Town of Ridgeland

April 11, 2024

PROJECT: **Town of Ridgeland Well Site No. 3 Improvements TOR-2024-03**

ADDENDUM: **Two (2)**

DUE DATE: **Thursday, April 18, 2024 at 2:00 PM**

THIS ADDENDUM IS FOR THE PURPOSE OF MAKING THE FOLLOWING CHANGES OR CLARIFICATIONS:

QUESTIONS:

1. Plans indicate to remove existing standing seam metal roof and replace with new standing seam metal roof. The existing roof does not appear to be standing seam. Please provide metal roof spec.

Response: (Reference notations on drawing A-5 at end of Addendum No. 2) For clarity see photos above. Existing standing seam roof to be removed along with what appears to be a asphalt shingle layer below.

Provide a new layer of ice and watershield membrane and standing seam metal roof similar to product provided by 4M Metals 843-208-2433 or approved equal. Color to be chosen by Owner.

2. I read on 11220-6 subsection I " I. All pumps and motors shall be rated for continuous duty and shall be capable of pumping the specified flow range without cavitation or excess vibration. The pumps shall not infringe upon the motor service factor at any point of the full speed curve" Can we get some supporting documentation that this well will

produce the Specified flow range without cavitation? From my interpretation the contractor is to be responsible for ensuring that the well is capable of providing enough water to meet your requirements? We dont have any well information at this time in regards to depth, screen size and quantity, and previously tested pumping rates and drawdown. I would also ask that the job require the well to have a video log after the Pump is removed in order to inspect the conditions of the well and screens. If any well rehabilitation needs to be done that would be an addendum to the project, correct?

Response: Based on recent information from the Town, the current pump flow rate is 1410 gpm. Based on available information, the well is 453 ft deep. The exact construction of the well is unknown.

Conducting a video log of the well after pump removal has been added to the bid form as an additive alternate. If rehabilitation needs are identified, a modification of project scope will be developed for Town review and negotiation, if acceptable to Town.

3. In 11220-13 reads " E. Field Testing: 1. Upon completion of all the mechanical work, the CONTRACTOR shall conduct testing as specified herein to demonstrate that the equipment performs in accordance with all specifications. 2. The CONTRACTOR shall perform initial testing of the equipment ensuring to himself that the tests listed in the Demonstration Test paragraph below can be completed. 3. The Demonstration Test shall demonstrate that all items of these Specifications have been met by the equipment, as installed, and shall include the following tests: a. That the pumps can deliver the specified pressure and quantity at rated efficiency. b. That the pump controls perform satisfactorily. 4. In the event that the equipment does not meet the Demonstration Test, the CONTRACTOR shall, at his own expense, make such changes and adjustments in the equipment which he deems necessary and shall conduct further tests until written certification is received from the ENGINEER.

Should the contractor be responsible for the pump not making the gpm and pressure if the well condition is unknown or not provided? If upon the pump test it is proven that the head conditions or water level drawdown is not adequate for the pump that is specified will the Town pay for the expenses necessary to remediate the problem?

Response: Reference response to question 2.

4. Lastly the drawing C4 calls out for a 2.5" access tube for the new transducer , a 2" access tube for future use , and a casing vent. The current casing vent is installed in the top of the discharge head and there are currently no other provisions in place for the 2.5" and the 2" access tubes. Can we simply have the discharge head built with the 2.5", 2", and casing vent in place vs trying to drill through concrete and well casing to install these tubes? I believe this would save considerable expense and accomplish the same goals as I have done this in the past.

Response: Yes, it is acceptable to have the tubes and vent built in with the discharge head. Drawing C-4 notes have been modified to include this alternative.

5. We would like to get some clarification on the NEMA rating of the electrical equipment enclosures. As it stands, the plans call for the electrical equipment enclosures to be NEMA 3R, however, it appears the specifications call for NEMA 4X Stainless Steel.

Response: The electrical equipment enclosures shall be NEMA 4X stainless steel for exterior, interior pump room, and interior chemical room locations.

6. Request to name Sherwin Williams as an approved equal for coatings.

Response: Yes, Sherwin Williams is acceptable as an approved equal for the project. All supplied products must meet or exceed the requirements of Section 09900: Protective Coatings.

PROJECT CONTRACT DRAWINGS have been updated and are reissued with Addendum 2 in their entirety as a separate document. Modified drawings have been addended with bubble and numbering. Primary modifications include but are not limited to:

1. Cover Dwg: updated sheet list to include electrical and architectural and new detail drawings D-3 and D-4.
2. G-1 Dwg – General Notes: updates to general notes 13, 14, 21, 22, 26 and 27.
3. G-3 Dwg – Existing Conditions: additional photo callout #13
4. G-5 Dwg – Well Site#3 Photos: Added Photo 13
5. G-6 Dwg – Well Site #3 Well Pump Building Detail: Entire drawing was edited to better clarify the existing infrastructure
6. C-1 Dwg – Construction Limits and Demolition Plan: demolition updates, primarily spill pad removal and SCADA pole to remain
7. C-2 Dwg – Demolition Plan: Entire drawing was edited to better clarify the proposed demolition and to add demolition notes
8. C-3 Dwg – Construction Plan: Entire drawing was edited to better clarify the proposed construction and to add construction notes which provide equipment selection information for chemical metering pumps, sump pump, eye wash and shower station, and other materials. Provides additional detail on well discharge piping valves, gauges, connections and accessories; water service feed for eyewash and shower station and hose station; well discharge blowoff spill pads, and modifications to vaults.
9. C-4 Dwg – Well Building Section and Details: Entire drawing was edited to better clarify the construction and notes. Provides additional detail on well discharge piping valves, gauges, connections and accessories; well discharge blowoffs, and modifications to vaults. Provides details for air/vacuum valve and other connections/tubes at well, pipe support, pump foundation pad, and outside blowoff pipe spill pads.
10. D-3 Dwg – Construction Details: New detail sheet added.
11. D-4 Dwg – Construction Details: New detail sheet added.
12. E-2 Dwg – One-Line Diagram, Calculations and Schedules: Minor edits to Power Monitor

13. E-6 Dwg – Control Block Diagram: Minor edit for Pump Temp Switch

PROJECT SPECIFICATIONS have been updated as noted below and are reissued with Addendum 2.

1. 00300 Bid Proposal Form: Addition of additive alternates 1 and 2 for video log of well and drainage discharge from blowoff at well building, respectively.

2. 01025 Measurement and Payment: Addition of descriptions for:

    i. Additive Alternate No. 1 Video Log of Well in paragraph D.11.
    ii. Additive Alternate No. 2 Drainage Discharge from Blowoff at Well Building in paragraph D.12.

3. 02662 Water Treatment Chemical System: Update to Metering Pumps paragraphs 2.1.C. 1 and 2 to address sodium hypochlorite and phosphate metering pump systems.

4. 11220 Lineshaft Vertical Turbine Pump:

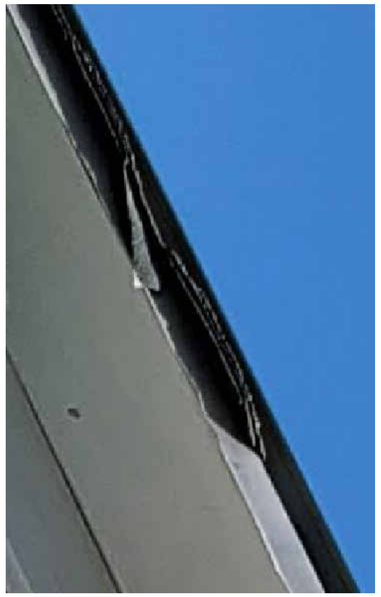
    i. Paragraph 1.1.A was modified to note that disinfection must adhere to the requirements of SCDHEC Regulation 61-58 also.
    ii. Paragraph 2.2.E.5 was modified to note the wellhead companion flange is as needed.
    iii. Addition of paragraphs 3.2 I. 1 through 4 related to Disinfection and Testing

5. The project SCDHEC General Coastal Zone Consistency Certification is included.

7. Acknowledgement:

The Bidder shall include acknowledgement of the Addendum Two (2) in bid by including this form and also acknowledge Addendum Two (2) in Section 00300 Bid Proposal Form.

Signature: _____ Date:_____



4-3-24

Plans indicate to remove existing standing seam metal roof and replace with new standing seam metal roof. The existing roof does not appear to be standing seam.

Please provide metal roof spec.

4-5-24 RESPONSE

FOR CLARITY SEE PHOTOS ABOVE. EXISTING STANDING SEAM ROOF TO BE REMOVED ALONG WITH WHAT APPEARS TO BE A ASPHALT SHINGLE LAYER BELOW.
PROVIDE A NEW LAYER OF ICE AND WATERSHIELD MEMBRANE AND STANDING SEAM METAL ROOF SIMILAR TO PRODUCT PROVIDED BY 4M METALS 843-208-2433 OR APPROVED EQUAL. COLOR TO BE CHOSEN BY OWNER

1 PHOTOS OF ROOF
1/4" = 1'-0"

WDA
Woods Dendy Architects, LLC
AMERICAN INSTITUTE OF ARCHITECTS MEMBERS
2201 BOUNDARY ST #103
BEAUFORT, SC 29902
PHONE: 843-379-7730

100% SUBMISSION 9 FEB 24

NEW CONSTRUCTION FOR:
WELL SITE #3 IMPROVEMENTS
CAPTAIN BILL ROAD
RIDGELAND, SC

PROJECT NO. 22014

DRAWN BY: Author CHECKED BY: Checker

REVISION SCHEDULE
REV. NO. REV. DATE

Project Status
DATE: 29 JAN 24

ADDENDUM RELATED TO ROOF

A-5

PLOT INFO: 4/5/2024 9:42:17 AM C:\Users\thomas henry\WDA Dropbox\Projects\2022\22014 WELL #3 RIDGELAND\DRAWINGS\WELL #3 REV 2.rvt

ADDENDUM NO. 2
PROJECT SPECIFICATION UPDATES

SECTION 00300
BID PROPOSAL FORM

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

_____

_____

BUSINESS TELEPHONE: _____

_____

PROJECT IDENTIFICATION:

Town of Ridgeland Well Site No.3 Improvements

THIS BID IS SUBMITTED TO:

Town Administrator
Town of Ridgeland
1 Town Square
Ridgeland, SC 29936

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement or Notice to Bidders and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for ninety days after the day of Bid opening. BIDDER will sign and deliver the required number of counterparts of the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER's Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement that:

   (a) BIDDER has examined and carefully studied the Bidding Documents and the following Addenda, receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date)

   Addendum No._____Date:_____

Addendum No._____ Date:_____

Addendum No._____ Date:_____

Addendum No._____ Date:_____

Addendum No._____ Date:_____

Addendum No._____ Date:_____

(b) BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work;

(c) BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Works.

