ARDURRA

ADDENDUM NO. 2

TO:	Prospective Bidders and Others Concerned
DATE:	November 18, 2024
PROJECT:	Wastewater Treatment Facilities Upgrades Project 1 - Mechanical SRF#: CS011088-01
OWNER:	City of Enterprise Enterprise, Alabama
BID DATE:	November 21, 2024
PROJECT NO.:	2024-0222-00 QuestCDN#: 9377978
SUBJECT:	***Changes to the Contract Documents***

The Contract Documents for this Project are amended as set forth below. Bidders must acknowledge receipt of this Addendum on the Bid Form when bids are submitted.

PERTAINING TO THE PROJECT MANUAL:

ITEM 1 Bidder is herein advised that the language in Section C-410 Bid Form shall be revised as follows:

Section C-410 Bid Form Article 7 – 7.01 parts H - K are to be deleted from the Bid Form as shown in the attached sample revised Section C-410.

PERTAINING TO THE TECHNICAL SPECIFICATIONS:

ITEM 1 Bidder is herein advised that Section 01740 Warranties and Bonds shall be deleted in its entirety and replaced with the attached revised Section 01740 Warranties and Bonds.

ITEM 2 Bidder is herein advised that Section 11307 Temporary Bypass Pumping shall be deleted in its entirety and replaced with the attached revised Section 11307 Temporary Bypass Pumping

ITEM 3 Bidder is herein advised that Section 11355 Weirs and Baffles shall be deleted in its entirety and replaced with the attached revised Section 11355 Weirs and Baffles

ITEM 4 Bidder is herein advised that Section 11379 Clarifiers shall be deleted in its entirety and replaced with the attached revised Section 11379 Clarifiers

ITEM 5 Bidder is herein advised that Section 11559 Slide and Weir Gates shall be deleted in its entirety and replaced with the attached revised Section 11559 Slide and Weir Gates

End of Addendum No. 2

SAMPLE REVISED SECTION C-410 BID FORM

BID FORM

WASTEWATER TREATMENT FACILITIES UPGRADES PROJECT #1 - MECHANICAL

ARDURRA PROJECT NO.: 2024-0222-00

SRF PROJECT NO.: CS011088-01

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EJCDC® C-410, Bid Form for Construction Contracts.
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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	Addendum, Date

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work and including all American Iron and Steel requirements.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related

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reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the e execution of the Contract.

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ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BID SCHEDULE
NOTE: BIDS shall include sales tax, if applicable and all other applicable taxes and fees.

Base Bid

ITEM NO.	DESCRIPTION	ITEM PRICE
1.	Northeast WWTP Pre-Screen Installation	$_____
2.	College Street WWTP Primary and Secondary Clarifiers R&R	$_____
	TOTAL BASE BID	$_____

Written: _____ DOLLARS

and _____ CENTS

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ALTERNATES

The costs listed for each alternate include all costs of related coordination, modification, or adjustment as indicated in Section 01230 – Alternates. The Owner may elect to add or remove these items from the Project. All Alternates must be filled out for bids to be considered.

ITEM NO.	DESCRIPTION	ITEM PRICE
1.	College Street WWTP Clarifier Catwalks Replacement	$_____
2.	College Street WWTP Intermediate Clarifier R&R	$_____
3.	Northeast WWTP Grit Removal System Repair	$_____
4.	College Street WWTP Primary Clarifier V-Notch Weirs and Baffles Replacement	$_____
5.	College Street WWTP Intermediate Clarifier V-Notch Weirs and Baffles Replacement	$_____
6.	College Street WWTP Secondary Clarifiers V-Notch Weirs and Baffles Replacement	$_____
7.	College Street WWTP Intermediate Clarifier and Primary Trickling Filter Structural Concrete Repair	$_____
8.	Replacement of Misc. Gates, Grating and Handwheels	$_____
	TOTAL ALTERNATES BID	$_____

Written: _____ DOLLARS

and _____ CENTS

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EXPLANATION OF BID SCHEDULE

Base Bid

Item No. 1 – Northeast WWTP Pre-Screen Installation: The complete construction of an in-ground concrete channel structure and installation of all necessary screening equipment as noted in the Contract Drawings, including mechanical screen, manual bar screen, screening compactor and dumpster, flow control gates, grating, electrical connections and equipment, and utility connections and equipment. Also includes the demolition and reconstruction of portions of the plant's influent sewer piping and manholes, and all necessary temporary bypass pumping, civil sitework and earthwork necessary to complete

Item No. 2 – College Street WWTP Primary and Secondary Clarifiers R&R: The demolition, disposal and replacement of internal clarifier machinery and equipment including center-feed well structure, cage, sludge collector, machine drive, scum collector arms and troughs for one (1) 45' radius x 8' deep primary clarifier and two (2) 45' radius x 11' deep secondary clarifiers.

Alternates

Item No. 1 – College Street WWTP Clarifier Catwalks Replacement [Additive Alternate]: The complete removal, disposal and replacement of the structural half-bridge catwalks and accompanying handrails for both the 45' radius primary and intermediate clarifiers and the 45' radius sludge thickener basin. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

Item No. 2 – College Street WWTP Intermediate Clarifier R&R [Additive Alternate]: The demolition and replacement of internal clarifier machinery and equipment including center-feed well structure, cage, sludge collector, machine drive, scum collector arm and trough for one (1) 45' radius x 8' deep intermediate clarifier. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

Item No. 3 – Northeast WWTP Grit Removal System Repair [Additive Alternate]: The inspection of the Smith&Loveless PISTA grit removal system in the headworks, and demolition, cleaning and reinstallation of equipment determined to be non-functional. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

Item No. 4 - College Street WWTP Primary Clarifier V-Notch Weirs and Baffles Replacement [Additive Alternate]: The removal and disposal of vintage stainless steel v-notch weirs and baffles on the outer perimeter of the 45' radius primary clarifier, and the replacement with new FRP v-notch weirs and baffles. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

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Item No. 5 – College Street WWTP Intermediate Clarifier V-Notch Weirs and Baffles Replacement [Additive Alternate]: The removal and disposal of vintage stainless steel v-notch weirs and baffles on the outer perimeter of the 45' radius intermediate clarifier, and the replacement with new FRP v-notch weirs and baffles. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

Item No. 6 – College Street WWTP Secondary Clarifiers V-Notch Weirs and Baffles Replacement [Additive Alternate]: The removal and disposal of v-notch weirs and baffles on the outer perimeter of the two 45' radius secondary clarifiers, and the replacement with new FRP v-notch weirs and baffles. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

Item No. 7 – College Street WWTP Intermediate Clarifier and Primary Trickling Filter Structural Concrete Repair [Additive Alternate]: The patch repairing of minor structural cracks on the above-ground portion of the intermediate clarifier and primary trickling filter's concrete containment wall. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

Item No. 8 – Replacement of Misc. Gates, Grating and Handwheels [Additive Alternate]: The removal and replacement of six (6) knife gates, three (3) metal grating covers located in splitter boxes throughout the College Street WWTP premises, as noted on the Contract Drawings. Also includes the replacement of four (4) hand wheel operators located at the headworks and Orbal Aeration Basin. BIDDER further acknowledges that award of contract will be based on the Lump Sum Base Bid amount and the acceptance or rejection of this ADDITIVE Item is at the sole discretion of the Owner.

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ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

A. Required Bid security;

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

D. List of Project References;

E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;

F. Contractor's License No.: _____ **[or]** Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;

G. Required Bidder Qualification Statement with supporting data; and

~~H. If Bid amount exceeds $10,000, signed Compliance Statement (RD 400-6). Refer to specific equal opportunity requirements set forth in the Supplemental General Conditions;~~

~~I. If Bid amount exceeds $25,000, signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions (AD-1048);~~

~~J. If Bid amount exceeds $100,000, signed RD Instruction 1940-Q, Exhibit A-1, Certification for Contracts, Grants, and Loans.~~

~~K. Manufacturers' Certification letter of compliance with Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference for all equals or substitutes approved by Addenda for American Iron and Steel products as provided in these Contract Documents.~~

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

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ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

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01740 WARRANTIES AND BONDS

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 DESCRIPTION

A. Related Work Described Elsewhere:

1. Contract Closeout: Section 01700.

1.02 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: Two (2) each.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product of work item.

2. Firm, with name of principal, address and telephone number.

3. Scope.

4. Date of beginning of warranty, bond or service and maintenance contract.

5. Duration of warranty, bond or service maintenance contract.

6. Provide information for Owner's personnel:

7. Proper procedure in case of failure.

8. Instances which might affect the validity or warranty or bond.

9. Contractor, name of responsible principal, address and telephone number.

1.03 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8-1/2 inches by 11 inches, punch sheets for standard three (3) ring binder.

