 1.05.H:

a. "Office space for the Engineer and Contractor will be provided by the Town. The contractor is responsible for all damages to the facility and the driveway as a result of construction activities."

D. 2.02 Contractor's Field Office, Page 2.

1. Remove paragraph 2.02.A.

E. 2.06 Temporary Utilities, Page 3.

1. Remove subparagraph 2.06.A.3.

F. 3.07 Maintenance and Janitorial Service, Page 4.

1. Remove paragraph 3.07.A.

2.03 Section 33 16 19 "Steel Elevated Water Utility Storage Tank"

A. 2.03 Accessories, Page 14.

1. Amend paragraph 2.03.G.1.f as follows:

a. Route the overflow pipe on the exterior of the tank and down tank support column, where the pipe must terminate with a flap valve. Pipe material to be stainless steel with minimum wall thickness of 1/4-inch.

ARTICLE 3 – DRAWINGS

3.01 Sheet C-5

A. Change callout for manway on Elevation as follows:

1. "30" MIN. DIAMETER RISER MANWAY"

B. Add elevation callout on Elevation view as follows:

1. "TOC EL 914.6'"

C. Add General Note 13 as follows:

1. "4" DRAIN LINE SHOWN FOR REFERENCE ONLY. PLACEMENT SHALL BE DESIGNED BY THE CONTRACTOR WITH ENGINEER APPROVAL."

D. Revise Tank Logo Note 1 as follows:

1. "SUBJECT TO CHANGE, THE PROPOSED TANK SHALL BE DARK GREEN WITH (2) ALL WHITE TOWN LOGOS. COORDINATE FINAL LOGO DESIGN AND PLACEMENT WITH THE OWNER."

END OF SECTION

00 01 10 TABLE OF CONTENTS

END OF SECTION

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01 50 00 TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Provide temporary facilities, including ~~OPT's field office, Contractor's field offices,~~ storage sheds, workshops, and other facilities needed to complete the Work.

B. Provide temporary utilities needed to support the operation of the facilities and construction activities.

C. Provide and maintain temporary project identification signs for Owner and Funding Agency.

D. Provide temporary informational signs to identify key elements of construction and direct the flow of traffic.

E. Provide a weatherproof kiosk for display of permits and other notices required by Laws and Regulations.

1.02 DOCUMENTATION

A. Submit Shop Drawings in accordance with Section 01 33 02 "Shop Drawings" for the following:

1. Project identification sign.

~~2. Office Floor Plan: Provide a scaled floor plan prior to installation of OPT's field office. Include details for:~~

~~a. Telephone equipment;~~

~~b. Internet equipment;~~

~~c. Computer equipment;~~

~~d. Security/alarm systems; and~~

~~e. Office furniture and appliances.~~

1.03 QUALITY ASSURANCE

A. Inspect and test each utility before using facilities. Arrange for all required inspections and tests by regulatory agencies, and obtain required certifications and permits for use of facilities.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Transport, unload, and set up all temporary buildings and utilities.

1.05 JOB CONDITIONS

A. Locate buildings and sheds at the Site as indicated or as approved by the OPT.

B. Prepare the Site by removing trees, brush, or debris and performing demolition or grubbing needed to clear a space adequate for the structures.

C. Provide Contractor's temporary facilities and utilities in time to avoid delays in the performance of the Work.

~~D. Provide OPT's field office, complete and ready for occupancy, and use no later than 7 days after the Notice to Proceed. Applications for Payment will not be processed until OPT's field office facilities are completed and approved.~~

E. Provide and maintain temporary facilities and utilities.

F. Operate temporary facilities in a safe and efficient manner.

1. Restrict loads on utilities to operate within their designed or designated capacities.
2. Provide sanitary conditions. Prevent public nuisance or hazardous conditions from developing or existing at the Site.
3. Prevent freezing of pipes, flooding, or the contamination of water.
4. Maintain site security and protection of the facilities.

G. Remove temporary facilities and utilities when construction is complete and removal is approved by the Construction Manager.

H. Office space for the Engineer and Contractor will be provided by the Town. The contractor is responsible for all damages to the facility and the driveway as a result of construction activities.

PART 2 - PRODUCTS

2.01 SIGN MATERIALS

A. Provide wood or metal signs in sound condition, structurally adequate to withstand wind and weather.

B. Provide 3/4-inch exterior grade A/D face veneer plywood with medium density overlay for sign surface.

C. Provide galvanized or stainless steel bolts, brackets, fasteners, and other hardware.

D. Provide exterior quality coatings.

2.02 CONTRACTOR'S FIELD OFFICE

~~A. Furnish a field office of adequate size for Contractor's use.~~

B. Subcontractors may provide their own field offices only when space is available on the Site and the OPT agrees to its size, condition, and location.

2.03 TEMPORARY STORAGE BUILDINGS

A. Furnish storage buildings of adequate size to store any materials or equipment delivered to the Site that might be affected by weather.

2.04 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities at the Site for the entire duration of the Project. Maintain these facilities in a clean and sanitary condition at all times, and comply with the requirements of

the local health authority. On large sites, provide portable toilets at such locations so that no point at the Site will be more than 600 feet from a toilet.

B. Use these sanitary facilities. Do not use restrooms within existing or Owner-occupied buildings.

2.05 TEMPORARY HEAT

A. Provide heating devices needed to protect buildings during construction. Provide fuel needed to operate the heating devices and attend the heating devices at all times they are in operation, including overnight operations.

2.06 TEMPORARY UTILITIES

A. Provide the temporary utilities for administration, construction, testing, disinfection, and startup of the Work, including electrical power, water, and telephone. Pay all costs associated with furnishing temporary utilities.

1. Provide a source of temporary electrical power of adequate size for construction procedures.

a. Use existing power systems where spare capacity is available. Provide temporary power connections that do not adversely affect the existing power supply. Submit connections to the Construction Manager for approval prior to installation.

b. Provide electrical pole and service connections that comply with Laws and Regulations and the requirements of the power company.

2. Provide temporary water. Potable water is not available at the site.

~~3. Provide telephone service to the Site and install telephones inside the Contractor's and OPT's field offices.~~

B. Provide power for construction and storage. Provide power to energize space heaters for stored electrical equipment.

2.07 WATER FOR CONSTRUCTION

A. Provide temporary water. Water is not available at the site. Non-potable water may be used for hydraulic testing of non-potable basins or pipelines. Include the cost of water in the Contract Price.

PART 3 - EXECUTION

3.01 LOCATION OF TEMPORARY FACILITIES

A. Locate temporary facilities in areas approved by the Construction Manager. Construct and install signs at locations approved by the Construction Manager. Install informational signs so they are clearly visible.

3.02 PROJECT IDENTIFICATION SIGNS

A. Arrange for a professional sign painter to paint and erect a sign for the Site in accordance with the sign information provided in the Contract Documents or provided by Owner and

Funding Agencies. Sign will include identification of the OPT and Contractor (including appropriate logos, as required) and other Project information as determined by the Construction Manager. Paint sign on a 4-foot by 8-foot by 3/4-inch exterior grade plywood board. Frame plywood with 2 x 4 wood frame and mount on not less than two 4 x 4 posts. House plywood board in a channel routed 1/2 inch deep in the 2 x 4 frame. Shoulder, glue, and screw corners.

3.03 TEMPORARY LIGHTING

A. Provide temporary lighting inside buildings once buildings are weatherproof.

B. Provide exterior security lighting.

C. Provide lighting that is adequate to perform Work within any space. Temporary lights may be removed once the permanent lighting is in service.

D. Provide portable flood lights at any time that Work will be performed outside the structure at night. Provide adequate lighting at any location Work is being performed.

3.04 DRINKING WATER

A. Provide all field offices with potable water. Provide a dispenser and cooling apparatus if bottled drinking water is provided.

B. Pay for water services and maintain daily.

3.05 CONSTRUCTION FENCE

A. Install and maintain a chain-link construction fence around the Site and off-site storage yards. Fence must be a minimum 6 feet high. Provide gates with padlocks.

3.06 REMOVAL OF TEMPORARY FACILITIES

A. Remove temporary buildings, sheds, and utilities at the conclusion of the Project and restore the Site to original condition or finished condition in accordance with the Drawings.

