Addendum No. 3

Four Rivers Sanitation Authority

Aerobic Granular Sludge-Phase I
Capital Project No. 2207
IEPA Project No. L17-6127

This Addendum Number 3, dated February 7, 2023, for the above referenced project, supersedes all contrary and conflicting information in the specifications and contract documents, which are hereby supplemented or revised as follows:

I. General Information:

1. The following revisions shall be made to the Advertisement for Bid:
   a. **Revise the date bids will be received by FRSA from "10:00 a.m., Friday, February 10, 2023" to "10:00 a.m., Thursday, February 16, 2023."**
   b. End of first page, insert "The apparent low bidder shall submit a schedule of values, including identification of subcontracted work, no later than 1:00 p.m. on Friday February 17, 2023."
2. The following revision shall be made to the first paragraph of the Information for Bidders and any other references to the bid opening:
   a. **Change from "10:00 a.m., February 10, 2023" to "10:00 a.m., February 16, 2023."**
3. As further clarification to questions relating to vendor supplied equipment, potential bidders are responsible for communicating and coordinating any additional information required on specific details of equipment and/or materials to be provided as part of the Work beyond the details provided in the Bidding Documents.
4. Any Change Proposal and/or Claim by Contractor will be evaluated based on the Contract Documents. No change Proposal nor Claim shall be submitted based on any discrepancy in any subcontractor or supplier scope of supply and/or scope of services that conflicts with the basis of the Work required by the Contract Documents.

II. The following are revisions to the Specifications:

1. The following revisions shall be made to Section 03 30 00 Cast-In-Place Concrete:
   a. Table 2A – Submittal Requirements (Preliminary Review of Materials). In the last row of Table 2A, NSF/ANSI 61 compliance, replace the "X" with "---" for Concrete Classes A1 and D1.
2. The following revisions shall be made to Section 08 33 23.33 Overhead Coiling Aluminum Doors:
   a. Paragraph 2.1.B.1, remove this paragraph and replace with the following paragraph: "1. Insulated rolling doors shall be Overhead "Stormtite Insulated Series 625", Wayne Dalton "Thermotite Series 800C", Cornell Cookson "ESD20", or Clopay "CESD20"."
   b. Paragraph 2.3.B.1, revise the service load from "25 psf" to "40 psf."

c. Paragraph 2.3.B.1, revise the outside face and inside face of "0.050 aluminum" to "0.040 aluminum."

3. The following revisions shall be made to Section 26 05 11 Electrical:

   a. Paragraph 1.1.C, remove this paragraph in its entirety.

   b. Following paragraph 2.15, insert the following:

      (1) 2.15 Temporary Power Supply: Power shall be provided by the Contractor to ensure continued service to all facilities during the timeframe of the ductbank and conductor replacement work. Individual temporary power cutovers shall be closely orchestrated and limited to no more than 1 hour of outage time. The Contractor shall provide power supply for all loads at the following facilities. In addition, a back-up to the Contractor power supply, for the full load indicated, shall be available at all times. The approximate average power loads to be satisfied throughout the power supply interruption include:

         (a) Existing Disinfection Building #15, load approximately 50 amps, 3 phase, 480 volts, fed to the 400 amp distribution panel.

         (b) Existing Aqua-Aerobic R&T Center, load approximately 50 amps, 3 phase, 480 volts fed to the switchboard.

         (c) We expect the River Station Building #14 power supply can remain active but for temporary outages, load is approximately 50 amps, 3 phase, 480 volts.

      Diesel power generation shall be rated for the type and size of load as well as the required continuous runtime to complete the work. During the time facilities are on temporary power, any unexpected outages shall be restored within 30 minutes. All costs associated with the temporary power system, such as rental, installation, grounding, fuel, cabling, operation, maintenance, removal, and staffing, shall be paid by the Contractor.

   c. Paragraph 3.1.A, Remove this paragraph in its entirety and replace with the following text: "A. All material, equipment, and components specified herein shall be tested in compliance with NETA and installed and commissioned for operation in compliance with NECA 1000 – NEIS Specification System. Where required in NECA 1000 or NETA, testing and commissioning procedures shall be followed prior to energizing equipment."

   d. Paragraph 3.2.M.1, revise the Arc Flash Analysis Software from "ETAP electrical power system analysis software" to "EasyPower arc flash analysis software."

   e. Paragraph 3.5.D.1.a, delete the words "within 15 feet of building entrances, under and within 5 feet of roadways, and within 10 feet of indicated future excavations."

4. The following revision shall be made to Section 26 05 83 Electrical Equipment Installation:

   a. "All material, equipment, and components specified to be installed according to this section shall be tested in compliance with NETA and installed and commissioned for operation in compliance with NECA 1000 – NEIS Specification System. Where required in NECA 1000 or NETA, testing and commissioning procedures shall be followed prior to energizing equipment."

5. The following revision shall be made to Section 26 29 24 Variable Frequency Drives:

a. Paragraph 2.1.A, remove the sentence "Active front end drives shall be as manufactured by ABB without exception." and replace with "Active front end drives shall be as manufactured by ABB or Danfoss without exception."

6. The following revision shall be made to Section 31 23 11 Excavation and Fill for Structures:

   a. Paragraph 3.2.H.5, revise "24" to "48" in the last sentence of this paragraph.

7. The following revisions shall be made to Section 40 05 61.43-S01 Knife Gate Valves Schedule:

   a. Add the following valves to the schedule:

Tag Number	Size (in)	Rated Working Pressure (psi)	Max. Differential Pressure Across Valve (psi)	Type of Service	Application	Type of Installation	Type of Manual Actuator	Electrical Actuator	Ends	High Pressure Side of Plugs
VKG-1121	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1123	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1221	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1223	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1321	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1323	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1421	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U
VKG-1423	14	5	6.5	Wastewater	O-C	IP	CW	No	F	U

8. The following revisions shall be made to Section 40 05 62.16-S02 Eccentric Plug Valves Schedule Electric Actuators:

   a. Add the following valves to the schedule:

Tag Number	Size (in)	Rated Working Pressure (psi)	Type of Service	Application	Type of Installation	Ends	Max. Differential Pressure Across Valve (psi)	High Pressure Side of Plugs	Type of Electric Actuator	Type of Housing	Operating Time (s)	Power for Electric Actuator Motor	Actuator Provides 120 VAC For remote controls	Number of Limit Switch Assemblies	Position Transmitter	Control Devices	Remote Control Station	Extension Stems	Position Indicator for Buried Valve Actuators	Cast Iron Operating Stands	Fabricated Steel Operating Stands
PV-1120*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1122*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1220*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1222*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1320*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1322*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1420*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No
PV-1422*	14	5	O-C	Wastewater	IP	F	6.5	U	IE	WP	60	460/3	No	2	No	A	CIS	No	No	No	No

9. The following revision shall be made to Section 40 05 64.11 AWWA Butterfly Valves:

   a. Remove this section in its entirety.

10. The following revision shall be made to Section 40 05 64.11-S01 AWWA Butterfly Valves Schedule Manual Actuators:

   a. Remove this schedule in its entirety.

11. The following revision shall be made to Section 40 05 64.11-S02 AWWA Butterfly Valves Schedule Electric Actuators:

   a. Remove this schedule in its entirety.

12. The following revision shall be made to Section 40 05 64.22 Industrial Butterfly Valves:

   a. Paragraph 2.1.D, revise the Trim Seat material from "EDPM" to "Viton."

13. The following revisions shall be made to Section 40 42 11 Mechanical Insulation:

   a. Paragraph 3.2, Insulation Schedule, Piping – Outdoor (Exposed), in the notes column for the AGS Reactor Air row, insert "(12)."

   b. Paragraph 3.2, Insulation Schedule, Notes, add the following Note to the end of Insulation Schedule table: "(12) Insulation shall be installed on the outdoor exposed air

piping and the horizontal air piping above the AGS reactor walkways. Insulation shall terminate preceding the air piping drop leg serving each reactor. Insulation shall not be installed on the vertical air piping drop legs."

14. The following revisions shall be made to Section 40 61 11 Instrument Device Schedule:

    a. Add Tag "AI-1005" with Service Description "AGS REACTORS COMMON EFFLUENT PHOSPHATE CONCENTRATION ANALYZER – MULTIPARAMETER ANALYZER (DISPLAY MODULE)". See AI-1400 for data entries that are typical for instrument AI-1005.

    b. Revise the Output Type for Item 14, AT-1005, from "4-20mA" to "MODBUS RTU."

    c. Add Tag "AI-1100" with Service Description "AGS REACTOR NO. 1 ANALYZER – MULTIPARAMETER ANALYZER (DISPLAY MODULE)." See AI-1400 for data entries that are typical for instrument AI-1100.

    d. Revise the Output Type for Item 20, AT-1100, from "PROFIBUS" to "MODBUS RTU."

    e. Add Tag "AI-1200" with Service Description "AGS REACTOR No. 2 ANALYZER – MULTIPARAMETER ANALYZER (DISPLAY MODULE)." See AI-1400 for data entries that are typical for instrument AI-1200.

    f. Revise the Output Type for Item 31, AT-1200, from "PROFIBUS" to "MODBUS RTU."

    g. Add Tag "AI-1300" with Service Description "AGS REACTOR No. 3 ANALYZER – MULTIPARAMETER ANALYZER (DISPLAY MODULE)." See AI-1400 for data entries that are typical for instrument AI-1300.

    h. Revise the Output Type for Item 42, AT-1300, from "4-20mA" to "MODBUS RTU."

    i. Revise the Output Type for Item 53, AI-1400, from "MODBUS TCP/IP" to "MODBUS RTU."

    j. Revise the Output Type for Item 54, AT-1400, from "PROFIBUS" to "MODBUS RTU."

15. The following revisions shall be made to Section 40 64 00A Input Output List:

    a. Add field devices PDAH-1510, PDAH-1520, and PDAH-1530 discrete inputs to the Input Output List as follows:

Description	Field Device	Controller ID	Signal Type	Closed State	Power Source	Interp Relay	P&ID Drawing
AGS BLOWER NO. 1 INTAKE FILTER DIFFERENTIAL PRESSURE	PDSH-1510	AGS SUPPLIER PLC	120VAC	NORMAL	PLC	NO	02-I-601
AGS BLOWER NO. 2 INTAKE FILTER DIFFERENTIAL PRESSURE	PDSH-1520	AGS SUPPLIER PLC	120VAC	NORMAL	PLC	NO	02-I-601
AGS BLOWER NO. 3 INTAKE FILTER DIFFERENTIAL PRESSURE	PDSH-1530	AGS SUPPLIER PLC	120VAC	NORMAL	PLC	NO	02-I-601

16. The following revision shall be made to Section 40 66 33 Metallic and Fiber Optic Communication Cable Connectors:

    a. Paragraph 2.2.B.1, remove this paragraph and replace with the following paragraph: "Modbus RTU cabling shall be a signal cable for RS-485 communication with three 22 AWG conductors, an outer shield that consists of a foil shield and tinned copper braid, and PVC insulation. The cable shall be a Belden 3106A or equal."

17. The following revisions shall be made to Section 40 68 83 Software Control Block Descriptions:

    a. Paragraph 3.4.D, revise the equipment tag references for the AGS Reactor WAGS Valves from "BFV-1120", "BFV-1220", "BFV-1320", and "BFV-1420" to "PV-1120", "PV-1220", "PV-1320", and "PV-1420."

    b. Paragraph 3.4.E, revise the equipment tag references for the AGS Reactor WLC Valves from "BFV-1122", "BFV-1222", "BFV-1322", and "BFV-1422" to "PV-1122", "PV-1222", "PV-1322", and "PV-1422."

18. The following revisions shall be made to Section 40 75 00 Process Analytical Instruments:

    a. Paragraph 2.2.A.2, remove this paragraph and replace it with the following paragraph: "The probe module shall receive the input from each instrument sensor. It shall be provided in IP65 enclosure with corrosion resistant finish. The probe module shall include internal 125 VAC power supply and EEPROM memory back-up."

    b. Paragraph 2.2.A.3, remove this paragraph and replace it with the following paragraph: "A display module shall be provided for each probe module. It shall have a color graphical touch-screen display. The display module shall be provided in IP65 enclosure with corrosion resistant finish."

    c. Paragraph 2.2.A.4, remove this paragraph and replace it with the following paragraph: "Each probe module shall be provided with a network card to allow

communication of the collected analytical data with the AGS control system via Modbus RTU. Independent Modbus RTU network connections with the AGS control system shall be provided for each probe module."

d. Paragraph 2.2.A.6, remove this paragraph and replace it with the following paragraph: "The multiparameter transmitter system shall be Hach SC1000 Multi-parameter Universal Controller. (AGS System Supplier)"

e. Paragraph 2.2, add the following paragraph following paragraphs 2.2.F: "G. Ammonium Analyzers

   (1) Analyzers shall utilize a gas selective electrode designed for the precise determination of ammonium concentration. The analyzer shall include an ASA UV-resistant, lockable housing, rated to IP55. The analyzer shall be equipped with a self-cleaning membrane, automatic calibration, and adjustable extensive self-diagnostics.

   (2) The ammonium analyzer shall be Hach Amtax sc. (AGS System Supplier)"

19. The following revisions shall be made to Section 43 11 15 High Speed Gearless Turbo Blowers:

    a. Paragraph 1.1.C, remove the text ", including the Most Open Valve (MOV) Control Strategy." and replace with the following text "The aeration valve control shall be a part of the AGS System Supplier's standard aeration control strategy."

    b. Paragraph 1.2.D.2, revise the paragraph from "All work shall comply with Underwriters' Laboratories (UL) safety requirements." to "All work shall comply with Underwriters' (UL) or TUV Rheinland (TUV) Safety requirements."

    c. Paragraph 2.5.B.1, add the following to the end of the first sentence ", or 110% if the manufacturer submits a reference list of installations of blowers with impellers having the first lateral critical speed at 110% or at/below 119%, for acceptance by the Engineer."

    d. Paragraph 2.5.E.7, delete this paragraph.

    e. Paragraph 2.10.C.3, from the end of this paragraph, remove the text "The digital power monitors shall be GE PQM II with GE Multinet module without exception."

    f. Paragraph 2.10.E.1, first sentence, delete "a NEMA Type 12" and replace with "an."

    g. Paragraph 2.10.E.1, following the first sentence, insert "Control panels shall be NEMA 1 certified or meet the requirements of NEMA 1."

    h. Paragraph 2.11, revise the paragraph title from "shop witness test" to "Unwitnessed shop performance test."

    i. Paragraph 2.11.A, delete this paragraph and replace with the following: "A. Blowers shall be shop tested over the capacity range from surge to maximum rated flow adequate to verify package wire-to-air power (hp). Following testing and prior to shipment of blowers to the site, test reports shall be submitted for review and

acceptance. Reports shall include data collected and performance curves. Data plotted on curves shall be adjusted to contract conditions."

j. Paragraph 2.11.D.12, remove this paragraph and replace with the following: "12. Not used."

k. Paragraph 2.11.D.13, remove this paragraph and replace with the following: "13. Not used."

l. Paragraph 2.11.D.14, remove the last sentence of this paragraph: "The Reynolds number correction shall be excluded in this case."

m. Paragraph 3.3.A.1, remove this paragraph and replace with the following: "1. Not used."

20. The following revisions shall be made to Section 46 43 55 Aerobic Granular Sludge System Equipment:

    a. Paragraph 2.5.E.1, delete "AWWA Butterfly valves shall meet the requirements of Section 40 05 64.11 – AWWA Butterfly Valves."

    b. Paragraph 2.5.E.1, remove the following tags from the Sludge (WAGS) Valve Quantity, per basin "BFV-1120, -1220, -1320, -1420" and replace with the following tags "PV-1120, -1220, -1320, -1420". Change valve type from "AWWA Butterfly" to "Eccentric Plug."

    c. Paragraph 2.5.E.1, remove the following tags from the WLC Valve Quantity, per basin "BFV-1122, -1222, -1322, -1422" and replace with the following tags "PV-1122, -1222, -1322, -1422." Change valve type from "AWWA Butterfly" to "Eccentric Plug."

    d. Paragraph 2.5.E.1, remove the following tags from the Sludge Isolation Valve Quantity, per basin "BFV-1121, -1221, -1321, -1421" and replace with the following tags "VKG-1121, -1222, -1322, -1422." Change valve type from "AWWA Butterfly" to "Knife Gate."

    e. Paragraph 2.5.E.1, remove the following tags from the WLC Isolation Valve Quantity, per basin "BFV-1123, -1223, -1323, -1423" and replace with the following tags "VKG-1123, -1223, -1323, -1423." Change valve type from "AWWA Butterfly" to "Knife Gate."

    f. Paragraph 2.5.F.1, remove "2550 disks per basin" and replace with "759 disks per basin, for a total of 3036 disks."

III. The following are revisions to the Drawings:

1. Drawing 01-I-601, Sheet 18 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-I-601.
2. Drawing 02-I-601, Sheet 20 of 163:
    a. Remove the entire drawing and replace with the attached drawing 02-I-601.
3. Drawing 01-M-301, Sheet 68 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-M-301.
4. Drawing 01-M-302, Sheet 69 of 163:

a. Remove the entire drawing and replace with the attached drawing 01-M-302.

