



ADDENDUM NO. 4 TO CONTRACT DOCUMENTS

Project	Wareham WPCF Improvements – Phase I	Project No.	11221642
Owner	Town of Wareham, MA	Federal Project No.	CW SRF No. 6642
Contract No.	2021-WW-01	Date	May 3, 2021

To All Contractors:

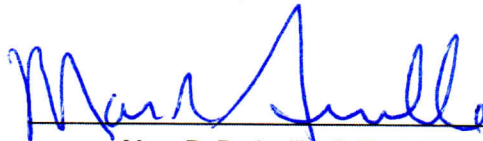
Contractors submitting proposals for the above-named project shall take note of the following changes, additions, deletions, clarifications, etc., in the Contract Documents, which shall become a part of and have precedence over anything contrarily shown or described in the Contract Documents, and all such shall be taken into consideration and be included in the Contractor's bid proposal.

Please note, this addendum changes the General Contractor's Scope of Work, see Item No. 1.

Please see attached pages.

The return receipt requested with this communication is to be deemed evidence that the bidder has received this addendum and has followed the instructions outlined therein.





Marc R. Drainville, P.E., BCEE, LEED AP



ITEM NO. 1.

On Thursday, April 29, 2021, Filed Sub-bids were opened for the Masonry, Miscellaneous and Ornamental Iron, HVAC, and Electrical Work.

Two bids were received for the HVAC work, described in Section 15001. One of these bids was restricted to the use of one General Construction bidder. The other bid was restricted and may not be used by one of the General Bidders who attended the mandatory (for General Contractors) Pre-Bid conference.

Two bids were received for the Electrical Work, described in Section 16001. One of these bids was restricted to the use of one General Construction bidder. The other bid was rejected for failing to fill out Paragraph E.

Therefore, per M.G.L. Chapter 149, Section 44F(4)(a)(1), as the only sub-bids for HVAC Work and for Electrical Work are restricted or rejected, the general bidder shall include in the cost of his own work an amount to cover all the work required for the HVAC Sub-bid work and for the Electrical Sub-bid work as described in Sections 15001 and 16001 of the Contract Documents, respectively. The General Contractor shall provide for the Work covered by the HVAC and Electrical Work subtrades to be done by a qualified and responsible sub-contractor, subject to the written approval of the Owner (Town of Wareham). If the Owner determines that the sub-contractor chosen by the General Contractor for Electrical Work is not qualified or responsible, the General Contractor shall obtain another sub-contractor who is satisfactory to the awarding authority with no adjustment in the General Contractor's price.

Subcontractors for the HVAC Work and for the Electrical Work shall be certified by the Division of Capital Asset Management (DCAM) for the respective trade.

This addendum will delete Specification Section 15001 and make other changes to reassign the work formerly assigned to the HVAC filed sub-bidder to the general bidder. The results of the Filed Sub-Bid opening can be found in Item No. 2.

This addendum will delete Specification Section 16001 and make other changes to reassign the work formerly assigned to the Electrical filed sub-bidder to the general bidder. The results of the Filed Sub-Bid opening can be found in Item No. 2.

ITEM NO. 2.

The results of the Filed Sub-Bid opening are included in the attached Canvass of Bids.

ITEM NO. 3.

Section 00400 – Form for General Bid

- A. DELETE Section 00400 in its entirety and REPLACE the Bid Form with the attached Bid Form.



ITEM NO. 4.

Section 01026 – Lump Sum Items (Bid Item Descriptions)