B. Remove informational signs upon completion of construction.

C. Remove project identification signs, framing, supports, and foundations upon completion of the Project.

3.07 MAINTENANCE AND JANITORIAL SERVICE

~~A. Provide janitorial service for the OPT's field office on a weekly basis or as requested. Empty trash receptacles daily or as needed.~~

B. Maintain signs and supports in a neat, clean condition. Repair damage to structures, framings, or signs.

C. Repair any damage to Work caused by placement or removal of temporary signage.

D. Service, maintain, and replace, if necessary, the field office computer equipment throughout the Project as required by the OPT including replacement cartridges for all office equipment.

END OF SECTION

33 16 19 STEEL ELEVATED WATER UTILITY STORAGE TANK

1.00 GENERAL

1.01 WORK INCLUDED

A. The Work performed under this Contract must include all labor, materials and equipment necessary to design, construct, inspect and test a multi-column steel elevated water storage tank and all appurtenances and accessories as shown on the Drawings and specified herein. The design must be the product of one manufacturer.

B. The Work must also include, but not limited to, all labor, materials and equipment necessary to clean, coat and disinfect the water storage tank.

C. Electrical power at the Site must be in accordance with Section 01 11 00 “Summary of Work” and as indicated in Division 26. The tank manufacturer will be responsible for coordination and installation of all water, communications, and electrical utilities as required.

D. System Description:

1. The elevated tank consists of the following: foundation, steel support structure, all internal and external piping ending at the tee between yard piping and 12” water line, tank accessories, platforms, handrails, balconies, any related appurtenances, and a welded steel water tank.

2. Concrete foundations must be provided as structural support for the steel tank.

3. The tank, appurtenances, and all material exposed on the interior of the tank or in contact with stored water must be resistant to degradation from the use of chlorine and chloramines.

4. All materials in contact with stored water must comply with the requirements of the Safe Drinking Water Act, NSF/ANSI 61 and other federal, state, local, and provincial requirements.

5. Hydraulic Design Criteria:

Design Criteria	Base Bid
Minimum Capacity Within Operating Range	150,000 gallons
Maximum Operating (Head) Range	28 feet
Elevation	
Overflow/Top Capacity Elevation	1,078 feet
Pedestal Floor Elevation	914.1 feet
Inlet/Outlet Pipe Diameter	12 inches
Overflow Pipe Diameter, minimum	10 inches
Maximum Fill Rate	200 GPM
Maximum Drain Rate (under normal operating conditions, tank manufacturer must design based on broken pipe analysis as specified)	1,000 GPM

6. General Design:

    a. Environmental Loads: The steel tank, concrete support structure and foundation must be designed to safely withstand loads acting separately or in load combinations as specified by the most current editions of AWWA D100 and ASCE/SEI 7 for category IV structures.

        1) Wind pressure formula must be determined using the mapped site location per AWWA D100.

        2) Dead load must be the estimated weight of all permanent construction.

        3) Water load must be the weight of water when the tank is filled to 6-inches above the overflow elevation.

        4) Roof snow load must be the larger of 15 psf or the snow load determined in accordance with AWWA D100 and ASCE/SEI 7.

    b. Seismic Loads must be determined in accordance with AWWA D100, Section 13.

    c. Foundation Design:

        1) The concrete foundations must be designed by the tank manufacturer and compatible with its proposed tank design per AWWA D100 and ACI 318. Foundations must be constructed by the tank manufacturer, or a subcontractor directly supervised by the tank manufacturer in accordance with the drawings supplied. Foundations must be of adequate size to properly distribute the bearing loads from the tank and to resist uplift due to wind forces.

        2) The tank manufacturer must design the foundations accounting for soils and subsurface conditions. The successful tank manufacturer must satisfy themself as to the adequacy of the geotechnical report that is included with these Contract Documents, and its recommendations. The successful tank manufacturer must acquire any additional soils and foundation data necessary for the final design at no additional cost to the Owner.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. The Work described in this Section must be performed by an elevated tank manufacturer that has a minimum of 10 years of experience in composite tank design and construction. Manufacturer must have designed, constructed, and commissioned a minimum of five steel elevated tanks of equal or greater capacity, all in satisfactory operation for at least 5 years. These tanks must be of the same design as described above.

2. Acceptable Manufacturers:

    a. McDermott International, Inc./CB&I Storage Tank Solutions.

    b. Caldwell Tanks, Inc.

    c. Phoenix Fabricators & Erectors, Inc.

    d. Landmark Tank Structures, LP.

e. Maguire Iron, Inc.

3. Other manufacturers may submit proposals only if they pre-qualify and show conformance with the specification criteria. Request for qualification with supporting documentation must be received in writing 14 days prior to bid date. Documentation must include an experience list detailing the projects completed directly by the manufacturer that comply with this Section. Information to be submitted must also include details of construction, steel tank erection process, and quality control procedures. The Owner and/or Engineer will be the sole judge as to the acceptability of the tank manufacturer based on the submitted documentation.

4. Elevated tank design and steel tank construction must not be subcontracted. These items must be performed by the tank manufacturer.

5. The tank manufacturer must directly employ a full time professional engineer licensed in the state in which the tank is being constructed, with a minimum 5 years of cumulative experience in the design and construction of elevated steel tanks of the type specified as described in this Section. The engineer must be in responsible engineering charge of the Work.

6. The tank manufacturer must have in its employ for this Project a team consisting of a tank superintendent, project manager and foreman(s) each of whom must have constructed a minimum of five AWWA D100 elevated steel tanks having a capacity equal to or greater than the tank specified and have a minimum of 10 years of experience in the construction of steel elevated tanks.

7. All welders employed on the Project must be tank manufacturer's employees and AWS D1.1 certified if welding structural steel and AWS D1.6 certified if welding stainless steel and/or ASME Section IX Certified as required by AWWA D100. Welders that have not had proof of certification submitted in accordance with the Specifications must not be employed on the Project until such certification is submitted.

8. The tank manufacturer's geotechnical engineering firm and testing laboratory may not be the same company as the one the Engineer used in the development of the project documents, as this is considered a conflict of interest per the International Building Code. The geotechnical firm to be used by the tank manufacturer must be approved by the Engineer prior to construction.

B. Regulatory Requirements:

1. The elevated tank must be designed and constructed in compliance with applicable federal, state and local regulations.

2. Personnel safety equipment, access openings, fall protection, etc. must be provided in accordance with OSHA 1910 requirements and manufacturer's documentation.

C. Singular Responsibility: It is acknowledged that the successful design and construction of elevated storage tanks requires specialized and proprietary knowledge and skills. It is further recognized that successful performance of the tank requires that the earthwork preparation, foundation for the tank and the tank itself be considered an integrated system. Therefore, it is the express intent of this Section to create a singular responsibility for the design and construction of this integrated system required for elevated storage tanks. The design and construction of all aspects, including but not limited to, excavation, tank

subgrade, fill placement beneath tank, tank foundation, foundation drainage systems, steel support structure, inlet and outlet pipes, all piping and equipment inside the tank, welded steel tank, and welded steel tank finishes must be performed by the tank manufacturer or its subcontractor under the direct supervision of the tank manufacturer.

1.03 FIELD QUALITY CONTROL

A. Refer to Section 09 95 00 “Coatings for Water Storage Tanks” for coordination of Owner’s Representative Field Quality Assurance Coordination during coating operations.

B. Owner’s Representative Field Quality Assurance Coordination for Concrete Placement:

1. Observations may be conducted by the Owner’s representative. Final observations will be performed in the presence of the Owner or its representative and the Contractor’s superintendent. All materials and equipment used in the accomplishment of testing are subject to observation at any time by the Owner’s representative. Periodic observation times will be agreed upon by the Owner’s representative and Contractor and approved by the Owner.

2. Contractor must provide a schedule for anticipated:

a. Observation of concrete reinforcement before all concrete pours.

b. Observation of concrete pouring operations.

3. Contractor will notify the Owner’s representative at least 7 days prior to any required inspections and confirmed 24 hours prior to inspection. Prior to scheduling an inspection, Contractor is responsible for reviewing Work and verifying it is ready for inspection. Once scheduled, if the Owner’s representative finds the Project not ready for inspection any additional trips for re-inspection or inspection for retesting of failed tests will be borne by the Contractor and deducted from the Contract Value by Change Order. Costs for additional inspection will be billed at the rates indicated in Section 00 73 00 “Supplementary Conditions.”

C. Owner’s Representative Field Quality Assurance Coordination for Welding Operations:

1. Observations must be conducted by the Owner’s representative and a third-party inspection company retained by the Engineer. Final observations will be performed in the presence of the Owner or its representative and the Contractor’s superintendent. All materials and equipment used in the accomplishment of testing are subject to observation at any time by the Owner’s representative. Periodic observation times will be agreed upon by the Owner’s representative and Contractor, and approved by the Owner.

2. Contractor must provide a schedule for anticipated welding operations and must notify the Owner’s representative at least 7 days prior to any required inspections and confirmed 24 hours prior to inspection. Prior to scheduling an inspection, Contractor is responsible for reviewing Work and verifying it is ready for inspection. Once scheduled, if the Owner’s representative finds the Project not ready for inspection any additional trips for re-inspection or inspection for retesting of failed tests will be borne by the Contractor and deducted from the Contract Value by Change Order.

3. Costs for additional inspection will be billed at the following rates:

Position	Per Day
Welding Inspector	$104/hour
Trip Charge	$58/day

4. Cost includes all travel expenses. Construction Contract Administration will be billed for actual effort per the rates established in Section 00 73 00 "Supplementary Conditions."
5. Contractor must not move or remove scaffolding, ladders or other fixtures necessary to provide proper observation until such Work has been observed and approved by the Owner's representative.
6. Any Work found to be deficient, damaged, or otherwise unacceptable must be repaired in accordance with these specifications at no additional cost to the Owner.
7. Observation and/or acceptance of Contractor's work by Owner's representative(s) in no way releases Contractor from any of the terms and conditions of the Contract Documents.
8. Contractor will provide the inspection and testing of the tank and welds. The number and location of spot radiographs must be in accordance with AWWA D100 and must include the review of spot radiographs. The Owner's representative may provide additional testing and will review tests provided by the Contractor. All sets of radiographs will be taken at locations selected by the Owner's representative and developed while the Owner's representative is present. All developed film will then be the property of the Owner.

1.04 SUBMITTALS

A. Submit the following Shop Drawings prior to the start of tank construction:

1. Construction Drawings:

a. Contractor may provide the submittal for the tank's foundation separate from the rest of the construction drawings. All other drawings must be all inclusive in one submittal. Partial submittals for tank design and components will not be accepted and will be returned without review.

b. Drawings must show all features of the Work, including the size and position of all structural components, interior layout of all floors, the required strength or grade of all materials, and construction tolerances.

c. Foundation details must also include excavation and backfill required.

d. Reinforced concrete details must include construction joints, openings and inserts. Reinforcement must be clearly indicated on the structural drawings and identified by mark numbers that are used on the fabrication schedule. Location, spacing and splice dimensions must be shown. Placement and fabrication details must conform to ACI 318.

e. Drawings of steel components must show all details of welded joints and other connections. Standard weld symbols as listed in AWS A2.4 must be used unless joint details are shown.

f. Provide a table showing capacity of the tank in gallons at all levels in 1-foot increments.

g. Final construction drawings must be sealed and signed by a professional engineer licensed in the state the tank is constructed in and submitted as Product Data.

B. Submit the following Product Data prior to the start of tank construction:

1. Signed and sealed construction drawings.

2. Provide shop and field welding procedures for all structural joints on the steel tank.

3. Tank manufacturer's Quality Control Plan.

4. Design Data: Provide a summary of the design and design calculations for the foundation, support structure, overflow weir, vent, tank and other components sealed and signed by the tank manufacturer's engineer. Document the codes and standards, methods of analysis, design coefficients, and resultant gravity, snow, wind, and seismic loads utilized.

5. Product Data:

a. Provide a separate concrete mix design for each specified concrete compressive strength indicated on the tank manufacturer's drawings.

b. Provide manufacturer's descriptive information for appurtenant equipment and accessories that are not detailed on the Drawings.

6. Reports/Certification:

a. Provide certification that testing and inspection requirements of this Section have been performed and the results comply with the requirements of the Specifications.

b. Documentation must include certification of test results and other information required by ASTM A6 or ASTM A20, as applicable.

c. Foundation excavation report as inspected by a representative of the tank manufacturer's geotechnical engineer prior to foundation construction.

d. Provide report to document field measurements, and certify compliance or non-compliance with the tolerance requirements in AWWA D100.

e. Inspection of concrete reinforcement and embedment.

f. Report on concrete sampling and testing during the Project.

g. Conformance to ASTM standards of concrete testing agency.

h. Certification of NDT personnel.

i. Certification of AWS Certified Welding Inspector (CWI).

j. Welding Report(s):

1) Welding procedure specification for all welds on the tank.

2) Provide proof of AWS D1.1, AWS D1.6 and/or ASME Section IX certifications of all welders. Documentation must include a current color photograph of the welder and welder performance qualifications.

3) Summary of visual and inspection of radiographs and other inspections, including location of tests on developed shell plate diagrams.

4) Identification of defective welds and a statement of action/procedure for repair.

5) Record of welders employed at each joint.

k. Leak and vacuum testing reports.

l. Settlement monitoring report.

C. Certified Test Reports:

1. Certified Test Reports must be submitted to the Owner within 7 days of the test being performed. Failure to submit test reports may result in non-payment for those pay items.

2. Steel mill test reports.

3. Welding test reports.

4. Subgrade compaction report.

5. Concrete test reports during construction.

6. Tests on hardened concrete.

7. Settlement monitoring report.

8. Vacuum box testing report.

D. Operation and Maintenance (O&M) Manual: Provide O&M manual with all operating instructions and maintenance procedures for the composite elevated tank, including but not limited to, complete drawings of the composite elevated tank, manuals and operating instructions for equipment, minimum maintenance and inspection instructions.

E. Logo and Artwork Mock-Up: Provide Owner with a mock-up of the artwork design for approval prior to commencing paint Work. Mock-up must be to scale, color and indicate size of logo and lettering. Paint samples of proposed colors must also be submitted for Owner approval per Section 09 95 00 “Coatings for Water Storage Tanks.”

1.05 STANDARDS

A. Comply with the provisions of the following standards as if written here in their entirety.

B. In the event of a conflict between the published standards, codes, and this Section, the provisions of this Section will govern.

1. American Concrete Institute (ACI):

ACI 117	Standard Tolerances for Concrete Construction and Materials
ACI 301	Specifications for Structural Concrete
ACI 304	Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 305	Hot Weather Concreting
ACI 306	Cold Weather Concreting
ACI 318	Building Code Requirements for Structural Concrete

ACI 347	Guide to Formwork for Concrete

2. American Institute of Steel Construction (AISC):

AISC S335	Specification for Structural Steel Buildings

3. American National Standard Institute (ANSI):

ANSI B16.5	Pipe Flanges and Flanged Fittings

4. American Society of Civil Engineers (ASCE):

ASCE/SEI 7	Minimum Design Loads for Buildings and Other Structures

5. ASTM International (ASTM):

ASTM A123	Zinc Coatings on Iron and Steel Products
ASTM A240	Stainless Steel Plate, Sheet and Strip for Pressure Vessels
ASTM A285	Pressure Vessel Plates, Carbon Steel
ASTM A774	Welded Stainless Steel Fittings
ASTM A778	Welded Stainless Steel Tubular Products
ASTM A780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

6. American Welding Society (AWS):

AWS A 2.4	Standard Symbols for Welding, Brazing, and Nondestructive Examination
AWS D1.1	Structural Welding Code
AWS D1.6	Structural Welding Code – Stainless Steel

7. American Water Works Association (AWWA):

AWWA C200	Steel Water Pipe 6 In. and Larger
AWWA C206	Field Welding of Steel Water Pipe
AWWA C220	Stainless Steel Pipe 4 In. and Larger
AWWA C652	Disinfection of Water Storage Facilities
AWWA D100	Welded Carbon Steel Tanks for Water Storage
AWWA D102	Coating Steel Water Storage Tanks

8. Federal Aviation Administration (FAA):

FAA 70/7460-1H	Obstruction Marking and Lighting

9. Miscellaneous Standards:

IBC	International Building Code as Adopted by Owner
NACE SP0178	Standard Recommended Practice: Design, Fabrication, and Surface Finish of Metal Tanks and Vessels to be Lined for

	Immersion Service with Weld Comparator Assembly
NSF/ANSI Standard 61	Drinking Water System Components – Health Effects
OSHA 29 CFR	Part 1910, Occupational Safety and Health Standards

1.06 DELIVERY AND STORAGE

A. Handling and Shipping: The tank manufacturer must handle materials and fabricated components in a manner that will protect them from damage. Allow painted materials adequate cure time prior to stacking or shipping.