5. Drawing 01-M-303, Sheet 70 of 163:
   a. Remove the entire drawing and replace with the attached drawing 01-M-303.
6. Drawing 01-M-401, Sheet 71 of 163:
   a. Remove the entire drawing and replace with the attached drawing 01-M-401.
7. Drawing 01-M-402, Sheet 72 of 163:
   a. Remove the entire drawing and replace with the attached drawing 01-M-402.
8. Drawing 01-M-403, Sheet 73 of 163:
   a. Remove the entire drawing and replace with the attached drawing 01-M-403.
9. Drawing 01-M-404, Sheet 74 of 163:
   a. Remove the entire drawing and replace with the attached drawing 01-M-404.
10. Drawing 01-M-405, Sheet 75 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-M-405.
11. Drawing 01-E-101, Sheet 86 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-E-101.
12. Drawing 01-E-102, Sheet 87 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-E-102.
13. Drawing 01-E-103, Sheet 88 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-E-102.
14. Drawing 02-S-302, Sheet 97 of 163:
    a. Revise the extents of the Structural Backfill beneath the AGS Support Facilities to match the extents indicated on Drawing 02-S-301.
15. Drawing 02-E-101, Sheet 105 of 163:
    a. Remove the entire drawing and replace with the attached drawing 02-E-101.
16. Drawing 02-E-703, Sheet 110 of 163:
    a. Remove the entire drawing and replace with the attached drawing 02-E-703.
17. Drawing 02-E-704, Sheet 111 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-E-704.
18. Drawing 02-E-705, Sheet 112 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-E-705.
19. Drawing 02-E-706, Sheet 113 of 163:
    a. Remove the entire drawing and replace with the attached drawing 01-E-706.
20. Drawing 99-M-501, Sheet 147 of 163:
    a. Remove the entire drawing and replace with the attached drawing 99-M-501.
21. Drawing 99-M-504, Sheet 150 of 163:
    a. Note 2 under Influent Distribution Assembly, Effluent Weir Assembly, and Solids Waste System, change "+/- 10%" to "+/- 5%."

b. Replace the text "16 IN" with "18 IN" for the Header Size (H1) entry within the Solid Waste System table.
c. Clarification: The text "BY OTHERS" within the Effluent Weir Assembly table refers to the Contractor.

22. Drawing 99-E-502, Sheet 157 of 163:
    a. Add the text "304 SS" to the 3/8" bent plate annotations (2 places) within the Elevation and Section 1 of the Typical Stanchion Mounted Light Fixture Installation (Aluminum Pole) detail.
    b. Add the following as Electrical Manhole Note 6 to the Electrical Manhole Section detail: "6. ACCESS DOOR MODEL FOR ELECTRICAL MANHOLES WITHIN PAVEMENTS SHALL BE REINFORCED FOR AASHTO H-20 WHEEL LOADING."
23. Drawing 99-I-601, Sheet 163 of 163:
    a. Remove the entire drawing and replace with the attached drawing 99-I-601.

This information shall be taken into consideration when preparing your bid. Bidders shall acknowledge all project addenda. This addendum will be emailed to all plan holders as well as posted to FRSA's website at fourrivers.illinois.gov.

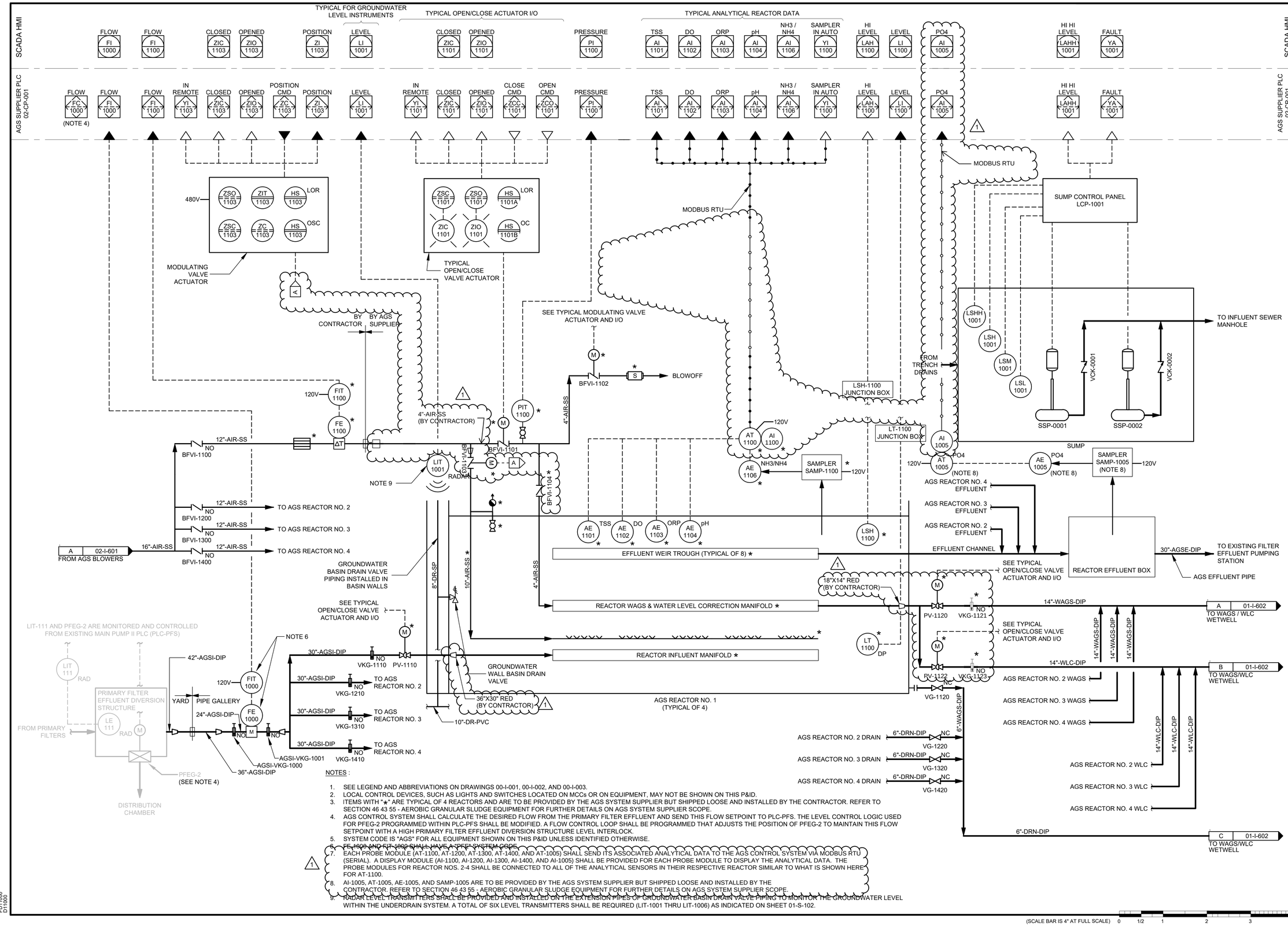
End of Addendum No. 3

Issued February 7, 2023

Four Rivers Sanitation Authority

Christopher T. Baer, PE
Director of Engineering

I:\District Projects\Aerobic Granular Sludge Phase I 2207\04 Bidding\Addenda\3\Addendum No. 3 dated 20230207.docx



NOTES :

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS 00-I-001, 00-I-002, AND 00-I-003.
2. LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCs OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ITEMS WITH "*" ARE TYPICAL OF 4 REACTORS AND ARE TO BE PROVIDED BY THE AGS SYSTEM SUPPLIER BUT SHIPPED LOOSE AND INSTALLED BY THE CONTRACTOR. REFER TO SECTION 46 43 55 - AEROBIC GRANULAR SLUDGE EQUIPMENT FOR FURTHER DETAILS ON AGS SYSTEM SUPPLIER SCOPE.
4. AGS CONTROL SYSTEM SHALL CALCULATE THE DESIRED FLOW FROM THE PRIMARY FILTER EFFLUENT AND SEND THIS FLOW SETPOINT TO PLC-PFS. THE LEVEL CONTROL LOGIC USED FOR PFEG-2 PROGRAMMED WITHIN PLC-PFS SHALL BE MODIFIED. A FLOW CONTROL LOOP SHALL BE PROGRAMMED THAT ADJUSTS THE POSITION OF PFEG-2 TO MAINTAIN THIS FLOW SETPOINT WITH A HIGH PRIMARY FILTER EFFLUENT DIVERSION STRUCTURE LEVEL INTERLOCK.
5. SYSTEM CODE IS "AGS" FOR ALL EQUIPMENT SHOWN ON THIS P&ID UNLESS IDENTIFIED OTHERWISE.
6. FE 1000 AND FIT 1000 SHALL HAVE A "PFE" SYSTEM CODE.
7. EACH PROBE MODULE (AT-1100, AT-1200, AT-1300, AT-1400, AND AT-1005) SHALL SEND ITS ASSOCIATED ANALYTICAL DATA TO THE AGS CONTROL SYSTEM VIA MODBUS RTU (SERIAL). A DISPLAY MODULE (AI-1100, AI-1200, AI-1300, AI-1400, AND AI-1005) SHALL BE PROVIDED FOR EACH PROBE MODULE TO DISPLAY THE ANALYTICAL DATA. THE PROBE MODULES FOR REACTOR NOS. 2-4 SHALL BE CONNECTED TO ALL OF THE ANALYTICAL SENSORS IN THEIR RESPECTIVE REACTOR SIMILAR TO WHAT IS SHOWN HERE FOR AT-1100.
8. AI-1005, AT-1005, AE-1005, AND SAMP-1005 ARE TO BE PROVIDED BY THE AGS SYSTEM SUPPLIER BUT SHIPPED LOOSE AND INSTALLED BY THE CONTRACTOR. REFER TO SECTION 46 43 55 - AEROBIC GRANULAR SLUDGE EQUIPMENT FOR FURTHER DETAILS ON AGS SYSTEM SUPPLIER SCOPE.
9. RADAR LEVEL TRANSMITTERS SHALL BE PROVIDED AND INSTALLED ON THE EXTENSION PIPES OF GROUNDWATER BASIN DRAIN VALVE PIPING TO MONITOR THE GROUNDWATER LEVEL WITHIN THE UNDERDRAIN SYSTEM. A TOTAL OF SIX LEVEL TRANSMITTERS SHALL BE REQUIRED (LIT-1001 THRU LIT-1006) AS INDICATED ON SHEET 01-S-102.

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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FDT1000
FDT1009

BLACK & VEATCH

Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

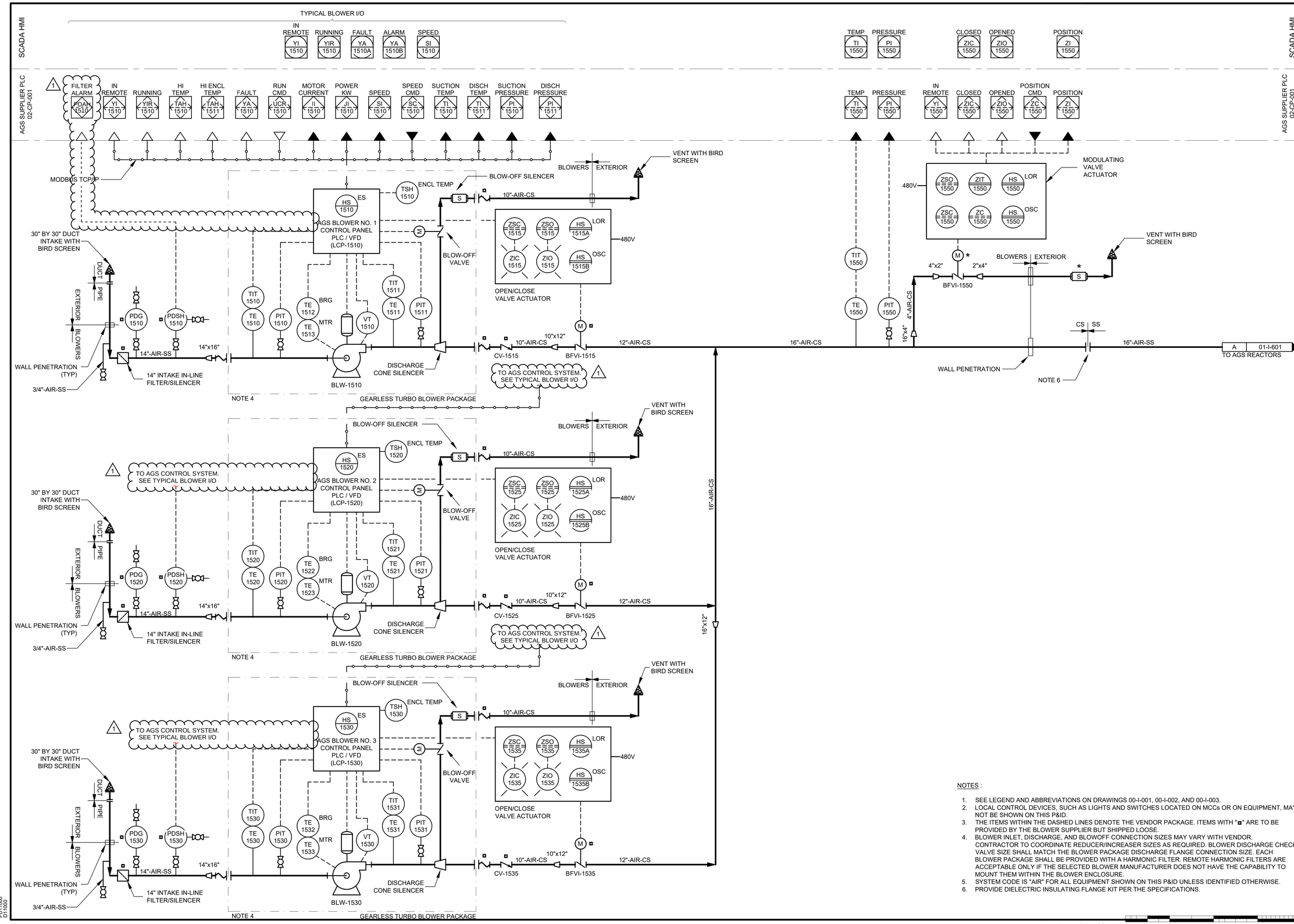
DESIGNED:	MJP
DETAILED:	DHH
CHECKED:	SAY
APPROVED:	MJP
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

INSTRUMENTATION

P&ID - AGS REACTORS AND GALLERY

01-I-601



NOTES :

1. SEE LEGEND AND ABBREVIATIONS ON DRAWINGS 00-I-001, 00-I-002, AND 00-I-003.
2. LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCs OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. THE ITEMS WITHIN THE DASHED LINES DENOTE THE VENDOR PACKAGE. ITEMS WITH "■" ARE TO BE PROVIDED BY THE BLOWER SUPPLIER BUT SHIPPED LOOSE.
4. BLOWER INLET, DISCHARGE, AND BLOWOFF CONNECTION SIZES MAY VARY WITH VENDOR. CONTRACTOR TO COORDINATE REDUCER/INCREASER SIZES AS REQUIRED. BLOWER DISCHARGE CHECK VALVE SIZE SHALL MATCH THE BLOWER PACKAGE DISCHARGE FLANGE CONNECTION SIZE. EACH BLOWER PACKAGE SHALL BE PROVIDED WITH A HARMONIC FILTER. REMOTE HARMONIC FILTERS ARE ACCEPTABLE ONLY IF THE SELECTED BLOWER MANUFACTURER DOES NOT HAVE THE CAPABILITY TO MOUNT THEM WITHIN THE BLOWER ENCLOSURE.
5. SYSTEM CODE IS "AIR" FOR ALL EQUIPMENT SHOWN ON THIS P&ID UNLESS IDENTIFIED OTHERWISE.
6. PROVIDE DIELECTRIC INSULATING FLANGE KIT PER THE SPECIFICATIONS.