(d) BIDDER acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to above ground or Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incidental thereto. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price, and other terms and conditions of the Contract Documents.

(e) BIDDER is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which the Bid is submitted as indicated in the Contract Documents.

(f) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

(g) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

(h) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly

or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. BIDDER will complete the Work in accordance with the Contract Documents for the following prices:

Schedule of Bid Prices for
Town of Ridgeland Well Site No. 3 Improvements
(Base Bid)

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
1	1	Well Site No. 3 Building Modifications and Improvements	1	LS	$	$
2	2	Vertical Turbine Pump System	1	LS	$	$
3	3	Well No. 3 Discharge Piping	1	LS	$	$
4	4	Well Site No. 3 Electrical Service and Power distribution equipment	1	LS	$	$
5	5	Well Site No. 3 Instrumentation, SCADA, and control systems	1	LS	$	$
6	6	Well Site No. 3 Lighting and receptacles	1	LS	$	$
7	7	Well Site No. 3 Grounding systems	1	LS	$	$
8	8	Well Site No. 3 Discharge Vaults Modifications	1	LS	$	$
9	9	Well No. 3 Chemical Feed Systems	1	LS	$	$
10	10	All Other Required Well Site No. 3 Improvements	1	LS	$	$
TOTAL BASE BID - WELL SITE NO. 3 IMPROVEMENTS					**$**	

The Total Well Site No. 3 Improvements Cost (Base Bid) 1 through 10 inclusive:

_____

_____dollars and cents (in words).

Schedule of Bid Prices for
Town of Ridgeland Well Site No. 3 Improvements
(Additive Alternate No. 1)

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
1	11	Video Log of Well	1	LS	$	$
TOTAL ADDITIVE ALTERNATE NO. 1 - WELL SITE NO. 3 IMPROVEMENTS					**$**	

The Total Well Site No. 3 Improvements Cost (Additive Alternate No. 1) inclusive:

_____

_____dollars and cents (in words).

Schedule of Bid Prices for
Town of Ridgeland Well Site No. 3 Improvements
(Additive Alternate No. 2)

Item No.	M&P No.	Item	Quantities	Unit	Unit Price	Total Price
1	12	Drainage Discharge from Blowoff at Well Building	1	LS	$	$
TOTAL ADDITIVE ALTERNATE NO. 2 - WELL SITE NO. 3 IMPROVEMENTS					**$**	

The Total Well Site No. 3 Improvements Cost (Additive Alternate No. 2) inclusive:

_____

_____dollars and cents (in words).

Note: All scheduled Bid Items may not be awarded. In such case, the OWNER shall select the most advantaged combination that meets project requirements, specification details, and budget availability.

Unit Prices have been computed in accordance with paragraph 11.03 of the General Condition.

Bidder acknowledges that quantities are not guaranteed and final payment will be based on actual quantities determined as provided in the Contract Documents.

5. BIDDER agrees that the Work will be substantially complete within **240 calendar days** after the date when the Contract Time commences to run as provided in paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions within **270 calendar days** after the date when the Contract Time commences to run.

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.

6. The following documents are attached to and made a condition of this Bid:

(a) Required Bid Security in the form of _____

7. Communications concerning this Bid shall be addressed to the address of BIDDER indicated on Page 00300-1.

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Notes on Bid Form:

1. Bidder shall submit a detailed Work Plan and schedule with the Bid. The Work Plan must include all anticipated project milestones, including dates of commencement, substantial completion, and final completion. Dates may be referenced (by days) from the Notice to Proceed. Final critical dates shall be determined during Contract negotiations between the selected CONTRACTOR and OWNER.

2. Bid form is given for general guidance only. Bidders shall inspect the project site and be familiar with local conditions and develop a detailed breakdown of quantities and costs.

3. All supporting documentation and drawings shall be included as attachments to the Bid Forms, including:

- Qualifications and experience documentation including:
  - Experience List
  - Reference List
  - Equipment List
  - Subcontractor List
  - Business License
  - Contractor's License
- Work Plan including proposed methods and schedule (can be submitted after project is awarded)
- Acknowledgment of Receipt of Addenda.

4. The following sections shall be included with the Bid and all associated forms and certificates therein shall be completed:

00010	Notice to Bidders
00100	Instructions to Bidders
00300	Bid Proposal Form
00400	Bid Bond with Payment
00500	Contract
00502	Wage Determination – General Decision Number: SC20240020 01/05/2024
00504	Federal Labor Standards Provisions
00506	CDBG Contract Special Provisions
00508	Debarment Certification
00509	W-9 Request for Taxpayer Identification Number and Certification
00510	Section 3 Information Sheet
00511	Section 3 Business Self-Certification
00512	Bidder's Proposed Section 3 Contract/Subcontracts
00514	Bidder's Section 3 Estimated New Hires
00520	South Carolina Illegal Immigration Reform Act Contractor Certification
00521	Mitigation Measures and Conditions

If BIDDER is:

An Individual
By _____
(Individual's Name)

Signature_____

doing business as_____

Business address:_____

_____

Phone No.:_____

A Partnership
By_____
(Firm Name)

_____
(general partner signature)

Business address:_____

_____

PhoneNo.:_____

A Corporation
By_____
(Corporation Name)

_____
(state of incorporation)

By_____
(signature of authorized person)

_____
(Title)

(Corporate Seal)
Attest_____
(Secretary)

Business address:_____

_____

Phone No.:_____

(V) Date of Qualification to do business is_____

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SECTION 01025
MEASUREMENT AND PAYMENT

A. GENERAL

1. The CONTRACTOR shall receive and accept the compensation provided in the Proposal and the Contract as full payment for furnishing all materials, labor, tools and equipment, for performing all operations necessary to complete the work under the Contract, and also in full payment for all loss or damages arising from the nature of the work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the Engineer, or from the action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the OWNER.

2. The prices stated in the proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. The basis of payment for an item at the unit price shown in the proposal shall be in accordance with the description of that item in this Section.

3. The CONTRACTOR's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the CONTRACTOR feel that the cost for any item of work has not been established by the Bid Form or Payment Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the project does reflect his total price for completing the work in its entirety.

B. MEASUREMENT

1. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the OWNER, in accordance with the applicable method of measurement therefor contained herein. A representative of the CONTRACTOR and OWNER shall witness all field measurements.

C. WORK ITEMS NOT PAID FOR SEPARATELY

1. Color Audio-Video Recording: Measurement for pre-construction color audio-video recording will not be made for payment and all items shall be included in the unit price of project unit items installed.

2. Construction Photographs: Measurement for construction photographs will not be made for payment and all items shall be included in the unit price of project unit items installed.

3. Maintenance of Traffic: Measurement for maintenance of traffic/temporary traffic control will not be made for payment and all items shall be included in the unit price of project items installed.

4. Erosion and Sediment Control: Measurement for erosion and sediment control will not be made for payment and all items shall be included in the unit price of project items installed.

5. Restoration: Measurement for restoration requirements (including but not limited to grassing, grading, restoring structures damaged by construction to preconstruction condition) other than pavement items noted in bid form will not be made for payment and all items shall be included in the unit price of project items installed.

6. Contractor Storage Site / Lay Down Yard / Temporary Office: Measurement for Contractor Storage Site / Lay Down Yard / Temporary Office will not be made for payment and all items shall be included in the unit price of project unit items installed.

7. Regular Excavation: Measurement for regular excavation will not be made for payment and all items shall be included in the unit price of project unit items installed.

8. Dewatering: Measurement for dewatering operations necessary for construction will not be made for payment and all items shall be included in the unit price of project unit items installed.

9. Stabilization: Measurement for stabilization operations necessary for construction will not be made for payment and all items shall be included in the unit price of project unit items installed.

10. Miscellaneous Work Items: Measurement for miscellaneous work items such as mobilization / demobilization, payment and performance bonds, testing and reporting, temporary fencing, temporary facilities, as-builts/record drawings, and other items not specifically listed in the Bid Proposal Form will not be made for payment and all items shall be included in the unit price of project unit items installed.

11. Project Sign: Measurement for Project Sign will not be made for payment and all items shall be included in the unit price of project unit items installed.

12. Permits: Any permits to be acquired by contractor will not be made for payment and all items and permit fees shall be included in the unit price of the related project items installed.

