

ADDENDUM NO. 1
03/17/2022

PROJECT: CITY OF VERNON
2022 WWTP IMPROVEMENTS

BID DATE: Previously MARCH 31, 2022 – **MOVED TO APRIL 6, 2022, at 11:00 AM**

The following changes and/or additions shall be made to the Plans, Specifications, and Contract Documents for the above referenced project. Bidder shall acknowledge receipt of this Addendum by signing below and returning this Addendum with the Bid.

1) GENERAL

- a) A mandatory pre-bid meeting will be held on 03/23/2022 at 11:00 AM at the Vernon WWTP.
- b) The bid opening date has been changed from March 31, 2022, to April 6, 2022, at 11:00 AM.
- c) All Manufacturers Equipment Warranties on this project for ALL equipment will be 12 months from equipment startup. Any references in the contract documents or specifications to a time from delivery are considered invalid for this project.

2) SPECIFICATIONS

a) Specification 11 09 07

- i) **Item 1.1 A** – There will only be one (1) circular suction header clarifier. This will be for the secondary clarifier #2.
- ii) **Item 2.1 B** – Materials –All submerged components shall be 304 SS. Bridge and components can be hot dipped galvanized or aluminum. No painted steel or fiberglass is allowed on this project.

- b) **Specification 11 09 09** – Specification 11 09 09 describing the Circular Segmented Scraper Clarifier is being added for Primary Clarifier replacement.

3) CONTRACT DOCUMENTS

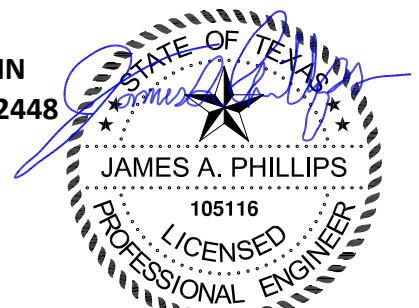
- a) The attached SRF-404 form will be added to the contract documents, Appendix A – ARPA Required Documents.
- b) All references to the bid opening date and time will be changed to April 6, 2022, at 11:00 AM.

Bidder's Acknowledgment

Date

Prepared by:

JACOB | MARTIN
TBPE Firm No. 2448



03/17/2022

Section 11 09 09 - Circular Segmented Scraper Primary Clarifier

Part 1 General

1.1 Scope

- A. There shall be furnished and installed equipment for one (1) circular segmented scraper shaft drive clarifier(s). The equipment shall include a center drive unit and torque control, walkway and platform with handrail, stationary influent pipe, center feedwell, rotating drive shaft, rake arms with segmented blades, anchor bolts, scum skimmer, scum box, effluent weir, scum baffle, and all other appurtenances required or shown on the drawings.

1.2 Supplier

- A. The clarifier equipment specified in this section shall be WesTech Model CLS25. Substitute equipment must be modified as necessary to provide the specified features and to meet the specified operating conditions.

1.3 Design Criteria

Influent flow rates per clarifier (MGD – w/o recycle)	
Design (avg. flow):	1.64 MGD
Maximum (max. daily flow):	3.28 MGD
Peak (peak hourly flow):	**
Return (max flow):	**
Tank diameter (ft.):	56
Side water depth (ft.):	10.25
Freeboard (ft.):	2
Bottom slope (in./ft.):	1"/1'
Drive shaft diameter (in.):	10
Scum trough	3'
Motor HP:	1
Torque (ft.-lbs.)	
Design running:	21,400
Momentary peak:	42,800
Main Gear diameter (in.):	43

1.4 Warranty

- A. A written supplier’s warranty shall be provided for the equipment specified in this section. **The warranty shall be for a minimum period of one (1) year from start-up.** Such warranty shall cover all defects or failures of materials or workmanship which occur as the

result of normal operation and service except for normal wear parts (i.e. squeegees, skimmer wipers, etc.).