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

BLACK & VEATCH

Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

DESIGNED:	MJP
DETAILED:	DHH
CHECKED:	SAY
APPROVED:	MJP
DATE:	12/20/2022
PROJECT NO.:	411752

GENERAL

INSTRUMENTATION

P&ID - BLOWERS

02-I-601

PLOTTED: 12/16/2022 1:38:43 PM
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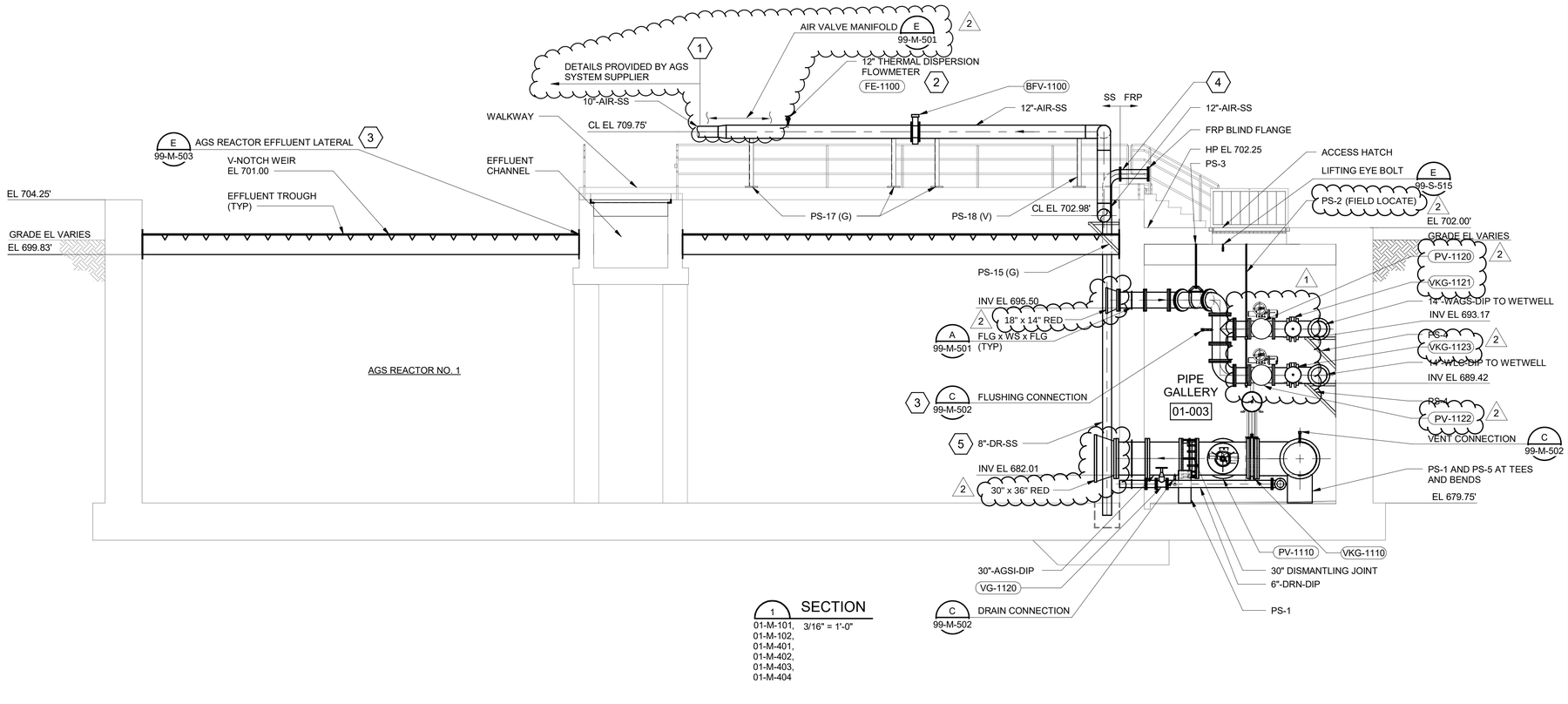
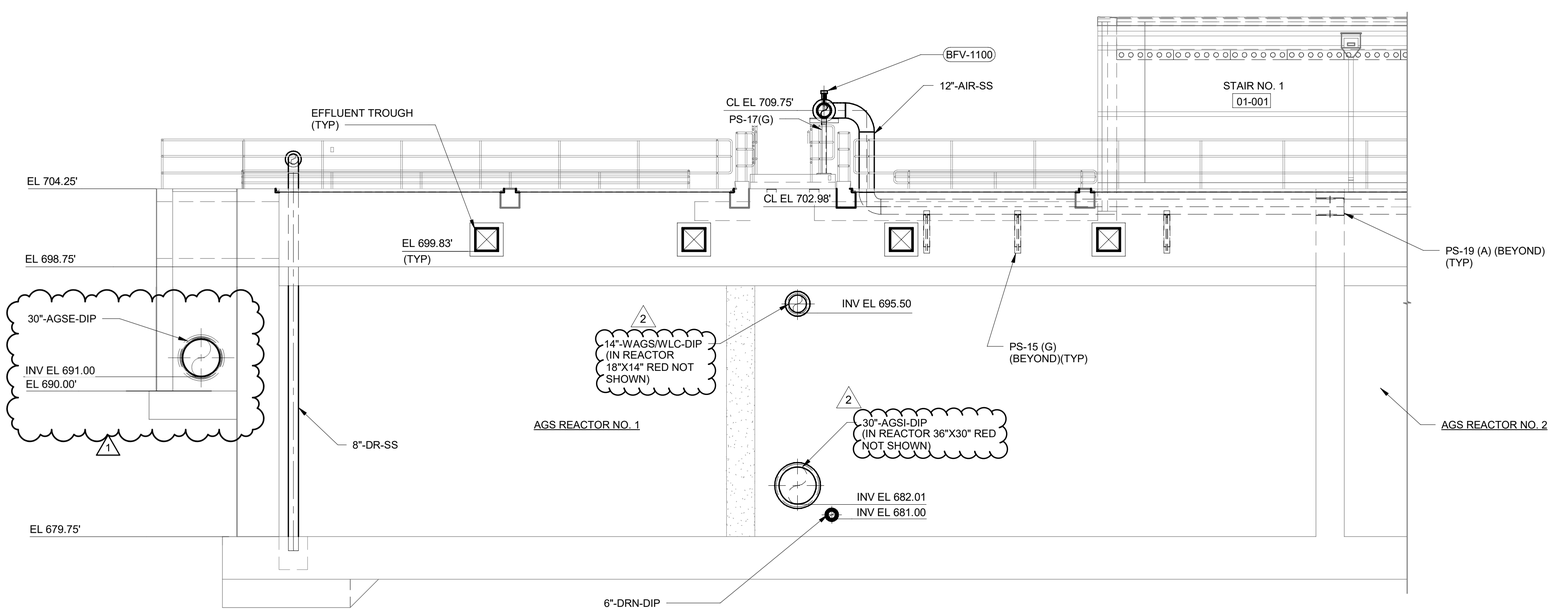
D11000
D11000



1 SECTION
01-M-101, 01-M-102, 01-M-401, 01-M-402, 01-M-403, 01-M-404
3/16" = 1'-0"



2 SECTION
01-M-101, 01-M-102, 01-M-401, 01-M-402
3/16" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT
4. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.

SHEET KEYNOTES

1. REFER TO P&IDS AND EQUIPMENT SPECIFICATION FOR ADDITIONAL INFORMATION ON AGS SYSTEM SUPPLIER SCOPE. DETAILED PIPE ROUTING AND EQUIPMENT LOCATIONS TO BE PROVIDED BY SUPPLIER AFTER AWARD OF CONTRACT. AGS SYSTEM SUPPLIER IS RESPONSIBLE FOR PIPE SUPPORTS WITHIN THE PIPING PROVIDED BY THE AGS SYSTEM SUPPLIER.
2. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.
3. CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF EFFLUENT CHANNEL OPENINGS WITH THE AGS SYSTEM SUPPLIER.
4. DRAIN PIPING SHOWN IS TYPICAL OF AGS REACTOR NO. 1. FOR AGS REACTORS NO. 2, 3, AND 4, CONTRACTOR SHALL ROUTE DRAIN PIPING TO AVOID AIR PIPING.
5. SUPPORTS FOR DRAIN PIPING SHALL BE DUPLEX SS AND SHALL MEET THE REQUIREMENTS OF SECTION 40 05 07 PIPE SUPPORTS.

6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	1/18/23	ADDENDUM NO. 1
2	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	VP
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

REACTOR SECTIONS 1 OF 3

01-M-301

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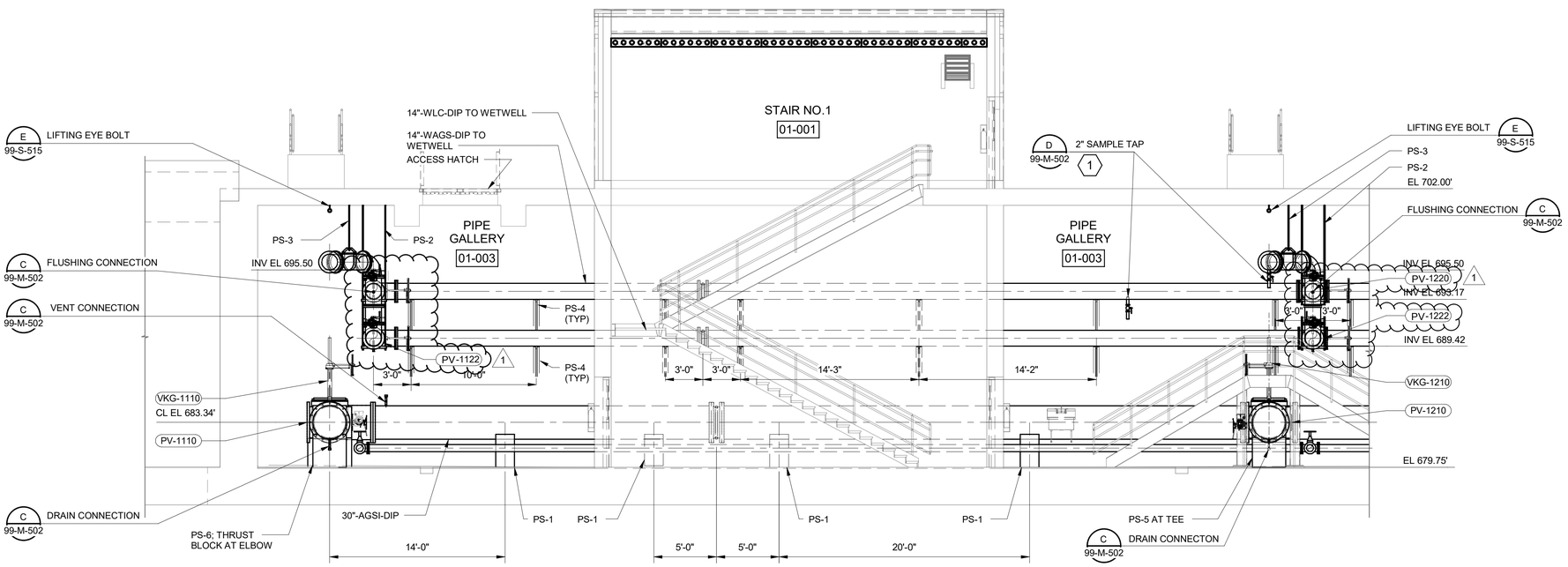

1 SECTION
01-M-101, 01-M-102, 01-M-401, 01-M-402
3/16" = 1'-0"

GENERAL SHEET NOTES

1. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
2. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.

6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

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PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

REACTOR SECTIONS 2 OF 3

01-M-302

PLOTTED: 12/16/2022 11:49:27 AM
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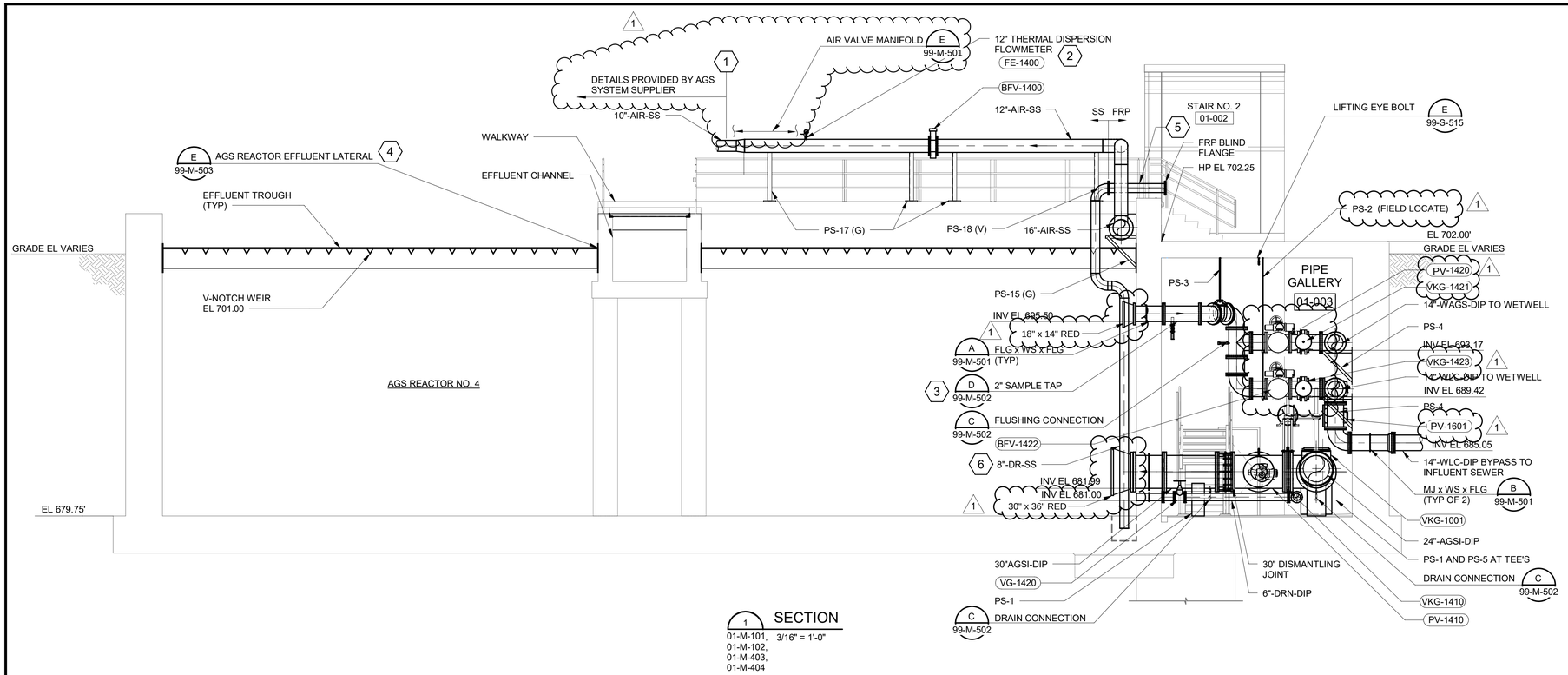
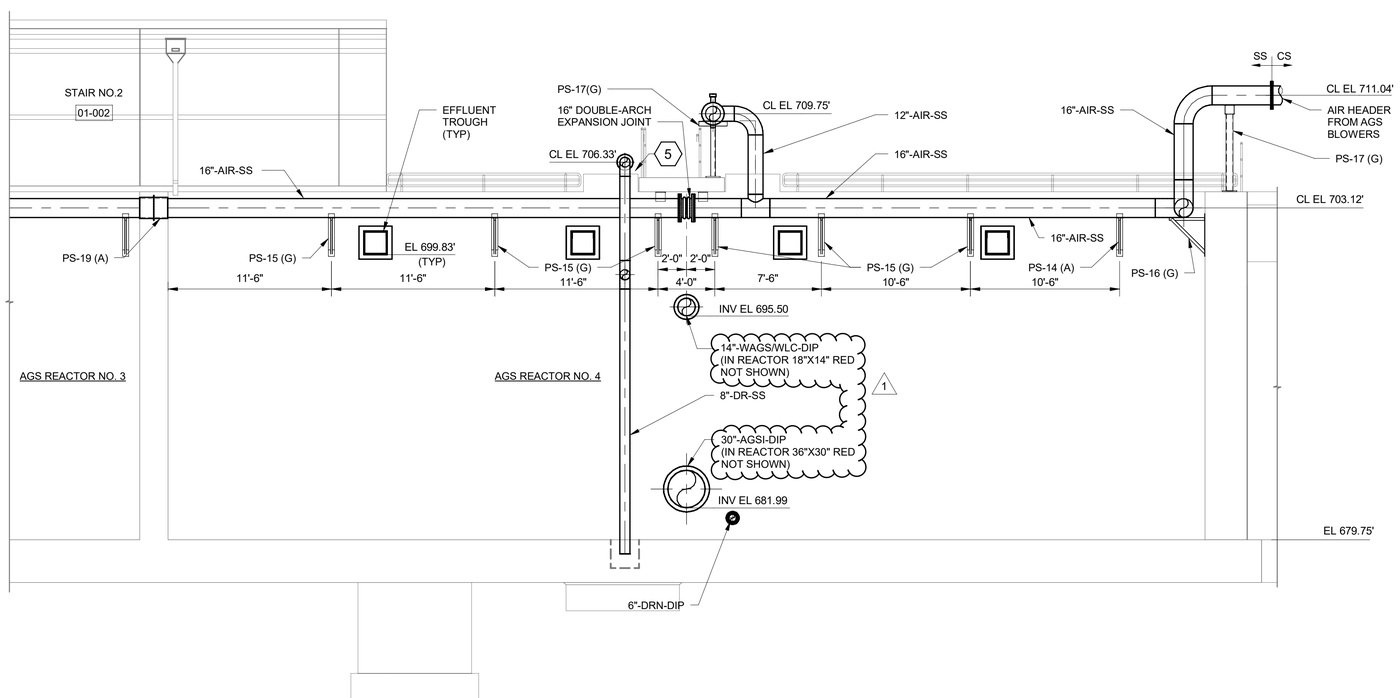


1 SECTION
01-M-101, 01-M-102, 01-M-403, 01-M-404
3/16" = 1'-0"



2 SECTION
01-M-101, 01-M-102, 01-M-403, 01-M-404
3/16" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:
   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT
4. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.

SHEET KEYNOTES

1. REFER TO P&IDS AND EQUIPMENT SPECIFICATION FOR ADDITIONAL INFORMATION ON AGS SYSTEM SUPPLIER SCOPE. DETAILED PIPE ROUTING AND EQUIPMENT LOCATIONS TO BE PROVIDED BY SUPPLIER AFTER AWARD OF CONTRACT. AGS SYSTEM SUPPLIER IS RESPONSIBLE FOR PIPE SUPPORTS WITHIN THE PIPING PROVIDED BY THE AGS SYSTEM SUPPLIER.
2. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.
3. CONTRACTOR TO FIELD ROUT SAMPLE PIPING TO NEAREST SERVICE SINK.
4. CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF EFFLUENT CHANNEL OPENINGS WITH THE AGS SYSTEM SUPPLIER.
5. DRAIN PIPING SHOWN IS TYPICAL OF AGS REACTOR NO. 2,3,4. CONTRACTOR SHALL ROUTE DRAIN PIPING TO AVOID AIR PIPING.
6. SUPPORTS FOR DRAIN PIPING SHALL BE DUPLEX SS AND SHALL MEET THE REQUIREMENTS OF SECTION 40 05 07 PIPE SUPPORTS.