2. Fold larger sheets to fit into binders.

3. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:

4. Title of Project.

5. Name of Contractor.

6. Binders: Commercial quality, three (3) D-ring type binders with durable and cleanable white plastic covers and maximum D-ring width of two (2) inches. Binders shall be presentation type with clear vinyl covers on front, back, and spine. Binders shall include two sheet lifters and two horizontal inside pockets.

1.04 WARRANTY SUBMITTALS REQUIREMENTS

A. All pre-purchased equipment include warranties in the equipment manufactuers Scope of Supply. For all non-prepurchased major pieces of equipment, submit a warranty from the equipment manufacturer. **The manufacturer's warranty period shall be for one (1) year from the date of Substantial Completion. The Contractors warranty period shall be for one (1) year from the date of Substantial Completion.**

B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment specified under Divisions 11: Equipment; 13: Special Construction; 15: Mechanical; and 16: Electrical and which has at least a 1 hp motor or which lists for more than $1,000. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.

C. The Owner shall incur no labor or equipment cost during the guarantee period.

D. Guarantee shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer or the Contractor.

E. In the event of a faulty or inadequate installation, the Contractor shall provide all labor, materials and costs to remove the defective equipment from service, shipment of the equipment to the manufacturer’s facility, and reinstallation of the repaired equipment. The equipment manufacturer shall cover all costs for complete repair of the equipment to like new conditions including shipment of the equipment to the Contractor. The equipment manufacturer shall cover all costs for field inspection and startup services for reinstallation of the faulty equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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11307 TEMPORARY BYPASS PUMPING

SECTION 11307
TEMPORARY BYPASS PUMPING SYSTEM

PART 1 – GENERAL

1.1 SCOPE

A. Furnishing, installing, testing, operating, and maintaining temporary pumping systems.

B. Provide all materials, labor, equipment, power, maintenance, associated items and superintendence to implement temporary pumping systems for diverting flow as required to maintain continuous operation of existing facilities during construction. Provide all additional temporary pumping systems needed using Contractor's means and methods at no additional cost to Owner.

1.2 DEFINITIONS

A. Bypass Pumping System: The bypass pumping system shall consist of all equipment, piping, valves, plugs, power supply, instrumentation, controls, and lines and other appurtenances required to divert flows from the facilities being rehabilitated to the discharge location illustrated on the drawings.

B. Bypass Pipe: The bypass pipe shall consist of the pipe, valves and other appurtenances including, but not limited to, air relief valves and dewatering connections. The bypass pipe includes both the suction and discharge pipe for each bypass pump setup.

C. Primary Pump(s): The primary pump(s) is/are the main pump(s) located at each setup. The primary pump(s) shall be capable of pumping the peak flow, be connected to the bypass pipe, be isolated with valves, and be complete with power supplies.

D. Backup Pump(s): The backup pump(s) is/are located at each primary setup. The backup pump(s) shall be capable of pumping peak flow, be operational, be connected to the bypass pipe, be isolated with valves, and be complete with power supplies.

E. Firm Capacity: Shall be the capacity of the bypass pumping system with the largest pump included in the system out of service.

F. Cycling Pump Control: Shall mean the use of starting and stopping of single speed and output pumps to achieve the bypass pumping requirements.

G. Variable Pump Control: Utilizes variable speed and output pumps in the design of the system to try and match the output of the system with the variable flow

conditions of the application.

1.3 PERFORMANCE REQUIREMENTS

A. Design the installation and operation of temporary pumping systems in accordance with Federal, State, and Local Municipality Laws and Regulations, including local noise and light ordinances.

B. The temporary pumping system shall be designed by the Contractor and provide uninterrupted service throughout construction.

C. For all bypass pump arrangements, multiple pumps are necessary.

1. One backup pump for each size pump utilized shall be installed at each bypass pump location, ready for use in the event of primary pump failure.

2. The backup pump shall be piped into the suction and discharge headers and shall have the capability of being brought online in the piping system by operating installed isolation valves.

D. The system shall be designed to pump the following flows:

1,800 @ 10' TDH - GPM from EX SSMH-3N (Northern Bypass Pumping Station)
1,000 @ 10' TDH - GPM from EX SSMH - 3S (Southern Bypass Pumping Station)

E. Contractor shall provide a 24-hour emergency contact, trained and certified by the pump supplier. Contractor's representative shall be available to provide response within a 1-hour period of time in the event of emergency.

F. Install, test, and maintain remote telemetry to monitor operation of the pumps and water levels. The telemetry system shall first notify the Contractor's local representative designated to monitor the pumps, then other individuals so designated by the Contractor and finally up to two individuals so designated by the Owner.

G. Temporary pumping systems shall be equipped with noise reduction features that limit the noise output to 65 dbA within 50 feet of the equipment or to 60 dbA at the nearest property line, whichever is less. Diesel-driven engines shall be equipped with critical- rated mufflers.

H. Provide pressure and vacuum gauges on the suction and discharge headers.

I. Provide level controls to start and stop the pumps. Each pump shall be equipped with a separate control panel. All pumps provided shall be variable speed and output type pumps such that the system design may operate as continuously as possible and spikes in flow conditions are minimized by the design. Cycling

pumps shall not be an acceptable design unless allowed by this specification.

1.4 SUBMITTALS

A. Bypass Pumping Plan: The Contractor shall submit to the Engineer for review and approval detailed drawings and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing flows.

B. Submit a specific detailed description of each proposed temporary pumping system at least 30 days prior to intended use. The submittal shall include, but not be limited to, the following:

1. A written description of the plan.

2. Quantity, capacity, dimensions and location of all pumping equipment.

3. Pump performance curves and head capacity curves demonstrating the capability to meet all required flows.

4. Pump net positive suction head required ($NPSH_r$) curves demonstrating the net positive suction head available ($NPSH_a$) exceeds the $NPSH_r$ by an acceptable margin defined by the manufacturer of the supplied pump.

5. Pump power curves demonstrating the temporary power system is adequately sized for pump startup and operation.

6. Pump diesel engine sizing, dimensions, emissions data, and location plan.

7. Diesel engine fuel-consumption curves.

8. Fuel storage tank details, including spill containment.

9. The size, type and routing of all suction and discharge pipe and the means of connecting the system.

10. Calculations of static lift, frictional losses, all pipe velocities, total dynamic head (TDH) requirements, and net positive suction head available ($NPSH_a$).

11. Existing facility plugging or bulkheading plan, including type, location and manufacturer of plugs with emergency release procedures.

12. Any temporary pipe supports, location, and anchoring requirements.

13. Description of controls, monitoring, mode of operation, sequence of

starting and stopping pumps, and emergency power source.

14. Method of noise control for each pump and/or generator for all operations.

15. Show force main pipe material and thickness can withstand all normal operating and surge pressures with a safety factor of 2.0.

16. Denote any conditions that will cause pumps to lose suction lift (prime) and describe procedures to rectify.

17. Show that the emergency switchover from primary to secondary pumping will be automatic should equipment fail.

18. Show emergency plan to be used if flooding occurs at work site.

19. Show suction and discharge piping is protected from possible damage from varying flood levels and construction activities.

20. Show any planned shifting of bypass equipment during construction.

21. Complete information on instruments, including calibration certificates.

22. Qualifications of pump supplier on-site operators.

23. Emergency contact telephone numbers.

C. Sequence of Construction Plan:

1. Contractors Sequence of Construction defining work to be performed, including the following items:

a. Definition of the start date, duration, and end date

b. Define activities to be performed by or witnessed by the Owner and date on which these activities are to be performed.

c. Scheduling/timing of manufacturers field services required to train all personnel that will be responsible for the operation of the bypass system and to verify that all system components are installed as recommended by the manufacturer.

1.5 SPECIAL PRECAUTIONS AND LIABILITIES

A. Contractor is responsible for fines levied on Owner by state, federal, and/or other agencies due to spills caused by failure of temporary pumping systems. The Contractor shall also be responsible for repairing any damage to existing

facilities including erosion of soils or contamination caused by a spill that is a direct result of the bypass pumping system failure. The cost of all repair and the immediate action required to facilitate the repairs are also the responsibility of the Contractor. This liability is limited to the firm capacity of the bypass pumping system as defined by this specification.

B. The Owner is not responsible for any damage to the bypass pumping system under any circumstance. The bypass pumping system supplier by submitting a design for approval accepts that temporary pumping facilities for collection and treatment facilities have unknown materials and debris in them and that any damage to any of the bypass pumping equipment due to unknown materials are the responsibility of the supplier. It shall be the responsibility of the suppler to take precautions as deemed necessary by the supplier against any and all materials that may be present in the liquid pumped by the system to prevent damage to the equipment and to prevent failures that may cause a spill.

C. Provide barriers in all locations where temporary pumps, pipe and other accessories are in roadways, driveways, and other vehicle-accessed areas.