D. PAY ITEMS

1. WELL SITE #3 BUILDING IMPROVEMENTS

Measurement and payment for Well Site #3 Building Improvements item is lump sum and will be full compensation for constructing proposed modifications to the Well Site #3 building as defined in the construction drawings and specifications. Payment shall be full compensation for all labor, tools, materials, and equipment to provide all noted or required demolition and disposal, building expansion, modifications and roof improvements, exhaust/fan systems, louvers, painting, new doors, concrete foundations and stoops, painting and all other construction necessary for complete building expansion in accordance with the architectural and structural drawings. Payment will be based on a percentage of work complete.

2. VERTICAL TURBINE PUMP SYSTEM

Measurement and payment of this item is lump sum and includes all items of work required to remove existing well pump system and discharge piping and valves as noted on construction drawings and to furnish, install and test and place into full operating condition the vertical turbine

pump, 125 HP electric motor, accepted and installed in accordance with contract documents. Item includes all labor, materials and equipment necessary for the satisfactory installation and operation of the Well # 3 vertical turbine pump including, suction cone, pump bowl(s), pump column, lineshafts, pump base plate, wellhead companion flange, discharge head, concrete equipment pad/foundation, 125 HP electric motor, , air release valve, stainless steel tubing, sample taps, discharge pressure gauge assembly and other accessories and spare parts as approved and accepted by the Engineer. All labor, tools, material and equipment necessary for disinfection, sampling, and testing of the completed Well #3 pump and piping system, required for clearance in accordance with SCDHEC requirements, are included in this item. Item includes but is not limited to all the labor, tools, material and equipment required. Payment will be made based on a percentage of the total work completed. All equipment necessary for the instrumentation and control systems shall be included in the separate pay item, Instrumentation, SCADA, and Control Systems.

3. WELL NO. 3 – DISCHARGE PIPING

Measurement for this item is lump sum and includes all materials and items of work to furnish, satisfactorily install and place into successfully operating service the Well # 3 discharge piping from the vertical turbine pump discharge head to the limits of the contract, as included in the contract documents, accepted and installed in accordance with contract documents. This work includes, but is not limited to, all ductile iron piping, associated pipe fittings, restraints, butterfly valves, check valve, pipe supports, sample tap assemblies, blowoff assemblies, gate valves, appurtenances and accessories, excavation and backfill, and testing required for a complete installation. Payment will be made based on a percentage of the total work completed. Instrumentation systems equipment (including flow meter) shall be included in the separate pay item, Instrumentation, SCADA and Control Systems. Demolition of existing piping and valve assemblies shall be included in the separate pay item, Vertical Turbine Pump System.

4. WELL SITE NO. 3 ELECTRICAL SERVICE AND POWER DISTRIBUTION EQUIPMENT

Measurement for this item is lump sum and includes all materials and items of work to furnish and satisfactorily install electrical service entrance and power distribution equipment associated with the Well # 3 project including such things as new underground Dominion Energy service entrance with main fused disconnect, relocated automatic transfer switch, panelboards, low voltage transformers, RVSS motor controllers, or other items included in the contract documents, accepted and installed in accordance with contract documents. The Work shall be as specified in Division 16 – Electrical and as shown on the Electrical Drawings and shall include installation, testing, and commissioning. Payment will be made based on a percentage of the total work completed.

5. WELL SITE NO. 3 INSTRUMENTATION, SCADA, AND CONTROL SYSTEMS

Measurement for this item is lump sum and includes all materials and items of work to furnish and satisfactorily install the instrumentation, SCADA, and control systems associated with the Well # 3 project including such things as new flow instrumentation, pressure instrumentation, level instrumentation, equipment control systems, SCADA systems, radio systems, control panels, or other items included in the contract documents, accepted and installed in accordance with contract documents. The DRACS-RTU and control panel are not included in this scope of work and will be provided by others under the Town of Ridgeland (EDA) Water & Sewer Resiliency project.

Contractor shall coordinate work with others as required. The Work shall be as specified in Division 16 – Electrical and as shown on the Electrical Drawings and shall include installation, testing, and commissioning. Payment will be made based on a percentage of the total work completed.

6. WELL SITE NO. 3 LIGHTING AND RECEPTACLES

Measurement for this item is lump sum and includes all materials and items of work to furnish and satisfactorily install interior and exterior lighting and receptacle systems associated with the Well # 3 project included in the contract documents, accepted and installed in accordance with contract documents. The Work shall be as specified in Division 16 – Electrical and as shown on the Electrical Drawings and shall include installation, testing, and commissioning. Payment will be made based on a percentage of the total work completed.

7. WELL SITE NO. 3 GROUNDING SYSTEMS

Measurement for this item is lump sum and includes all materials and items of work to furnish and satisfactorily install facility grounding and bonding systems associated with the Well # 3 project including such things as new grounding electrode conductors, equipment grounding conductors, ground rods, equipment bonding jumpers, or other items included in the contract documents, accepted and installed in accordance with contract documents. The Work shall be as specified in Division 16 – Electrical and as shown on the Electrical Drawings and shall include installation, testing, and commissioning. Payment will be made based on a percentage of the total work completed.

8. WELL SITE NO. 3 DISCHARGE VAULTS MODIFICATIONS

Measurement and payment for Well Site No. 3 Discharge Vaults Modifications is lump sum and will be full compensation for constructing required modifications to the two concrete vaults located outside of the well building including coring common wall, grating replacement, furnishing and installing sump pump system and discharge piping through vault wall and routing to swale, and all testing required for a complete installation. Payment will be made based on a percentage of the total work completed. Demolition of existing piping and valves in vault; new chemical feed systems; new discharge piping and fittings, valves; and electrical, instrumentation and control systems equipment shall be included in separate pay items.

9. WELL NO. 3 CHEMICAL FEED SYSETMS

Measurement and payment for Well No. 3 Chemical Feed Systems is lump sum and will be full compensation for constructing required modifications to the existing chemical feed systems at Well Site. No. 3 for sodium hypochlorite and phosphate including furnishing and installation of new chemical feed metering pumps and associated accessories, relocating existing chemicals and equipment (as relevant) to new chemical feed room, installation of new chemical feed piping including conduit outside of building, valves, and injection systems from chemical feed pumps, through Well No. 3 building wall, underground to discharge into piping in vaults located outside of Well No. 3 building, and all testing required for a complete installation. Payment will be made based on a percentage of the total work completed. All electrical, instrumentation and control systems equipment shall be included in separate pay item, Instrumentation, SCADA, and Control Systems.

10. ALL OTHER REQUIRED WELL SITE NO. 3 IMPROVEMENTS

Measurement and payment for All Other Required Well Site No. 3 Improvements is lump sum and will be full compensation for constructing all other proposed demolition and construction at Well Site No. 3, in accordance with the construction drawings and specifications which are not included in other pay items. Payment will be full compensation for all labor, tools, materials and equipment to provide the remaining improvements at the Well Site No. 3 primarily comprising replacement of eye wash station, new water feed/service for eye wash, concrete spill pads outside of well building and adjacent to vault, and any other miscellaneous proposed improvements and modifications. Payment will be based on a percentage of work complete.

11. VIDEO LOG OF WELL (ADDITIVE ALTERNATE NO. 1)

Measurement and payment for Video Log of Well is lump sum and will be full compensation for the video log of the existing well following removal of the existing well pump. Color TV video logging equipment shall be capable of logging the total well depth. During inspection, maintain continuous image on video screen displaying depth of camera below ground surface. Video logs shall be conducted with equipment that has both down-hole and side-view capabilities capable of providing a clear color image up to 24-inches in diameter with sufficient resolution to identify the targets of the survey. A video record of the entire well shall be made from land surface to the total depth of the well in the down-hole and up-hole directions. Each casing joint shall be inspected using a sideward-looking camera with full 360° rotation capability. The survey shall be logged at slow play (SP) on high quality Digital Video Disc (DVD). Payment will be full compensation for all labor, tools, materials and equipment to provide the video inspection and log.

12. DRAINAGE DISCHARGE FROM BLOWOFF AT WELL BUILDING (ADDITIVE ALTERNATE NO. 2)

Measurement and payment for Drainage Discharge from Blowoff at Well Building is lump sum and will be full compensation for installing a drainage structure, SCDOT Type 1, (3’ depth), in lieu of 4’x4’ concrete spill pad, under well discharge blowoff near well building and routing 12” PVC gravity storm piping and fittings (as needed) at 0.3% slope from drainage structure to fenceline with discharge to existing ditch system (approximately 75 LF). Shall also include routing of sump pump 3” discharge piping to drainage structure and connection and restoration of site.

Payment will be made based on a percentage of the total work completed. Payment will be full compensation for all labor, tools, materials and equipment necessary to complete the drainage discharge system.

END OF SECTION 01025

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SECTION 02662
WATER TREATMENT CHEMICAL SYSTEM

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall furnish and install water treatment chemical system equipment systems, complete, tested and ready for operation. The work shall also include such connections, reconnections, temporary service and all other provisions in regard to the existing operation and modification as is required to perform the new work. All references to Industry Standards (ASTM, ANSI, AWWA, etc.) shall be to the latest revision unless otherwise stated. Only those materials included in these specifications and drawings and the Town of Ridgeland Standard Water and Sewer Specifications, details and testing shall be installed. All materials shall be new unless specifically called for otherwise.

B. Shop Drawing Submittals

Complete shop drawings, actual catalog data, brochures and descriptive literature will be required and shall meet the requirements of these specifications and the Town of Ridgeland Water and Sewer Standards. Submittals shall be in accordance with Section 01340: Shop Drawings, Working Drawings, and Samples. The Engineer may at any time require the Contractor to provide a complete detailed shop drawing submittal for any material which may, in the Engineer's opinion, not be in compliance with these specifications and the Town of Ridgeland Water and Sewer Standards.

