



**ADDENDUM #3**

Bid Number: #181-2017

Date: December 15, 2017

Subject: **Town Branch WWTP Primary Digester Complex  
Improvements**

Address inquiries to:  
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(859) 258-3325

**TO ALL PROSPECTIVE SUBMITTERS:**

Please be advised of the following clarification to the above referenced Bid:

See the attached questions and answers.

Attached clarification and drawings.

Pre-bid sign in sheet.

Todd Slatin, Director  
Division of Central Purchasing

All other terms and conditions of the Bid and specifications are unchanged.  
This letter should be signed, attached to and become a part of your Bid.

COMPANY NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

SIGNATURE OF BIDDER: \_\_\_\_\_

ADDENDUM NO. 3

PROJECT MANUAL

TOWN BRANCH WASTEWATER TREATMENT PLANT  
PRIMARY DIGESTER COMPLEX IMPROVEMENTS  
CONTRACT 181-2017  
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, KENTUCKY

Note: Change in Bid Date.

Bids will be received until 2:00 P.M., local time, **December 28, 2017**.

This Addendum to the Project Manual is issued to modify, explain, or correct the original Project Manual and is hereby made part of the Contract Documents. Insert the number of this Addendum in the blank space provided in PART III–FORM OF PROPOSAL, page P-3.

The sign-in sheets from the Prebid Meeting held on December 7 are attached.

A. DIVISION 0–BIDDING AND CONTRACTING REQUIREMENTS

1. PART III–FORM OF PROPOSAL

a. Page P-7

CLARIFICATION: Bid Alternative No. 3 includes all ductile iron piping and valves in the Digester Control Building and Digesters No. 1, 2, and 3 with three exceptions:

1. Existing wall sleeves do not need to be replaced.
2. Piping and valves that are already being replaced because of equipment additions in the Base Bid do not need to be replaced in Bid Alternative No. 3.
3. Piping that is demoed in the Base Bid does not need to be replaced in Bid Alternative No. 3.

b. Page P-8

REPLACE page P-8 with pages P-8a and P-8b included as attachment to this addendum.

2. PART V–SPECIAL CONDITIONS

a. Page SC-2

REPLACE sections B., C., and D. with the following:

**“B. INDEMNIFICATION AND HOLD HARMLESS PROVISION**

1. It is understood and agreed by the parties that CONTRACTOR hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of CONTRACTOR under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.
2. CONTRACTOR shall indemnify, save, hold harmless and defend the OWNER from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest,

defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by CONTRACTOR's performance or breach of the agreement and/or the provision of goods or services provided that (1) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the CONTRACTOR; and (2) not caused solely by the active negligence or willful misconduct of the OWNER.

3. In the event the OWNER is alleged to be liable based upon the above, CONTRACTOR shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by the OWNER, which approval shall not be unreasonably withheld.
4. These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this Agreement (Contract).
5. The Work and services performed hereunder involve a Consent Decree as further explained in of Section SC, provision 2.0 of these Specifications. The provisions of that provision are incorporated herein by reference as if expressly stated.
6. OWNER is a political subdivision of the Commonwealth of Kentucky. CONTRACTOR acknowledges and agrees that the OWNER is unable to provide indemnity or otherwise save, hold harmless, or defend the CONTRACTOR in any manner.

#### **C. FINANCIAL RESPONSIBILITY**

CONTRACTOR understands and agrees that it shall, prior to final acceptance of its Bid and the commencement of any Work, demonstrate the ability to assure compliance with the Indemnity Agreement and other provisions of this Agreement (Contract).

#### **D. INSURANCE REQUIREMENTS**

Bidders' attention is directed to the following insurance requirements, as Bidders must confer with their respective insurance agents, brokers, or carriers to determine in advance of Bid submission the availability of the insurance coverage's and endorsements required herein. If an apparent low Bidder fails to comply strictly with the insurance requirements below, that Bidder shall be disqualified from the award of the Agreement (Contract), at OWNER's discretion.

##### **1. Minimum Scope of Insurance**

Coverage shall be at least as broad as:

- a. Insurance Services Office Commercial General Liability Coverage (Occurrence Form CG 00 01) or Insurance Services Office Form (CG 00 090 11 88 Owners and Contractors Protective Liability Coverage Form—Coverage for Operations of Designated Contractor).

- b. Insurance Services Office Form number CA 0001 covering Automobile Liability, code 1 (any auto).
- c. Workers Compensation Insurance as required by the Commonwealth of Kentucky and Employer's Liability Insurance.
- d. Builders Risk (Course of Construction) Insurance covering all risk of loss, less policy exclusions.
- e. Completed Operations Policy Duration Form 2010 & 2037.
- f. Surety bonds as described below.
- g. Contractor's Pollution Liability and/or Errors and Omissions (if project involves environmental hazards).

2. Required Insurance Coverage

CONTRACTOR shall procure and maintain for the duration of this Agreement (Contract) the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to OWNER in order to protect OWNER against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by CONTRACTOR. The cost of such insurance shall be included in any Bid.

Coverage

- a. General Liability, including Operations Products and Completed Operations.
- b. Limits: \$1,000,000 per occurrence, \$2,000,000 aggregate for bodily injury, personal injury and property damage with a \$10,000,000 umbrella. If Commercial General Liability Insurance or other form with a general aggregate limit is used the general aggregate limit shall be at \$10,000,000 or higher.
- c. Automobile Liability: \$1,000,000 combined single limit for bodily injury and property damage.
- d. Worker's Compensation: As required by the Common Wealth of Kentucky.
- e. Employer's Liability: \$1,000,000 each accident, \$2,000,000 policy limit bodily injury by disease, \$1,000,000 each employee bodily injury by disease.
- f. Builder's Risk-Installation Floater: Completed value of the project with no coinsurance penalty provisions. Coverage includes LFUGG, all contractors and subcontractors involved in the project.
- g. Line 6: N/A.
- h. Contractor's Pollution: \$2,000,000 each occurrence; \$5,000,000 policy aggregate, including errors and omissions.

- i. Umbrella or Excess Liability Policy: \$10,000,000.
3. The policies above shall contain the following conditions:
  - a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). OWNER shall be named as additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.
  - b. The General Liability Policy shall be primary to any insurance or self-insurance retained by OWNER.
  - c. The General Liability Policy shall include a Products and Completed Operations endorsement or Premises and Operations Liability endorsement unless it is deemed not to apply by OWNER.
  - d. The General Liability Policy shall include an Explosion-Collapse Underground (XCU) endorsement.
  - e. The General Liability Policy shall include a Pollution Liability and/or Environmental Casualty endorsement unless it is deemed not to apply by OWNER.
  - f. OWNER shall be provided at least thirty (30) days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.
  - g. Said coverage shall be written by insurers acceptable to OWNER and shall be in a form acceptable to OWNER. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.
  - h. That the Bidder obtain an Umbrella Liability policy with a limit \$10,000,000.00 and that this policy be renewed for one (1) year after.

#### 4. Renewals

After insurance has been approved by OWNER, evidence of renewal of an expiring policy must be submitted to OWNER, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

#### 5. Deductibles and Self-Insured Programs

IF CONTRACTOR INTENDS TO SUBMIT SELF-INSURANCE PLAN. IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507, NO LATER THAN A MINIMUM OF FIVE WORKING DAYS PRIOR TO BID OPENING DATE. Self-insurance programs, deductibles, and self-

insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of Contractor's financial capacity to respond to claims. Any such programs or retentions must provide OWNER with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If CONTRACTOR satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, CONTRACTOR agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of Bid and the commencement of work:

- a. CONTRACTOR's latest audited financial statement, including auditor's notes.
- b. Any records of any self-insured trust fund plan or policy and related accounting statement.
- c. Actuarial funding reports or retained losses.
- d. Risk Management Manual or a description of self-insurance and risk management program.
- e. A claim loss run summary for the previous five years.
- f. Self-Insured Associations will be considered.

6. Safety and Loss Control

CONTRACTOR shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and OWNER.

7. Verification of Coverage

Prior to award of bid, CONTRACTOR agrees to furnish OWNER with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf. If requested, CONTRACTOR shall provide OWNER copies of all insurance policies, including all endorsements.

8. Right to Review, Audit, and Inspect

CONTRACTOR understands and agrees that OWNER may review, audit, and inspect any and all of CONTRACTOR's records and operations to insure compliance with these Insurance Requirements.

CONTRACTOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default under this Agreement (Contract). CONTRACTOR also agrees that OWNER may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging CONTRACTOR for any such insurance premiums purchased, or suspending or terminating this Agreement (Contract).

## 9. Additional Insured Endorsement

- a. CONTRACTOR shall purchase and maintain liability insurance, as described above, specifically naming as additional insureds OWNER, ENGINEER, and OWNER/ENGINEER's Consultant as well as other individuals or entities identified, using Additional Insurance Endorsement Form CG 20 26 07 04, CG 81 11 05 06, CG 20 10 07 04, or equivalent form. General liability policies shall also be endorsed with Form CG 20 37 07 04 to include the "products-completed operations hazard." Endorsements or General Liability policy shall not exclude supervisory or inspection services. CONTRACTOR shall also provide an Additional Insured Endorsement for the automobile policy.
- b. CONTRACTOR shall, prior to the start of any work on the project by a subcontractor receive:
  - i. A certificate of insurance from each subcontractor naming OWNER, ENGINEER, and OWNER/ENGINEER's Consultant as well as other individuals and entities so identified as an additional insured, under each subcontractor's general liability for policy; and
  - ii. The Additional Insured Endorsement language as required by paragraph 1 for subcontractor's operations. Certificate shall be Acord 25-S or equivalent.
- c. That failure of CONTRACTOR or subcontractor to comply with the above requirements with respect to the Additional Insured Endorsement and/or Certificate of Insurance, shall not be construed as waiver of those provisions by OWNER, ENGINEER, and OWNER/ENGINEER's Consultant as well as other individuals and entities so identified.

## B. SPECIFICATIONS

### 1. DIVISION 1—GENERAL REQUIREMENTS

- a. Page 01010-3, SECTION 01010—SUMMARY OF WORK, PART 1—GENERAL, 1.04.B.3.a.(1).

REPLACE the paragraph with the following:

- "(1) Digester 2 is currently out of service, fully drained and cleaned. Complete work on Digester 2, then move to Digester 3, then move to Digester 1. Two digesters must be in service at any given time. Two weeks will be required for OWNER to transfer the contents of a full digester to an empty digester. CONTRACTOR will be responsible for removing the remaining contents the digester after OWNER has sludge removed to the top of cone level. CONTRACTOR may pump remaining sludge to the plant sewer or vactor it out and use the vactor dump pad on the other side of Town Branch. When a refurbished digester is placed into service, process performance must be demonstrated for two weeks before work begins on the next digester. When a digester is out of service, CONTRACTOR shall clean digester, remove cover and mixing system, provide means of access for ENGINEER to inspect interior side of tanks walls, prepare areas of the interior tank walls for repair as may be determined by ENGINEER, perform structural repairs, install carbon fiber reinforcing both sides of tank walls at new pipe penetrations prior to coring tank walls, install new mixing system, install new or refurbished cover, install new gas safety equipment, and new recirculation pump and heat exchanger as noted in point 4, below."

b. Page 01010-3, SECTION 01010–SUMMARY OF WORK, PART 1–GENERAL, 1.04.B.3.a.(2).

ADD to the end of the paragraph, “CONTRACTOR may opt to refurbish Digester 3 cover for placement on Digester 3 and Digester 1 cover for placement on Digester 1.”

c. Page 01010-3, SECTION 01010–SUMMARY OF WORK, PART 1–GENERAL, 1.04.B.3.a.(10).(c).

REPLACE the words “digester vas” with “digester gas.”

d. Page 01500-1, SECTION 01500–TEMPORARY FACILITIES, PART 1–GENERAL, 1.02.C.

ADD to end of paragraph, “OWNER will furnish plant effluent water to CONTRACTOR at no charge. CONTRACTOR may dispose of water used for testing in the plant sewer system at a rate that does not overwhelm the system. CONTRACTOR shall supply its own potable water, if needed.”

e. Page 01650-4, SECTION 01650–STARTING OF SYSTEMS, PART 3-EXECUTION, 3.01.

DELETE paragraphs E., F., G., H., I., J., K., and L.

## 2. DIVISION 2–SITE WORK

a. Page 02050-3, SECTION 02050–DEMOLITION, PART 3–EXECUTION, 3.03.F.5.

ADD “The existing gas unit heater in the South boiler room shall remain in operation” to the end of list-point 5.

## 3. DIVISION 3–CONCRETE

a. SECTION 03320–CONCRETE REPAIRS

REPLACE with the Revised Section 03320, attached.

## 4. DIVISION 7–THERMAL AND MOISTURE PROTECTION

a. SECTION 07120–FLUID APPLIED WATERPROOFING

REPLACE with the Revised Section 07120, attached.

b. SECTION 07511–BUILT-UP ASPHALT ROOFING

ADD Section 07511, attached.

## 5. DIVISION 8–DOORS AND WINDOWS

a. SECTION 08710–DOOR HARDWARE

ADD Section 08710, attached.

## 6. DIVISION 11–EQUIPMENT

a. Page 11310-1, SECTION 11310–CENTRIFUGAL SLUDGE PUMPS, PART 1–GENERAL, 1.02.B.

REPLACE TDH and pump speed in the table from “35”, “29”, “48” and “1,175” with “28”, “22”, “40” and “1,075”, respectively.

- b. Page 11310-2, SECTION 11310–CENTRIFUGAL SLUDGE PUMPS, PART 1–GENERAL, 1.02.D.

REPLACE TDH and pump speed in the table from “20” and “900” with “16.5” and “850”, respectively.

- c. Page 11381-1, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 1–GENERAL, 1.02.A.

REPLACE the second sentence with the following:

“The projected peak week gas production for each digester including the 1.5 times safety factor are as follows.”

- d. Page 11381-9, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2–PRODUCTS, 2.02.H.

REPLACE Paragraph 2 with the following:

“2. Inlet size: Minimum 6 inches for Primary Digester Nos. 1, and 3; minimum 8 inches for Primary Digester No. 2; and minimum 4 inches for H2S Removal Tank.”

- e. Page 11316-1, SECTION 11316–DIGESTER MIXING PUMPS, PART 1–GENERAL, 1.02.A.2.

REPLACE the table with the following:

OPERATING CONDITIONS							
Pump	Head Conditions at Given Flows to Define Pump Curve						Pump Speed (rpm)
	Normal		Minimum		Maximum		
	GPM	TDH (ft)	GPM	TDH (ft)	GPM	TDH (ft)	
MP-1	3,500	33	4,000	26	3,000	39	885
MP-2							
MP-3							

- f. Page 11316-1, SECTION 11316–DIGESTER MIXING PUMPS, PART 1–GENERAL, 1.02.A.3.

REPLACE the table with the following:

Pump	GPM	TDH (ft)	Speed (rpm)	VFD (Hz)
MP-1	2,625	28	664	45
MP-2				
MP-3				

- g. Page 11381-3, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2–PRODUCTS, 2.02.A.1.

REPLACE “54,900 SCFH” with “36,600 SCFH.”

- h. Page 11381-4, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2-PRODUCTS, 2.02.A.4.b(1).

REPLACE with the following:

“(1) Start-up sequence on the burner shall be initiated through the remote start contacts.”

- i. Page 11381-4, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2-PRODUCTS, 2.02.A.4.b(11)(c).

DELETE paragraph in its entirety.

- j. Page 11381-6, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2-PRODUCTS, 2.02.B.2.

REPLACE “54,900 SCFH” with “36,600 SCFH.”

- k. Page 11381-6, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2-PRODUCTS, 2.02.B.8.

REPLACE “8 1/2 inches W.C.” with “9 inches W.C.”

- l. Page 11381-8, SECTION 11381–DIGESTER GAS SAFETY EQUIPMENT, PART 2-PRODUCTS, 2.02.E.8.

REPLACE the first paragraph with the following:

“8. A timer shall be provided in its own enclosure to open and close the drip trap at specified time intervals. The adjustable timing range shall be 15 minutes minimum to 10 hours from fill to drain cycle. One NEMA 4X control panel shall be provided at the boiler building for drip trap on the hydrogen sulfide removal vessel. Two NEMA 7 control panels shall be provided for the digester building upper level gas room and for the digester building basement gas room drip traps. The NEMA 7 enclosures shall be for installation in Class I, Division 1 hazardous locations.”

## 7. DIVISION 13–SPECIAL STRUCTURES

- a. Page 13231-8, SECTION 13231–FLOATING DIGESTER COVERS, PART 3–EXECUTION

ADD paragraph 3.08

“3.08 REMOVAL AND DISPOSAL OF EXISTING COVER

- A. CONTRACTOR shall remove any existing digester cover (No. 2 and/or No. 3) that is not rehabilitated from the site and properly dispose of cover.”

- b. SECTION 13232–ANAEROBIC DIGESTER COVER REPAIR AND MODIFICATIONS

REPLACE with the Revised Section 13232, attached.

- c. Page 13250-3, SECTION 11381–MEMBRANE GAS-HOLDING DIGESTER COVER, PART 2–PRODUCTS, 2.02.A.2.

CHANGE paragraph e. operating gas pressure set point from “9 in w.c” to “8.5 in w.c.”

CHANGE paragraph f. pressure setting to waste gas flare from “8.5 in w.c” to “9 in w.c.”

8. DIVISION 15–MECHANICAL

- a. Page 15050-9, SECTION 15050–PIPING AND APPURTENANCES, PART 2–PRODUCTS, 2.03.H.1.

REPLACE the first sentence with the following:

“The following valves shall be provided with motorized valve operators as listed and be Limitorque Series QX, or equal.”

- b. Page 15050-9, SECTION 15050–PIPING AND APPURTENANCES, PART 2–PRODUCTS, 2.03.H.1.

CHANGE valve size for MOV-1 and MOV-3 from “4-inch” to “6-inch.”

CHANGE valve type for MOV-1, MOV-2, and MOV-3 from “Plug” to “Butterfly–Refer to Specification Section 15510.”

ADD valve MOV-5 to the valve operator schedule. Valve shall have the following characteristics:

Equipment Number	Valve Service	Valve Type	Valve Size (Inch)	Open/Close Time, Sec	Rating	Control Service
MOV-5	Energy Recovery Hot Water	Butterfly	6	10	NEMA 4	Modulating

- c. Page 15250-7, SECTION 15250–MECHANICAL INSULATION, PART 3–EXECUTION, 3.07.A.

ADD row to table with the following information:

SERVICE	INSULATION	JACKET	INSULATION THICKNESS BY PIPE SIZE				
			<1 IN	1 IN to <1 1/2 IN	1-1/2 IN to < 4 IN	4 IN to < 8 IN	8 IN and Larger
Processing Piping w/ Heated/Conditioned Contents (Interior)	Rigid Fomed Fiberglass	PVJ	1 1/2 IN	1 1/2 IN	2 IN	2 IN	2 IN

- d. Page 15510-4, SECTION 15510–HYDRONIC PIPING AND SPECIALTIES, PART 2–PRODUCTS, 2.10.A.

ADD the following valve to the valve schedule:

Valve Serving	Type	Fail Position	Spring Return Required?
Heat recovery unit	Butterfly	Closed	Yes

- e. Page 15780-2, SECTION 15780–ENERGY RECOVERY UNITS, PART 2–PRODUCTS, 2.01.F.

ADD “The heat recovery unit hot water heating coil shall be a three row coil and shall flow 56 GPM of 170°F entering in-lieu-of 26 @ 160°F.”

- f. SECTION 15980–COMBUSTION AIR DAMPERS

ADD Section 15980, attached.

9. DIVISION 16–ELECTRICAL

- a. Page 16420-1, SECTION 16420–ELECTRICAL SERVICE SYSTEM, PART 1–GENERAL, 1.05.C.

REVISE allowance amount from “\$50,000” to “\$20,000.”

C. DRAWINGS

1. SHEET NO. 2, G-2–LIST OF DRAWINGS AND DESIGN CRITERIA

REPLACE drawing with attached revised Drawing 2R.

2. SHEET NO. 11, G-11–PRIMARY DIGESTER CONTROL BUILDING HEAT EXCHANGER HYDRONIC SYSTEM SCHEMATIC

ADD: “Provide a 2-inch, 3-way motorized, modulating diverter valve in the 2-inch return line from the HVAC unit. Provide a balancing valve in an arrangement similar to the other MOV’s indicated on the same drawing and balance to 56 GPM. The valve shall modulate water flow through the hot water coil in the HRV scheduled on sheet 56 H-11 from a maximum of 56 GPM to zero and diverting water to the return line. The valve shall be controlled by thermostat mounted on a wall in the south end of the operations floor with a temperature sensor mounted in the 28-inch by 22-inche section of the supply air duct indicated on sheet 49 H-4. The discharge air temperature from the coil shall be set at 80°F; however, the discharge air temperature shall be adjustable.”

3. SHEET NO. 12, C-1–SITE LOCATION PLAN

CHANGE fence height in Detail 1 should be 6-foot 0-inch instead of 8-foot 0-inch.

ADD Note “E/C-5” to end of Key Note 10.

ADD Note “E/C-5” to end of Key Note 11.

4. SHEET NO. 13, C-2–SITE PIPING PLAN

REPLACE Note 40 with “CONTRACTOR to identify nearest natural gas piping in building and tie into it.”

REPLACE Note 41 with “Manhole 1–8-inch drain from media cooling slab IE ±896.6 and 8-inch drain to Boiler Building IE ±896.5. Top of casting 903.0±.”

5. SHEET NO. 15, C-4–SITE GRADING PLAN

REPLACE drawing with attached revised Drawing 15R.”

6. SHEET NO. 16, C-5—STANDARD CIVIL DETAILS

REPLACE note in Detail G/C-5, “8-INCH D TO MH-1” with “8-INCH D TO MH-1, IE ±897.0.”

ADD note “D/C-5” to apron between exiting asphalt road and media cooling slab in Detail G/C-5.

7. SHEET NO. 18, D-2—LOWER LEVEL—SOUTH DEMOLITION PLAN

CLARIFICATION: Two parallel hatched pipes at the top of the sheet are existing 4-inch heat recovery hot water piping to be removed.

8. SHEET NO. 30, D-14—OPERATING LEVEL—SOUTH HVAC AND PLUMBING DEMOLITION PLAN

DELETE Sheet Note D.

CLARIFICATION: Gas-Fired Unit heater in Boiler Room near south wall will remain. Do Not remove gas-fired unit heater, controls, piping or gas flue vent up through roof.

9. SHEET NO. 35, M-1—LOWER LEVEL—NORTH MECHANICAL PLAN

REPLACE drawing with attached revised Drawing 35R.

10. SHEET NO. 36, M-2—LOWER LEVEL—SOUTH MECHANICAL PLAN

REPLACE drawing with attached revised Drawing 36R.

11. SHEET NO. 37, M-3—OPERATING LEVEL—NORTH MECHANICAL PLAN

REPLACE 6-inch by 4-inch reducer on SRP-3 suction with 6-inch pipe spool.

12. SHEET NO. 38, M-4—OPERATING LEVEL—SOUTH MECHANICAL PLAN

REPLACE 6-inch by 4-inch reducer on SRP-1 and SRP-2 suction with 6-inch pipe spool.

13. SHEET NO. 40, M-6—DIGESTER NO. 3 MECHANICAL PLAN

CHANGE Keynote No. 4 to “8-INCH PRESSURE/VACUUM RELIEF ASSEMBLY.”

CHANGE callout in Section 2 to “8-INCH PRESSURE/VACUUM RELIEF VALVE WITH FLAME ARRESTOR (TYP. 2).”

14. SHEET NO. 43, M-9—DIGESTER NO. 2 MECHANICAL PLAN

ADD General Note “3. Cover appurtenances may be rotated into view in sections.”

ADD General Note “4. See general notes on Drawing M-8.”

CHANGE “SECTION 1” TO “SECTION 2.”

CHANGE “SECTION 2” TO “SECTION 1.”

DELETE Keynote No. 15 and associated callout.

CHANGE in Key Note 33 reference from “DETAIL A on sheet M-20” to “DETAIL B on sheet M-20.”

15. SHEET NO. 39, M-5–UPPER LEVEL–NORTH AND SOUTH MECHANICAL PLAN

DELETE Keynote 6 “ELECTRIC DRIP TRAP” pointing to Digester No. 2 gas drawoff pipe noted as “VERTICAL TEE WITH TAPPED BLIND FLANGE AT BOTTOM.”

CHANGE on Digester No. 2 gas drawoff pipe, “VERTICAL TEE WITH TAPPED BLIND FLANGE AT BOTTOM.” to “90 degree EL.”

REPLACE General Note 1 with “1. See drawing G-8 for DG piping schematic. Unless otherwise shown, all DG piping shall slope 1/4 in/ft. provide a drip trap with isolation valve at all low points in piping. Except where shown, all DG piping shall be stainless steel as specified. Slope piping in this room toward condensate and sediment traps.”

16. SHEET NO. 44, M-10–DIGESTER NO. 3 MECHANICAL PLAN

CLARIFICATION: Conflicts between digester mixing pump suction piping and existing sludge feed and sludge drawoff piping shall be addressed during shop drawing review.

17. SHEET NO. 45, M-11–BUILDING AND TANK MECHANICAL SECTIONS–1

ADD General Note “1. See drawing G-8 for DG piping schematic. Unless otherwise shown, all DG piping shall slope 1/4in/ft. provide a drip trap with isolation valve at all low points in piping. Except where shown, all DG piping shall be stainless steel as specified. Slope piping in this room toward condensate and sediment traps.”

ADD General Note “2. Gas/Foam Separator nonpotable water supply and drain piping are not shown in Section Views.”

18. SHEET NO. 46, M-12–BUILDING AND TANK MECHANICAL SECTIONS–2

REPLACE General Note 2 with “2. Provide pressure gauge taps on suction and discharge at each pump. Include isolation valve and gauge. Piping and valve shall be 316 SS.”

ADD General Note “3. Provide 2-inch sample tap downstream of each pump. Provide valve, hose clamp, and flexible hose to floor. Sample pipe, valve, and hose clamp shall be 316 SS.”

CHANGE in Section 6/M-12 BSWP-2 suction piping centerline elevation from “887.20” to “888.00” and discharge piping centerline elevation from “888.00” to “888.08.”

19. SHEET NO. 47, M-13–BUILDING AND TANK MECHANICAL SECTIONS–3

REPLACE General Note 2 with “2. Provide pressure gauge taps on suction and discharge at each pump. Include isolation valve and gauge. Piping and valve shall be 316 SS.”

ADD General Note “3. Provide 2-inch sample tap downstream of each pump. Provide valve, hose clamp, and flexible hose to floor. Sample pipe, valve, and hose clamp shall be 316 SS.”

CHANGE Keynote No. 7 to “4-INCH SLUDGE GRINDER.”

REPLACE 6-inch by 4-inch reducer on SRP-2 suction in Section 1 with 6-inch pipe spool.

20. SHEET NO. 48, M-13–BUILDING AND TANK MECHANICAL SECTIONS–3

REPLACE General Note 2 with “2. Provide pressure gauge taps on suction and discharge at

each pump. Include isolation valve and gauge. Piping and valve shall be 316 SS.”

ADD General Note “3. Provide 2-inch sample tap downstream of each pump. Provide valve, hose clamp, and flexible hose to floor. Sample pipe, valve, and hose clamp shall be 316 SS.”

CHANGE Keynote No. 6 to “4-INCH SLUDGE GRINDER.”

REPLACE: 6-inch by 4-inch reducer on SRP-3 suction in section 2 with 6-inch pipe spool.

21. SHEET NO. 49, M-15–BOILER BUILDING MECHANICAL PLAN

REPLACE drawing with attached revised Drawing 49R.

22. SHEET NO. 50, M-16–BOILER BUILDING, MECHANICAL SECTIONS–1

REPLACE General Note No. 1 with “1. See Drawing G-8 for DG piping schematic. All DG piping shall slope 1/4 in/ft. Provide a drip trap where shown. All DG piping shall be stainless steel as specified.”

REPLACE General Note No. 5 with “5. Area within 10 feet of HSRS-1 is a rated space. Drip trap for HSRS-1 shall be controlled by one NEMA 4X control panel located 15 feet from HSRS-1. See sheet E-8.”

ADD General Note “14. Support exterior gas pipe and appurtenances from ground. Provide concrete pads as necessary.”

CHANGE Keynote No. 8 callout in SECTION 1 and SECTION 3 to a keynote No. 6 callout when pointing to gas piping.

23. SHEET NO. 51, M-17–BOILER BUILDING MECHANICAL SECTION–2

REPLACE drawing with attached revised Drawing 51R.

24. SHEET NO. 52, M-18–MECHANICAL DETAILS–1

CHANGE Raise all waste gas burner pad elevations by 2 feet. In DETAIL F, SECTION A-A, and SECTION B-B, “891.70” changes to “893.70” and “891.50” changes to “893.50”. In SECTION B-B, change the 12-inch DG pipe centerline elevation from “811.00” to “890.00.”

25. SHEET NO. 53, M-19–MECHANICAL DETAILS–2

CHANGE Change General Note No. 1 to “ALL AIR PIPING AND PIPE FITTINGS ARE TO BE CARBON STEEL PIPE.”

CHANGE Change air piping callout from “6-inch PVC Pipe and Fittings” to “6-inch carbon steel Pipe and Fittings.”

26. SHEET NO. 54, M-20–MECHANICAL DETAILS–3

ADD General Note to DETAIL A/M-20 “1. Slope all air piping to low point at drain plug for condensate removal.”

ADD Note to DETAIL D/M-20 “Handrail is needed at top of wall where the drop to the media cooling slab is 18 inches or greater.”

CLARIFICATION: The top of wall elevation in DETAIL D varies.

27. SHEET NO. 56, M-1—GENERAL NOTES

REMOVE “ADDITIONAL REPAIR QUANTITIES” listed on right side of page.

REPLACE General Note 5 with “Anticipated Base Bid and Bid Alternate quantities are indicated throughout the Drawings. Where specific numeric quantities are not provided, Bidder is responsible to determine quantities based on depiction of the work in the Drawings and field verification. Final quantities of completed work may vary. Payment for final completed work shall be adjusted based on Bidder’s Unit Price schedule for both Add and Deducts. Add adjustments shall be approved by the ENGINEER and OWNER prior to proceeding with the work. No payment will be made for work indicated on the Drawings that the CONTRACTOR fails to complete.”

28. SHEET NO. 58, S-3—BASEMENT AND FIRST FLOOR PLAN

REPLACE last Note in Window and Door Keynotes with, “Remove existing door/window and frame. Infill opening with new concrete masonry units (of same size) and brick. Anchor new cmu to existing cmu and supporting concrete at 16-inch maximum spacing. Tie new brick to new cmu with adjustable ties at maximum spacing of 16-inch vertical and horizontal. Submit details of anchoring methods and brick ties for approval.”

29. SHEET NO. 59, S-4—SECOND FLOOR (MEZZANINE) PLAN AND ROOF PLAN

REPLACE last Note in Window and Door Keynotes with “Remove existing door/window and frame. Infill opening with new concrete masonry units (of same size) and brick. Anchor new cmu to existing cmu and supporting concrete at 16-inch maximum spacing. Tie new brick to new cmu with adjustable ties at maximum spacing of 16-inch vertical and horizontal. Submit details of anchoring methods and brick ties for approval.”

30. SHEET NO. 60, S-5—EAST ENTRANCE PLAN AND DETAILS

ADD “ROOFING GENERAL NOTES:

1. Install roof drains. (Zurn model Z-165 or approve equal.)
2. Install new 4-inch Polyisocyanurate Insulation (R-22 minimum) over roof deck.
3. Install new Tapered Insulation to facilitate drainage.
4. Install new SBS Modified Roofing System over coverboard.
5. Install flashings per manufacturer’s recommendations.”

31. SHEET NO. 61, S-6—WEST ENTRANCE PLAN AND DETAILS

ADD “ROOFING GENERAL NOTES:

1. Install roof drains. (Zurn model Z-165 or approve equal.)
2. Install new 4-inch Polyisocyanurate Insulation (R-22 minimum) over roof deck.
3. Install new Tapered Insulation to facilitate drainage.
4. Install new SBS Modified Roofing System over coverboard.
5. Install flashings per manufacturer’s recommendations.”

### 32. SHEET NO. 66, S-11–ROOFING REPLACEMENT PLAN

#### ADD “ROOFING GENERAL NOTES:

1. Remove existing flashings, roofing, and insulation materials down to the existing roof deck.
2. Remove and replace existing roof drains.
3. Install new insulation to match existing insulation depth. Provide sumps at roof drains.
4. Install new Tapered Insulation as indicated to facilitate drainage.
5. Install new SBS Modified Roofing System over coverboard.
6. Inspect existing edge flashings for re-use into new roofing system. Replace edge flashings not deemed to be re-useable with new flashings that match the existing flashings. Install all flashings per manufacturer’s recommendations.
7. Install flashing at all new mechanical curbs and roof penetrations. (Reference mechanical and process drawings for size and locations.)
8. Install walkway pads from stair access to each tank walkway and to all equipment after equipment is installed.”

#### ADD Notes to DRAWING NOTES:

- “2. Replace twelve existing roof drains. Include all removal, mechanical and other associated work items to complete the installation.
3. Dimensions shown are taken from existing drawings and may not be exact per as-built conditions. CONTRACTOR shall verify.
4. Reference demolition plans for existing mechanical items to be removed.
5. Where concrete pipe supports or similar items are to be removed, remove concrete flush with slab or 1/4-inch maximum depth below slab surface.
6. Provide walkway pads from stair access to tank walkways and all equipment.”

ADD detail section cuts section 1/S-12 and section 4/S-12 at wall between roof elevations 909.50 and 918.00. Section 1 applies at low roof. Section 4 applies at high roof.

### 33. SHEET NO. 71, S-16–TYPICAL INFILL DETAILS

#### ADD note to TYPICAL PIT INFILL DETAIL

“Boiler Building finished floor elevation = 904.00, bottom of pits = 896.00.”

### 34. SHEET NO. 74, S-19–MASONRY REPAIR ELEVATIONS–1

CHANGE Keynote 1B first sentence to read, “Saw cut completely through full thickness of brick full height of brick. Width of joint shall be 1/2-inch minimum through full depth of joint.”

CHANGE Keynote 3 and 4 to apply to Bid Alternative No. 5 rather than Bid Alternative No. 6.

CHANGE Keynote 10 to read, “Specification for fluid applied waterproofing is Section 07120. Change quantity to 500 square feet in lieu of 700.”

ADD to end of Keynote 11, “Include removable handrail in Base Bid in lieu of Bid Alternate No. 6.”

CHANGE Keynote 16 section reference to, “Section 1 on sheet S-22.” Apply to Bid Alternative No. 6 rather than Base Bid.

ADD to end of Keynote 26, "See Sheet S-22 for details."

ADD to end of Keynote 27, "See Sheet S-22 for details."

ADD Keynote 28 to Base Bid items "28. Refurbish existing lintel angles at doors and windows (except at covered walkway). Remove rust scale, hand tool clean, apply one coat rust inhibitor and apply one coat finish paint. Clean out drain holes if present, 60 L.F."

### 35. SHEET NO. 75, S-20–MASONRY REPAIR ELEVATIONS–2

CHANGE Keynote 1B first sentence to read, "Saw cut completely through full thickness of brick full height of brick. Width of joint shall be 1/2-inch minimum through full depth of joint."

CHANGE Keynote 3 and 4 to apply to Bid Alternative No. 5 rather than Bid Alternative No. 6.

CHANGE Keynote 10 to read, "Specification for fluid applied waterproofing is Section 07120. Change quantity to 500 square feet in lieu of 700."

ADD to end of Keynote 11, "Include removable handrail in Base Bid in lieu of Bid Alternate No. 6."

CHANGE Keynote 16 section reference to, "Section 1 on sheet S-22." Apply to Bid Alternative No. 6 rather than Base Bid.

ADD to end of Keynote 26, "See Sheet S-22 for details."

ADD to end of Keynote 27, "See Sheet S-22 for details."

ADD Keynote 28 to Base Bid items "28. Refurbish existing lintel angles at doors and windows (except at covered walkway). Remove rust scale, hand tool clean, apply one coat rust inhibitor and apply one coat finish paint. Clean out drain holes if present, 60 L.F."

DELETE note for Sections 1 and 1A "Elastomeric Coating See Sheet S-XX for installation details."

### 36. SHEET NO. 76, S-21–TYPICAL CONCRETE REPAIR DETAILS

REPLACE Concrete Repairs Note 1.B.5 with: "Provide five zinc corrosion protection anodes to be embedded in concrete repairs as directed by ENGINEER (Galvashield XP2 or approved equal)."

DELETE Concrete Repairs Note 1.B.7.

ADD Concrete Repairs Note below CRACK SEALING: "This work applies to existing joints and/or cracks to be sealed but not epoxy injected as to be determined by ENGINEER. Include Unit Price for quantity of ten L.F."

### 37. SHEET NO. 77, S-22–SOUTH WALKWAY REPAIRS

CHANGE Keynote 1B first sentence to read, "Saw cut completely through full thickness of brick full height of brick. Width of joint shall be 1/2-inch minimum through full depth of joint."

CHANGE Keynote 3 and 4 to apply to Bid Alternative No. 5 rather than Bid Alternative No. 6.

CHANGE Keynote 10 to read, "Specification for fluid applied waterproofing is Section 07120. Change quantity to 500 square feet in lieu of 700."

ADD to end of Keynote 11, "Include removable handrail in Base Bid in lieu of Bid Alternate No. 6."

CHANGE Keynote 16 section reference to, "Section 1 on sheet S-22." Apply to Bid Alternative No 6 rather than Base Bid.

ADD to end of Keynote 26, "See Sheet S-22 for details."

ADD to end of Keynote 27, "See Sheet S-22 for details."

ADD Keynote 28 to Base Bid items "28. Refurbish existing lintel angles at doors and windows (except at covered walkway). Remove rust scale, hand tool clean, apply one coat rust inhibitor and apply one coat finish paint. Clean out drain holes if present, 60 L.F."

ADD notes to Section 3:

1. "In lieu of a full height concrete extension provide 8-inch wide by 1-foot 6-inch deep haunch. Top of haunch to match existing walkway. Dowel to existing concrete with six #4 dowel with standard hook embedded into concrete 6 inches with epoxy. Provide three #4 horizontal with standard hook each end. Use 4000 psi concrete.
2. Provide aluminum non-slip tread embedded into concrete haunch to match stair width.
3. Provide 2-foot 0-inch wide by 1-foot 0-inch by 7-foot 6-inch long footing for stringers. Provide six #4 by 7-foot 3-inch longitudinal bars with standard hook each end (3 top, 3 bottom). Provide eight #4 by 1-foot 9-inch transverse (4 top, 4 bottom). Provide 6 inches minimum open graded granular fill beneath footing.
4. Change number of risers to 6 in lieu of 5.
5. Provide new aluminum stair and handrails. Stairs and handrail to be designed to meet Kentucky Building Code requirements. Design treads and stringers for 100 psf live load. Provide extensions at top of handrails to close gap between new and existing handrail.
6. Provide two 1/2-inch diameter (minimum) 304 stainless steel anchor each end of stringers."

#### 38. SHEET NO. 87, H-7–ROOF LEVEL–SOUTH HVAC AND PLUMBING PLAN

ADD Sheet Note 20, "20. Route PVC condensate piping from the three connections on the heat recovery unit."

#### 39. SHEET NO. 91, H-11–ROOF LEVEL–BOILER BUILDING HVAC AND PLUMBING PLAN

ADD Sheet Note 5, "5. The heat recovery unit hot water heating coil shall be a three row coil and shall flow 56 GPM of 170°F entering in-lieu-of 26 @ 160°F."

ADD Sheet Note 6, "6. Provide motorized damper and actuator mounted to louvers L-1, L-2, and L-3. Actuators shall be as specified in Section 15980."

#### 40. SHEET NO. 93, E-2–LOWER LEVEL–SOUTH ELECTRICAL PLAN

REPLACE Drawing with attached revised Drawing 93R.

#### 41. SHEET NO. 96, E-5–UPPER LEVEL–NORTH AND SOUTH ELECTRICAL PLAN

REPLACE Drawing with attached revised Drawing 96R.

42. SHEET NO. 99, E-8-BOILER BUILDING ELECTRICAL PLAN

REPLACE Drawing with attached revised Drawing 99R.

43. SHEET NO. 103, E-12-ELECTRICAL DETAILS AND ONE-LINE DIAGRAMS

REPLACE Drawing with attached revised Drawing 103R.

44. SHEET NO. 105, E-14-ELECTRICAL SCHEDULES

CHANGE Description for Lighting Panel LP-J circuit 20 from "SPARE" to "DRIP TRAP CONTROL PANEL."

CHANGE Description for Lighting Panel LP-N circuits 32, 34, and 36 from "SPARE" to "DRIP TRAP CONTROL PANEL", "DRIP TRAP CONTROL PANEL," and "FOAM SEPARATOR CONTROL PANEL."

CHANGE in FIXTURE SCHEDULE, change model number for Fixture B to the following:

"HPLED56-700-4K-AH-US-G-L5-40C-GD."

\*\*\*\*\*  
**BIDDERS MUST ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE  
SPACE PROVIDED IN THE BID FORM**  
\*\*\*\*\*

Dated at Lexington, Kentucky  
December 15, 2017

STRAND ASSOCIATES, INC.®  
1525 Bull Lea Road, Suite 100  
Lexington, KY 40511





**SIGN-IN SHEET**  
**Pre-Bid Meeting 181-2017 Town Branch WWTP Primary Digester Complex Improvements**  
**December 7, 2017 @ 10:00 AM**

Representative	Company Name	DBE/MBE/WBE/ Veteran	Phone#	Email Address
Brian Marcum	LFUGG		859-258-3320	brianm@lexingtonky.gov
Sherita Miller	LFUGG		859-258-3323	smiller@lexingtonky.gov
Michael Davis	Strand Assoc.		859.225.8500	mike.davis@strand.com
Georgy Oriov	CORPUS STONE E.M.Y		502-423-2217	Georgy@CSSE-Engineering.com
Brad Pennington	LFUGG		859-425-2420	brpennington@lexingtonky.gov
Ben Clements	LFUGG		502 275 9587	benclaments@lexingtonky.gov
Charlie Begley	LFUGG		859-425-2414	cbegley@lexingtonky.gov
Danny L Hyatt	LFUGG		859-621-2722	dhyatt@lexingtonky.gov
Jim Nagle	LFUGG		859-494-9549	Jim.Nagle@LexingtonKY.gov
Rick Baughman	LFUGG		859.425.2475	rbauhman@lexingtonky.gov
Jonathan Cole	LFUGG		859.425.2420	jc@lexingtonky.gov
Mark Spaul	Strand			
Tim Courtney	Suby Construction Co.		859-234-6900	tcourtney@subyconstruction.com
STEVE JUDY	"		/	sjudy@subyconstruction.com
Stranden Leeth	HPT		512-222-7747	bleethe@hptompson.com
TOM CURRIG	TEAM GROUP INC.		502-454-0101	tc@teamgroupinc.com
Ray Wilkey	BI Anderson		502-528-0398	Ray@BIAnderson.com
D. S Huff	Blue Tank & Pump		855.361.6331	DHuff@BlueTankandPump

The price of \$\_\_\_\_\_ shall be added to the Contract Lump Sum Base Bid if OWNER elects to have CONTRACTOR perform repairs to masonry cracking and replace deteriorated lintels in the Digester Control Building and Perform repairs to brick and coping in the three digesters as shown on Drawing S-19, S-20, S-21, and S-22.

**BID ALTERNATIVE NO. 6:**

CONTRACTOR shall include in the cost of the Bid Alternative ALL work associated with providing the scope listed below.

The price of \$\_\_\_\_\_ shall be added to the Contract Lump Sum Base Bid if OWNER elects to have CONTRACTOR perform repairs on walkway and steps on the south side of the Digester Control Building and provide handrails for south elevated walkway as shown on Drawing S-19, S-20, S-21, and S-22.

**CASH ALLOWANCES**

The following Cash Allowances shall be included in the Lump Sum Base Bid. The Cash Allowances for non-Lump Sum items shall be equal to the product of the quantity included in the Lump Sum Base Bid and the Unit Price. The Cash Allowances will be adjusted in the event that estimated quantities to be included in the Lump Sum Base Bid are different from final measured quantities. A single Unit Price shall be bid for each item. Failure to include one or more of the following Unit Price items may result in rejection of the entire Bid as nonconforming. For items with a quantity of 1, the Cash Allowance shall be adjusted based on actual final costs.

Item Number	Description	Estimated Quantity Included in the Lump Sum Base Bid	Unit	Bid Unit Price	Total Bid Price Included in the Lump Sum Base Bid
1.	Project Soils Engineer Section 02222	1	LS	\$15,000	\$15,000
2.	Digester Cover Repairs Not Included In Bid Alternative No. 2 Section 13232	1	LS	\$20,000	\$20,000
3.	Kentucky Utilities Company Section 16420	1	LS	\$20,000	\$20,000
4.	Systems Integration Section 16940	1	LS	\$30,000	\$30,000
5.	Deep Concrete Repair	10	SF	\$	\$
6.	Shallow Concrete Repair	30	SF	\$	\$
7.	Concrete Scaling Repair	10	SF	\$	\$

Item Number	Description	Estimated Quantity Included in the Lump Sum Base Bid	Unit	Bid Unit Price	Total Bid Price Included in the Lump Sum Base Bid
8.	Sacrificial Zinc Corrosion Protection Devices	5	Units	\$	\$
9.	Concrete Crack Epoxy Injection	300	LF	\$	\$
10.	Two Layers of Carbon Fiber Reinforcing with Topping and Surface Preparation Repair	10	SF	\$	\$
11.	Steel Angle/Column Cleaning and Repair	80	LF	\$	\$
12.	Brick Tuckpointing	600	SF	\$	\$
13.	CMU Tuckpointing	50	LF	\$	\$
14.	Replace Tank Wall Cap Sealants	680	LF	\$	\$
15.	Demolish and Rebuild Brick Veneer	166	SF	\$	\$
16.	Install 9MM Helical Wall Anchors	100	Units	\$	\$
17.	Install Horizontal Joint at Top of Tank Wall	553	LF	\$	\$
18.	Remove and Reseal Vertical and Horizontal Sealant Joints	140	LF	\$	\$
19.	New Vertical Control Joint in Masonry Installation (Including Adjacent Anchors, Sealants and Scaffolding)	18	LF	\$	\$
20.	Clean Masonry and Apply Water Repellent Coating	10	SF	\$	\$
21.	Install Traffic Coating	100	SF	\$	\$
22.	Replace Individual CMU Blocks	8	Units	\$	\$

**SECTION 033200**  
**CONCRETE REPAIRS**

**PART 1 GENERAL**

1.01 RELATED ITEMS

- A. The Conditions of the Contract and Division 1 apply to this Section.

1.02 DESCRIPTION

- A. Furnish all labor, material, equipment, shoring (if required), special tools and all services required to complete all repairs required on the project, shown on the drawings and herein specified.
- B. This work shall consist of providing the necessary labor, materials, equipment and supervision for the removal of unsound concrete or unsound previous repairs, and the cleaning of the newly exposed underlying sound concrete.
- C. Work under this section includes repairs identified as beam and joist bottom repairs and other forms of overhead patching to slabs and patching to vertical concrete surfaces.

1.03 SUBMITTALS

- A. Prior to cutting, which affects structural safety of project, or work of another Contractor, submit written notice to Engineer prior to cutting.
- B. Submit (2) copies of literature for manufactured products, including manufacturer's specifications, test data and installation instructions.
- C. Submit (2) copies of all information requested in this Section.

1.04 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 301—Specification for Structural Concrete for Buildings
  - 2. ACI 305R—Hot Weather Concreting
  - 3. ACI 306R—Cold Weather Concreting
  - 4. ACI 318—Building Code Requirements for Reinforced Concrete
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM A185—Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
  - 2. ASTM C31—Method of Making and Curing Concrete Specimens in the Fields
  - 3. ASTM C33—Concrete Aggregates
  - 4. ASTM C39—Test Method for Compressive Strength of Cylindrical Concrete Specimens
  - 5. ASTM C94—Specification for Ready-Mixed Concrete
  - 6. ASTM C143—Standard Test Method for Slump of Portland Cement Concrete
  - 7. ASTM C150—Specification for Portland Cement Concrete

8. ASTM C260—Specification for Air-Entraining Admixtures for Concrete
  9. ASTM C494—Specification for Chemical Admixtures for Concrete
- C. Structural Steel Painting Council (SSPC):
1. Surface Preparation Specification No. 3 (SP3)—Wire Wheel Cleaning
  2. Surface Preparation Specification No. 6 (SP6)—Commercial Blast Cleaning
- D. American Association of State Highway and Transportation Officials (AASHTO):
- AASHTO M182—Specifications for Burlap Cloth Made from Jute or Kenaf.
- E. Keep a copy of the referenced specifications cited in this section in the on-site field office.

#### 1.05 QUALITY ASSURANCE

- A. The Contractor is responsible for correction of overhead or vertical surface repairs that do not conform to the specified requirements, including bond to substrate, finish and tolerances. Excessive shrinkage cracking occurring within 45 days of repair placement, as determined by the Engineer, shall also require correction at no additional cost to the Owner. Repair areas that do not meet the requirements, as determined by the Engineer, shall be subject to removal and replacement, including necessary preparatory work, at no additional cost to the Owner and without extension to the Contract Time. Contractor shall be responsible for restoration of any other components of the work if damaged during repair placement or if damaged during removal of unsatisfactory repair concrete.
- B. ACI 301—Specifications for Structural Concrete for Buildings, ACI 305R—Hot Weather Concreting and ACI 306R—Cold Weather Concreting, all current editions published by the American Concrete Institute, are a part of the Contract Documents, are incorporated herein as fully as if here set forth and are referred to as General Contracting Requirements.
- C. The Contractor shall guarantee the repair areas shall remain intact and bonded to the substrate for a period of five years from the date of substantial completion of the project. Failed repair areas shall be repaired by the Contractor at no cost to the Owner, following procedures outlined in this Section.

#### 1.06 JOB CONDITIONS

- A. Overhead and vertical delaminations and spalls to be repaired are as noted on the drawings.
- B. The Contractor shall, when submitting his bid, take into consideration the actual field conditions associated with the repairs.
- C. The Contractor shall include following quantity of repairs in the base bid to be installed as requested by Engineer in the filed. Final payment shall be adjusted to reflect quantity repaired based on unit price.
1. Deep concrete repair-10 S.F.
  2. Shallow concrete repair-30 S.F.
  3. Concrete scaling repair-10 S.F.
  - 4 Sacrificial zinc corrosion protection devices installed -5 Units

## 1.07 WARRANTY

- A. Standard One-Year Warranty: Unless otherwise stated below, manufacturer shall warrant the equipment to be free from defects in material and workmanship for a period of one year in accordance with GC12.6.

## **PART 2 PRODUCTS**

### 2.01. OVERHEAD AND VERTICAL PATCH MATERIAL

- A. Materials for patching overhead and vertical concrete surfaces shall be high strength, shrinkage compensating type that will bond with old concrete and provide protection/cover over exposed reinforcing. Material may be of a flowable type which can be used with forms or a trowelable type which can be used on vertical surfaces. Patching material shall be compatible with all other materials used in the repair and shall be capable of providing bond to existing surfaces without the use of a bonding agent. Material shall be shrinkage compensating. Minimum strength of the repair material shall be 6000 psi. Mortar cube tests shall be made in accordance with applicable standards of ASTM and tests shall be made by an approved testing laboratory.
- B. Subject to compliance with the requirements and approval provide one of the following or an approved equal:

Sika Top 123 Plus by Sika Corporation  
EMACO SS88CI by BASF Corporation

### 2.02. REINFORCEMENT PROTECTION/COATING

- A. Exposed reinforcing steel shall be fully cleaned of all rust, scale, loose concrete or other debris as outlined elsewhere in this specification and coated with a rust inhibitive coating which will not inhibit the bond of fresh polymer concrete patching systems.
- B. Subject to compliance with the requirements and approval provide one of the following or an approved equal:

Zinc Rich Rebar Primer by BASF Corporation  
Armatec 110 EpoCem by Sika Corporation  
EMACO P24 by BASF Corporation  
Sikadur 32, Hi-Mod, LPL by Sika Corporation

- C. Corrosion protection coating shall be applied and used in accordance with all recommendations of the manufacturer, including all time and temperature constraints.

### 2.03 ANODE CORROSION PROTECTION DEVICES

- A. Anode corrosion protection devices to be placed in patch concrete on columns shall be Galvashield XP+ as manufactured by Sika or Vector Corrosion Technologies, or approved equal.

## 2.04 CORROSION INHIBITOR MATERIALS

- A. Provide typically applied corrosion inhibitor materials to concrete surfaces as identified on the drawings. Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

MCI 2020 by Cortec  
Sika Ferrogard 903 by Sika Corp.

1. All Corrosion Inhibitor products shall be applied in strict accordance with the manufacturers requirements including all surface preparation, application rates, cleanup requirements, etc. In addition, coordinate final clean-up/surface preparation with manufacturer's of Traffic Coating Membrane Products and Penetrating Concrete Sealer Products, as well as any other products that may be affected by the application of the Corrosion Inhibitor.
  - a. Corrosion inhibitors shall be applied to concrete surfaces at the rate of 150 sq. ft./gallon.
  - b. Concrete surface preparation shall be completed by shot blast methods. Samples of completed surface preparation shall be provided for review by the Corrosion Inhibitor Manufacturer and Engineer for review with the Contractor. Locations inaccessible by shot blasting equipment or overhead conditions shall be prepared by sandblasting methods. All such cleaning methods shall scarify and clean the concrete surface to be free of all dirt, grease or oils and to provide a roughened, open-textured surface capable of accepting chemical treatment.
  - c. Provide Engineer with no less than 48 hours advance notice prior to application of Corrosion Inhibitors. Coordinate application to a time mutually agreed upon with the Engineer.
  - d. Following application of corrosion inhibitors, allow for the product to remain on the concrete surface for a time period as recommended by the manufacturer in their written instructions. Upon sufficient wait time, remove all residue and/or any byproducts of the corrosion inhibitor materials pressure washing.
  - e. All surfaces to receive other treatments such as penetrating sealers or traffic coating membranes shall receive subsequent shot blasting treatments in accordance with their respective specification sections.
2. Corrosion Inhibitors shall only be applied by firms experienced in the use of these products and with verifiable past experience as per written letter of authorization from the Manufacturer (not local supplier) of the product. Provide manufacturer's written letter to the Engineer along with no less than 3 references (Project name, location, Owner contact, Engineer contact) for past successful projects completed within the past 3 years using these products at the time of bidding.
3. Provide letters of compatibility from the Corrosion Inhibitor Manufacturer, Traffic Coating Manufacturer, Penetrating Sealer Manufacturer, and Joint Sealant Manufacturer indicating that their products will be compatible with one another. No work shall proceed without the receipt of such letters.

## 2.05 CEMENTITIOUS WATERPROOFING COATING

- A. Provide flexible, cementitious waterproofing and protective slurry mortar product for coating over post-tensioning tendon pockets at interior columns along ramp offset in the Cowger Parking Garage. See drawings for quantity of locations for consideration. Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

## SikaTop Seal 107 by Sika Corporation

1. Gently clean existing columns surfaces to be coated over, after all other concrete repairs are made, by water blast, light sandblast, light scrubbing and detergent cleaning, and potential combinations thereof to remove all dirt, oils and other contaminants from the concrete surfaces. Leave concrete surface to be coated over in an open-textured, light sand-paperlike consistency. Use devices to mask off concrete surfaces which are not to be so cleaned and coated.
2. Complete application of corrosion inhibitors to the surfaces to be coated in strict accordance with the manufacturer's recommendations. Upon completion of all corrosion inhibitor work, completely re-clean the surface and re-scarify to the same texture as per paragraph 1 and as otherwise recommended by the manufacturer of the cementitious waterproof coating. Verify cleaned surface is acceptable to the coating manufacturer's representative and ready to accept the coating.
3. Using trowels, notched trowels, stiff bristle brush, spray equipment or combinations thereof, install coating in strict accordance with the manufacturer's recommendations filling all pores and discontinuities of the concrete surface. Provide 2 coats of no less than 40 mil thickness each.
4. For columns which presently have signage either attached to the concrete surface or painted on the concrete, remove such signage and restore after completion of repair.

### 2.06 PRODUCT COMPATIBILITY

- A. All products listed in this specification, as well as referenced specification sections, shall be compatible with each other. Manufacturer shall provide a written certification verifying compatibility of chosen products. If products by different manufacturers are to be used, each manufacturer shall provide written certification verifying that manufacturer's product is compatible with the other manufacturer's product. Obtaining written verification is the responsibility of the Contractor and all certification shall be submitted as a part of the shopdrawing process prior to the beginning of work.

### 2.07 EQUIPMENT

- A. Chipping hammers of nominal 15-lb. class or less for removal of concrete and for detail work.
- B. Sandblasting equipment capable of removing all laitance, dirt and debris from newly exposed concrete surfaces.
  1. Perform all sandblasting work and maintain all sandblasting materials on the outside of buildings. During sandblasting work, seal off all windows and doors at all levels of the building with polyethylene sheathed barriers to prevent any intrusion of particulates to the interior of the building. If the above, in the opinion of the Engineer, is not sufficiently preventing intrusion of sand, the Contractor shall provide additional protection as may be required to prevent intrusion of sand or any other materials into the building. Contractor shall repair all damage, of any kind, at no cost to the Owner.
  2. Contractor shall protect all landscaping, trees, grass, nearby structures, automobiles, people, etc. from particulate created by sandblasting operations.

- C. High pressure, oil-free compressed air equipment capable of removal of dust and dirt from concrete repair areas, and exposed concrete surfaces.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION FOR OVERHEAD AND VERTICAL CONCRETE REPAIRS**

- A. Overhead and vertical surface delaminations, indicated on the drawings, will be sounded by the Contractor for limits of unsound concrete and marked. Repair shall remove all deteriorated concrete regardless of any paint markings.
- B. Immediately prior to concrete patch placement, the cavities shall be blasted by oil- and water-free compressed air to remove residual loose sand and debris which may have accumulated in the cavity. All debris shall be removed from the site prior to the commencement of the patching.
- C. The concrete shall be in a saturated surface dry condition or as otherwise recommended by the product manufacturer. Properly prepare surface to receive patch in accordance with the manufacturer's recommendations. Use a solution of the patching material as recommended by the manufacturer as a bonding agent, scrubbing this material into the surface of the areas to receive patch. Perform all such activity as per the manufacturer's recommendations.
- D. If it is determined by the Contractor and Engineer that an overhead patch material may not be successful in bonding to the concrete, the Contractor shall, at no additional cost, install stainless steel pins to be epoxy grouted into sound concrete. Pins may be of a product fabricated especially for this use (Stainless Steel "Spikes" by Powers Fastener Group) or may be stainless steel threaded rod, not less than 1/4" diameter. Minimum anchorage into sound substrate shall be 4", greater where possible. Pins shall be placed at no greater spacing than 8" o.c. in each direction. A mesh fabric, epoxy coated, (or stainless steel wire) can then be attached to the pins in order to secure new patching materials to existing concrete surfaces.
  - 1. Submit stainless steel pin product and mesh/wire product data for review as a part of the submittal process.
- E. Adhesion tests with the polymer system are recommended to show that preparation has been proper and that good bond strength has been attained. Adhesion tests shall exhibit failure in the concrete.

#### **3.02 CONCRETE REMOVAL**

- A. Overhead, vertical or horizontal surface delimitations and damage, indicated on the drawings, will be sounded by the Contractor for limits of unsound concrete and marked. Repair shall remove all deteriorated concrete. Any markings made in the field by the Contractor shall be made with materials that can be easily removed and do not permanently mark or stain concrete or masonry surfaces.
  - 1. If any unusual conditions are uncovered or if a structural elements appears to be in an unstable or unsafe condition, the Contractor shall immediately make all necessary efforts to shore and support the suspect element and contact the Engineer for assistance.
- B. Remove all loose and deteriorated concrete in and around the spalled or

delaminated area. The substrate shall be rendered clean, sound and dry. Preparation shall provide complete removal of all substances detrimental to bond development (dirt, grease, oils, fats, waxes and chemical contaminants), weak, loose and unsound concrete. The concrete removal shall be done using a chipping hammer not heavier than 15 lbs. Hold hammer at a 45° angle or less with the plane of the concrete. Remove concrete around all exposed reinforcing steel leaving a 1/2" to 3/4" void around the entire bar. Care shall be taken so that removal methods and tools do not damage or weaken otherwise sound concrete. Extreme care must be taken not to damage existing reinforcing steel. A chisel shall be used. Chip the concrete back as indicated in the detail on the design drawings. Prepare edges so that no "featheredge" conditions exist.

1. TAKE EXTREME CAUTION WITH SAW CUTTING EQUIPMENT. Saws may be used to lightly cut or score concrete at surface. However, do not allow saw to cut any deeper than 1/2" depth. DO NOT CUT REINFORCING BARS WITH SAW. Use methods involving chipping hammer and chisels to carefully cut the concrete while leaving any and all reinforcing steel intact and undamaged.
  2. For any locations where the integrity of any structural element is in question, provide supplemental shoring of the suspect area, at no additional cost, to prevent additional damage and/or collapse of the element. Report all suspect conditions to the Engineer.
- C. Clean and scarify the existing excavated concrete by sandblasting. All existing exposed reinforcing steel shall be cleaned by commercial blast methods (sandblasting) per the requirements of SSPC-SP6. Existing reinforcement shall receive one (1) coat of reinforcement protection/coating with brush to steel within 4 hours of cleaning in accordance with the recommendations of the manufacturer. Apply additional coats as required by the product manufacturer when required to comply with time constraints associated with the material surface condition at the time of concrete patching. (Note: Depending upon the coating product used, it may be necessary to apply a final rebar coating just prior to concrete patching and while the rebar coating is still tacky.)
1. Perform all sandblasting operations in strict accordance with all Federal, State and Local requirements including but not limited to OSHA, EPA, etc. Perform sandblasting operations no sooner than 48 hours before patching.
- D. The Engineer shall be allowed a minimum of 72 hours advance notice for the inspection of properly prepared concrete surfaces and reinforcement, before the patch material is placed. It is the responsibility of the Contractor to provide sufficient notice to the Engineer. Group patching placement activities into as large of quantity as practical for placement and for observation purposes. The Contractor shall not require the Engineer to observe individual patch locations. Patch placement shall not occur until typical and representative preparation methods for each group of repairs are observed and the preparations are acceptable.
- E. If more than 48 hours has elapsed since the patch area was sandblasted and cleaned with high pressure compressed air at the point in time when the patch material is to be placed, then the patch area must be blown clean again with high pressure compressed air immediately prior to placement of the patch material. (Compressor must be equipped with functional oil and water separators.)
- F. If it is determined by the Contractor and Engineer that an overhead patch material may not be successful in bonding to the concrete, the Contractor shall, at no

additional cost, install stainless steel pins to be epoxy grouted into sound concrete. Pins may be of a product fabricated especially for this use (Stainless Steel "Spikes" by Powers Fastener Group) or may be stainless steel threaded rod, not less than 1/4" diameter. Minimum anchorage into sound substrate shall be 4", greater where possible. Pins shall be placed at no greater spacing than 8" o.c. in each direction. A mesh fabric, epoxy coated, (or stainless steel wire) can then be attached to the pins in order to secure new patching materials to existing concrete surfaces.

1. Submit stainless steel pin product and mesh/wire product data for review as a part of the submittal process.

- G. Unless required otherwise, all surfaces to receive cementitious patching materials or cast-in-place concrete patch shall be maintained in a saturated surface dry (SSD) condition for 24 hours prior to patch material placement. For proprietary patching products, confirm placement and SSD requirements with the product manufacturer.

### 3.03 EXECUTION OF OVERHEAD AND VERTICAL CONCRETE REPAIRS

- A. Mix and install patch material in accordance with manufacturer's instructions, adequately prewetting the cavity of the repair area prior to installation. A plaster or rotary drum mixer with at least twice the capacity of the batch size shall be employed. Add the liquid component first, followed by the aggregate component. Complete all mixing and consistency requirements for application as required by the product manufacturer.
- B. The base concrete shall be in a saturated surface dry condition or as otherwise recommended by the product manufacturer. Bond to existing substrate shall be achieved without the use of a bonding agent by using a slurry mix of the patching material as a bonding agent (unless otherwise recommended by the manufacturer of the patching material).
- C. The completed repair surface shall receive a finish to match the adjacent original concrete surfaces.
- D. Material shall not be placed when temperature exceeds 90°F, nor at temperature below 50°F unless specific requirements for the conditions as set forth by the product manufacturer are followed. Temperatures of base concrete shall not be any more than 10°F different than that of patching material.
- E. For areas not exposed to exterior view, overhead and vertical patches applied by hand, troweling in lifts of 1-1/2" maximum thickness. For multiple layer patches, a trowel with a serrated edge shall be used to prepare the initial patch layer for the future applications. Finish final surface of patch material with steel trowel. Remove all excess material from adjacent surfaces to repair areas.
- F. Provide curing of all new patch materials as recommended by the manufacturer. Provide moist curing by means of wet burlap for a period of no less than 7 days. Provide a plan or methodology to maintain to maintain curing in a moist condition for the required time frame. In no case shall the curing time be less than as recommended by the manufacturer.
- G. Test all materials periodically to make sure that products used will achieve strengths as listed in Manufacturer's data. For every type of patching (thin patch, full depth

repair, overhead patch, etc), provide a set of mortar cubes to be tested. Mortar cubes shall be made in accordance with applicable Standards of ASTM and tests shall be performed by an acceptable testing laboratory. Tests results shall be provided to the Engineer within 48 hours of the time that the tests are made and shall be distributed by the lab directly to the following:

- 1 copy to Structural Engineer
- 1 copy to Contractor
- 1 copy to Material Supplier

- H. At the completion of all work, return the site to a clean and useable condition removing all construction materials and debris from the site.

**END OF SECTION**

## SECTION 07120

### FLUID-APPLIED WATERPROOFING

#### PART 1–GENERAL

##### 1.1 SUMMARY

- A. Medium Duty Traffic Coating Membrane for use in pedestrian areas as indicated on the drawings.
- B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

##### 1.2 REFERENCES

- A. NRCA (National Roofing Contractors Association)–Waterproofing Manual.

##### 1.3 SUBMITTALS

- A. Submit two samples of coating system applied to 1/4-inch plywood or similar rigid base.
- B. Submit list of at least five projects of similar nature by waterproofing applicator that have been installed within the last 5 years, identified with project name, location, and date.
- C. Submit letter from membrane manufacturer stating that applicator is an approved or certified applicator of its product.
- D. Submit copies of warranty.

##### 1.4 QUALIFICATIONS OF APPLICATOR

- A. Membrane applicator shall be approved by the manufacturer and shall have a minimum of 5 years experience in application of fluid-applied waterproofing coatings.

##### 1.5 ENVIRONMENTAL CONDITIONS

- A. No waterproofing work shall be performed at ambient temperatures below 40°F.
- B. No waterproofing work shall be performed during inclement weather or when such weather is imminent.

##### 1.6 WARRANTY

- A. Provide installer's 2-year total system warranty of watertightness covering cost (labor and materials) to repair any leaks in the waterproofing membrane, including cost to remove backfill material or other materials concealing the membrane, if

required.

- B. Provide manufacturer's standard 5-year product warranty.

## PART 2--PRODUCTS

### 2.1 GENERAL

- A. Material Compatibility: Provide primers, base and top coats, and miscellaneous materials that are compatible with one another and with substrate under condition of service and application, as demonstrated by the Manufacturer based on testing and field experience.
- B. Color: Provide Manufacturer's standard gray color which will match closely to color of existing concrete surfaces.

### 2.2 ACSEPTBLE MANUFACTURERS

- A. Neogard FC System, as manufactured by Neogard, a division of Jones-Blair of Dallas, TX.
- B. LymTal Iso-Flex System, as manufactured by LymTal International, Inc of Lake Orion, MI.
- C. Sika "Sikalastic" Traffic System, as manufactured by Sika Corporation of Lyndhurst, NJ.

### 2.3 TRAFFIC COATING SYSTEM

- A. The "basis of design" for this project is the Neogard FC system as detailed below. Other manufacturers shall listed as acceptable may be utilized provided that the final system submitted/used is similar to the "basis of design" system with respect to components and component thickness/application rates. Additionally, each acceptable system shall have a total completed dry film thickness similar to the "basis of design" system with +/- 5%.
- B. Loading dock Traffic Coating System (pedestrian and light industrial traffic)

Components:

- Primer: Neogard 7780/7781 Water-Borne Epoxy Primer; coverage at manufacturer's recommended rate.
- Base Coat: Neogard FC 7500/FC 7960, 2-component, fast-cure Aromatic Urethane – 20 mils dry film thickness
- Top Coat: Neogard FC 7540/FC 7964, 2-component, fast-cure Aromatic Urethane – 20 mils dry film thickness, color gray.
- Aggregate: Neogard 7992U – 12/20 Silica Sand – 15 to 18 lbs/100 sq. ft.
- Total System Thickness = 40 mils dry

## 2.4 MISCELLANEOUS MATERIALS

- A. Joint sealants indicated on the drawings or in Manufacturer's recommended details shall be materials compatible with the penetrating sealer or traffic coating systems used in the work. Multi-component, unmodified, polyurethanes having a Shore A Hardness of 28-42 shall be used for all sealant work, except where expressly prohibited by sealer manufacturer in published literature. All physical and chemical characteristics of the sealants shall be acceptable to the manufacturers. Sealant material shall be capable of a minimum compression or extension of 25% of the nominal joint width without adhesive or cohesive failure in a properly prepared, primed and sealed joint with a width to depth ratio of 2.0, and without the use of a bond-breaker in the bottom of the joint. Provide standard gray color acceptable to the Engineer.
- B. Aggregate: Uniformly graded washed silica sand of particle sizes and shape as recommended by Traffic Coating Manufacturer, with minimum hardness of 7 on the Moh Scale. Coating Manufacturer shall also make available the same aggregate that has been pretreated to resist aggregate tear-out. This pretreated aggregate shall be installed in areas of demonstrated heavy wear as determined by the Engineer. Aggregate shall be installed by "seed and backroll" method as permitted by the system Manufacturer.
- C. Sheet Flashing: 50-mil minimum non-staining uncured sheet neoprene.
- D. Adhesive: Manufacturer's recommended contact adhesive.
- E. Reinforcing Strip: Manufacturer's recommended fiber-glass mesh.

## 2.5 PRODUCT COMPATIBILITY

- A. All products listed in this specification, as well as with referenced specification sections, shall be compatible with each other. Manufacturer shall provide a written certification verifying compatibility of chosen products. If products by different manufacturers are to be used, each manufacturer shall provide written certification verifying that manufacturer's product is compatible with the other manufacturer's product. Obtaining written verification is the responsibility of the Contractor and all certification shall be submitted as a part of the shop drawing process prior to the beginning of work.

## PART 3-EXECUTION

### 3.1 EXAMINATION

- A. The Contractor, Manufacturer, and Applicator shall jointly examine substrate and conditions under which traffic coating systems will be applied for compliance with requirements. Do not proceed with installation until unsatisfactory conditions have been corrected.
  - 1. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by the plastic sheet method according to ASTM D4263.
  - 2. Verify all new and existing concrete surface repairs or overlays are sound and suitable for traffic coatings.
  - 3. Verify all sealants included as part of the work are correctly installed and fully adhered to substrates.
  - 4. Notify the Engineer, in writing, of anticipated problems using traffic coatings over

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suspect substrate.

### 3.2 SURFACE PREPARATION

- A. Clean and prepare substrate according to Manufacturer's recommendations and as specified. Provide clean, dust-free and dry substrate for traffic coating application.
- B. Protect adjacent structures, vehicles, and pedestrians from the work. Provide sufficient barriers and enclosures to protect the work as well as to protect items not to be coated from the work.
- C. Protect all architectural features, plumbing, electrical devices, lights, piping, ductwork, etc. from any damage or from materials used in traffic coating work.
- D. Unless otherwise noted, clean and prepare all surfaces and materials to receive traffic coatings in strict accordance with this specification and with the Manufacturer's recommendations.
- E. All concrete surfaces shall be dry and shall be verified so per the Manufacturer's standard testing methods.
- F. All new cementitious repair surfaces to receive coatings shall be fully cured no less than 28 days prior to start of coating work.
- G. All surfaces to receive traffic coatings shall be cleaned by shot-blasting methods to produce a clean surface of a profile and cleanliness level suitable to the manufacturer of the traffic coating system. Provide no less than 2 passes of such shot-blast equipment with either one pass overlapping the joints of the first pass or where the second pass is run at 90 degrees direction from the first pass. Provide a 2'-0" x 2'-0" sample of a fully cleaned area for review by the Contractor, Applicator, Traffic Coating Manufacturer, Owner and Engineer. Once approved, the sample condition shall be used as the basis for all future cleaning.
- H. Use sandblasting equipment to clean/abrade areas of concrete surfaces that are inaccessible to shot blasting equipment. Match surface cleanliness and profile of shot-blasted, approved sample.
- I. Areas which become soiled due to scheduling considerations or due to traffic flow-through the work area shall be "re-cleaned" as required at no additional cost.
- J. Acids or other chemicals which are corrosive to embedded reinforcing steel or detrimental to concrete surfaces shall not be used. Aggressive chemical cleaners shall not be used without review/approval of the Engineer, in writing. Remove all grease, oils, or other surface contaminants as per the Traffic Coating Manufacturer's recommendations.
- K. Repair all minor surface damage or irregularities created by the shot-blasting process as a part of the base bid work. Re-abrade all such new cementitious surfaces prior to application of traffic coating materials.

### 3.3 PREPARATION AT TERMINATIONS AND PENETRATIONS

- A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains and sleeves according to ASTM C1127 and Manufacturer's recommendations.
- B. Provide sealant cants at penetrations and reinforced and non-reinforced deck-to-wall butt joints.
- C. Repair all cracks over 1/16" width by routing and sealing as per drawing details. All cracks or discontinuities shall receive a "detail" base coat of 20 mil thickness as per the drawing details. Minimum width of the detail coat is 4" wide or 2" to each side of the discontinuity width.
- D. Prime substrates and apply preparatory base coat. Embed joint reinforcing strip in coating when recommended by Traffic Coating Manufacturer.
- E. Terminate edges of deck-to-deck expansion joints with preparatory base coat strip.

### 3.4 SHEET FLASHING

- A. Deck-to-Wall Expansion Joints and Dynamic Joints: Install sheet flashing and bond to deck and wall substrates according to Manufacturer's recommendations.

### 3.5 TRAFFIC COATINGS APPLICATION

- A. General: Apply each traffic coating material according to ASTM C1127 and Manufacturer's recommendations.
  - 1. Start installation of traffic coatings in presence of Manufacturer's technical representative.
  - 2. Mix materials according to Manufacturer's instructions.
  - 3. Apply primer over prepared substrate at Manufacturer's recommended spreading rate.
  - 4. Apply coatings by calibrated, notched squeegee according to the traffic coating Manufacturer's recommendations. Do not use squeegee or other devices which are worn or show signs of damage.
  - 5. Apply total dry film thickness of traffic coating as indicated, but to not less than the minimum thickness recommended by the Manufacturer. Apply each coating to the thickness recommended by the Manufacturer. Confirm that final system thickness specified is achieved.
  - 6. Apply aggregate into wet coating according to Manufacturer's recommendations, Using seed and backroll method.
  - 7. Check/verify wet film thickness of each component coat every 100 sq. ft. during application.
  - 8. Upon completion and curing of the work, restore traffic markings as specified elsewhere.
- B. Wall Terminations and Vertical Surfaces: Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated according to Manufacturer's recommendations and details.
  - 1. Omit aggregate on vertical surfaces.

### 3.7 FIELD QUALITY CONTROL

- A. In-Place Testing: Test each near-level deck area for leaks immediately after nominal cure of completed traffic coatings. Flood each area for 24 hours and examine underside of decks for evidence of leaks. Repair any leaks observed. Repeat test and make repairs until no leaks remain.
- B. Perform Bond or Adhesion Testing in accordance with Manufacturer's recommendations and standard criteria. Perform no less than 5 such tests per level at the Commonwealth Garage or approximately 1 test per 5000 sq. ft. For other limited applications such as in the Cowger Garage, perform no less than 1 test per 5000 sq. ft. for coatings at the ramp from level 1 to level 2 and no less than one test for every 80 feet of length for coatings place along ramp edges, across control joints, and along barrier wall edges. Tests shall prove material adhesion or bond in excess of 300 psi. Failing areas shall be completely removed and corrected at no costs to the Owner. Additional bond tests which may be required to identify areas of non-compliance shall be completed at no additional cost.
- C. Perform Skid or Coefficient of Static Friction tests in accordance with the traffic coating Manufacturer's recommendations or standard criteria. The Manufacturer shall perform such testing on ramp areas and turning radius conditions as specified by the Engineer and shall certify a non-slip surface. Of particular emphasis are ramp conditions and the first to second level ramp condition at the Cowger Garage. The Contractor, Applicator and Manufacturer shall certify that traction of vehicles shall not be impaired in any way at these conditions.
- D. The Manufacturer shall make available a field representative to make periodic observations of the coating preparation and application work. The representative shall prepare written reports outlining the work taking place for review by the Engineer. The reports should outline corrections in activity that must be made and or issues that must be corrected as a part of the work.
- E. The Contractor shall retain the services of a testing laboratory acceptable to the Engineer and the Owner, to perform sampling and testing of in-place dry mil thickness of each coating layer, along with the specified testing required in preceding paragraphs. The Contractor shall allow testing agency access to all areas of the deck for random sampling of each coating layer at inconspicuous locations. Test samples shall be taken following initial cure of each coating layer for no less than each 5,000 s.f. of deck surface area. Test reports shall be provided directly by the testing agency within 3 days of the test as follows:
  - 3 Copys - Engineer
  - 1 Copy - Owner
  - 1 Copy - User agency representative
  - 1 Copy - General Contractor
  - 1 Copy - Traffic Coating System Manufacturer
  - 1 Copy - Traffic Coating System Applicator

Locations of coatings not meeting the required thickness as specified shall be subject to additional sampling/testing, at no additional cost to the Owner, to locate and identify the limits of non-compliance. Such areas not meeting the requirements of the specification shall be removed and replaced at no cost to the Owner.

### 3.8 CURING, PROTECTION AND CLEANING

- A. Cure traffic coatings according to Manufacturer's recommendations taking care to prevent contamination and damage during application stages and curing.
- B. Empty containers shall be removed from the site at the end of each working day. All cloths soiled with sealer that might constitute a fire hazard shall be placed in suitable metal safety containers or shall be removed from the site at the end of each working day. Special care shall be taken in storage or disposal of flammable materials. Comply with health and fire regulations.
- C. Protect traffic coatings from damage and wear during remainder of construction period.
- D. Cleaning: Remove temporary covering and clean traffic coatings just before final inspections. Use cleaning materials and procedures recommended by Manufacturer.

**END OF SECTION**

## SECTION 07511

### BUILT-UP ASPHALT ROOFING

#### PART 1-GENERAL

##### 1.1 SUMMARY

- A. This Section includes the following summary of work to be performed:
1. Apply a one-ply asphalt-coated, polyester-reinforced, tri-laminate base sheet to the new concrete deck set in Type III Asphalt. Extend the base sheet a minimum of 8 inches up the vertical walls and projection curbs and seal to vertical surface with asphalt mastic and mesh.
  2. Apply tapered polyisocyanurate insulation system (1/4 Inch: Foot, Minimum of 1.5 inch at the drain) set in Type III Asphalt or install tapered lightweight insulating fill as shown on roof plans and drawings.
  3. For tapered polyisocyanurate insulation only: Adhere a cover-board insulation layer consisting of 1/2-inch wood fiberboard adhered in Type III asphalt. Stagger joints a minimum of 6 inches in either direction. Install wood fiber cants set in Type III asphalt.
  4. Adhere an asphalt-coated, polyester-reinforced tri-laminate base ply set in Type III asphalt. Asphalt adhesion rate is approximately 25 pounds per 100 square feet.
  5. Adhere Built Up Roof Membrane consisting of three plies of Type VI felts set in SEBS rubberized, modified asphalt-shingled fashion. Adhesion rate of the rubberized asphalt is approximately 25 pounds per 100 square feet.
  6. Install specified flashings adhered with SEBS rubberized/modified asphalt and mastics.
  7. After inspection of manufacturer, flood coat roof system membrane with SEBS rubberized asphalt at an application rate of 50 pounds to 60 pounds per 100 square feet and immediately broadcast new gravel at an application rate of 450 pounds per 100 square feet.
  8. After the flashing mastics have cured, then apply the aluminum coating to all flashings and projections at a rate of 2.5 gallons per 100 square feet as a finish surfacing.
  9. Install required sheet metal components and projection flashings.
- B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this Section.

##### DEFINITIONS

- C. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- D. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mopping application and 75 centipoise for mechanical application, within a range of plus or minus 25°F

(14°C), measured at the mop cart or mechanical spreader immediately before application.

## 1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight, do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings. Fire/Windstorm Classification: Class 1A-90.

## 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work. Base flashings, cants, and membrane terminations.
- C. Samples for Verification: For the following products:
  - 1. 12-inch by 8-inch (300 by 300 mm) square of base , sheet ply sheet.
  - 2. 12-inch by-8-inch (300 by 300 mm) square of flashing sheet, of color specified.
  - 3. Pull sample of rubberized asphalt material specified.
  - 4. Manufacturer standard color options.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Manufacturer Certificates:
  - 1. Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  - 2. Submit evidence of meeting performance requirements.
- F. Qualification Data: For Installer and manufacturer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
  - 1. Indicate that bulk-roofing asphalt materials delivered to Project comply with requirements. Include quantity and statistical and descriptive data for each product. Submit certificate with each load before it is used.
  - 2. Include continuous log showing time and temperature for each load of bulk asphalt, indicating date obtained from manufacturer, where held, and how transported before final heating and application on roof.

- H. Research/Evaluation Reports: For components of roofing system.
- I. Maintenance Data: For roofing system to include in maintenance manuals.
- J. Warranties: Special warranties specified in this Section.
- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- B. Technical Inspector Qualifications: CONTRACTOR will engage a qualified manufacturer's technical representative for a minimum of 5 days per 10,000 square feet to perform roof tests and inspections and to prepare test reports. If the technical inspector is not provided by the roofing system manufacturer, an outside qualified inspector can be employed along with a letter from the roof system manufacturer that they will comply with all decisions from the technical inspector and compliance with outside technical inspector will not affect roof system manufacturer's warranty.
- C. Manufacturer Qualifications: A qualified manufacturer that has UL listing for roofing system identical to that used for this Project.
- D. Manufacturer Qualifications: Proof of ISO 9001 quality certification for roof manufacturer providing warranty for the roof system and components.
- E. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated.
- F. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer providing the roof warranty.
- G. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
  - 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
- H. Pre-installation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
  - 1. Meet with OWNER, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
  - 2. Review methods and procedures related to roofing installation, including Section 07511-3

manufacturer's written instructions.

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

#### 1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

#### 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
  1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover boards, and other components of roofing system.
  2. Warranty Period: 20 years from date of Substantial Completion.
  3. Peak Wind Coverage: Up to 115 miles per hour.

- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period: Warranty Period: Two years from date of Substantial Completion.

**PART 2-PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following: The "Basis of Design" specification is based upon TREMCO, Inc. materials and roof systems. Roofing system shall be TREMCO, or equal.
- B. The intent of the specification package is to establish minimum acceptable quality and performance standards for the finished roof replacement project. Subject to compliance with all requirements, any primary manufacturer meeting or exceeding the specification design standard is encouraged to pursue the project.
- C. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection: Products: Subject to compliance with requirements, provide one of the products specified.

**2.2 FINISHED ROOF MEMBRANE PERFORMANCE REQUIREMENTS**

- A. Built Up Roof System (Base+Three (3) ply BUR Membrane)

Property	Typical Value	Test Method
Tensile Strength: @ 0 deg. F	484 lbf/in MD	ASTM D 2523
	428 lbf/in XMD	ASTM D 2523

**2.3 BASE-SHEET MATERIALS**

- A. Base Sheet: Tri-laminate reinforced ply sheet complying with ASTM D 4601-91, ASTM 228-90A, and ASTM 146-90 with the following properties:
  1. Thickness: 1.2 mm.
  2. Breaking strength: 220 lbf/in(38.5 kN/M) MD. 235 lbf/in (41.1 kN/m) XMD.
  3. Elongation: 6.5% MD/XMD.
  4. Tear Strength: 345 lbf (1534 N) MD. 330 lbf (1467 N) XMD minimum.
  5. Mass of desaturated polyester/glass/polyester mat, min.: 3.5 lb/100ft (172 g/m<sup>2</sup>)
  6. Asphalt: 10.0 lb/100 ft (485g/m<sup>2</sup>) minimum.

**2.4 ROOFING MEMBRANE PLIES**

- A. Ply Sheet: ASTM D 2178, Type VI, asphalt-impregnated, glass-fiber felt.

**2.5 FLASHING MATERIALS**

- A. Backer Sheet: ASTM D 2178, Type VI, asphalt-impregnated, glass-fiber felt.

- B. Flashing Sheet: Elastomeric sheeting blend of EPDM and SBR thermoset elastomers. Sheet must be reinforced with polyester woven scrim.
- C. Glass-Fiber Fabric: Woven glass cloth, treated with asphalt, complying with ASTM D 1668, Type I.
- D. Stripping Ply: 6-inch polyester-woven felt.

## 2.6 ASPHALT MATERIALS

- A. Asphalt Primer: ASTM D 41.
- B. Roofing Asphalt: ASTM D 312, Type III.
- C. Roofing Asphalt–Membrane and Flashing Application: SEBS-modified asphalt.

## 2.7 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
- B. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- C. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- D. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM 4470; designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.
- E. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."
- F. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

## 2.8 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation:
  - 1. ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces.
  - 2. Manufacturers: As recommended by Roof System Manufacturer / Warranty Provider.

- C. Cellulosic-Fiber Board Insulation:
  - 1. ASTM C 208, Type II, Grade 1, fibrous-felted wood fiber or other cellulosic-fiber and water-resistant binders, asphalt impregnated, chemically treated for deterioration.
  - 2. Manufacturers: As recommended by Roof System Manufacturer/Warranty Provider.
- D. Provide preformed crickets, tapered-edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- E. Polyisocyanurate Insulation Board: Tapered Board Stock Insulation:
  - 1. Tapered Rate: 1/4 Inch: 12 Inches Slope
  - 2. Minimum Thickness: 1.5 inches at the drain area.
- F. Cover Board: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board, 1/2-inch (13 mm) thick

## 2.9 VENTED BASE-SHEET MATERIALS

- A. Base Sheet to Lightweight Insulating Concrete: Fiberglass-reinforced, nonperforated, embossed-venting base sheet complying with ASTM D 4897, Type II.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470, designed for fastening base sheet to substrate.

## 2.10 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- C. Tapered wedge boards: ASTM C 208, Type II, Grade 1, cellulosic-fiber tapered insulation board.
- D. Wood Nailer Strips: Comply with requirements in Division 6 Section, Miscellaneous Carpentry.

## 2.11 WALKWAYS

- A. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition, slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 1/2-inch (13 mm) thick, minimum. Pad Size: 3 feet by 4 feet.

## PART 3-EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
  - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

### 3.3 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installing roof insulation.
- C. Install one lapped course of base sheet to substrate according to roofing system manufacturer's written instructions.
- D. Insulation Cant Strips: Install and secure preformed 45° wood cant strips at junctures of built-up roofing membrane system with vertical surfaces or angle changes greater than 45°.
- E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- F. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- G. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Set the layer of polyisocyanurate insulation in a solid mopping of Type III asphalt.
  2. Envelope the insulation layers with one ply of 28 pounds roofing felt adhered with a solid mopping of Type III asphalt. The roofing felt shall be applied to the existing new vapor barrier, run up the parapet wall the height of the insulation including the cant and overlapped on top of the new insulation (wood fiberboard) a minimum of 12 inches onto the top layer of insulation.
- H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Stagger joints from joints in insulation below a minimum of 6 inches (150 mm) in each direction. Apply hot roofing asphalt to underside and immediately bond cover board to substrate.

### 3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."
- B. Start installation of built-up roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing built-up roofing system.
- D. Coordinate installing roofing system components so insulation and roofing membrane sheets are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.
  1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
  2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
  3. Remove and discard temporary seals before beginning work on adjoining roofing.
- E. Asphalt Heating: Heat roofing asphalt and apply within plus or minus 25°F (14°C) of equi-viscous temperature unless otherwise required by roofing system manufacture. Do not raise roofing asphalt temperature above equi-viscous temperature range more than 1 hour before time of application. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Do not heat roofing asphalt with 25°F (14°C) of flash point. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.
- F. Asphalt Heating: Heat and apply SEBS-modified roofing asphalt according to roofing system manufacturer's written instructions.
- G. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

### 3.5 ROOFING MEMBRANE INSTALLATION

- A. Install one lapped course of polyester reinforced, tri-laminate base sheet, extending sheet over and terminating beyond cants. Attach base sheet as follows: Adhere to substrate in a solid mopping of hot roofing asphalt.
- B. Install three-ply sheets starting at low point of roofing system. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants. Embed each ply sheet in a solid mopping of hot rubberized asphalt applied at rate required by roofing system manufacturer, to form a uniform membrane without ply sheets touching.
- C. Gravel Surfacing: Promptly after installing and testing roofing membrane, base flashing, and stripping, coat roof surface with rubberized asphalt applied at a rate of approximately 50 to 60 pounds per 100 square feet. Immediately after application of flood coat of roof system broadcast new gravel at a rate of 500 pounds per 100 square feet. Broom the gravel to achieve uniform appearance.

### 3.6 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
  - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
  - 2. Backer Sheet Application: Install backer sheet and adhere to substrate in a solid mopping of hot roofing asphalt.
  - 3. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot rubberized asphalt applied at not less than 425°F (218°C). Apply hot rubberized asphalt to back of flashing sheet if recommended by roofing system manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing. Utilize the built-in nailer below the existing reglet joint. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
- D. Install stripping, according to roofing system manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing. Flashing-Sheet Stripping: Install flashing-sheet stripping in a continuous coating of asphalt roofing cement or in a solid mopping of hot roofing asphalt applied at not less than 425°F (218°C), reinforced with 6-inch polyester felt, and extend onto roofing membrane.
- E. Roof Drains: Set 30-inch by 30-inch (760 mm by 760 mm) metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with stripping and extend a minimum of 4 inches (100 mm) beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring. Install flashing-sheet stripping by same method as installing base flashing.

### 3.7 COATING INSTALLATION

- A. Apply coatings to membrane and base flashings according to manufacturer's written instructions, by spray, roller, or other suitable application method.

### 3.8 WALKWAY INSTALLATION

- A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions. Sweep away loose aggregate surfacing and set walkway pads in additional flood coat of hot roofing asphalt.

### 3.9 FIELD QUALITY CONTROL

- A. Testing Agency: OWNER reserves the right to engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Test Cuts: Before flood coating and surfacing built-up roofing membrane, OWNER reserves the right to test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
  - 1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
  - 2. Test specimens will be examined for inter-ply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to OWNER. Notify OWNER 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, including infrared analysis at CONTRACTOR's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to OWNER.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION  
Section 07511-11

2815.256/181-2017 (Addenda No. 3)

## SECTION 08710

### DOOR HARDWARE

#### 1.01 SUMMARY

- A. Work Included:
  - 1. Hardware to fully equip all doors.
  - 2. Thresholds and weatherstripping.
- B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

#### 1.02 REFERENCES

- A. NFPA 80—Fire Doors and Windows
- B. DHI Installation Guide for Doors and Hardware (1984)
- C. DHI Sequence and Format for the Hardware Schedule (1996)
- D. ANSI/BHMA A156.4 — Door Controls — Closers (2013)
- E. ANSI/BHMA A156.18 — Materials and Finishes (2012)

#### 1.03 REGULATORY REQUIREMENTS

- A. Hardware shall conform to the I.B.C 2012 for requirements applicable to fire-rated doors and frames. Hardware shall comply with NFPA 80 and shall be properly stamped or labeled for easy identification.

### PART 2—PRODUCTS

#### 2.01 LOCKSETS AND LATCHSETS

- A. Locks and latches shall be of one manufacturer as listed for continuity of design and consideration of warranty. Product to be certified and listed by following:
  - 1. Schlage L9000 series mortise lock, no substitutes.
  - 2. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
  - 3. UL/cUL Labeled and listed up to 3 hours for single doors up to 48 inches (1219 mm) in width and up to 96 inches (2438 mm) in height.
- B. Lock and latch function numbers and descriptions of manufacturer's series as listed on door schedule. Material and Design:
  - 1. Non-handed, field reversible without opening lock case.
  - 2. Levers are to be Zinc cast, Forged Brass, or Stainless Steel and plated to match finish designation in hardware sets.
  - 3. Sectional Roses are to be of solid Brass or Stainless Steel material and have a

- minimum diameter of 2-7/16 inches (62 mm).
4. Armor fronts are to be self-adjusting to accommodate a square edge door or a standard 1/8 inch (3 mm) beveled edge door.
- C. Latch and Strike: Stainless Steel latch bolt with minimum of 3/4 inch (19 mm) throw and deadlocking for keyed and exterior functions. Strike is to fit a standard ANSI A115 prep measuring 1-1/4 inches (32 mm) by 4-7/8 inches (124 mm) with proper lip length to protect surrounding trim.
  - D. Cylinders:  
Appropriate cam and blocking rings for proper installation

## 2.02 HINGES

- A. Butt hinges
  1. Type:
    - a. Five-knuckle, full mortise, ball bearing, stainless steel.
    - b. Furnish heavy weight hinges on heavy doors and doors expected to have high frequency use.
  2. Quantity:
    - a. One pair of hinges for all doors up to 5 feet high. Furnish one additional hinge for every 2'-6" in height or fraction thereof.
  3. Size:
    - a. For 1-3/4-inch thick doors up to 3 feet wide: 4 inches high.
    - b. For 1-3/4-inch thick doors over 3 feet wide: 5 inches high.
    - c. For all doors over 1-3/4-inches thick: 5-inches high.

## 2.03 DOOR CLOSERS

- A. Surface Door Closers:
  1. Sargent 351 Series or approved equal.
  2. Conform to ANSI/BHMA A156.4 Grade 1.
  3. Heavy duty cast iron, Stainless Steel, or aluminum body closers.
  4. Furnish manufacturers recommended size, arms and configuration for door and frame application required.

## 2.04 KICKPLATES

- A. Where bottom rail allows, furnish 10-inch high kick plates.
- B. Material: 0.050-inch thick stainless steel plates with four beveled edges.
- C. Width: 2-inch less door width on stop (push) side and 1-inch less door width on face (pull) side.

## 2.05 DOOR STOPS

- A. Provide Convex cast wall stops.
- B. Where wall stops cannot be used, use surface overhead stops.
- C. Furnish fastener suitable for wall condition

### Section 08710-2

## 2.06 THRESHOLD AND WEATHERSTRIPPING

### A. Thresholds:

1. Returned closed ends at openings where threshold extends beyond frame face.
2. Door gasketing: BHMA A156; air leakage not to exceed 0.50 c.f.m. per foot of crack length for gasketing as tested according to ASTM E283 with resilient or flexible strips that are easily replaceable and readily available from stocks maintained by manufacturer.

## 2.07 KEYING

A. Existing KABA Gemini key system.

B. Cylinders: Verify with owner number of pins and key system level.

C. Furnish keys in the following quantities:

1. 4 each master keys per new master key set.
2. 2 each change keys each keyed core.

## 2.08 FINISH

### A. Conform to ANSI/BHMA A156.18

1.	Hinges	630	Stain Stainless Steel
		626	Stain Chrome
2.	locks and latches	CL	Clear Anodized Aluminum
		320	Satin Stainless Steel
		320AM	Satin Stainless Steel with Antimicrobial Finish
		630	Satin Stainless Steel
		630Ralm	Powder Coat Satin Stainless Steel Antimicrobial Finish
3.	Exit Devices Steel	630	Stain Stainless
		630Ralm	Powder Coat Satin Stainless Steel Antimicrobial Finish
4.	Door closers	260 CPC SRI	Satin Corm with Clear Powder Coat and Special Rust Inhibitor
5.	Protection Plates	630	Satin Stainless Steel
6.	Wall Stops	US32D	Satin Chrome
7.	Threshold	SS	Satin Stainless Steel
8.	Gaskets	AL	Anodized Mil Finished Aluminum
		SS	Stainless Steel

## PART 3-EXECUTION

### 3.01 INSTALLATION

A. Provide finish hardware to fully equip all doors.

B. Install hardware in accordance with manufacturer's instructions.

### 3.02 INSTALLATION

- A. Install hardware in compliance with the DHI publication, Installation Guide for Doors and Hardware.
- B. Drill and countersink items not factory prepared for fasteners.
- C. Mount closers on room-side of corridor doors, inside of exterior doors, and stair-side of stairway doors. Use necessary arms, brackets, spacers and plates to accommodate auxiliary hardware and special applications.
- D. Install fire door assemblies to maintain clearances at door edge to frame and meeting edge of pairs of doors in compliance with NFPA 80, providing 1/8-inch clearance at the hinge edge, lock edge, head and between pairs. Provide maximum 3/4-inch undercut at door bottom. Where panic thresholds are used, undercut door to allow 1/8-inch clearance between door and threshold.
- E. Trim, cut, and notch thresholds and saddles neatly to minimally fit the profile of the door frame. Set thresholds in bed of mastic sealant, forming tight seal between threshold and surface to which set.
- F. Use only fasteners furnished by manufacturer for installation as recommended by manufacturer.
- G. Install blocking material for all wall mounted door stops at height appropriate to contact door trim.
- H. Install weather-strip prior to installation of door closers and exit devices. Do not cut or notch weather-strip.

### 3.03 FIELD QUALITY CONTROL

- A. Verify doors open and close smoothly without rubbing or catching and have positive latching where scheduled. Verify fire rated doors are installed with clearances in compliance with NFPA 80.

### 3.04 FIELD QUALITY CONTROL

- A. Upon substantial completion, make final adjustments to door closers and other items of hardware after balance of heating and ventilating equipment so that the doors close and latch properly.
- B. Clean and polish all exposed hardware surfaces in accordance with manufacturer's recommended procedures.
- C. Clean or repair pencil or tool marks from adjacent surfaces damaged or soiled by work of this Section.
- D. Recycle cardboard boxes and paper products used in packaging and transport of finish hardware.

### 3.05 PROTECTION

- A. Remove hardware prior to painting or finishing door and frame. Wrap or mask exposed hardware that cannot be removed until date of substantial completion to avoid exposure to paint, solvents, and abuse.
- B. Repair or replace hardware damaged during construction at least two weeks prior to date of substantial completion.

### 3.06 ADJUSTING AND CLEANING

- E. Upon substantial completion, make final adjustments to door closers and other items of hardware after balance of heating and ventilating equipment so that the doors close and latch properly.
- F. Clean and polish all exposed hardware surfaces in accordance with manufacturer's recommended procedures.
- G. Clean or repair pencil or tool marks from adjacent surfaces damaged or soiled by work of this Section.
- H. Recycle cardboard boxes and paper products used in packaging and transport of finish hardware.

END OF SECTION

## SECTION 13232

### ANAEROBIC DIGESTER COVER REPAIR AND MODIFICATIONS

#### PART 1–GENERAL

##### 1.01 SUMMARY

- A. Work Included In Lump Sum Bid:
  - 1. Provide all labor material and equipment to remove three 75-foot diameter anaerobic digester floating covers.
  - 2. Surface prepare in accordance with manufacturer's requirements and inspect removed covers by manufacturer and the OWNER, and submittal of manufacturer's inspection report to the OWNER and ENGINEER.
  - 3. Disassembly and proper disposal of cover removal from Digester No. 1.
  - 4. Provide all labor, material, and equipment to renovate two 75-foot diameter anaerobic digester floating covers from Digesters No. 1 and No. 3, reinstall them on Digesters No. 3 and No 1, and return them to operation as specified herein.
  - 5. All Work shall be in accordance with the cover manufacturer's recommendations.
  - 6. Clean the existing covers and perform structural repairs, including removal of the PERTH gas mixing housing and enclosed components, PERTH lances, and interconnecting piping as necessary. Repair cover to gas-tight condition according to manufacturer's recommendations.
  - 7. Perform recommended repairs, CONTRACTOR shall include welding new steel to 20 percent of the ceiling plates and rim skirt surface area.
  - 8. Install new ballast as recommended by manufacturer to revise cover weight.
  - 9. Install new roller guide angles, new rollers, new spring shoes, new entrance hatch, new sampling well covers, gaskets, and new digital Cover Position Indicators (CPI) as required or recommended by the manufacturer.
  - 10. Prepare surface of the covers and repaint per Section 09900.
  - 11. Reinstallation of the covers in the existing digester tanks (No. 3 and No. 1).
  - 12. Testing and start-up of covers by manufacturer.
- B. Work Included Under the Allowances:
  - 1. Perform additional repairs not included in Items 1.01.A.7, 8, and 9 as recommended by manufacturer and as authorized by OWNER, using \$20,000 cash allowance.
  - 2. Allowance: CONTRACTOR shall INCLUDE in Lump Sum Base Bid an allowance of \$20,000 (total) for the repair of the digester covers as recommended by the cover manufacturer that are identified as a result of the on-site inspection and recommended by the cover manufacturer. This allowance only pertains to unidentified repairs and required testing recommended by the cover manufacturer.
- C. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.
- D. CONTRACTOR shall coordinate cover repairs with Section 09900–Painting.
- E. CONTRACTOR shall submit shop drawings from cover manufacturer with inspection report showing detailed drawings with proposed repairs and modifications described herein.

- F. Any and all repairs, modifications, and work performed on the covers shall be coordinated with the cover manufacturer.
- G. Payment:
  - 1. All Work included in paragraph 1.01.A shall be included in the Lump Sum Base Bid.
  - 2. All Work included in paragraph 1.01.B shall be included in the Lump Sum Base Bid as part of Bid Alternative No. 2.

## 1.02 WARRANTY

- A. Standard One Year Warranty: Unless otherwise stated below, manufacturer shall warrant the equipment to be free from defects in material and workmanship for a period of one year from the earlier of either the date established for partial utilization or substantial completion in accordance with GC12.6.

## PART 2-PRODUCTS

### 2.01 MANUFACTURERS

- A. Anaerobic digester covers were manufactured by Envirex. A representative of Envirex (now Evoqua Water Technologies) shall perform digester cover inspection, provide inspection report and provide start-up for each rehabilitated cover. CONTRACTOR shall provide roller guide angles, target plates, spring shoes, roller assemblies, any required guides, entrance hatch, sampling well covers, digital cover position indicators (CPI), ballast and any other cover modification as recommended.

### 2.02 GENERAL

- A. Target Plates: Target plate for ultrasonic cover position indicator shall be fabricated of 1/4-inch A36 steel. Size and location shall be determined by cover manufacturer.
- B. Anchor bolts, washers, and nuts in contact with sludge shall be stainless steel type 314. Others shall be galvanized steel.
- C. Provide swing-joints for 8-inch digester gas line to be installed between floating cover and fixed digester gas pipe on the building roof. Material of construction for body and gasket should be suitable for digester gas service at temperatures up to 100°F.

### 2.03 REPAIRS

- A. Cover Repair and Rehabilitation:
  - 1. Repairs to be made may include, but are not limited to, items such as welding new plates, and replacing guides and rods.
  - 2. Remove the PERTH housing and components and dispose of properly.
  - 3. All structural steel used in the covers shall comply with ASTM A-36 specifications. Steel plate and trusses shall be 1/4-inch minimum thickness.
  - 4. All structural members shall be designed to provide for the covers to be self-supporting when resting on the corbels in an empty digester tank, with maximum possible loadings as follows:
    - a. Dead load and roof load: 40 lb. per sq. ft.
    - b. Live, snow, and vacuum load: 55 lb. per sq. ft.

- c. Total load: 95 lb. per sq. ft.
- 5. All welding, both shop and field, shall be shielded arc welding and shall conform to the latest standards of the American Welding Society for gas-tight welding.
- 6. Additional ballast concrete recommended by the manufacturer shall be added in the attic space to induce a pressure inside the tanks of 11-inches of water column, maximum, with pressure vacuum relief valves set for 10-inches w.c. pressure and 2 inches w.c. vacuum. Operating pressure is 9 inches w.c. Cover manufacturer should verify operating pressures during inspection and document in inspection report.

## 2.04 FINISHES

- A. All surfaces of the covers and shall be prepared and painted as specified:
  - 1. Field surface preparation and painting shall be in accordance with the following specification.
    - a. Exterior–Non Submerged (Digester Cover Roof)
      - (1) Sand Blast Clean SSPC – SP6 Commercial Blast
      - (2) One coat of Tnemec N 69 Epoxoline – 4.0 to 6.0 mils DFT
      - (3) One intermediate coat of Tnemec N 69 – 4.0 to 6.0 mils DFT
      - (4) One final coat of Tnemec 1074 Endurashield – 2.0 to 3.0 mils DFT (color selected by OWNER)
    - b. Interior–Non submerged (Digester Cover Attic Space)
      - (1) Sand Blast Clean per SSPC – SP6 Commercial Blast
      - (2) One prime coat of Tnemec N 69 Epoxoline – 3.0 to 4.0 mils DFT
      - (3) One final coat of Tnemec N 69 Epoxoline – 3.0 to 4.0 mils DFT
    - c. Exterior–Submerged (Bottom of Digester Cover and Rim Skirt)
      - (1) Sand Blast Clean per SSPC – SP10 Near White Blast
      - (2) One prime coat of Tnemec N 69 Epoxoline – 4.0 to 6.0 mils DFT
      - (3) One final coat of Tnemec N 69 Epoxoline – 4.0 to 6.0 mils DFT
  - 2. Spread coarse sand on the last coat of paint over the entire surface of the roof to create a non-slip walking surface. Clean up any excess sand.
- B. It is the intent of this specification that unless otherwise specified, all steel parts of the cover, roller guides, supports, and appurtenances shall be furnished shop-primed, clean, and ready to accept finish painting by CONTRACTOR, with a minimal amount of surface preparation. Preparation and painting shall conform to all requirements and provisions specified in Division 9. Unless otherwise specified, mechanical equipment and accessories shall be furnished with all surfaces (except galvanized, stainless steel, rubber, copper, PVC) prepared in accordance with near white grade SSPC Specification No. 10 removing all dirt, rust scale, and foreign materials. Surface preparation shall be done at such time during the assembly process as to preclude damage to the equipment once assembled. Cleaned surfaces shall then be shop-primed. Shop-priming shall be with one coat of Tnemec N69-1255 Hi-Build Epoxoline primer, or equal, applied to a minimum of 5.0 mils dry thickness. Finish coats shall be applied within a period of 60 days or as otherwise recommended by the paint manufacturer. Primer used shall be compatible with proposed finish coats; CONTRACTOR shall verify.
- C. After all painting is complete, any lightweight insulating concrete that was removed during the repair process shall be replaced.

## PART 3–EXECUTION

### 3.01 REMOVAL AND EXAMINATION

- A. Remove the existing floating covers from the Digester Tanks in accordance with the manufacturer's recommendations. Not more than one primary digester may be down at a time. Refer to Construction Sequence in Section 01010. Prior to preparing the cover for removal, the CONTRACTOR shall disconnect all interfering pipes, cables, and equipment, and drain the contents of the digester.
- B. Prepare covers for removal, including determining proper lifting points, coordination of the lift with the cover manufacturer, removal of ballast, removal of PERTH system, removal of PERTH lances, and cutting lifting holes and/or attaching new lifting lugs as required.
- C. Furnish and erect all cribbing to support the covers in an undamaged state on the ground as shown on the Drawings. Lift and remove the covers, and set the covers on the cribbing. Covers should be high enough such that a man can comfortably walk under the cover.
- D. CONTRACTOR shall clean covers by powerwashing until sufficiently clean for a proper inspection. After cleaning and powerwashing, OWNER, ENGINEER, and qualified representative of digester cover manufacturer, Evoqua Water Technologies, will observe the covers for all possible repairs. The cover manufacturer shall document the inspection and the recommended repairs and repair procedures in a written report issued to OWNER and ENGINEER within one week of the inspection. A verbal report shall be provided within 48 hours of inspection. If unforeseen repairs are required, they shall be paid for as specified below. CONTRACTOR shall provide all equipment and material required for safe performance of the inspection.
- E. Sandblast areas of the cover as needed to reveal the condition of metal surfaces and determine metal thickness.
- F. The inspector shall prepare a written report outlining any repairs that are recommended for the proper operation and rehabilitation of the covers and shall at a minimum address the following conditions:
  - 1. Lower inside of the rim plate.
  - 2. Bottom side of the ceiling plates.
  - 3. Truss cord plates.
  - 4. Inside of the gas dome.
  - 5. Rim plate.
  - 6. Exterior of the cover.
  - 7. Inside attic space.
  - 8. All welded and bolted connections.

### 3.02 REPAIRS AND REFINISHING

- A. All repairs and refinishing shall be as specified in 2.03 and 2.04, respectively.

### 3.03 REINSTALLATION

- A. Prepare the covers for reinstallation, including coordination of the lift with the cover manufacturer, and cutting lifting holes and/or attaching new lifting lugs as required.

- B. Supply and install two new anti-rotation guide brackets for the floating cover digester tank wall. Provide two sets of 2 x 3 x 1/4-inch steel angle wall guides set on tank wall, provided with suitable wall anchors for the digester. Guides shall extend the full range of cover travel.
- C. Replace all equipment and piping that was removed or altered in order to remove the covers, except the PERTH housings.
- D. Perform all miscellaneous work required for the complete restoration of the cover so as to leave the owner with a properly operating cover system.
- E. The reinstalled floating cover shall provide a static gas pressure of at least 1-inch W.C. greater than the specified operating pressure, with a minimum 6-inches of freeboard. The required ballast shall be provided in the form of concrete blocks and shall be structurally supported in the cover framework.
- F. Provide for inspection of the covers after installation by the manufacturer's representative.
- G. Remove and properly dispose of the cribbing system and restore the site to pre-construction conditions.

### 3.04 TESTING

- A. All testing shall be done in accordance with the recommendations of the cover manufacturer. All water and electrical hookups required for testing will be furnished by the OWNER.
- B. Prior to reinstallation of the covers and final touch up painting, and upon completion of all structural rehabilitation work, the cover attic space shall be tested for gas tightness by pressurizing the attic space to 5-inch. water column. The CONTRACTOR shall submit a testing plan to the ENGINEER for review.
  - 1. The test shall be observed by the cover manufacturer and the ENGINEER. All welded seams shall be checked for leaks by means of a soap solution. Any leaks found shall be sealed by rewelding and then retested by the CONTRACTOR until the cover is found to be gas tight by the Manufacturer and the ENGINEER.
  - 2. After satisfactory air tests, the covers shall then be re-installed in the digester and floated on plant water, and all seams tested for water tightness. Leaks found shall be sealed by rewelding and then retested by the CONTRACTOR until the covers are acceptable as water-tight to the Manufacturer and the ENGINEER.
- C. After all ballast has been re-installed (if removed or damaged) and the roof plates re-welded, the attic space shall again be tested for gas tightness. The attic space shall be pressurized to 5-inch water column and welded seams sprayed with a soap suds solution, and leaks or cracks shall be re-welded until the attic space is acceptable as gas tight to the Manufacturer and ENGINEER.
- D. A float test shall be performed across the full range of cover travel to demonstrate that the cover can float, without binding or tipping.
- E. Final touchup paint shall be applied after all testing is completed to the reinstalled roof, and after all rewelding repairs are made to the cover plates, using the same finish coat as for the original repainting.

### 3.05 MANUFACTURER'S SERVICES

- A. Provide manufacturer's services under the provisions of Division 1. Provide a minimum of three trips and four days on site per cover.
- B. Provide a certificate signed by the manufacturer's authorized representative that the covers are properly installed in accordance with the manufacturer's guarantee requirements.

### 3.07 REMOVAL AND DISPOSAL OF COVER

- A. CONTRACTOR shall remove existing digester cover No. 1 from the site and properly dispose of the cover. Cost of removal, disassembly, and proper disposal for this cover shall be included in the Lump Sum Base Bid and not included in Bid Alternative No. 2.

END OF SECTION

## SECTION 15980

### TEMPERATURE CONTROLS AND INSTRUMENTATION

#### PART 1–GENERAL

##### 1.01 SUMMARY

- A. Work Included:
  - 1. Electrical components.
  - 2. Dampers and actuators.
- B. Related Sections and Divisions: Applicable provisions of Division 1 shall govern work in this section.

##### 1.02 SUBMITTALS

- A. Submit under provision of Section 01300–Submittals.
- B. Submittal shall include control schematics with wiring and logic diagrams in addition to equipment information. All wiring shall be color coded and labeled at each end with corresponding numbers in accordance with 15195–Ductwork and Equipment Identification. This numbering shall be shown on the shop and record drawings. Wiring diagrams shall be job-specific and indicate all point-to-point wiring connections. Manufacturer’s standard wiring diagrams are not acceptable.

##### 1.03 QUALITY ASSURANCE

- A. Temperature control equipment including panels and other standard marketed apparatus shall bear the nameplate of the manufacturer. The entire system including temperature control wiring shall be installed by mechanics employed by or under contract to the temperature control provider, a factory-licensed distributor, or factory-licensed dealer. The provider shall be responsible for the quality and satisfactory operation of all materials.
- B. All control panels shall bear a serialized UL label.
- C. Comply with the National Electric Code (NFPA 70) and any and all local codes as applicable to construction of electrical wiring devices, material, and equipment herein specified.

#### PART 2–PRODUCTS

##### 2.01 ELECTRICAL COMPONENTS

- A. Provide electrical work in accordance with Division 16. All line voltage wiring and conduit shall be provided by Division 16 contractor. All low voltage wiring (100 volts and below) shall be provided by temperature controls contractor and be installed in raceways provided by Division 16 contractor.
- B. Provide all components necessary to complete the work of this section including, but not limited to relays, transformers, motors, solenoid valves, starters, switches, override controls,

operator linkages, and associated low voltage wiring. Outdoor wiring and equipment shall be NEMA 4X, or as indicated.

- C. All relays, time clocks, transformers, motors, operator linkages, wiring, etc., not specifically mentioned herein but necessary to make the control system complete and operative in accordance with the sequence of operation shall be provided as part of this section.
- D. All boxes for thermostats shall be provided by Division 16 contractor.
- E. All control and auxiliary relays shall have indicating LEDs.
- F. Pushbuttons shall be heavy-duty, oil-tight, 30 mm, flush head style.
- G. Indicating lights shall be heavy-duty, oil-tight, 30 mm, push-to-test type.
- H. Selector switches shall be heavy-duty, oil-tight, 30 mm.
- I. Temperature control contractor shall utilize a licensed electrician for installation of all conduit and wiring. TCC shall submit name and license number of electrician with shop drawings.

## 2.02 DAMPERS AND ACTUATORS

- A. Outside Air Intake and Exhaust Outlet:
  - 1. Dampers shall be TAMCO Series 9000 BF, Alumavent Series 3900SS, or Arrow AFDTI-25LT, thermally insulated control damper with aluminum construction.
  - 2. Dampers shall be parallel blade.
  - 3. Extruded aluminum (6063T5) damper frame shall be thermally broken, minimum 0.080 inch thickness. Damper frame to be 4 inches deep and shall be insulated with polystyrene on four sides. Damper shall be rated at a leakage of less than 8.0 cfm per square foot at 4.0 inches of water column pressure differential at 20°F.
  - 4. Blades to be extruded aluminum (6063T5), internally insulated with non-CFC, expanded polyurethane foam and shall be thermally broken. Complete blade shall have an insulating factor of R-2.29 and a temperature index of 55.
  - 5. Blade gaskets shall be extruded EPDM; blade seals shall be silicone.
  - 6. Shaft to actuator shall be hex type, material to match damper construction.
  - 7. Side seals shall be silicone.
  - 8. Dampers shall be flanged to duct type. Clear opening in damper shall be same size as ductwork.
- B. Actuators:
  - 1. Actuators shall be Belimo NFBUP, Honeywell MS4110, or Siemens GCA, maintenance-free actuator rated at minimum 88 in-lb. of torque. Dampers shall be power-to-open, spring-closed unless otherwise specified. Provide auxiliary switch where noted on drawings. Actuator shall be capable of accepting 120-volt power for operation and control.
  - 2. Actuators shall include electronic overload protection and visual position indication throughout range of motion.
  - 3. Actuators shall include a manual override via a manufacturer-supplied hex crank.
  - 4. All actuators shall be direct-coupled to damper and mounted outside the air stream utilizing TAMCO motor mounting bracket model AL-0001, or equal unless otherwise noted. CONTRACTOR shall verify suitability of mounting bracket prior to ordering.
  - 5. If auxiliary switch is not used, terminate cord in nearest junction box.

6. All actuators shall be of the same manufacturer. Manufacturer shall be responsible for furnishing quantity of actuators required to meet minimum damper torque rating, plus an additional 10% torque.

### PART 3-EXECUTION

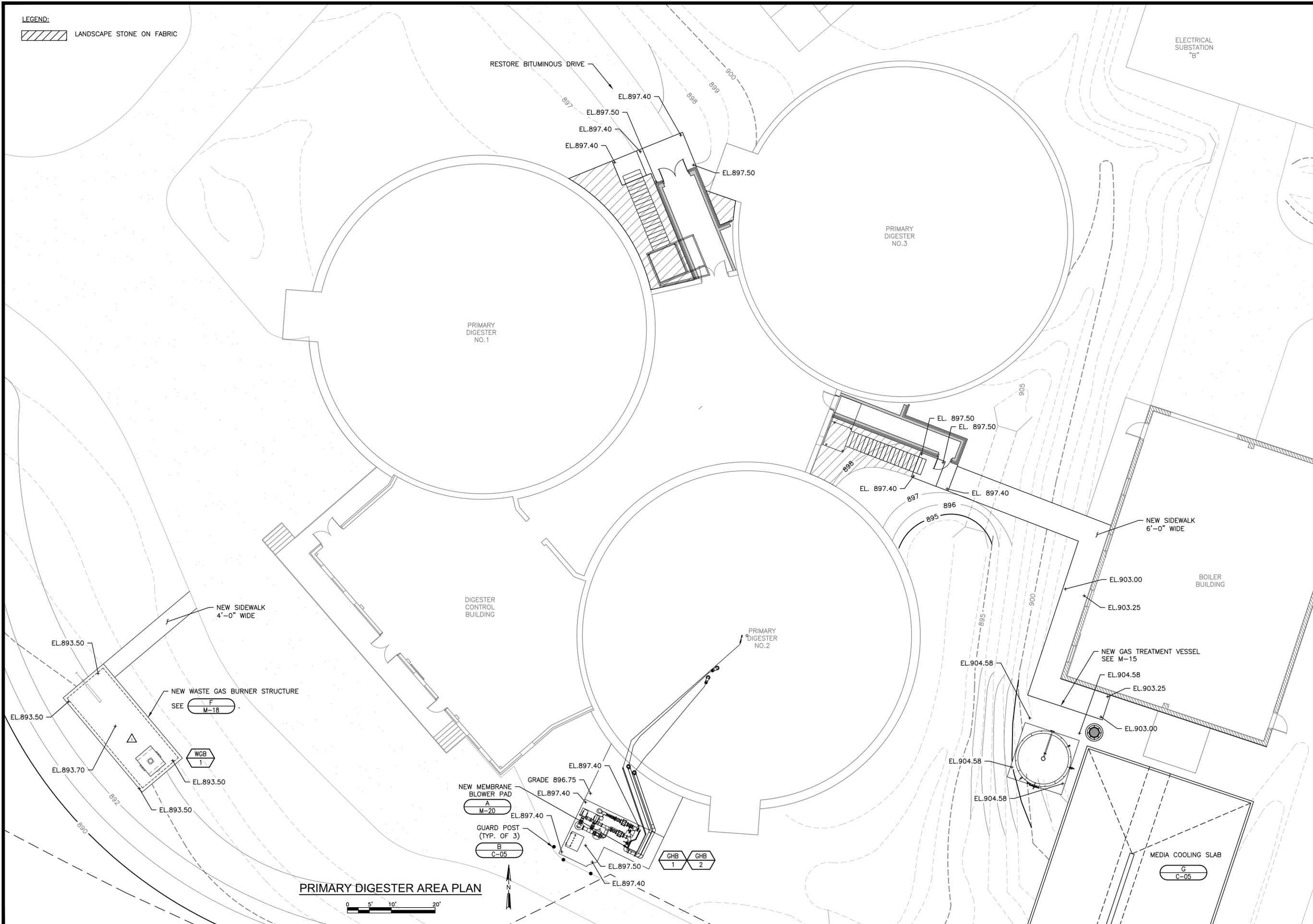
#### 3.01 INSTALLATION

- A. Install all equipment in accordance with manufacturer's recommendations and Division 16.
- B. Install all dampers in accessible locations with ample space to install direct-coupled actuator, housing and accessories.

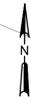
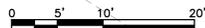
END OF SECTION



LEGEND:  
 LANDSCAPE STONE ON FABRIC



PRIMARY DIGESTER AREA PLAN



STATE OF KENTUCKY  
 EMILY LAUREN EPPERSON  
 33008  
 LICENSED PROFESSIONAL ENGINEER  
 12/13/2017

NO.	REVISIONS	DATE
1	ADDENDUM NO. 2	12/13/17

**SITE GRADING PLAN**  
 TOWN BRANCH WASTEWATER TREATMENT PLANT  
 PRIMARY DIGESTER COMPLEX IMPROVEMENTS PROJECT  
 LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
 LEXINGTON, KENTUCKY

JOB NO.  
2815.256  
 PROJECT MGR.  
MARK SNEVE



SHEET  
**15R**  
 C-4

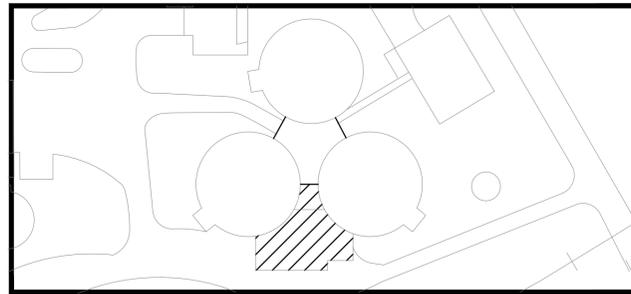


**GENERAL NOTES:**

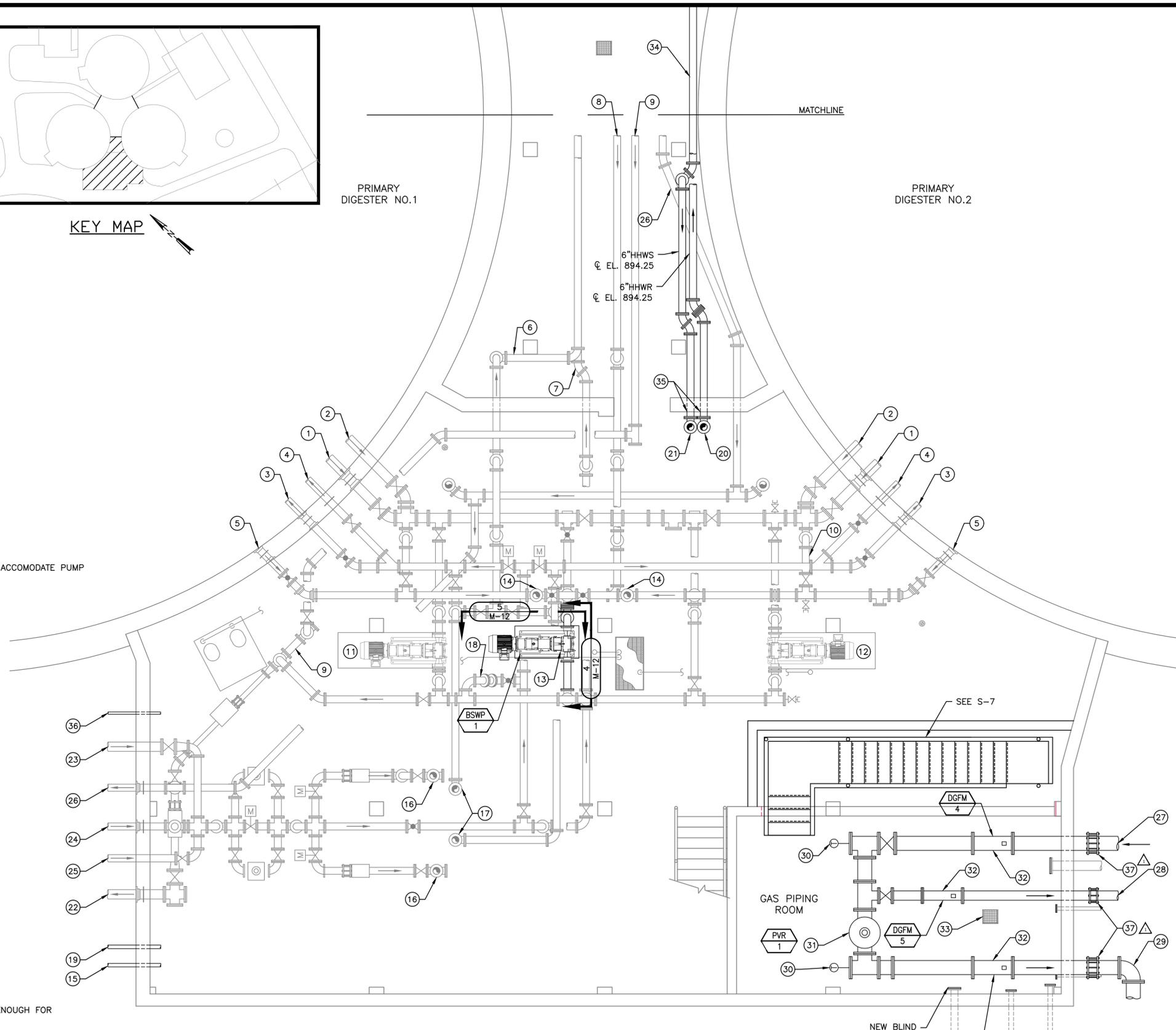
1. SEE DRAWING G-08 FOR DIGESTER GAS PIPING SCHEMATIC. UNLESS OTHERWISE SHOWN, ALL DIGESTER GAS PIPING SHALL BE SLOPED 1/4 INCH PER FOOT. PROVIDE AN AUTOMATIC DRIP TRAP WITH ISOLATION VALVE AT LOW POINTS IN PIPING, EXCEPT WHERE SHOWN, ALL DG PIPING SHALL BE STAINLESS STEEL AS SPECIFIED.
2. GAS SENSING LINES AND VENT LINES SHALL HAVE NO LOW POINTS WHERE MOISTURE CAN ACCUMULATE.
3. DRIP TRAPS IN THE BASEMENT GAS ROOM SHALL BE CONTROLLED BY ONE CONTROL PANEL RATED FOR THE INSTALLATION IN A CLASS 1, DIVISION 1, GROUP C OR D AREA. REFER TO E-02.
4. PIPE SUPPORTS ARE NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR SUPPORT AND SPACING REQUIREMENTS.
5. UNLESS OTHERWISE NOTED OR SHOWN, ALL PIPE PENETRATIONS AT CORED HOLES IN TANK WALLS SHALL BE SEALED WATER TIGHT WITH A DOUBLE MECHANICAL SEAL. ALL PIPE PENETRATIONS AT CORED HOLES IN EXTERIOR BASEMENT WALLS SHALL BE SEALED WATER TIGHT WITH A SINGLE MECHANICAL SEAL.
6. CONTRACTOR SHALL VERIFY LOCATIONS AND SIZES OF PIPE TAPS FOR INSTRUMENTATION AND SMALL DIAMETER PIPING. COORDINATE WITH MANUFACTURERS AND SCHEMATICS IN THESE DRAWINGS.

**KEY NOTES:**

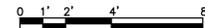
- ① 8" DS DRAWOFF  $\varnothing$  EL. 887.23±.
- ② 8" ALTERNATE DS DRAWOFF  $\varnothing$  EL. 887.23±.
- ③ 6" LOW LEVEL SF  $\varnothing$  EL. 894.00±.
- ④ 6" HIGH LEVEL SF  $\varnothing$  EL. 894.00±.
- ⑤ 6" DS RECIRCULATION SUCTION  $\varnothing$  EL. 895.13±.
- ⑥ 6" DS RECIRCULATION DISCHARGE INTERCONNECT TO DIGESTER NO.3  $\varnothing$  EL. 894.50±.
- ⑦ 6" SF TO DIGESTER NO.3  $\varnothing$  EL. 893.70±.
- ⑧ 6" DS RECIRCULATION SUCTION INTERCONNECT FROM DIGESTER NO.3  $\varnothing$  EL. 894.50±.
- ⑨ 6" DS WITHDRAWAL TO SECONDARY DIGESTION  $\varnothing$  EL. 894.80±.
- ⑩ 6" ALTERNATE DS RECIRCULATION SUCTION.
- ⑪ SWP NO.1.
- ⑫ SWP NO.2.
- ⑬ INSTALL BACKUP SWP NO.1. MODIFY EXISTING SUCTION AND DISCHARGE PIPING AS NECESSARY TO ACCOMMODATE PUMP PROVIDED.
- ⑭ 6" DS RECIRCULATION TO SRP'S NO.1 & NO.2 AND HTX'S NO.1 & NO.2.
- ⑮ 3" NPW.
- ⑯ 6" SF TO HEAT EXCHANGERS NO.1 & NO.2.
- ⑰ 6" DS RECIRCULATION FROM SRP'S NO.1 & NO.2 & HTX'S NO. 1 & NO. 2.
- ⑱ 6" BACKBLOW PIPING.
- △ ⑲ 3" NG.
- ⑳ 6" HHWR.
- ㉑ 6" HHWS.
- ㉒ 8" DS TO SECONDARY DIGESTION  $\varnothing$  EL. 887.23±.
- ㉓ 8" SF FROM GRAVITY THICKENER BUILDING  $\varnothing$  EL. 890.50±.
- △ ㉔ 6" SF FROM PRIMARY SLUDGE PUMP STATION  $\varnothing$  EL. 890.50±.
- △ ㉕ 6" SF FROM SOLIDS PROCESSING BUILDING  $\varnothing$  EL. 890.50±.
- ㉖ 6" OVERFLOW PIPING  $\varnothing$  EL. 889.00±.
- △ ㉗ 12" DG FROM UPPER LEVEL GAS ROOM.  $\varnothing$  EL. 888.50±.
- △ ㉘ 8" DG TO GAS PURIFIER AND BOILERS.  $\varnothing$  EL. 888.50±.
- △ ㉙ 12" DG TO WASTE GAS BURNER.  $\varnothing$  EL. 888.50±.
- △ ㉚ ELECTRIC ACTUATED DRIP TRAP. TAP INTO BLIND FLANGE AT INVERT AND PIPE TO FLOOR DRAIN.
- ㉛ BACK PRESSURE REGULATOR.
- ㉜ THERMAL MASS FLOW METER.
- ㉝ EXISTING FLOOR DRAIN.
- ㉞ STACKED 6" HHW PIPING. TOP PIPE  $\varnothing$  EL. 894.25±, BOTTOM PIPE  $\varnothing$  EL. 893.25±.
- ㉟ ENLARGE AND REUSE EXISTING HOLES IN WALL FROM OLD 4" PIPE. ADD MASONRY SLEEVE LARGE ENOUGH FOR INSULATED 6" PIPES. TYP. OF 2
- ㊱ 2" PW.
- △ ㊲ PROVIDE SS MDPE TRANSITION FITTING.



KEY MAP



LOWER LEVEL SOUTH MECHANICAL PLAN



DATE:	12/13/17
REVISIONS	
NO.	ADDENDUM NO. 2

**PRIMARY DIGESTER CONTROL BUILDING  
LOWER LEVEL - SOUTH MECHANICAL PLAN**

TOWN BRANCH WASTEWATER TREATMENT PLANT  
PRIMARY DIGESTER COMPLEX IMPROVEMENTS PROJECT  
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
LEXINGTON, KENTUCKY

JOB NO.  
2815.256

PROJECT MGR.  
MARK SNEVE



SHEET  
36R  
M-2

GENERAL NOTES:

1. SEE DRAWING G-8 FOR DG PIPING SCHEMATIC. ALL DG PIPING SHALL SLOPE 1/4"/FT. PROVIDE A DRIP TRAP WITH ISOLATION VALVE AT ALL LOW POINTS IN PIPING WHERE SHOWN. ALL DG PIPING SHALL BE STAINLESS STEEL AS SPECIFIED.
2. PIPE SUPPORTS ARE NOT SHOWN ON THESE DRAWINGS. SEE SPECIFICATIONS FOR SUPPORT AND SPACING REQUIREMENTS. ALL PIPING MUST BE SUPPORTED FROM FLOOR IN THIS BUILDING.
3. GAS SENSING LINES AND VENT LINES SHALL HAVE NO LOW POINTS WHERE MOISTURE CAN ACCUMULATE.
4. PROVIDE ISOLATION VALVE FOR EACH DRIP TRAP.

GENERAL NOTES (CONT):

5. AREA WITHIN 10' OF HRSR-1 IS A RATED SPACE. DRIP TRAP FOR HRSR-1 SHALL BE CONTROLLED BY ONE NEMA 4X CONTROL PANEL. SEE SHEET E-8.
6. OVERHEAD VALVES SHALL HAVE CHAINWHEEL OPERATORS.
7. DRIP TRAP DRAIN SHALL DRAIN TO ADJACENT MANHOLE.
8. BURIED HHWR AND HHWS PIPING SHALL BE WRAPPED WITH INSULATION PER SPECIFICATIONS.
9. CONTRACTOR SHALL VERIFY LOCATIONS AND SIZES OF PIPE TAPS FOR INSTRUMENTATION AND SMALL DIAMETER PIPING. COORDINATE WITH MANUFACTURERS AND SCHEMATICS IN THESE DRAWINGS.

GENERAL NOTES (CONT):

10. PROVIDE HEAT TRACING AND INSULATION AS RECOMMENDED BY MANUFACTURER FOR GAS PURIFIER INCLUDING TANK, PIPING, VALVES, AND FITTINGS.
11. PROVIDE DIFFERENTIAL PRESSURE GAUGE BETWEEN GAS PURIFIER TANK INLET AND OUTLET PIPING.
12. VERIFY GAS PURIFIER ELEVATION AND DIMENSIONS WITH EQUIPMENT MANUFACTURER.
13. BOILER EXHAUST STACKS SHALL DISCHARGE DIRECTLY ABOVE THE BOILER OUTLETS. PROVIDE A RAIN HOOD AND EXTEND THE STACK ABOVE ANY OBSTRUCTIONS ON THE ROOF.

GENERAL NOTES (CONT):

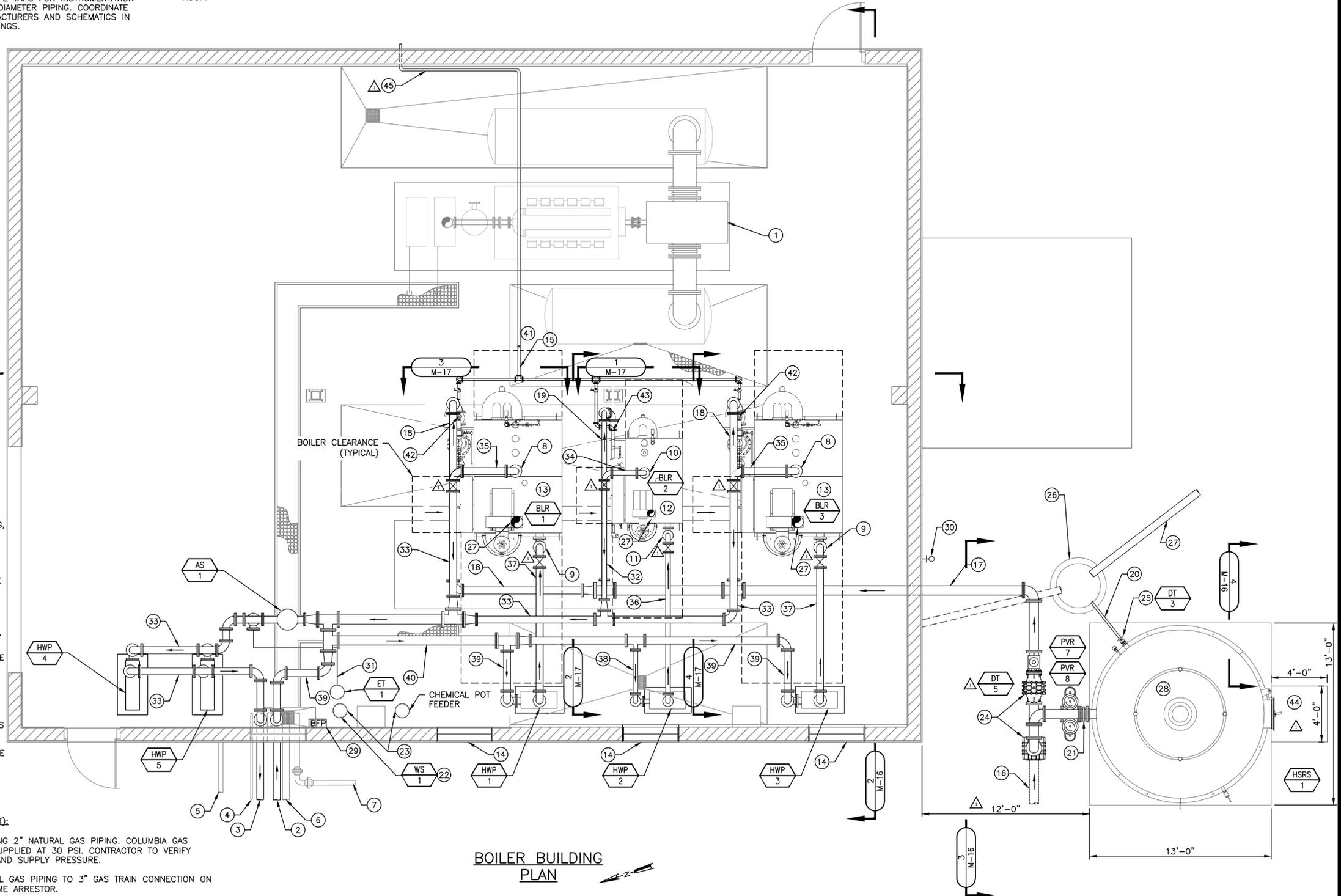
14. PROVIDE A 1'-4" X 1'-4" ROOF OPENING FOR THE EXHAUST STACKS FOR EACH 3.0 MIL BTU/HR BOILER. SEE SECTION A ON SHEET S-16. PROVIDE A 1' X 1' ROOF OPENING FOR THE EXHAUST STACK FOR THE 1.25 MIL BTU/HR BOILER. SEE SECTION B ON SHEET S-16.
15. SEE SHEET E-08 FOR INSTRUMENTATION AND CONTROLS EQUIPMENT RELATED TO THE HYDRONIC SYSTEM.
16. PROVIDE SAMPLE TAPS IN HHWS AND HHWR PIPING WHERE PIPING LEAVES BOILER BUILDING. INCLUDE ISOLATION VALVE AND SAMPLE VALVE.

KEY NOTES:

- 1 ENGINE BLOWER (TO BE REMOVED BY OWNER).
- 2 6" HHWR.
- 3 6" HHWS.
- 4 1 1/2" PW.
- 5 EXISTING 4" DRAIN TO DIGESTER BUILDING.
- 6 REMOVE EXISTING 4" COOLING WATER RETURN TO AERATION STEPS.
- 7 EXISTING 4" RAW WATER FROM NONPOTABLE WATER SYSTEM.
- 8 6" HHWS CONNECTION.
- 9 6" HHWR CONNECTION.
- 10 4" HHWS CONNECTION.
- 11 4" HHWR CONNECTION.
- 12 1.125 MIL BTU/HR DUAL FUEL BOILER.
- 13 3.0 MIL BTU/HR DUAL FUEL BOILER.
- 14 INSTALL LOUVERS FOR BOILER COMBUSTION AIR. SEE TYPICAL LOUVER DETAIL ON SHEET S-16.
- 15 2" NG  $\varnothing$  ELEV. 914.0.
- 16 8" DG FROM BASEMENT GAS ROOM SLOPE TOWARD BASEMENT GAS ROOM.
- 17 8" DG TO BOILERS  $\varnothing$  ELEV 912.0. SLOPE DOWN TO HRSR-1.
- 18 6" DG  $\varnothing$  ELEV. 912.0. SLOPE DOWN TO HRSR-1.
- 19 4" DG  $\varnothing$  ELEV. 912.0. SLOPE DOWN TO HRSR-1.
- 20 2" DRIP TRAP DRAIN LINE TO MANHOLE. HEAT TRACE.
- 21 EXPANSION JOINT AT INLET AND OUTLET CONNECTIONS.
- 22 SUPPLY TO WATER SOFTENER SHALL TIE-IN DOWNSTREAM OF BACKFLOW PREVENTER. SEE BOILER SCHEMATIC FOR ROUTING, SIZING, AND VALVING DETAILS.
- 23 TIE MAKE-UP WATER SUPPLY AND CHEMICAL POT FEEDER INTO HYDRONIC SYSTEM.
- 24 FLAME TRAP ASSEMBLY. PROVIDE DRIP TRAP FOR HORIZONTAL FLAME TRAP ASSEMBLY.
- 25 DRIP TRAP WITH DRAIN CONNECTION. HEAT TRACE.
- 26 INSTALL 4' DIAMETER MANHOLE. CONNECT MEDIA COOLING SLAB TRENCH DRAIN WITH 6" PIPE AND GAS PURIFIER DRIP TRAP WITH 2" PIPE. DRAIN MANHOLE THROUGH BOILER BUILDING FOUNDATION WALL TO SANITARY DRAIN IN FUTURE ENGINE BLOWER INLET OR DISCHARGE SILENCER PITS. BORING REQUIRED.
- 27 6" TRENCH DRAIN DISCHARGE FROM MEDIA COOLING SLAB.
- 28 12' DIAMETER GAS CONDITIONING SYSTEM. HEAT TRACE.
- 29 MOVE BACKFLOW PREVENTER SO IT DOES NOT INTERFERE WITH HHWS AND HHWR PIPING.
- 30 ADD NPW EXTERIOR HOSE BIBB. ROUTE FROM NEAREST NPW SOURCE AND LABEL AS NONPOTABLE.
- 31 1" HHWS  $\varnothing$  ELEV. 912.5.
- 32 4" HHWS  $\varnothing$  ELEV. 915.5.
- 33 6" HHWS  $\varnothing$  ELEV. 915.5.
- 34 4" HHWS  $\varnothing$  ELEV. 915.5.
- 35 6" HHWS  $\varnothing$  ELEV. 915.5.
- 36 4" HHWR  $\varnothing$  ELEV. 913.5.
- 37 6" HHWR  $\varnothing$  ELEV. 913.5.
- 38 4" HHWR  $\varnothing$  ELEV. 915.5.
- 39 6" HHWR  $\varnothing$  ELEV. 915.5.
- 40 8" HHWR  $\varnothing$  ELEV. 915.5.

KEY NOTES (CONT):

- 41 TIE-IN TO EXISTING 2" NATURAL GAS PIPING. COLUMBIA GAS INDICATED GAS SUPPLIED AT 30 PSI. CONTRACTOR TO VERIFY FIELD LOCATION AND SUPPLY PRESSURE.
- 42 CONNECT NATURAL GAS PIPING TO 3" GAS TRAIN CONNECTION ON BOILER WITH FLAME ARRESTOR.
- 43 CONNECT NATURAL GAS PIPING TO 2" GAS TRAIN CONNECTION ON BOILER WITH FLAME ARRESTOR.
- 44 CONCRETE SLAB BELOW ACCESS LADDER.
- 45 CONNECT TO EXISTING NG PIPE AT WALL.



BOILER BUILDING  
PLAN



DATE:	12/13/17
NO.	1
REVISIONS	
ADDENDUM NO. 2	

**BOILER BUILDING  
MECHANICAL PLAN**  
 TOWN BRANCH WASTEWATER TREATMENT PLANT  
 PRIMARY DIGESTER COMPLEX IMPROVEMENTS PROJECT  
 LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
 LEXINGTON, KENTUCKY

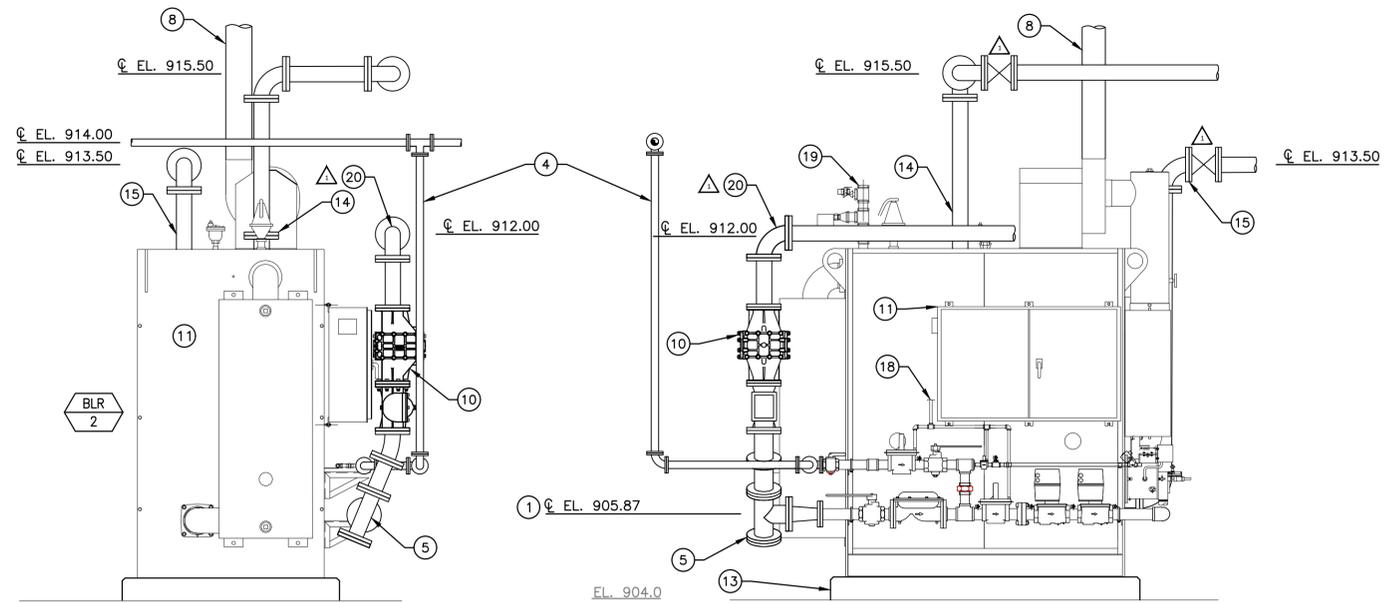
**JOB NO.**  
 2815.256  
**PROJECT MGR.**  
 MARK SNEVE



**SHEET**  
**49R**  
**M-15**

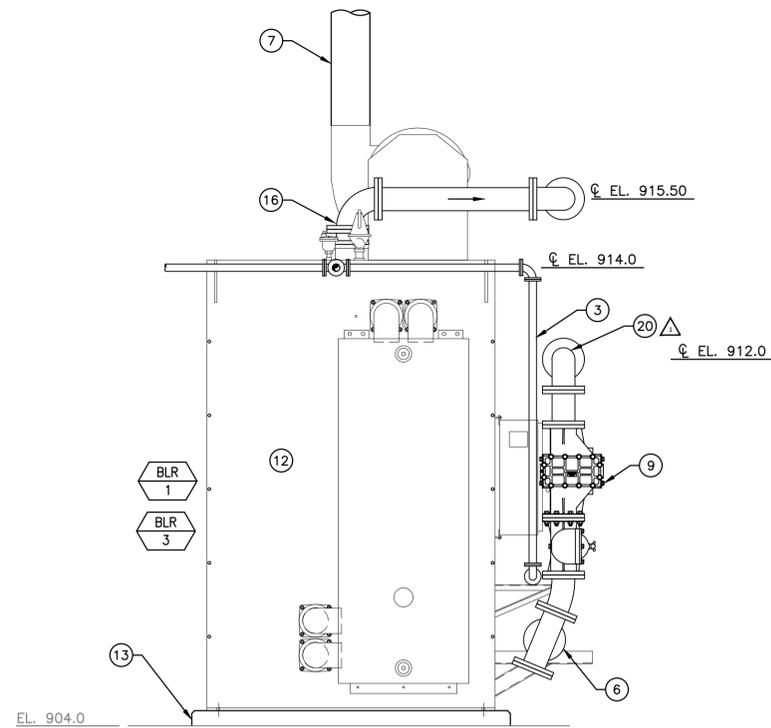
KEY NOTES:

- ① 4" DG PIPING.
- ② 6" DG PIPING.
- ③ 3" NG.
- ④ 2" NG.
- ⑤ 4"x4" TEE WITH BLIND FLANGE ON BOTTOM.
- ⑥ 6"x6" TEE WITH BLIND FLANGE ON BOTTOM.
- ⑦ 9 3/4" BOILER EXHAUST STACK.
- ⑧ 6 1/16" BOILER EXHAUST STACK.
- ⑨ 6" FLAME TRAP ASSEMBLY.
- ⑩ 4" FLAME TRAP ASSEMBLY.
- ⑪ 1.125 MIL BTU/HR DUAL FUEL BOILER.
- ⑫ 3.0 MIL BTU/HR DUAL FUEL BOILER.
- ⑬ CONCRETE EQUIPMENT PAD. A  
M-18
- △⑭ 4" HHWS CONNECTION.
- △⑮ 4" HHWR CONNECTION.
- △⑯ 6" HHWS CONNECTION.
- △⑰ 6" HHWR CONNECTION.
- ⑱ VENT TO OUTSIDE ATMOSPHERE. DO NOT CONNECT TO HEATER EXHAUST STACK.
- ⑲ 2" NPT CONNECTION TO EXPANSION TANK.
- △⑳ HIGH POINT IN DG PIPING. SLOPE BACK TO HSRS-1.

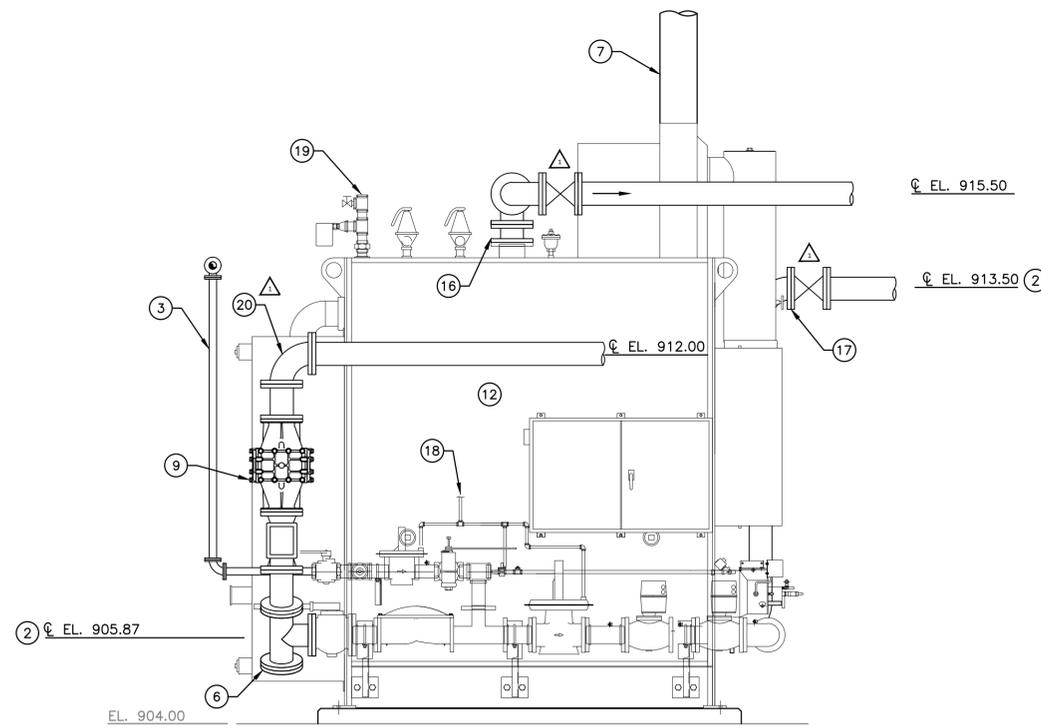


SECTION 1  
NO SCALE M-17

SECTION 2  
NO SCALE M-17



SECTION 3  
NO SCALE M-17



SECTION 4  
NO SCALE M-17



DATE:	12/13/17
REVISIONS	
NO.	ADDENDUM NO. 2

**BOILER BUILDING  
MECHANICAL SECTIONS - 2**

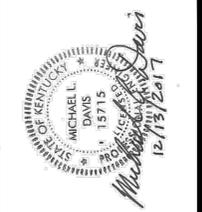
TOWN BRANCH WASTEWATER TREATMENT PLANT  
PRIMARY DIGESTER COMPLEX IMPROVEMENTS PROJECT  
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
LEXINGTON, KENTUCKY

JOB NO.  
2815.256  
PROJECT MGR.  
MARK SNEVE



SHEET  
51R  
M-17





NO.	REVISIONS	DATE
1	ADDENDUM NO. 2	12/13/17

**PRIMARY DIGESTER CONTROL BUILDING  
UPPER LEVEL - NORTH AND SOUTH ELECTRICAL PLAN**

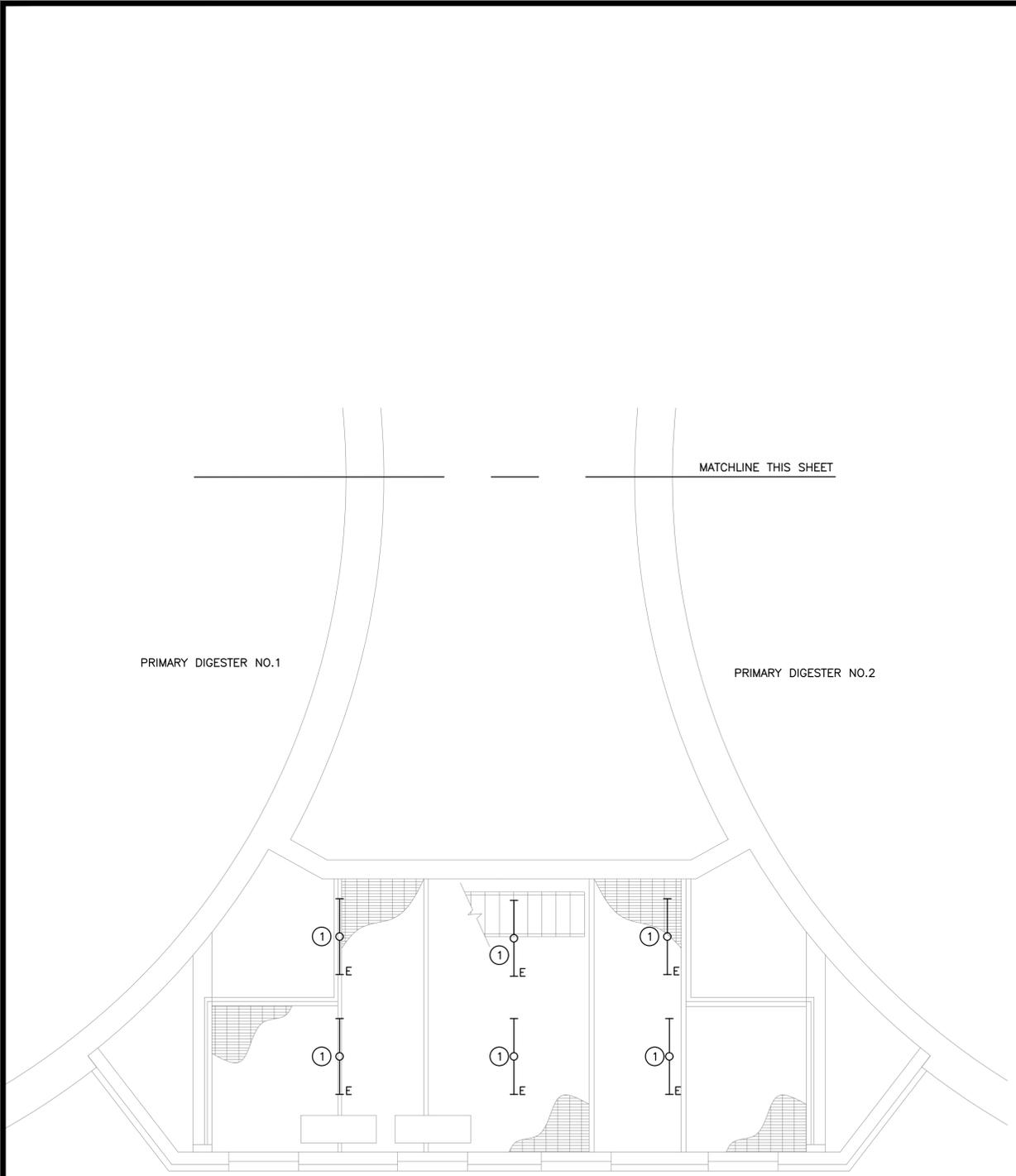
TOWN BRANCH WASTEWATER TREATMENT PLANT  
PRIMARY DIGESTER COMPLEX IMPROVEMENTS PROJECT  
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
LEXINGTON, KENTUCKY

**JOB NO.**  
2815.256

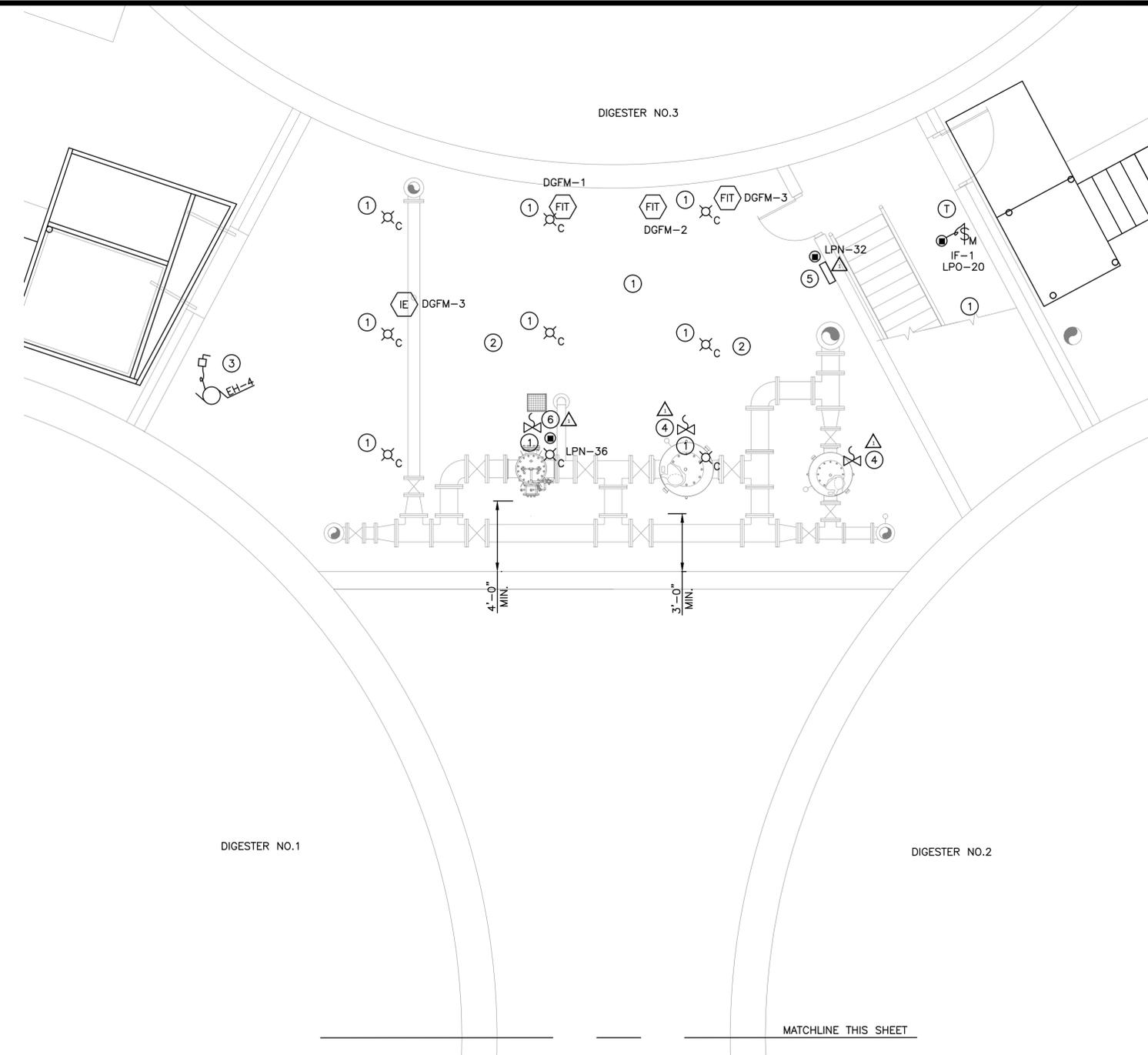
**PROJECT MGR.**  
MARK SNEVE



**SHEET**  
**96R**  
**E-5**



UPPER LEVEL  
SOUTH  
ELECTRICAL PLAN



UPPER LEVEL  
NORTH  
ELECTRICAL PLAN

- KEY NOTES:**
- ① REPLACE EXISTING CEILING MOUNTED LIGHT FIXTURES. REUSE EXISTING CONDUIT AND CONDUCTORS FOR POWER TO LIGHT FIXTURES.
  - ② ALL ELECTRICAL INSTALLATION IN THIS ROOM SHALL BE FOR CLASS 1, DIVISION 2 HAZARDOUS LOCATION.
  - ③ REPLACE EXISTING ELECTRIC UNIT HEATER. REUSE EXISTING CONDUIT AND CONDUCTORS FOR POWER TO HEATER.
  - △ ④ DRIP TRAP SOLENOID VALVE. PROVIDE 2~#12, 3/4" C. TO CONTROL PANEL.
  - △ ⑤ DRIP TRAP CONTROL PANEL.
  - △ ⑥ GAS/FOAM SEPARATOR SOLENOID VALVE AND HIGH/LOW LEVEL FLOAT SWITCHES. PROVIDE 4~#14, 3/4" C. TO TERMINATION CABINET FOR I/O TO SCADA SYSTEM.

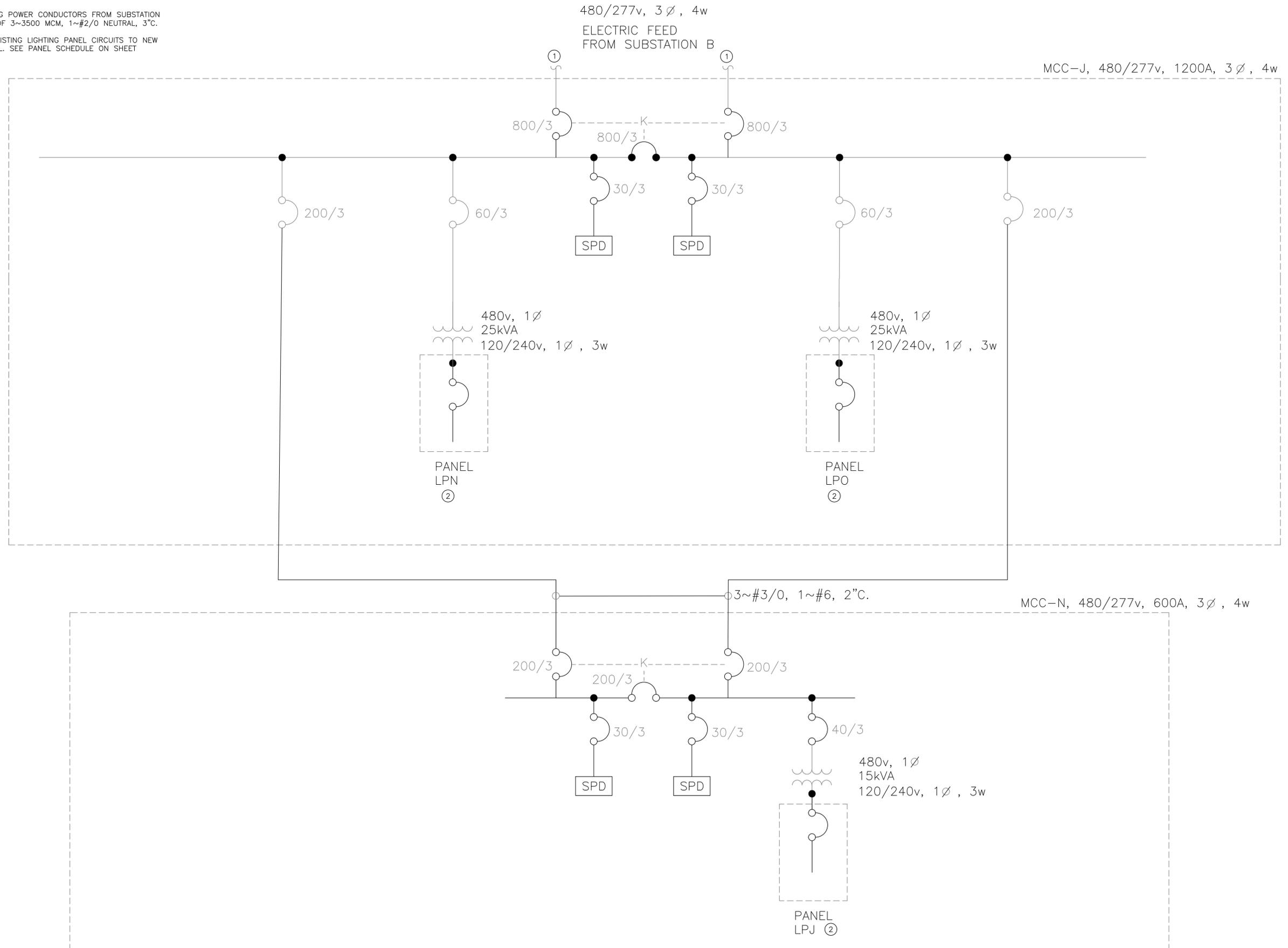
**GENERAL NOTES:**

1. REFER TO SPECIFICATIONS SECTION 16990 FOR WIRING ASSOCIATED WITH THE PLANT SCADA SYSTEM.



KEY NOTES:

- ① REUSE EXISTING POWER CONDUCTORS FROM SUBSTATION B - 3 SETS OF 3~3500 MCM, 1~#2/0 NEUTRAL, 3" C.
- ② RECONNECT EXISTING LIGHTING PANEL CIRCUITS TO NEW LIGHTING PANEL. SEE PANEL SCHEDULE ON SHEET E-13.



NO.	REVISIONS	DATE
1	ADDENDUM NO. 2	12/13/17

**ELECTRICAL DETAILS AND ONE-LINE DIAGRAMS**  
 TOWN BRANCH WASTEWATER TREATMENT PLANT  
 PRIMARY DIGESTER COMPLEX IMPROVEMENTS PROJECT  
 LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT  
 LEXINGTON, KENTUCKY

**JOB NO.**  
2815.256  
**PROJECT MGR.**  
MARK SNEVE



**SHEET**  
103R  
E-12

Town Branch Digester Complex Improvements  
Response to Bidder Questions  
December 15, 2017

1. Section 01650, Page 4 and 5, lists several electrical specifications that don't appear to be in the project or are missing from the specifications: 16523, 16341, 16347, 16348, 16349, 16361, 16720 and 16721. Please resolve the conflict. **References to specification sections that are not applicable are removed by addendum.**

2. We find various descriptions of Bid Alternative #3:

a. Form of Proposal, page P-7 defines Alternate #3 as 'replace all ductile iron piping and valves in the Primary Digester Complex identified on the Drawings, with piping and valves in accordance with Specification Section 15050.'

b. Section 15050, 1.01, C defines this as 'replacing all piping and valves in the Primary Digester Complex that are not already being replaced as part of the Base Bid.'

c. General Note Sheet G-9 states the alternative includes 'replacement of all ductile iron pipe and valves shown as existing'.

d. General Note 7 on Sheet D-8 states the alternative 'include replacement of all ductile iron pipe in digesters'.

The differing descriptions lead to confusion:

(1) What are limits of Primary Digester Complex – is this Primary Digesters 1, 2, 3 and all areas and levels in between?

(2) The difference between 2a and 2b above is substantial. Strict reading of 2a only requires replacement of any pipe or valve that is ductile iron. Strict reading of 2b would mean all piping of any type whether gray iron, cast iron, ductile iron, copper, black/galvanized steel, stainless steel, plastic or otherwise. This would include small diameter piping that exists but isn't shown on the plans. Given the difference in cost between the various descriptions, please consolidate and clarify exactly what is required.

**Bid Alternative 3 includes replacing all ductile iron piping and valves in the Primary Digester Complex (Digester Control Building and Digesters 1, 2 and 3. Wall pipes will not need to be replaced. The Base bid does include some new piping and valves for installation of new equipment. Bid Alternative 3 therefore includes all piping not already being replaced in the base bid. This will be clarified in the addendum.**

3. Section 01010, 1.04, B, 10 effectively places a milestone on placing Digester #2 in service. Digester #2 is currently off-line and may not be out of service for more than 8 months.

a. We assume the 8 months referred to above is from date of Contract start, not whenever LFUCG to it out of service. Please advise if this assumption is incorrect. **Milestone for Digester 2 starts with the Notice to Proceed date.**

b. Given this requirement, we must have Digester #2 work completed in 7 months 2 weeks to permit a 2-week proving period. **Correct.**

c. To meet this will require completing installation of the membrane gas-holding digester cover, blowers GHB-1 and GHB-2, gas pressure/vacuum relief assembly and other work gas safety equipment as a minimum (all shown on Sheet M-9). What other work must be completed to bring Digester #2 back on line – are there pumps, grinders, etc. within Sections 11310, 11316, 11317, 11333, 11382, 11384, 11389 that must be in service before this 8-month milestone is reached? Are there electrical or instrumentation/controls installations (beyond that detailed by sheet E-7) that must be completed to reach this milestone? **All appurtenances for Digester 2 must be ready to place digester 2 into service (structural repairs, new mixing system, cover and appurtenances, recirculation pump, heat exchanger, related electrical and controls. Construction Sequence 3.A.(4) includes the**

**requirement to have the boilers and heat exchanger for Digester 2 ready for use when Digester 2 is placed into service.**

4. Sheet 36 (M-2), shows a Section 4/M-13 cut through the Gas Piping Room. I do not find the Section on Sheet M-13. Neither do I find a section on any plan sheet that seems to be from this location. Please provide. **Addendum 3 will delete the section 4 cut from M-2.**

5. Sheet 13 (C-2) Legend identifies objects to be removed and objects to be demolished. Lines 6, 16, 24 and 25 appear to crosshatched in such manner as to meet criteria for objects to be removed. So do lines 18 and 23 however notes 18 and 23 define these as abandoned. Please clarify if lines are considered as objects (like a waste gas burner or gas holder are objects). Please confirm lines 18 and 23 are not removed, simply abandoned. **Lines 18 and 23 are abandoned in place. They may be partially removed if encountered. Lines are intended to be piping. The waste gas burner and low pressure gas holder are objects and are to be removed.**

6. MOV-1 is shown on plan sheet M-4 and appears to be 6-inch. Spec section 15050, Part 2.03, Paragraph H, note 1 holds a table that lists this valve as 4-inch. Please confirm the size of this valve. **MOV-1 - is 6-inch. This is clarified in Addendum 3.**

7. Plan sheet M-3 show MOV-3 as 6-inch. Spec section 15050, Part 2.03, Paragraph H, note 1 holds a table that lists this valve as 4-inch. Please confirm the size of this valve. **MOV-3 - is 6-inch. This is clarified in Addendum 3.**

8. Plan sheet M-11 shows a drain line from the foam separator. What is the apparatus shown in the drain line after the pipe elbow? **This is a drain sight flow indicator provided by Varec.**

9. Valves MOV-1, 2 and 3 are drawn as 3-way plug valves. I cannot find a specification for the 3-way plug valve. If we are to use the plug valve spec shown in 15050, Part 2.03, Paragraph B, a note would need to be added clarifying that 3-way valves being used with electric motor actuators need to be supplied with metal plugs. When 3-way plug valves are supplied with manual operators, an actuator with a double hand wheel set up is supplied to lift-turn-resent the tapered plug with the resilient facing. Electric actuators have the ability to only turn the valve. Providing a 3-way plug valve with an electric actuator and a metal plug will ensure a smooth operation (the valve will not provide drip tight shut off). If a 3-way plug valve were supplied with electric motor operator AND a resilient faced plug, the tapered plug would rub against the body of the valve, cause excessive wear to the plug, undue stress on the electric actuator and possible damage to the motor. **Please see Section 15510. Modulating valves are butterfly valves. We will clarify 15050 in Addendum 3.**

10. Does the material on this project need to be supplied per the requirements of American Iron and Steel as set forth in House Reform Bill 3547? **No, AIS is not required.**

11. Sheet 58 (S-3) indicates door #109 is to be replaced with a new door. Sheet 72R (S-17, Addendum No. 1) shows door #109 to be infilled with masonry (not replaced). Sheet 61 (S-6) indicates door #109 is to be a new door (not infilled with masonry). Please clarify what is intended with regard to door #109. **Door #109 is to be replaced with a new double door per the Door Schedule on sheet 72R drawing S-17. Section cut A/S-13 indicated on West Entrance Corridor and Stair Plan will be removed.**

12. Section 08221, Article 2.06.C., references Section 08710 (Door Hardware), which is not found elsewhere in the bid documents. Please provide Section 08710. **Door hardware specification will be provided with Addendum 3.**
13. The project bid documents do not include a typical section or similar illustration of the intended asphalt pavement details, and no illustration of intended pavement replacement locations are provided. Please provide applicable information. **New pavement is not anticipated unless damaged during construction. For the new Apron entrance to the gas media slab, follow detail D/C-5. This will be clarified by addendum.**
14. I would like to see the prebid meeting attendee sign in sheet. **This will be attached to Addendum 3.**
15. I would also like to see a few more drawings from Envirex for the existing digester covers. **Existing shop drawings for the covers are available for inspection at the Town Branch WWTP.**
16. Because this project requires an abnormally extensive takeoff, and because the alternates are extremely detailed in their required takeoff, I would request a bid date extension into to mid January 2018. **Bid date changed by Addendum 2.**
17. Note at the bottom of sheet S-23 does not tell us where or how to price the items noted. It just says they are not in the lump sum. Please clarify. **These are being added to the bid form in Addendum 3.**
18. Keynote 2 on sheet S-22 about 1200 helical anchors references an allowance. Please clarify. **These are being added to the bid form in Addendum 3.**
19. Sheet D-2 has a crosshatched pipe at the top of the page that is not labeled. **Those are existing 4-inch hot water supply and return pipes - this will be clarified by Addendum 3.**
20. The M drawings do not clearly indicate what piping is in the base bid and what piping is in alternate 3. Is there any way the pipe could be labeled. Could you label what is in the base bid and then we can assume the rest is in the alternate. **Piping that is shown as new for the purpose of installing new equipment is in the base bid, all other existing piping is part of Bid Alternative 3. This is also stated in Section 15050 part 1.01.**
21. Note 10 & Note 11 on Sheet C-1 is said to be a 6" and 4" SOG. The typical details on Sheet 16 do not have a typical detail for slabs with thickness 6" and 4". Are we to assume the details shown apply to the sidewalks and that the sidewalk concrete is to include fiber? **Yes, detail E/C-5 applies to both note 10 and 11 - this will be clarified by addendum.**
22. Although there is a mix ratio chart provided in the Div.03 Specs, classes of concrete are not assigned anywhere on the plans or within the specifications. Can you please assign? **All concrete is to be Class A (4000 psi).**
23. Is Builders Risk Insurance Required? **Changes included in Addendum 3.**

24. Per the Section 1010 Paragraph 1.04.A.5; Contractor is required to dispose of any “sludge, girt, or other residue that cannot be drained or pumped in its present state”. We understand this to be material as referred to in the pre-bid meeting. Can this material be quantified for bidding purposes, or can it be made an allowance? **No quantity is available. No allowance will be created.**
25. Can you please provide elevations for the infill pits in the Boiler Building, or is the contractor safe to scale the depth of pits using the “Typical Pit Infill Detail” shown sheet 71? **Boiler Building finished floor elevation = 904.00, bottom of pits = 896.00. These are shown on Sheet 50.**
26. In comparing the description of alternates on the Bid Form and the plan notes on sheets S-19, S-20, S-21, and S-22, we believe the Alternate designations to be in error. We believe Notes 1 thru 1C, 2, 3, 4 should fall under Alternate #5. We think Notes 8, 9, 10, 11, 16, 26, and 27 should fall under Alternate #6. **Include Keynotes 3 and 4 on sheets S-19, S-20 and S-22 under Alternate #5 in lieu of Alternate #6. Include Keynote 16 under Alternate #6 in lieu of Base Bid. Keynotes 26 and 27 are to remain under Base Bid. The affected Keynotes are not indicated on drawing S-21. This will be addressed in Addendum 3.**
27. Please confirm that the contractor is not required to remove any pads associated with the existing engine blower or associated equipment, other than Key Note 2, Sheet E-8. **Correct.**
28. Please confirm that the contractor is not required to demo and fill any pits associated with the existing engine blower building not specifically designated on Sheet D-18. **Correct.**
29. Sheet D-18 contains General Note #4 that states to removal all existing electrical equipment and materials back to its source. Is the owner removing complete all the electrical equipment and controls associated with the existing engine blower back to its source, or is it the responsibility of the owner? **The owner is removing electrical controls directly associated with the engine blower. The MCC is being removed by the Contractor as noted on sheet 99.**
30. Is the owner removing the existing engine blower outside filter/silencer unit and pad? **Filter pad and filter will remain.**
31. Can the owner please consider removing Alternate No. 3 from the bid? We find given the information provided and limited section details, no valve schedules etc. a difficult task to get correct. If not willing to remove, can you consider making an allowance? **Bid Alt 3 will remain in the bid.**
32. Can a Valve Schedule be provided for all of the existing valves not a part of the base bid scope but required replaced per Alternate No. 3? **Schedule will not be provided.**
33. We assume cast wall pipe not included in Alternate No. 3? **Correct. Wall pipes will not be replaced in Bid Alt 3 - this will be clarified in Addendum 3.**
34. Can the contractor make return visits to the site, and whom should we contact to make a return visit request? **Yes - coordinate with Tiffany Rank 859.425.2406.**
35. In reviewing the specification section 15250 – Mechanical Insulation, we don’t find the “Heating Hot Water” designated in the insulation schedule provided in paragraph 3.07. What are the insulation and jacketing requirements for the HHWS and HHWR lines? **Will add by addendum, it will be rigid formed Fiberglass, 2-inches thick.**

36. We have reviewed the specification section 13232 – Anaerobic Digester Cover Repair and Modifications, in addition to drawing details. It is unclear to us whether the existing DG gas piping and associated swivel joints between the fixed roof piping and digester lid is to be reused should the repair option be chosen, or replaced with new. Can you please clarify? Is it expected the insulation will be replaced complete should the existing piping be reused? **New Swing joints will be furnished with new piping in either rehab or replace option. See 13232 2.02 ( C).**

37. Has there been any testing done on the existing digester complex to determine if lead paint or asbestos is present? **No.**

38. In the pre-bid meeting, a question was raised regarding the availability of water. It was stated that water is available and would be available for use at no charge. Please confirm the water is free of charge to the contractor for pressure testing pipe, and water for float testing the lids should either rehab or new be selected (Section 13231 & 13232). Per 13231, is pumping the test water to the plant drain system or plant influent consider “properly disposing of the water by the CONTRACTOR”? **Water will be made available at no charge. Will add by addendum. Yes, water can be returned to the plant sewer system at a rate that it can handle.**