D. When overnight pumping is necessary, provide security fencing for all temporary pumps when not located within a secured area to prevent tampering.

PART 2 – PRODUCTS

2.1 PUMPS

A. The pumps and drives shall be rated for continuous duty and shall be capable of pumping the required flow ranges without surging, cavitation, or vibration. Pumps shall not overload drives at any point on the pump operating curve.

B. Pumps shall be suitable for the service specified and the debris contained within it.

C. Pumps shall be self-contained units designed for temporary use.

D. Pumps shall have fully automatic self-priming units that do not require the use of foot- valves, vacuum pumps, or diaphragm pumps in the priming system, or they shall be submersible.

E. All pumps must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of flows.

F. Provide the necessary start/stop/variable speed and level controls for each pump.

G. The primary pumps shall be diesel powered.

1. Contractor shall be responsible for providing and storing a sufficient quantity of diesel fuel on site to continually operate the pumps for the duration of the temporary bypass pumping period. Once started the Contractor shall provide fuel until all work is complete and bypass pumping is no longer needed. Diesel-powered pumps shall have adequate fuel storage capacity to operate continuously for 24 hours without refueling.

2. Contractor shall check the pump fuel levels and shall refill the tanks to full capacity at a frequency based on fuel consumption but not less than daily. Fuel deliveries shall only be made during normal daytime working hours.

3. Each pump and drive shall be rated for continuous duty operation over the specified range of conditions without cavitating or overheating, and without excessive vibration or noise. In addition, each pump and drive shall be rated to operate intermittently at shutoff head against a closed discharge valve for periods of not less than 5 minutes without excessive cavitation, overheating, or vibration.

4. All pumps are to be Godwin Dri-Prime Automatic self-priming pumps as manufactured by Xylem Dewatering Solutions, Inc., or Engineer approved equal.

5. Furnish each pump with the necessary stop/start controls.

2.2 PIPE

A. In order to prevent accidental spillage, all temporary pipe must be constructed of rigid or semi-rigid pipe with positive, leak proof connections. All pipe materials and joints for temporary pipe systems must be High Density Black Polyethylene Pipe - ANSI/ASTM D1248, butt heat fusion type joint fittings shall conform to ASTM D2657 and D3261. Flexible hose of any type shall not be permitted.

B. Pump discharge piping shall be valved and manifolded so that pumped liquid can be conveyed to the dedicated discharge location. Provide check valves for each pump discharge. Air-relief valves shall be provided at high points in the discharge piping as required. Air-relief valves shall expel air upon pipe filling, admit air upon pipe dewatering, and release small amounts of entrained air during operation. Air-relief valves shall be suitable with the specified service.

2.3 TEMPORARY PLUGS AND BULKHEADS

A. Provide temporary plugs and bulkheads, as required, for successful operation of the temporary pumping systems. Acceptable temporary plugs and bulkheads

include inflatable dams specifically designed for such service, brick bulkheads, timer bulkheads, sandbags, and other bulkhead methods suitable for the specified service.

B. Plugs shall be designed for the specific purpose of providing temporary plugging of active pipes. Each plug and temporary bulkhead shall be suitable for the maximum pressure encountered.

C. All plugs shall be firmly attached to a stationary object at ground level by a cable in order to prevent loss of plugs in pipelines.

D. Piping plugs shall be capable of accommodating the maximum allowable surcharge heads within the gravity system that may be experienced during construction. All plugs shall be designed with a minimum factor of safety of 1.5. Where temporary plugs and bulkheads are under pressure or surcharged, provide either two plugs or a plug and a temporary bulkhead.

E. The plugs shall be readily removed from the system during emergency shutdowns and shall be operated pneumatically.

2.4 ALARM SYSTEMS

A. The minimum acceptable alarm system shall consist of high-water float(s) and automatic dialer with a battery backup. The alarm system design shall be the responsibility of the bypass pumping system supplier. The alarm system must be capable of full operation in the absence of electrical power and must provide redundancy in case of alarm system component failure.

B. The automatic dialer system shall be provided with either cellular or satellite phone as appropriate to provide reliable contact during any failures.

PART 3 – EXECUTION

3.1 GENERAL

A. Install, operate and maintain temporary pumping systems and appurtenances, including but not limited to, associated pipe, valves, instrumentation, controls and accessories, in accordance with the manufacturer's instructions for each component and as required by the approved bypass pumping submittal.

B. Provide all oil, fuel, grease, lubricants, tools and spare parts required for operation and maintenance of the temporary pumping systems for the duration of use. Spill containment around diesel-powered pumps, including filling operations, shall be provided per applicable regulations.

C. Adequate hoisting equipment for each pump and accessory shall be maintained

on Site.

D. Temporary pumping systems shall remain operable until all components of new work requiring temporary pumping systems have successfully completed all required testing and have been accepted by the Owner.

E. The design of the bypass pumping system must allow for prompt dewatering of the system during periods of non-use or if leakage occurs.

F. The Contractor will not be permitted to stop or impede the sewer flow under any circumstances without having the primary setups operational.

G. The Contractor shall be responsible for the provision of temporary fall-protection devices around all removed manhole covers, grating, openings, etc.

H. The Contractor shall assemble a list of 24-hour emergency telephone numbers that shall include the Contractor's project manager, the Contractor's foreman, and a responsible representative from the pump supplier, and submit it to the Engineer for review and approval.

3.2 SITING OF FACILITIES

A. Location of pumps and piping shall be coordinated with the Engineer and Owner.

B. In all instances, unobstructed roadway access must be maintained. All driveways and connections to roadways must be kept clear.

C. The discharge of the bypass pumping system shall be placed and designed in such a way to facilitate proper flow momentum on the direction of normal flow in the receiving facility structure. The bypass pumping contractor will be responsible for the design of the discharge piping and ensuring that no spills occur as a direct result of the design of the discharge.

3.3 PREPARATION

A. The Contractor is responsible for locating any existing utilities in the area selected for installation of the bypass pumps and pipelines. The Contractor shall minimize the disturbance to existing utilities and shall obtain approval from the Owner for any relocation of the bypass pipeline. All costs associated with the relocation of utilities and obtaining approvals shall be included in the contract price.

B. During all bypass pumping operations, the Contractor shall protect the bypass pumping facilities and existing collection system from damage inflicted by equipment. The Contractor shall be responsible for all intentional or accidental physical damage to the bypass pumping system caused by human or mechanical

failure or interference.

C. During installation of the bypass pumping pipes, the Contractor shall make every effort to minimize the disruption of normal facility flows and pump station operation.

D. The Contractor shall protect all mature vegetation and structures or other obstacles in the path of the pipeline from damage through use of shields and buffering devices. All private property that must be relocated to construct the work must be stored at a location acceptable to the property owner.

E. In instances where fences must be disturbed for the construction of the pipeline, temporary fencing shall be required.

F. Temporarily burying the bypass piping may be required to provide access over the piping during operations. All fittings and costs associated with this temporary piping location shall be the responsibility of the Contractor. All locations where temporary burying of the pipe will be required shall be included in the bypass pumping system submittal. Rehabilitation and returning the area of temporary burying back to the original condition including paving or seeding or any other item removed to facilitate pipe installation shall also be the responsibility of the Contractor.

G. In the event that the bypass pipeline crosses local streets or private driveways, place the bypass pipelines in trenches and cover with temporary pavement, or utilize pump through type road ramps. Obtain all approvals for placement of the temporary pipeline within public ways.

3.4 INSTALLATION AND REMOVAL

A. The Contractor shall pipe sections or make connections to the existing piping systems and construct temporary bypass pumping structures only at the access location and as may be required to provide an adequate suction conduit.

B. Operation test: Contractor shall operate the temporary bypass pumping system for as long as necessary, but no less than 8 hours, without failure to demonstrate reliable operation of the entire system, including but not limited to pumps and controls, to the satisfaction of the Owner.

C. Plugging or blocking of flows shall incorporate primary and secondary plugging devices. When plugging or blocking is no longer needed for performance of the work, the plugs are to be removed in a manner that permits the flow to slowly return to normal without surge, surcharging, or causing other major disturbances upstream or downstream.

3.5 QUALITY CONTROL AND MAINTENANCE

A. Testing: Contractor shall perform leakage and pressure tests of the bypass pump suction and discharge piping using potable or approved surface water prior to actual operation. Low pressure air test shall be conducted at a test pressure of 15 psi before any liquid is pumped to ensure the system is assembled correctly. The system will pass the low-pressure air test if it holds the test pressure for 2 hours. The Engineer shall be given 24 hours' notice prior to testing. The force main shall be tested to 1.5 times the normal working pressure of the system at the firm capacity specified and will be considered ready for service if the pressure is held for 2 hours. Surface water or potable water shall be supplied and used by the Contractor for this test.