B. Storage and Protection: Protect delivered materials and equipment from damage. Store in well-drained areas and provide blocking to minimize contact with the ground.

1.07 JOB CONDITIONS

A. Permits and Easements:

1. Permits or licenses required for permanent structures, changes in existing facilities or advancement of the construction must be secured and paid for by the tank manufacturer prior to the start of construction. These include building permits, code inspections, etc.

2. Airspace authority permits and site easements have been secured by the Owner prior to construction. Contractor will be required to coordinate and permit any temporary structures or cranes exceeding the permitted height with the FAA.

B. Access: Tank manufacturer must provide access to the Site as indicated on the Drawings.

C. Working Conditions:

1. Safety and Health: Tank manufacturer must comply with safe working practices and all health and safety regulations of OSHA, state and local health regulatory agencies and Safety Data Sheets (SDS). Provide protective and lifesaving equipment for persons working at the Site.

D. Subsurface and Physical Conditions:

1. The following reports of explorations and tests of subsurface conditions at or contiguous to the Site of the Work:

a. The technical data contained in the report upon which the Contractor may rely is core depth. Contractor recognizes that the technical data listed reflect only the conditions for the day the data was collected and reflects only conditions existing at the exact location of samples.

b. Copies of these reports and drawings that are not included with Bidding Documents may be examined at the offices of Freese and Nichols located at 531 N. Liberty Street, Winston-Salem, NC during regular business hours. These reports and drawings are not part of the Contract Documents. Tank manufacturer is not entitled to rely upon other information and data utilized by the Engineer and Engineer's consultants in preparation of the Contract Documents.

c. No additional geotechnical information will be provided by the Owner. It will be the complete responsibility of the tank manufacturer to satisfy itself of the geotechnical

conditions at the proposed tank site. If the tank manufacturer deems it necessary for additional geotechnical investigations and analysis, such investigations and analysis must be provided by the tank manufacturer at no additional cost to the Owner and no additional time will be added to the Contract for such investigations. All changes to the tank manufacturer's design based on any additional geotechnical information acquired after the Project is bid is to be included in the project cost and no additional payment or time is due to the Contractor.

1.08 SEQUENCING AND SCHEDULING

A. Notification: The Contractor must provide notification of the intent to start Work at least 7 days prior to commencing each major phase of the Work.

1.09 GUARANTEES

A. Workmanship and Material Guarantee: The tank manufacturer will guarantee the tank structure against defects in workmanship and material for a period of 2 years. If, within 2 years from final completion of the Project, workmanship or material is proven defective, the tank manufacturer must repair such defects at their own expense.

B. Design Warranty: The tank manufacturer will warrant its design of the proposed facility to be structurally and functionally applicable to serve the intended use of the projected Work. Such intended use is exemplified by the criteria of design, workmanship, and material expressed by the requirements of the Specifications and Drawings prepared by the Engineer. The Owner's or Engineer's review of the tank manufacturer's design, or the Owner's acceptance and final payment for the Work does not relieve the tank manufacturer of design responsibility. The Owner must be the direct beneficiary of the warranty.

2.00 PRODUCTS

2.01 MATERIALS

A. Reinforced Concrete:

1. All structural concrete materials, foundations, and reinforcement used in constructing the elevated tank must comply with applicable requirements of AWWA D100 and ACI 318, except as modified in this Section and are the responsibility of the Contractor.

2. Driveways, mow strips, sidewalks, flumes, and other miscellaneous concrete items must be in accordance with Section 03 30 00 "Cast-In-Place Concrete."

B. Steel Structure:

1. Steel tank and structure components, including steel plates, sheets, structural shapes and filler metals must be in accordance with AWWA D100.

2. The minimum thickness for any part of the structure must be 3/16-inch for parts not in contact with water and 1/4-inch for parts in contact with water. All portions of the tank including the roof must be of watertight construction.

3. At junctions in plates where the meridional forces are discontinuous such as cone to cylinder junctions or cone to base plate junctions, a tension or compression ring may be

required to resist radial forces generated by the discontinuous membrane forces. In these regions, allowable stresses must not exceed the following stresses:

a. Tension ring must not exceed the lesser of 15,000 psi or one half of the minimum specified yield of the plate materials.

b. Compressions ring stresses must not exceed 15,000 psi.

c. The overturning moment used in designing the pedestal and foundation must include the moment due to eccentricity of the gravity loads caused by deflection of the structure under wind or seismic conditions (i.e., P-delta effect).

2.02 STEEL TANK STRUCTURE

A. General: The steel structure must be all welded construction and must be designed in accordance with applicable sections of AWWA D100. The required capacity and dimensions of the tank are noted on the Drawings and in this Section of the Specifications.

B. Structural posts or columns must be tubular and must be sealed against the entrance of air and/or water.

C. Tank roof structural members must be flat bar or sealed square tubular sections. I-beams or other sections with horizontal projections may be used if the nominal depth is 10 inches or greater. Support beams must be seal welded to the underside of the roof plate along the entire length of the beam.

D. All tank interior lap joints must be continuously seal welded, including penetrations of roof accessories.

2.03 ACCESSORIES

A. General:

1. Accessories must comply with the minimum requirements of the Specifications, Codes and Standards listed in this Section, current applicable safety regulations, and the operating requirements of the structure.

2. Electrical isolation kits must be used between dissimilar pipe and other metal materials.

B. Name Plate:

1. Provide minimum 8-inch by 10-inch laser engraved stainless steel name plate on the exterior of the tank, field verify location. Provide stainless steel hardware to mount nameplate.

2. Name plate must include the following information:

a. Manufacturer.

b. Manufacturer’s Job Number.

c. Date of Completion.

d. Capacity.

e. Tank Diameter.

f. Head Range.

g. Bottom Height AMSL.

h. Overflow Height AMSL.

C. Ladders:

1. Install ladders with appurtenances as indicated:

Location	Material	Ladder Safety System Req.
Exterior Tank (Ground to Balcony)	Galvanized Steel	X
Balcony to Top Platform	Galvanized Steel	X

2. Ladders must be in accordance with OSHA 1910, except as modified in this Section.

3. Ladder rails must be punched for the rungs and welded on both sides of the rail.

4. Ladders to be 18 inches wide.

5. Ladders that terminate at platforms or landings must extend a minimum of 48 inches beyond the platform elevations.

6. Include ladder safety systems on all ladders as specified in Section 10 40 13 "Fall Prevention and Safety Systems."

7. Provide self-closing safety gate on at least one side or as shown on the Drawings to protect floor openings for ladder access per OSHA 1910 and as specified in Section 10 40 13 "Fall Prevention and Safety Systems."

8. Galvanized steel ladders within the pedestal and access tube may be delivered in segments and bolted together. Hardware must be galvanized, and the bolts must be properly sized with approximately two threads extending past the nut. Bolts cannot be trimmed in the field. Hardware location cannot obstruct the climber per OSHA 1910.

D. Tank Openings:

1. Wet Riser Manhole:

a. Tank manufacturer must design and install 30~~6~~-inch minimum I.D. manhole approximately 3-feet above the base of the wet riser in accordance with AWWA D100, as specified and indicated on the Drawings.

b. Manhole cover must be davited or hinged.

c. Manhole hardware must be galvanized steel. Provide washers on both sides of flange to avoid damage to coatings during installation. The location will be as indicated on the Drawings and approved by the Engineer.

d. All gaskets be reinforced with cloth or annular rings and NSF/ANSI 61 certified.

e. Refer to Section 10 40 13 "Fall Prevention and Safety Systems" for confined space entry signage requirements.

