GMC

ADDENDUM NO. 3

PROJECT: **GROVE CREEK WPCP**
FOR CITY OF COMMERCE
GMC PROJECT NO. CATL230033

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1. Introduction

1.1 The content included in this addendum is hereby added to the referenced Project Manual and Plans and shall be duly considered when preparing bids.

2. General Information

2.1 **Sealed bid proposals will be received** by City of Commerce; at their offices at **27 Sycamore Street, Commerce, GA 30529** until **2:00 PM, EDT, Thursday, 15 May, 2025.**

2.2 **Additional questions** will be accepted via email at graham.sizemore@gmcnetwork.com until **Wednesday, 7 May, 2025**.

2.3 **Project substantial completion** to be extended to **2 years and ten (10) days (730 calendar days)** with 60 days until **final completion (790 calendar days)**. **Approximately $31,000,000.00 must be spent by October 31st 2026**, including stored materials and all other project related expenses.

3. Clarifications

3.1 ***EQ Basin Effluent Valve***
V2103 shown in valve schedule and I-Series sheets to be located adjacent to roadway on 24" line just upstream of bypass tee adjacent to proposed roadway with valve box.

3.2 ***UV Top of Slab Elevation***
The top of slab elevation for UV shall be 794.50'.

3.3 ***Influent Screens and Grit Removal; Blowers***
The current Basis of Design Screens (ClenTek) and grit (John Meunier) have indicated issues with meeting BABAA requirements of 55% of product cost being domestically sourced. Blower manufacturers have also indicated issues meeting BABAA. Contractor shall plan to follow one of the options listed below to remain in compliance with BABAA:

1. Plan for cost associated with the above mentioned Basis of Design equipment and remain within compliance on BABA (De Minimis Waiver – less than 5% of total project cost for any non-domestic products cumulatively) for the project; OR
2. Use alternative manufacturer. Suggested manufacturers based on similar products include JWC, Parkson, Vulcan, or Duperon for fine screens and Smith & Loveless or Huber for grit removal. Equipment not listed as Basis of Design proposed for BABAA compliance subject to Specification Section 01 60 00 part 1.9.

4. Revisions to Drawings

4.1 Drawing sheet G-006, delete the Parshall flume after grit system in the flow diagram.
4.2 Drawing sheet C-102, delineate 150-ft buffer to property line.
4.3 Drawing sheet [C-203-204]: grading revisions/clarification
4.4 Drawing sheet [C-603-604]: erosion control revisions/clarification
4.5 Drawing sheet [C-904-905]: proposed grading revisions/clarification
4.6 Add fire protection sheets FA100, FA101, and FA200
4.7 Drawing sheet [D-921-922]: valve schedule revisions
4.8 Drawing sheet [E-010, E-014, E-016, E-017, E-601-603]: change to UV power feed plan
4.9 Add outfall sign, cleanout, backflow preventer and box, single cantilevered electric sliding gate, valve box, fire flow meter and NPW yard hydrant details in Civil Series (will be added within conformed set – see this document [contractor questions, clarifications] for details)

5. Revisions to Project Manual

5.1 Section 08 71 00 – Door Hardware: Delete this section and replace with new Section 08 71 00 – Door Hardware.

5.2 Section 40 90 00 - Instrumentation and Control for Process Systems, 1.01.D.2.:

System Integrator qualifications:

The following system integrator is pre-qualified to perform the control system work described in Division 40:

1. Global Integrated Group, LLC, Atlanta, GA 30329

Please note that Global Integrated Group is the only pre-qualified system integrator.

5.3 Section 43 53 54 – Blowers: Delete this section and replace with new Section 43 53 54 – Blowers.

5.4 Section 46 43 21 - Circular Clarifier Equipment: Delete this section and replace with new Section 46 43 21 - Circular Clarifier Equipment.

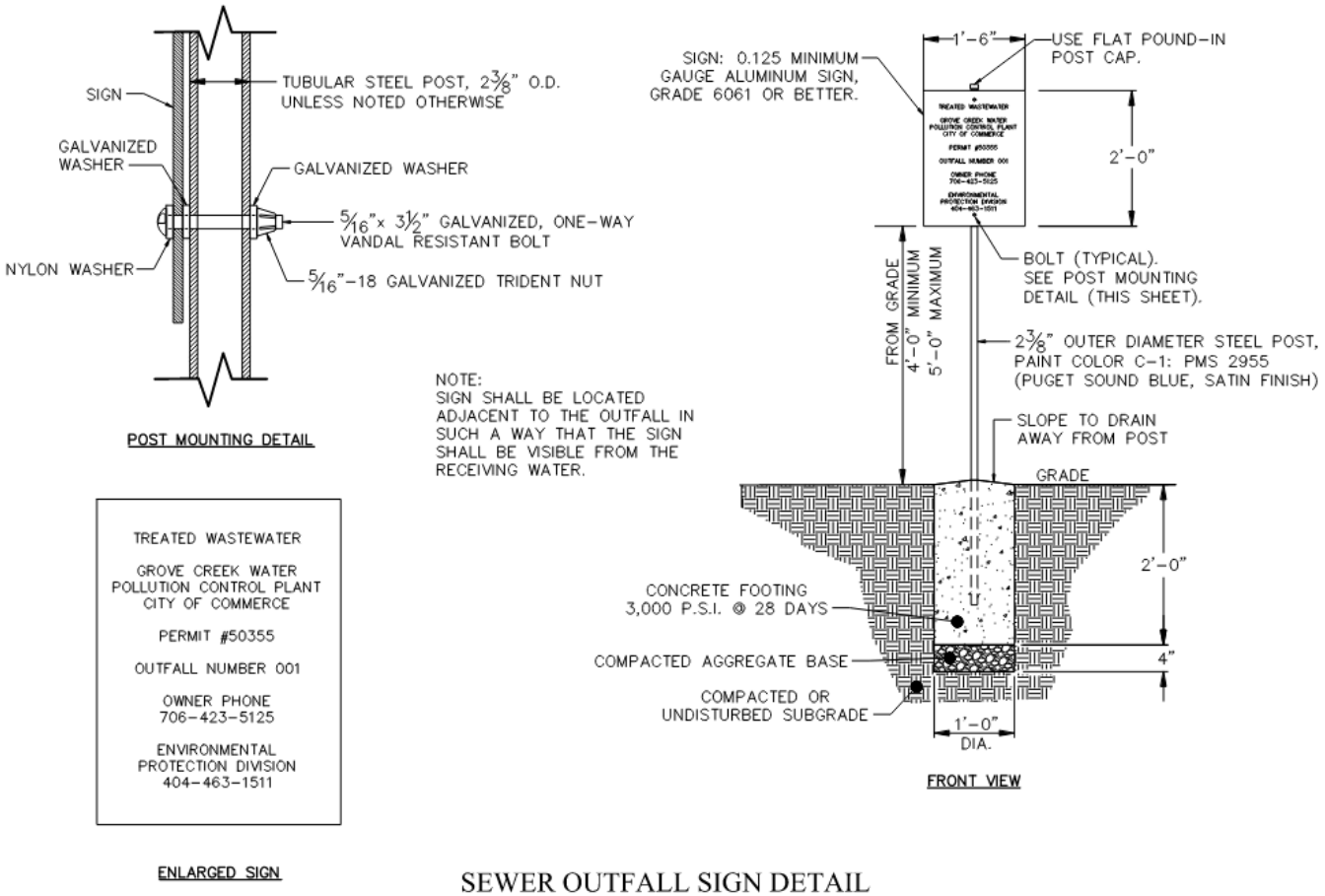
5.5 Section 46 73 22 Decanter Assembly: Delete this section and replace with new Section 46 73 22 Decanter Assembly.

6. Contractor Questions

Answers to contractor questions are provided below with as much detail as reasonable in the time allowed. Necessary clarifications and additional questions can be submitted for incorporation into a subsequent addendum. All questions and answers are formatted as follows:

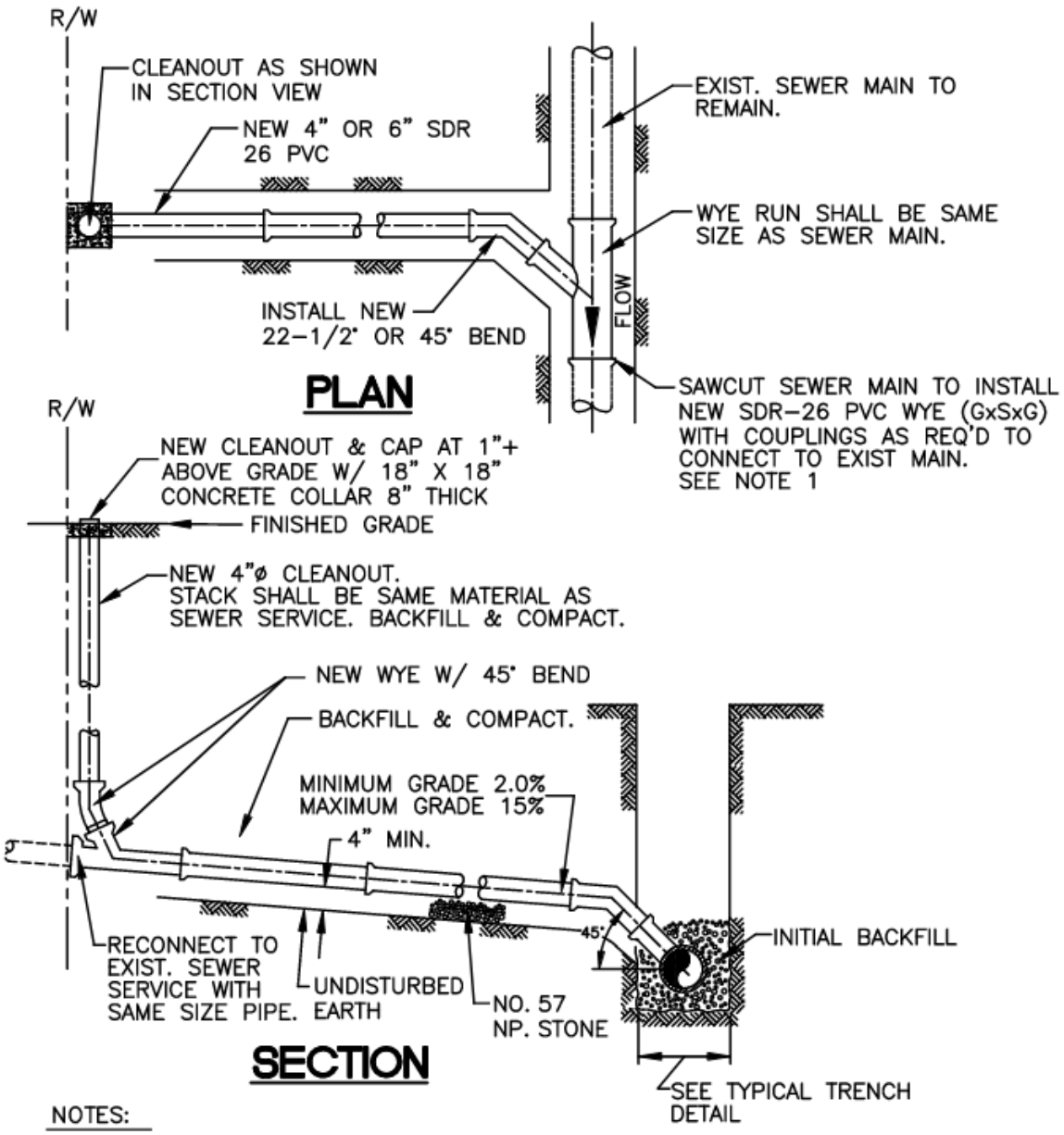
[Contractor question]
[GMC answer]

6.1 Please provide outfall sign detail.



SEWER OUTFALL SIGN DETAIL

6.2 Please provide cleanout detail.



NOTES:

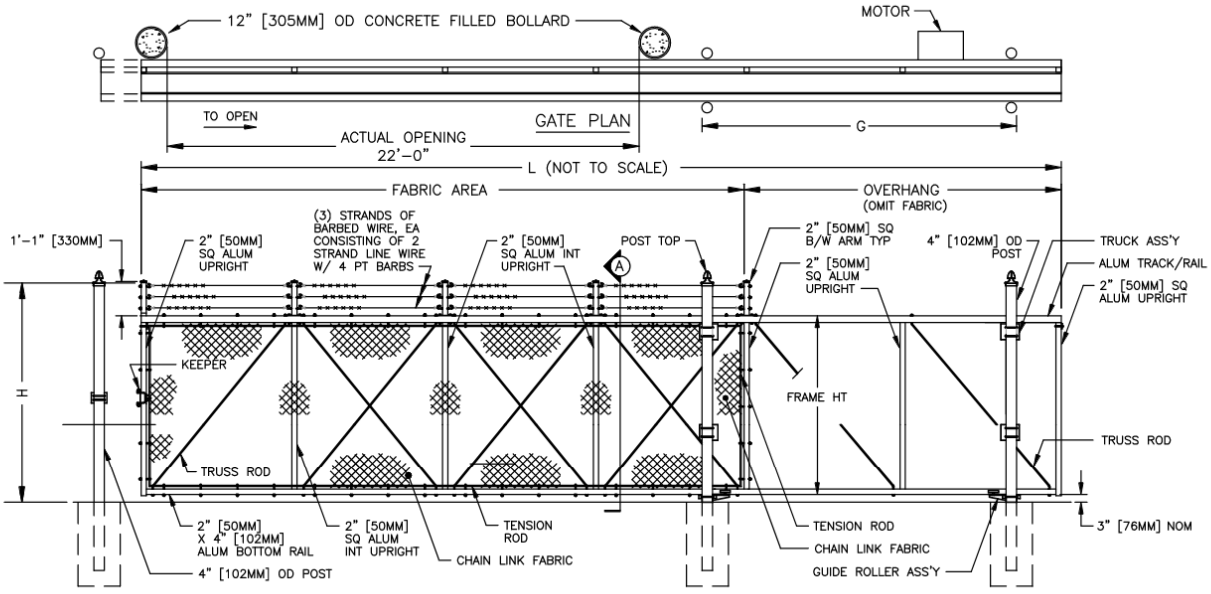
1. ALL NEW SEWER MAIN, LATERAL WYE's AND SERVICE PIPE SHALL BE SDR 26 PVC UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

2. CONSTRUCTION/REPAIR OF THE SEWER MAIN, LATERAL & CLEANOUT SHALL BE INSTALLED APPROXIMATELY JUST INSIDE R/W LINE.

TYPICAL SEWER SERVICE LATERAL W/NEW MAIN WYE AND CLEANOUT

N.T.S.

6.3 **Please provide single cantilevered electric sliding gate detail for the front entrance.**



GATE ELEVATION – (4) BAYS SHOWN

N.T.S.

NOM HEIGHT (H)
7'-0" [2134MM] (6'+1')
8'-0" [2438MM] (7'+1')
9'-0" [2743MM] (8'+1')

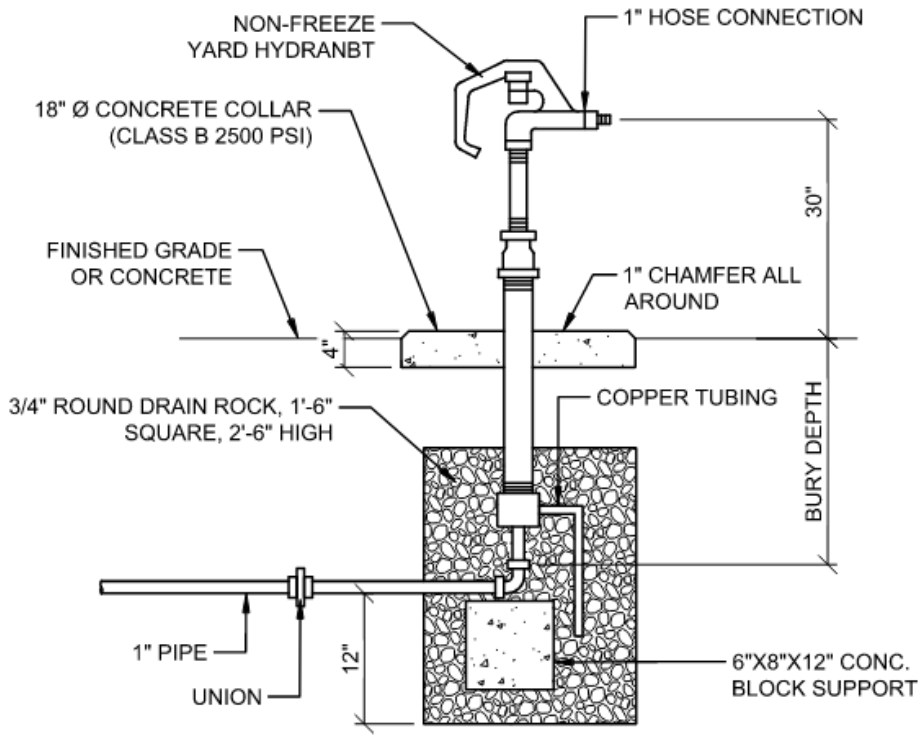
ACTUAL OPENING
19'-0" [5791MM] THROUGH 26'-0" [7925MM]

NOTES:
1. METRIC DIMENSIONS ARE NOMINAL EQUIVALENTS TO U.S. DIMENSIONS.
2. FOOTING WIDTH TO BE (4)X POST WIDTH. MIN DEPTH TO BE 36".
3. CALL BOX NOT SHOWN FOR CLARITY AND SHALL BE FIELD LOCATED. PROVIDE CONCRETE PEDESTAL (12" x 12" x 12") W/#4 REBAR @ 4" O.C., FOR REINFORCEMENT.
4. FURNISH AND INSTALL AN INTEGRATED GATE ACCESS CONTROL SYSTEM INCLUDING:
   A. GATE ENTRY CONTROL BOX COMPLETE WITH KEYPAD, SPEAKER, PUSH TO CALL BUTTON, KNOX FIRE/MED/EMERGENCY KEY.
   B. CONSTRUCTION OF CONTROL PANEL SHALL BE 316 SSTL.
   C. ENTER AND EXIT SAFETY LOOP.
   D. PROVIDE RECEIVER IN ADMIN. BLDG. OPERATIONS CENTER.

SINGLE CANTILEVERED ELECTRIC SLIDING GATE W/ROUND OR SQUARE POSTS

N.T.S.

6.4 **Please provide NPW yard hydrant details.**

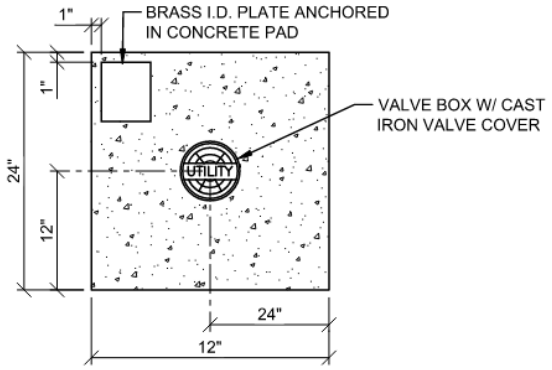


B
C-911

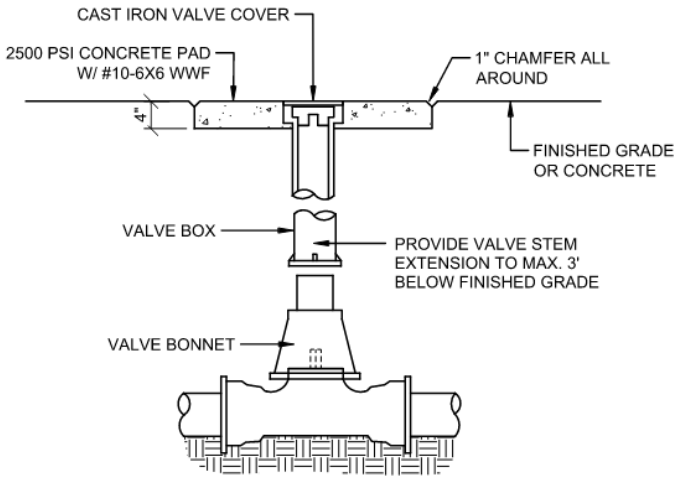
FROST PROOF YARD HYDRANT

SCALE: NOT TO SCALE

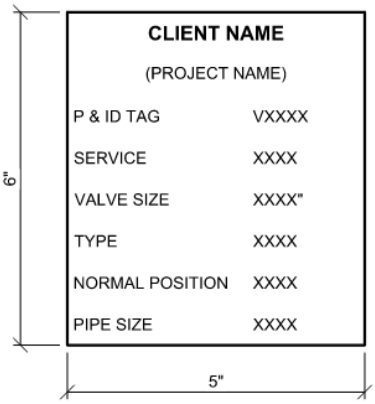
6.5 **Please provide valve box details.**



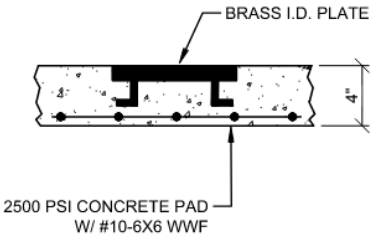
PLAN



ELEVATION



BRASS I.D. PLATE DETAILS



BRASS I.D. PLATE SECTION

C-911 **VALVE AND VALVE BOX**

SCALE: NOT TO SCALE

6.6 **CU-317 indicates 36" welded steel casing in open trench in plan view and 36" welded steel casing by jack and bore in profile. Please clarify which is required.**
Jack and Bore

6.7 **Can a copy of GDOT permit that Contractor is to comply with at Hwy 441 on CU-319 be provided so bidders know what GDOT's requirements there are and what needs to be included with our bids?**
Currently awaiting approval of GDOT Permit. Contractor will be notified of Permit Approval and will need to pick up Permit from local GDOT Area Inspector.

6.8 **Are bidders required to remove the tanks near STA 68+00 inside LOD on CU-320?**
Contractor to Demo and Remove abandoned Tank and Pump House and coordinate with Property Owner.

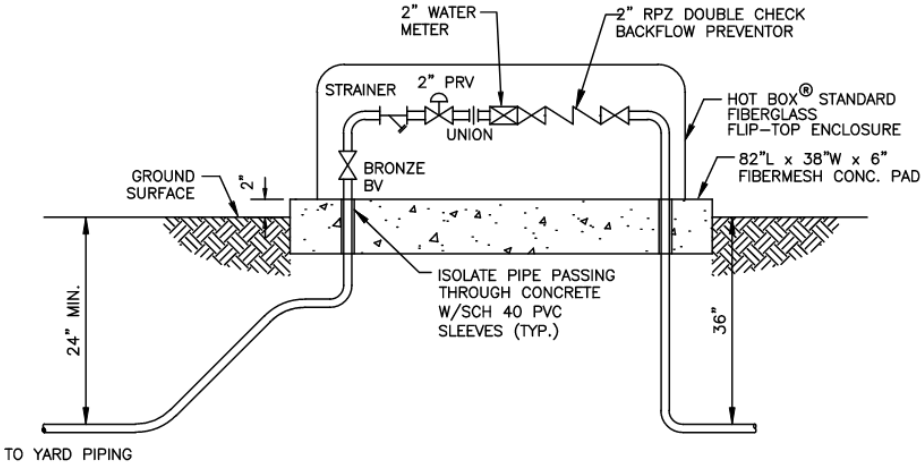
6.9 **Are there any permits that are required to be obtained that aren't already acquired by the City for this bid?**
Land disturbance permits and GDOT Permit have yet to be approved; however, these are anticipated to be acquired and furnished to selected contractor prior to NTP.

6.10 **In Division II, are there any domestic requirements?**
Yes, BABAA is a requirement.

6.11 **In Division II, any special coatings/linings required on the DIP and fittings? Such as P-401 or ZINC?**
See answer in Addendum 1.

6.12 **The Filter Effluent Line is shown as 18" on D-501, but on C-303 and at the UV area it's 16"? Should it be 16" from the Filters?**
It shall be 18 inch, revise the Yard Piping plan. Add an 18"X16" MJ decreaser before the 16" Tee on the UV plan before the UVs. Pipe shall be 18" until this point.

6.13 **Backflow preventer and box shown on sheet C-301, can you provide details?**

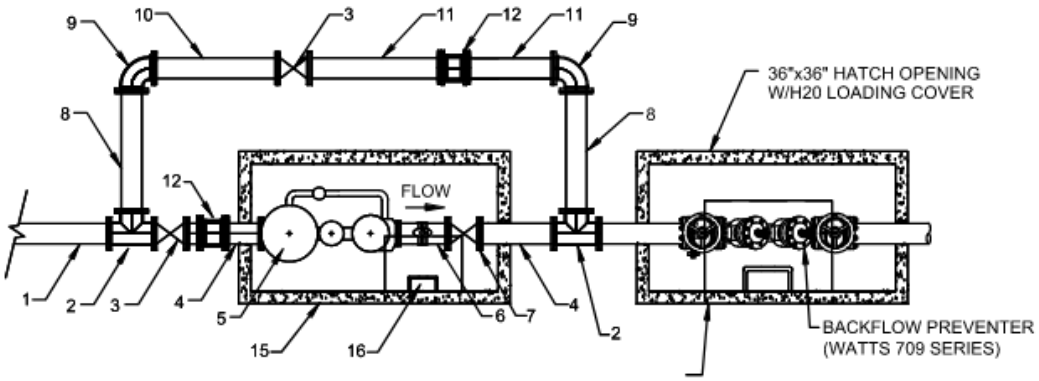


HOTBOX AND PIPING DIAGRAM

N.T.S.

6.14 **Can Generac be added to the approved generator manufacturers?**
No.

6.15 **Specification Section 03 30 00 requires the Contractor to provide all water for wet testing. We are requesting that the Owner provide the water to the Contractor at no cost.**
Agree. The Owner will provide the water to the Contractor at no cost for wet testing via water line within the scope of work. Water line must be complete/in the vicinity of the structures tested at the time testing is to occur. Contractor shall provide temporary provisions for filling structures with water from this line. Contractor shall install fire flow meter per detail below at plant entrance on potable water line. Provide 8" x 6" MJ restrained reducer/increasers just upstream and downstream of meter.



METER INSTALLATION				
ITEM NO.	NOM. SIZE (INCHES)	DESCRIPTION	QTY.	ENDS
1	6	PIPE	2	MJ,MJ
2	6	TEE	2	MJ,MJ,MJ
3	6	GATE VALVE, STD. OPER. NUT, VALVE BOX	2	MJ,MJ
4	6	PIPE, W/MEGAFLANGE (EBAA #2100)	2	FL,PE
5	6	WATER METER (SENSUS OMNI T2 W/STRAINER, ¾" BYPASS & INVENSYS RADIO READ LOW FLOW METER)	1	FL,FL
6	6	PIPE, W/¾" TAP & GATE VALVE (CRANE BRONZE)	1	FL,FL
7	6	GATE VALVE, OUTSIDE YOLK AND STEM	1	FL,FL
8	6	PIPE	2	PE,PE
9	6	90° BEND	2	MJ,MJ
10	6	PIPE, W/MEGAFLANGE (EBAA #2100)	1	FL,PE
11	6	PIPE, FIELD CUT	2	PE
12	6	SLEEVE	2	MJ
13	6	PIPE	1	PE
14	6	PIPE	1	RJPE
15	PRECAST CONC. VAULT, 6'W X 8'L X 6'H (I.D.), HS 20 RATED, TINDALL UV SERIES OR EQUAL			
16	ALUMINUM HATCH, HALLIDAY #S1R3042 (30"X42"), OR EQUAL, TOP ELEV. OF SLAB SET 3" ABOVE GRADE			

NOTES:
1. ALL FITTINGS INSIDE VAULTS TO BE FLANGED.
2. VAULT SHALL SIT ON MIN. 12" OF #57 STONE.
3. METER AND BACKFLOW ARE TO BE ANCHORED TO CONCRETE PIERS.

WATER METER DETAILS
N.T.S.

6.16 **Please clarify if the excavation is classified or unclassified. The specifications list both.**

All excavation shall be “unclassified” unless it can be classified as “rock” excavation as specified in Section 31 23 16.26 of these specifications.

6.17 **Specification Section 31 23 16.13 states the contractor shall retain and pay for compaction testing of the trench backfill. All other compaction testing on the project is paid for by the Owner. Please revise to be paid as part of the testing allowance.**
Agree. Compaction testing of the trench backfill will be paid as part of the testing allowance.

6.18 **Can GlascoUV be added to the approved UV manufacturers?**
Glasco will be considered for Or-Equal status based on current specification and drawings. Bids including Glasco shall take into account any additional cost incurred by the contractor associated with changes to the plans and/or specifications to accommodate Glasco. Headloss is firm and must match the specification.

6.19 **Will walkways on the Orbal aeration basin come with the equipment? They are not detailed in any way.**
Yes, equipment manufacturer will provide aluminum walkways on the Orbal aeration basin.

6.20 **The clarifier spec calls for a 5-year warranty, while normal standard is 1-year. Which one shall we use?**
Use 1 year (12 months) warranty for clarifier. The Manufacturer and Contractor shall furnish a warranty extending twelve (12) months after substantial completion date.

6.21 **Will the local clarifier control panels be included in clarifier manufacturer’s scope?**
Yes, see updated specification.

6.22 **The support beams for the monorail at the Orbal basin are shown to be stainless steel. Those sizes are unavailable and will have to be welded together out of stock stainless steel. We recommend you change them to galvanized carbon steel which is very standard for this type of application.**
Agree. Galvanized carbon steel can be used for the support beams for the monorail at the Orbal basin, high performance coating shall be applied on the surface of carbon steel.

6.23 **Can you please confirm if Subcontractors Affidavits are due with the Bid Submittal or post award by the lowest bidder?**
Subcontractors Affidavits are due post award by the lowest bidder.

6.24 **Article 5.01 of Qualification Statement asks the Contractor to provide their most recent financial statement. This information is confidential and cannot be provided with the Bid Submittal. Can this be submitted post award, by the lowest bidder, and to a direct contact with the Owner/Engineer?**
Contractor's most recent financial statement can be submitted post bid (not post award), by the lowest bidder.

6.25 **Article 4.02 of Qualification Statement asks the Contractor to provide the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Due to the nature of "last minute bids" and the complexity of the Bid Form, can this information be provided within 24 hours post Bid Submittal?**
Yes, this information be provided within 24 hours post Bid Submittal.

6.26 **Can Warminster Fiberglass be added to the approved FRP building manufacturers?**
Yes.

6.27 **Please provide the spread footing schedule for the Administration & Lab Bldg.**
See table shown below.

SPREAD FOOTING SCHEDULE		
MARK	SIZE	REINF. EA. WAY
SF-2	2'-0"x2'-0"x1'-0"	3-#4
SF-2.5	2'-6"x2'-6"x1'-0"	3-#5
SF-3	3'-0"x3'-0"x1'-0"	3-#5
SF-3.5	3'-6"x3'-6"x1'-0"	4-#5
SF-4	4'-0"x4'-0"x1'-0"	4-#5
SF-4.5	4'-6"x4'-6"x1'-2"	5-#6
SF-5	5'-0"x5'-0"x1'-2"	5-#6
SF-5.5	5'-6"x5'-6"x1'-2"	6-#6
SF-6	6'-0"x6'-0"x1'-2"	6-#6
SF-6.5	6'-6"x6'-6"x1'-4"	7-#6
SF-7	7'-0"x7'-0"x1'-4"	7-#7
SF-7.5	7'-6"x7'-6"x1-4"	7-#7
SF-8	8'-0"x8'-0"x1'-4"	8-#7
SF-8.5	8'-6"x8'-6"x1'-4"	8-#7
SF-9	9'-0"x9'-0"x1'-6"	9-#8
SF-9.5	9'-6"x9'-6"x1'-6"	9-#8
SF-10	10'-0"x10'-0"x1'-6"	10-#8
SF-10.5	10'-6"x10'-6"x1'-6"	10-#8
SF-11	11'-0"x11'-0"x1'-8"	11-#8
SF-11.5	11'-6"x11'-6"x1'-8"	11-#8
SF-12	12'-0"x12'-0"x2'-0"	12-#8

SPREAD FOOTING NOTES:

1. NOT ALL FOOTINGS ARE NECESSARILY USED
2. FOOTINGS HAVE BEEN SIZED FOR AN ASSUMED BEARING CAPACITY AS LISTED IN THE GENERAL NOTES OF THIS DOCUMENT. SEE GENERAL NOTES FOR ALL DESIGN REQUIREMENTS AND ASSUMPTIONS

6.28 **The directional drill subcontractor will require a minimum 50' wide pad/mat inside of a wider easement and is not constructable if confined to a 40' wide easement. Can 60' minimum easement be provided to construct this directional drill called out for Div II Bid Item #14?**

Coordination of area required for this work to be determined with selected contractor. Additional easement area to be provided as required.

6.29 **Spec section 40 05 59 Aluminum Slide 2.2 E and F call out for seats and wedges, which are not included in the AWWA C562 requirements. Can UHMWPE seats be used in lieu of seats and wedges?**

Yes, as long as it meets or exceeds the leakage testing requirements per specification.

6.30 **SG1202 & 1205 are listed in the gate schedule, however, on the drawings they appear to be FUTURE gates, so we question whether they are to be included on the project or not.**
SG1202 & 1205 shall **not** be included in the scope of the project and are future.

6.31 **If Tindall's standard SC1012 (10' x 11.5' inside dimensions) would be considered an approved alternate to the 12' diameter wetwell shown on the drawings? Our SC1012 has the same volume as a 12' diameter. With ASTM C478 standards, a 12' diameter wetwell has to have 12" walls, making the structure total width 14'. Anything over 12' wide has to have front and back escorts to get to the jobsite. Since we ship regionally, we came up with a rectangular wetwell and use our standard over width trucking permits to get it to the jobsite. There are hundreds of these SC1012's throughout the state of Georgia acting as wetwells currently.**
Yes, Tindall's standard SC1012 can be used in lieu of 12' diameter wetwell.

6.32 **Section 46 23 23 - Item 2.16.C.1 : The Main Control Panel for the Grit Removal System is specified in NEMA12 enclosure. However, drawing E-113 seems to show it to be installed outside, requiring NEMA4X enclosure. Please confirm that NEMA4X enclosure is required for the Grit Removal System Control Panel (FCP1210) ?**
The Main Control Panel for the Grit Removal System shall be NEMA 4X. Sunshield on top and two sides.

6.33 **Will Dutchland precast construction be considered to the cast in place design for the concrete construction?**
Yes. Dutchland precast construction will be considered in lieu of the cast in place design for the concrete construction in the event that it can save time and/or cost at Contractor's discretion. Precast construction shall be considered for compliance subject to Specification Section 01 60 00 part 1.9.

6.34 **The reference 65' Rim-Flos from the 2003 Commerce project were designed with a 7.35 MGD peak mixed liquor flow which required the addition of overflow tubes in the influent launder to limit headloss at peak flows. The current project specs are calling for a 3.25 MGD peak mixed liquor flow which does not require overflow tubes based on typical headloss guidelines. I am intending to exclude the overflow tubes based on the specified peak flows. Can the Engineer confirm this or provide a new peak flow for us to consider in the design?**
Consider 7.35 MGD peak mixed liquor flow to match Northside design.

7. Acknowledgement of Receipt

7.1 Receipt of this addendum shall be acknowledged as follows:

1. On Page 4 of Bid Form of the Project Manual, note the addendum number and date of each addendum received and include this in the bid submittal.

AND

2. Email Goodwyn Mills Cawood, LLC. **immediately** at the **Atlanta, GA** office at kim.ross@gmcnetwork.com and confirm that addendum was received and is legible.

8. Conclusion

8.1 This is the end of Addendum No. 3, dated May 6, 2025.

FLOWS								
TREATMENT PROCESS / DESIGN FLOW	INFLUENT PUMP STATION	DRUM SCREENS	HEADCELL GRIT SYSTEM	INFLUENT PARSHALL FLUME	ORBAL AERATION BASINS	CLARIFIERS	TERTIARY FILTERS	UV DISINFECTION SYSTEM
MAX MONTHLY FLOW (MGD)	-	-	-	-	2.0	2.0	2.0	2.0
PEAK HOURLY FLOW (MGD)	-	-	-	-	-	-	3.28	3.28
INSTANT FLOW (MGD)	6.55	6.55	6.55	13.1	-	-		-

FLOW LINES

- NEW PRIMARY FLOW PATH
- NEW SECONDARY FLOW PATH
- FUTURE PRIMARY FLOW PATH
- FUTURE SECONDARY FLOW PATH

PROCESS FLOW DIAGRAM NOTES:

1. EQUIPMENT ARRANGEMENTS ARE BASED ON THE EQUIPMENT BASIS OF DESIGN IN THE SPECIFICATIONS. CHANGES TO THE LISTED BASIS OF DESIGN RESULTING IN DIFFERENCES OF THE SHOWN ARRANGEMENT SHALL BE THE CONTRACTORS RESPONSIBILITY. NO PAYMENT WILL BE ISSUED TO THE CONTRACTOR FOR MODIFICATIONS.
2. THE CONFIGURATION SHOWN ON THE PROCESS FLOW SCHEMATIC SHALL NOT BE USED FOR CONSTRUCTION BECAUSE THE LAYOUT IN THE PROCESS FLOW DIAGRAM IS NOT TO SCALE AND IS NOT REPRESENTATIVE OF THE ACTUAL FIELD LAYOUT.
3. DRAIN SYSTEM TO YDPS NOT SHOWN FOR CLARITY.