B. Once installation and testing of the temporary pumping systems are complete, a trained representative from the pump supplier shall inspect the installation and verify in writing that the installation is complete in all aspects and ready to run as intended on a continuous basis.

C. Inspection: during operation of the temporary pumping system the Contractor shall inspect all components every two (2) hours to ensure that the system is working correctly. Contractor shall inspect the bypass pumping fuel system a minimum of either one (1) time per day or as often as necessary to ensure full fuel tanks for the bypass pumps.

D. Maintenance service: Contractor shall ensure that the temporary pumping system is properly maintained, and a responsible and competent mechanic/operator shall be on call at all times. The Contractor shall supply all necessary lubrication, fuel, and supplies necessary to maintain the entire installation.

3.6 SEQUENCE OF CONSTRUCTION

A. Contractor shall propose a Sequence of Construction incorporating all constraints detailed in this Section and shall secure concurrence of Owner prior to starting work.

B. The Contractor shall submit a construction plan and schedule, which details the methods, means, techniques, and sequences to be used to establish a base element of surety against a spill, to the Engineer for review and approval by the Owner as part of the bypass pumping system submittal.

C. Schedule of construction, interconnection details, and other revisions necessary for proper interfacing of the Work are to be subsequently modified by Contractor accounting for results of said coordination meeting. The Engineer and Owner are to be notified one week prior to any actual interruptions or connections being made. No work shall be undertaken prior to securing Owner's approval of respective connection plan and work schedule.

END OF SECTION

11355 WEIRS AND BAFFLES

SECTION 11355

WEIRS AND BAFFLES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install, complete and ready for operation, and field test, v- notch weirs, baffles, supports and butt plates of the sizes, shapes and the quantities as shown on the Drawings and as specified herein.

1.02 RELATED WORK

A. Concrete is included in Division 3.

B. Miscellaneous metals are included in Division 5.

C. Clarifier Equipment is included in Section 11379.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.

2. ASTM D256 - Standard Test Methods for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.

3. A S TM D 570 - Standard Test Method for Water Absorption of Plastics.

4. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.

5. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced PIastics and Electrical Insulating Materials.

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 SUBMITTALS

A. Submit, in accordance with Section 01300, copies of all materials required to establish compliance with this Section. Submittals shall include the following:

1. Dimensions of all components.

2. Complete installation instructions.

3. Complete description of materials and resins used, including physical properties and methods of manufacture for the fiberglass weirs.

4. Certification that materials of fiberglass reinforced polyester is resistant to chemical attack from sewage and chemicals.

5. Statement that fabrication is in accordance with this Section.

6. Complete bill of materials.

7. Complete assembly drawings.

8. Submit certified test reports of manufactured laminates, as specified herein. Submit one 6-in by 6-in by 114-in sample of polyester laminate to be used in the weirs, baffles and supports and one 6-in long actual weir with anchor bolt hole.

B. Operating and Maintenance Data

1. Operating and maintenance instructions shall be furnished as provided in Section 01170. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, descriptions that are required to instruct operating and maintenance personnel unfamiliar with such equipment. The maintenance instructions shall include trouble shooting data and full preventive maintenance schedules.

1.05 QUALITY ASSURANCE

A. All fiberglass weirs, baffles and supports shall be furnished by the Contractor from a single manufacturer who is fully experienced, reputable and qualified in the fabrication of such equipment.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Items to be shipped as complete assemblies except where partial disassembly is required by transportation regulations or for protection of components.

B. The Contractor shall be responsible for the unloading and safe storage of equipment in a manner acceptable to the Manufacturer prior to installation. Lifting of equipment will be in strict accordance with manufacturer's written instructions.

1.07 WARRANTY

A. The equipment shall be warranted by the Manufacturer through a separate contract for a period of two (2) years from the date of Substantial Completion to begin no later than January 1, 2025, to be free from defects in workmanship,

design or material. If the equipment should fail during the warranty period due to a defective part(s), it shall be replaced in the machine and the unit(s) restored to service at no additional cost to the Owner.

1.08 SYSTEM DESCRIPTION

A. Weirs, baffles and support brackets for the final sedimentation tanks shall be of fiberglass reinforced polyester resin with stainless steel hardware, constructed to the dimensions shown on the Drawings.

1.09 MAINTENANCE

A. Spare Parts

1. All spare parts required for normal operation and maintenance of the equipment shall be furnished in accordance with Section 01170.

2. Provide spare parts for one (1) year of service as recommended by the manufacturer.

3. All spare parts shall be suitably packaged and clearly identified with indelible markings on the containers.

PART 2 PRODUCTS

2.01 GENERAL

A. Except for bolts and hardware specified herein, the weirs, baffles and supports shall be polyester plastic resin, reinforced with fiberglass.

B. Weir plates and scum baffle plates produced from fabricated plate stock with cut edges, notches, etc will not be acceptable.

C. All weir plates, scum baffle plates, butt plates, washers and scum baffle support brackets shall be fiberglass reinforced polyester plastic molded by the matched die method to produce uniform, smooth surfaces. All surfaces shall be smooth, resin rich, free of voids and porosity, without dry spots, crazes, or unreinforced areas and shall provide for increased corrosion resistance and weathering.

D. Laminate shall contain ultra-violet inhibitors added to protect the laminate from deterioration from sunlight.

E. Manufacturer shall maintain a continuous quality control program and shall furnish the Engineer with certified test reports consisting of physical tests of samples as listed below and otherwise as required to show quality of plastic being furnished.

F. Hardness test shall be made with the resin-rich surface of the product. Flexural tests shall be made with the resin rich surface in compression. Test samples shall be full thickness of the item produced and shall not be machined on the surface.

G. Procedure to be used in determining the properties listed in the following tables shall be in accordance with the following ASTM Standards: ASTM D638, ASTM D790, ASTM D256 and ASTM D570.

H. Minimum physical properties at a temperature of 70 degrees F for the plastic shall be as follows:

1. Tensile Strength 7,500psi

2. Flexural Strength 16,000psi

3. Flexural Modulus 800,000psi

4. Impact Notches, Izod foot pound per inch 10.0

5. Barcol Hardness minimum 35

6. Average coefficient of thermal expansion – inch per inch, per degree .000016

7. Water absorption, percent 24 hours 0.2

8. The weir plates, baffle plates and supports shall be plastic laminate that is 1/4-in thick and molded to the sizes and shapes as shown on the Drawings. Oversize mounting holes shall be provided on 12-in centers on the weir plate plastic laminate for vertical and horizontal adjustment of at least 2-in plus/minus. Cut ends of non-standard lengths of weirs and baffles shall be resin sealed with Leo-Lite (141-120-7) seal mix or equal.

2.02 V-NOTCH WEIR

A. Effluent weir plates shall be gusseted bracket configuration and consist of 9-inch-deep x 1/4-inch thick FRP sections with 2-1/2 inch deep 90-degree V notches at 6 inch intervals. The weir sections shall be fastened to the tank wall using 316 stainless steel cinch anchor bolts hex nuts and 5-inch diameter FRP washers, allowing for vertical adjustment. To prevent leakage all surfaces between the launder walls and weir plates shall be given a caulking compound that shall be an acrylic polymer or a two-part sealant equal or exceeding Federal Spec. TT-S227B.

B. Anchor bolts, bolts, nuts, washers and other hardware shall be stainless steel in accordance with ASTM A276, Type 316.

C. Weirs shall be by NEFCO, Enduro, Warminster or Engineer Approved Equal.

2.03 SCUM BAFFLE

A. The scum baffle plates shall consist of 24-inch-deep x 1/4-inch thick FRP sections supported from the tank wall by FRP angle brackets secured with 316 stainless steel cinch anchor bolts and hex nuts, allowing for vertical and radial adjustment.

B. Anchor bolts, bolts, nuts, washers and other hardware shall be stainless steel in accordance with ASTM A276, Type 316.

C. The scum baffle and supports shall withstand the constant forces exerted on it by the scum skimming mechanisms of the final sedimentation tanks.

D. Scum baffles shall be by NEFCO, Enduro or Engineer Approved Equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation shall be in strict accordance with the manufacturer's instructions and recommendations, by mechanics skilled in the installation of this type of work, in the locations shown on the Drawings. Anchor bolts shall be furnished by themanufacturer and set in accordance with the manufacturer's recommendations.

B. Weirs and baffles shall be carefully aligned and leveled to the elevations shown on the Drawings. In the completed installation, no variation greater than 1/8-in shall exist between any two notches of the weir plate in any one tank. In addition, the average deviation from one quadrant of the weir to any 'other shall not exceed 1/16-in. Caulking compound shall be used to completely prevent flow of liquid up between the concrete weir wall and the weir plate.

