ST. TAMMANY PARISH

MICHAEL B. COOPER
PARISH PRESIDENT

November 19, 2024

Please find the following addendum to the below-mentioned BID.

Addendum No.:3

Bid#: 24-62-2

Project Name: Cross Gates Wastewater Treatment Plant Improvements

Bid Due Date: Tuesday, December 3, 2024

GENERAL INFORMATION:

Receipt of this addendum shall be acknowledged by inserting its number and date in the space provided in Section 04 on the Louisiana Uniform Public Bid Form.

1. A Non-Mandatory Pre-Bid was held Friday, November 8th on site. Sign sheet is attached.
2. Section 13 – Technical Specifications - Specification Section 00001 – Table of Contents: Remove this section in its entirety and replace with the revised section included herein. (Attached)
3. Specification Section 09800 – Protective Coatings: Remove this section in its entirety and replace with the revised section included herein. (Attached)
4. Specification Section 15055 – Common Motor Requirements for HVAC Equipment: This section is hereby added to the Bid Proposal documents. (Attached)
5. Specification Section 15061 – Sleeves and Sleeve Seals for HVAC Piping: This section is hereby added to the Bid Proposal documents. (Attached)
6. Specification Section 15075 – Identification for HVAC Piping and Equipment: This section is hereby added to the Bid Proposal documents. (Attached)
7. Specification Section 15670 – Variable Refrigerant Flow HVAC Systems: This section is hereby added to the Bid Proposal documents. (Attached)
8. Drawing Sheet GC-2: Remove this sheet and replace with the revised sheet included herein. (Attached)
9. Drawing Sheet 4M-3: Remove this sheet and replace with the revised sheet included herein. (Attached)
10. Drawing Sheet 5S-1: Remove this sheet and replace with the revised sheet included herein. (Attached)

11. Drawing Sheet 5S-2: Remove this sheet and replace with the revised sheet included herein. (Attached)
12. Drawing Sheet E100: Remove this sheet and replace with the revised sheet included herein. (Attached)
13. Drawing Sheet E200: Remove this sheet and replace with the revised sheet included herein. (Attached)
14. Drawing Sheet E201: Remove this sheet and replace with the revised sheet included herein. (Attached)
15. Drawing Sheet E202: Remove this sheet and replace with the revised sheet included herein. (Attached)
16. Drawing Sheet E203: Remove this sheet and replace with the revised sheet included herein. (Attached)
17. Drawing Sheet E205: Remove this sheet and replace with the revised sheet included herein. (Attached)
18. Drawing Sheet E300: Remove this sheet and replace with the revised sheet included herein. (Attached)
19. Drawing Sheet E400: Remove this sheet and replace with the revised sheet included herein. (Attached)
20. Drawing Sheet E500: Remove this sheet and replace with the revised sheet included herein. (Attached)
21. Drawing Sheet E601: Remove this sheet and replace with the revised sheet included herein. (Attached)
22. Drawing Sheet E602: Remove this sheet and replace with the revised sheet included herein. (Attached)
23. Drawing Sheet E603: Remove this sheet and replace with the revised sheet included herein. (Attached)
24. Drawing Sheet E700: Remove this sheet and replace with the revised sheet included herein. (Attached)
25. Drawing Sheet E701: Remove this sheet and replace with the revised sheet included herein. (Attached)
26. Drawing Sheet E702: Remove this sheet and replace with the revised sheet included herein. (Attached)
27. Drawing Sheet M001 – Legends and Abbreviations: This sheet is hereby added to the Bid Proposal documents. (Attached)
28. Drawing Sheet M101 – Site Plan: This sheet is hereby added to the Bid Proposal documents. (Attached)
29. Drawing Sheet M201 – Floor Plan, Details, and Schedules: This sheet is hereby added to the Bid Proposal documents. (Attached)
30. Drawing Sheet G-2: Add the following to the General Notes:
"23. The owner will pump the water and sludge from Plant 1 into Plants 2 and 3 prior to Notice to Proceed. During construction, the owner will address and manage sludge

wasting using Plants 2 and 3. After Plant 1 is complete and has been started up, sludge and water from Plants 2 and 3 will be pumped into the new Plant 1 prior to demo of Plants 2 and 3."

QUESTIONS & ANSWERS:

QUESTION 1: There is a discrepancy between the 2 views of the lift station plan. One view shows the discharge pipe above-ground connections to be 6". The other view shows everything above ground to be 4", with the exception of the 2 check valves and the 2 - 90^{o} elbows, located between the Tee & the Plug valves. Those are shown to be 6". Which is the correct size?
ANSWER 1: All of the piping and valves are 4". See revised Sheet 4M-3 included herein.

QUESTION 2: The pump station Data Table shows pump discharge size as 3" that then increases to 4" pipe to the top of the lift station. Would a 4" pump discharge size be acceptable?
ANSWER 2: The 3" discharge in the Data Table was incorrect. The correct discharge size for the specified pump is 4". See revised Sheet 4M-3 included herein.

QUESTION 3: Does this project have AIS or domestic requirements? Section 12 para. 11 suggests domestic preferences, but does not necessarily say it is a requirement.
ANSWER 3: There are no other requirements except what is shown in Section 12.

QUESTION 4: Please confirm the job is not sales tax exempt.
ANSWER 4: See Section 2, Instructions to Bidders, Paragraph 11 which reads in part "…The price in the Bid shall include all costs necessary for the complete performance of the Work in full conformity with the conditions of the Contract Documents, and shall include all applicable Federal, State, Parish, Municipal or other taxes…"

QUESTION 5: Are there design drawings on the existing plants 1, 2, & 3 that can be shared for our demolition take off?
ANSWER 5: Design drawings for Plant 3 are included as part of this addendum. There are no drawings available for Plant 1 & 2. Contractors should visit the project site to familiarize themselves with the existing structures and make their best judgement concerning the effort required to properly demolish them.

QUESTION 6: Who will be responsible for pumping the existing water and sludge out of the plants to be demolished?

ANSWER 6: The owner will pump the water and sludge from Plant 1 into Plants 2 and 3 prior to Notice to Proceed. During construction, the owner will address and manage sludge wasting using Plants 2 and 3. After Plant 1 is complete and has been started up, sludge and water from Plants 2 and 3 will be pumped into the new Plant 1 prior to demo of Plants 2 and 3. The amount of sludge to be hauled off by the contractor during demo will be minimized.

ATTACHMENTS:

1. **Pre-Bid Meeting sign in sheet**
2. **Revised Specification Section 00001**
3. **Revised Specification Section 09800**
4. **Specification Section 15055**
5. **Specification Section 15061**
6. **Specification Section 15075**
7. **Specification Section 15670**
8. **Revised Drawing Sheet GC-2**
9. **Revised Drawing Sheet 4M-3**
10. **Revised Drawing Sheet 5S-1**
11. **Revised Drawing Sheet 5S-2**
12. **Revised Drawing Sheet E100**
13. **Revised Drawing Sheet E200**
14. **Revised Drawing Sheet E201**
15. **Revised Drawing Sheet E202**
16. **Revised Drawing Sheet E203**
17. **Revised Drawing Sheet E205**
18. **Revised Drawing Sheet E300**
19. **Revised Drawing Sheet E400**
20. **Revised Drawing Sheet E500**
21. **Revised Drawing Sheet E601**
22. **Revised Drawing Sheet E602**
23. **Revised Drawing Sheet E603**
24. **Revised Drawing Sheet E700**
25. **Revised Drawing Sheet E701**
26. **Revised Drawing Sheet E702**
27. **Drawing Sheet M001**
28. **Drawing Sheet M101**
29. **Drawing Sheet M201**
30. **Drawings for Plant #3**

End of Addendum #3

St. Tammany Parish Government
Office Complex, 21454 Koop Dr.
Mandeville, LA 70471

Pre-Bid Sign-In Sheet

November 8, 2024; 10:00 AM

Cross Gates Wastewater Treatment Plant Improvements; BID No.: Bid # 24-62-2

Name	Company	Email	Phone
Bob Moeinian	St. Parish	BMoeinian@STPGOV.org	985-893-1717
Greg Roch	WPS	greg.roch@wpspump.com	352.368.5784
Glen Smith	Fluid Process & Pumps	GSCFluidProcess.net	504-615-4181
Andrew Hontiveros	STP-DH	AHontiveros@STPGOV.ORG	985-893-1717
Aaron Lofton	Rngd Infrastructure, LLC	ALofton@RNGD.com	903-691-4921
Kevin Drone	Kyle Associates	kdrone@kyleassociates.net	985-727-9377
Zach Lewis	Kyle Associates	zlewis@kyleassociates.net	985-727-9377
Paul Nola	The Lemoine Company	Paul.nola@lemoine.com	225-939-3475
Bradley Cieslinski	Command Construction, LLC	michelle@commandindustries.com	985-778-3484
Anthony Papa	Centric Gulf Coast	anthonyp@centricgc.com	985-788-8606
David Cuniso	Centric	DavidC@Centricgc.com	985-677-1731

SECTION 13 – TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2 – SITE WORK

DIVISION 3 – CONCRETE

DIVISION 4 – NOT USED

DIVISION 5 – METALS

DIVISION 6 – NOT USED

DIVISION 7 – SEALANTS

DIVISION 8 – NOT USED

DIVISION 9 – FINISHES

DIVISION 10 – NOT USED

DIVISION 11 - EQUIPMENT

DIVISION 12-14 – NOT USED

DIVISION 15 – MECHANICAL

DIVISION 16 – ELECTRICAL

DIVISION 17 – INSTRUMENTATION

SECTION 09800 – PROTECTIVE COATINGS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide protective coatings, complete and in place, in accordance with the Contract Documents.

B. Definitions

1. The term “paint,” “coatings,” or “finishes” as used herein, shall include surface treatments, emulsions, enamels, paints, epoxy resins, and all other protective coatings, excepting galvanizing or anodizing, whether used as a pretreatment, primer, intermediate coat, or finish coat.

2. The term “DFT” means minimum dry film thickness, without any negative tolerance.

C. The following surfaces shall not be protective coated:

1. Concrete, unless required by items on the concrete coating schedule below or the Drawings.

2. Stainless steel

3. Machined surfaces

4. Grease fittings

5. Glass

6. Equipment nameplates

7. Platform gratings, stair treads, door thresholds, and other walk surfaces, unless specifically indicated to be coated.

D. The coating system schedules summarize the surfaces to be coated, the required surface preparation, and the coating systems to be applied. Coating notes on the Drawings are used to show or extend the limits of coating schedules, to show exceptions to the schedules, or to clarify or show details for application of the coating systems.

E. Where protective coatings are to be performed by a subcontractor, the subcontractor shall provide 5 references which show that the painting subcontractor has previous successful experience with the indicated or comparable coating systems. Include the name, address, and the telephone number for the owner of each installation for which the painting subcontractor provided the protective coating.

F. Where provisions of this section conflict with provisions specified in sections for packaged equipment, the provisions in those sections shall govern.

1.2 CONTRACTOR SUBMITTALS

A. General: Submittals shall be furnished in accordance with Section 01300 – Contractor Submittals, unless indicated otherwise below.

B. Submittals shall include the following information and be submitted at least 30 days prior to protective coating work:

1. Coating Materials List: Eight copies of a coating materials list showing the manufacturer and the coating number, keyed to the coating systems herein. The list shall be submitted prior to or at the time of submittal of samples.

2. Paint Manufacturer's Information: For each coating system to be used, the following data:

   a. Paint manufacturer's data sheet for each product proposed, including statements on the suitability of the material for the intended use.

   b. Technical and performance information that demonstrates compliance with the system performance and material requirements.

   c. Paint manufacturer's instructions and recommendations on surface preparation and application.

   d. Colors available for each product (where applicable)

   e. Compatibility of shop and field applied coatings (where applicable)

   f. Material Safety Data Sheet for each product used.

C. Samples

1. Two sets of color samples to match each color selected by the ENGINEER from the manufacturer's standard color sheets. If custom mixed colors are indicated, the color samples shall be made using color formulations prepared to match the color samples furnished by the ENGINEER. The color formula shall be shown on the back of each color sample.

1.3 SPECIAL CORRECTION OF DEFECTS REQUIREMENTS

A. Warranty Inspection: A warranty inspection may be conducted during the eleventh month following completion of all coating and painting work. The CONTRACTOR and a representative of the coating material manufacturer shall attend this inspection. All defective work shall be repaired in accordance with these specifications and to the satisfaction of the OWNER. The OWNER may, by written notice to the CONTRACTOR, reschedule the warranty inspection to another date within the one-year correction period, or may cancel the warranty inspection altogether. If a warranty inspection is not held, the CONTRACTOR is not relieved of its responsibilities under the Contract Documents.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Suitability: The CONTRACTOR shall use suitable coating materials as recommended by the manufacturer. Materials shall comply with Volatile Organic Compound (VOC) limits applicable at the Site.

B. Materials Sources: Where manufacturers and product numbers are listed, it is to show the type and quality of coatings that are required. If a named product does not comply with VOC limits in effect at the time of bid opening, that product will not be accepted, and the CONTRACTOR shall propose a substitution product of equal quality that does comply. Unless indicated otherwise, proposed substitute materials will be considered as indicated above. Coating materials shall be materials that have a record of satisfactory performance in industrial plants, manufacturing facilities, and water and wastewater treatment plants.

C. Compatibility: In any coating system only compatible materials from a single manufacturer shall be used in the work. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, a

barrier coat shall be applied between existing prime coat and subsequent field coats to ensure compatibility.

D. Containers: Coating materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacturer, and name of manufacturer, all of which shall be plainly legible at the time of use.

E. Colors: All colors and shades of colors of all coats of paint shall be as indicated or selected by the ENGINEER. Each coat shall be of a slightly different shade, to facilitate inspection of surface coverage of each coat. Finish colors shall be as selected from the manufacturer's standard color samples by the ENGINEER.

F. Substitute or "Or-Equal" Products

1. To establish equality under Section 01600 – Products, Materials, Equipment, and Substitutions, the CONTRACTOR shall furnish satisfactory documentation from the manufacturer of the proposed substitute or "or-equal" product that the material meets the indicated requirements and is equivalent or better in the following properties:

    a. Quality

    b. Durability

    c. Resistance to abrasion and physical damage

    d. Life expectancy

    e. Ability to recoat in future

    f. Solids content by volume

    g. Dry film thickness per coat

    h. Compatibility with other coatings

    i. Suitability for the intended service

    j. Resistance to chemical attack

    k. Temperature limitations in service and during application

    l. Type and quality of recommended undercoats and topcoats

    m. Ease of application

    n. Ease of repairing damaged areas

    o. Stability of colors

    p. Test data as required by the engineer

2. Protective coating materials shall be standard products produced by recognized manufacturers who are regularly engaged in production of such materials for essentially identical service conditions. Where requested, the CONTRACTOR shall provide the ENGINEER with the names of not less than 10 successful

applications of the proposed manufacturer's products that comply with these requirements. No product will be considered that fails to meet the performance of the specified materials.

3. If a proposed substitution requires changes in the WORK, the CONTRACTOR shall bear all such costs involved as part of the WORK.

2.2 INDUSTRIAL COATING SYSTEMS

A. System 1 – Not Used

B. System 2 – Not Used

C. System 3 – Not Used

D. System 4 – Aliphatic Polyurethane: Two component aliphatic acrylic polyurethane coating material shall provide superior color and gloss retention, resistance to splash from acid and alkaline chemicals, resistance to chemical fumes and severe weathering and with a minimum solids content of 58 percent by volume. Primer shall be a rust inhibitive two component epoxy coating with a minimum solids content of 68 percent by volume.

1. Prime coat (Shop and Touch-Up Primer) DFT = 4-5 mils, Tnemec N69, or equal.

2. Intermediate Coat DFT = 4-6 mils, Tnemec N69, or equal.

3. Finish coat (one or more, DFT = 2-3 mils), Tnemec 1094, or equal.

4. Total system DFT = 10-14 mils.

5. More than one finish coat shall be applied as necessary to produce a finish with uniform color and texture.

E. System 5 – Not Used

F. System 6 – Not Used

G. System 7 – Acrylic Latex: Single component, water based acrylic latex with a fungicide additive shall have a minimum solids content of 40 percent by volume. Prime coat shall be as recommended by manufacturer. The coating material shall be available in ANSI safety colors.

1. Prime coat DFT = 2-3 mils, Tnemec 1028/1029, or equal.

2. Finish coat DFT = 2-3 mils, Tnemec 1028/1029, or equal.

3. Total system DFT = 4-6 mils.

H. System 8 – Epoxy, Equipment: Two component, rust inhibitive polyamide cured epoxy coating material shall provide a recoatable finish that is available in a wide selection of colors. The coating material shall have a minimum solids content of 66 percent by volume and be resistant to service conditions of condensing moisture, splash and spillage of lubricating oils, and frequent washdown and cleaning.

1. Prime coat DFT = 3-4 mils, Tnemec N69, or equal.

2. Finish coats (2 or more, DFT = 6-8 mils), Tnemec N69, or equal.

3. Total system DFT = 9-12 mils.

I. System 9 – Not Used

J. System 10 – Not Used

K. System 11 – Not Used

L. System 12 – Not Used

M. System 13 – Aliphatic Polyurethane, Galvanized Metal: Two component aliphatic acrylic polyurethane coating material shall provide superior color and gloss retention, resistance to splash from acid and alkaline chemicals, resistance to chemical fumes and severe weathering and with a minimum solids content of 58 percent by volume. Primer shall be a rust inhibitive two component epoxy coating with a minimum solids content of 68 percent by volume.

1. Prime coat DFT = 2-3 mils, Tnemec N69, or equal.

2. Finish coat (one or more, DFT = 2-3 mils), Tnemec 1094, or equal.

3. Total system DFT = 4-6 mils.

4. More than one finish coat shall be applied as necessary to produce a finish with uniform color and texture.

N. System 14 – Acrylic Latex, Galvanized Metal: Single component, water based acrylic latex shall have a minimum solids content of 40 percent by volume. Primer shall be a single component acrylic latex coating with a minimum solids content of 44 percent by volume.

1. Prime coat DFT = 2-3 mils, Tnemec 115, or equal.

2. Finish coat (one or more, DFT = 2-3 mils), Tnemec 1028, or equal.

3. Total system DFT = 4-6 mils.

2.3 SUBMERGED AND SEVERE SERVICE COATING SYSTEMS

A. Material Sources: The manufacturer's products listed in this paragraph are materials which satisfy the material descriptions of this paragraph and have a documented successful record for long term submerged or severe service conditions. Proposed substitute products will be considered as indicated above.

B. System 100 – 100% Solids Amine Cured Epoxy: High build, amine cured, epoxy resin shall have a solids content of at least 69 percent by volume, and shall be suitable for long-term immersion service in potable water and municipal wastewater.

1. Prime coat (Shop Primer and Field Touch-Up) Tnemec Series N69 (DFT = 3-5 mils), or equal.

2. Intermediate Coat: Tnemec Series 435 (DFT = 12-15 mils), or equal.

3. Finish Coat: Tnemec Series 435 (DFT = 12-15 mils), or equal.

C. System 101 – Amine Cured Epoxy: High build, amine cured, epoxy resin shall have a solids content of at least 69 percent by volume, and shall be suitable for long-term immersion service in potable water and municipal wastewater.

1. Prime coat (Shop Primer and Field Touch-Up) Tnemec Series N69 (DFT = 3-5 mils), or equal.

2. Intermediate Coat: Tnemec Series 104 (DFT = 6-8 mils), or equal.

3. Finish Coat: Tnemec Series 104 (DFT = 6-8 mils), or equal.

D. System 102 – Cold-Applied Tape: Tape coating materials and procedures shall be in accordance with ANSI/AWWA C209. Prefabricated tape shall be Type II. The system shall consist of a primer layer, inner layer tape (35 mils), and an outer layer tape (35 mils), Total system DFT = 70 mils.

E. System 103 – Polyamide Cured Epoxy: High build, polyamide epoxy resin shall have a solids content of at least 56 percent by volume, and shall be suitable for long-term immersion in potable water and municipal wastewater.

1. Prime coat and finish coats (3 or more, DFT = 12 mils), Tnemec Pota-Pox 104, or equal.

F. System 103 – Not Used

G. System 104 – Not Used

H. System 105 – Not Used

I. System 106 – Fusion Bonded Epoxy: The coating material shall be a 100 percent powder epoxy, certified as compliant with NSF Standard 61, applied in accordance with the ANSI/AWWA C213 – Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines, except that the surface preparation shall be as listed in the coating system schedule of this Section. The coating shall be applied using the fluidized bed or electrostatic spray process.

1. Coating DFT = 16 mils, Scotchkote 134 or 206N, or equal.

2. For coating of valves, DFT = 12 mils.

3. Liquid Epoxy: For field repairs, the use of a liquid epoxy will be permitted, applied in not less than 3 coats to provide a DFT of 15 mils. The liquid epoxy shall be a 100 percent solids epoxy recommended by the powder epoxy manufacturer.

J. System 107 – Not Used

2.4 SPECIAL COATING SYSTEMS

A. System 200 – PVC Tape: Prior to wrapping the pipe with PVC tape, the pipe and fittings first shall be primed using a primer recommended by the PVC tape manufacturer. After being primed, the pipe shall be wrapped with a 20-mil adhesive PVC tape, half-lapped, to a total thickness of 40 mils.

B. System 201 – Not Used

C. System 203 – Not Used

D. System 204 – Not Used

E. System 205 – Polyethylene Encasement: Application of polyethylene encasement shall be in accordance with ANSI/AWWA C105 using Method C.

F. System 206 – Not Used

G. System 207 – Not Used

H. System 208 – Aluminum Metal Isolation: Two coats of a high build polyamide epoxy paint, such as Tnemec 66, or equal (8 mils). Total thickness of system DFT = 8.0 mils.

I. System 209 – Not Used

J. System 210 – Not Used

K. System 211 – Acrylic Latex, Drywall: Single component, water-based acrylic latex coating material with a fungicide additive and a minimum solids content of 35 percent by volume. Primer shall be a PVA sealer as recommended by the manufacturer.

1. Prime coat DFT = 1.5 mils, Tnemec Series 51, or equal.

2. Finish coats (two or more, DFT = 6 mils), Tnemec 1029, or equal.

3. Total system DFT = 7.5 mils.

2.5 COATING SYSTEMS FOR EXTERIOR CMU

A. Exterior of CMU Building

1. System Type: Elastomeric

2. Surface Preparation: In accordance with manufacturer's instructions.

3. Block Filler: Series 130 Envirofill 60-80 sq ft/gal

4. 1st Coat: Series 156 Envirocrete 6.0-8.0 dry mils.

5. 2nd Coat: Series 156 Envirocrete 6.0-8.0 dry mils.

6. Total DFT: 12.0 to 16.0 mils (excluding block filler)

7. Finish Color: Manufacturer's standard

PART 3 -- EXECUTION

3.1 MANUFACTURER'S SERVICES

A. The CONTRACTOR shall require the protective coating manufacturer to furnish a qualified technical representative to visit the Site for technical support as may be necessary to resolve field problems attributable or associated with the manufacturer's products.

3.2 WORKMANSHIP

A. Skilled craftsmen and experienced supervision shall be used on all WORK.

B. Coating shall be done in a workmanlike manner so as to produce an even film of uniform thickness. Edges, corners, crevices, and joints shall receive special attention to insure thorough cleaning and an adequate thickness of coating material. The finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. The hiding shall be so complete that the addition of another coat would not increase the hiding. Special attention shall be given to insure that edges, corners,

crevices, welds, and similar areas receive a film thickness equivalent to adjacent areas, and installations shall be protected by the use of drop cloths or other precautionary measures.

C. All damage to surfaces resulting from the WORK shall be cleaned, repaired, and refinished to original condition.

3.3 STORAGE, MIXING, AND THINNING OF MATERIALS

A. Manufacturer's Recommendations: Unless otherwise indicated, the coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protecting its coating shall be strictly observed.

B. All protective coating materials shall be used within the manufacturer's recommended shelf life.

C. Storage and Mixing: Coating materials shall be stored under the conditions recommended by the Material Safety Data Sheets, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings of different manufacturers shall not be mixed together.

3.4 PREPARATION FOR COATING

A. General: All surfaces to receive protective coatings shall be cleaned as indicated prior to application of coatings. The CONTRACTOR shall examine all surfaces to be coated, and shall correct all surface defects before application of any coating material. All marred or abraded spots on shop-primed and on factory-finished surfaces shall receive touch-up restoration prior to any coating application. Surfaces to be coated shall be dry and free of visible dust.

B. Protection of Surfaces Not to be Coated: Surfaces that are not to receive protective coatings shall be protected during surface preparation, cleaning, and coating operations.

C. All hardware, lighting fixtures, switchplates, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not to be painted shall be removed, masked, or otherwise protected. Drop cloths shall be provided to prevent coating materials from falling on or marring adjacent surfaces. The working parts of all mechanical and electrical equipment shall be protected from damage during surface preparation and coating operations. Openings in motors shall be masked to prevent entry of coating or other materials.

D. Care shall be exercised not to damage adjacent work during blast cleaning operations. Spray painting shall be conducted under carefully controlled conditions. The CONTRACTOR shall be fully responsible for and shall promptly repair any and all damage to adjacent work or adjoining property occurring from blast cleaning or coating operations.

E. Protection of Painted Surfaces: Cleaning and coating shall be coordinated so that dust and other contaminants from the cleaning process will not fall on wet, newly coated surfaces.

3.5 SURFACE PREPARATION STANDARDS

A. The following referenced surface preparation specifications of the Steel Structures Painting Council shall form a part of this specification:

1. Solvent Cleaning (SSPC SP1): Removal of oil, grease, soil, salts, and other soluble contaminants by cleaning with solvent, vapor, alkali, emulsion, or steam.

2. Hand Tool Cleaning (SSPC SP2): Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, by hand chipping, scraping, sanding, and wire brushing.

3. Power Tool Cleaning (SSPC SP3): Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, by power tool chipping, descaling, sanding, wire brushing, and grinding.

4. White Metal Blast Cleaning (SSPC SP5): Removal of all visible rust, oil, grease, soil, dust, mill scale, paint, oxides, corrosion products and foreign matter by blast cleaning.

5. Commercial Blast Cleaning (SSPC SP6): Removal of all visible oil, grease, soil, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except that staining shall be limited to no more than 33 percent of each square inch of surface area.

6. Brush-Off Blast Cleaning (SSPC SP7): Removal of all visible oil, grease, soil, dust, loose mill scale, loose rust, and loose paint.

7. Near-White Blast Cleaning (SSPC SP10): Removal of all visible oil, grease, soil, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except that staining shall be limited to no more than 5 percent of each square inch of surface area.

3.6 METAL SURFACE PREPARATION (UNGALVANIZED)

A. The minimum abrasive blasting surface preparation shall be as indicated in the coating system schedules included at the end of this Section. Where there is a conflict between these specifications and the coating manufacturer's printed recommendations for the intended service, the higher degree of cleaning shall apply.

B. Workmanship for metal surface preparation shall be in conformance with the current SSPC Standards and this Section. Blast cleaned surfaces shall match the standard samples available from the National Association of Corrosion Engineers, NACE Standard TM-01-70 - Visual Standard for Surfaces of New Steel Airblast Cleaned with Sand Abrasive and TM-01-75 - Visual Standard for Surfaces of New Steel Centrifugally Blast Cleaned with Steel Grit.

C. All oil, grease, welding fluxes, and other surface contaminants shall be removed by solvent cleaning per SSPC SP1 - Solvent Cleaning prior to blast cleaning.

D. All sharp edges shall be rounded or chamfered and all burrs, and surface defects and weld splatter shall be ground smooth prior to blast cleaning.

E. The type and size of abrasive shall be selected to produce a surface profile that meets the coating manufacturer's recommendation for the particular coating and service conditions. Abrasives for submerged and severe service coating systems shall be clean, hard, sharp cutting crushed slag. Automated blasting systems shall not be used for surfaces that will be in submerged service. Metal shot or grit shall not be used for surfaces that will be in submerged service, even if subsequent abrasive blasting is planned to be one with hard, sharp cutting crushed slag.

F. The abrasive shall not be reused unless an automated blasting system is used for surfaces that will be in non-submerged service. For automated blasting systems, clean oil-free abrasives shall be maintained. The abrasive mix shall include at least 50 percent grit.

G. The CONTRACTOR shall comply with the applicable federal, state, and local air pollution control regulations for blast cleaning.

H. Compressed air for air blast cleaning shall be supplied at adequate pressure from well-maintained compressors equipped with oil and moisture separators that remove at least 95 percent of the contaminants.

I. Surfaces shall be cleaned of all dust and residual particles of the cleaning operation by dry air blast cleaning, vacuuming, or another approved method prior to painting.

J. Enclosed areas and other areas where dust settling is a problem shall be vacuum cleaned and wiped with a tack cloth.

K. Damaged or defective coating shall be removed by the blast clearing to meet the clean surface requirements before recoating.

L. Shop applied coatings of unknown composition shall be completely removed before the indicated coatings are applied. Valves, castings, ductile or cast iron pipe, and fabricated pipe or equipment shall be examined for the presence of shop-applied temporary coatings. Temporary coatings shall be completely removed by solvent cleaning per SSPC SP1 before the abrasive blast cleaning work has been started.

M. All shop primed surface shall be thoroughly cleaned to remove all soluble surface contaminants prior to coatings.

N. All shop primed surfaces that will be submerged or intermittently submerged shall be brush blasted in accordance with SSPC-SP7 with a fine abrasive to properly de-gloss and profile.

3.7 SURFACE PREPARATION FOR GALVANIZED FERROUS METAL

A. Galvanized ferrous metal shall be alkaline cleaned per SSPC SP1 to remove oil, grease, and other contaminants detrimental to adhesion of the protective coating system to be used, followed by brush off blast cleaning per SSPC SP7.

B. Pretreatment coatings of surfaces shall be in accordance with the printed recommendations of the coating manufacturer.

3.8 SURFACE PREPARATION OF FERROUS SURFACES WITH EXISTING COATINGS, EXCLUDING STEEL RESERVOIR INTERIORS

A. General: All grease, oil, heavy chalk, dirt, or other contaminants shall be removed by solvent or detergent cleaning prior to abrasive blast cleaning. The generic type of the existing coatings shall be determined by laboratory testing.

B. Abrasive Blast Cleaning: The CONTRACTOR shall provide the degree of cleaning indicated in the coating system schedule for the entire surface to be coated. If the degree of cleaning is not indicated in the schedule, deteriorated coatings shall be removed by abrasive blast cleaning to SSPC SP6. Areas of tightly adhering coatings shall be cleaned to SSPC SP7, with the remaining thickness of existing coating not to exceed 3 mils.

C. Incompatible Coatings: If coatings to be applied are not compatible with existing coatings the CONTRACTOR shall apply intermediate coatings per the paint manufacturer's recommendation for the indicated coating system or shall completely remove the existing coating prior to abrasive blast cleaning. A small trial application shall be conducted for compatibility prior to painting large areas.

D. Unknown Coatings: Coatings of unknown composition shall be completely removed prior to application of new coatings.

E. Water Abrasive or Wet Abrasive Blast Cleaning: Where indicated or where Site conditions do not permit dry abrasive blasting for industrial coating systems due to dust or air pollution considerations, water abrasive blasting or wet abrasive blasting may be used. In both methods, paint-compatible corrosion inhibitors shall be used, and coating application shall begin as soon as the surfaces are dry. Water abrasive

blasting shall be done using high pressure water with sand injection. In both methods, the equipment used shall be commercially produced equipment with a successful service record. Wet blasting methods shall not be used for submerged and severe service coating systems unless indicated.

