

HSE damages per occurrence. Failure to comply with HSE within 60 days may (at the discretion of HSE) result in suspension from performing work in the utility's service area.		6. All job excavated materials which are used for trench backfill above pipe embedment and which are to be compacted by any method except settlement by water, must be "clean backfill".		D. The macerator assembly is to be serviceable without requiring confined space entry.		10. Manufacturers a. The pump, mechanical seals, and motor manufacturer shall be KSB or Wilo.		iii. Operation of the cover shall not be affected by temperature.		5. Maximum pump run time	
3. Operate de-watering equipment ahead of pipe laying to keep the water level below the excavation until structures are secured by backfilling.		7. Material excavated from an open trench can be used for backfilling from the pipe to six (6) inches below finished grade provided it meets the requirements of "clean backfill" and providing a different type of backfill material has not been specified or shown on the Construction Plans. Where excavated material is used for backfilling and there is a deficiency due to the rejection of a part thereof, Contractor, upon direction of Engineer, must remove the rejected material from the site and furnish an additional quantity of "clean backfill" at his own expense.		E. The macerator shall be capable of fine distance adjustment between the grinder and screen to minimize solids bypass.		K.		iv. Entire door, including all hardware components, shall be highly corrosion resistant.		6. Blocked pump detection	
4. Contractor must provide de-watering equipment, shoring, or other construction practices deemed necessary by Engineer.		8. Excavated material must be placed immediately after the hand backfill. Such backfilling can be done from the top of the trench by mechanical means or directly from trucks by depositing the backfill on a slope equal to the angle of repose of the material and allowing it to flow progressively forward in such a manner to prevent the formation of voids. Earth backfill must be compacted to at least ninety-five (95) percent Standard Proctor density or mounded six (6) inches for settlement.		F. The grinder unit shall be the Channel Monster Flex or approved equal as manufactured by JWC, Santa Anna, CA.		1.03		c. Cover: Shall be ¼" aluminum diamond plate.		7. Pump operation control capability	
5. De-watering well spacing is to provide sufficient draw down of the water table to prevent water from entering the trench and sand spoils. It shall be Contractor's responsibility to provide a geotechnical engineer's assessment of corrective action to prevent future post-construction pipe settlement should a sand boil be encountered during trench work and implement corrective measures. Such an occurrence indicates excessive dewatering well spacing.		9. In no case must backfill be dropped from such height or in such volume that its impact damages Sanitary Sewer Facilities. Engineer reserves the right to regulate and control the manner of depositing such backfill. Contractor will be held liable for damage to the Sanitary Sewer Facilities.		1.02		A. Submersible Pump Pumps are to demonstrate the functional benefit to meet existing or future changing operational conditions. Energy savings in projected electricity bills is anticipated to be approximately 25% when compared to a similar Hydramatic or Barnes submersible pump. Energy cost savings less than this amount shall cause acceptance to be contingent upon Engineer's approval.		d. Frame: Channel frame shall be extruded aluminum with continuous 1 ½" anchor flange around the perimeter.		H. "Locked Level" alarm function to indicate a level device fault.	
6. All wells (potable, non-potable, and de-watering) must be drilled, of sufficient size, spacing and depth for the excavation, and upon completion abandoned in accordance with the requirements of Engineer, the Indiana Administrative Code, Indiana Department of Natural Resources – Groundwater Section, Hamilton County Health Department, and all other governmental agencies and public entities having jurisdiction.		10. Settling of backfill by flooding or puddling will not be permitted.		C. With the understanding of the above conditions, the approved pumps for the Project shall be either KSB, Wilo, or approved equal.		1.04		e. Hinges: Cover hinges shall be of recessed heavy-duty design. Materials shall be grade 316 stainless-steel. Hinges shall be fastened to an angle and diamond plate with grade 316 stainless-steel bolts and ny-lock nuts.		I. Pump alternation modes shall include: 1. Fixed lead pump assignment 2. Normal alternation	
7. As directed by Engineer, Contractor must maintain the well casing in-place for all Lift Station/Force Main infrastructure which will be extended in the future and at the Lift Station site.		11. Excess trench material must be roughly graded over the trench in a timely manner soon after the pipe is installed. This material must be mounded over the trench with a crown height of no more than six (6) inches, feathered to existing grade, until final settlement has occurred, and the trench is ready for grading and cleanup. An exception to this would be trenches in traveled pathways. Any excess must be hauled off and disposed of or stored by Contractor.		B. Pump Construction Major pump components shall be of grey cast iron, ASTM A48, Class 35, with smooth surfaces devoid of blow holes or other irregularities. The lifting handles and exposed bolts shall be stainless-steel. All metal surfaces encountering the pumping system, other than stainless-steel or brass, shall be protected by a factory applied 2-component epoxy resin spray coating.		A. Instrumentation and Control Specification General 1. Summary – The control system is to be compatible and integrate with HSE's communication and SCADA system.		f. Drain Coupling: Provide a 1 ½" drain coupling located within the channel frame.		J. Pump decommissioning modes shall include: 1. Decommissioned pump is automatically removed from the pump controller.	