C. Baffles shall be coordinated with the skimmings boxes of the tank equipment to assure fitting between the baffles and the skimmings boxes and the proper action of the skimming blade to collect and discharge the skimmings to the boxes.

3.02 FIELD INSPECTION AND TESTING

A. Furnish the services of a factory representative for 2 days, who has complete knowledge of proper installation, startup and operation of the weirs and baffles to inspect the final installation and supervise a test run of the equipment. If there are difficulties in operation of the equipment due to the manufacturer's fabrication or Contractor's installation, additional service shall be provided at no

additional cost to the Owner.

B. Upon completion of installation, fill each tank with water to observe the leveling of the weir plates and shall operate the sludge collector mechanism to demonstrate proper installation of the skimmer and weir brush with the weirs and baffles. Furnish all labor and materials for such tests and correct defects in the fabrication and installation. Weirs and baffles exhibiting excessive deflection, as determined by the Engineer, shall be removed and replaced at no additional cost to the Owner.

END OF SECTION

11379 CLARIFIERS

SECTION 11379

CLARIFIERS

PART 1 - GENERAL

1.1 SPECIAL PROVISIONS

A. The Owner intends to rehabilitate their one (1) existing primary clarifier and two (2) existing secondary clarifiers as outlined in the following assessment report. In addition the Owner is providing an additive alternate to rehabilitate their one (1) existing intermediate clarifier, and to replace the v-notch weirs and baffles on all four systems. For weirs and baffles see Section 11355.

1.2 SUMMARY

A. Existing Clarifiers:

1. Provide all labor, materials, equipment, tools and incidentals required for retrofitting the existing secondary clarifiers as shown on the Drawings and as specified herein.
2. The following is a scope list for each group of clarifiers proposed for rehabilitation:

Description	Action per Clarifier
All Clarifiers	Replace drive assembly. Replace influent well section (*with and without tie bar holes*) Replace scum trough assembly Replace seal collar manifold Replace skimmer assembly. Replace A-frame Skimmer & Scum Blade Support Replace tie rod arm Replace support brackets for influent well Replace manifold seal Replace fluidizing vein Replacement Hardware kit Replace Clamp plate skimmer Replace Clamp plate scum blade

Replace Scum blade inner & outer sections
Replace Seal Collar Center Pier
Replace Influent well brackets
Replace Influent well section with scum outlets

B. All equipment shall be the sizes shown, new and of current manufacturer [Dorr-Oliver] or approved manufacture [Walker] or other engineer approved equal, and complete with all accessories and controls to provide complete operating systems.

1.3 SYSTEM DESCRIPTION

A. Design Requirements – Existing Clarifiers:

1. Diameter as follows:

Description	Diameter
Primary Clarifier	45 feet
Secondary Clarifier 1	45 feet
Secondary Clarifier 2	45 feet
Intermediate Clarifier	45 feet

B. Performance Requirements:

1. Design equipment for reliable performance under stresses occurring during continuous operation and additional strains occurring during installation.
2. Design equipment so parts are readily accessible for inspection and repair, easily duplicated and replaced, and suitable for service required.
3. Design equipment to be free from shock, vibration, and noise under load conditions.
4. Design equipment for brush assembly loads.

1.4 SUBMITTALS

A. Submit product data and shop drawings in sufficient detail to confirm compliance with requirements of this Section. Submit product data and shop drawings in one complete submittal package. Partial submittals are unacceptable.

B. Product Data for each clarifier:

1. Complete description of the equipment, including construction details, material descriptions, rated capacities, operating characteristics, furnished specialties, accessories, dimensions of individual components and profiles.
2. Complete bill of materials for the equipment.
3. List of recommended spare parts.
4. Description of surface preparation and shop prime painting, including certification that the paint to be used to shop prime the equipment is compatible with the finish coat paint to be applied to the equipment.
5. The weight of each component.
6. Complete motor data.
7. Complete controls data, including functional narrative description.

C. Shop Drawings:

1. Certified shop drawings and installation drawings including plans, elevations, sections, details, and attachments to other Work. Include components, assembly, dimensions, weights and loading, required clearances, and location and size of field connections.
2. Wiring diagrams for motors and controls. These should show such details as necessary to locate conduit stub-ups and field wiring.
3. Control panel schematic.
4. Piping schematic showing all components of the ready-for-operation clarifier systems.

D. Quality Control Submittals:

1. Design Data:

   a. Design calculations demonstrating the equipment process design requirements are met or exceeded.
   b. Gear rating calculations, where applicable.
   c. Certifications that all wetted materials are compatible with service conditions.

2. Test Results:

   a. Torque test results for each clarifier mechanism.

      1) Submit in accordance with Section 01300 – Submittal Procedures.

3. Certificate signed by manufacturer certifying compliance with requirements of this Section.

E. Contract Closeout Submittals:

1. Operation and Maintenance Data:

    a. Submit in accordance with Section 01730 – Operation and Maintenance Data.

2. Warranties:

    a. Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. See Section 01400 – Quality Control.

B. All equipment specified under this Section shall be furnished by a single manufacturer regularly engaged in the production of such equipment. The manufacturer shall have the sole responsibility for the proper functioning of the equipment as furnished.

C. The manufacturer is responsible for supplying complete clarification systems as defined above and for assuming complete system responsibility.

1.6 DELIVERY, STORAGE AND HANDLING

A. See Section 01600 – Equipment Delivery and Storage

B. No shipment shall be made until equipment shop drawings are approved by the Engineer in writing.

C. Fabricated assemblies shall be shipped in the largest sections permitted by carrier regulations and properly match-marked for ease of field erection.

D. Factory assembled parts and components shall not be disassembled for shipment unless permission is received in writing from the Engineer.

E. Finished iron and steel surfaces not painted shall be properly protected to prevent rust and corrosion.

F. All components shall be erected immediately upon receipt or stored in conformance with the recommendations of the manufacturer.

G. All equipment parts shall be properly handled and stored so that no damage or deterioration shall occur during shipment or prolonged delay from the time of shipment until installation is completed and the equipment is ready for operation.

H. Equipment damaged during shipping, storage or installation shall not be accepted.

I. The equipment shall be lubricated in conformance with the recommendations of the manufacturer.

1.7 WARRANTY

A. All equipment shall be warranted for a period of one (1) year from start-up.

B. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced and the unit(s) restored, at no cost to the Owner.

C. The manufacturer's warranty period shall run concurrently with the contractor's warranty period. No exception to this provision shall be allowed.

1.8 MAINTENANCE

A. Furnish one set of all special tools required for normal maintenance of the equipment. Tools shall be packaged in a steel case, clearly and indelibly marked on the exterior to indicate the equipment for which the tools are intended.

B. Furnish the manufacturer's recommended spare parts required for two years of normal operation and maintenance of the equipment. Include, as a minimum:

1. One (1) sight glass for each main drive housing containing oil.
2. One (1) set of neoprene skimmer wipers.
3. One (1) set of cleaning brushes.

C. All spare parts shall be suitably packaged or boxed for long-term storage. Each part shall be clearly identified by Owner, equipment number, part description, part number and other pertinent information or data.

PART 2 - PRODUCTS

2.1 GENERAL

A. Each clarifier mechanism shall be of the center-drive type, supported on a stationary influent column, with the flow entering at the bottom of the influent column and flowing upward to the inlet openings located at liquid level. The clarifiers shall be designed to remove sludge uniformly from the bottom of the tank.

2.2 MATERIALS

A. All plates and structural members designated for submergence service shall have a minimum thickness of 1/4 inch. All structural steel shall conform to ASTM A36 requirements and steel plate shall conform to ASTM A283C requirements. All anchor bolts shall be Type 304 or 316 stainless steel. Handrail, skimmer, rake blade squeegee, and miscellaneous fasteners shall be Type 304 stainless steel. All bolts and fasteners shall have a stainless steel nut and washer.

2.3 SURFACE SCUM SKIMMING EQUIPMENT

A. There shall be furnished one (1) skimming device to move floating scum from the surface of the tank to a fabricated steel scum trough with approach ramp extending out from the tank wall.

B. Surface scum skimming equipment shall be furnished with each clarifier mechanism. It shall be arranged to have the surface scum swept along a skimmer blade to the for discharge to the scum box. The surface of the clarifier shall be swept once per revolution.

C. The skimmer shall consist of hinged adjustable aluminum arms with neoprene bottom and side wiping blades that seal entrapped scum and water when discharging into the scum trough. The skimmer shall also have full radius steel deflector blades extending from the influent well to the skimmer to assist in scum removal. The skimmer shall be supported by structural steel members fixed to each of the collector arms

D. The scum box shall consist of a fabricated steel box with a minimum length of 4'-0", vertically adjustable steel approach lip, rider straps and a back plate to allow the skimmer arm a smooth transition from the trough to the water surface. Structural steel braces attached to the tank wall shall support each scum trough and approach lip.