3.9 CONCRETE AND CONCRETE BLOCK MASONRY SURFACE PREPARATION

A. Concrete Block

1. Allow new mortar to cure a minimum of 14 days prior to coating.

2. Level protrusions and mortar spatter.

B. Nonsubmerged Concrete

1. Surface preparation shall not begin until at least 28 days after the concrete or masonry has been placed. Verify moisture levels are within the limitations of the coating manufacturer.

2. All oil, grease, and form release and curing compounds shall be removed by detergent cleaning before abrasive blast cleaning.

3. Concrete surfaces to be coated shall be abrasive blast cleaned to remove existing coatings, laitance, deteriorated concrete, and to roughen the surface equivalent to the surface of the No. 80 grit flint sandpaper.

C. Submerged Concrete

1. Surface preparation shall not begin until at least 28 days after the concrete or masonry has been placed. Verify moisture levels are within the limitations of the coating manufacturer.

2. All oil, grease, and form release and curing compounds shall be removed by detergent cleaning before abrasive blast cleaning.

3. Concrete surfaces to be coated shall be abrasive blast cleaned to remove existing coatings, laitance, sealers, deteriorated concrete, and to roughen the surface equivalent to ICRI CSP 5.

D. Surfaces shall be clean and as recommended by the coating manufacturer before coating is started.

E. Unless required for proper adhesion, surfaces shall be dry prior to coating. The presence of moisture shall be determined with a moisture detection device such as Delmhorst Model DB, or equal.

3.10 PLASTIC, FIBER GLASS AND NONFERROUS METALS SURFACE PREPARATION

A. Plastic and fiber glass surfaces shall be sanded or brush off blast cleaned prior to solvent cleaning with a chemical compatible with the coating system primer.

B. Non-ferrous metal surfaces shall be solvent-cleaned to remove all soluble surface contaminants followed by brush-off blast cleaning to remove insoluble contaminants and to achieve a uniformly profiled surface.

C. All surfaces shall be clean and dry prior to coating application.

3.11 SHOP COATING REQUIREMENTS

A. Unless otherwise indicated, all items of equipment, or parts of equipment which are not submerged in service, shall be shop primed and then finish coated in the field after installation with the indicated or selected color.

The methods, materials, application equipment and all other details of shop painting shall comply with this section. If the shop primer requires topcoating within a specified period of time, the equipment shall be finish coated in the shop and then touch-up painted after installation.

B. All items of equipment, or parts and surfaces of equipment which are submerged or inside an enclosed hydraulic structure when in service, with the exception of pumps and valves, shall have all surface preparation and coating work performed in the field.

C. The interior surfaces of steel water reservoirs, except for Part A surfaces, shall have all surface preparation and coating work performed in the field.

D. For certain pieces of equipment it may be undesirable or impractical to apply finish coatings in the field. Such equipment may include engine generator sets, equipment such as electrical control panels, switchgear or main control boards, submerged parts of pumps, ferrous metal passages in valves, or other items where it is not possible to obtain the indicated quality in the field. Such equipment shall be primed and finish coated in the shop and touched up in the field with the identical material after installation. The CONTRACTOR shall require the manufacturer of each such piece of equipment to certify as part of its Shop Drawings that the surface preparation is in accordance with these specifications. The coating material data sheet shall be submitted with the Shop Drawings for the equipment.

E. For certain small pieces of equipment the manufacturer may have a standard coating system that is suitable for the intended service conditions. In such cases, the final determination of suitability will be made during review of the Shop Drawing submittals. Equipment of this type generally includes only indoor equipment such as instruments, small compressors, and chemical metering pumps.

F. Shop painted surfaces shall be protected during shipment and handling by suitable provisions including padding, blocking, and the use of canvas or nylon slings. Primed surfaces shall not be exposed to the weather for more than 2 months before being topcoated, or less time if recommended by the coating manufacturer.

G. Damage to shop-applied coatings shall be repaired in accordance with this Section and the coating manufacturer's printed instructions.

H. The CONTRACTOR shall make certain that the shop primers and field topcoats are compatible and meet the requirements of this Section. Copies of applicable coating manufacturer's data sheets shall be submitted with equipment Shop Drawings.

3.12 APPLICATION OF COATINGS

A. The application of protective coatings to steel substrates shall be in accordance with SSPC PA1 – Paint Application Specification No. 1 and in accordance with manufacturer’s instructions.

B. Cleaned surfaces and all coats shall be inspected prior to each succeeding coat. The CONTRACTOR shall schedule such inspection with the ENGINEER in advance.

C. Blast cleaned ferrous metal surfaces shall be painted before any rusting or other deterioration of the surface occurs. Blast cleaning shall be limited to only those surfaces that can be coated in the same working day.

D. Coatings shall be applied in accordance with the manufacturer's instructions and recommendations, and this Section, whichever has the most stringent requirements.

E. Special attention shall be given to edges, angles, weld seams, flanges, nuts and bolts, and other places where insufficient film thicknesses are likely to be present. Use stripe painting for these areas.

F. Special attention shall be given to materials that will be joined so closely that proper surface preparation and application are not possible. Such contact surfaces shall be coated prior to assembly or installation.

G. Finish coats, including touch-up and damage repair coats shall be applied in a manner that will present a uniform texture and color matched appearance.

H. Coatings shall not be applied under the following conditions:

1. Temperature exceeding the manufacturer's recommended maximum and minimum allowable.

2. Dust or smoke laden atmosphere.

3. Damp or humid weather.

4. When the substrate or air temperature is less than 5 degrees F above dewpoint.

5. When air temperature is expected to drop below 40 degrees F or less than 5 degrees F above the dewpoint within 8 hours after application of coating.

6. When wind conditions are not calm.

I. Dewpoint shall be determined by use of a sling psychrometer in conjunction with U.S. Dept. of Commerce, Weather Bureau psychometric tables.

J. Unburied steel piping shall be abrasive blast cleaned and primed before installation.

K. The finish coat on all work shall be applied after all concrete, masonry, and equipment installation is complete and the work areas are clean and dust free.

L. Follow manufacturer’s requirements for recoat windows.

3.13 CURING OF COATINGS

A. The CONTRACTOR shall maintain curing conditions in accordance with the conditions recommended by the coating material manufacturer or by this Section, whichever is the most stringent, prior to placing the completed coating system into service.

B. In the case of enclosed areas, forced air ventilation, using heated air if necessary, may be required until the coatings have fully cured.

C. Forced Air Ventilation of Steel Reservoirs and Enclosed Hydraulic Structures: Forced air ventilation is required for the application and curing of coatings on the interior surfaces of steel reservoirs and enclosed hydraulic structures. During application and curing periods, continuously exhaust air from a manhole in the lowest shell ring, or in the case of an enclosed hydraulic structure, from the lowest level of the structure using portable ducting. After all interior coating operations have been completed, provide a final curing period for a minimum of 10 days, during which the forced ventilation system shall operate continuously. For additional requirements, refer to the specific coating system requirements in Part 2 above.

3.14 IDENTIFICATION OF PIPING

A. Identification of piping shall be in accordance with Section 15005 - Piping Identification Systems.

B. Every valve or connection, where it may be possible for a worker to be exposed to a hazardous substance, shall be labeled per Occupational Safety and Health Standards 29CFR1910.1200.

3.15 SHOP AND FIELD INSPECTION AND TESTING

A. General: The CONTRACTOR shall give the ENGINEER a minimum of 3 days advance notice of the start of any field surface preparation work or coating application work, and a minimum of 7 days advance notice of the start of any shop surface preparation work.

B. All such work shall be performed only in the presence of the ENGINEER, unless the ENGINEER has granted prior approval to perform such work in its absence.

C. Inspection by the ENGINEER, or the waiver of inspection of any particular portion of the WORK, shall not relieve the CONTRACTOR of its responsibility to perform the work in accordance with these Specifications.

D. Scaffolding shall be erected and moved to locations where requested by the ENGINEER to facilitate inspection. Additional illumination shall be furnished to cover all areas to be inspected.

E. Inspection Devices: The CONTRACTOR shall furnish, until final acceptance of such coatings, inspection devices in good working condition for the detection of holidays and measurement of dry-film thicknesses of protective coatings. Dry-film thickness gauges shall be made available for the ENGINEER'S use at all times while coating is being done, until final acceptance of such coatings. The CONTRACTOR shall furnish the services of a trained operator of the holiday detection devices until the final acceptance of such coatings. Holiday detection devices shall be operated only in the presence of the ENGINEER.

F. Holiday Testing: The CONTRACTOR shall holiday test all coated ferrous surfaces inside a steel reservoir, other surfaces which will be submerged in water or other liquids, or surfaces which are enclosed in a vapor space in such structures and surfaces coated with any of the submerged and severe service coating systems. Areas that contain holidays shall be marked and repaired or recoated in accordance with the coating manufacturer's printed instructions and then retested.

1. Coatings With Thickness Exceeding 20 Mils: For surfaces having a total dry film coating thickness exceeding 20 mils: pulse-type holiday detector such as Tinker & Rasor Model AP-W, D.E. Stearns Co. Model 14/20, or equal shall be used. The unit shall be adjusted to operate at the voltage required to cause a spark jump across an air gap equal to twice the required coating thickness.

2. Coatings With Thickness of 20 Mils or Less: For surfaces having a total dry film coating thickness of 20 mils or less: Tinker & Rasor Model M1 non-destructive type holiday detector, K-D Bird Dog, or equal shall be used. The unit shall operate at less than 75-volts. For thicknesses between 10 and 20 mils, a non-sudsing type wetting agent, such as Kodak Photo-Flo, or equal, shall be added to the water prior to wetting the detector sponge.

G. Film Thickness Testing: On ferrous metals, the dry film coating thickness shall be measured in accordance with the SSPC "Paint Application Specification No. 2" using a magnetic-type dry film thickness gauge such as Mikrotest model FM, Elcometer model 111/1EZ, or equal. Each coat shall be tested for the correct thickness. No measurements shall be made until at least 8 hours after application of the coating. On non-ferrous metals and other substrates, the coating thicknesses shall be measured at the time of application using a wet film gauge.

H. Surface Preparation: Evaluation of blast cleaned surface preparation work will be based upon comparison of the blasted surfaces with the standard samples available from the NACE, using NACE standards TM-01-70 and TM-01-75.

3.16 COATING SYSTEM SCHEDULES – FERROUS METALS

A. Coating System Schedule, Ferrous Metal – Not Galvanized:

	Item	Surface Prep.	System No.
FM-1	Surfaces of indoor equipment and piping, not submerged; and all other indoor surfaces not indicated otherwise.	Steel: Commercial blast cleaning SSPC SP6; Ductile iron pipe: Clean as required to remove all soluble surface contaminants. Abrasive blast all surfaces to be coated in accordance with NAPF 500-03-04 to remove all insoluble surface contaminants and to achieve a minimum surface profile of 1.5 mils.	(8) epoxy, equipment
FM-2	Surfaces in chlorination rooms, chlorine storage rooms.	Commercial blast cleaning SSPC SP6	(101) amine-cured epoxy
FM-3	Ferrous metal surfaces and piping submerged or intermittently submerged in wastewater including walls and floors of all treatment structures.	White metal blast cleaning SSPC SP5 and to achieve a minimum 3.0 mil angular surface profile.	(100) 100% solids amine-cured epoxy
FM-3A	Wall and floors of chlorine contact chamber and all piping that is submerged or intermittently submerged in wastewater.	White metal blast cleaning SSPC SP5 and to achieve a minimum 3.0 mil angular surface profile. Ductile iron pipe: Clean as required to remove all soluble surface contaminants. Abrasive blast all surfaces to be coated in accordance with NAPF 500-03-04 to remove all insoluble surface contaminants and to achieve a minimum surface profile of 1.5 mils.	(101) amine-cured epoxy
FM-4	Buried small steel pipe.	Removal of dirt, grease, oil	(200) PVC tape
FM-5	Where indicated, ferrous surfaces in water passages of all	White metal blast cleaning SSPC SP5	(103) polyamide-cured epoxy

	valves 2-inch size and larger, exterior surfaces of submerged valves.		
FM-6	Where indicated, ferrous surfaces in water passages and submerged surfaces of all pumps which have discharge size of 4 inches or larger.	White metal blast cleaning SSPC SP5	(103) amine-cured epoxy
FM-7	Ferrous surfaces of sleeve couplings.	Solvent cleaning SSPC SP1, followed by white metal blast cleaning SSPC-SP10	(106) fusion-bonded epoxy
FM-8	Buried surfaces that are not indicated to be coated elsewhere.	Near white metal blast cleaning SSPC SP10	(101) amine-cured epoxy
FM-9	Buried pipe, pipe couplings, valves, and flanged joints (where piping is ductile or cast iron, not tape-coated), including factory-coated surfaces	As specified by reference specification	(205) polyethylene encasement
FM-10	Surfaces of exterior exposed equipment, piping and tanks not submerged; and all other outdoor surfaces not indicated otherwise.	Steel: Commercial blast cleaning SSPC SP6; Ductile iron pipe: Clean as required to remove all soluble surface contaminants. Abrasive blast all surfaces to be coated in accordance with NAPF 500-03-04 to remove all insoluble surface contaminants and to achieve a minimum surface profile of 1.5 mils.	(4) aliphatic polyurethane

B. Coating System Schedule, Ferrous Metal – Galvanized: Pretreatment coatings, barriers coatings, or washes shall be applied as recommended by the coating manufacturer. All galvanized surfaces shall be coated except for the following items which shall be coated only if required by other Sections: (1) Floor gratings and frames, (2) Handrails, (3) Stair treads, (4) Chain link fencing and appurtenances.

	Item	Surface Prep.	System No.
FMG-1	All exposed surfaces outdoors, except those indicated otherwise.	Solvent cleaning SSPC SP1 followed by brush-off grade blast cleaning SSPC SP7	(13) aliphatic polyurethane, galvanized
FMG-2	All exposed surfaces indoors, except those indicated otherwise.	Clean as required to remove all soluble contaminants; power tool clean as required to remove all insoluble contaminants; treat with Great Lakes Clean 'N Etch, or equal, per manufacturer's recommendations	(14) acrylic latex, galvanized
FMG-2	Surfaces in chlorinator room, chlorine storage room.	Solvent cleaning SSPC SP1 followed by brush-off grade blast cleaning SSPC SP7	(101) amine-cured epoxy
FMG-3	Buried small galvanized steel pipe.	Removal of dirt, grease, oil	(200) PVC tape
FMG-4	Surfaces buried or submerged in water or wastewater, including all surfaces lower than two feet above high water level and all surfaces inside enclosed hydraulic structures and vents.	Solvent cleaning SSPC SP1 followed by brush-off grade blast cleaning SSPC SP7	(101) amine-cured epoxy

3.17 COATING SYSTEM SCHEDULE, NON-FERROUS METAL, PLASTIC, FIBER GLASS

A. Where isolated non-ferrous parts are associated with equipment or piping, the CONTRACTOR shall use the coating system for the adjacent connected surfaces. Do not coat handrails, gratings, frames or hatches. Only primers recommended by the coating manufacturer shall be used.

	Item	Surface Prep.	System No.
NFM-1	All exposed surfaces, indoors and outdoors, except those included below.	Solvent cleaned SSPC SP1	(4) aliphatic polyurethane
NFM-2	Chlorination room, chlorine storage room.	Solvent cleaned SSPC SP1	(101) amine-cured epoxy
NFM-3	Aluminum surfaces in contact with concrete, or with any other metal except galvanized ferrous metal.	Solvent cleaned SSPC SP1	(208) aluminum metal isolation
NFM-4	Polyvinyl chloride plastic piping, indoors and outdoors, or in structures, not submerged.	Solvent cleaned SSPC SP1	(7) acrylic latex
NFM-5	Buried non-ferrous metal pipe.	Removal of dirt, grease, oil	(200) PVC tape

END OF SECTION 09800

SECTION 15055 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on alternating-current power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:

1. Motor controllers.
2. Torque, speed, and horsepower requirements of the load.
3. Ratings and characteristics of supply circuit and required control sequence.
4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with NEMA MG 1 unless otherwise indicated.

B. Comply with IEEE 841 for severe-duty motors.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.

B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

B. Efficiency: Premium efficient, as defined in NEMA MG 1.

C. Service Factor: 1.15.

D. Multispeed Motors: Variable torque.

1. For motors with 2:1 speed ratio, consequent pole, single winding.
2. For motors with other than 2:1 speed ratio, separate winding for each speed.

E. Multispeed Motors: Separate winding for each speed.

F. Rotor: Random-wound, squirrel cage.

G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

H. Temperature Rise: Match insulation rating.

I. Insulation: Class F.

J. Code Letter Designation:

1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
2. Motors Smaller Than 15 HP: Manufacturer's standard starting characteristic.

K. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 ADDITIONAL REQUIREMENTS FOR POLYPHASE MOTORS

A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

B. Motors Used with Variable-Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width-modulated inverters.
2. Premium-Efficient Motors: Class B temperature rise; Class F insulation.
3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

C. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.5 SINGLE-PHASE MOTORS

A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:

1. Permanent-split capacitor.
2. Split phase.
3. Capacitor start, inductor run.
4. Capacitor start, capacitor run.

B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

D. Motors 1/20 HP and Smaller: Shaded-pole type.

E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 15055

SECTION 15061 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Sleeves.
2. Grout.
3. Silicone sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Advance Products & Systems, Inc.
2. CALPICO, Inc.
3. GPT; an EnPro Industries company.

B. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, anti-corrosion coated or zinc coated, with plain ends and integral welded waterstop collar.

C. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

D. PVC Pipe Sleeves: ASTM D 1785, Schedule 40.

2.2 GROUT

A. Description: Nonshrink, recommended for interior and exterior sealing openings in nonfire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.3 SILICONE SEALANTS

A. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 25, use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Dow Corning Corporation.
b. GE Construction Sealants; Momentive Performance Materials Inc.
c. Pecora Corporation.
d. Polymeric Systems, Inc.
e. Schnee-Morehead, Inc., an ITW company.
f. Sherwin-Williams Company (The).

B. Silicone, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT. Grade P Pourable (self-leveling) formulation is for opening in floors and other horizontal surfaces that are not fire rated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. May National Associates, Inc.; a subsidiary of Sika Corporation.

C. Silicone Foam: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Smooth-On.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

A. Install sleeves for piping passing through penetrations in walls.

B. Install sleeves in concrete or block walls as new walls are constructed.

1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
2. Cut sleeves to length for mounting flush with both surfaces.

    a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.

3. Using grout or silicone sealant, seal space outside of sleeves in slabs and walls without sleeve-seal system.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.

B. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.

3.3 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:

1. Exterior Concrete or Block Walls Above Grade:

    a. Piping Smaller Than NPS 6: Steel pipe sleeves.

END OF SECTION 15061

SECTION 15075 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to *this* Section.

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

C. Valve numbering scheme.

D. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. Brimar Industries, Inc.
c. Carlton Industries, LP.
d. Champion America.
e. Craftmark Pipe Markers.
f. emedco.
g. Kolbi Pipe Marker Co.
h. LEM Products Inc.
i. Marking Services, Inc.

j. Seton Identification Products.

2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
3. Letter Color: Black.
4. Background Color: White.
5. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

3.3 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

END OF SECTION 15075

SECTION 15670 – VARIABLE-REFRIGERANT-FLOW HVAC SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes complete VRF HVAC system(s) including, but not limited to the following components to make a complete operating system(s) according to requirements indicated:

1. Indoor, exposed, wall-mounted units.
2. Outdoor, air-source, heat-pump units.
3. System controls.
4. System refrigerant and oil.
5. System condensate drain piping.
6. System refrigerant piping.
7. Metal hangers and supports.
8. Fastener systems.
9. Miscellaneous support materials.
10. Piping and tubing insulation.
11. System control cable and raceways.

1.3 DEFINITIONS

A. Air-Conditioning System Operation: System capable of operation with all zones in cooling only.

B. Heat-Pump System Operation: System capable of operation with all zones in either heating or cooling, but not with simultaneous heating and cooling zones that transfer heat between zones.

C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

D. VRF: Variable refrigerant flow.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for indoor and outdoor units.

2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
3. Include operating performance at design conditions and at extreme maximum and minimum outdoor ambient conditions.
4. Include description of system controllers, dimensions, features, control interfaces and connections, power requirements, and connections.
5. Include refrigerant type and data sheets showing compliance with requirements indicated.
6. Indicate location and type of service access.

B. Shop Drawings: For VRF HVAC systems.

1. Include plans, elevations, sections, and mounting details.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. For Installer: Certificate from VRF HVAC system manufacturer certifying that Installer has successfully completed prerequisite training administered by manufacturer for proper installation of systems, including but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.
2. For VRF HVAC system manufacturer.
3. For VRF HVAC system provider.

B. Source quality-control reports.

C. Field quality-control reports.

D. Sample Warranties: For manufacturer's warranties.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For VRF HVAC systems to include in emergency, operation, and maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters:

a. One set for each unit with replaceable filters.
b. One set for each unit type and unique size of washable filters.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Nationally recognized manufacturer of VRF HVAC systems and products.
2. Shipped VRF HVAC systems with similar requirements to those indicated for a continuous period of five years within time of bid.
3. VRF HVAC systems and products that have been successfully tested and in use on at least five completed projects.
4. Having complete published catalog literature, installation, and operation and maintenance manuals for all products intended for use.
5. Having full-time in-house employees for the following:

    a. Product research and development.
    b. Product and application engineering.
    c. Product manufacturing, testing, and quality control.
    d. Technical support for system installation training, startup, commissioning, and troubleshooting of installations.
    e. Owner training.

B. Factory-Authorized Service Representative Qualifications:

1. Authorized representative of, and trained by, VRF HVAC system manufacturer.
2. Demonstrated past experience with products being installed for period within five consecutive years before time of bid.
3. Demonstrated past experience on five projects of similar complexity, scope, and value.
4. Staffing resources of competent and experienced full-time employees that are assigned to execute work according to schedule.
5. Service and maintenance staff assigned to support Project during warranty period.
6. Product parts inventory to support ongoing system operation for a period of not less than five years after Substantial Completion.
7. VRF HVAC system manufacturer's backing to take over execution of Work if necessary to comply with requirements indicated. Include Project-specific written letter, signed by manufacturer's corporate officer, if requested.

C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by VRF HVAC system manufacturer.

1. Each employee shall be certified by manufacturer for proper installation of systems, including, but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.
2. Installer certification shall be valid and current for duration of Project.
3. Retain copies of Installer certificates on-site and make available on request.
4. Each person assigned to Project shall have demonstrated past experience.

    a. Demonstrated past experience with products being installed for period within three consecutive years before time of bid.
    b. Demonstrated past experience on five projects of similar complexity, scope, and value.

5. Installers shall have staffing resources of competent, trained, and experienced full-time employees that are assigned to execute work according to schedule.

D. ISO Compliance: System equipment and components furnished by VRF HVAC system manufacturer shall be manufactured in an ISO 9001 and ISO 14001 facility.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in a clean and dry place.

B. Comply with manufacturer's written rigging and installation instructions for unloading and moving to final installed location.

C. Handle products carefully to prevent damage, breaking, denting, and scoring. Do not install damaged products.

D. Protect products from weather, dirt, dust, water, construction debris, and physical damage.

1. Retain factory-applied coverings on equipment to protect finishes during construction and remove just prior to operating unit.
2. Cover unit openings before installation to prevent dirt and dust from entering inside of units. If required to remover coverings during unit installation, reapply coverings over openings after unit installation and remove just prior to operating unit.

E. Replace installed products damaged during construction.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace equipment and components that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Faulty operation.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period:

a. For Compressor: Five years from date of Substantial Completion.
b. For Parts, Including Controls: One year from date of Substantial Completion.
c. For Labor: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Carrier Corporation.
2. Daikin AC (Americas), Inc.
3. Mitsubishi Electric & Electronics USA, Inc.
4. Samsung HVAC.

5. Trane Company (The).

B. Source Limitations: Obtain products from single source from single manufacturer including, but not limited to, the following:

1. Indoor and outdoor units, including accessories.
2. Controls and software.
3. Refrigerant isolation valves.
4. Specialty refrigerant pipe fittings.

2.2 SYSTEM DESCRIPTION

A. Direct-expansion (DX) VRF HVAC system with variable capacity in response to varying cooling and heating loads. System shall consist of multiple indoor units, outdoor unit, piping, controls, and electrical power to make complete operating system(s) complying with requirements indicated.

1. Two-pipe system design.
2. System(s) operation, heat pump as indicated on Drawings.
3. Each system with one refrigerant circuit shared by all indoor units connected to system.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. AHRI Compliance: System and equipment performance certified according to AHRI 1230.

D. ASHRAE Compliance:

1. ASHRAE 15: For safety code for mechanical refrigeration.
2. ASHRAE 62.1: For indoor air quality.
3. ASHRAE 135: For control network protocol with remote communication.
4. ASHRAE/IES 90.1 Compliance: For system and component energy efficiency.

E. UL Compliance: Comply with UL 1995.

2.3 PERFORMANCE REQUIREMENTS

A. Service Access:

1. Provide and document service access requirements.
2. Locate equipment, system isolation valves, and other system components that require service and inspection in easily accessible locations. Avoid locations that are difficult to access if possible.
3. If less than full and unrestricted access is provided, locate components within an 18-inch reach of the finished assembly.
4. Where ladder access is required to service elevated components, provide an installation that provides for sufficient access within ladder manufacturer's written instructions for use.
5. Comply with OSHA regulations.

B. System Design and Installation Requirements:

1. Design and install systems indicated according to manufacturer's recommendations and written instructions.
2. Where manufacturer's requirements differ from requirements indicated, contact Architect for direction. The most stringent requirements should apply unless otherwise directed in writing by Architect.

C. Isolation of Equipment: Provide isolation valves to isolate each indoor unit for service, removal, and replacement without interrupting system operation.

D. System Turndown: Stable operation down to 20 percent of outdoor-unit capacity.

E. System Auto Refrigerant Charge: Each system shall have an automatic refrigerant charge function to ensure the proper amount of refrigerant is installed in system.

F. Outdoor Conditions:

1. Suitable for outdoor ambient conditions encountered.
2. Maximum System Operating Outdoor Temperature: See Drawings.
3. Minimum System Operating Outdoor Temperature: See Drawings.

G. Sound Performance: Sound levels generated by operating HVAC equipment shall be within requirements indicated.

1. Indoor: Within design guidelines of "2015 ASHRAE HANDBOOK- HVAC Applications."]
2. Outdoor: Within ordinance of governing authorities.

H. Thermal Movements: Allow for controlled thermal movements from ambient, surface, and system temperature changes.

I. Capacities and Characteristics: As indicated on Drawings.

2.4 INDOOR, EXPOSED, WALL-MOUNTED UNITS

A. Description: Factory-assembled and tested complete unit with components, piping, wiring, and controls required for mating to piping, power, and controls field connections.

B. Cabinet:

1. Material: Painted steel, or coated steel frame covered by a plastic cabinet, with an architectural acceptable finish suitable for tenant occupancy on exposed surfaces.
2. Insulation: Manufacturer's standard internal insulation, complying with ASHRAE 62.1, to provide thermal resistance and prevent condensation.
3. Mounting: Manufacturer-designed provisions for field installation.
4. Internal Access: Removable panels of adequate size for field access to internal components for inspection, cleaning, service, and replacement.

C. DX Coil Assembly:

1. Coil Casing: Aluminum, galvanized, or stainless steel.
2. Coil Fins: Aluminum, mechanically bonded to tubes, with arrangement required by performance.
3. Coil Tubes: Copper, of diameter and thickness required by performance.
4. Expansion Valve: Electronic modulating type with linear or proportional characteristics.
5. Unit Internal Tubing: Copper tubing with brazed joints.
6. Unit Internal Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
7. Field Piping Connections: Manufacturer's standard.
8. Factory Charge: Dehydrated air or nitrogen.
9. Testing: Factory pressure tested and verified to be without leaks.

D. Drain Assembly:

1. Pan: Non-ferrous material, with bottom sloped to low point drain connection.
2. Condensate Removal: Gravity.

    a. If a floor drain or dry well is not available near unit, provide unit with field-installed condensate pump accessory.

3. Field Piping Connection: Non-ferrous material.

E. Fan and Motor Assembly:

1. Fan(s):

    a. Direct-drive arrangement.
    b. Single or multiple fans connected to a common motor shaft and driven by a single motor.
    c. Fabricated from non-ferrous components or ferrous components with corrosion protection finish.
    d. Wheels statically and dynamically balanced.

2. Motor: Brushless dc or electronically commutated with permanently lubricated bearings.
3. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.
4. Speed Settings and Control: Two (low, high), three (low, medium, high), or more than three speed settings or variable speed with a speed range of least 50 percent.
5. Vibration Control: Integral isolation to dampen vibration transmission.

F. Filter Assembly:

1. Access: Front, to accommodate filter replacement without the need for tools.
2. Washable Media: Manufacturer's standard filter with antimicrobial treatment.

G. Grille Assembly: Manufacturer's standard discharge grille with field-adjustable air pattern mounted in top or front face of unit cabinet.

H. Unit Accessories:

1. Condensate Pump (if required): Integral reservoir and control with electrical power connection through unit power.

I. Unit Controls:

1. Enclosure: Manufacturer's standard, and suitable for indoor locations.
2. Features and Functions: Self-diagnostics, time delay, auto-restart.
3. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
4. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.

J. Unit Electrical:

1. Enclosure: Manufacturer's standard, and suitable for indoor locations.
2. Field Connection: Single point connection to power entire unit and integral controls.
3. Disconnecting Means: Factory-mounted circuit breaker or switch, complying with NFPA 70.
4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.
5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
6. Raceways: Enclose line voltage wiring in metal raceways to comply with NFPA 70.

2.5 OUTDOOR, AIR-SOURCE HEAT-PUMP UNITS

A. Description: Factory-assembled and -tested complete unit with components, piping, wiring, and controls required for mating to piping, power, and controls field connections.

1. Specially designed for use in systems with either all heating or all cooling demands, but not for use in systems with simultaneous heating and cooling.
2. Systems shall consist of one unit, or multiple unit modules that are designed by variable refrigerant system manufacturer for field interconnection to make a single refrigeration circuit that connects multiple indoor units.
3. All units installed shall be from the same product development generation.

B. Cabinet:

1. Galvanized steel and coated with a corrosion-resistant finish.

    a. Coating with documented salt spray test performance of 1000 hours according ASTM B 117 surface scratch test (SST) procedure.

2. Mounting: Manufacturer-designed provisions for field installation.
3. Internal Access: Removable panels or hinged doors of adequate size for field access to internal components for inspection, cleaning, service, and replacement.

C. Compressor and Motor Assembly:

1. One or more positive-displacement, direct-drive and hermetically sealed scroll compressor(s) with inverter drive and turndown to 15 percent of rated capacity.
2. Protection: Integral protection against the following:

a. High refrigerant pressure.
b. Low oil level.
c. High oil temperature.
d. Thermal and overload.
e. Voltage fluctuations.
f. Phase failure and phase reversal.
g. Short cycling.