- A. Paragraph 1.04 LIST OF LUMP SUM ITEMS: For Bid Item F-3, DELETE the text “Heating, Ventilating, and Air Conditioning” and REPLACE with the text “NOT USED”.
- B. Paragraph 1.04 LIST OF LUMP SUM ITEMS: For Bid Item F-4, DELETE the text “Electrical and Instrumentation” and REPLACE with the text “NOT USED”.
- C. BID ITEM DESCRIPTION – BI-1: For Section C – Associated Work Not Included Under This Item, DELETE the sentence beginning “Mobilization for filed subbids...” in its entirety, and REPLACE with “Mobilization for filed subbids shall be included in Bid Items F-1 and F-2 and not included in this Bid Item.”
- D. BID ITEM DESCRIPTION – BI-2: For Section B – Work Included Under this Item, DELETE the Specification Sections listed for Division 15, and REPLACE with “All work included under Division 15.”
- E. BID ITEM DESCRIPTION – BI-2: For Section B – Work Included Under this Item, ADD the following at the end of the list “All work included under Division 16.”, and “All work included under Division 17.”
- F. BID ITEM DESCRIPTION – F-3:
 - 1. For the Title, DELETE the text “HEATING, VENTILATING, AND AIR CONDITIONING” and REPLACE with the text “NOT USED”.
 - 2. DELETE Sections A, B, C, and D in their entirety.
- G. BID ITEM DESCRIPTION – F-4:
 - 1. For the Title, DELETE the text “ELECTRICAL AND INSTRUMENTATION” and REPLACE with the text “NOT USED”.
 - 2. DELETE Sections A, B, C, and D in their entirety.

ITEM NO. 5.

Section 02698 – Underground Process Piping

- A. Paragraph 2.02.B: DELETE paragraph 15 in its entirety.

ITEM NO. 6.

Section 13133 – FRP Covers

- A. DELETE Section 13133 in its entirety and REPLACE with attached Section 13133 – FRP Covers.



ITEM NO. 7.

Section 15001 – HVAC Work – General (FILED SUB-BID REQUIRED)

- B. DELETE Section 15001 in its entirety.

ITEM NO. 8.

Section 16001 – Electrical Work – General (FILED SUB-BID REQUIRED)

- A. DELETE Section 16001 in its entirety.

ITEM NO. 9.

Drawing S101 – Equalization Basin No. 5 – Upper Plan

- A. EQUALIZATION BASIN NO. 5 UPPER PLAN: DELETE callout “36” x 36” ALUMINUM OBSERVATION HATCH (TYP OF 9)” in nine (9) locations and REPLACE with callout “36” x 36” FRP OBSERVATION HATCH (TYP OF 9)”.
- B. EQUALIZATION BASIN NO. 5 UPPER PLAN: DELETE callout “48” x 48” ALUMINUM ACCESS HATCH (TYP OF 2)” in two (2) locations and REPLACE with callout “48” x 48” FRP ACCESS HATCH (TYP OF 2)”.
- C. EQUALIZATION BASIN NO. 5 UPPER PLAN: DELETE callout “48” x 48” ALUMINUM EQUIPMENT HATCH (TYP OF 2)” in two (2) locations and REPLACE with callout “48” x 48” FRP EQUIPMENT HATCH (TYP OF 2)”.

ITEM NO. 10.

Drawing S102 – Equalization Basin No. 5 – Sections

- A. SECTION A: DELETE callout “36” x 36” ALUMINUM OBSERVATION HATCH (TYP OF 9)” and REPLACE with callout “36” x 36” FRP OBSERVATION HATCH (TYP OF 9)”.
- B. SECTION A: DELETE callout “48” x 48” ALUMINUM ACCESS HATCH (TYP OF 2)” and REPLACE with callout “48” x 48” FRP ACCESS HATCH (TYP OF 2)”.
- C. SECTION A: DELETE callout “48” x 48” ALUMINUM EQUIPMENT HATCH (TYP OF 2)” and REPLACE with callout “48” x 48” FRP EQUIPMENT HATCH (TYP OF 2)”.
- D. SECTION B: DELETE callout “48” x 48” ALUMINUM ACCESS HATCH (TYP OF 2)” and REPLACE with callout “48” x 48” FRP ACCESS HATCH (TYP OF 2)”.
- E. SECTION B: DELETE callout “48” x 48” ALUMINUM EQUIPMENT HATCH (TYP OF 2)” and REPLACE with callout “48” x 48” FRP EQUIPMENT HATCH (TYP OF 2)”.

ITEM NO. 11.

Drawing S103 – Equalization Basin No. 5 – Framing Plan

- A. EQUALIZATION BASIN NO. 5 UPPER PLAN: DELETE callout “OPENING FOR 36” x 36” ALUMINUM OBSERVATION HATCH (TYP OF 9)” and REPLACE with callout “OPENING FOR 36” x 36” FRP OBSERVATION HATCH (TYP OF 9)”.