E. The scum box shall be supported from the tank wall and connected to a 6-inch scum line.

2.4 ACCESS WALKWAY

A. Each collector shall have an access walkway that is supported by a truss access walkway extending half the full diameter of 45’ and including a center drive platform, with a minimum 2 foot clearance around the drive. The access walkway shall be aluminum grating at least 3'-0" wide. The access walkway shall be supported on the outer 45’ diameter tank walls at its access ends and on the spur

gear housing at the center of the tank. Access walkway shall be designed for all dead loads applied to it plus a live load of 100 lb./ft. The live load shall not cause a deflection of more than 1/360 of the span.

B. The sides of a truss access walkway may serve as railings, provided the top chord is 3'-6" above the walkway surface; otherwise, handrailings shall be mounted on each side, 3'-6" above the walkway surface.

2.5 CENTER DRIVE MECHANISM

A. Each center drive mechanism that is replaced or rebuilt shall utilize bearings, seals, etc. from known manufacturers such as Timken, SKF, Nikon and the original equipment manufacturer for the strip liners located in the main gear and base. Bearings, seals from unknown sources are not acceptable. Submittals must indicate the manufacturer of bearing, seals, etc.

B. The center drive assembly shall consist of an integral motor and primary speed reducer coupled through roller chain and sprockets to a secondary worm/worm gear reducer driving the main gear through a pinion and shall have an integral overload protection system.

C. All gears and bearings shall be oil bath lubricated with the main bearing totally submerged in oil and the teeth of the main spur gear submerged at least 85 per cent in the oil bath. Oil pumps for lubrication or grease lubricated bearings are not considered appropriate for this application and will not be allowed. The oil reservoir for the main bearing and gear shall have a section of minimum depth 5 inches below the main bearing to positively prevent contamination of the main bearing and gears with condensate or other contaminants. Gear and bearing housings must also be fitted with oil level sight glasses and condensate drains. Condensate must be allowed to drain from a low point of the housing. Condensate and contaminants will not be allowed to drain through the lower pinion bearing.

D. Drive components will be located via a machined, registered fit to preserve the alignment of key drive components under all load conditions. Inspection of the completed drive unit shall be accomplished at the clarifier manufacturer's shop, with reports of all tests and certifications of material hardness being made available for review at the Engineer's request prior to shipment to the job site.

E. Major drive components, main gears and bearings must be designed to allow for separate and individual replacement by plant personnel to facilitate quick and economical repairs.

F. The complete center drive assembly, including the overload protection device, shall be a regularly manufactured in-house product of the clarifier manufacturer. The

center drive assembly is a key element in a successful clarifier installation, therefore drive assemblies purchased from third party vendors will not be accepted.

G. The gearmotor primary speed reducer shall drive a secondary worm gear reducer through a #60 roller chain and steel sprockets enclosed in a galvanized 18 gauge steel guard. The speed reducer shall be a variable speed traction drive type. Sprockets and chain shall be designed for the connected horsepower of the drive with a minimum service factor of 1.4. Provision shall be made for adjustment of chain tension.

H. The main drive unit shall consist of a worm gear secondary reduction unit, pinion and main spur gear assembly. The secondary reducer shall be a worm/worm gear reducer specifically designed for this application. The worm gear shall be centrifugally cast manganese bronze. The worm shall be hardened alloy steel. A single piece pinion shall be keyed to the worm gear to transmit power from the worm gear to the spur gear. In order to maintain proper alignment between the pinion and the spur gear, the pinion will be supported by bearings both above and below the spur gear. The bearings shall be fitted into precision machined bearing pilots to positively insure bearing and gear alignment.

I. The main spur gear material shall be cast iron per ASTM A536 grade 100-70-03 or equal. The gear shall have a minimum pitch diameter of 30 inches with a 4.75 inch face width or the equivalent spur gear surface area of 447 square inches. Spur gear surface area is defined as the spur gear pitch diameter multiplied by the spur gear face width multiplied by 3.14.

J. The main gear shall rotate and be supported on a ball bearing assembly provided with four replaceable liner strips fitted into the main gear and turntable base. Liner strips shall be special vacuum degassed carbon corrected alloy steel hardened to a Rockwell hardness of at least 38 to 46 Rc. The turntable base shall be a minimum 1 inch thick to insure adequate structural rigidity to properly support the drive bearing and gear.

K. The main gear and bearing shall be completely enclosed in an ASTM A-48 Class 30A cast iron housing provided with neoprene dust seals. In order to ensure the maximum possible base rigidity the gear housing shall be of full sidewall construction, integral with the base. Prior to assembly, the base shall be thoroughly inspected for seep holes or inclusions and given a hydrostatic test to insure no leaks are in the oil containment area. Shop inspection reports must be made available for review.

L. The drive unit shall be equipped with an electro-mechanical overload control device actuated by thrust from the worm shaft. The pointer shall provide a visual reading of the relative main gear output torque on a 0 to 100 percent graduated scale. The

control device shall also activate an alarm switch for warning of impending overload, a motor cutout switch for overload protection and a back-up safety motor cutout switch for back up overload protection. In lieu of a back-up safety motor cutout switch a slip clutch assembly will be acceptable upon review by the Engineer. The respective switches in the overload control device shall be factory calibrated and set to the following settings;

1. Alarm; 40% of scale.
2. Motor cutout; 85% of scale.
3. Back-up motor cutout or slip clutch; 100% of scale.

M. All drive control components shall be mounted in a NEMA 4X enclosure of epoxy coated aluminum construction with a gasket sealed removable cover. The pointer shall be covered with a plexi-glass enclosure and shall be above the walkway surface for visibility from the walkway. Amperage sensing devices are not acceptable for torque overload protection due to their inability to react quickly enough to prevent damage to the drive. Overload devices with exposed linkage connections will not be accepted due to possible corrosion problems. Devices which react to rotational movement of the secondary reduction unit will not be allowed due to possible misalignment of gearing created by the movement of the reduction unit.

N. The center drive unit shall be designed for the continuous torque rating as matches the existing unit. The continuous torque shall be defined as the minimum torque at which the drive mechanism may operate continuously 24 hours per day, 365 days per year, for 20 years, at the specified sludge collector arm speed. Main gear and pinion calculations shall be based upon ANSI/AGMA 2001-C95 standards for rating the pitting resistance and bending strength of involute spur and helical gear teeth. Calculations shall clearly present the values used for the following design parameters:

1. Number of pinions
2. Actual face width
3. Tooth geometry (I and J factors)
4. Load distribution factor
5. Allowable contact stress
6. Allowable bending stress
7. Pinion pitch diameter
8. Hardness ratio factor
9. Elastic coefficient
10. Life factor

O. The load distribution factor shall be determined by the empirical method. For parameters which are material dependent, such as allowable contact stress, the calculations shall include a complete description of material and heat treatment used.

P. Worm gearing shall be designed and rated to equal or exceed the specified continuous torque and life. The basis for rating shall be ANSI/AGMA 6034-B92 standards for durability rating and design of wormgear reducers.

Q. The continuous torque rating for the drive unit shall be the lowest value determined for the gearing.

R. Motor horsepower, nominal rpm and voltage shall match the existing motor.

S. The motor shall be standard premium efficiency, electric induction motors meeting NEMA MG-1 and other applicable NEMA, ANSI and IEEE standards. Motor shall be constructed with Class F insulated winding, Class B 30,000 anti-friction bearings. The motor nameplates shall be rate for continuous duty at 40 degrees C ambient temperature with a 1.15 service factor. Motor shall be rated for high humidity and dusty environment.

T. If any motor fails during the warranty period, the rebuild facility shall replace the motor with a new motor. Rewinding a failed motor shall not be acceptable.

2.6 CENTER PIER

A. Provided a cylindrical steel center pier that shall support the main gear and shall serve as the influent pipe inside the tank. The pier diameter shall not be less than 20." The pier shall be fabricated of not less than 1/4" thick steel plate suitably reinforced where necessary, and designed to withstand twice the continuous torque of the drive mechanism. The pier shall be anchored with a minimum of eight (8) - 1" diameter anchor bolts.

2.7 INFLUENT WELL

A. Furnish an energy dissipating type inlet arrangement consisting of a gated inner distribution well and an outer well. The arrangement shall be designed to provide efficient hydraulic control and distribution of flow entering the tank.

B. The inner distribution well shall have a bottom and circular side walls. The bottom shall be made with minimum1/4" thick steel plate and extend to within 1 inch of the pier. The side walls shall be made with minimum 3/16" thick steel plate. The side wall shall have multiple, tangential diffusion gates to provide balanced inlet diffusion to the area between the inner and outer wells.