3. Speed Control: Variable to automatically maintain refrigerant suction and condensing pressures while varying refrigerant flow to satisfy system cooling and heating loads.
4. Vibration Control: Integral isolation to dampen vibration transmission.
5. Oil management system to ensure safe and proper lubrication over entire operating range.
6. Crankcase heaters with integral control to maintain safe operating temperature.
7. Fusible plug.

D. Condenser Coil Assembly:

1. Plate Fin Coils:

a. Casing: Aluminum, galvanized, or stainless steel.
b. Fins: Aluminum or copper, mechanically bonded to tubes, with arrangement required by performance.
c. Tubes: Copper, of diameter and thickness required by performance.

2. Aluminum Microchannel Coils:

a. Series of flat tubes containing a series of multiple, parallel-flow microchannels layered between refrigerant header manifolds.
b. Single- or multiple-pass arrangement.
c. Construct fins, tubes, and header manifolds of aluminum alloy.

3. Corrosion Protection: Coating with documented salt spray test performance of 1000 hours according ASTM B 117 surface scratch test (SST) procedure.
4. Hail Protection: Provide condenser coils with louvers, baffles, or hoods to protect against hail damage.

E. Condenser Fan and Motor Assembly:

1. Fan(s): Propeller type.

a. Direct-drive arrangement.
b. Fabricated from non-ferrous components or ferrous components with corrosion protection finish to match performance indicated for condenser coil.
c. Statically and dynamically balanced.

2. Fan Guards: Removable safety guards complying with OSHA regulations. If using metal materials, coat with corrosion-resistant coating to match performance indicated for condenser coil.
3. Motor(s): Brushless dc or electronically commutated with permanently lubricated bearings and rated for outdoor duty.
4. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.

5. Speed Settings and Control: Variable speed with a speed range of least 75 percent.
6. Vibration Control: Integral isolation to dampen vibration transmission.

F. Unit Controls:

1. Enclosure: Manufacturer's standard, and suitable for unprotected outdoor locations.
2. Factory-Installed Sensors:

    a. Refrigerant suction temperature.
    b. Refrigerant discharge temperature.
    c. Outdoor air temperature.
    d. Refrigerant high pressure.
    e. Refrigerant low pressure.
    f. Oil level.

3. Features and Functions: Self-diagnostics, time delay, auto-restart, fuse protection.
4. Communication: Network communication with indoor units.
5. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
6. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.

G. Unit Electrical:

1. Enclosure: Metal, similar to enclosure, and suitable for unprotected outdoor locations.
2. Field Connection: Single point connection to power entire unit and integral controls.
3. Disconnecting Means: Factory-mounted circuit breaker or switch, complying with NFPA 70.
4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.
5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
6. Raceways: Enclose line voltage wiring in metal raceways to comply with NFPA 70.

H. Unit Hardware: Zinc-plated steel, or stainless steel. Coat exposed surfaces with additional corrosion-resistant coating if required to prevention corrosion when exposed to salt spray test for 1000 hours according ASTM B 117.

I. Unit Piping:

1. Unit Tubing: Copper tubing with brazed joints.
2. Unit Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
3. Field Piping Connections: Manufacturer's standard.
4. Factory Charge: Dehydrated air or nitrogen.
5. Testing: Factory pressure tested and verified to be without leaks.

2.6 SYSTEM CONTROLS

A. Wired Controllers for Indoor Units:

1. Single controller.
2. Auto Timeout Touch Screen LCD: Timeout duration shall be adjustable.
3. Multiple Language: English.
4. Temperature Units: Fahrenheit.
5. On/Off: Turns indoor unit on or off.
6. Operation Mode: Cool, Heat, Auto, Dehumidification, Fan Only, and Setback.
7. Temperature Display: 1-degree increments.
8. Temperature Set-Point: Separate set points for Cooling, Heating, and Setback. Adjustable in 1-degree increments.
9. Fan Speed Setting: Select between available options furnished with the unit.
10. Seven-day programmable operating schedule with up to five events per day. Operations shall include On/Off, Operation Mode, and Temperature Set-Point.
11. Auto Off Timer: Operates unit for an adjustable time duration and then turns unit off.
12. Error Code Notification Display: Used by service personnel to troubleshoot abnormal operation and equipment failure.
13. Setting stored in nonvolatile memory to ensure that settings are not lost if power is lost. Battery backup for date and time only.
14. Low-voltage power required for controller shall be powered through non-polar connections to indoor unit.

2.7 SYSTEM REFRIGERANT AND OIL

A. Refrigerant:

1. As required by VRF HVAC system manufacturer for system to comply with performance requirements indicated.
2. ASHRAE 34, Class A1 refrigerant classification.
3. R-410a.

B. Oil:

1. As required by VRF HVAC system manufacturer and to comply with performance requirements indicated.

2.8 SYSTEM CONDENSATE DRAIN PIPING

A. If more than one material is listed, material selection is Contractor's option.

B. Copper Tubing:

1. Drawn-Temper Tubing: According to ASTM B 88, Type M or Type DWV according to ASTM B 306.
2. Wrought-Copper Fittings: ASME B16.22.
3. Wrought-Copper Unions: ASME B16.22.
4. Solder Filler Metals: ASTM B 32, lead-free alloys, and water-flushable flux according to ASTM B 813.

C. CPVC plastic pipe according to ASTM F 441/F 441M, Schedule 40, with socket-type pipe fittings according to ASTM F 438 and solvent cement according to ASTM F 493.

2.9 SYSTEM REFRIGERANT PIPING

A. Refrigerant Piping:

1. Copper Tube: ASTM B 280, Type ACR.
2. Wrought-Copper Fittings: ASME B16.22.
3. Brazing Filler Metals: AWS A5.8/A5.8M.

B. Refrigerant Tubing Kits:

1. Furnished by VRF HVAC system manufacturer.
2. Factory-rolled and -bundled, soft-copper tubing with tubing termination fittings at each end.
3. Standard one-piece length for connecting to indoor units.
4. Pre-insulated with flexible elastomeric insulation of thickness to comply with governing energy code and sufficient to eliminate condensation.
5. Factory Charge: Dehydrated air or nitrogen.

C. Divided-Flow Specialty Fittings: Where required by VRF HVAC system manufacturer for proper system operation, VRF HVAC system manufacturer shall furnish specialty fittings with identification and instructions for proper installation by Installer.

D. Refrigerant Isolation Ball Valves:

1. Description: Uni-body full port design, rated for maximum system temperature and pressure, and factory tested under pressure to ensure tight shutoff. Designed for valve operation without removing seal cap.
2. Seals: Compatible with system refrigerant and oil. Seal service life of at least 20 years.
3. Valve Connections: Flare or sweat depending on size.

2.10 METAL HANGERS AND SUPPORTS

A. Copper Tube Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of galvanized or copper-coated steel.

2.11 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded, zinc-coated steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Indoor Applications: Zinc-coated steel.

2. Outdoor Applications: Stainless steel.

2.12 MISCELLANEOUS SUPPORT MATERIALS

A. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

B. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; galvanized.

C. Threaded Rods: Continuously threaded. Zinc-plated steel or galvanized steel for indoor applications and stainless steel for outdoor applications. Mating nuts and washers of similar material as rods.

2.13 PIPING AND TUBING INSULATION

A. Condensate Drain Piping and Tubing Insulation and Jacket Requirements:

1. Flexible Elastomeric Insulation:

a. Closed-cell, sponge- or expanded-rubber materials, complying with ASTM C 534, Type I for tubular materials.
b. Indoors: 1 inch thick.

B. Refrigerant Tubing Insulation and Jacket Requirements:

1. Flexible Elastomeric Insulation:

a. Closed-cell, sponge- or expanded-rubber materials, complying with ASTM C 534, Type I for tubular materials.
b. Indoors: 1 inch thick.
c. Outdoors: 1 inch thick.

C. Flexible Elastomeric Insulation Adhesive: Comply with MIL-A-24179A, Type II, Class I.

2.14 SYSTEM CONTROL CABLE

A. Cable Rating: Listed and labeled for application according to NFPA 70.

1. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262, by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.

a. Flame Travel Distance: 60 inches or less.
b. Peak Optical Smoke Density: 0.5 or less.
c. Average Optical Smoke Density: 0.15 or less.

2. Flame Travel and Smoke Density for Riser Cables in Non-Plenum Building Spaces: As determined by testing identical products according to UL 1666.
3. Flame Travel and Smoke Density for Cables in Non-Riser Applications and Non-Plenum Building Spaces: As determined by testing identical products according to UL 1685.

B. Low-Voltage Control Cabling:

1. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

a. One pair, twisted, No. 16 AWG, stranded (19x29) or No. 18 AWG, stranded (19x30) tinned-copper conductors as required by VRF HVAC system manufacturer.
b. PVC insulation.
c. Braided or foil shielded.
d. PVC jacket.
e. NFPA 262 includes the standard flame-resistance test criteria in common use for cables and conductors.
f. Flame Resistance: Comply with NFPA 262.

2.15 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect factory-assembled equipment.

B. Equipment will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports for historical record. Submit reports only if requested.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine products before installation. Reject products that are wet, moisture damaged, or mold damaged.

C. Examine roughing-in for piping and tubing to verify actual locations of connections before equipment installation.

D. Examine roughing-in for wiring and conduit to verify actual locations of connections before equipment installation.

E. Examine walls, floors, roofs, and outdoor pads for suitable conditions where equipment will be installed.

F. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION, GENERAL

A. Clearance:

1. Maintain manufacturer's recommended clearances for service and maintenance.
2. Maintain clearances required by governing code.

B. Loose Components: Install components, devices, and accessories furnished by manufacturer, with equipment, that are not factory mounted.

3.3 INSTALLATION OF INDOOR UNITS

A. Install units to be level and plumb while providing a neat and finished appearance.

B. Adjust supports of exposed and recessed units to draw units tight to adjoining surfaces.

C. Protect finished surfaces of walls that come in direct contact with units. Refinish or replaced damaged areas after units are installed.

D. In rooms without ceiling, arrange piping and tubing, controls, and electrical power serving units to provide a neat and finished appearance.

E. Attachment: Install hardware for proper attachment to supported equipment.

F. Grouting: Place grout under equipment supports and make bearing surface smooth.

3.4 INSTALLATION OF OUTDOOR UNITS

A. Install units to be level and plumb while providing a neat and finished appearance.

B. Pad-Mounted Installations: Install outdoor units on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in "Cast-in-Place Concrete."

1. Attachment: Install anchor bolts to elevations required for proper attachment to supported equipment.
2. Grouting: Place grout under equipment supports and make bearing surface smooth.

3.5 GENERAL REQUIREMENTS FOR PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping and tubing systems. Install piping and tubing as indicated unless deviations to layout are approved.

B. Install piping and tubing in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping and tubing at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping and tubing to permit valve servicing.

E. Install piping and tubing at indicated slopes.

F. Install piping and tubing free of sags.

G. Install fittings for changes in direction and branch connections.

H. Install piping and tubing to allow application of insulation.

I. Install groups of pipes and tubing parallel to each other, spaced to permit applying insulation with service access between insulated piping and tubing.

J. Install sleeves for piping and tubing penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 15061 "Sleeves and Sleeve Seals for HVAC Piping."

3.6 INSTALLATION OF SYSTEM CONDENSATE DRAIN PIPING

A. General Requirements for Drain Piping and Tubing:

1. Install an adjustable stainless-steel hose clamp with adjustable gear operator on unit hose connections. Tighten clamp to provide a leak-free installation.
2. Extend drain piping from units with drain connections to drain receptors as indicated on Drawings. If not indicated on Drawings, terminate drain connection at nearest accessible location that is not exposed to view by occupants.
3. Provide each 90-degree change in direction with a Y- or T-fitting. Install a threaded plug connection in the dormant side of fitting or future use as a service cleanout.

B. Gravity Drains:

1. Slope piping from unit connection toward drain termination at a constant slope of not less than two percent.

3.7 INSTALLATION OF REFRIGERANT PIPING

A. Refrigerant Tubing Kits:

1. Unroll and straighten tubing to suit installation. Deviations in straightness of exposed tubing shall be unnoticeable to observer.
2. Support tubing using hangers and supports indicated at intervals not to exceed 5 feet. Minimum rod size, 1/4 inch.
3. Prepare tubing ends and make mating connections to provide a pressure tight and leak-free installation.

B. Install refrigerant piping according to ASHRAE 15 and governing codes.

C. Select system components with pressure rating equal to or greater than system operating pressure.

D. Install piping as short and direct as possible, with a minimum number of joints and fittings.

E. Arrange piping to allow inspection and service of equipment. Install valves and specialties in accessible locations to allow for service and inspection.

F. Unless otherwise required by VRF HVAC system manufacturer, slope refrigerant piping and tubing as follows:

1. Install horizontal hot-gas discharge piping and tubing with a uniform slope downward away from compressor.
2. Install horizontal suction lines with a uniform slope downward to compressor.
3. Install traps to entrain oil in vertical runs.
4. Liquid lines may be installed level.

G. When brazing, remove or protect components that could be damaged by heat.

H. Before installation, clean piping, tubing, and fittings to cleanliness level required by VRF HVAC system manufacturer.

I. Joint Construction:

1. Ream ends of tubes and remove burrs.
2. Remove scale, slag, dirt, and debris from inside and outside of tube and fittings before assembly.
3. Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.

    a. Use Type BCuP (copper-phosphorus) alloy for joining copper fittings with copper tubing.
    b. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze.

3.8 INSTALLATION OF METAL HANGERS AND SUPPORTS

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

C. Comply with MFMA-103 for metal framing system selections and applications that are not specified.

D. Fastener System Installation:

1. Install powder-actuated fasteners, for use in lightweight concrete or concrete slabs less than 4 inches thick, in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
3. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

G. Install building attachments within concrete slabs or attach to structural steel.

1. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

I. Piping and Tubing Insulation:

1. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
2. Shield Dimensions for Pipe: Not less than the following:

a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.

J. Horizontal Piping Hanger Spacing and Rod Size: Install hangers for drawn-temper copper piping with the following maximum horizontal spacing and minimum rod sizes:

1. Sizes through NPS 3/4: Maximum span, 5 feet; minimum rod size, 1/4 inch.
2. NPS 1: Maximum span, 6 feet; minimum rod size, 1/4 inch.
3. NPS 1-1/4: Maximum span, 7 feet; minimum rod size, 3/8 inch.
4. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.

K. Plastic Pipe Hanger and Support Spacing:

1. Space hangers and supports according to pipe manufacturer's written instructions for service conditions.
2. Maximum spacing, 5 feet; minimum rod size, 1/4 inch.

L. Vertical-Piping Clamps: Install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8).
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): If longer ends are required for riser clamps.

M. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified.

N. Use hangers, supports, and attachments with galvanized coatings unless otherwise indicated.

O. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

P. Trim excess length of continuous-thread hanger and support rods to 1 inch.

3.9 INSTALLATION OF PIPING AND TUBING INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated. Installation to maintain a continuous vapor barrier.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are unavailable, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.10 ELECTRICAL INSTALLATION

A. Comply with requirements indicated on Drawings and in applicable Division 16 Sections.

B. To extent electrical power is required for system equipment, components, and controls, and is not indicated on Drawings and addressed in the Specifications, the design for such electrical power shall be delegated to VRF HVAC system provider.

1. Delegated design of electrical power to equipment, components and controls, and associated installation shall be included at no additional cost to Owner.

C. Connect field electrical power source to each separate electrical device requiring field electrical power. Coordinate termination point and connection type with Installer.

D. Comply with requirements in division 16 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

E. Comply with requirements in division 16 "Grounding and Bonding for Electrical Systems" for grounding connections.

F. Comply with requirements in division 16 "Raceways and Boxes for Electrical Systems" for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or revised in this Section.

G. Comply with TIA-569-D for pull-box sizing and length of conduit and number of bends between pull points.

H. Install manufactured conduit sweeps and long-radius elbows if possible.

I. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.11 INSTALLATION OF SYSTEM CONTROL CABLE

A. Comply with NECA 1.

B. Installation Method:

1. Install cables in raceways except as follows:

    a. Within equipment and associated control enclosures.
    b. In accessible ceiling spaces where open cable installation method may be used.
    c. In gypsum board partitions where cable may be enclosed within wall cavity.

2. Conceal raceway and cables except in unfinished spaces.

C. General Requirements for Cabling:

1. Comply with TIA-568-C Series of standards.
2. Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems."
3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
4. Cables may not be spliced and shall be continuous from terminal to terminal. Do not splice cable.
5. Cables serving a common system may be grouped in a common raceway. Install control cable in separate raceway from power wiring. Do not group conductors from different systems or different voltages.
6. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems." Install lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Do not use heat lamps for heating.
10. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems." Monitor cable pull tensions.
11. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.

12. Provide strain relief.
13. Keep runs short. Allow extra length for connecting to terminals.
14. Do not bend cables in a radius less than 10 times the cable OD.
15. Use sleeves or grommets to protect cables from vibration at points where they pass around sharp corners and through penetrations.
16. Ground wire shall be copper, and grounding methods shall comply with IEEE C2. Demonstrate ground resistance.

D. Balanced Twisted-Pair Cable Installation:

1. Comply with TIA-568-C.2.
2. Do not untwist balanced twisted-pair cables more than 1/2 inch at the point of termination to maintain cable geometry.

E. Open-Cable Installation:

1. Suspend copper cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 30 inches apart.
2. Cable shall not be run through or on structural members or in contact with pipes, ducts, or other potentially damaging items. Do not run cables between structural members and corrugated panels.

F. Separation from EMI Sources: Comply with BICSI TDMM and TIA-569-D recommendations for separating unshielded cable from potential EMI sources including electrical power wiring and equipment.

3.12 GROUNDING INSTALLATION

A. For data communication wiring, comply with TIA-607-B and with BICSI TDMM, "Bonding and Grounding (Earthing)" Chapter.

B. For low-voltage control cabling, comply with requirements in division 16 "Grounding and Bonding for Electrical Systems."

3.13 IDENTIFICATION

A. Identify system equipment, piping, tubing, and valves. Comply with requirements for identification specified in Section 15705 "Identification for HVAC Piping and Equipment."

3.14 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage VRF HVAC system manufacturer's service representative to advise and assist installers; witness testing; and observe and inspect components, assemblies, and equipment installations, including controls and connections.

1. Field service shall be performed by an employee or a factory-trained and -authorized service representative of VRF HVAC system manufacturer whose primary job responsibilities are to provide direct technical support of its products.

B. Perform the following tests and inspections with the assistance of manufacturer's service representative:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Refrigerant Tubing Positive Pressure Testing:

1. Comply with more stringent of VRF HVAC system manufacturer's requirements and requirements indicated.
2. After completion of tubing installation, pressurize tubing systems to a test pressure of not less than 1.5 times VRF HVAC system operating pressure, but not less than 600 psig, using dry nitrogen.
3. Successful testing shall maintain a test pressure for a continuous and uninterrupted period of 24 hours. Allowance for pressure changes attributed to changes in ambient temperature are acceptable.
4. Prepare test report to record the following information for each test:

    a. Name of person starting test, company name, phone number, and e-mail address.
    b. Name of manufacturer's service representative witnessing test, company name, phone number, and e-mail address.
    c. Detailed description of extent of tubing tested.
    d. Date and time at start of test.
    e. Test pressure at start of test.
    f. Outdoor temperature at start of test.
    g. Name of person ending test, company name, phone number, and e-mail address.
    h. Date and time at end of test.
    i. Test pressure at end of test.
    j. Outdoor temperature at end of test.
    k. Remarks:

5. Submit test reports for Project record.

D. Refrigerant Tubing Evacuation Testing:

1. Comply with more stringent of VRF HVAC system manufacturer's requirements and requirements indicated.
2. After completion of tubing positive-pressure testing, evacuate tubing systems to a pressure of 500 microns.
3. Successful testing shall maintain a test pressure for a continuous and uninterrupted period of one hour with no change.
4. Prepare test report to record the following information for each test:

    a. Name of person starting test, company name, phone number, and e-mail address.

b. Name of manufacturer's service representative witnessing test, company name, phone number, and e-mail address.
c. Detailed description of extent of tubing tested.
d. Date and time at start of test.
e. Test pressure at start of test.
f. Outdoor temperature at start of test.
g. Name of person ending test, company name, phone number, and e-mail address.
h. Date and time at end of test.
i. Test pressure at end of test.
j. Outdoor temperature at end of test.
k. Remarks:

5. Submit test reports for Project record.
6. Upon successful completion of evacuation testing, system shall be charged with refrigerant.

E. System Refrigerant Charge:

1. Using information collected from the refrigerant tubing evacuation testing, system Installer shall consult variable refrigerant system manufacturer to determine the correct system refrigerant charge.
2. Installer shall charge system following VRF HVAC system manufacturer's written instructions.
3. System refrigerant charging shall be witnessed by system manufacturer's representative.
4. Total refrigerant charge shall be recorded and permanently displayed at the system's outdoor unit.

F. Products will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports.

3.15 STARTUP SERVICE

A. Engage a VRF HVAC system manufacturer's service representative to perform system(s) startup service.

1. Service representative shall be an employee or a factory-trained and -authorized service representative of VRF HVAC system manufacturer.

B. System Operation Report:

1. After completion of startup service, manufacturer shall issue a report for each separate system.
2. Report shall include complete documentation describing each startup check, the result, and any corrective action required.
3. Manufacturer shall electronically record not less than two hours of continuous operation of each system and submit with report for historical reference.

a. All available system operating parameters shall be included in the information submitted.

3.16 ADJUSTING

A. Adjust equipment and components to function smoothly, and lubricate as recommended by manufacturer.

B. Adjust initial temperature and humidity set points. Adjust initial airflow settings and discharge airflow patterns.

C. Set field-adjustable switches and circuit-breaker trip ranges according to VRF HVAC system manufacturer's written instructions, and as indicated.

3.17 PROTECTION

A. Protect products from moisture and water damage. Remove and replace products that are wet, moisture damaged, or mold damaged.

B. Protect equipment from physical damage. Replace equipment with physical damage that cannot be repaired to new condition. Observable surface imperfections shall be grounds for removal and replacement.

C. Protect equipment from electrical damage. Replace equipment suffering electrical damage.

D. Cover and seal openings of equipment to keep inside of equipment clean. Do not remove covers until finish work is complete.

3.18 DEMONSTRATION

A. Engage a VRF HVAC system manufacturer's employed training instructor or factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain entire system.

B. Location: Owner shall provide a suitable on-site location to host training.

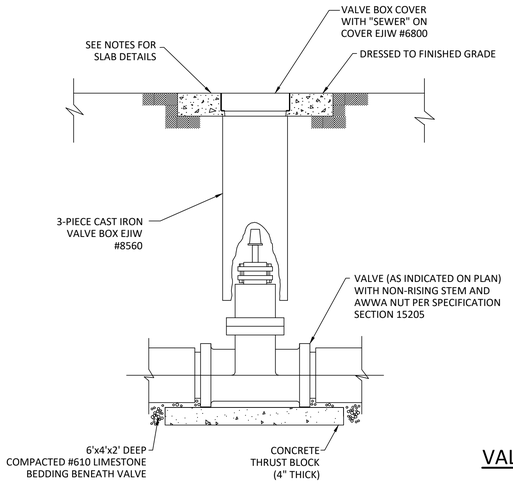
C. Training Attendees: Assume three people.

D. Training Attendance: For record purposes, document training attendees.

E. Training Format: Individual training modules shall include hands-on field demonstration and training.

F. Acceptance: Obtain Owner written acceptance that training is complete and requirements indicated have been satisfied.

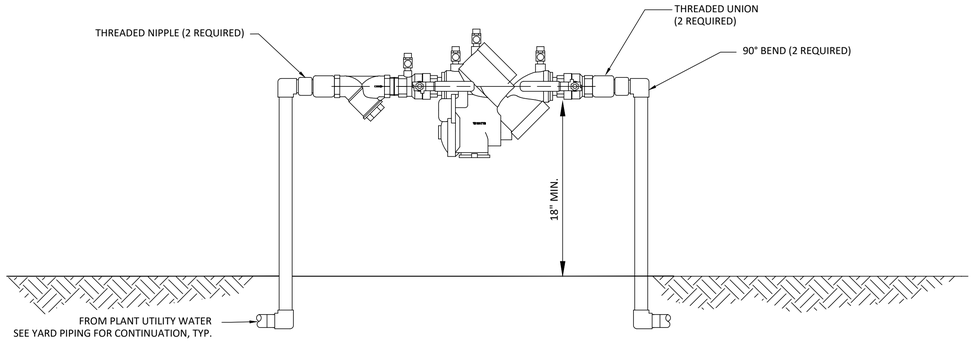
END OF SECTION 15670



NOTES:

1. FOR NON-PAVEMENT AREAS, SLAB SHALL BE 2'x2'x4" CONCRETE.
2. FOR TRAFFIC AREAS, SLAB SHALL BE 2'x2' WITH THICKNESS TO MATCH PAVEMENT (8" MIN.)
3. IN CONCRETE PAVEMENT, USE EXPANSION JOINT ON ALL SIDES OF VALVE BOX SLAB.
4. FOR VALVE CLUSTERS, SLAB SHALL BE SIZE INDICATED ON SITE PLAN.

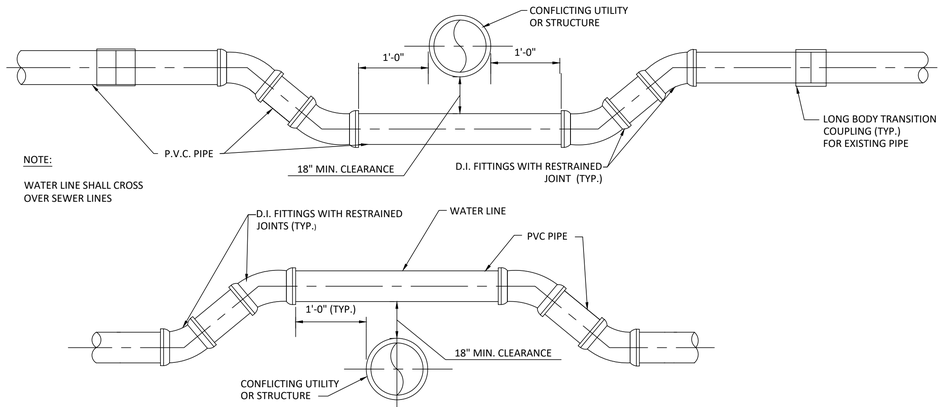
VALVE AND VALVE BOX DETAIL — C-7



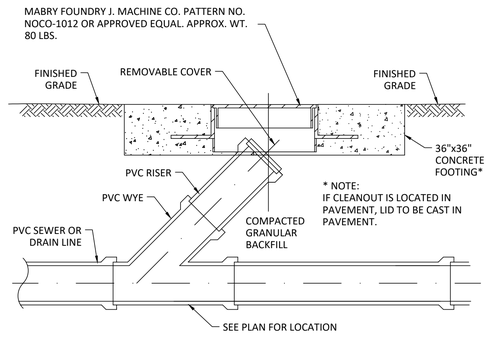
NOTES:

1. SUPPORT PIPING AS REQUIRED, PER SPECIFICATION SECTION 15006.
2. BACKFLOW PREVENTER SHALL BE INSULATED TO PROTECT AGAINST FREEZING.

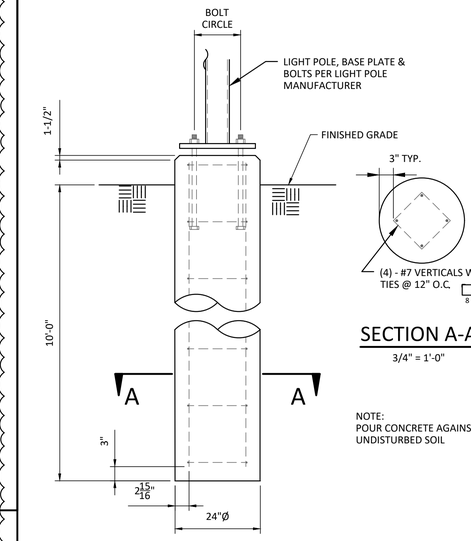
BACK-FLOW PREVENTER DETAIL — C-8



TYPICAL VERTICAL OFFSET FOR UTILITY CONFLICTS — C-9



TYPICAL CLEANOUT DETAIL — C-10



SECTION A-A

3/4" = 1'-0"

NOTE:
POUR CONCRETE AGAINST
UNDISTURBED SOIL

LIGHT POLE FOUNDATION — C-11

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM #3	11/18/24

DESIGNED BY:	KMD
DRAWN BY:	GAL
CHECKED BY:	KMD
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	3/16"=1'-0"

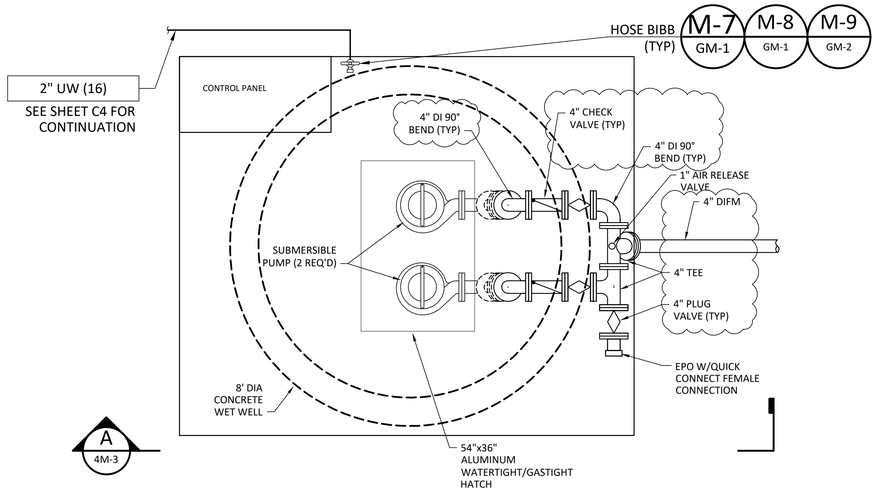
STATE OF LOUISIANA
KEVIN M. DRANE
License No. 35485
PROFESSIONAL ENGINEER
11/14/24

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

CIVIL DETAILS – II

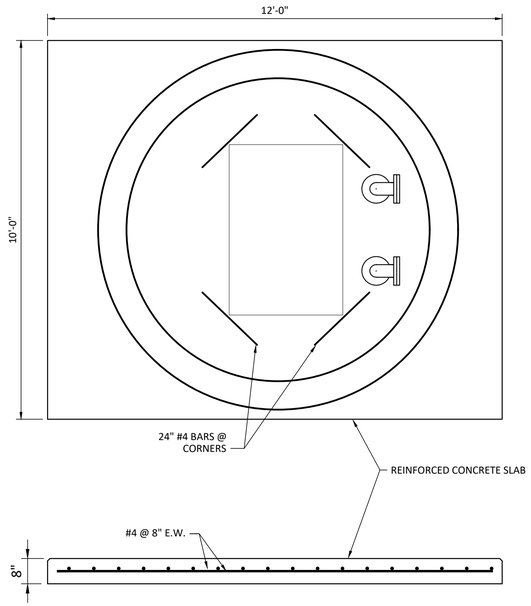
SHEET NO.
GC-2

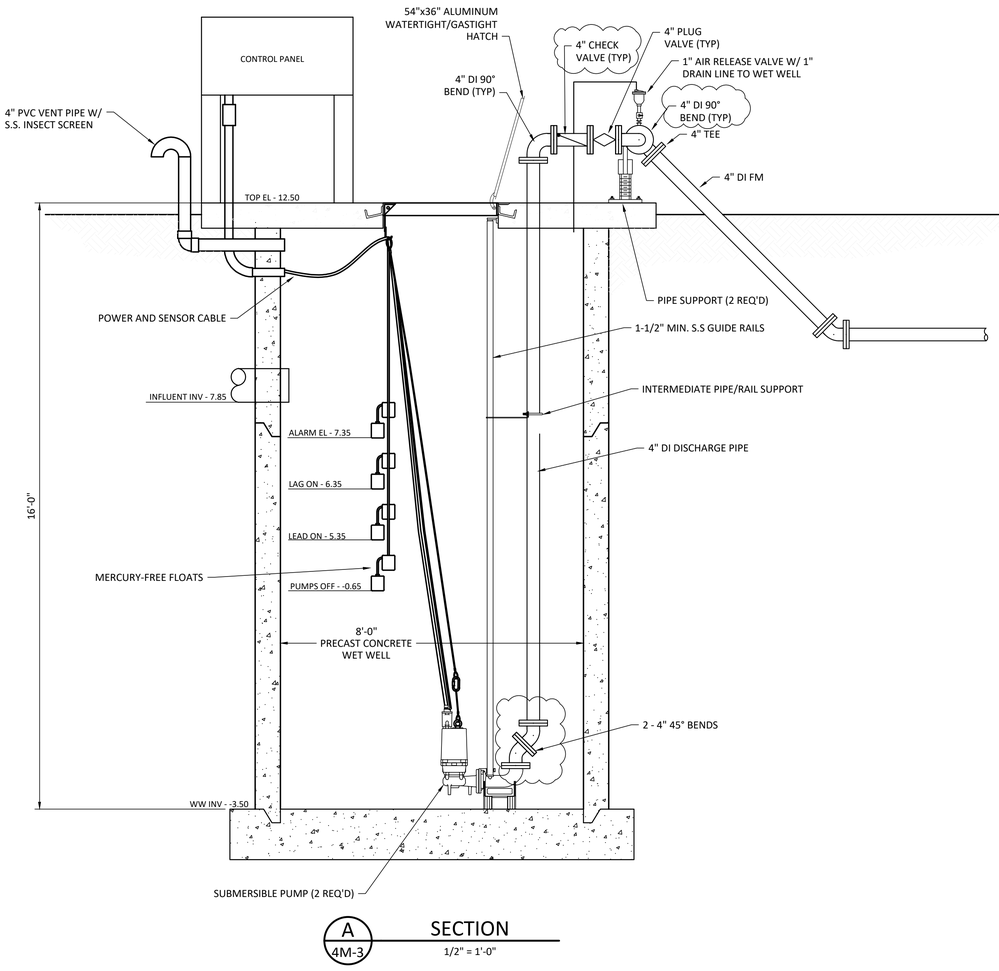
Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377



PLAN

1/2 "= 1'-0"





A 4M-3 SECTION

1/2" = 1'-0"

GENERAL SHEET NOTES

1. PUMPS AND CONTROLS TO BE FURNISHED BY PUMP SUPPLIER.
2. WALLS FOR WET WELL SHALL BE PRECAST SECTIONS MEETING ASTM C-478 AS MANUFACTURED BY GAINET'S, OR EQUAL, WITH REINFORCING TO MEET ASTM A-615, GRADE 60. BIOSAN, OR EQUAL, SHALL BE ADDED TO CONCRETE AT 1% BY WEIGHT OF CEMENTITIOUS MATERIAL. JOINT SEALANT SHALL BE RAM-NEK, OR EQUAL, DOUBLED EACH JOINT.
3. CONTRACTOR SHALL SUPPLY 240 VOLT, THREE PHASE POWER TO THE PUMP STATION.
4. SEE ELECTRICAL DRAWINGS FOR LOCATION AND DETAILS OF ELECTRICAL COMPONENTS FOR PUMP STATION.