6' 4' 2' 0' 5' 10'
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

REACTOR SECTIONS 3 OF 3

01-M-303

PLOTTED: 12/16/2022 11:50:03 AM
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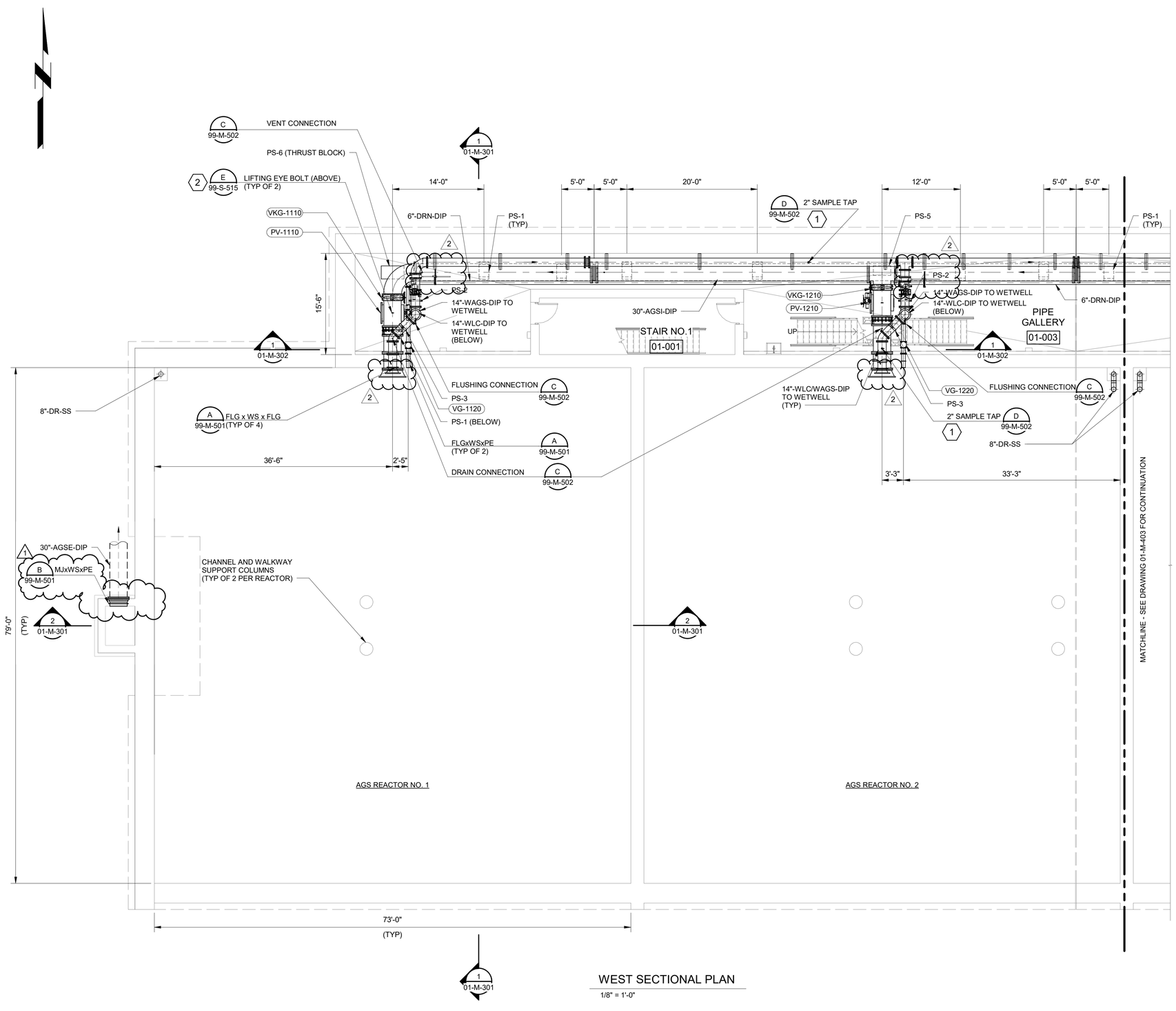

WEST SECTIONAL PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
4. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.
2. LIFTING EYE BOLT TO BE LOCATED DIRECTLY ABOVE CENTER OF 30-INCH PLUG VALVE.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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PROJECT NO.:	411752

AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

WEST SECTIONAL PLAN

01-M-401

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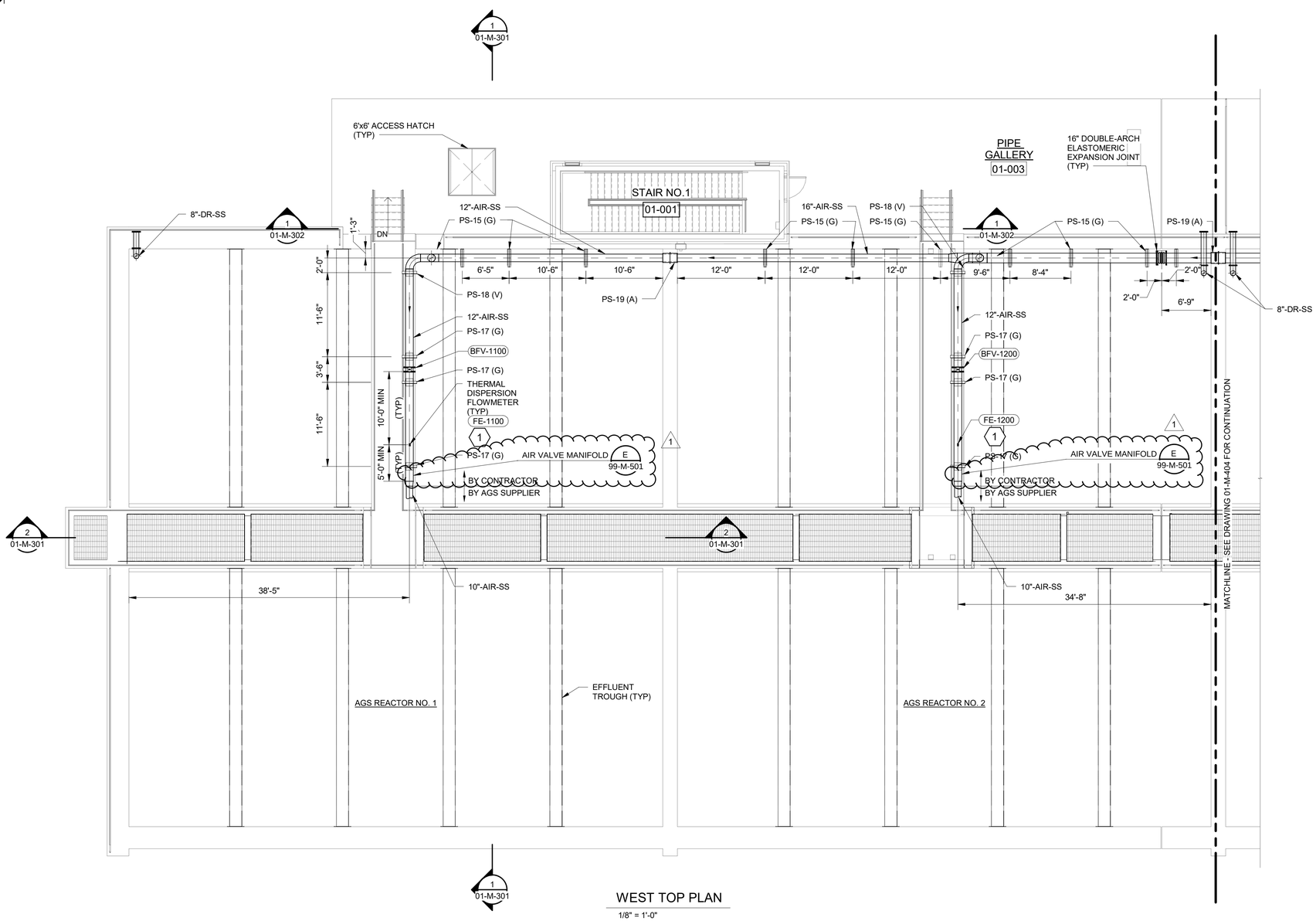

WEST TOP PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

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   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.

8' 4' 0' 8' 16'

1/8" = 1'-0"

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

WEST TOP PLAN

01-M-402

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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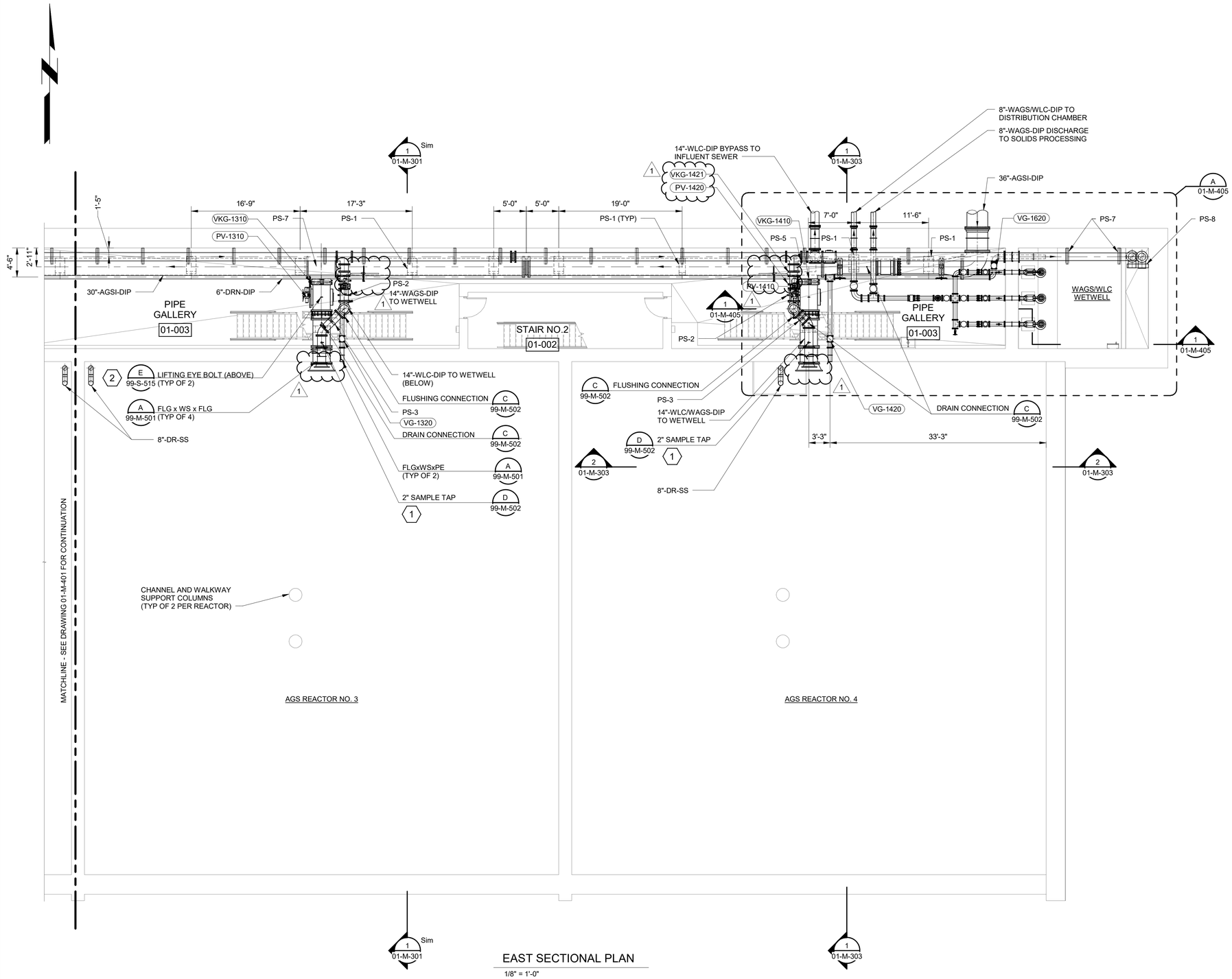

EAST SECTIONAL PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
4. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED SING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.
2. LIFTING EYE BOLT TO BE LOCATED DIRECTLY ABOVE CENTER OF 30-INCH PLUG VALVE.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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1	2/7/23	ADDENDUM NO. 3

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

EAST SECTIONAL PLAN

01-M-403

PLOTTED: 12/16/2022 11:49:49 AM
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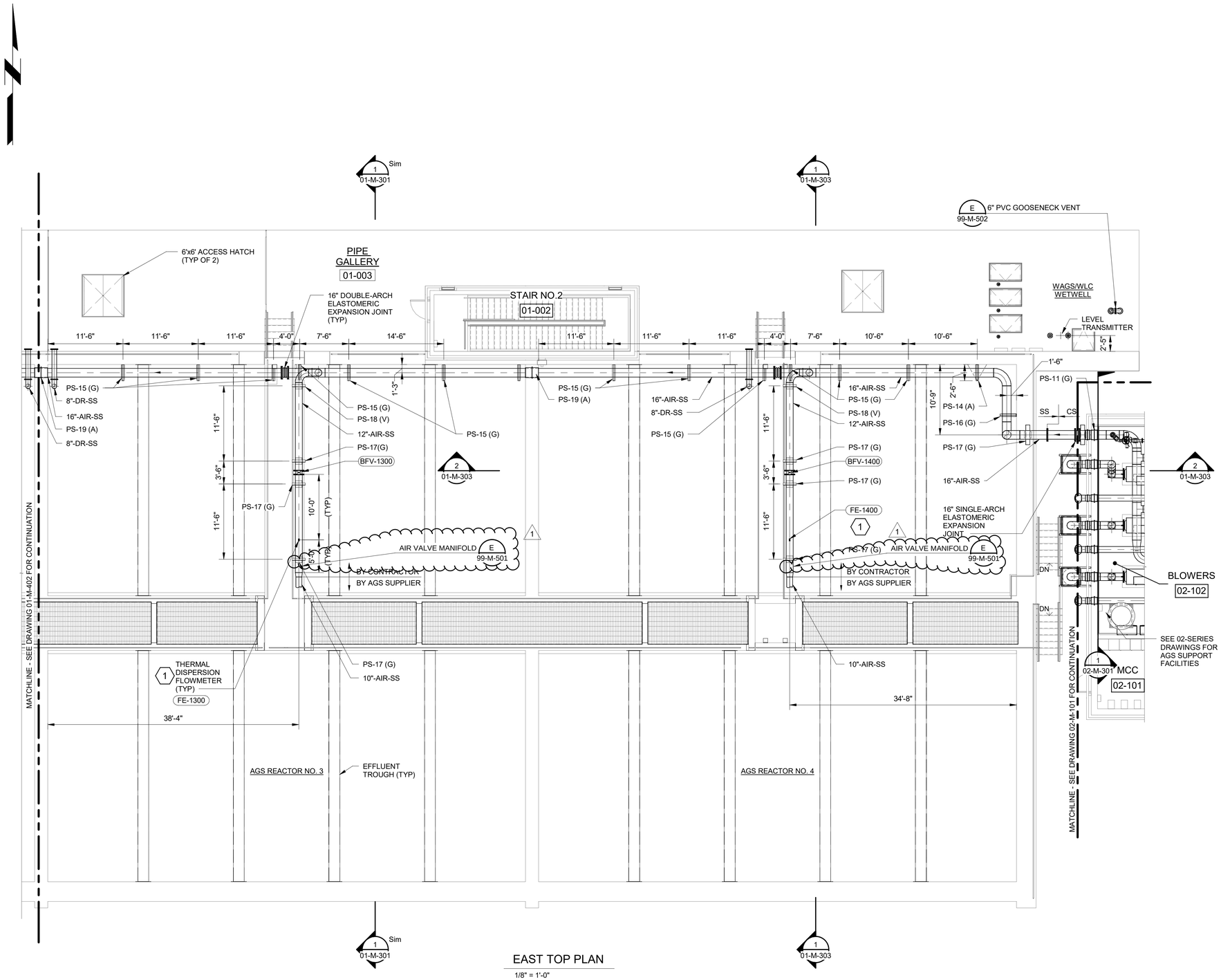

EAST TOP PLAN

1/8" = 1'-0"

GENERAL SHEET NOTES

1. AIR DIFFUSER LAYOUT AND CONNECTION DETAILS SHALL BE PROVIDED BY AGS SYSTEM SUPPLIER AFTER AWARD OF CONTRACT.
2. AGS REACTOR TANK INTERNAL EQUIPMENT INCLUDING MANIFOLDS, TROUGHS, SUPPORTS, AND DIFFUSERS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS. FINAL EQUIPMENT LIST AND QUANTITIES TO BE PROVIDED BY AGS SYSTEM SUPPLIER. REFER TO AGS SPECIFICATION AND SHEETS 99-M-502, 99-M-503, AND 99-M-504 FOR ADDITIONAL DETAIL.
3. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT

SHEET KEYNOTES

1. THERMAL DISPERSION FLOWMETER PROVIDED BY AGS SYSTEM SUPPLIER. FLOWMETERS SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 10 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

EAST TOP PLAN

01-M-404

PLOTTED: 12/16/2022 11:49:54 AM
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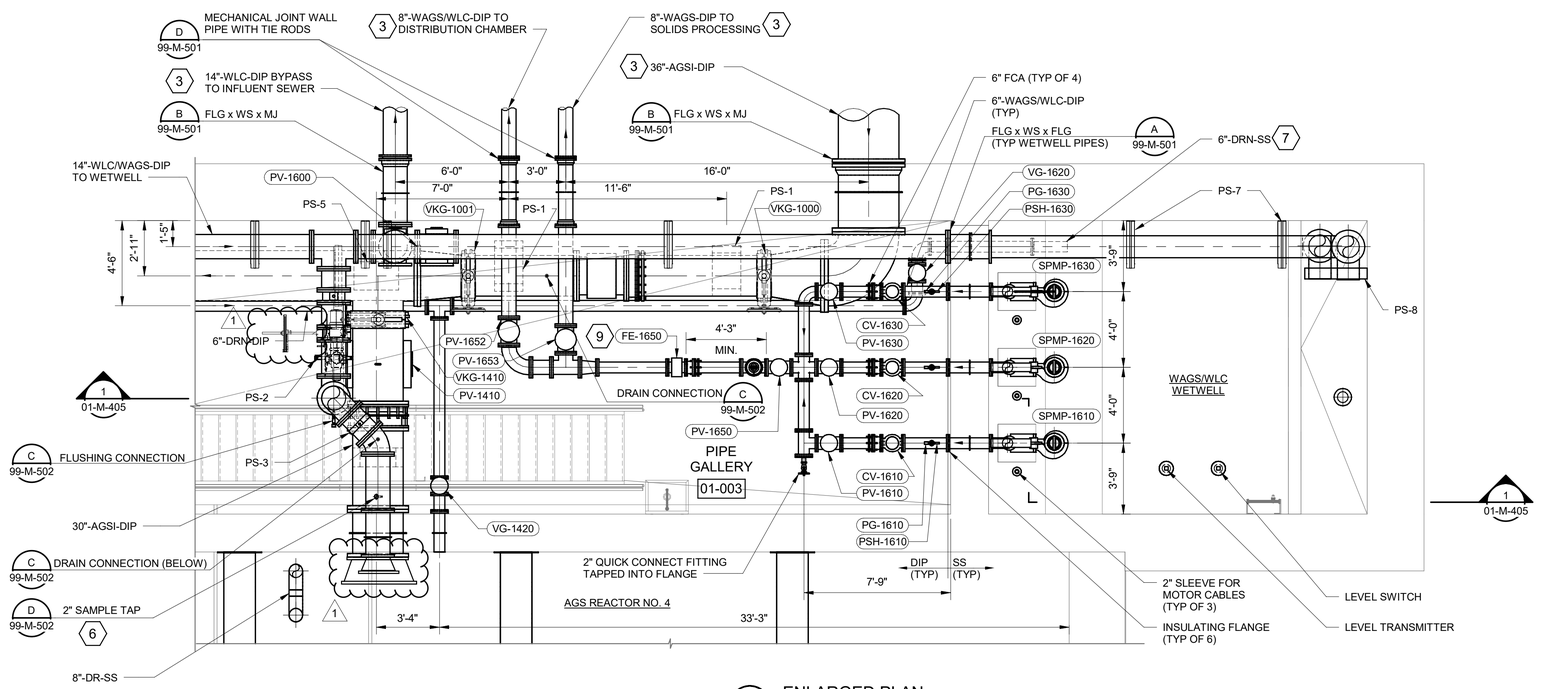
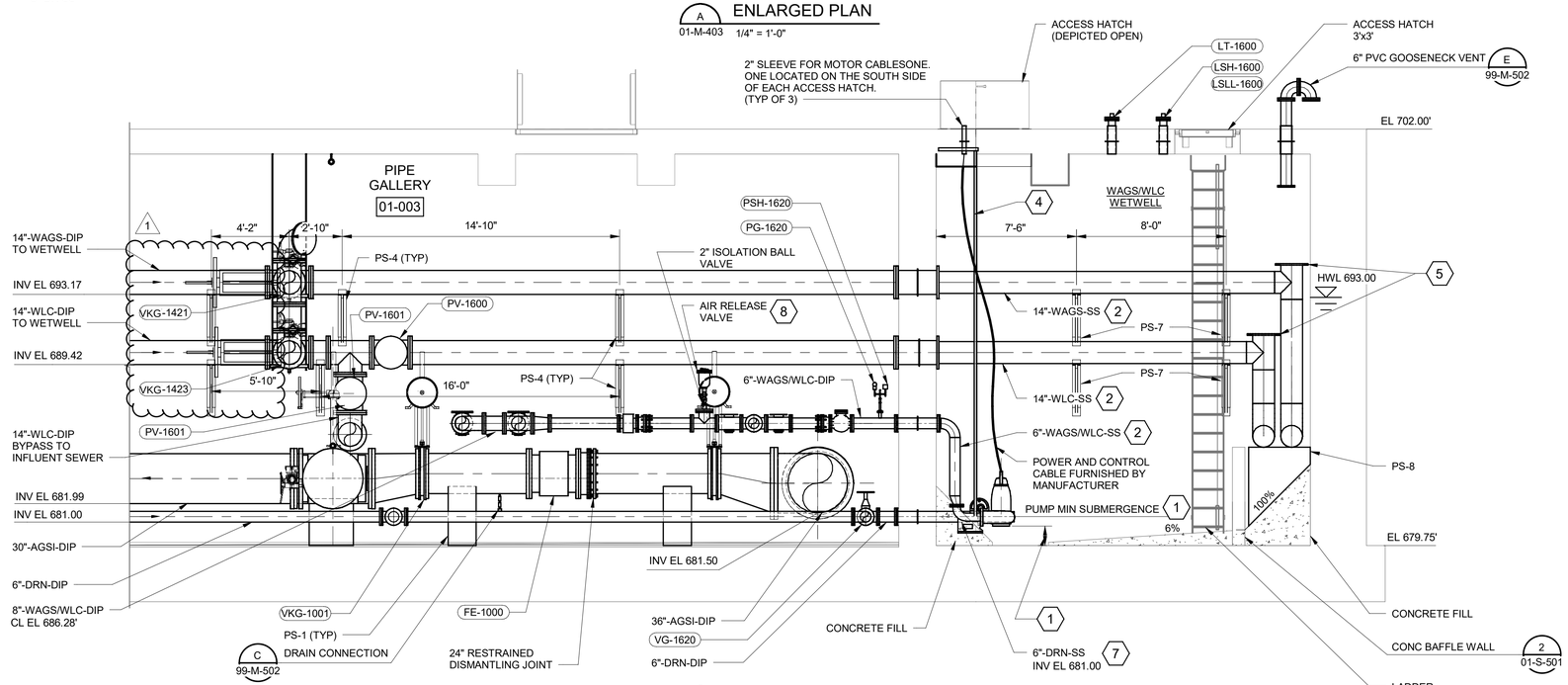


A 01-M-403 ENLARGED PLAN 1/4" = 1'-0"



1 01-M-101, 01-M-403, 01-M-405 SECTION 1/4" = 1'-0"

GENERAL SHEET NOTES

1. PIPING AND PIPE SUPPORTS IN WAGS/WLC WETWELL SHALL BE DUPLEX STAINLESS STEEL AND TRANSITION TO DUCTILE IRON PIPE AT LOCATION SHOWN IN PIPE GALLERY.
2. PS-X REPRESENTS PIPE SUPPORT TYPE. SEE PIPE SUPPORT SCHEDULE ON SHEET 99-M-502.

   AIR PIPING SUPPORT TYPES ARE IDENTIFIED USING THE FOLLOWING DESIGNATIONS:

   (G) : GUIDE SUPPORT
   (A) : AXIAL STOP
   (V) : VERTICAL SUPPORT
   (SPR) : SPRING HANGER SUPPORT
3. CONTRACTOR SHALL USE HANGER SUPPORTS FROM THE ROOF FOR ALL THE WAGS/WLC DISCHARGE LINES IN THE PIPE GALLERY.
4. PIPE SUPPORTS TO BE ADJUSTED IN THE FIELD AS REQUIRED TO AVOID FLANGE LOCATIONS IN PIPES.
5. ALL MATERIALS LOCATED IN THE WAGS/WLC WETWELL SHALL BE CORROSION RESISTANT TO A CHLORIDE CONCENTRATION OF 300 MG/L.

SHEET KEYNOTES

1. VARIES BY PUMP MANUFACTURER. CONTRACTOR TO COORDINATE.
2. FLANGED STAINLESS STEEL CAN BE SUBSTITUTED FOR WELDED STAINLESS STEEL. PROVIDE FLANGED PIPE AT WALL FITTINGS AS SHOWN ON THE DRAWINGS.
3. SEE YARD PIPING DRAWINGS FOR CONTINUATION.
4. PUMP MANUFACTURER SHALL PROVIDE STAINLESS STEEL GUIDE RAIL, GUIDE RAIL SUPPORTS, INTERMEDIATE GUIDE RAIL BRACKETS, AND CABLE HOOK. CONTRACTOR SHALL COORDINATE GUIDE RAIL SPACING WITH PUMP MANUFACTURER.
5. PROVIDE TEE WITH OPEN FLANGE IN VERTICAL FOR AIR RELEASE.
6. CONTRACTOR TO FIELD ROUTE SAMPLE PIPING TO NEAREST SERVICE SINK.
7. PROVIDE 6" DUCKBILL CHECK VALVE, RED VALVE TIDEFLEX SERIES TF-2 OR APPROVED EQUAL. PER SHEET KEYNOTE 2, PROVIDE SERIES 35 OR APPROVED EQUAL FOR FLANGED PIPING.
8. DISCHARGE LINE FROM AIR RELEASE VALVE SHALL BE SLOPED AND FIELD ROUTED TO NEAREST FLOOR DRAIN.
9. FLOWMETER SHALL BE PROVIDED WITH MINIMUM UPSTREAM STRAIGHT RUN OF 5 PIPE DIAMETERS AND MINIMUM DOWNSTREAM STRAIGHT RUN OF 2 PIPE DIAMETERS.

4' 2' 0' 4' 8'
1/4" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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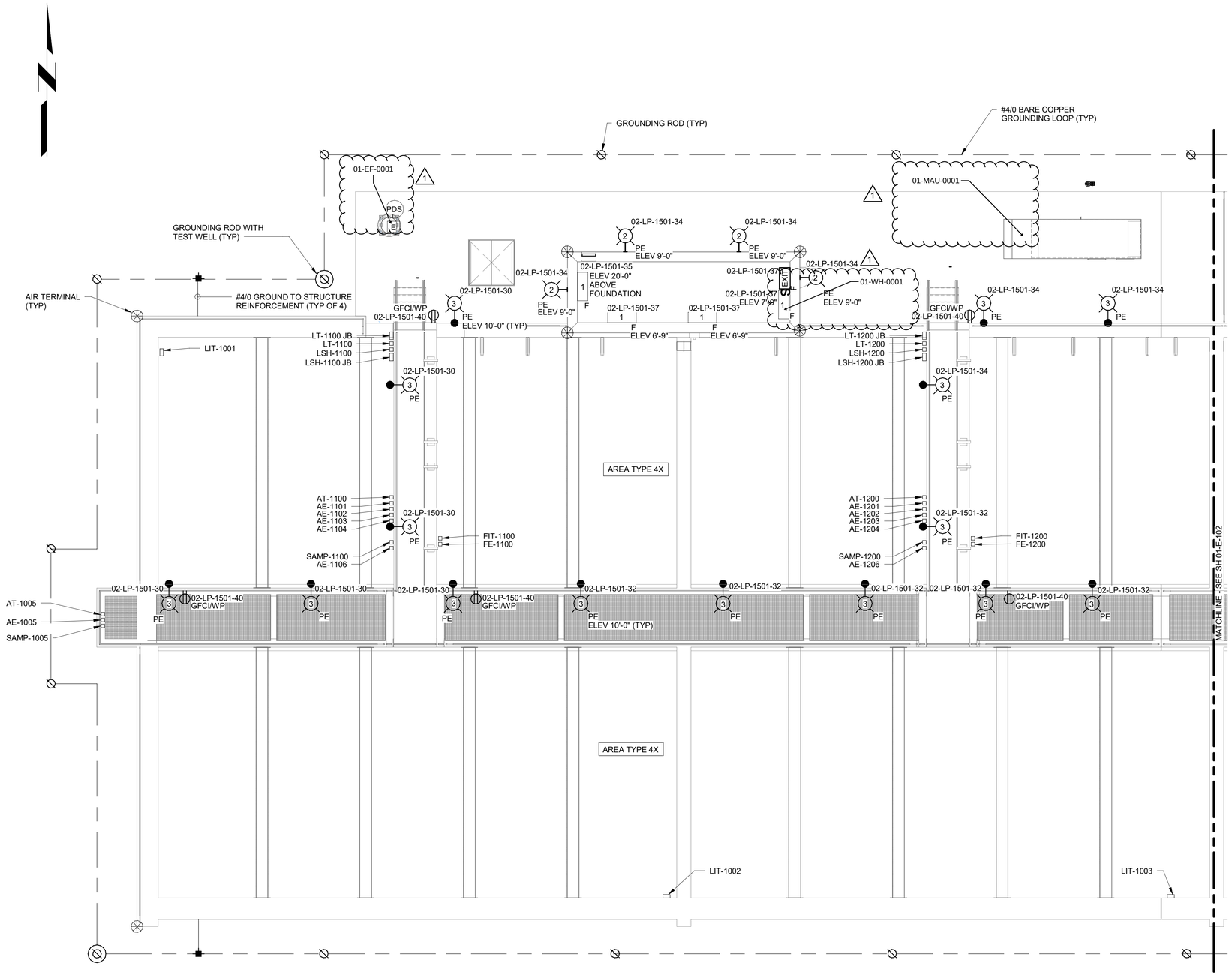
AGS REACTORS AND PIPE GALLERY

PROCESS MECHANICAL

WETWELL ENLARGED PLAN AND SECTION

01-M-405

PLOTTED: 12/16/2022 11:48:29 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL PLAN

1/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.
2. LOCATIONS OF VALVE ACTUATORS AND PRESSURE TRANSMITTERS ON AIR PIPING INTERNAL TO AGS REACTORS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
DETAILED:	SFR
CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

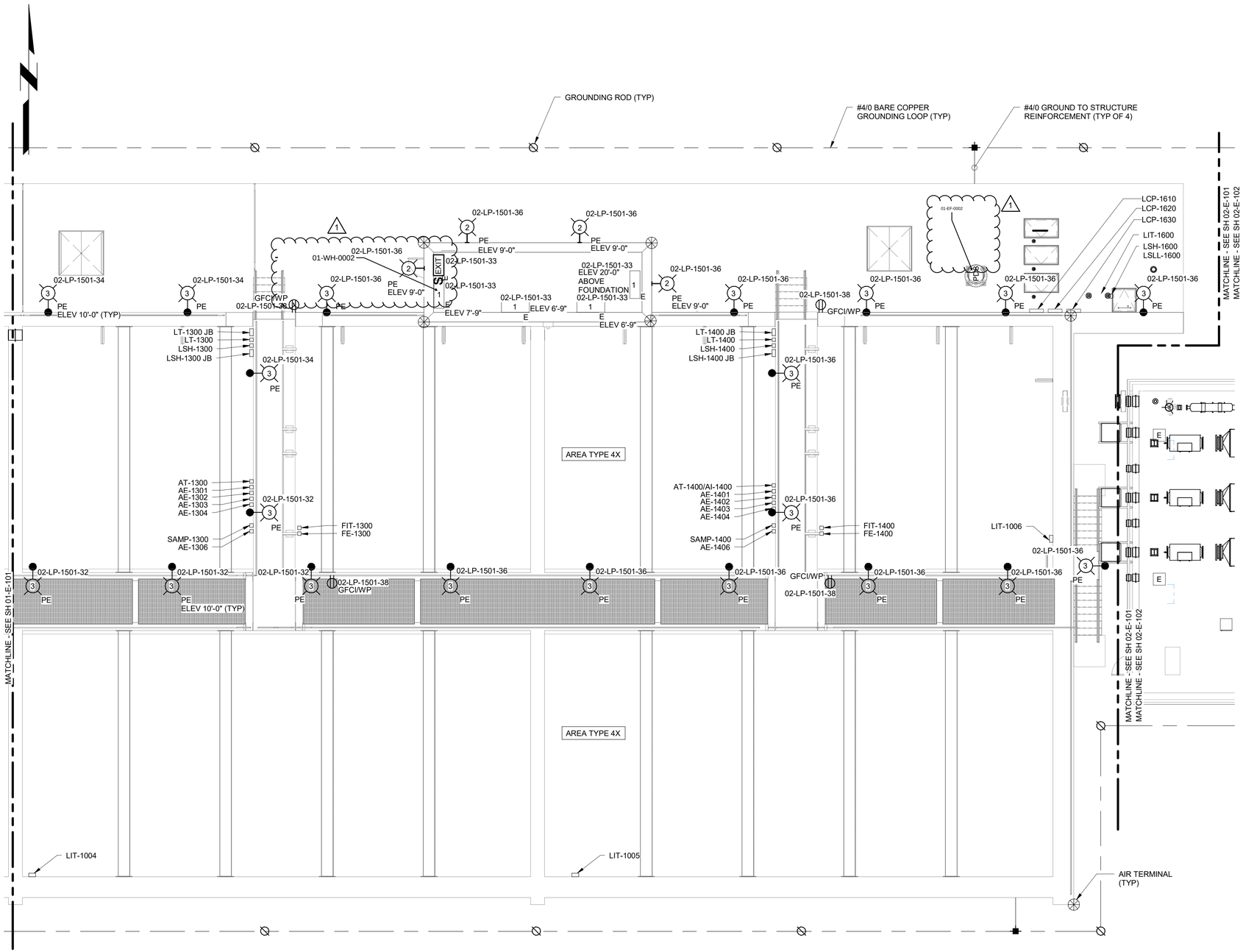
AGS REACTORS AND PIPE GALLERY

ELECTRICAL

REACTOR 1 AND REACTOR 2 ELECTRICAL PLAN

01-E-101

PLOTTED: 12/16/2022 4:30:22 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL PLAN