- B. EQUALIZATION BASIN NO. 5 UPPER PLAN: DELETE callout “OPENING FOR 48” x 48” ALUMINUM ACCESS HATCH (TYP OF 2)” in two (2) locations and REPLACE with callout “OPENING FOR 48” x 48” FRP ACCESS HATCH (TYP OF 2)”.
- C. EQUALIZATION BASIN NO. 5 UPPER PLAN: DELETE callout “OPENING FOR 48” x 48” ALUMINUM EQUIPMENT HATCH (TYP OF 2)” in two (2) locations and REPLACE with callout “OPENING FOR 48” x 48” FRP EQUIPMENT HATCH (TYP OF 2)”.
- D. EQUALIZATION BASIN NO. 5 UPPER PLAN: ADD a note to the drawing as follows:

“NOTE:

- 1. SUPPORT OF FRP COVER AS DESIGNED IS FOR ALUMINUM SUPPORT FRAMES. FRP SUPPORT FRAMES ARE ACCEPTABLE IF THEY ARE DESIGNED BY THE FRP MANUFACTURER AND IN ACCORDANCE WITH SECTION 13133. IF FRP SUPPORT MEMBERS ARE SUPPLIED DESIGN SHALL BE SIGNED AND SEALED BY PROFESSIONAL ENGINEER LICENSED IN MA.”

ITEM NO. 12.

Drawing C903 – Miscellaneous Details III

- A. Detail 7: Detail indicates a 24” manhole frame and cover. DELETE dimensions for 24” cover and REPLACE with dimensions for a 30” cover.

Attachment for Item No. 2

Canvass of Bids

CANVASS OF BIDS
FILED SUB-BIDS BID OPENING OF APRIL 29, 2021 at 2:00 P.M.
TOWN OF WAREHAM WATER POLLUTION CONTROL FACILITY IMPROVEMENTS
CONTRACT 2020-WW-01 - CWSRF No. 6442

Contractor	Category	Bid Price Total	Restrictions: May be Used by Any Bidder Except:	Restrictions: May Only be Used by the Following General Bidders:	Paragraph E Sub-bidder	Sub-bid Price	Comments
Commercial Masonry Corporation	Masonry	\$ 74,800.00			NA		
Fernandes Masonry, Inc.	Masonry	\$ 124,000.00			NA		Rejected: Addenda not acknowledged
Folan Waterproofing & Construction Co., Inc.	Masonry	\$ 99,810.00			NA		
Kenny Masonry, LLC	Masonry	\$ 177,795.00			NA		Rejected: Addenda not acknowledged
K Walter Construction Inc.	Masonry	\$ 109,000.00			NA		
Marmelo Brothers Construction	Masonry	\$ 116,000.00			NA		
L&L Contracting, Inc.	Miscellaneous and Ornamental Iron	\$ 337,700.00			NA		
Waterline Industries Corporation	Miscellaneous and Ornamental Iron	\$ 117,677.00		Waterline Industries Corporation	NA		
G+H Heating + Cooling LLC	HVAC	\$ 81,600.00	Northern Construction, Builders Systems Inc, Waterline Industries, Winston Builders		HVAC Control + Sequence :The Steele Machine	\$ 5,200.00	
					Testing + Balancing: Theman Young + Assoc.	\$ 889.00	
Waterline Industries Corporation	HVAC	\$ 67,677.00		Waterline Industries Corporation	Testing, Adjusting & Balancing : Airadigm Solutions	\$ 1,800.00	
Fall River Electrical Associates Co., Inc.	Electrical and Instrumentation	\$ 778,361.00	Waterline Industries Corporation		None		Rejected: Nonresponsive to paragraph E Subbidder
Waterline Industries Corporation	Electrical and Instrumentation	\$ 477,677.00		Waterline Industries Corporation	Instrumentation: RE Erickson Co., Inc	\$ 71,542.00	

Attachment for Item No. 3

Section 00400 – Form for General Bid

**FORM FOR GENERAL BID
FOR
CONSTRUCTION OF CONTRACT NO. 2021-WW-01
WATER POLLUTION CONTROL FACILITY IMPROVEMENTS – PHASE 1
CWSRF NO. 6642
WAREHAM, MA**

THIS BID IS SUBMITTED TO:

Water Pollution Control Facility
6 Tony's Lane
Wareham, MA 02571

A. The Undersigned proposes to furnish all labor and materials required for Water Pollution Control Facility Improvements – Phase 1 (project) in Wareham, Massachusetts, in accordance with the accompanying plans and specifications prepared by GHD Inc. for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda numbered _____ to _____

C. The proposed contract price is _____ dollars

(\$ _____). Total of Items A and B.

D. Subdivision of Proposed Contract Price and Alternates Price

1. The subdivision of the proposed contract price is as follows:

ITEM A. The work of the General Contractor, being all work other than that covered by Item 2.

\$ _____ and consisting of the following:

Bid Item No. 1 Mobilization (max 5% of Bid Items 2 and 3):

\$ _____

Bid Item No. 2 Modification to the Wareham WPCF:

\$ _____

Bid Item No. 3 Stipulated Procurement Price for Denitrification Filters:

\$ 780,385.00 _____

Total Item A: (Sum of Bid Item No. 1 through Bid Item No. 3):

\$ _____

BID FORM

ITEM B. Sub-bids as follows:

Sub-trade	Name of Sub-bidder	Amount	Bonds required, (indicate by "Yes" or "No")
F-1: Masonry	_____	\$ _____	_____
F-2: Misc. and Ornamental Iron	_____	\$ _____	_____

Total of Items A and B: \$ _____

In words: _____

The undersigned agrees that each of the above named sub-bidders will be used for the work indicated at the amount stated, unless a substitution is made. The undersigned further agrees to pay the premiums for the performance and payment bonds furnished by sub-bidders as requested herein and that all of the cost of all such premiums is included in the amount set forth in Item 1 of this bid.

The undersigned agrees that if he is selected as general contractor, he will promptly confer with the awarding authority on the question of sub-bidders; and that the awarding authority may substitute for any sub-bid listed above a sub-bid filed with the awarding authority by another sub-bidder for the sub-trade against whose standing and ability the undersigned makes no objection; and that the undersigned will use all such finally selected sub-bidders at the amounts named in their respective sub-bids and be in every way as responsible for them and their work as if they had been originally named in this general bid, the total contract price being adjusted to conform thereto.

- E. The undersigned agrees that, if he is selected as general contractor, he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price; provided, however, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony withall other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.

The undersigned hereby certifies that the proposed Project Manager and proposed Superintendent whose resumes are attached to this bid will be assigned to this project in their respective roles and becommitted full-time to this project. Should either the Project Manager or Superintendent be unavailable at the start of or at any time during the Contract, the qualifications of the replacement Project Manager or Superintendent will be presented to the Owner for acceptance, and that the Owner reserves the right to reject the replacement.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona

BID FORM

fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

F. Bidder Acknowledgements (SRF Requirements)

1. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The time period for holding bids, where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids and where Federal approval is required, the time period for holding bids is 30 days, Saturdays, Sundays and holidays excluded after Federal approval.
2. Bidders must fully comply with Subpart C of 2 CFR Part 180 and 2 CFR Part 1532, entitled Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons). Contractors, subcontractors, or suppliers that appear on the Excluded Parties List System at www.epls.gov are not eligible for award of any contracts funded by the Massachusetts State Revolving Fund.
3. If Contract is awarded, successful Bidder will submit a Payment Bond in the amount of 100% of the total contract price.
4. If Contract is awarded, successful Bidder will submit a Performance Bond in the amount of 100% of the total contract price.
5. Bidder agrees that the Work will be substantially completed and ready for final payment in accordance with paragraphs 14.04 and 14.07 of the General Conditions and Supplementary Conditions within the number of calendar days indicated in the Agreement. The time of completion of this contract is 340 calendar days for Substantial Completion after the date contained in the Notice to Proceed, and 400 calendar days for completion and final payment.
6. Bidder accepts the provisions of the Agreement as to liquidated damages. Liquidated damages specified in this contract are \$1,900.00 per day for each calendar day beyond the Substantial Completion date that Work remains uncompleted plus any costs incurred by the Owner as result of penalties assessed or costs incurred to defend or renegotiate the consent order contained in Appendix G of the Supplementary Conditions and \$850.00 per day for each calendar day beyond the date for completion and final payment plus any costs incurred by the Owner as result of penalties assessed or costs incurred to defend or renegotiate the consent order contained in Appendix G.
7. Contract award shall be based upon lowest bid for base work if no alternate work will be performed. If alternate work will be performed, the Contract award shall be based upon the lowest bid for the sum of base work and one or more alternates with the Town considering alternates in ascending numerical sequence, such that no single alternate shall be considered unless every alternate preceding it on the list has been added to the base bid (per Chapter 149 44G (B)).
8. All aspects of this project are SRF eligible.

BID FORM

G. Attachments to this Bid

The following documents are submitted with and made a condition of this Bid:

1. Bid Form
2. Required Bid Security in the form of a Bid Bond or certified check, or money order
3. Massachusetts DEP Certification Statement Regarding State Taxes, Equal Employment Opportunity, Non-Debarment, and Non-Collusion
4. Certification: American Iron and Steel Compliance
5. Statement of Intent to Comply (MassDEP Diesel Retrofit Program)
6. Massachusetts DEP Certification OSHA Training
7. Proposal Form Affidavit
8. Certification: Division of Capital Asset Management for GC
9. MBE/WBE/DBE SRF Forms
10. Certification: Division of Capital Asset Management for HVAC
11. Certification: Division of Capital Asset Management for Electrical / Instrumentation

Date _____

(Name of General Bidder)

By _____
(Printed Name of Person Signing Bid and Title)

By _____
(Signature of Person Signing Bid and Title)

(Business Address)

(City and State)

Attachment for Item No. 6

Section 13133 – FRP Covers

SECTION 13133

FIBERGLASS ODOR CONTROL COVERS

PART 1 GENERAL

1.01. DESCRIPTION OF WORK

- A. Furnish, install, and test removable, pre-engineered, flat fiberglass reinforced plastic (FRP) covers, complete with all necessary structural support framing, flashing and trim, fasteners and anchors, gaskets, sealants, and other accessories and appurtenances listed herein and shown on the drawings.
- B. Covers shall be provided and installed at the following locations as shown on the Contract Drawings:
 - 1. Equalization Basin No. 5

1.02. RELATED SECTIONS

The specification sections listed below are an integral part of this specification, and the General Contractor shall be responsible for providing these specifications to the cover supplier.

- 1. Section 01400 – QUALITY CONTROL
- 2. Section 01640 – EQUIPMENT-GENERAL
- 3. Section 01660 – TESTING AND STARTUP
- 4. Section 05500 – MISCELLANEOUS FABRICATIONS
- 5. Section 05505 – CONCRETE AND MASONRY ANCHORS

1.03. REFERENCES

- A. The following codes and standards form a part of this specification:
 - 1. ADMI-05 – Aluminum Design Manual, Parts 1-A and 1-B.
 - 2. ASCE 7 – Minimum Design Loads for Buildings and Other Structures
 - 3. ASCE 8 – Specification for Design of Stainless Steel Structural Members.
 - 4. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.
 - 5. ASTM D790 – Standard Test Method for Flexural Properties of Plastics and Electrical Insulating Materials.
 - 6. ASTM D695 – Standard Test Method for Compressive Strength of Plastics.
 - 7. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Plastic.

1.04. SYSTEM DESCRIPTION

- A. Fiberglass covers shall be clear spanning and either self-supporting or supported underneath with stainless steel, aluminum or FRP support beams.
- B. Fiberglass cover panels shall be installed on top of walls and have non-slip surfaces.
- C. Aluminum framing designed by engineer will be utilized for support of the system as indicated on the drawings. Design for fastening of covers to be coordinated by the Contractor.
- D. FRP Deck Panels – Large-Scale Uniform Load and Deflection Test.
- E. FRP Structural Components – 3-Point Load Bending Test.

1.05. DESIGN REQUIREMENTS

- A. Contractor-Furnished Design – Design FRP covers and support framing, including connections, for the design load conditions and spans indicated on the Contract Drawings and for additional loads imposed by openings and support of the work of other trades.
- B. The overall cover and support system shall be designed by a professional engineer currently licensed to practice in the Commonwealth of Massachusetts.
- C. The covers and individual structural support members and components shall be designed to accommodate the Structural Design Criteria indicated on Contract Drawing S-001 and the specified loadings herein:
 - 1. Dead load shall consist of the full dead weight of the cover plus all attached or supported materials, including piping and supports.
 - 2. Uniform Live Load – 50 lbs. per square foot. Uniform live load to be applied over the total projected area.
 - 3. Concentrated Live Load – 400 lbs. concentrated load on a 6-inch by 6-inch area at any point. This load is to be considered as acting separately and not simultaneously with other live loads.
 - 4. Wind Loading – ± 25 lbs. per square foot acting normal to cover surface.
 - 5. Thermal Expansion – The temperature range from -30 degrees F to +110 degrees F.
 - 6. Internal Design Pressures – 1-inch water column (vacuum).
 - 7. Design shall include all load combinations indicated in ASCE 7, which provide worst case loading.
 - 8. Deflection requirements of cover system and components shall be as follows:
 - a. For dead load plus live load combination, the deflection of all components (structural and cladding) shall not exceed $L/180$, with L equal to the span of the component.
 - b. For live load only, deflection shall not exceed $L/240$. Submittal shall include a deflection table.

- c. At full deflection, covers shall be self-draining as indicated above (no ponding allowed).
- D. The covers and individual structural support members shall be designed to accommodate the specified loadings within the stress limitations.
- E. The design shall also take into account the required vent and access hatch openings with additional members or built-up sections as necessary to sustain stress concentrations.
- F. All covers shall be flat and mounted on top of walls.
- G. All beams used to support the cover panels shall be aluminum, stainless steel, or FRP and as specified herein.
- H. Contractor shall coordinate supports, cover installation, and dimensions with all equipment and odor control pipe connections.

1.06. COORDINATION

- A. Contractor shall coordinate layout of covers and of openings and penetrations with the cover system manufacturer.
- B. Contractor shall coordinate supports, cover installation, and dimensions with all equipment and pipe connections.
- C. Contractor shall coordinate cover installation to occur after application of concrete coatings and equipment installation below covers.

1.07. PERFORMANCE REQUIREMENTS

- A. The cover panels shall create a relatively airtight seal between adjacent cover sections (panels). Cover penetrations shall maintain the airtight seal.
- B. The design shall prevent water ponding. Covers shall be sloped to drain. Edge seals shall be interrupted to allow runoff water to drain into the covered tank.
- C. The covers shall not interfere with the proper operation of any mechanisms or equipment.

1.08. SUBMITTALS

- A. Shop Drawings
 - 1. Shop drawings shall accurately show all details of support framing, covers, openings, curbs, frames, connections, fasteners, etc. Shop drawings shall show plan layout of the entire cover system, including all access hatch locations.
 - 2. The shop drawings shall include a summary of all loads and design criteria used by the manufacturer. The design summary shall state the maximum deflections at each span.
 - 3. All calculations and shop drawings shall be prepared, sealed, and signed by the professional engineer responsible for the overall system design. Reference Article 1.05 above.

4. Provide two file copies of calculations for each cover system, including all structural support members. The prepared calculations shall include a stamped and sealed design summary page to list all design loads, design standards, material specifications, and design criteria used in the calculations. Only the design summary page will be reviewed. Calculations will not be reviewed by the Engineer; calculations will not be returned to the Contractor.
 5. Shop drawings shall not be submitted until the Contractor has field verified the location of all equipment that will break the plane of the covers or could impact the cover installation.
 6. Shop drawings shall show clearances between tank components and cover system.
 7. Fabrication shall not begin until the Engineer has approved the shop drawings.
- B. Manufacturer's cover removal and re-installation instructions.
 - C. Manufacturer's installation certificate.
 - D. Manufacturer's cover warranty.
 - E. Panel sample (minimum 6-inch by 6-inch) to show surface finish, handle, and workmanship.
 - F. Manufacturer's standard color selection chart. Color to be selected by Owner.

PART 2 PRODUCTS

2.01. MANUFACTURERS

- A. Covers and accessories shall be provided by a single supplier.
- B. Covers shall be the Tuff Span XL3 Cover System as manufactured by Enduro, or approved equal.

2.02. MATERIALS AND ACCESSORIES

- A. Unless otherwise specified, all materials and equipment shall be standard commercial products in regular production by the manufacturer and suitable for the required service.
- B. Structural shapes shall be Type 316 stainless steel or aluminum alloy 6061-T6. Reference Section 05500, Miscellaneous Fabrications.
- C. Fasteners shall be Type 316 stainless steel, 2024-T4 or 7075-T73 aluminum bolts with self-locking nuts. The entire fastener assembly (nut, washer and bolt) shall be of the same material.
- D. Anchor bolts, washers, and nuts shall be Type 316 stainless steel adhesive anchors per Section 05505, Concrete and Masonry Anchors.
- E. Sealant shall be silicone-based sealant. Sealants shall be resistant to ultraviolet light.
- F. All gaskets shall be santoprene, neoprene, or silicone and shall be shielded from exposure to ultraviolet light.

- G. Hatches shall have an airtight seal with the cover. Hatches shall be flush mounted and shall not be more than 1/2 inch above the rest of the cover. Hatches shall be provided with gear hinges.

2.03. EQUIPMENT DESIGN

FRP structural components, beams, and framing shall be manufactured by pultrusion process. Contact molded or hand-laid up fiberglass materials are not acceptable as structural components.

A. Cover Deck Panels

- 1. Resin type for FRP tank cover decking shall be UV stabilized, isophthalic polyester. General purpose or orthothalic polyester is not acceptable.
- 2. Glass fiber reinforcements shall be 50% (minimum) of the material weight.
- 3. Materials shall be fire retardant and have a flame spread rating of 25 or less when tested in accordance with ASTM E84 (UL723).
- 4. Materials shall exhibit the following physical properties (at a minimum):

Property	Value	Reference Standard
Tensile strength	40,000 psi	ASTM D638
Flexural strength	45,000 psi	ASTM D790
Flexural modulus	1,600,000 psi	ASTM D790
Compressive strength	37,000 psi	ASTM D695
Izod impact (notched)	25	ASTM D256
Water absorption	0.25 percent maximum	ASTM D570

- 5. Deck panels shall be sealed at side-laps with non-adhesive, 1" diameter neoprene bulb gasket (conforming to ASTM C864). The side-lap gaskets shall be factory installed and oriented vertically so they are compressed when an adjacent panel is placed into position.
- 6. Each panel shall be accessible for vertical lifting with integral handles or lifting handle slats located at approximately each end. Handles shall not extend above cover surface or pond water. Lifting slats shall be continuous across the panel.
- 7. Male deck panels shall be removable by detachment of no more than two fasteners at each panel end (except where structural conditions require additional panel attachment). Female deck panels do not require any fasteners.
- 8. The top of the tank cover decking shall be flat with factory applied, non-skid surface. The non-skid surface shall not be achieved by the use of paint or adhesive tapes.

B. Hatches

- 1. Access hatches shall be raised with one-leaf hatch door and fabricated from pultruded fiberglass components.
- 2. Locations of access hatches shown on the Drawings are approximate. Access hatches and framing shall fit inside a single deck panel so that individual deck panels with hatches can be removed without affecting adjacent panels and not require

additional framing. Size of hatches shall be 22 inches by 36 inches, unless indicated otherwise on the Contract Drawings.

3. Underside of hatch lids shall be fully sealed with factory installed, 3/8-inch diameter neoprene bulb gasket. Perimeter hatch curb shall be sealed to decking surface with adhesive sealant.
4. The hinged access hatches shall weigh no more than 50 lbs. Hatches shall have an airtight seal with the cover. Hinged panel components including hinges, decking and lifting handles shall be extruded 316 stainless steel.
5. Hatches shall have a stainless steel hold-open device to prevent door from blowing open or closing on itself.

Hatches shall be secured with hand-operable latches and without special tools.

6. Hatch lids shall have a factory applied non-skid, UV resistant surface with plastic or stainless steel lift handles.
7. Hatch openings shall be factory cut into the tank cover decking by Manufacturer.

C. FRP Beams and Structural Framing

1. Resin type for FRP beams and framing members shall be vinyl ester.
2. Glass fiber reinforcements shall be 50 percent (minimum) of the material weight.
3. Structural components shall be fire retardant and have a flame spread rating of 25 or less when tested in accordance with ASTM E84 (UL723).
4. Metallic angles or plates attached to FRP beams or fastening connections shall be 316 stainless steel.
5. Sizing and spacing of support beams shall be in accordance with Article 1.05 of this section.

D. Flashing and Trim

1. Fiberglass flashing shall be isophthalic polyester with thickness, dimensions, and profile as shown on the drawings.
2. Non-radius end flashing shall be factory attached to individual, rectangular deck panels.
3. Flashing at the perimeter of a tank shall be a separate part and field attached by the installing contractor.

E. Air Vents and Connections (if indicated on Drawings) – Provide gooseneck ventilation piping with bird screen. Size and quantity shall be as indicated on drawings.

F. Pipe Penetrations

1. The Contractor shall not field install any of the pipe penetrations. All pipe penetrations shall be fabricated in the tank cover to assure an airtight seal.

2. Sheet neoprene or silicone shall be used to seal around gaps at all cover penetrations. Contractor shall coordinate sealing of gaps with the respective equipment suppliers and the cover manufacturer.
- G. Hardware
1. Fasteners, anchorage, hinges, and other structural accessories located on the underside of cover shall be 316 stainless steel.
 2. Perimeter flashing anchors, concrete anchors, or other hardware not exposed to the inside environment of the tank shall be 304 stainless steel.
 3. Fasteners to attach tank cover decking to structural supports shall be 316 stainless steel.
- H. Gaskets and Sealants
1. All panel side laps and perimeter conditions shall be gasketed.
 - a. Gaskets located along longitudinal side laps between panels shall be factory installed, 1-inch diameter neoprene, bulb type.
 - b. Gaskets under end flashing shall be factory installed, bulb type.
 2. A weatherseal gasket shall form a continuous airtight seal along all panel edges except to allow rainwater runoff to drain into the tank as noted above.
 3. Adhesive sealant shall be applied by Contractor at various locations as required by manufacturer to maximize odor containment.
- I. The cover supplier shall provide all accessories required to attach, support, and seal the covers to the concrete.

PART 3 EXECUTION

3.01. TANK COVER INSTALLATION

- A. Furnish and install the equipment according to the Contract Documents and the manufacturer's instructions.
- B. The tank covers shall not be installed until equipment installation is complete.
- C. Contractor shall field verify all dimensions and elevations and shall notify Engineer of any specific differences.
- D. The flat FRP covers shall be erected in proper alignment by the cover installer. A manufacturer's representative shall supervise the installation and instruct the Owner's operating personnel in care and maintenance of the covers.
- E. Use adequate protection during fabrication, shipment, site storage, and erection to prevent damage to the finish of the FRP covers. The Contractor shall be responsible for protection of the covers during and after erection to prevent stains, discoloration, scratches, and gouges to the FRP surfaces.

3.02. SERVICES OF MANUFACTURER'S REPRESENTATIVE

- A. Provide services of the equipment manufacturer or their approved representative in accordance with Sections 01400, 01640, and 01660.
- B. Provide jointly to the Owner and the Engineer, an installation certificate from the equipment manufacturer or their approved representative stating that the covers have been properly installed and tested to their satisfaction and that all final adjustments required have been made.

3.03. WARRANTY

- A. Provide equipment warranty in accordance with Section 01640.
- B. The cover manufacturer shall guarantee for a period of one year, starting at the time of Substantial Completion, that the covers supplied are free from defects in materials or workmanship and will meet the specified performance requirements when operated in accordance with the manufacturer's recommendations. The manufacturer shall correct any breach in this warranty at their expense.

END OF SECTION