PUMP STATION DATA TABLE

PUMP MODEL NUMBER: HYDROMATIC, OR EQUAL	S4P
NUMBER OF PUMPS	2
DESIGN CAPACITY PER PUMP GPM	175
TOTAL DYNAMIC HEAD, FT.	45
DESIGN SPEED, MAXIMUM RPM	1750
HORSEPOWER PER PUMP	5
SIZE SOLIDS PASSED, INCHES	3
DISCHARGE SIZE, INCHES	4
IMPELLER DIA., INCHES	7.50
FORCE MAIN DIA., INCHES	4
FORCE MAIN LENGTH, FEET	380

APPROXIMATE FORCE MAIN FLOW CURVE

FLOW, G.P.M.	125	150	175	200
TOTAL HEAD, FT.	41	43	45	47

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM #3	11/18/24

DESIGNED BY: KMD
DRAWN BY: GAL
CHECKED BY: KMD
SUBMITTED BY: KYLE ASSOC.
PROJECT No.: TU19000091
ISSUE DATE: 10/11/2024
APPROVED BY: ---
SHEET SIZE: ANSI D
SCALE: NTS

STATE OF LOUISIANA
KEVIN M. DRANE
License No. 35485
PROFESSIONAL ENGINEER
11/18/24

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

SITE LIFT STATION – PLAN AND SECTION

SHEET NO.
4M–3

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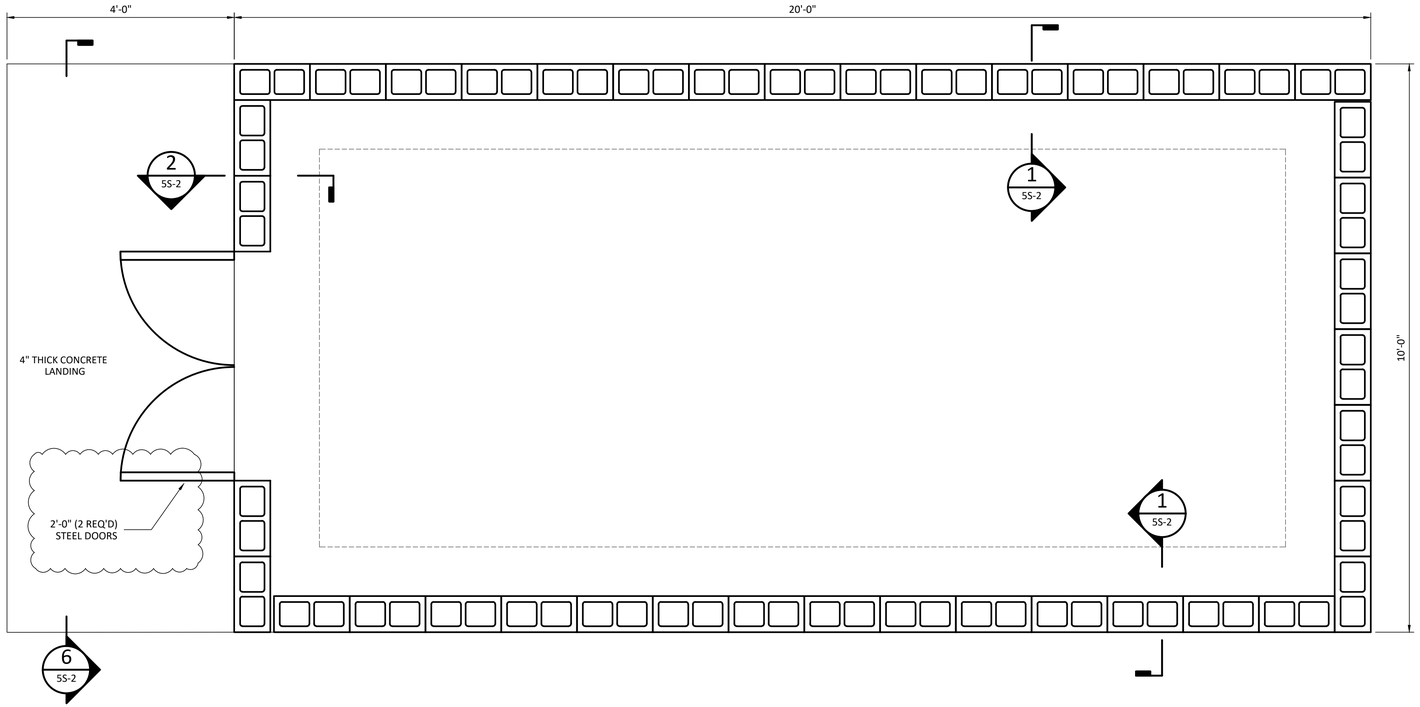
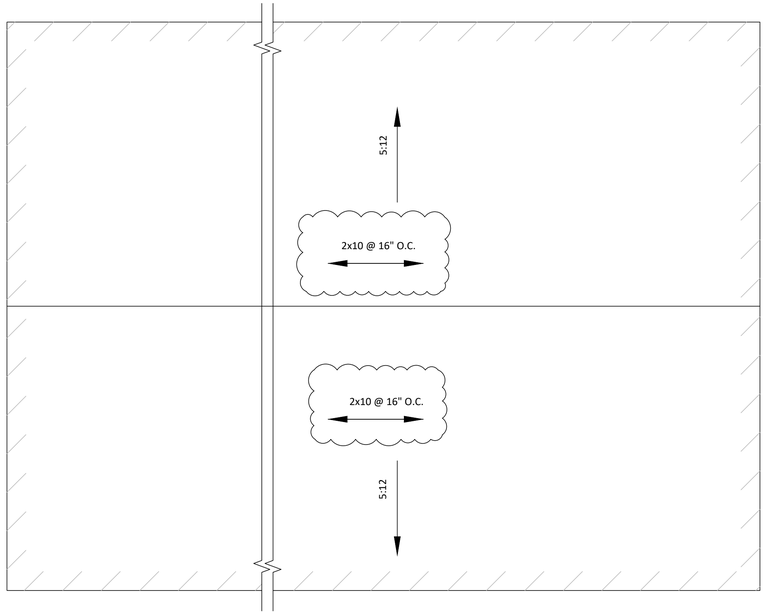


1 / 5S-1 ELECTRICAL BUILDING PLAN

3/4" = 1'-0"

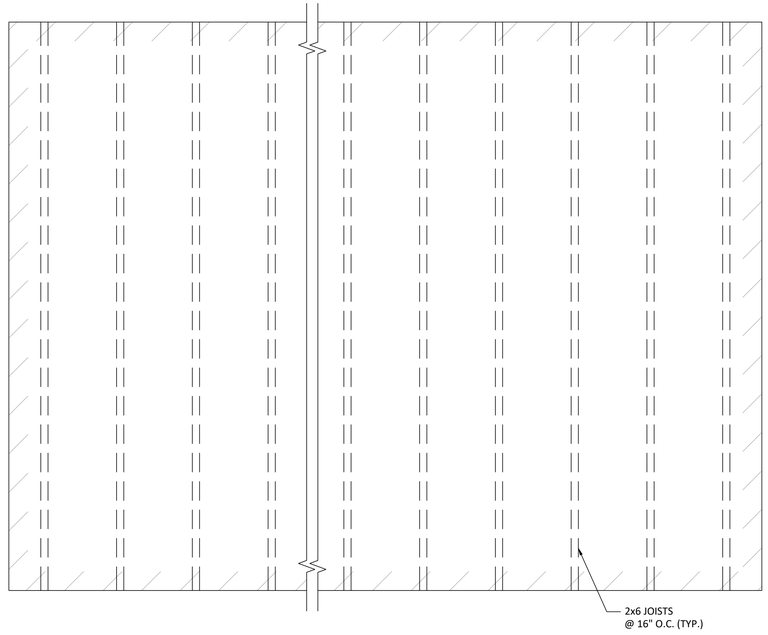
STRUCTURAL GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FINAL DIMENSIONS AND FIT-UP OF THE STRUCTURE, INCLUDING VERIFYING ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE COMMENCING WORK.
2. SEE SITE PLAN FOR ORIENTATION OF BUILDING.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING ANY WORK. ANY INTERFERENCE SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, PLACEMENT, MAINTENANCE, ETC. OF ANY AND ALL SHORING, BRACING, TIE BACKS, ETC. NEEDED TO SUPPORT ANY PART OF THE NEW OR EXISTING CONSTRUCTION DURING THE ENTIRE CONSTRUCTION PROCESS TO ENSURE THE SAFETY AND INTEGRITY OF THE STRUCTURE UNTIL THE NECESSARY PERMANENT ELEMENTS ARE IN PLACE.
5. ALL CONCRETE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, LATEST EDITION AND SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
6. ALL CONCRETE SHALL BE NORMAL WEIGHT (APPROXIMATELY 150 LBS. PER CUBIC FT.).
7. ALL REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ASTM A-615 GRADE 60.
8. ALL REINFORCING SHALL BE SPLICED WITH A CLASS "B" SPLICE IN ACCORDANCE WITH ACI 318-LATEST EDITION.
9. WELDED WIRE FABRIC (WWF) SHALL BE IN ACCORDANCE WITH ASTM A-185. WIRE SHALL CONFORM TO ASTM A82. LAP ALL FABRIC ONE WIRE SPACING PLUS 2 INCHES.
10. REINFORCING OR FABRIC ON GRADE SHALL BE CHAIRED WITH 3000 PSI CONCRETE BRICKETTES SPACED TO ADEQUATELY SUPPORT THE REINFORCING, BUT NOT GREATER THAN 3'-0" O.C. EACH WAY.
11. INSTALL CORNER BARS IN THE OUTSIDE FACE OF EDGE BEAMS AT EVERY CORNER ONE TOP AND ONE BOTTOM. BAR SHALL BE THE SAME SIZE AS THE LARGEST BEAM BAR.
12. PROVIDE A 90 DEGREE HOOK ON ALL TOP REINFORCEMENT IN ALL BEAMS AT DISCONTINUOUS ENDS.
13. GABLE ENDS SHALL BE SHEATHED WITH HARDIE PANEL SIDING.
14. SOFFITS SHALL BE SHEATHED WITH HARDIE SOFFIT (UNVENTED).
15. METAL ROOF SHALL BE GALVALUME PBR PANEL , 24 GAUGE MIN. WITH AZ-50 COATING AND SELF ADHERED HIGH TEMPERATURE MEMBRANE UNDERLAYMENT (GRACE ICE & WATER SHIELD HT OR EQUAL).
16. INTERIOR WALLS SHALL BE INSULATED WITH 1" POLYISOCYANURATE FOAM BOARD INTENDED FOR EXPOSED INTERIOR USE (SIKA RMAX TSX-8510 OR EQUAL, R-6 MIN). BOARDS SHALL BE SECURED TO WALL WITH ADHESIVE IN ACCORDANCE WITH MANUFACTUER'S REQUIREMENTS FOR CONTINUOUS INSULTATION.
17. ROOF SHALL BE INSULATED WITH OPEN CELL SPRAY FOAM (JOHNS MANVILLE JM CORBOND OR EQUAL, R-38 MIN) APPLIED TO THE UNDERSIDE OF THE ROOF DECK BETWEEN RAFTERS IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.



2 / 5S-1 ELECTRICAL BUILDING ROOF PLAN

3/4" = 1'-0"



3 / 5S-1 ELECTRICAL BUILDING CEILING JOISTS PLAN

3/4" = 1'-0"

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM #3	11/18/24

DESIGNED BY:	KMD
DRAWN BY:	GAL
CHECKED BY:	KMD
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	3/4"=1'-0"

STATE OF LOUISIANA
KEVIN M. DRANE
License No. 35485
11/18/24
PROFESSIONAL ENGINEER

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL BUILDING PLAN

SHEET NO.
5S-1

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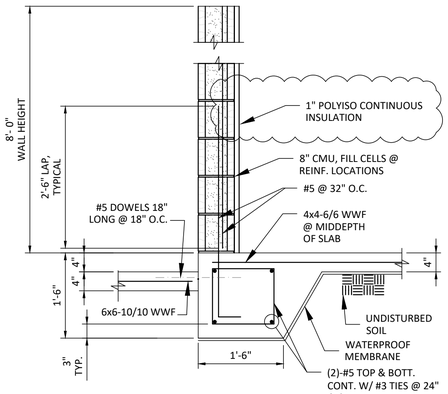
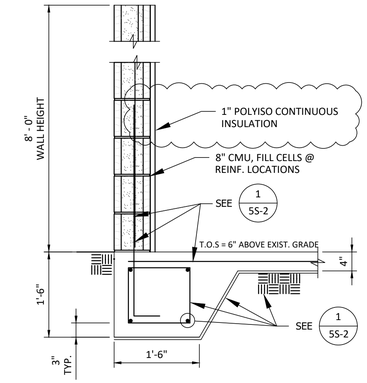
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377



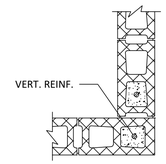
1 / 5S-2 **SECTION**

3/4" = 1'-0"

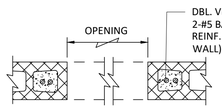


2 / 5S-2 **SECTION**

3/4" = 1'-0"



WALL CORNER

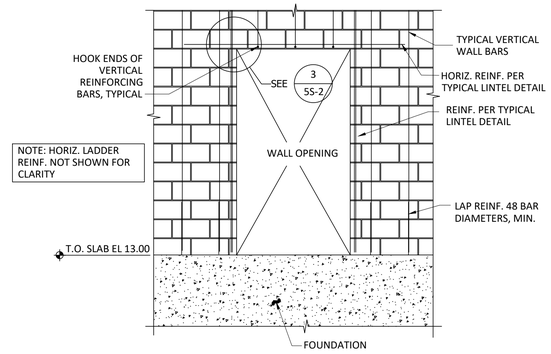


LINTEL OVER CMU OPENING

NOTE:
TYPICAL CMU WALL REINFORCEMENT TO BE AS SHOWN ON PLAN OR DESCRIBED IN REINF. MASONRY NOTES ON THIS DRAWING IN ADDITION TO THE CONDITIONS SHOWN ABOVE.

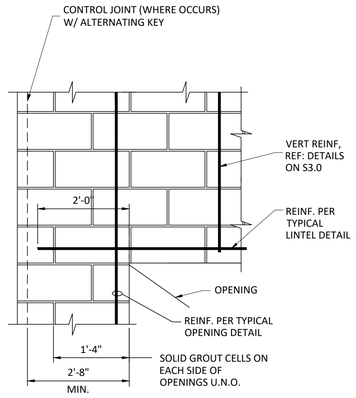
TYPICAL REINFORCED WALL INTERSECTION

N.T.S



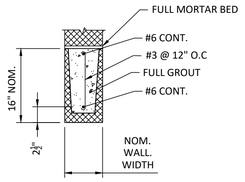
TYPICAL CMU WALL OPENING

NO SCALE



3 / 5S-2 **SECTION**

3/4" = 1'-0"



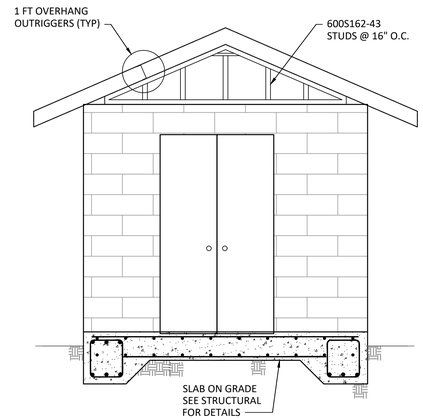
TYPICAL LINTEL DETAIL

NO SCALE

NOTES:

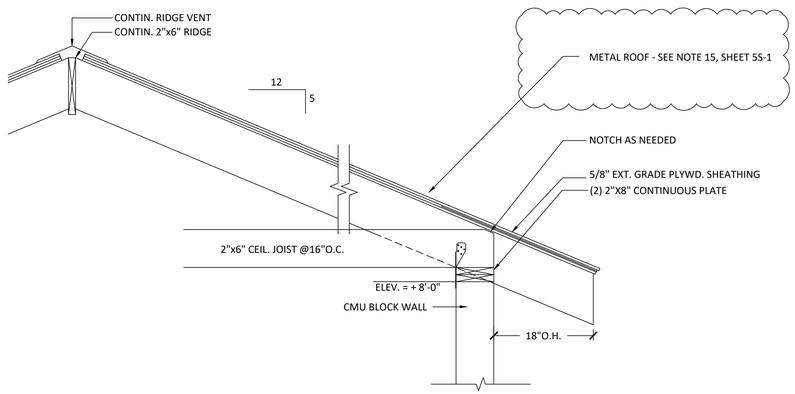
1. PROVIDE 1" OF BEARING AT EACH JAMB FOR EACH FOOT OF CLEAR SPAN BUT NOT LESS THAN 7 5/8" U.N.O. REINFORCEMENT SHALL PROJECT A MINIMUM OF 6" ONTO THE BEARING.
2. MINIMUM MASONRY COMPRESSIVE STRENGTH OF GROUTED PRISM F'M=1500 PSI
3. PRECAST CONCRETE LINTELS AS SHOWN MAY BE USED WITH ARCHITECT APPROVAL, MINIMUM f'c=3000 PSI.
4. 8X16= NOMINAL WIDTH X MIN. DEPTH OF LINTEL.

LINTEL SCHEDULE CONCRETE MASONRY UNITS		
OPENING SIZE (UP TO & INCLUDING)	LINTEL "U"-BLOCK SIZE AND REINFORCING	JAMBS AT EACH END
4'-0"	8"x8" "U"-BLOCK 1-#5 CONT. BOT.	8x8 COL. REINF. W/1-#5
6'-0"	8"x8" "U"-BLOCK 1-#6 CONT. BOT.	8x16 COL. REINF. W/2-#5
8'-0"	8"x16" "U"-BLOCK 1-#6 CONT. BOT.	8x16 COL. REINF. W/2-#5
12'-0"	2-8"x16" "U" BLOCK 1-#6 CONT. BOT. EA. BLOCK	8x16 COL. REINF. W/2-#6
> 12'-0"	SEE SPECIFIC DETAILS CUT ON PLAN	12x16 COL. REINF. W/2-#8



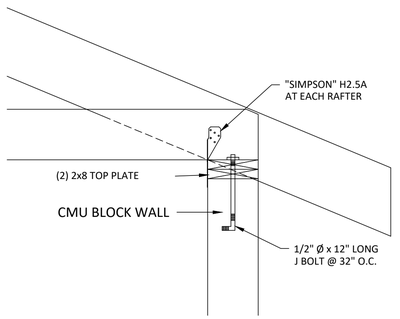
6 / 5S-2 **SECTION**

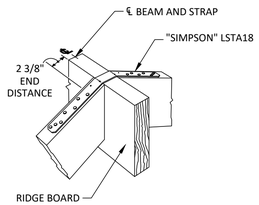
3/8" = 1'-0"



4 / 5S-2 **TYPICAL ROOF SECTION**

3/4" = 1'-0"





5 / 5S-2 **TYPICAL ROOF STRAPPING DETAIL**

1" = 1'-0"

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638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
1	ADDENDUM #3	11/18/24

DESIGNED BY:	KMD
DRAWN BY:	GAL
CHECKED BY:	KMD
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	VARIES

STATE OF LOUISIANA
KEVIN M. DRANE
License No. 35485
PROFESSIONAL ENGINEER
11/18/24

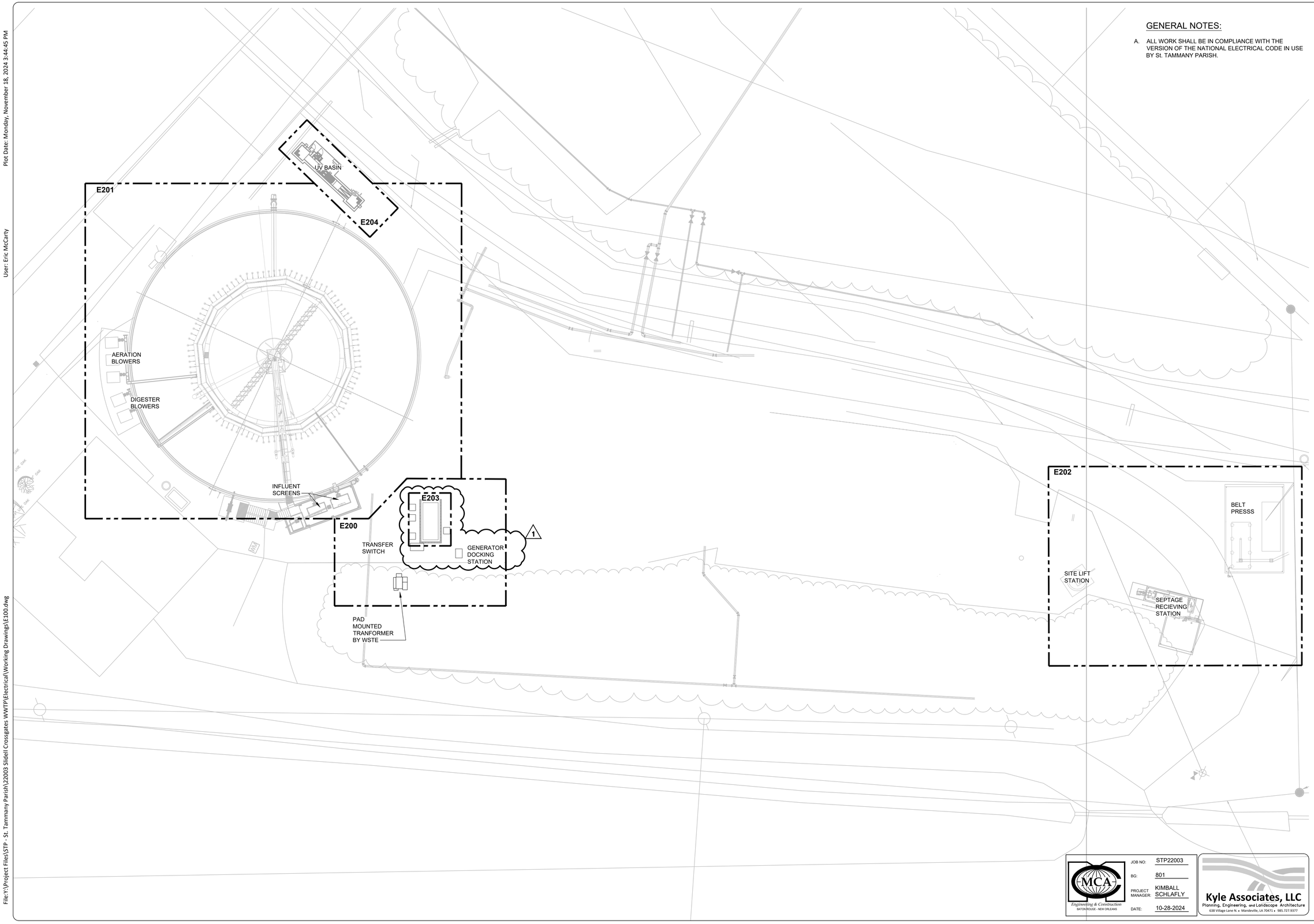
ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL BUILDING DETAILS

SHEET NO.
5S-2

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.



ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
A	ISSUE FOR BID	10/24
1	ADDENDUM #3	11/15/24

DESIGNED BY:	CSS
DRAWN BY:	GEM
CHECKED BY:	CSS
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
CHRISTIAN S. SCHAFLY
License No. 32483
PROFESSIONAL ENGINEER IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL SITE & KEY PLAN

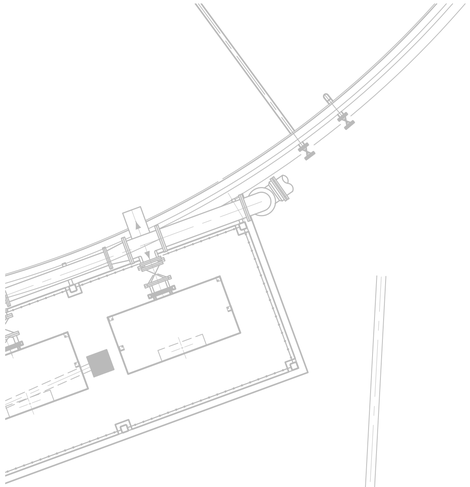
SHEET NO.

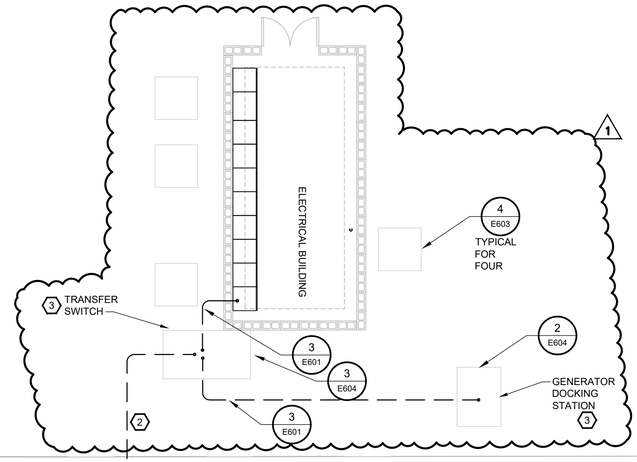
E100

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.5377





1 POWER ENLARGED PLAN
SCALE: 3/16" = 1'-0"

0' 1' 2' 3' 4' 5'

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.

B. CONTRACTOR SHALL PROVIDE FOUNDATIONS FOR ALL ELECTRICAL EQUIPMENT SHOWN. NO FOUNDATION WORK SHALL COMMENCE UNTIL VENDOR CERTIFIED SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED BY ALL DISCIPLINES. FOR UTILITY TRANSFORMER, CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH WSTE.

KEY NOTES:

1. PAD MOUNT TRANSFORMER SHALL BE PROVIDED BY WASHINGTON ST. TAMMANY ELECTRIC (WSTE). CONTRACTOR SHALL COORDINATE LOCATION WITH WSTE AND PROVIDE FOUNDATION PER WSTE STANDARDS. CONTRACTOR SHALL INCLUDE IN BID THE INSTALLATION OF TWO 4" UNDERGROUND CONCRETE ENCASED SCHEDULE 40 PVC CONDUITS FOR THE TRANSFORMER PRIMARY FEEDER RUN TO THE BASE OF THE NEAREST WSTE POLE. ALSO INCLUDE RIGID RGS CONDUIT AND BUSHING FOR WSTE TO RUN UP THE POLE. COORDINATE ALL REQUIREMENTS WITH WSTE PRIOR TO ANY WORK BEING PERFORMED OR ORDERING OF MATERIALS.

2. DUCT BANK FROM TRANSFORMER SECONDARY ROUTED TO TRANSFER SWITCH AND TO ELECTRICAL BUILDING MCC INCOMING SECTION. SEE ONE LINE DRAWING E400 FOR FEEDER SIZE. INCLUDE GROUND CONDUCTOR AS INDICATED ON GROUNDING PLAN E205. SAME SIZE FEEDERS SHALL BE ROUTED FROM DOCKING STATION TO TRANSFER SWITCH.

