

WELLS NO. 1, 3, AND 4 WATER TREATMENT PLANT

WATER AND SEWER DEPARTMENT
TOWN OF GROVELAND, MA
DWSRF #18991

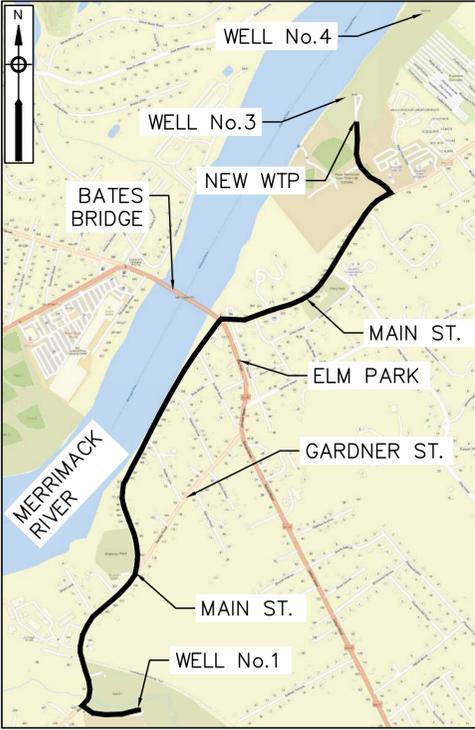
WATER & SEWER SUPERINTENDENT
COLIN STOKES

COMMISSIONERS
SARAH SHEEHAN-MCGRATH - CHAIR
TERRY GRIM
JOSEPH FORTE

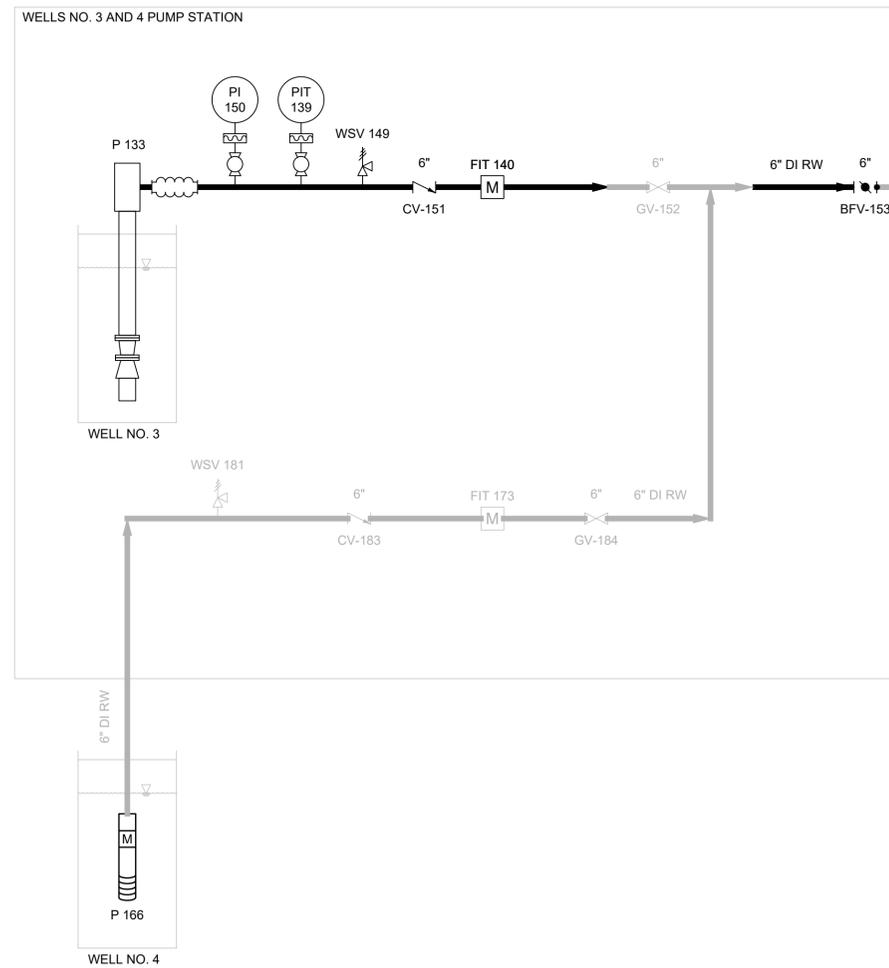
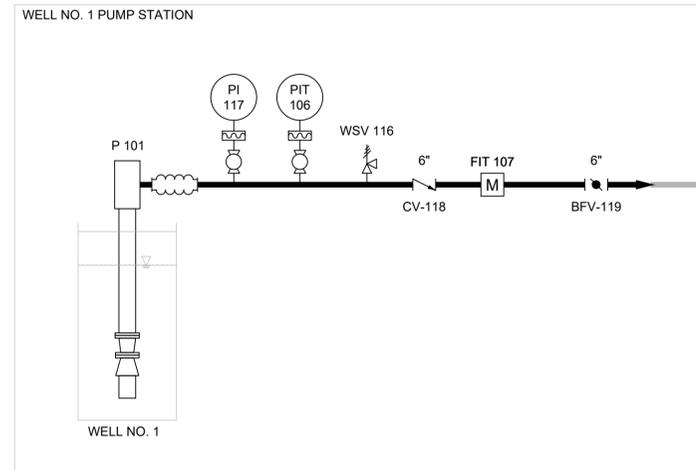
DECEMBER 2025
25% DESIGN



APEX



VICINITY MAP
1" = 1,000'



DRAFT



MARK	DATE	DESCRIPTION

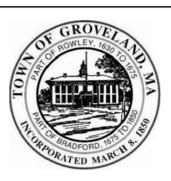
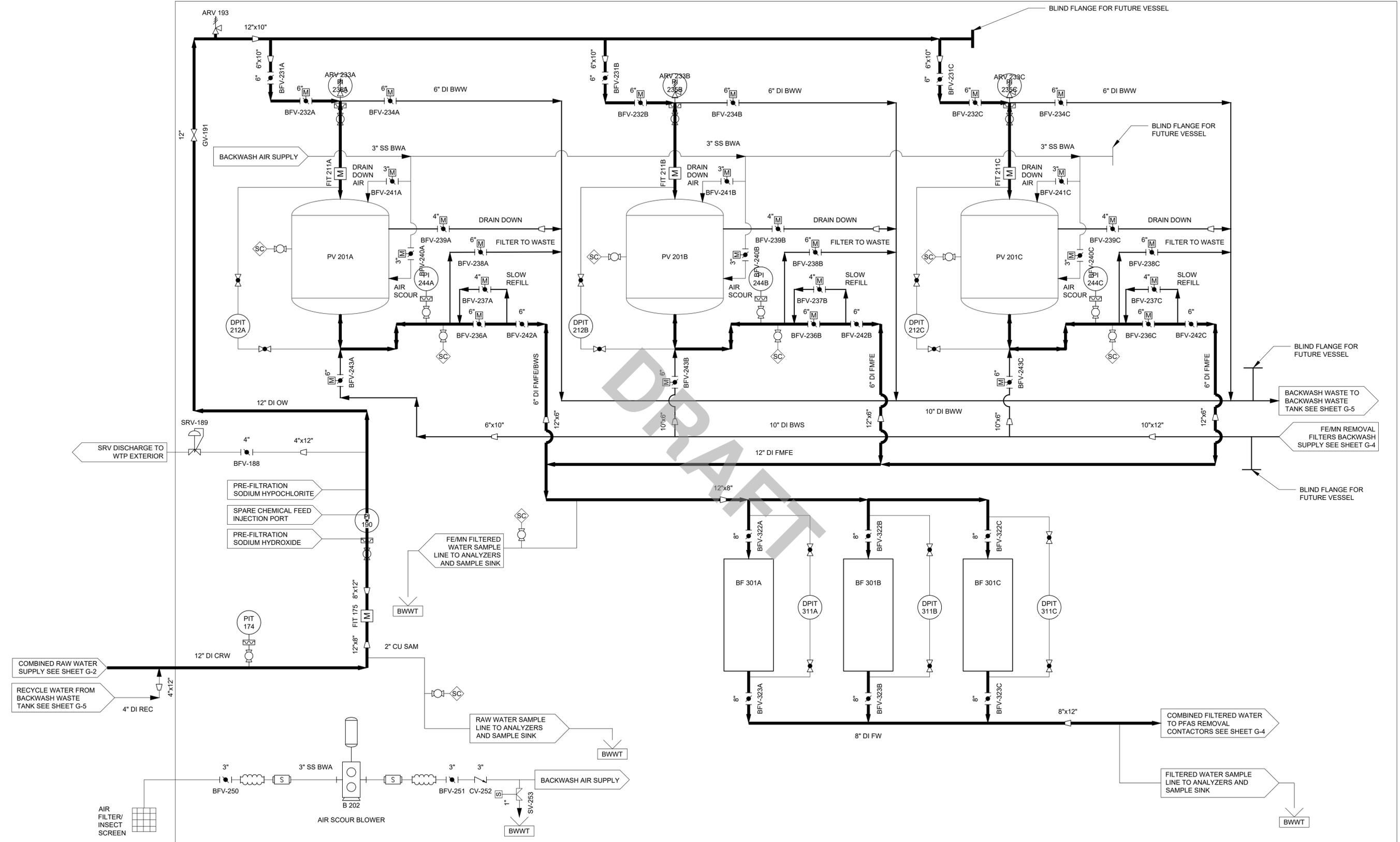
Scale	N.T.S
Date	NOVEMBER 2025
Job No.	23008867
Designed by	BDP
Drawn by	BDP
Checked by	AWCP
Approved by	RJA

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

**WELL NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MA**

**WATER TREATMENT PLANT
PROCESS FLOW DIAGRAM I**

25% DESIGN
Sheet No.
G-2



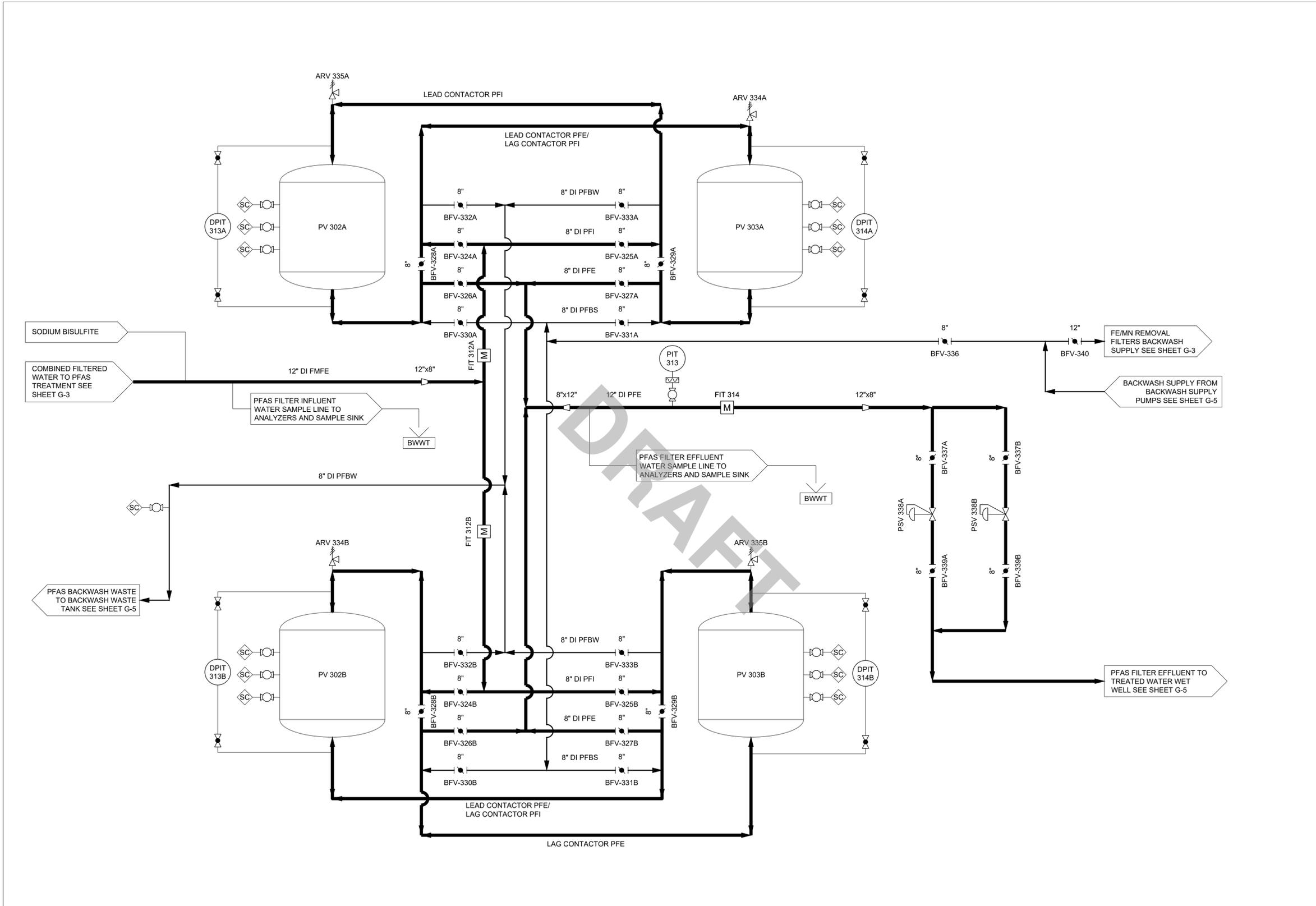
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TOWN OF GROVELAND, MA
WATER TREATMENT PLANT
PROCESS FLOW DIAGRAM II

Drawing file: C:\Users\BDR-1\OneDrive\Local\Temp\AcPublish_20468\WTP_Avg_Plot_Date: Dec 18, 2025 9:54am



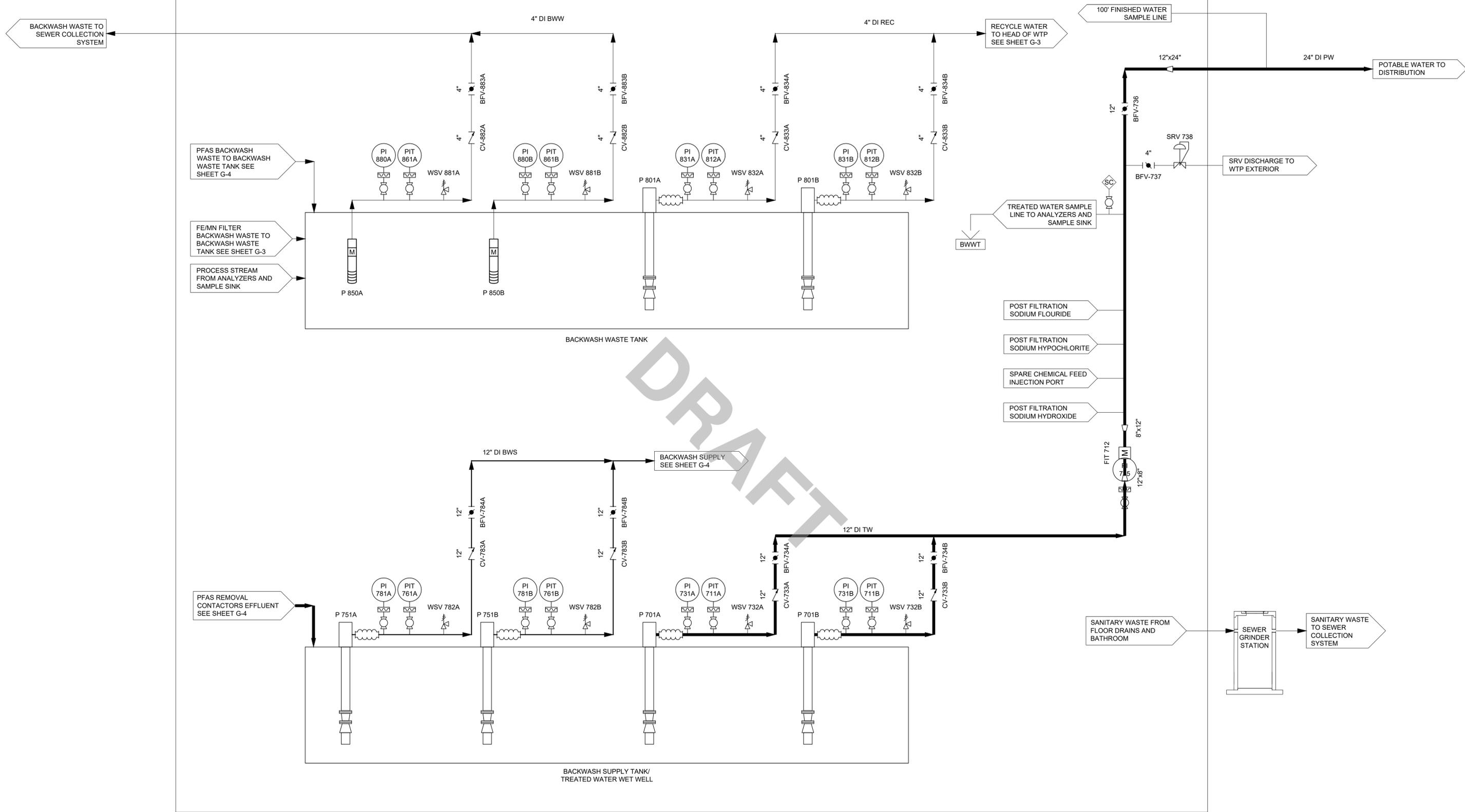
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TOWN OF GROVELAND, MA
WATER TREATMENT PLANT
PROCESS FLOW DIAGRAM III

25% DESIGN
Sheet No.
G-4



MARK	DATE	DESCRIPTION

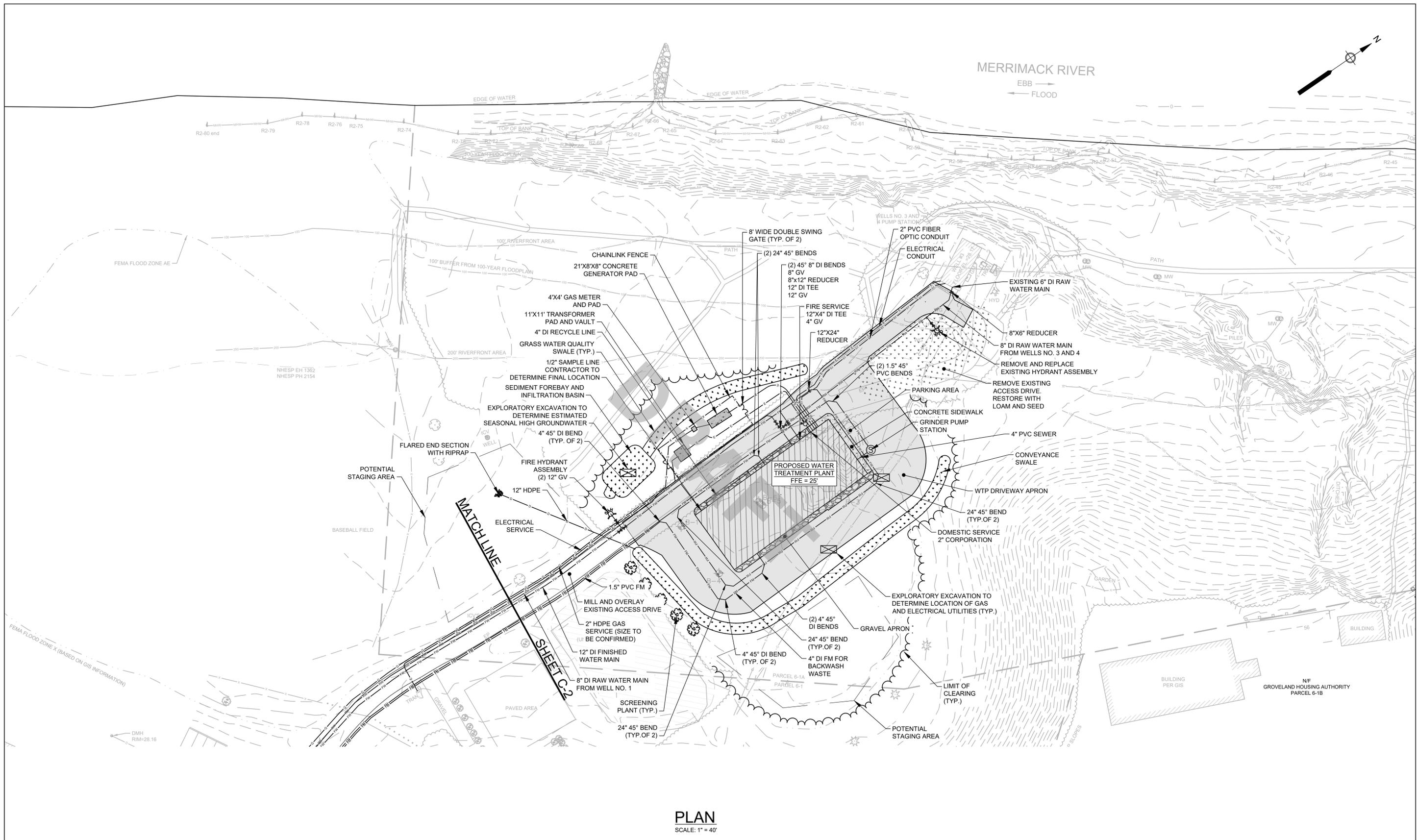
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Job No.	23008867
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Drawn by	BDP
Checked by	AWCP
Approved by	RJA

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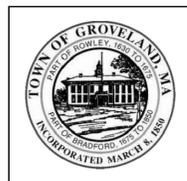
WELL NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MA
WATER TREATMENT PLANT
PROCESS FLOW DIAGRAM IV

25% DESIGN
Sheet No.
G-5

Drawing file: C:\Users\BDR~1\PC\Work\Temp\AcPublish_20468\WTP3.dwg Plot Date: Dec-19-2025-9:54am



PLAN
SCALE: 1" = 40'



MARK	DATE	DESCRIPTION

Scale	1" = 40'
Date	DECEMBER 2025
Job No.	23008867
Designed by	EAE
Drawn by	EHY/SLC
Checked by	DBS
Approved by	

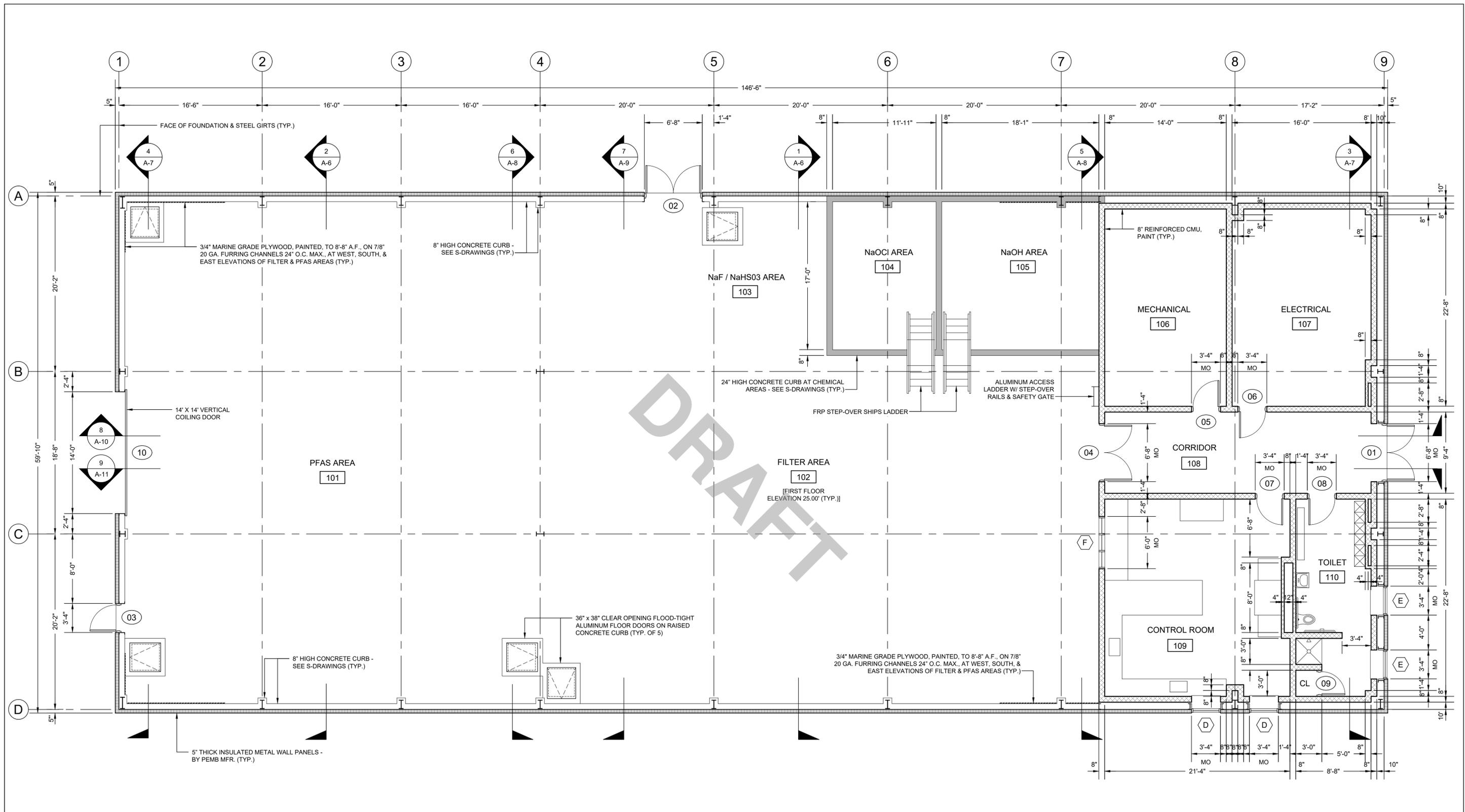
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**WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS**

CIVIL SITE PLAN II

25% DESIGN
Sheet No.
C-3

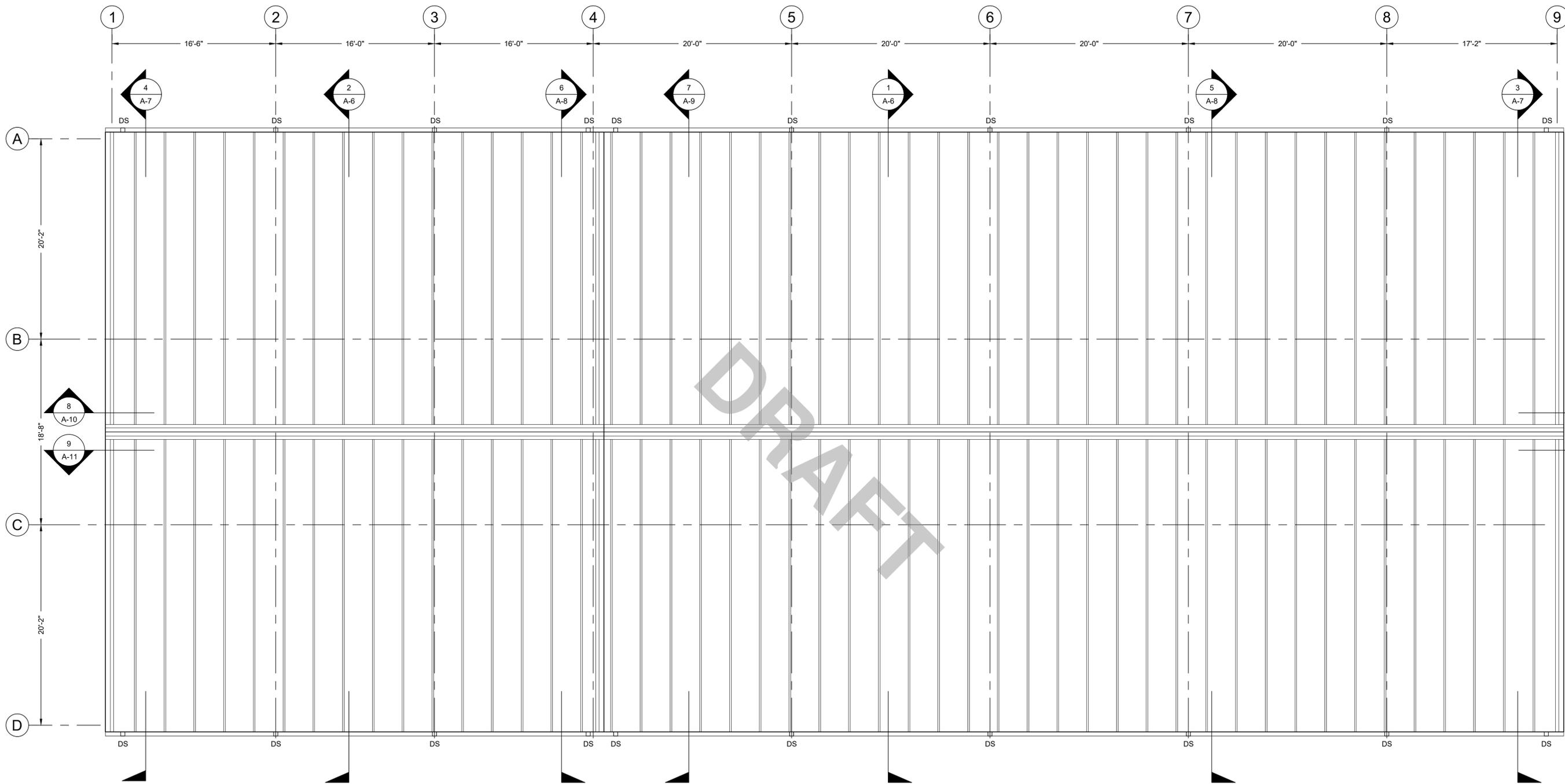
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FIRST FLOOR PLAN
 SCALE: 3/16"=1'-0"

	 APEX CGKV Architects, Inc.								WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT TOWN OF GROVELAND, MASSACHUSETTS ARCHITECTURAL FIRST FLOOR PLAN	25% DESIGN											
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Scale</td><td>AS SHOWN</td></tr> <tr><td>Date</td><td>DECEMBER 2025</td></tr> <tr><td>Job No.</td><td>23008867</td></tr> <tr><td>Designed by</td><td>JK</td></tr> <tr><td>Drawn by</td><td>EZ</td></tr> <tr><td>Checked by</td><td>JK</td></tr> <tr><td>Approved by</td><td></td></tr> </table>	Scale	AS SHOWN	Date	DECEMBER 2025	Job No.		23008867	Designed by	JK	Drawn by	EZ	Checked by	JK	Approved by		<p style="font-size: 8px;">THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING</p>	Sheet No. A-1	
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Drawing file: F:\Projects\2510 - Groveland WTP - ApexDrawings\plan_elev_sct.dwg Plot Date: Dec 17, 2025 10:40am



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



MARK	DATE	DESCRIPTION

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Drawn by	EZ
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Approved by	