1/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.
2. LOCATIONS OF VALVE ACTUATORS AND PRESSURE TRANSMITTERS ON AIR PIPING INTERNAL TO AGS REACTORS ARE PROVIDED BY AGS SYSTEM SUPPLIER. FINAL EQUIPMENT AND PIPING LAYOUT IS PROPRIETARY AND SHALL BE AS PROVIDED IN VENDOR SUBMITTAL DRAWINGS.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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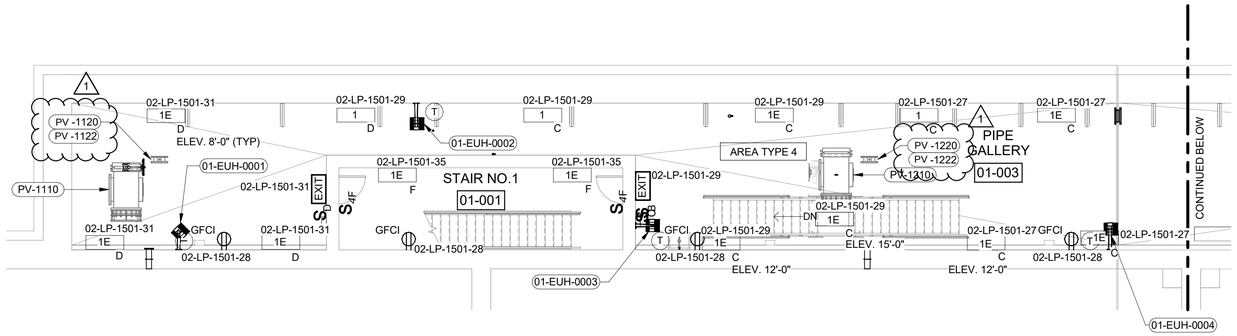
AGS REACTORS AND PIPE GALLERY

ELECTRICAL

REACTOR 3 AND REACTOR 4 ELECTRICAL PLAN

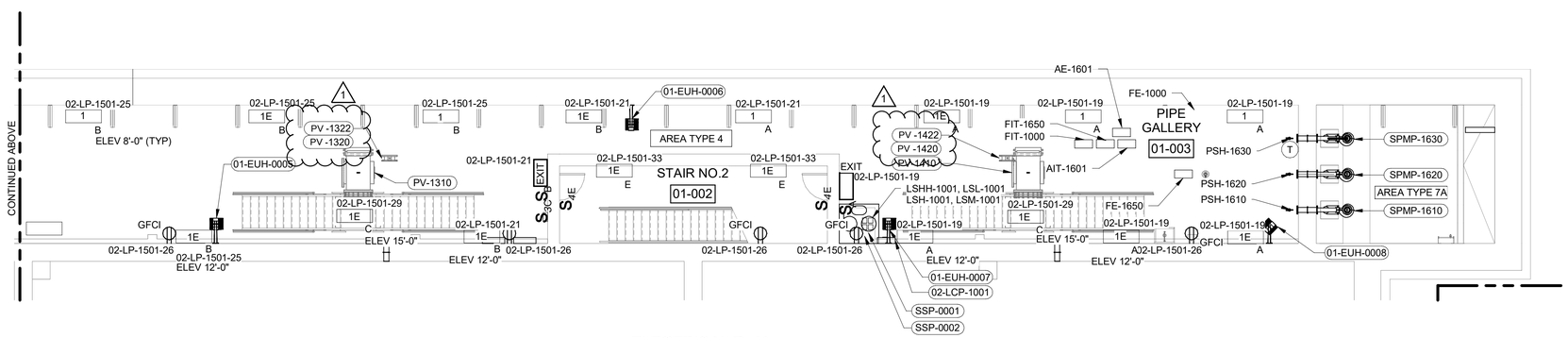
01-E-102

PLOTTED: 12/16/2022 4:30:18 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL PLAN

1/8" = 1'-0"



ELECTRICAL PLAN

1/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.

8' 4' 0' 8' 16'

1/8" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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AEROBIC GRANULAR SLUDGE - PHASE 1

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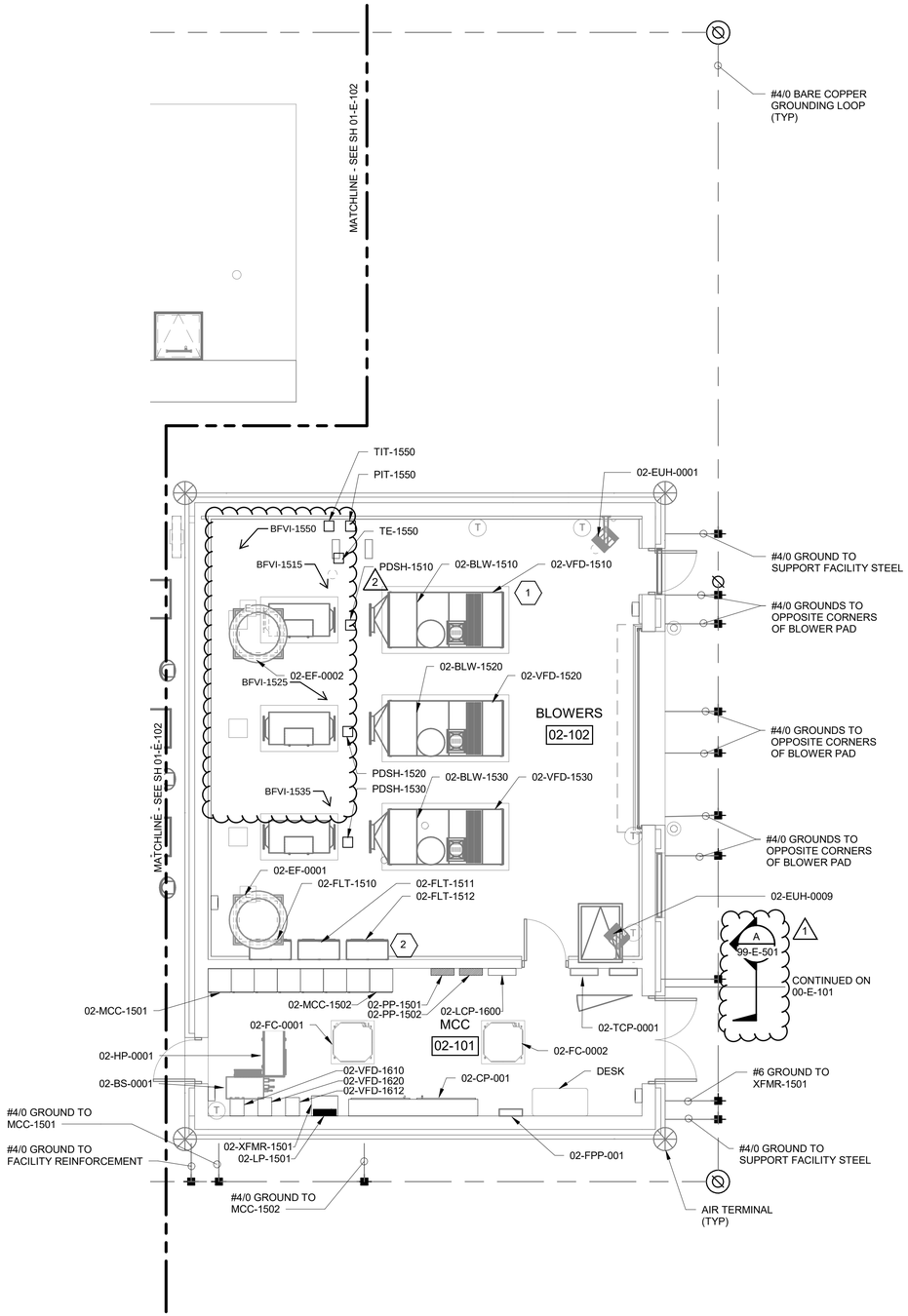
AGS REACTORS AND PIPE GALLERY

ELECTRICAL

GALLERY ELECTRICAL PLANS

01-E-103

PLOTTED: 12/16/2022 4:30:30 PM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



ELECTRICAL POWER AND GROUNDING PLAN

3/16" = 1'-0"

GENERAL NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 DOR LEGENDS, ABBREVIATIONS AND NOTES.

SHEET KEYNOTES

1. VARIABLE FREQUENCY DRIVES SUPPLIED AS PACKAGED UNIT WITH BLOWER BY BLOWER VENDOR. TYPICAL OF THREE BLOWERS.
2. HARMONIC FILTERS SUPPLIED BY BLOWER VENDOR BUT SHIPPED LOOSE. TYPICAL OF THREE BLOWERS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	1/13/23	ADDENDUM NO. 1
2	2/7/23	ADDENDUM NO. 3

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AGS SUPPORT FACILITIES

ELECTRICAL

FACILITIES POWER & GROUNDING PLAN

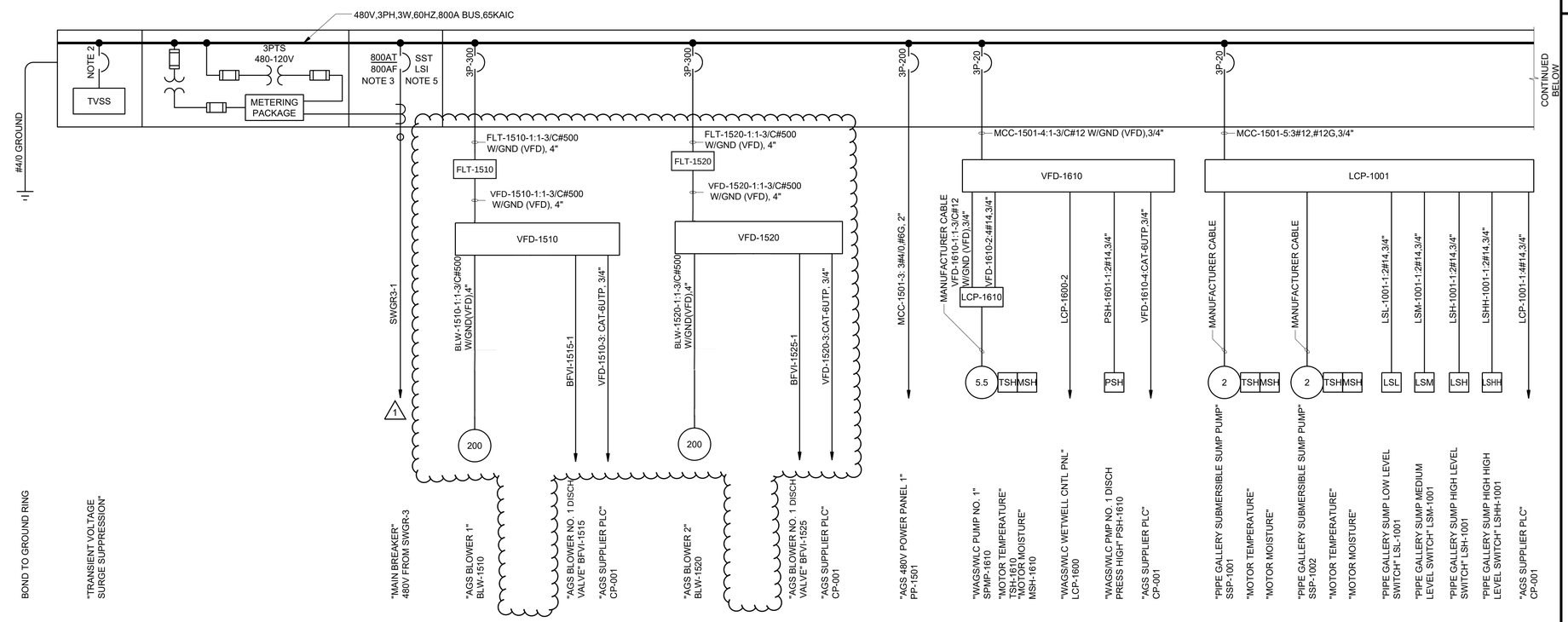
02-E-101

6' 4' 2' 0' 5' 10'

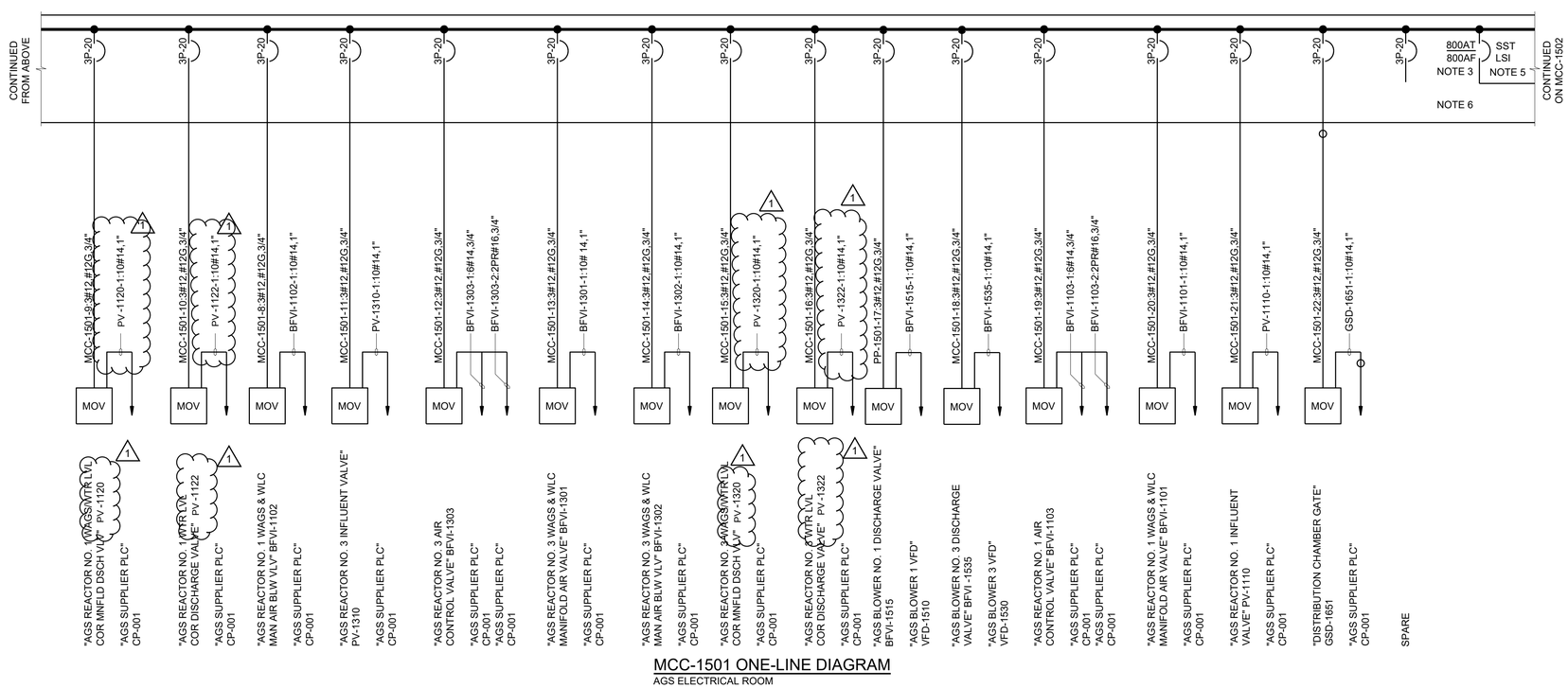
3/16" = 1'-0"

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 1/10/2023 8:30:15 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000



MCC-1501 ONE-LINE DIAGRAM
AGS SUPPORT FACILITIES



MCC-1501 ONE-LINE DIAGRAM
AGS ELECTRICAL ROOM

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. MCC NAMEPLATE WORDING IS SHOWN IN QUOTATION MARKS (" ") ON THE ONE-LINE DIAGRAM
3. MCC MAIN AND TIE BREAKERS SHALL BE RATED TO OPERATE AT 800 AMPS CONTINUOUSLY.
4. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.
5. THE MAIN AND TIE BREAKER INSTANTANEOUS OVER CURRENT PICKUPS MUST COORDINATE WITH ALL FEEDER AND STARTER BREAKERS.
6. SPARE SPACES SHALL BE PROCURED TO ACCOMMODATE 4 SIZE 2 MOTOR STARTERS.