Hatch Location	Qty.	Clear Opening Size
Tank Interior Roof Hatch	1	36" x 42"

f. General:

1) Hatches must be installed on a minimum 4-inch curb. Hatch lid must have a minimum 2-inch overhang. Hatch must be equipped with a neoprene gasket between steel curb and hatch.

2) An EPDM rubber gasket must be used to make a positive seal when the hatch is closed.

3) Aluminum must have a clear anodic finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

4) Installation must be in accordance with the manufacturer's written instructions.

5) Hatches must open to a 90-degree angle.

6) Refer to Section 10 40 13 "Fall Prevention and Safety Systems" for confined space entry signage requirements.

7) Manufacturer must provide a lifetime guarantee against defects in materials and workmanship.

g. Tank Interior Roof Hatch:

1) Hatch must be single leaf and constructed of aluminum with 316 stainless steel hardware. Hatch must be rated for a minimum live load of 150 psf.

2) Hatch must be equipped with stainless steel pressure locks on the exterior of hatch, three each minimum and an exterior padlock staple.

3) The door must have stainless steel gas shocks or springs to assist in opening the door and reducing the force during closing.

4) A 316 stainless steel or aluminum hold open arm with push/pull handle must automatically keep the cover in its upright, open position.

5) Approved Manufacturers:

a) Halliday Products – F1R.

b) Approved equal.

E. Rigging Access and Rails:

1. Provide one circular continuous galvanized and epoxy coated interior access rails suitable for use with a beam trolley. Rails must be configured and designed to safely support a horizontal scaffolding system that will provide access to all interior surfaces for coatings and maintenance. Rails must be mounted to the underside of the roof such that a minimum of 6-inch clearance is provided from the top flange to the roof plate. Bottom of rails must be a minimum of 6-inches above the overflow elevation. All hangers and connections must be fully seal welded plate steel.

F. Roof Guardrail:

1. Provide a 42-inch roof guardrail with top-rail, mid-rail(s), and toe plates in accordance with OSHA requirements and as shown on the Drawings. The circular guardrail must extend at least 3 feet beyond the outside of any roof appurtenances, including cathodic protection hand holes, if included.

2. Guardrail must be a structurally designed for loading per OSHA 1910 and any antennas, lights or other loading specified herein and as shown on the Drawings. Provide design calculations, design assumptions and design for guardrail with tank Shop Drawings.

G. Piping:

1. Materials:

a. Ductile Iron Pipe in accordance with Section 33 05 01.02 "Ductile Iron Pipe and Fittings."

b. Stainless steel pipe and fittings must be Type 304L/316L stainless steel fabricated from material meeting the requirements of ASTM A240 as indicated. Fabrication, inspection, testing, marking and certification of pipe and fittings must be in accordance with ASTM A778 and A774 respectively. Backing flanges, retaining rings and related hardware must be 304L/316L stainless steel to match adjacent piping and drilled to ANSI B16.5 Class 150. Pipe, fittings and welds must be cleaned and passivated.

c. Carbon steel pipe and fittings must be in accordance with AWWA C200 and ASTM A-53. Fabrication, inspection, testing, marking and certification of pipe and fittings must be in accordance with AWWA C208. Backing flanges, retaining rings and related hardware must match adjacent piping and drilled to ANSI B16.5 Class 150.

d. All carbon steel piping must have shop applied epoxy lining in accordance with AWWA C210. All linings are to be applied after welding and fabrication that may damage the interior lining.

e. Wet riser must be at least 48-inch diameter or as required to accommodate wet riser ladder while meeting OSHA 1910 clearances and as required to accommodate 30~~6~~-inch minimum diameter manhole at ground level.

f. Route the overflow pipe on the exterior of the tank and down tank support column, where the pipe must terminate with a flap valve. Pipe material to be carbon steel or stainless steel with minimum wall thickness of 1/4-inch.

g. Flap Valve:

1) Flap valve must consist of a cast iron frame, cover (flap) and adjustable hinge blocks.

2) Assembly bolts, hinge pins and keepers must be 304 stainless steel.

3) Hinge bushing must be bronze.

4) Valve must assure positive closing with less than a 1/16-inch gap.

5) Valve frame must be able to connect to a flanged connection. Mating flange and flap valve flange must be 125-lb. standard drilling. The number of bolt holes in the valve flange must match the mating flange and be able to rotate the valve sufficiently to mount it horizontal or vertical to the ground.

6) If mounted in a horizontal position, provide a counterweight as required to operate the valve and maintain a positive closure while not in use.

7) Seat faces must have a resilient seat, neoprene rubber or equal.

8) Valve will be prepared and coated as specified. Shop applied primers must be confirmed by the manufacturer to be compatible with specified coating system.

9) Approved Manufacturers:

a) Waterman Industries – Model F-55.

b) Approved equal.

2. Tank Drain: A 6-inch diameter nozzle must be installed as low as possible on the wet riser. Provide a 6-inch gate valve and blind flange.

H. Tank Ventilation:

1. Tank vent must be as indicated on the Drawings. The tank manufacturer to size roof ventilator to pass air so that the maximum fill/draw rate must not develop pressure within the tank per the design parameters provided and a broken pipe analysis assuming a broken pipe immediately outside of the tank's foundation. Broken pipe analysis must be based on largest diameter inlet/outlet pipe with a break 5 feet beyond the pedestal wall.

2. Vent must be constructed of Aluminum with #16 316 stainless steel insect screen, minimum diameter is 36 inches, meeting current AWWA and NCDEQ standards.

3. Vent must be securely fastened using 316 stainless steel hardware.

4. Vent must be provided with a pressure-vacuum relief mechanism that will operate in the event that the vent fails. The mechanism must be designed to return automatically to its original position after operation. The pressure/vacuum relief mechanism must be located on the tank roof above the maximum weir crest elevation, and incorporated in the vent assembly.

5. Contractor must include detailed calculations of vent sizing and broken pipe analysis with design calculations and Shop Drawings.

6. #16 vent screen condition must be observable without removing the vent's hood.

7. Approved Manufacturer(s):

a. AST Model Vent by Advance Tank and Construction Co.

b. Approved equal.

I. Level Monitoring and Sampling:

1. Provide 1-inch Schedule 80 steel threaded couplings or thread-o-lets welded to inlet/outlet pipe(s) or on wet riser a maximum of 5 feet above grade with isolation bronze ball valves. Piping to be galvanized steel.

a. Provide one coupling for pressure gauge and pressure transmitter as shown on the Drawings. Provide pressure gauge(s) as shown on the Drawings.

b. Provide one coupling for sampling port with ball valve and ball valve type hose bid. Label sampling port with vinyl decal.

2. Provide additional monitoring and sampling lines within the access tube as indicated on the Drawings.

3. Instrumentation Roof Nozzles: Provide one 4-inch and one 6-inch standard weight steel pipe nozzles welded to the roof with 125-lb. blind flanges to allow mounting of instrumentation and/or cathodic protection system.

J. Cathodic Protection Openings: Provide welded steel couplings and penetrations as required by the approved cathodic protection design.

K. Lightning Protection: Provide a lightning protection system for the elevated tank as indicated in Section 26 41 13 “Lightning Protection for Structures.”

L. Communications Equipment:

1. Install antenna mounts on tank as required by Division 26 and as specified herein.

2. The Owner’s antenna mounts must be provided at the top of the tank. Two antenna locations must be provided. The location of the mount on top of the tank must be coordinated with the Owner.

3. Cellular antennas may be installed in the future and attached to the tank’s guardrail systems. The tank manufacturer must design the guardrail for loading per OSHA 1910, and any antennas, lights or other loading specified herein and as shown on the Drawings.

a. Nine future cellular antennas to be mounted on the exterior of the guardrail just above the guardrail height, weighing at least 100 pounds each with approximate dimensions of 36 inches high by 24 inches wide by 12 inches deep.

b. Nine future radios/miscellaneous antenna support equipment to be mounted on the interior of the guardrail at the same locations as the antennas. The support equipment is to be assumed to weigh 50 pounds each with approximate dimensions of 24 inches high by 24 inches wide by 12 inches deep.

c. The guardrail must be able to support a grouping of three antennas and support equipment anywhere on the guardrail.

d. Install carbon steel 2-inch angle iron, 24 inches wide at each guardrail post to mount conduits. Install stainless steel Unistrut with stainless steel hardware to the angle iron. Angle iron is to be seal welded on both sides at the attachment to the posts.