3. PRECISE LOCATION OF ALL EQUIPMENT PADS SHALL BE FIELD DETERMINED AND COORDINATED WITH OWNER.

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH
GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

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DRAWN BY:	GEM
CHECKED BY:	CSS
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
CHRISTIAN S. SCHAFLY
License No. 32483
PROFESSIONAL ENGINEER IN ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

POWER
ENLARGED PLAN

SHEET NO.
E200

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

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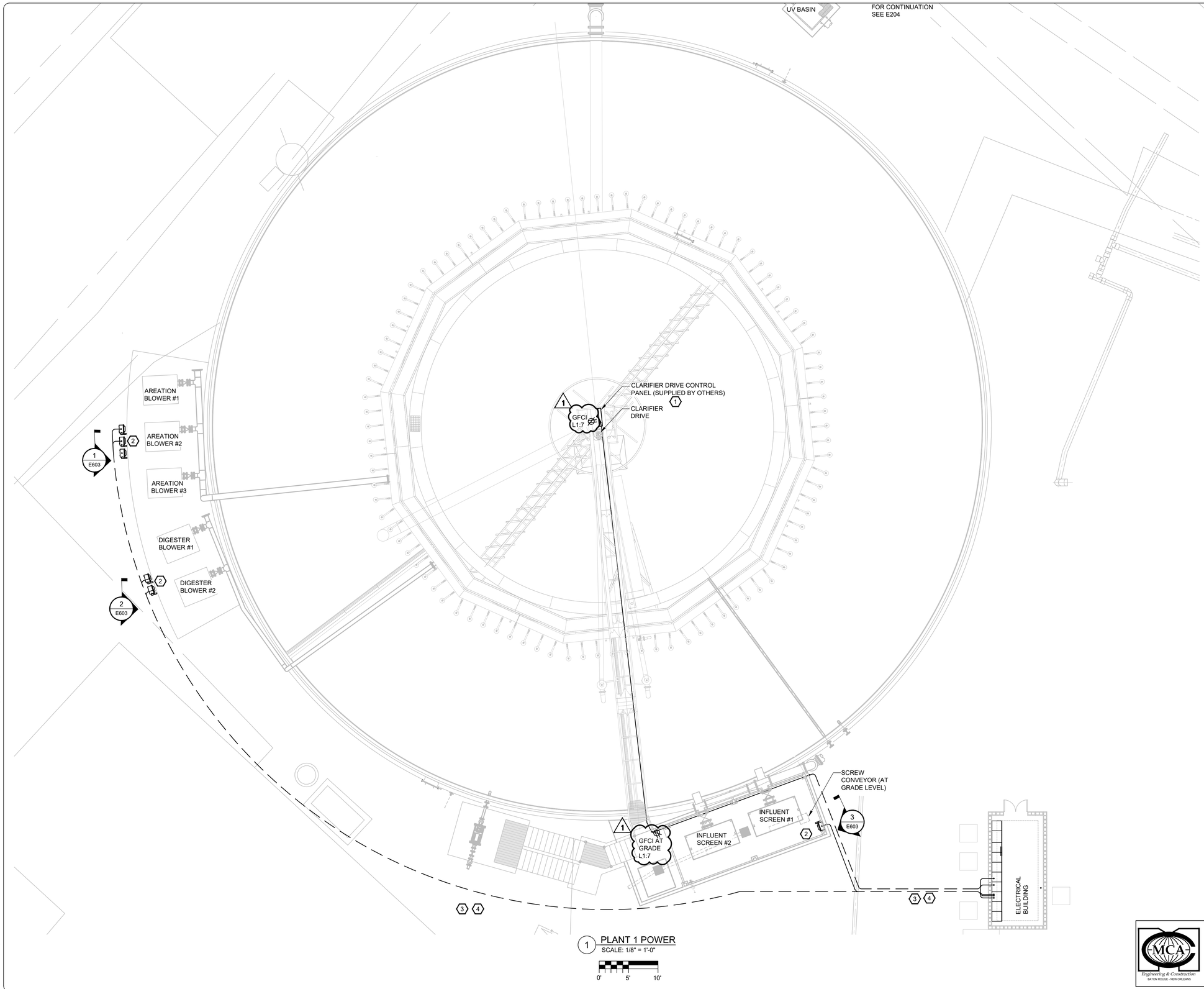
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.5577



1 PLANT 1 POWER
SCALE: 1/8" = 1'-0"
0' 5' 10'

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.

B. ALL MOTOR T LEADS SHALL CONSIST OF SURFACE RUN RGS CONDUIT WITH FINAL CONNECTION MADE USING LFMC.

C. ALL CONDUIT STUB UPS IN PLANT AREA SHALL HAVE SEAL OFF FITTINGS ABOVE GRADE LEVEL

D. UNDERGROUND CONDUIT RUNS TO PLANT EQUIPMENT SHALL BE CONCRETE ENCASED AND A BARE COPPER GROUNDING CONDUCTOR SHALL BE RUN ABOVE THE CONCRETE. SEE GROUNDING PLAN E205 FOR SIZE. CONTRACTOR SHALL PROVIDE AND INSTALL WARNING TAPE AS WELL. SEE ONE LINE DRAWING E400 FOR CONDUIT AND CONDUCTOR SIZES.

KEY NOTES:

1. PROVIDE POWER FOR CLARIFIER DRIVE CONTROL PANEL. SEE ONE LINE DRAWING E400 FOR SIZE.
2. CONTRACTOR SHALL PROVIDE AND INSTALL NON FUSED DISCONNECT SWITCHES FOR EACH EQUIPMENT ITEM. DISCONNECT SWITCHES FOR VFD DRIVEN EQUIPMENT SHALL HAVE AUXILIARY CONTACTS WIRED BACK TO THE VFD FOR THE PURPOSE OF RESETTING THE DRIVE WHEN THE SWITCH IS OPERATED. SEE ONE LINE DRAWING E400 FOR SIZES. EXTEND TO EQUIPMENT AS REQUIRED.
3. UNDERGROUND CONDUIT RUNS TO PLANT 1 AREATION BLOWERS 1,2,3, DIGESTER BLOWERS 1,2 AND INFLUENT SCREENS. CONDUITS SHALL BE PVC CONCRETE ENCASED . SEE ONE LINE DRAWING E400 FOR CONDUIT AND CONDUCTOR SIZES.
4. CONTRACTOR SHALL INCLUDE 4-2" PVC CONDUITS TO BLOWER AND SCREEN AREA FOR MISCELLANEOUS INSTRUMENTATION/SCADA/CONTROL CABLES.

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
A	ISSUE FOR BID	10/24
1	ADDENDUM #3	11/15/24

DESIGNED BY:	CSS
DRAWN BY:	GEM
CHECKED BY:	CSS
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU1900091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
CHRISTIAN S. SCHADE
License No. 32483
PROFESSIONAL ENGINEER
IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL BUILDING LAYOUT
ENLARGED PLAN

SHEET NO.
E201

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

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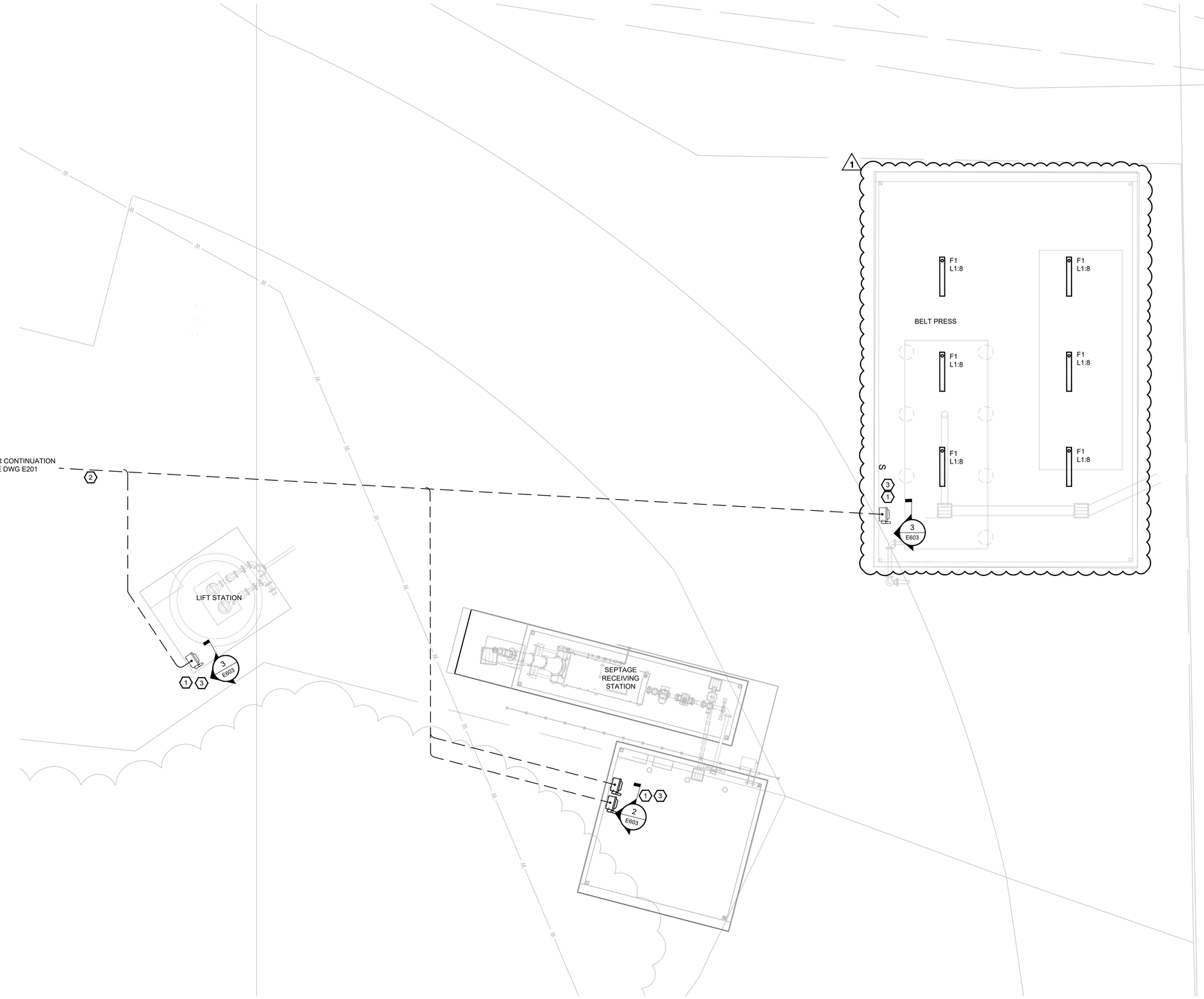
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377



GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.

B. ALL MOTOR T LEADS SHALL CONSIST OF SURFACE RUN RGS CONDUIT WITH FINAL CONNECTION BY LFMC.

C. ALL CONDUIT STUB UPS IN PLANT AREA SHALL HAVE SEAL OFF FITTINGS ABOVE GRADE LEVEL

D. UNDERGROUND CONDUIT RUNS TO PLANT EQUIPMENT SHALL BE CONCRETE ENCASED AND A BARE COPPER GROUNDING CONDUCTOR SHALL BE RUN ABOVE THE CONCRETE. SEE GROUNDING PLAN E205 FOR SIZE. CONTRACTOR SHALL PROVIDE AND INSTALL WARNING TAPE AS WELL. SEE ONE LINE DRAWING E400 FOR CONDUIT AND CONDUCTOR SIZES.

KEY NOTES:

1

1. CONTRACTOR SHALL PROVIDE AND INSTALL NON FUSED DISCONNECT SWITCHES FOR EACH EQUIPMENT ITEM. COORDINATE EXACT LOCATIONS WITH EQUIPMENT INSTALLER TO LOCATE SWITCHES AS CLOSE TO SEPTAGE CONTROL PANELS AS POSSIBLE. DISCONNECT SWITCHES FOR VFD DRIVEN EQUIPMENT SHALL HAVE AUXILIARY CONTACTS WIRED BACK TO THE VFD FOR THE PURPOSE OF RESETTING THE DRIVE WHEN THE SWITCH IS OPERATED. SEE ONE LINE DRAWING E400 FOR SIZES. EXTEND TO EQUIPMENT AS REQUIRED.
2. UNDERGROUND CONDUIT RUN TO BELT PRESS SINGLE POINT ELECTRICAL CONNECTION AND TO SEPTAGE RECEIVING STATION PUMP, AUGER AND SITE LIFT STATION. SEE ONE LINE DRAWING E400 FOR CONDUIT AND CONDUCTOR SIZES.
3. RUN A 2" CONDUIT FROM MCC TO EQUIPMENT PAD FOR CONTROL/INSTRUMENTATION WIRING.

N 1 LIFT STATION, SEPTAGE REC. & BELT PRESS POWER ENLARGED PLAN
SCALE: 3/16" = 1'-0"

0' 1' 2' 3' 4' 5'

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
A	ISSUE FOR BID	10/24
1	ADDENDUM #3	11/15/24

DESIGNED BY: CSS
DRAWN BY: GEM
CHECKED BY: CSS
SUBMITTED BY: KYLE ASSOC.
PROJECT No.: TU19000091
ISSUE DATE: 10/11/2024
APPROVED BY: ---
SHEET SIZE: ANSI D
SCALE:

STATE OF LOUISIANA
CHRISTIAN S. SCHADE
License No. 32483
PROFESSIONAL ENGINEER
IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

LIFT STATION, SEPTAGE REC. & BELT PRESS
POWER
ENLARGED PLAN

SHEET NO.
E202

MCA Engineering & Construction
BATON ROUGE · NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

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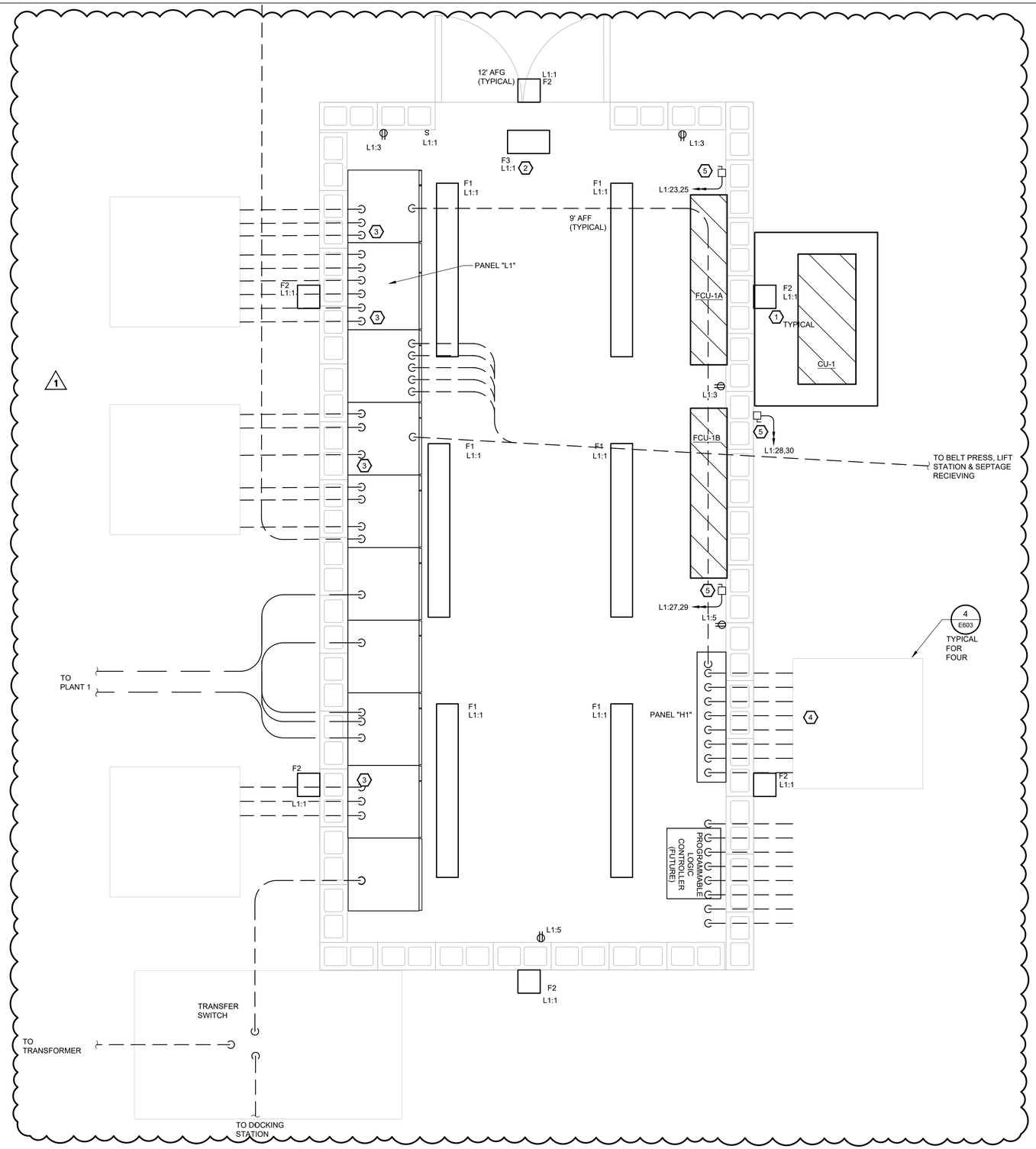
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377



1 ELECTRICAL BUILDING ENLARGED PLAN
SCALE: 3/4" = 1'-0"

0' 3" 6" 9" 1' 2'

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.

B. CONSTRUCTION OF ELECTRICAL BUILDING SHALL NOT COMMENCE UNTIL VENDOR CERTIFIED SHOP DRAWINGS OF THE MCC HAVE BEEN REVIEWED AND APPROVED BY ALL DISCIPLINES.

C. SEE GROUNDING PLAN DRAWING E205 FOR ELECTRICAL BUILDING GROUNDING.

KEY NOTES:

1. EXTERIOR WALL SCONCES SHALL BE CONTROLLED BY PHOTOCELL CONTRACTOR SHALL LOCATE, AIM AND ADJUST PHOTOCELL FOR OPTIMUM PERFORMANCE.
2. CONNECT TO UNSWITCHED LIGHTING CIRCUIT.
3. CONTRACTOR SHALL RUN 3" CONDUITS FROM MCC BASE TO IN GROUND PULL BOX FOR FUTURE USE. NUMBER OF CONDUITS SHALL BE AS INDICATED ON PLAN VIEW.
4. CONTRACTOR SHALL RUN EIGHT 3" CONDUITS FROM PANEL H1 BASE TO IN GROUND PULL BOX FOR FUTURE USE.
5. PROVIDE NEMA 3R DISCONNECT SWITCHES FUSED PER HVAC EQUIPMENT MANUFACTURER'S REQUIREMENTS.

1

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
A	ISSUE FOR BID	10/24
1	ADDENDUM #3	11/15/24

DESIGNED BY:	CSS
DRAWN BY:	GEM
CHECKED BY:	CSS
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
CHRISTIAN S. SCHAFLY
License No. 32483
PROFESSIONAL ENGINEER IN ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL BUILDING LAYOUT
ENLARGED PLAN

SHEET NO.
E203

MCA Engineering & Construction BATON ROUGE - NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.

B. IT IS THE INTENT OF THE DESIGN TO PROVIDE A COMPLETE GROUNDING SYSTEM PER NEC 250. ALL ELECTRICAL DISTRIBUTION EQUIPMENT, GENERATOR, METAL DECKING, REBAR, RAILINGS, STRUCTURES, PIPING, ETC. THAT COULD POSSIBLY BECOME ENERGIZED SHALL BE BONDED TO THE ELECTRICAL SERVICE ENTRANCE GROUND VIA #2/O BARE COPPER CONDUCTORS. ALL CONDUIT RUNS SHALL HAVE EQUIPMEMNT GROUNDS PER NEC.

C. SEE DWG E600 FOR GROUNDING DETAILS.

D. LIGHTING PROTECTION AIR TERMINALS AND DOWNCOMERS ARE SHOWN FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL SECURE THE SERVICES OF A CERTIFIED LIGHTING PROTECTION CONSULTANT/CONTRACTOR TO PROVIDE LIGHTING PROTECTION FOR THE FACILITY AND INCLUDE COST IN BID. ALL STRUCTURES ON SITE SHALL BE INCLUDED.

E. CONTRACTOR SHALL PROVIDE REBAR GROUNDS PER NEC 250.68(C) (3).

F. FOR ALL CONDUIT RUNS TO EQUIPMENT LOCATIONS, CONTRACTOR SHALL PROVIDE AND INSTALL A 2/O BARE COPPER GROUNDING ELECTRODE CONDUCTOR RUN ABOVE CONCRETE ENCASEMENT. BOND TO GROUNDING ELECTRODE AT EACH END.

N 1 ELECTRICAL BUILDING GROUNDING & LIGHTNING PROTECTION PLAN
SCALE: 1" = 20'-0"

0' 5' 10' 20' 40'

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
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DESIGNED BY: CSS
DRAWN BY: GEM
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SUBMITTED BY: KYLE ASSOC.
PROJECT No.: TU19000091

ISSUE DATE: 10/11/2024
APPROVED BY: ---
SHEET SIZE: ANSI D
SCALE:

STATE OF LOUISIANA
CHRISTIAN S. SCHADE
License No. 32483
PROFESSIONAL ENGINEER
IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL BUILDING GROUNDING & LIGHTNING PROTECTION PLAN

SHEET NO.
E205

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS
JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St. TAMMANY PARISH.

KEY NOTES:

1. CONTRACTOR SHALL RUN 2 # 8 AWG, 1 # 8AWG(G) IN 1-1/4" PVC CONDUIT, BURIED MINIMUM 36" BELOW FINISHED GRADE.
2. SEE PANEL SCHEDULE FOR SOURCE

P1, P1A, P2, P3

2 / E601

N 1 ELECTRICAL SITE LIGHTING
SCALE: 1" = 20'-0"
0' 5' 10' 20' 40'

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
A	ISSUE FOR BID	10/24
1	ADDENDUM #3	11/24

DESIGNED BY: CSS
DRAWN BY: GEM
CHECKED BY: CSS
SUBMITTED BY: KYLE ASSOC.
PROJECT No.: TU19000091
ISSUE DATE: 10/11/2024
APPROVED BY: ---
SHEET SIZE: ANSI D
SCALE:

STATE OF LOUISIANA
CHRISTIAN S. SCHAFLY
License NO. 32483
PROFESSIONAL ENGINEER
IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

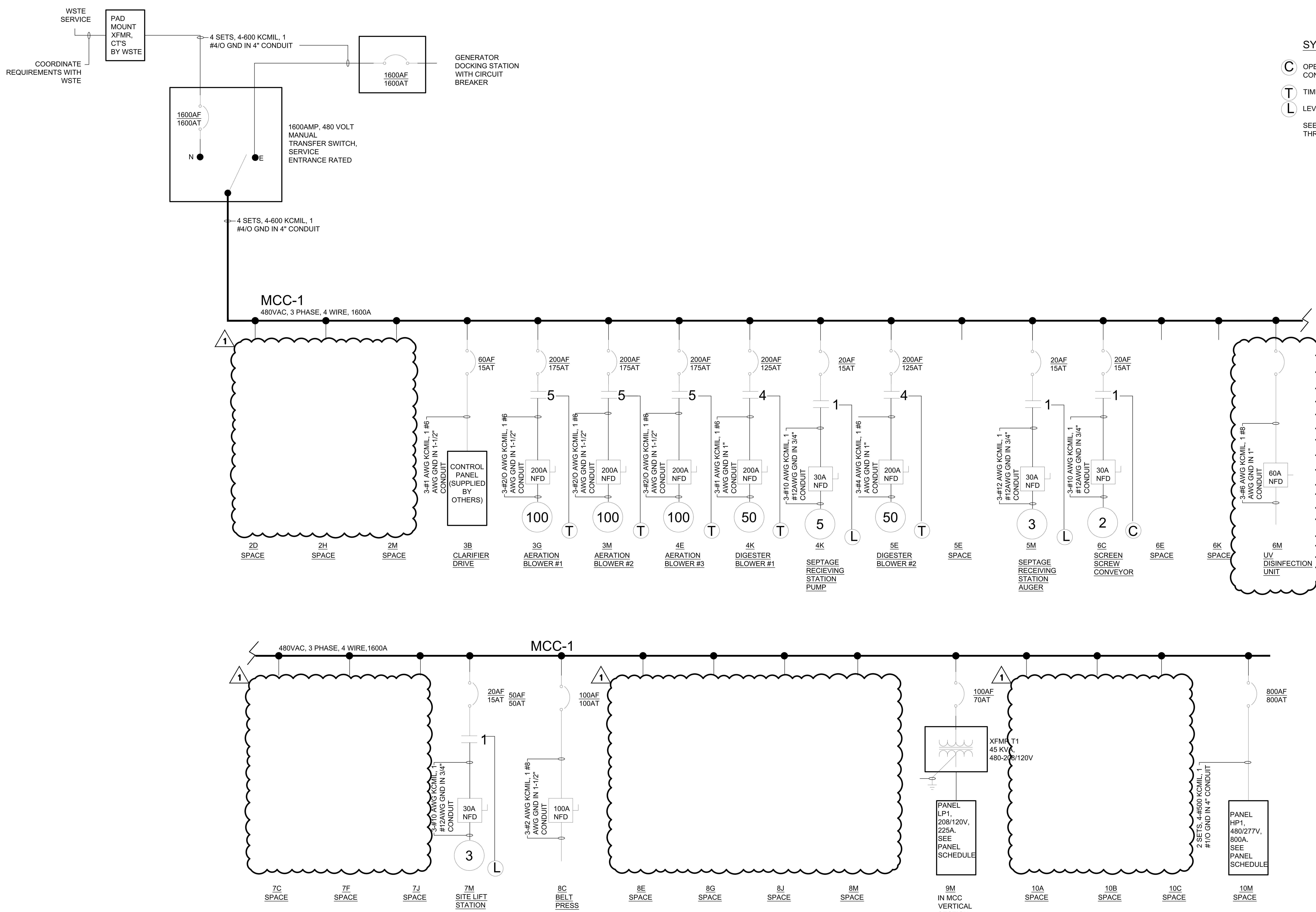
ELECTRICAL SITE LIGHTING

SHEET NO.
E300

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377


WSTE SERVICE
PAD MOUNT XFMR, CT'S BY WSTE
COORDINATE REQUIREMENTS WITH WSTE
4 SETS, 4-600 KCMIL, 1 #4/O GND IN 4" CONDUIT
1600AF 1600AT
GENERATOR DOCKING STATION WITH CIRCUIT BREAKER
1600AF 1600AT
N
E
1600AMP, 480 VOLT MANUAL TRANSFER SWITCH, SERVICE ENTRANCE RATED
4 SETS, 4-600 KCMIL, 1 #4/O GND IN 4" CONDUIT
MCC-1
480VAC, 3 PHASE, 4 WIRE, 1600A
60AF 15AT
3-#1 AWG KCMIL, 1 #6 AWG GND IN 1-1/2" CONDUIT
CONTROL PANEL (SUPPLIED BY OTHERS)
200AF 175AT
3-#2/O AWG KCMIL, 1 #6 AWG GND IN 1-1/2" CONDUIT
200A NFD
100
200AF 125AT
3-#1 AWG KCMIL, 1 #6 AWG GND IN 1"
50
20AF 15AT
3-#10 AWG KCMIL, 1 #12AWG GND IN 3/4" CONDUIT
30A NFD
3-#4 AWG KCMIL, 1 #6 AWG GND IN 1" CONDUIT
3-#12 AWG KCMIL, 1 #12AWG GND IN 3/4" CONDUIT
3-#10 AWG KCMIL, 1 #12AWG GND IN 3/4" CONDUIT
3-#6 AWG KCMIL, 1 #8 AWG GND IN 1" CONDUIT
60A NFD
2D SPACE
2H SPACE
2M SPACE
3B CLARIFIER DRIVE
3G AERATION BLOWER #1
3M AERATION BLOWER #2
4E AERATION BLOWER #3
4K DIGESTER BLOWER #1
4K SEPTAGE RECIEVING STATION PUMP
5E DIGESTER BLOWER #2
5E SPACE
5M SEPTAGE RECEIVING STATION AUGER
6C SCREEN SCREW CONVEYOR
6E SPACE
6K SPACE
6M UV DISINFECTION UNIT
480VAC, 3 PHASE, 4 WIRE,1600A
MCC-1
20AF 15AT
50AF 50AT
100AF 100AT
3-#2 AWG KCMIL, 1 #8 AWG GND IN 1-1/2" CONDUIT
100A NFD
100AF 70AT
XFMR T1 45 KVA, 480-208/120V
PANEL LP1, 208/120V, 225A, SEE PANEL SCHEDULE
800AF 800AT
2 SETS, 4-#500 KCMIL, 1 #1/O GND IN 4" CONDUIT
PANEL HP1, 480/277V, 800A, SEE PANEL SCHEDULE
7C SPACE
7F SPACE
7J SPACE
7M SITE LIFT STATION
8C BELT PRESS
8E SPACE
8G SPACE
8J SPACE
8M SPACE
9M IN MCC VERTICAL SECTION
10A SPACE
10B SPACE
10C SPACE
10M SPACE

SYMBOL LEGEND:

- (C) OPERATES WITH OTHER EQUIPMENT OR LOCAL CONTROL PANEL
- (T) TIMER
- (L) LEVEL

SEE ELEMENTARY LOGIC DIAGRAMS, DWGS E700 THRU E703.

