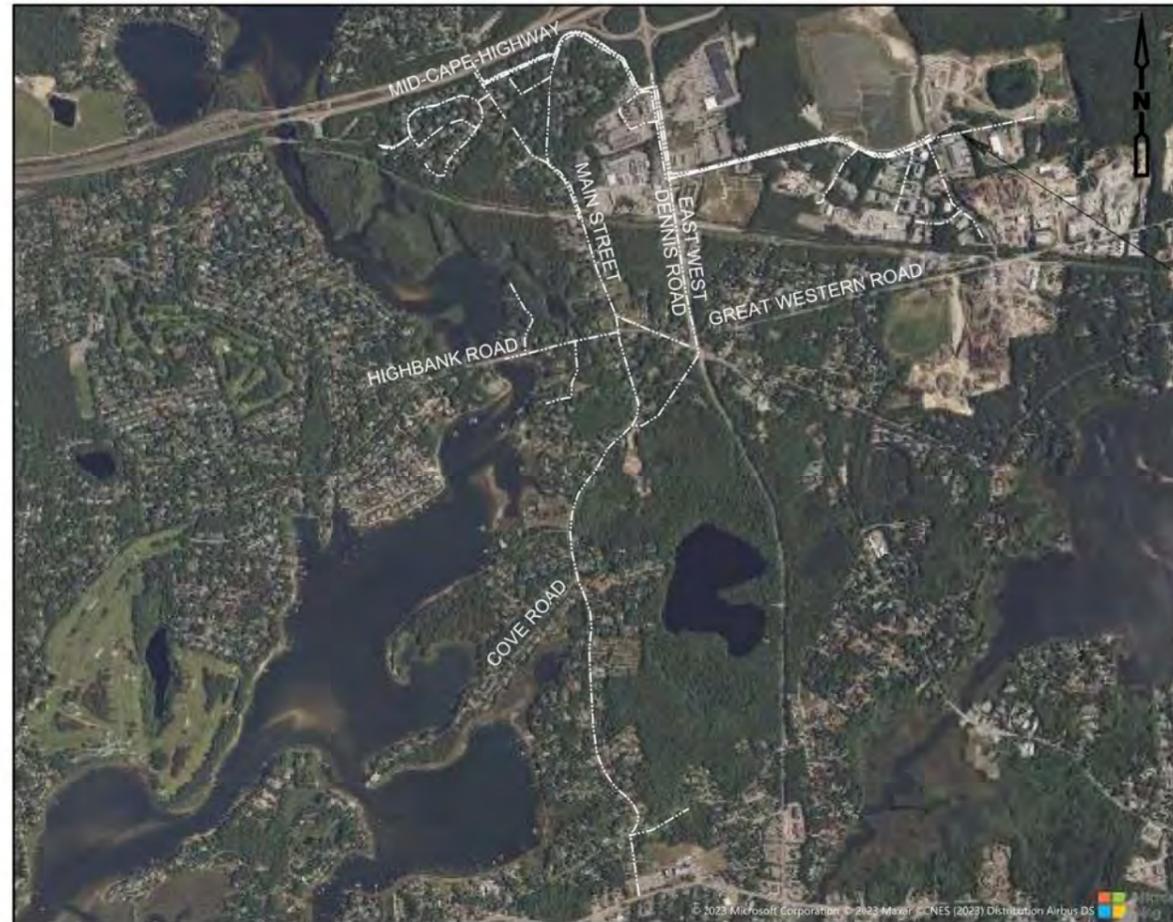


**TOWN OF DENNIS, MASSACHUSETTS**  
**WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES**

**PHASE 1 - CONTRACT NO. 2**

**PROJECT NO. CWSRF - 16676/2**



**LIMIT OF WORK**

**SEPTEMBER 2024**  
**(CONFORMED DECEMBER 2024)**

**CONFORMED DOCUMENTS**  
CONFORMED DOCUMENTS HAVE BEEN PREPARED FOR CONVENIENCE ONLY AND HAVE NO OFFICIAL OR LEGAL STANDING. CONFORMED DOCUMENTS ARE NOT AN INTERPRETATION OF EITHER THE ADDENDA OR THE CONTRACT. THE USER ASSUMES ALL RISK ASSOCIATED WITH USE OF THIS DOCUMENT.

**CONFORMED PER ADDENDUM NO. 1**

**SELECT BOARD**

CHRISTOPHER LAMBTON, CHAIR  
PAUL McCORMICK, VICE CHAIR  
JAMES PLATH  
JOHN TERRIO  
CARLYN CAREY

**TOWN ADMINISTRATOR**

ELIZABETH SULLIVAN

**DPW DIRECTOR**

MICHAEL LAVIN

**TOWN ENGINEER**

THOMAS ANDRADE, P.E.

**WASTEWATER SUPERINTENDENT**

RICHARD V. PETER

**LOCATION PLAN**



Michael P. Guidice  
2024.09.06 14:39:25-04'00'