B. Trenching 1. All excavation work must incorporate safety measures that comply with all applicable OSHA regulations and these Specifications. In the event of a conflict, the more stringent requirement will apply.		12. After settlement of backfill, and immediately before restoration of vegetated areas, grade and remove excess earth in unpaired areas. Remove to a depth of six (6) inches below finished grade. Place six (6) inches of topsoil over entire area to be restored.		3. Quality Assurance a. Pump(s) shall be configured for electrical voltage and power phase available and optimum operating efficiency. b. Submersible cable sized according to ICEA standards and meet with P-MSHA approval. c. The submersible power cable shall consist of synthetic rubber composition on the exterior sheathing.		2. Related Section – "Basic Electrical Materials and Methods" for general component identification and support requirements.		g. Lifting Mechanisms: Manufacturer shall provide the appropriate number and size of stainless-steel compression spring assists to provide smooth, easy, and controlled operation and act as a check in retarding downward motion of the cover when dosing.		K. Up to six (6) unique user defined profiles of set point shall be available to control pumps during specific site conditions or events. Features shall include: 1. Automatic profile change based on date and time 2. Profile selection option from SCADA (remote control), digital input, logic tag, or local display HMI.	
2. Trees, boulders, and other surface encumbrances, located to create a hazard to employees involved in excavation work or in the vicinity thereof at any time during operations, must be removed or made safe before excavation begins.		2.12 Restoration This section pertains to the restoration of the Project site upon completion of the work.		C. Cooling System (Non-cooling Jacket Equipped) Each pump motor shall be sufficiently cooled by the surrounding environment or by submergence in the pumped media. (Cooling Jacket Equipped) Each unit shall be provided with an integral motor cooling system. A stainless-steel motor cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the system. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures up to 104°F (40°C).		3. Definitions: a. LCD – Liquid Crystal Display b. LED – Light Emitting Diode c. COM – Communications d. LAN – Local Area Network e. PVC – Polyvinyl Chloride f. CMF – Central Monitoring Facility		h. The lift handle shall be flush with the top of the ¼" diamond plate integral locking mechanism in frame or hatch. No padlock type standing hasps.		L. A data logger for user-defined faults and events shall include: 1. Recording of up to 50,000 events to internal flash memory. 2. Download capability of up to 10,000,000 events by writing directly via USB.	
3. Sides, slopes, and faces of all excavations must meet accepted engineering requirements by scaling, benching, barricading, rock bolting, wire meshing, or other equally effective means. Give special attention to slopes that could be adversely affected by weather or moisture content.		A. Completion of the work.		D. Cable Entry Seal Cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. Cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable entry unit, thus providing a strain relief function. The assembly shall provide ease of changing the cable when necessary, using the same entry seal. Cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered equal.		4. Submittals a. Submittal data shall be provided to show compliance with these specifications, plans, or other specifications that will influence the proper operation of the pump(s). b. Standard submittal data for approval must consist of: i. Pump performance curves. ii. Pump outline drawing. iii. Station drawing for accessories. iv. Electrical motor data. v. Sufficient power/control cable length vi. Control drawing and data. vii. Access frame drawing. viii. Typical installation guides. ix. Technical manuals. x. Parts list. xi. Printed warranty xii. Manufacturer's equipment storage recommendations. xiii. Manufacturer's standard recommended start-up report form. c. Lack of the above requested submittal data is cause for rejection.		i. Unit shall be supplied with a hinged safety ladder grate to provide full protection.		M. For the following conditions: 1. Under-voltage 2. Over-voltage 3. Phase fail 4. Phase rotation	
4. Flatten the excavation side when an excavation has water conditions, silty materials, loose boulders, and areas where erosion, deep frost action, and slide planes appear.		B. Restoration of improvements on public and private property must be in-kind and acceptable to the owner.		E. Motor Pump motor shall be a NEMA G design, induction type with a squirrel cage rotor, shell type design, housed in an air or oil filled, watertight chamber. The motor windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%.		5. Quality Assurance a. Electrical Component Standard – Provide components that comply with NFPA 70 and that are listed and labeled by UL where applicable. b. Listing and Labeling – Provide products specified in this Section that are listed and labeled. i. The terms "listed" and "labeled" as specified in the "National Electrical Code", Article 100. ii. Listing and Labeling Agency Qualifications – a "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.		j. Unit shall be equipped with a built-in gasket to limit the transmission of odors.		N. Monitoring of DC power supply, battery voltage, and internal controller temperature.	
