

**UV DISINFECTION & REAERATION IMPROVEMENTS
VICTOR, IOWA**

CONTRACTOR'S BID DATE: Thursday, June 9, 2022 @ **2:00 P.M.**

PLACE FOR CONTRACTORS
TO SUBMIT BIDS:

City of Victor
City Hall
707 2nd Street
Victor, Iowa 52347

ADDENDUM NO.1

June 2, 2022

TO ALL PLANHOLDERS:

The following changes, clarifications, additions, and/or deletions are hereby made a part of the contract documents for the above-referenced project, as fully and completely as if the same were fully set forth therein. All Bidders submitting a Bid on the above Contract shall carefully read this Addendum and give it consideration in the preparation of their Bid.

This Addendum No. 1 consists of the following:

- Addendum No. 1 pages ADN1-1 through ADN1-2
- Section 00400 Bid Form – ADDENDUM #1 (5 pages)
- Section 33 3219 Lift Station – ADDENDUM #1 (9 pages)



SPECIFICATIONS:

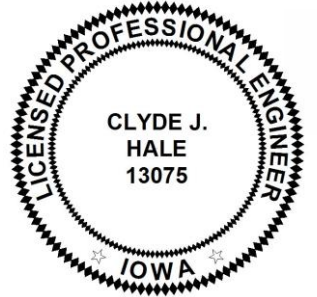

1. **REPLACE SECTION 004000 BID FORM WITH THE ATTACHED** (changes highlighted)
2. **REFER TO SECTION 01 2000 PRICE AND PAYMENT PRODCUDURES, 1.07:**
 - a. **O. DIVISION 33 - UTILITIES: REPLACE** “8-inch C900 Force Main,” with “8-inch DIP Force Main.”
3. **REFER TO SECTION 33 3111 SANITARY SEWER PIPING, 2.04:**
 - a. **ADD TO A 4** “Ceramic Epoxy 40-60 mil thickness or SP-2000 are acceptable for interior lining.”
4. **REPLACE SECTION 33 3219 LIFT STATION WITH THE ATTACHED** (changes highlighted)

PLANS:

1. Sheet E501- Details: Refer to interior Lighting Fixture Schedule. **ADD** the following manufacturers to the Schedule,
 - a. Type W1: Hubbell Outdoor Lighting.
 - b. Type L1: Columbia Lighting.
 - c. Type E1: Dual-Lite.

All bidders shall acknowledge receipt and acceptance of Addendum No. 1 by signing in the space provided on the Bid Form. Bids submitted without Addendum No. 1 being acknowledged will be considered non-responsive.

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.  Date: <u>6/02/22</u>
	MATTHEW JOHN WILDMAN, P.E. License No. 17910 My renewal date is December 31, 2023 Pages or sheets covered by this seal: Addendum #1

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.  Date: <u>6/02/22</u>
	CLYDE J. HALE, P.E. License No. 13075 My renewal date is December 31, 2023 Pages or sheets covered by this seal: Div. 25 and Div. 26 Addendum #1

MATT WILDMAN
HR GREEN, INC.
8710 EARHART LANE
CEDAR RAPIDS, IOWA 52404
PHONE: (319) 841-4000

END OF ADDENDUM #1

**SECTION 00400
BID FORM**

BID TO: City of Victor, IA
707 2nd Street
Victor, IA 52347

- The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the Owner in the form included in the Contract Documents to perform the WORK as specified or indicated in said Contract Documents entitled:

Victor, IA – UV Disinfection Improvements

- Bidder accepts all of the terms and conditions of the Contract Documents, including without limitation those in the Notice to Bidders and Instructions to Bidders, dealing with the disposition of the Bid Security.
- Schedule of prices for construction of Victor, IA – UV Disinfection Improvements in accordance with the Contract Documents.

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
DIVISION 1 - GENERAL					
1.	Mobilization/Testing/Miscellaneous	LS	1	\$	\$
2.	WWTP Warning Signs	EA	6	\$	\$
DIVISION 2 - DEMOLITION					
3.	Demolition of Existing UV Tank	LS	1	\$	\$
4.	Demolition of Existing Manhole 5	LS	1	\$	\$
5.	Fence Removal, 6' Chain Link	LF	160	\$	\$
DIVISION 3 - CONCRETE					
6.	UV Disinfection and Reaeration Structure	LS	1	\$	\$
7.	Effluent Pump Station Control Panel Pad	LS	1	\$	\$
8.	Pre-Engineered Building Foundation and Pad	LS	1	\$	\$
DIVISION 5 - METALS					
9.	Bollards	EA	4	\$	\$
10.	Aluminum Grating	SF	220	\$	\$
11.	Galvanized Handrails	LF	82	\$	\$
12.	V-notch Weir	EA	1	\$	\$
13.	Stainless Steel Baffle Plate	EA	1	\$	\$
14.	UV Tank Stairs	LS	1	\$	\$

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
DIVISION 5 – METALS cont.					
15.	Davit Crane Wall Mount	EA	1	\$	\$
16.	Davit Crane Pedestal Mount	EA	1	\$	\$
DIVISION 9 - FINISHES					
17.	Paints and Coatings	LS	1	\$	\$
DIVISION 13 – SPECIAL CONSTRUCTION					
18.	Pre-Engineered Wood Post Frame Building	LS	1	\$	\$
DIVISION 22 - PLUMBING					
19.	5/8-Inch Ball Valve	EA	1	\$	\$
20.	12-Inch Plug Valve	EA	2	\$	\$
21.	6-Inch Plug Valve	EA	1	\$	\$
DIVISION 23 - HVAC					
22.	Building Heat and Ventilation	LS	1	\$	\$
DIVISION 25 – INTEGRATED AUTOMATION					
23.	Existing PLC Panel Updates	LS	1	\$	\$
24.	Effluent Pump Station Controls	LS	1	\$	\$
25.	SCADA	LS	1	\$	\$
26.	EQ Return Flow Meter and Influent LS Programming	LS	1	\$	\$
DIVISION 26 - ELECTRICAL					
27.	Pre-Engineered Building Electrical	LS	1	\$	\$
28.	UV and Reaeration Electrical	LS	1	\$	\$
29.	Effluent Pump Station Electrical	LS	1	\$	\$
30.	Manhole 5 Electrical	LS	1	\$	\$
DIVISION 31 – SITE WORK					
31.	Earthwork	LS	1	\$	\$
32.	Gravel Landscape	SF	1,618	\$	\$
33.	Gravel Drive	SF	1,598	\$	\$
34.	Gravel Overlay	SF	1,020	\$	\$
DIVISION 32 – EXTERIOR IMPROVEMENTS					
35.	Gate, Chain Link and Barbed Wire, 20', Reinstallation	EA	1	\$	\$
36.	Gate, Chain Link and Barbed Wire, 3', Reinstallation	EA	1	\$	\$
37.	Fencing, 6' Chain Link and Barbed Wire	LF	161	\$	\$

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
DIVISION 33 - UTILITIES					
38.	12-Inch PVC Sanitary Sewer	LF	106	\$	\$
39.	8-Inch DIP Force Main	LF	28	\$	\$
40.	Effluent Pump Station Structure, PS-8010	LS	1	\$	\$
41.	MH #11 Extension, MH-9011	LS	1	\$	\$
42.	Manhole #5, MH-1805	LS	1	\$	\$
DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION					
43.	12-Inch Slide Gate	EA	2	\$	\$
DIVISION 43 – PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT					
44.	UV Disinfection Equipment and Installation	LS	1	\$	\$
DIVISION 44 – POLLUTION CONTROL EQUIPMENT					
45.	Composite Sampler	EA	1	\$	\$
DIVISION 46 – WATER AND WASTEWATER EQUIPMENT					
46.	Effluent Aeration Equipment and Installation	LS	1	\$	\$
47.	Effluent Pump Station Pumps and Installation	LS	1	\$	\$
TOTAL ITEM 1 THROUGH 47					

4. Name of person who inspected site of proposed WORK for your firm:

Name: _____ Date of Inspection: _____

5. Bidder has examined copies of all the Contract Documents including the following addenda (receipt of all of which is hereby acknowledged):

Number _____ Date _____

6. Failure to acknowledge addenda may render the Bid non-responsive and be cause for its rejection. Bidder has familiarized itself with the nature and extent of the Contract Documents, WORK, site, locality where the WORK is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations), and the conditions affecting cost, progress or performance of the WORK and has made such independent investigations as Bidder deems necessary.

7. The Bidder hereby agrees to comply with the additional requirements listed below which are included in this proposal and identified as Bid Form attachments:

ITEM NO.	DESCRIPTION OF ATTACHMENT
1.	Section 00430 Bid Bond (Separate Sealed Envelope)
2.	Bidder Status Form and Worksheet: Authorization to Transact Business
3.	State Revolving Fund (SRF) Exhibit 7A Attachments <ul style="list-style-type: none">• Attachment 1• Attachment 2• Attachment 3• Attachment 4• Attachment 5• Attachment 10

8. Bidders on this work will be required to comply with the President's Executive Order Nos. 11246 as amended, 11518, and 11625 as amended. The requirements for bidders and contractors under these orders are explained in the specifications. This project has a goal of awarding 1 percent of the total project cost to certified minority owned businesses and 3 percent of the total project cost to certified woman owned businesses.

Your special attention is invited to the attached **MBE/WBE Subcontractor Solicitation Information Form and Certification Regarding Debarment, Suspension, and Other Responsibility Matters Form**. Both forms must be completed and submitted with your bid proposal. Failure to submit both forms will cause the bid to be rejected. Bidders shall demonstrate compliance with good faith efforts in order to be deemed responsible. The information shall be included for each MBE/WBE Subcontractor contacted by the bidder, not just those used to meet the fair share objective. By completing the MBE/WBE Subcontractor Solicitation Information Form, you are advising the City how the contract goal will be met.

Please be advised that good-faith efforts will be subjected to close scrutiny and if the good-faith effort submission is unacceptable, your bid will be rejected.

These forms are included in the State Revolving Fund (SRF) General Conditions following Section 800 in the specifications.

To all the foregoing, and including all Bid Forms contained in this Bid, said Bidder further agrees to complete the WORK required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefore the Contract Price based on the Total Bid Price(s) named in the aforementioned Bid Form.

Signed this _____ day of _____, 2022.

By: _____
(Firm Name)

(Signature)

(Typed or Printed Name)

(Title)

(1) BIDDER's name and address:

(2) BIDDER's telephone numbers, and e-mail address:

(3) Federal Tax I.D. No.: _____ Iowa Contractor License No.: _____
(DO NOT OMIT)

(4) BIDDER's authorized agent for contract execution: _____
Name and Title

(5) BIDDER's attesting agent for contract execution: _____
Name and Title

(6) BIDDER's type of business: _____
(Corporation, partnership, individual, etc.)

END OF SECTION 00400

**SECTION 33 3219
LIFT STATION**

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Submersible pump and motor units with necessary lifting accessories.
- B. Access frame and cover.
- C. Wet well.
- D. Valves and piping.

1.02 REFERENCES

- A. ASTM A48 - Specification for Gray Cast Iron Castings.
- B. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- C. ASTM A496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
- D. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- E. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
- F. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.
- G. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
- H. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
- I. ASTM D429 - Standard Test Methods for Rubber Property—Adhesion to Rigid Substrates.
- J. AWWA A21.51/C115 - Water Treatment - Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges.
- K. AWWA C110 - Ductile-Iron & Gray-Iron Fittings for Water.
- L. AWWA C509 - Resilient-Seated Gate Valves.
- M. NEMA MG1 - Motors and Generators.

1.03 SUBMITTALS

- A. Shop Drawings showing arrangement, dimensions, and materials.
- B. Characteristic performance curves for pumps, showing total dynamic head, pump runout, shutoff head, efficiency, brake horsepower, and net positive suction head required plotted against capacity in gpm. Include full curve from shutoff head to maximum capacity for all impeller sizes. Indicate operating point and impeller diameter being furnished.
- C. Certified shop test curves.
- D. Power and control system including internal and interconnecting wiring diagrams, physical layout, and sequence of operation description.
- E. Motor data.
- F. Operation and maintenance manuals:
 - 1. Submit three copies in 3-ring binders.
 - 2. Submittal shall include the following at a minimum:
 - a. Schematics of all equipment, check valves, valves, pumps, control panel, floats, etc.
 - b. Manufacturer's instructions for operation of all equipment.
 - c. Troubleshooting guide for pump controls (i.e., what to do if amp draw high on pump leads, alarm does not work, low voltage side, etc.).
 - d. Recommended spare parts for all equipment.
 - e. Recommended maintenance and schedule for maintenance for all equipment.

- f. Contact numbers for supplier and manufacturer.
- g. Any other information that pertains to the operation or maintenance of equipment.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Receive and unload shipments to plant site from suppliers of equipment under this contract.
- B. Unload equipment as soon as possible after arrival.
- C. Pay freight car and truck demurrage, detention, and any other costs which may be billed to Owner due to failure to unload cars or trucks within time required by freight companies.
- D. Provide physical protection for equipment placed in storage.
 - 1. Support stored equipment above ground and cover with canvas or other heavy-duty sheeting. Cover shall be securely fastened and shall be replaced if torn or otherwise damaged during storage period.
 - 2. Store motors in dry, warm place and in accordance with manufacturer's recommendations. Motors over 20 hp shall have shaft rotated 90 degrees each month. Provide Engineer with evidence that this requirement is met.
 - 3. Maintain desiccant between cover and motor frames on motors. Provide desiccant of type permitting visual determination of condition of desiccant. Replace desiccant when it becomes ineffective.
 - 4. Store the following items in weatherproof, heated (minimum 50 degrees F.) building complete with bins for storage of small pieces of equipment. Storage inside of existing treatment plant not available.
 - a. Electronic instruments and cabinets.
 - b. Electrical equipment with general purpose enclosures.
 - c. Insulation materials.
 - d. Rotating equipment.
 - e. Miscellaneous electronic equipment, gaskets, and small machined parts.
 - f. Instruments and controls.
- E. Inspect stored equipment weekly. Renew protective coatings as necessary to preserve fitness of equipment.
- F. Provide for safekeeping of materials or equipment received. Store and maintain materials and equipment after receipt until completed installation is accepted by Owner. Such storage and maintenance shall be in accordance with manufacturer's recommendations and requirements of these Specifications. Provide materials, equipment, and labor required for such storage and maintenance.
- G. Contractor shall be accountable for any deterioration of materials or equipment occasioned by improper storage or maintenance, and shall recondition, repair, or replace any such materials or equipment without additional cost to Owner.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described below.
 - 1. Instruct the Contractor's personnel in the installation, startup, and testing of equipment.
 - 2. Inspect equipment after it is installed to assure that all details of installation are correct and that equipment is prepared for operation in accordance with manufacturer's instructions and recommendations.
 - 3. Check connections to equipment and adjust, or supervise adjustment of, control and indicating devices after equipment has been installed and connected.
 - 4. Fully instruct Owner's operating personnel in operation and maintenance of equipment.
 - 5. Provide Engineer with duplicate copies of final alignment and clearance measurements on all rotating or reciprocating equipment. Measurements shall clearly identify each piece of equipment.
 - 6. Supervise preliminary operation of equipment and necessary adjustments.

- B. Presence of service representative will in no way relieve Contractor of any responsibility assumed under the Agreement.
- C. Work and abilities of service representative shall be subject to review by the Engineer. If Engineer determines that any service representative is not properly certified, Contractor shall replace service representative upon written notification by Engineer.
- D. Contractor shall provide continuity in assignment of service representative to Work. In event substitution of service representative is made which is not at request of Engineer, substitute's time for familiarization shall be at Contractor's expense.
- E. Include necessary trips by the manufacturer's representative to provide one 8-hour work day on-site (travel time not included) for startup and training of operations personnel. Training may be video taped by Owner.
- F. Additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.
- G. The pump manufacturer shall have an authorized factor service center/stocking facility capable of completely servicing and stocking parts for pumps and motors within 100 miles of the Owner.
- H. Service center shall be certified to work on explosion-proof motors.

1.06 START-UP, COMMISSIONING AND TRAINING

- A. Factory test all pumps at manufacturer's plant. Perform tests in accordance with test code of Hydraulic Institute Standards. Pump test will not be witnessed by Owner or Engineer.
- B. Provide shop space, tools, equipment, instruments, personnel, and facilities required for satisfactory completion of tests.
- C. Submit test curves and allow Engineer's review prior to pump shipments.
- D. Hydraulic performance shop test:
 - 1. Submersible pumps shall be factory-tested at pump manufacturer's plant. Tests shall be in accordance with Test Code of Hydraulic Institute Standards.
 - 2. Test curves shall cover full range of operation from shutoff to maximum capacity, and have capacity plotted as abscissas, and operating head, brake horsepower, and efficiency plotted as ordinates. Conduct tests for variable speed pumps at maximum and minimum operating speeds.
 - 3. Test points.
 - a. Shut off.
 - b. Maximum run out.
 - c. Design operating condition.
 - d. Two additional points, one on each side of design operating condition.
 - 4. Test tolerances:
 - a. Pumps shall be within one or the other of the following tolerance:
 - 1) At rated head: +10% of rated capacity.
 - 2) At rated capacity: +5% of rated head.
 - b. No minus tolerance or margin shall be allowed with respect to capacity or total head at rated or specified condition.
 - c. Pump manufacturer shall provide shop space, tools, equipment, instruments, personnel, and all else required for satisfactory completion of tests. Payment for tests shall be included in Contract amount.
 - d. Test curves shall be submitted and reviewed prior to pumps being released for shipment.
- E. Pump Tests:
 - 1. Pump manufacturer shall perform following inspections and tests on pumps prior to shipment.
 - a. Inspect for conformance to Contract Documents with respect to correct model number, motor rating, and electrical connections.
 - b. Test motor and seal housing chambers for moisture content or insulation defects.

- c. Prior to submergence, allow pump to run dry to establish correct rotation and mechanical integrity.
 - d. Discharge piping attached to pump shall operate submerged under a minimum of 6' of water for a minimum of 30 minutes.
 - e. After operational test, motor and cable shall be tested again for moisture content or insulation defects.
2. Pumps failing inspection or tests shall be repaired or replaced at no cost to Owner.

1.07 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.
- B. Full warranty on pumps for a clog-free operation for two years after substantial completion, including all parts, labor, and expenses.

1.08 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer engaged primarily in design and fabrication of submersible pumps, including solids handling type pumps for wastewater service for at least the last 10 years.
 - 2. Minimum of 100 similar units installed and operating successfully in U.S.
- B. Unit responsibility:
 - 1. Units shall be supplied by one manufacturer for commonality.

PART 2 PRODUCTS

2.01 SYSTEM REQUIREMENTS

- A. Service: Sewage.
- B. Rotation: Counter-clockwise, when viewed from the top of pump.
- C. Pumping units shall consist of submersible pumps and motors, guide rails, lifting chains, discharge connection and mounting plate, anchor bolts, access frame and cover, piping, and accessories for a complete, operable system.
- D. Pumps shall be suitable for pumping wastewater with solids concentrations of up to 3% by weight and shall be capable of passing 3" spheres without clogging.
- E. Pumps shall be suitable for continuous operation at flow conditions stated herein without excessive noise, vibration, heating, cavitations, or damage to pump.
- F. Head characteristics for pumps: Continuously rising as flow is decreased. Shutoff head shall be minimum of 1.35 times rated head.
- G. Size pumps to allow increase in rated pump head by as much as 10% by replacement of impellers.
- H. Fit each pump with centered lifting loop and stainless steel lifting chain of adequate strength to raise and lower pumping unit. Chain shall be of length required for installation depth shown on Drawings.
- I. Discharge connections shall be permanently installed in wet well with discharge piping. Pump shall automatically connect to discharge connection when lowered into place and shall disengage easily and automatically without removal of fasteners or piping when pump is raised.
- J. Attach sliding guide bracket to pump units which will slide between a minimum of two guide rails to properly position pump discharge on discharge connection elbow.
- K. Pump, appurtenances, and cable shall be capable of continuous submergence underwater to depth of (actual depth up to 20') without loss of watertight integrity.
- L. Design pump motors to operate continuously at design conditions with 50% of motor unsubmerged without overheating.

2.02 PUMP DESIGN AND CONSTRUCTION

- A. Manufacturers

1. Flygt Corporation, Model NP-3127.
 2. ABS.
 3. Gorman-Rupp.
 4. Myers.
 5. Fairbanks Morse.
 6. Hydromatic.
 7. Engineer Approved Equivalent.
- B. Type: Explosion proof, submersible, nonclog, sewage handling, bottom suction, integral discharge mating with discharge connection, rail guided. Elbow type discharge connection.
- C. Materials:
1. Casing: Cast iron, ASTM A48.
 2. Impeller: Cast iron, ASTM A48.
 3. Shaft: AISI Type 431 stainless steel.
 4. Shaft seal: Pump side: - Corrosion resistant Tungsten carbide WCCR
 5. Shaft seal: Motor side: - Carbon (Csb) – Aluminum Oxide (AL2O3)
 6. Exposed nuts and bolts: Type 304 stainless steel.
 7. Volute inlet wear ring contact surface: Brass-coated steel ring.
 8. Anchor bolts: Type 304 stainless steel.
- D. Casing:
1. Volute: Single-piece design with smooth fluid passages.
 2. Pump casing shall be of sufficient thickness to withstand a minimum hydrostatic test pressure of 125 psig.
 3. Provide with replaceable wearing ring.
 4. Mating surfaces requiring watertight sealing shall be machined and fitted with nitrile rubber O-rings. Sealing shall be accomplished by metal-to-metal contact and controlled compression of O-ring without specific torque requirement.
 5. Cable entry design:
 - a. Ensure a watertight and submersible seal without specific torque requirement.
 - b. Provide close tolerance fit against cable outside diameter and cable entry inside diameter and shall produce compression seal when installed.
 - c. Entry body shall provide strain relief separate from sealing function to prevent strain in cable from damaging seal and allowing entry of water.
 - d. Cable entry junction chamber and motor shall be separated by stator lead sealing gland or terminal board which shall prevent foreign material from coming in contact with motor interior.
 - e. Junction chamber, containing terminal board with permanently affixed connectors between cable conductors and stator leads, shall provide completely leakproof seal from motor.
 - f. Cable sealing design which does not utilize a compression fitted power cord and requires epoxy or other secondary sealing system to be reapplied after each cable disconnection or removal shall not be considered acceptable.
- E. Impeller:
1. One-piece, enclosed, nonclog-type capable of handling solids normally present in sewage.
 2. Statically and dynamically balanced, securely positioned and locked to shaft using key and cap screw. Provide means for impeller clearance adjustment.
 3. Impellers shall have smooth contours.
 4. The impeller shall be wear resistant and made of high chromium cast iron with at least 24% chrome.
 5. Impeller hardness of 60 HRC or greater.
- F. Shaft:
1. Machine and polish over entire length.

2. Dynamically balanced with impeller at all operating speeds.
 3. Isolated from pumped liquid.
 4. Shaft shall provide rigid support of impeller and prevent critical vibration and all operating speeds.
- G. Bearings:
1. Anti-friction ball and/or roller bearings, AFBMA L10 life rating of 40,000 hours, designed to carry thrust and radial loads.
 2. Lubrication: Permanently lubricated with grease or oil specifically suited for high temperature applications.
- H. Thermal protection:
1. Provide a thermal sensor in each phase winding or the stator to monitor stator temperatures and respond to thermal overloading of the motor.
 2. Provide any remote monitoring device(s) or control module(s) required by the pump manufacturer for monitoring the status of the thermal sensing devices. These devices or modules shall be supplied to the System Integrator for installation in the control panel.
- I. Moisture protection:
1. Provide one float-actuated reed switch in motor housing to detect liquid leakage into stator area.
 2. Provide a sensing device in the motor housing or seal chamber to detect water or moisture leakage passing by the seal and into the motor housing or seal chamber.
 3. Provide any remote monitoring device(s) or control module(s) required by the pump manufacturer for monitoring the seal leakage sensing device. These devices or modules shall be supplied to the System Integrator for installation in the control panel.
- J. Seals:
1. Provide pump with shaft sealing system utilizing oil chamber.
 - a. Oil chamber shall provide means to compensate for changes in oil pressure.
 - b. Provide oil chamber with easily accessible drain and inspection plug equipped with positive, antileak seal. Access to plug shall not require any disassembly of pump.
 2. Dual independent mechanical rotating shaft seal system running in oil reservoir.
 - a. Lower seal unit, between pump and oil chamber: One stationary and one positively driven rotating tungsten-carbide.
 - b. Upper seal unit, between oil chamber and motor housing: One stationary tungsten-carbide and one positively driven rotating carbon ring.
 - c. Seal faces: Hold in contact by integral springs and hydrodynamically lubricate at constant rate.
 3. Seals shall require neither maintenance nor adjustment and shall be easily inspected and replaceable.
- K. Spare parts: Provide following for each pump.
1. One repair kit, including:
 - a. One set of gaskets and O-rings required for disassembly and reassembly.
 - b. One set of upper and lower seal units.
 - c. One shaft sleeve if used.
 - d. One volute and impeller wear rings.
 - e. One cable entry grommet.

2.03 ACCESS FRAME AND COVER

- A. Manufacturers:
1. Bilco Type J, Single Leaf.
 2. Babcock-David, Type B-FHA, Single Leaf.
 3. Flygt.
 4. Engineer approved equivalent.
- B. Provide one access frame and cover for the two pumps.

- C. Size and completely coordinate with pumps; furnished by pump manufacturer.
- D. Material:
 - 1. Frame: 1/4" x 3" x 3" aluminum angle.
 - 2. Cover: 1/4" aluminum diamond plate, rated support strength 300 lb/sq ft.
- E. Factory Finish: Mill finish on aluminum surfaces with coal tar epoxy coating applied to surfaces in contact with concrete.
- F. Dimensions: Wet well hatch confirmed by manufacturer; minimum size shall be 1 1/2 times largest pumps being installed.
- G. Construction:
 - 1. Single leaf covers: Equip with lifting mechanisms to aid in opening/closing covers.
 - 2. Provide automatic hold-open and over release arms.
 - 3. Cover: Equip with underside-mounted slam lock with attached handle and flush removable plug and key wrench handle for topside use.
 - 4. Top surface of doors shall be skidproof.
 - 5. Equip frame with rails or O-ring device for attaching lifting chain and other accessories.
 - 6. Provide a hasp and staple for padlock. A temporary padlock shall be provided by the Contractor until acceptance. A permanent padlock shall be provided to the Owner after acceptance by the Owner.
- H. Equip with required brackets, hooks, and holders for cables and lifting accessories.

2.04 PIPING

- A. Exposed Piping and Fittings:
 - 1. Flanged header pipe shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C 115 and Class 53 thickness.
 - 2. Flanges shall be ductile iron.
 - 3. Pipe and flanges shall be threaded and suitable thread sealant applied before assembling flange to pipe.
 - 4. Bolt holes shall be in angular alignment within 1/20 between flanges. Flanges shall be faced and a gasket finish applied. Gasket material shall be suitable for sewage service. Torque requirement of gaskets shall be less than torque rating of flange, bolts, and nuts.
 - 5. Fittings shall be ductile iron flange joint with a minimum pressure rating of 250 psi in accordance with AWWA C110.
 - 6. Inside Lining of exposed piping and fittings shall be cement lining and seal coat.
 - 7. Outside Coating of exposed piping and fittings shall have the standard asphaltic coating.
 - 8. All pipes connected to the pump station shall be supported according to good commercial practice.

2.05 LIFTING ACCESSORIES

- A. Fit each pump with centered lifting loop and stainless steel lifting chain of adequate strength to raise and lower pumping unit. Chain shall be of length required for installation depth shown on Drawings.
- B. Working load of lifting system shall be 50 percent greater than the pump unit weight.
- C. Attach sliding guide bracket to pump units which will slide between a minimum of 2 guide rails to properly position pump discharge on discharge connection elbow.
- D. Pump bracket over guide rails to be explosion proof with bronze insert.
- E. Each pump will be fitted with a lifting handle.

2.06 GUIDE RAILS AND BRACKETS

- A. Guide rails: minimum Schedule 40 Type 304 stainless steel pipe of sufficient size to remain rigid and unbending under intended loading conditions. Coordinate size of guide rail with pump manufacturer.

- B. Guide rails shall not support any portion of weight of pump.
- C. Secure lower end of guide bars to discharge connection. Secure upper ends to frame of access cover.
- D. Provide intermediate guide bar spacer supports when clear span distances between supports will exceed 20'.
- E. Sliding guide brackets: Stainless Steel.

2.07 MOTORS

- A. Motor horsepower shall be adequate so that pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.
- B. Submergence: Design pump motors to operate continuously at design conditions with 50% of motor unsubmerged or with continuous submerged conditions without overheating.
- C. Standards: Applicable parts of NEMA MG1, part 31.
- D. Type: squirrel cage induction, shell-type design, housed in air-filled, watertight chamber. Oil-filled ball bearing motor acceptable alternate.
- E. Enclosure: Completely submersible, watertight.
- F. Ratings: Continuous duty 208-volt, 3-phase, 60 Hz, 1.15 service factor; capable of sustaining a minimum of 10 starts per hour.
- G. Insulation and temperature rating: Class H insulation rated 180°C (40°C ambient plus 155°C rise).
- H. Operation: Constant speed.
- I. Nameplate horsepower shall be not less than maximum required pump input for all conditions of head and capacity for full range of impeller furnished.
- J. Monitor stator temperature for pumps using thermal sensors embedded in each stator winding. Sensors shall be used in conjunction with and supplemental to external motor overload protection.
- K. Motors shall be furnished with preassembled power and control cables of adequate length to reach electrical terminal box location shown on drawings.
 - 1. Cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 20'.
 - 2. Motors shall be furnished with an adequately designed cooling system. The cooling jacket shall surround the stator housing, thereby providing heat dissipation of the motor.

2.08 SHOP PAINTING

- A. All external surfaces of the pumps and motors, except where stainless steel, aluminum or other corrosion-resistant materials are used, given one (1) shop coat of rust-inhibitive primer. The compatibility of the primer with specified finish coats to be the responsibility of the Contractor.
- B. Field finish painting according to manufacturer recommendations.
- C. Interior surfaces of pumps and motors, and internal elements except for items of stainless steel or other special materials, shop sandblasted per SSPC-SP10 and coated with potable epoxy paint system.
- D. All touch-up and field coatings furnished and applied by the Contractor.

2.09 IDENTIFICATION

- A. Permanently attach stainless steel nameplate to pump. Nameplate shall contain following information:
 - 1. Equipment number.
 - 2. Serial number of pumps.
 - 3. Capacity in gpm.
 - 4. Manufacturer's name.
 - 5. Size and type of pump.

6. Design pressure and temperature.

B. Each pump shall be provided with a cast-in or permanently attached direction-of-rotation arrow.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions, as indicated on drawings, by qualified craftsmen.
- B. Location, orientation, and quantities as indicated on Drawings.
- C. Include all required related items necessary for a complete installation.
- D. Coordinate for compatibility of manufacturer's shop coating and final finish.
- E. Support and anchor as indicated on drawings.
- F. Extend wiring to above manhole with submersible duty wire. Provide water proof splice.
- G. Start up in presence of manufacturer's service representative.
- H. Test power draw and motor vibration during initial operation with manufacturer's service representative.

3.02 SUBMERSIBLE PUMP SCHEDULE

- A. Submersible Sewage Non-Clog Pumps:
 - 1. Quantity: 2.
 - 2. Design Point: 833 GPM @ 12' TDH.
 - 3. Nominal speed (rpm): 1750.
 - 4. Minimum Pump Efficiency at Design Point (%): 50.
 - 5. Discharge Size (in): 6.
 - 6. Motor Efficiency (%): 83.
 - 7. Maximum Motor Horsepower (hp): 7.5.
 - 8. Rating: 3 phase, 208 VAC, 60 Hz.

END OF SECTION