FUTURE RWW
FUTURE INFLUENT FLOW METER
HEADWORKS
RWW
INFLUENT FLOW METER (BYPASS NOT SHOWN - SEE I-SERIES)
PE
FROM SEWER COLLECTION SYSTEM
RWW
DRUM SCREEN
GRIT SYSTEM
BY-PASS
IP NO.1
IP NO.2
IP NO.3
BECK ROAD INFLUENT PUMP STATION
BIOLOGICAL TREATMENT SYSTEM INFLUENT FLOW CONTROL (BYPASS NOT SHOWN - SEE I-SERIES)
FUTURE BIOLOGICAL TREATMENT SYSTEM INFLUENT FLOW CONTROL
BY-PASS
PE
PE
ORBAL AERATION BASIN NO. 1
FUTURE ORBAL AERATION BASIN NO. 2
FUTURE RAS
EQ BASIN
PD
RAS
RAS
FUTURE RAS
FUTURE RAS
FUTURE RAS JUNCTION/SPLITTER BOX
SPLITTER BOX NO.1
FUTURE SPLITTER BOX NO.2
YDPS PUMP NO.1
YDPS PUMP NO.2
YARD DRAIN PUMP STATION
PE
CLARIFIER NO.1
CLARIFIER NO.2
FUTURE CLARIFIER NO.3
FUTURE CLARIFIER NO.4
SN
RAS
FUTURE RAS
RAS/WAS FLOW CONTROL
FUTURE RAS/WAS FLOW CONTROL
PSW
TO PLANT REUSE WATER
RAS
WAS
RAS/WAS PUMP STATION NO.1
FUTURE WAS
FUTURE RAS
FUTURE RAS/WAS PUMP STATION NO.2
RP NO.1
RP NO.2
REUSE PUMP STATION
FROM PLANT DRAIN NETWORK
WAS
FUTURE WAS
SE
FRE
TERTIARY FILTER NO.1
UV SYSTEM NO.1
EFF
TO GROVE CREEK
POST AERATION
PARSHALL FLUME
SE
FRE
TERTIARY FILTER NO.2
UV SYSTEM NO.2
FUTURE WAS INTERCONNECT
FUTURE WAS
SE
FRE
FUTURE TERTIARY FILTER NO.3
FUTURE UV SYSTEM NO.3
AEROBIC DIGESTER NO.1
FUTURE AEROBIC DIGESTER NO.2
FUTURE SN
SE
FRE
FUTURE TERTIARY FILTER NO.4
FUTURE UV SYSTEM NO.4
SN
FUTURE DS
FUTURE DS
BELT PRESS NO.1
FILTRATE TO PLANT DRAIN PS
DS
DS
FUTURE BELT PRESS NO.2
DRY SLUDGE TO LANDFILL
WAS

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — NO ALTERATION — CERTIFICATE OF AUTHORIZATION
GOODWYN MILLS CAWOOD, LLC
No. PEO007186
Exp.06.30.2026

1" 0" 5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
REV2	05.06.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

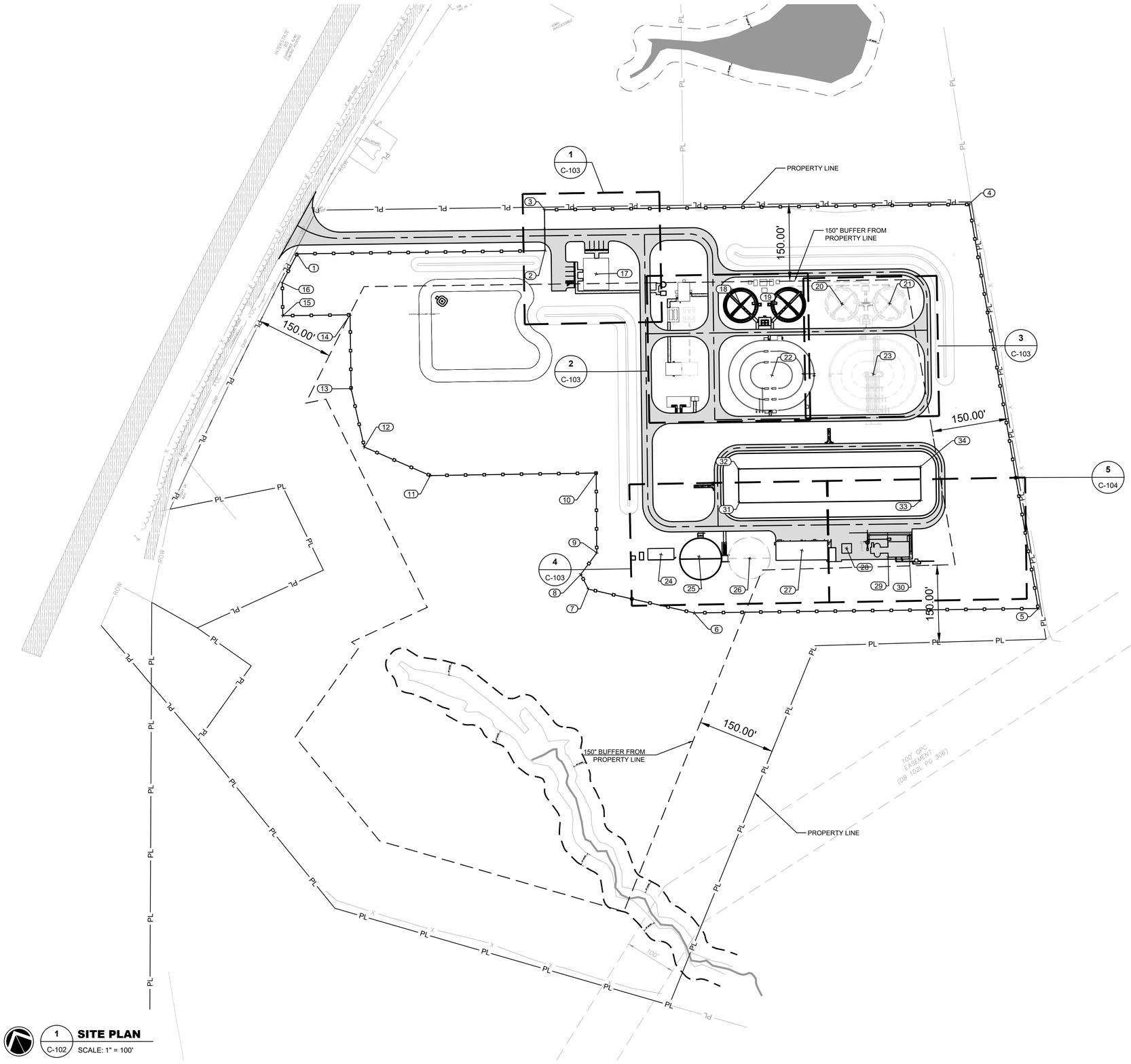
COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA REGISTERED No. PE051452 PROFESSIONAL ENGINEER GRAHAM S. SIZEMORE 05.06.2025

PROCESS FLOW DIAGRAM

G-006



1 C-102 **SITE PLAN**
SCALE: 1" = 100'

POINT TABLE			
NAME	NORTHING	EASTING	DESCRIPTION
1	1545903.44	2505630.42	FEN
2	1545690.11	2506062.66	FEN
3	1545761.40	2506097.84	FEN
4	1545396.07	2506838.05	FEN
5	1544634.73	2506601.16	FEN
6	1544930.94	2506000.98	FEN
7	1545065.37	2505838.97	FEN
8	1545097.66	2505838.97	FEN
9	1545120.93	2505885.53	FEN
10	1545259.62	2505955.00	FEN
11	1545401.70	2505665.42	FEN
12	1545509.19	2505576.28	FEN
13	1545622.37	2505604.90	FEN
14	1545750.96	2505668.37	FEN
15	1545808.91	2505550.95	FEN
16	1545866.41	2505579.33	FEN
17	1545604.57	2506130.54	CEN
18	1545422.48	2506353.60	CEN
19	1545381.61	2506436.40	CEN
20	1545335.29	2506530.25	CEN
21	1545294.42	2506613.05	CEN
22	1545273.76	2506345.90	CEN
23	1545186.58	2506522.56	CEN
24	1545061.11	2505995.24	CEN
25	1545023.95	2506059.23	CEN
26	1544975.98	2506145.27	CEN
27	1544943.78	2506242.78	CEN
28	1544907.96	2506322.34	CEN
29	1544856.06	2506386.38	CRNR
30	1544837.74	2506423.36	CRNR
31	1545082.26	2506176.66	CEN
32	1545140.39	2506205.35	CEN
33	1544926.10	2506493.05	CEN
34	1544984.24	2506521.74	CEN

LEGEND

- PROPERTY LINE — PL
- PERIMETER FENCE
- RETENTION POND
- ASPHALT ROAD
- ROAD CENTERLINE
- OFFSITE PROPERTY — PL
- EXISTING ROAD
- FENCE — X
- TREELINE
- OVERHEAD ELECTRIC — OHE
- RIGHT OF WAY — ROW
- EASEMENT
- WATERBODY
- STREAM CENTERLINE

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — NOT VALID WITHOUT ORIGINAL SIGNATURE AND SEAL
GOODWYN MILLS CAWOOD, LLC
GA PE051452
Exp.06.30.2026
CERTIFICATE OF AUTHORIZATION

1" 0" 5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
REV2	05.06.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

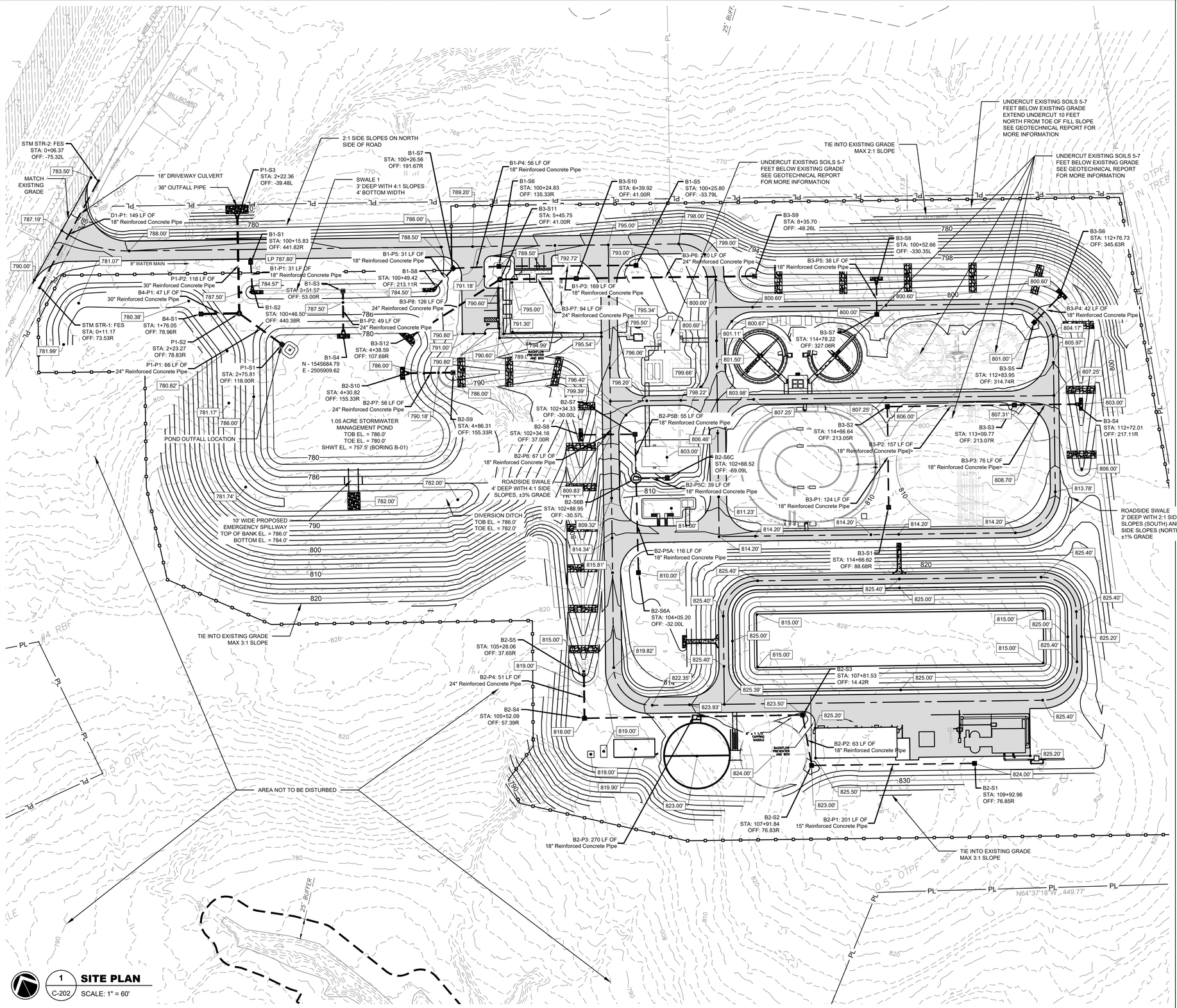
COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA REGISTERED No. PE051452 PROFESSIONAL ENGINEER GRAHAM S. SIZEMORE
05.06.2025

CIVIL SITE PLAN - GEOMETRIC CONTROLS

C-102



1 C-202 **SITE PLAN**
SCALE: 1" = 60'

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL SERVICE AND UTILITY LINES ON THE SITE AND WITHIN THE PROJECT CORRIDOR PRIOR TO BEGINNING EXCAVATION. UTILITIES LOCATED WITHIN THE FOOTPRINT OF THE PROPOSED UTILITY SHALL BE RELOCATED AS REQUIRED AND THE COST OF RELOCATION SHALL BE PART OF THE CONTRACT.
2. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS.
3. GRADE AREAS ADJACENT TO STRUCTURE LINES TO DRAIN AWAY FROM STRUCTURES TO PREVENT PONDING.
4. WHEN FINISHED GRADING MEETS OR ABUTS CURBS, WALKS OR PAVEMENT, UPHILL GRADES SHALL BE SLIGHTLY HIGHER THAN PAVEMENT TO PERMIT PROPER DRAINAGE.
5. FIELD ADJUSTMENTS IN GRADE MUST BE APPROVED BY THE ENGINEER.
6. NO FILL MATERIAL IS TO BE STORED ON CONCRETE, ASPHALT OR PERVIOUS ROADS WITHIN SITE.
7. CONTRACTOR SHALL REFERENCE SPECIFICATIONS FOR CLEARING, GRUBBING, AND STOCK PILING SOIL.
8. CONTRACTOR TO FIELD VERIFY DEPTH OF ANY UNDERCUTS DURING CONSTRUCTION. AREAS REQUIRING UNDERCUT TO BE THOROUGHLY PROOF-ROLLED ONCE SUB-GRADE IS ACHIEVED AND PRIOR TO FILL PLACEMENT.

EROSION CONTROL NOTE:

1. SEE ALSO CIVIL DRAWINGS FOR EROSION CONTROL PLANS.

Cut/Fill Report

Generated:	2025-03-13 09:24:16
By user:	marcher
Drawing:	T:\1 Projects\GA\Commerce\CATL230033 - Commerce 2.0 MGD Grove Creek WPCP\0 DWG\1 PLANS\02 SHEETS\03 CIVIL\T:\1 Projects\GA\Commerce\CATL230033 - Commerce 2.0 MGD Grove Creek WPCP\0 DWG\1 PLANS\02 SHEETS\03 CIVIL\C-101-CATL230033-Base.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
VOL	full	1.000	1.000	731735.37	123973.89	112900.10	11073.79<Cut>

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	731735.37	123973.89	112900.10	11073.79<Cut>

* Value adjusted by cut or fill factor other than 1.0

LEGEND

- PROPERTY LINE — PL
- P. MAJOR CONTOUR
- P. MINOR CONTOUR
- PERIMETER FENCE
- DITCH BOTTOM
- ASPHALT ROAD
- ROAD CENTERLINE
- EXISTING ROAD
- OFFSITE PROPERTY — PL
- FENCE — X
- TREELINE
- OVERHEAD ELECTRIC — OHE
- RIGHT OF WAY — ROW
- EASEMENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- WATERBODY
- STREAM CENTERLINE

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — GOODWYN MILLS CAWOOD, LLC — NAFCO01.1686 — Exp.06.30.2026 — CERTIFICATE OF AUTHORIZATION

1" 0" 5" 1"

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Designer:	GS
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COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA REGISTERED PROFESSIONAL ENGINEER No. PE051452 GRAHAM S. SIZEMORE 05.06.2025

CIVIL SITE PLAN - GRADING AND DRAINAGE

C-203

STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:	PIPES IN:	PIPES OUT
P1-S3 30" Flared End Section	RIM = 775.40 INV IN = 771.00	P1-P2, 30" REINFORCED CONCRETE PIPE, INV IN =771.00	
B4-S1 48" x 48" Catch Basin	RIM = 780.00 INV IN = 775.76	B4-P1, 30" REINFORCED CONCRETE PIPE, INV IN =775.76	
B2-S10 24" Flared End Section	RIM = 782.25 INV IN = 780.00	B2-P7, 24" REINFORCED CONCRETE PIPE, INV IN =780.00	
B3-S12 24" Flared End Section	RIM = 782.25 INV IN = 780.00	B3-P8, 24" REINFORCED CONCRETE PIPE, INV IN =780.00	
B1-S4 24" Flared End Section	RIM = 782.25 INV IN = 780.00	B1-P2, 24" REINFORCED CONCRETE PIPE, INV IN =780.00	
P1-S1 60" x 60" Catch Basin	RIM = 783.50 INV OUT = 777.08		P1-P1, 24" REINFORCED CONCRETE PIPE, INV OUT =777.08
B1-S8 18" Flared End Section	RIM = 786.21 INV IN = 784.50	B1-P5, 18" REINFORCED CONCRETE PIPE, INV IN =784.50	
B1-S2 18" Flared End Section	RIM = 786.21 INV IN = 784.50	B1-P1, 18" REINFORCED CONCRETE PIPE, INV IN =784.50	
B1-S3 36" x 36" Catch Basin	RIM = 786.50 INV OUT = 780.25		B1-P2, 24" REINFORCED CONCRETE PIPE, INV OUT =780.25
P1-S2 48" x 48" Junction Box	RIM = 786.79 INV IN = 775.76 INV OUT = 776.23 INV OUT = 775.76	P1-P1, 24" REINFORCED CONCRETE PIPE, INV IN =775.76	B4-P1, 30" REINFORCED CONCRETE PIPE, INV OUT =776.23 P1-P2, 30" REINFORCED CONCRETE PIPE, INV OUT =775.76
B1-S1 36" x 36" Catch Basin	RIM = 788.00 INV OUT = 784.66		B1-P1, 18" REINFORCED CONCRETE PIPE, INV OUT =784.66
B1-S7 36" x 36" Catch Basin	RIM = 788.50 INV IN = 784.65 INV OUT = 784.66	B1-P4, 18" REINFORCED CONCRETE PIPE, INV IN =784.65	B1-P5, 18" REINFORCED CONCRETE PIPE, INV OUT =784.66
B3-S11 48" Junction Box	RIM = 788.95 INV IN = 781.27 INV OUT = 781.27	B3-P7, 24" REINFORCED CONCRETE PIPE, INV IN =781.27	B3-P8, 24" REINFORCED CONCRETE PIPE, INV OUT =781.27
B1-S6 36" x 36" Catch Basin	RIM = 789.50 INV IN = 784.95 INV OUT = 784.95	B1-P3, 18" REINFORCED CONCRETE PIPE, INV IN =784.95	B1-P4, 18" REINFORCED CONCRETE PIPE, INV OUT =784.95
B2-S9 48" x 48" Catch Basin	RIM = 789.50 INV OUT = 781.68		B2-P7, 24" REINFORCED CONCRETE PIPE, INV OUT =781.68
B1-S5 36" x 36" Catch Basin	RIM = 794.00 INV OUT = 788.35		B1-P3, 18" REINFORCED CONCRETE PIPE, INV OUT =788.35
B3-S10 36" x 36" Catch Basin	RIM = 795.07 INV IN = 785.07 INV OUT = 785.07	B3-P6, 24" REINFORCED CONCRETE PIPE, INV IN =785.07	B3-P7, 24" REINFORCED CONCRETE PIPE, INV OUT =785.07
B2-S8 36" x 36" Catch Basin	RIM = 795.29 INV IN = 786.00	B2-P6, 18" REINFORCED CONCRETE PIPE, INV IN =786.00	
B3-S8 18" Flared End Section	RIM = 797.05 INV IN = 795.34	B3-P5, 18" REINFORCED CONCRETE PIPE, INV IN =795.34	
B3-S9 36" x 36" Catch Basin	RIM = 798.00 INV OUT = 791.70		B3-P6, 24" REINFORCED CONCRETE PIPE, INV OUT =791.70
B3-S6 18" Flared End Section	RIM = 799.14 INV IN = 796.50	B3-P4, 18" REINFORCED CONCRETE PIPE, INV IN =796.50	
B3-S7 36" x 36" Catch Basin	RIM = 800.00 INV OUT = 795.53		B3-P5, 18" REINFORCED CONCRETE PIPE, INV OUT =795.53
B2-S7 36" x 36" Catch Basin	RIM = 801.00 INV IN = 788.44 INV OUT = 788.44	B2-P5B, 18" REINFORCED CONCRETE PIPE, INV IN =788.44	B2-P6, 18" REINFORCED CONCRETE PIPE, INV OUT =788.44
B3-S5 36" x 36" Catch Basin	RIM = 801.00 INV OUT = 796.70		B3-P4, 18" REINFORCED CONCRETE PIPE, INV OUT =796.70
B2-S6C 36" x 36" Catch Basin	RIM = 801.50 INV OUT = 792.20		B2-P5C, 18" REINFORCED CONCRETE PIPE, INV OUT =792.20
B2-S6B 48" Junction Box	RIM = 804.53 INV IN = 790.64 INV IN = 790.64 INV OUT = 790.64	B2-P5C, 18" REINFORCED CONCRETE PIPE, INV IN =790.64 B2-P5A, 18" REINFORCED CONCRETE PIPE, INV IN =790.64	B2-P5B, 18" REINFORCED CONCRETE PIPE, INV OUT =790.64
B3-S4 18" Flared End Section	RIM = 804.71 INV IN = 803.00	B3-P3, 18" REINFORCED CONCRETE PIPE, INV IN =803.00	
B3-S3 36" x 36" Catch Basin	RIM = 806.00 INV IN = 803.50 INV OUT = 803.50	B3-P2, 18" REINFORCED CONCRETE PIPE, INV IN =803.50	B3-P3, 18" REINFORCED CONCRETE PIPE, INV OUT =803.50
B3-S2 36" x 36" Catch Basin	RIM = 806.00 INV IN = 804.25 INV OUT = 804.25	B3-P1, 18" REINFORCED CONCRETE PIPE, INV IN =804.25	B3-P2, 18" REINFORCED CONCRETE PIPE, INV OUT =804.25
B3-S1 36" x 36" Catch Basin	RIM = 809.00 INV OUT = 805.00		B3-P1, 18" REINFORCED CONCRETE PIPE, INV OUT =805.00
B2-S6A 36" x 36" Catch Basin	RIM = 810.00 INV OUT = 795.32		B2-P5A, 18" REINFORCED CONCRETE PIPE, INV OUT =795.32
B2-S5 24" Flared End Section	RIM = 816.13 INV IN = 805.50	B2-P4, 24" REINFORCED CONCRETE PIPE, INV IN =805.50	
B2-S4 36" x 36" Catch Basin	RIM = 818.00 INV IN = 806.80 INV OUT = 806.80	B2-P3, 18" REINFORCED CONCRETE PIPE, INV IN =806.80	B2-P4, 24" REINFORCED CONCRETE PIPE, INV OUT =806.80
B2-S2 36" x 36" Catch Basin	RIM = 823.00 INV IN = 815.15 INV OUT = 815.15	B2-P1, 15" REINFORCED CONCRETE PIPE, INV IN =815.15	B2-P2, 18" REINFORCED CONCRETE PIPE, INV OUT =815.15
B2-S3 36" x 36" Catch Basin	RIM = 823.50 INV IN = 813.55 INV OUT = 813.55	B2-P2, 18" REINFORCED CONCRETE PIPE, INV IN =813.55	B2-P3, 18" REINFORCED CONCRETE PIPE, INV OUT =813.55
B2-S1 36" x 36" Catch Basin	RIM = 824.00 INV OUT = 817.17		B2-P1, 15" REINFORCED CONCRETE PIPE, INV OUT =817.17

PIPE TABLE

PIPE NAME	LENGTH	SIZE	SLOPE	MATERIAL
B1-P1	31	18	0.52%	Concrete Pipe
B1-P2	49	24	0.52%	Concrete Pipe
B1-P3	169	18	2.01%	Concrete Pipe
B1-P4	56	18	0.53%	Concrete Pipe
B1-P5	31	18	0.51%	Concrete Pipe
B2-P1	201	15	1.00%	Concrete Pipe
B2-P2	63	18	2.53%	Concrete Pipe
B2-P3	269	18	2.50%	Concrete Pipe
B2-P4	51	24	2.53%	Concrete Pipe
B2-P5A	116	18	4.03%	Concrete Pipe
B2-P5B	55	18	4.03%	Concrete Pipe
B2-P5C	39	18	4.05%	Concrete Pipe
B2-P6	67	18	3.64%	Concrete Pipe
B2-P7	55	24	3.03%	Concrete Pipe
B3-P1	124	18	0.60%	Concrete Pipe
B3-P2	157	18	0.48%	Concrete Pipe
B3-P3	76	18	0.66%	Concrete Pipe
B3-P4	42	18	0.47%	Concrete Pipe
B3-P5	37	18	0.51%	Concrete Pipe
B3-P6	220	24	3.01%	Concrete Pipe
B3-P7	94	24	4.04%	Concrete Pipe
B3-P8	126	24	1.01%	Concrete Pipe
B4-P1	47	30	1.00%	Concrete Pipe
P1-P1	66	24	2.01%	Concrete Pipe
P1-P2	118	30	4.02%	Concrete Pipe

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

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GOODWYN MILLS CAWOOD, LLC
No. PEO07186
Exp.06.30.2026

1" 0" 5" 1"

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CATL230033

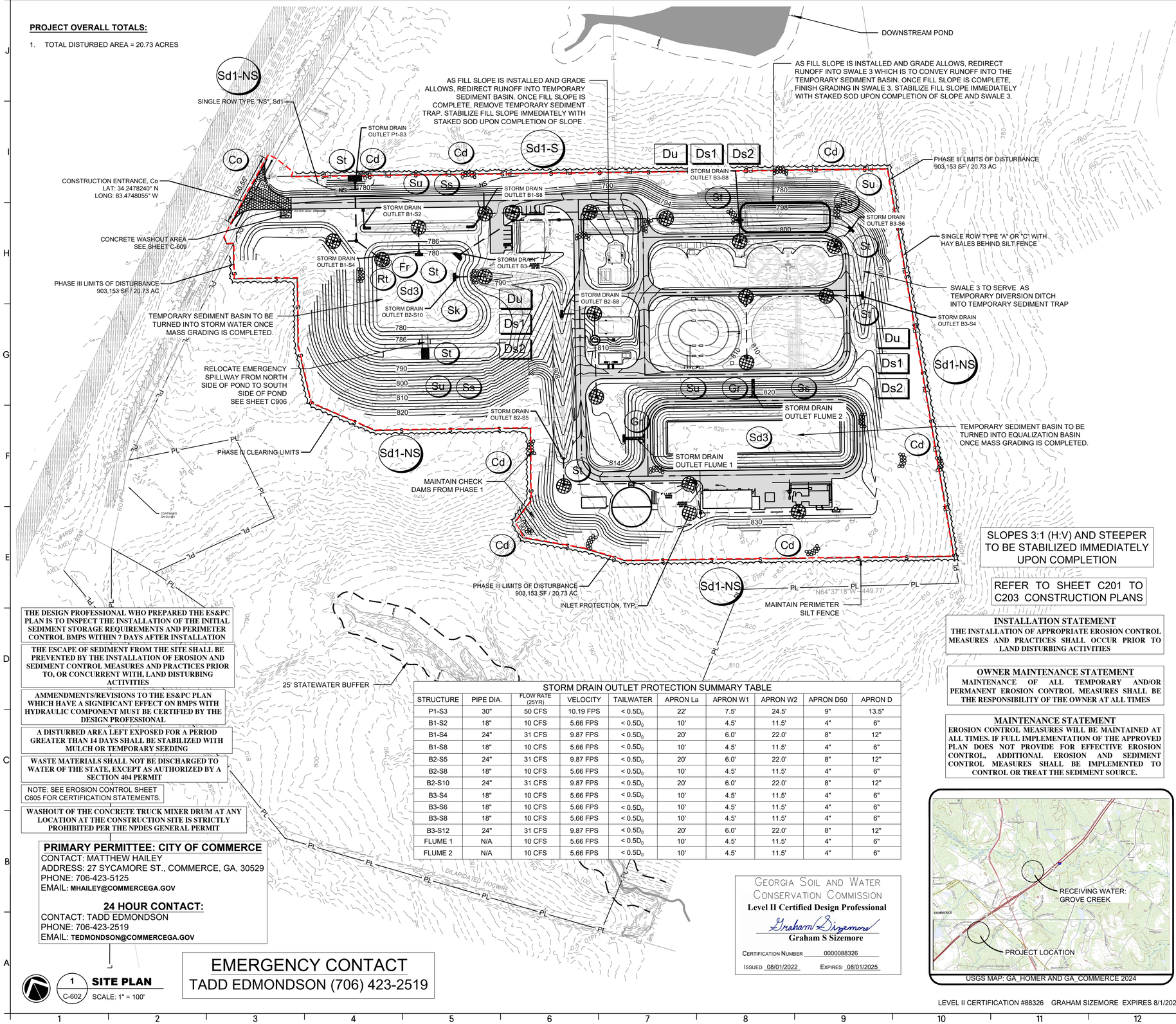
GEORGIA REGISTERED No. PE051452 PROFESSIONAL ENGINEER GRAHAM S. SIZEMORE 05.06.2025

CIVIL SITE PLAN - PIPE AND STRUCTURE TABLE

C-204

PROJECT OVERALL TOTALS:

1. TOTAL DISTURBED AREA = 20.73 ACRES



SLOPES 3:1 (H:V) AND STEEPER TO BE STABILIZED IMMEDIATELY UPON COMPLETION

REFER TO SHEET C201 TO C203 CONSTRUCTION PLANS

INSTALLATION STATEMENT

THE INSTALLATION OF APPROPRIATE EROSION CONTROL MEASURES AND PRACTICES SHALL OCCUR PRIOR TO LAND DISTURBING ACTIVITIES

OWNER MAINTENANCE STATEMENT

MAINTENANCE OF ALL TEMPORARY AND/OR PERMANENT EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE OWNER AT ALL TIMES

MAINTENANCE STATEMENT

EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

THE DESIGN PROFESSIONAL WHO PREPARED THE ES&PC PLAN IS TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS AND PERIMETER CONTROL BMPS WITHIN 7 DAYS AFTER INSTALLATION

THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES

AMMENDMENTS/REVISIONS TO THE ES&PC PLAN WHICH HAVE A SIGNIFICANT EFFECT ON BMPS WITH HYDRAULIC COMPONENT MUST BE CERTIFIED BY THE DESIGN PROFESSIONAL

A DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING

WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATER OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT

NOTE: SEE EROSION CONTROL SHEET C605 FOR CERTIFICATION STATEMENTS.

WASHOUT OF THE CONCRETE TRUCK MIXER DRUM AT ANY LOCATION AT THE CONSTRUCTION SITE IS STRICTLY PROHIBITED PER THE NPDES GENERAL PERMIT

PRIMARY PERMITTEE: CITY OF COMMERCE
CONTACT: MATTHEW HAILEY
ADDRESS: 27 SYCAMORE ST., COMMERCE, GA, 30529
PHONE: 706-423-5125
EMAIL: **MHAILEY@COMMERCEGA.GOV**

24 HOUR CONTACT:
CONTACT: TADD EDMONDSON
PHONE: 706-423-2519
EMAIL: **TEDMONDSON@COMMERCEGA.GOV**

EMERGENCY CONTACT
TADD EDMONDSON (706) 423-2519

1 C-602 **SITE PLAN**
SCALE: 1" = 100'

STORM DRAIN OUTLET PROTECTION SUMMARY TABLE

STRUCTURE	PIPE DIA.	FLOW RATE (25YR)	VELOCITY	TAILWATER	APRON La	APRON W1	APRON W2	APRON D50	APRON D
P1-S3	30"	50 CFS	10.19 FPS	< 0.5D_0	22'	7.5'	24.5'	9"	13.5"
B1-S2	18"	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
B1-S4	24"	31 CFS	9.87 FPS	< 0.5D_0	20'	6.0'	22.0'	8"	12"
B1-S8	18"	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
B2-S5	24"	31 CFS	9.87 FPS	< 0.5D_0	20'	6.0'	22.0'	8"	12"
B2-S8	18"	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
B2-S10	24"	31 CFS	9.87 FPS	< 0.5D_0	20'	6.0'	22.0'	8"	12"
B3-S4	18"	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
B3-S6	18"	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
B3-S8	18"	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
B3-S12	24"	31 CFS	9.87 FPS	< 0.5D_0	20'	6.0'	22.0'	8"	12"
FLUME 1	N/A	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"
FLUME 2	N/A	10 CFS	5.66 FPS	< 0.5D_0	10'	4.5'	11.5'	4"	6"

GEORGIA SOIL AND WATER CONSERVATION COMMISSION
Level II Certified Design Professional
Graham S Sizemore
CERTIFICATION NUMBER 0000088326
ISSUED: 08/01/2022 EXPIRES: 08/01/2025

USGS MAP: GA_HOMER AND GA_COMMERCE 2024

LEVEL II CERTIFICATION #88326 GRAHAM SIZEMORE EXPIRES 8/1/2025

EROSION CONTROL NOTES:

1. LIMITS OF DISTURBANCE WILL BE A MINIMUM OF WHAT IS REQUIRED TO INSTALL PROPOSED IMPROVEMENTS. A MAXIMUM CLEARING LIMIT SHALL BE RIGHT OF WAY AND PROPERTY LINES. IN AREAS WHERE THIS IS NECESSARY, CONTRACTOR SHALL KEEP ALL CLEARING TO ABSOLUTE MINIMUM REQUIRED.

2. MATTING AND BLANKETING REQUIRED ON ALL DISTURBED SLOPES GREATER THAN 3:1. FLOCCULANTS AND COAGULANTS SHALL ALSO BE USED IN AREAS SUSCEPTIBLE TO HIGH EROSION AND IN AREAS ADJACENT TO CREEKS OR STREAMS.

3. DOUBLE ROW OF TYPE "S" SENSITIVE SILT FENCE WITH HAYBALES IN BETWEEN ROWS REQUIRED AT ALL CREEK OR STREAM CROSSINGS.

4. SEE SHEETS C604 THROUGH C612 FOR MORE INFORMATION.

5. REFER TO SHEETS C-606 THROUGH C-607 FOR BMP LEGEND AND DESCRIPTION

Ds1 – Ds2 – Ds3 – Ds4 – Du

REQUIRED ON ALL DISTURBED AREAS WHERE APPLICABLE

EROSION CONTROL SEQUENCING NOTES:

PHASE-1: CONSTRUCTION ENTRANCE, LAYDOWN AREA, CONCRETE WASH OUT AND PERIMETER CONTROLS SHALL BE INSTALLED.

PHASE-2: CONSTRUCTION ENTRANCE AND PERIMETER CONTROLS SHALL BE MAINTAINED. SEDIMENT BASINS, SEDIMENTS TRAPS AND ALL ADDITIONAL EROSION BMPS SHALL BE INSTALLED AS CONSTRUCTION PROCEEDS.

PHASE-3: CONSTRUCTION ENTRANCE AND PERIMETER CONTROLS SHALL BE MAINTAINED. AS SITE GRADING PROCEEDS, TEMPORARY SEDIMENT BASINS ARE TO BE REMOVED.

PHASE-4: ALL DISTURBED AREAS ARE TO BE SODDED AND STABILIZED AT THE CONCLUSION OF CONSTRUCTION. ALL EROSION CONTROL MEASURES SHALL BE REMOVED ONCE FINAL STABILIZATION HAS BEEN ACHIEVED.

FOR EROSION CONTROL MEASURES OUTSIDE OF THE TREATMENT PLANT FENCE SEE CU-311- CU-324.

KEY NOTES: [#]

1. CO CONSTRUCTION ENTRANCE/EXIT
   LAT: 34.2478240° N
   LONG: 83.4748055° W
2. Sd1 SINGLE ROW TYPE "A" OR "C" WITH HAY BALES BEHIND SILT FENCE. SEE SHEET C601
3. Sd1 SINGLE ROW TYPE "NS"
4. Cd-S STONE CHECK DAM
5. INLET PROTECTION
6. Sd3 SEDIMENT POND SEE EROSION DETAILS
8. STORM DRAIN OUTLET PROTECTION
9. PHASE III LIMITS OF DISTURBANCE 903,153 SF / 20.73 AC
10. PHASE III CLEARING LIMITS
11. CONCRETE WASHOUT AREA. SEE SHEET C609.