7. A competent Contractor's representative, as defined under OSHA regulations, must inspect excavations, and approve trench safety measures for the excavation after every rain event or other hazard increasing occurrence.		C. Restoration of road surfaces, drainage ways and other similar improvements within the public right-of-way or acquired easements must be in accordance with the directions of the government agency or public entity having jurisdiction.		F. Pump Control Equipment: a. MPE Level control probe and transducer b. KSB or Wilo recommended motor protection monitoring c. Products of other manufacturers assembled to provide all specified functions including reliability equal to or exceeding that of the manufacturer listed in (a) above.		6. Warranty a. General Warranty – The special warranty specified in this Article shall not deprive the Owner of other rights he may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by Contractor under requirements of the Contract Documents. b. Warranty Period – Two (2) years from the date of Substantial Completion and Acceptance unless otherwise indicated in other sections of this Specification.		k. Material shall be grade 6061-T6 aluminum for bars, angles, and extrusions. ¼" diamond plate shall be 5086 aluminum.		O. Energy, power, and pump efficiency monitoring: 1. kW, kVA, power factor, kWhr, KVAH calculation for each pump 2. Pump efficiency calculation (gallons per kWhr) for each pump Motor protection feature: 1. 3-phase current monitoring for each pump 2. Over-current and under-current trip 3. Ground/earth fault 4. Current phase imbalance fault 5. I2T fault	
8. Do not store excavated or other material nearer than four (4) feet from the edge of any excavation. Store and retain materials to prevent materials from falling or sliding back into excavation. Install substantial stop logs or barricades when mobile equipment is utilized or allowed adjacent to excavations.		D. All vegetated areas disturbed or damaged during construction must be re-vegetated with a stand of grass. Agricultural areas and areas currently under construction do not require re-vegetation.		G. Mechanical Seals Each pump shall be provided with double mechanical seals in tandem with elastomer bellows. The pump side seals are to be silicon carbide/silicon carbide and the bearing side carbon / silicon carbide. A lubricant chamber for the shaft sealing system. The seal system shall not rely upon the pumped media for lubrication.		7. Inspection – Verify that the vault access door installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to installation.		Execution 1. Inspection – Verify that the vault access door installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to installation.		P. Motor protection feature: 1. 3-phase current monitoring for each pump 2. Over-current and under-current trip 3. Ground/earth fault 4. Current phase imbalance fault 5. I2T fault	
9. Minimize the amount of excavation around Lift Station/Force Main manholes.		2. Commercial fertilizer, 6-12-12 or equal, must be uniformly spread at the rate of thirty-five (35) pounds per one thousand (1,000) square feet over the topsoil by a mechanical spreader at least forty-eight (48) hours before seeding and mixed into the soil for a depth of two (2) inches.		H. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		2. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		Q. Flow measurement – Calculated flow via liquid level draw down data.	
10. The width of trench is determined by the size and depth of the pipe as specified by the manufacturer and these Specifications, the more stringent will apply. If the specified trench width is must be applied, Contractor is responsible for the provision and installation, at his own expense, of all remedial measures required by Engineer.		3. A grass seed mixture comprised of thirty-five (35) parts Kentucky Blue Grass, thirty (30) parts Perennial Rye, thirty (30) parts Kentucky 31 Fescue and no more than five (5) parts inert matter must be sown on the disturbed areas at a rate of three (3) pounds per one thousand (1,000) square feet. Seeding must be done only between April 1 and June 1 or August 15 and October 15.		I. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		3. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		d. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		R. VFD speed control capability.	