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

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APPROVED BY:	— —
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
CHRISTIAN S. SCHADE
License No. 32483
PROFESSIONAL ENGINEER
IN ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL ONE LINE DIAGRAM

MCA Engineering & Construction — BATON ROUGE - NEW ORLEANS

JOB NO:	STP22003
BG:	801
PROJECT MANAGER:	KIMBALL SCHLAFLY
DATE:	10-28-2024

Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

SHEET NO.
E400

NAME: H1

LOCATION: ELEC 204

VOLTAGE (L-L): 480
VOLTAGE (L-N): 277
NUMBER OF PHASES: 3
NEUTRAL BUS: YES
FEED-THRU LUGS: YES

BUS: 800
MAIN: 800
KAIC: 10
NEMA 1 SURFACE

CKT #	ITEM	AMP RATE	# POLE	LEFT LOADING (VA) A	LEFT LOADING (VA) B	LEFT LOADING (VA) C	RIGHT LOADING (VA) A	RIGHT LOADING (VA) B	RIGHT LOADING (VA) C	# POLE	AMP RATE	ITEM	CKT #
1				14411			18000						2
3	40 HP BLOWER	100	3		14411			18000		3	70	54 KW TANKLESS WATER HEATER	4
5						14411			18000				6
7				14411									8
9	40 HP BLOWER	100	3		14411					3	200	SPARE	10
11						14411							12
13				443									14
15	CLARIFIER	15	3		443					3	200	SPARE	16
17						443							18
19													20
21	SPARE	200	3							3	200	SPARE	22
23													24
25													26
27	SPARE	200	3							3	200	SPARE	28
29													30
31													32
33	SPARE	200	3							3	200	SPARE	34
35													36
37													38
39	SPARE	200	3							3	200	SPARE	40
41													42
43													44
45	SPARE	200	3							3	200	SPARE	46
47													48
49													50
51	SPARE	200	3							3	200	SPARE	52
53													54
55													56
57	SPARE	200	3							3	200	SPARE	58
59													60
61													62
63	SPARE	200	3							3	200	SPARE	64
65													66
67													68
69	SPARE	200	3							3	200	SPARE	70
71													72
73	SPACE									-	-	SPACE	74
75	SITE LIGHTING	20	1		624					-	-	SPACE	76
77	SITE LIGHTING	20	1			624				-	-	SPACE	78
79	SITE LIGHTING	20	1	624						-	-	SPACE	80
81	SITE LIGHTING	20								-	-	SPACE	82
83	SPACE									-	-	SPACE	84
				29889	29889	29889	18000	18000	18000				

	(VA)	(A)
TOTAL CONNECT LOAD:	143666	
PHASE A:	47889	173
PHASE B:	47889	173
PHASE C:	47889	173
PEAK DEMAND LOAD:	143666	
PHASE A:	47889	173
PHASE B:	47889	173
PHASE C:	47889	173

	LOAD	DVRSTY	DMND
1 LIGHTS	1872	1.00	1872
2 RECEPT <10KVA	0	1.00	0
RECEPT >10KVA	0	1.00	0
3 AHU BLOWER	0	1.00	0
4 CONDENSER	0	1.00	0
5 HEAT	0	1.00	0
6 HPU	0	1.00	0
7 WATER HEAT	54000	1.00	54000
8 REFRIGERATION	0	1.00	0
9 KITCHEN	0	1.00	0
10 ELEVATOR	0	1.00	0
11 MISC	0	1.00	0
12 SUBFEED DEM	87794	1.00	87794

NOTES:
* PROVIDE FINAL TYPEWRITTEN DIRECTORY INSIDE PANEL.
* PROVIDE ENGRAVED PLASTIC LABEL WITH PANEL DESIGNATION ON PANEL COVER.
* PROVIDE INTEGRAL TVSS - 120 KA

NAME: L1

LOCATION: MAIN ELEC

VOLTAGE (L-L): 208
VOLTAGE (L-N): 120
NUMBER OF PHASES: 3
NEUTRAL BUS: YES
FEED-THRU LUGS: NO

BUS: 225
MAIN: MLO
KAIC: 65
NEMA 1 SURFACE

CKT #	ITEM	AMP RATE	# POLE	LEFT LOADING (VA) A	LEFT LOADING (VA) B	LEFT LOADING (VA) C	RIGHT LOADING (VA) A	RIGHT LOADING (VA) B	RIGHT LOADING (VA) C	# POLE	AMP RATE	ITEM	CKT #
1	ELECTRICAL BUILDING LIGHTS	20	1	1600			732			1	20	INFLUENT SCREEN	2
3	ELECTRICAL BUILDING RECEPTACLES	20	1		1600			732		1	20	INFLUENT SCREEN	4
5	ELECTRICAL BUILDING RECEPTACLES	20	1			1600			1600	1	20	PLC	6
7	CLARIFIER RECEPTACLES	20	1	400			240			1	20	BELT PRESS LIGHITNG	8
9	SPARE	20	1							1	20	SPARE	10
11	SPACE											SPACE	12
13	SPACE											SPACE	14
15	SPACE											SPACE	16
17	SPACE											SPACE	18
19	SPACE											SPACE	20
21	SPACE											SPACE	22
23	FCU-1A	15	2			89						SPACE	24
25				89								SPACE	26
27	FCU-2A	15	2		89			4160		2	50	CU-1	28
29						89			4160				30
				2089	1689	1779	972	4892	5760				

	(VA)	(A)
TOTAL CONNECT LOAD:	17182	
PHASE A:	3061	25
PHASE B:	6581	55
PHASE C:	7539	63
PEAK DEMAND LOAD:	6772	
PHASE A:	2406	20
PHASE B:	1966	16
PHASE C:	2400	20

	LOAD	DVRSTY	DMND
1 LIGHTS	240	1.00	240
2 RECEPT <10KVA	400	0.50	200
RECEPT >10KVA	0	0.50	0
3 AHU BLOWER	0	1.00	0
4 CONDENSER	4518	0.00	0
5 HEAT	0	1.00	0
6 HPU	0	1.00	0
7 WATER HEAT	0	0.50	0
8 REFRIGERATION	0	0.50	0
9 KITCHEN	0	0.50	0
10 ELEVATOR	4800	1.00	4800
11 MISC	3064	0.50	1532
12 SUBFEED DEM	0	1.00	0

NOTES:
* PROVIDE FINAL TYPEWRITTEN DIRECTORY INSIDE PANEL.
* PROVIDE ENGRAVED PLASTIC LABEL WITH PANEL DESIGNATION ON PANEL COVER.
* PROVIDE INTEGRAL TVSS - 120 KA

1 PANEL SCHEDULE
SCALE: NONE

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COVINGTON, LA 70433

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SCALE:

STATE OF LOUISIANA
CHRISTIAN S. SCHLADE
License No. 32483
PROFESSIONAL ENGINEER IN ELECTRICAL ENGINEERING
10/28/2024

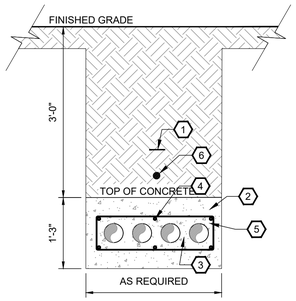
ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL PANEL SCHEDULES

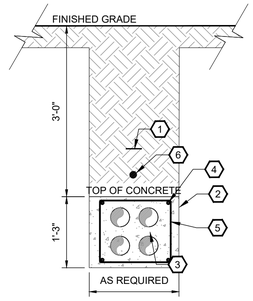
SHEET NO.
E500

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS
JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

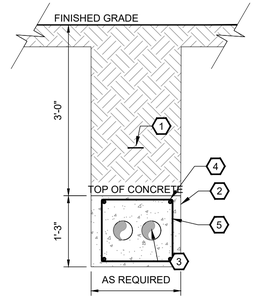
Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377



1 FOUR CONDUIT DUCTBANK DETAIL
SCALE: N.T.S.



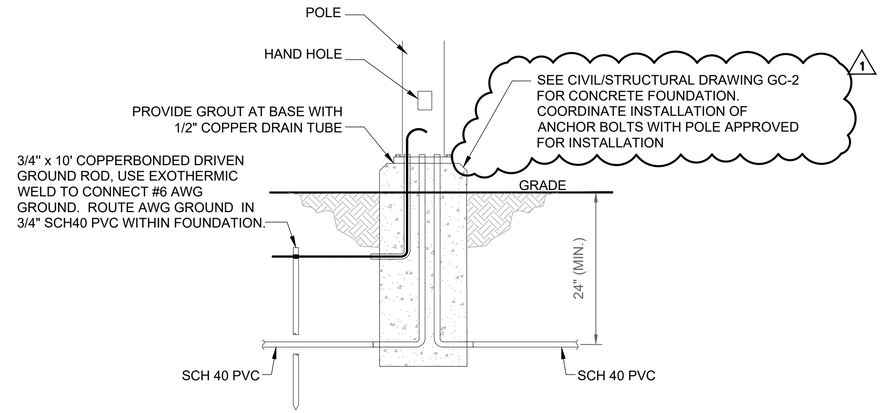
3 FOUR CONDUIT DUCTBANK DETAIL
SCALE: N.T.S.



4 TWO CONDUIT DUCTBANK DETAIL
SCALE: N.T.S.

KEY NOTES:

1. DUCT BANK GROUND CABLE SHALL BE BONDED TO TRANSFORMER GROUNDING LUG AND BUILDING GROUNDING ELECTRODE.
2. RED-DYE CONCRETE ENCASED ELECTRICAL DUCTBANK.
3. CONTRACTOR SHALL USE SPACERS AS REQUIRED TO SUPPORT CONDUITS DURING CONCRETE POUR.
4. MAXIMUM SPACING BETWEEN REBARS SHALL NOT EXCEED 12". ADD ADDITIONAL REBAR AS REQUIRED.
5. CONTRACTOR SHALL MAINTAIN MINIMUM 3" CONCRETE COVER FOR REBAR.
6. BOND TO EQUIPMENT GROUNDING ELECTRODE.



2 LIGHT POLE FOUNDATION DETAIL
SCALE: N.T.S.

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

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CHRISTIAN S. SCHAFLY
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PROFESSIONAL ENGINEER IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL DETAILS

SHEET NO.
E601

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

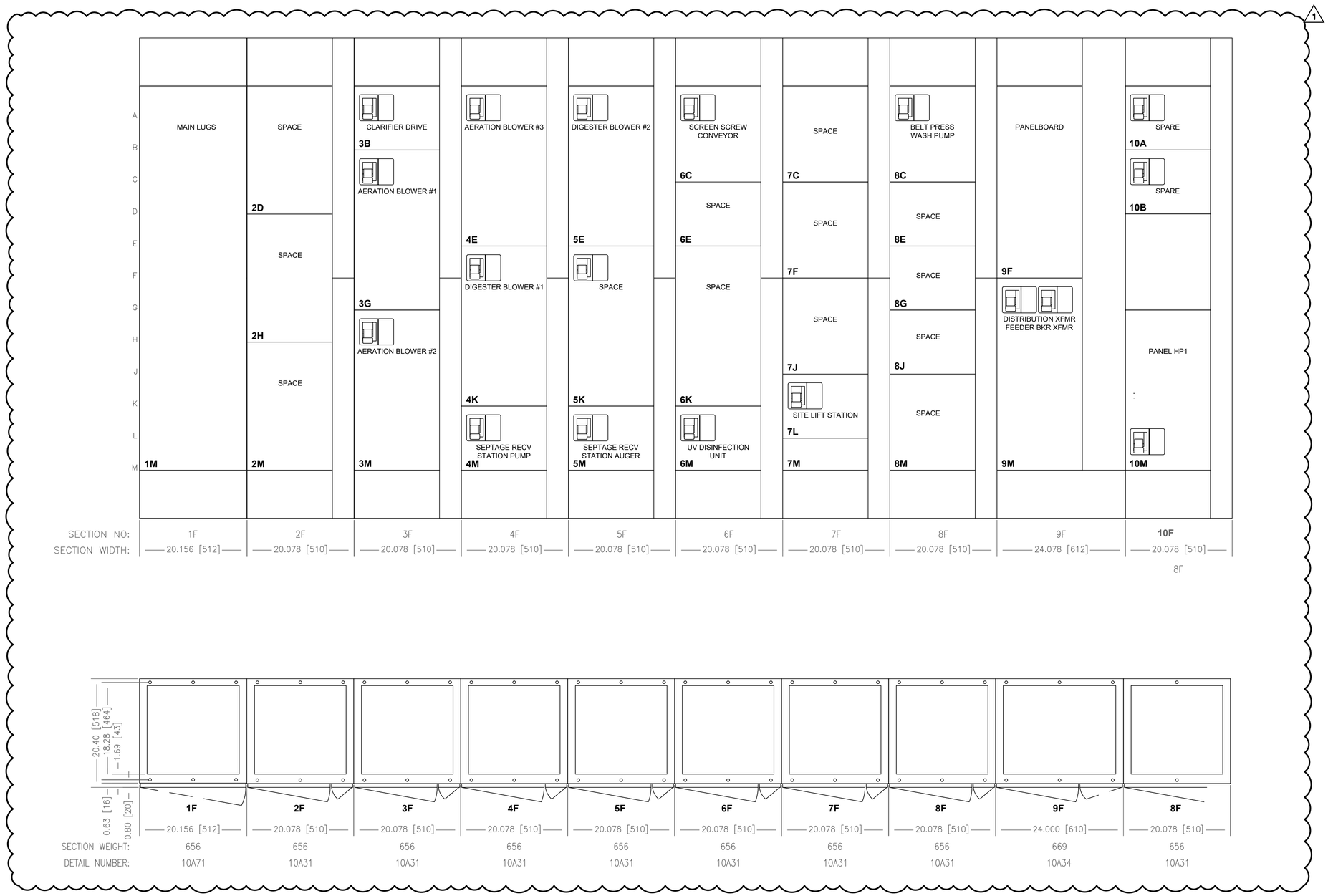
JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St TAMMANT PARISH.

B. ELEVATIONS AND FOOTPRINTS ARE SHOWN FOR BIDDING PURPOSES ONLY CONTRACTOR SHALL CONFIRM ALL DIMENSIONS WITH VENDOR CERTIFIED SHOP DRAWINGS.



1 MCC ELEVATION & FOOTPRINT
SCALE: 1/4" = 1'-0"
0' 1' 2' 3' 4' 5'

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10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL BUILDING MCC-1
ELEVATIONS

SHEET NO.
E602

MCA Engineering & Construction BATON ROUGE - NEW ORLEANS
JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
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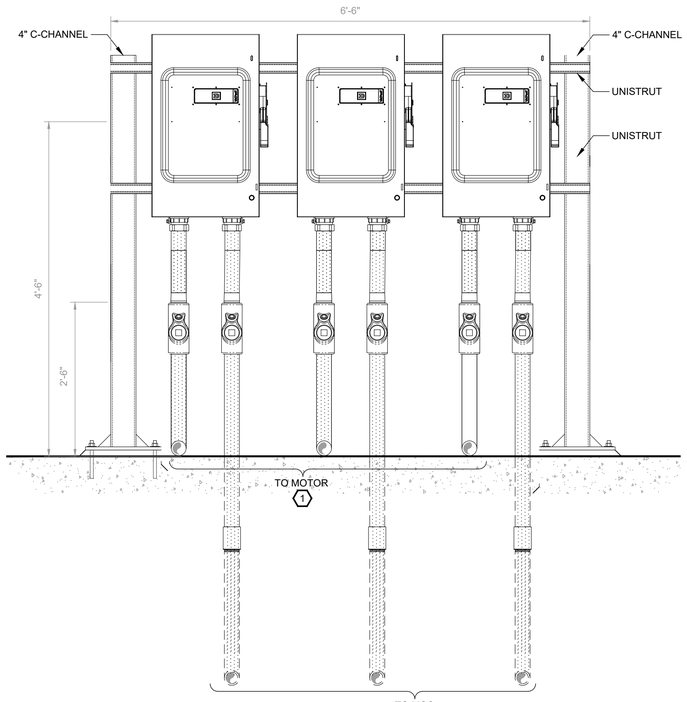
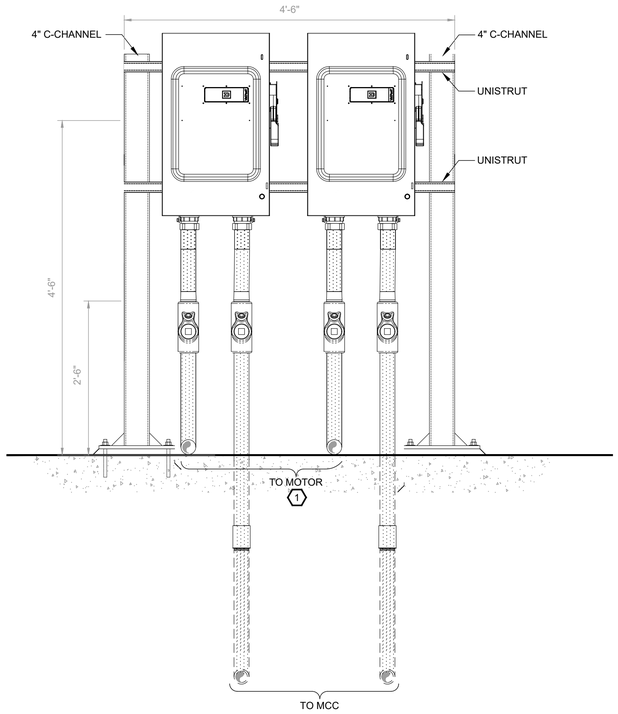
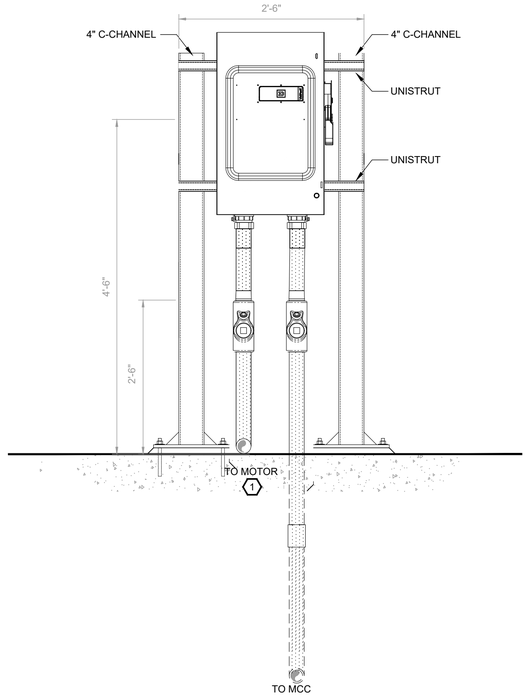


1 3 DISCONNECT RACK
SCALE: NONE



2 2 DISCONNECT RACK
SCALE: NONE



3 2 DISCONNECT RACK
SCALE: NONE

GENERAL NOTES:

A. ALL WORK SHALL BE IN COMPLIANCE WITH THE VERSION OF THE NATIONAL ELECTRICAL CODE IN USE BY St TAMMANY PARISH.

B. ELEVATIONS AND FOOTPRINTS ARE SHOWN FOR BIDDING PURPOSES ONLY CONTRACTOR SHALL CONFIRM ALL DIMENSIONS WITH VENDOR CERTIFIED SHOP DRAWINGS.

B. ALL MOTOR T LEADS SHALL CONSIST OF SURFACE RUN RGS CONDUIT WITH FINAL CONNECTION BY LFMC.

C. ALL CONDUIT STUB UPS IN PLANT AREA SHALL HAVE SEAL OFF FITTINGS UL LISTED FOR CLASS 1 DIV 2 GROUPS C AND D ABOVE GRADE LEVEL.

D. UNDERGROUND CONDUIT RUNS TO PLANT EQUIPMENT SHALL BE CONCRETE ENCASED AND A BARE COPPER GROUNDING CONDUCTOR SHALL BE RUN ABOVE THE CONCRETE. SEE GROUNDING PLAN E205 FOR SIZE. CONTRACTOR SHALL PROVIDE AND INSTALL WARNING TAPE AS WELL. SEE ONE LINE DRAWING E400 FOR CONDUIT AND CONDUCTOR SIZES.

KEY NOTES:

1 CONDUIT TO MOTOR SHALL BE RUN ON SURFACE IN RGS CONDUIT. FINAL CONNECTION SHALL BE MADE USING FLEXIBLE SEALTIGHT.

4 PULLBOX DETAIL
SCALE: NONE

ST. TAMMANY PARISH GOVERNMENT

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10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

ELECTRICAL DISCONNECT RACK ELEVATIONS

SHEET NO.
E603

MCA Engineering & Construction BATON ROUGE - NEW ORLEANS

JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

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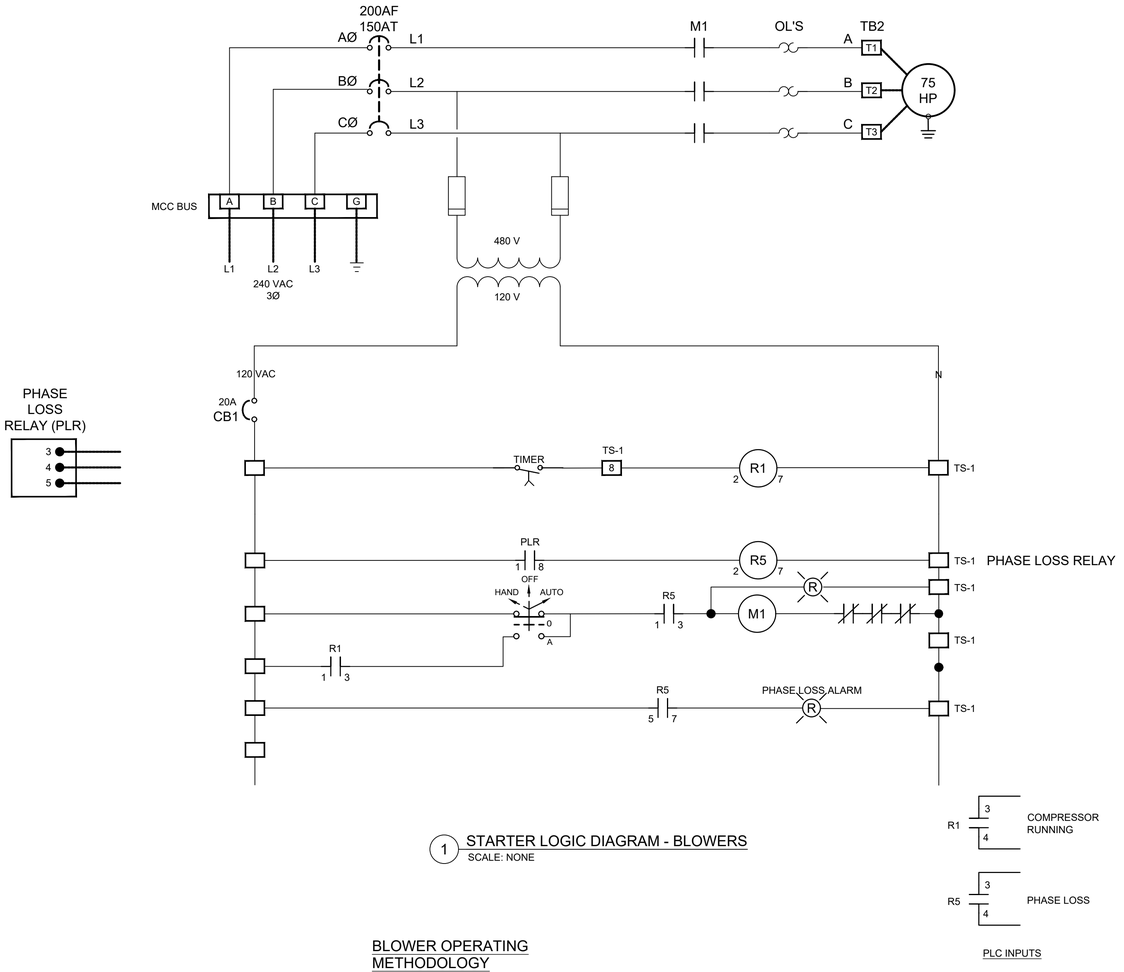
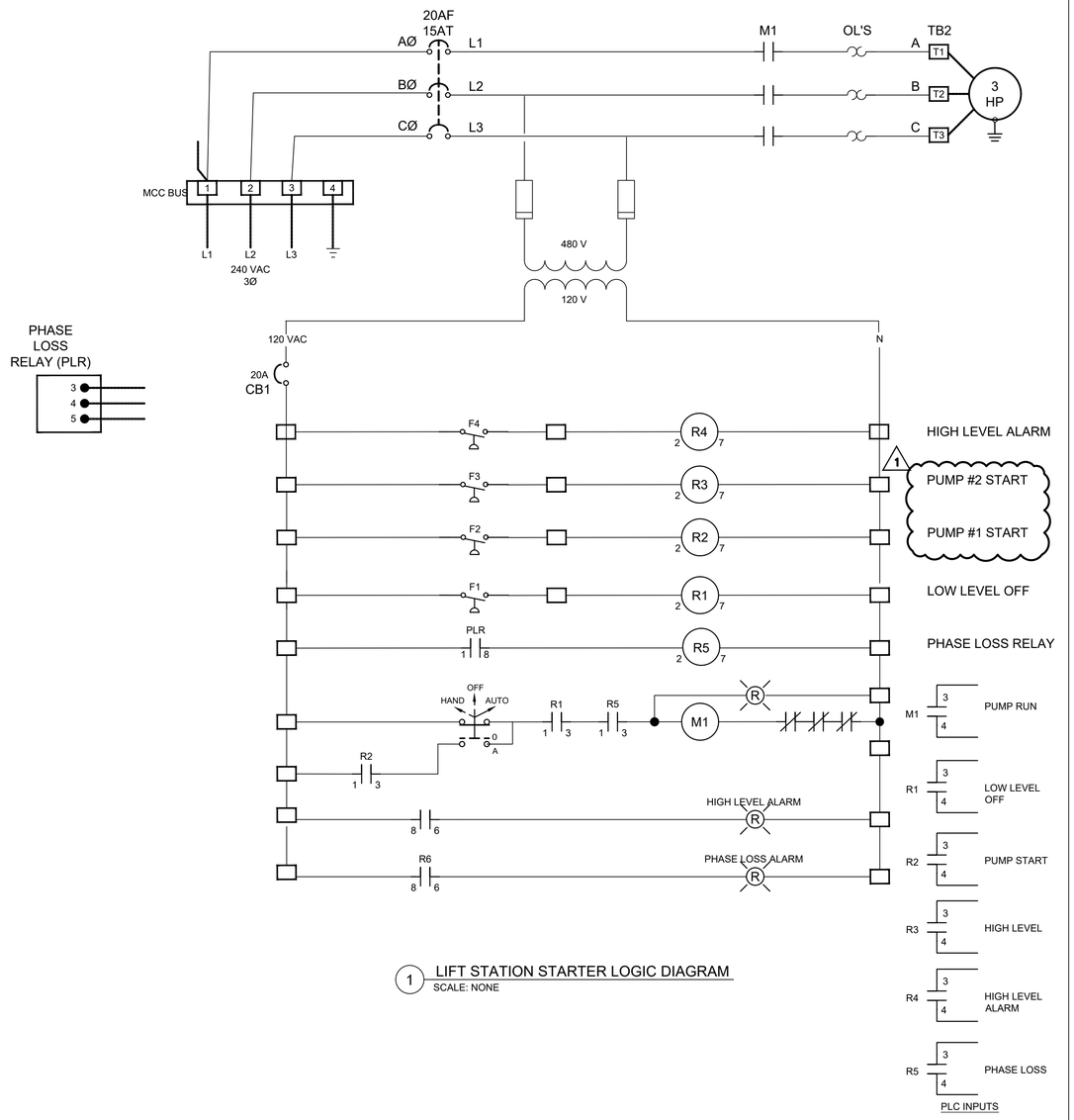


1 STARTER LOGIC DIAGRAM - BLOWERS
SCALE: NONE

BLOWER OPERATING METHODOLOGY

A. ONE DIGESTER BLOWER SHALL RUN FOR SET TIME PERIOD. WHEN ONE SHUTS DOWN, THE OTHER BLOWER STARTS. TIMER SHALL ALTERNATE BETWEEN BOTH SO THAT EACH HAVE EQUAL RUN TIME.

B. TWO AERATION BLOWERS SHALL RUN SIMULTANEOUSLY WITH ONE AS BACKUP. TIMER SHALL ALTERNATE BETWEEN ALL THREE SO THAT ALL HAVE EQUAL RUN TIME.



1 LIFT STATION STARTER LOGIC DIAGRAM
SCALE: NONE

ST. TAMMANY PARISH GOVERNMENT

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
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ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

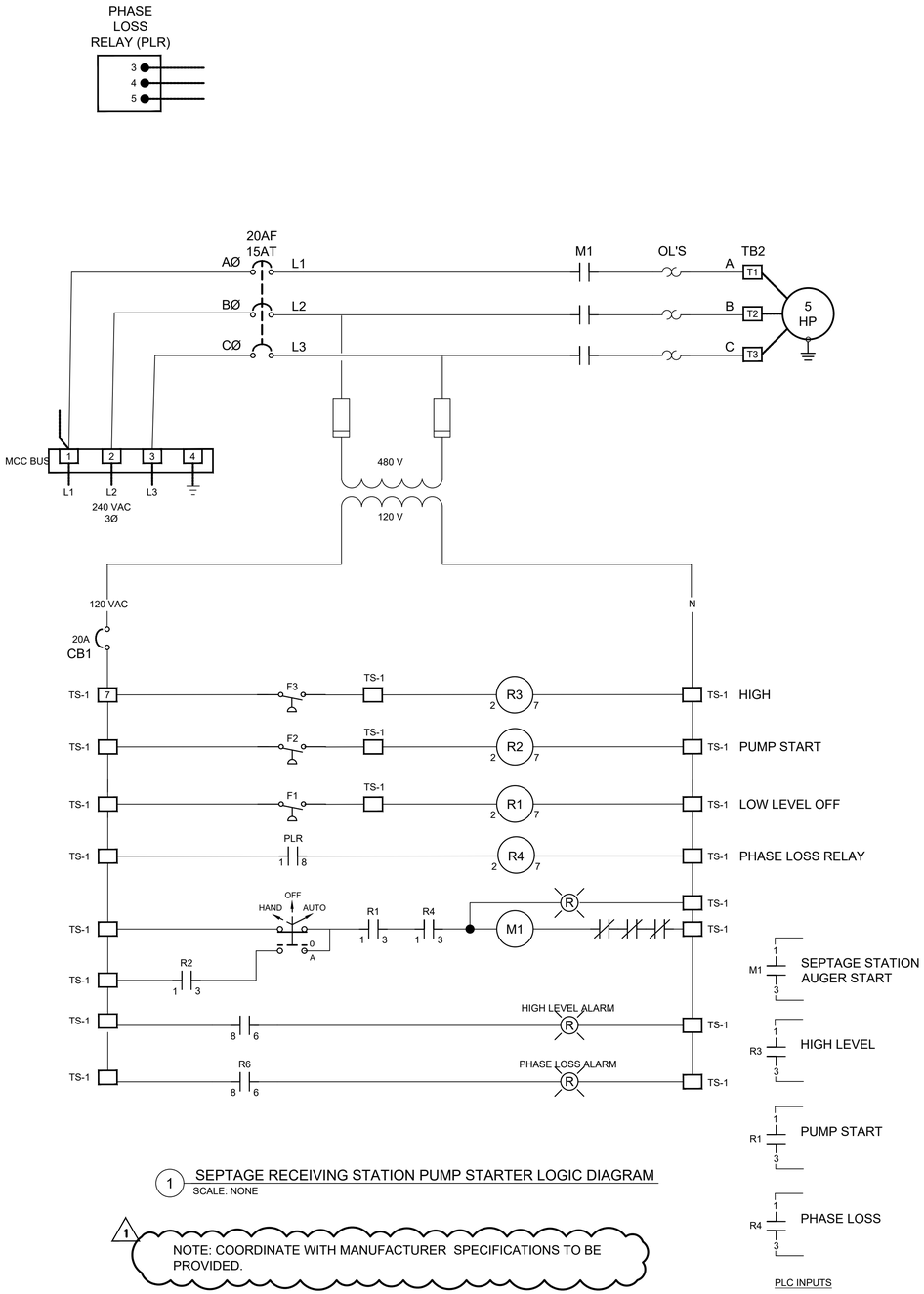
LOGIC DIAGRAMS

JOB NO:	STP22003
BG:	801
PROJECT MANAGER:	KIMBALL SCHLAFLY
DATE:	10-28-2024

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

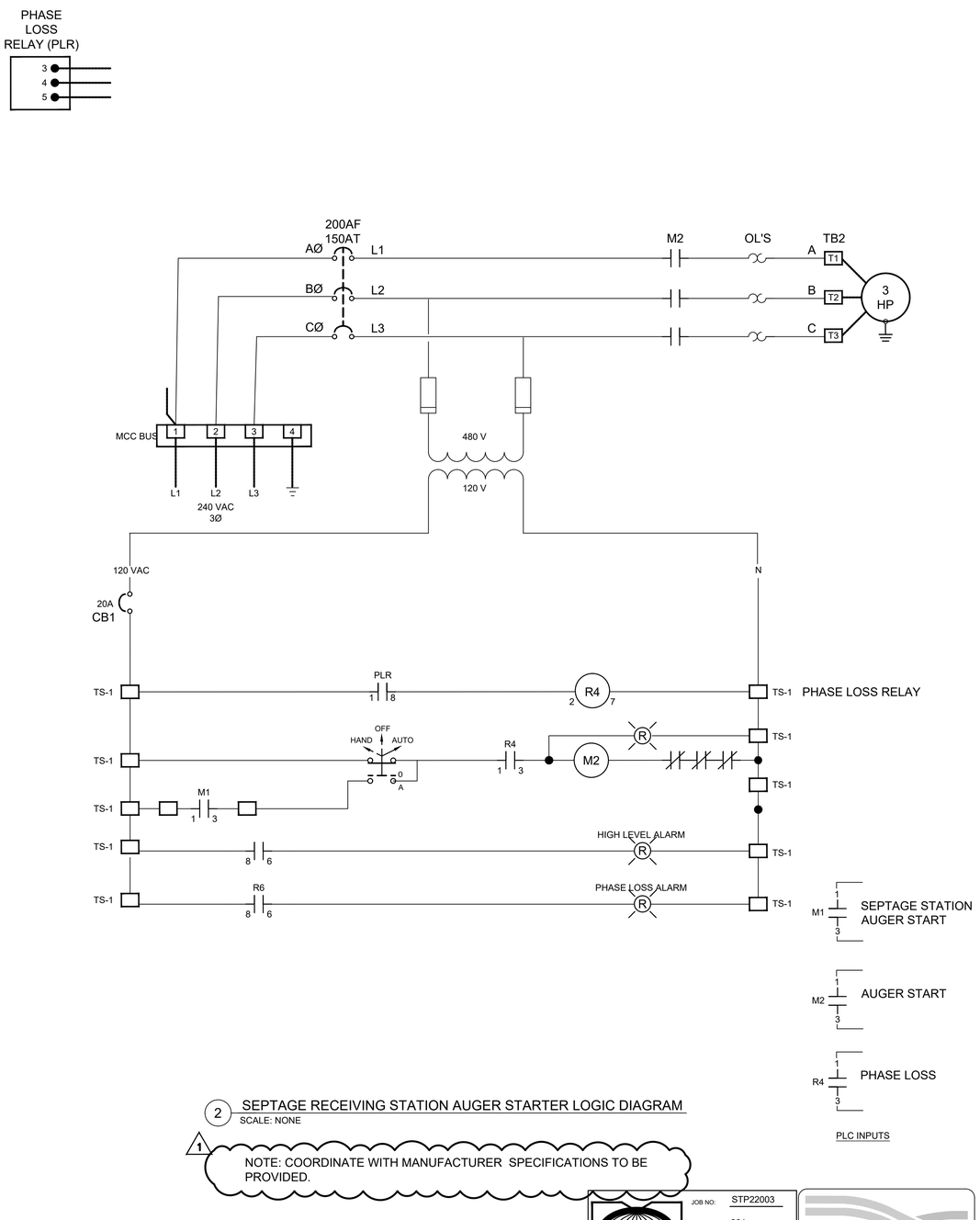
Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