1.5 Submittals

- A. Two copies of all materials required to establish compliance with these specifications shall be submitted for review. Submittals shall include at least the following:
 - 1. Certified general arrangement drawings showing all important details and materials of construction, dimensions, loads on supporting structures, and anchor bolt locations.
 - 2. Descriptive literature, bulletins, and/or catalogs of the equipment.
 - 3. Complete data on motors and speed reducers.
 - 4. Wiring diagrams and electrical schematics for all control equipment to be furnished.
 - 5. Calculations documenting the AGMA rating of the drive unit and life of the main bearing, prepared and signed by a registered professional engineer.
 - 6. Complete descriptive information and electrical schematic for the torque overload device.
 - 7. Complete sludge transport calculations substantiating the rake blade design, rake tip speed, and floor slope.
 - 8. Complete process calculations substantiating the sizing of the influent pipe and feedwell. These calculations shall be based on parameters from the manufacturers operating experience. These parameters shall be verified by data presented from successful operating installations.

1.6 Experience

- A. The equipment supplier shall have at least 15 years experience in the design, application, and supply of circular clarifiers in water or wastewater treatment plants, and shall submit a list of not less than 25 operating installations of clarifiers with segmented rake blades as evidence of meeting the experience requirement. This experience shall be evidenced by process performance data that is submitted showing actual data on a minimum of five existing installations that are operating successfully as required in the submittal section.
- B. To show evidence of being able to provide the quality of equipment and services described in this specification, the equipment supplier shall submit their ANAB-accredited ISO 9001 quality system certification. AIAO-BAR accredited systems are not a recognized equivalent and are therefore specifically prohibited. The quality procedures shall provide for a means of qualifying all sub-vendors and shall specify that the fabrication facility is a critical vendor and shall require inspection. The quality system shall be audited on-site by a third-party independent registrar at least annually. Certification shall remain in effect throughout the project start-up. Mechanism shall be manufactured according to requirements of Machinery Directive 98/37/EC.

1.7 Shop Assembly and Inspection

- A. The equipment specified herein shall be factory assembled as far as practical to verify that all mating parts can be field assembled. All mating parts shall be trial fit and match-marked.

The manufacturer shall submit certification of shop trial assembly and photographs of assembly before shipment. The customer and installing contractor shall be given the opportunity to witness the shop assembly.

- B. Shop inspection shall be performed by a qualified inspector and certified by the manufacturer. The inspection shall be documented, and all deficiencies noted, corrected, re-inspected and final completion formally authorized. Final shipment authorization shall be by the manufacturer to ensure completion of all fabrication, assembly, and inspection requirements. Inspection records and evidence of inspector qualification shall be submitted to the owner upon request.

Part 2 Products

2.1 General Design

A. Description

- 1. The clarifier mechanism shall be of the center drive type, mounted on a walkway which spans the tank and bears on the wall at each end. Flow shall enter the feedwell through an influent pipe. The clarifier shall be designed to remove settled sludge from the bottom of the tank and floating scum from around the periphery of the tank.
 - a. The clarifier shall perform the following integrated functions:
 - 1) Dissipate energy and control localized currents.
 - 2) Separate solids from the clear liquid.
 - 3) Evenly withdraw the clear liquid.
 - 4) Transport and thicken settled sludge.
 - 5) Remove scum from the clarifier surface.

B. Materials

- 1. All submerged components shall be 304 SS. Bridge and components can be hot dipped galvanized or aluminum. No painted steel or fiberglass is allowed on this project.
- 2. All structural steel shall conform to AISC – Steel Construction Manual latest edition. All steel plates shall conform to ASTM A36. All structural steel shape series of M, MT, S, ST, C, MC, L shall conform to ASTM A36. Structural steel shapes W, WT, HP shall conform to ASTM A992/A572. All pipes shall be ASTM A53, Grade B. All square and rectangular tubing shall be ASTM A500, Grade B, unless otherwise noted. Steel members in contact with liquids, either continuously or intermittently, shall have a minimum thickness of 1/4 inch unless otherwise noted. All aluminum shall be type 5052, 6061, 6063, or 2014 alloy unless noted.

C. Fabrication

- 1. Shop fabrication and welding of structural members shall be in accordance with the latest edition of the "Structural Welding Code", AWS D1.1, (AWS D1.2-Aluminum, AWS

D1.6-Stainless Steel), of the American Welding Society. All welded connections shall develop the full strength of the connected elements and all joined or lapped surfaces shall be completely seal welded with a minimum 3/16" fillet weld. Intermittent welding shall not be allowed, except on non-ferrous metals.