LEGEND

TYPE "S" SILT FENCE	S
TYPE "NS" SILT FENCE	NS
CHECK DAM	
FLOW ARROW	
INLET PROTECTION	
LIMITS OF DISTURBANCE	
CLEARING LIMITS	
P. MAJOR CONTOUR	
P. MINOR CONTOUR	
PROPERTY LINE	PL
OFFSITE PROPERTY	PL
EXISTING ROAD	
FENCE	X
TREELINE	
OVERHEAD ELECTRIC	OHE
RIGHT OF WAY	ROW
EASEMENT	
WATERBODY	
STREAM CENTERLINE	
EX. MAJOR CONTOUR	
EX. MINOR CONTOUR	

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE051452
GOODWYN MILLS CAWOOD, LLC
NA PE052 GMC
Exp.06.30.2026
CERTIFICATE OF AUTHORIZATION

1" 0" 1" 5"

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Engineer:	GS
Designer:	GS
Drawn By:	

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GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. PE051452
05.06.2025
GRAHAM S. SIZEMORE

CIVIL SITE PLAN - PHASE III - EROSION & SEDIMENT CONTROL PLAN

C-603

THE DESIGN PROFESSIONAL WHO PREPARED THE ES&PC PLAN IS TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS AND PERIMETER CONTROL BMPS WITHIN 7 DAYS AFTER INSTALLATION

THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES

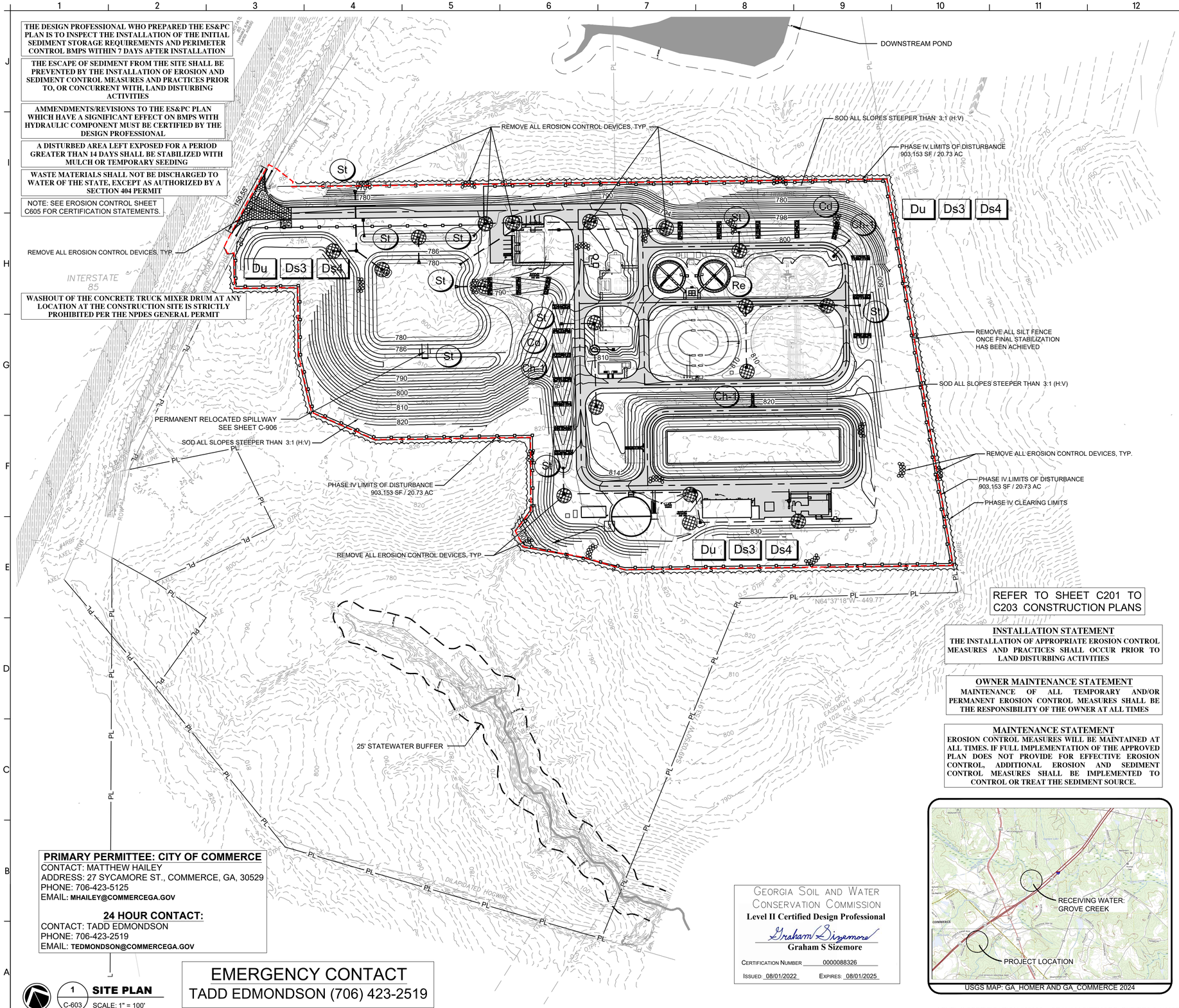
AMMENDMENTS/REVISIONS TO THE ES&PC PLAN WHICH HAVE A SIGNIFICANT EFFECT ON BMPS WITH HYDRAULIC COMPONENT MUST BE CERTIFIED BY THE DESIGN PROFESSIONAL

A DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING

WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATER OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT

NOTE: SEE EROSION CONTROL SHEET C605 FOR CERTIFICATION STATEMENTS.

WASHOUT OF THE CONCRETE TRUCK MIXER DRUM AT ANY LOCATION AT THE CONSTRUCTION SITE IS STRICTLY PROHIBITED PER THE NPDES GENERAL PERMIT



REFER TO SHEET C201 TO C203 CONSTRUCTION PLANS

INSTALLATION STATEMENT
THE INSTALLATION OF APPROPRIATE EROSION CONTROL MEASURES AND PRACTICES SHALL OCCUR PRIOR TO LAND DISTURBING ACTIVITIES

OWNER MAINTENANCE STATEMENT
MAINTENANCE OF ALL TEMPORARY AND/OR PERMANENT EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE OWNER AT ALL TIMES

MAINTENANCE STATEMENT
EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

PRIMARY PERMITTEE: CITY OF COMMERCE
CONTACT: MATTHEW HAILEY
ADDRESS: 27 SYCAMORE ST., COMMERCE, GA, 30529
PHONE: 706-423-5125
EMAIL: **MHAILEY@COMMERCEGA.GOV**

24 HOUR CONTACT:
CONTACT: TADD EDMONDSON
PHONE: 706-423-2519
EMAIL: **TEDMONDSON@COMMERCEGA.GOV**

EMERGENCY CONTACT
TADD EDMONDSON (706) 423-2519

1 C-603 **SITE PLAN**
SCALE: 1" = 100'

GEORGIA SOIL AND WATER CONSERVATION COMMISSION
Level II Certified Design Professional
Graham S Sizemore
CERTIFICATION NUMBER 0000088326
ISSUED: 08/01/2022 EXPIRES: 08/01/2025

USGS MAP: GA_HOMER AND GA_COMMERCE 2024

LEVEL II CERTIFICATION #88326 GRAHAM SIZEMORE EXPIRES 8/1/2025

EROSION CONTROL NOTES:

1. LIMITS OF DISTURBANCE WILL BE A MINIMUM OF WHAT IS REQUIRED TO INSTALL PROPOSED IMPROVEMENTS. A MAXIMUM CLEARING LIMIT SHALL BE RIGHT OF WAY AND PROPERTY LINES. IN AREAS WHERE THIS IS NECESSARY, CONTRACTOR SHALL KEEP ALL CLEARING TO ABSOLUTE MINIMUM REQUIRED.

2. MATTING AND BLANKETING REQUIRED ON ALL DISTURBED SLOPES GREATER THAN 3:1. FLOCCULANTS AND COAGULANTS SHALL ALSO BE USED IN AREAS SUSCEPTIBLE TO HIGH EROSION AND IN AREAS ADJACENT TO CREEKS OR STREAMS.

3. DOUBLE ROW OF TYPE "S" SENSITIVE SILT FENCE WITH HAYBALES IN BETWEEN ROWS REQUIRED AT ALL CREEK OR STREAM CROSSINGS.

4. SEE SHEETS C604 THROUGH C612 FOR MORE INFORMATION.

5. REFER TO SHEETS C-606 THROUGH C-607 FOR BMP LEGEND AND DESCRIPTION

Ds1 – Ds2 – Ds3 – Ds4 – Du

REQUIRED ON ALL DISTURBED AREAS WHERE APPLICABLE

EROSION CONTROL SEQUENCING NOTES:

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FOR EROSION CONTROL MEASURES OUTSIDE OF THE TREATMENT PLANT FENCE SEE CU-311- CU-324.

LEGEND

- TYPE "S" SILT FENCE — S — S —
- TYPE "NS" SILT FENCE — NS —
- CHECK DAM
- FLOW ARROW
- INLET PROTECTION
- LIMITS OF DISTURBANCE
- CLEARING LIMITS
- P. MAJOR CONTOUR
- P. MINOR CONTOUR
- PROPERTY LINE — PL —
- OFFSITE PROPERTY — PL —
- EXISTING ROAD
- FENCE — X —
- TREELINE
- OVERHEAD ELECTRIC — OHE —
- RIGHT OF WAY — ROW —
- EASEMENT
- WATERBODY
- STREAM CENTERLINE
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EROSION CONTROL BLANKET

PROJECT OVERALL TOTALS:

1. TOTAL DISTURBED AREA = 20.73 ACRES

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — GOODWYN MILLS CAWOOD, LLC — NAFCO20.LAG — Exp.06.30.2026 — CERTIFICATE OF AUTHORIZATION NO.

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Designer:	GS
Drawn By:	

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

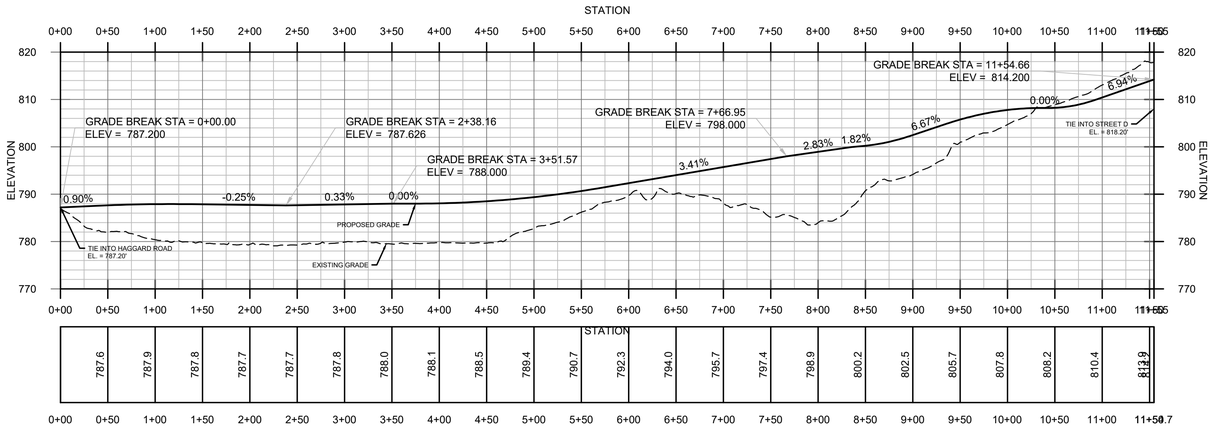
CATL230033

GEORGIA REGISTERED No. PE051452 PROFESSIONAL ENGINEER GRAHAM S. SIZEMORE 05.06.2025

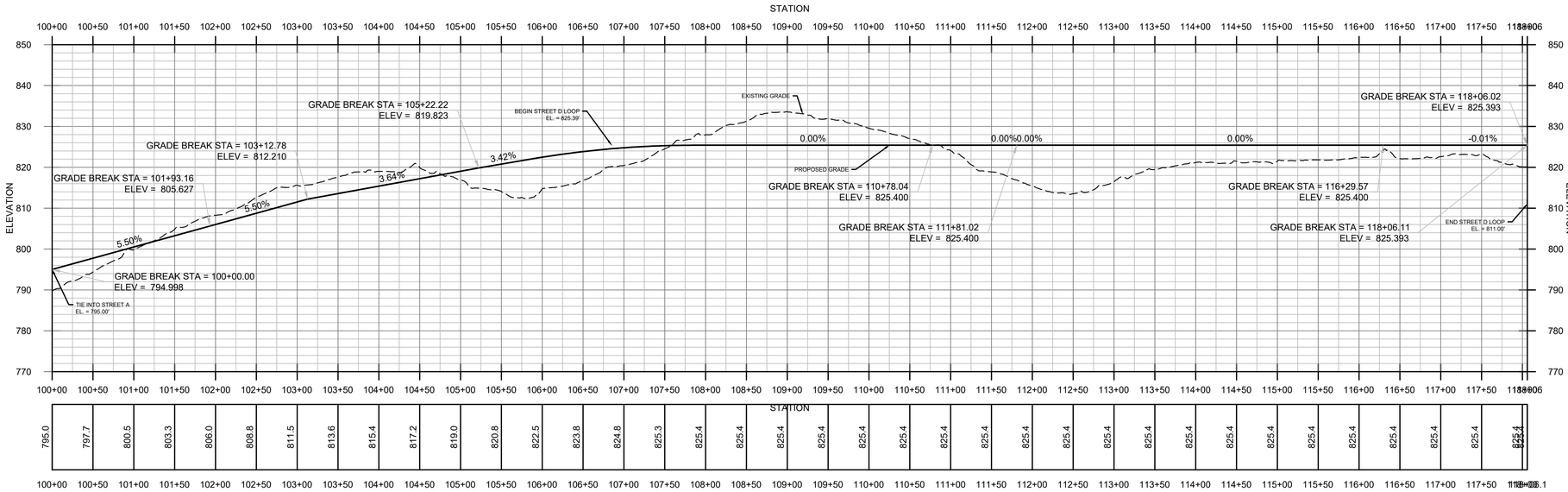
CIVIL SITE PLAN - PHASE IV - EROSION & SEDIMENT CONTROL PLAN

C-604

STREET A PROFILE VIEW



STREET B PROFILE VIEW



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6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

GOODWYN MILLS CAWOOD, LLC
No.PEF007898
Exp.08.30.2026

1" 0" .5" 1"

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GROVE CREEK WPCP
COMMERCE, GA

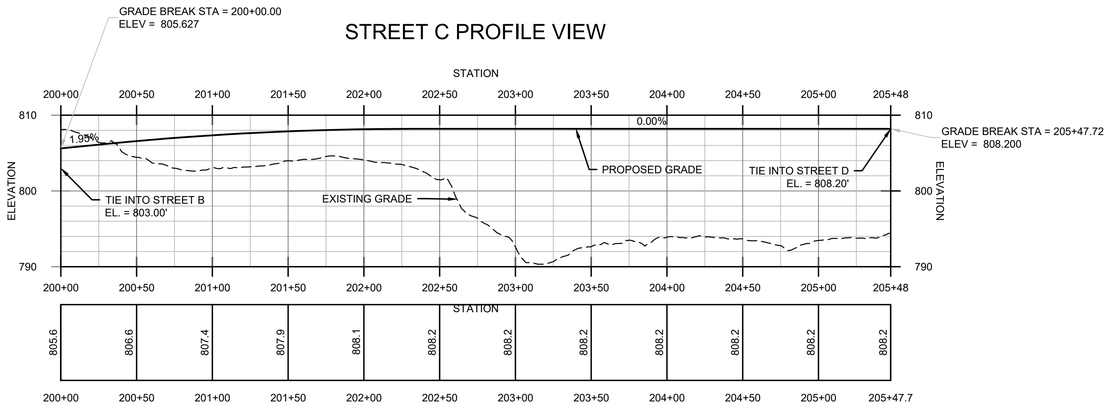
CATL230033

No. PE051452
05.06.2025
GRAHAM S. SIZEMORE

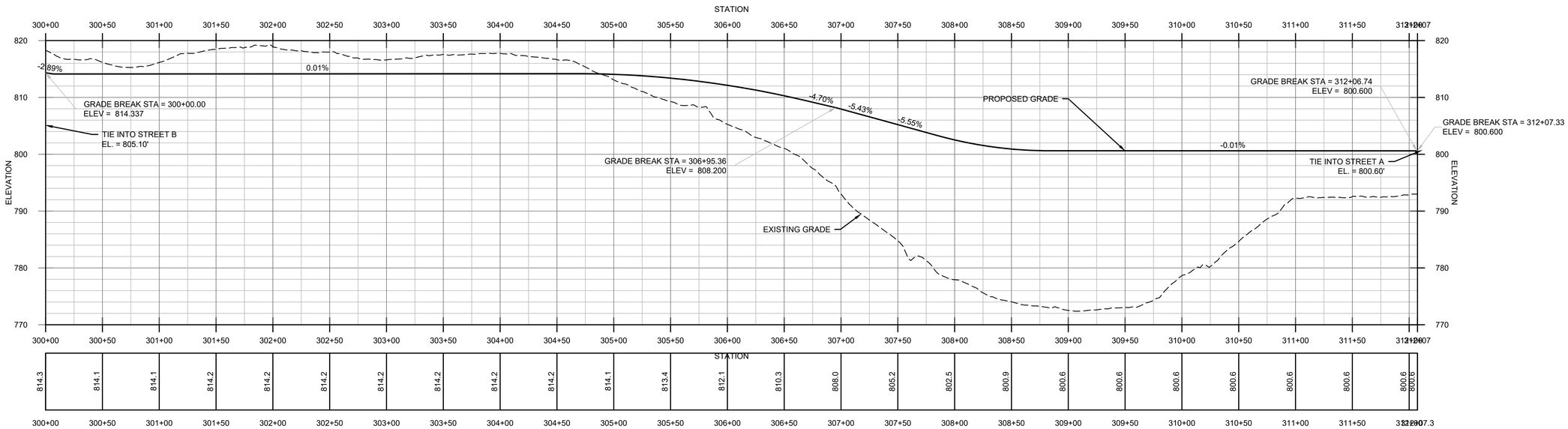
CIVIL -
CIVIL SITE DETAILS

C-904

STREET C PROFILE VIEW



STREET D PROFILE VIEW



GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA NOT VALID WITHOUT ORIGINAL SIGNATURE AND SEAL
GOODWYN MILLS CAWOOD, LLC
NA.PE051452
Exp.06.30.2026
CERTIFICATE OF AUTHORIZATION

1" 0" 5" 1"

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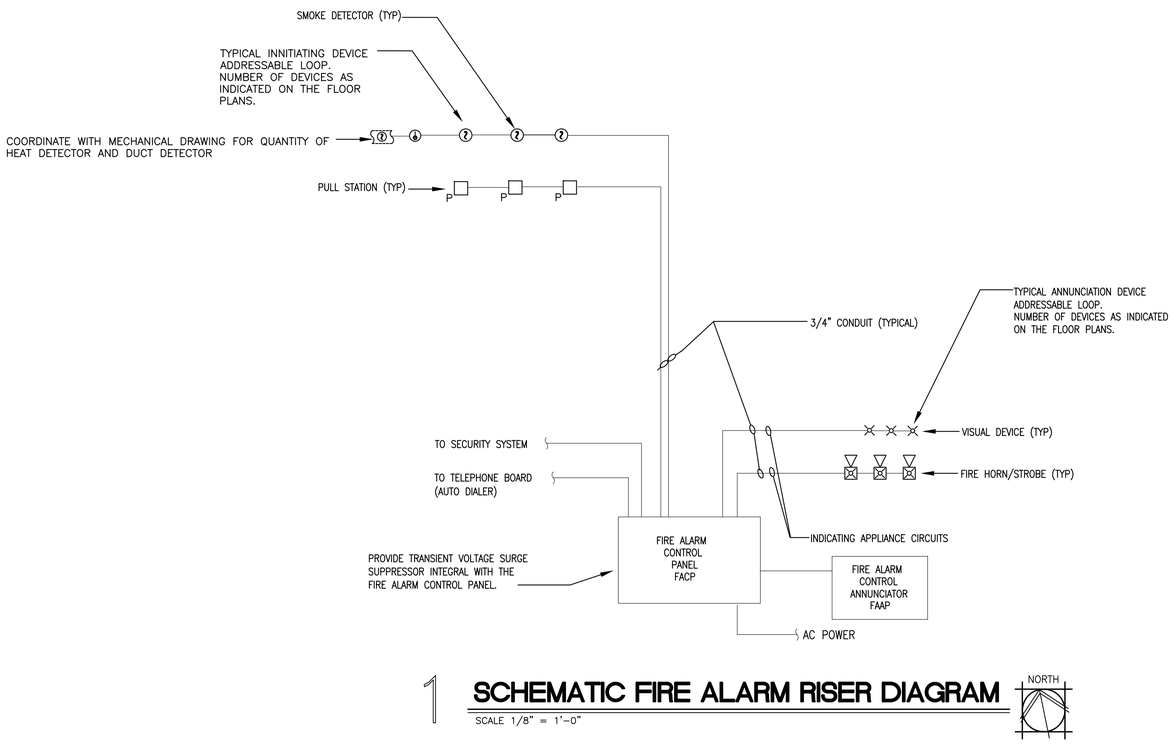
GEORGIA REGISTERED No. PE051452 PROFESSIONAL ENGINEER
05.06.2025
GRAHAM S. SIZEMORE

CIVIL -
CIVIL SITE DETAILS

C-905



1 SCHEMATIC FIRE ALARM RISER DIAGRAM

SCALE 1/8" = 1'-0"

NORTH

KEY NOTES:

1 NOT USED

FIRE ALARM LEGEND (NOTE: ALL SYMBOLS SHOWN MAY NOT APPEAR ON DRAWINGS AND ARE USED AS APPLICABLE TO THIS PROJECT)

SYMBOL	DESCRIPTION	REMARKS	MOUNTING HEIGHT TO CENTERLINE UNO
	FIRE ALARM STROBE/FLASHING LIGHT		80" TO BOTTOM OF VISUAL
	FIRE ALARM HORN/STROBE COMBINATION		80" TO BOTTOM OF VISUAL
	FIRE ALARM HORN ONLY		80" TO BOTTOM OF VISUAL
P	FIRE ALARM MANUAL PULL STATION		48" TO BOTTOM OF VISUAL
	DUCT-SMOKE DETECTOR (DAMPER) OR (EXHAUST)		———
	SMOKE DETECTOR		CEILING
	AUTOMATIC HEAT DETECTOR (RATE OF RISE TYPE)		CEILING
F	FIREMAN'S PHONE JACK		54"
TS	TAMPER SWITCH		———
FS	FLOW SWITCH		CEILING
FACP	FIRE ALARM CONTROL PANEL		———
FAPC	FIRE ALARM PULL CABINET		———
FAA	FIRE ALARM REMOTE ANNUNCIATOR		———
UV	ULTRAVIOLET FLAME DETECTOR		———
KB	KNOX BOX	KEYBOX PER LOCAL AHJ REQUIREMENTS	———

FIRE ALARM RISER DIAGRAM NOTES:

1. SYSTEM IS U.L. LISTED FOR POWER-LIMITED D.C. APPLICATIONS PER NEC 760.
2. ALL RACEWAY (WHERE INDICATED) SHALL BE MINIMUM 3/4" CONDUIT.
3. QUANTITY OF DEVICES IS SHOWN FOR SCHEMATIC PURPOSES ONLY. SEE FLOOR PLAN DRAWINGS FOR ACTUAL NUMBER OF DEVICES. RISER DOES NOT INDICATE THE TOTAL QUANTITY OF FIRE ALARM DEVICES.
4. WHEN AN ALARM CONDITION IS DETECTED BY ONE OF THE SYSTEM INITIATING DEVICE, THE FOLLOWING FUNCTIONS SHALL IMMEDIATELY OCCUR.
   A. THE SYSTEM ALARM LED SHALL FLASH.
   B. A LOCAL SOUND DEVICE IN THE PANEL SHALL BE ACTIVATED.
   C. THE CORRESPONDING LED ON THE INITIATING ZONE(S) IN ALARM SHALL FLASH.
   D. ALL AUTOMATIC PROGRAMS ASSIGNED TO THE ALARM POINT SHALL BE EXCUTED. AS EACH INDICATING CIRCUIT OR CONTROL RELAY IS ACTIVATED, IT'S LED SHALL BE ILLUMINATED.
   E. ACTIVATE AN OUTPUT TO THE MONITORING SERVICE APPROVED BY THE LOCAL AUTHORITY.
   F. ALL AUDIBLE, VISUAL, AUDIBLE/VISUAL COMBO UNITS, MINI HORNS IN GUEST ROOMS AND MINI HORNS IN HEARING IMPAIRED ROOMS WILL BE ACTIVATED.
   G. ALL AIR HANDLING UNITS AND FAN COIL UNITS SERVING MEANS OF EGRESS SHALL BE SHUT DOWN.
   H. AUTOMATICALLY DIAL LOCAL FIRE DEPARTMENT, POLICE DEPARTMENT, ETC. IN ACCORDANCE WITH NFPA 101.16-3.4.3.4. COORDINATE WITH THE OWNER AND FIRE MARSHALL.
5. FIRE ALARM SYSTEM SHALL COMPLY WITH NFPA-72 & ADA.
6. FIRE ALARM SYSTEM SHALL BE DESIGNED AND INSTALLED BY FIRE ALARM SYSTEM VENDOR. FIRE ALARM SYSTEM SHALL COMPLY WITH LOCAL, CITY, COUNTY, STATE AND FEDERAL CODES. ELECTRICAL DRAWINGS MUST BE MODIFIED BY THE FIRE ALARM SYSTEM VENDOR IN ORDER TO COMPLY WITH ABOVE. ADD, RELOCATE, ETC. FIRE ALARM DEVICES AS REQUIRED.
7. FIRE ALARM CABLES SHALL COMPLY WITH NEC ARTICLE 760 AND APPROVED FOR THEIR USE.

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — GOODWYN MILLS CAWOOD LLC — No. PE032226 — Exp.06.30.2026 — CERTIFICATE OF AUTHORIZATION — NOT VALID WITHOUT ORIGINAL SEAL

1" 0" .5" 1"

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Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

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GROVE CREEK WPCP
COMMERCE, GA

CATL230033

KOSTAS KAZILIS — REGISTERED — PE032226 PROFESSIONAL ENGINEER — 4/22/2025

FIRE ALARM LEGEND AND RISER

FA100

FIRE ALARM SYSTEM

SCOPE AND RELATED DOCUMENTS:

A. THE WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS INCLUDES THE FURNISHING OF ALL LABOR, EQUIPMENT, MATERIALS, AND PERFORMANCE OF ALL OPERATIONS ASSOCIATED WITH THE INSTALLATION OF THE FIRE ALARM SYSTEM AS SHOWN ON THE DRAWINGS AND AS HEREIN SPECIFIED.

B. THE REQUIREMENTS OF THE CONDITIONS OF THE CONTRACT, SUPPLEMENTARY CONDITIONS, AND GENERAL REQUIREMENTS APPLY TO THE WORK SPECIFIED IN THIS SECTION.

C. THE COMPLETE INSTALLATION SHALL CONFORM TO THE APPLICABLE SECTIONS OF NFPA–72, NFPA 71, LOCAL CODE REQUIREMENTS, AND NATIONAL ELECTRICAL CODE WITH PARTICULAR ATTENTION TO ARTICLE 760.

D. THE WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS SHALL BE COORDINATED WITH THE RELATED WORK AS SPECIFIED ELSEWHERE UNDER THE PROJECT SPECIFICATIONS.

GENERAL:

A. FURNISH AND INSTALL A COMPLETE FIRE ALARM SYSTEM AS DESCRIBED HEREIN AND AS SHOWN ON THE PLANS, TO BE WIRED, CONNECTED, AND LEFT IN FIRST CLASS OPERATING CONDITION. INCLUDE SUFFICIENT CONTROL PANEL(S), ANNUNCIATOR(S), MANUAL STATIONS, AUTOMATIC FIRE DETECTORS, SMOKE DETECTORS, ALARM INDICATING APPLIANCES, WIRING, TERMINATIONS, ELECTRICAL BOXES, AND ALL OTHER NECESSARY MATERIAL FOR A COMPLETE OPERATING SYSTEM.
   1. THE FIRE ALARM SYSTEM SHALL ALLOW FOR LOADING AND EDITING SPECIAL INSTRUCTIONS AND OPERATING SEQUENCES AS REQUIRED. THE SYSTEM SHALL BE CAPABLE OF ON–SITE PROGRAMMING TO ACCOMMODATE SYSTEM EXPANSION AND FACILITATE CHANGES IN OPERATION. ALL SOFTWARE OPERATIONS SHALL BE STORED IN A NON–VOLATILE PROGRAMMABLE MEMORY WITHIN THE FIRE ALARM CONTROL PANEL. LOSS OF PRIMARY AND SECONDARY POWER SHALL NOT ERASE THE INSTRUCTIONS STORED IN MEMORY.
   1. 2. FULL FLEXIBILITY FOR SELECTIVE INPUT/OUTPUT CONTROL FUNCTIONS BASED ON BOOLEAN 'AND–ING', 'OR–ING', 'NOT–ING', TIMING, AND SPECIAL CODED OPERATIONS SHALL ALSO BE INCORPORATED IN THE RESIDENT SOFTWARE PROGRAMMING OF THE SYSTEM.

B. RESIDENT SOFTWARE SHALL ALLOW FOR FULL CONFIGURATION OF INITIATING CIRCUITS SO THAT ADDITIONAL HARDWARE SHALL NOT BE NECESSARY TO ACCOMMODATE CHANGES IN, FOR INSTANCE, SENSING OF NORMALLY OPEN CONTACT DEVICES TO SENSING OF NORMALLY CLOSED CONTACT DEVICES, OR FROM SENSING OF NORMALLY OPEN CONTACT DEVICES TO SENSING A COMBINATION OF CURRENT LIMITED AND NON–CURRENT LIMITED DEVICES ON THE SAME CIRCUIT AND BEING ABLE TO DIFFERENTIATE BETWEEN THE TWO, OR CHANGING FROM A NON–VERIFICATION CIRCUIT TO A VERIFICATION CIRCUIT OR VICE–VERSA.

C. RESIDENT SOFTWARE SHALL ALSO ALLOW FOR CONFIGURATION OF INDICATING APPLIANCE AND CONTROL CIRCUITS SO THAT ADDITIONAL HARDWARE SHALL NOT BE NECESSARY TO ACCOMMODATE CHANGES IN, FOR INSTANCE CHANGING A NON–CODED INDICATING APPLIANCE CIRCUIT TO A CODED CIRCUIT, OR FROM A SLOW MARCH TIME (20 BPM) TO A FAST MARCH TIME (120 BPM).

D. THE SYSTEM SHALL HAVE THE CAPABILITY OF RECALLING ALARMS AND TROUBLE CONDITIONS IN CHRONOLOGICAL ORDER FOR THE PURPOSE OF RECREATING AN EVENT HISTORY.

E. ALL PANELS AND PERIPHERAL DEVICES SHALL BE THE STANDARD PRODUCT OF A SINGLE MANUFACTURER AND SHALL DISPLAY THE MANUFACTURER'S NAME ON EACH COMPONENT. THE CATALOG NUMBERS SPECIFIED UNDER THIS SECTION ARE THOSE OF SIMPLEX TIME RECORDER COMPANY AND CONSTITUTE THE TYPE, PRODUCT QUALITY, MATERIAL, AND DESIRED OPERATING FEATURES.

QUALITY ASSURANCE:

A. EACH AND ALL ITEMS OF THE FIRE ALARM SYSTEM SHALL BE LISTED AS A PRODUCT OF A SINGLE FIRE ALARM SYSTEM MANUFACTURER UNDER THE APPROPRIATE CATEGORY BY UNDERWRITERS' LABORATORIES, INC. (UL), AND SHALL BEAR THE UL LABEL. ALL CONTROL EQUIPMENT SHALL BE LISTED UNDER UL CATEGORY UOJZ AS A SINGLE CONTROL UNIT. PARTIAL LISTING SHALL NOT BE ACCEPTABLE.

B. ALL CONTROL EQUIPMENT MUST HAVE TRANSIENT PROTECTION TO COMPLY WITH UL864 REQUIREMENTS.

C. WHERE FIRE ALARM CIRCUITS LEAVE THE BUILDING, ADDITIONAL TRANSIENT PROTECTION MUST BE PROVIDED FOR EACH CIRCUIT. DEVICES MUST BE UL LISTED UNDER STANDARD 497B, ISOLATED LOOP CIRCUIT PROTECTORS.

D. IN ADDITION TO THE UL–UOJZ REQUIREMENT MENTIONED ABOVE, THE SYSTEM CONTROLS SHALL BE UL LISTED FOR POWER LIMITED APPLICATIONS AND ALL CIRCUITS MUST BE MARKED IN ACCORDANCE WITH NEC ARTICLE 760–23.

SUPERVISION:

A. THE SYSTEM SHALL BE 100 ADDRESSABLE STYLE 4 SYSTEM. THE ALARM ACTIVATION OF ANY INITIATION CIRCUIT SHALL NOT PREVENT THE SUBSEQUENT ALARM OPERATION OF ANY OTHER INITIATION CIRCUIT.

B. THERE SHALL BE SUPERVISORY SERVICE INITIATION DEVICE CIRCUITS FOR CONNECTION OF ALL SPRINKLER VALVE SUPERVISORY (TAMPER). DEVICE ACTIVATION SHALL CAUSE A SUPERVISORY ALARM AT THE CONTROL PANEL.

C. THERE SHALL BE INDEPENDENTLY SUPERVISED AND INDEPENDENTLY FUSED INDICATING APPLIANCE CIRCUITS FOR ALARM HORNS AND FLASHING ALARM LAMPS. DISARRANGEMENT CONDITIONS OF ANY CIRCUIT SHALL NOT AFFECT THE OPERATION OF OTHER CIRCUITS.

D. AUXILIARY MANUAL CONTROLS SHALL BE SUPERVISED SO THAT AN "OFF NORMAL" POSITION OF ANY SWITCH SHALL CAUSE AN "OFF NORMAL" SYSTEM TROUBLE.

E. EACH INDEPENDENTLY SUPERVISED CIRCUIT SHALL INCLUDE A DISCRETE LCD READOUT TO INDICATE DISARRANGEMENT CONDITIONS PER CIRCUIT.

F. THE INCOMING POWER TO THE SYSTEM SHALL BE SUPERVISED SO THAT ANY POWER FAILURE MUST BE AUDIBLY AND VISUALLY INDICATED AT THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR. A GREEN "POWER ON" LED SHALL BE DISPLAYED CONTINUOUSLY WHILE INCOMING POWER IS PRESENT.

G. THE SYSTEM BATTERIES SHALL BE SUPERVISED SO THAT A LOW BATTERY CONDITION OR DISCONNECTION OF THE BATTERY SHALL BE AUDIBLY AND VISUALLY INDICATED AT THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR.

H. THE SYSTEM MODULES SHALL BE ELECTRICALLY SUPERVISED FOR MODULE PLACEMENT. SHOULD A MODULE BECOME DISCONNECTED, THE SYSTEM TROUBLE INDICATOR SHALL ILLUMINATE AND THE AUDIBLE TROUBLE SIGNAL SHALL SOUND.

I. THE SYSTEM SHALL HAVE PROVISIONS FOR DISABLING AND ENABLING ALL CIRCUITS INDIVIDUALLY FOR MAINTENANCE OR TESTING PURPOSES.

J. WIRING TO A HARDWIRED (NON–SERIAL) REMOTE ANNUNCIATOR SHALL BE SUPERVISED FOR OPEN AND GROUND CONDITIONS. A SEPARATE ANNUNCIATOR TROUBLE LCD READOUT MUST BE PROVIDED. IT SHALL ILLUMINATE AND AN AUDIBLE TROUBLE SIGNAL SHALL SOUND AT THE CONTROL PANEL UPON THE DETECTION OF AN OPEN OR GROUND CONDITION.

K. THERE SHALL BE INDEPENDENT SUPERVISION FOR OPENS OF THE AIR HANDLING ON/OFF/AUTO SWITCH CONTROL OUTPUT WIRING. A DISCRETE TROUBLE LCD READOUT PER OUTPUT CIRCUIT WILL BE PROVIDED FOR INDICATION. A GROUND CONDITION OF THE AIR HANDLING CONTROL OUTPUT WIRING SHALL INDICATE A COMMON GROUND TROUBLE ON THE CONTROL PANEL.

OPERATION:

A. THE SYSTEM ALARM OPERATION SUBSEQUENT TO THE ALARM ACTIVATION OF ANY MANUAL STATION, AUTOMATIC DETECTION DEVICE, OR SPRINKLER FLOW SWITCH SHALL BE AS FOLLOWS:
   1. ALL AUDIBLE ALARM INDICATING APPLIANCES SHALL SOUND A CONTINUOUS FIRE ALARM SIGNAL UNTIL SILENCED BY THE ALARM SILENCE SWITCH AT THE CONTROL PANEL AT THE REMOTE ANNUNCIATOR.
   2. ALL VISIBLE ALARM INDICATING APPLIANCES SHALL FLASH CONTINUOUSLY UNTIL SYSTEM IS RESET.
   3. ALARM INDICATING APPLIANCES SHALL OPERATE SELECTIVELY BY ZONE.
   4. THE AUDIBLE ALARMS SHALL BE AUTOMATICALLY SILENCED AFTER 2 MINUTES OF ALARM OPERATION.
   5. ANY SUBSEQUENT ZONE ALARM SHALL REACTIVATE THE ALARM INDICATING APPLIANCES.
   6. ALL DOORS NORMALLY HELD OPEN BY DOOR CONTROL DEVICES SHALL RELEASE AFTER A 5–SECOND TIME DELAY.
   7. A SUPERVISED SIGNAL TO NOTIFY THE LOCAL FIRE DEPARTMENT SHALL BE ACTIVATED.
   8. THE MECHANICAL CONTROLS SHALL ACTIVATE THE AIR HANDLING SYSTEMS IN ACCORDANCE WITH NFPA 90.

B. UPON RESET OF THE FIRE ALARM CONTROL PANEL, AIR HANDLING UNITS SHALL SEQUENTIALLY START UP TO MINIMIZE POWER DEMAND.

C. THE ALARM SHALL BE DISPLAYED ON AN 80 CHARACTER LCD DISPLAY. THE TOP LINE OF 40 CHARACTERS SHALL BE THE POINT LABEL AND THE SECOND LINE SHALL BE THE DEVICE TYPE IDENTIFIER. THE SYSTEM ALARM LED SHALL FLASH ON THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR UNTIL THE ALARM HAS BEEN ACKNOWLEDGED. ONCE ACKNOWLEDGED, THIS SAME LED SHALL LATCH ON. A SUBSEQUENT ALARM RECEIVED FROM ANOTHER ZONE SHALL FLASH THE SYSTEM ALARM LED ON THE CONTROL PANEL AND REMOTE ANNUNCIATOR. THE LCD DISPLAY SHALL SHOW THE NEW ALARM INFORMATION.

D. A PULSING ALARM TONE SHALL OCCUR WITHIN THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR UNTIL THE EVENT HAS BEEN ACKNOWLEDGED.

E. THE ACTIVATION OF ANY SYSTEM SMOKE DETECTOR SHALL INITIATE AN ALARM VERIFICATION OPERATION WHEREBY THE PANEL WILL RESET THE ACTIVATED DETECTOR AND WAIT FOR A SECOND ALARM ACTIVATION. IF, WITHIN ONE (1) MINUTE AFTER RESETTING, A SECOND ALARM IS REPORTED FROM THE SAME OR ANY OTHER SMOKE DETECTOR, THE SYSTEM SHALL PROCESS THE ALARM AS DESCRIBED PREVIOUSLY. IF NO SECOND ALARM OCCURS WITHIN ONE MINUTE, THE SYSTEM SHALL RESUME NORMAL OPERATION. THE ALARM VERIFICATION SHALL OPERATE ONLY ON SMOKE DETECTOR ALARMS. OTHER ACTIVATED INITIATING DEVICES SHALL BE PROCESSED IMMEDIATELY. THE ALARM VERIFICATION OPERATION SHALL BE SELECTABLE BY ZONE.
   1. THE CONTROL PANEL SHALL HAVE THE CAPABILITY TO DISPLAY THE NUMBER OF TIMES (TALLY) A ZONE HAS GONE INTO A VERIFICATION MODE. SHOULD THIS SMOKE VERIFICATION TALLY REACH A PRE–PROGRAMMED NUMBER, A TROUBLE CONDITION SHALL OCCUR.
   2. ALARM VERIFICATION ZONES SHALL BE ABLE TO BE DIVIDED INTO EIGHT SEPARATE GROUPS WHEREBY ONLY VERIFICATION ZONES FROM THE SAME GROUP WILL CONFIRM THE FIRST ACTIVATION AND CAUSE THE ALARM SEQUENCE TO OCCUR.

F. THE CONTROL PANEL SHALL HAVE A DEDICATED SUPERVISORY SERVICE LED AND A DEDICATED SUPERVISORY SERVICE ACKNOWLEDGE SWITCH.
   1. THE ACTIVATION OF ANY STANDPIPE OR SPRINKLER VALVE SUPERVISORY (TAMPER) SWITCH SHALL ACTIVATE THE SYSTEM SUPERVISORY SERVICE AUDIBLE SIGNAL AND ILLUMINATE THE LED AT THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR. DIFFERENTIATION BETWEEN VALVE TAMPER ACTIVATION AND OPENS AND/OR GROUNDS ON THE INITIATION CIRCUIT WIRING SHALL BE PROVIDED.
   2. PRESSING THE SUPERVISORY SERVICE ACKNOWLEDGE KEY WILL SILENCE THE SUPERVISORY AUDIBLE SIGNAL WHILE MAINTAINING THE SUPERVISORY SERVICE LED "ON" INDICATING THE OFF–NORMAL CONDITION.
   3. RESTORING THE VALVE TO THE NORMAL POSITION SHALL CAUSE THE SUPERVISORY SERVICE LED TO EXTINGUISH, INDICATING RESTORATION TO NORMAL.

G. THE ALARM ACTIVATION BY EITHER A MANUAL OR AN ELECTRICALLY–OPERATED CODED STATION SHALL PULSE THE ALARM INDICATING APPLIANCE TO FOLLOW THAT CODE. THE CODED INPUT SIGNAL SHALL TAKE PRIORITY OVER ALL OTHER INPUT SIGNALS. ALL OTHER ALARM INPUTS SHALL BE PROCESSED ACCORDINGLY AFTER CODING IS COMPLETED. IF FNIS CODE IS INTERRUPTED, IT MUST BE RESTARTED AND COMPLETED IN ITS ENTIRETY WITHOUT MISSING ANY PORTION OF THE CODE. ACTIVATION OF CONTROL CIRCUITS FOR DOOR RELEASE AND AIR HANDLING SYSTEM SHALL NOT BE DELAYED.

H. A MANUAL EVACUATION (DRILL) SWITCH SHALL BE PROVIDED TO OPERATE THE ALARM INDICATING APPLIANCES WITHOUT CAUSING OTHER CONTROL CIRCUITS TO BE ACTIVATED. HOWEVER, SHOULD A TRUE ALARM OCCUR, ALL ALARM FUNCTIONS WOULD OCCUR AS DESCRIBED PREVIOUSLY.

I. ACTIVATION OF AN AUXILIARY BYPASS SWITCH SHALL OVERRIDE THE SELECTED AUTOMATIC FUNCTIONS.

J. THE SYSTEM SHALL HAVE A SINGLE KEY THAT WILL ALLOW THE OPERATOR TO DISPLAY ALL ALARMS, TROUBLES, AND SUPERVISORY SERVICE CONDITIONS INCLUDING THE TIME OF EACH OCCURRENCE.

K. THE ACTUATION OF THE "ENABLE WALK TEST" PROGRAM AT THE CONTROL PANEL SHALL ACTIVATE THE "WALK TEST" MODE OF THE SYSTEM WHICH SHALL CAUSE THE FOLLOWING TO OCCUR:
   1. THE CITY CIRCUIT CONNECTION SHALL BE BYPASSED.
   2. CONTROL RELAY FUNCTIONS SHALL BE BYPASSED.
   3. THE CONTROL PANEL SHALL SHOW A TROUBLE CONDITION.
   4. THE ALARM ACTIVATION OF ANY INITIATION DEVICE SHALL CAUSE THE AUDIBLE SIGNALS TO ACTIVATE FOR TWO SECONDS.
   5. THE PANEL SHALL AUTOMATICALLY RESET ITSELF AFTER SIGNALING IS COMPLETE.
   6. ANY MOMENTARY OPENING OF AN INITIATING OR INDICATING APPLIANCE CIRCUIT WIRING SHALL CAUSE THE AUDIBLE SIGNALS TO SOUND FOR 4 SECONDS INDICATING A TROUBLE CONDITION.
   7. THE SYSTEM SHALL HAVE THE CAPACITY OF A 8 DISTINCTIVE WALK TEST GROUPS. SUCH THAT ONLY A PORTION OF THE SYSTEM NEED BE DISABLED DURING TESTING.

POWER REQUIREMENTS:

A. THE CONTROL PANEL SHALL RECEIVE 120 VAC POWER (AS NOTED ON THE PLANS) VIA A DEDICATED FUSED DISCONNECT CIRCUIT.

B. THE SYSTEM SHALL BE PROVIDED WITH SUFFICIENT BATTERY CAPACITY TO OPERATE THE ENTIRE SYSTEM UPON LOSS OF NORMAL 120 VAC POWER IN A NORMAL SUPERVISORY MODE FOR A PERIOD OF FOUR (4) HOURS WITH 15 MINUTES OF ALARM OPERATION AT THE END OF THIS PERIOD. THE SYSTEM SHALL AUTOMATICALLY TRANSFER TO THE STANDBY BATTERIES UPON POWER FAILURE. ALL BATTERY CHARGING AND RECHARGING OPERATIONS SHALL BE AUTOMATIC.

C. ALL EXTERNAL CIRCUITS REQUIRING SYSTEM OPERATING POWER SHALL BE 24 VDC AND SHALL BE INDIVIDUALLY FUSED AT THE CONTROL PANEL.

FIRE ALARM CONTROL PANEL

A. CONTROL PANEL CONSTRUCTION SHALL BE MODULAR WITH SOLID–STATE, MICROPROCESSOR–BASED ELECTRONICS. IT SHALL DISPLAY ONLY THOSE PRIMARY CONTROLS AND DISPLAYS ESSENTIAL TO OPERATION DURING A FIRE ALARM CONDITION. KEYBOARDS OR KEYPADS SHALL NOT BE REQUIRED TO OPERATE THE SYSTEM DURING FIRE ALARM CONDITIONS.
   1. A LOCAL AUDIBLE DEVICE SHALL SOUND DURING ALARM, TROUBLE, OR SUPERVISORY CONDITIONS. THIS AUDIBLE DEVICE SHALL SOUND DIFFERENTLY DURING EACH CONDITION TO DISTINGUISH ONE CONDITION FROM ANOTHER WITHOUT HAVING TO VIEW THE PANEL. THIS AUDIBLE DEVICE SHALL ALSO SOUND DURING EACH KEYPRESS TO PROVIDE AN AUDIBLE FEEDBACK TO ENSURE THAT THE KEY HAS BEEN PRESSED PROPERLY.

B. THE FOLLOWING PRIMARY CONTROLS SHALL BE VISIBLE THROUGH A FRONT ACCESS PANEL:
   1. EIGHTY CHARACTER LIQUID CRYSTAL DISPLAY.
   2. INDIVIDUAL RED SYSTEM ALARM LED.
   3. INDIVIDUAL YELLOW SUPERVISORY SERVICE LED.
   4. INDIVIDUAL YELLOW TROUBLE LED.
   5. GREEN "POWER ON" LED.
   6. ALARM ACKNOWLEDGE KEY.
   7. SUPERVISORY ACKNOWLEDGE KEY.
   8. TROUBLE ACKNOWLEDGE KEY.
   9. ALARM SILENCE KEY.
   10. SYSTEM RESET KEY.
   11. INDIVIDUAL RED PRIORITY 2 ALARM LED.
   12. YELLOW SIGNALS SILENCED LED.
   13. PRIORITY 2 ALARM ACKNOWLEDGE KEY.

C. THE FOLLOWING SECONDARY CONTROL SWITCHES AND LEDS SHALL BE AVAILABLE BEHIND AN ACCESS DOOR:
   1. CITY DISCONNECT/SWITCH.
   2. 2.MANUAL EVACUATION (DRILL).
   3. DOOR HOLDER RELEASE BYPASS.
   4. FUTURE.

D. THE CONTROL PANEL SHALL PROVIDE THE FOLLOWING:
   1. SETTING OF TIME AND DATE.
   2. LED TESTING.
   3. ALARM, TROUBLE, AND ABNORMAL CONDITION LISTING.
   4. ENABLING AND DISABLING OF EACH MONITOR POINT SEPARATELY.
   5. ACTIVATION AND DEACTIVATION OF EACH CONTROL POINT SEPARATELY.
   6. CHANGING OPERATOR ACCESS LEVELS.
   7. WALK TEST ENABLE.
   8. RUNNING DIAGNOSTIC FUNCTIONS.
   9. DISPLAYING SOFTWARE REVISION LEVEL.
   10. DISPLAYING HISTORICAL LOGS.
   11. DISPLAYING CARD STATUS.
   12. POINT LISTING.

E. FOR MAINTENANCE PURPOSES, THE FOLLOWING LISTS SHALL BE AVAILABLE FROM THE POINT LISTS MENU:
   1. ALL POINTS LIST BY ADDRESS.
   2. MONITOR POINT LIST.
   3. SIGNAL/SPEAKER LIST.
   4. AUXILIARY CONTROL LIST.
   5. FEEDBACK POINT LIST.
   6. PSEUDO POINT LIST.
   7. LED/SWITCH STATUS LIST.

F. SCROLLING THROUGH MENU OPTIONS OR LISTS SHALL BE ACCOMPLISHED IN A SELF–DIRECTING MANNER IN WHICH PROMPTING MESSAGES SHALL DIRECT THE USER. THESE CONTROLS SHALL BE LOCATED BEHIND AN ACCESS DOOR.

G. PRIMARY KEYS, LEDS, AND LCD DISPLAY:
   1. THE CONTROL PANEL SHALL HAVE A 2 LINE X 40 CHARACTER LIQUID CRYSTAL DISPLAY WHICH SHALL BE BACKLIT FOR ENHANCED READABILITY. SO AS TO CONSERVE BATTERY STANDBY POWER, IT SHALL NOT BE LIT DURING AN AC POWER FAILURE UNLESS AN ALARM CONDITION OCCURS OR THERE IS KEYPAD ACTIVITY.
   2. THE DISPLAY SHALL SUPPORT BOTH UPPER AND LOWER CASE LETTERS. LOWERCASE LETTERS SHALL BE USED FOR SOFTKEY TITLES AND PROMPTING THE USER. UPPERCASE LETTERS SHALL BE USED FOR SYSTEM STATUS INFORMATION. A CURSOR SHALL BE VISIBLE WHEN ENTERING INFORMATION.

SYSTEM PANEL OPERATION AND CAPABILITIES:

A. UNDER NORMAL CONDITION, THE FRONT PANEL SHALL DISPLAY A "SYSTEM IS NORMAL" MESSAGE AND THE CURRENT TIME AND DATE.

B. SHOULD AN ABNORMAL CONDITION BE DETECTED, THE APPROPRIATE LED (ALARM, SUPERVISORY, OR TROUBLE) SHALL FLASH. THE PANEL AUDIBLE SIGNAL SHALL PULSE FOR ALARM CONDITIONS AND SOUND STEADY FOR TROUBLE AND SUPERVISORY CONDITIONS.

C. FIRE ALARM CONTROL SYSTEM NETWORK:
   1. FIRE ALARM CONTROL PANEL SHALL OPERATE AS A PROPRIETARY LOCAL SYSTEM WITH DATA COMMUNICATION TO A HIGHER ORDER CENTRAL PROCESSING UNIT (CPU).
   2. THE CPU SHALL MONITOR ALL ALARMS AND TROUBLES OF EACH FIRE ALARM CONTROL PANEL.
   3. THE CPU SHALL CONTROL EACH FIRE ALARM CONTROL PANEL AS LISTED IN THIS SPECIFICATION.
   4. ALL DATA COMMUNICATION WIRING BETWEEN THE CPU AND FIRE ALARM CONTROL PANEL SHALL BE SUPERVISED FOR OPENS, SHORTS, AND GROUNDS.

D. TWO METHODS OF ACKNOWLEDGEMENT FOR EACH ABNORMAL CONDITION SHALL BE PROVIDED. ONE MAY BE CHOSEN DEPENDING ON THE NFPA REQUIREMENTS.
   1. FOR NFPA 72D REQUIREMENTS:
      PRESSING THE APPROPRIATE ACKNOWLEDGE BUTTON SHALL DISPLAY THE FIRST UNACKNOWLEDGED CONDITION IN THE APPROPRIATE LIST (EITHER ALARM, SUPERVISORY, OR TROUBLE), AND REQUIRE ANOTHER ACKNOWLEDGE BUTTON. PRESS TO ACKNOWLEDGE ONLY THE DISPLAYED POINT.
   2. FOR NFPA 72A, B, OR C REQUIREMENTS:
      PRESSING THE APPROPRIATE ACKNOWLEDGE BUTTON SHALL GLOBALLY ACKNOWLEDGE EVERY POINT IN THE LIST.

E. EQUIPMENT ENCLOSURES: PROVIDE CABINETS OF SUFFICIENT SIZE TO ACCOMMODATE THE AFOREMENTIONED EQUIPMENT. CABINET SHALL BE EQUIPPED WITH LOCKS AND TRANSPARENT DOOR PANEL PROVIDING FREEDOM FROM TAMPERING YET ALLOWING FULL VIEW OF THE VARIOUS LIGHTS AND CONTROLS.

MULTIPLE ADDRESSABLE PERIPHERAL NETWORK (MAPNET):

A. COMMUNICATION WITH ADDRESSABLE DEVICES. THE SYSTEM MUST PROVIDE COMMUNICATION WITH INITIATING AND CONTROL DEVICES INDIVIDUALLY. ALL OF THESE DEVICES WILL BE INDIVIDUALLY ANNUNCIATED AT THE CONTROL PANEL. ANNUNCIATION SHALL INCLUDE THE FOLLOWING CONDITIONS FOR EACH POINT:
   1. ALARM.
   2. TROUBLE.
   3. OPEN.
   4. SHORT.
   5. DEVICE MISSING/FAILED.

B. ALL ADDRESSABLE DEVICES SHALL HAVE THE CAPABILITY OF BEING DISABLED OR ENABLED INDIVIDUALLY.

C. UP TO 127 ADDRESSABLE DEVICES MAY BE MULTIDROPPED FROM A SINGLE PAIR OF WIRES. SYSTEMS THAT REQUIRE FACTORY REPROGRAMMING TO ADD OR DELETE DEVICES ARE UNACCEPTABLE.

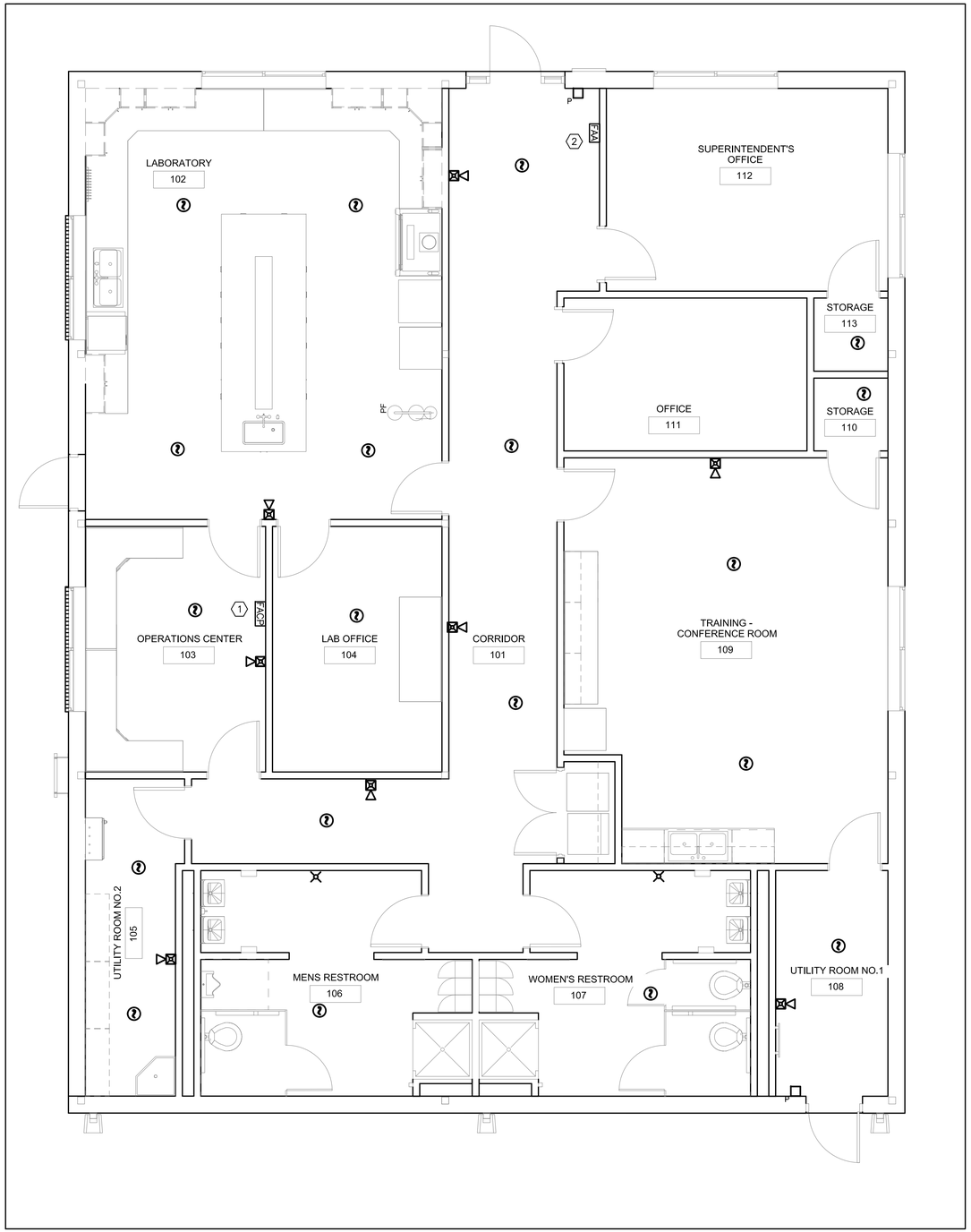
D. FORMAT: THE COMMUNICATION FORMAT MUST BE A COMPLETELY DIGITAL POLL/RESPONSE PROTOCOL TO ALLOW T–TAPPING OF THE CIRCUIT WIRING. A HIGH DEGREE OF COMMUNICATION RELIABILITY MUST BE OBTAINED BY USING PARITY DATA BIT ERROR CHECKING ROUTINES FOR ADDRESS CODES AND CHECK SUM ROUTINES FOR THE DATA TRANSMISSION PORTION OF THE PROTOCOL. SYSTEMS THAT DO NOT UTILIZE FULL DIGITAL TRANSMISSION PROTOCOL ARE NOT ACCEPTABLE.

E. IDENTIFICATION OF ADDRESSABLE DEVICES: EACH ADDRESSABLE DEVICE MUST BE UNIQUELY IDENTIFIED BY AN ADDRESS CODE ENTERED ON EACH DEVICE AT TIME OF INSTALLATION. THE USE OF JUMPERS TO SET ADDRESS WILL NOT BE ACCEPTABLE DUE TO THE POTENTIAL OF VIBRATION AND POOR CONTACT. DEVICE IDENTIFICATION SCHEMES THAT DO NOT USE UNIQUELY SET ADDRESSES BUT RELY ON ELECTRICAL POSITION ALONG THE COMMUNICATION CHANNEL ARE UNACCEPTABLE. THESE SYSTEMS CANNOT ACCOMMODATE T–TAPPING THE ADDITION OF AN ADDRESSABLE DEVICE BETWEEN EXISTING DEVICES REQUIRES REPROGRAMMING ALL EXISTING ELECTRICALLY FURTHER DEVICES. THE SYSTEM MUST VERIFY THAT PROPER TYPE DEVICE IS IN PLACE AND MATCHES THE DESIRED SOFTWARE CONFIGURATION.

F. WIRING TYPE, DISTANCES, SURVIVABILITY, AND CONFIGURATIONS: WIRING TYPES WILL BE APPROVED BY THE EQUIPMENT MANUFACTURER. EXISTING WIRING WILL BE UTILIZED IN RETROFIT APPLICATIONS. THE SYSTEM SHALL ALLOW A LINE DISTANCE OF UP TO 2,500 FEET TO THE FURTHEST ADDRESSABLE DEVICE ON A CLASS B CIRCUIT. (CLASS A COMMUNICATIONS WILL BE PROVIDED WHERE SHOWN ON THE DRAWINGS. WIRE WILL BE ROUTED TO MAINTAIN SUFFICIENT DISTANCE BETWEEN THE FORWARD AND RETURN LOOP AS CALLED FOR BY THE AUTHORITY HAVING JURISDICTION.) TO MINIMIZE WIRE ROUTING AND TO FACILITATE FUTURE ADDITIONS, T–TAPPING OF THE COMMUNICATIONS CHANNEL WILL BE SUPPORTED EXCEPT WHERE CLASS A WIRING IS REQUIRED.

G. ADDRESSABLE DEVICE TYPES:
   1. GENERAL: THE SYSTEM CONTROL PANEL, MUST BE CAPABLE OF COMMUNICATING WITH THE TYPES OF ADDRESSABLE DEVICES SPECIFIED BELOW. ADDRESSABLE DEVICES WILL BE LOCATED AS SHOWN ON THE DRAWINGS.
   2. TRUEALARM ADDRESSABLE DETECTOR BASES – SIMPLEX TYPE 4098–9781: ALL ADDRESSABLE SMOKE AND HEAT DETECTOR HEADS AS SPECIFIED BELOW WILL BE PLUGGABLE INTO THEIR BASES. THE BASE WILL CONTAIN ELECTRONICS THAT COMMUNICATE THE DETECTOR STATUS (NORMAL, ALARM, TROUBLE) TO THE CONTROL PANEL OVER TWO WIRES. THE SAME TWO WIRES SHALL ALSO PROVIDE POWER TO THE BASE AND DETECTOR. DIFFERENT DETECTOR HEADS (SMOKE OR HEAT) MUST BE INTERCHANGEABLE. UPON REMOVAL OF THE HEAD, A TROUBLE SIGNAL WILL BE TRANSMITTED TO THE CONTROL PANEL.
   3. PHOTOELECTRIC TRUEALARM SENSOR :
      a. THE PHOTOELECTRIC TYPE DETECTOR SHALL BE A PLUG–IN UNIT WHICH MOUNTS TO A TWIST–LOCK BASE, AND SHALL BE UL APPROVED.
      b. THE DETECTORS SHALL BE OF THE SOLID–STATE PHOTOELECTRIC TYPE AND SHALL CONTAIN NO RADIOACTIVE MATERIAL. THEY WILL USE A PULSED INFRARED LED LIGHT SOURCE AND BE SEALED AGAINST REAR AIRFLOW ENTRY.
      c. THE DETECTOR SHALL FIT INTO A BASE THAT IS COMMON WITH BOTH THE HEAT DETECTOR AND IONIZATION TYPE DETECTOR AND SHALL BE COMPATIBLE WITH OTHER ADDRESSABLE DETECTORS, ADDRESSABLE MANUAL STATIONS, AND ADDRESSABLE ZONE ADAPTER MODULES ON THE SAME CIRCUIT.
      d. THERE SHALL BE NO LIMIT TO THE NUMBER OF DETECTORS OR ZONE ADAPTER MODULES WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.
   4. ADDRESSABLE THERMAL DETECTOR HEAD : THERMAL DETECTOR HEADS MUST BE UL LISTED. THEY WILL BE A COMBINATION RATE–OF–RISE AND FIXED TEMPERATURE (135 F OR 190 F AS NOTED ON DRAWINGS) TYPE, AUTOMATICALLY RESTORABLE.
   5. ADDRESSABLE PULL STATIONS :
      a. ADDRESSABLE PULL STATIONS WILL CONTAIN ELECTRONICS THAT COMMUNICATE THE STATION'S STATUS (ALARM, NORMAL) TO THE TRANSPONDER OVER TWO WIRES WHICH ALSO PROVIDE POWER TO THE PULL STATION. THE ADDRESS WILL BE SET ON THE STATION. THEY WILL BE MANUFACTURED FROM HIGH IMPACT RED LEXAN. STATION WILL MECHANICALLY LATCH UPON OPERATION AND REMAIN SO UNTIL MANUALLY RESET BY OPENING WITH A KEY COMMON TO ALL SYSTEM LOCKS. PULL STATIONS WILL BE DOUBLE ACTION.
      b. THE FRONT OF THE STATION IS TO BE HINGED TO A BACKPLATE ASSEMBLY AND MUST BE OPENED WITH A KEY TO RESET THE STATION. THE KEY SHALL BE COMMON WITH THE CONTROL PANELS. STATIONS WHICH USE ALLEN WRENCHES OR SPECIAL TOOLS TO RESET, WILL NOT BE ACCEPTED. THE STATION SHALL CONSIST OF HIGH IMPACT LEXAN PLASTIC, RED IN COLOR.
      c. THE ADDRESSABLE MANUAL STATION SHALL BE CAPABLE OF FIELD PROGRAMMING OF ITS "ADDRESS" LOCATION ON AN ADDRESSABLE INITIATING CIRCUIT. THE MANUAL STATION SHALL BE FITTED WITH SCREW TERMINALS FOR FIELD WIRE ATTACHMENT.
      d. THERE SHALL BE NO LIMIT TO THE NUMBER OF STATIONS, DETECTORS OR ZONE ADAPTER MODULES, WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.
      e. THE ADDRESSABLE MANUAL STATION SHALL BE UL LISTED.
   7. WATER FLOW, VALVE TAMPER, NON–ADDRESSABLE DETECTORS, AND FOR CONTROL OF EVACUATION INDICATING APPLIANCES AND AHU SYSTEMS:
   8. ADDRESSABLE DEVICE SUPERVISION:
      a. ALL DEVICES SHALL BE SUPERVISED FOR TROUBLE CONDITIONS. THE SYSTEM CONTROL PANEL WILL BE CAPABLE OF DISPLAYING THE TYPE OF TROUBLE CONDITION (OPEN, SHORT, DEVICE MISSING/FAILED).
      b. SHOULD A DEVICE FAIL, IT WILL NOT HINDER THE OPERATION OF OTHER SYSTEM DEVICES.

H. EVACUATION SIGNALS:
   1. CHIME AND FLASHING ADA STROBE: WHEELOCK CH70–241575W–FR.
   2. HORN AND FLASHING XENON LIGHT: 4903_9219 ADA STROBE.
   3. FLASHING XENON LIGHT: 4904_9137 WITH STANDARD LETTERING WHEN WALL MOUNTED. SPECIAL LETTERING, VERTICAL ON RECTANGULAR FACES AND HORIZONTAL ON TRIANGULAR WHEN CEILING MOUNTED.
   4. WATERFLOW SWITCHES SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 15 AND CONNECTED BY THE ELECTRICAL CONTRACTOR. TO PREVENT FALSE ALARMS, THE FLOW SWITCH SHALL INCORPORATE AN ADJUSTABLE TIME DELAY MECHANISM BETWEEN THE PADDLE OPERATED STEM AND THE ALARM INITIATING CONTACTS.
   5. 5. SPRINKLER VALVE TAMPER SWITCHES SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 15 AND CONNECTED



1 FA200 FIRE ALARM FLOOR PLAN

SCALE: 1/4" = 1'-0"

0 2' 4' 8'

FIRE ALARM PLAN GENERAL NOTES:

A. WIRE AND CABLE FOR FIRE ALARM SYSTEM SHALL BE UL LISTED AND LABELED AS COMPLYING WITH NFPA 70, ARTICLE 760. SIGNALING LINE CIRCUITS SHALL BE COMPRISED OF CIRCUIT INTEGRITY CABLE, TWISTED SHIELDED PAIR, NFPA 70 ARTICLE 760, CLASSIFICATION CI, FOR POWER-LIMITED FIRE ALARM SIGNAL SERVICE, UL LISTED AS TYPE FPL, AND COMPLYING WITH REQUIREMENTS IN UL 1424 AND IN UL 2196 FOR A 2-HOUR RATING.

B. FIRE ALARM CONTROL PANEL SHALL BE INTERLOCKED WITH SPRINKLE SYSTEM.

C. FIRE ALARM SIGNALING LINE CIRCUITS SHALL COMPLY WITH NFPA 72, CLASS B, STYLE 4. NOTIFICATION-APPLIANCE CIRCUITS SHALL COMPLY WITH NFPA 72, CLASS A, STYLE Z.

D. REFERENCE MECHANICAL DRAWINGS FOR EXACT LOCATIONS OF DAMPERS & DUCT DETECTORS. PROVIDE LOW VOLTAGE WIRING AS REQUIRED.

E. REFER TO DRAWING E-9 FOR FIRE ALARM LEGEND AND RISER DIAGRAM.

F. REFER TO SPRINKLER DRAWING FOR ALL THE FIRE PROTECTION CONNECTION REQUIREMENTS.

FIRE ALARM PLAN KEY NOTES:

1. FIRE ALARM CONTROL PANEL. LOCATION TO BE VERIFIED WITH OWNER PRIOR TO INSTALL.
2. FIRE ALARM REMOTE ANNUNCIATOR PANEL.

GMC
6120 Powers Ferry Road NW,
Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA
GOODWYN MILLS CAWOOD, LLC
No. PE032226
Exp.06.30.2026
CERTIFICATE OF AUTHORIZATION

1" 0" .5" 1"

ISSUE	DATE	
30% Submittal	05.30.2024	
60% Submittal	08.29.2024	
90% Submittal	11.27.2024	
Bid Set	03.19.2025	
Conformed Set		CW
Project Manager:		
Engineer:		GS
Designer:		GS
Drawn By:		

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

STATE OF GEORGIA
PE032226
PROFESSIONAL
ENGINEER
GABRIEL KATZ

4/22/2025

FIRE ALARM
FLOOR PLAN

FA200

	TAG	SERVICE	TYPE	SIZE	CONNECTION	OPERATOR	NOTES
	V1001	RWW	PLUG	12	FLG	Handwheel	For Emergency Pump Connection
	V1010	RWW	PLUG	16	MJ	Nut	Buried service; operator in valve box
	V1011	RWW	BALL	1/4	THD	Lever	
	V1012	RWW	BALL	2	THD	Lever	
	V1013	RWW	AIR RELEASE	2	THD	N/A	
	V1014	RWW	SWING CHECK	12	FLG	N/A	
	V1015	RWW	PLUG	12	MJ	Handwheel	Buried service; extended bonnet w/ Handwheel
	V1020	RWW	PLUG	16	MJ	Nut	Buried service; operator in valve box
	V1021	RWW	BALL	1/4	THD	Lever	
	V1022	RWW	BALL	2	THD	Lever	
	V1023	RWW	AIR RELEASE	2	THD	N/A	
	V1024	RWW	SWING CHECK	12	FLG	N/A	
	V1025	RWW	PLUG	12	MJ	Handwheel	Buried service; extended bonnet w/ Handwheel
	V1031	RWW	BALL	1/4	THD	Lever	
	V1032	RWW	BALL	2	THD	Lever	
	V1033	RWW	AIR RELEASE	2	THD	N/A	
	V1034	RWW	SWING CHECK	12	FLG	N/A	
	V1035	RWW	PLUG	12	MJ	Handwheel	Buried service; extended bonnet w/ Handwheel
	V1041	RWW	PLUG	10	MJ	Nut	Buried service; operator in valve box
	V1042	RWW	PLUG	10	MJ	Nut	Buried service; operator in valve box
	V1043	BYPASS	PLUG	10	MJ	Nut	Buried service; operator in valve box
	V1045	RWW	PLUG	12	MJ	Nut	Buried service; operator in valve box
1000	V1055	RWW	PLUG	12	MJ	Nut	Buried service; operator in valve box
	V1110	RWW	PLUG	20	FLG	Handwheel	
	V1111	RUW	SOLENOID	1	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V1112	RUW	BALL	1/4	THD	Lever	
	V1113	RUW	PRESSURE REGULATING	1	THD	N/A	
	V1114	RUW	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V1115	RUW	SOLENOID	3/4	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V1116	RUW	BALL	1/4	THD	Lever	
	V1117	RUW	PRESSURE REGULATING	3/4	THD	N/A	
	V1118	RUW	BALL	3/4	THD	Lever	Furnished by Equipment Manufacturer
	V1120	RWW	PLUG	20	FLG	Handwheel	
	V1121	RUW	SOLENOID	1	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V1122	RUW	BALL	1/4	THD	Lever	
	V1123	RUW	PRESSURE REGULATING	1	THD	N/A	
	V1124	RUW	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V1130	NaOH	BALL	1/2	TRUE UNION	Lever	
	V1131	NaOH	BALL	1/2	TRUE UNION	Lever	
	V1215	RUW	SOLENOID	1-1/2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V1216	RUW	BALL	1/4	THD	Lever	
	V1217	RUW	PRESSURE REGULATING	1-1/2	THD	N/A	
	V1218	RUW	BALL	1-1/2	THD	Lever	Furnished by Equipment Manufacturer
	V1219	D	BALL	2	THD	Lever	
	V2101	RWW	PLUG	24	MJ	Nut	Buried service; operator in valve box
	V2102	BYPASS	PLUG	24	MJ	Nut	Buried service; operator in valve box
	V2103	RWW	PLUG	24	MJ	Nut	Buried service; operator in valve box
	V2104	RWW	PLUG	16	MJ	Nut	Buried service; operator in valve box
2000	V2105	RWW	PLUG	16	MJ	Nut	Buried service; operator in valve box
	V2201	RWW	PLUG	16	MJ	Nut	Buried service; operator in valve box
	V2202	RWW	PLUG	12	FLG	Electric Actuator-Modulating	
	V2203	RWW	PLUG	16	MJ	Nut	Buried service; operator in valve box
	V2204	BYPASS	PLUG	16	MJ	Nut	Buried service; operator in valve box
	V3111	RAS	PLUG	12	FLG	Handwheel	
	V3112	RAS	PLUG	12	FLG	Handwheel	
	V3113	RWW	PLUG	16	FLG	Motorized	
	V3114	RWW	PLUG	16	FLG	Motorized	
	V3115	RWW	PLUG	16	FLG	Motorized	
3000	V3116	NaOH	BALL	1/2	TRUE UNION	Lever	
	V3117	NaOH	BALL	1/2	TRUE UNION	Lever	
	V3118	NaOH	BALL	1/2	TRUE UNION	Lever	
	V3119	D	PLUG	6	FLG	Handwheel	Provided manhole
	V3120	D	PLUG	6	FLG	Handwheel	Provided manhole
	V3211	SSL	PLUG	12	FLG	Electric Actuator-Modulating	
	V3221	SSL	PLUG	12	FLG	Electric Actuator-Modulating	

	TAG	SERVICE	TYPE	SIZE	CONNECTION	OPERATOR	NOTES
	V4010	PACL	BALL	1/2	TRUE UNION	Lever	Furnished by Equipment Manufacturer
	V4011	D	PLUG	6	FLG	Handwheel	Provided manhole
	V4021	D	PLUG	6	FLG	Handwheel	Provided manhole
	V4311	RAS	BALL	1/4	THD	Lever	
	V4312	RAS	BALL	2	THD	Lever	
	V4313	RAS	AIR RELEASE	2	THD	N/A	
	V4314	RAS	SWING CHECK	8	FLG	N/A	
	V4315	RAS	PLUG	8	FLG	Handwheel	
	V4321	RAS	BALL	1/4	THD	Lever	
	V4322	RAS	BALL	2	THD	Lever	
	V4323	RAS	AIR RELEASE	2	THD	N/A	
4000	V4324	RAS	SWING CHECK	8	FLG	N/A	
	V4325	RAS	PLUG	8	FLG	Handwheel	
	V4331	WAS	BALL	1/4	THD	Lever	
	V4332	WAS	BALL	2	THD	Lever	
	V4333	WAS	AIR RELEASE	2	THD	N/A	
	V4334	WAS	SWING CHECK	6	FLG	N/A	
	V4335	WAS	PLUG	6	FLG	Handwheel	
	V4341	WAS	BALL	1/4	THD	Lever	
	V4342	WAS	BALL	2	THD	Lever	
	V4343	WAS	AIR RELEASE	2	THD	N/A	
	V4344	WAS	SWING CHECK	6	FLG	N/A	
	V4345	WAS	PLUG	6	FLG	Handwheel	
	V5100	PACL	BALL	1/2	TRUE UNION	Lever	Furnished by Equipment Manufacturer
	V5101	SE	BUTTERFLY	18	FLG	Handwheel	
	V5102	REC	BALL	3	THD	Lever	
	V5103	D	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5104	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5105	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5106	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5107	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5108	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5109	D	BALL	3	THD	Lever	
	V5111	BWW	BALL	1/4	THD	Lever	
	V5112	BWW	BALL	1/4	THD	Lever	
	V5113	BWW	GATE	3	THD	Lever	Furnished by Equipment Manufacturer
	V5121	BWW	BALL	1/4	THD	Lever	
	V5122	BWW	BALL	1/4	THD	Lever	
	V5123	BWW	GATE	3	THD	Lever	Furnished by Equipment Manufacturer
5000	V5124	D	BUTTERFLY	3	WFR	Lever	
	V5201	SE	BUTTERFLY	18	FLG	Handwheel	
	V5202	REC	BALL	3	THD	Lever	
	V5203	D	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5204	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5205	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5206	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5207	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5208	BWW	BALL	2	THD	Electric Actuated	Furnished by Equipment Manufacturer
	V5209	D	BALL	3	THD	Lever	
	V5211	BWW	BALL	1/4	THD	Lever	
	V5212	BWW	BALL	1/4	THD	Lever	
	V5213	BWW	GATE	3	THD	Lever	Furnished by Equipment Manufacturer
	V5221	BWW	BALL	1/4	THD	Lever	
	V5222	BWW	BALL	1/4	THD	Lever	
	V5223	BWW	GATE	3	THD	Lever	Furnished by Equipment Manufacturer
	V5224	D	BUTTERFLY	3	WFR	Lever	