SHEET NO.
E700



1 SEPTAGE RECEIVING STATION PUMP STARTER LOGIC DIAGRAM
SCALE: NONE

1 NOTE: COORDINATE WITH MANUFACTURER SPECIFICATIONS TO BE PROVIDED.



2 SEPTAGE RECEIVING STATION AUGER STARTER LOGIC DIAGRAM
SCALE: NONE

1 NOTE: COORDINATE WITH MANUFACTURER SPECIFICATIONS TO BE PROVIDED.

JOB NO:	STP22003
BG:	801
PROJECT MANAGER:	KIMBALL SCHLAFLY
DATE:	10-28-2024

MCA Engineering & Construction, BATON ROUGE - NEW ORLEANS

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DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
A	ISSUE FOR BID	10/24
1	ADDENDUM #3	11/15/24

DESIGNED BY:	CSS
DRAWN BY:	GEM
CHECKED BY:	CSS
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	10/11/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
CHRISTIAN S. SCHLAFLY
License No. 32483
PROFESSIONAL ENGINEER IN
ELECTRICAL ENGINEERING
10/28/2024

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

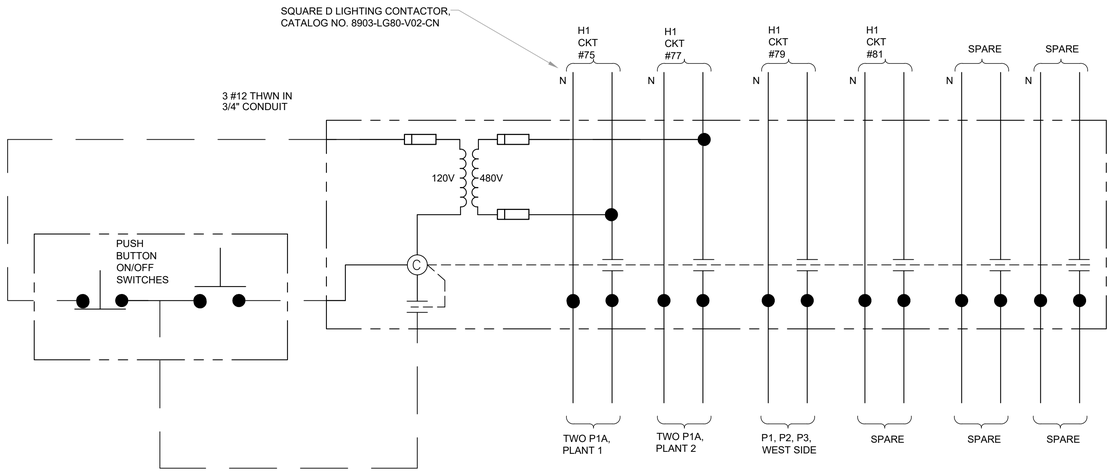
LOGIC DIAGRAMS

SHEET NO.

E701

NOT USED

1 TYPICAL VFD DRIVEN PUMP LOGIC DIAGRAM
SCALE: NONE



NOTE: LIGHTING CONTACTOR SHALL BE
LOCATED IN THE ELECTRICAL BUILDING:

2 LIGHTING CONTACTOR
SCALE: NONE

DEPT. OF UTILITIES
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GOVERNMENT
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ST TAMMANY PARISH
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SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

LOGIC DIAGRAMS

SHEET NO.
E702

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS
JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

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MECHANICAL LEGENDS / SYMBOLS - AIR SIDE

SYMBOL	DESCRIPTION
	FLEXIBLE CONNECTION
	SQUARE ELBOW
	SQUARE ELBOW WITH TURNING VANES
	LONG RADIUS ELBOW
R	DUCT RISE IN DIRECTION OF AIR FLOW
D	DUCT DROP IN DIRECTION OF AIR FLOW
AP	ACCESS PANEL
10x8	DUCTWORK, SIZE IN INCHES, FIRST DIMENSION IS SIDE SHOWN
	MANUAL BALANCING DAMPER
	LINED DUCTWORK
	RECTANGULAR TRANSITION
	RECTANGULAR TO ROUND TRANSITION
	RECTANGULAR BOOT TAP WITH BALANCING DAMPER
	ROUND TAP WITH BALANCING DAMPER
	SUPPLY REGISTER
	EXHAUST/RETURN REGISTER
	DUCT TURN UP
	DUCT TURN DOWN
	ROUND CEILING DIFFUSER
	SUPPLY DIFFUSER
	RETURN DIFFUSER
	EXHAUST GRILLE
	LINEAR SLOT SUPPLY DIFFUSER
	LINEAR SLOT RETURN DIFFUSER
	ITEMS TO BE REMOVED (DEMO)
	EXISTING
	NEW
	NEW EQUIPMENT (DASHED LINES INDICATE CLEARANCE)
	FLEXIBLE DUCT
	INDICATES AIR FLOW DIRECTION - SA OR OA
F	INDICATES AIR FLOW DIRECTION - RA OR EA
V F D	VARIABLE FREQUENCY DRIVE
M	MOTORIZED DAMPER
FD	FD: FIRE DAMPER SD: SMOKE DAMPER FSD: COMBINATION FIRE SMOKE DAMPER
AFT	AIRFLOW TRANSMITTER

*NOTE: NOT ALL SYMBOLS ARE USED.

MECHANICAL LEGENDS / SYMBOLS - CONTROLS

SYMBOL	DESCRIPTION
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
	CURRENT SWITCH
T ITEM	THERMOSTAT (SUBSCRIPT DENOTES ITEM CONTROLLED)
TS	TEMPERATURE SENSOR
TT	TEMPERATURE TRANSMITTER
A	AUDIBLE ALARM
V	VISUAL ALARM
H ITEM	HUMIDISTAT (SUBSCRIPT DENOTES ITEM(S) CONTROLLED)
HS	HUMIDITY SENSOR
G TYPE	GAS SENSOR (SUBSCRIPT DENOTES TYPE OF SENSOR)
	DENOTES CONTROL WIRING CONNECTING DEVICES
	PNEUMATIC TUBE
	CONTROL / ALARM WIRE / CABLE
	POWER WIRE
	BAS / LAN WIRE
	FAN
	DAMPER
H L	MAGNEHELIC GAUGE
	TEMPERATURE SENSOR
	HUMIDITY SENSOR
	AVERAGING TEMPERATURE SENSOR
	STATIC PRESSURE SWITCH
	SMOKE OR CO2 DETECTOR
H L	DIFFERENTIAL PRESSURE SENSOR
M	ELECTRIC/ELECTRONIC ACTUATOR
	AIRFLOW MONITORING STATION
	STATIC PRESSURE TRANSMITTER

*NOTE: NOT ALL SYMBOLS ARE USED.

MECHANICAL LEGENDS / SYMBOLS - WATER SIDE

SYMBOL	DESCRIPTION
	AIR VENT - AUTOMATIC
	BACK FLOW PREVENTER: REDUCED - PRESSURE - PRINCIPLE
	BACK FLOW PREVENTER: DOUBLE CHECK
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	CIRCUIT SETTER/BALANCING VALVE
	CONCENTRIC REDUCER
	DIAPHRAGM VALVE
DP	DIFFERENTIAL PRESSURE SENSOR
	ECCENTRIC REDUCER
	ELBOW - TURNED DOWN
	ELBOW - TURNED UP
M	ELECTRIC / ELECTRONIC ACTUATOR
	EXPANSION JOINT
	FLANGED CONNECTION
	FLEXIBLE PIPING CONNECTION
	FLOW DIRECTION
FM	FLOW METER
FS	FLOW SWITCH
	GATE VALVE
	GLOBE VALVE
	INSULATED PIPE
	NEEDLE VALVE
	PIPE ANCHOR
	PIPE CAP
	PIPE GUIDE
PS	PIPE SUPPORT
	PLUG VALVE
	PNEUMATIC ACTUATOR
P	PRESSURE GAUGE W/ GAUGE COCK
	PRESSURE REDUCING VALVE
	PUMP
PSD	PUMP SUCTION DIFFUSER
	RELIEF OR SAFETY VALVE
S	SOLENOID ACTUATOR
	STRAINER
	TEE - OUTLET DOWN
	TEE - OUTLET UP
	TEE - SIDE VIEW
TI	TEMPERATURE INDICATOR (THERMOMETER)
TS	TEMPERATURE SENSOR
	THREE WAY VALVE
TW	THERMO WELL
	TRIPLE DUTY VALVE (SHUT-OFF, CHECK AND BALANCING)
	UNION

*NOTE: NOT ALL SYMBOLS ARE USED.

MECHANICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AC	AIR CONDITIONING
ACCU	AIR COOLED CONDENSING UNIT
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AFS	AIR FLOW STATION
AHU	AIR HANDLING UNIT
AMB	AMBIENT
AMP	AMPERE
AS	AIR SEPARATOR
AUTO	AUTOMATIC
AV	AIR VENT
BAS	BUILDING AUTOMATION SYSTEM
BDD	BACKDRAFT DAMPER
BFP	BACKFLOW PREVENTER
BOD	BOTTOM OF DUCT
BOI	BOTTOM OF INSULATION ELEVATION
BOP	BOTTOM OF PIPE ELEVATION
BTUH	BRITISH THERMAL UNIT PER HOUR
C	COMMON
CAP	CAPACITY
CC	COOLING COIL
CD	CEILING DIFFUSER
CDS	CENTRIFUGAL DIRT SEPARATOR
CFF	CAP FOR FUTURE
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHW	CHILLED WATER
CHWCF	CHILLED WATER CHEMICAL FEED
CHWP	CHILLED WATER PUMP
CL	CENTERLINE
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
COMP	COMPRESSOR
COND	CONDENSING/ CONDENSATE
CP	CONTROL PANEL
CU	CONDENSING UNIT
CT	COOLING TOWER
CV	CONTROL VALVE
CW	COLD WATER
CWCF	CONDENSER WATER CHEMICAL FEED
CWR	CONDENSER WATER RETURN
CWP	CONDENSER WATER PUMP
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB TEMP (DEG F)
DDC	DIRECT DIGITAL CONTROL
DH	DEHUMIDIFIER
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DMPR	DAMPER
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPS	DIFFERENTIAL PRESSURE SWITCH
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAV	EXHAUST AIR (CONTROL) VALVE
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ENT	ENTERING
EOM	END OF MAIN DRIP
ERU	ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EVAP	EVAPORATOR
EXH	EXHAUST
EXT	EXTERNAL
FA	FRESH AIR
FC/FCU	FAN COIL UNIT
FD	FIRE DAMPER
FT	FEET
FLA	FULL LOAD AMPS
FL	FLOOR
FLEX	FLEXIBLE
FO	FLAT OVAL
FPB	FAN POWERED BOX
FPM	FEET PER MINUTE
FUT	FUTURE
FV	FACE VELOCITY
GALV	GALVANIZED
GND	GROUND
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
GUH	GAS UNIT HEATER
GV	GATE VALVE
HC	HEATING COIL
HORIZ	HORIZONTAL
HP	HORSEPOWER
HR	HOUR
HW	HEATING WATER
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
ID	INSIDE DIAMETER
IN	INCHES
KW	KILOWATTS
L	LOUVER
LVG	LEAVING
LEL	LOWER EXPOSURE LIMIT
LF	LINEAR FEET
MA	MIXED AIR
MAX	MAXIMUM
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFR	MANUFACTURER

*NOTE: NOT ALL SYMBOLS ARE USED.

MECHANICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
NC	NORMALLY CLOSED
NG	NATURAL GAS
MIN	MINIMUM
NK	NECK
MVD	MANUAL VOLUME DAMPER
NAT	NATURAL
NFPA	NATIONAL FIRE PROTECTION ASSOC.
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OAU	OUTSIDE AIR UNITS
OBVD	OPPOSED BLADE VOLUME DAMPER
OC	ON CENTER
OS&Y	OUTSIDE STEM AND YOKE
OZ	OUNCES (PRESSURE)
PCHR	PRIMARY CHILLED WATER RETURN
PCHS	PRIMARY CHILLED WATER SUPPLY
PCHWP	PRIMARY CHILLED WATER PUMP
PD	PRESSURE DROP
PRESS	PRESSURE
PROP	PROPELLER
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
REF	REFERENCE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RND	ROUND
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAV	SUPPLY AIR (CONTROL) VALVE
SCHR	SECONDARY CHILLED WATER RETURN
SCHS	SECONDARY CHILLED WATER SUPPLY
SCHWP	SECONDARY CHILLED WATER PUMP
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SUPPLY AIR FAN
SHT	SHEET
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
TC	TEMPERATURE CONTROLLER
TEF	TRUCK EXHAUST FAN
TEMP	TEMPERATURE
TK	TANK
TOD	TOP OF DUCT
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LISTED
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATOR
VOJ	VERIFY ON JOB
W /	WITH
W / O	WITHOUT
WB	WET BULB (DEG F)

*NOTE: NOT ALL SYMBOLS ARE USED.

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
X / XXX	SECTION LETTER INDICATES DRAWING SHEET ON WHICH SECTION IS SHOWN
1	DRAWING NOTE
C22	COLUMN REFERENCE
	POINT OF CONNECTION
1	DRAWING REVISION NUMBER
	DRAWING REVISION CLOUD
TP.CFM	TYPE OF AIR DEVICE (REFER TO HVAC SCHEDULE DRAWING) CFM

*NOTE: NOT ALL SYMBOLS ARE USED.

MECHANICAL PIPING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
	CHS	CHILLED WATER SUPPLY
	CHR	CHILLED WATER RETURN
	CWS	CONDENSER WATER SUPPLY
	CWR	CONDENSER WATER RETURN
	HWS	HEATING WATER SUPPLY
	HWR	HEATING WATER RETURN
	RL	REFRIGERANT LIQUID
	RS	REFRIGERANT SUCTION
	FOS	FUEL OIL SUPPLY
	FOR	FUEL OIL RETURN
		EXISTING (SEE ABOVE FOR DESIGNATION)

*NOTE: NOT ALL SYMBOLS ARE USED.

MECHANICAL GENERAL NOTES

A. ALL WORK SHALL BE DONE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL CODES, AND COMPLY WITH LOCAL AUTHORITIES HAVING JURISDICTION.

B. PROVIDE MANUFACTURER RECOMMENDED MAINTENANCE CLEARANCES AT ALL EQUIPMENT.

C. PROVIDE AND INSTALL MANUAL VOLUME DAMPERS ON ALL MAIN DUCT TAKEOFFS TO SUPPLY DIFFUSERS.

D. PROVIDE OFFSETS, RISERS AND DROPS TO COORDINATE DUCTWORK WITH STRUCTURE, LIGHTING, SPRINKLER PIPING, CONDUITS, PLUMBING, ETC.

E. CONTRACTOR IS TO COORDINATE WITH ALL APPROPRIATE TRADES TO ELIMINATE CONFLICTS AND PROVIDE MANUFACTURER REQUIRED MAINTENANCE AND REPAIR CLEARANCES PRIOR TO ORDERING EQUIPMENT AND PRIOR TO ROUGH-IN.

F. CONTRACTOR SHALL BE COMPLETELY FAMILIAR WITH THE SCOPE OF WORK AND SHALL INCLUDE ALL WORK IN BID PRICE.

G. DUCT DIMENSIONS INDICATED ON DRAWINGS ARE SHEET METAL SIZES. ALLOWANCE IS MADE FOR INTERNAL LINER WHERE APPLICABLE. IF DOUBLE WALL DUCTWORK IS UTILIZED, THE SIZE SHOWN INDICATES THE OUTER DUCT DIMENSION.

H. IF REQUESTED BY THE OWNER/ARCHITECT, THE CONTRACTOR SHALL PROVIDE AND INSTALL CLEAR, PROTECTIVE LOCKABLE COVERS EQUAL TO RESIDEO MODEL TG511A1000 FOR ALL THERMOSTATS AND WALL MOUNTED SENSORS, HUMIDISTATS, ETC.

I. CONTRACTOR SHALL INSTALL EQUIPMENT TO ACCOMMODATE ARCHITECTURAL CEILING HEIGHTS.

J. EXISTING SYSTEMS, INCLUDING EXISTING UTILITIES TO BE COORDINATED BY CONTRACTOR INCLUDES SEWER, GAS, DOMESTIC WATER, CHILLED WATER, ELECTRIC DUCT BANKS, AND POWER. COMPLETELY COORDINATE WITH ALL EXISTING CONDITIONS, SYSTEMS, INSTALLATION, PRIOR TO BEGINNING WORK AND ROUGH-IN. NOT ALL EXISTING SYSTEMS ARE INCLUDED ON DRAWINGS. VERIFY ALL SYSTEM LOCATIONS PRIOR TO STARTING WORK.

K. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDS FOR THOROUGH INSPECTION IN REGARD TO ANY WORK NECESSARY TO COMPLETE THE PROJECTS SCOPE OF WORK.

L. COORDINATE INSTALLATION OF ALL MECHANICAL SYSTEMS WITH ASSOCIATED TRADES PRIOR TO ROUGH-IN.

M. CONTRACTOR SHALL COORDINATE AND REVISE DUCTWORK DIMENSIONS TO ACCOMMODATE NEW AND EXISTING CONFLICTS INCLUDING STRUCTURAL, MECHANICAL, PLUMBING AND ARCHITECTURAL SYSTEMS. DUCTWORK FREE AREA SHALL BE MAINTAINED AS NOTED.

N. PROVIDE FIRE DAMPERS WHERE SHOWN ON PLANS AND AS REQUIRED BY N.F.P.A. AND LOCAL BUILDING CODES.

O. PROVIDE U.L. LISTED SMOKE DETECTORS IN THE MAIN SUPPLY AND RETURN AIR DUCT FOR ALL RECIRCULATING AIR SYSTEMS HANDLING OVER 2000 C.F.M. NOTE: SMOKE DETECTORS SHALL BE WIRED TO THE BUILDING FIRE ALARM SYSTEM BY FIRE ALARM CONTRACTOR. FIRE ALARM CONTRACTOR IS TO PROVIDE AND INSTALL ALL WIRING, TERMINATIONS, ETC. TO PROVIDE A COMPLETE, PROPERLY FUNCTIONING AND OPERATING SYSTEM.

P. PROVIDE ALL GAS REGULATORS REQUIRED FOR MANUFACTURER RECOMMENDED PRESSURE AND FLOW TO ALL NEW GAS FIRED EQUIPMENT.

Q. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT AND RELATED SYSTEM COMPONENTS FOUND POSITIVE FOR MOLD, MILDEW, ASBESTOS, HARMFUL BACTERIA AND ANY OTHER CONTAMINATION BE PLACED INTO SERVICE. THIS INCLUDES HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS (HVAC) EQUIPMENT, (DUCTWORK, DAMPERS, ETC.), PLUMBING SYSTEMS, FIRE PROTECTION SYSTEMS, CONTROL SYSTEMS, ELECTRICAL SYSTEMS AND RELATED COMPONENTS THAT INVOLVE MATTERS OF HEALTH, HYGIENE, CONTACT HAZARDS AND OTHER CONTAMINATION.

R. PROVIDE ACCESS PANELS FOR EQUIPMENT,VALVES, DAMPER, ETC. LOCATED ABOVE A NON ACCESSIBLE CEILING. ACCESS PANELS SHALL BE LARGE ENOUGH FOR ALL REQUIRED MAINTENANCE, ADJUSTMENT, ECT. PROVIDE MULTIPLE ACCESS PANELS AS REQUIRED. COORDINATE COLOR AND LOCATIONS WITH ARCHITECT. PROVIDE FIRE AND/ OR SMOKE RATED ACCESS PANELS WHERE REQUIRED IN RATED CEILINGS. REFERENCE ARCHITECTURAL DRAWINGS FOR RATED CEILING LOCATIONS. WHERE ACCESS PANELS ARE SHOWN ON ARCHITECTURAL REFLECTED CEILING PLAN, COORDINATE EXACT LOCATION OF EQUIPMENT, DEVICES, ETC. WITH ACCESS PANEL LOCATIONS.

S. PROVIDE TRANSITIONS, AS REQUIRED, PER SMACNA AT ALL EQUIPMENT LOCATIONS.

T. EXHAUST LOUVERS SHALL BE LOCATED MIN. 10 FEET FROM ANY AIR INTAKE OR OPENING INTO THE BUILDING.

U. PROVIDE TURNING VANES FOR ALL DUCT ELBOWS WHERE DUCT IS POSITIVELY PRESSURIZED, EVEN IF TURNING VANES ARE NOT SHOWN IN ELBOW.

V. DO NOT ROUTE PIPE CONTAINING WATER OVER ELECTRICAL EQUIPMENT.

W. CONTRACTOR SHALL COORDINATE EXACT LOCATION OF ALL SLAB PENETRATIONS WITH STRUCTURAL BEAMS, JOISTS, COMPONENTS, ETC. DO NOT CUT OR MODIFY ANY STRUCTURAL COMPONENTS WITHOUT APPROVAL FROM STRUCTURAL ENGINEER.

X. DRAWINGS ARE BASED ON SCHEDULED/SPECIFIED EQUIPMENT. CONTRACTOR SHALL ENSURE PURCHASED EQUIPMENT FITS IN SPACE PROVIDED AND ALL MAINTENANCE / SERVICE CLEARANCES ARE MAINTAINED. CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED MODIFICATIONS WHERE PURCHASED EQUIPMENT IS DIFFERENT OR HAS DIFFERENT REQUIREMENTS THAN THE BASIS OF DESIGN EQUIPMENT.

Y. MECHANICAL CONTRACTOR SHALL COORDINATE WITH PLUMBING CONTRACTOR ON EXACT LOCATIONS OF ALL FLOOR DRAINS IN MECHANICAL OR EQUIPMENT ROOMS AS NOT TO CONFLICT WITH MECHANICAL EQUIPMENT NOR EQUIPMENT PADS. FLOOR DRAIN LOCATIONS SHOWN ON DRAWINGS ARE BASED ON SCHEDULED EQUIPMENT.

Z. IF NOT CLEARLY SHOWN ON THE MECHANICAL DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS OF ALL SIDEWALL DIFFUSERS, GRILLES AND REGISTERS. COORDINATE MOUNTING HEIGHT WITH ARCHITECT IF NOT CLEARLY SHOWN ON ARCHITECTURAL DRAWINGS.

AA. CONTRACTOR SHALL COORDINATE ALL WALL MOUNTED DEVICES IN MECHANICAL/EQUIPMENT ROOMS WITH SOUND INSULATION INSTALLED ON THE WALLS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS WHERE SOUND INSULATION IS INSTALLED ON THE WALLS.

*NOTE: NOT ALL NOTES ARE USED.

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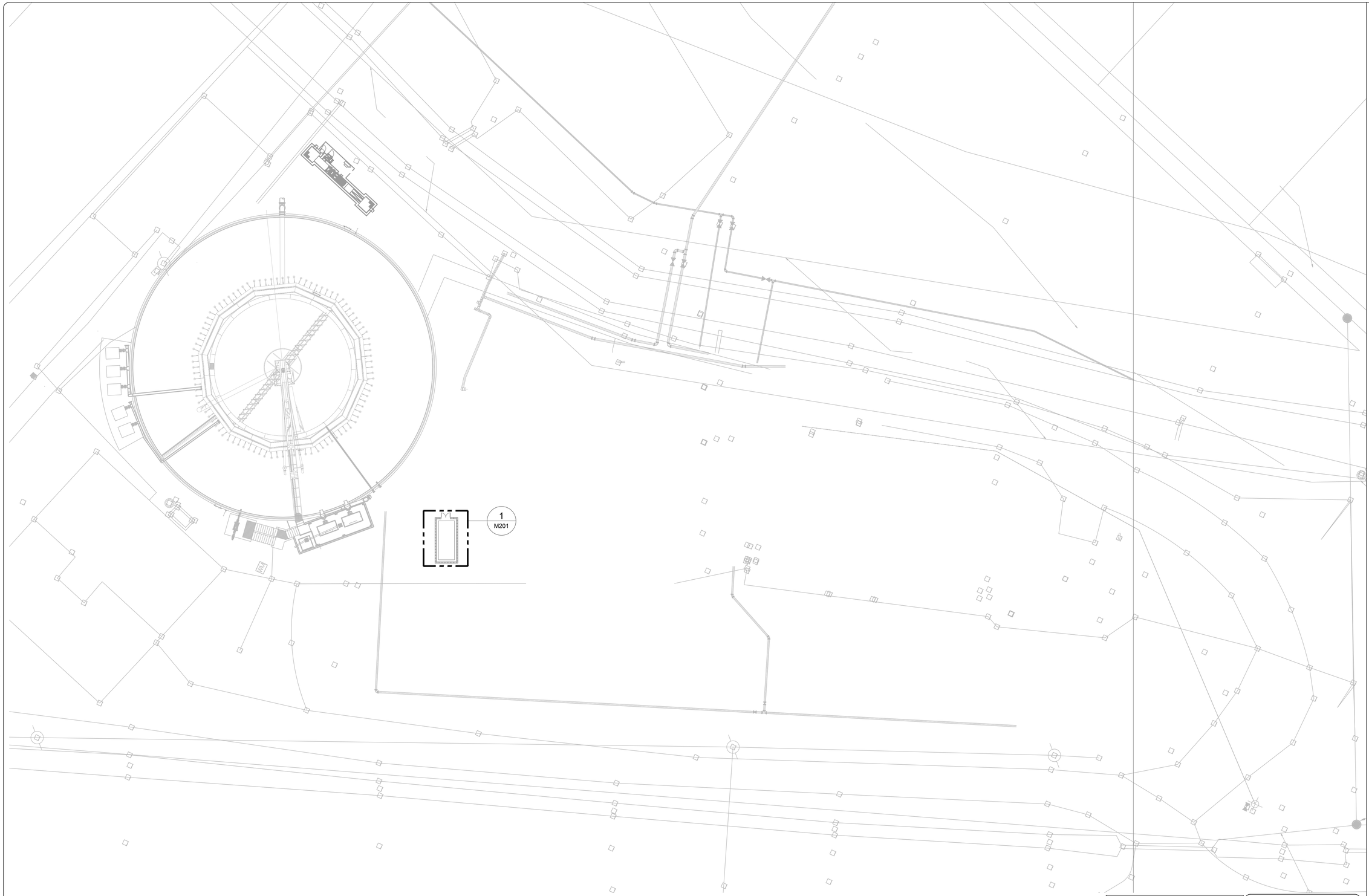
BRIAN T. MILLER
License No. 26080
PROFESSIONAL ENGINEER IN MECHANICAL ENGINEERING
11-15-24

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

MECHANICAL LEGENDS & ABBREVIATIONS

SHEET NO.
M001



1 MECHANICAL SITE PLAN
SCALE: 1" = 20'

0' 5' 10' 20' 40'

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License No. 26080
PROFESSIONAL ENGINEER IN MECHANICAL ENGINEERING
11-15-24

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

MECHANICAL SITE PLAN

SHEET NO.
M101

MCA Engineering & Construction
BATON ROUGE - NEW ORLEANS

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BG: 801
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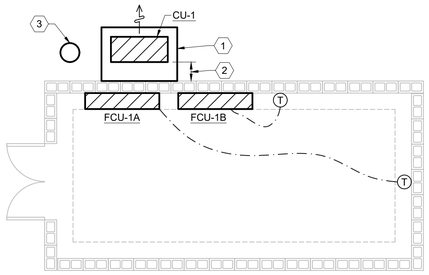


1 MECHANICAL FLOOR PLAN
SCALE: 1/4" = 1'-0"

0' 1' 2' 3' 4' 5'

GENERAL NOTES:

A. COORDINATE EXACT LOCATIONS OF FAN COIL UNITS WITH ELECTRICAL EQUIPMENT AND PANELS. MAINTAIN ALL REQUIRED CLEARANCES FOR BOTH MECHANICAL AND ELECTRICAL EQUIPMENT. REFERENCE ELECTRICAL DRAWINGS FOR COORDINATION.