D. Edge Grinding

1. Sharp projections of cut or sheared edges of ferrous metals shall be ground to a radius by multiple passes of a power grinder as required to ensure satisfactory coating adhesion.

E. Shop Surface Preparation/Coating

1. No Painted Steel is allowed on this project. All materials shall be aluminum, stainless steel or Hot Dipped Galvanized. It is assumed that all references to "steel" will be either stainless steel or Hot Dipped Galvanized throughout this specification.
2. All iron and steel surfaces, except the drive unit, shall be field cleaned and painted by the contractor to ensure paint compatibility and assign unit responsibility for the coating system. The drive unit shall be coated with the supplier's standard enamel paint system.

F. Structural Design

1. All steel design shall be in accordance with the AISC Manual of Steel Construction, latest edition and the International Building Code (IBC), latest edition.

2.2 Drive Unit

A. Design Parameters (S25)

1. The drive unit shall be designed and manufactured by the clarifier equipment supplier to ensure unit responsibility. The drive unit shall be designed for the torque values previously listed. It shall turn the mechanism at the design collector tip speed. The drive main bearing shall be designed for the total rotating mechanism loads with a minimum L-10 life of 50 years or 438,000 hours. The drive unit shall be capable of producing and withstanding the previously listed momentary peak torque while starting. The drive main gear shall be designed to a minimum AGMA 6 rating when rated in accordance with the latest AGMA standard. Gear teeth shall be designed for proper load distribution and sharing. Stub tooth design and surface hardening of the main gear shall not be allowed. The main bearing shall be capable of withstanding the listed overturning moment without the aid of any underwater guides or bearings to ensure correct tooth contact for AGMA rating of the main gear.
 - a. All spur gearing shall be designed to the latest AGMA spur gear standard for strength and surface durability, based on a life of 175,000 hours. The design running torque rating of the drive gearing shall be based on the smaller of the strength and durability values determined from the above AGMA standard. To ensure safety and ease of maintenance, all components of the drive shall be direct coupled.

CIRCULAR SEGMENTED SCRAPER CLARIFIER

- b. No overhung pinions shall be allowed on the speed reducing unit. The lower pinion bearing shall not be located below the turntable base.
- c. Any and all welding on the drive unit shall be done using E70XX weld rod.

B. Physical Characteristics

1. The drive unit shall consist of a solid external main spur gear, bearing turntable, pinion, secondary speed reducer, support base, and drive unit bearing. The drive shall be mounted on the walkway and support the entire rotating load of the mechanism. The main external gear shall be forged of alloy hardened steel. The pinion shall be heat treated alloy steel. All speed reducers shall be fully enclosed and running in grease. Support base for the drive shall be of welded steel to assure rigidity. Lubricant and dust shields shall be provided. The drive bearing shall include a forged steel precision gear/bearing set, with fully contoured raceways hardened to a minimum 58-60 Rc and protected by a neoprene seal. The drive shall be designed so that the balls and nylon spacers can be replaced without removing the access walkway. The main gear to pinion gear mesh shall be oil lubricated. Lubrication fittings shall be readily accessible. Continuous condensate drains shall be provided in the main gear housing.

C. Overload Protection

1. An overload device shall be provided in a stainless steel, weatherproof enclosure. The device shall be actuated by torque generated from the main drive, which shall operate two independently adjustable switches (the alarm switch at 100 percent of design running torque and the motor cutout switch at 120 percent of design running torque). Devices that require the worm to float and measure the thrust of the worm gear shall not be acceptable. These two switches shall be factory adjusted to accurately calibrate the alarm torque value and the overload position. A visual torque indicator shall be provided and oriented so that it may be read from the walkway. It shall be calibrated from 0 to 160 percent of design running torque.

D. Turntable

1. The turntable base shall have an annular bearing raceway upon which the rotating assembly rests. It shall have a maximum allowable deflection in accordance with the bearing specifications. The allowable modulus of elasticity shall be a minimum of 29 x 10⁶ psi. The center cage shall be fastened to and supported from the gear casing. Ball bearings shall be of high carbon chrome alloy 52100 steel running in fully contoured races, as part of a precision gear/bearing set. The balls shall be grease oil lubricated and protected by elastomer seals.

E. Speed Reducing Unit

1. The speed reducing unit shall consist of cycloidal, helical, or planetary speed reducers directly connected to a motor without the use of chains or v-belts and shall be keyed to the pinion.
 - a. The main ring gear of cycloidal drives shall be made of high carbon chromium bearing steel and be fixed to the drive casing. An eccentric bearing on the high-speed shaft shall roll cycloidal discs of the same material around the internal circumference of this main ring gear. The lobes of the cycloid disc shall engage successively with pins in the fixed ring gear. The movement of the cycloid discs shall

be transmitted then by pins to the low speed shaft. Speed reducer efficiency shall be a minimum of 90% per reduction stage.

- b. Speed reducer helical or planetary gearing shall be manufactured to AGMA standards and shall provide at least 95% power transmission efficiency per stage. The speed reducer shall have a minimum service factor of 1.25 based on the output torque rating of the drive.
- c. The reducers shall be fitted with radial and thrust bearings of proper size for all mechanism loads and be grease lubricated. As a safety feature, the speed reducer shall be back driveable to release any stored energy as the result of an over torque condition.

F. Motor

1. The motor shall be a squirrel cage, induction type, TEFC, ball bearing heavy duty unit of ample power for starting and operating the mechanism without overload, with a minimum service factor of 1.15.
 - a. Power supply to the equipment shall be 240/480-volt, 60 hertz, 3 phase.

2.3 Walkway and Platform

A. Walkway

1. One (1) 36-inch-wide walkway and platform with handrails shall be supported by the tank wall at its outer ends and shall be designed to safely withstand a live load of 50 pounds per square foot. Deflection shall not exceed $L/360$ when both the dead load and live loads are applied. It shall consist of two trusses or beams with 1-1/4-inch aluminum I-bar grating between the trusses or beams. The walkway shall be diagonally braced against lateral movement, and provided with handrails 42 inches high, of double-row 1-1/2-inch diameter horizontal aluminum pipe, and 4-inch-high kickplates on both sides. Walkway trusses may serve as the handrail if the top chord is 3 feet-6 inches above the walking surface.
 - a. Stainless steel bearing plates, UHMW-PE slide plates, and anchor bolts for the wall support shall be provided by the equipment supplier and installed by the contractor. Bearing plate dimensions and anchor bolt diameter, length, quantity, and arrangement shall be per the equipment supplier. The contractor shall block out or otherwise modify the tank or support structure to accommodate walkway and supports, if required.

B. Center Drive Platform

1. A center drive platform shall be provided which allows 24 inches clearance outside the center drive components. It shall consist of 1/4-inch aluminum checkered plate with necessary stiffeners and supports, resting on the drive unit and center column, and provided with connections to the walkway. The entire platform shall be surrounded by handrails 42 inches high of double-row 1-1/2-inch diameter horizontal aluminum pipe with 4-inch high kickplates.

2.4 Influent and Sludge Removal

A. Rotating Center Drive Shaft and Cone Scraper

1. A rotating steel drive shaft of 1/4" minimum wall thickness shall be provided. The shaft shall be suspended vertically from and receive its rotational power from the center drive unit mounted on the operating platform. The shaft shall extend down to a sludge cone in the center of the tank floor.
 - a. The shaft shall have a steel cone scraper attached to its lower end to prevent deposit of solids in the sludge cone.
 - b. The shaft shall be provided with connections for the two sludge rake arms and feedwell supports. The shaft shall be bolted to the drive unit which shall rotate the shaft with the attached arms and feedwell. The shaft and each arm shall be designed to withstand 150 percent of the design running torque of the drive without overstressing the members. Loading to develop the torque shall be considered as uniform loads applied to each arm individually.
 - c. The rotating shaft shall have adequate structural strength to support the entire rotating mechanism, including rake arms, cone scraper, scum scraper and support, scum skimmer, and feedwell. Design shall accommodate dead load plus live load and torque with an adequate factor of safety to eliminate deflection or vibration.

B. Feedwell

1. The flocculating feedwell shall diffuse the liquid into the tank without disturbance or formation of velocity currents. Baffled openings shall be provided near the water surface to allow scum to exit the feedwell.
 - a. The supports for the feedwell shall be located above the liquid extending from the shaft. No feedwell support or feedwell spliced connection shall be contained within the annular space formed between the feedwell and the shaft. The depth of the feedwell shall be such as to provide proper detention time and an exit velocity at maximum flow that will not scour the settled sludge. The diameter, depth, detention time, and exit velocities shall match the process application calculations as evidenced by the required successful operating installations.
 - b. The feedwell shall be made of not less than 3/16-inch-thick steel plate with necessary stiffening angles.

C. Influent Pipe

1. A steel influent pipe shall be provided for delivering influent into the feedwell and be supported from the tank wall.

D. Sludge Rake Arms

1. The mechanism shall include two long sludge rake arms of steel truss construction with segmented steel scraper blades and adjustable stainless-steel squeegees. Squeegees shall be fastened to the rake blades with stainless steel fasteners.
 - a. Scraper blades shall be designed for sufficient sludge transport capacity to handle the design solids loading rate, with the depth of the blade varying from a minimum at the tank periphery to a maximum at the tank center.

- b. Scraper blades shall be designed for sufficient sludge transport capacity to handle the design solids loading rate, with the depth of the blade varying from a minimum at the tank periphery to a maximum at the tank center.
- c. The blades shall rake the sludge to a center sludge cone. The arms shall be adjustable at the shaft to assure an even grout thickness over the tank bottom.
- d. The rake speed shall be sufficient to transport the necessary volume of sludge to the sludge outlet but shall not re-suspend settled sludge.

2.5 Scum Removal

A. General

1. The clarifier manufacturer shall furnish two (2) skimming devices as part of each clarifier mechanism. Each skimming mechanism shall be arranged to sweep the surface of the sedimentation compartment, automatically removing scum and floating material to a scum box at the periphery of the tank.

B. Skimmer Construction

1. The rotating scum skimmer shall include a horizontal steel plate skimmer blade supported by vertical steel members extending up from the rake arms. The blade shall extend from a point 6 inches away from the influent feedwell to the hinged scum skimmer assembly at the tank periphery.

C. Scum Skimmer Assembly

1. A hinged scum skimmer assembly shall be mounted on the outer end of the skimmer blade. The hinged scum skimmer assembly shall be designed to form a pocket for trapping the scum. The hinged arrangement shall insure continual contact and proper alignment between wiper blade, scum baffle, and ramp as the blade travels up the scum box ramp. The wiper blade shall have a wearing strip on its outer end which contacts the scum baffle and a neoprene strip on its lower and inner edge. The neoprene wipers shall be a minimum 1/4-inch thickness. The scum is trapped as the wiper blade meets the ramp and is raised up the ramp to be deposited into the scum trough for disposal.

D. Scum Box

1. The scum box shall be of the size specified, supported from the tank wall and connected to the scum withdrawal piping. It shall be made of 1/4 inch thick welded steel plate. The box shall have a scum trough, vertical steel sides, and a sloping approach ramp that extends from 1-1/2 inches above water level to 5-1/2 inches below. A similar ramp shall be provided at the opposite end to allow the skimmer blade to lower back to the operating position. A flexible connector shall be provided for connection to the contractor supplied scum withdrawal piping in the tank wall.

E. Scum Flushing Valve

1. A valve shall be attached to the scum box which automatically opens and allows clarified liquid into the scum box to flush out solids. The valve shall actuate at every pass of the scum skimmer over the scum box, allowing sufficient delay after deposit of the solids before flushing begins. Delay and flush duration shall be adjustable. The opening and

closing of the scum flushing valve shall be one smooth continuous movement. The valve shall provide 2 to 5 gallons of flush water per each pass of the skimmer assembly.

F. Scum Baffle

1. The baffle shall consist of 1/4-inch-thick x 12 inches deep fiberglass sections. In the area of the scum box the scum baffle shall extend to 24 inches starting approximately 6 feet before and ending 2 feet after the scum box. The baffle sections shall be curved and fastened to the launder wall with adjustable stainless steel support brackets, stainless steel fasteners, and anchor bolts.

2.6 Effluent Removal

A. Launder

1. A rectangular effluent launder shall be provided around the perimeter of the tank. The launder shall be formed as part of the concrete wall. A drop-out box shall be provided in the bottom of the launder at one point for collection and discharge of the clarified effluent.

B. Weir

1. An adjustable weir shall be provided around the periphery of the tank at the water surface for removal of clarified effluent.
 - a. The weir shall consist of 1/4-inch-thick x 9 inches deep stainless-steel sections with 2-1/2-inch-deep 90-degree v-notches at 6-inch intervals. The weir sections shall be curved and fastened to the launder wall with special large washers, anchor bolts, and hex nuts to allow vertical adjustment.

2.7 Electrical

- A. The equipment supplier shall furnish all electrical items specifically called for in this specification section. The contractor shall supply and install all other electrical items required to place the equipment into service.
- B. The contractor shall supply and install all field wiring required including but not limited to proper size wire, conduit, fittings, and supports.

2.8 Anchorage and Fasteners

A. Anchor Bolts

1. All anchor bolts shall be a minimum of 1/2-inch diameter and made of type 316 stainless steel. The equipment supplier shall furnish all anchor bolts, nuts, and washers required for the equipment.

B. Fasteners

1. All structural fasteners shall be a minimum of 1/2-inch diameter and made of type 316 stainless steel. The equipment supplier shall furnish all fasteners required for the assembly of the equipment.

Part 3 Installation

3.1 General

- A. The equipment shall be installed properly to provide a complete working system. Installation shall follow the supplier's recommendations.

3.2 Manuals

- A. The equipment supplier shall furnish an electronic copy of the operation and maintenance manual, which will be retained at the installation site to assist plant operators. The manual shall include the supplier's erection and assembly recommendations and a complete list of recommended spare parts.

3.3 Field Service

- A. The equipment supplier shall provide the service of a qualified representative for one trip and one day per mechanism to inspect the mechanism installation, assist in start-up, and instruct plant personnel in the proper operation and maintenance of the mechanism.

3.4 Field Testing

- A. Torque Tests
 - 1. The entire sludge collector mechanism shall be statically load tested by loading the rake arm with 150 percent of the specified design running torque. The test shall verify the torque overload control device settings for alarm and motor cutout. One truss arm shall be anchored, and the load measured to demonstrate the rake arms', cage's, and drive unit's ability to withstand the specified torque. Sketches and calculations shall be submitted illustrating how the torque will be applied prior to the test taking place.
- B. Operation Tests
 - 1. The contractor shall operate the mechanism in a dry tank for a minimum of 4 continuous hours before flow is allowed to enter the system. There shall be no binding, jerky, or unusual motion exhibited during this run-in period. Motor amperage shall be checked at least hourly for any unusual or higher than normal figures. After the unit has successfully passed this initial test, flow shall be introduced into the tank and the same 4-hour observation test run. If the unit should fail under any of these conditions, the test shall be halted, and the problem corrected. If, after several attempts, the unit does not successfully pass the field test, the faulty portion of the equipment shall be repaired or replaced and the test re-run.

- End of Section -

Debarment / Suspension Certification

I, _____, hereby certify that I have checked on the federal
(Authorized Representative of Recipient)

System for Award Management (www.sam.gov/SAM/) website and determined that

_____ is not shown as an “excluded party” that is debarred,
(Name of entity)

suspended or otherwise excluded from or ineligible for participation in federal assistance programs under Executive Order 12549. (See 2 CFR Part 180 and 2 CFR Part 1532 for additional information on the federal governmentwide debarment and suspension system for nonprocurement programs and activities.)

I understand that a false statement herein may subject me to penalties under federal and state laws relating to filing false statements and other relevant statutes.

Signature

Date

Title

Name of Recipient

Verifying prime contractors and subcontractors for construction, equipment, supplies and services: Using the www.sam.gov/SAM/ website, the recipient must verify prior to awarding the contract that the prime contractor is not listed as an “excluded party” that is debarred, suspended or otherwise excluded from or ineligible. Once any subcontractors are known, they also must be verified as not listed as an “excluded party” prior to award of a subcontract. The recipient must print a dated record of the verification from the www.sam.gov/SAM/ website and retain a copy that is available for review by TWDB. The prime contractors and subcontractors must be verified prior to the contract award or the costs may be disallowed.