4. Provide angle iron brackets at 10-foot intervals on the exterior of a tank column. Length of conduit hangers will be as required to provide adequate spacing between the quantity of conduits required for the Project, 24 inches minimum.

2.04 ELECTRICAL AND LIGHTING

A. All Work must be performed and all materials must be provided in accordance with National Electric Code and the governing electrical, safety and inspection codes, regulations and ordinances. Refer to Division 26 for additional requirements.

2.05 STEEL TANK PAINTING

A. Refer to Section 09 95 00 “Coatings for Water Storage Tanks.”

2.06 SOURCE QUALITY CONTROL

A. Tests: Review mill test certifications of all steel plate, structural components and reinforcement to ensure compliance with specification requirements.

B. Inspections: Provide inspection of shop fabricated components in accordance with AWWA D100.

3.00 EXECUTION

3.01 EXAMINATION

A. Foundation Excavation: The foundation bearing surface and excavation must be inspected by a representative of the tank manufacturer's geotechnical engineer prior to foundation construction. Verification of the applicable design and construction recommendations is required in a letter signed and sealed by the geotechnical engineer and submitted to the Engineer. The geotechnical engineer must be retained by the tank manufacturer.

B. Environmental Conditions: Prior to performing any Work, verify the expected temperature, humidity and weather conditions are within the specified limitations for executing the Work.

C. Elevated Tank Components: After completion of each major component and prior to proceeding with the next stage of construction, verify that tolerance inspections and material quality control tests conform to the requirements as specified in this Section.

3.02 REINFORCED CONCRETE CONSTRUCTION

A. Reinforcement: Fabrication, placement, development and splicing of reinforcement must be in accordance with ACI 318 and ACI 117.

B. Formwork:

1. Formwork design, installation and removal must comply with the minimum requirements of ACI 318 and ACI 117 and with the applicable recommendations of ACI 347.

2. Forming systems must be designed with the provision of ties and bracing such that concrete components conform to the correct dimensions, shape, alignment and elevation without leakage of mortar. Formwork systems must be designed to safely support all loading conditions. Embedded items must be properly positioned and secured. Form surfaces must be cleaned of foreign materials and coated with a release agent prior to placing reinforcement.

C. Concrete: Concrete proportioning, production, placement, quality control and curing procedures must comply with ACI 318 and ACI 117. Concrete must satisfy the specific structural, durability and architectural requirements of the completed components.

1. Proportioning: The proportions of materials for concrete must be established to provide adequate workability and proper consistency to permit concrete to be worked readily into the forms and around reinforcement without excessive segregation or bleeding. Unless otherwise specified, concrete without high range water reducer must be proportioned to produce concrete slumps at the point of placement between 2 and 4 inches. If high range water reducer is used, concrete slump prior to addition must be 3

to 4 inches. The slump, after addition of high range water reducer, must be a maximum of 8 inches. Air must be entrained to provide concrete with 3.0 to 6.0 percent air content.

2. Production: Concrete that arrives at the Project with slump below that suitable for placing, may have water added within the limits of the maximum permissible water-cement ratio. Maximum slump must not be exceeded. The water must be incorporated by additional mixing equal to at least half of the total mixing time required. For concrete with site-administered high range water reducer, the pre-plasticized minimum slump requirement must be attained as permissible by addition of water and mixing prior to the addition of the water reducer.

    a. Placement: Prior to concrete placement, all snow, ice, water or other foreign material must be removed from the spaces that the concrete will occupy. Concrete must be deposited in its final position in accordance with ACI 318. These must be moved at short intervals to prevent stacking of concrete.

    b. All concrete must be consolidated by vibration while fresh concrete is still plastic so that the concrete is thoroughly worked into the corners of forms and around the reinforcement and embedded items to eliminate all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Internal vibrators must be the largest practical size that can be used in the Work and must be operated by competent workmen.

D. Weather:

1. Concrete must not be placed during precipitation or extreme temperatures unless protection is provided.

2. During cold weather the recommendations of ACI 306.1 must be followed.

3. During hot weather the recommendations of ACI 305.1 must be followed.

3.03 FOUNDATION

A. Excavation: After verification of the foundation-bearing surface, provide a 2-inch thick concrete working slab within the lower excavation limits. Grade the Site to prevent runoff from entering the excavation.

B. Concrete Construction:

1. For shallow foundations, reinforcement placed adjacent to a concrete working slab must have a 2-inch minimum cover and reinforcing steel must be supported by precast concrete block, metal or plastic bar supports.

2. The sides of foundations must be formed using any suitable system conforming to ACI 318. Earth cuts must not be used as forms for vertical surfaces. Forms must be provided on top sloping surfaces steeper than 2.5 horizontal to 1 vertical. Straight form panels may be used to form circular foundation shapes. The minimum design radius must be maintained at all sections.

C. Finish:

1. Formed surfaces must have a smooth form finish when exposed and a rough form finish when not exposed.

2. Unformed surfaces must have a troweled finish when exposed and floated finish when not exposed.

3. The top of the concrete pier for each of the tank legs must be 6 inches above finished grade.

3.04 STEEL TANK

A. Welding:

1. Welding procedures and general welding requirements must be in accordance with AWWA D100.

2. No structural welding is permitted to any steel embedded in hardened concrete, unless a weld procedure is utilized that will preclude damage to the concrete.

B. Fabrication: Layout, cutting, forming, edge preparation and workmanship for steel tank components and fabrications must be in accordance with AWWA D100.

C. Tank Erection: Steel tank erection procedures and general requirements must be in accordance with AWWA D100.

D. All weld slag, spatter, rough welds and other sharp or rough areas must be removed to a profile conforming to NACE SP0178, Profile 'D'.

E. Inspection of shop and field welds must be in accordance with AWWA D100, Section 11, Inspection and Testing. All inspection must be performed before interior and exterior painting.

3.05 TANK PAINTING

A. Refer to Section 09 95 00 "Coatings for Water Storage Tanks."

B. Painting of the tank's exterior shell and cone, including logos if included, must be completed on the ground and prior to hoisting.

C. Galvanized steel must be repaired after welding or if damaged with zinc-based solder in accordance with ASTM A780.

3.06 FIELD QUALITY CONTROL

A. All cost of testing required for the construction of the tank will be borne by the Contractor. The results of all tests must be submitted to the Owner within 7 calendar days of the test being completed.

B. Soil and compaction testing for foundation and backfill will be provided by the Contractor.

C. Concrete Testing and Inspection:

1. The evaluation and acceptance of concrete must be in accordance with Section 5.6 of ACI 318 and ACI 117, except as modified in this Section.

2. The first sample for concrete that is pumped must be taken at the point of placement after the concrete has been pumped. After the first sample has been tested and certified to be within the specifications, subsequent samples may be taken from the truck.

3. Four cylinders must be made from each sample required. Two cylinders should be tested at 28 days for the strength test. One cylinder should be tested at 7 days to supplement the 28-day tests. The fourth cylinder is a spare to replace or supplement other cylinders.

4. Slump, air and compressive cylinder testing must be performed by an independent laboratory. The tank manufacturer will retain the independent laboratory and provide the Owner with copies of all test results within 7 days of completing the test.

D. Steel Tank Testing and Inspection:

1. All costs of tests required for the construction of the tank will be borne by the Contractor. The results of all tests must be submitted to the Owner within 7 calendar days of the test being completed.

2. Inspection procedures for the steel tank must be as required by AWWA D100. Radiographic inspection of full penetration butt-welded joints must be made by an independent inspection company retained by the tank manufacturer. Contractor must submit name of company completing the tests for the Engineer's approval prior to construction.

E. Provide leak testing per AWWA D100.

F. Conduct settlement testing by providing four survey points on each column foundation and at the wet riser. Record elevations and submit survey data prior to filling and upon completion of filling. Settlement must be within the tolerances of AWWA D100. Larger settlements will not be accepted unless sealed by the tank manufacturer's engineer as being acceptable and as approved by the Owner.

G. Piping Test Inspection: Refer to Section 01 40 00 "Quality Management."

H. Tank Painting Inspection and Testing: Refer to Section 09 95 00 "Coatings for Water Storage Facilities."

3.07 CLEAN AND ADJUST

A. The Site must be kept in a clean and safe condition at all times. The tank manufacturer must remove all construction equipment and debris at Project completion.

B. Tank Disinfection:

1. Water and sufficient pressure for flushing, cleaning, initial testing and disinfection will be supplied by the Owner at no cost to the tank manufacturer. Tank manufacturer is responsible for coordination with the Owner and all materials required to test and disinfect tank. Tank disinfection must be in accordance with AWWA C652, Chlorination Method No. 2 or 3.

2. After disinfection, the tank manufacturer must arrange for bacteriological testing of water samples from the tank. Failed tests will be supplemented by the tank manufacturer. The tank must not be placed in service until bacteriological tests pass.

3. Disinfection of piping must be performed per Section 33 10 13 "Disinfecting of Water Utility Distribution."

3.08 WARRANTY INSPECTION

A. The Owner and Contractor will observe all surfaces of the reservoir within 11 to 23 months after the reservoir Work has been accepted for Substantial Completion and placed in service to establish if remedial work is required. If the water utility is not able to remove the tank from service for the inspection or for any repair work, due to adverse weather conditions, drought or system limitations, the inspection or repair work may be delayed by the Owner for up to 16 months at no additional cost. All repair work must be conducted within a schedule approved by the Owner.

B. The Owner will isolate the reservoir from the distribution system and drain the reservoir. Contractor must open, clean out, high-pressure water wash, and rinse the tank prior to the anniversary observation. After observation of the tank is complete and repair work accepted by Owner, the Contractor must follow disinfection procedures specified.

C. Contractor must provide suitable and adequate equipment including, lighting, ventilation, rigging, cable climbers, mirrors, inspection equipment, and sufficient manpower to clean, disinfect and move equipment and tools around the reservoir, etc., as may be necessary to facilitate complete observation of all interior surfaces. Contractor will bear all costs of the anniversary observation and must incorporate such costs into bid.

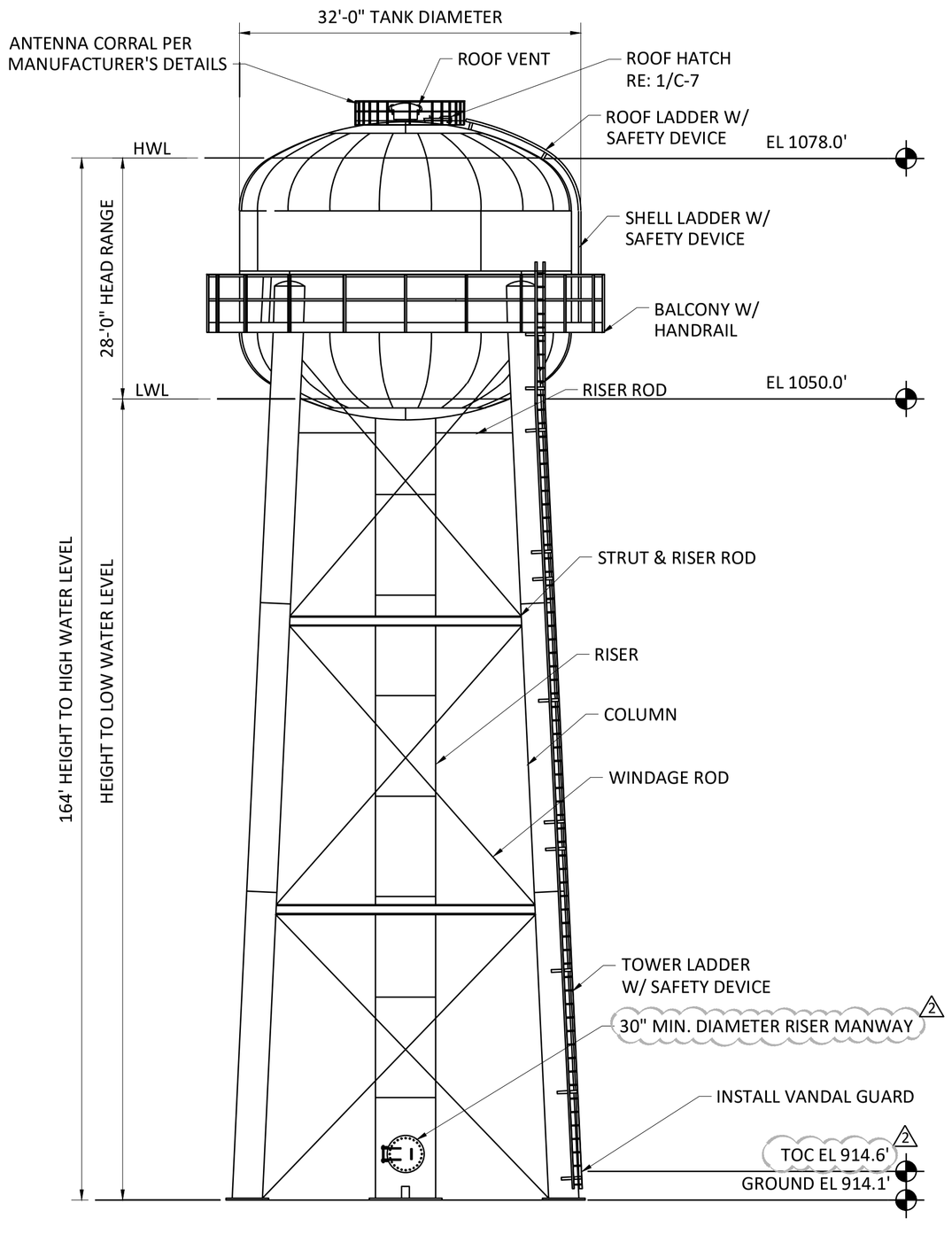
D. The Owner will document the inspection in accordance with AWWA D100.

E. Provide coating inspection per Section 09 95 00 “Coatings for Water Storage Tanks.”

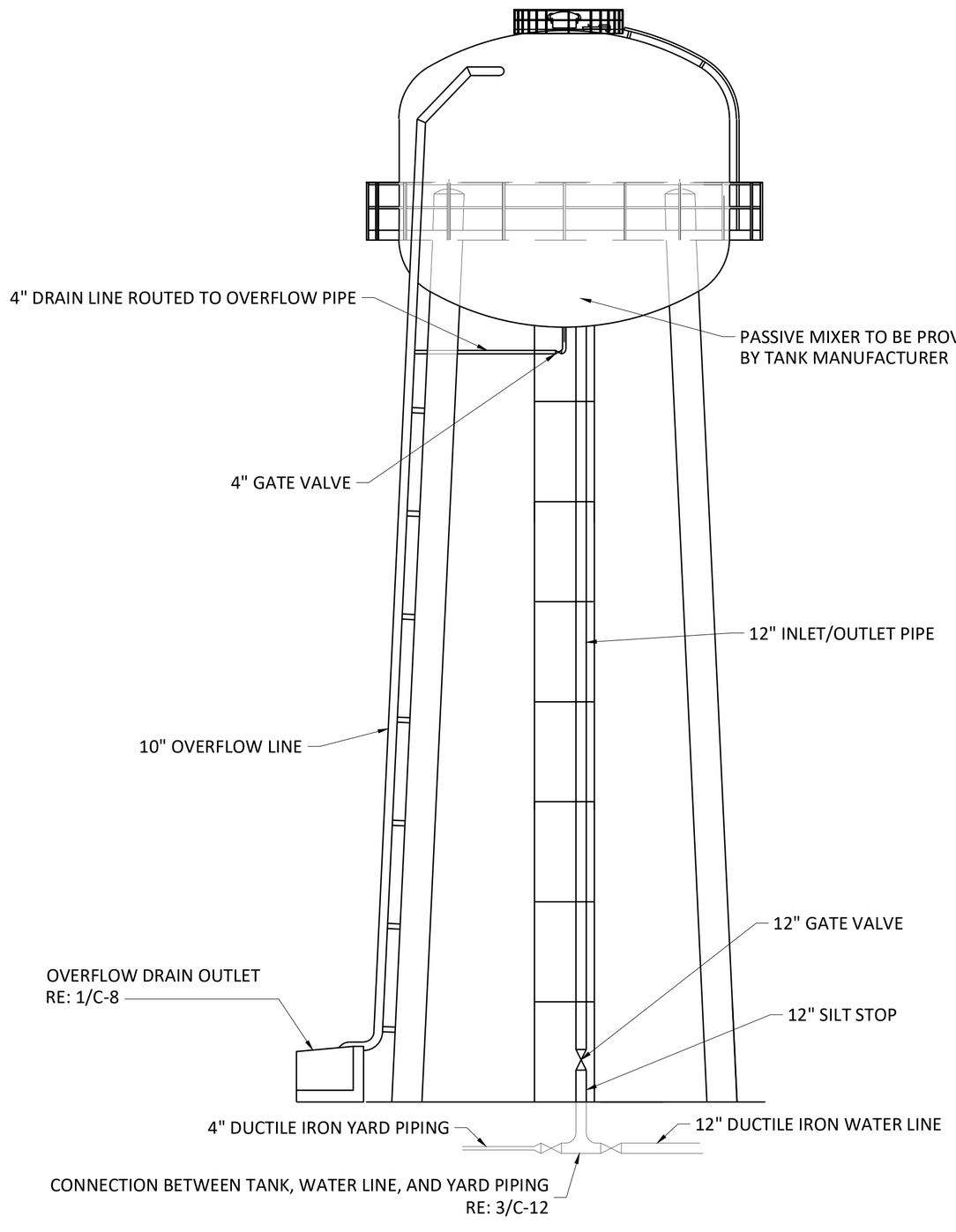
END OF SECTION

GENERAL

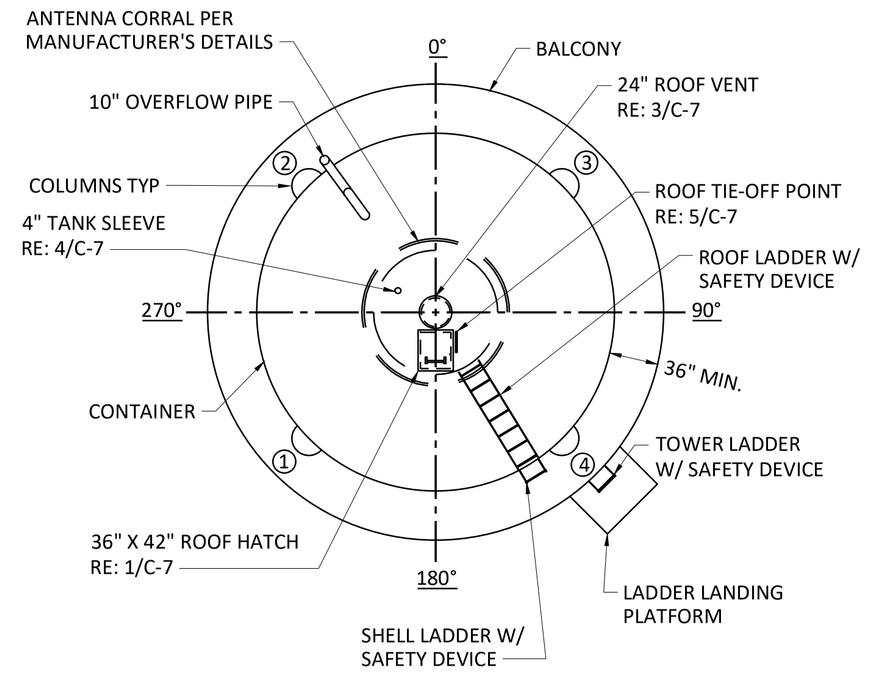
1. ALL ACCESSORIES SHOWN ON THE ELEVATION DRAWING ARE ROTATED FOR CLARITY.
2. THE NUMBER OF PERIMETER COLUMNS SHALL BE PER MANUFACTURER'S STANDARD DESIGN.
3. ALL LADDERS, LADDER SAFETY DEVICES, PLATFORMS, HANDRAILS, ETC. SHALL CONFORM TO CURRENT OSHA REGULATIONS.
4. TANK CONTRACTOR SHALL GROUT BENEATH COLUMN AND RISER BASE PLATES UPON COMPLETION OF ERECTION.
5. SURFACE PREPARATION AND COATING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
6. THE TANK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C652-02.
7. SUPPORTS FOR OVERFLOW PIPING INSIDE TANK BOWL SHALL BE DESIGNED BY TANK MANUFACTURER.
8. CONTRACTOR RESPONSIBLE FOR INCLUDING OPERATOR FOR DRAIN LINE VALVE THAT IS ACCESSIBLE FROM GROUND LEVEL INSIDE THE RISER.
9. TANK MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE TANK FOUNDATION.
10. CONNECT 12" STEEL INLET/OUTLET PIPE TO PROPOSED 12" DUCTILE IRON WATER LINE BELOW GRADE. COORDINATE WITH TANK MANUFACTURER.
11. TANK MANUFACTURER TO PROVIDE SHOP DRAWINGS FOR ALL BALCONIES, HANDRAILS, ACCESS LADDERS, AND PLATFORMS.
12. TANK MANUFACTURER TO PROVIDE SHOP DRAWINGS FOR PASSIVE MIXING SYSTEM.
13. 4" DRAIN LINE SHOWN FOR REFERENCE ONLY. PLACEMENT SHALL BE DESIGNED BY THE CONTRACTOR WITH ENGINEER APPROVAL.



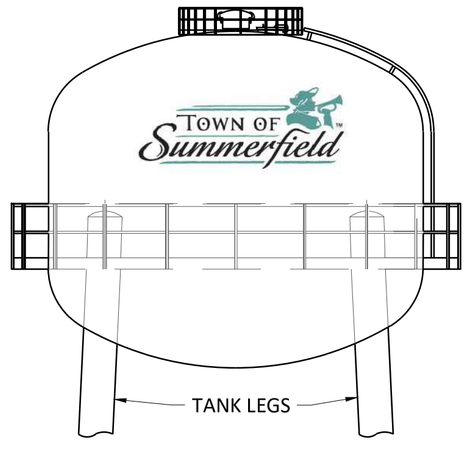
1 / C-5 ELEVATION
NOT TO SCALE



2 / C-5 ENLARGED SECTION
NOT TO SCALE



3 / C-5 TANK ROOF PLAN
NOT TO SCALE



NOTES

1. SUBJECT TO CHANGE, THE PROPOSED TANK SHALL BE DARK GREEN WITH (2) ALL WHITE TOWN LOGOS. COORDINATE FINAL LOGO DESIGN AND PLACEMENT WITH THE OWNER.
2. INCLUDE TWO LOGOS IN BID.

4 / C-5 TANK LOGO
NOT TO SCALE

ISSUED FOR BID

Freese and Nichols, Inc
North Carolina Registered Engineering Firm C-3916

FREESE NICHOLS
1001 Tuckaseegee Rd.
Suite 120
Charlotte, NC 28208
Phone - (704) 251-0178
Web - www.freese.com

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054851 JOANNA ALLEN 5/4/2026

TOWN OF SUMMERFIELD
WATER SYSTEM IMPROVEMENTS

CIVIL
TANK PLAN, SECTION, AND ELEVATION

NO.	ISSUE	BY	DATE
2	ADDENDUM 02	JRA	5/4/2026
1	ISSUED FOR BID	JRA	2/20/2026
	VERIFY SCALE Bar Scale is one inch on original drawing. If not one inch on this sheet, adjust scale.		

F&N JOB NO.	SMF24162
DATE	APRIL 2026
DESIGNED	JRA
DRAWN	KALP
CHECKED	BCJ
APPROVED	JRA
FILE NAME	CV-TANK-PLAN.dwg

SHEET C-5
SEQ. 9 OF 32