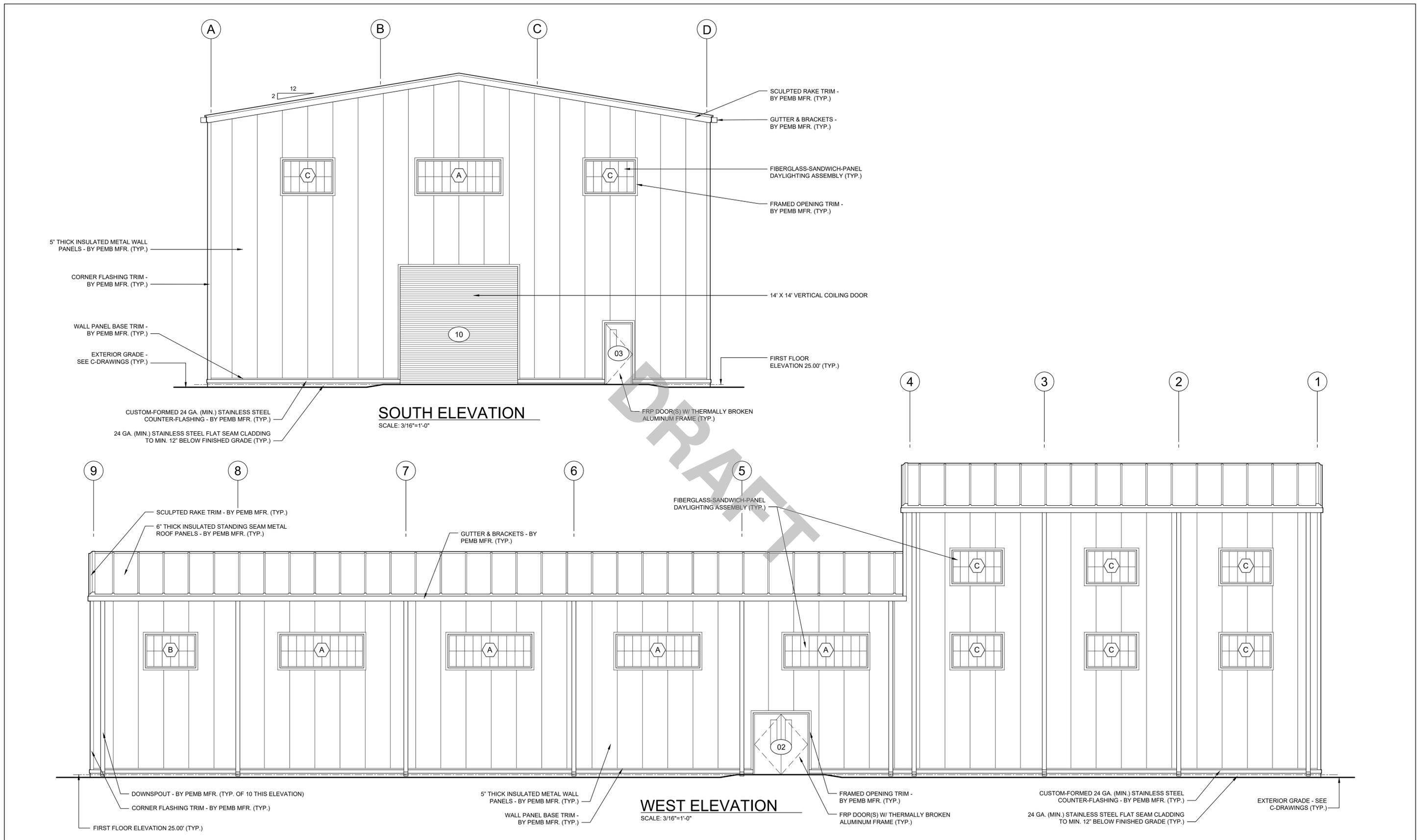
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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

ARCHITECTURAL ROOF PLAN

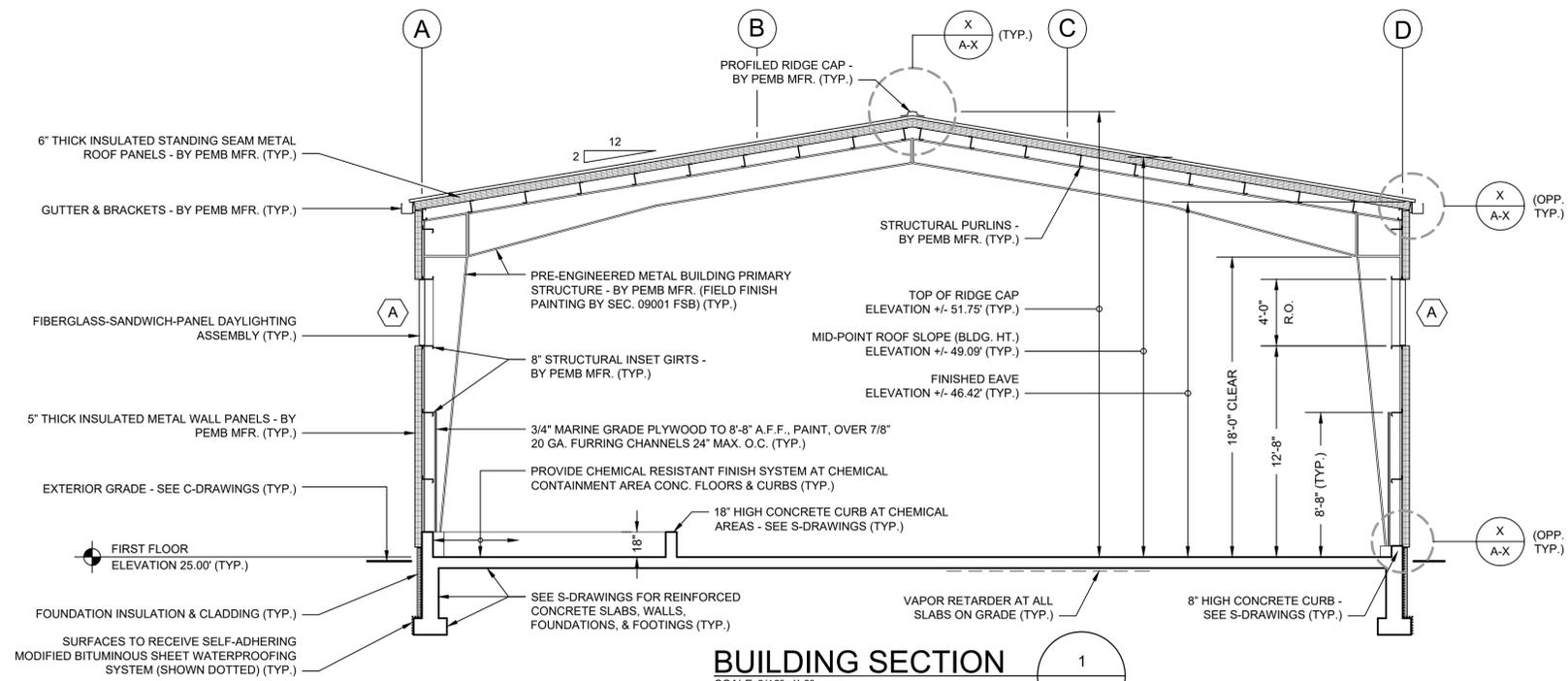
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Sheet No.

A-3

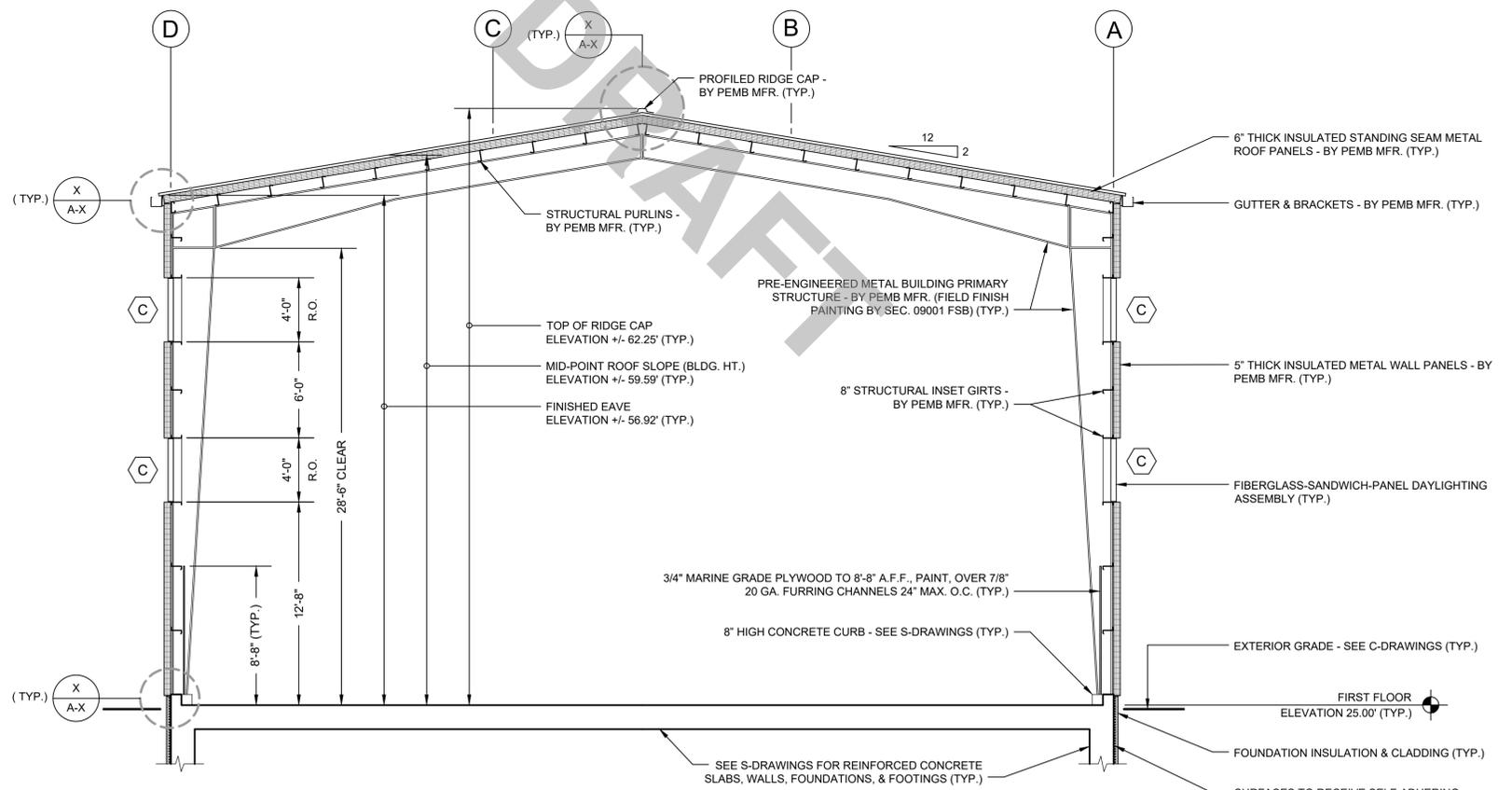


	 APEX CGKV Architects, Inc.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">MARK</th> <th style="width: 10%;">DATE</th> <th style="width: 80%;">DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	MARK	DATE	DESCRIPTION										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Scale</td><td>AS SHOWN</td></tr> <tr><td>Date</td><td>DECEMBER 2025</td></tr> <tr><td>Job No.</td><td>23008867</td></tr> <tr><td>Designed by</td><td>JK</td></tr> <tr><td>Drawn by</td><td>EZ</td></tr> <tr><td>Checked by</td><td>JK</td></tr> <tr><td>Approved by</td><td> </td></tr> </table>	Scale	AS SHOWN	Date	DECEMBER 2025	Job No.	23008867	Designed by	JK	Drawn by	EZ	Checked by	JK	Approved by		 THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING	WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT TOWN OF GROVELAND, MASSACHUSETTS ARCHITECTURAL EXTERIOR ELEVATIONS II	25% DESIGN Sheet No.
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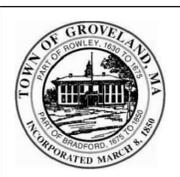
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BUILDING SECTION 1
SCALE: 3/16"=1'-0"



BUILDING SECTION 2
SCALE: 3/16"=1'-0"



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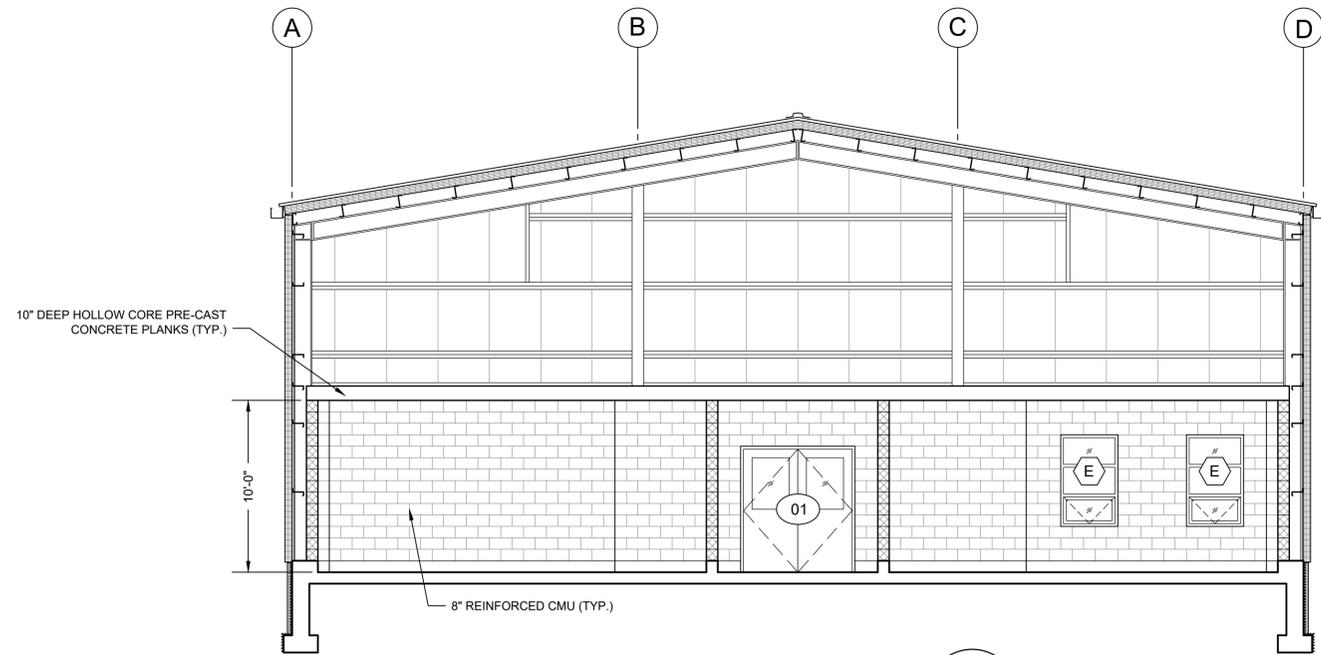
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TOWN OF GROVELAND, MASSACHUSETTS

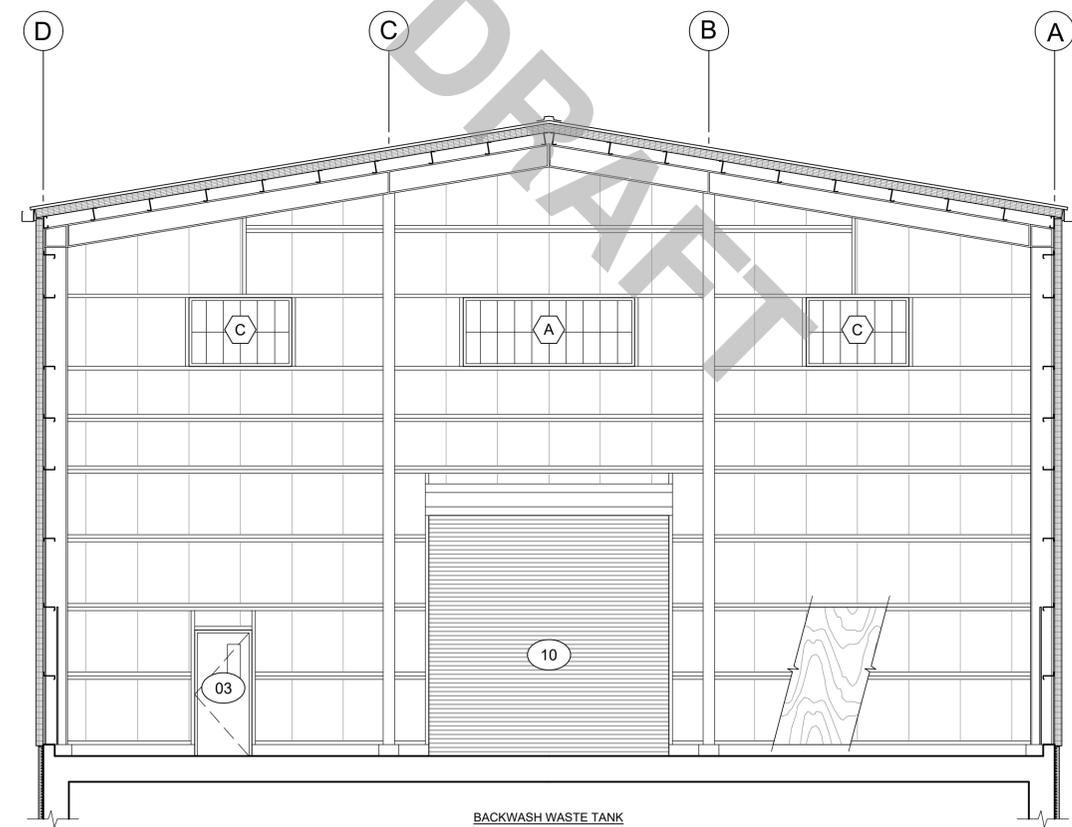
ARCHITECTURAL BUILDING SECTIONS I

25% DESIGN
Sheet No.

A-6



BUILDING SECTION
 SCALE: 3/16"=1'-0"
 3
 A-1



BUILDING SECTION
 SCALE: 3/16"=1'-0"
 4
 A-1



MARK	DATE	DESCRIPTION

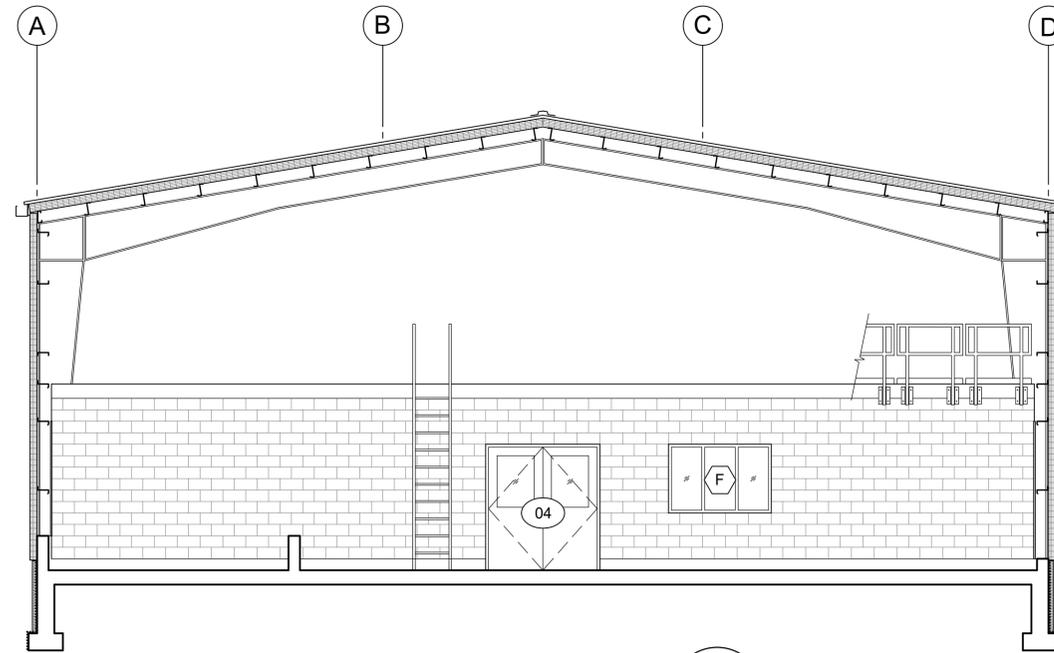
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TOWN OF GROVELAND, MASSACHUSETTS

ARCHITECTURAL BUILDING SECTIONS II

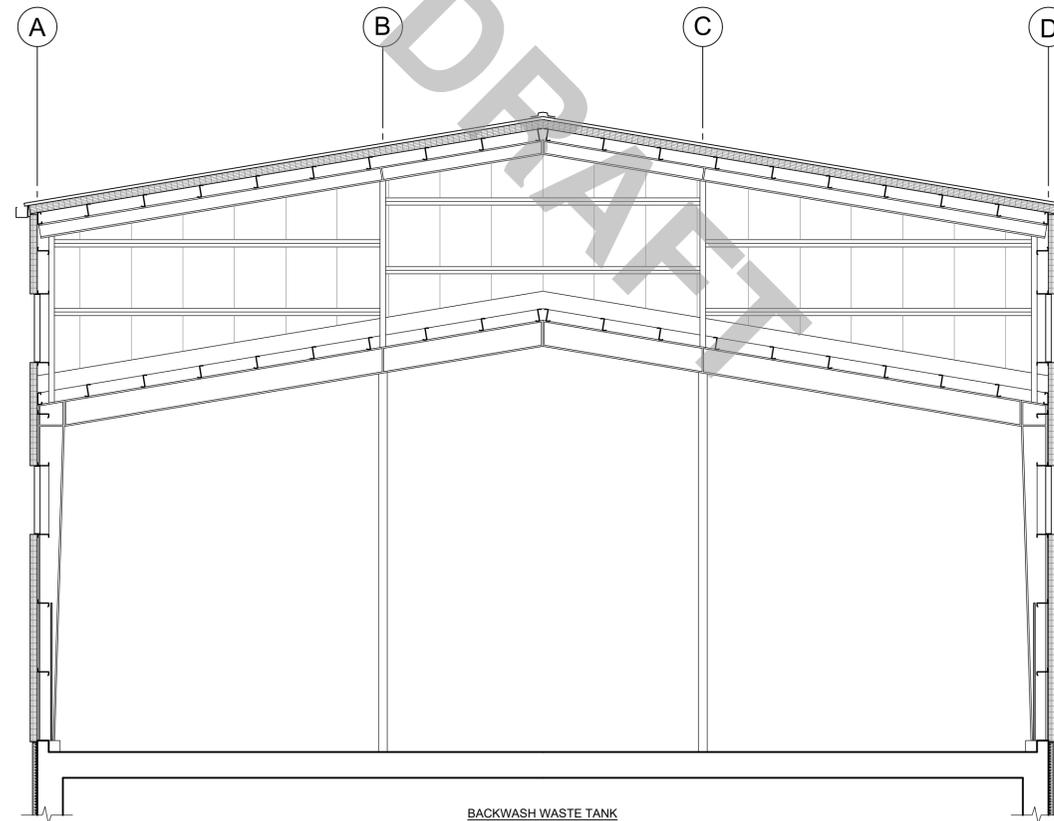
25% DESIGN
 Sheet No.
A-7



BUILDING SECTION

SCALE: 3/16"=1'-0"

5
A-1



BUILDING SECTION

SCALE: 3/16"=1'-0"

6
A-1



CGKV Architects, Inc.

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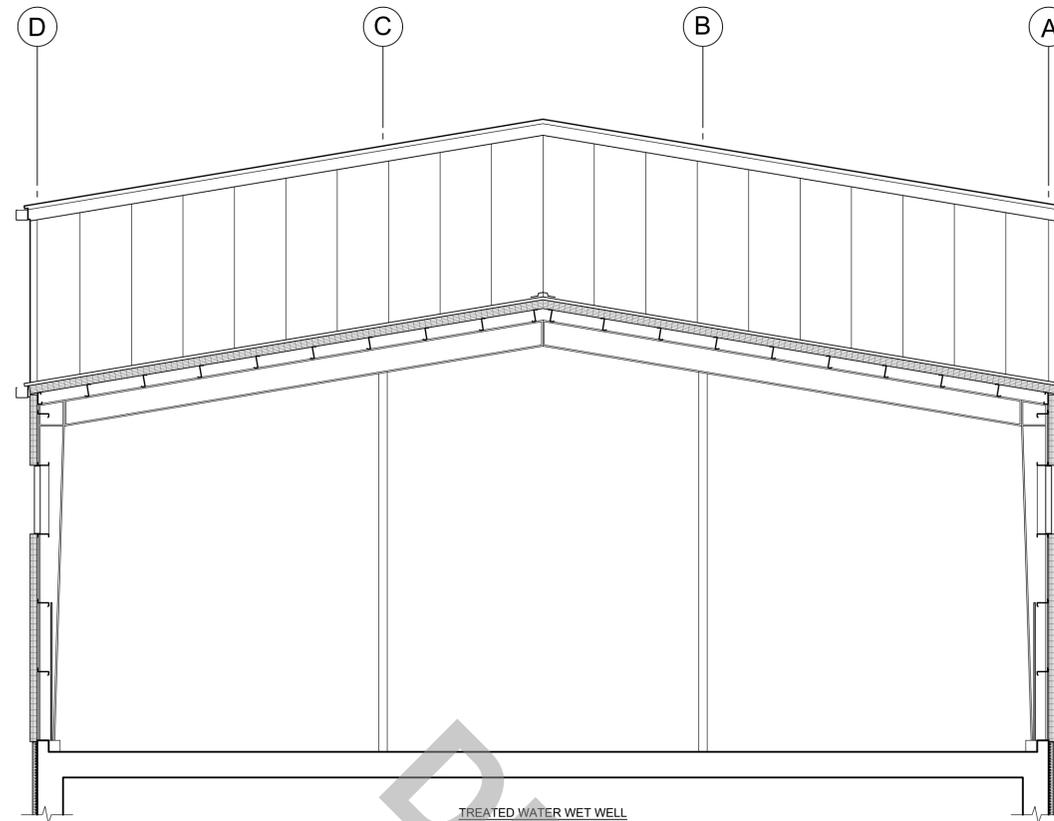
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TOWN OF GROVELAND, MASSACHUSETTS**

ARCHITECTURAL BUILDING SECTIONS III

25% DESIGN
Sheet No.

A-8



BUILDING SECTION
SCALE: 3/16"=1'-0"

7
A-1

DRAFT



CGKV Architects, Inc.

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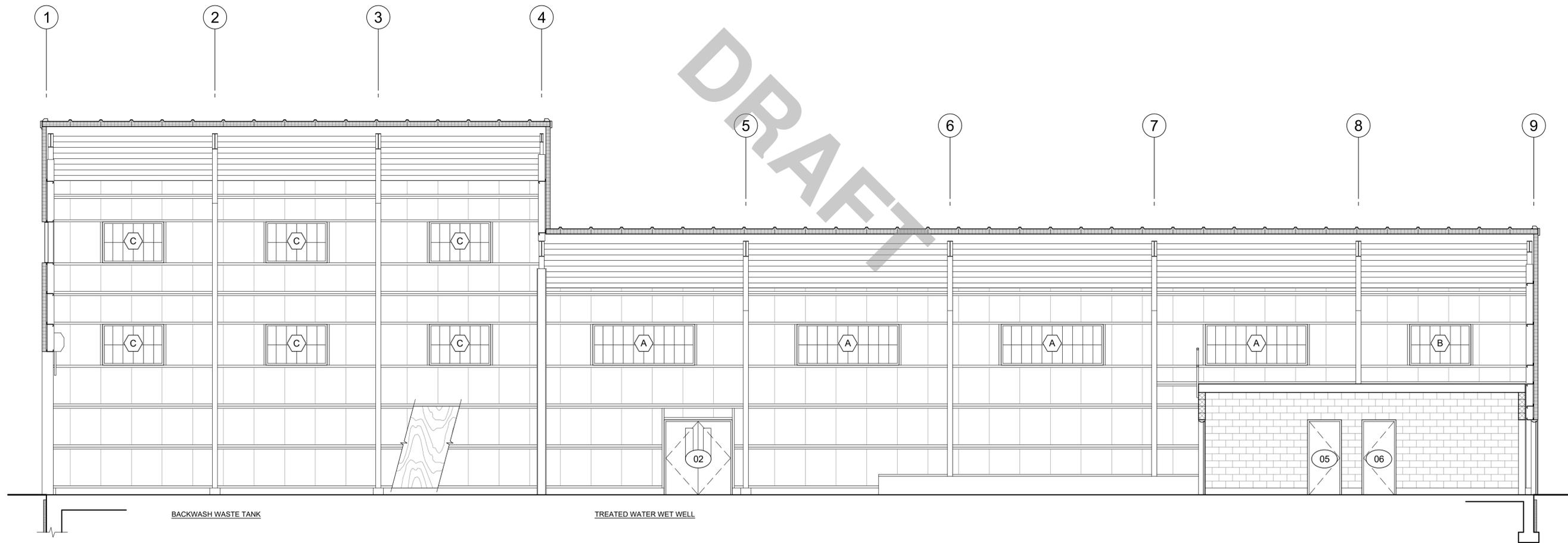
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TOWN OF GROVELAND, MASSACHUSETTS**

ARCHITECTURAL BUILDING SECTIONS IV

25% DESIGN
Sheet No.
A-9

DRAFT



BUILDING SECTION
SCALE: 3/16"=1'-0"

8
A-1



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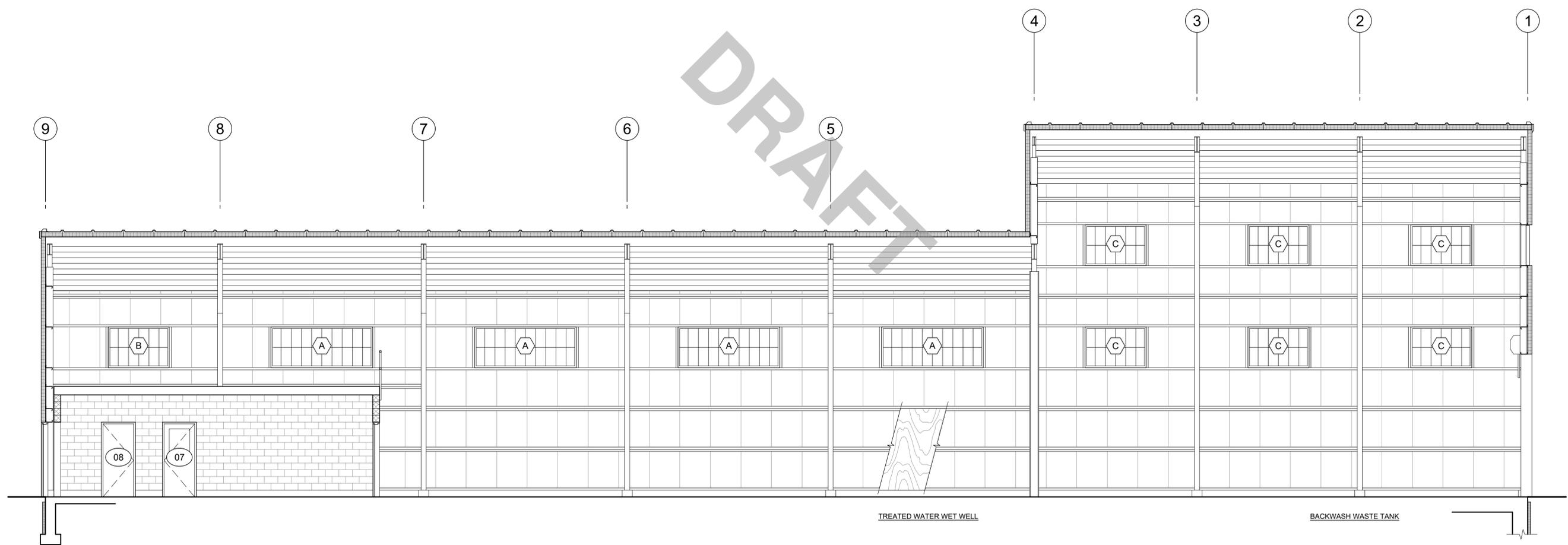
ARCHITECTURAL BUILDING SECTIONS V

25% DESIGN
Sheet No.

A-10

Drawing file: F:\Projects\2510 - Groveland WTP - Apex\Drawings\plan_elev_sect.dwg Plot Date: Dec 17, 2025 10:50am

DRAFT



BUILDING SECTION
SCALE: 3/16"=1'-0"

9
A-1



MARK	DATE	DESCRIPTION

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ARCHITECTURAL BUILDING SECTIONS VI

25% DESIGN
Sheet No.
A-11

Drawing file: F:\Projects\2510 - Groveland WTF - Apex\Drawings\plan_elev_sect.dwg Plot Date: Dec 17, 2025 10:52am

CODES AND STANDARDS

ALL WORK SHALL CONFORM TO THE TENTH EDITION OF THE MASSACHUSETTS STATE BUILDING CODE (780 CMR), HEREAFTER REFERRED TO AS THE MSBC.