2

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — NOT VALID WITHOUT ORIGINAL SIGNATURE AND SEAL — CERTIFICATE OF AUTHORIZATION
GOODWYN MILLS CAWOOD, LLC
No. PE051452
Exp.06.30.2026

1" 0" 5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
REV1	04.17.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA REGISTERED No. PE051452 PROFESSIONAL ENGINEER
GRAHAM S. SIZEMORE
05.06.2025

VALVE SCHEDULE

D-921

DRAWING FILE: T:\1 Projects\GA\Commerce\CATL230033 - Commerce 2.0 MGD Grove Creek WPCP\0 DWG\1 PLANS\02 SHEETS\04 PROCESS\D-921 VALVE SCHEDULE.dwg
PLOTTED: May 06, 2025 - 9:37am

	TAG	SERVICE	TYPE	SIZE	CONNECTION	OPERATOR	NOTES
6000	V6010	FE	BUTTERFLY	16	FLG	Handwheel	
	V6011	FNE	BUTTERFLY	16	FLG	Handwheel	
	V6020	FE	BUTTERFLY	16	FLG	Handwheel	
	V6021	FNE	BUTTERFLY	16	FLG	Handwheel	
	V6100	FNE	PLUG	16	MJ	NUT	Buried service; Provided Valve Box
	V6101	RUW	BALL	1/4	THD	Lever	
	V6102	RUW	BALL	1/4	THD	Lever	
	V6103	RUW	CHECK	4	WFR	DISK	Furnished by Equipment Manufacturer
	V6104	RUW	CHECK	4	WFR	DISK	Furnished by Equipment Manufacturer
	V6105	RUW	BUTTERFLY	4	FLG	Lever	Furnished by Equipment Manufacturer
	V6106	RUW	BUTTERFLY	4	FLG	Lever	Furnished by Equipment Manufacturer
	V6107	RUW	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V6108	RUW	AIR RELEASE	1	THD	N/A	Furnished by Equipment Manufacturer
	V6109	RUW	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V6110	RUW	AIR RELEASE	1	THD	N/A	Furnished by Equipment Manufacturer
	V6111	RUW	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V6112	RUW	BALL	2	THD	Lever	Furnished by Equipment Manufacturer
	V6113	RUW	BALL	1/4	THD	Lever	Furnished by Equipment Manufacturer
	V6114	RUW	PRESSURE RELIEF	1-1/4	THD	N/A	Furnished by Equipment Manufacturer
	V6115	RUW	BUTTERFLY	4	FLG	Lever	Furnished by Equipment Manufacturer
	V6116	D	PLUG	6	MJ	Nut	Buried service; operator in valve box
	V6117	D	PLUG	6	MJ	Nut	Buried service; operator in valve box
7000	V7011	WAS	PLUG	6	FLG	Handwheel	
	V7012	AIR	BUTTERFLY	12	WFR	Lever	
	V7013	D	PLUG	8	MJ	2" NUT	Buried service; Provided Valve Box
	V7014	DS	PLUG	8	MJ	2" NUT	Buried service; Provided Valve Box
	V7021	WAS	PLUG	6	FLG	Handwheel	
	V7022	AIR	BUTTERFLY	12	WFR	Lever	
	V7023	D	PLUG	8	MJ	2" NUT	Buried service; Provided Valve Box
	V7024	DS	PLUG	8	MJ	2" NUT	Buried service; Provided Valve Box
	V7030	NaOH	BALL	1/2	TRUE UNION	Lever	
	V7031	PACL	BALL	1/2	TRUE UNION	Lever	
	V7040	NaOH	BALL	1/2	TRUE UNION	Lever	
	V7041	PACL	BALL	1/2	TRUE UNION	Lever	
	V7111	AIR	DUAL PLATE WAFER CHECK	10	WFR	N/A	Furnished by Equipment Manufacturer
	V7112	AIR	BUTTERFLY	10	WFR	Handwheel	
	V7121	AIR	DUAL PLATE WAFER CHECK	10	WFR	N/A	Furnished by Equipment Manufacturer
	V7122	AIR	BUTTERFLY	10	WFR	Handwheel	
	V7132	AIR	BUTTERFLY	10	WFR	Handwheel	
	V7141	AIR	BUTTERFLY	12	WFR	Handwheel	
	V7142	AIR	BUTTERFLY	12	WFR	Handwheel	
	V7210	DS	PLUG	8	FLG	Handwheel	
	V7211	DS	PLUG	8	FLG	Handwheel	
	V7240	POL	BALL CHECK	1	TRUE UNION	N/A	
	V7241	POL	BALL	1	TRUE UNION	Lever	
8000	V8011	PD	BALL	1	THD	Lever	
	V8012	PD	AIR RELEASE	1	THD	N/A	
	V8013	PD	BALL	1/4	THD	Lever	
	V8014	PD	CHECK	8	FLG	N/A	
	V8015	PD	PLUG	8	FLG	Handwheel	
	V8021	PD	BALL	1	THD	Lever	
	V8022	PD	AIR RELEASE	1	THD	N/A	
	V8023	PD	BALL	1/4	THD	Lever	
	V8024	PD	CHECK	8	FLG	N/A	
	V8025	PD	PLUG	8	FLG	Handwheel	
	V8026	PD	PLUG	6	MJ	Nut	Buried service; operator in valve box
	V8027	PD	PLUG	6	MJ	Nut	Buried service; operator in valve box
	V8030	PD	PLUG	6	MJ	Nut	Buried service; operator in valve box

	TAG	SERVICE	TYPE	SIZE	CONNECTION	OPERATOR	NOTES
8000	V8100	NAOH	BALL	2	THD	TRUE UNION	
	V8101	NAOH	BALL	2	THD	TRUE UNION	
	V8102	NAOH	BALL	2	THD	TRUE UNION	
	V8103	D	PLUG	4	MJ	NUT	Buried service; Provided Valve Box
	V8110	NAOH	BALL	2	THD	Lever	Furnished by Equipment Manufacturer
	V8111	V	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V8112	V	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V8113	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8114	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8115	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8116	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8117	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8118	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8123	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8124	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8125	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8126	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8127	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8133	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8134	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8135	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8136	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8137	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8138	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8143	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8144	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8145	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8146	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8147	NAOH	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8200	PACL	BALL	2	THD	TRUE UNION	
	V8201	PACL	BALL	2	THD	TRUE UNION	
	V8202	D	BALL	2	THD	TRUE UNION	
	V8203	D	PLUG	4	MJ	NUT	Buried service; Provided Valve Box
	V8210	PACL	BALL	2	THD	Lever	Furnished by Equipment Manufacturer
	V8211	V	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V8212	V	BALL	1	THD	Lever	Furnished by Equipment Manufacturer
	V8213	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8214	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8215	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8216	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8223	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8224	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8225	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8226	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8233	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8234	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8235	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8236	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8243	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8244	V	SAFETY RELIEF	1/2	THD	N/A	Furnished by Equipment Manufacturer
	V8245	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8246	PACL	BALL	1/2	THD	Lever	Furnished by Equipment Manufacturer
	V8301	POL	BALL	1	THD	TRUE UNION	
	V8310	D	BALL	1	THD	TRUE UNION	
	V8311	POL	BALL	1	THD	TRUE UNION	
	V8312	W	BALL	1	THD	TRUE UNION	

2

GMC
6120 Powers Ferry Road NW, Suite 500
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA
NOT VALID WITHOUT
GOODWYN MILLS CAWOOD, LLC
No. PE000716RS
Exp.06.30.2026
CERTIFICATE OF AUTHORIZATION

1" 0" 5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
REV1	04.17.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

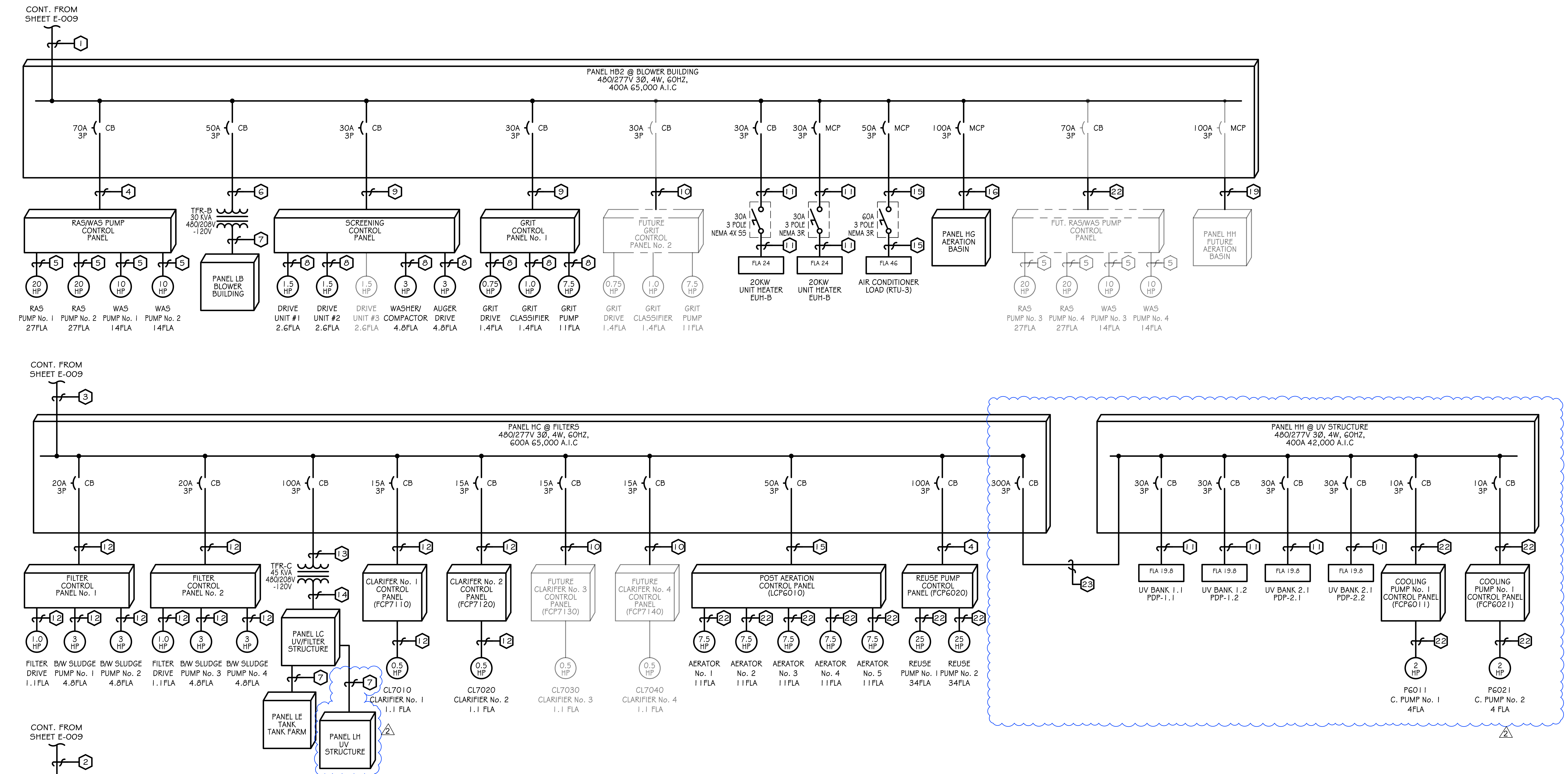
CATL230033

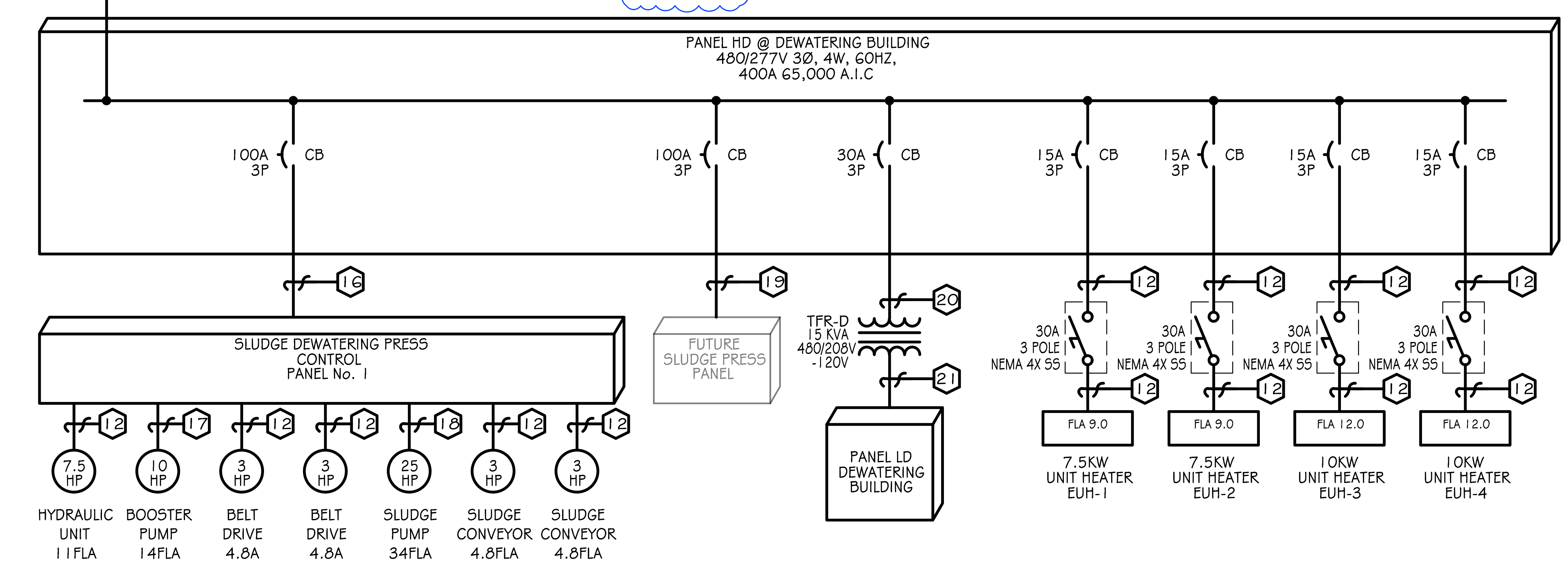
GEORGIA REGISTERED No. PE051452 PROFESSIONAL Graham Sizemore 05.06.2025 ENGINEER GRAHAM S. SIZEMORE

VALVE SCHEDULE

D-922

DRAWING FILE: T:\1 Projects\GA\Commerce\CATL230033 - Commerce 2.0 MGD Grove Creek WPCP\0 DWG\1 PLANS\02 SHEETS\04 PROCESS\D-921 VALVE SCHEDULE.dwg
PLOTTED: May 06, 2025 - 9:38am





CABLE & CONDUIT SCHEDULE

1	2 SETS OF 4#3/0, 1#3(G) - 2.5" C.	10	3/4" C.	19	2" C.
2	4#250KCM, 1#4(G) - 3" C.	11	3#10, 1#10(G) - 3/4" C.	20	3#10, 1#10(G) - 3/4" C.
3	2 SETS OF 4#350KCM, 1#1(G) - 3" C.	12	3#12, 1#12(G) - 3/4" C.	21	4#4, 1#10(G) - 1.25" C.
4	3#4, 1#8(G) - 1.25" C.	13	3#1, 1#8(G) - 2" C.	22	3#14, 1#14(G) - 3/4" C.
5	3#10, 1#10(G) - 3/4" C.	14	4#3/0, 1#6(G) - 2.5" C.	23	4#350, 1#4(G) - 3" C.
6	3#6, 1#10(G) - 1.25" C.	15	3#6, 1#10(G) - 1.25" C.		
7	4#1, 1#6(G) - 2" C.	16	3#1, 1#8(G) - 2" C.		
8	3#12, 1#12(G) - 3/4" C.	17	3#10, 1#10(G) - 3/4" C.		
9	3#10, 1#10(G) - 3/4" C.	18	3#8, 1#8(G) - 1" C.		

2

NOTE: CABLE AND CONDUIT SCHEDULE ITEM 12 SHALL BE USED FOR ALL PANEL HG FEEDERS.

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

GOODWYN MILLS CAWOOD, LLC
No.PEF007898
Exp.06.30.2026

1" .5" 0" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
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Bid Set	03.19.2025
2 REV2	05.06.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

03/19/2025
NO. 31217
CHARLES K. BUTTERFIELD

CATL230033

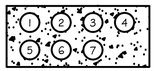
TREATMENT PLANT SINGLE LINE DIAGRAM (CONT.)

E-010

DRAWING FILE: G:\Shared drives\BFIELD\Commerce\Drawings\E-001 CATL230033 Single Line Diagram.dwg
PLOTTED: May 06, 2025 - 10:31am

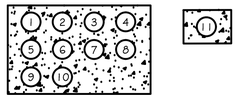
DB-1

1 - 4" C. (POWER COMPANY FEEDERS)
2 - 4" C. (POWER COMPANY FEEDERS)



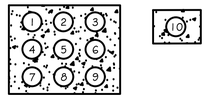
DB-2

1 - 3.5" C. (480V POWER CO TO ATS)
2 - 3.5" C. (480V POWER CO TO ATS)
3 - 3.5" C. (480V POWER CO TO ATS)
4 - 3.5" C. (480V POWER CO TO ATS)
5 - 3.5" C. (480V POWER CO TO ATS)
6 - 3.5" C. (480V POWER CO TO ATS)
7 - 3.5" C. (480V POWER CO TO ATS)



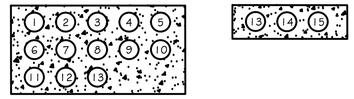
DB-3

1 - 3.5" C. (480V ATS TO SWITCHBOARD)
2 - 3.5" C. (480V ATS TO SWITCHBOARD)
3 - 3.5" C. (480V ATS TO SWITCHBOARD)
4 - 3.5" C. (480V ATS TO SWITCHBOARD)
5 - 3.5" C. (480V ATS TO SWITCHBOARD)
6 - 3.5" C. (480V ATS TO SWITCHBOARD)
7 - 3.5" C. (480V ATS TO SWITCHBOARD)
8 - 1" C. (208V TO GENERATOR)
9 - 1" C. (120V TO GENERATOR)
10 - 1" C. (SPARE)
11 - 1" C. (CONTROL)



DB-4

1 - 3.5" C. (480V GENERATOR TO ATS)
2 - 3.5" C. (480V GENERATOR TO ATS)
3 - 3.5" C. (480V GENERATOR TO ATS)
4 - 3.5" C. (480V GENERATOR TO ATS)
5 - 3.5" C. (480V GENERATOR TO ATS)
6 - 3.5" C. (SPARE)
7 - 1" C. (208V TO GENERATOR)
8 - 1" C. (120V TO GENERATOR)
9 - 1" C. (SPARE)
10 - 1" C. (CONTROL)



DB-5&6

1 - 3/4" C. (480V TO SCREENING PANEL No. 1)
2 - 3/4" C. (480V TO SCREENING PANEL No. 2)
3 - 3/4" C. (480V TO CONVEYOR PANEL)
4 - 3/4" C. (FUT. SCREENING PANEL No. 3)
5 - 3/4" C. (480V TO GRIT REMOVAL CONTROL PANEL)
6 - 3/4" C. (FUT. GRIT REMOVAL PANEL)
7 - 1.5" C. (120V CKTS.)
8 - 1.5" C. (SPARE)
9 - 1.25" C. (480V TO EQ. AERATOR 1)
10 - 1.25" C. (480V TO EQ. AERATOR 2)
11 - 1.25" C. (480V TO EQ. AERATOR 3)
12 - 2.5" C. (480V TO PANEL HD)
13 - 2.5" C. (480V TO PANEL HD)
14 - 1.5" C. (CONTROL)
15 - 1.5" C. RGS (SIGNAL)
16 - 1.5" C. (SPARE)

LEGEND

PROPOSED

DUCT BANK W/ CONCRETE HATCH INDICATES CONCRETE ENCASED DUCT BANK. SEE DUCT BANK INSTALLATION DETAIL SHEET E-003. SHADED DUCTS TO BE MODIFIED.

DUCT BANK W/ SOLID HATCH INDICATES SAND ENCASED CONDUITS SEE CONDUIT ROUTING DETAIL SHEET E-003.

NOTES:

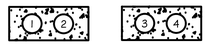
1. SPACE POWER & SIGNAL DUCTS MIN. 12" SEE DUCT BANK INSTALLATION DETAIL SHEET E-003. DUCT BANKS ARE NOT DRAWN TO SCALE, 12" SPACING IS EXAGGERATED.
2. 480V, 208V AND 120V POWER CIRCUIT CONDUITS SHALL BE SCHEDULE 40 RIGID PVC.
3. SIGNAL CIRCUIT CONDUITS SHALL BE GALVANIZED RIGID CONDUIT (GRC).

DB-7

1 - 1" C. (120V CKTS.)
2 - 1" C. RGS (CONTROL)
3 - 3/4" C. (CONTROL)

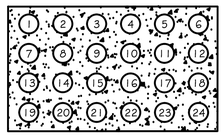
DB-8

1 - 1.25" C. (480V TO EQ. AERATOR 1)
2 - 1.25" C. (480V TO EQ. AERATOR 2)
3 - 3/4" C. (CONTROL)



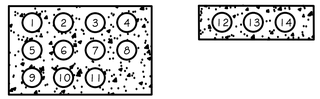
DB-9

1 - 2.5" C. (480V TO PANEL HD)
2 - 2.5" C. (480V TO PANEL HD)
3 - 1" C. (CONTROL)
4 - 1" C. RGS (SIGNAL)



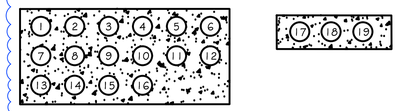
DB-13

1 - 3" C. (480V TO PANEL HC)
2 - 3" C. (480V TO PANEL HC)
3 - 1.5" C. (480V TO AERATOR RA3102)
4 - 1.5" C. (480V TO FUT. AERATOR)
5 - 1.25" C. (480V TO RAS/WAS FCP8010)
6 - 1.25" C. (480V TO FUTURE RAS/WAS)
7 - 2" C. (480V TO TRANSFORMER F)
8 - 1" C. (480V TO VALVE V2202)
9 - 1"C. (SITE LIGHTING)
10 - 1.5" C. (120V CKTS.)
11 - 2" (SPARE)
12 - 2" C. (480V TO AERATOR RA3101)
13 - 2" C. (480V TO AERATOR RA3103)
14 - 1.5" C. (480V TO AERATOR RA3104)
15 - 2" C. (480V TO AERATOR RA3105)
16 - 1.5" C. (480V TO AERATOR RA3106)
17 - 2" C. (480 TO PANEL HF)
18 - 2" C. (FUTURE AERATOR)
19 - 2" C. (FUTURE AERATOR)
20 - 1.5" C. (FUTURE AERATOR)
21 - 1.5" C. (FUTURE AERATOR)
22 - 2" C. (FUTURE AERATOR)
23 - 2" C. (FUTURE PANEL HH)
24 - 1.5 " C. (120V CKTS.)
25 - 1.5" C. (CONTROL)
26 - 1.5" C. RGS (SIGNAL)
27 - 2" C. (FIBER OPTIC CABLE)
28 - 1.5" C. (CONTROL)
29 - 1" C. RGS (SIGNAL)
30 - 1.5" C. (SPARE)



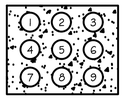
DB-14

1 - 3" C. (480V TO PANEL HC)
2 - 3" C. (480V TO PANEL HC)
3 - 1.5" C. (480V TO AERATOR RA3102)
4 - 1.5" C. (480V TO FUT. AERATOR)
5 - 1.25" C. (480V TO RAS/WAS FCP8010)
6 - 1.25" C. (480V TO FUTURE RAS/WAS)
7 - 2" C. (480V TO TRANSFORMER F)
8 - 1"C. (SITE LIGHTING)
9 - 1.5" C. (120V CKTS.)
10 - 2" (SPARE)
11 - 2" (SPARE)
12 - 1.5" C. (CONTROL)
13 - 1.5" C. RGS (SIGNAL)
14 - 2" C. (FIBER OPTIC CABLE)



DB-15

1 - 3/4" C. (480V TO CLARIFIER No. 1)
2 - 3/4" C. (480V TO CLARIFIER No. 2)
3 - 3/4" C. (480V TO FUT. CLARIFIER No. 3)
4 - 3/4" C. (480V TO FUT. CLARIFIER No. 4)
5 - 1.5" C. (480V TO AERATOR RA3102)
6 - 1.5" C. (480V TO FUT. AERATOR)
7 - 1.25" C. (480V TO RAS/WAS FCP8010)
8 - 1.25" C. (480V TO FUTURE RAS/WAS)
9 - 2" C. (480V TO TRANSFORMER F)
10 - 1.25" C. (480V TO REUSE CONTROL PANEL)
11 - 1.25" C. (480V TO POST AERATION CONTROL PANEL)
12 - 3" C. (480V TO PANEL HH)
13 - 2" C. (208V TO PANEL LH)
14 - 1"C. (SITE LIGHTING)
15 - 1.5" C. (120V CKTS.)
16 - 1.5" (SPARE)
17 - 1.5" C. (CONTROL)
18 - 1.5" C. RGS (SIGNAL)
19 - 2" C. (FIBER OPTIC CABLE)

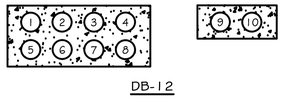


DB-10

1 - 3/4" C. (480V TO SCREENING PANEL No. 1)
2 - 3/4" C. (480V TO SCREENING PANEL No. 2)
3 - 3/4" C. (480V TO CONVEYOR PANEL)
4 - 3/4" C. (FUT. SCREENING PANEL No. 3)
5 - 3/4" C. (480V TO GRIT REMOVAL CONTROL PANEL)
6 - 3/4" C. (FUT. GRIT REMOVAL PANEL)
7 - 1" C. (120V CKTS.)
8 - 1.5" C. (SPARE)
9 - 1.25" C. (480V TO EQ. AERATOR 3)
10 - 1" C. (CONTROL)
11 - 1" C. RGS (SIGNAL)

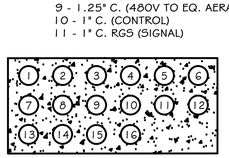
DB-11

1 - 1.25" C. (480V TO EQ. AERATOR)
2 - 3/4" C. (CONTROL)



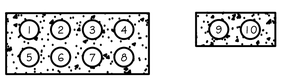
DB-12

1 - 3/4" C. (480V TO SCREENING PANEL No. 1)
2 - 3/4" C. (480V TO SCREENING PANEL No. 2)
3 - 3/4" C. (480V TO CONVEYOR PANEL)
4 - 3/4" C. (FUT. SCREENING PANEL No. 3)
5 - 3/4" C. (480V TO GRIT REMOVAL CONTROL PANEL)
6 - 3/4" C. (FUT. GRIT REMOVAL PANEL)
7 - 1" C. (120V CKTS.)
8 - 1.5" C. (SPARE)
9 - 1" C. (CONTROL)
10 - 1" C. RGS (SIGNAL)



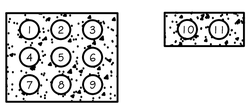
DB-16

1 - 2" C. (480V TO AERATOR RA3101)
2 - 2" C. (480V TO AERATOR RA3103)
3 - 1.5" C. (480V TO AERATOR RA3104)
4 - 2" C. (480V TO AERATOR RA3105)
5 - 1.5" C. (480V TO AERATOR RA3106)
6 - 2" C. (480 TO PANEL HG)
7 - 1.5" C. (FUTURE AERATOR)
8 - 1.5" C. (FUTURE AERATOR)
9 - 1.25" C. (FUTURE AERATOR)
10 - 1.5" C. (FUTURE AERATOR)
11 - 1.25" C. (FUTURE AERATOR)
12 - 2" C. (FUTURE PANEL HH)
13 - 1" C. (480V TO VALVE V2202)
14 - 1.5 " C. (120V CKTS.)
15 - 1.5" (SPARE)
16 - 1" C. (SITE LIGHTING)
17 - 1.5" C. (CONTROL)
18- 1" C. RGS (SIGNAL)



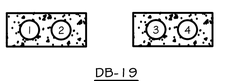
DB-17

1 - 2" C. (480V TO AERATOR RA3101)
2 - 2" C. (480V TO AERATOR RA3103)
3 - 1.5" C. (480V TO AERATOR RA3104)
4 - 2" C. (480V TO AERATOR RA3105)
5 - 1.5" C. (480V TO AERATOR RA3106)
6 - 2" C. (480 TO PANEL HG)
7 - 1" C. (120V CKTS.)
8 - 1.5" (SPARE)
9 - 1.5" C. (CONTROL)
10 - 1" C. RGS (SIGNAL)



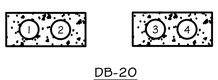
DB-18

1 - 3/4" C. (480V TO CLARIFIER No. 1)
2 - 3/4" C. (480V TO CLARIFIER No. 2)
3 - 3/4" C. (480V TO FUT. CLARIFIER No. 3)
4 - 3/4" C. (480V TO FUT. CLARIFIER No. 4)
5 - 1.5" C. (480V TO AERATOR RA3102)
6 - 1.25" C. (480V TO FUT. AERATOR)
7 - 1.5" C. (120V CKTS.)
8 - 1" C. (SITE LIGHTING)
9 - 1.5" (SPARE)
10 - 1.5" C. (CONTROL)
11 - 1.5" C. RGS (SIGNAL)



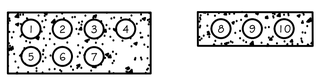
DB-19

1 - 1.5" C. (480V TO AERATOR RA3102)
2 - 1" C. (120V CKTS.)
3 - 1" C. (CONTROL)
4 - 1" C. RGS (SIGNAL)



DB-20

1 - 3/4" C. (480V TO CLARIFIER CONTROL PANEL)
2 - 3/4" C. (120V CKTS.)
3 - 1" C. (CONTROL)
4 - 1" C. RGS (SIGNAL)

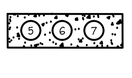


DB-21

1 - 1.25" C. (480V TO RAS/WAS FCP8010)
2 - 1.25" C. (480V TO FUTURE RAS/WAS)
3 - 2" C. (480V TO TRANSFORMER F)
4 - 3/4" C. (480V TO REUSE CONTROL PANEL)
5 - 3/4" C. (480V TO POST AERATION CONTROL PANEL)
6 - 1" C. (120V CKTS.)
7 - 1"C. (SITE LIGHTING)
8 - 1" C. (CONTROL)
9 - 1" C. RGS (SIGNAL)
10 - 2" C. (FIBER OPTIC CABLE)

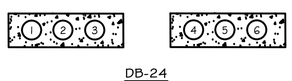
DB-22

1 - 1.25" C. (480V TO RAS/WAS FCP8010)
2 - 1.25" C. (480V TO FUTURE RAS/WAS)
3 - 2" C. (480V TO TRANSFORMER F)
4 - 1"C. (SITE LIGHTING)
5 - 1" C. (CONTROL)
6 - 1" C. RGS (SIGNAL)
7 - 2" C. (FIBER OPTIC CABLE)



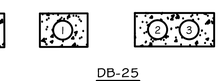
DB-23

1 - 2" C. (480V TO TRANSFORMER F)
2 - 1" C. (SITE LIGHTING)
3 - 2" C. (FIBER OPTIC CABLE)



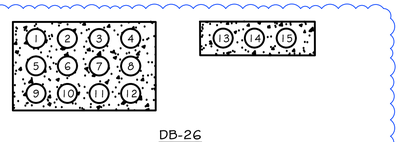
DB-24

1 - 1.25" C. (480V TO RAS/WAS FCP8010)
2 - 1.25" C. (480V TO FUTURE RAS/WAS)
3 - 1"C. (SITE LIGHTING)
4 - 1" C. (CONTROL)
5 - 1" C. RGS (SIGNAL)
6 - 2" C. (FIBER OPTIC CABLE)



DB-25

1 - 1.25" C. (480V TO RAS/WAS CP8010)
2 - 1" C. (CONTROL FROM CP8010)
3 - 1" C. RGS (SIGNAL FROM CP8010)

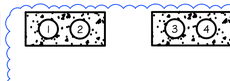


DB-26

1 - 3" C. (480V TO PANEL HC)
2 - 3" C. (480V TO PANEL HC)
3 - 3/4" C. (480V TO CLARIFIER No. 1)
4 - 3/4" C. (480V TO CLARIFIER No. 2)
5 - 3/4" C. (480V TO FUT. CLARIFIER No. 3)
6 - 3/4" C. (480V TO FUT. CLARIFIER No. 4)
7 - 3/4" C. (480V TO REUSE CONTROL PANEL)
8 - 3/4" C. (480V TO POST AERATION CONTROL PANEL)
9 - 3" C. (480V TO PANEL HH)
10 - 2" C. (208V TO PANEL LH)
11 - 1" C. (120V CKTS.)
12 - 2" C. (SPARE)
13 - 1" C. (CONTROL)
14 - 1" C. RGS (SIGNAL)
15 - 2" C. (FIBER OPTIC CABLE)

DB-27

1 - 2" C. (208V TO PANEL LE)
2 - 1.5" C. (CONTROL)
3 - 1.5" C. RGS (SIGNAL)



DB-28

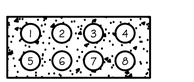
1 - 3/4" C. (480V TO PANEL HH)
2 - 3/4" C. (208V TO PANEL LH)
3 - 1" C. (CONTROL FROM FCP6010)
4 - 1" C. RGS (SIGNAL FROM FCP6010)

DB-29

(DELETED)

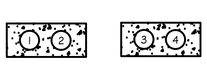
DB-30

1 - 3/4" C. (480V TO REUSE CONTROL PANEL)
2 - 3/4" C. (480V TO POST AERATION CONTROL PANEL)
3 - 1" C. (120V CKTS.)
4 - 1" C. (CONTROL)
5 - 1" C. RGS (SIGNAL)



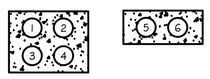
DB-31

1 - 2" C. (480V TO AERATOR RA3101)
2 - 2" C. (480V TO AERATOR RA3103)
3 - 1.5" C. (480V TO AERATOR RA3104)
4 - 2" C. (480V TO AERATOR RA3105)
5 - 1.5" C. (480V TO AERATOR RA3106)
6 - 2" C. (480 TO PANEL HG)
7 - 1" C. (120V CKTS.)
8 - 1.5" (SPARE)
9 - 1.5" C. (CONTROL)
10 - 1" C. RGS (SIGNAL)



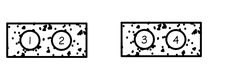
DB-32

1 - 1" C. (480V TO VALVE V2202)
2 - 1" C. (120V CKTS.)
3 - 1" C. (CONTROL)
4 - 1" C. RGS (FUTURE SIGNAL)



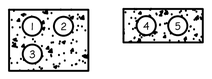
DB-33

1 - 1.5" C. (FUTURE AERATOR)
2 - 1" C. (FUTURE 120V CKTS.)
3 - 3/4" C. (480V TO FUT. CLRF. No. 3)
4 - 3/4" C. (480V TO FUT. CLRF. No. 4)
5 - 1" C. (CONTROL)
6 - 1" C. RGS (FUTURE SIGNAL)



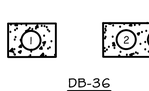
DB-34

1 - 1.5" C. (FUTURE AERATOR)
2 - 1" C. (FUTURE 120V CKTS.)
3 - 1" C. (CONTROL)
4 - 1" C. RGS (FUTURE SIGNAL)



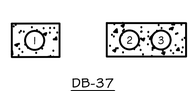
DB-35

1 - 1" C. (FUTURE 120V CKTS.)
2 - 3/4" C. (480V TO FUT. CLRF. No. 3)
3 - 3/4" C. (480V TO FUT. CLRF. No. 4)
4 - 1" C. (CONTROL)
5 - 1" C. RGS (FUTURE SIGNAL)



DB-36

1 - 1.25" C. (FUTURE RAS/WAS)
2 - 1" C. (CONTROL)
3 - 1" C. RGS (SIGNAL)
4 - 2" C. (FIBER OPTIC CABLE)



DB-37

1 - 2" C. (STUB UP FUTURE RAS/WAS)
2 - 1" C. (STUB UP CONTROL)
3 - 1" C. RGS (STUB UP SIGNAL)

DB-38

1 - 2" C. (FIBER OPTIC CABLE)

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — NOT VALID WITHOUT ORIGINAL SIGNATURE AND SEAL — CERTIFICATE OF AUTHORIZATION
GOODWYN MILLS CAWOOD, LLC
Exp.06.30.2025

1" 0" .5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
2 REV2	05.06.2025
Project Manager:	CJW
Engineer:	GS
Designer:	GS
Drawn By:	

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA REGISTERED 03/19/2025 NO. 31217 PROFESSIONAL ENGINEER CHARLES K. BUTTERFIELD

ELECTRICAL DUCT BANK SCHEDULE

E-014

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

PROPOSED SINGLE PHASE PANEL SCHEDULE "PANEL HA" LOCATION: INFLUENT PS											
VOLTAGE, PHASE & AMPS: 277/480Y—3Ø 4W. 1200AMP MLO A.I.C. RATING: 42kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 1			CONNECTED KVA						OTHER:		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	PUMP P-1010	400/	67	2.1					15/	HEAT PUMP	2
3	|	/			67	2.1			/	|	4
5	|	/3					67	2.1	/3	|	6
7	PUMP P-1020	400/	67	2.1					15/	HEAT PUMP	8
9	|	/			67	2.1			/	|	10
11	|	/3					67	2.1	/3	|	12
13	PUMP P-1030	400/	66.5	3.5					30/	PANEL-LA	14
15	|	/			66.5	1.2			/	|	16
17	|	/3					66.5	2.6	/3	|	18
19	PUMP P-1040	225/	38.2	-					/	SPACE	20
21	|	/			38.2	-			/	|	22
23	|	/3					38.2	-	/3	|	24
25	PUMP P-1050	225/	38.2	-					/	SPACE	26
27	|	/			38.2	-			/	|	28
29	|	/3					38.2	-	/3	|	30
31	SPACE	/	-	-					/	SPACE	32
33	|	/			-	-			/	|	34
35	|	/3					-	-	/3	|	36
37	SPACE	/	-	-					/	SPACE	38
39	|	/			-	-			/	|	40
41	|	/3					-	-	/3	|	42

PROPOSED THREE PHASE PANEL SCHEDULE "PANEL LA" LOCATION: INFLUENT PS											
VOLTAGE, PHASE & AMPS: 120/208Y—3Ø 4W. 60AMP MCB A.I.C. RATING: 10kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 1			CONNECTED KVA						OTHER:		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	LIGHTING	20/1	0.3	0.7					20/1	RECEPTACLES	2
3	OUTDOOR LIGHTING	20/1			0.2	0.5			20/1	SCADA PANEL (RTU-5)	4
5	GENERATOR HEATER	30/					2.5	0.1	20/1	GENERATOR CHARGER	6
7	|	/2	2.5	-					20/1	SPARE	8
9	PUMP CONTROL PANEL FCP1000	20/1			0.5	-			20/1	SPARE	10
11	SPARE	20/1					-	-	20/1	SPARE	12
13	SPARE	20/1	-	-					20/1	SPACE	14
15	SPACE	20/1			-	-			20/1	SPACE	16
17	SPACE	20/1					-	-	20/1	SPACE	18
19	SPACE	20/1	-	-					20/1	SPACE	20
21	SPACE	20/1			-	-			20/1	SPACE	22
23	SPACE	20/1					-	-	20/1	SPACE	24

NOTES:

1. PANELS HA & LA TO BE PROVIDED WITH "E-HOUSE"

PROPOSED THREE PHASE POWER PANEL SCHEDULE "PANEL HB1" LOCATION: BLOWER BUILDING											
VOLTAGE, PHASE & AMPS: 277/480Y—3Ø 4W. 1200AMP MLO A.I.C. RATING: 42kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 1			CONNECTED KVA						OTHER: FEED-THRU LUGS		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	DISC AERATOR No. 1	60/	11.1	11.1					60/	DISC AERATOR No. 2	2
3	|	/			11.1	11.1			/	|	4
5	|	/3					11.1	11.1	/3	|	6
7	DISC AERATOR No. 3	60/	11.1	21.3					125/	DISC AERATOR No. 4	8
9	|	/			11.1	21.3			/	|	10
11	|	/3					11.1	21.3	/3	|	12
13	DISC AERATOR No. 5	125/	21.3	21.3					125/	DISC AERATOR No. 6	14
15	|	/			21.3	21.3			/	|	16
17	|	/3					21.3	21.3	/3	|	18
19	FUTURE DISC AERATOR No. 7	60/	11.1	11.1					60/	FUTURE DISC AERATOR No. 8	20
21	|	/			11.1	11.1			/	|	22
23	|	/3					11.1	11.1	/3	|	24
25	FUTURE DISC AERATOR No. 9	60/	11.1	21.3					125/	FUTURE DISC AERATOR No. 10	26
27	|	/			11.1	21.3			/	|	28
29	|	/3					11.1	21.3	/3	|	30
31	FUTURE DISC AERATOR No. 11	125/	21.3	21.3					125/	FUTURE DISC AERATOR No. 12	32
33	|	/			21.3	21.3			/	|	34
35	|	/3					21.3	21.3	/3	|	36
37	SPACE	/	-	-					/	SPACE	38
39	|	/			-	-			/	|	40
41	|	/3					-	-	/3	|	42

PROPOSED THREE PHASE PANEL SCHEDULE "PANEL LB" LOCATION: BLOWER BUILDING											
VOLTAGE, PHASE & AMPS: 120/208Y—3Ø 4W. 125AMP MCB A.I.C. RATING: 10kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 1			CONNECTED KVA						OTHER:		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	OUTDOOR LIGHTING	20/1	1.1	0.4					20/1	RECEPTACLES	2
3	BLOWER BUILDIING LIGHTING	20/1			1.1	0.5			20/1	RECEPTACLES	4
5	BLOWER BUILDIING EMERGENCY LIGHTING	20/1					0.2	-	20/1	SPARE	6
7	BLOWER BUILDING EF-1	20/1	0.9	-					20/1	SPARE	8
9	BLOWER BUILDING EF-2	20/1			0.9	0.7			20/1	SCREEN/GRIT RECEPTACLES	10
11	INFLUENT SAMPLER	20/1					0.5	0.7	20/1	SCREEN/GRIT LIGHTING	12
13	SCREEN WASH HEAT TRACE	20/1	1.0	0.7					20/1	SCREEN/GRIT RECEPTACLES	14
15	GRIT FLUIDIZING HEAT TRACE	20/1			1.0	0.7			20/1	SCREEN/GRIT LIGHTING	16
17	WASHER/COMPACTOR HEAT TRACE	20/1					1.0	0.5	20/1	DIGESTER DO ANALYZER (AIT7010)	18
19	AERATION CONTROL PANEL (FCP3100)	20/1	1.0	0.5					20/1	AERATION BASIN ANALYZER (AIT3101)	20
21	RAS FLOW METER No. 1	20/1			0.5	1.0			20/1	NAOH FEED HEAT TRACE	22
23	FUTURE RAS FLOW METER	20/1					0.5	1.0	20/1	NAOH FEED HEAT TRACE	24
25	SCADA (RTU-2)	20/1	0.5	-					20/1	SPARE	26
27	EXHAUST FAN	20			0.0	-			20/1	SPARE	28
29	|	/2					0.7	-	20/1	SPARE	30
31	INFLUENT FLOW METER (FIT1040)	20/1	0.3	-					20/1	SPARE	32
33	EQ FLOW METER (FIT2201)	20/1			0.3	-			20/1	SPARE	34
35	SPACE	20/1					-	-	20/1	SPACE	36
37	SPACE	20/1	-	-					20/1	SPACE	38
39	SPACE	20/1			-	-			20/1	SPACE	40
41	SPACE	20/1					-	-	20/1	SPACE	42

PROPOSED THREE PHASE LOAD CENTER SCHEDULE "PANEL HF" LOCATION: ADMIN BUILDING											
VOLTAGE, PHASE & AMPS: 277/480Y—3Ø 3W. 200AMP MCB A.I.C. RATING: 42kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 3R			CONNECTED KVA						OTHER:		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	ROOF TOP UNIT (RTU-1)	40/	8.6	10.7					100/	PANEL-LF	2
3	|	/			8.6	10.8			/	|	4
5	|	/3					8.6	10.4	/3	|	6
7	ROOF TOP UNIT (RTU-2)	60/	16.4	-					/	SPACE	8
9	|	/			16.4	-			/	|	10
11	|	/3					16.4	-	/3	|	12
13	WATER HEATER	20/	4.0	-					/	SPACE	14
15	|	/			4.0	-			/	|	16
17	|	/3					4.0	-	/3	|	18
19	SPACE	/	-	-					/	SPACE	20
21	|	/			-	-			/	|	22
23	|	/3					-	-	/3	|	24
25	SPACE	/	0.0	0.0					/	SPACE	26
27	|	/			0.0	0.0			/	|	28
29	|	/3					0.0	0.0	/3	|	30

PROPOSED THREE PHASE PANEL SCHEDULE "PANEL LF" LOCATION: ADMIN BUILDING											
VOLTAGE, PHASE & AMPS: 120/208Y—3Ø 4W. 200AMP MCB A.I.C. RATING: 10kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 1			CONNECTED KVA						OTHER: SUB-FEED LUGS		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	LIGHTING	20/1	0.5	0.7					20/1	RECEPTACLES	2
3	LIGHTING	20/1			1.0	0.9			20/1	RECEPTACLES	4
5	LIGHTING	20/1					1.4	0.9	20/1	RECEPTACLES	6
7	EMERGENCY LIGHTING / EXIT SIGNS	20/1	0.3	0.9					20/1	RECEPTACLES	8
9	OUTDOOR LIGHTING	20/1			0.4	1.3			20/1	RECEPTACLES	10
11	FIRE ALARM PANEL	30/1					2.4	1.1	20/1	RECEPTACLES	12
13	RECEPTACLES	20/1	0.7	0.7					20/1	RECEPTACLES	14
15	RECEPTACLES	20/1			0.7	0.7			20/1	RECEPTACLES	16
17	REFRIGERATOR	20/1					1.0	0.7	20/1	RECEPTACLES	18
19	INCUBATOR	20/1	1.0	0.6					20/	FUME HOOD	20
21	AUTOCLAVE	20/1			1.0	0.6			/2	|	22
23	OVEN	20/1					1.0	1.2	20/1	DISHWASHER	24
25	REFRIGERATOR	20/1	1.0	0.2					20/1	EF-1	26
27	WALL HEATER (EWH-1)	15/			0.8	0.2			20/1	EF-2	28
29	|	/2					0.8	1.2	20/1	LEF-1	30
31	SCADA (RTU-1)	20/1	1.0	1.0					20/1	GATE OPERATOR	32
33	BOTTLE WASHER	20/1			1.2	0.0			20/1	SPARE	34
35	WASHER	20/1					1.2	0.0	20/1	SPARE	36
37	DRYER	30/	2.0	-					20/1	SPARE	38
39	|	/2			2.0	-			20/1	SPARE	40
41	SPARE	20/1					-	-	20/1	SPARE	42

PROPOSED THREE PHASE POWER PANEL SCHEDULE "PANEL HB2" LOCATION: BLOWER BUILDING											
VOLTAGE, PHASE & AMPS: 277/480Y—3Ø 4W. 400AMP MLO A.I.C. RATING: 42kAIC											
MOUNTING: SURFACE ENCLOSURE: NEMA 1			CONNECTED KVA						OTHER: FEED-THRU LUGS		
CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	RAS/WAS CONTROL PANEL	70/	11.4	9.9					50/	PANEL LB	2
3	|	/			11.4	7.5			/	|	4
5	|	/3					12.8	8.6	/3	|	6
7	SCREENINGS CONTROL PANEL (FCP1110)	30/	3.5	3.9					/	FUTURE GRIT CONTROL PANEL (FCP1220)	8
9	|	/			3.5	3.9			/	|	10
11	|	/3					3.5	3.9	/3	|	12
13	GRIT CONTROL PANEL (FCP1210)	30/	3.9	11.4					/	FUT. RAS/WAS CONTROL PANEL	14
15	|	/			3.9	11.4			/	|	16
17	|	/3					3.9	12.8	/3	|	18
19	ROOF TOP UNIT (RTU-3)	50/	12.7	0.3					15/	FLOW CONTORL VALVE (V2202)	20
21	|	/			12.7	0.3			/	|	22
23	|	/3					12.7	0.3	/3	|	24
25	BLOWER BUILDING UNIT HEATER EUH-B	30/	6.7	4.8					100/	PANEL HG	26
27	|	/			6.7	4.8			/	|	28
29	|	/3					6.7	4.8	/3	1	30
31	BLOWER BUILDING UNIT HEATER EUH-B	30/	6.7	1.8					30/1	SITE LIGHTING (OLCP1)	32
33	|	/			6.7	-			-	-	34
35	|	/3					6.7	-	-	-	36
37	FUTURE PANEL HH	/	-	-					/	SPACE	38
39	|	/			-	-			/	|	40
41	|	/3					-	-	/3	|	42

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — GOODWYN MILLS CAWOOD, LLC — NOT VALID WITHOUT ORIGINAL SIGNATURE AND SEAL — CERTIFICATE OF AUTHORIZATION — Exp.06.30.2026

1" 0" 5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
2 REV2	05.06.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

ELECTRICAL PANEL SCHEDULES

E-016

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

DRAWING FILE: G:\Shared drives\BFIELD\Commerce\Drawings\E-001 CATL230033 Single Line Diagram.dwg
PLOTTED: May 06, 2025 - 10:32am

PROPOSED THREE PHASE POWER PANEL SCHEDULE "PANEL HC" LOCATION: UV / FILTER STRUCTURE

VOLTAGE, PHASE ϕ AMPS: 277/480Y—3Ø 4W. 600AMP MCB A.I.C. RATING: 42kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER: FEED-THRU LUGS

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	PANEL HH	300/	-	-					/	SPACE	2
3	|	/			-	-			/	|	4
5	|	/3					-	-	/3	|	6
7	SPACE	/	-	-					/	SPACE	8
9	|	/			-	-			/	|	10
11	|	/3					-	-	/3	|	12
13	FILTER No. 1 (FCP5010)	15/	3.0	3.0					15/	FILTER No. 2 (FCP5020)	14
15	|	/			3.0	3.0			/	|	16
17	|	/3					4.4	4.5	/3	|	18
19	CLARIFIER No. 1	15/	0.5	0.5					15/	FUTURE CLARIFIER No. 3	20
21	|	/			0.5	0.5			/	|	22
23	|	/3					0.5	0.5	/3	|	24
25	CLARIFIER No. 2	15/	0.5	0.5					15/	FUTURE CLARIFIER No. 4	26
27	|	/			0.5	0.5			/	|	28
29	|	/3					0.5	0.5	/3	|	30
31	POST AIR CONTROL PANEL	50/	9.1	14.8					100/	PANEL-LC	32
33	|	/			9.1	12.8			/	|	34
35	|	/3					10.6	12.2	/3	|	36
37	REUSE WATER CONTROL PANEL	100/	18.8	1.8					30/1	SITE LIGHTING (OLCP2)	38
39	|	/			18.8	0.0			-	-	40
41	|	/3					20.3	0.0	46:54	-	42

PROPOSED THREE PHASE PANEL SCHEDULE "PANEL LC" LOCATION: FILTER STRUCTURE

VOLTAGE, PHASE ϕ AMPS: 120/208Y—3Ø 4W. 200AMP MCB A.I.C. RATING: 10kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER: FEED-THRU LUGS

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	SPARE	20/1	-	-					100/	PANEL LH	2
3	SPARE	20/1			-	-			/	|	4
5	FILTER LIGHTS	20/1					0.5	-	/3	|	6
7	FILTER RECEPTACLES	20/1	0.5	-					20/1	SPARE	8
9	EFFLUENT FLOW METER	20/1			0.5	-			20/1	SPARE	10
11	EFFLUENT SAMPLER	20/1					0.5	-	20/1	SPARE	12
13	CLARIFIER No. 1 LIGHTING	20/1	0.2	0.2					20/1	CLARIFIER No. 3 LIGHTING	14
15	CLARIFIER No. 2 LIGHTING	20/1			0.2	0.2			20/1	CLARIFIER No. 4 LIGHTING	16
17	PANEL LE	125/					8.4	0.5	20/1	SCADA PANEL (RTU-3)	18
19	|	/	10.6	0.5					20/1	AERATION BASIN No. 1 DO/ORP ANALYZER	20
21	|	/3			8.4	0.5			20/1	FUT. A.B. No. 2 DO/ORP ANALYZER	22
23	SLUDGE BLANKET ANALYZER (AIT4010)	20/1					0.5	0.3	20/1	AERATION BASIN LIGTHING	24
25	SLUDGE BLANKET ANALYZER (AIT4020)	20/1	0.5	0.3					20/1	FUTURE AERATION BASIN LITHGING	26
27	SLUDGE FLOW METER (FIT3210/3220)	20/1			0.0	-			20/1	SPARE	28
29	SLUDGE FLOW METER (FIT4340)	20/1					0.5	-	20/1	SPARE	30
31	SLUDGE FLOW METER (FIT4350)	20/1	0.5	-					20/1	SPARE	32
33	YARD DRAIN PS FLOW METER (FIT8030)	20/1			0.5	-			20/1	SPARE	34
35	SPARE	20/1					-	-	20/1	SPARE	36
37	SPARE	20/1	-	-					20/1	SPARE	38
39	SPARE	20/1			-	-			20/1	SPARE	40
41	SPARE	20/1					-	-	20/1	SPARE	42

PROPOSED THREE PHASE POWER PANEL SCHEDULE "PANEL HH" LOCATION: UV STRUCTURE

VOLTAGE, PHASE ϕ AMPS: 277/480Y—3Ø 4W. 400AMP MLO A.I.C. RATING: 42kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER:

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	UV REACTOR #1 BANK #1 (PDP-1.1)	30/	5.5	5.5					30/	UV REACTOR #2 BANK #1 (PDP-2.1)	2
3	|	/			5.5	5.5			/	|	4
5	|	/3					5.5	5.5	/3	|	6
7	UV REACTOR #1 BANK #2 (PDP-1.2)	30/	5.5	5.5					30/	UV REACTOR #2 BANK #2 (PDP-2.2)	8
9	|	/			5.5	5.5			/	|	10
11	|	/3					5.5	5.5	/3	|	12
13	COOLING PUMP #1 (FCPG011)	10/	1.1	1.1					10/	COOLING PUMP #2 (FCPG021)	14
15	|	/			1.1	1.1			/	|	16
17	|	/3					1.1	1.1	/3	|	18
19	SPACE	/	-	-					/	SPACE	20
21	|	/			-	-			/	|	22
23	|	/3					-	-	/3	|	24
25	SPACE	/	-	-					/	SPACE	26
27	|	/			-	-			/	|	28
29	|	/3					-	-	/3	|	30
31	SPACE	/	-	-					/	SPACE	32
33	|	/			-	-			/	|	34
35	|	/3					-	-	/3	|	36
37	SPACE	/	-	-					/	SPACE	38
39	|	/			-	-			/	|	40
41	|	/3					-	-	/3	|	42

PROPOSED THREE PHASE PANEL SCHEDULE "PANEL HD" LOCATION: SLUDGE DEWATERING BUILDING

VOLTAGE, PHASE ϕ AMPS: 277/480Y—3Ø 3W. 400AMP MLO A.I.C. RATING: 42kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER:

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	SLUDGE PRESS (FCP7100)	100/	12.6	7.1					30/	PANEL LD	2
3	|	/			12.6	7.4			/	|	4
5	|	/3					14.0	-	/3	|	6
1	EUH-A	15/	1.7	3.5					15/	EUH-A	8
9	|	/			1.7	3.8			/	|	10
11	|	/3					1.7	1.7	/3	|	12
13	EUH-A	15/	1.7	1.7					15/	EUH-A	14
15	|	/			1.7	1.7			/	|	16
17	|	/3					1.7	1.7	/3	|	18
19	FUTURE SLUDGE PRESS (FCP7200)	100/	12.6	-					/	SPACE	20
21	|	/			12.6	-			/	|	22
23	|	/3					12.6	-	/3	|	24
25	SPACE	/	-	-					/	SPACE	26
27	|	/			-	-			/	|	28
29	|	/3					-	-	/3	|	30
31	SPACE	/	-	-					/	SPACE	32
33	|	/			-	-			/	|	34
35	|	/3					-	-	/3	|	36

PROPOSED THREE PHASE PANEL SCHEDULE "PANEL LD" LOCATION: SLUDGE DEWATERING BUILDING

VOLTAGE, PHASE ϕ AMPS: 120/208Y—3Ø 4W. 60AMP MCB A.I.C. RATING: 10kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER:

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	WATER HEATER	20/1	1.5	0.9					15/	EXHAUST FAN-5	2
3	WATER HEATER	20/1			1.5	0.9			/2	|	4
5	EMERGENCY LIGHTING	20/1					0.3	0.2	20/1	EXHAUST FAN-4	6
7	LIGHTING	20/1	0.6	2.3					30/	WATER HEATER (WH-1)	8
9	LIGHTING	20/1			1.1	2.3			/2	|	10
11	RECEPTACLES	20/1					0.9	0.4	20/1	MOTORIZED LOUVER	12
13	RECEPTACLES	20/1	0.9	0.9					20/1	RECEPTACLES	14
15	RECEPTACLES	20/1			0.9	0.7			20/1	POLYMER PANEL	16
17	FLOW METER (FIT7220)	20/1					0.3	0.2	20/1	EXHAUST FAN-3	18
19	SPACE	20/1	-	-					20/1	SPACE	20
21	SPACE	20/1			-	-			20/1	SPACE	22
23	SPACE	20/1					-	-	20/1	SPACE	24
25	SPACE	20/1	-	-					20/1	SPACE	26
27	SPACE	20/1			-	-			20/1	SPACE	28
29	SPACE	20/1					-	-	20/1	SPACE	30

PROPOSED THREE PHASE LOAD CENTER SCHEDULE "PANEL LH" LOCATION: UV STRUCTURE

VOLTAGE, PHASE ϕ AMPS: 120/208Y—3Ø 4W. 200AMP MLO A.I.C. RATING: 10kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER:

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	UV LIGHTS	20/1	0.5	0.5					20/1	UV-1 CONTROL PANEL (FCPG010)	2
3	UV RECEPTACLES	20/1			0.5	0.9			20/1	POWER DISCONNECT PANEL (PDP-1.1)	4
5	POWER DISCONNECT PANEL (PDP-2.1)	20/1					0.9	0.9	20/1	POWER DISCONNECT PANEL (PDP-1.2)	6
7	POWER DISCONNECT PANEL (PDP-2.2)	20/1	0.9	2.3					30/1	PUMP-1 CONTROL PANEL (FCPG011)	8
9	PUMP-2 CONTROL PANEL (FCPG021)	30/1			2.3	0.0			20/1	SPARE	10
11	SPARE	20/1					0.0	0.0	20/1	SPARE	12
13	SPACE	20/1	0.0	0.0					20/1	SPACE	14
15	SPACE	20/1			0.0	0.0			20/1	SPACE	16
17	SPACE	20/1					0.0	0.0	20/1	SPACE	18
19	SPACE	20/1	0.0	0.0					20/1	SPACE	20
21	SPACE	20/1			0.0	0.0			20/1	SPACE	22
23	SPACE	20/1					0.0	0.0	20/1	SPACE	24

PROPOSED THREE PHASE LOAD CENTER SCHEDULE "PANEL HG" LOCATION: AERATION BASIN

VOLTAGE, PHASE ϕ AMPS: 277/480Y—3Ø 3W. 100AMP MCB A.I.C. RATING: 42kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER:

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	AERATION HOIST No. 1	15/	1.3	1.3					15/	AERATION HOIST No. 2	2
3	|	/			1.3	1.3			/	|	4
5	|	/3					1.3	1.3	/3	|	6
7	AERATION HOIST No. 3	15/	1.3	0.3					/	VALVE V3113	8
9	|	/			1.3	0.3			/	|	10
11	|	/3					1.3	0.3	/3	|	12
13	VALVE V3114	/	0.3	0.3					/	VALVE V3115	14
15	|	/			0.3	0.3			/	|	16
17	|	/3					0.3	0.3	/3	|	18
19	SPACE	/	-	-					/	SPACE	20
21	|	/			-	-			/	|	22
23	|	/3					-	-	/3	|	24
25	SPACE	/	-	-					/	SPACE	26
27	|	/			-	-			/	|	28
29	|	/3					-	-	/3	|	30

PROPOSED THREE PHASE LOAD CENTER SCHEDULE "PANEL LE" LOCATION: CHEMICAL FEED AREA

VOLTAGE, PHASE ϕ AMPS: 120/208Y—3Ø 4W. 125AMP MCB A.I.C. RATING: 10kAIC

MOUNTING: SURFACE ENCLOSURE: NEMA 3R | CONNECTED KVA | OTHER:

CKT	DESCRIPTION	CB/P	PHASE A		PHASE B		PHASE C		CB/P	DESCRIPTION	CKT
1	CHEMICAL FEED AREA RECEPTACLES	20/1	0.7	0.9					20/1	CHEMICAL FEED AREA LIGHTING	2
3	CHEMICAL FEED HEATER EUH-1	20/			1.7	1.0			20/	CHEMCIAL FEED PANEL No. 1	4
5	|	/2					1.7	1.0	/2	|	6
7	TANK HEATER	20/	1.9	1.0					20/	CHEMCIAL FEED PANEL No. 2	8
9	|	/2			1.9	1.0			/2	|	10
11	TANK HEATER	20/					1.9	1.0	20/1	CHEMCIAL FEED PANEL No. 3	12
13	|	/2	1.9	1.0					20/1	|	14
15	HEAT TRACE RECEPTACLES	20/1			1.5	0.3			20/1	LEVEL TRANSDUCER	16
17	HEAT TRACE RECEPTACLES	20/1					1.5	0.3	20/1	LEVEL TRANSDUCER	18
19	HEAT TRACE RECEPTACLES	20/1	1.5	0.7					20/1	EXHAUST FAN (EF-6)	20
21	UNIT HEATER (EUH-1)	15/			1.1	-			20/1	SPARE	22
23	|	/					1.1	-	20/1	SPARE	24
25	|	/3	1.1	-					20/1	SPARE	26
27	SPACE	20/1			-	-			20/1	SPACE	28
29	SPACE	20/1					-	-	20/1	SPACE	30
31	SPACE	20/1	-	-					20/1	SPACE	32
33	SPACE	20/1			-	-			20/1	SPACE	34
35	SPACE	20/1					-	-	20/1	SPACE	36

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — GOODWYN MILLS CAWOOD, LLC — NOT VALID WITHOUT ORIGINAL SIGNATURE — CERTIFICATE OF AUTHORIZATION — Exp.06.30.2026

1" 0" 1" 5"

ISSUE	DATE
30% Submittal	05.30.2024
60% Submittal	08.29.2024
90% Submittal	11.27.2024
Bid Set	03.19.2025
2 REV2	05.06.2025

Project Manager: CJW
Engineer: GS
Designer: GS
Drawn By:

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

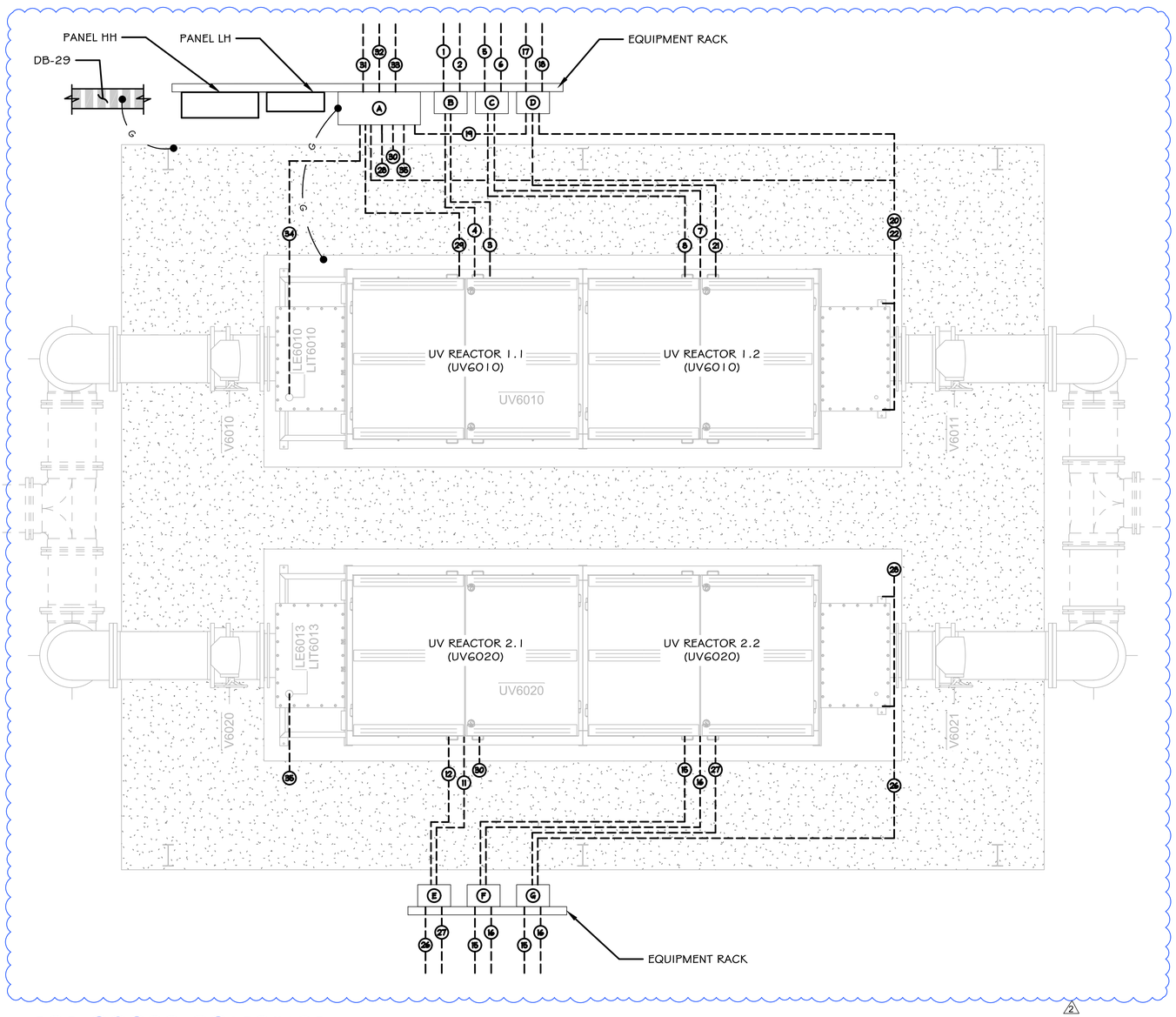
GEORGIA — REGISTERED — 03/19/2025 — NO. 31217 — PROFESSIONAL — CHARLES K. BUTTERFIELD — ENGINEER

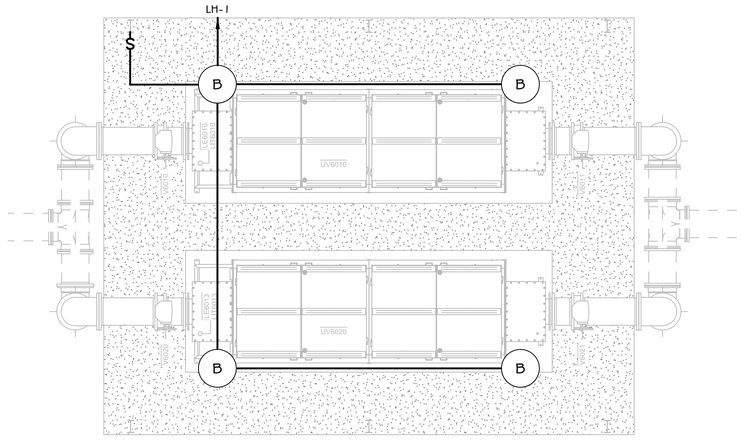
ELECTRICAL PANEL SCHEDULES

E-017

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

DRAWING FILE: G:\Shared drives\BFIELD\Commerce\Drawings\E-001 CATL230033 Single Line Diagram.dwg
PLOTTED: May 06, 2025 - 10:33am





UV EQUIPMENT SCHEDULE

MARK	DESCRIPTION
A	UV-1 CONTROL PANEL (FCPG010)
B	POWER DISCONNECT PANEL (PDP-1.1)
C	POWER DISCONNECT PANEL (PDP-1.2)
D	PUMP CONTROL PANEL (FCPG011)
E	POWER DISCONNECT PANEL (PDP-2.1)
F	POWER DISCONNECT PANEL (PDP-2.2)
G	PUMP CONTROL PANEL (FCPG021)

LIGHTING FIXTURE SCHEDULE

MARK	SYMBOL	DESCRIPTION	MANUFACTURER / CATALOG NUMBER	LAMPS					VOLTS	REMARKS
				WATTS	LUMENS	TEMP	CRI	TYPE		
B	○	LED CANOPY LIGHT	COOPER LIGHTING - LUMARK / RPGC255 LITHONIA LIGHTING / VVCPG LED V4 P4 40K 70CRI T5M PM	63	7,811	4000K	70	LED	120V	1

NOTES:
1. SYMBOL LETTERS INDICATE MARK, AND NUMBER DESIGNATES LIGHTING CIRCUIT IDENTIFICATION.

REMARKS:
1. PENDANT MOUNT BY CONTRACTOR.

1 E-601 **UV DISINFECTION ELECTRICAL PLAN**
SCALE: 1/2" = 1'-0"

2 E-601 **UV DISINFECTION LIGHTING PLAN**
SCALE: 1/4" = 1'-0"

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — NOT VALID WITHOUT ORIGINAL SIGNATURE AND SEAL — CERTIFICATE OF AUTHORIZATION
GOODWYN MILLS CAWOOD, LLC
NAME OF PROFESSIONAL
Exp.06.30.2026

1" 0" 5" 1"

ISSUE	DATE
30% Submittal	05.30.2024
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1 REV2	05.06.2025
Project Manager:	CW
Engineer:	GS
Designer:	GS
Drawn By:	GS

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA — REGISTERED — 03/19/2025 — NO. 31217 — PROFESSIONAL ENGINEER — CHARLES K. BUTTERFIELD

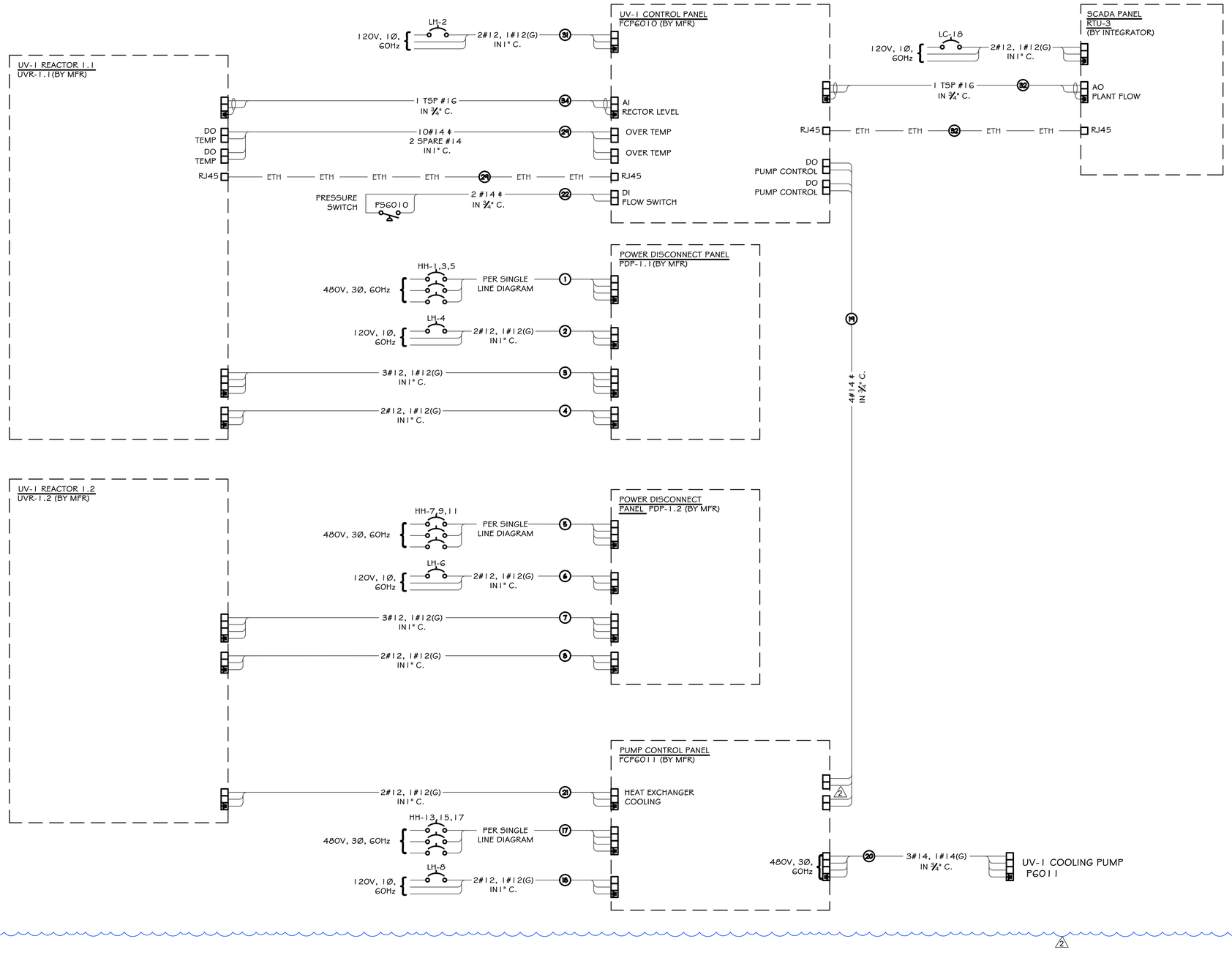
UV DISINFECTION
ELECTRICAL PLAN

E-601

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

DRAWING FILE: G:\Shared drives\BFIELD\Commerce\Drawings\E-601 CATL230033 UV.dwg
PLOTTED: May 06, 2025 - 10:38am

NOTE:
LABEL PANELS PDP-1.1 AND FCPG011, INDICATING MULTIPLE SOURCES OF INCOMING POWER. "MULTIPLE POWER SOURCES – VERIFY ISOLATION BEFORE MAINTENANCE"



1 E-602 **UV REACTOR 1 ELECTRICAL SCHEMATIC**
SCALE: N.T.S.

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

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1" 0" .5" 1"

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Project Manager:	CW
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Drawn By:	GS

COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

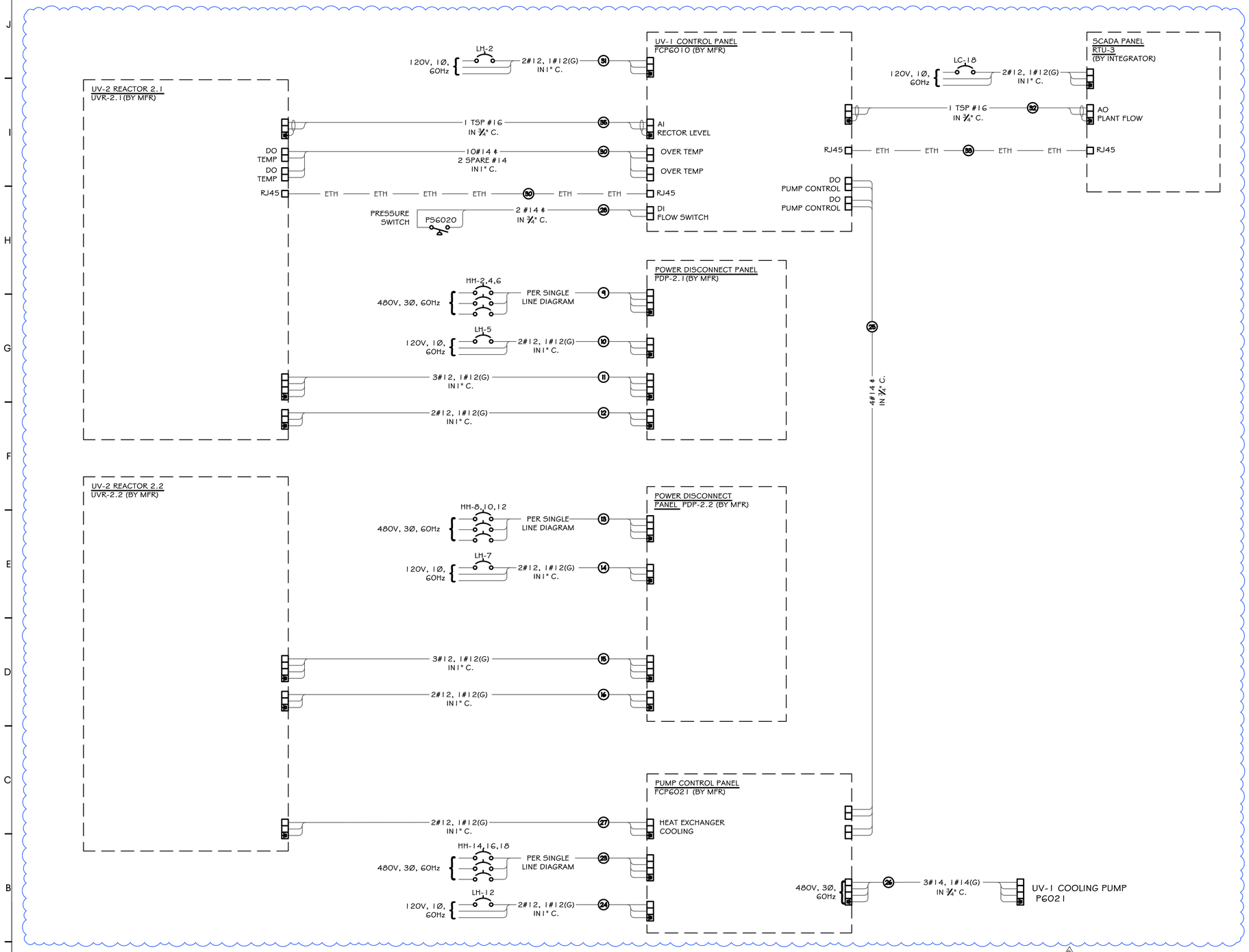
GEORGIA — REGISTERED — 03/19/2025 — NO. 31217 — PROFESSIONAL ENGINEER — CHARLES K. BUTTERFIELD

UV DISINFECTION ELECTRICAL SCHEMATICS

E-602

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

DRAWING FILE: G:\Shared drives\BFIELD\Commerce\Drawings\E-601 CATL230033 UV.dwg
PLOTTED: May 06, 2025 - 10:39am



NOTE:
LABEL PANELS PDP-2.1 AND FCP6021, INDICATING MULTIPLE SOURCES OF INCOMING POWER. "MULTIPLE POWER SOURCES – VERIFY ISOLATION BEFORE MAINTENANCE"

1 **UV REACTOR 2 ELECTRICAL SCHEMATIC**
E-603 SCALE: N.T.S.

GMC
6120 Powers Ferry Road NW, Suite 200
Atlanta, GA 30339
T 770.952.2481

STATE OF GEORGIA — GOODWYN MILLS CAWOOD, LLC — NOT VALID WITHOUT ORIGINAL SIGNATURE — CERTIFICATE OF AUTHORIZATION — Exp.06.30.2026

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COMMERCE 2.0 MGD
GROVE CREEK WPCP
COMMERCE, GA

CATL230033

GEORGIA — REGISTERED — 03/19/2025 — NO. 31217 — PROFESSIONAL ENGINEER — CHARLES K. BUTTERFIELD

UV DISINFECTION ELECTRICAL SCHEMATICS

E-603

BFIELD ENGINEERING, LLC
4180 Providence Road, Suite 325
Marietta, GA 30062
Phone: (678) 650-0732

DRAWING FILE: G:\Shared drives\BFIELD\Commerce\Drawings\E-603 CATL230033 UV.dwg
PLOTTED: May 06, 2025 - 10:41am

SECTION 08 71 00 - DOOR HARDWARE

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. Mechanical door hardware for the following:

    a. Swinging doors.
    b. Sliding doors.
    c. Folding doors.

2. Cylinders for door hardware specified in other Sections.
3. Electrified door hardware.

B. Related Requirements:

1. Coordinate products specified in Part 2 with Division 08 Sections in subparagraphs below. Astragals, silencers, and cylinders can be specified in this Section or with doors and frames.
2. Division 8 – Openings
3. Division 13 – Special Construction

1.3 COORDINATION

A. Floor-Recessed Door Hardware: Coordinate layout and installation with floor construction.

1. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation and Keying Conference: Conduct conference at Project site.

1. Conference participants shall include Installer's Architectural Hardware Consultant.
2. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:

a. Flow of traffic and degree of security required.
b. Preliminary key system schematic diagram.
c. Requirements for key control system.
d. Requirements for access control.
e. Address for delivery of keys.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Samples: For each exposed product in each finish specified, in manufacturer's standard size.

1. Tag Samples with full product description to coordinate Samples with door hardware schedule.

D. Samples for Initial Selection: For each type of exposed finish.

E. Samples for Verification: For each type of exposed product, in each finish specified.

1. Sample Size: Full-size units or minimum 2-by-4-inch Samples for sheet and 4-inch long Samples for other products.

a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

2. Tag Samples with full product description to coordinate Samples with door hardware schedule.

F. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Submittal Sequence: Submit door hardware schedule after or concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
2. Format: Use same scheduling sequence and format and use same door numbers as in door hardware schedule in the Contract Documents.
3. Content: Include the following information:

a. Identification number, location, hand, fire rating, size, and material of each door and frame.
b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
d. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
e. Fastenings and other installation information.
f. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
g. Mounting locations for door hardware.
h. List of related door devices specified in other Sections for each door and frame.

G. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Architectural Hardware Consultant.

B. Product Certificates: For each type of electrified door hardware.

1. Certify that door hardware for use on each type and size of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals.

B. Schedules: Final door hardware and keying schedule.

1.8 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.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedule.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant (AHC).

1.10 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

D. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

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

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:

a. Exit Devices: Two years from date of Substantial Completion.
b. Manual Closers: 10 years from date of Substantial Completion.
c. Concealed Floor Closers: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

2.2 PERFORMANCE REQUIREMENTS

A. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the ABA standards of the Federal agency having jurisdiction.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 SCHEDULED DOOR HARDWARE

A. Provide products for each door that comply with requirements indicated in Part 2 and door hardware schedule.

1. Door hardware is scheduled in Part 3.

2.4 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. Stanley Commercial Hardware; a division of Stanley Security Solutions.
c. Or approved equal.

2.5 SELF-CLOSING HINGES AND PIVOTS

A. Self-Closing Hinges and Pivots: BHMA A156.17.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. Stanley Commercial Hardware; a division of Stanley Security Solutions.
c. Or approved equal.

2.6 CENTER-HUNG AND OFFSET PIVOTS

A. Center-Hung and Offset Pivots: BHMA A156.4.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Hager Companies.
b. Stanley Commercial Hardware; a division of Stanley Security Solutions.
c. Or approved equal.

2.7 CONTINUOUS HINGES

A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch-thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.

B. Pin-and-Barrel-Type Hinges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Hager Companies.
    b. Select Products Limited.
    c. Stanley Commercial Hardware; a division of Stanley Security Solutions.
    d. Or approved equal.

2.8 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch latchbolt throw.
2. Mortise Locks: Minimum 3/4-inch latchbolt throw.
3. Deadbolts: Minimum 1-inch bolt throw.

C. Lock Backset: 2-3/4 inches unless otherwise indicated.

D. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

E. Locks and Latches: BHMA A156.2, BHMA A156.12, BHMA A156.13, BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Best Access Systems; Stanley Security Solutions, Inc.
    b. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
    c. Stanley Commercial Hardware; a division of Stanley Security Solutions.
    d. Yale Security Inc; an ASSA ABLOY Group company.
    e. Or approved equal.

2.9 EXIT LOCKS AND EXIT ALARMS

A. Exit Locks and Alarms: BHMA A156.29, Grade 1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Precision Hardware, Inc.; a Stanley company.
    b. SARGENT Manufacturing Company; ASSA ABLOY.
    c. Or approved equal.

2.10 SURFACE BOLTS

A. Surface Bolts: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Trimco.
c. Or approved equal.

2.11 MANUAL FLUSH BOLTS

A. Manual Flush Bolts: BHMA A156.16; minimum 3/4-inch throw; designed for mortising into door edge.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Trimco.
c. Or approved equal.

2.12 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Precision Hardware, Inc.; a Stanley company.
b. SARGENT Manufacturing Company; ASSA ABLOY.
c. Yale Security Inc; an ASSA ABLOY Group company.
d. Or approved equal.

2.13 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. Provide cylinder from same manufacturer of locking devices.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Best Access Systems; Stanley Security Solutions, Inc.
b. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
c. Hager Companies.
d. SARGENT Manufacturing Company; ASSA ABLOY.
e. Stanley Commercial Hardware; a division of Stanley Security Solutions.

f. Yale Security Inc; an ASSA ABLOY Group company.
g. Or approved equal.

B. Standard Lock Cylinders: BHMA A156.5; Grade 2 permanent cores; face finished to match lockset.

1. Core Type: Interchangeable.

C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide ten (10) construction master keys.

D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide ten (10) construction master keys.

2.14 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Supplier is to closely coordinate with owner and architect all keying requirements. All lock cylinders shall be construction master keyed using split key method. Incorporate decisions made in keying conference.

1. Master Key System: Change keys and a master key operate cylinders.

a. Provide three (3) cylinder change keys and five (5) master keys.

2. Existing System:

a. Master key or grand master key locks to Owner's existing system.
b. Re-key Owner's existing master key system into new keying system.

3. Keyed Alike: Key all cylinders to same change key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE."

2.15 OPERATING TRIM

A. Operating Trim: BHMA A156.6; aluminum or stainless steel unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Hager Companies.
c. Trimco.
d. Or approved equal.

2.16 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.

B. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

C. Astragals: BHMA A156.22.

2.17 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. SARGENT Manufacturing Company; ASSA ABLOY.
b. Stanley Commercial Hardware; a division of Stanley Security Solutions.
c. Yale Security Inc; an ASSA ABLOY Group company.
d. Or approved equal.

2.18 CONCEALED CLOSERS

A. Concealed Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. SARGENT Manufacturing Company; ASSA ABLOY.
b. Or approved equal.

2.19 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
c. Trimco.
d. Or approved equal.

2.20 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Allegion plc.
b. Or approved equal.

2.21 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. Reese Enterprises, Inc.
c. Zero International, Inc.
d. Or approved equal.

B. Maximum Air Leakage: When tested according to ASTM E 283 with tested pressure differential of 0.3-inch wg, as follows:

1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. of door opening.
2. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
3. Gasketing on Double Doors: 0.50 cfm per foot of door opening.

2.22 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. National Guard Products, Inc.
c. Reese Enterprises, Inc.
d. Zero International, Inc.
e. Or approved equal.

2.23 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Allegion plc.
b. Or approved equal.

2.24 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.25 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are

acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.2 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated on Drawings unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30

inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule, but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.
2. Furnish permanent cores to Owner for installation.

F. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."

G. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

I. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.

3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.8 DOOR HARDWARE SCHEDULE

HW SET:01

DOOR NUMBER:
102A, 103A, 109

EACH TO HAVE:
3 HINGES 5BB1HW X USP
1 CLASSROOM LOCK L9070
1 SURFACE CLOSER RA1461
1 KICK PLATE 8400
1 WALL BUMPER WS407CCV

HW SET:02

DOOR NUMBER:
103B

EACH TO HAVE:
3 HINGES 5BB1 X USP
1 CLASSROOM LOCK L9070
1 WALL BUMPER WS407CCV

HW SET:03

DOOR NUMBER:
202A, 101B, Dewatering Building (101D)

EACH TO HAVE:
6 HINGES 5BB1 X USP
2 MANUAL FLUSH BOLT FB458
1 DUST PROOF STRIKE DP2
1 CLASSROOM LOCK L9070
2 OVERHEAD STOP 904S

HW SET:04

DOOR NUMBER:
104

EACH TO HAVE:
3 HINGES 5BB1 X USP
1 OFFICE LOCK L9050
1 WALL BUMPER WS407CCV

HW SET:05

DOOR NUMBER:
111, 112

EACH TO HAVE:
3 HINGES 5BB1HW X USP
1 OFFICE LOCK L9050
1 SURFACE CLOSER RA1461
1 KICK PLATE 8400
1 WALL BUMPER WS407CCV

HW SET:06

DOOR NUMBER:
110, 113

EACH TO HAVE:
3 HINGES 5BB1 X USP
1 CLASSROOM LOCK L9070
1 OVERHEAD STOP 904S

HW SET:07

DOOR NUMBER:
108B

EACH TO HAVE:
3 HINGES 5BB1 X USP
1 STOREROOM LOCK L9080
1 SURFACE CLOSER PA1461 CNS
1 THRESHOLD 410
1 SET DOOR SEALS5020
1 DOOR BOTTOM SEAL 220SA

MOUNT THRESHOLD UNDER DOOR BOTTOM

HW SET:08

DOOR NUMBER:
108A

EACH TO HAVE:
3 HINGES 5BB1 NRP X US32D
1 MANUAL FLUSH BOLT FB458
1 CORRIDOR LOCKL9456
1 OVERHEAD HOLDER904H
1 THRESHOLD 4425
1 SET DOOR SEALS5020
1 DOOR BOTTOM SEAL C627A
1 ASTRAGAL BY DOOR MANUFACTURER

HW SET:09

DOOR NUMBER:
106, 107

EACH TO HAVE:
3 HINGES 5BB1HW X USP
1 PASSAGE LATCH L9010
1 SURFACE CLOSER RA1461
1 KICK PLATE 8400
1 WALL BUMPER WS407CCV

HW SET:10

DOOR NUMBER:
105

EACH TO HAVE:
3 HINGES 5BB1 X USP
1 CLASSROOM LOCK L9070

1 SURFACE CLOSER RA1461
1 KICK PLATE 8400
1 WALL BUMPER WS407CCV

HW SET:11

DOOR NUMBER:
Dewatering Building (101C, 103A, 103C), 201B, 201C, 201D

ALL HARDWARE BY DOOR SUPPLIER

HW SET:12

DOOR NUMBER:
102B, 201A, 201B, Dewatering Building (101A, 103B, 103D)

EACH TO HAVE:
3 HINGES 5BB1 NRP X US32D
1 CORRIDOR LOCKL9456
1 SURFACE CLOSER PA1461 SCNS
1 KICK PLATE 8400
1 THRESHOLD 425
1 SET DOOR SEALS5020
1 DOOR BOTTOM SEAL C627A

HW SET:13

DOOR NUMBER:
Dewatering Building (102A)

EACH TO HAVE:
3 HINGES 5BB1HW X USP
1 PRIVACY LOCK L9040
1 SURFACE CLOSER PA1461 CNS
1 KICK PLATE 8400
1 SET DOOR SEALS5020

HW SET:14

1 KEY CABINET RWC-50-S

HW SET:AL-1

DOOR NUMBER:
101A

EACH TO HAVE:
1 CONTINUOUS HINGE SL24-HD
1 DEADLOCK WITH/ THUMBTURN CYLINDER MS1850S X 4066
1 CYLINDER 20-013

1 PUSH/PULL SET 9190-0-NO
1 CONCEALED CLOSER 2034
1 FLOOR STOP FS18S
1 THRESHOLD 424
1 SET DOOR SEALSBY DOOR MANUFACTURER
1 DOOR BOTTOM SEAL BY DOOR MANUFACTURER

HW SET:15

DOOR NUMBER:
101B

EACH TO HAVE:
6 HINGES 5BB1HW X USP
1 CLASSROOM LOCK L9070
2 OVERHEAD STOP 904S
1 WALL BUMPER WS407CCV

END OF SECTION 08 71 00

SECTION 43 53 54 - BLOWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rotary-Screw blower package with integrated controls including accessories as specified herein.
   a. Quantity: 2
   b. Blower Application: Aerobic Digester
   c. All equipment specified in this section shall be designed and furnished by the blower manufacturer, who shall be responsible for the suitability and compatibility of all included equipment per this section.

B. Related Sections:

1. Div. 26 - Execution requirements for electrical connections to equipment specified by this Section.

1.2 SCOPE

A. Contractor:

1. Furnish, unload, store and install rotary-screw blower equipment with accessories necessary to provide a complete operational system as shown on the plans and as specified.

2. Shall be responsible for startup and training activities under the direction of the qualified manufacturer’s representative.

1.3 QUALITY ASSURANCE

A. Manufacturers’ Qualifications:

1. All equipment furnished under this section shall be manufactured in a plant whose quality management system is certified / registered as being in conformity with ISO 9001 and who shall assume complete responsibility for the design and performance of the blower package.
2. All equipment furnished under this section shall be new, unused, and shall be the standard product of the manufacturer, who shall have a minimum of 10 years’ experience in producing blower packages and be able to produce evidence of at least 5 installations of similar size in satisfactory operation in the United States, if requested.

B. Factory Tests:

1. All cast parts to be manufactured in a plant whose quality management system is certified / registered as being in conformity with ISO 9001.
2. All critical dimensions of the blower components provided by the manufacturer shall be verified and documented prior to assembly.
3. Each Rotary-Screw VFD blower package provided by the manufacturer shall be guaranteed to provide performance to ISO 1217, Annex E.
4. On completion of final assembly of the packaged blower and prior to shipment, each blower package shall be mechanically run at the prescribed design conditions to confirm machine operation.
5. Each blower package provided by the manufacturer shall be guaranteed to provide performance to ISO 1217, Annex C.

C. Reference Standard:

1. American Society of Testing and Materials (ASTM)
2. National Electrical Manufacturers Association (NEMA)
3. Occupational Safety and Health Administration (OSHA)
4. National Electrical Code (NEC)
5. American Gear Manufacturers Association (AGMA)
6. Anti-Friction Bearing Manufacturers Association (AFBMA)
7. International Organization of Standardization (ISO)
8. International Electrotechnical Commission (IEC)
9. German Institute for Standardization (DIN)

1.4 SUBMITTAL

A. Manufacturer's standard submittal for establishing compliance to this section shall include the following items; following submittal procedures in accordance with Section 01 33 00
1. Table of contents
2. A complete and detailed list of any and all variations to the specification
3. Descriptive literature, bulletins, and/or catalog cut sheets of the equipment
4. Scope of supply
5. Blower package performance data sheets showing at least the following:
    a. Package model name
    b. Bare blower model name
    c. Design conditions as listed in this section
    d. Air flow in ICFM and SCFM for design conditions listed
    e. Discharge Pressure
    f. Motor size
    g. Package input power and Specific performance per ISO 1217 Annex C/E
    h. Process air connection size
    i. Operating Voltage required for both main motor and enclosure ventilation fan
    j. Sound pressure and power levels within the tolerances of ISO 2151
    k. Dimensions
    l. Package weight
    m. Discharge temperature
    n. Accessories being supplied
6. Installation Data sheets
7. Manufacturer's Selection data sheet showing design point plus five different speeds which include the minimum and maximum flows in SCFM. The Selection data sheet

must also show graphs for the flow vs block speed, specific power vs block speed, motor shaft power/block shaft power/total power consumption vs block speed and pressure vs flow, and temperature rise at standard conditions.

8. Blower package drawing showing all important details required for installation including dimensions, anchor bolt locations, size and location of connections to other works and weight of equipment.
9. Motor manufacturer's data sheet showing at least the following:
    a. Motor manufacturer's name and model number
    b. Efficiency class and %
    c. Efficiency at ½, ¾, and full load
    d. Amp draw
    e. Motor RPM
    f. Code letter
    g. Motor frame
10. Electrical connection diagram for motor, enclosure ventilation fan and any blower accessory requiring an electrical connection.
11. Process data map for controller bus connection
12. Inlet filter documentation conforming to EN 779, Class G4
13. Data sheets for supplied instrumentation, components, and accessories
14. A list of recommended maintenance parts for one year of operation
15. Spare parts overview drawing
16. Recommend spare parts list
17. Paint specification for blower package
18. Maintenance overview
19. Blower startup check list
20. Lubrication requirements
21. SDS sheet (oil)
22. Warranty information
23. Manufacturer's standard for equipment standards
24. Compliance with Machinery Standards for sound and performance certificate

B. Manufacturer's standard Operation and Maintenance Manual shall include the following sections; following submittal procedures in accordance with Section 01 33 00
1. Regarding this document
2. Technical Data for the blower package
3. Safety and Responsibility
4. Design and Function
5. Installation and operating conditions
6. Installation
7. Initial Start-Up
8. Operation
9. Fault Recognition and Rectification
10. Maintenance
11. Spare parts, Operating Materials, Service
12. Decommissioning, storage and transport
13. Annex with drawings and diagrams

1.5 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Delivery and handling of Equipment:

1. Manufacturer and Contractor shall coordinate the delivery schedule for just in time delivery to minimize the period the Blower package is on site before installation.
2. Contractor shall unload and inspect all equipment and materials against reviewed shop drawings at the time of delivery. Any damage shall be reported to the freight company immediately upon receipt.
3. Equipment and materials damaged or not meeting the requirements of the reviewed shop drawings shall be immediately returned for replacement or repair.
4. Each box or shipping crate shall be properly marked to show its net weight and its contents.

B. Storage:
1. Contractor shall prepare for storage and label all equipment and materials after they have been inspected. The Contractor shall be responsible for the equipment and materials while in storage.
2. Store materials to permit easy access for inspection and identification. Support all material off of the ground while protecting steel members and packaged material from corrosion and deterioration as per manufacturers' instructions.

1.6 SPARE PARTS

A. Furnish the following manufacturer's recommended routine maintenance spare parts for each blower package provided:
1. Two (2) integral inlet silencer filter elements
2. Lubrication for first year of operation
3. One (1) oil demister filter element
4. Three (3) inlet and One (1x) exhaust filter mats for blower control cabinet
5. One (1) automatic motor greasing cartridge
6. One (1) Siemens or Allen Bradley Basic Operator Panel
7. One (1) Temperature and Pressure Sensors and Cables (per model)
8. One (1) tube of motor grease (50HP or larger) as applicable
9. One (1) Set of fuses

B. All parts shall be furnished in clearly identified packaging

1.7 WARRANTY

A. The manufacturer shall warrant the bare blower being supplied against all defects in workmanship and materials for a period of sixty (60) months from date of startup, not to exceed sixty-six (66) months from date of shipment from the manufacturer of the blowers. All other package components shall be warranted for a period of twelve (12) months from the substantial completion, not to exceed eighteen (18) months from the date of shipment.

B. The contractor shall be responsible for proper storage of the equipment so as to remain in "as shipped" condition. If the equipment remains in storage at the job site for longer than six (6) months before installation, the contractor shall provide factory service personnel for a complete inspection of the equipment. Any work necessary to restore the equipment to "as shipped" condition shall be the responsibility of the contractor.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. The equipment specified herein is intended to be standard equipment for use in low pressure air systems and be supplied by a single manufacturer or authorized sales representative to assure uniform quality, ease of maintenance, and minimal parts storage.

B. Manufacturers:

1. Kaeser Compressors, Inc.
   a. Model - GBS1050M
2. Aerzen USA
   a. Equivalent model
3. Or Pre-Approved Equal.
   a. Reference Section 01 60 00 for product substitution procedures for information pertaining to alternate products

C. Plan layouts, weights, and pertinent specification language used in the design have been based upon Kaeser Compressors, Inc. equipment. Any changes required to accommodate equipment other than the basis of design shall be provided by the Contractor at no additional expense to the Owner. Furthermore, a complete and detailed deviation list from the specification shall be provided with proposal.

2.2 DESIGN CRITERIA

A. Standard Conditions for SCFM:
1. Elevation: 14.7 PSIA (0’ elevation)
2. Temperature: 68 deg F
3. Relative Humidity 36%

B. Design (site) Conditions for ICFM:
1. Elevation: 14.2 PSIA (912’ elevation)
2. Maximum Blower Inlet Temperature: 113 deg F
3. Relative Humidity*: 50%
   *Relative humidity at maximum blower inlet temperature

C. Performance Data:
1. Application: Aerobic Digester
2. Quantity: 2
3. Blower Packaged Controlled by a VFD: YES
4. Flow Required: 730-3100 SCFM
5. Blower Package Discharge Pressure: 9.5 PSIG
   a. Maximum rated pressure: 14.1 PSIG
6. Blower airend: Low pressure
7. Motor Horsepower: 175 HP
   a. The motor shall not operate in its service factor at design conditions.
   b. VFD efficiency loss shall be accounted for.
8. Power supply voltage:

a. Main Motor: 460v/3ph/60hz
b. Incoming supply configuration: center grounded WYE
9. Sound pressure level = 75 dB(A) at 3 feet*
10. Sound power level = 94 dB(A) *
*In accordance with ISO 2151, +/- 3 dB(A), with insulated piping.

D. Performance Guarantee:

1. Blower sound level shall be guaranteed by the manufacturer to be within the allowed tolerances of ISO 2151, +/- 3 dB(A) at 1m, free field conditions, with insulated piping.
2. The blower element performance provided by the manufacturer shall be guaranteed per ISO 1217, Annex B.
3. The specific performance (kw/100-cfm) of the complete Rotary-Screw blower package provided by the manufacturer shall be guaranteed to provide performance to ISO 1217, Annex C/E. For flows greater than 500 CFM, the permissible tolerance on flow is +/-4% and specific performance tolerance is +/- 5%.

E. Plant System Communication:

1. Interface: Ethernet/IP

2.3 BLOWER PACKAGE CONFIGURATION:

A. Installation Location: Indoor

B. Inlet Configuration: Ambient

C. All components and instrumentation are to be mounted and pre-piped; no field installation shall be required by the contractor. The manufacturer shall be responsible for all aspects of the engineering, from the blower package's air inlet to its discharge connection.

2.4 DESIGN CRITERIA:

A. Blower Type:
1. The bare blower shall be factory mounted for the package base frame, be of the positive displacement, rotary-screw type, designed for air or other inert gas service, and 1:1 direct drive via coupling (directly coupled and gear driven) driven via electric motor.
2. The bare blower assembly must operate at the effective value for vibration velocity in frequency range A and B, according to VDI 3836.

B. Material:
1. AISI, ASTM, GJL, GLS, DIN, etc., numbers types, and grades specified are typical of material composition and quality, equivalent materials will be considered.

C. Housing:
1. The casing shall be made of high strength, close grained, cast iron, and shall be adequately ribbed to prevent casing deflection and facilitate cooling. Casing shall be of EN GJL-200 material.

2. The casing shall be precision machined to allow for minimum clearances.
3. The casing shall allow for the thermal decoupling of the gearbox section from the compressor. chamber allowing for low oil temperature. No additional oil cooler, oil pump or oil filter in the oil circuit is acceptable.
4. Reliable separation of compression chamber from oil chamber with no-wear air-side labyrinth sleeve oil sealing ring and oil-side spiral sealing ring, to include an atmospheric break between the air-side and oil-side.
5. Bearing fits shall be precision machined to ensure accurate positioning of the rotors in the casing.

D. Rotors:
1. The primary rotor shall be machined out of a one-piece casting made of EN GJL-250 material.
2. The secondary rotor and shaft shall be machined out of a one-piece casting made of EN GJS-500 material.
3. The shaft of the primary rotor shall be press fit and machined out of C45 shaft material.
4. The rotors shall be machined with precision tolerance to ensure consistent rotor clearance and stable volumetric efficiency.
5. The rotor assemblies shall be statically and dynamically balanced to ISO standard 1940/1- Q2.5 (turbine rotor).
6. The rotors shall have the energy-efficient 4/5 rotor profile for the maximum degree of delivery.
7. The rotors shall operate without rubbing, liquid seals or lubrication in the air chamber. No surface coating shall be allowed.

E. Timing Gears:
1. The rotor timing gears shall be precision machined from case hardened, ground alloy steel to quality standard 5f 21. Each timing gear shall be straight cut, beveled, and precision ground to eliminate axial bearing loads and ensure long life as well as quiet operation.

F. Bearings:
1. All four rotor shaft support locations shall incorporate large, heavy-duty, full complement, cylindrical roller bearings with PEEK cages to absorb the radial gas forces which affect the rotors.
2. An additional gear side ball bearing set loaded for axial forces only.
3. The bearings minimum acceptable L10 design life shall be as follows;
   a. At least 100,000 hours at design conditions

G. Lubrication:
1. 1. Both the gear end and the drive end of the blowers shall be oil splash lubricated via a disc slinger for minimal maintenance and long service life. Grease lubricated bearings in the blower are not acceptable.
2. The drive-end and gear-end oil chambers shall not be interconnected.
3. Each oil chamber shall have x1 drive-end and x2 gear-end domed designed sight glasses which will allow visual inspection of oil level and oil condition, viewable from the front of the blower.
4. Blower to be factory filled with a synthetic lubricating fluid that is rated for the design conditions specified.
5. The motor bearings of the drive motor are to be re-lubricated by means of an automatic lubrication system. The grease is supplied from a grease cartridge at regular intervals.

The blower controller shall define the lubricant delivery frequency to meet the motor manufacturer's specifications.

H. Rotor Seal Assembly:
1. Each rotor shall include one seal assembly on each end, four assemblies in total per blower.
2. Each seal assembly shall consist of the following;
   a. Oil splash guard ring.
   b. Shaft guide wear sleeve, with atmospheric break to prevent contamination of the air delivered, located between the air and oil seals. Wear sleeve to protect the blower casing.
   c. Replaceable wear sleeve to protect the blower casing.
   d. Two piston ring type labyrinth seals made from heat treated GG/42CrMo4 material shall be located on the air side and two spiral sealing seals shall be located on the oil side of the rotor sleeve. The use of rubber lip seals shall not be allowed.
   e. Seal assemblies shall not require an additional vacuum pump or electric oil mist separator for a sealing effect.

I. Input Shaft Seal Assembly:
1. The input drive shaft seal shall be a sliding ring type seal that will prevent oil leakage from where the input shaft goes through the drive end cover plate.
2. The sliding ring type seal assembly shall consist of the following;
   a. Replaceable wear sleeve on the input drive shaft
   b. Cover plate with a machined sealing surface
   c. Sliding ring seal assembly
3. The input shaft seal design must allow for the seal assembly to be replaced without removing the drive end cover plate.

2.5 MOTORS:

A. Drive Motor:
1. Motor shall be designed, manufactured, and tested in accordance with the latest revised editions of NEMA MG-1, IEC, DIN, ISO, IEEE, ANSI, and AFBMMA standards as applicable and shall be capable of continuous operation.
2. Motor must exceed Energy Independence and Security Act (EISA 2007) standards for NEMA Premium efficiency. It shall also be marked with a Department of Energy Certification Compliance Number to assure compliance, when to be connected to the grid (STC). VFD drive motors to reach IE5 per IEC 60034-2-3.
3. Motor shall comply with Low Voltage Directive 2006/95/EC or equivalent and be UL listed.
4. Motor must be inverter-rated with impulse peak resistance in accordance with IEC 60034-17 or equivalent for operation with an IGBT frequency converter or equivalent.
5. Motor shall be suitable for Full Load/Direct On-line starting, Solid State Ramp starting, VFD, and/or Wye-Delta reduced current starting. SynRM motors are only capable of VFD operation.
6. Motor to be supplied, mounted and aligned by the blower package manufacturer.
7. Motor shall conform to the following:
   a. Motor voltage: 460v/ 3ph/ 60hz
   b. Type: Squirrel cage induction
   c. Speed: Single

d. Torque: Constant
e. Service Factor: 1.15
f. Enclosure: TEFC
g. Mounting: Horizontal
h. Speed: 4,500 rpm @ 75 hz (maximum)
i. Design: A
j. Duty cycle: continuous (24 hours a day)
k. Winding insulation: F
l. Temperature rise: B
m. Thermal motor protection: Pt100 resistance
n. Conduit box location: Left side from shaft end
o. Wiring Connection: Terminal strip inside conduit box. Use of wire nuts for connection of motor wiring to power source shall not be allowed.
p. Bearing service interval: >60,000 hours
q. Bearing lubrication: Grease
r. Bearing type: Greaseable
s. Bearing design: Cantilever forces
t. Condensation winding 110v heater: No
u. Inverter duty rated as required to accommodate VFD operation

8. Motor shall be as manufactured by Siemens or Blower Manufacturer standard equivalent.

B. Sound enclosure ventilation fan motor:
1. Motor shall be UL listed.
2. Motor starter/overload protection shall be provided and wired by the blower package manufacturer.
3. Motor shall turn “on” when the main motor starts and turn “off” after a predetermined time when the main motor stops.
4. Ventilating fans mounted on the blower or motor shaft are not allowed.

2.6 BLOWER PACKAGE

A. Drive:
1. The blower shall be a robust, slip-free 1:1 direct drive system (slip-free power transmission).
2. Flexible drive coupling shall be located between motor shaft and blower shaft. Cast iron housing between motor and blower shall provide for permanent shaft alignment.
3. No additional oil pump, oil reservoir, or heat exchangers shall be used.
4. Drive motor must be flanged, direct-mount face.
5. Drive motor shall use grease-filled bearings with automatic re-greasing.
6. Drive motor shall include heavy-duty mechanical drive shaft seal with drain system towards motor face.
7. Drive system shall provide for low radial loads on the motors ball bearing design for long bearing lifetime.

B. Inlet Silencer:
1. An inlet silencer designed for the frequency range of the blower, shall be provided to reduce the noise of the blower package as specified.
a. The inlet silencer shall be of carbon steel construction and be of the wear-free absorptive type, directly connected to the inlet port of the blower, and shall be mounted horizontally.

b. The inlet silencer shall be lined with replaceable polyether absorptive material.
c. The inlet silencer shall have an integral filter designed to protect the blower from particulates. It shall be located between the absorptive material and the blower inlet.
   1) The filter element shall be a washable and reusable polyester element for minimal pressure drop.
   2) The filter efficiency shall meet ASHRAE 52.2 MERV7 50-70%% @ 3-10 microns corresponding to EN779 G4.
   3) The filter element integral to the silencer shall be supplied no matter if the inlet configuration of the silencer is ambient or piped.
   4) Filter element shall be removable without disconnecting the inlet duct.
d. The filter maintenance cover and element must be removable by hand (without the use of tools).
e. The pressure loss thru the inlet silencer assembly shall be accounted for in the motor horsepower selection of the blower package.
f. If required on piped inlet configuration, any additional filtration or screening at the inlet location of the piped inlet air source is not the responsibility of the blower manufacturer.

C. Base frame:
1. Elevated base frame shall support the blower airend, valves, and silencers completely pre-mounted on elastic machine mounts.

D. Discharge Silencer:
1. The discharge silencer is to be designed for the frequency range of the blower and is to reduce the noise of the blower package as specified.
2. Discharge silencer shall mount to blower discharge adapter port via flexible flange type connector.
3. The discharge silencer shall be of carbon steel construction.
4. Discharge silencer shall incorporate a solid outer shell and a perforated inner cylinder with absorptive material in between the outer shell and the inner cylinder.
5. Absorptive material shall be long, flexible, knotted polyester fibers to prevent fiber migration, to allow for lowering the noise and to reduce heat emissions inside the sound enclosure. The use of mineral wool or attenuating blankets mounted externally will not be allowed.
6. The pressure loss through the discharge silencer assembly shall be accounted for in the motor horsepower selection of the blower package.
7. The discharge silencer shall have a connection port for pressure relief valve, pressure and temperature probes, and unloaded starting valve. Unused ports should be capped or plugged.

E. Blower Sound Enclosure:
1. A sound enclosure shall be provided which fully covers the blower, motor, drive assembly, inlet silencer, blower base frame, discharge silencer, and shall be shipped fully assembled.
   a. The sound enclosure shall be the product of the blower manufacturer to insure proper integration of blower package components.
   b. The sound enclosure shall meet or exceed the sound level specified.
   c. The sound enclosure shall be fitted with heavy foam, bulk density 120 kg/m3.
   d. The sound enclosure assembly shall be of self-supporting bolted steel panel construction on a fabricated steel skid.

1) All removable maintenance panels or doors shall be located on the sides of the sound enclosure and must have a slotted key lock. A door key shall be provided. All maintenance panels shall meet OSHA weight requirements.
2) The enclosure base shall be designed to enclose the full bottom of the sound enclosure, function to contain oil spillage, and include fork lift guides for easy transportation and installation.

e. The sound enclosure ventilation cooling air circuit shall be separate from the process air circuit.
1) Mixing of the two air circuits within the enclosure shall not be allowed.

f. The sound enclosure shall have a deflector plate positioned at the blower coupling to allow for the flow of ambient cooling air across the blower oil chambers.

g. A screened inlet louver shall be located on the back of the enclosure and designed to provide a laminar flow of ambient cooling air across the blower drive motor.

h. The sound enclosure ventilation air exhaust and the ventilation fan shall be located at the top of the sound enclosure.

i. The ventilation fan shall be sized to provide adequate cooling of the blower package at all blower speeds. Shaft-mounted fans are not allowed.

F. Control Cabinet:

1. A control cabinet located at the front side of the sound enclosure shall be preinstalled and wired on the sound enclosure skid.
2. The control cabinet shall be UL-508A approved and shall meet or exceed IP52 standards for environmental protection.
3. The back of the control cabinet shall have predrilled holes with grommets for easy pass thru of electrical wiring.
4. The control cabinet's back plate shall be galvanized for improved grounding.
5. The Rotary-Screw VFD blower package's control cabinet shall have a lockable hinged door which allows access to the factory installed variable frequency drive, enclosure vent fan starter, terminals, relays, operator control panel, cabinet cooling fan and all interconnecting wiring.
   a. The control cabinet shall utilize a high capacity cooling fan to remove heat from the cabinet and maintain proper operating temperatures.
6. The electrical cabinet shall be fitted with inlet and exhaust filter mats to mitigate contamination inside the cabinet.
7. Electrical cabinet shall be independently ventilated using a cabinet cooling fan.

G. Operator Control Panel

1. The operator control panel shall include a graphical user interface. The controller shall be suitable for use in an ambient temperature range of -4ºF to +140ºF.
2. The controller shall be suited for the specified conditions as previously listed and include an industrial PC with powerful processing software that will allow for the control, regulation, and monitoring of the blower package, along with allowing the display and modification of machine settings and external communication.
   a. The controller shall include a stabilized 24VDC power supply and a real time clock with a scheduling timer.
   b. A buffer battery with a ten-year lifetime shall be included for protection of system memory and internal clock.
   c. The controller shall include digital and analog inputs/outputs for controlling and/or monitoring the following.

1) Main motor, sound enclosure ventilation fan motor and electrical cabinet ventilation fan motor.
2) Emergency stop push button.
3) Incoming power monitor relay for phase failure, undervoltage, overvoltage, and phase sequence.
4) Blower inlet and discharge temperature.
5) Blower inlet and discharge pressure.
6) Filter differential pressure.
7) Sound enclosure temperature.
8) Oil temperature and oil level.

d. The controller shall have the ability for the operator to be able to externally wire the following digital input/output signals.
1) Remote on/off (DI)
2) Remote reset of fault message (DI)
3) Remote no external failure (DI)
4) Blower running signal (DO)
5) Blower on signal (DO)
6) Group alarm signal (DO)
7) Group warning signal (DO)
8) Remote 4-20mA blower speed signal (AI)
9) 4-20mA speed output from inverter (Rotary-Screw VFD blower packages) (AO)

e. The controller shall include touch key controls with LED indications on important functions.

f. The controller display shall be LED backlit with a plain text and graphical display capable of displaying the blower packages status in English.

g. The controller shall utilize Radio Frequency Identification (RFID) Technology or passcode, which ensures secure log-in for users and service personnel so service work and system changes can be performed only by authorized and qualified personnel.

h. The controller shall include an integrated web server.

i. The controller shall include a SD card slot for the manual loading of updates and downloading of controller specific process data.

j. The controller shall include an expansion slot for communicating with various industrial protocols/plant monitoring systems.

k. The controller sensor connections shall be via a central I/O module with labelled connections.

l. The controller shall include displayable operating and maintenance hour counters for major components.

m. The controller shall have the ability to be timed controlled via up to 10 programmable timers.

n. The controller shall shut down the blower package in the event of a motor overload, high blower differential temperature, high blower differential pressure, high sound enclosure temperature, in-correct rotation, loss of drive or external failure signal.

o. The controller shall have a programmable and selectable auto re-start after loss of power.

3. The controller shall have the ability to communicate the status of the blower package in the following ways to the operator.
a. Local control status at the controller display
b. Remote machine status via the supplied Ethernet connection

c. Operator's systems plant communication via EtherNet/IP
1) The process data map of the controller shall be supplied by the blower manufacturer The interface programming to the systems plant controller is not included in the blower manufacturer's scope of supply.

4. The controller shall enable the blower package to be controlled by the following ways.
a. On and off directly at the blower package
b. On and off remotely away from the blower package
c. On and off from selectable timers in the controller
5. The Rotary-Screw VFD blower package's controller shall enable the blower package to be controlled by the following control modes.
a. Speed setting with an external 4-20mA signal
1) The motor speed must be capable of being controlled via an external analog signal within the programmed speed minimum and maximum speed range.
b. Manual speed setting
1) The motor speed shall be capable of being controlled manually by the operator changing the speed via the controller display.

H. The Rotary-Screw VFD blower package's drive system shall be Variable Frequency Drive as follows
1. The blower drive system shall use a 6-pulse, constant torque, AC variable frequency drive using pulse width modulation technology (PWM), integrally mounted and wired into the blower package control cabinet.
2. The blower drive shall consist of the power module (frequency converter) and control unit. It shall be of Siemens SINAMICS converter family or an approved equal.
3. VFD and motor combination to meet IES2 efficiency standard.
4. The blower drive shall "soft start" to allow for unlimited motor starts per hour.
5. The blower drive shall monitor the motor Pt100 sensors.
6. The blower drive control and data input shall be via bus system from the blower controller as sole and central operating unit and communication interface.
7. The blower drive shall come completely programmed and parametrized. An SD card slot shall be provided for updates.
8. The blower drive shall have an integrated DC link reactor line. The DC link reactor shall smooth voltage peaks, bridge commutation gaps and reduce the effects of harmonics on the inverter and line supply.
9. The blower drive shall include a class A noise suppression line (RFI) filter either integrated to the power module or preinstalled and wired between the line reactor and power module.
10. The blower drive shall be protected from Electro Magnetic Interference by utilizing shielded motor connection cables.

I. Blower Package Accessories:
1. Safety Relief Valve
a. The relief valve(s) shall be factory installed within sound enclosure. Relief valve may not be shipped loose for field installation in the discharge piping.
b. The relief valve(s) shall be spring type and must be sized for 100% of the design flow specified. Weighted relief valves shall not be used.
c. The relief valve(s) shall be set to protect the blower from excessive differential pressure based on the design conditions specified. A seal shall be affixed that must be broken if set point is changed.
d. The relief valve(s) exhaust shall be vented out of the sound enclosure. Exhaust vented into the sound enclosure shall not be allowed.

e. The relief valve shall be ASME Section VIII, UV, CE, and PED certified.

2. Check Valve
   a. A check valve to prevent back flow through the blower shall be factory installed and not shipped loose for field installation in the discharge piping.
   b. The check valve flapper shall be swing type made from a steel disc embedded in a high temperature silicone elastomer. The valve shall be designed so that, in the event of failure, the valve element is retained in the valve housing. Split disc or center hinged designs shall not be used.
   c. The check valve capacity shall exceed the blower package's maximum discharge pressure, flow, and temperature.
3. Flexible Connector
   a. An elastomeric compensator/flex connector shall be provided to isolate the connection of the blower package to the self-supporting system piping. Restraining rods shall not be used. Flex connectors located between the bare blower and silencers shall not be allowed.
   b. The flexible connector capacity shall exceed the blower package's maximum discharge pressure and temperature.
   c. Piped Inlet connection not required.
   d. Discharge connection shall be provided with flange compensator.
4. Oil Drains
   a. An oil drain from the blower drive-end and gear-end lubricating oil sumps shall be separately piped to the front of the blower base with flexible tubing. Common fill and drain shall not be allowed.
   b. Each oil drain shall include a drain valve installed for ease of maintenance. The drain valves shall be 90° stainless steel ball valves and include a fully retained gasketed and threaded cap to prevent accidental discharge of the blower lubricant.
5. Vibration Isolators
   a. Vibration isolators shall be provided between the blower assembly and sound enclosure skid to prevent transmission of vibration to the foundation.
   b. A ground wire shall be installed between the blower base and the sound enclosure base to allow for grounding of the complete blower package.
6. Inlet and Discharge Pressure Transducer
   a. Pressure transducers shall be installed on the inlet and discharge of the blower and shall be monitored by the blower controller.
   b. The transducers shall have the following range
      1) 0 to -17.4 PSIG (inlet)
      2) 0 to 17.4 PSIG (discharge)
   c. The transducers shall have a sensor made of Ceramic aluminum oxide
   d. The transducers shall have an output signal of 4-20mA
7. Inlet and Discharge Temperature Sensor
   a. Temperature sensors shall be installed on the inlet and discharge of the blower and shall be monitored by the blower controller.
   b. The sensors shall have a temperature range of -58ºF to 392ºF.
   c. The sensors shall have a thermowell made of brass.
   d. The sensors shall have a measure element of Pt100.
8. Enclosure Temperature Thermostat
   a. The blower package shall include an installed temperature thermostat that measure the temperature inside of the blower package's enclosure and shall be monitored by the blower controller.

b. The device shall monitor the enclosure of the blower package with a temperature setpoint of 140ºF.

9. Oil Temperature Sensor
   a. The blower shall include an installed oil temperature sensor in the gear side oil sump (or blower discharge end) that shall measure the oil temperature and shall be monitored by the blower controller.
   b. The oil temperature sensor shall have a temperature range of -58ºF to 482ºF
   c. The sensors shall have a thermowell made of brass.
   d. The sensors shall have a measure element of Pt100.
10. Oil Level Switch
   a. The blower shall include an installed oil level switch, one for each oil sump that shall measure the oil level in each oil sump of the blower. The oil levels shall be monitored by the blower controller.
   b. The oil level switch shall be preset for low oil condition.
   c. The oil level switch shall be a SPST switch, Voltage rating up to 250v, 0.5 A
11. Gear Chamber Aeration Demister System:
   a. Each air chamber shall be vented to atmosphere through an aeration demister system.
   b. The demister system will discharge into cabinet 99.98% oil free air.
   c. Any oil collected by demister system shall be automatically drained back into gear side blower oil sump.

J. Nameplates:
1. The blower package shall have at least two weather proof corrosion resistant type nameplates which includes the manufacturer name, model number, year, max pressure difference, equipment number, part number, serial number, voltage, phase, HP, motor rpm and rated temperature attached on the outside and inside of the blower package.

K. Anchor bolts and hardware:
1. Anchor bolts, washers, hex nuts, and all other fastening hardware shall be stainless steel and be supplied by the contractor. Anchoring hardware shall be of the size and type recommended by the blower manufacturer.

L. Paint Specification:
1. The blower manufacturer is responsible for surface preparation, priming and finish coating of the blower package and components requiring paint in accordance with the manufacture's standard procedures. Field painting of blower equipment or supplying components that are only prime painted is not acceptable.
   a. Cast parts are to be painted with a two-part gray epoxy primer and two-part top coat.
   b. Fabricated parts are to be painted with a two-part gray epoxy primer and two-part top coat.
   c. Sound enclosure parts are to be powder coated.
      1) Panels and base paint finish shall be pretreated by de-greasing and phosphate cleaning, then powder coated to a thickness of 70 µm -100 µm on both sides.
2. The blower package to be painted the blower manufacturer's standard colors.

SECTION 46 43 21 - CIRCULAR CLARIFIER EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes the following for two (2) clarifiers:

1. Control panels.
2. Full diameter access bridge and walkway.
   a. Center platform
   b. Grating
   c. Hand-railing
   d. Toe Plates
3. Clarifier drive mechanism.
   a. Gearmotor reduction unit
   b. Micro-switch torque overload devices
   c. Shear pin
4. Unitube sludge removal mechanism.
   a. Header
   b. Manifold
   c. Seals
   d. Clamp Kit
   e. Supports
5. Center cage.
   a. Cage
   b. Truss arm
   c. Tie-chord A-frame
   d. Clevis assembly
6. Surface skimmer assembly.
   a. Scum blade
   b. Hinged skimmer assembly
   c. Raceway skimmer
   d. Ramp
7. Scum trough with flushing device
8. Influent peripheral feed channel.
   a. Oriface tubes
   b. Overflow tubes
   c. Skirt baffle
   d. Target baffle
9. All associated hardware and anchor bolts

B. Related Requirements:

1. Section 06 60 00 – FRP Weir Plates, Scum Baffles and Brackets: Weirs and Baffles furnished under this section
2. Section 46 05 53 - Identification for Water and Wastewater Equipment: Nameplates for equipment specified in this Section.

1.2 DEFINITIONS

A. FRP: Fiberglass-reinforced plastic.

1.3 REFERENCE STANDARDS

A. American Bearing Manufacturers Association:

1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. American Gear Manufacturers Association:

1. AGMA 201.02 - Tooth Proportions for Coarse-Pitch Involute Spur Gears.
2. AGMA 390.03a - Handbook - Gear Classification, Materials and Measuring Methods for Bevel, Hypoid, Fine Pitch Wormgearing and Racks Only as Unassembled Gears.
3. AGMA 908 - Information Sheet - Geometry Factors for Determining the Pitting Resistance and Bending Strength of Spur, Helical and Herringbone Gear Teeth.
4. AGMA 2000 - Gear Classification and Inspection Handbook - Tolerances and Measuring Methods for Unassembled Spur and Helical Gears (Including Metric Equivalents)
5. AGMA 2001 - Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth.
6. AGMA 2004 - Gear Materials and Heat Treatment Manual.
7. AGMA 6001 - Design and Selection of Components for Enclosed Gear Drives.
8. AGMA 6013 - Standard for Industrial Enclosed Gear Drives.
9. AGMA 6019 - Standard for Gearmotors Using Spur, Helical, Herringbone, Straight Bevel or Spiral Bevel Gears.
10. AGMA 6022 - Design Manual for Cylindrical Wormgearing.
11. AGMA 6034 - Practice for Enclosed Cylindrical Wormgear Speed Reducers and Gearmotors.
12. AGMA 6113 - Standard for Industrial Enclosed Gear Drives (Metric Edition).
13. AGMA 9005 - Industrial Gear Lubrication

C. American Society of Mechanical Engineers:

1. ASME B17.1 - Keys and Keyseats.
2. ASME B17.2 - Woodruff Keys and Keyseats.
3. ASME B29.100 - Double-Pitch Roller Chains, Attachments, and Sprockets.

D. ASTM International:

1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

E. American Society for Testing and Materials (ASTM):

1. A36/A36M – Standard Specifications for Structural Steel
2. A48 – Standard Specification for Gray Iron Castings

3. A148/A148M – Standard Specification for Steel Castings, High Strength, for Structural Purposes
4. A276 – Standard Specification for Stainless Steel Bars and Shapes
5. A325 – Standard Specification for High-Strength Bolts for Structural Steel Joints
6. A536 – Standard Specification for Ductile Iron Castings

F. American Welding Society:

1. D 1.1 – Structural Welding Code for Steel

G. American Institute of Steel Construction (AISC):

1. Specification for Structural Steel Buildings
2. Code of Standard Practice for Steel Bridges and Buildings

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer's Product Data for system materials and component equipment, including electrical characteristics.

C. Shop Drawings:

1. Indicate system materials and component equipment.
2. Submit wiring and control diagrams, installation and anchoring requirements, fasteners, and other details.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1. Certify that installation is completed according to manufacturer's instructions.

E. Manufacturer's Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Manufacturer Reports: Indicate that equipment has been installed according to manufacturer's instructions.

H. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for closeout procedures.

B. Project Record Documents: Record actual locations of installed clarifiers and components.

C. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Spare Parts:

1. Furnish one set of manufacturer's recommended spare parts.

C. Tools: Furnish special tools and other devices required for Owner to maintain and calibrate equipment.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on-Site and inspect for damage.

C. Store materials according to manufacturer's instructions.

1.9 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish five-year manufacturer's warranty for circular clarifier equipment and accessories.

PART 2 - PRODUCTS

2.1 CIRCULAR CLARIFIER EQUIPMENT

A. Manufacturers:

1. Evoqua Water Technologies Corp.

2. Westech

3. Ovivo

4. Approved Equal

a. Specifications and equipment arrangements for the circular clarifier equipment are based on Evoqua. Changes to the arrangement indicated in the specifications and in the plan set shall be at the expense often installing contractor. No change orders will be issued to the contractor for modifications to the laying length, footprint, concrete layout, electrical, mechanical, etc.

B. Description:

1. Furnish and deliver suction type sludge collectors for installation in two (2) concrete settling tanks.
   a. Tank inside diameter of 65 feet with inboard effluent launder
   b. Tank side water depth of 14 feet
   c. Tank freeboard of 2 feet
   d. Floor slope of 1/16 in per foot

C. Performance and Design Criteria:

1. Clarifier Mechanism:

a. Provide a center pier supported, peripheral feed design with peripheral overflow.
b. Provide a center drive mechanism that supports a walkway, maintenance platform, and rotating structural steel cage.
c. The cage shall support the Unitube header, manifold, and truss arm.
d. (1) surface skimmer assembly which includes scum blade, hinged skimmer assembly, raceway skimmer, and ramp.
e. Fabricated steel structures shall be shipped in the largest sub-assemblies permitted by carrier regulations, properly match-marked and identified for ease of field erection.

2. Design Criteria - Equipment

Internal Diameter (feet)	65
Side-water Depth (feet)	14
Minimum Freeboard (feet)	2
Floor Slope	1/16:12
Center Pier Minimum Inside Diameter (in)	 24
Skimmer and Scum Trough Number of skimmer arms Trough width (feet)	 1 6

3. Design Criteria – Drive Mechanism

Ball Race Diameter (in)	30
Torque Requirements AGMA Rated Torque (ft-lbs) Motor Shut-Off Torque (ft-lbs) Momentary Peak Torque (ft-lbs)	 12,100 14,520 24,200

Service Factor	1.25
Drive Output Speed (RPM)	0.04

4. Hydraulic Design Criteria (per Clarifier)

	MIN.	AVE.	PEAK
Effluent Flow (MGD)	0.625	1.0	5.0
Return Flow (MGD)	0.625	1.0	2.4
Mixed Liquor Flow (MGD)	1.25	2.0	7.35

D. Materials:

1. Drive housing: Cast iron
2. Non-submerged steel: A36 carbon steel
3. Submerged steel: A36 carbon steel
4. Grating: 1 ¼-inch aluminum grating
5. Handrails: Aluminum
6. Anchor bolts and hardware: Type 316 SS
7. Structural steel components: Minimum thickness of ¼-inch unless otherwise specified
8. Sharp corners or sheared edges ground to provide a smooth edge
9. Panel lengths and member sizes shall be selected such that slenderness ratios do not exceed 200 for compression and 240 for tension
10. Maximum deflection in a span under combined live and dead loads shall not exceed L/360

E. Drive Mechanism

1. General:

a. Drive mechanism consisting of primary helical gear reduction, intermediate worm gear reduction unit and enclosed final reduction unit consisting of internal spur gear and pinion in a turntable base is to be completely assembled and finish painted in the Manufacturer's shop.
b. All gearing shall be enclosed in gray cast iron ASTM A-48 Class 40B housings. Fabricated steel housings, exposed gearing and submerged bearings will not be acceptable.
c. The drive shall be designed to allow removal and replacement of internal gear, balls and strip liners without raising the walkway.
d. All components of the drive mechanism shall be designed in accordance with AGMA Standard 6034-B92 "Practice for Enclosed Cylindrical Worm Gear Speed Reducers and Gearmotors", and Standard 2001-D04 "Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth"; for 24-hour continuous, uniform load duty and 20-year design gear life at the specified output speed. The AGMA rated torque of the drive shall be the lowest value computed for worm gear set, spur gear and pinion for strength and durability.
e. Select conservative values for bending strength and pitting resistance life factors Kl and Cl based on a minimum of 420,000 cycles of the main gear. The drive

AGMA torque rating shall be as specified above with a minimum 1.25 service factor.

f. All bearings shall be designed for a minimum B-10 life of 200,000 hours.

2. Primary Reduction Unit:

a. Provide commercially available helical gear reducer or gearmotor in a cast housing.
b. All bearings shall be anti-friction type running in oil.
c. Motor shall be totally enclosed, ball bearing type, of ample power for starting and continuously operating the drive mechanism without overloading.
d. Motor to conform to NEMA standards and be suitable for operation on 230/460 volt, 3 phase, 60 Hertz current.
e. Primary reduction unit shall drive the intermediate reduction through a chain and sprocket arrangement with #80L self-lubricating chain and non-corrosive OSHA approved removable chain guard.
f. Provide proper chain tension by an adjustable steel base mounted on the intermediate reduction unit.

3. Intermediate Reduction Unit:

a. Provide worm gear speed reduction with grease and oil lubricated anti-friction type bearings in cast iron housing securely bolted on the machined top face of the final reduction unit. Worm and shaft shall be a two-piece assembly for ease of maintenance. Cycloidal and planetary gearing will not be acceptable.
b. Align and maintain accurate centers with the final reduction gearing. Swivel base mounting of the intermediate unit will not be acceptable.
c. Mount an electro-mechanical overload device on the thrust end of the worm shaft consisting of plate spring assembly, plunger, indicator dial two (2) micro-switches (one N.O. and one N.C.) and a terminal block, all enclosed in a weather tight, gray cast iron housing. Amperage metering devices will not be considered equal to the overload device specified.
d. Micro-switches shall be factory set to: (1) sound an alarm when the load on the mechanism reaches 100% of the AGMA torque; and (2) stop the motor when the load reaches 120% of the AGMA torque.
e. Provide a shear pin device mounted on the drive end of the worm shaft.

4. Final Reduction:

a. Provide internal, full depth involute tooth design, ductile iron spur gear driven by a heat treated steel pinion from the slow speed shaft of the intermediate reduction unit. Stub tooth design will not be acceptable.
b. Provide bearings at top and bottom of pinion to ensure complete tooth contact between mating surfaces. Pinion and pinion shaft shall be furnished as a two-piece assembly for ease of maintenance.
c. Provide cast iron turntable base with annular raceway to contain balls upon which the internal gear rotates. The ball race shall ensure low unit ball load, long life and stability without the use of submerged guide shoes, bumpers or steady bearings.
d. Provide (4) 3/8" thick x 3/4" wide renewable special hardened (38-42 Rockwell C) steel liner strips force fitted (pins and cap screws not permitted) into the turntable base and internal gear for balls to bear on vertically and horizontally.

e. Provide an internal gear of split design with precision mating surfaces for ease of removal of gear, balls and liner strips without raising bridge. Drives without this feature are not acceptable.
f. Internal gear, pinion and balls to run in an oil bath and be protected by a felt seal and vertical neoprene dust shield.
g. Provide oil filling and level pipe along with a drain plug and sight gauge.
h. Turntable base shall be bolted to the center column and be designed to support the bridge, internal gear and rotating mechanism.

F. Influent/Effluent Channels:

1. Contractor to construct channels of concrete at periphery of tank.
2. Influent flow to be in one direction only.
3. Decrease influent channel width uniformly to maintain constant flow velocities.
4. Increase effluent channel width uniformly with decrease in influent channel width to maintain concentric weir wall.

G. Orifices:

1. Manufacturer to size and space inlet orifices in floor of influent channel to provide uniform flow distribution around periphery of the tank.
2. Provide each orifice with a deflection baffle and anchors to reduce jetting action and diffuse the flow.
3. Orifice length shall not be greater than floor thickness.
4. Spacing shall not exceed 6 feet.
5. Provide 3/16" steel plate orifice baffles allowing no restriction less than the orifice diameter and no greater than the diameter plus one inch.

H. Influent Skirt Baffle:

1. Provide influent skirt baffle constructed of 3/16" thick steel sheets and extending 5' beneath the water surface or a minimum 1' below bottom of influent channel, whichever is greater.
2. Fabricate skirt baffle in approximately 20' sections supported from bottom of influent channel floor.
3. Provide sufficient clearance beneath skirt to permit operation of sludge collector mechanism.
4. Maximum velocity beneath skirt baffle not to exceed 5 FPM at maximum flow.

I. Center Pier:

1. A cylindrical 1/4" thick steel plate center pier shall support the drive, collector mechanism and access bridge.
2. Top of pier to have a drive mounting plate set plumb with the centerline.
3. Drive to be positioned, leveled and grouted in place on top of pier with a non-shrink grout.
4. Manufacturer to provide minimum eight (8) 1" diameter anchor bolts and steel template/grout shield to accurately locate anchors.

J. Sludge Collection Header:

1. The header shall be parallel to the tank floor and have a series of inlet orifices such that the entire tank bottom is swept clean in a single revolution.
2. The header shall be designed to uniformly remove sludge in proportion to the area swept with the removal of a larger volume of sludge at greater distances from the tank center.
3. Sludge shall be transported through the header to the center manifold, with removal being accomplished by hydrostatic pressure.
4. Provide a fully tapered, rectangular-shaped Unitube header varying in cross section from a maximum near the tank center to a minimum at the outer wall.
5. Fabricate header from 1/4" thick steel plate.
6. Provide steel plate counterweights not exceeding 50# each as necessary for proper equipment balance. Field welding of galvanized header or supports will not be allowed.
7. Longitudinal cross sectional axis to be mounted at an angle of 45 degrees to tank bottom to trap sludge.
8. Provide a 2" fluidizing vane as an integral part of header. Attach neoprene squeegee to fluidizing vane provided with 1" vertical adjustment.
9. Manufacturer to size and space header inlet orifices at regular intervals not exceeding 30".
10. Orifice design to be proportionate to the volume of sludge withdrawn from the entire tank floor at all flows.
11. Provide header flange with silicone seal for bolted connection to center manifold. Tie bar shall provide header support.
12. Alternate Manufacturers shall submit header verification field data in accordance with the Substitute Equipment Section of this specification.
13. Sludge withdrawal by means of individual riser pipes or stepped header construction will not be acceptable.

K. Center Cage, Truss Arm, and Manifold:

1. Center cage to be of an all-welded box truss construction made up of structural steel members having a minimum thickness of 1/4".
2. Truss arm shall be furnished with a triangular three-point contact design for ease of installation and alignment. Truss shall be constructed with 1/4" minimum thick members. Truss shall be pinned at the base for vertical adjustment and connected to the center cage through strut and adjustable clevis assembly. Tie-rod and turnbuckle designs that do not provide lateral support will not be acceptable.
3. Provide a cylindrical manifold with (2) seals for bolted connection to the sludge collection header and bottom of cage. A bottom seal plate shall be furnished by the equipment Manufacturer securely anchored to the floor and grouted in place after final adjustment.

L. Surface Skimmer:

1. Provide (1) skimmer assembly consisting of scum blade and hinged wiper assembly.

    a. The scum blade shall span the full length between the center pier and scum trough. Scum blade shall have a height of 5-in rigidly attached to vertical pipe supports and structural A-frame. The A-frame shall be bolted to the truss arm at maximum of 15’ spacing.
    b. Mount a hinged wiper assembly on the end of the scum blade to form a pocket for trapping scum. The wiper assembly shall maintain continual contact and proper alignment between scum blade, outer scum baffle and scum trough. The wiper

blade shall have a wearing strip on its outer end which contacts the scum baffle and neoprene strip on its inner and lower edges which contact the scum trough.

c. All springs, pivot points and threaded fasteners shall be constructed of 302 stainless steel. The hinged wiper assembly shall be hot dipped galvanized. The wiper blade shall be neoprene with Durometer range 50-60. The wiper assembly shall be the same dimension of the scum trough.

d. Provide a manual lockout mechanism on hinged skimmer assembly to allow for flexible independent operation for surface ice. Lockout mechanism shall raise hinged skimmer assembly above water surface without removal.

2. Provide (1) scum trough 6’-0” wide with inclined beach of 1/4" thick plate, supported from the tank wall.

a. Scum trough shall have an overall length of 4'-9" along the scum baffle consisting of beach plate, inner radius baffle, hopper and 6" discharge pipe. Manufacturer shall provide a loose plate flange for contractor to field weld and connect to scum drain piping.

3. Provide mechanical flushing device made from 304 stainless steel and activated by the main tank skimmer arm. The flushing device shall pivot on a fabricated hinge that uses a ¾” diameter minimum stainless steel pin/bolt. The flushing device will provide a counterweight action which in conjunction with a neoprene seal will assure a positive closure. The flushing device shall be held open to allow 15 to 25 gallons of flushing water per trip.

M. Raceway Scum Removal:

1. Contractor to provide an adjustable inverted slide gate for removal of influent channel scum to a pit located outside the clarifier wall as shown on the contract drawings.
2. Extend a channel sweep arm with blade from the main tank skimmer.

N. Access Bridge:

1. Provide a bridge of wide flange beam construction extending from the tank wall to the stationary drive base.
2. Provide a bridge extension to provide full-diameter access.
3. Bridge to be designed for the dead load and a live load of 60#/sq. ft., with a deflection not exceeding L/360 of the span.
4. Provide a 3' wide walkway of 1 1/4-inch aluminum grating extending over the entire bridge length.
5. Provide a 2-rail handrail consisting of 1-1/2" diameter, Sch. 40 mechanically fastened Aluminum pipe for rails and Sch. 80 posts. Post spacing not to exceed 5’. Omit handrail only where truss bridge members at 21" and 42" above the walkway provide the same function.
6. Provide a 4" high aluminum toe plate along both sides of bridge and bridge extension.
7. Provide a minimum 8’-0” x 10’-0”, rectangular platform to provide a 2’ working clearance around the drive.

O. Effluent Weirs and Scum Baffles **(to be provided by installing contractor)**

1. Fabricate weirs from 3/16" thick x 9" FRP.

2. Weir shall have 90 degree, 2.5 inch deep "V" notches spaced 6" on centers.
3. Fabricate scum baffle from 1/4" thick x 12" FRP

P. Anchor Bolts:

1. All equipment anchor bolts shall be Type 316 stainless steel.
2. Equipment Manufacturer shall furnish steel template and grout shield to accurately locate center pier anchors and allow for grouting beneath the pier and manifold seal plate after final plumbing.

Q. Control Panel (FCP-4010, FCP-4020):

1. One (1) clarifier control panel shall be provided for each clarifier furnished. The control panel shall contain all interlocks, alarm functions and motor control as required for operation of the clarifier mechanism. Design and construction shall conform to the latest edition of the NEC. The panel will be UL listed.

2. Each panel shall be NEMA 4X rated of Type 304 stainless steel. The panel will be supplied containing:
   a. Main disconnect w/operating handle
   b. Motor starter 0.5 HP w/OL
   c. CPT with both primary and secondary fuse protection
   d. Selector Switch, ON-OFF
   e. Reset pushbuttons
   f. Pilot lights
   g. Relays
   h. Alarm Light
   i. Misc. nameplates, terminal blocks, etc.

3. The panel will contain terminal blocks for connection of all external monitoring signals (Dry Contact). It will be suitable for wall mounting and will be approximately 24” H x 24” W x 8” D.

4. Main power for the panel is 480 volt, 3 phase, 60 Hz.

5. Disconnect shall be (1) NEMA 4X SS Non-fused disconnect, 30A, 3P, 600V, 3W.

2.2 SURFACE PREPARATION AND FINISHING

A. The center drive mechanism shall be shipped, assembled and finish painted with manufacturer’s standard paint system.

B. Fabricate header from 1/4" thick steel plate hot-dip galvanized after fabrication per ASTM-A123.

C. Submerged components will be prepared by blasting to SSPC-SP10 and prime painted with (1) shop coat. Finish coats are to be applied in the field by the Contractor.

D. Non-submerged components will be prepared by blasting to SSPC-SP10 and prime painted with (1) shop coat. Finish coats are to be applied in the field by the Contractor.

E. Galvanized and stainless-steel components will be shipped unpainted.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for testing, inspection, and analysis.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that clarifier basin is installed and ready to receive circular clarifier equipment.

3.2 INSTALLATION

A. Install circular clarifier equipment according to manufacturer's instructions.

B. Weir Plates: Mount weir plates against double bead of the sealant.

3.3 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

B. Dry Startup: Run equipment without liquid in basins and inspect for:

1. Alignment of sprockets, chain, flights, and wearing surfaces.
2. Binding and excessive heat buildup in drive units.

C. Wet Startup: Run equipment with wastewater in basins and verify proper operation.

D. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than two trips of two days each on-Site for installation, inspection, field testing, and instructing Owner's personnel in maintenance of equipment.

E. Equipment Acceptance:

1. Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.
2. Make final adjustments to equipment under direction of manufacturer's representative.

F. Furnish installation certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.

3.4 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Check control module functions and adjust as necessary.

3.5 DEMONSTRATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for demonstration and training.

B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION 46 43 21

PART 3 - EXECUTION

3.1 INSTALLATION

A. The blower package shall be handled and installed in accordance with the manufacturer's recommendations and instructions as shown in the location on the drawings

B. Contractor shall field verify all dimensions and elevations. The engineer shall be notified of any specific differences

C. The blower package shall arrive on site ready for installation. Aligning, adjusting and filling the blower with lubrication shall not be required by the contractor

3.2 FIELD QUALITY CONTROL

A. Furnish the services of a manufacturer's authorized representative for proper installation to inspect and approve the installation, and to supervise a test run of the blower package.

B. After the installation and test run has been completed; the blower package shall be given a field test in the presence of the Engineer to verify that operation is satisfactory and in compliance with the Specification. If the blower package does not meet the Specification, corrective measures shall be taken to ensure the machine meets compliance

3.3 TRAINING

A. Furnish the services of a manufacturer's authorized representative, who will instruct plant personnel in the operation and maintenance of the blower package. All procedures shall be covered including preventive maintenance, method of controlling the blower package and troubleshooting.

END OF SECTION 43 53 54

SECTION 46 73 22 – DECANTER ASSEMBLY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install two (2) decant lines for drawing off fluid from two (2) sludge digester tanks at any point between the maximum tank water level and the invert of the draw-off pipe as specified herein and shown in the Drawings

B. The decant line shall be provided complete with all accessories, anchor bolts and other appurtenances as specified and as may be required for a complete and operating installation

1.2 REFERENCES

A. American Gear Manufacturers Association (AGMA)

B. National Electrical Manufacturers Association (NEMA)

C. American Federation of Bearing Manufacturers Association (AFBMA)

D. American Society for Testing and Materials (ASTM)

E. American Welding Society (AWS)

F. Steel Structures Painting Council, American National Standards Institute (SSPC)

G. Underwriters Laboratory (UL)

1.3 SUBMITTALS

A. Shop Drawing Submittals shall be submitted in accordance with Section 01 33 00, and contain the following minimum content:

1. Shop Drawings and erection drawings showing details of construction, dimensions, anchor bolt locations, and field connections

2. Descriptive literature, bulletins, and catalogs of the equipment, including details of the hand winch and any lubrication points

3. Installation, operation, and maintenance procedures

4. Total weight of the equipment

1.4 OPERATION AND MAINTENANCE MANUALS

A. Submit operations and maintenance manuals for the equipment in compliance with Section 01 33 00. Manuals shall include:
   1. Contact name, address, and telephone number of the equipment manufacturer's Service Department and Parts Department
   2. Descriptive literature, including illustrations, covering the operational features of the equipment, specific for the particular installation, with all inapplicable information omitted or marked out
   3. Operation and maintenance information
   4. Complete maintenance parts list
   5. Complete connection, interconnecting and assembly diagrams
   6. Approved Shop Drawings

1.5 QUALITY ASSURANCE

A. The materials covered by these specifications are intended to be standard equipment of proven reliability and as manufactured by a reputable manufacturer having experience in the production of fluid decanting equipment. The equipment furnished shall be designed and constructed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the Contract Drawings and operated per the manufacturer's recommendations

B. The design is based on a model as produced by Vulcan Industries, Inc. of Missouri Valley, Iowa. Acceptable manufacturers include Jim Myers & Sons, Waste-Tech, Inc., and Custom Fabricating, Inc.. Substitute, alternate, and "or-equal" manufacturers are not acceptable

1.6 DESIGN REQUIREMENTS

Number of Units:	Two (2)
Maximum Water Surface Elev:	836.50
Decanter Intake Elev:	837.50
Invert Elev. of Draw-off Pipe (Swivel Joint):	832.50
Decant Pipe Size:	8-inch

1.7 STORAGE AND HANDLING OF EQUIPMENT

A. The CONTRACTOR shall store and temporarily support equipment prior to installation in strict accordance with the Manufacturer's recommendations and instructions. Protect all exposed surfaces. The CONTRACTOR shall be responsible for work, equipment and materials until inspected, tested and finally accepted.

B. Protect the equipment from being contaminated by dust, dirt, vibration and moisture.

PART 2 - PRODUCTS

2.1 GENERAL

A. The decant line furnished shall be capable of decanting fluid from a storage tank at any point between the maximum fluid level and the invert of the draw-off pipe. The decant line shall be installed as shown on the Contract Drawings

2.2 DECANT TUBE

A. The decant tube(s) shall be fabricated of a minimum schedule 10, 304 stainless steel. The unit shall be of single swivel joint design and shall be of proper length as shown on the Contract Drawings

B. The decant tube shall have a flanged elbow that shall be bolted to the contractor supplied draw-off piping. Contractor shall coordinate actual laying lengths with installation of piping

C. A swivel joint shall be furnished to allow the decant tube to travel between the high water level and the invert of the draw-off pipe as shown on the Contract Drawings. Swivel joint shall have replaceable seal gaskets

D. The decant tube shall be weighted with a properly sized weld-on weight to prevent flotation of the pipe

2.3 WINCH

A. A 1000-pound capacity, 304 stainless steel spur gear hand operated ratchet winch shall be furnished for each decant assembly. Winches shall have a suitable length of 3/16-inch diameter stainless steel cable and a hook with safety latch to attach the cable to the decant tube

2.4 FASTENERS

A. All fasteners and anchor bolts shall be 304 stainless steel unless otherwise indicated in this specification. Anchor bolts shall be provided for mounting the hand winch. All threaded fasteners shall be coated with a nickel based anti-seize thread lubricant prior to assembly

2.5 PROTECTIVE COATINGS

A. Stainless steel and plastic components shall not be painted. The stainless steel structural components and enclosure panels shall be passivated after fabrication to remove embedded iron, surface rust and weld burn. All other surfaces shall be blast cleaned to an SSPC-SP6 finish, removing all dirt, rust, scale and foreign materials

B. Cleaned surfaces shall be shop primed with one (1) coat of Tnemec 69-1212 primer, or equal, to attain a minimum dry film thickness of 2.5 mils

PART 3 - EXECUTION

3.1 WARRANTY

A. The equipment supplier shall warrant that its equipment shall be free from defects in material and workmanship; and that it will replace or repair, F.O.B. its factory, any part or parts returned to it which examination shall show to have failed under normal use and service by the user within one (1) year from date of Substantial Completion on the project

3.2 START-UP

A. Manufacturer shall provide the services of manufacturer's technician to check out the equipment with ½ day and certify the installation before the start-up

END OF SECTION 46 73 22