11. Test air in excavations where oxygen deficiency or gaseous conditions are possible. Establish controls to assure acceptable atmospheric conditions. Provide adequate ventilation and eliminate sources of ignition when flammable gases may be present. Emergency rescue equipment, such as a breathing apparatus, a safety harness and line, and basket stretcher, must be readily available where adverse atmospheric conditions may exist or develop in an excavation.		4. Seeded areas must be mulched with straw, hay, wood cellulose fiber, or cane fiber. Straw or hay must be applied at a rate of two and a half (2 ½) tons per acre. Wood cellulose or cane fiber mulch must be applied at a rate of one thousand (1,000) pounds per acre. On special areas of high-water concentration, unstable soils, or sloped surfaces, manufactured mulch materials such as soil retention blankets, erosion control netting or others may be required by Engineer. Manufactured mulch materials must be installed according to the manufacturer's recommendations.		J. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		4. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		e. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		S. Fault module capability as follows: 1. Pump hold out function 2. Automatic restart function after fault condition is no longer present	
12. Provide walkways or bridges with guardrails where employees or equipment are required or permitted to cross over excavations.		5. Seeded areas must be thoroughly watered with a fine spray to prevent wash out of the seed. These areas shall be maintained and patched as directed by Engineer. A satisfactory stand of grass at least one (1) inch in height, without bare spots, will be required. Within three (3) months after Project Completion, Contractor must correct defective work, such as settled areas, uneven road surfaces, bare spots in grass coverage, erosion, and gullies.		K. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		5. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		f. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		T. Remote control via remote telemetry monitoring to include the following: 1. Changing the mode of pumps (hand/off/auto operations) 2. Reset of pump faults and station faults 3. Changing pump and alarm set points 4. Changing operational profiles	
13. Provide ladders where employees are required to be in excavations four (4) feet deep or more. Ladders must extend from floor of excavation to at least three (3) feet above the top of the excavation. Locate ladders to provide means of exit without more than twenty-five (25) feet of lateral travel.		SECTION 2 – LIFT STATION EQUIPMENT PART 1 – PRODUCTS		L. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		6. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		g. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		U. Security 1. User defined password management for access to programming areas in the controller	
A. Backfilling 1. Backfilling must meet the requirements of ANSI/AWWA C605 unless otherwise specified in these Specifications.		Contractor is to provide a complete functional lift station which integrates with HSE's SCADA system and is compliant with HSE's overall system communication protocol configuration. The full compliant, operational component must be proved prior to acceptance by HSE. The pumps must be capable of handling raw, unscreened sewage, three (3) inch spherical solids, and stringy materials typical of domestic sewage. Dual cutting action macerator(s) installed in a receiving wet well should precede lift station pumping wet well.		M. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		7. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		h. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		V. USB type access ports shall be available for the following operations: 1. Firmware upgrades 2. Save and load pump controller configuration 3. Download data logs 4. Export/Import MODBUS and DNP3 points list Advanced Programming Functions 1. Pump controller shall have the option of interfacing with Allen Bradley compliant PLC programming languages to enhance functionality or interact with the pump controller.	
2. The Engineer retains the right to delay an excavation backfill to inspect workmanship if he deems necessary.		1.01 Channel Mounted Macerator Macerator(s) are to demonstrate the functional benefit to meet existing or future changing operational conditions. The application shall be capable of handling the high flows seen at pump stations, including first flush loading. It shall be capable of grinding up tough solids and rags to protect pumps from damage.		N. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		8. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		i. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		W. Advanced Programming Functions 1. Pump controller shall have the option of interfacing with Allen Bradley compliant PLC programming languages to enhance functionality or interact with the pump controller.	
3. Place and tamp bedding and backfill in a manner that will not damage the pipe, pipe coating, wrapping, or encasement.		2. The separate dual shaft grinder and solids diverter are designed for easy field replacement. When the cutters are worn, replace the grinder with a new unit. If the solids diverter perforated screen gets damaged, replace it with a new unit.		O. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		9. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		j. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		X. Input/Output Characteristics – pump controller inputs and outputs shall be modular and shall be expandable. Available I/O types shall include: 1. Digital inputs (voltage free input), also configurable as counters 2. Digital Outputs (240V, 5A resistive) 3. Analog Inputs (10bit) 4. Analog outputs (10bit) 5. User defined digital inputs 6. Digital inputs shall be configurable based on specific pump sensor arrangements: a. Seal sensor (conductive) b. P/TC Thermistor c. Conductive probe (for liquid level sensing) d. Dedicated pump monitoring inputs	
4. Excess dry replacement material without visible fines will not be acceptable.		3. High flow solids diverter with perforated screen captures solids and directs them into grinder without compromising flow.		P. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.		10. Installation a. Submit product design drawings for review and approval to the architect or specifier before fabrication. b. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions. c. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.		k. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.		8. Level device support Pump controller shall have an internal atmospheric pressure sensor to allow for atmospheric pressure sensing and signal	
5. When used in these Specifications, the term "clean backfill" shall mean backfill material of any type which is free of roots, brush, sticks, debris, junk, cinders, broken concrete or brick, large lumps of clay, frozen material, stones, etc. greater than six (6) inches in their largest dimension. Not more than fifteen (15) percent of the rocks or lumps can be larger than two and a half (2 1/2) inches in their largest diameter.				Q. Impeller The impeller shall be dynamically balanced, closed, single or multi-vane, non-clog design and capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater.				l. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the operation prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.			