KEY NOTES:

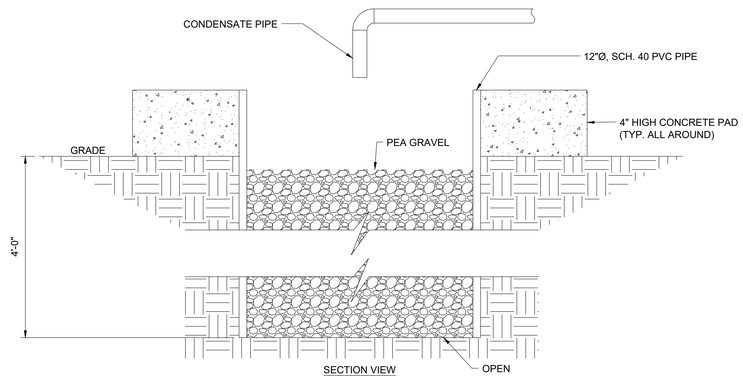
1. CONCRETE HOUSEKEEPING PAD MIN. 6 IN. LARGER THAN PURCHASED EQUIPMENT ON FRONT AND SIDES AND ALLOWING MIN. 12 IN. BETWEEN UNIT AND BUILDING WALL. COORDINATE WITH MANUFACTURER'S REQUIRED CLEARANCES AND ADJUST PAD SIZE ACCORDINGLY. HEIGHT SHALL BE 6 IN. ABOVE GRADE.
2. MAINTAIN MANUFACTURERS REQUIRED CLEARANCE TO WALL.
3. CONDENSATE DRYWELL PER DETAIL.

VARIABLE REFRIGERANT VOLUME FAN COIL UNIT SCHEDULE

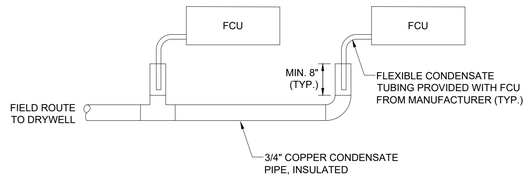
ITEMS	SERVES	FAN	COOLING COIL						HEAT	ELECTRICAL CONNECTION					EQUAL TO:
		TOTAL AIRFLOW (CFM)	EAT (°F)		LAT (°F)	SENSIBLE (MBH)	TOTAL (MBH)	REFRIGERANT	TOTAL (MBH)	V	PH	HZ	MCA	MOCP	
			DB	WB	DB										
FCU-1A	ELECTRICAL BUILDING	770	76.1	64.2	52.7	19.1	26.1	R-410A	22.2	208	1	60	0.86	15	CARRIER 40VMW030
FCU-1B	ELECTRICAL BUILDING	770	76.1	64.2	52.7	19.1	26.1	R-410A	22.2	208	1	60	0.86	15	CARRIER 40VMW030

AIR COOLED CONDENSING UNIT (HEAT PUMP) SCHEDULE

MARK	SERVICE	LOCATION	NOMINAL COOLING CAPACITY (MBH)	NOMINAL HEATING CAPACITY (MBH)	SEER 2	HSPF2	COP	COOLING OUTDOOR TEMP. (°F)	HEATING OUTDOOR TEMP. (°F)	FAN		COMPRESSOR		ELECTRICAL CONNECTION					EQUAL TO:
										TYPE	QTY	TYPE	QTY	V	PH	HZ	MCA	MOCP	
CU-1	FCU-1A & 1B	AT GRADE	60	60	18.6	10.2	2.99	96	16.5	PROPELLER	2	ROTARY INVERTOR	1	208	1	60	40	45	CARRIER 38VMB060



2 CONDENSATE DRYWELL DETAIL
SCALE: N.T.S.



3 CONDENSATE PUMP DISCHARGE PIPE DETAIL
SCALE: N.T.S.

DEPT. OF UTILITIES
ST. TAMMANY PARISH GOVERNMENT
620 N. TYLER STREET
COVINGTON, LA 70433

No.	DESCRIPTION OF REVISION	DATE:
0	ADDENDUM #3	11/15/24

DESIGNED BY:	CAB
DRAWN BY:	KPW
CHECKED BY:	BTM
SUBMITTED BY:	KYLE ASSOC.
PROJECT No.:	TU19000091
ISSUE DATE:	11/15/2024
APPROVED BY:	---
SHEET SIZE:	ANSI D
SCALE:	

STATE OF LOUISIANA
BRIAN T. MILLER
License No. 26080
PROFESSIONAL ENGINEER IN MECHANICAL ENGINEERING
11-15-24

ST TAMMANY PARISH
CROSS GATES WWTP IMPROVEMENTS
SLIDELL, LOUISIANA
PROJECT No.: TU 19000097

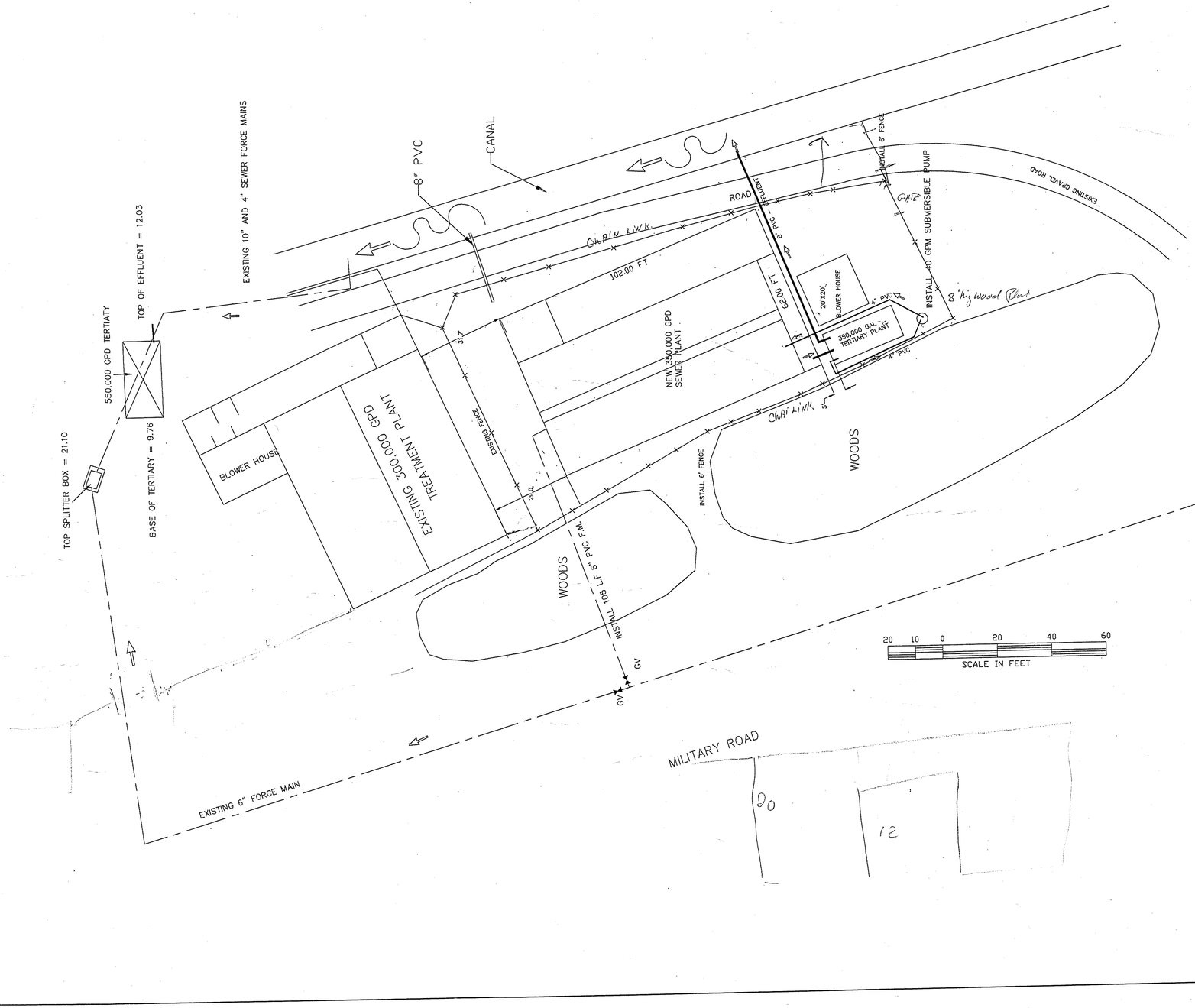
MECHANICAL FLOOR PLAN, DETAILS & SCHEDULES

SHEET NO.
M201

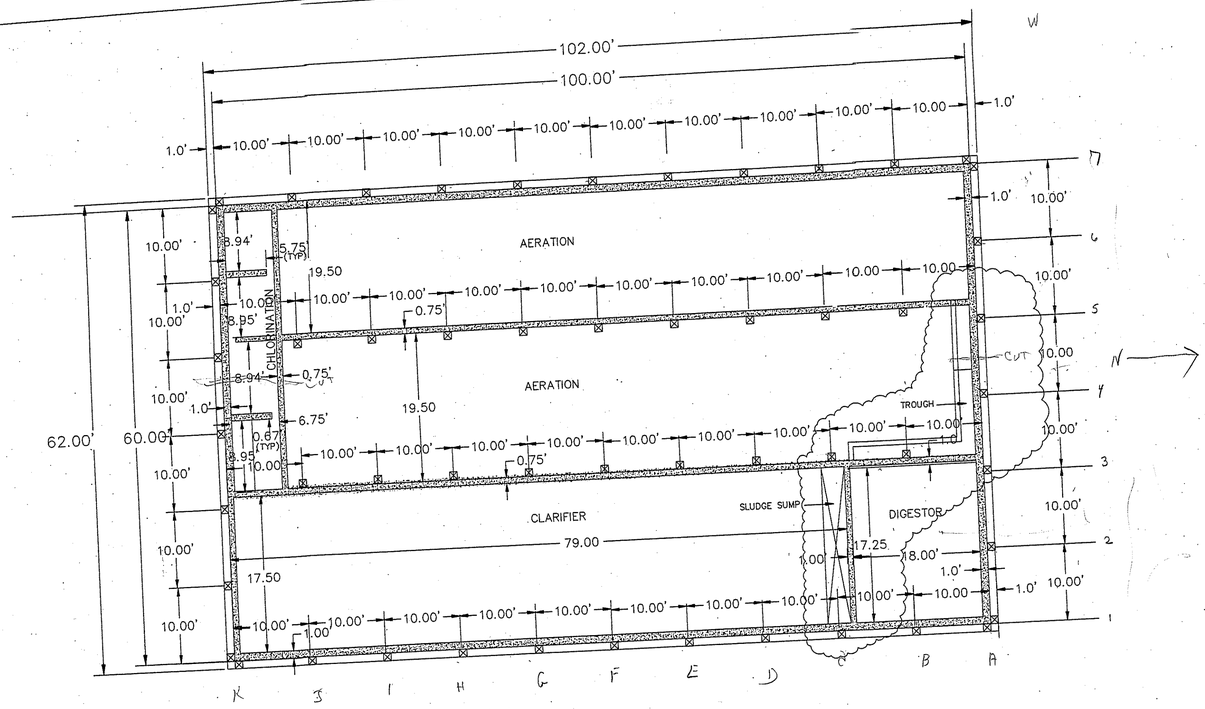
MCA Engineering & Construction BATON ROUGE - NEW ORLEANS
JOB NO: STP22003
BG: 801
PROJECT MANAGER: KIMBALL SCHLAFLY
DATE: 10-28-2024

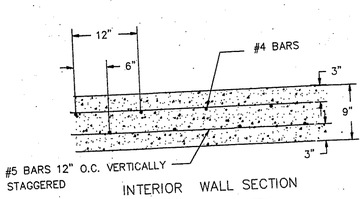
Kyle Associates, LLC
Planning, Engineering, and Landscape Architecture
638 Village Lane N. • Mandeville, LA 70471 • 985.727.9377

Drawings for Plant #3

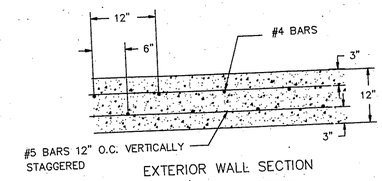


J.V. BURKES & ASSOC.,	
P.O. BOX 1568 (504) 649-0075	SLIDELL, L
SCALE : 1" = 20'	DRAWN B
DATE: OCT. 01-1998	
350,000 GALLONS SEWER TREATMENT PLANT	
FOR: CROSS GATES INC.	DWG. NO.

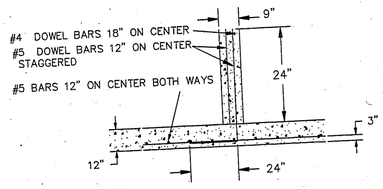




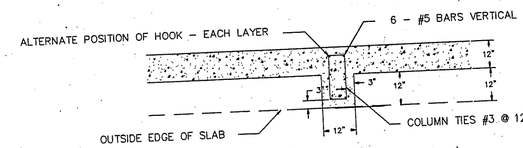
INTERIOR WALL SECTION



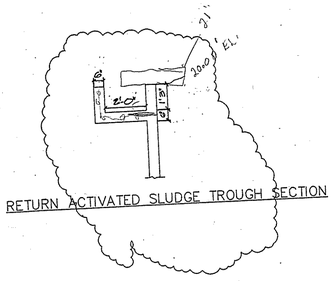
EXTERIOR WALL SECTION

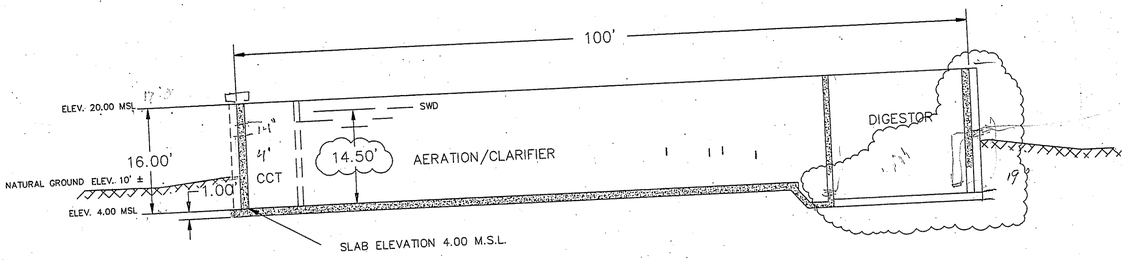


WALL – SLAB SECTION



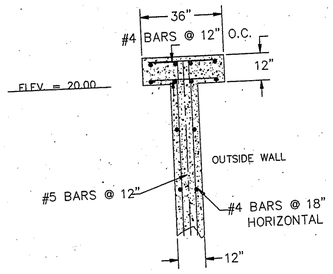
TYPICAL COLUMN DETAIL



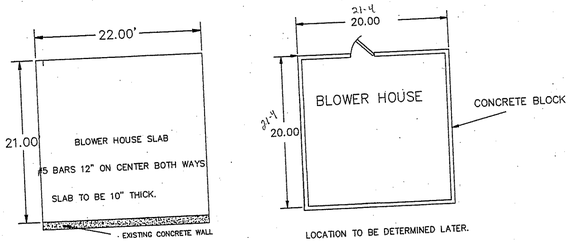


SECONDARY PLANT PLAN

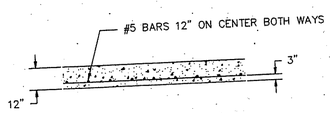
SECONDARY PLANT SIDE



WALKWAY DETAIL

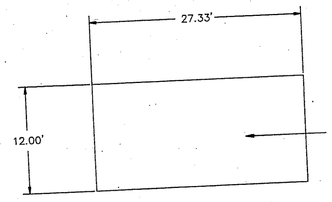


BLOWER HOUSE DETAILS



SLAB DETAIL

SECONDARY FOUNDATION PLAN



TERTIARY FOUNDATION PLAN

STATE OF LOUISIANA
J.V. BURKES III
REG. NO. 6507
REGISTERED
PROFESSIONAL ENGINEER
CIVIL ENGINEERING

NOTE: CONCRETE SHALL HAVE 4000 p.s.i. 28 DAYS STRENG
SLAB DETAIL FOR BOTH THE SECONDARY AND TERTI
TREATMENT PLANTS.

REV: 1-06-99 CHLORINATOR BAFFLES, WALKWAY, STEEL.
REV: 7-10-98 PLANT SIZE

MAPFILE ' CGLAND\6GPLANT1.DWG

J.V. BURKES & ASSOC., I
P.O. BOX 1568 (504) 649-0075 SLIDELL, LA.

SCALE : VARIES		DRAWN BY:
DATE: OCT. 10, 1998		REVISED: 1

LANDINGS S/D
TREATMENT PLANT DETAIL

FOR: CROSS GATES, INC.

DWG. NO. 9826

9"

100'-0"

1'-0"

6'-9"

91'-6"

1'-0"

EFFLUENT

19'-6"

AERATION 1

4'-0" TYPICAL

CL2

4'-9"

39'-9"

6" INFLUENT

FLOW

RETURN ACTIVATED

19'-6"

AERATION 2

60'-0"

9"

WHAT IS THE SIZE OF THIS BOX??

EFFLUENT WEIRS

12"ø SCUM COLLECTOR

EXISTING PLANT

17'-6"

CLARIFIER

CLARIFIER DRIVE

DIGESTOR

SCUM FLIGHTS

12"ø

1'-0"

79'-0"

SLUDGE

REMOVABLE WASTE ACTIVATED SLUDGE

SLUDGE SUMP

WASTE SLUDGE

CROSSGATES
WASTEWATER TREATMENT PLANT

PLAN VIEW

SCALE: N.T.S.

DATE: 12/15/98

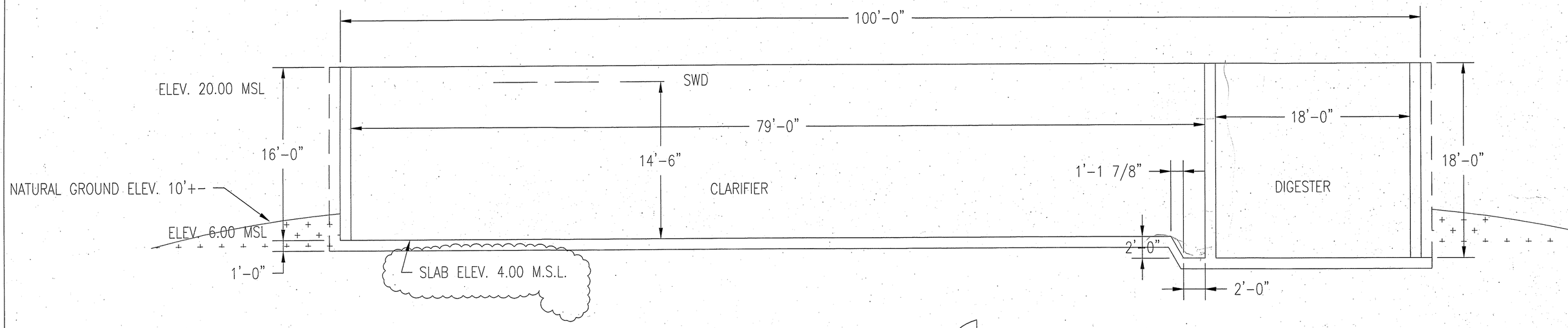
APPROVED BY:

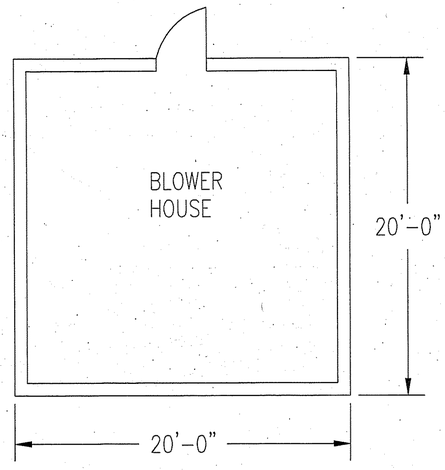
DRAWN BY: jog

REVISED:

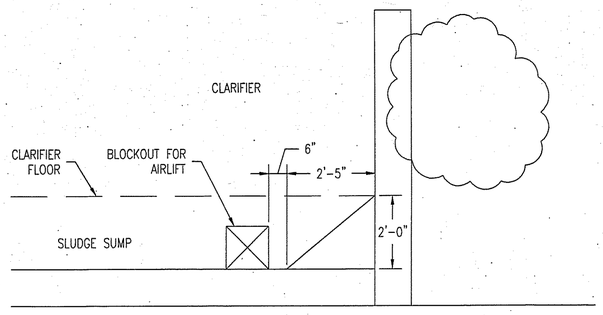
AquaSource

DRAWING NUMBER:





LOCATION TO BE DETERMINED LATER



NOTE: FILLET TO BE CONSTRUCTED ON BOTH SIDES OF CLARIFIER SUMP

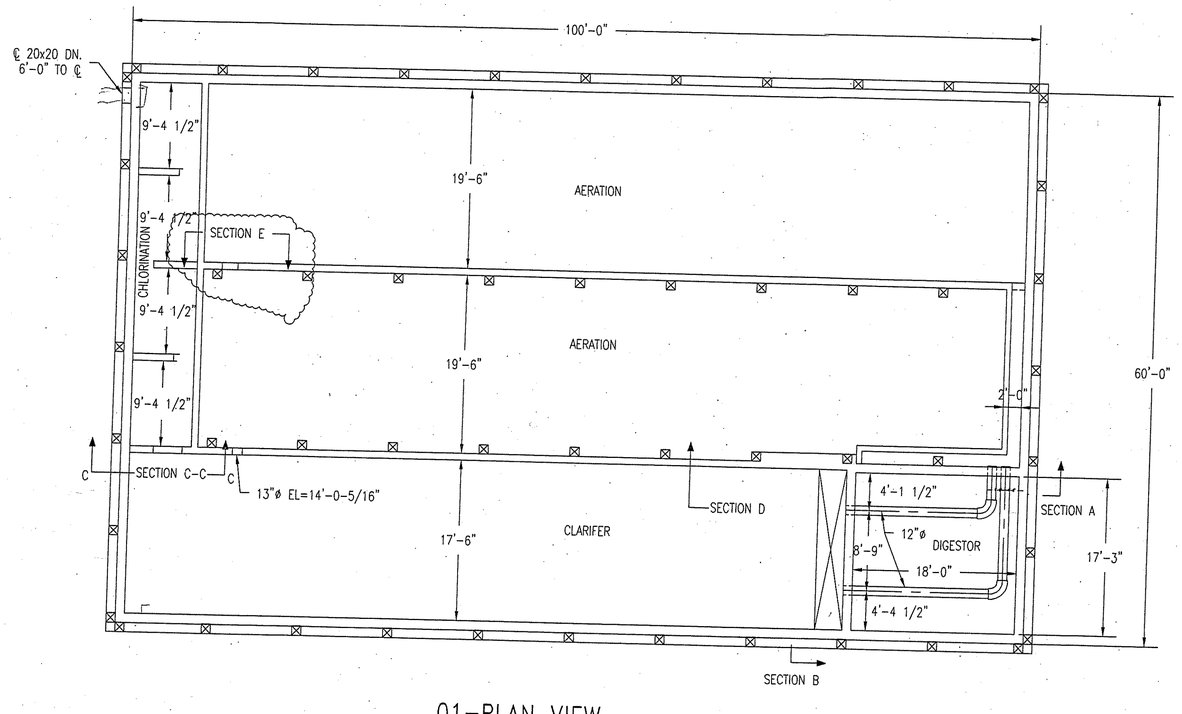
SUMP DETAIL

CROSSGATES
WASTEWATER TREATMENT PLA

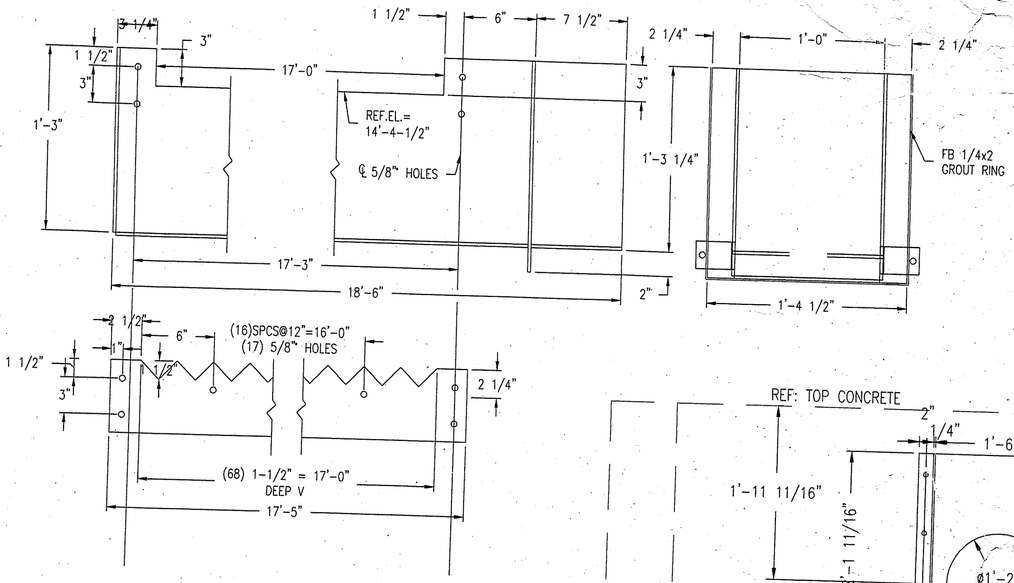
ELEVATION

SCALE: N.T.S.
DATE: 12/15/98
APPROVED BY:
DRAWN
REVISE

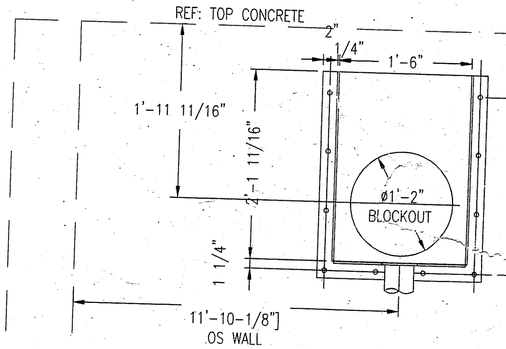
AquaSource
Engineering & Construction Inc.
P.O. Box 570977 Houston, Texas 77257-0177 • 713-783-8511 713-782-2877 (fax)

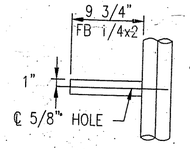


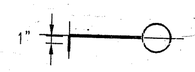
01-PLAN VIEW



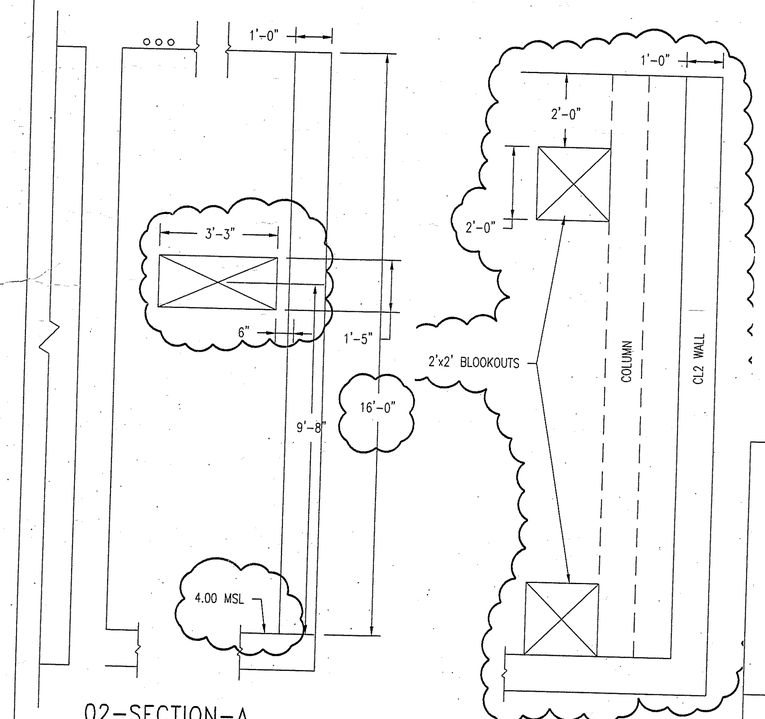
07-WEIR TROUGH





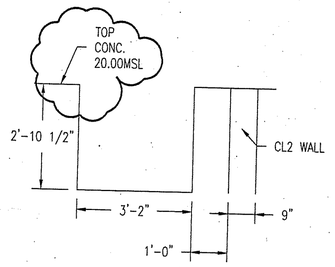


06-SCUM RETURN

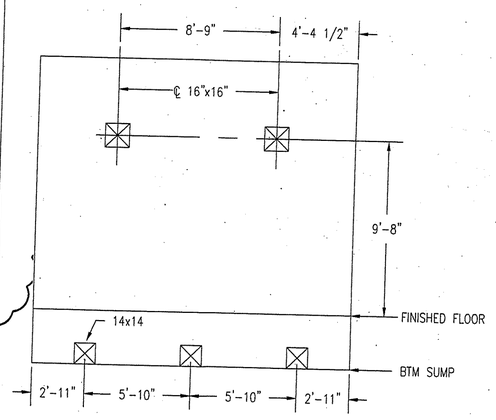


02-SECTION-A

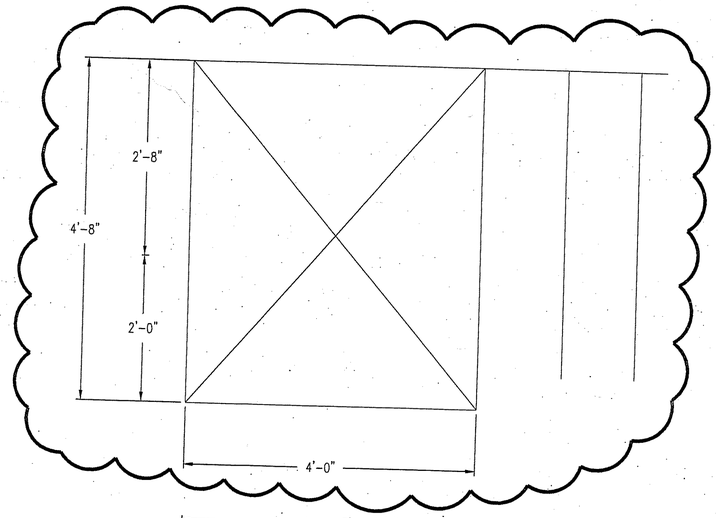
08-SECTION-E

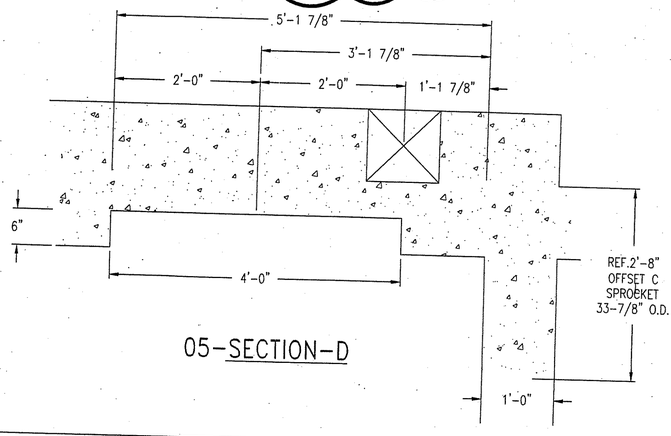


03-SECTION-C



04-SECTION-B





05-SECTION-D

CROSSGATES WASTEWATER TREATMENT PLANT

DETAILS

SCALE: N.T.S.	APPROVED BY:	DRAWN BY: jog
DATE: 12/14/98		REVISED: 1-6-99

AquaSource
Engineering & Construction Inc.
P.O. Box 570977 Houston, Texas 77257-0177 • 713-783-6811 713-782-2877 (fax)

DRAWING NUMBER: