THE CITY OF PHENIX CITY

Phenix City, Alabama

Contract Documents
For the

WWTP Digester No. 3 Cover Material Proposal

CONSISTING OF:

BIDDING REQUIREMENTS
CONTRACT FORMS
CONDITIONS OF THE CONTRACT
SPECIFICATIONS
DRAWINGS

ALABAMA LICENSED No. 32785 PROFESSIONAL 4/9/18 ENGINEER WILLIAM EVANS MORGAN

Prepared By:

Constantine Engineering

Project No. 100425.16
April, 2018

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BIDDING REQUIREMENTS

SPECIFICATIONS

INSERT
ADVERTISEMENT FOR BID
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INSTRUCTIONS TO BIDDERS

1. BID REQUIREMENTS

A. SUBMISSION OF PROPOSALS

Each Bid must be submitted in a sealed envelope, addressed to **City of Phenix City Utilities Department, Stephen Smith, Utility Manager, 1119 Broad Street, Phenix City, Alabama 36867**. Each sealed envelope should bear on the outside the Bidder's name, address, and license number. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the Owner at above address. Any Bid received after the time and date specified shall not be considered.

B. PREPARATION OF PROPOSALS

All Bids must be made on the required Bid form. All blank spaces for Bid prices must be filled in, in ink or typewritten, and the Bid form must be fully completed and executed when submitted. Only one (1) copy of the Bid form is required.

C. ACCEPTANCE OF PROPOSALS

The Owner may waive any informalities or minor defects or reject any and all Bids. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. No Bidder may withdraw a Bid within sixty (60) days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder. A conditional or qualified Bid will not be accepted.

D. BIDDER'S UNDERSTANDING

Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the Specifications including Addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of Work or of the nature of the Work to be done.

The Owner shall provide to Bidders prior to Bidding, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to its Bid.

The Contract Documents contain the provisions required for the construction of the Project. Information obtained from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve the Contractor from fulfilling any of the conditions of the Contract.

Prospective Bidders shall contact Charles Woody 334-291-4736, to schedule inspection trips to the project site.

The Engineer is Constantine Engineering. The Engineer's address is 2414 Airport Road, W., Fort Payne, AL 35968, (256) 997-9199. All questions regarding interpretations of the Contract Documents should be directed to Evan Morgan, P. E.

2. AWARD OF CONTRACT

A. BASIS OF AWARD

The Owner reserves the following rights: (1) to reject all proposals where the Owner deems rejection to be in its best interest; (2) to reject any proposal that is not in compliance with the Contract Documents; (3) to waive any informalities and irregularities in said proposals; and (4) to accept any combination of sub-totals within any schedule which is determined to be in the Owner's best interest; and (5) to postpone award of the Contract for a period of time, which, however, shall not extend beyond sixty (60) days from the proposal opening, unless extended by mutual agreement by the Owner and the Proposer.

B. DETERMINATION OF WINNING PROPOSAL BIDDER

Award will be made on the basis of selecting the most advantageous proposal for the City of Phenix City.

C. QUALIFICATIONS

The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work contemplated therein.

BID SCHEDULE

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

Base Bid

ITEM NO.	QUANTITY AND UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1.	LS	Furnish 70' Steel Floating Gasholder Cover	$_____	$_____
		TOTAL BASE BID		$_____

Written: _____ DOLLARS

and _____ CENTS

Alternate Bid

ITEM NO.	QUANTITY AND UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
2.	LS	Furnish Perimeter Handrail	$_____	$_____
		TOTAL ALTERNATE BID		$_____

Written: _____ DOLLARS

and _____ CENTS

TOTAL BASE BID AND ALTERNATE BID $_____

EXPLANATION OF BID SCHEDULE

Item No. 1 Furnish 70’ Diameter Steel Floating Gasholder Cover

The proposal shall be based on the technical specifications enclosed and shall include:

- A firm cost for providing the cover delivered to the Phenix City Wastewater Treatment Plant at 1600 State Docks Road, Phenix City, Alabama.
- Any exceptions to the enclosed technical specifications.
- A maximum time period required to provide a complete submittal to the Owner’s Engineer (Constantine) from issuance of a formal purchase order.
- A maximum time period required to deliver cover to the site from the issuance of an approved submittal.
- Weight of and number of pieces to be delivered.
- Linear feet of field welding required to install cover.
- Surface area of cover as installed.
- The manufacturer may also provide an additive alternative cost to reduce time required for submittal or cover delivery.
- Additionally, any special recommendations should also be included in the proposal

Item No. 2 Furnish Permiter Handrail

Includes all materials for permiter handrail as described in the enclosed technical specifications.

SECTION 13232
FLOATING DIGESTER COVER

PART 1 GENERAL

1.1 SCOPE

A. The Manufacturer shall furnish (1) floating steel gas holding cover for the 70 ft. diameter digester.

1.2 GENERAL INFORMATION AND DESCRIPTION

A. The cover(s) shall all be made of structural steel, conforming to the requirements of "Standard Specifications for Steel for Bridges and Buildings" ASTM A-36, A500 or A283, Grade C. The minimum thickness of the steel shall be 1/4 inch or 6 mm (metric equivalent).

B. All welding shall be shielded arc welding and shall conform to the latest edition of the American Welding Society (AWS) D1.1 "Structural Welding Code - Steel" for gastight welding.

1.3 MANUFACTURERS

A. Acceptable Manufacturers

1. Olympus Technologies, Inc..
2. Ovivo Water, Inc
3. Engineer Approved Equal

B. The equipment covered by these specifications is intended to be the Manufacturer’s standard equipment of proven performance. Equipment shall be designed in accordance with the best practices of the trade, and shall operate satisfactorily when installed as recommended by the manufacturer.

C. The Manufacturer proposing to supply the digester cover shall have demonstrated ability to design and manufacture covers of this diameter and pressure conforming to these specifications. The Manufacturer shall provide a history of being regularly engaged in the design, manufacture, project management, execution, shipment, field inspection and startup services of arched, radial beam dome design covers as defined in this specification. Manufacturers not meeting the following requirements will be rejected.

1. The cover Manufacturer shall have designed and furnished not less than twenty (20) steel digester covers of 70-foot diameter or greater. The Manufacture's proposal shall include a list indicating the number, diameter and location of the covers.

2. The person responsible for the design of the digester cover shall be a Professional Engineer registered in the state of Alabama. The Professional Engineer shall have designed a minimum of ten (10) covers furnished by the Manufacturer, while employed by the Manufacturer. The Manufacturer shall submit with the proposal, the name of the Professional Engineer and a list of the covers designed by that person for the Manufacturer. The proposal shall not be considered responsive without this list.

1.4 PROPOSAL

A. The Manufacturer will submit a firm cost for providing one seventy foot (70') diameter floating cover as specified herein. The proposal shall include the total cost for delivering the cover to the site located at 1600 State Docks Road, Phenix City, AL. Off-loading will be handled by the Contractor under separate contract.

B. The proposal will also include any exceptions to these specifications, the length of time required to prepare a submittal after purchase order is approved, and the length of time required to deliver the cover after submittal approval. Additionally, the Manufacturer may provide an alternative additive or deductive cost that reduces time required to delivery of the cover complete.

1.5 SUBMITTALS

A. The Manufacturer shall complete and submit the submittal to the Owner and Owner's Engineer in the time allotted by Manufacturer in the proposal.

B. The Contractor shall submit: general arrangement drawings, design data, support details for appurtenances, design calculations by a registered engineer in the state of Alabama, detailed shop drawings of the cover and assembly details.

C. The Professional Engineer that performs and stamps the calculations for the equipment covered under this section shall have designed digester covers of similar diameters and operating pressures.

D. Fabrication of the cover shall not begin until the Owner's Engineer has accepted the design data, design calculations, and details.

E. The equipment manufacturer's shop drawing shall clearly show complete information regarding location, type, size and length of all field welds in accordance with AWS D1.1 "Welding Code - Steel". Special conditions shall be fully explained by notes and/or details.

1.6 OPERATION AND MAINTENANCE MANUAL

A. After equipment approval, the Contractor shall submit installation, operation and maintenance manuals.

1.7 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Manufacturer shall provide the services of a qualified manufacturer's technical representative, who shall provide installation assistance of all equipment furnished under this Contract and instruct the Contractor's personnel and the Owner's operating personnel in its maintenance and operation. The services of the manufacturer's representative shall be provided for a period of not less than four days as follows:

One trip of one (1) day(s) for equipment inspection and installation review.

One trip of three (3) day(s) for equipment start-up and to instruct Owner's operating personnel.

B. Any additional on-site time required to achieve successful installation and operation shall be at the expense of the Owner. The manufacturer's representative shall sign in and out at the office of the Owner on each day he is at the project.

PART 2 PRODUCTS

2.1 GENERAL

A. The cover(s) shall be stable under all design load conditions, including localized static and dynamic loads. All structural members shall be designed to allow the cover(s) to be self-supporting when resting in an empty tank on the tank wall with the maximum possible applied loading as follows:

Dead Load	According to the manufacturer's design
Uniform live load, psf	40
Vacuum load, inches W.C.	2
Concentrated live load, lbs.	4,500
Wind load on the total projected area above the tank wall, psf	25
Mixer dynamic and static Loads	N/A
Internal gas pressure:	
Internal design pressure, inches W.C.	16
Pressure relief valve setting, inches W.C.	10
Waste gas Pressure, inches W.C.	9
Normal operating pressure, inches W.C.	8
Emergency vacuum relief, inches W.C.	2

B. Maximum allowable stresses shall not exceed the limiting stresses as set forth in the AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings," latest edition, for structural steel with 36,000 psi yield point. The cover shall be designed as a membrane with side skirt, thrust ring, erection members, center compression ring, and cover plates properly proportioned to match deflections and stresses.

C. The structural framework shall be arranged for complete assembly by field welding all pieces in place, followed by field welding of the framework and roof plates to provide a gastight and watertight cover. The cover shall have a dome radius of 1.5 times the tank diameter and be held in position by thrust and compression rings.

D. The dome framework shall consist of arched radial erection beams held in position by a center compression ring and peripheral thrusting ring. As a minimum the thrust ring and lower skirt rim angle splice joint welds shall be CJP full penetration. A closed section shall be used for the thrusting rings to insure maximum torsional stiffness. Thrusting rings using open sections (angles, channels, etc.) are not acceptable due to their inherent weakness in torsion. Side skirts shall not be used to close channel or angle sections in forming the thrusting ring.

2.2 MATERIALS

A. The structural steel for arched radial beams shall conform to ASTM A36, A500, or A283, Grade C, with minimum thickness of ¼".

B. The steel cover plates, side skirts, manholes, gas dome, etc. materials shall be ¼" minimum thickness conforming to ASTM A-36.

2.3 WELDING

A. Shield arc welding conforming to standards of the American Welding Society.

B. Welding shall be performed by pre-qualified AWS certified welders.

C. Weld inspection shall be by AWS/C.W.I. per D1.1 of the AWS codes.

D. All interior joints and seams shall be continuously welded. Exterior joints and seams shall be continuously welded where required by the manufacturer for structural purposes and/or gas tight construction and where top application of insulation is not performed

2.4 GASHOLDER COVER

A. Vertical Guides:

1. The gasholder cover shall be provided with minimum 7 vertical guides.
2. The guide system shall consist of vertical 316 stainless steel guide assemblies designed for installation on separate tank wall mounting plates which are designed to anchor to the inside face of the concrete tank wall. Anchor mounting plates with epoxy and stainless steel anchorage.
3. The tank wall mounting plate shall be designed to provide adequate adjustment, in and out, for the guide to achieve an exact fit with the vertical slide mounted to the cover. Vertical guides shall not be mounted directly to the tank wall.
4. Vertical guides shall include non-corrosive high density plastic (UHMW) guide surfaces. Plastic components exposed to direct sunlight shall be provided with UV inhibitors.
5. The guide system shall include 316 stainless steel closed HSS section slide members attached to the gasholder cover and designed to slide within the wall mounted guide assembly. The slide member shall extend the entire side skirt length to develop uniform resistance against unbalanced loadings. The design shall include adjustment capability of the slide, during installation, to insure proper and exact fit with the vertical guide.
6. The guide system shall require no routine maintenance or lubrication.
7. The plastic guide surfaces shall be designed to be replaceable while the digester is in operation. Designs which require the digester to be drained, the liquid level to be changed from normal operation, or the digester to be de-pressurized to replace the plastic guide surfaces shall not be considered.
8. Provide for uniform vertical travel of the cover from the low position with the cover resting on the corbels to the highest position at maximum gas storage and maximum liquid level.
9. The guides shall prevent the gasholder from rotating and from potential imbalance caused from wind, snow, or point loads throughout the entire cover travel range.
10. The guides shall be designed to allow the installing Contractor to mount them after the cover is installed in the tank to insure proper guide to slide alignment.

B. Side skirt:

1. Provide vertical side skirt located at a nominal distance of 6½" from tank wall.
2. Side skirt shall be designed to trap and store gas and shall be a minimum height of 7 ft.

3. Side skirt sections shall be designed and include shop welded lifting lugs for use in field assembly located to suspend the skirt in the vertical plane while being lifted.
4. Vertical skirt joints shall have shop welded back-up plates and temporary connection tabs used for convenience in field assembly.
5. Side skirt shall include structural ballast support structures. Tie-rods, wire rope or similar items shall not be used in the design of ballast support structure.
6. Ballast support structure shall be sufficient to accept concrete ballast members provided by the Contractor. Ballast and cover steel shall create an operating pressure of 8" w.c. and provide at least a 2" pressure increase as ballast emerges from the liquid at high gas storage conditions to provide flexibility in setting gas utilization devices.

C. Cover Plates:

1. Cover plates shall be minimum ¼" thick steel.
2. Cover plates shall be shop welded to each pair of arched radial beams to form rigid panels ready for installation. Designs which include separate arched beams and separate cover plates will not be accepted.
3. Closure plates shall be provided loose for field welding in between the shop fabricated rigid panels.
4. Each shop fabricated rigid panel shall have temporary field assembly connection tabs for bolting to thrust ring sections and to center ring.
5. The cover shall be designed to be completely assembled with temporary tabs and bolts for ease in final field alignment and adjustments prior to field welding.
6. Tabs and bolts shall be removed after field welding.

D. Ballast Support:

1. Structural 316 stainless steel ballast supports shall be provided as part of the side skirt designed for the ballast members.
2. The cover manufacturer shall provide design information in its submittal describing the required concrete ballast members.
3. The installing Contractor shall supply the ballast members as described in the approved submittal documents.
4. The ballast support system and the cover design shall include procedures to allow for future removal of the ballast without any cutting or re-welding the ballast support system for periodic inspection and servicing purposes.

2.5 PENETRATIONS

Provide normal appurtenances required:

1. (2) 36" access manhole with gasket, flange bolts and lid.
2. (1) center compression ring and cleanout port with gasket, flange bolts and cover.
3. (1) 6" flanged nozzle and pressure / vacuum relief valve with flame arrester.
4. (1) 6" eccentric plug valve with lever operator shall be provided for isolation of the PVR at times of servicing.
5. (1) 18" gas bonnet with 6" gas take-off nozzle.
6. The penetrations shall have flanges located a minimum of 6" above the finished levels of the cover.

2.6 FASTENERS

A. All anchor bolts and structural fasteners shall be ⅝" minimum diameter.

B. Anchor bolt material: Type 316 stainless steel.

C. Flange bolt material: Type 316 stainless steel.

PART 3 EXECUTION

3.1 TESTING

All field welding and testing shall be done by installation contractor.

A. Field Weld testing shall be accordance with section 6, AWS D.1.1, latest edition with the minimum level of non-destructive testing as follows:

1. Visual inspection of 100% of welds for size, undercut, etc.
2. Magnetic particle and/or dye penetrant as required for all joints suspected to have cracks in the weld.
3. All CJP (continuous joint penetration) joints shall be inspected as required by UBC and AWS. Radiograph or ultrasonic tests shall be required per AWS. The contractor shall include the services of an independent AWS certified weld inspector (CWI) to perform the weld testing.
4. Final painting of the covers shall not commence until the AWS CWI has completed the weld testing, certified the cover is in compliance with AWS codes and with the welding requirements of the field assembly drawings, and is authorized to coat at the direction of the inspecting agency.
5. At the authorization of the inspecting agency, lift the cover into place, perform a cover pressure and travel tests by filling tank with water and trapping air beneath cover plate.
6. The tests shall demonstrate that the cover is gas tight and will travel from its resting position while setting on the tank corbels to its maximum travel condition at maximum liquid level and maximum gas storage. There shall be no binding or rotation of the cover during this test. The cover shall travel in a balanced condition. If any temporary weights are used to fine tune the cover balance, the weight and location shall be recorded. After completion of the test, the contractor may be required to provide a permanent trim weighting assembly at proper location on the cover and of proper weight.
7. The contractor shall conduct these tests, record results, and submit a final test report to the owner and the manufacturer.

B. After assembly and field welding, the contractor shall test cover for gas tight construction by filling tank with water and trapping air beneath cover plate.

1. Pressurize air to 10" water column, relief pressure.

2. Check all welded seams for leaks by applying soap suds solution. Welds shall be cleaned with wire brush before testing.
3. Any leaks shall be carefully chipped out to sound metal, marked and then re-welded, re-tested, and re-painted.
4. Contractor shall be responsible for supply of the test water and testing equipment.

C. Other test methods may also be considered such as dye penetrant or vacuum box procedures. Prior approval shall be received from Engineer before conducting such tests.

3.2 PERIMETER HANDRAIL

A. Install 1½" standard weight 2-rail aluminum safety rail around the outer perimeter of the completed digester covers.

B. The handrail and support posts shall be of welded construction and shall include 4" aluminum kick plates.

C. An access opening in the handrail shall be provided with 316 stainless steel safety chain and clips as indicated on the drawings.

D. The support posts shall be designed for bolted connections to the top of the cover side skirt with 316 stainless steel bolts, and shall include the necessary isolation gasketing materials for dissimilar metals protection. The bolted connection configuration shall be coordinated with the cover manufacturer.

E. All fabricated aluminum components for the perimeter safety system shall be anodized.

3.3 PAINTING

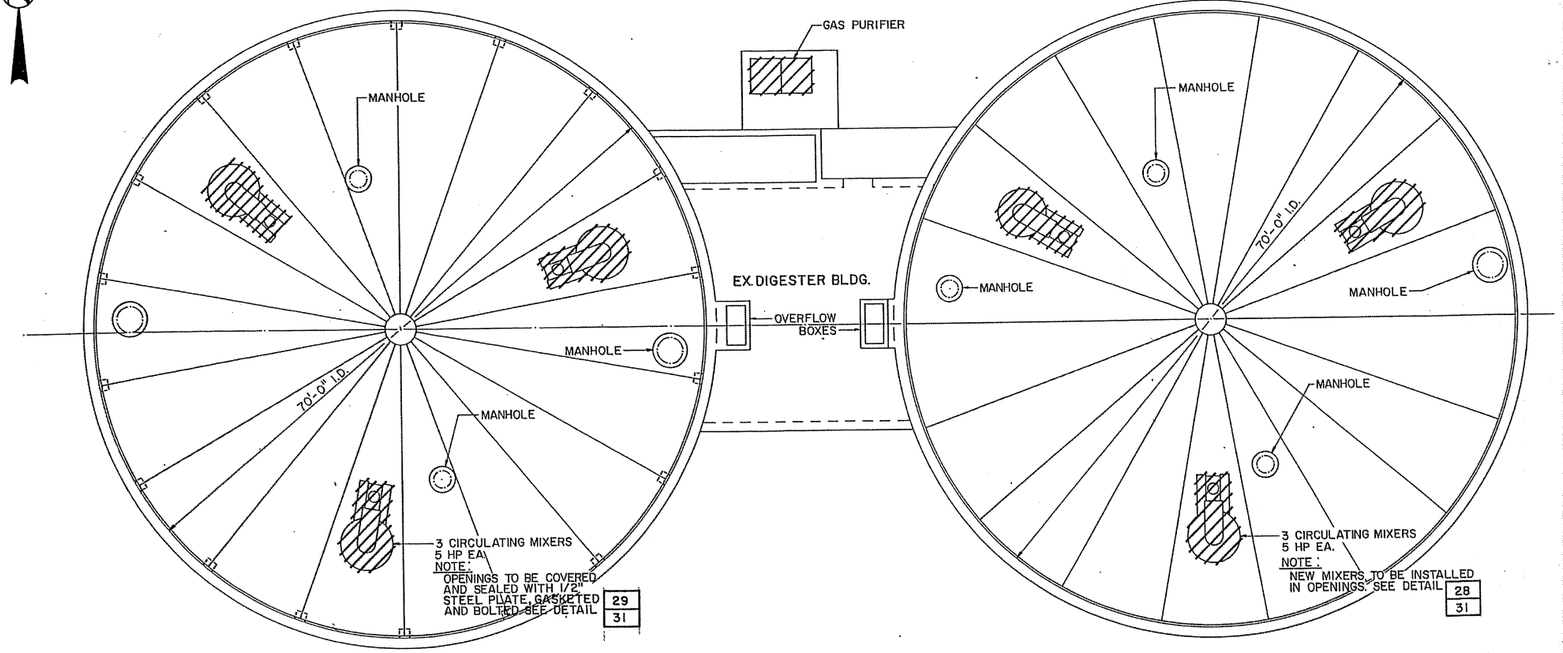
A. Digester cover steel plates, structural shapes and fabricated assemblies shall be shipped unpainted, for field painting. After erection, welding, testing and final inspection of erection by manufacturer's representative, the cover shall be painted as directed.

B. All steel surfaces to receive paint shall be prepared and painted per the latest edition of the SSPC Manual.

C. Field preparation and paint as follows as specified in installation documents.

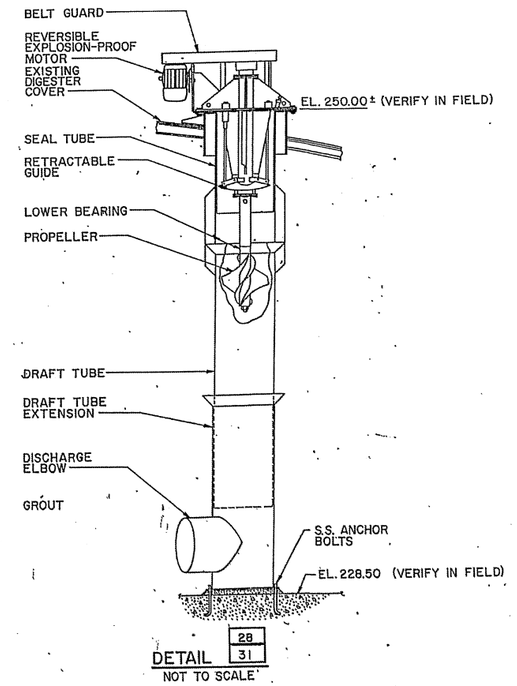
D. Testing of steel preparation and painting shall be per the SSPC Manual and the paint manufacturer's written instructions.

END OF SECTION



EX. SECONDARY DIGESTER

EX. PRIMARY DIGESTER



DETAIL 28 31
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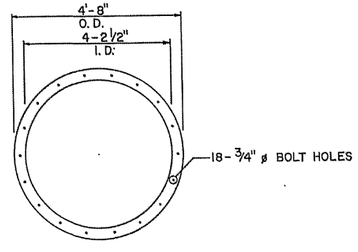

PLAN
MIXER OPENING AT EXISTING DIGESTER
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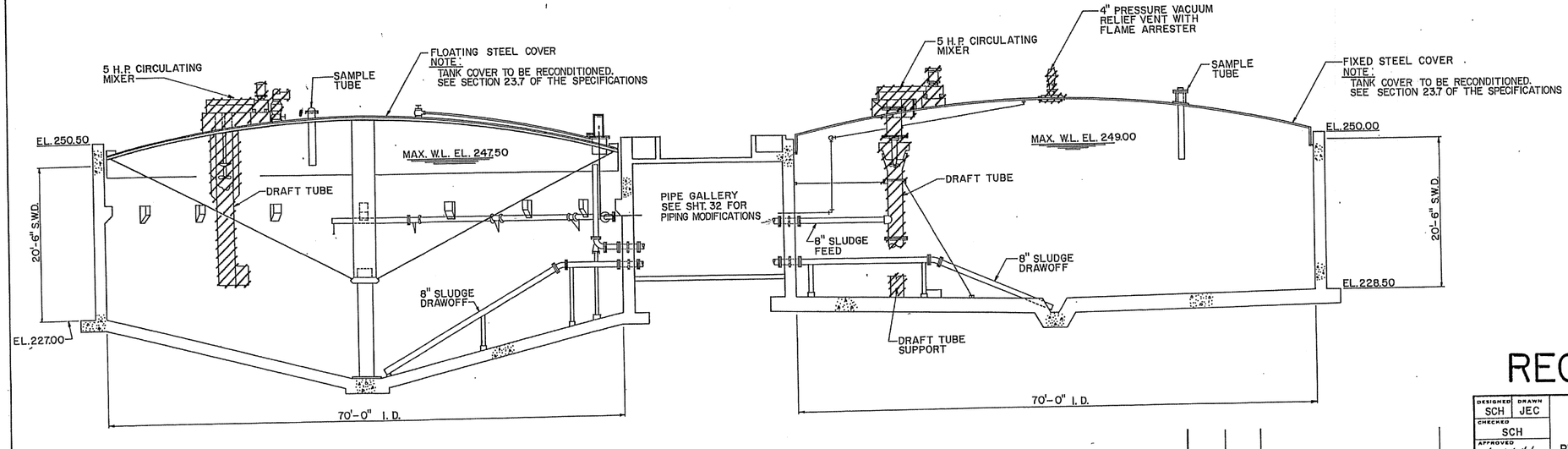
DETAIL 29 31



SECTION THROUGH EXISTING SECONDARY AND PRIMARY DIGESTER

LEGEND

REMOVE

NOTE: ALL EQUIPMENT, PUMPS, VALVES, PIPING, ETC., THAT ARE SHOWN TO BE REMOVED SHALL BE MADE AVAILABLE TO THE OWNER. ALL ITEMS WHICH THE OWNER DETERMINES TO BE UNUSEABLE SHALL BE DISPOSED OF BY THE CONTRACTOR.

ALABAMA REGISTERED No. 16204 PROFESSIONAL ENGINEER SCOTT C. HOKE

RECORD DRAWING

NO.	DATE	CHARACTER	BY

DESIGNED SCH	DRAWN JEC
CHECKED SCH	
APPROVED Scott C. Hoke	
SCALE AS NOTED	
DATE	

PHENIX CITY, ALABAMA
DEPARTMENT OF PUBLIC UTILITIES
WASTEWATER IMPROVEMENTS
PHENIX CITY WWTP UPGRADE-PH. II
EXISTING PRIMARY & SECONDARY DIGESTERS

PAUL B. KREBS & ASSOCIATES
INCORPORATED
CONSULTING ENGINEERS
BIRMINGHAM, ALABAMA

SHEET 31 OF 42 JOB NO. 88405