C. The outer well shall match the existing structure in diameter and side depth, and shall be fabricated from minimum 3/16" steel plate and reinforced as necessary.

Scum relief ports shall be provided on the outer well. The outer well may be supported either from the drive cage or from the access walkway.

2.8 DRIVE CAGE

A. A steel drive cage shall be suspended from the internal spur gear and shall be matching existing dimensions, constructed of 1/4" minimum structural steel members designed to support and rotate the sludge collector arms. Connection to the internal spur gear shall be adjustable for proper alignment and allowance for structural tolerances. The drive cage shall be fabricated from rolled structural angles or sections having a minimum thickness of 1/4" and designed to meet AISC specifications when twice the continuous torque of the drive unit is applied.

2.9 SUCTION HEADS AND MANIFOLD

A. There shall be furnished one suction header of rectangular cross section, fully tapered, varying in cross sectional area from a maximum at the inner end (near the tank center) to a minimum at the outer end to provide a uniform velocity of sludge in the headers.

B. The header shall be fabricated from 1/4" thick steel plate, and hot dip galvanized after fabrication.

C. The longitudinal cross-sectional axis of each header shall form an angle of 45° with the tank floor. The header shall be provided with a 2" lip or flange beneath the orifices, and which is an integral part of the header, to fluidize the sludge and facilitate sludge flow into the orifices.

D. The header shall have a steel flight with a neoprene squeegee to clean the tank floor around the manifold, directing sludge outwardly into the path of the inner end of the headers. At the inner end of the header, a flange shall be provided for bolting to the manifold.

E. The header shall be supported from the drive cage by truss rods, or where necessary, from a steel truss arm fabricated from 1/4" structural steel members.

F. The fabricated steel manifold shall be rotated by the drive cage and shall be provided with seals to prevent the passage of liquid between the tank and the manifold.

G. Each orifice shall be designed to withdraw a specific flow rate of sludge. The design of the orifices and headers shall be such as to ensure hydraulic balance in the tank and uniform sludge withdrawal from the entire tank bottom at all flows between

the minimum and the maximum stated herein. The velocity through the header shall not be less than 0.5 fps at the minimum sludge flow rate.

H. Orifices shall be drilled in the header at regular intervals not exceeding 30", and shall vary in diameter from a minimum at the inner end of the header, to a maximum at the outer end of the header.

2.10 HYDRAULIC DESIGN CRITERIA

A. The Equipment Manufacturer shall submit calculations showing that the sludge collection through each orifice is accomplished in proportion to the floor surface area served by that orifice. The calculations shall be based upon orifice headloss coefficients and form loss coefficients, for the flow through the suction arm(s). These coefficients shall have been determined from experimental testing, performed by an independent agency, on a full-scale suction arm with multiple orifices. The tests shall have been performed to determine the effects of multiple orifices, varying ratios of flow through the orifice and the manifold and the Reynolds number.

B. Each portion of the flow (the flow through each orifice and the flow in the suction arm upstream of the orifice) shall be individually metered to determine that flowrate. The method of flow metering shall be by a calibrated orifice plate.

C. Pressure measurements shall have been made with high precision piezometers. At each pressure measuring location along the suction arm, four pressure taps (one tap located on each of the four sides of the suction arm) shall have been connected to a common manifold to eliminate any errors due to asymmetrical velocity profiles.

2.11 SLUDGE MANIFOLD

A. A sludge manifold assembly shall be provided consisting of a rotating manifold, a fixed seal plate, and seals between the manifold, pier, and seal plate. The rotating manifold shall be minimum ¼" thick material and be attached to and supported from the drive cage and shall contain a reinforced flange in the vertical side wall for connection of each sludge header. The seal plate shall be a minimum of 4" wide x 3/8" thick and shall be anchored to the tank floor. The neoprene seal shall be minimum ¼" thick and shall be replaceable.

2.12 WELDING

A. The equipment manufacturer's shop welding procedures, welders and welding operators shall be qualified and certified in accordance with the requirement of

AWS D1.1 "WELDING IN BUILDING CONSTRUCTION" of the American Welding Society.

B. The equipment manufacturer's installation drawings shall clearly show complete information regarding location, type, size, and length of all welds in accordance with "STANDARD WELDING SYMBOLS" AWS A2.0 of the American Welding Society. Special conditions shall be fully explained by notes or details.

C. The contractor's welding procedures, welders and welding operators shall be qualified and certified in accordance with the requirements of AWS D1.1 "WELDING IN BUILDING CONSTRUCTION" of the American Welding Society.

D. The contractor shall perform all field welding in conformance with the information shown on the equipment manufacturer's drawings regarding location, type size and length of all welds in accordance with "STANDARD WELDING SYMBOLS" AWS A2.0 of the American Welding Society, and special conditions as shown by notes and details.

2.13 ELECTRICAL WORK

A. The contractor shall furnish and install all field wiring required including proper sized wire, conduit, fittings and supports.

B. The contractor shall furnish and install all electrical items required but not specifically called for as furnished by the equipment manufacturer.

2.14 PAINTING

A. See Section 09900

2.15 ACCESSORIES

A. Provide anchor bolts and fasteners in accordance with Section 05500 – Misc Metal Fabrications.

B. Identification:
   1. Provide a stainless steel nameplate attached to each clarifier mechanism with information on manufacturer and model.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine equipment for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before installation.

C. Examine walls, floors and concrete bases for suitable conditions where clarifier mechanisms shall be installed.

D. Proceed in accordance with Section 01400 – Quality Control

3.2 PREPARATION

A. Coordinate with other trades, equipment and systems to the fullest extent possible.

B. Take all necessary field measurements to determine the exact dimensions for all work and the required sizes of all equipment under this Contract. Verify all pertinent data and dimensions.

C. Surface Preparation:

1. All non-submerged steel shall be sandblasted to SSPC-SP-6 specifications and given one coat of manufacturer's epoxy primer 2-3 MDFT. All submerged steel shall be sandblasted to SSPC-SP-10 specifications and given one coat of manufacturer's epoxy primer 2-3 MDFT.
2. Prior to assembly of the drive unit, the castings shall have been sandblasted and thoroughly cleaned to remove any foreign particles in the drive base. After assembly, the drive mechanism shall be solvent cleaned and power wire brushed as needed prior to application of manufacturer's standard primer.
3. Gear motors shall be furnished with manufacturer's standard enamel.
4. Proceed in accordance with Section 09900 – Painting.

3.3 INSTALLATION

A. Install equipment in accordance with manufacturer’s instructions and recommendations and any applicable code or standard requirement. Installation shall include furnishing the required consumable materials for initial operation in accordance with manufacturer’s recommendations.

B. Plumb, adjust for true plane of rotation, grout beneath center pier and drive unit and grout the floor in accordance with the manufacturer's recommendations and as shown on the Drawings.

C. Include required oil and grease in accordance with the manufacturer's recommendations.

D. Set anchor bolts in accordance with the manufacturer's recommendations and templates.

E. Provide local electrical shutoffs for power supplied to field equipment.

F. If there are difficulties in operation of the equipment due to the manufacturer's fabrication or contractor's installation, provide additional service at no cost to the Owner.

G. Wiring and conduits for electrical power, control and instrumentation shall be as specified and shown on the Drawings.

H. If there are difficulties of operation due to the manufacturer's fabrication or contractor's installation, provide additional service at no additional cost to the Owner.

3.4 FIELD QUALITY CONTROL

A. Inspection:

1. The manufacturer's representative for each piece of equipment shall inspect installation, provide certification that the system components have been installed correctly and are ready for operation.

B. Tests:

1. After installation, the equipment shall be field tested to ensure all items are in compliance with the Contract Documents.
2. Torque Test:

    a. Before placing in operation, each clarifier mechanism shall be field torque-tested to verify the structural integrity of the structural steel and center drive design of the mechanism. Test under the supervision of manufacturer's representative and as approved by the Engineer.
    b. Test by securing the rake arms by cables to anchor bolts installed by the contractor in the tank floor at locations specified by the manufacturer. Apply a load to the scraper arm in small increments by means of a

ratchet lever and a cylinder connected to the cable assembly. Measure the applied load by calculating the torque from the distance of the line of action of each cable to the center line of the mechanism. Read at the drive design torque.

c. Demonstrate the structure's ability to withstand loads resulting from at least 120 percent of clarifier drive design torque.

d. Demonstrate proper operation of high-torque alarm, motor cut-out and back-up safety motor cut-out switches.

e. Repeat test to verify results.

C. Manufacturer's Field Services:

1. Supplier's or manufacturer's technician for equipment specified shall be present at jobsite for minimum man-days indicated, travel time excluded, for assistance during construction, start-up, training of personnel for plant operation, and as required by Owner or Engineer. Include minimum of:

a. Installation and Start-up Services: Three (3) Trips:

1) Three (3) man-days for Installation Services.
2) One (1) man-day for Start-up Services.
3) Two (2) man-days for Instructional Services.

b. Post Start-up Services: One (1) Trip:

1) One (1) man-day for Instructional Services.

D. If the performance of the equipment does not meet the Specifications, take corrective measures or remove and replace the item(s) with item(s) that satisfy the Specifications. A fourteen (14) day operating period of each item of equipment shall be required before acceptance.

E. Thirty (30) days after plant start-up, provide post start-up services by manufacturer's service representative to fine-tune the travel cycles of the sludge collector systems and instruct operating personnel accordingly.

3.5 INSPECTION

A. Inspect the after-installation in accordance with the manufacturer's field service checklist.

B. Correct any functional deficiencies. Provide all water and other materials necessary to complete the field verification. Completed inspection reports shall be submitted to the Engineer.

3.6 CLEANING

A. Clean work under provisions of Section 01710 - Cleaning.

B. Clean surfaces and components.

C. After completing system installation, including outlet fitting and devices, inspect exposed finishes. Remove burns, dirt and construction debris and repair damaged finishes.

3.7 PROTECTION

A. Protect all equipment prior to, during and after installation.

END OF SECTION

11559 SLIDE AND WEIR GATES

SECTION 11559

SLIDE GATES AND WEIR GATES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required for the slide gates, weir gates, operators, operating stems and appurtenances as shown on the Drawings and as specified herein.

1.2 SUBMITTALS

A. Submit copies of all materials required to establish compliance with this Section. Submittals shall include the following:

1. Complete description of all materials.

2. Certified shop and installation drawings showing all details of construction, dimensions and anchor bolt locations.

3. Descriptive literature, bulletins and/or catalogs of the equipment.

4. A complete total bill of materials.

5. The weight of each component.

6. Description of surface preparation and shop prime painting of gates and accessories.

B. In the event it is not possible to conform with certain details of this Section, describe completely all non-conforming aspects.

C. Operation and Maintenance Data

1. Operating and maintenance instructions, for each type of equipment, shall be furnished to the Design Builder.

2. A factory representative who has complete knowledge of proper operation and maintenance shall be provided for 1 day to instruct representatives of the Owner and Design Builder on the proper operation and maintenance of the equipment. This work may be conducted in conjunction with the inspection of the installation and test runs as provided under PART 3.

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

B. Aluminum Association (AA)

C. National Electrical Manufacturers Association

D. Factory Mutual (FM)

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.4 QUALITY ASSURANCE

A. The slide gates, weir gates, operators, operating stems, and appurtenances specified under this Section shall be furnished by manufacturers who are fully experienced, reputable and qualified in the manufacture of the equipment furnished. The slide gates, weir gates, operators, operating stems and all related equipment shall be designed, constructed and installed in accordance with the best practices and methods. Approved manufacturers for this project are RW Gate, Whipp, Watch Technologies and Aquanox.

1.5 MAINTENANCE

A. Tools and Spare Parts

1. Special tools required for normal operation and maintenance, shall be furnished with the equipment by the supplier.

2. Spare parts routinely requiring replacement during one year's operation at design loading shall be furnished by the supplier.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Gates

1. The slide gates and weir gates shall have the characteristics, dimensions, and materials as shown on the Drawings and specified in the gate schedule at the end of this specification.

2. All slide gates and weir gates shall be fabricated from 304L or 316L Stainless Steel and designed to have adequate strength to prevent distortion in handling and placing and under any condition of service.

3. Gate frames shall be manufactured of the same material specified for the gate. The frame shall be sufficiently strong so that where the guide extends above the operating floor to support the hoisting yoke, no further reinforcing of the frame will be required.

    a. The guide grooves in which the head guide angle travel shall contain ultra-high molecular weight polyethylene bearing bars in dovetail slots. The frame configuration shall be of the flush-bottom type and shall allow the replacement of the top and side seals without removing the gate frame from the wall or wall thimble

4. The frame configuration shall be of the flush-bottom type and shall allow the replacement of the top and side seals without removing the gate frame from the wall or wall thimble.

5. Guides shall be of such length as to retain and support at least two thirds (2/3) of the vertical height of the slide in the fully open position.

    a. Stainless Steel gates shall possess guides that shall be provided with ultra-high molecular weight polyethylene UHMW seats on both sides of the slide. Seals shall be frame mounted and fully adjustable. The flush bottom resilient neoprene seal shall be mounted to bottom member of the frame

6. The disc or sliding member shall be as tabulated, of the same composition as the frame, reinforced to limit deflection.

    a. For stainless steel gates the slide shall consist of stainless steel plate reinforced to limit deflection to L/720 of the gate span under the design head.

7. Gates shall be provided with a yoke to support the operating bench stand.
8. The yoke shall be formed by two structural members welded at the top of the guides to provide a one piece rigid frame. The maximum deflection of the yoke shall be L/360 of the gate span or ¼", whichever is less. Non-self-contained gates shall be provided with pedestal and/or wall brackets mounted lifts. Wall brackets and pedestal shall be 2-part epoxy coated steel or stainless steel.
9. The slide gates and weir gates shall be designed such that under the design seating head, the leakage rate shall not exceed 0.1 pm/lf of seating perimeter. Additional seals shall be provided as required to insure that the above leakage requirement is met.

10. All required attaching bolts and anchor bolts shall be furnished with the equipment and shall be stainless steel.
11. Gate operators shall be bench stands mounted on the gate yoke, floor stands, non-rising stem floor boxes, or electric operators.
12. The operating stem shall be of stainless steel designed to transmit in compression at least 2 times the rated output of the operating manual mechanism with a 40 lb effort on the crank or handwheel.
13. All stem guides shall be fabricated from stainless steel. Stem guides shall be equipped with a UHMWPE bushing. Guides shall be adjustable and spaced in accordance with the manufacturer's recommendation. The L/R ratio shall not be greater than 200.
14. Rising stem gates shall be provided with a clear polycarbonate or butyrate plastic stem cover. The stem cover shall have a cap and condensation vents and a clear mylar position indicating tape. The tape shall be field applied to the stem cover after the gate has been installed and positioned.

B. Operators of the types listed in the schedule shall be provided by the gate manufacturer.

1. Each manual operator shall be designed to operate the gate under the maximum specified seating and unseating heads by using a maximum effort of 40 lb on the crank or handwheel, and shall be able to withstand, without damage, an effort of 80 lb.
2. Gearboxes shall be provided when required to maintain the operating force below 40 lb. All bearings and gears shall be totally enclosed in a weather tight housing. Operator housing shall be cast steel or cast iron. The pinion shaft of crank-operated mechanisms shall be supported by roller bearings. The operating shaft shall be fitted with a 2 inch square operating nut and removable crank. The crank shall be fitted with a corrosion-resistant rotating handle. The maximum crank radius shall be 15 inches and the maximum handwheel diameter shall be 24 inches.
3. Remote Actuators: When specified or the yoke height is greater than 54 inches above the operating floor, a remote handwheel or crank with bearing housing and sprocket shall be bolted to the frame at approximately 42" above the operating floor elevations. A removable stainless steel cover shall be provided to protect the extension shaft, drive chain, and/or sprockets.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation of all gates and guides shall be done in a workmanlike manner. Handle, store and install the equipment specified in this Section in strict accordance with the manufacturer's drawings and recommendations. Frames and guides shall be installed in a true vertical plane and shall be installed with 90 degree corners.

B. Gates with embedded guides and inverts shall be installed in accordance with the recommendations of the manufacturer.

C. The installation of all gates shall be under the supervision of a representative of the manufacturer furnishing the gates.

3.2 INSPECTION AND TESTING

A. Furnish the services of a factory representative, as provided under PART 1, who has complete knowledge of proper operation and maintenance to inspect the final installation and supervise a test of the equipment. These services may be combined with those provided under PART 1.

B. After installation, all slide gates and weir gates shall be field tested at maximum differential head to ensure that all items of equipment are in compliance with this Section, including the leakage requirements.

1. Maximum allowable leakage for slide gates and weir gates shall be 0.1 gpm/ft of perimeter under the design seating head.

C. In the event that any unit fails to meet the above requirements, the necessary changes shall be made and the unit retested. If the unit remains unable to meet the test requirements to the satisfaction of the Owner, it shall be removed and replaced with a satisfactory unit at no additional cost to the Owner.

Slide Gate Schedule											
Qty.	Type	Process Area	Service	Mount	Operation	Height	Width	Maximum Head		Voltage	Comments
								Seating	Unseating		
3	Upward Opening Slide Gate	Prescreen	Prescreen Isolation	Wall Embedded	Handwheel Actuator	3′	2′	15-ft	15-ft	480	.

END OF SECTION