FOUNDATIONS

- FOUNDATION DESIGN IS BASED ON FINAL GEOTECHNICAL REPORT BY --- DATED: ---, PROJECT No.---
- FOUNDATION WORK SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT, AND THE CONTRACTOR SHALL BE FAMILIAR WITH THIS REPORT.
- FOOTING DESIGNS ARE BASED ON A NET ALLOWABLE BEARING PRESSURE AS INDICATED BELOW. FOOTINGS SHALL BEAR ON ENGINEERED FILL OR COMPETENT NATIVE SOILS.
- SPECIAL INSPECTION SHALL BE PERFORMED DURING SITE EXCAVATION TO CONFIRM THAT EXISTING CONDITIONS COMPLY WITH CONDITIONS IN THE GEOTECHNICAL REPORT.
- EXTERIOR FOOTINGS SHALL BEAR AT OR BELOW MINIMUM BEARING DEPTH. MINIMUM BEARING DEPTH IS 18 INCHES BELOW ADJACENT FINISHED GRADE.
- SOIL PROPERTIES: (PRELIMINARY)

ALLOWABLE BEARING PRESSURE	3000 PSF
MODULUS OF SUBGRADE REACTION	150 PCI
COEFFICIENT OF FRICTION AT STRENGTH	0.35
EQUIVALENT FLUID ACTIVE SOIL PRESSURE (UNRESTRAINED)	40 PCF
EQUIVALENT FLUID AT REST SOIL PRESSURE (RESTRAINED)	55 PCF
EQUIVALENT FLUID PASSIVE SOIL PRESSURE	350 PCF

STRUCTURAL CONCRETE

- CONCRETE WORK SHALL CONFORM TO REQUIREMENTS OF ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE.
- DESIGN MIXES FOR THE FOLLOWING CLASSES OF CONCRETE, SHALL BE PROPORTIONED TO PROVIDE THE SPECIFIED COMPRESSIVE STRENGTH, TEST AGE AT 28 DAYS:

FOUNDATIONS	4,000 PSI
SLAB-ON-GRADE	4,000 PSI
CURBS, PEDESTALS AND HOUSEKEEPING PADS	5,000 PSI
ELEVATED SLABS	5,000 PSI
COLUMNS & BEAMS	5,000 PSI
- SLAB-ON-GRADE CONCRETE FLEXURAL STRENGTH 650 PSI AT 90 DAYS.
- STEEL REINFORCEMENT SHALL CONFORM TO THE FOLLOWING STANDARDS AND SPECIFIED STRENGTH.

DEFORMED BARS (A615)	Fy = 60,000 PSI
DEFORMED BARS (A706)	Fy = 60,000 PSI
WELDED WIRE REINF (A1064)	Fu = 270,000 PSI
- TYPICAL DETAILS OF REINFORCEMENT SUCH AS HOOKS, BEND DIAMETERS, ETC. SHALL BE IN ACCORDANCE WITH ACI SP-66 - "ACI DETAILING MANUAL".
- REINFORCEMENT MARKED "CONT" (CONTINUOUS) SHALL BE SPLICED BY LAPPING OR WITH MECHANICAL CONNECTORS.

LAP LENGTH NOTES:

 - SEE DEVELOPMENT AND LAP SPlice LENGTH SCHEDULE FOR REINFORCED CONCRETE
 - LAP SPLICES OF WELDED WIRE REINFORCEMENT SHALL HAVE A LENGTH OF LAP EQUAL TO THE GREATER OF 1.5X WIRE DEVELOPMENT LENGTH OR ONE CROSSWIRE SPACING PLUS 2 INCHES.
 - MECHANICAL CONNECTORS SHALL HAVE A MINIMUM CAPACITY OF 1.25 X YIELD STRENGTH OF THE BAR.
 - IN MEMBERS DESIGNATED AS PART OF THE SEISMIC-FORCE-RESISTING-SYSTEM, MECHANICAL CONNECTORS SHALL HAVE A MINIMUM CAPACITY EQUAL TO THE TENSILE STRENGTH OF THE BAR.
- MECHANICAL REBAR ANCHORS (TERMINATORS) SHALL BE THREADED DEVICES WITH A CAPACITY GREATER THAN THE YIELD STRENGTH OF THE BAR.
- REFER TO ARCHITECTURAL, ELECTRICAL, MECHANICAL, AND STRUCTURAL DRAWINGS FOR SURFACE FEATURES AND INSERTS, TO BE CAST IN CONCRETE AND FOR LOCATIONS OF PENETRATIONS FOR PIPES, DUCTS, CONDUITS, ETC.
- CONCRETE COVER FOR REINFORCEMENT STEEL IN CAST-IN-PLACE NON-PRESTRESSED CONCRETE MEMBERS SHALL BE AS FOLLOWS, UNO:

A. CONCRETE CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND (UNFORMED):	3 INCHES
B. CONCRETE EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:	
#5 BARS AND SMALLER	1 ½ INCHES
#6 BARS AND LARGER	2 INCHES
C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:	
SLABS, WALLS, JOISTS	
#11 BARS AND SMALLER	¾ INCHES
#14 BARS AND LARGER	1 ½ INCHES
BEAMS, COLUMNS	
PRIMARY REINF. TIES, STIRRUPS,	
SPIRALS & HOOPS	1 ½ INCHES

MASONRY

- MASONRY WORK SHALL CONFORM TO REQUIREMENTS OF TMS 602-16, SPECIFICATIONS FOR MASONRY STRUCTURES.
- PROVIDE LEVEL B QUALITY ASSURANCE AND SPECIAL INSPECTION PER TMS 602-16.
- CONCRETE MASONRY: SPECIFIED COMPRESSIVE STRENGTH, f_m = 2,000 PSI AS DETERMINED PER ARTICLE 1.4B OF TMS 602-13. THE SPECIFIED COMPRESSIVE STRENGTH SHALL BE VERIFIED PRIOR TO START OF CONSTRUCTION.
- CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT AND HAVE A MINIMUM NET AREA COMPRESSIVE STRENGTH = 2,000 PSI AS DETERMINED PER ASTM C90.
- UNITS SHALL BE LAID UP IN RUNNING BOND UNLESS NOTED OTHERWISE. THICKNESS OF BED JOINTS SHALL NOT EXCEED 5/8 INCH. USE BOND BEAM UNITS AT HORIZONTAL REINFORCING.
- MORTAR SHALL BE TYPE S CONFORMING TO ASTM C270 WITH f_m = 1,800 PSI. MASONRY CEMENT MORTAR SHALL NOT BE USED.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. WELDED REINFORCING STEEL SHALL CONFORM TO ASTM A706, GRADE 60.
- CONTINUOUS REINFORCING STEEL SHALL BE LAP SPLICED IN ACCORDANCE WITH THE DEVELOPMENT AND LAP SPlice LENGTH FOR CMU SCHEDULE. MECHANICAL SPLICES, WHERE NOTED, SHALL BE THREADED COUPLERS FOR TAPERED THREADED OR UPSET THREADED BARS CERTIFIED TO DEVELOP 1.25 x F_y. SIMILARLY, TERMINATORS SHALL BE THREADED DEVICES TO FULLY ANCHOR THE YIELD STRENGTH OF BAR.
- CENTER VERTICAL REINFORCING IN WALL UNLESS NOTED OTHERWISE. WHERE REQUIRED, VERTICAL BAR POSITIONERS SHALL BE USED TO SECURE VERTICAL REINFORCING AGAINST DISPLACEMENT PRIOR TO GROUTING.
- PROVIDE VERTICAL BARS FULL HEIGHT AT WALL CORNERS, DOORS, WINDOWS AND OTHER OPENINGS. PROVIDE CONTINUOUS HORIZONTAL REINFORCEMENT AT CORNERS. PROVIDE HORIZONTAL REINFORCEMENT ABOVE DOOR OPENINGS, ABOVE AND BELOW WINDOWS AND OTHER OPENINGS. EXTEND REINFORCEMENT L_d BEYOND EACH SIDE OF OPENING UNLESS NOTED OTHERWISE. OPENINGS FOR DUCTS AND PIPES PENETRATING MASONRY WALLS SHALL BE VERIFIED AND COORDINATED WITH MECHANICAL AND ELECTRICAL CONTRACTOR'S REQUIREMENTS. PENETRATIONS THROUGH WALLS SHALL HAVE ADDITIONAL REINFORCING WHERE SHOWN.
- GROUT SHALL CONFORM TO ASTM C476, WITH MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 2,000 PSI. GROUT SLUMP AT TIME OF GROUTING SHALL BE 8 TO 11 INCHES. WATER REDUCING ADMIXTURES MAY BE ADDED TO ACHIEVE THE DESIRED SLUMP.
- FINE GROUT OR COARSE GROUT SHALL BE SELECTED BASED ON MINIMUM GROUT SPACE REQUIREMENTS OF TABLE 7 OF TMS 602-13.
- HIGH LIFT GROUTING (LIFT HEIGHT GREATER THAN 5'-4"): ONLY ALLOWED WITH PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD AND THE CONTRACTING OFFICER REPRESENTATIVE. THE MASONRY CONTRACTOR SHALL REQUEST WRITTEN APPROVAL A MINIMUM OF TEN (10) DAYS PRIOR TO PROCEEDING WITH SITE MOBILIZATION. THE MASONRY CONTRACTOR SHALL SUBMIT QUALIFICATIONS TO PERFORM HIGH LIFT GROUTING ADDRESSING EACH OF THE FOLLOWING ITEMS AND OTHERS THEY DEEM IMPORTANT WITHIN THE WRITTEN SUBMISSION.
 - REFERENCE: ARTICLE 3.5 OF TMS 602-13.
 - UNIT AND GROUTING CREWS SHALL HAVE A MINIMUM OF FIVE (5) YEARS SUCCESSFUL COMMERCIAL OR MILITARY BUILDING EXPERIENCE WITH SIMILAR HIGH LIFT GROUTING PROJECTS. LIST THREE PROJECTS WITH A CONTACT FOR EACH.
 - A LIFT SHALL NOT EXCEED ONE STORY LEVEL, OR 12'-8" MAXIMUM.
- CONTROL JOINTS:
 - CONCRETE MASONRY WALL CONTROL JOINTS SPACED AT A MAXIMUM OF 30 FEET ON CENTER, THREE TIMES THE WALL HEIGHT, OR AS OTHERWISE SHOWN ON THE DRAWINGS. ENGINEER NOTE: AVAILABLE TYPICAL DETAILS COVER THIS CONDITION AND NOTE COULD BE DELETED.
 - MASONRY VENEER CONTROL JOINTS SPACED AT A MAXIMUM OF 20 FEET ON CENTER OR AS OTHERWISE SHOWN ON THE DRAWINGS.
- COORDINATE WITH ARCHITECTURAL DRAWINGS FOR THE LOCATION, EXTENT AND ORIENTATION OF CMU BLOCKS WITH REGARD TO COLOR, FINISH OR ORIENTATION.
- COLD AND HOT WEATHER CONSTRUCTION SHALL BE IN ACCORDANCE WITH ARTICLE 1.8C AND ARTICLE 1.8D RESPECTIVELY OF TMS 602-13.

ANCHOR RODS

- ANCHOR RODS SHALL BE ASTM F1554 GRADE 55, UNLESS NOTED OTHERWISE. FURNISH ANCHOR RODS PREFABRICATED WITH MATCHING DOUBLE HEAVY HEX NUTS JAMMED AT THE END EMBEDDED IN CONCRETE. FURNISH HARDENED PLATE WASHERS, DOUBLE HEAVY HEX NUTS FOR SECURING THE BASE PLATE TO THE ANCHOR RODS.
- PLATE WASHERS SHALL BE WELDED ALL AROUND WHERE AISC OVERSIZED HOLES ARE USED AT BASE PLATES. ENGR NOTE: THIS NOTE APPLIES ONLY WHERE ANCHOR ROD ARE DESIGNED TO RESIST SHEAR AT THE COLUMN BASE.
- A RIGID STEEL TEMPLATE SHALL BE USED TO LOCATE ANCHOR RODS WHILE PLACING CONCRETE.
- ANCHOR RODS SHALL HAVE SUFFICIENT LENGTH TO PROVIDE THE MINIMUM EMBEDMENT SHOWN ON THE DRAWINGS (MEASURED FROM THE FACE OF CONCRETE) WITH ADEQUATE EXTENSION AS REQUIRED TO RECEIVE THE GROUT PAD, BASE PLATE, AND FULL THREAD PROJECTION FOR NUT INSTALLATION + 1/2" ABOVE THE INSTALLED NUTS.
- ANCHOR ROD INSTALLATION SHALL BE COORDINATED WITH REINFORCING AND FORMWORK. AFTER BASE INSTALLATION, ANCHOR ROD NUTS SHALL BE INSTALLED TO A FULLY-TIGHT CONDITION UNLESS NOTED OTHERWISE.
- NO HEATING OR BENDING OF THE ANCHOR RODS IS PERMITTED.

ANCHORAGE TO CONCRETE AND MASONRY

- EXCEPT WHERE INDICATED IN THE DRAWINGS, POST-INSTALLED ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES.
- ANCHOR CAPACITY USED IN DESIGN SHALL BE BASED ON THE TECHNICAL DATA PUBLISHED IN THE ICC APPROVAL REPORT. SUBSTITUTION REQUESTS MUST INCLUDE ICC ESR REPORT SHOWING COMPLIANCE WITH RELEVANT BUILDING CODE AND INSTALLATION CATEGORY AND BE APPROVED IN WRITING BY THE CONTRACTING OFFICER'S REPRESENTATIVE/ENGINEER OF RECORD PRIOR TO USE.
- INSTALL ANCHORS PER THE MANUFACTURER INSTRUCTIONS, AS INCLUDED IN THE ANCHOR PACKAGING.
- ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND EDGE DISTANCE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
- EXISTING CONSTRUCTION: EXISTING REINFORCING BARS IN THE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. UNLESS NOTED OTHERWISE IN THE DRAWINGS, THE CONTRACTOR SHALL LOCATE THE POSITION OF THE EXISTING REINFORCING BARS AND AVOID CUTTING.

DRILLED-IN SCREW ANCHORS INTO CONCRETE

- HILTI KWIK HUS-EZ SCREW ANCHORS PER ICC ESR-3027
- SIMPSON TITEN HD SCREW ANCHOR PER ICC ESR-2713
- DEWALT WEDGE-BOLT+ PER ICC ESR-2526

DRILLED-IN EXPANSION ANCHORS INTO CONCRETE

- HILTI KWIK-BOLT TZ EXPANSION ANCHOR PER ICC ESR-1917
- SIMPSON STRONG BOLT 2 WEDGE ANCHOR PER ICC ESR-3037
- DEWALT POWER-STUD+SD1 MECHANICAL ANCHOR PER ICC ESR-2818

ADHESIVE ANCHORS AND REBAR DOWELING INTO CONCRETE

- HILTI HIT-HY 200 ADHESIVE ANCHOR SYSTEM PER ICC ESR-3187
- SIMPSON SET-XP ADHESIVE ANCHOR SYSTEM PER ICC ESR-2508
- DEWALT PE1000+ ADHESIVE ANCHOR SYSTEM PER ICC ESR-2583
- STEEL ANCHOR E:EMANT SHALL BE ASTM F1556 GRADE 55 THREADED ROD OR STEEL REINFORCEMENT PER DRAWINGS

DRILLED-IN SCREW ANCHORS INTO SOLID-GROUTED MASONRY

- HILTI KWIK HUS-EZ SCREW ANCHORS PER ICC ESR-3056
- SIMPSON TITEN HD SCREW ANCHOR PER ICC ESR-2713
- DEWALT SCREW-BOLT+ PER ICC ESR-4042

DRILLED-IN EXPANSION ANCHORS INTO SOLID-GROUTED MASONRY

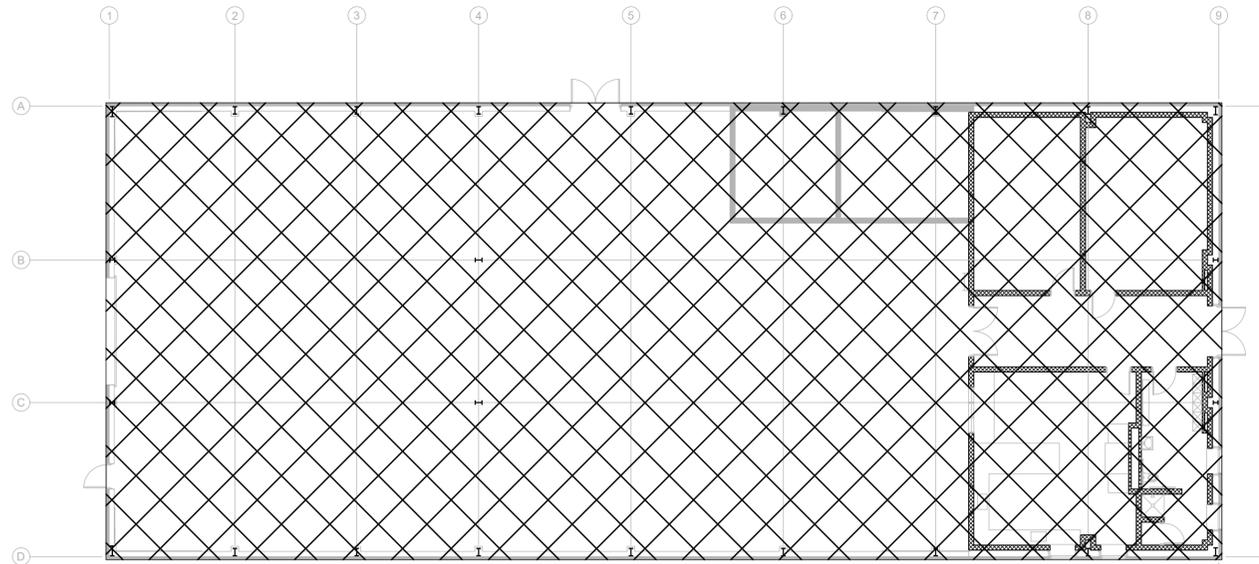
- HILTI KWIK-BOLT 3 EXPANSION ANCHOR PER ICC ESR-1385
- SIMPSON STRONG BOLT 2 WEDGE ANCHOR PER UES ER-240
- DEWALT POWER-STUD+SD1 MECHANICAL ANCHOR PER ICC ESR-2966

ADHESIVE ANCHORS AND REBAR DOWELING INTO SOLID-GROUTED MASONRY

- HILTI HIT-HY 270 ADHESIVE ANCHOR SYSTEM PER ICC ESR-4143
- SIMPSON SET-XP ADHESIVE ANCHOR SYSTEM PER IAMPO UES ER-2385
- DEWALT AC100+GOLD ADHESIVE ANCHOR SYSTEM PER ICC ESR-3200
- STEEL ANCHOR E:EMANT SHALL BE ASTM F1556 GRADE 55 THREADED ROD OR STEEL REINFORCEMENT PER DRAWINGS

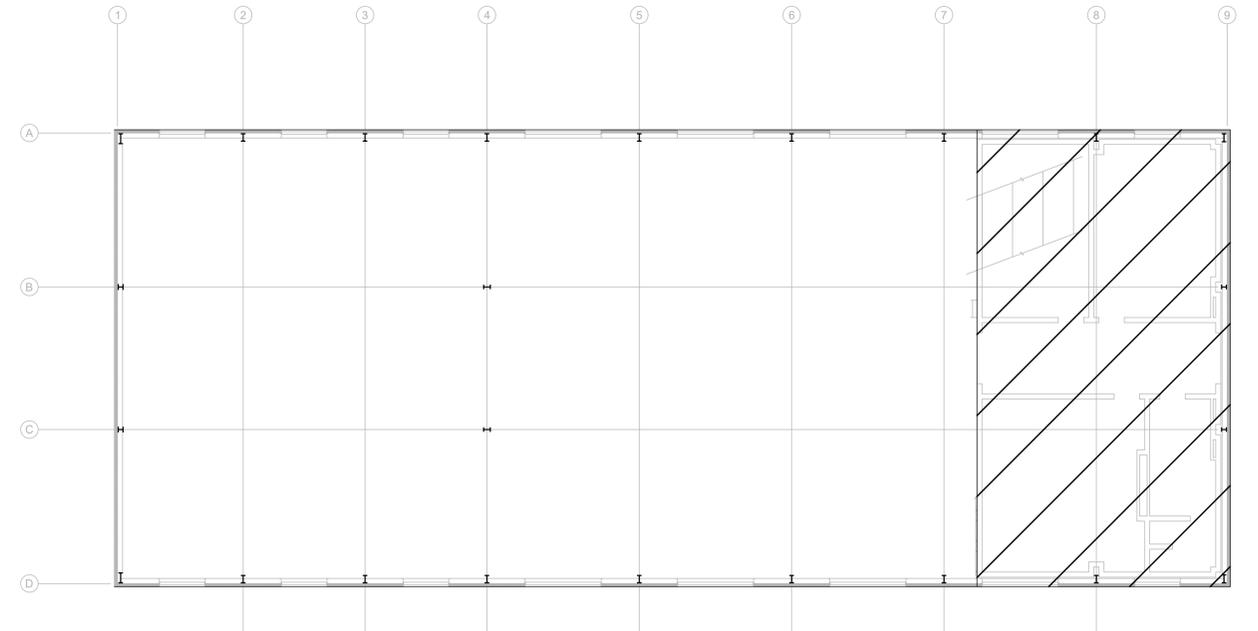
	.\APEX Logo.png				Scale	AS SHOWN	 THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING	WELLS NO. 1, 3, & 4 RAW WATER MAIN TOWN OF GROVELAND, MASSACHUSETTS	25% DESIGN
					Date	DECEMBER 2025			Job No.
Drawn by	MG	Checked by	HAW	STRUCTURAL GENERAL NOTES					
Approved by		MARK	DATE		DESCRIPTION				

Drawing file: C:\Users\ngm\Downloads\Groveland WTP-working folder\Groveland CAD\Groveland Structural Details - Standard\Groveland Structural Sheets 11_25.dwg Plot Date: Dec 18, 2025 5:11pm



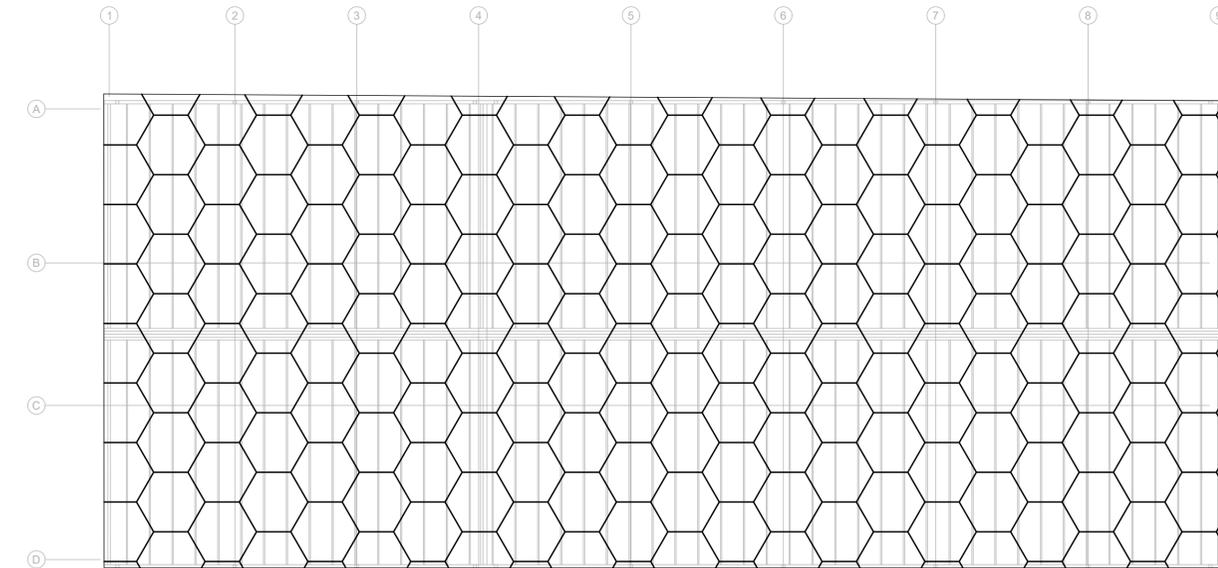
FIRST FLOOR LOADING PLAN

SCALE: NOT TO SCALE



UPPER LEVEL LOADING PLAN

SCALE: NOT TO SCALE



ROOF LOADING PLAN

SCALE: NOT TO SCALE



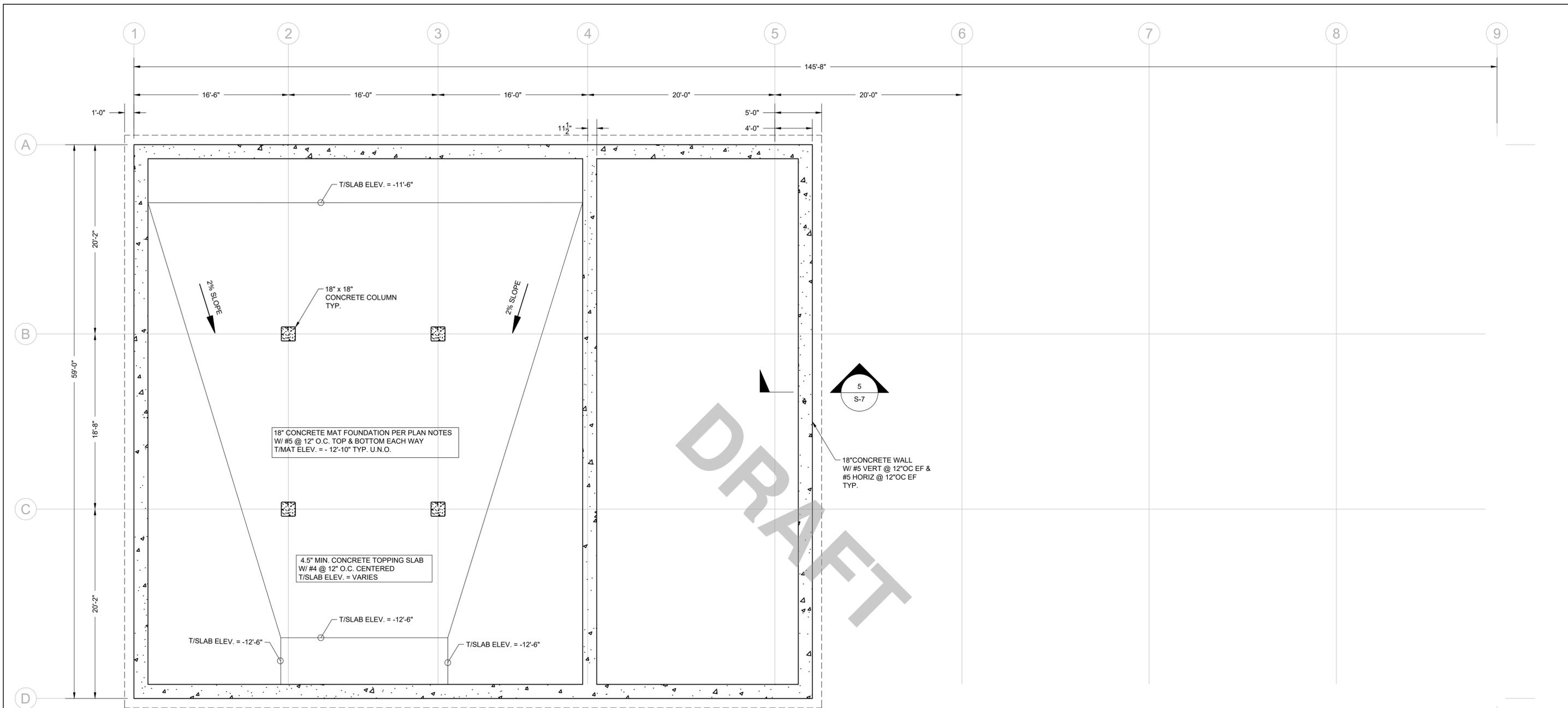
DRAFT

LOADING PLAN LEGEND					
MARK	PATTERN	AREA	SUPERIMPOSED DEAD LOAD	LIVE LOAD	SNOW LOAD
PR		LOWER LEVEL (PROCESS)	---	250 PSF	---
UF		UPPER LEVEL	---	250 PSF	---
RO		ROOF	20 PSF	20 PSF	35 PSF



	.IAPEX Logo.png			Scale AS SHOWN	 THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING	WELLS NO. 1, 3, & 4 RAW WATER MAIN TOWN OF GROVELAND, MASSACHUSETTS STRUCTURAL LOADING PLANS	25% DESIGN																					
			<table border="1" style="font-size: 8px;"> <thead> <tr> <th>MARK</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	MARK			DATE	DESCRIPTION										<table border="1" style="font-size: 8px;"> <tbody> <tr><td>Scale</td><td>AS SHOWN</td></tr> <tr><td>Date</td><td>DECEMBER 2025</td></tr> <tr><td>Job No.</td><td>23008867</td></tr> <tr><td>Designed by</td><td>MG</td></tr> <tr><td>Drawn by</td><td>MG</td></tr> <tr><td>Checked by</td><td>HAW</td></tr> <tr><td>Approved by</td><td> </td></tr> </tbody> </table>	Scale	AS SHOWN	Date	DECEMBER 2025	Job No.	23008867	Designed by	MG	Drawn by	MG
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LOWER FOUNDATION PLAN NOTES:

- STRUCTURAL GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND LEGEND PER S-1 AND S-2.
- VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS.
- CONTRACTOR SHALL LOCATE AND VERIFY THE FOLLOWING WITH OTHERS PRIOR TO POURING CONCRETE: ALL DOOR OPENINGS IN FOUNDATION WALLS; DRAINS AND SLOPES; BLOCKOUT FOR TANKS, VESSELS, PLUMBING, AND HVAC; ALL DUCTS CHASES, AND PIPES PER PROCESS MECHANICAL, MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION DRAWINGS; STAIR DETAILS AND GUARDRAILS PER ARCHITECTURAL DRAWINGS.
- TOP OF SLAB (T/SLAB) ELEVATION = FINISH FLOOR ELEVATION = XXX'-XX" PER ARCHITECTURAL DRAWINGS. PROVIDE 6 MIL VAPOR BARRIER BELOW SLAB AT INTERIOR SPACES. PROVIDE FREE-DRAINING GRANULAR FILL PER GEOTECH REPORT.
- ALL FOOTINGS AND SLABS TO BEAR ON COMPETENT NATIVE SOIL AND/OR STRUCTURAL FILL. SUBGRADE PREPARATION, STRUCTURAL FILL, FOOTING DRAINS, AND OTHER REQUIREMENTS PER GEOTECH REPORT AS NOTED IN THE STRUCTURAL GENERAL NOTES.
- CJ INDICATES CONTROL JOINT PER PLAN.
- STEEL STAIRS SHALL BE BIDDER-DESIGNED, UNO. APPLICABLE DESIGN REQUIREMENTS PER STRUCTURAL GENERAL NOTES.

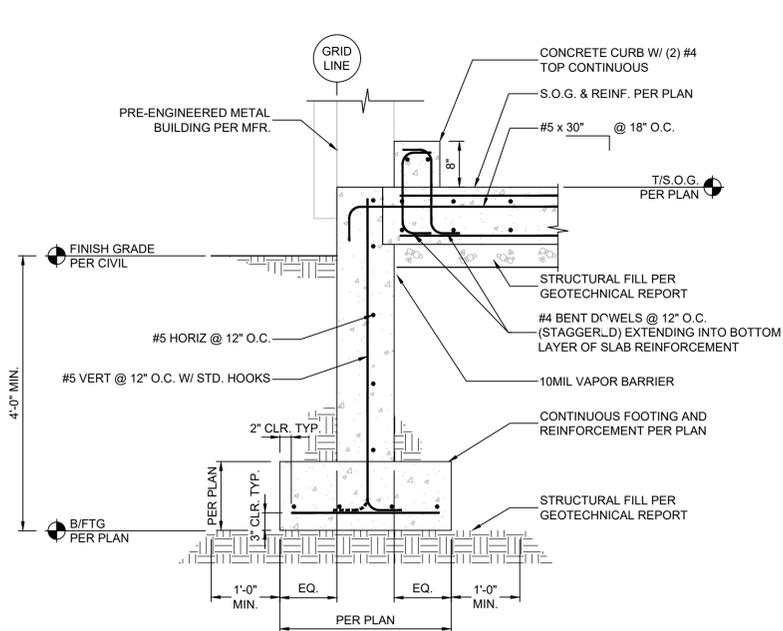
- TYPICAL DETAILS PER:
 S-8 CONCRETE DETAILS
 S-9 MASONRY DETAILS
 S-10 HOLLOW CORE PLANKS DETAILS
 S-11 CONCRETE PILASTER DETAILS

LOWER FOUNDATION PLAN

SCALE: 3/16" = 1'-0"



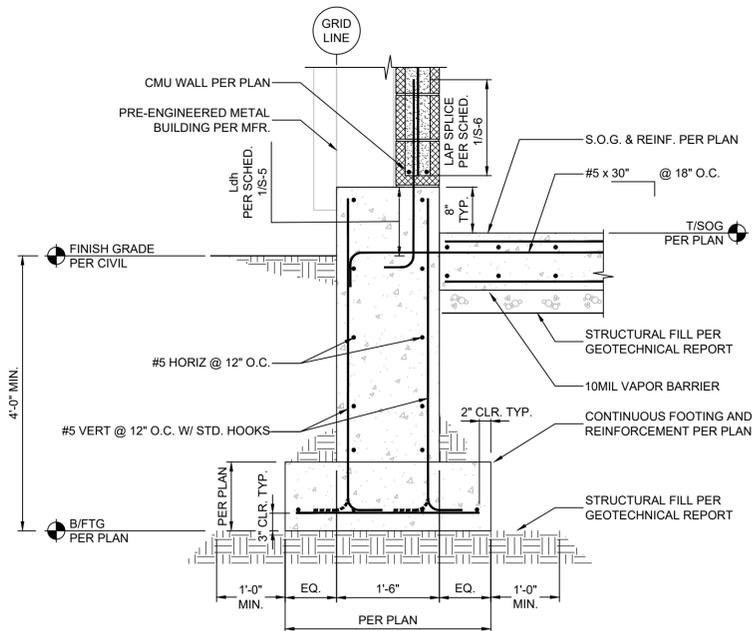
	.\APEX Logo.png	<table border="1"> <thead> <tr> <th>MARK</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	MARK	DATE	DESCRIPTION													<table border="1"> <tr><td>Scale</td><td>AS SHOWN</td></tr> <tr><td>Date</td><td>DECEMBER 2025</td></tr> <tr><td>Job No.</td><td>23008867</td></tr> <tr><td>Designed by</td><td>MG</td></tr> <tr><td>Drawn by</td><td>MG</td></tr> <tr><td>Checked by</td><td>HAW</td></tr> <tr><td>Approved by</td><td> </td></tr> </table>	Scale	AS SHOWN	Date	DECEMBER 2025	Job No.	23008867	Designed by	MG	Drawn by	MG	Checked by	HAW	Approved by		<p>THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING</p>	<p>WELLS NO. 1, 3, & 4 RAW WATER MAIN</p> <p>TOWN OF GROVELAND, MASSACHUSETTS</p> <p>STRUCTURAL LOWER FOUNDATION PLAN</p>	<p>25% DESIGN</p> <p>Sheet No.</p> <p>S-4</p>
			MARK	DATE	DESCRIPTION																														
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<p>Drawing file: C:\Users\ngm\Downloads\Groveland WTP\working folder\Groveland CAD\Groveland Structural Details - Standard\Groveland Structural Sheets 11.25.dwg Plot Date: Dec 18, 2025 2:11pm</p>																																			



10" FOUNDATION WALL

SCALE: 3/4" = 1'-0"

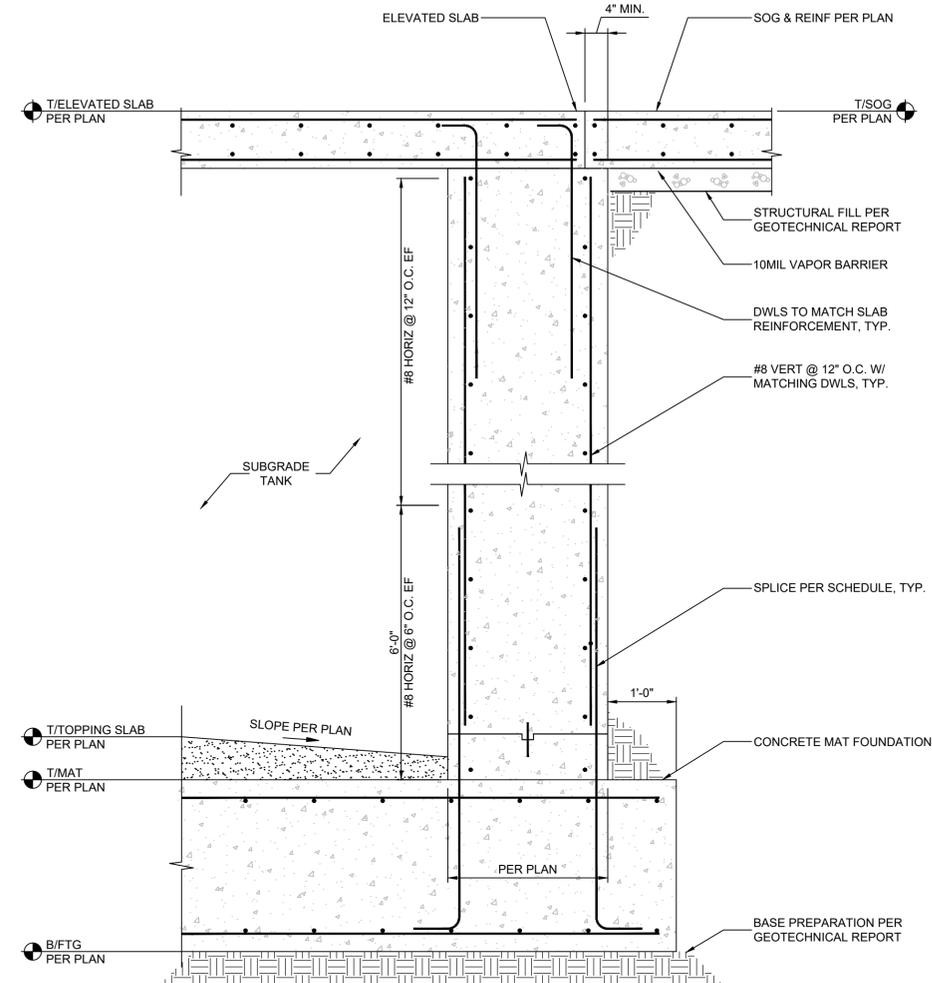
1
S-5



18" FOUNDATION WALL

SCALE: 3/4" = 1'-0"

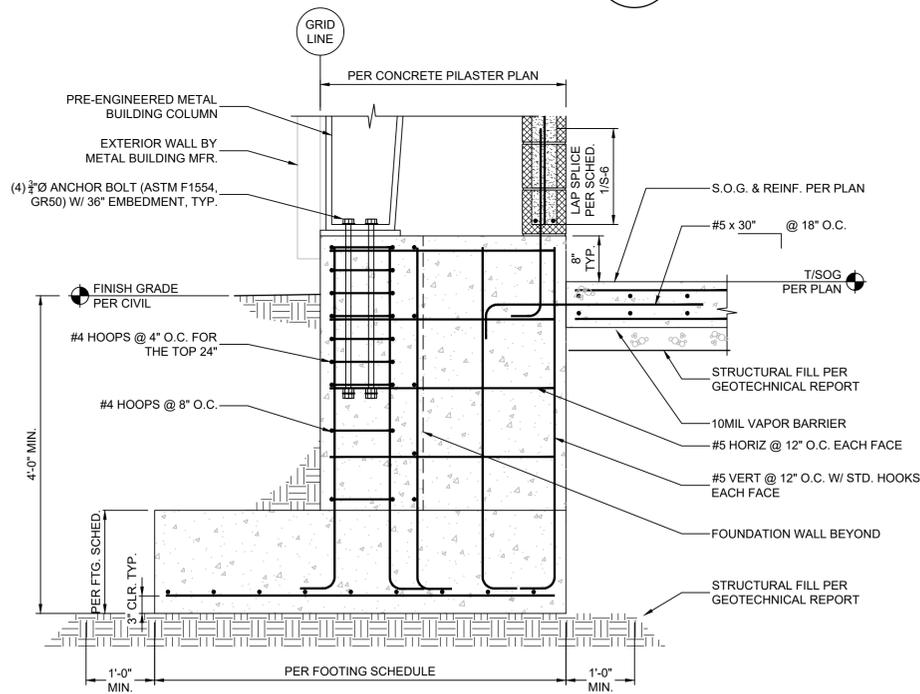
2
S-5



TYPICAL LOWER FOUNDATION WALL AND FOOTING

SCALE: 3/4" = 1'-0"

5
S-4



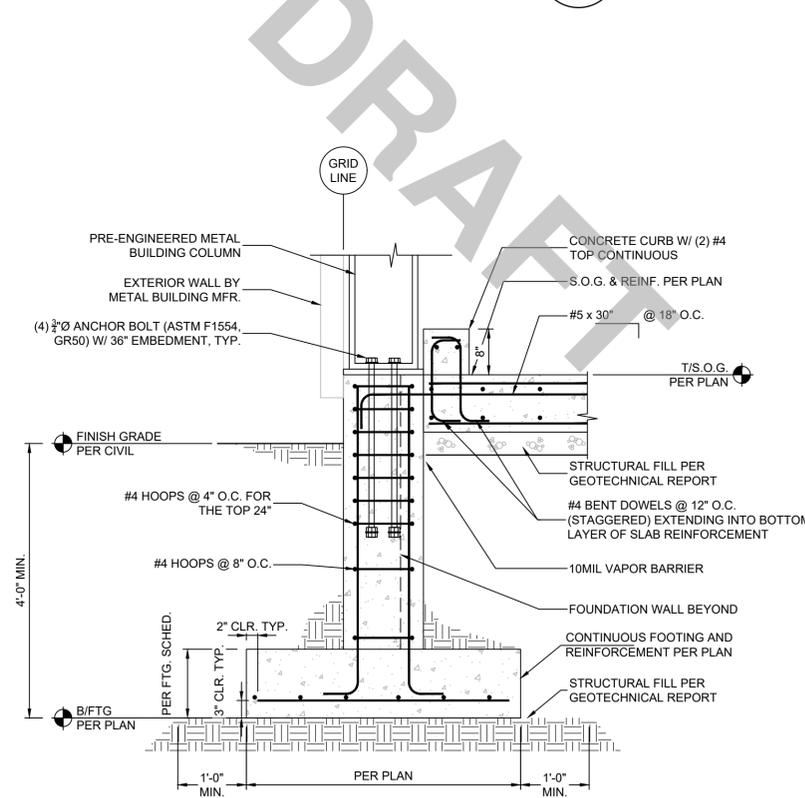
NOTES:

1. ANCHOR BOLTS AND PIERS DIMENSIONS TO BE COORDINATED WITH METAL BUILDING REQUIREMENTS.
2. CENTER OF BASE PLATE TO BE ALIGN WITH CENTER OF CONCRETE FOOTING PAD.
3. REFER TO S-8 FOR CONCRETE PILASTER PLANS.
4. HOOKED BAR Ldh PER SCHEDULE 1/S-5 AND LAP SPLICE AT MASONRY WALL PER SCHEDULE 1/S-6.

STEEL COLUMN @ CONCRETE PILASTER

SCALE: 3/4" = 1'-0"

3
S-5



STEEL COLUMN @ CONCRETE PILASTER

SCALE: 3/4" = 1'-0"

4
S-5



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MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	MG
Drawn by	MG
Checked by	HAW
Approved by	

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 RAW WATER MAIN
TOWN OF GROVELAND, MASSACHUSETTS
CONCRETE FOUNDATION DETAILS

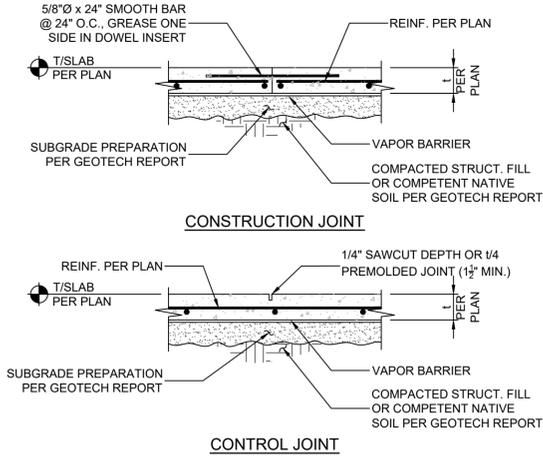
25% DESIGN

Sheet No.

S-7

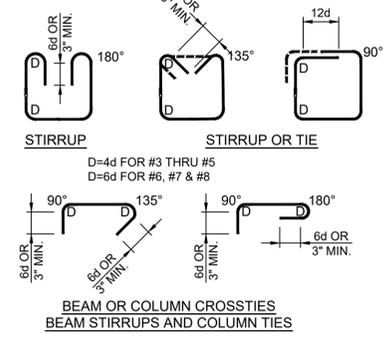
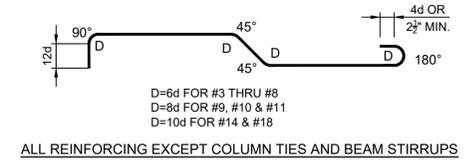
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GRADE 60 REINFORCING					
BAR SIZE	MISCELLANEOUS BAR		TOP BARS (SEE NOTE 5)		HOOKED BARS
	Ld	Splice	Ld	Splice	
f'c=4000psi					
#3	15	19	19	25	8
#4	19	25	25	33	10
#5	24	31	31	41	12
#6	29	37	37	49	15
#7	42	54	54	71	17
#8	48	62	62	81	19
#9	54	70	70	91	22
#10	61	79	79	102	25
#11	67	87	87	114	27
#14	81	N/A	105	N/A	33
#18	108	N/A	140	N/A	43
f'c=5000psi					
#3	13	17	17	22	7
#4	17	23	23	29	9
#5	22	28	28	36	11
#6	26	34	34	44	13
#7	38	49	49	63	15
#8	43	56	56	72	17
#9	48	63	63	81	20
#10	54	71	71	92	22
#11	60	78	78	102	24
#14	72	N/A	94	N/A	29
#18	96	N/A	125	N/A	39
f'c=6000psi					
#3	12	16	16	20	6
#4	16	21	21	27	8
#5	20	26	26	33	10
#6	24	31	31	40	12
#7	34	45	45	58	14
#8	39	51	51	66	16
#9	44	57	57	74	18
#10	50	64	64	84	20
#11	55	71	71	93	22
#14	66	N/A	86	N/A	27
#18	88	N/A	114	N/A	35



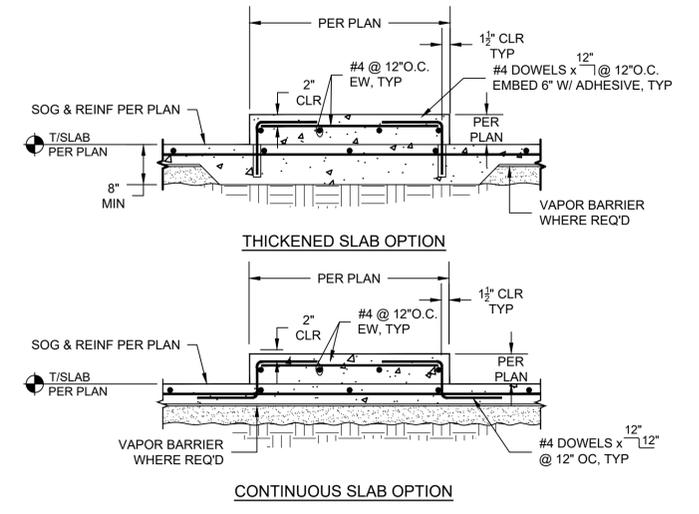
- NOTES:**
- CONSTRUCTION JOINT IS A JOINT BETWEEN DIFFERENT POURS. CONTROL JOINT IS A CRACK CONTROL JOINT WITHIN THE SAME POUR.
 - USE "EARLY ENTRY DRY-CUT SAW" AS SOON AS POSSIBLE WITHOUT CAUSING RAVELING OF CONCRETE EDGES. SAWCUT ALONG SHORT DIRECTION OF POUR FIRST.
 - ALIGN A CONSTRUCTION OR CONTROL JOINT WITH RE-ENTRANT SLAB CORNERS, EACH WAY, TYPICAL.
 - CONSTRUCTION/CONTROL JOINT TO ENCLOSE APPROXIMATE SQUARE AREAS 225 SQUARE FEET MAXIMUM, WITH MAXIMUM PANEL ASPECT RATION OF 1.3 TO 1.0.
 - CONTRACTOR TO SUBMIT CONSTRUCTION/CONTROL JOINT PLAN TO STRUCTURAL ENGINEER OF RECORD FOR REVIEW/APPROVAL.

TYP. SLAB ON GRADE JOINT DETAILS WITH REINFORCING
 SCALE: N.T.S.



NOTE:
 TIES AND CROSSTIES FOR SHEAR WALL BOUNDARY ELEMENTS SHALL BE DETAILED AS COLUMN TIES/CROSSTIES

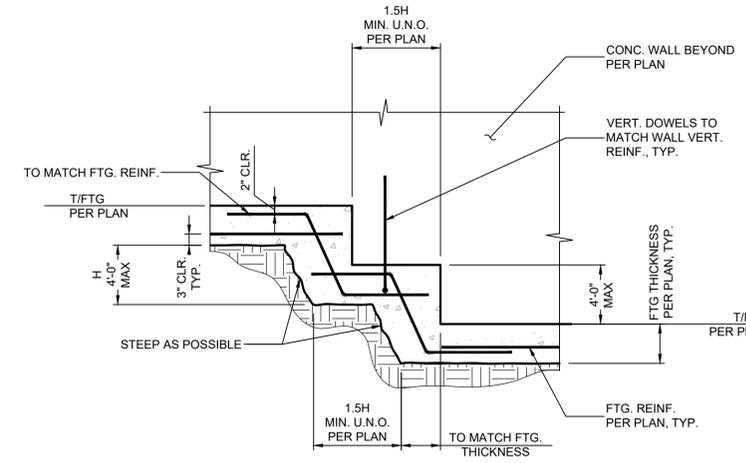
STANDARD HOOKS AND BENDS
 SCALE: N.T.S.



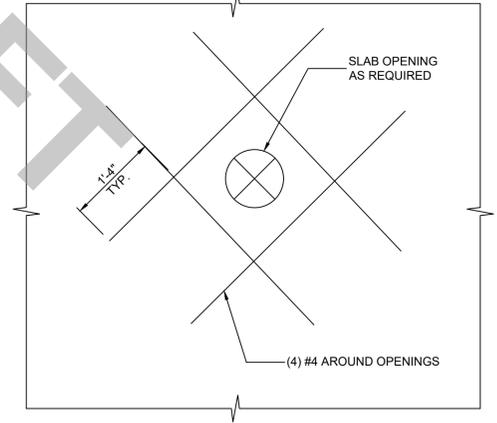
CONCRETE PAD ON SLAB ON GRADE
 SCALE: N.T.S.

- NOTES:**
- ALL TABULATED VALUES ARE IN INCHES.
 - VALUES FOR UNCOATED REINFORCING AND NORMAL WEIGHT CONCRETE WITH CLEAR SPACING > db, CLEAR COVER > db AND MINIMUM STIRRUPS OR TIES THROUGHOUT Ld OR CLEAR SPACING > 2db AND CLEAR COVER > db.
 - DEVELOP ALL REINFORCING IN STRUCTURAL SLABS WITH MINIMUM DEVELOPMENT LENGTH Ld.
 - Ldh = DEVELOPMENT LENGTH OF BAR WITH STANDARD HOOK.
 - TOP BAR = HORIZONTAL BAR WITH MORE THAN 12" OF FRESH CONCRETE BELOW OR AS NOTED ON DOCUMENTS AS "TOP BAR".
 - LAP SPLICE OF DIFFERENT SIZED BARS TO BE THE LARGER OF Ld OF THE LARGER BAR OR SPLICE LENGTH OF THE SMALLER BAR.
 - LAP SPLICE OF DIFFERENT SIZED BARS IS NOT PERMITTED. LAP SPLICE OF SMALLER TO #14 AND #18 BARS IS NOT PERMITTED.
 - LAP SPLICE OF DIFFERENT GRADES OF REINFORCING TO BE THE LARGER OF Ld OF THE HIGHER GRADE BAR OR SPLICE LENGTH OF THE LOWER GRADE BAR.

TYP. LAP SPLICE & DEVELOPMENT LENGTH SCHEDULE
 SCALE: N.T.S.



TYPICAL STEPPED FOOTING
 SCALE: N.T.S.



- NOTES:**
- COORDINATE LOCATIONS W/MECH., ELECTRICAL, HVAC, & PLUMBING DWGS.
 - CUT OPENING IN WWF AS REQ'D FOR OPENING.
 - SECURE VAPOR BARRIER TO PIPE DRAIN.

TYP. OPENING IN SLAB ON-GRADE
 SCALE: N.T.S.

	.IAPEX Logo.png	MARK	DATE	DESCRIPTION	Scale	AS SHOWN		WELLS NO. 1, 3, & 4 RAW WATER MAIN TOWN OF GROVELAND, MASSACHUSETTS STRUCTURAL CONCRETE TYPICAL DETAILS	25% DESIGN
					Date	DECEMBER 2025			Job No.
					Designed by	MG			
					Drawn by	MG			
					Checked by	HAW			
					Approved by				

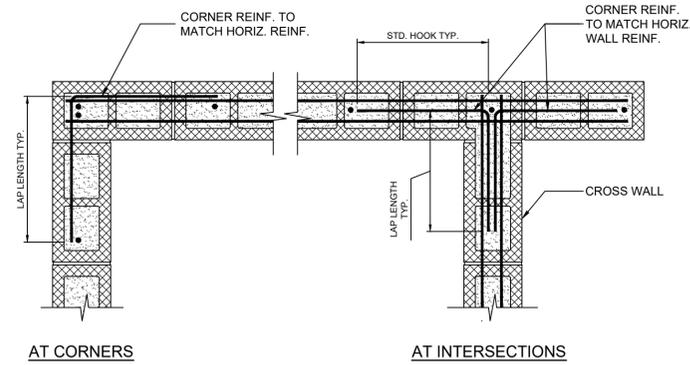
THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

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REINFORCING SIZE	GRADE 40	GRADE 60
#4	20	24
#5	25	30
#6	30	36
#7	35	42
#8	40	48

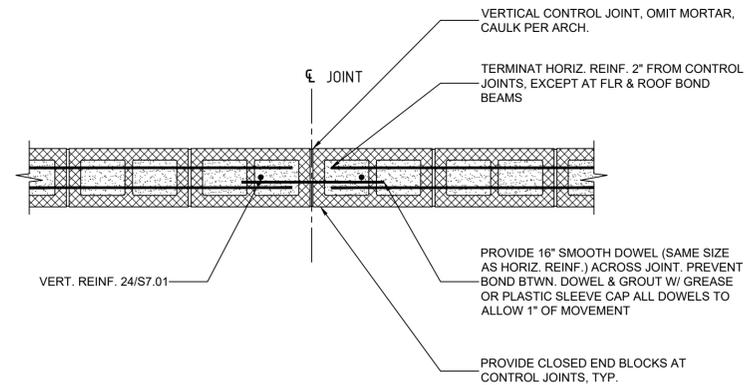
NOTES:

1. DEVELOPMENT AND LAP SPLICE LENGTHS INDICATED SHALL BE USED UNLESS SPECIFICALLY NOTED ON DRAWINGS.
2. REINFORCING MAY BE CONSIDERED TO BE SPLICED WHEN PLACED IN ADJACENT GROUDED CELLS AND IF THE BARS ARE SPACED NO FURTHER APART THAN IS THE REQUIRED LENGTH INDICATED AND NEVER FURTHER APART THAN 8'.
3. ALL TABULATED VALUES ARE IN INCHES.



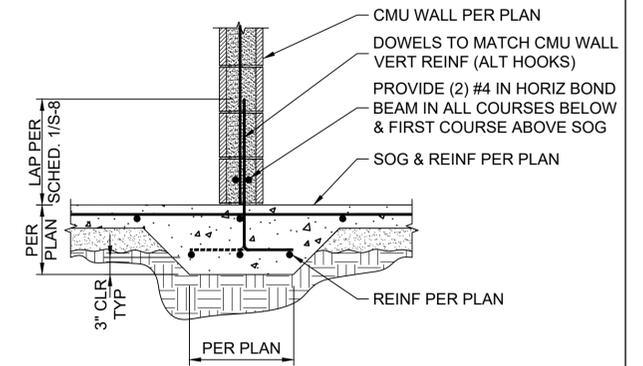
NOTES:

1. LAP LENGTH PER REINFORCING LAP SPLICE AND DEVELOPMENT LENGTH SCHEDULE FOR CMU.
2. WALL REINFORCING PER PLANS, ELEVATIONS, SECTIONS AND DETAILS.
3. CORNER REINFORCEMENT AT FOOTING AND STEMWALLS TO MATCH FOOTING AND STEMWALL HORIZONTAL REINFORCING.



NOTE:

CONTROL JOINT LOCATION CRITERIA PER STRUCTURAL GENERAL NOTES. CONTRACTOR SHALL COORDINATE LOCATION OF JOINT WITH ARCHITECT AND STRUCTURAL ENGINEER.



TYP. LAP SPLICE & DEVELOPMENT LENGTH SCHEDULE FOR STRUCTURAL MASONRY

SCALE: N.T.S.

PLAN - TYPICAL CORNER REINFORCING AT CMU WALLS

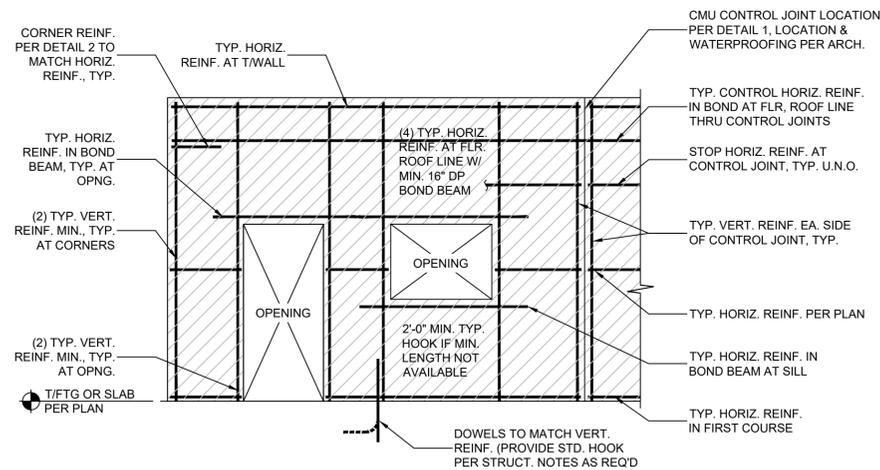
SCALE: 3/4" = 1'-0"

PLAN - CMU CONTROL JOINT

SCALE: 3/4" = 1'-0"

THICKENED SLAB FOOTING AT CMU WALL

SCALE: 3/4" = 1'-0"

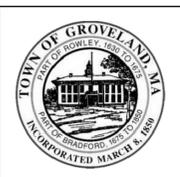


NOTES:

1. TYPICAL REINFORCING PER STRUCTURAL GENERAL NOTES.
2. INFORMATION NOT SHOWN PER TYPICAL SECTIONS.
3. CMU WALLS ARE SOLID GROUDED.

ELEVATION - TYPICAL REINFORCING IN CMU WALL

SCALE: N.T.S.



.\APEX Logo.png

MARK	DATE	DESCRIPTION

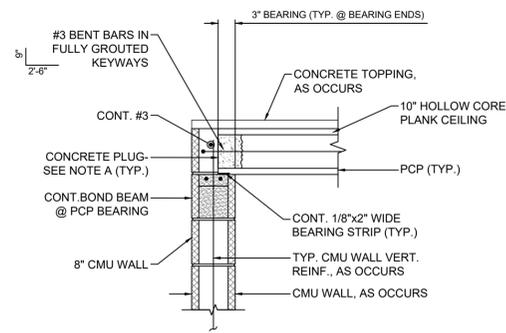
Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	MG
Drawn by	MG
Checked by	HAW
Approved by	

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 RAW WATER MAIN
TOWN OF GROVELAND, MASSACHUSETTS
STRUCTURAL MASONRY TYPICAL DETAILS

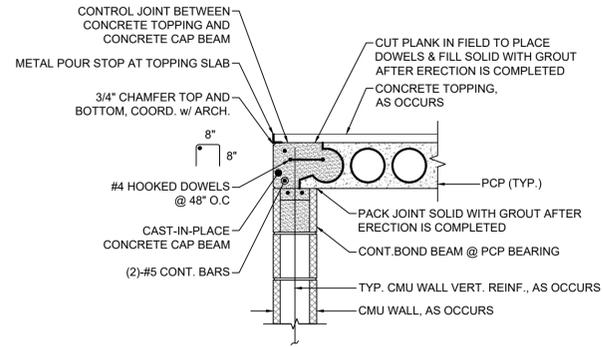
25% DESIGN
 Sheet No.

S-9



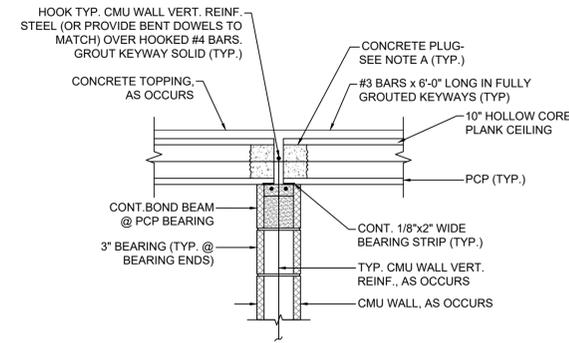
HOLLOW CORE PLAN TO EXTERIOR WALL (PERPENDICULAR)

SCALE: N.T.S.



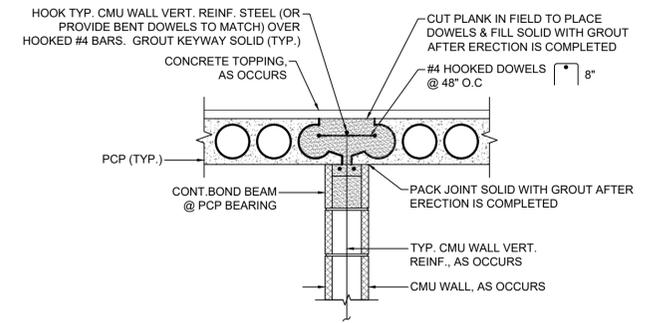
HOLLOW CORE PLAN TO EXTERIOR WALL (PARALLEL)

SCALE: N.T.S.



HOLLOW CORE PLAN TO INTERIOR WALL (PERPENDICULAR)

SCALE: N.T.S.



HOLLOW CORE PLAN TO INTERIOR WALL (PERPENDICULAR)

SCALE: N.T.S.



DRAFT



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Designed by	MG
Drawn by	MG
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Approved by	

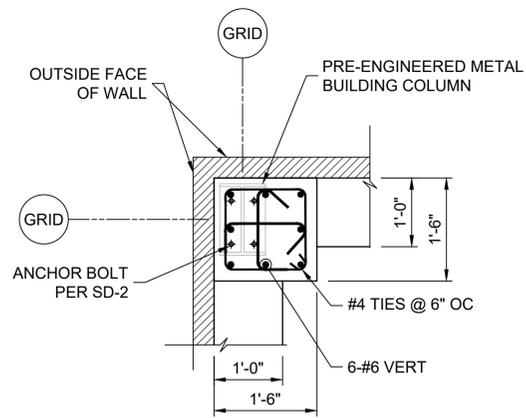
THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 RAW WATER MAIN
TOWN OF GROVELAND, MASSACHUSETTS

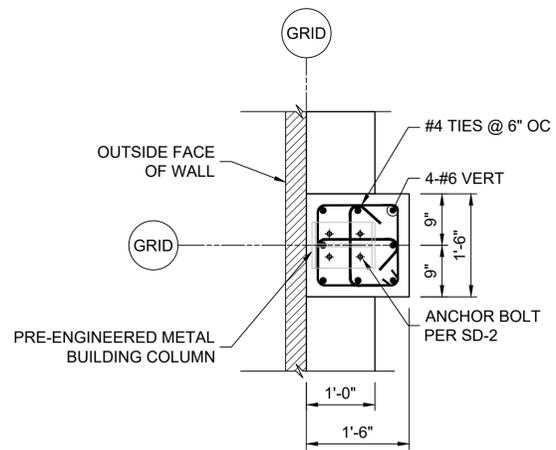
HOLLOW CORE PLANKS DETAILS

25% DESIGN
 Sheet No.

S-10



P1
SCALE: 1" = 3/4'-0"
1
S-5

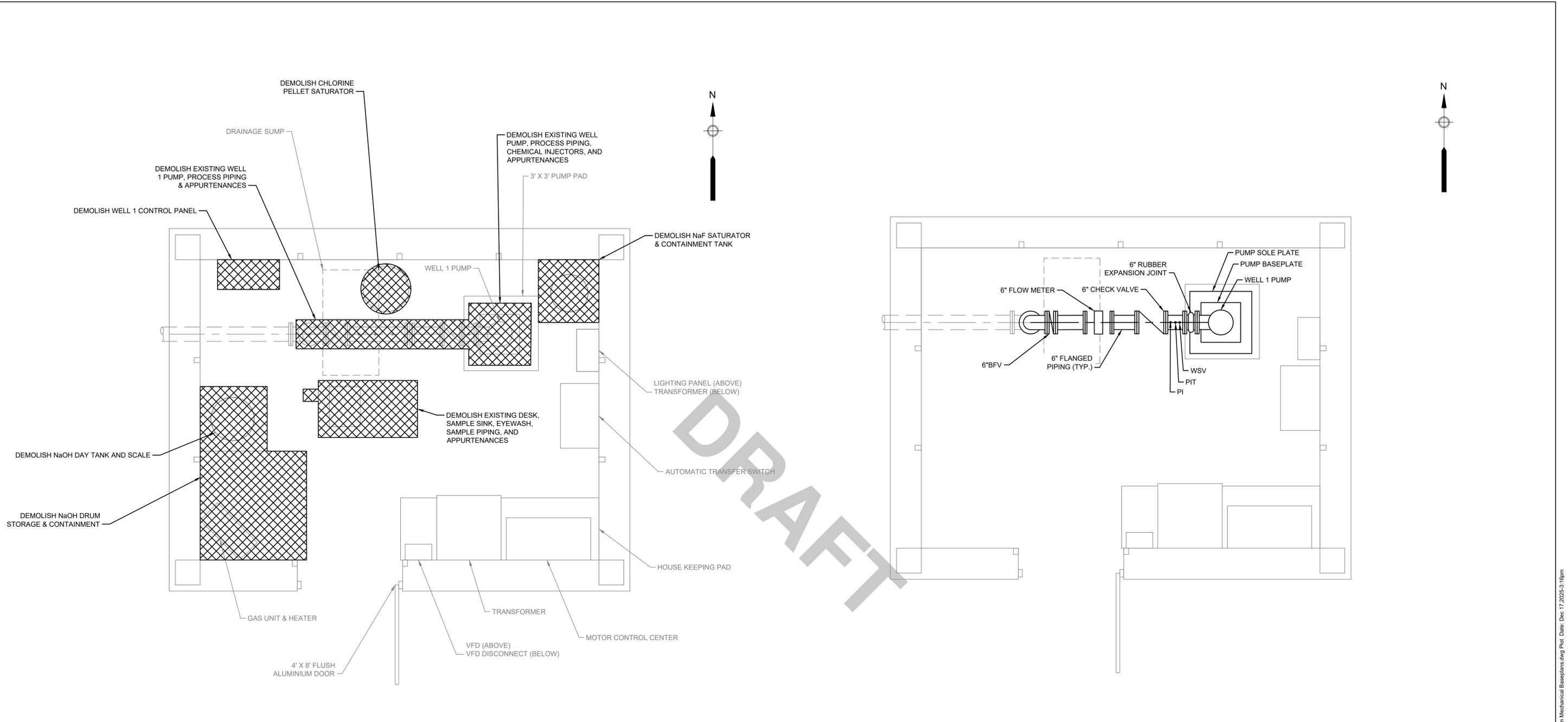


P2
SCALE: 1" = 3/4'-0"
2
S-5

DRAFT

	.APEX Logo.png	<table border="1"> <thead> <tr> <th>MARK</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	MARK	DATE	DESCRIPTION																			<table border="1"> <tr><td>Scale</td><td>AS SHOWN</td></tr> <tr><td>Date</td><td>DECEMBER 2025</td></tr> <tr><td>Job No.</td><td>23008867</td></tr> <tr><td>Designed by</td><td>MG</td></tr> <tr><td>Drawn by</td><td>MG</td></tr> <tr><td>Checked by</td><td>HAW</td></tr> <tr><td>Approved by</td><td> </td></tr> </table>	Scale	AS SHOWN	Date	DECEMBER 2025	Job No.	23008867	Designed by	MG	Drawn by	MG	Checked by	HAW	Approved by		 THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING	WELLS NO. 1, 3, & 4 RAW WATER MAIN TOWN OF GROVELAND, MASSACHUSETTS	25% DESIGN Sheet No.
			MARK	DATE	DESCRIPTION																																				
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Approved by																																									
CONCRETE PILASTER DETAILS					S-11																																				

Drawing file: C:\Users\jgongm\Downloads\Groveland WTP - working folder\Groveland CAD\Groveland Structural Details - Standard\Groveland Structural Details 11.17.dwg Plot Date: Dec 18, 2025 1:45pm



WELL NO. 1 PUMP STATION DEMOLITION PLAN

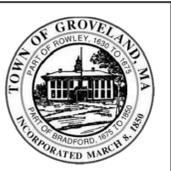
SCALE: 1/2"=1'-0"

NOTE:

- 1. REFER TO ELECTRICAL DRAWINGS FOR SCOPE OF ELECTRICAL EQUIPMENT DEMOLITION.

WELL NO. 1 PUMP STATION MODIFICATION PLAN

SCALE: 1/2"=1'-0"



MARK	DATE	DESCRIPTION

Scale	AS NOTED
Date	DECEMBER 2025
Job No.	23008867
Designed by	AWCP
Drawn by	SSP
Checked by	AWCP
Approved by	RJA

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

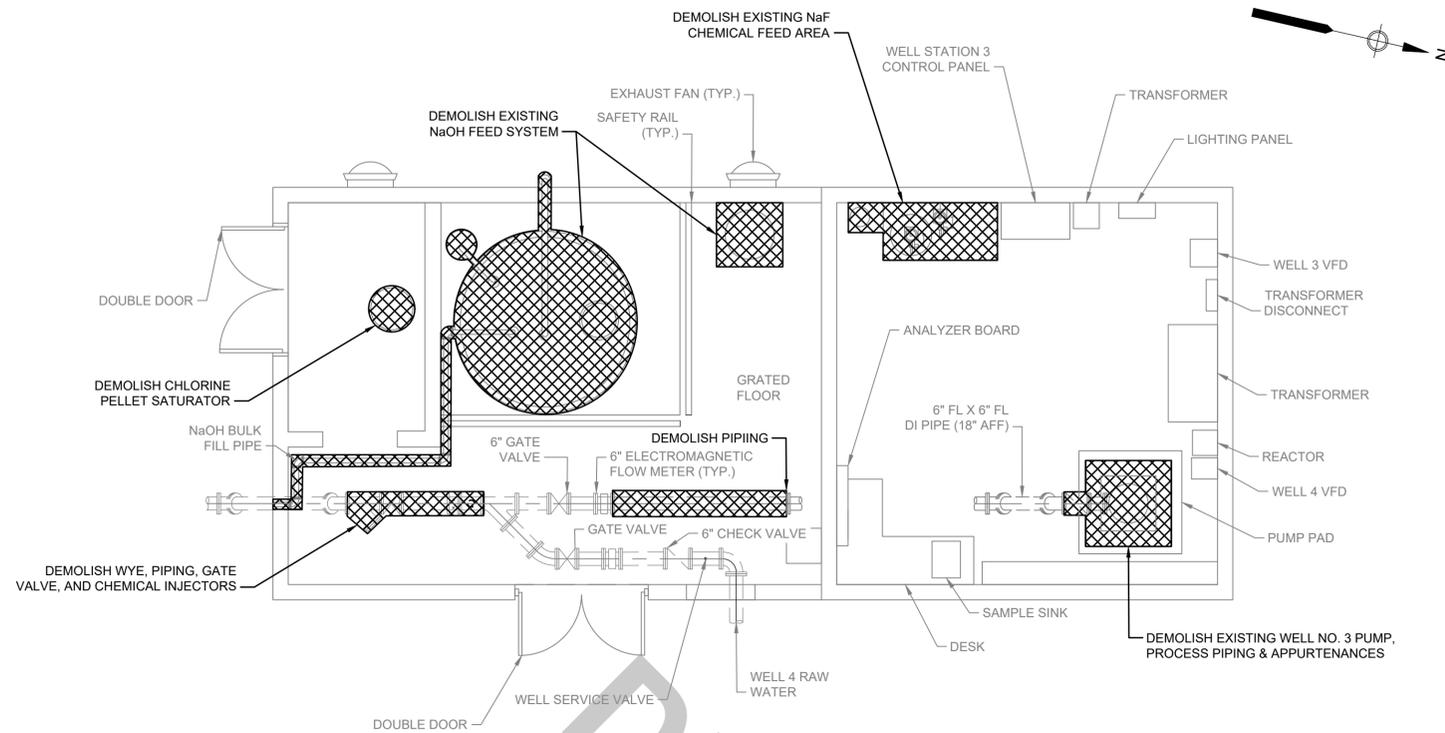
WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

PROCESS MECHANICAL WELL NO. 1 PUMP STATION
DEMOLITION AND MODIFICATIONS PLAN

25% DESIGN

Sheet No.

M-1

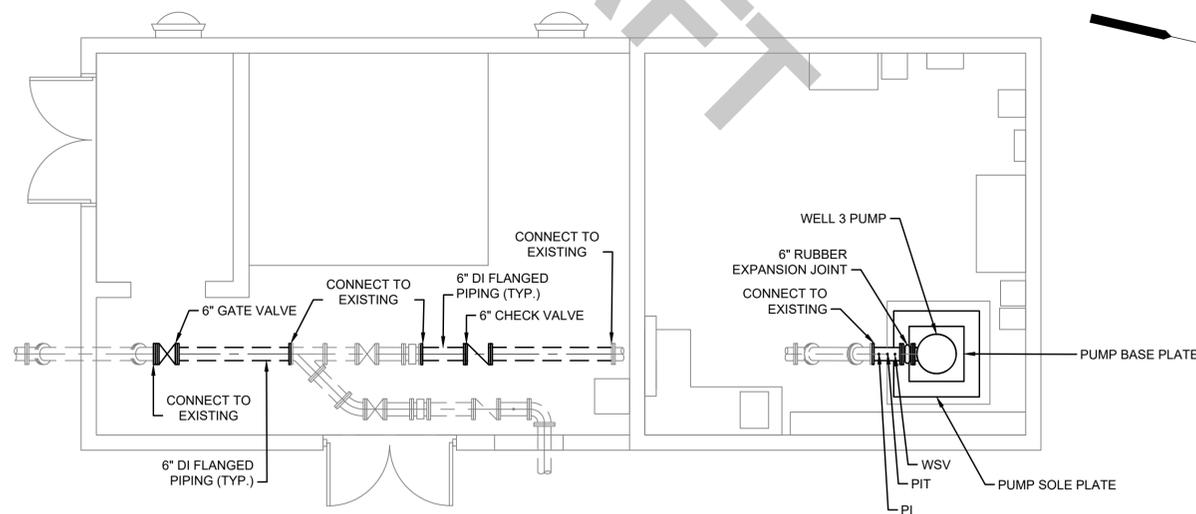


WELLS NO. 3 AND 4 PUMP STATION DEMOLITION PLAN

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

NOTE:

1. REFER TO ELECTRICAL DRAWINGS FOR SCOPE OF ELECTRICAL EQUIPMENT DEMOLITION.



WELLS NO. 3 AND 4 PUMP STATION MODIFICATION PLAN

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



MARK	DATE	DESCRIPTION

Scale	AS NOTED
Date	DECEMBER 2025
Job No.	23008867
Designed by	AWCP
Drawn by	SSP
Checked by	AWCP
Approved by	RJA

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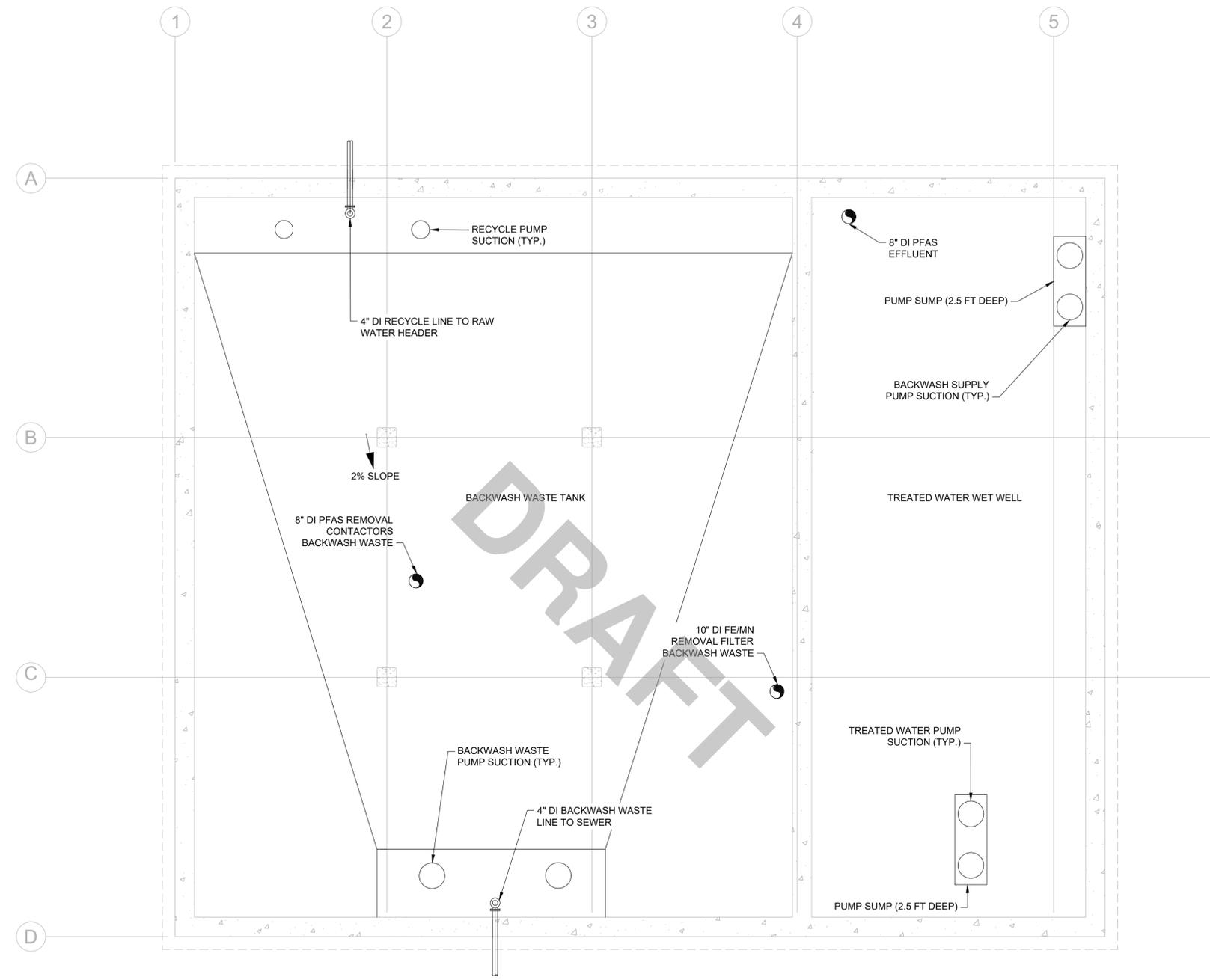
WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

PROCESS MECHANICAL WELLS NO. 3 AND 4 PUMP STATION
DEMOLITION AND MODIFICATIONS PLAN

25% DESIGN

Sheet No.

M-2



PLAN
SCALE: 3/16"=1'



MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	AWCP
Drawn by	BDP
Checked by	AWCP
Approved by	RJA

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

**WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS**

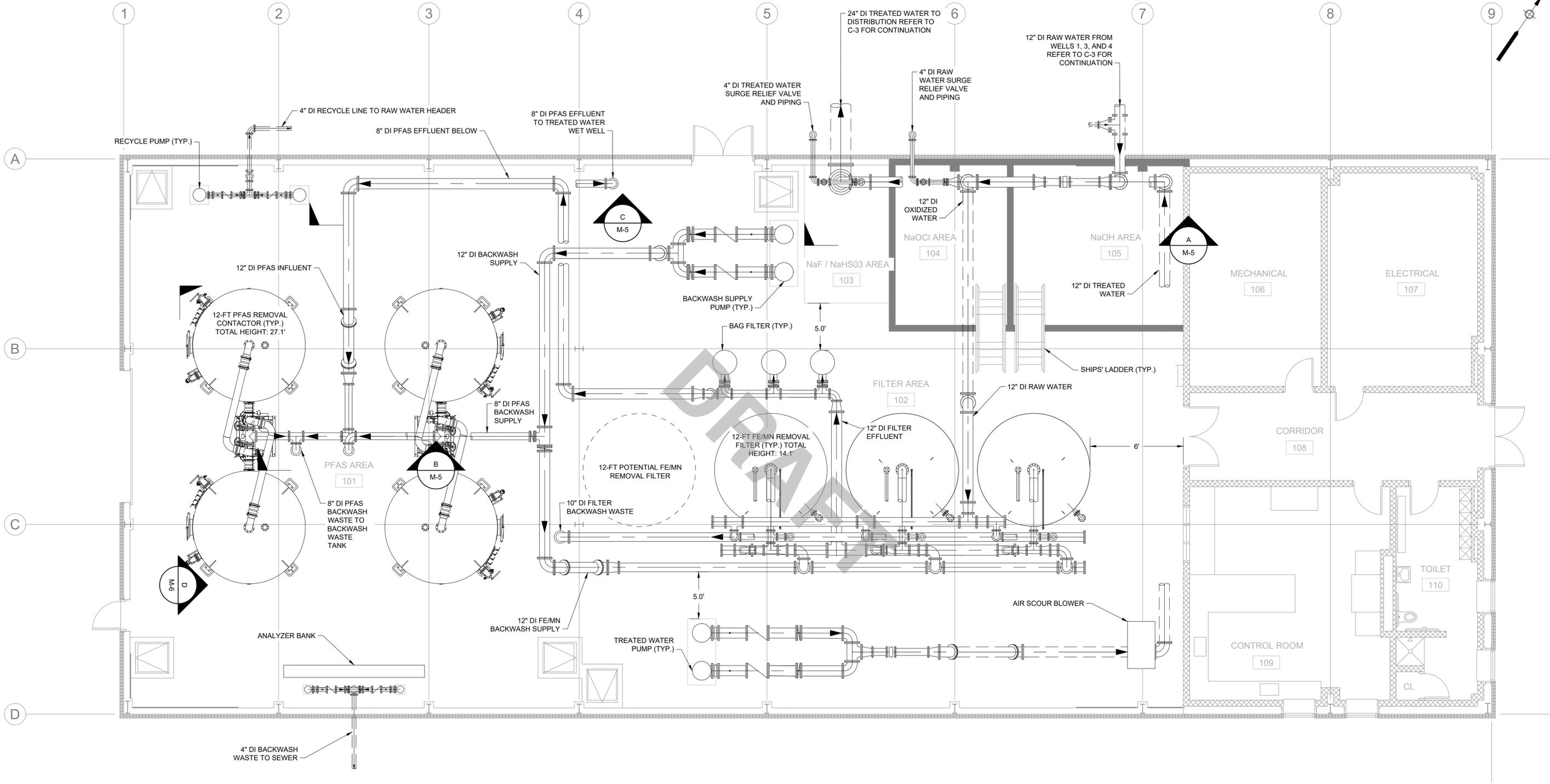
PROCESS MECHANICAL WTP LOWER LEVEL PLAN

25% DESIGN

Sheet No.

M-3

Drawing file: I:\Groveland\23008867 Water Treatment Plant\01 25% Design\Drawings\CAD\07 Mechanical.dwg Plot Date: Dec 19, 2025 9:35am



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



MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	AWCP
Drawn by	SES
Checked by	AWCP
Approved by	RJA

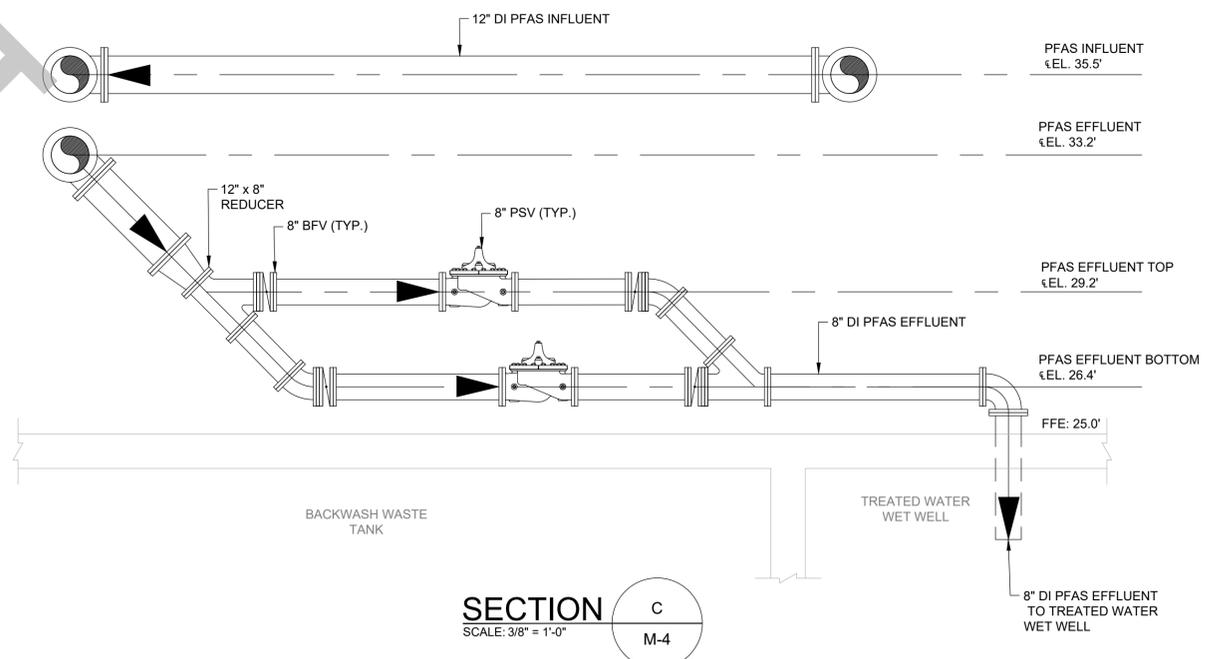
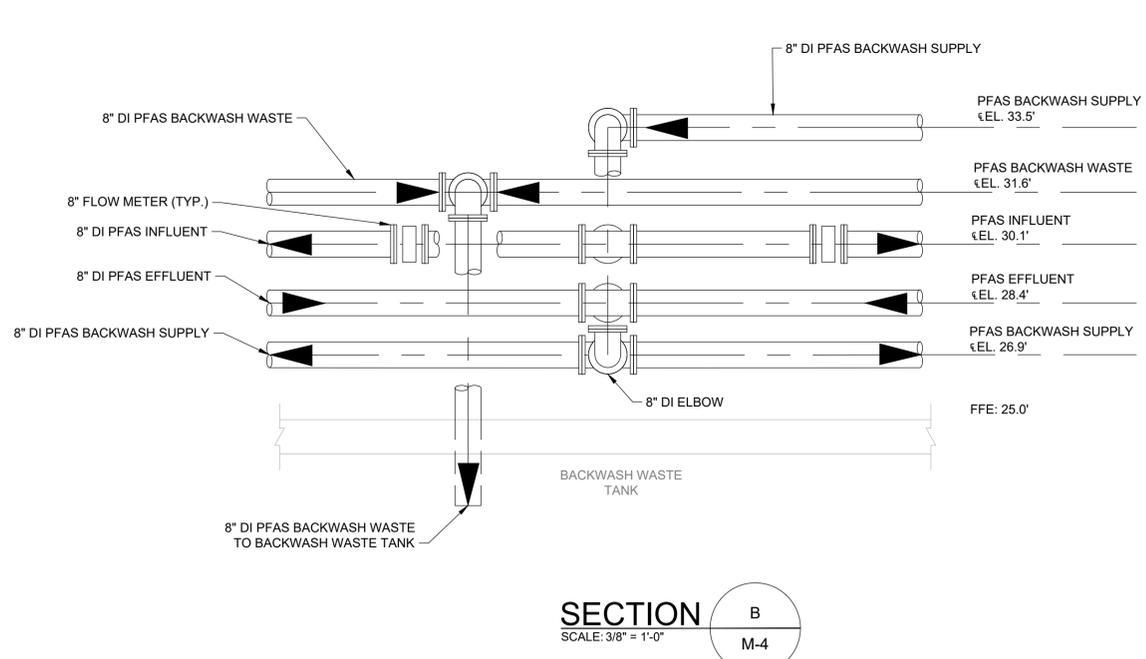
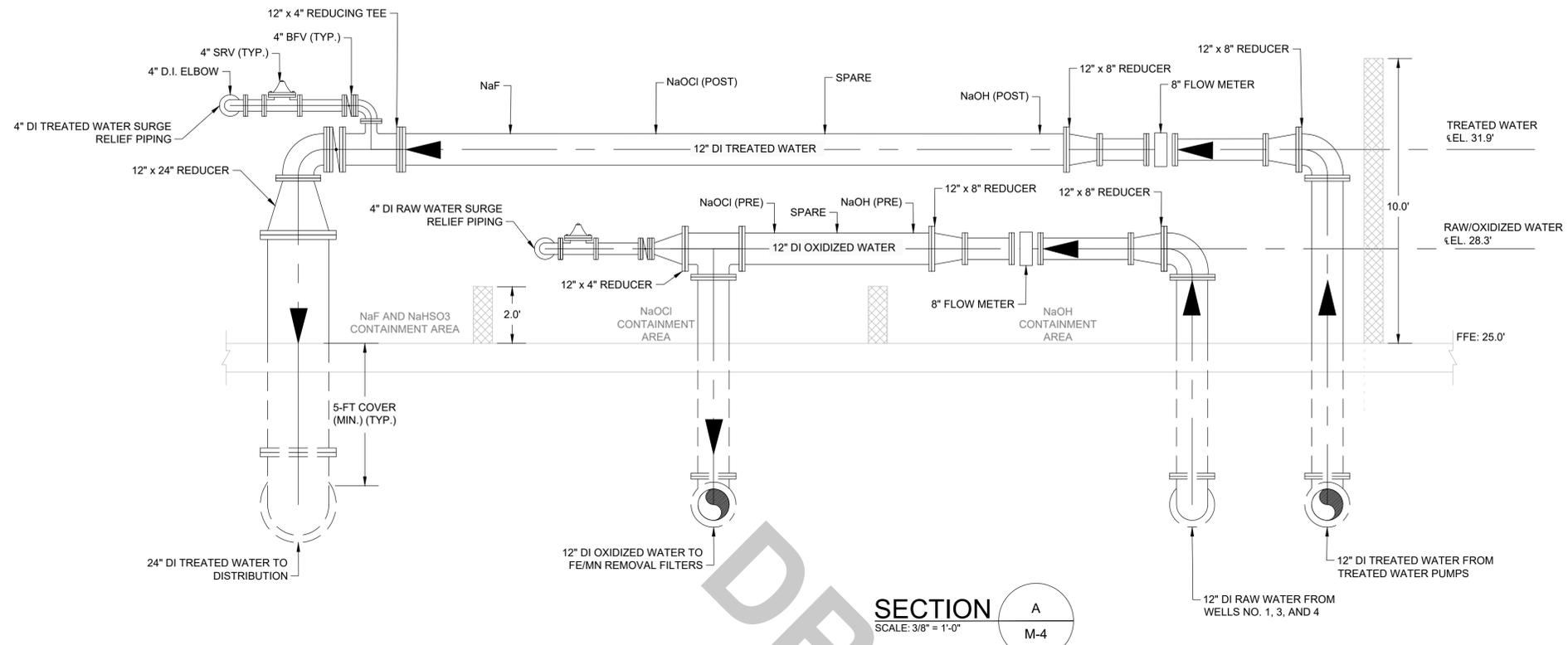
THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

PROCESS MECHANICAL WTP FIRST FLOOR PLAN

25% DESIGN
Sheet No. **M-4**

Drawing file: I:\Groveland\318\Water System\23008867 Water Treatment Plant\01 25% Design\Drawings\CAD\07 Mechanical.dwg Plot Date: Dec-19-2025-11:00am



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MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	BDP
Drawn by	SES
Checked by	AWCP
Approved by	RJA

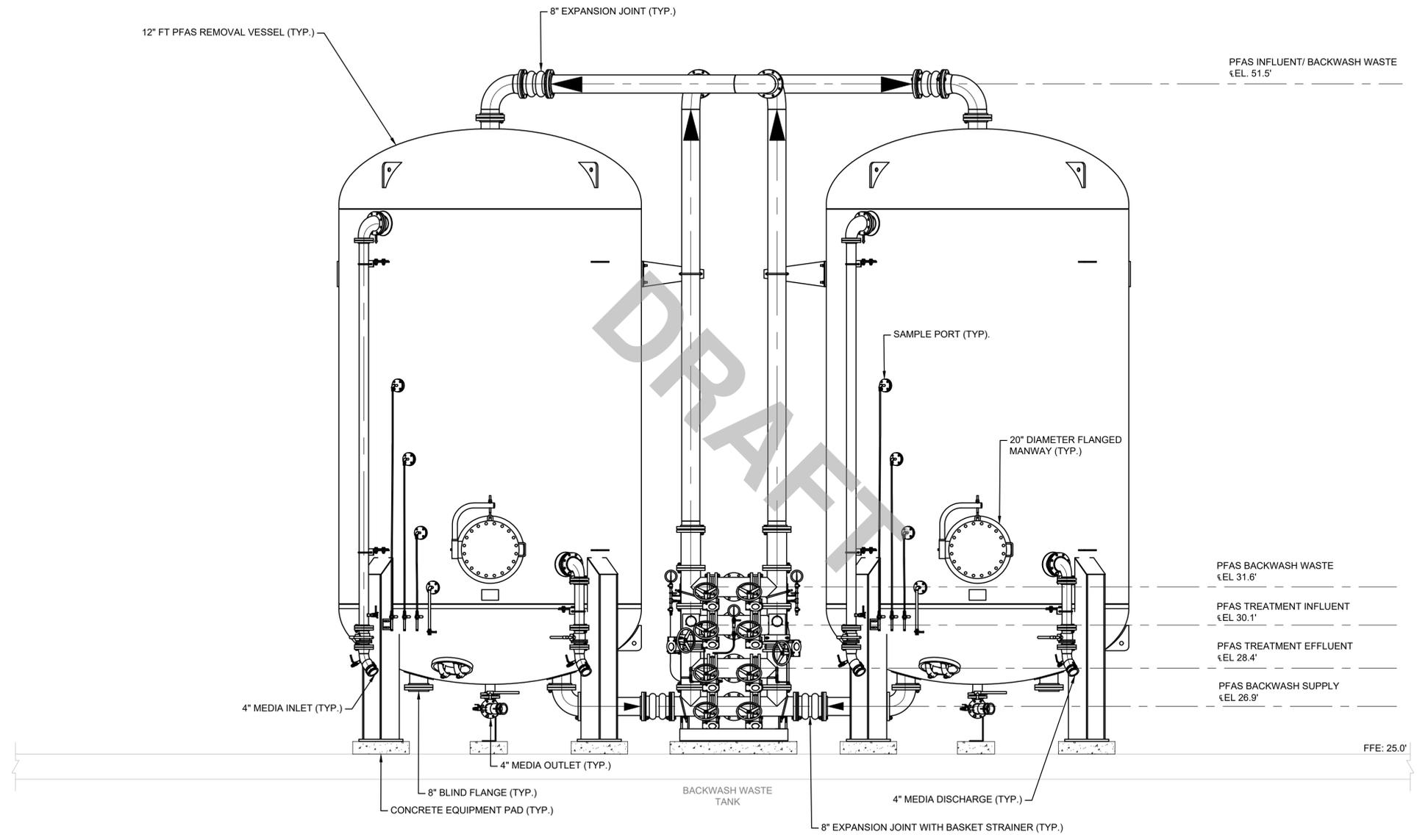
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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

PROCESS MECHANICAL SECTIONS I

25% DESIGN
Sheet No.

M-5



SECTION D
SCALE: 3/8" = 1'-0"
M-4



MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	BDP
Drawn by	SES
Checked by	AWCP
Approved by	RJA

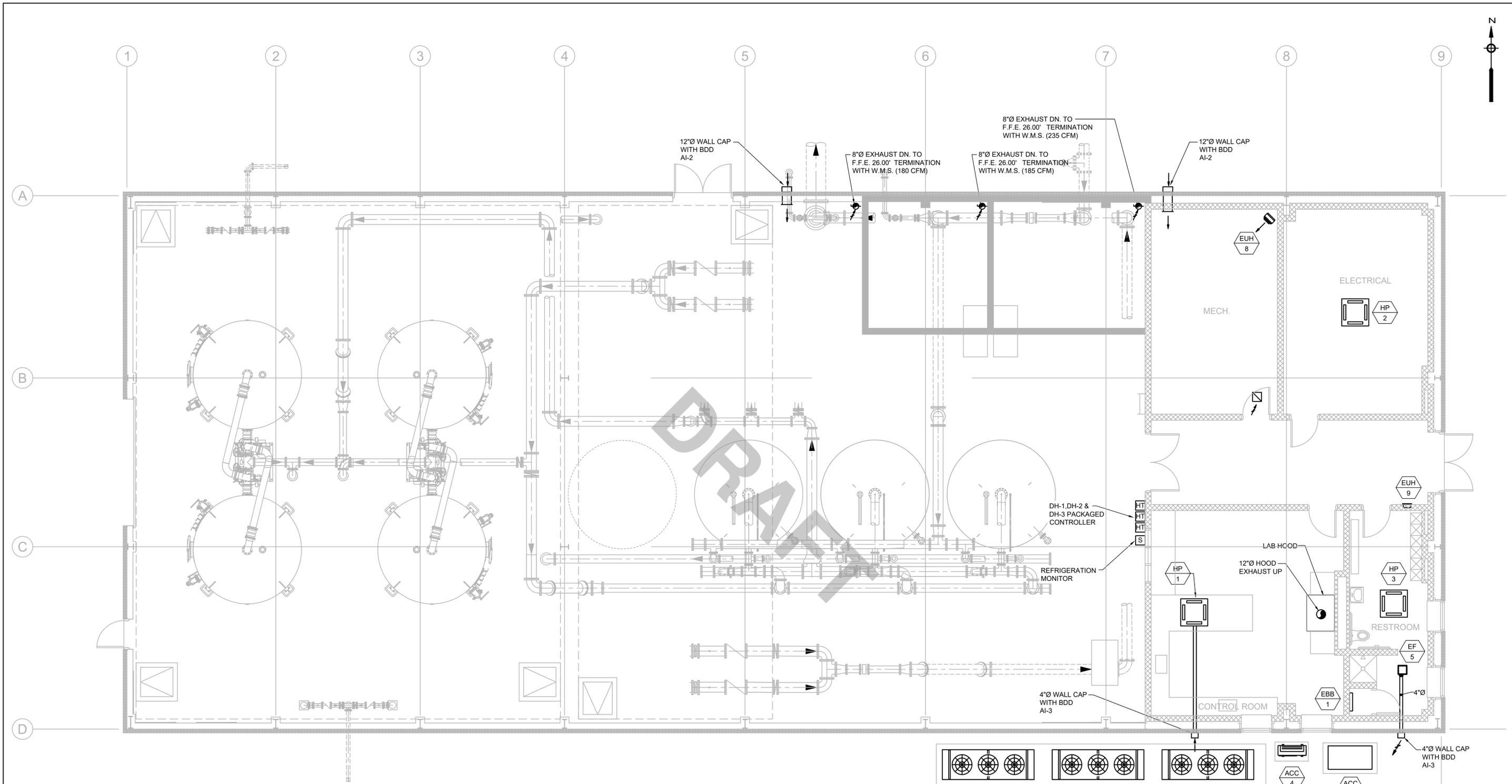
THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

**WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS**

PROCESS MECHANICAL SECTIONS II

25% DESIGN
Sheet No.

M-6



FIRST FLOOR PLAN
SCALE: 3/16"=1'-0"



MARK	DATE	DESCRIPTION

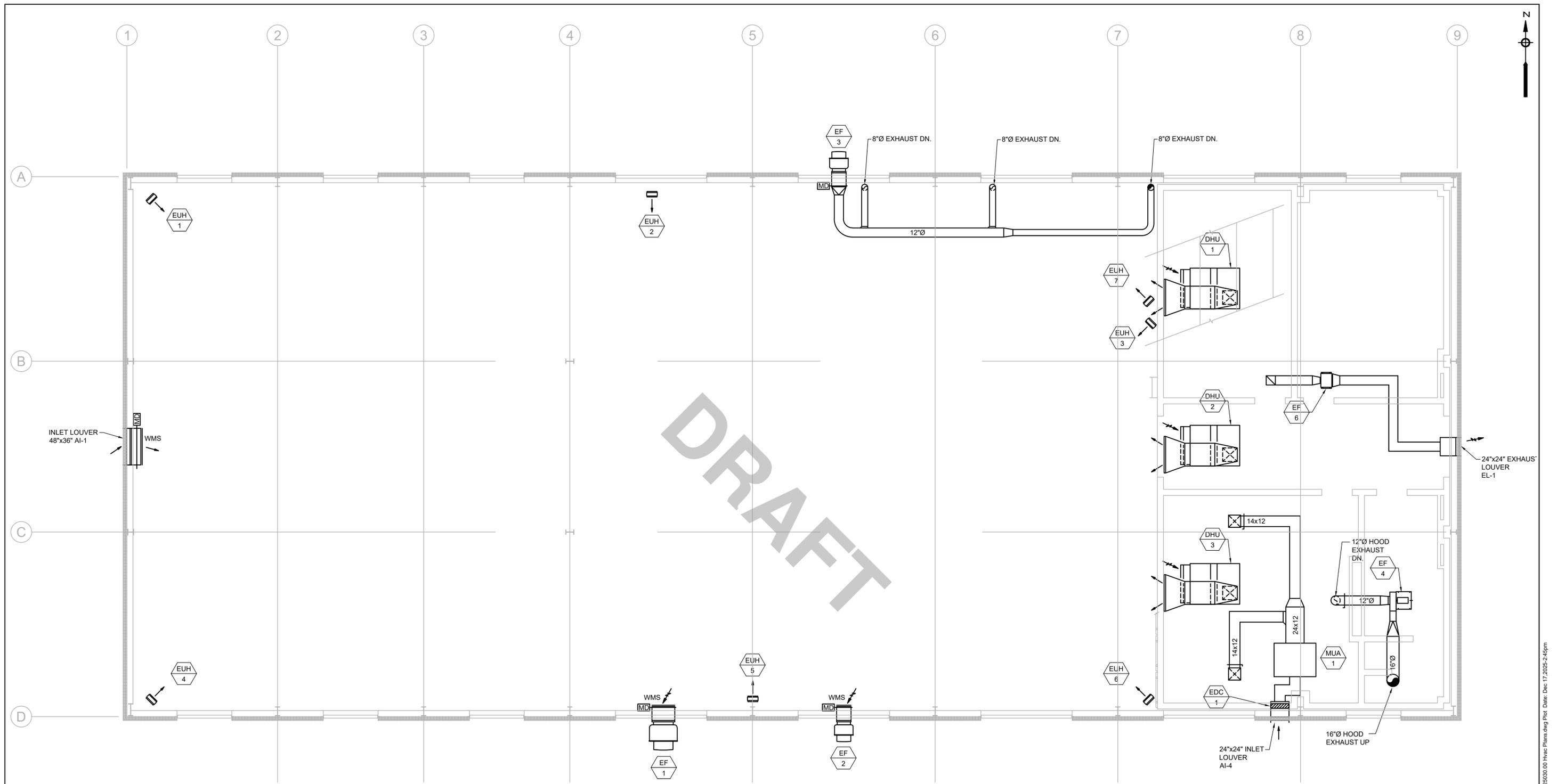
Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	RLB
Drawn by	RLB
Checked by	RHB
Approved by	

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
HVAC
FIRST FLOOR PLAN

25% DESIGN
Sheet No.
H-2

Drawing file: W:\Year - 2025\25030.00 - Groveland Water Treatment Facility\HVAC Department\25030.00 Hvac Plans.dwg Plot Date: Dec 17 2025 2:45pm



UPPER LEVEL PLAN
SCALE: 3/16"=1'-0"



MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	RLB
Drawn by	RLB
Checked by	RHB
Approved by	

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

HVAC
MEZZANINE PLAN

25% DESIGN
Sheet No.
H-3

Drawing file: W:\Year - 2025\25030.00 - Groveland Water Treatment Facility\HVAC Department\25030.00 Hvac Plans.dwg Plot Date: Dec 17 2025 2:45pm

PLUMBING NOTES:

1. THE WORK COVERED CONSISTS OF FURNISHING ALL LABOR AND MATERIALS NECESSARY TO INSTALL, COMPLETE AND READY FOR CONTINUOUS OPERATION, THE PLUMBING SYSTEMS, APPARATUS AND EQUIPMENT FOR THIS PROJECT.
2. ALL EQUIPMENT AND MATERIALS FURNISHED UNDER THE PLUMBING SUB-CONTRACT, LABOR AND TESTING PERFORMED HEREIN SHALL BE IN COMPLETE ACCORDANCE WITH THE STATE BUILDING CODE, LOCAL FUEL GAS AND PLUMBING CODES, ALL LOCAL CODES AND REGULATIONS, NATIONAL FIRE PROTECTION ASSOCIATION, INSURANCE REGULATIONS AND REQUIREMENTS GOVERNING SUCH WORK.
3. CONTRACTOR SHALL ENSURE ALL PLUMBING PRODUCTS UTILIZED ON THIS PROJECT ARE APPROVED BY THE MA STATE BOARD OF PLUMBERS AND GAS FITTERS. CONTRACTOR SHALL ENSURE APPROVAL IS VALID DURING SHOP DRAWING REVIEW. AT THE TIME OF INSTALLATION AND AT THE TIME OF PUTTING INTO SERVICE.
4. ANY AND ALL PERMITS REQUIRED FOR INSTALLATION OF ANY MATERIAL SHALL BE OBTAINED AS PART OF THE WORK OF THE SPECIFICATION INCLUDING ALL FEES OR EXPENSES INCURRED.
5. WHERE WATER PIPING IS SHOWN DROPPING INTO PLUMBING CHASES WITH SIZES NOTED, THAT SIZE SHALL BE CARRIED FULL LENGTH THROUGH THE CHASE. REFER TO PLUMBING FIXTURE SCHEDULE ON THIS DRAWING FOR INDIVIDUAL FIXTURE CONNECTION SIZES.
6. UNLESS OTHERWISE NOTED, ALL HORIZONTAL DRAINAGE PIPING WHICH IS 3" OR LESS IN DIAMETER SHALL PITCH OF NOT LESS THAN 1/4" PER FOOT AND ALL HORIZONTAL DRAINAGE PIPING WHICH IS 4" OR LARGER IN DIAMETER SHALL PITCH OF NOT LESS THAN 1/8" PER FOOT.
7. ALL BELOW FLOOR PIPING THAT INTERSECTS A GRADE BEAM REQUIRES COORDINATION WITH STRUCTURAL. FOR STRUCTURAL DETAILS, REFER TO STRUCTURAL DRAWINGS.
8. PROVIDE ALL FLOOR CLEANOUTS WITH HUB AND SPIGOT; LEAD AND OAKUM JOINTS FROM CLEANOUT TO AND INCLUDING CONNECTION TO SANITARY OR STORM DRAIN.
9. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION OF ALL PLUMBING FIXTURES AND EQUIPMENT.
11. INTERIOR PLUMBING AND HVAC EQUIPMENT REQUIRING A NATURAL GAS CONNECTION SHALL BE PROVIDED WITH AN EMERGENCY GAS RELIEF VENT AT EACH GAS TRAIN IN ACCORDANCE WITH THE MASSACHUSETTS FUEL GAS CODE AND AS INDICATED WITH THE FOLLOWING CHART:

CFH	AMOUNT OF RELIEF VENTS REQUIRED	SIZE OF EACH RELIEF VENT		
		0' TO 40'	0' TO 100'	0' TO 200'
UNDER 1,000 CFH	1	3/4"	1"	1 1/4"
1,000 CFH TO 2,500 CFH	3	3/4"	1"	1 1/4"
2,500 CFH TO 12,500 CFH	3	3/4"	1"	1 1/4"
OVER 12,500 CFH	4	3/4"	1"	1 1/4"

12. MISCELLANEOUS DISCREPANCIES OR OMISSIONS WHICH MIGHT APPEAR ON THE PLANS OR SPECIFICATIONS WILL NOT RELIEVE THE PLUMBING SUB-CONTRACTOR OF CODE COMPLIANCE.
13. ALL FLOOR DRAINS SHALL BE PROVIDED WITH A TRAP PRIMER CONNECTION. PLUMBING CONTRACTOR SHALL PROVIDE ALL ASSOCIATED EQUIPMENT NECESSARY TO PROVIDE A COMPLETE SYSTEM INCLUDING AN ELECTRONICALLY OPERATED PRIMING MANIFOLD AND ALL ASSOCIATED PIPING REQUIRED.
14. GAS FIRED EQUIPMENT - PROVIDE FULL SIZE OF VENT AND DRIP LEG IN ACCESSIBLE LOCATION. MAKE FINAL CONNECTION TO EQUIPMENT WITH NECESSARY REDUCER AND UNION CONNECTION. PC TO COORDINATE EXACT CONNECTION SIZE, LOAD, LOCATION, AND EQUIPMENT ACCESS NEEDS PRIOR TO GAS INSTALLATION.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
		ABOVE FLOOR PIPING (INDICATED AS SINGLE LINEWORK)
		BELOW FLOOR PIPING (INDICATED AS DOUBLE LINEWORK)
		NEW WORK (INDICATED AS HEAVY LINEWORK)
	CW	COLD WATER
	HW	HOT WATER
	HWR	HOT WATER RECIRCULATION
	NPCW	NON-POTABLE COLD WATER
	SW	SANITARY DRAINAGE (SOIL/WASTE)
	V	VENT
	AW	ACID WASTE
	AV	ACID VENT
	FLUE	FLUE EXHAUST
	G	GAS (LIQUID PROPANE)
	UP	UP (PENETRATES LEVEL ABOVE)
	DN	DOWN (PENETRATES LEVEL BELOW)
	DP	DROP (BUT DOES NOT PENETRATE LEVEL BELOW)
		DIRECTION OF FLOW
		DIRECTION & DESIGNATION OF SLOPE (IN FT/FT)
		SHUTOFF VALVE
	BVA	BALANCING VALVE ASSEMBLY
	CV	CHECK VALVE
	DV	DRAIN VALVE WITH HOSE THREADS
		GAS SHUTOFF VALVE
	PG	PRESSURE GAUGE
	SA	SHOCK ABSORBER WITH SHUTOFF VALVE
	CO	CLEANOUT
	WCO	WALL CLEANOUT
	FCO	FLOOR CLEANOUT
	SCO	SEWER CLEANOUT
	FD	FLOOR DRAIN
	HB	HOSE BIBB
	WH	WALL HYDRANT
	NIPC	NOT IN PLUMBING CONTRACT
	PC	PLUMBING CONTRACTOR
	NO	NORMALLY OPEN
	NC	NORMALLY CLOSED
	INV	INVERT ELEVATION
	CFH	CUBIC FEET PER HOUR
	W&T	WASTE & TRAP
	VIV	VALVE IN VERTICAL
	OED	OPEN END DRAIN
	VTR	VENT THRU ROOF
	CC	CAPPED CONNECTION
	UN	UNION
	ST	STRAINER
	WTS	WATER TIGHT SLEEVE
	P	PLUMBING FIXTURE DESIGNATION
	WM	WATER METER
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
	TWH	TANKLESS WATER HEATER
	FFE	FINISHED FLOOR ELEVATION
	LPC	LIMIT PLUMBING CONTRACT
	TDL	TOTAL DEVELOPED LENGTH
		EMERGENCY EYEWASH/DRENCH HOSE UNIT

DRAFT



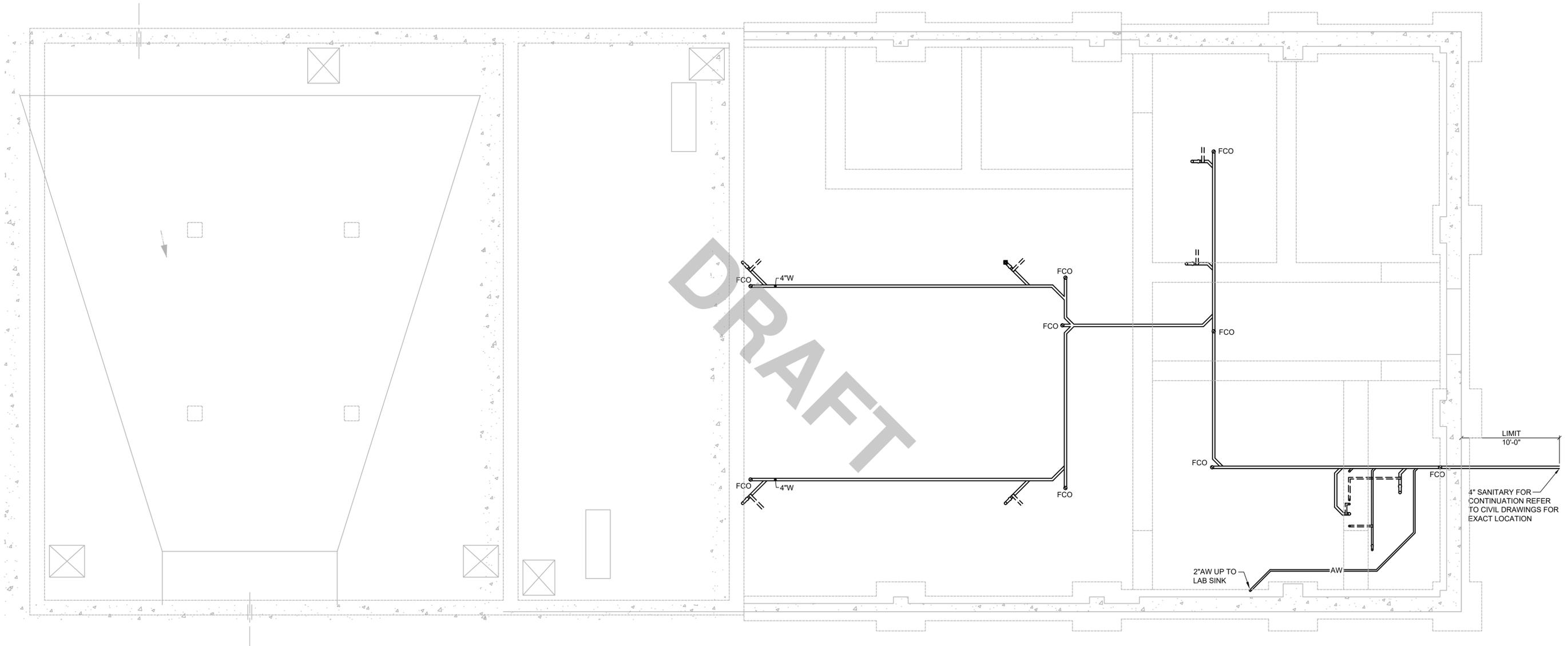
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Date	DECEMBER 2025	
Job No.	23008867	
Designed by	RLB	
Drawn by	RLB	
Checked by	RHB	
Approved by		
MARK	DATE	DESCRIPTION

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
PLUMBING
LEGEND, SCHEDULE AND GENERAL NOTES

25% DESIGN
Sheet No.
P-1

Drawing file: W:\Year - 2025\25030.00 - Groveland Water Treatment Facility\Plumbing Department\25030.00 Plumbing Plans.dwg Plot Date: Dec 17, 2025 2:38pm



LOWER LEVEL PLAN
SCALE: 3/16"=1'-0"



MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	RLB
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Checked by	RHB
Approved by	

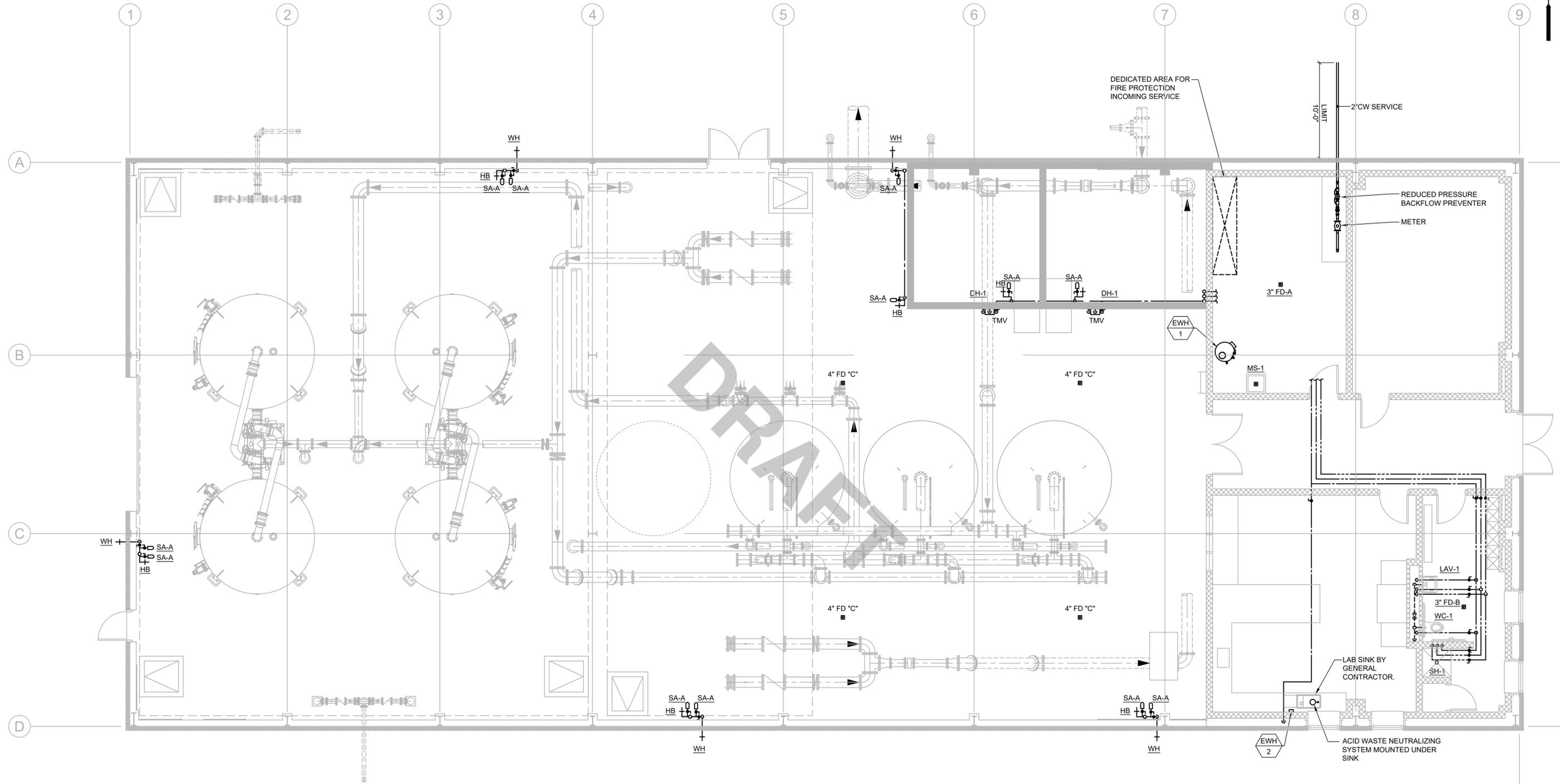
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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

PLUMBING
LOWER LEVEL PLAN

25% DESIGN
Sheet No.

P-2



FIRST FLOOR PLAN
SCALE: 3/16"=1'-0"



MARK	DATE	DESCRIPTION

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Checked by	RHB
Approved by	

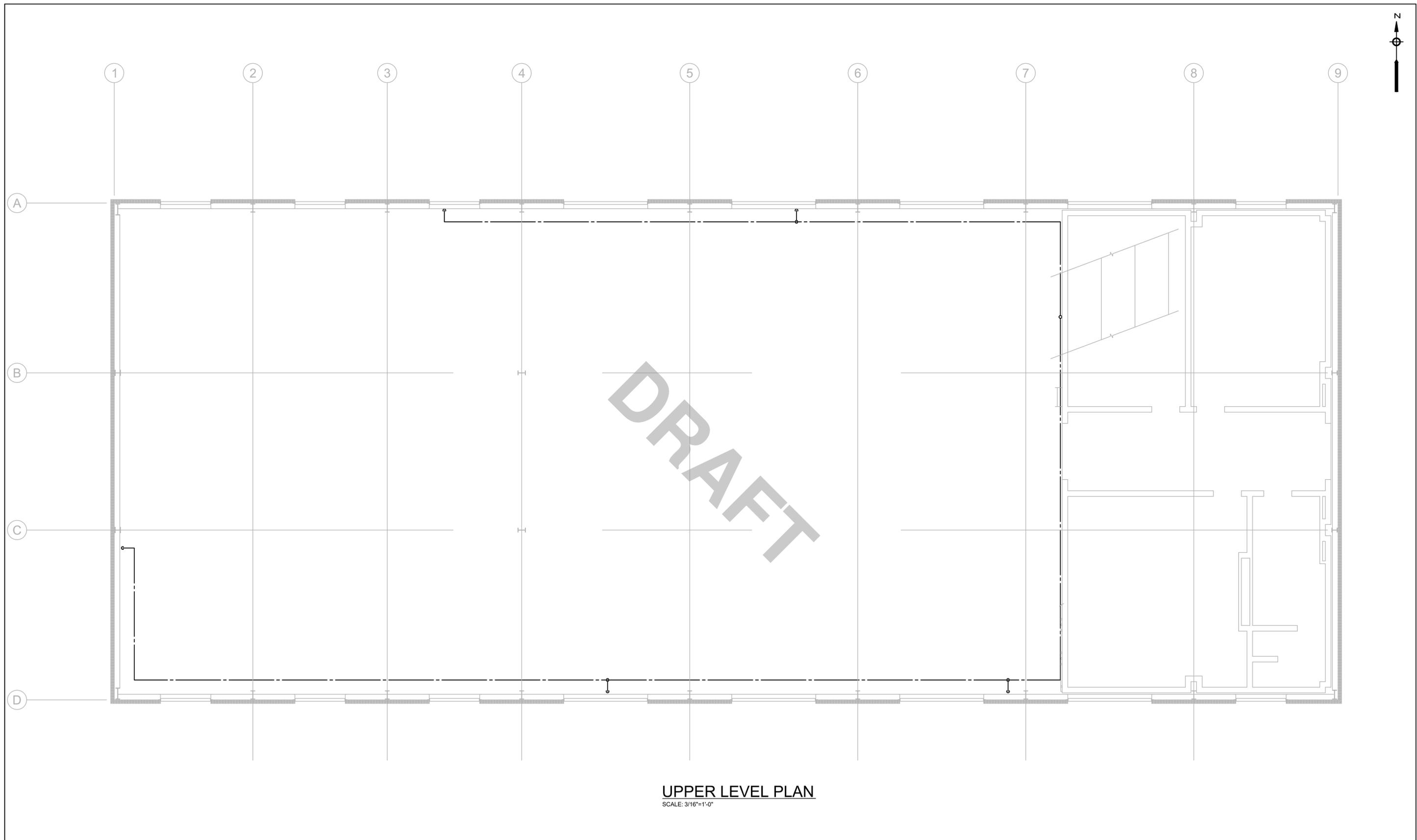
THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

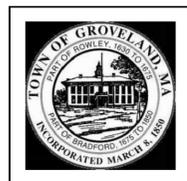
PLUMBING
FIRST FLOOR PLAN

25% DESIGN
Sheet No.

P-3



UPPER LEVEL PLAN
SCALE: 3/16"=1'-0"



MARK	DATE	DESCRIPTION

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Drawn by	RLB
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Approved by	

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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
PLUMBING
MEZZANINE PLAN

25% DESIGN
Sheet No.
P-4

FIRE PROTECTION NOTES

- THE WORK COVERED CONSISTS OF FURNISHING ALL LABOR AND MATERIALS NECESSARY TO INSTALL, COMPLETE AND READY FOR CONTINUOUS OPERATION, THE FIRE PROTECTION SYSTEMS, APPARATUS AND EQUIPMENT FOR THIS PROJECT.
- ALL EQUIPMENT AND MATERIALS FURNISHED UNDER THE FIRE PROTECTION FSB, LABOR AND TESTING PERFORMED HEREIN SHALL BE IN COMPLETE ACCORDANCE WITH THE STATE BUILDING CODE, ALL LOCAL CODES AND REGULATIONS, NATIONAL FIRE PROTECTION ASSOCIATION, INSURANCE REGULATIONS AND REQUIREMENTS GOVERNING SUCH WORK.
- ANY AND ALL PERMITS REQUIRED FOR INSTALLATION OF ANY MATERIAL SHALL BE OBTAINED AS PART OF THE WORK OF THE SPECIFICATION, INCLUDING ALL FEES OR EXPENSES INCURRED.
- IT IS THE INTENT OF THESE DOCUMENTS THAT THE ENTIRE BUILDING BE 100% SPRINKLED, INCLUDING ELECTRIC ROOMS.
- PROVIDE A COMPLETE HYDRAULICALLY CALCULATED SPRINKLER SYSTEM THROUGHOUT THE BUILDING. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH NFPA 13 (2013) AND INCLUDING ALL RULES AND REGULATIONS OF THE LOCAL FIRE DEPARTMENT.
- SPRINKLERS, PIPING AND THEIR LAYOUT SHOWN ON THE DRAWINGS ARE SCHEMATIC AND ARE SHOWN ON THE DRAWINGS ONLY AS A GUIDE AND AID TO THE CONTRACTOR IN PREPARATION OF THE FABRICATION DRAWINGS. THE SPRINKLERS, PIPING AND THEIR LAYOUT ARE NOT INTENDED TO SHOW EVERY OFFSET AND FITTING. ADDITIONAL OFFSETS AND FITTINGS WILL BE REQUIRED TO BE INSTALLED WHEN COORDINATING WITH ALL TRADES TO AVOID WHERE CONFLICTS MAY OCCUR THAT MAY NOT BE INDICATED ON THE DRAWINGS. SUCH AS, BUT NOT LIMITED TO: BEAMS, COLUMNS, DUCTWORK, LIGHTING, OR PIPING. MODIFICATION TO THE SPRINKLER SPACING WILL BE ALLOWED AT NO COST TO THE PROJECT SUBJECT TO ARCHITECT'S/ENGINEER'S APPROVAL AND CONTINUED COMPLIANCE WITH NFPA 13 (2013).
- THE FIRE PROTECTION CONTRACTOR SHALL PREPARE WORKING DRAWINGS OF THE SPRINKLER WORK AND OBTAIN APPROVALS FROM THE LOCAL FIRE DEPARTMENT PRIOR TO INSTALLATION.
- ROUTING OF SPRINKLER MAINS, BRANCHES AND SPRINKLERS SHALL BE THOROUGHLY COORDINATED WITH OTHER TRADES AND THE BUILDING STRUCTURE PRIOR TO SUBMISSION OF COORDINATED SHOP DRAWINGS.
- SPRINKLERS IN AREAS WITH NO FINISHED CEILING SHALL BE UPRIGHT TYPE, LOCATED AS HIGH AS POSSIBLE. SPRINKLERS SUBJECT TO POTENTIAL PHYSICAL DAMAGE SHALL BE INSTALLED WITH LISTED PROTECTIVE CAGES.
- SPRINKLERS INSTALLED BELOW SLOPED CEILINGS OR ROOFS, SHALL BE INSTALLED IN STRICT ACCORDANCE TO NFPA 13 (2013) AND SPRINKLER MANUFACTURER'S INSTALLATION LISTING.
- SPRINKLERS IN AREAS WITH FINISHED CEILING SHALL BE CONCEALED TYPE WITH FACTORY PAINTED COVER PLATES. COVER PLATE COLORS SHALL BE COORDINATED WITH ENGINEER FOR FINAL APPROVAL OF THE COLOR SELECTION.
- SPRINKLERS SHALL BE LOCATED ABOVE AND BELOW ALL DUCTWORK GREATER THAN 4'-0" IN WIDTH.
- MISCELLANEOUS DISCREPANCIES OR OMISSIONS WHICH MIGHT APPEAR ON THE DRAWINGS OR IN THE SPECIFICATIONS WILL NOT RELIEVE THE FIRE PROTECTION SUB-CONTRACTOR OF CODE COMPLIANCE.
- SPRINKLER PIPING SHALL NOT BE INSTALLED TO PASS OVER ELECTRIC PANELS. PROVIDE SHEET METAL PROTECTIVE SHIELDS OVER ELECTRIC PANELS.
- BACKFLOW PREVENTION DEVICES SHALL BE PROVIDED WITH A HOSE VALVE TEST HEADER ASSEMBLY PIPED TO EXTERIOR OR OTHER ACCEPTED MEANS THAT ALLOWS FOR FULL FLOW TESTING OF SYSTEM DEMAND IN ACCORDANCE WITH NFPA 13 (2013).
- REFER TO DESIGN CRITERIA FOR SPRINKLER DENSITY AND AREA OF APPLICATION.
- REFER TO ARCHITECTURAL SECTIONS AND ELEVATIONS FOR EXACT LOCATION OF EXTERIOR PENETRATIONS.

FIRE PROTECTION DESIGN CRITERIA

- FIRE SUPPRESSION CRITERIA**
 - THE FIRE PROTECTION FSB SHALL MAKE PROVISIONS FOR OBTAINING UPDATED HYDRANT FLOW TEST INFORMATION FOR THIS PROJECT. ANY FLOW TEST INFORMATION NOTED IN THE CONTRACT DOCUMENTS ARE CONSIDERED PRELIMINARY. A NEW FLOW TEST SHALL BE REQUIRED AT THIS CONTRACTOR'S EXPENSE.
 - THE FOLLOWING SPRINKLER DESIGN DENSITIES SHALL BE USED FOR SPRINKLER SYSTEM PIPE SIZING:
ORDINARY HAZARD OCCUPANCIES GROUP 1
DESIGNED FOR 0.15 GPM OVER THE MOST REMOTE 1500 SQUARE FEET. MAXIMUM SPACING OF 130 SQUARE FEET PER SPRINKLER, UNLESS NOTED OTHERWISE. INCLUDE 250 GPM FOR INSIDE HOSE STREAM ALLOWANCE AS PART OF THE CALCULATION. MAXIMUM VELOCITIES SHALL NOT EXCEED 20 FEET PER SECOND.
 - FIRE PROTECTION SIGNALING SYSTEMS CONTROL EQUIPMENT AND ANNUNCIATOR PANEL ARE SHOWN ON THE ELECTRICAL DRAWINGS.
 - THE SPRINKLER LAYOUT SHOWN ON THESE DRAWINGS SHALL BE HYDRAULICALLY CALCULATED. THE RESULTS OF THE HYDRAULIC CALCULATION SHALL SHOW THAT THERE IS SUFFICIENT PRESSURE TO OPERATE THE REQUIRED NUMBER OF SPRINKLERS AT THE MOST REMOTE DESIGN AREAS. PIPE SIZES AND NODE LOCATIONS HAVE BEEN SHOWN ON THE DRAWINGS TO INDICATE DESIGN INTENT.
 - THE SPRINKLER CONTRACTOR SHALL FOLLOW THE DESIGN CRITERIA INDICATED ON THE DRAWINGS, BUT WILL BE ALLOWED TO VARY THE PIPE SIZES TO ALLOW FOR COORDINATION AND MINOR CHANGES IN THE PREPARATION.
- SEQUENCE OF OPERATION**
 - WET SPRINKLER SYSTEM: THE WET PIPE SYSTEM EMPLOYS AUTOMATIC (CLOSED FUSIBLE LINK) SPRINKLERS ATTACHED TO PIPING CONTAINING WATER UNDER PRESSURE AT ALL TIMES. WHEN A FIRE OCCURS, INDIVIDUAL SPRINKLERS ARE ACTIVATED BY HEAT AND WATER FLOWS IMMEDIATELY. THE FLOW OF WATER RAISES THE ALARM CHECK VALVE CLAPPER FROM ITS SEAT, THIS ALLOWS WATER TO ENTER THE ALARM LINE. THE FLOW SWITCH ON THE ALARM LINE ACTIVATES A LOCAL AUDIBLE ALARM PROVIDING AN ELECTRIC SIGNAL, WHICH IS SENT TO THE FIRE ALARM CONTROL PANEL, THIS SIGNAL IS FORWARDED TO THE LOCAL FIRE DEPARTMENT. A FIRE DEPARTMENT CONNECTION IS CONNECTED TO THE SUPPLY SIDE OF THE SYSTEM FOR USE BY THE LOCAL FIRE DEPARTMENT PUMPER TRUCK.
- TESTING CRITERIA FOR FINAL ACCEPTANCE**
 - APPROVAL OF SPRINKLER SYSTEM: THE INSTALLING SPRINKLER CONTRACTOR SHALL:
 - NOTIFY THE AUTHORITY HAVING JURISDICTION AND OWNER'S REPRESENTATIVE OF THE TIME AND DATE TESTING WILL BE PERFORMED.
 - PERFORM ALL REQUIRED ACCEPTANCE REQUIREMENTS LISTED IN NFPA 13 (2013) HYDROSTATIC TESTS.
 - COMPLETE AND SIGN THE APPROPRIATE CONTRACTOR'S MATERIAL AND TEST CERTIFICATES.
 - COMPLETE AS-BUILT DRAWINGS AS SPECIFIED.

FIRE PROTECTION LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
		NEW WORK PIPING (INDICATED AS HEAVY LINE)
	F	FIRE SERVICE BELOW GRADE OR BURIED
	F	FIRE SERVICE MAIN
	WS	WET SPRINKLER PIPE
	SD	SPRINKLER DRAIN
	FDC	FIRE DEPARTMENT CONNECTION PIPE
		PIPE TEE LOOKING UP
		PIPE TEE LOOKING DOWN
	UP	PIPE ELBOW UP
	DNDROP	PIPE ELBOW DOWN OR DROP
	CONT	CONTINUATION
		FLOW IN DIRECTION OF ARROW
	UN	UNION
	PG	PRESSURE GAUGE WITH PETCOCK
	CV	CHECK VALVE
	GV	GATE VALVE
	TS	GATE VALVE WITH TAMPER SWITCH
	PRV	PRESSURE REDUCING/REGULATING VALVE
	OS&Y WTS	OS & Y GATE VALVE WITH TAMPER SWITCH
	BV WTS	BALL VALVE WITH TAMPER SWITCH
	VIV	VALVE IN VERTICAL
	VIV WTS	VALVE IN VERTICAL WITH TAMPER SWITCH
	WACV	ALARM CHECK VALVE (WET SYSTEM)
	DACV	ALARM CHECK VALVE (DRY SYSTEM)
	PIV WTS	POST INDICATOR VALVE W/TAMPER SWITCH
	DCVA	HORIZONTAL DOUBLE CHECK VALVE ASSEMBLY
	WTS	WATER TIGHT SLEEVE
	DV	DRAIN VALVE WITH HOSE END
	FDV	FIRE DEPARTMENT VALVE
	SCF	SIAMESE CONNECTION (FLUSH)
	SCE	SIAMESE CONNECTION (EXPOSED)
	SZC	STORZ CONNECTION
		CONCEALED SPRINKLER
		PENDENT WET SPRINKLER
		UPRIGHT SPRINKLER
		UPRIGHT SPRINKLER W/ PROTECTIVE GUARD

FIRE PROTECTION LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
		NODE NUMBER
		SPRINKLER NUMBER
	NAS	NO AUTOMATIC SPRINKLERS
		DIAGRAM NO. & DWG. NO. REFERENCE
	DC	DRESSER COUPLING
	EB	ELECTRIC BELL
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	LFPC	LIMIT OF FIRE PROTECTION CONTRACT
	NFFC	NOT IN FIRE PROTECTION CONTRACT
	GC	GENERAL CONTRACTOR
	FPC	FIRE PROTECTION CONTRACTOR
	PC	PLUMBING CONTRACTOR
	EC	ELECTRICAL CONTRACTOR
	HVAC	HVAC CONTRACTOR
	FI	FURNISH & INSTALL
	CFOI	CONTRACTOR FURNISHED / OWNER INSTALLED
	OFCI	OWNER FURNISHED / CONTRACTOR INSTALLED
	FFE	FINISHED FLOOR ELEVATION
	WSE	WATER SERVICE ENTRANCE

NOTE- NOT ALL SYMBOLS APPEAR ON DRAWINGS



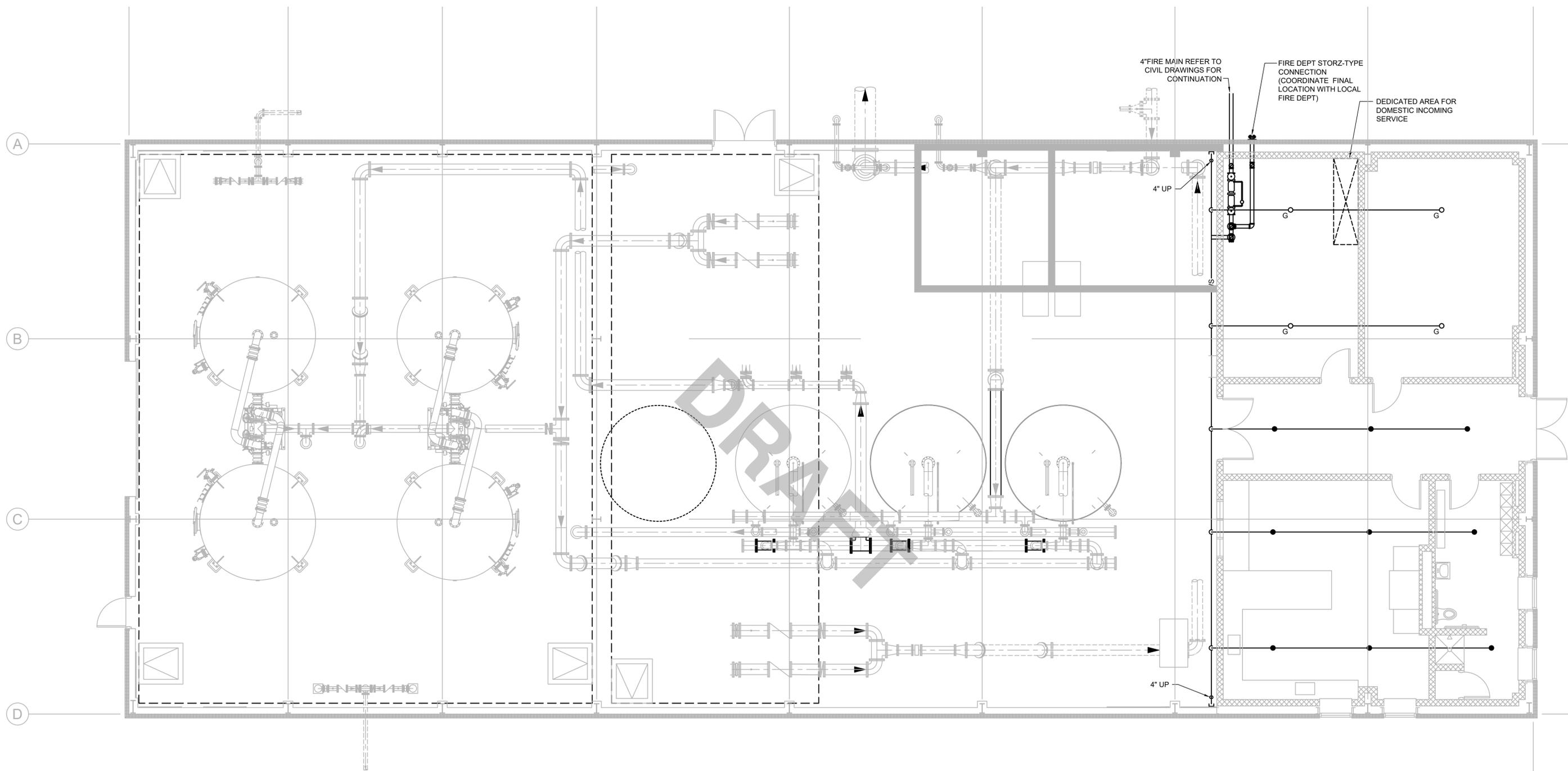
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Designed by	RLB
Drawn by	RLB
Checked by	RHB
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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
FIRE PROTECTION
LEGEND AND GENERAL NOTES

25% DESIGN
Sheet No.
FP-1



FIRST FLOOR PLAN

SCALE: 3/16"=1'-0"



MARK	DATE	DESCRIPTION

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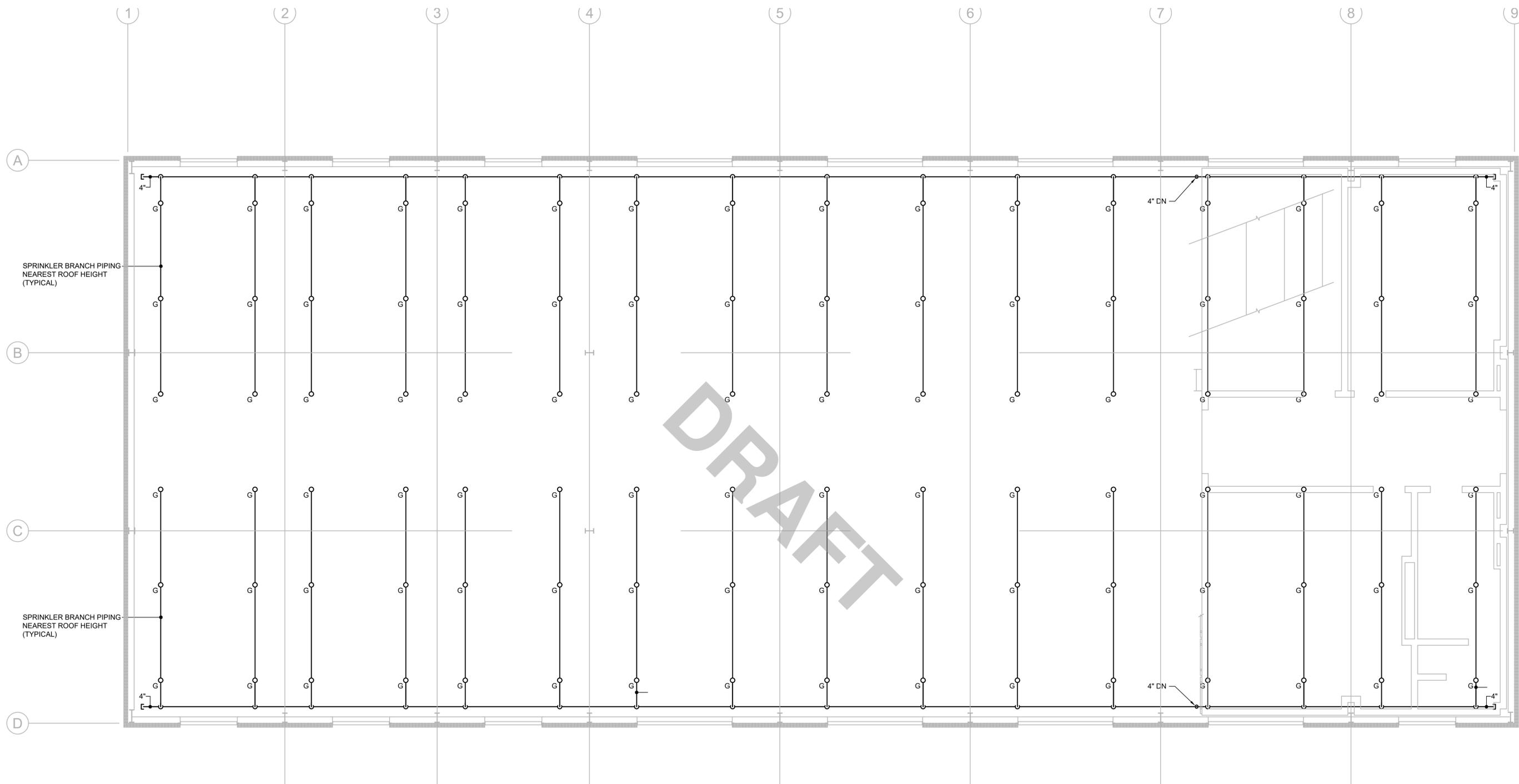
WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT

TOWN OF GROVELAND, MASSACHUSETTS

**FIRE PROTECTION
FIRST FLOOR PLAN**

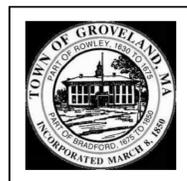
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FP-2



UPPER LEVEL PLAN
SCALE: 3/16"=1'-0"

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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
FIRE PROTECTION MEZZANINE PLAN

25% DESIGN
Sheet No.
FP-3

ABBREVIATIONS

(2)1"C, 3#8, #10GND	2. 1-INCH CONDUITS EACH CONDUIT CONTAINING 3-#8 AWG WIRES AND 1-#10 GROUND CONDUCTOR	PB	PUSHBUTTON CONTROL STATION MOMENTARY CONTACT TYPE, STOP START
3/4" CE	EMPTY CONDUIT WITH PULL STRING. NUMERAL DENOTES SIZE	PBE	PUSHBUTTON CONTROL STATION MAINTAINED EMERGENCY STOP TWIST TO RELEASE
AFF	ABOVE FINISHED FLOOR	PBL	PUSHBUTTON CONTROL STATION MOMENTARY TYPE START AND EMERGENCY STOP TWIST TO RELEASE
AFG	ABOVE FINISHED GRADE	PBM	PUSHBUTTON CONTROL STATION MAINTAINED CONTACT TYPE, STOP START
AR	ALARM RELAY	PIT	PRESSURE INDICATOR TRANSMITTER
ATS	AUTOMATIC TRANSFER SWITCH	PL	PUSHBUTTON CONTROL STATION MOMENTARY TYPE WITH LOCK-OUT DEVICE, STOP
CR	CONTROL RELAY	PS	PRESSURE SWITCH
CP	CONTROL PANEL	PT	PRESSURE TRANSMITTER
DRG. DWG.	DRAWING	PV	PHOTOVOLTAIC
EAN	EXCEPT AS NOTED	RGS	RIGID GALVANIZED STEEL
EC	ELECTRICAL CONTRACTOR	RVNR	REDUCED VOLTAGE NON-REVERSING
EOV	ELECTRICALLY OPERATED VALVE	SPD	SURGE SUPPRESSOR DEVICE
ETM	ELAPSED TIME METER	SOV	SOLENOID VALVE
FE	FLOW ELEMENT	S/S	SOFT STARTER
FIT	FLOW INDICATOR TRANSMITTER	TB	TERMINAL BOX
FS	FLOW SWITCH	TD	MOTOR TEMPERATURE DETECTOR
FSB	FILE SUB-BID CONTRACTOR	TR	TIMING RELAY
FT	FLOW TRANSMITTER	TS	TEMPERATURE SWITCH
RVNR	FULL VOLTAGE NON-REVERSING	TSH	TEMPERATURE SWITCH HIGH
GND, GRD	GROUNDING CONDUCTOR (EQUIPMENT)	TSL	TEMPERATURE SWITCH LOW
HOA	HAND-OFF-AUTOMATIC	TSP	TWISTED SHEILDIED PAIR
HO	HAND-OFF	TSTW	TWO SPEED TWO WINDING
HH	HANDHOLE	TYP	TYPICAL
ISR	INTRINSICALLY SAFE RELAY	UG	UNDERGROUND
J OR JB	JUNCTION BOX	UNO	UNLESS NOTED OTHERWISE
JPB	JOG PUSHBUTTON	VFD	VARIABLE FREQUENCY DRIVE
LE	LEVEL ELEMENT	WP	WATER PROOF
LIT	LEVEL INDICATOR TRANSMITTER	WHM	WATT HOUR UTILITY METER
LL	LOW LEVEL	XFMR	TRANSFORMER
LS	LEVEL SWITCH	ZS	POSITION SWITCH
LSH	LEVEL SWITCH HIGH		
LSL	LEVEL SWITCH LOW		
LT	LEVEL TRANSMITTER		
MC	MOTOR CONTROLLER (STARTER)		
MCC	MOTOR CONTROL CENTER		
MH	MANHOLE		
MFR	MANUFACTURER		
MOV	MOTOR OPERATED VALVE		
MPCP	METERING PUMP CONTROL PANEL		
MS	MOTION SENSOR		
NTS	NOT TO SCALE		
OEM	ORIGINAL EQUIPMENT MANUFACTURER SUPPLIED		
OH	OVERHEAD		
OL	MOTOR OVERLOAD HEATER		
OS	OPERATOR STATION		

GENERAL NOTES

- GENERAL CONTRACTOR TO PROVIDE CONCRETE HOUSEKEEPING AND MOUNTING PADS ON ALL FLOOR AND GRADE MOUNTED ELECTRICAL EQUIPMENT. THE FOLLOWING EQUIPMENT IS THE MINIMUM REQUIREMENT FOR PADS. ADDITIONAL PADS MAYBE REQUIRED BASED ON THE ELECTRICAL CONTRACTORS MOUNTING METHODS, ELECTRICAL FSB SHALL COORDINATE WITH GENERAL CONTRACTOR FOR ALL PAD SIZES AND LOCATIONS.
 - UTILITY TRANSFORMER INCLUDING OIL CONTAINMENT CURB
 - GENERATORS
 - MAIN DISTRIBUTION BOARD
 - MOTOR CONTROL CENTER
 - DRY TYPE TRANSFORMERS
 - FREE STANDING VFD, CONTROL, AND TERMINATION PANELS
 - ELECTRIC VEHICLE CHARGING STATIONS
- ALL CONDUIT AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.
- BONDING JUMPERS, CONDUIT CLAMPS AND POINTS OF ATTACHMENT ARE NOT SHOWN ON DRAWINGS. SIZE BONDING JUMPERS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. THE POINTS OF ATTACHMENT OF THE GROUND CLAMPS SHALL BE ACCESSIBLE LOCATIONS.
- EQUIPMENT & CONDUIT INSTALLATIONS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO BEAMS AND WALLS.
- CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTIONS TO MOTORS AND OTHER EQUIPMENT.
- NO CONDUIT SMALLER THAN 3/4" PIPE SIZE NOR WIRE SMALLER THAN NO. 12 A.W.G. SHALL BE USED UNLESS OTHERWISE NOTED.
- RECEPTACLES AND SWITCHES SHALL BE MOUNTED 45" AFF/AFG EXCEPT FOR RECEPTACLES IN THE CONTROL ROOM WHICH SHALL BE 18" UNDER DESKS AND OPEN WALL SPACE AND 6" ABOVE TOP OF COUNTERS. RECEPTACLES ASSOCIATED WITH TELE/COM RACK AND BACKBOARD SHALL BE MOUNTED 60" AFF. RECEPTACLES ASSOCIATED WITH REFRIGERATORS SHALL BE 45" AFF.
- THE WIRING AND BLOCK DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL AND PROCESS EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
- CONDUITS SHALL NOT BE INSTALLED WITHIN SLAB STRUCTURE AND SHALL BE RUN UNDER THE SLAB.
- CONDUITS SHALL NOT BE INSTALLED IN THE FINISHED WATER WET WELL OR BACKWASH WASTE TANK.

DEMOLITION NOTES

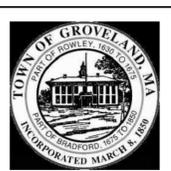
- UNLESS OTHERWISE NOTED, ALL EXISTING ELECTRICAL SYSTEMS (POWER, LIGHTING, LOW VOLTAGE, CONTROLS, ETC) WITHIN HATCH MARKS AND ASSOCIATED EQUIPMENT IS TO BE DEMOLISHED OR SALVAGED. DISCONNECT AND DE-ENERGIZE THE EQUIPMENT. REMOVE THE EQUIPMENT TO BE DEMOLISHED OR SALVAGED PER SECTION 01900. ALL CONTROL DEVICES, CONDUIT, CABLING, BOXES, SUPPORTS, ETC, ASSOCIATED WITH THE DEMOLISHED EQUIPMENT SHALL BE REMOVED. THE CONDUIT AND CABLING SHALL BE REMOVED BACK TO SOURCE.
- DISCONNECT AND REMOVE THE ELECTRICAL SERVICE BACK TO UTILITY POLE FOR WELL STATION 1. DISCONNECT AND REMOVE THE ELECTRICAL SERVICE BACK TO PAD MOUNTED TRANSFORMER FOR WELL STATION 3.
- NO DEVICE OR EQUIPMENT INDICATED FOR DEMOLITION WILL BE REUSED OR SALVAGED UNLESS SPECIFICALLY NOTED AS SUCH. ALL EQUIPMENT REMOVED SHALL BE REMOVED FROM SITE AND PROPERLY DISPOSED OF, PRIOR TO REMOVAL OF EQUIPMENT COORDINATE WITH OWNER FOR ANY EQUIPMENT THE OWNER WILL KEEP.
- EXISTING EQUIPMENT INDICATED ON THE DEMOLITION PLANS ARE BASED ON SITE OBSERVATIONS AND IT IS NOT THE INTENTION OF THESE DRAWINGS TO SHOW ALL EQUIPMENT AND MATERIALS TO BE DISCONNECTED AND/OR REMOVED.
- ALL UNDERGROUND CONDUIT SHALL BE CUT BELOW GRADE, CAPPED AND BACKFILLED WITH DIRT TO MATCH GRADE. ALL CONDUIT STUBBING UP FROM CONCRETE SLAB SHALL BE CUT AND CAPPED AND SLAB LEVEL.

POWER CABLE/CONDUIT SCHEDULE

SYMBOL	CONDUIT SIZE	CONDUCTORS	GND
P22	3/4"	(2)#12	(1)#12
P23	3/4"	(3)#12	(1)#12
P26	3/4"	(6)#12	(1)#12
P32	3/4"	(2)#10	(1)#10
P33	3/4"	(3)#10	(1)#10
P34	3/4"	(4)#10	(1)#10
P53	3/4"	(3)#8	(1)#10
P54	3/4"	(4)#8	(1)#10
P63	1"	(3)#6	(1)#8
P64	1"	(4)#6	(1)#8
P73 & P83	1 1/4"	(3)#4	(1)#8
P74 & P84	1 1/4"	(4)#4	(1)#8
P103	1 1/2"	(3)#3	(1)#6
P104	1 1/2"	(4)#3	(1)#6
P113	1 1/2"	(3)#2	(1)#6
P114	1 1/2"	(4)#2	(1)#6
P133	2"	(3)#1	(1)#6
P134	2"	(4)#1	(1)#6
P153	2"	(3)#1/0	(1)#6
P154	2"	(4)#1/0	(1)#6
P173	2 1/2"	(3)#2/0	(1)#6
P174	2 1/2"	(4)#2/0	(1)#6
P204	2 1/2"	(4)#3/0	(1)#4
P233	3"	(4)#4/0	(1)#4
P1004	(3)4"	(12)500KCMIL	(3)#2/0

VFD CABLE/CONDUIT SCHEDULE

SYMBOL	CONDUIT SIZE	CONDUCTORS	GND
V23	1"	(3)#12	(1)#12
V63	1 1/2"	(3)#6	(1)#8
V73 & V83	1 1/2"	(3)#4	(1)#6
V133	2 1/2"	(3)#1	(1)#6
V173	3"	(3)#2/0	(1)#6
V233	4"	(3)#4/0	(1)#4



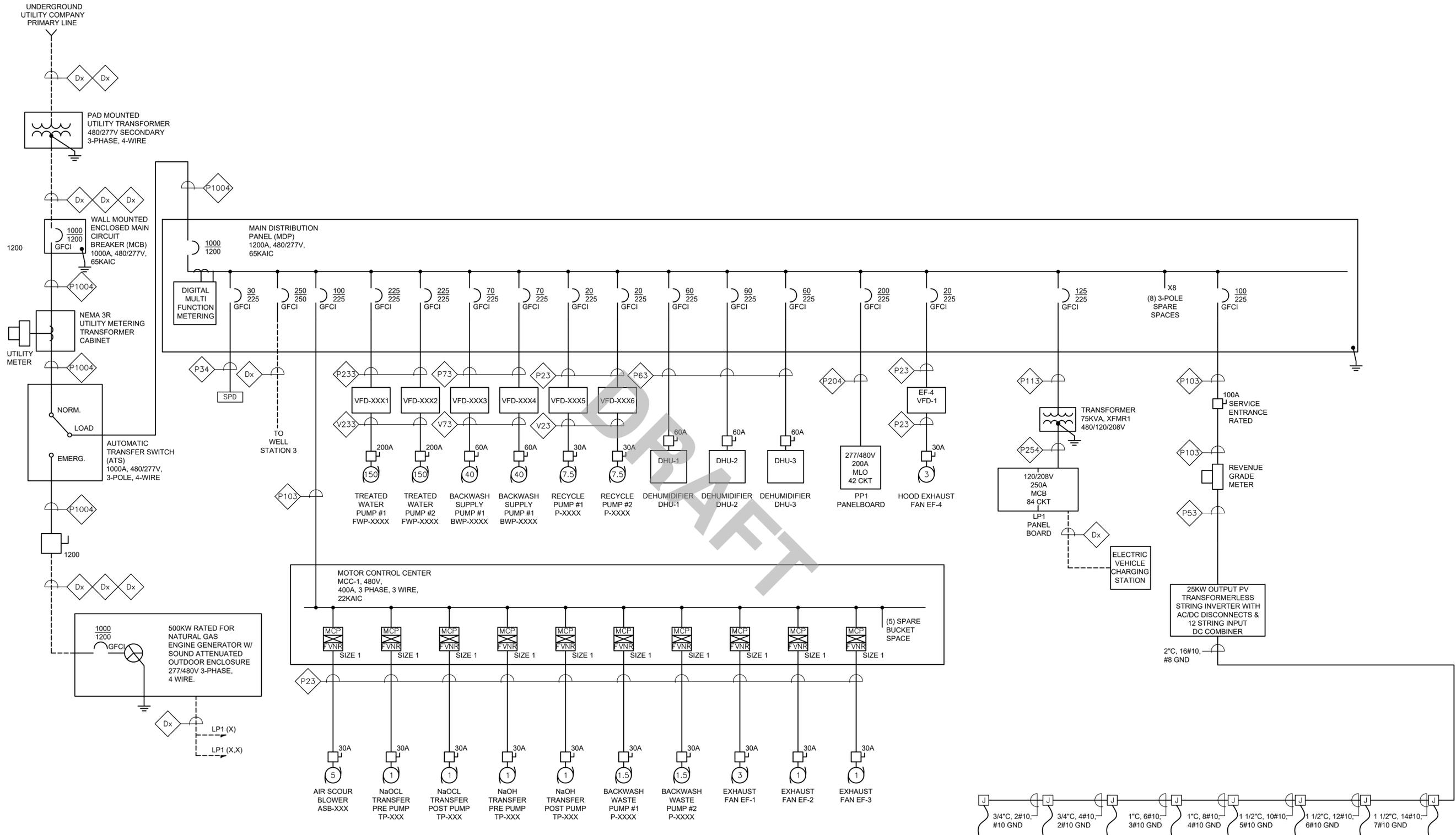
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Job No.	23008867
Designed by	MC
Drawn by	RLB
Checked by	MC
Approved by	

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WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
ELECTRICAL ABBREVIATIONS AND NOTES

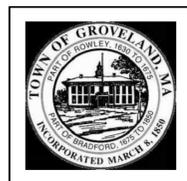
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E-2

Drawing file: W:\Year - 2025\25030.00 - Groveland Water Treatment Facility\Electrical\Department\25030.00 Electrical Plans\avg Plot Date: Dec 17, 2025 2:46pm



WTP ONE LINE DIAGRAM
SCALE: N.T.S.

STRING #1 (11) 400W ROOF MOUNTED PV PANELS	STRING #2 (10) 400W ROOF MOUNTED PV PANELS	STRING #3 (10) 400W ROOF MOUNTED PV PANELS	STRING #4 (10) 400W ROOF MOUNTED PV PANELS	STRING #5 (10) 400W ROOF MOUNTED PV PANELS	STRING #6 (10) 400W ROOF MOUNTED PV PANELS	STRING #7 (10) 400W ROOF MOUNTED PV PANELS	STRING #8 (10) 400W ROOF MOUNTED PV PANELS
3/4" C, 2#10, #10 GND	3/4" C, 4#10, 2#10 GND	1" C, 6#10, 3#10 GND	1" C, 8#10, 4#10 GND	1 1/2" C, 10#10, 5#10 GND	1 1/2" C, 12#10, 6#10 GND	1 1/2" C, 14#10, 7#10 GND	1 1/2" C, 14#10, 7#10 GND



MARK	DATE	DESCRIPTION

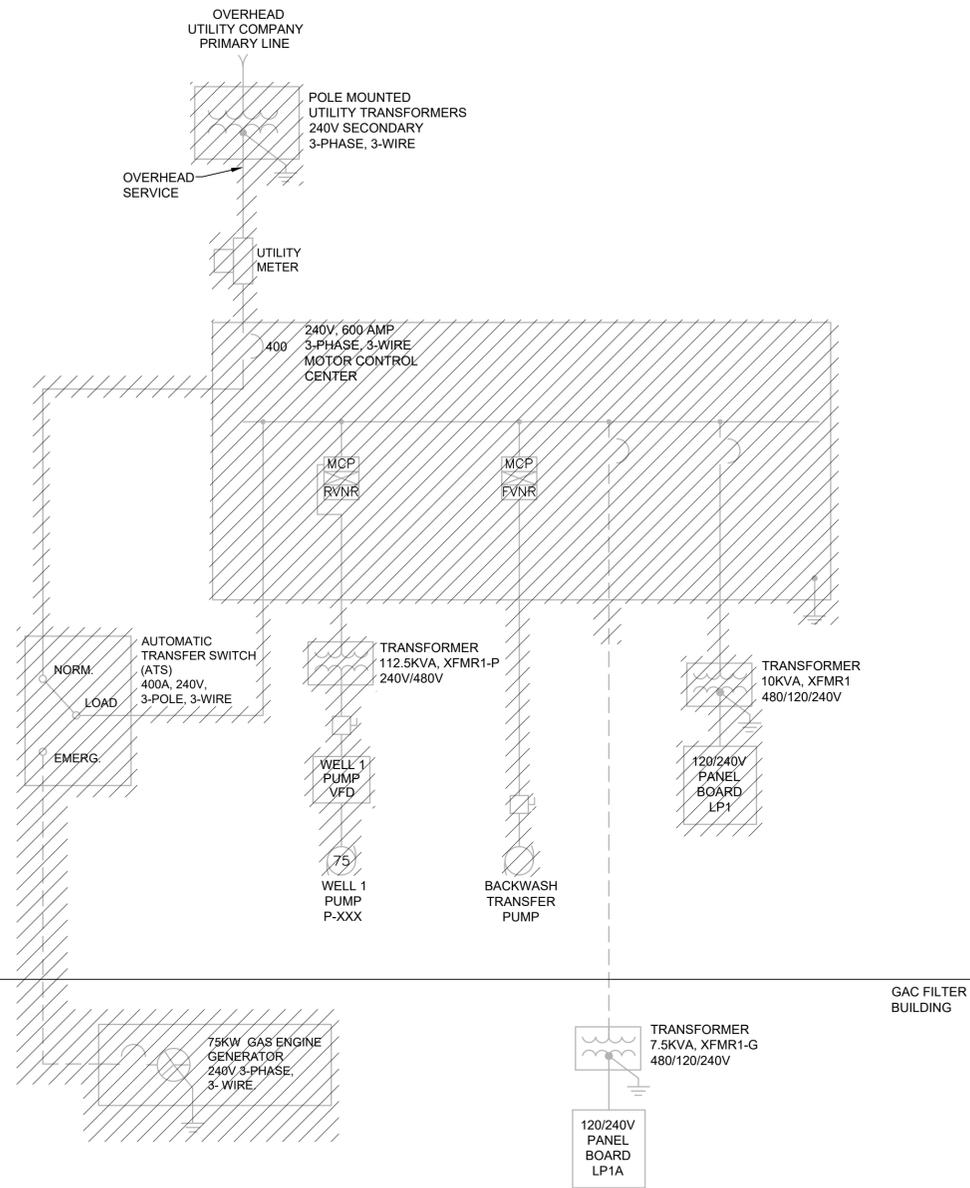
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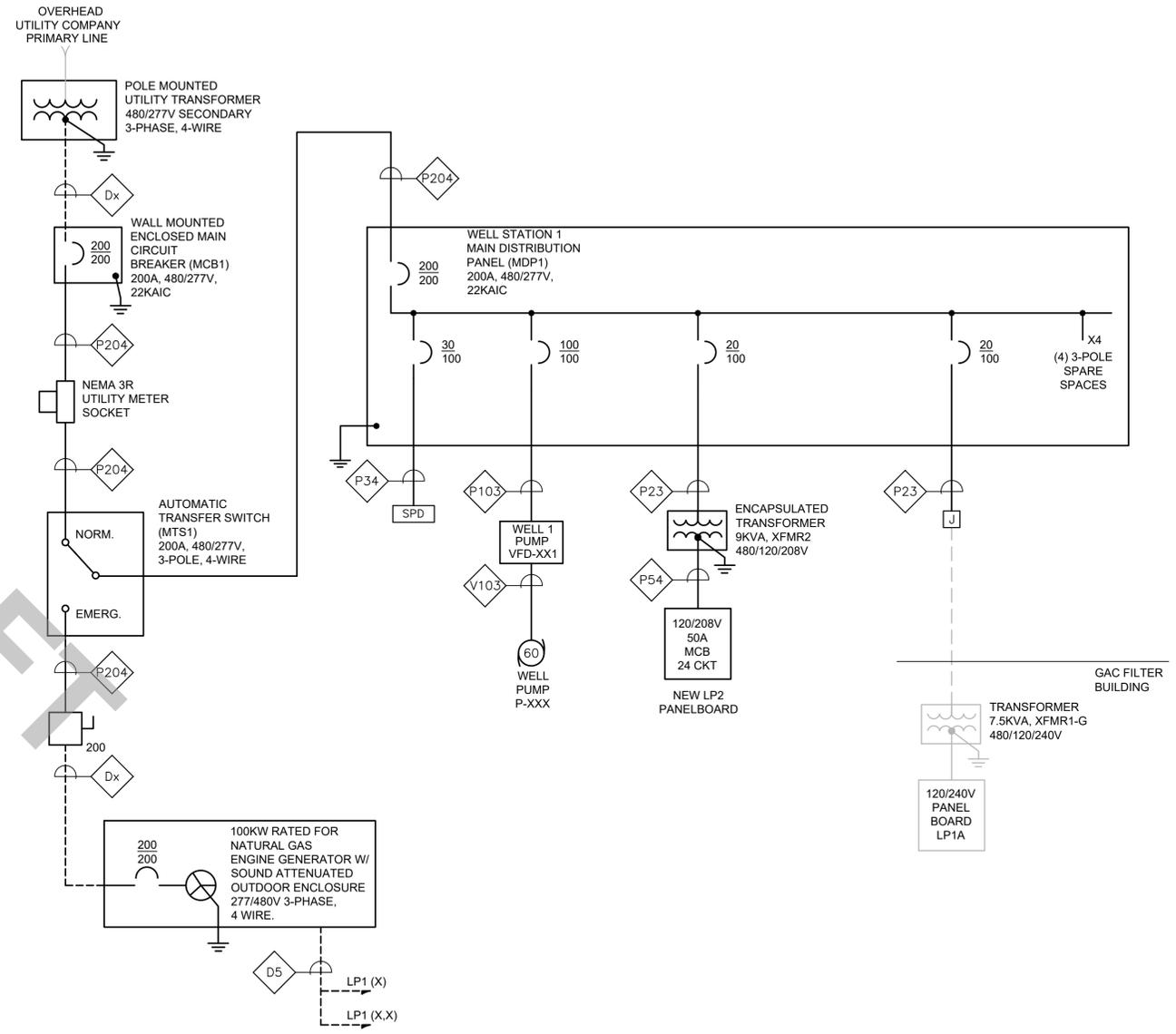
WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
ELECTRICAL
WTP ONE LINE DIAGRAM

25% DESIGN
Sheet No.
E-3

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WELL STATION 1 DEMOLITION ONE LINE DIAGRAM
SCALE: N.T.S.



WELL STATION 1 ONE LINE DIAGRAM
SCALE: N.T.S.

DRAFT



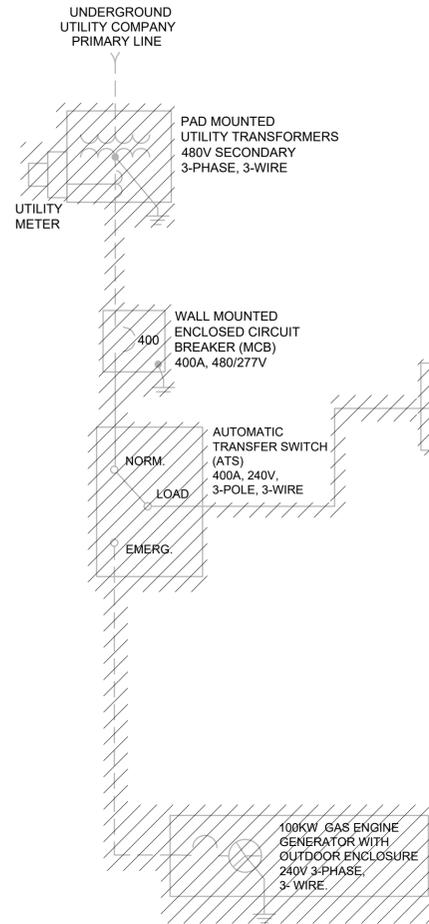
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MARK	DATE	DESCRIPTION

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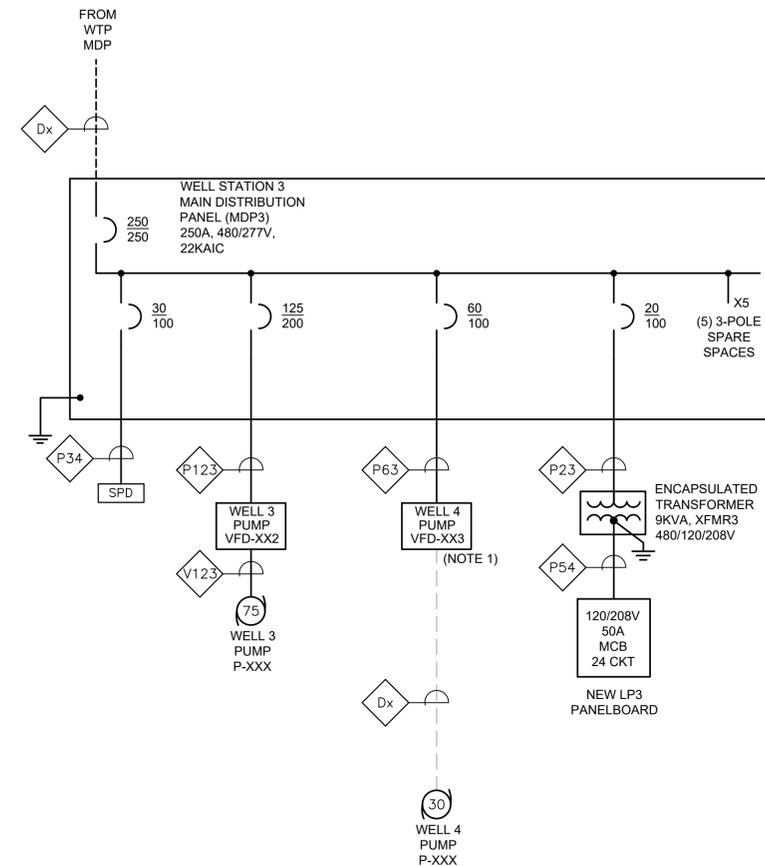
WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
ELECTRICAL
WELL STATION 1 ONE LINE DIAGRAMS

25% DESIGN
Sheet No.
E-4

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WELL STATION 3 DEMOLITION ONE LINE DIAGRAM
SCALE: N.T.S.



WELL STATION 3 ONE LINE DIAGRAM
SCALE: N.T.S.

- NOTES:
- VFD TO BE PROVIDED WITH DV/DT OUTPUT FILTER MOUNTED WITHIN THE VFD ENCLOSURE.

DRAFT



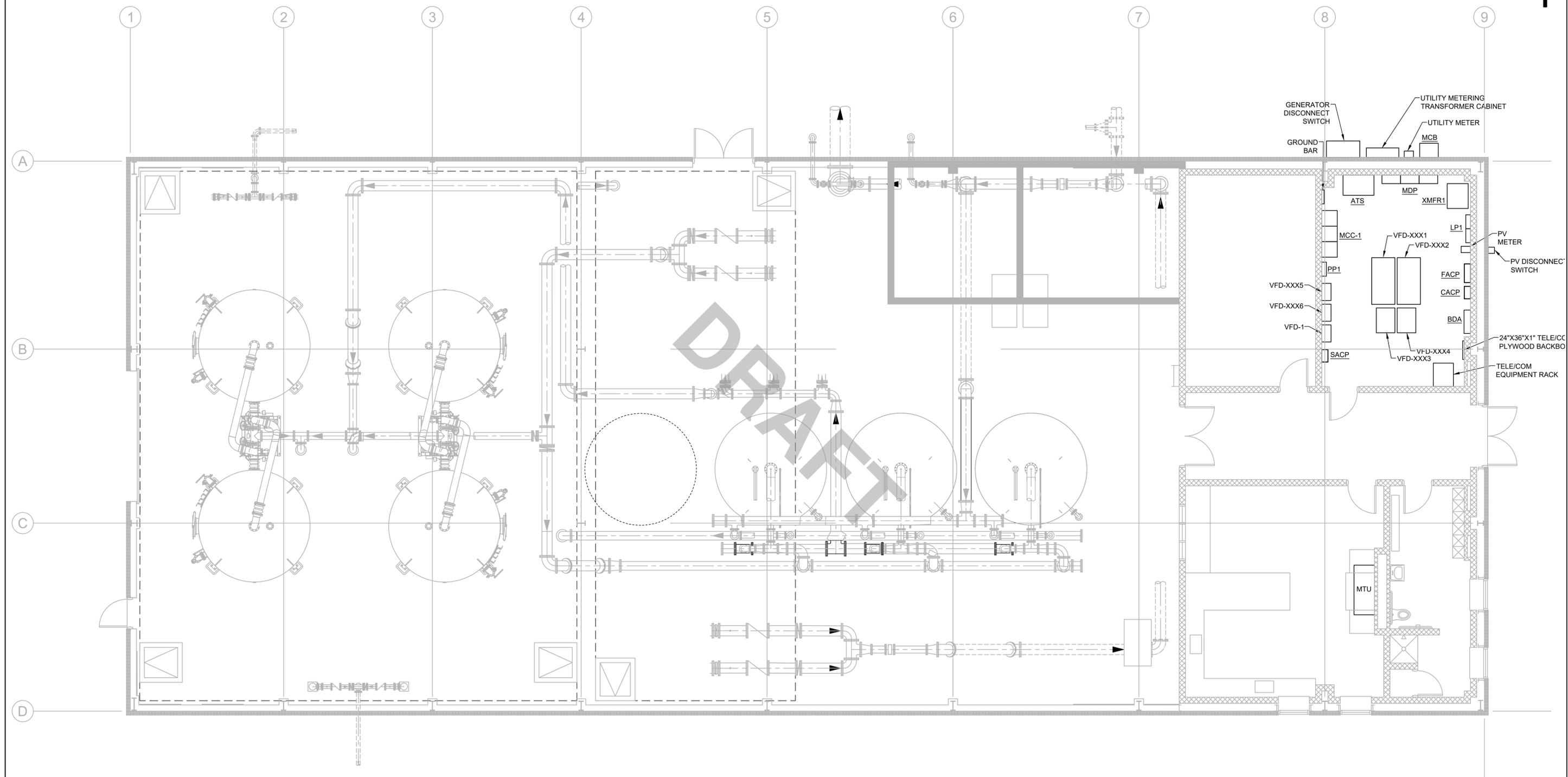
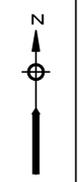
MARK	DATE	DESCRIPTION

Scale	AS SHOWN
Date	DECEMBER 2025
Job No.	23008867
Designed by	MC
Drawn by	RLB
Checked by	MC
Approved by	

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
ELECTRICAL
WELL STATION 3 ONE LINE DIAGRAMS

25% DESIGN
Sheet No.
E-5



FIRST FLOOR PLAN
SCALE: 3/16"=1'-0"

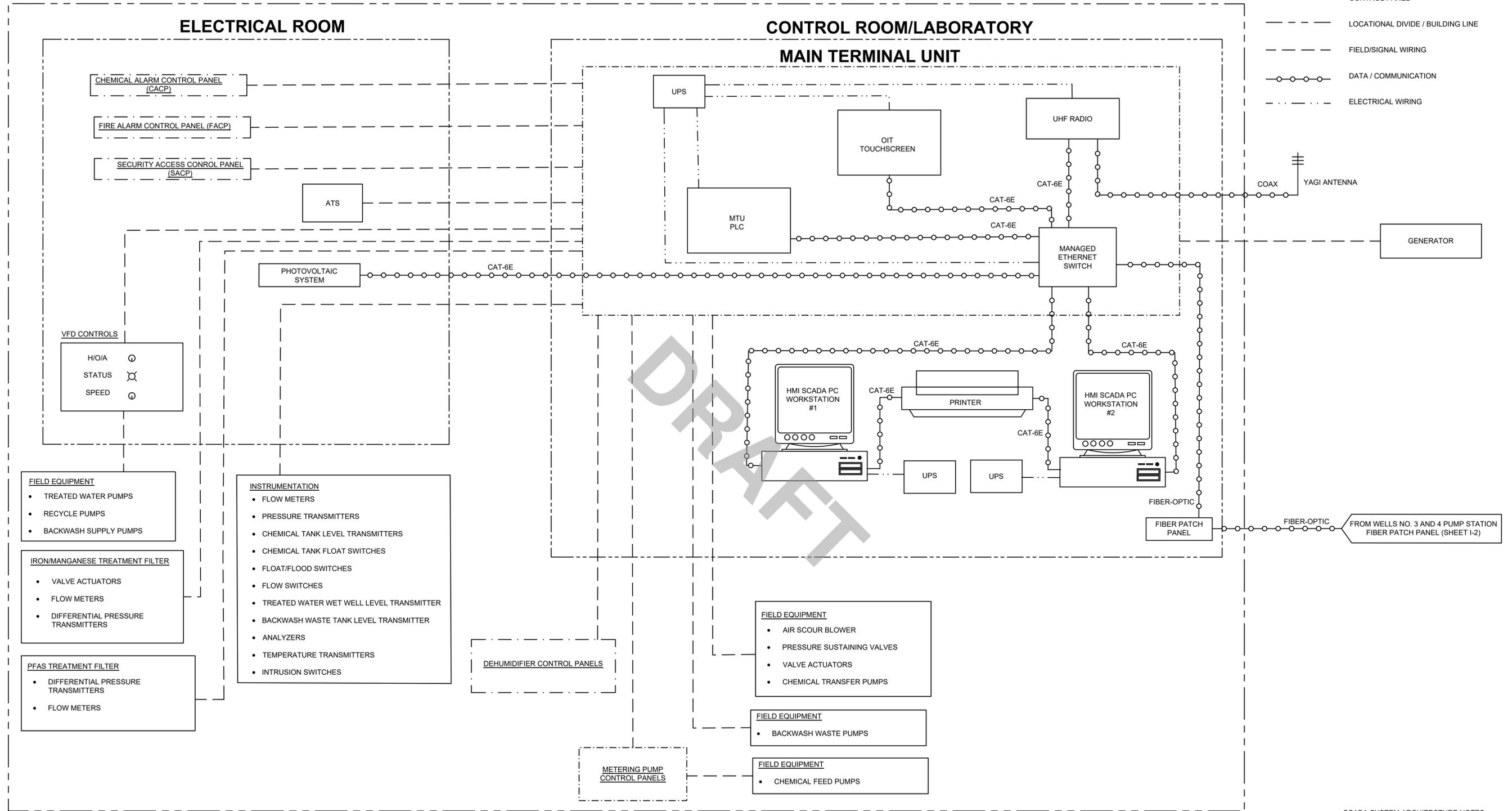
	 						WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT TOWN OF GROVELAND, MASSACHUSETTS ELECTRICAL FIRST FLOOR POWER PLAN	25% DESIGN		
			1	5/2/24	ADDENDUM #1	Scale AS SHOWN		Date DECEMBER 2025	Job No. 23008867	Designed by MC

Drawing file: W:\Year - 2025\25030.00 - Groveland Water Treatment Facility\Electrical\Department\25030.00 Electrical Plans\avg Plot Date: Dec 17, 2025-2:47pm

WELLS NO. 1, 3, AND 4 WATER TREATMENT PLANT

LEGEND

- ROOM LINE
- - - CONTROL PANEL
- - - - - LOCATIONAL DIVIDE / BUILDING LINE
- - - - - FIELD/SIGNAL WIRING
- DATA / COMMUNICATION
- ELECTRICAL WIRING



- SCADA SYSTEM ARCHITECTURE NOTES:**
1. COMMUNICATIONS: RADIO & FIBER OPTIC
 2. PLC SYSTEM: ALLEN BRADLEY
 3. SCADA SOFTWARE: iFix



Scale	AS NOTED
Date	DECEMBER 2025
Job No.	23008867
Designed by	JDH
Drawn by	SES
Checked by	RJA
Approved by	AWCP

MARK	DATE	DESCRIPTION

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS

PROCESS AND INSTRUMENTATION CONTROL
WATER TREATMENT PLANT SCADA SCHEMATIC

25% DESIGN

Sheet No.

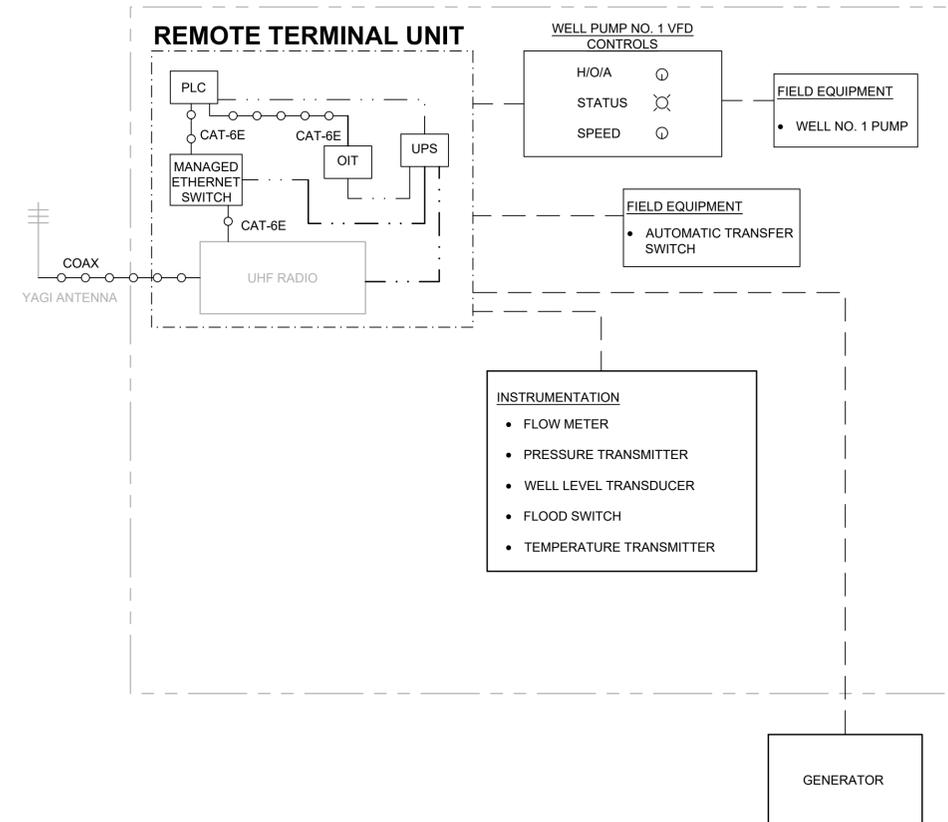
1-1

Drawing file: I:\Groveland\318\Water System\Drawings\CAD\12 Instrumentation & Controls.dwg Plot Date: Dec 18, 2025 - 4:49pm

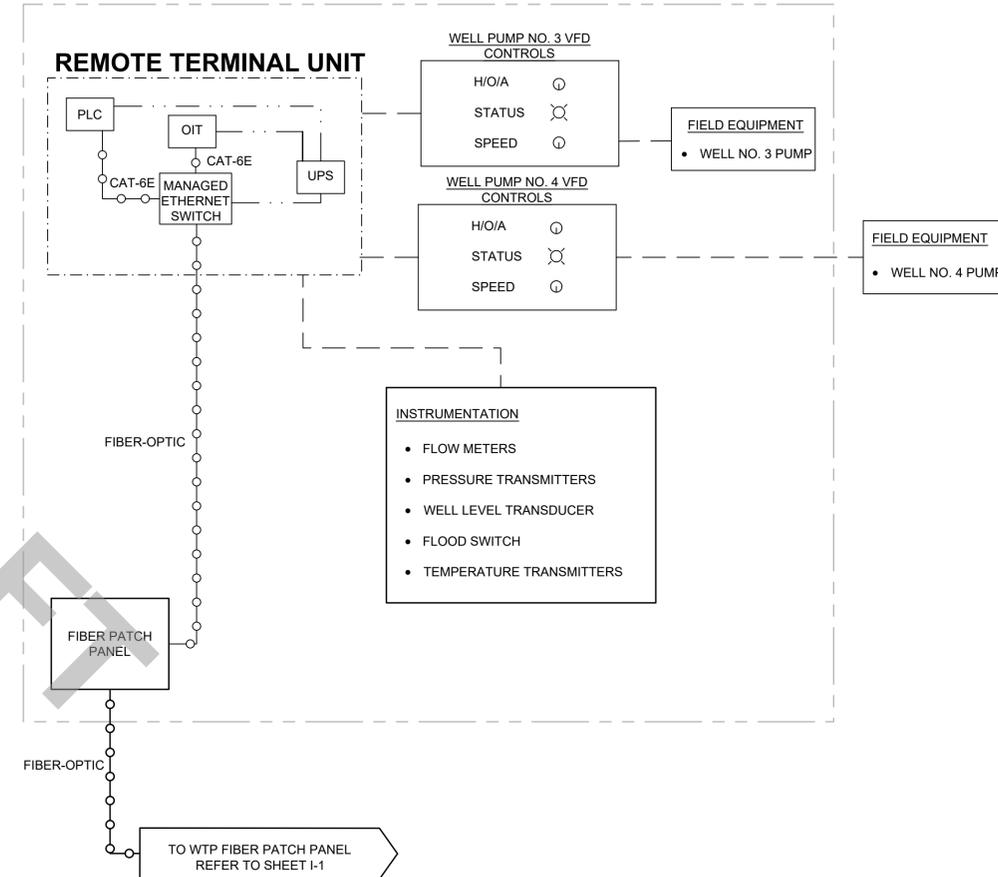
LEGEND

- ROOM LINE
- CONTROL PANEL
- LOCATIONAL DIVIDE / BUILDING LINE
- FIELD/SIGNAL WIRING
- DATA / COMMUNICATION
- ELECTRICAL WIRING

WELL NO. 1 PUMP STATION



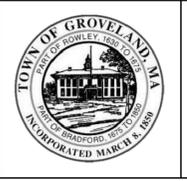
WELLS NO. 3 AND 4 PUMP STATION



DRAFT

SCADA SYSTEM ARCHITECTURE NOTES:

1. COMMUNICATIONS: RADIO & FIBER OPTIC
2. PLC SYSTEM: ALLEN BRADLEY
3. SCADA SOFTWARE: iFix



Scale	AS NOTED	
Date	DECEMBER 2025	
Job No.	23008867	
Designed by	JDH	
Drawn by	SES	
Checked by	RJA	
Approved by	AWCP	
MARK	DATE	DESCRIPTION

THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X 34" DRAWING

WELLS NO. 1, 3, & 4 WATER TREATMENT PLANT
TOWN OF GROVELAND, MASSACHUSETTS
PROCESS AND INSTRUMENTATION CONTROL
WELL STATION SCADA SCHEMATICS

25% DESIGN
 Sheet No.
1-2