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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PROJECT NO.:	411752

AGS SUPPORT FACILITIES

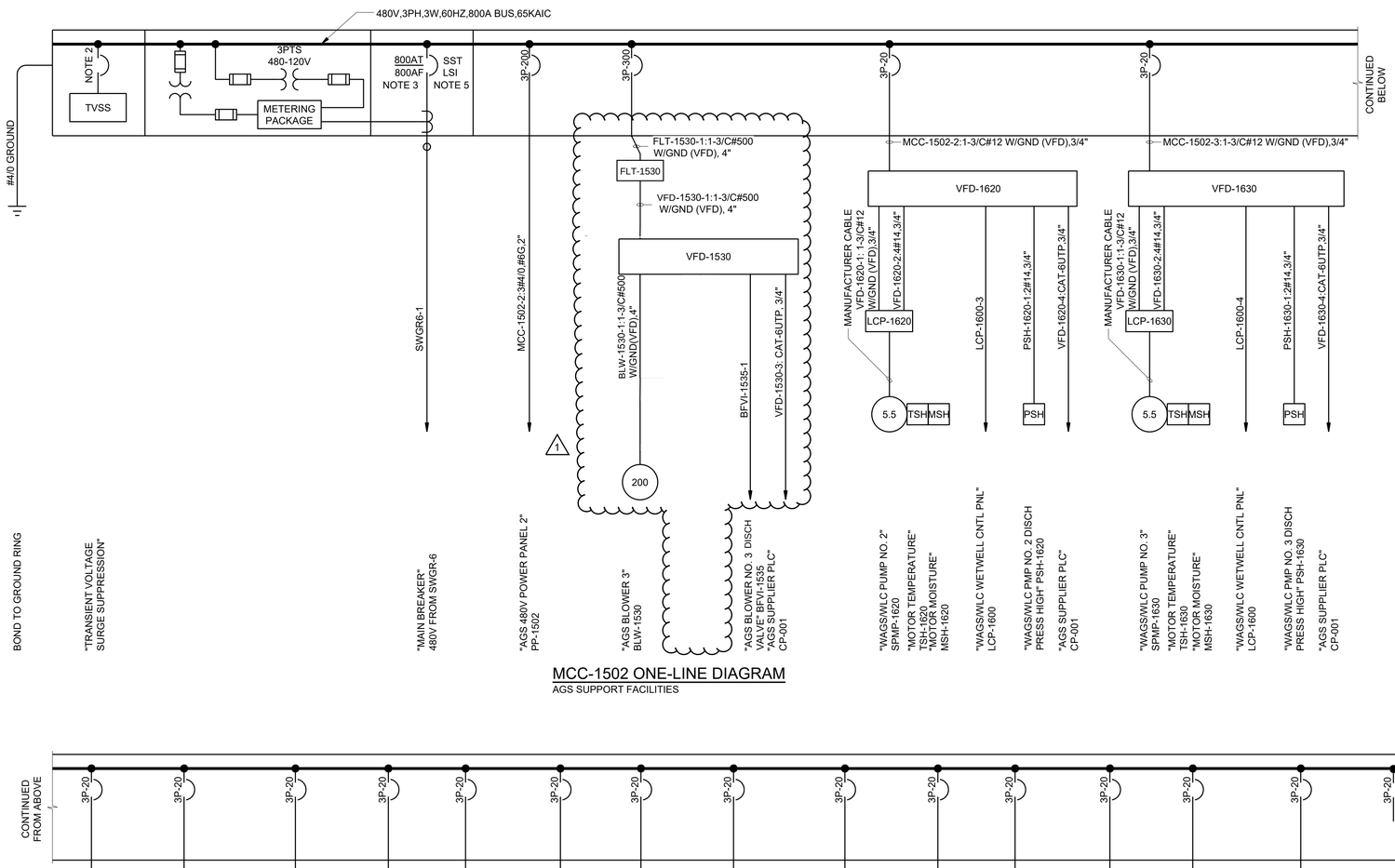
ELECTRICAL

AGS MCC ONE-LINE DIAGRAM

02-E-703

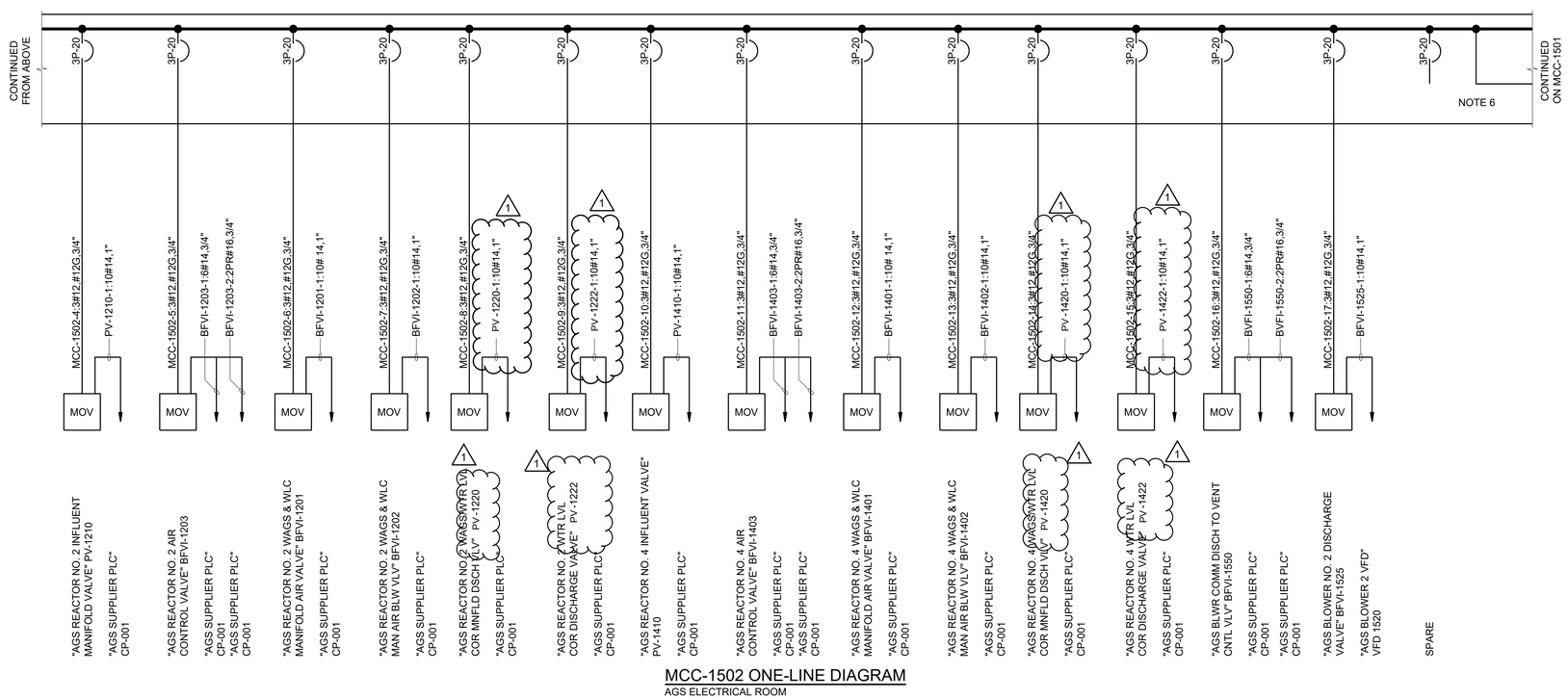
PLOTTED: 12/16/2022 11:16 AM FILE: C:\pw_working\bvw_americas\d1495380\02-E-703.dwg

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4



MCC-1502 ONE-LINE DIAGRAM

AGS SUPPORT FACILITIES



MCC-1502 ONE-LINE DIAGRAM

AGS ELECTRICAL ROOM

GENERAL SHEET NOTES

1. SEE DRAWINGS 00-E-001 AND 00-E-002 FOR LEGENDS, ABBREVIATIONS AND NOTES.
2. MCC NAMEPLATE WORDING IS SHOWN IN QUOTATION MARKS (" ") ON THE ONE-LINE DIAGRAM
3. MCC MAIN AND TIE BREAKERS SHALL BE RATED TO OPERATE AT 800 AMPS CONTINUOUSLY.
4. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.
5. THE MAIN AND TIE BREAKER INSTANTANEOUS OVER CURRENT PICKUPS MUST COORDINATE WITH ALL FEEDER AND STARTER BREAKERS.
6. SPARE SPACES SHALL BE PROCURED TO ACCOMMODATE 3 SIZE 2 MOTOR STARTERS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

AGS MCC ONE-LINE DIAGRAM

02-E-704

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 11:32 AM FILE: C:\pw_working\bvw_americas\d1495380\02-E-704.dwg
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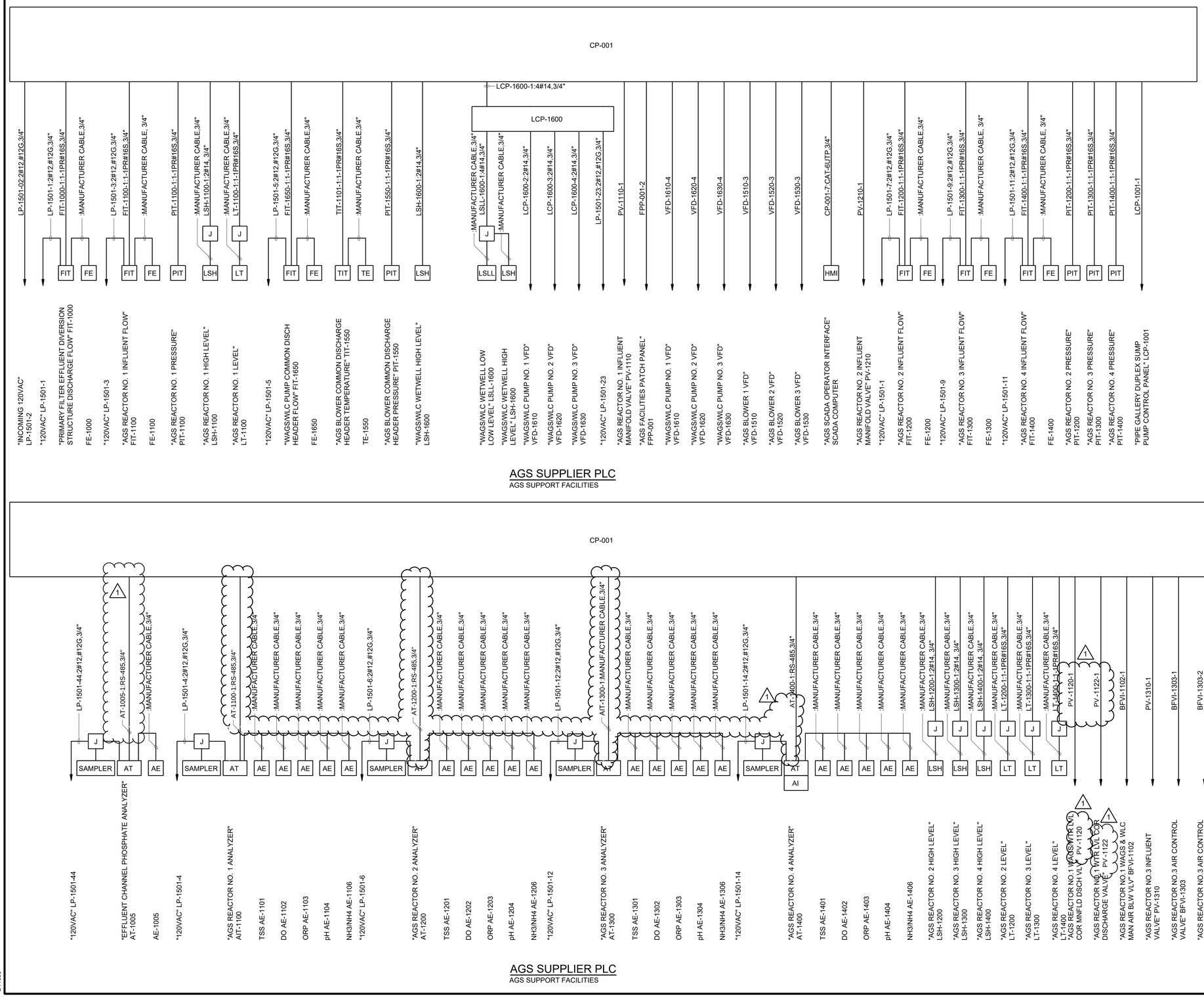

GENERAL SHEET NOTES

1. SEE SPECIFICATION SECTION 23 09 11 FOR COMPLETE HVAC CONTROL SYSTEM CABLES, INTERCONNECTIONS, AND REQUIREMENTS.
2. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

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DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

AGS PLC ONE-LINE DIAGRAM

02-E-705

PLOTTED: 12/16/2022 11:34 AM FILE: C:\pw_working\bvw_americas\d1495380\02-E-705.dwg

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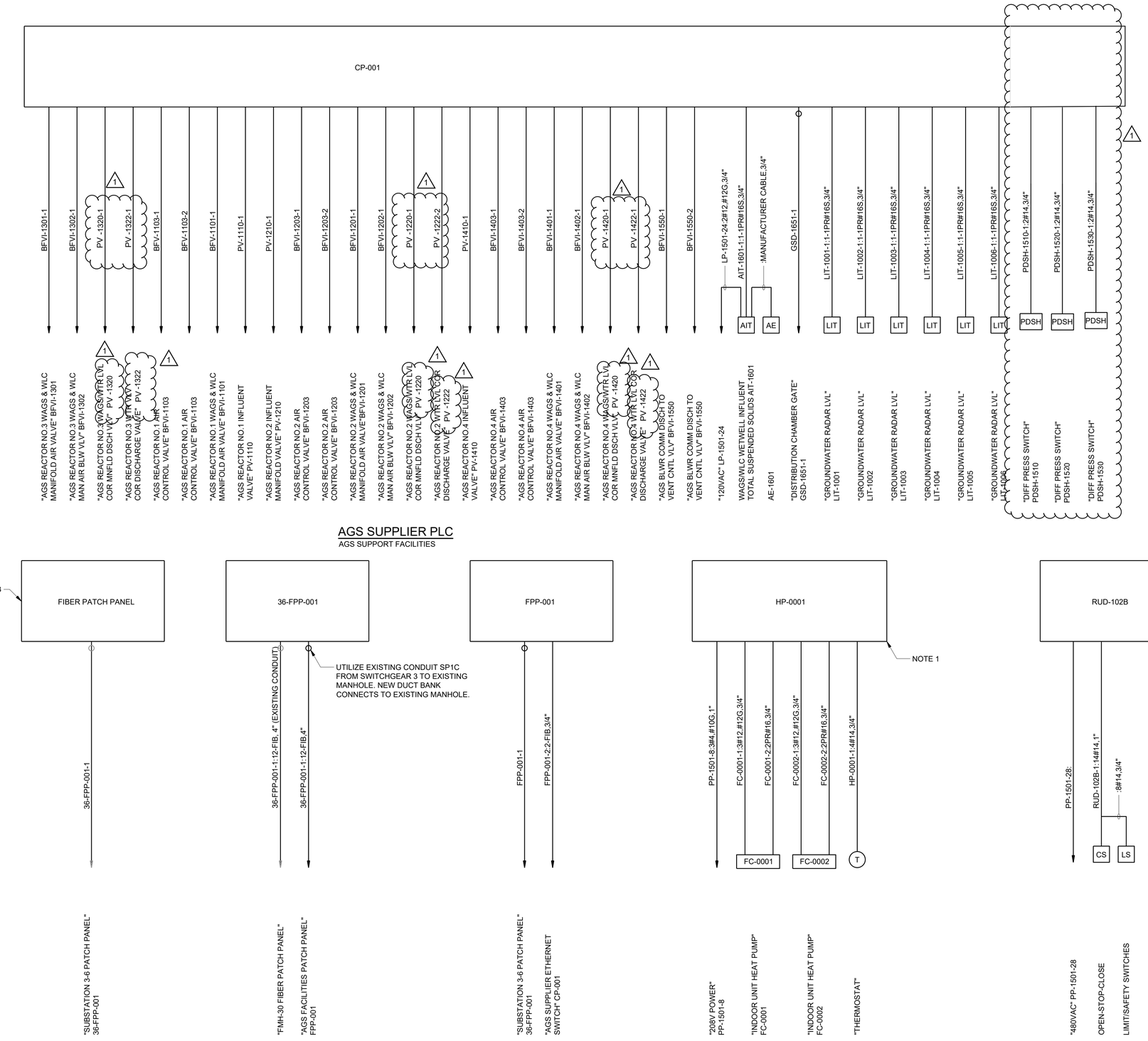

AGS SUPPLIER PLC
AGS SUPPORT FACILITIES

FMH-30 FIBER PATCH PANEL
FIBER MANHOLE 30

SUBSTATION 3-6 FIBER PATCH PANEL
SUBSTATION 3-6

AGS FACILITIES FIBER PATCH PANEL
AGS SUPPORT FACILITIES

AGS HEAT PUMP
AGS SUPPORT FACILITIES

ROLL-UP DOOR CONTROLLER
AGS SUPPORT FACILITIES

GENERAL SHEET NOTES

1. SEE SPECIFICATION SECTION 23 09 11 FOR COMPLETE HVAC CONTROL SYSTEM CABLES, INTERCONNECTIONS, AND REQUIREMENTS.
2. ALL TAGS ARE PREFACED BY "02" UNLESS OTHERWISE SHOWN.
3. FIBER PATCH PANEL IN "FIBER MANHOLE 30", FURNISHED AND INSTALLED BY OTHERS.