1. The Contractor shall submit for the approval of the Engineer four (4) copies, plus as many additional copies as he may need for his files of all shop and setting drawings and schedules required for the work.
2. The Contractor shall submit all drawings and schedules sufficiently in advance of construction requirements to allow ample time for checking, correcting, resubmitting, and rechecking; no claim by the Contractor for delays arising from his failure in this respect shall be allowed.
3. All shop drawings submitted must bear the stamp of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings without this stamp of approval shall not be considered and will be returned to the Contractor for resubmission. If documents vary from the requirements of the Contract Documents because of standard shop practice or other reason, the Contractor shall make mention in such letter of variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise, the Contractor shall not be relieved of the responsibility of executing the work in accordance with the Contract Documents even though such shop drawings have been approved.
4. Where a shop drawing is submitted by the Contractor indicates a departure from the Contract which the Engineer deems to be a minor adjustment in the interest of the Town and which does not involve a change in Contract Price or extension of time, the Engineer will approve the drawings.
5. The approval by the Engineer of shop drawings will be general and shall not relieve the Contractor from the responsibility for inherent error which may exist.

PART 2 – PRODUCTS

2.1 MATERIALS

A. All material shall be free from defects impairing strength and durability, shall be of the best commercial quality for the purpose specified, and shall have structural properties sufficient to safely

sustain or withstand strains and stresses to which it is normally subjected and be true to detail.

B. All equipment and systems shall adhere to the SCDHEC Regulation 61-58 State Primary Drinking Water Regulations and the associated project SCDHEC permit. All materials and coatings in contact with water shall be National Sanitation Foundation NSF 61 and shall have no measurable lead content, all drinking water chemicals shall be NSF 60 certified.

C. Metering Pumps

1. Sodium Hypochlorite: Metering pump and motor shall be provided for sodium hypochlorite dosing system at Well Site #3. Metering pump system shall have 0 – 4.0 GPH at 100 PSI capacity minimum and shall be LMI Electronic Metering Pump Series C, C12 1-D60HI with 0.375" tubing & connections. System shall have adjustable capacity with a turn-down ratio of 10:1. Pump shall have internal relief valve, ball check valve on both suction and discharge side of pump. Pump shall be epoxy painted, completely assembled on a base plate and have been fully tested. Materials liquid end shall be suitable for use with sodium hypochlorite and shall allow gas in the head to be automatically relieved thus eliminating air binding.

2. Phosphate: Metering pump and motor shall be provided for phosphate (long chain linear phosphate (corrosion control)/orthophosphate) dosing system at Well Site #3. System shall have adjustable capacity with a turn-down ratio of 10:1. Pump shall have internal relief valve, ball check valve on both suction and discharge side of pump. Pump shall be epoxy painted, completely assembled on a base plate and have been fully tested. Materials liquid end shall be suitable for use with phosphate. Pump shall be LMI Chemical Metering Pump PD Series, PD751-938NI with Enhanced Controls or approved equal with capacity of 0 – 1.1 GPH at 110 psi.

3. Each chemical feed system shall include the following items: Clear PVC calibration column with vent and vented ball valve, pressure relief valve with vented ball for isolation (pressure relief valve shall discharge to pump suction piping), diaphragm protected discharge pressure gauge with vented ball for isolation, pulsation dampener with vented ball valve for isolation, back pressure valve, unions on each side of pump, vented ball valves for suction and discharge piping, wye strainer for suction piping, flushing line with quick connect on suction piping.

D. Injection quill shall be corrosion resistant retractable injection quill. Length shall be adequately sized based on the potable water pipe. Unions and isolation valves shall be provided to ensure isolation and quill removal. The injection quill shall be easily accessible and fully removable.

E. Material Warranty

The manufacturer of materials furnished on the project shall supply to the Town of Ridgeland, a one (1) year unconditional warranty. The warranty shall be limited to the material which shall constitute complete replacement and delivery to the site of materials only to replace defective materials with new materials conforming to the specifications. This warranty is contingent upon determination of failure by a private independent testing laboratory. The testing shall prove that the failure was caused by failure of the material. The testing laboratory shall be selected by and agreed upon by both parties involved. This warranty is in addition to any warranty required for pipe linings herein before specified.

PART 3 – EXECUTION

3.1 INSTALLATION

A. All materials and equipment shall be installed as shown on the Drawings and as recommended by the manufacturer.

3.2 INSPECTION AND TESTING

A. Field Tests: A qualified representative of the equipment system supplier shall inspect the installation and supervise start-up performed by the Contractor's personnel. All components of the system shall be tested for proper operation prior to and during the start-up operation. Representatives shall provide a written report to the Engineer verifying that all their equipment is properly installed and ready to start-up, prior to system start-up.

B. Maintenance Procedures: After the equipment has been placed into operation, the qualified representative of the equipment system supplier shall instruct the Owner's personnel in proper operating and maintenance procedures without additional cost to the Owner.

END OF SECTION 02662

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SECTION 11220
LINESHAFT VERTICAL TURBINE PUMP

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope of Work: The work included under this section consists of furnishing and installing one deep well lineshaft vertical turbine pump and electric motor, an above ground discharge, and related equipment for raw water transfer from the proposed well to the existing TOWN owned water storage and distribution facility. The pump shall be water lubricated type by the water being pumped and suitable for raw water service in a vertical groundwater well. The pump and well waters will be initially disinfected by chlorination after installation in accordance with AWWA standards, and SCDHEC Regulation 61-58, and periodically thereafter. The pumping unit shall be designed and furnished in accordance with the latest Hydraulic Institute, AWWA, and UL/FM standards for lineshaft turbine pumps and electric motors.

B. All materials and coatings used in the manufacture shall conform to NSF 61 as required by the South Carolina Department of Health and Environment Control, Regulation 61-58 State Primary Drinking Water Regulations, and the pump must be NSF-61 certified.

C. The CONTRACTOR shall provide a fully completed installation which is fully tested, complete and in satisfactory operating condition. Pump shall be suitable for installation in the existing well casings .

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. The reference edition in effect at the time of project bidding shall be used.

AMERICAN BEARING MANUFACTURERS ASSOCIATION (ABMA)

ABMA 9	Load Ratings and Fatigue Life for Ball Bearings

AMERICAN GEAR MANUFACTURERS ASSOCIATION (AGMA)

ANSI/AGMA 2001	Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth
ANSI/AGMA 2003	Rating the Pitting Resistance and Bending Strength of Generated Straight Bevel, ZEROL Bevel, and Spiral Bevel Gear Teeth
ANSI/AGMA 6013	Standard for Industrial Enclosed Gear Drives

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA E101	Vertical Turbine Pumps – Line Shaft and Submersible Types

ASME INTERNATIONAL (ASME)

ASME B1.1	Unified Inch Screw Threads (UN and UNR Thread Form)
ASME B16.1	Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250

ASME B16.5	Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard
ASME B40.100	Pressure Gauges and Gauge Attachments

ASTM INTERNATIONAL (ASTM)

ASTM A48	Standard Specification for Gray Iron Castings.
ASTM A53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
ASTM A276	Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
ASTM B62	Standard Specification for Composition Bronze or Ounce Metal Castings.
ASTM B148	Standard Specification for Aluminum-Bronze Sand Castings.
ASTM B584	Standard Specification for Copper Alloy Sand Castings for General Applications.

HYDRAULIC INSTITUTE

ANSI / HI 9.1 – 9.5	Pumps - General Guidelines
ANSI / HI 9.6.4	Rotodynamic Pumps for Vibration Measurement and Allowable Values
ANSI / HI 14.6	Rotodynamic Pumps for Hydraulic Performance Acceptance Tests

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1	Motors and Generators

1.3 RELATED SECTIONS

A. Section 00100 - Instructions to Bidders

B. Section 01340 - Shop Drawings Working Drawings and Samples

C. Section 01730 - Operation and Maintenance Data

D. Section 09900 – Protective Coatings

E. Division 16 - Electrical

1.4 QUALITY ASSURANCE

A. Qualifications:

1. The pumping units specified herein are to be standard pumping units for the intended service and shall be

the product of a fully experienced, reputable and qualified manufacturer. The manufacturer shall supply the ENGINEER with the shop drawing submittal in accordance with Division 1 Section 01340: Shop Drawings Working Drawings & Samples and as listed in this section.

2. The supplier shall supply the services of a qualified factory-trained service representative for a period specified in paragraph 3.2 of this specification. The representative shall inspect the completed equipment installation to ensure that it meets with the manufacturer's recommendations. Any necessary adjustment or modifications shall be made, at no additional cost to the TOWN, to place the equipment in trouble-free operation.

3. Pumps shall be in accordance with applicable Hydraulic Institute Standards.

4. Motors shall be in accordance with NEMA Standards.

5. Pumps shall be NSF-61 certified.

B. Balancing: All pump and motor units shall be statically and dynamically balanced. The vibration allowance in the units shall not exceed the upper limits as established by the Hydraulic Institute Standards.

C. Tests: Each model pump with its own drive motor shall be fully tested on water at the pump manufacturer's plant before shipment. Tests shall consist of checking the unit at its rated speed, head, capacity, efficiency and brake horsepower, and at such other conditions of head and capacity to properly establish the performance curve. Certified copies of the test report shall be submitted to the ENGINEER. The Standards of the Hydraulic Institute shall govern the procedures and calculations for these tests. During these tests the pumps with drive motors shall be checked for balance.

D. Equipment Manufacturers: The vertical turbine pump shall be manufactured by Flowserve, Goulds Water Technology, or Fairbanks Nijhuis. Substitution of equipment by alternate manufacturers will be considered if the equipment proposed for substitution is demonstrably equal or superior in quality and efficiency to the standards established in the specifications and this is demonstrated to the complete satisfaction of the ENGINEER and TOWN. Request for approval of substitute equipment shall be submitted in accordance with Section 00100: Instructions to Bidders. Use of approved alternate manufacturers in no way relieves any manufacturer of strictly adhering to the specification and submittal requirements.

E. To assure a properly integrated and compatible system, all equipment described in this section, including but not limited to bowl assembly, column, lineshaft, discharge head, wellhead companion flange and motor, shall be furnished by the Pump Manufacturer, who shall assume full responsibility for the proper operation of the pump and associated equipment.

1.5 SUBMITTALS

A. Shop Drawings: Prior to shipping the pumps and motors, the CONTRACTOR shall submit to the ENGINEER for review: shop drawings, test certificates, material specifications by ASTM reference and grade, and other pertinent data in conformance with the Standards of the Hydraulic Institute.

B. The CONTRACTOR shall submit the following to the ENGINEER for approval:

1. Manufacturer's literature, illustrations and applicable data for the individual pumps, including the total weight of the equipment and the weight of the single largest item. Show linings and coatings.

2. Submit expected bowl performance curves for approval, on which the specified operating points are shown. Include bowl head, efficiency, break horsepower and NPSH required at full speed. Indicate separately the impeller trim, head, capacity, horsepower demand, overall efficiency, and minimum submergence required at the guarantee point. Submit manufacturer’s certified bowl performance curve for approval prior to shipment. Provide pump maximum downthrust or upthrust in pounds.

3. Curves shall be submitted on 8-1/2 inch by 11-inch sheets, at as large a scale as is practical. Curves shall

be plotted from no flow at shut off head to maximum pump runout head and gallonage allowed by the manufacturer.

4. Points of operation which cause bearing stress or shaft deflection in excess of the manufacturer's tolerances for continuous operation shall be indicated on the submitted curves.
5. The shop drawings shall include details of pump assembly, installation layouts, procedures, types of materials used in pump construction, details on all pump accessories, and dimensions of major components, power and control wiring diagrams including terminals and numbers, complete motor nameplate data, as defined by NEMA, motor manufacturer and including any motor modificaitons.
6. A signed certified letter from the pump manufacturer certifying that the column pipe and line shafting have been supplied by the pump manufacturer.
7. A complete total bill of materials for all equipment.
8. A list of manufacturer's recommended spare parts to be supplied, with the manufacturer's current price for each item to be replaced after 1 and 3 years of service. Include O-rings, seals, etc. on the list. List bearings by the bearing manufacturer's name and numbers only.
9. Pumping equipment requiring special tools for maintenance shall be provided with one set of tools labeled, packed with instructions for use, and housed in a metal box with lock-end hoop for each two units provided.
10. The following data shall be provided on the drive motors: rpm at full load, frequency, voltage, full load current, code and design letter, efficiency, horsepower, number of phases, time rating, temperature rise, service factor and bearing life rating. The submittal shall include motor manufacturer's recommended lubrication requirements.

C. Operating and Maintenance Instructions: For all pumps furnished under this Section, the CONTRACTOR shall submit operation and maintenance manuals in accordance with Section 01730 - Operation and Maintenance Data, to include, at a minimum, the following:

1. Equipment function.
2. Description.
3. Normal and limiting operating characteristics.
4. Installation instructions (assembly, alignment and adjustment procedures).
5. Operation instructions (normal operating conditions and emergency situations).
6. Lubrication and maintenance instructions.
7. Troubleshooting guide.
8. Parts list and predicted list of parts subject to wear.
9. Drawings - cross sectional view, assembly and wiring diagrams.
10. Performance curves.

D. Factory Performance Test Data:

1. After acceptance of pump shop drawings, factory performance test data will be submitted for approval on each pumping unit. Duplicate units require factory testing for only one unit, unless otherwise specified.
2. Test shall be certified by a registered professional ENGINEER.
3. Tests shall be in accordance with the standards of the Hydraulic Institute including head, capacity, brake horsepower, pump efficiency and NPSH.

E. Conformance with Agency Requirements: Where materials or equipment are specified to be an approved type, the seal or label of approval from a nationally recognized testing agency adequately equipped and competent

to perform such services, shall be attached thereto. A written certificate from the testing agency shall accompany the materials or equipment and shall be submitted to the ENGINEER stating that the items have been tested and that they conform to the applicable requirements of the specifications herein. The certificate shall indicate the methods of testing used by the testing agency. In lieu of certificate from the testing agency, published catalog specification data , accompanied by the manufacturer's certified statement to the effect that the items are in accordance with the applicable requirements of the specifications and the referenced standards, will be considered by the ENGINEER and may be acceptable as evidence that the items conform with agency requirements.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Finished surfaces of all exposed pump openings shall be protected by wooden blanks.

B. After hydrostatic or other tests, all entrapped water shall be drained prior to shipment, and proper care shall be taken to protect parts from the entrance of water during shipment, storage, and handling. Each completed pump unit shall be totally encased in a shrink wrap, polyethylene plastic enclosure to protect the transported unit from adverse elements encountered during shipment. The plastic enclosure shall be of Griff-Shrink 5-ply VCI clear reinforced shrink film as manufactured by Reef Industries or equal.

C. Each box or package shall be properly marked to show its net weight in addition to its contents.

1.7 WARRANTY AND GUARANTEES

A. Warranty: The pump manufacturer shall warrant the pumps being supplied to the TOWN against defects in workmanship and materials for a period of two (2) years after project acceptance under normal use, operation and maintenance. Should any part of the pumping system fail during the warranty period, it shall be replaced and restored to service at no additional expense to the TOWN. The manufacturer's warranty period shall run concurrently with the CONTRACTOR's warranty period.

B. Certifications: The CONTRACTOR shall furnish the ENGINEER with a written certification signed by the manufacturer's representative noting that the installed equipment:

1. Has been installed per manufacturer's requirements.
2. Has been lubricated per manufacturer's instructions.
3. Has been accurately aligned and proper running clearances set.
4. Is free from undue stress imposed by piping or mounting bolts.
5. Is ready to be operated on a continuous basis and is free from any known defects.

C. The nominal nameplate horsepower rating for the motors at their rated speed shall not be exceeded by the drive equipment at any point of operation on its characteristic curve.

PART 2 - PRODUCTS

2.1 EQUIPMENT GENERAL REQUIREMENTS

A. The equipment covered by these Specifications shall be designed, constructed, and installed in accordance with the best practice and methods. CONTRACTOR shall provide materials and equipment which are the standard products of a manufacturer regularly engaged in the manufacture of the products and that essentially duplicate items that have been in satisfactory use for at least five (5) years prior to bid opening. Equipment shall be supported by a service organization that is, in the opinion of the ENGINEER, reasonably convenient to the site. The manufacturer must be able to list at least ten (10) locations within the United States where their pumps have provided satisfactory service for at least five (5) years.

B. All equipment for the pumps, including motors, well heads, and accessories shall be furnished as a complete unit by the pump supplier. The pump design requirements in Table 11220-A show the minimum pump requirements that are acceptable. Final selection of the pump performance point has not been completed at the time of bid, refer to Table 11220-A for assumptions to select a pump, column, discharge head and motor to provide a bid price.

C. All parts shall be so designed and proportioned as to have liberal strength and stiffness, and to be especially adapted for the work to be done. Ample room and facilities shall be provided for inspection, repair and adjustment.

D. Equipment Guards: Equipment driven by open shafts, belts, chains, or gears shall be provided with all-metal guards enclosing the drive mechanism. Guards shall be constructed of galvanized sheet steel or galvanized woven wire or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps which will permit easy removal for servicing the equipment. The guards shall conform in all respects to all applicable safety codes and regulations.

E. Equipment shall be rigidly and accurately anchored into position, precisely leveled and aligned, so that the completed installation is free from stress or distortion. All necessary foundation bolts, plates, nuts and washers shall be furnished and installed by the CONTRACTOR and conform to the recommendations and instructions of the equipment manufacturer. Anchor bolts, nuts, and washers shall be 316 Stainless Steel unless noted otherwise.

F. Nameplates and Identification Tag:

1. Stainless steel pump nameplate giving the name of the pump manufacturer, the rated capacity, head, speed, serial number, model number and any other pertinent data shall be attached to each pump on the well head.
2. Stainless steel motor nameplate giving the name of the manufacturer, serial number, model number, horsepower, speed, voltage, amperes and all other pertinent data shall be attached to each motor.

G. Hardware: All machine bolts, nuts and cap screws shall be of the hex head type. Hardware requiring special tools or wrenches shall not be used.

H. Parts Numbering: Parts shall be completely identified with a numerical system to facilitate parts inventory control and stocking. Each part shall be properly identified by a separate number, and those parts which are identical for more than one size unit shall have the same number to effect minimum spare parts inventory.

I. All pumps and motors shall be rated for continuous duty and shall be capable of pumping the specified flow range without cavitation or excess vibration. The pumps shall not infringe upon the motor service factor at any point of the full speed curve.

2.2 LINESHAFT VERTICAL TURBINE PUMP

A. General: The pump shall be of the lineshaft turbine type with above ground discharge and complete with strainer, bowl assemblies / impellers, column pipe and shaft assembly, discharge head assembly with accessories and electric motor. The discharge head and electric motor shall be suitable for outdoor installation. The final pump length shall be determined by the pump manufacturer (base to bell) for optimum conditions. The lineshaft vertical turbine pump shall be constructed in accordance with AWWA E101 except as modified herein.

1. Pump performance requirements and design criteria are listed in Table 11120-A at the end of this specification section. Final pump selection will be determined after confirmation of well conditions by contractor.

B. Suction Bowl Strainer:

1. Strainer: A suction strainer shall be furnished with the pump assembly. It shall be made of 316 or 316L stainless steel and threaded to the suction bowl. The cone strainer shall have a free area of at least four (4) times the flow area of the suction pipe. The strainer shall be of sufficient mesh size to block sand particles from entering the pump bowl assembly. Suction strainer shall be of the conical type, fabricated from stainless steel. Strainers shall be free from sand holes, blowholes, or other faults and must be accurately machined and fitted to close tolerances. They shall be capable of withstanding a hydrostatic pressure equal to twice the pressure at rated flow or 1.5 times shut-off head, whichever is greater.

C. Bowl Assembly: Pump bowl assembly shall include the pump bowl(s), pump impeller(s), pump shaft and bearings. The bowl assembly may be of single stage or multistage configuration.

1. Bowl assembly shall consist of flanged type bowls constructed of close grained cast iron conforming to ASTM A48 Class 30. The bowls shall be free of blow holes, sand holes, or other faults and accurately machined and fitted to close tolerances, and capable of meeting or exceeding the hydrostatic pressure ratings of the Hydraulic Institute.

2. The intermediate bowls shall have enamel lined waterways for maximum efficiency and wear protection. All intermediate bowls shall be of identical design for interchangeability. A discharge bowl shall be sized and threaded to connect the bowl assembly to the discharge column.

3. The discharge bowl and all intermediate bowls shall be fitted with Vesconite HiLube composite sleeve bearings by VescoPlastics.

4. The suction bowl shall be provided with nonsoluble grease packed bronze bearing. A bronze sand collar shall be provided to protect this bearing from abrasives in the pumping fluids. The bearing housing shall have sufficient opening at the bottom for easy removal of the bearing.

5. The bowls shall be assembled using all Type 316 stainless steel bolting.

6. A stainless steel nameplate with the operating conditions and bowl and impeller date stamped into it shall be attached to the bowl with noncorrosive fasteners. An additional stainless steel nameplate shall be furnished loose for use by TOWN.

7. Impellers shall be constructed of either Type 316 stainless steel or ASTM C95500 Nickel Aluminum Bronze. No silicone bronze alloy impellers shall be allowed.

8. Impellers shall be free from defects and accurately cast, machined, filed, and polished for premium efficiency and minimum vibration. Impellers shall be balanced to grade G6.3 of ISO 1940 as a minimum.

9. Impellers shall be secured to the bowl shaft with tapered split Type 316 stainless steel bushing (collets).

10. The bowl shaft shall be constructed from Type 416 stainless steel meeting ASTM 582. It shall be precision ground, balanced, and polished with a surface finish better than 40 rms.

11. The pump shall be tested by the factory after trimming and assembly and a curve of the operating conditions including flow, head, efficiency, and horsepower shall be plotted and submitted to the ENGINEER for approval prior to shipping any materials. The test shall be a nonwitnessed test, but TOWN reserves the right to reject the test and witness any retesting at its own cost.

D. Water-Lubricated Column and Shaft Assembly:

1. Column pipe shall be furnished in sections not exceeding a nominal 10 feet, connected by threaded sleeve coupling, of nominal diameter listed in this section.

2. The top and bottom sections shall not be more than 5 feet in length.

3. Column shall be manufactured of ASTM A53 Grade B steel pipe, Schedule 40 (Standard) for nominal diameters 10 inches and less.

4. The column pipe ends shall be threaded, 8 threads per inch with 3/16-inch taper per foot thread and faced parallel to butt against the centering spiders so the assembled sections are accurately aligned.

5. Lineshaft shall be made of Type 416 stainless steel meeting ASTM 582. It shall be precision ground, balanced, and polished with a surface finish better than 40 rms. Each shaft length shall be straight, not exceeding 0.005 inch out in total indicator reading per 10-foot section.

6. Lineshaft diameter shall be a minimum 1-3/16-inch.

7. Lineshaft shall be furnished with a stainless steel coupling for each section of shaft. Couplings shall be machined from solid stainless steel bar and have left hand threads that will tighten during pump operation. The threads of the lineshaft and coupling shall be compatible. Couplings shall be Type 410 stainless steel.

8. Bearing retainers (spiders) shall be furnished for each column and shaft section. The spiders shall be made of Type 304 or 316 stainless steel or ASTM C95800 Nickel Aluminum Bronze and designed to drop in the column couplings and be retained by the butted ends of the column pipe.

9. Shaft bearings shall be Buna-N retained in the spider by a shoulder on each end of the bearing, designed for water lubricated operation with the appropriate shaft diameter.

10. The pump manufacturer shall provide a signed letter certifying that the column pipe and line shafting have been supplied by the pump manufacturer. Column and line shafting provided by suppliers or contractors other than the pump manufacturer will not be acceptable.

11. Lineshaft Sleeve. Stainless steel shaft sleeves shall be furnished at each bearing location. The shaft shall be provided with type 304 stainless steel sleeve to act as a journal at each bearing location. The sleeve shall be placed on a full size shaft without undercutting and secured in position by a suitable adhesive.

E. Discharge Head:

1. The discharge head shall be made of high-grade cast iron, ASTM A48 Class 30. A fabricated steel discharge head will be allowed provided that access to the wellhead is maintained as shown in the Drawings.

2. The discharge head shall be manufactured and provided by the pump manufacturer. The outlet shall be abovegrade, flanged, and sized to meet the flanged discharge piping diameter as listed in the operating conditions.

3. A Type 316 stainless steel nameplate with the pump serial number, pump model number, operating conditions, bowl data and impeller data stamped into it shall be attached to the head with noncorrosive fasteners.

4. The stuffing box shall be made of cast iron with Type 316 stainless steel split-type packing gland, studs, and nuts, and furnished with five rings of graphited synthetic fiber packing. The bearing shall be bronze, Type C89835 or equal. A rubber slinger shall be furnished with the stuffing box for securing to the shaft above the packing gland to protect the motor from excess spray. The head shall have a threaded connection in the stuffing box location for connecting a drain pipe.

5. Discharge head base shall be provided with an appropriate wellhead companion flange (as needed) which connects to the top of the well, see Drawings. The wellhead companion flange shall be threaded for the column pipe diameter as listed in the operating conditions. The connection shall be a watertight gasketed connection.

6. The discharge head assembly shall be furnished with the connections and openings shown on the Drawings. Accessories shall include non-metallic power cable ties, a 316 stainless steel safety cable with 316 stainless steel shackles and eyebolts, and 304 stainless steel thimble eyes, to go between the pump and the well head, and pack off devices to seal the motor cable coming through the well head.

7. Discharge head baseplate shall be equipped with bolt holes which match the diameter, number, and placement of the wellhead companion flange and access port assembly. Any necessary spool piece between the well casing and discharge head shall be ASTM A53 carbon steel Schedule 40.

8. Discharge head shall be designed to prevent contamination of the well from the surface, and shall accommodate the required motor assembly. Space shall be provided for access to the coupling between the pump shaft and drive shaft. Pipe taps shall be provided on the discharge head as required for prelubrication and a ½" discharge pressure gauge assembly connections.

9. The pump shall be furnished with a two-piece top shaft. The head shaft passing through the stuffing box shall be made of Type 416 stainless steel meeting ASTM 582. It shall be precision ground, balanced, and polished with a surface finish better than 40 rms. Its length shall be sized to accommodate the length of top column pipe plus the height of the head through the stuffing box, so that the couplings are easily accessible at the head and the first column pipe joint.

F. Electric Motors:

1. See Electrical Drawings and Division 16 Electrical Specifications.

2. The motor shall be designed for single, constant speed operation.

3. The pump manufacturer shall be responsible for supplying the motors and shall ensure proper coordination for mounting of the motors on the pumps. He shall properly select and size the drive unit for each pump inclusive of thrust bearing capacity for all conditions at startup, runout, and shutoff.

4. The motor shall be a heavy duty squirrel cage induction type, NEMA Class B or Class F insulation with TEFC enclosure,1800 RPM maximum vertical hollow shaft motor, with a non-reverse ratchet (or self-release coupling) to prevent reverse rotation of the rotating elements. A thrust bearing of ample capacity to carry the weight of all rotating parts plus the maximum hydraulic thrust load under all conditions of operation calculated L10 life shall be no less than 8800 hours. The motor shall be premium efficiency, 1.15 service factor, and suitable for use on 460 volt, three phase, 60 Hz electric service. An adjusting nut shall be provided at the top of the motor for setting the impeller to bowl running clearance.

5. The motor bearing loading for the driver shall include the total pump lineshaft downthrust. The motor bearings shall be designed to withstand any momentary total upthrust.

6. Vertical hollow shaft electric motor drivers shall be provided with ball or roller bearings of adequate strength to carry the hydraulic thrust of the pump impellers and the weight of all rotating parts. The bearings shall have a minimum calculated L-10 rating life of 100,000 hours in accordance with ABMA 9. If there is a potential for pump upthrust during any operating condition, the drive shall be designed for this upthrust. The vertical hollow shaft motor shall be sized to transmit the maximum horsepower required by the pump over the entire operating range of the pump. Motor shall be provided with a nonreversible ratchet device to prevent reverse rotation of the pump and line shafts of pumps with settings of 50 feet or more. Provisions shall be made for vertical impeller adjustment at the top of the motor.

7. The motor shall be sized so that the service factor is not infringed upon throughout the full speed performance curve of the pump. The thrust bearing shall be of ample capacity to carry the weight of all the rotating parts plus the hydraulic thrust and shall be an integral part of the driver. The bearing shall be of such size that the average life rating is based on five (5) years continuous operation.

8. Performance Requirements:

a.	Service rating:	460-volt, 3 phase, 60 Hz.
b.	Vibration	Shall not exceed Hydraulic Institute Standards
c.	Sound pressure level:	Shall not exceed 80 dbA at 5 feet under free field load conditions in accordance with IEEE Standard 85.
d.	Temperature rise:	Shall not exceed 80 degrees Centigrade (°C) as measured by resistance when motor is operated continuously at rated horsepower, rated voltage and frequency in ambient air temperature of 40 °C.
e.	Factory tests:	Completely assembled motors shall be given the following tests conducted in accordance with NEMA standards MG1-20.46 and MG 1-20.47.
	(1)	No load current
	(2)	Winding resistance

f. Pump motor shall be equipped with normally closed motor winding thermostats and 120 volt motor winding space heater. Provide wattage rating with the shop drawing submittals.

2.3 CONTROL PANEL

A. Panel Requirements: See Electrical Drawings and Division 16: Electrical Specifications.

2.4 SPARE PARTS

A. Spare parts to be provided by the Manufacturer for each pump shall be as follows unless noted otherwise:

1. One (1) set of bearings.
2. Two (2) sets of O-rings and gaskets.
3. One (1) set of wear rings.
4. One (1) year supply of lubricant.
5. Where applicable, one (1) set of belts and sheaves.
6. Where applicable, two (2) sets of packing and one (1) lantern ring.

7. Where applicable, one (1) set of mechanical seals or one (1) mechanical seal.

8. Where applicable, one (1) shaft sleeve per unit supplied.

B. All parts shall be packed for shelf storage and placed in boxes indicating model numbers, part numbers, manufacturer of part, manufacturer of pumping unit, manufacturer's local representative, and shall be tagged as spare parts. Instructions for preparation and installation of each spare part or group of parts shall be packaged with the spare part or parts.

C. Spare parts and lubricants, as received, shall be turned over to the TOWN immediately upon receipt by the CONTRACTOR.

2.5 SPECIAL TOOLS

A. A complete set of all special tools which may be necessary for the adjustment, operation, maintenance, and disassembly of all equipment shall be furnished. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment. Tools shall be high-grade, smooth, forged, alloy, tool steel. Special tools shall be delivered at the same time as the equipment to which they pertain. Properly store and safeguard such special tools until completion of the work, at which time they shall be delivered to the TOWN.

2.6 PAINTING AND COATING – FACTORY FINISH

A. Discharge Head (Interior and Exterior)..
   1. Exterior:
      - Surface preparation SP5 White Metal Blast Cleaning.
      - Manufacturer’s standard NSF 61 certified fusion bonded coating.
   2. Interior: Coat interior with Tnemec Series N141 Pota-Pox epoxy coating, or approved equal, 8 mil minimum dry film thickness.

B. Pump Bowl (Interior and Exterior) and Column Pipe (Interior and Exterior), and Suction Bell (Interior and Exterior): Coat interior and exterior with Tnemec Series N141 Pota-Pox epoxy coating, or approved equal, 8 mil minimum dry film thickness.

C. Wellhead Flange and Access Port Arrangement Assembly, Interior and Exterior.
   1. Surface preparation SP5 White Metal Blast Cleaning.
   2. Polyamidoamine Epoxy, Tnemec Series N141 applied at 2 coats at 4.0 to 6.0 MDFT per coat.

D. Motor.
   1. Surface preparation SP10 Near-White Metal Blast Cleaning.
   2. Polyamide High Build Epoxy. Two coats at 4.0 to 6.0 MDFT per coat.
   3. Top Coat: Aliphatic Acrylic Polyurethane, Tnemec Series 1095 applied at 2.5 to 5.0 MDFT.

E. Finish Color: Submit color chart for Owner selection. See Section 09900: Protective Coatings

F. Provide a sufficient quantity of the top coat paint for field touchup.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's field services technicians instructions. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations.

B. Connect suction and discharge piping without imposing strain to pump flanges.

C. Orient discharge head to accurately mate with discharge piping.

D. Anchor Bolts: Accurately place using equipment templates. Use new neoprene flange gasket.

E. Painting and Coating:

1. All coatings shall be ANSI/NSF-61 approved for use with potable water systems.

2. See Section 09900 – Protective Coatings for color schedule.

3. Color of finish coat shall match the color of the adjacent piping per color coding of piping system.

4. All nameplates shall be properly protected during painting. Do not paint over any portion of the nameplate.

3.2 INSPECTION AND TESTING

A. General: Furnish the services of a competent and experienced factory representative who has complete knowledge or proper operation and maintenance of the equipment for a period of not less than two (2) days in two (2) separate visits to inspect the final installation, supervise a test run of the equipment and provide operator training. The first visit will be for checking and inspecting the equipment after it is installed. The second visit will be to operate and supervise the initial field test. At least one (1) of the two (2) days shall be allocated primarily to the instruction of plant personnel in operation and maintenance of the equipment. This instruction period shall be scheduled at least ten (10) days in advance with the TOWN and shall take place prior to start-up and acceptance by the TOWN. The final copies of operation and maintenance manuals must have been delivered to the ENGINEER prior to scheduling the instruction period with the TOWN.

B. Well Casing Flange: Confirm Well Casing Flange with Pump Manufacturer. The Contractor shall conduct field tests to confirm the well casing flange is level and plumb and meets the requirements of the pump manufacturer. The precision of the field measurements to determine the well casing flange level shall be as recommended by the pump manufacturer.

1. If the well casing flange does not meet the pump manufacturer’s requirements, perform the following:
   a. Notify the Engineer and Owner immediately.
   b. Submit modifications to the Wellhead Flange and Access Port Arrangement Assembly to adjust for the well casing flange level to provide a sufficiently level base for the pump discharge head.
2. If the well casing flange meets the pump manufacturer’s requirements, submit a confirming statement with the pump Shop Drawing.

C. Motors: The CONTRACTOR shall check all motors for correct clearances and alignment and for

correct lubrication in accordance with the manufacturer's instructions. The CONTRACTOR shall check the direction of rotation of all motors and reverse if necessary.

D. Pumps: After the pumps have been completely installed and inspected by a factory representative, field tests shall be conducted on each unit in the presence of the ENGINEER to confirm mechanical soundness of the installation. The CONTRACTOR shall supply all electric power, water, labor, equipment and incidentals required to complete this test.

E. Field Testing:

1. Upon completion of all the mechanical work, the CONTRACTOR shall conduct testing as specified herein to demonstrate that the equipment performs in accordance with all specifications.

2. The CONTRACTOR shall perform initial testing of the equipment insuring to himself that the tests listed in the Demonstration Test paragraph below can be completed.

3. The Demonstration Test shall demonstrate that all items of these Specifications have been met by the equipment, as installed, and shall include the following tests:

   a. That the pumps can deliver the specified pressure and quantity at rated efficiency.

   b. That the pump controls perform satisfactorily.

4. In the event that the equipment does not meet the Demonstration Test, the CONTRACTOR shall, at his own expense, make such changes and adjustments in the equipment which he deems necessary and shall conduct further tests until written certification is received from the ENGINEER.

F. Upon completion of the installation, the manufacturer, in the presence of the ENGINEER, shall perform a preliminary test at the specified service conditions of each system to insure the functioning of all component parts to the satisfaction of the ENGINEER. The manufacturer shall furnish all labor and equipment. Power shall be supplied by the CONTRACTOR. Approval of the preliminary test by the ENGINEER shall not constitute final acceptance of the equipment furnished.

G. After the facility is in operation, a full operating test shall be performed in the presence of the ENGINEER and a qualified manufacturer's representative of the system. The manufacturer shall furnish all labor, material and equipment required for such tests and shall correct any deficiencies noted, by repairing or replacing the defective components and retesting as required until the equipment meets the specifications and the satisfaction of the ENGINEER. The manufacturer shall have 30 days to make the changes necessary to meet the Specifications, the owner may order the manufacturer to remove rejected equipment from the site and refund to the TOWN all payments made to him.

1. Functional Test: Conduct on each pump.

   a. Alignment: Test complete assemblies for correct rotation, proper alignment and connection, and quiet operation.

   b. Vibration Test:

      - Test with unit installed and in normal operation, and discharging to the connected piping systems at rates between low discharge head and high discharge head conditions specified.
      - Shall not develop vibration exceeding the limits specified in Hydraulic Institute Standards 9.6.4. The vibration measurement

locations and directions shall be as shown on Figure 9.6.4.2.3.1 for a VS3 configuration.

- If unit exhibits vibration in excess of limits specified, adjust or modify as necessary. Unit that cannot be adjusted or modified to conform as specified shall be replaced.

2. Performance Test: Conduct on each pump.

   a. A step test shall be conducted in the presence of the Owner and Engineer.

   b. The step test shall include a minimum of four steps.

   c. The duration of each step shall be as required to obtain steady and reliable test data. The following data shall be measured and recorded during each step of the test:

      - Flow Measurement: Measured by flow instrumentation.
      - Pressure: Owner's pressure gauge, or as approved by the Engineer.
      - Operating Temperature: Monitor bearing areas on pump and motor for abnormally high temperatures
      - Water level shall be measured by level instrumentation or Engineer approved instrumentation.
      - Measure phase to phase volts and amp draw at the motor control center using an ammeter provided by the Contractor.

H. Performance Guarantee: Provide a written guarantee from the equipment manufacturer that the pump, motor, and drive are installed and operating properly in compliance with the plans and specifications and the manufacturer's specifications.

I. DISINFECTION AND TESTING:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SCDHEC REGULATION 61-58 STATE PRIMARY DRINKING WATER REGULATIONS. ALL MATERIALS OR PRODUCTS WHICH COME INTO CONTACT WITH DRINKING WATER SHALL BE CERTIFIED AS MEETING THE SPECIRFICATIONS OF THE AMERICAN NATIONAL STANDARD INSTITUTE/NATIONAL SANITATION FOUNDATION STANDARD 61, DRINKING WATER SYSTEM COMPONENTS – HEALTH EFFECTS.

2. WELL, PUMP, PIPING AND EQUIPMENT IN CONTACT WITH DRINKING WATER SHALL BE DISINFECTED AND TESTED IN ACCORDANCE WITH SCDHEC REGULATION 61-58.2 AND 61-58.4. ALL NEWLY INSTALLED PIPE SHALL BE PRESSURE TESTED AND LEAKAGE TEST IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARD C600.

3. The well shall be disinfected after installation of the thoroughly scrubbed and cleaned permanent pump.

   a. Disinfectants - Chlorine disinfectant shall be delivered to the site of the work in original closed containers bearing the original label indicating the percentage of available chlorine. The disinfectant shall be recently purchased (chlorine compounds in dry form shall not be stored for more than one year and storage of liquid compounds shall not exceed 60 days). During storage, disinfectants shall not be exposed to the atmosphere or to direct sunlight. The quantity of chlorine compounds used for disinfection shall be sufficient to produce a minimum of fifty (50) milligrams per liter available chlorine in solution when mixed with the total volume of water in the well.

b. Disinfection procedure - For each disinfection, a reliable means shall be provided for ensuring that the disinfecting agent is uniformly applied throughout the entire depth of the well including the casing, pipes and wiring above the water level. The disinfection shall be in accordance with current AWWA Standards for disinfection of wells.

After the contact period, the well shall be pumped to clear it of the disinfecting agent. The disposal point for the purged water shall be selected so as to avoid damage to aquatic life or vegetation.

4. Bacteriological analysis - Prior to sampling, the well shall be pumped until the chlorine residual in non-detectable. Two consecutive samples of water shall be collected at least twenty-four (24) hours apart and be analyzed for total coliform bacteria. The results of both samples must show the absence of total coliform bacteria using membrane filter methodology. The measured chlorine residual and non-coliform growth must also be reported. If the non-coliform growth is greater than eighty (80) colonies per one hundred (100) milliliters, the sample result will be deemed invalid and must be repeated. All samples must be analyzed by a laboratory certified by the Department. The Department (SCDHEC) may request that heterotrophic plate count analyses be conducted on a case- by-case basis where construction, development, or disinfection problems are suspected.

TABLE 11220-A
VERTICAL TURBINE PUMP DESIGN REQUIREMENTS

Item/Design Criteria		Design Condition
a.	No. of Pumps Required	1
b.	Pump Discharge Size, Inches	10”
c.	Primary Operating Condition	1,500 gpm @ 236’ TDH
d.	Primary Operating Hydraulic Efficiency, Minimum	74%
e.	Additional Condition	2,000 gpm @ 90’ TDH
f.	Shut Off Head, maximum	214’
g.	Motor, Maximum HP	125
h.	Speed, Maximum RPM	1,800
i.	Voltage, Volts	460
j.	Phase	3
k.	Frequency, Hertz	60
l.	Service	Transfer Raw Water to Elevated Storage Tank and Distribution
m.	Control Panel	See Division 16
n.	NPSHR, Feet (Max)	22.50
o.	Setting Depth, Feet	135’ below finished floor

TABLE 11220-B
VERTICAL TURBINE PUMP DESIGN REQUIREMENTS

Pump Manufacturer	**Flowserve**	**Goulds**	**Fairbanks**
Model No.	12ENL	DWT-DITM 14RJLC	11H-SS
Impeller Dia (In.)	9.38”	9”	7.55”
Stages	5	4	6
Column Dia (In.)	8”	8”	8”

Design criteria identified in Table 11220-A above were selected based on the results of the Four Waters Engineering, Inc. design assumptions and calculations. These conditions and pumps listed in Table 11220-B shall be used for bidding purposes.

END OF SECTION 11220

Coastal Zone Consistency Determination

To:	Dennis Averkin, Town of Ridgeland
From:	Bisig, Anna M., OCRM Coastal Zone Consistency Section AB
Project Name:	Town of Ridgeland Well Site No. 3 Improvements
Site Location:	Jasper Hwy & Captain Bill Road, Ridgeland, Jasper County, SC
Ref #:	HQ1-SD4S-XDW7M
Date:	March 13, 2024

The staff of the Office of Ocean and Coastal Resource Management (OCRM) reviewed the above referenced Coastal Zone Consistency project request for land disturbance associated with site improvements including the expansion of the building footprint for updated chemical storage, interior improvements, facade improvements, and electrical grounding system improvements for Stormwater and Water permits. No wetland impacts. The total area of disturbance will be 0.30 acres of a 0.30-acre project site.

We hereby certify the above referenced project is Conditionally Consistent with the Guidelines for the Evaluation of All Projects as well as the Transportation Facilities *(Roads and Highways, Parking Facilities),* Commercial Development, Public Services and Facilities *(Sewage Treatment and Water Supply),* and Stormwater Management (*Runoff*) policies contained in the S.C. Coastal Zone Management Program provided the provided the following conditions are included in the permit and adhered to by the applicant.

Conditions for Minor Impact Projects

1. The Coastal Zone Consistency certification does not alleviate the applicant's responsibility for obtaining any other necessary local, state and/or federal approvals for the development of the residential lot prior to work beginning.

2. All construction BMPs must be installed, inspected and maintained to hold sediment onsite and to protect any adjacent or downstream critical area, wetlands and waters through the life of the project. Upon completion of construction activities, all disturbed (includes undeveloped) areas, including those impacted for access, must be immediately stabilized.

3. Projects that are part of a LCP are authorized/granted coverage provided the consistency determination review for the development including its stormwater management drainage system has been approved under a previously authorized NPDES CGP Land Disturbance Permit (clearing and grading or site development). The development infrastructure, and site layout deemed consistent under the referenced NPDES Land Disturbance Permit's

Stormwater Pollution Prevention Plan (SWPPP) remains unchanged from the time of approval as referenced under Section 2.2.2.A of the current NPDES General Permit For Stormwater Discharges From Construction Activities, as well as, compliant with the S.C. Stormwater Management and Sediment Reduction Regulations (26 S.C. Code Ann. Regs. 72-300) and Chapter III, Section XIII, A, E, and D of the SCCZMP.

4. For all projects with a permanent water quality pond having a permanent pool, regardless of size, which are located within one-half (1/2) mile of a receiving water body in the coastal zone, the applicant must demonstrate storage of the first ½ inch of runoff from the entire site or storage of the first one (1) inch of runoff from the built-upon portion of the property, whichever is greater. Storage may be accomplished through retention, detention or infiltration systems as appropriate for the specific site. Additionally, if the project is in close proximity to shellfish beds (within 1000' of the project), the applicant must demonstrate that the first one and half (1½) inches of runoff from the built upon portion of the property is retained onsite.

5. The project, as applicable, must be compliant with any MOA or Restrictive Covenants/Recorded plats for the project associated with previous Coastal Zone Consistency Determinations of any respective Bureau Permit. Proof of compliance must be included with the request narrative and shown on the lot construction plan sheet.

6. In the event that any historic or cultural resources and/or archaeological materials are found during the course of work, the applicant must notify the State Historic Preservation Office (SHPO) and the South Carolina Institute of Archaeology and Anthropology. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials.

7. The applicant must continue to adhere to all conditions of any Coastal Zone Consistency Determinations of respective Bureau permits.

8. Project development must not result in adverse impacts through nonpoint stormwater runoff and/or point source water discharge on adjacent lands.

9. The project must adhere to sediment, erosion and water quality controls required by the current NPDES General Permit for Stormwater Discharges from Large and Small Construction Activities and the S.C. Stormwater Management and Sediment Reduction Regulations (26 S.C. Code Ann. Regs. 72-300, as amended, are satisfied by the project design and are correctly installed and maintained.

10. The proposed activity is not located in areas identified as "Areas of Special Resource Significance" as detailed in Chapter III, Section XII of the SCCZMP, as refined. Areas of Special

Resource Significance includes (1) Barrier Islands, (2) Dune Areas (outside of the critical area), (3) Navigation Channels, (4) Public Open Spaces, and (5) Wetlands.

11. The proposed activity is not located in areas identified as GAPCs as detailed in Chapter IV of the SCCZMP; Areas of Unique Natural Resource Value: (1) Heritage Trust Sites, (2) State Wildlife Preserves, (3) State Parks, (4) Scenic Rivers, (5) Marine and Estuarine Sanctuaries, (6) Shellfish Areas, (7) Groundwater Resources, and (8) Threatened and Endangered Species; Activities or Facilities Dependent on Coastal Location: (1) State Ports, (2) Navigation Channels, and (3) Mining Operations; Areas of Special Historic, Archaeological or Cultural Significance: (1) special historic, (2) archaeological, or (3) culturally significant sites. For those projects adjacent to or that may significantly affect a priority of use for any GAPC, DHEC OCRM will determine a project's affects during individual review of application for coverage under this GCZC. Those projects which are likely to adversely affect the priority of use for a GAPC will require an individual certification.

This determination shall serve as the DHEC OCRM State/Federal Coastal Zone Consistency Determination for the work described above. This determination ***does not*** serve as the final permitting decision and ***does not*** alleviate the applicant's responsibility to obtain final authorizing State or Federal permit(s). Local government authorizations ***may also*** be required.