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AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

DESIGNED:	EJB
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CHECKED:	SDS
APPROVED:	EJB
DATE:	12/20/2022
PROJECT NO.:	411752

AGS SUPPORT FACILITIES

ELECTRICAL

AGS PLC ONE-LINE DIAGRAMS

02-E-706

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

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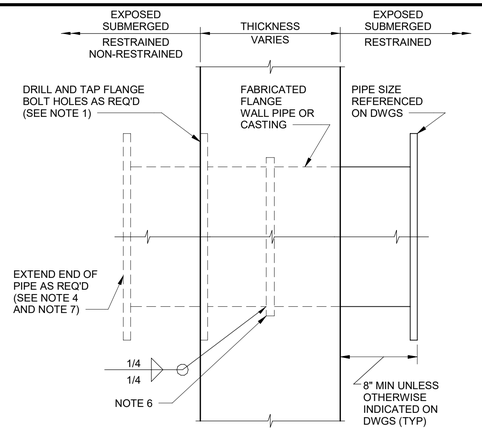
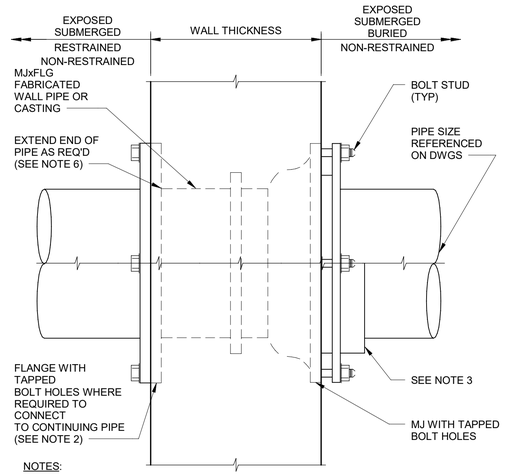


NOTES:

1. WALL PIPE MATERIAL SHALL BE DUCTILE IRON, STEEL OR AS INDICATED ON THE DRAWINGS. STEEL PIPE SHALL BE SCHEDULE 40 FOR PIPE 20 INCHES AND SMALLER, 3/8" FOR PIPE LARGER THAN 20", AND COATINGS SAME AS CONNECTING PIPE.
2. IF CONNECTING STEEL PIPE THICKNESS IS GREATER THAN 3/8", STEEL WALL PIPE THICKNESS SHALL BE INCREASED TO MATCH CONNECTING PIPE.
3. ANNULAR COLLAR SHALL BE SAME MATERIAL AS PIPE, 1/4" X 2" FOR PIPE 20" AND SMALLER, AND 3/8" X 3" FOR PIPE LARGER THAN 20".
4. WALL PIPE MAY BE FLUSH WITH FACE OF WALL OR EXTENDED WITH END AS REQUIRED OR INDICATED ON DRAWINGS.
5. WALL PIPE SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.
6. FOR AIR PIPE WALL ANCHORS (SUPPORT DESIGNATION PS-16 (A)), WELD A SINGLE FLANGE BETWEEN PROCESS PIPE. FLANGE MATERIAL AND SIZE SHALL MATCH PROCESS PIPE.
7. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE FLGxPE WALL PIPE.

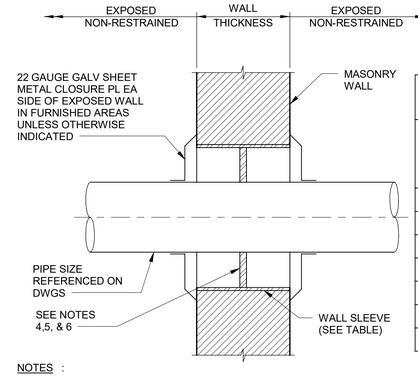
A FLANGED WALL PIPE
NO SCALE



NOTES:

1. WALL PIPE SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.
2. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE MJxPE WALL PIPE.
3. FOR STEEL PIPE APPLICATIONS BUILD UP END OF STEEL PIPE TO FIT MJ WALL PIPE.
4. FOR BURIED PIPING, CONTRACTOR SHALL PROVIDE AN ADDITIONAL FIELD JOINT AS CLOSE AS PRACTICAL TO FACE OF WALL, BUT NO MORE THAN 5 FEET.
5. USE WAX TAPE TO PROTECT ALL BURIED FERROUS SURFACES, INCLUDING PAINTED SURFACES. FOR PROTECTION OF ADJACENT PIPE BARREL SURFACES, SHRINK WRAP MAY BE USED IN LIEU OF WAX TAPE. SEE SPECIFICATIONS.
6 . WALL PIPE FLANGE MAY BE FLUSH WITH FACE OF WALL OR EXTENDED WITH END AS REQUIRED OR INDICATED ON DRAWINGS.

B FLANGED - MECHANICAL JOINT WALL PIPE
NO SCALE

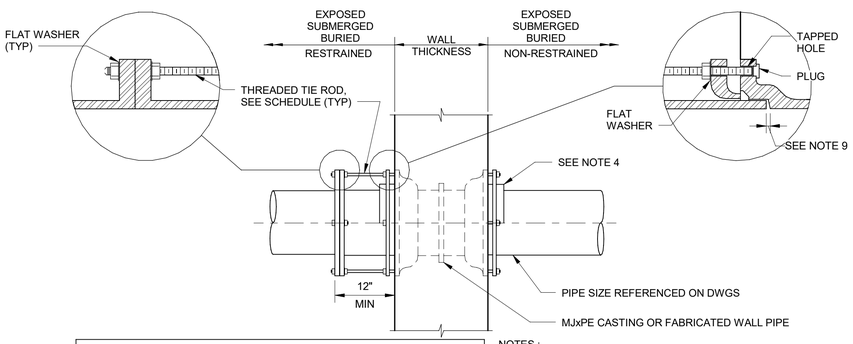


WALL SLEEVE TABLE	
PIPE SIZE	SLEEVE SIZE UNLESS OTHERWISE INDICATED (SEE NOTES 3 & 4)
1"& SMALLER	3"
1 1/4"&1 1/2"	3 1/2"
2" & 2 1/2"	4"
3"	6"
4"	6"
6"	8"
8"& LARGER	PIPE OD+2"±

NOTES :

1. SCHEDULE 40 GALV STEEL PIPE FOR PIPING SMALLER THAN 3", SCHEDULE 20 GALV STEEL PIPE FOR PIPING SMALLER THAN 6", AND GALV 1/4" MINIMUM WALL THICKNESS FOR PIPING LARGER THAN 6".
2. FOR PIPING LARGER THAN 3" PROVIDE PIPE SUPPORT WITHIN 3' OF WALL SLEEVE TO PREVENT THE TRANSFER OF PIPE LOADS TO MASONRY WALL WHEN MODULAR CASING SEALS ARE USED.
3. WHERE REQUIRED, USE SLEEVE LARGE ENOUGH FOR FLANGE OR OTHER JOINT RESTRAINT TO PASS THROUGH.
4. FOR PIPE SIZES 1 1/2" IN DIAMETER AND SMALLER, CAULK ANNULAR SPACE AROUND PIPE. FOR PIPE LARGER THAN 1 1/2" IN DIAMETER, USE MODULAR CASING SEALS AND COORDINATE SLEEVE SIZE WITH CASING SEAL MANUFACTURER.
5. PROVIDE MODULAR CASING SEALS ON ALL SLEEVES AT CHLORINE AND AMMONIA FEED AND STORAGE ROOMS AND WHERE INDICATED ON THE DRAWINGS. COORDINATE SLEEVE SIZE WITH CASING SEAL MANUFACTURER.
6. FIRESAFING TO BE PROVIDED AT ALL RATED WALLS INDICATED ON THE DRAWINGS AND INSTALLED PER ACCEPTED UL RATED SYSTEMS.

C MASONRY WALL SLEEVE
NO SCALE



TIE ROD SCHEDULE			
NOMINAL PIPE SIZE (INCHES)	MAX PRESSURE (PSI) (NOTE 1)	TIE BOLTS	
		NO. OF RODS (NOTE 2)	DIA OF RODS (INCHES)
6	250 OR LESS	2	3/4
8	150 OR LESS	2	3/4
10	200 OR LESS 350	2 6	3/4
12	150 OR LESS 300	2 4	3/4
14	100 OR LESS 200	2 4	3/4
16	75 OR LESS 150	2 4	3/4
18	75 OR LESS 150	2 4	3/4
20	50 OR LESS	2	3/4
24	75	4	3/4
30	50 OR LESS	4	1
36	50 OR LESS 100	4 8	1
42	50 OR LESS	4	1 1/4

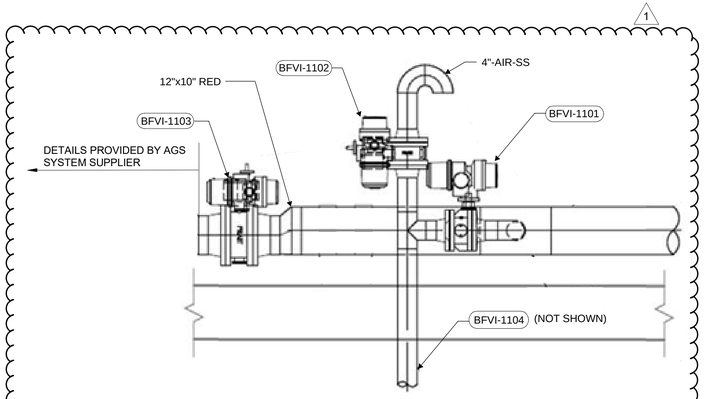
NOTES :

1. PRESSURE SHALL BE THE PRESSURE AT WHICH THE PIPE IS HYDROSTATICALLY TESTED, OR IF THERE IS NO HYDROSTATIC FIELD TEST, IT SHALL BE THE SPECIFIED SHOP TEST PRESSURE.
2. UNLESS OTHERWISE INDICATED, TIE RODS SHALL BE SPACED UNIFORMLY AROUND THE PIPE, BEGINNING WITH THE FIRST TWO AT THE HORIZONTAL CENTERLINE OF THE PIPE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON WALL PIPE. ALL BOLT HOLES IN WALL PIPE SHALL BE TAPPED. WALL PIPES SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.

   FOR STEEL PIPE APPLICATIONS, BUILD UP END OF STEEL PIPE TO FIT MJ WALL PIPE.
4. FOR BURIED PIPING, CONTRACTOR SHALL PROVIDE AN ADDITIONAL FIELD JOINT AS CLOSE AS PRACTICAL TO FACE OF WALL, BUT NO MORE THAN 5 FEET.
5. USE WAX TAPE TO PROTECT ALL BURIED FERROUS SURFACES, INCLUDING PAINTED SURFACES. FOR PROTECTION OF ADJACENT PIPE BARREL SURFACES, SHRINK WRAP MAY BE USED IN LIEU OF WAX TAPE. SEE SPECIFICATIONS.
6. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE MJxPE WALL PIPE.
7. FOR PIPING FLEXIBILITY, PROVIDE GAP LARGE ENOUGH TO FACILITATE PIPE ASSEMBLY AND DISASSEMBLY AT ASSOCIATED FLANGE PIPE JOINTS.
8. FOR PENETRATION AT EXISTING WALL, REFER TO EXISTING WALL PENETRATION DETAIL.

D MECHANICAL JOINT WALL PIPE WITH TIE RODS
NO SCALE

1



NOTES :

1. PIPE AND PIPE SUPPORTS FOR 4" AIR MANIFOLD SHALL BE PROVIDED BY CONTRACTOR.
2. PIPE SUPPORTS FOR 12"-AIR-SS NOT SHOWN. SEE DRAWING 01-M-301.

E AIR VALVE MANIFOLD
NO SCALE

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Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

DESIGNED:	JL
DETAILED:	KDG
CHECKED:	AM/JH
APPROVED:	MR
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

PROCESS MECHANICAL

MECHANICAL DETAILS
1 OF 4

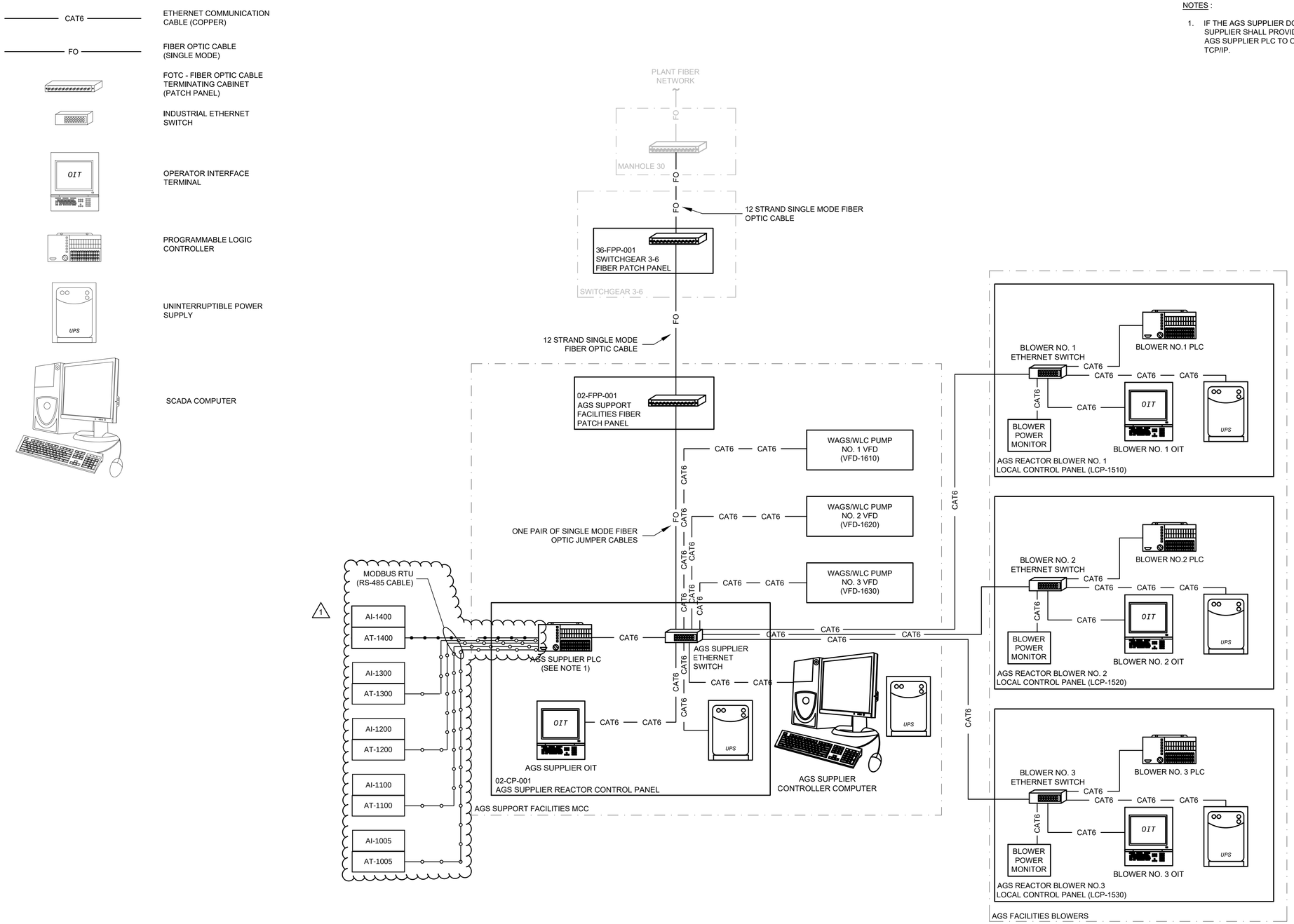
99-M-501

PLOTTED: 12/16/2022 11:54:32 AM
FILE: BIM 360://409469 - Aerobic Granular Sludge Phase 1/409469 - AGS.rvt
D11000

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

NOTES :

1. IF THE AGS SUPPLIER DOES NOT PROVIDE AN EMERSON AUTOMATION PLC, AGS SUPPLIER SHALL PROVIDE A PLC MODULE OR PROTOCOL CONVERTER TO ALLOW THE AGS SUPPLIER PLC TO COMMUNICATE WITH PLANT CONTROL SYSTEM VIA MODBUS TCP/IP.



BLACK & VEATCH

Black & Veatch Corporation
Chicago, Illinois
ILLINOIS PROFESSIONAL
DESIGN FIRM - 184.002143 -0006

Four Rivers Sanitation Authority

AEROBIC GRANULAR SLUDGE - PHASE 1

1	2/7/23	ADDENDUM NO. 3

REVISIONS AND RECORD OF ISSUE

DESIGNED:	MJP
DETAILED:	DHH
CHECKED:	SAY
APPROVED:	MJP
DATE:	12/20/2022
PROJECT NO.:	411752

DETAILS

INSTRUMENTATION

CONTROL SYSTEM BLOCK DIAGRAM

99-I-601

(SCALE BAR IS 4" AT FULL SCALE) 0 1/2 1 2 3 4

PLOTTED: 12/16/2022 1:44:47 PM
FILE: C:\USERS\HO106334\APPDATA\LOCAL\AUTODESK\AUTOCAD PLANT 3D\COLLABORATION\CACHE\411752\PID DWG\99-I-601.DWG
ED1000
ED1005