**CDM  
Smith**

**PROVIDENCE, RHODE ISLAND**

**Water**

**Environment**

**Transportation**

**Energy**

**Facilities**

XREFS: [CDMS\_2436\_PHASE\_2\_CEP001SS\_CWP001\_CWP001-3\_CWP001-4\_30609 - Dennis\_MA Additional areas, CDMS\_2436\_EMP002ST\_EMP002PL\_CWP001ST-2\_APSWP001\_OCW001PL] Images: □  
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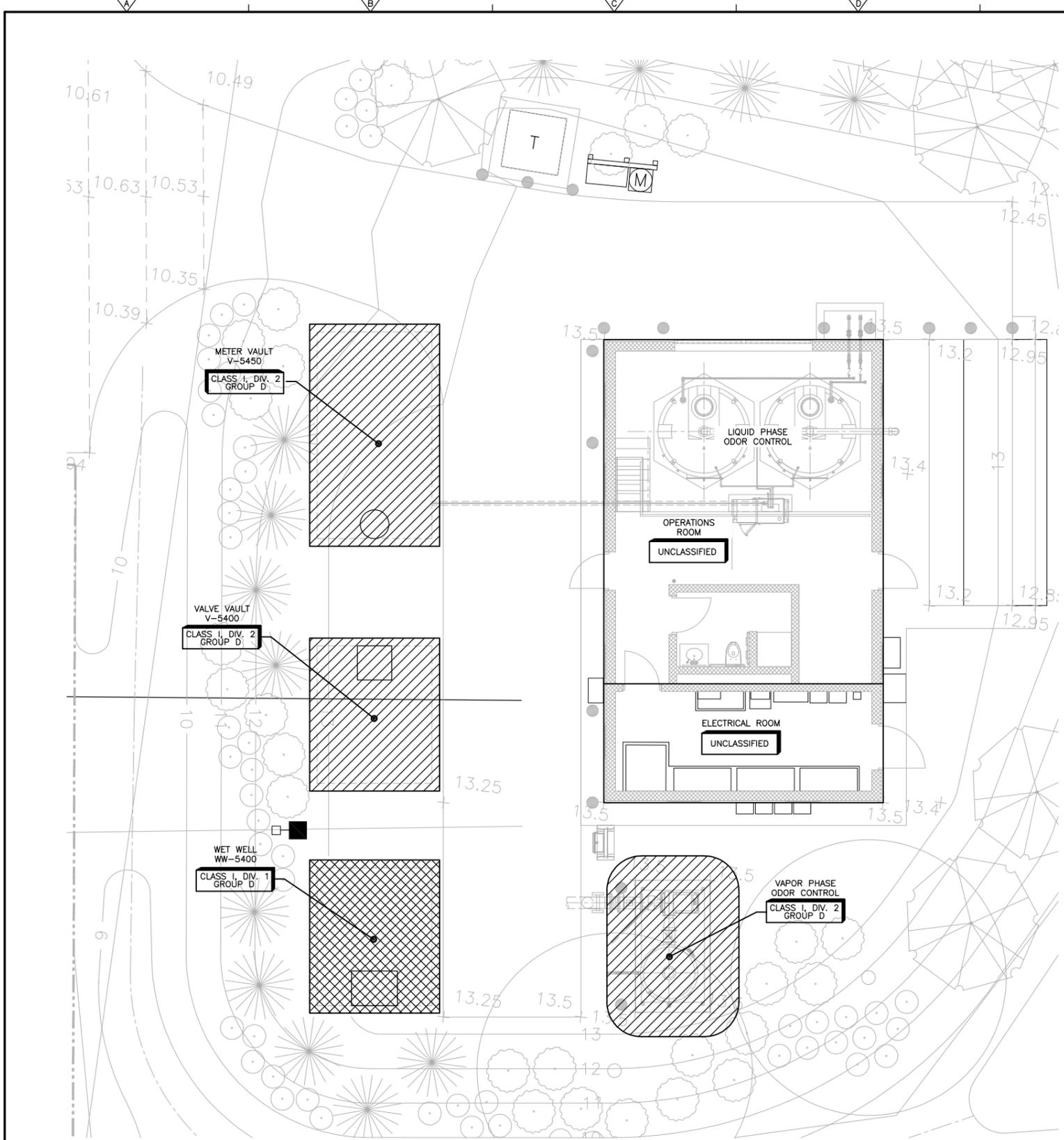
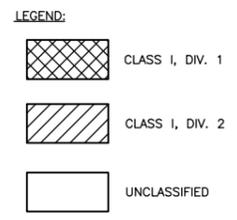
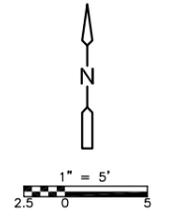


TABLE OF ELECTRICAL AREA CLASSIFICATIONS						
AREA	CLASSIFICATION	NFPA 820 TABLE 2024 EDITION	VENTILATION REQUIREMENTS	EXTENT OF CLASSIFIED AREA	FIRE AND GAS DETECTION	REMARKS
WET WELL	CLASS 1, DIVISION 1, GROUP D	4.2.2-ROW 14A	NOT VENTILATED OR AT LESS THAN 12ACH	ENTIRE ROOM OR SPACE. REFER TO DETAIL 1 ON SHEET E-1.	COMBUSTIBLE GAS DETECTION SYSTEM.	N/A
BELOWGRADE VALVE VAULT	CLASS 1, DIVISION 2, GROUP D	4.2.2-ROW 29A	NOT NORMALLY VENTILATED	ENCLOSED SPACE. REFER TO DETAIL 1 ON SHEET E-1.	NOT REQUIRED	N/A
OPERATIONS ROOM	UNCLASSIFIED	N/A	N/A	ENTIRE ROOM OR SPACE	NOT REQUIRED	N/A
BELOWGRADE METER VAULT	CLASS 1, DIVISION 2, GROUP D	4.2.2-ROW 34A	NOT NORMALLY VENTILATED	ENCLOSED SPACE. REFER TO DETAIL 1 ON SHEET E-1.	NOT REQUIRED	N/A
VAPOR PHASE ODOR-CONTROL	CLASS 1, DIVISION 2, GROUP D	4.2.2-ROW 18D	N/A	NOT ENCLOSED.	FIRE EXTINGUISHER	N/A
LIQUID PHASE ODOR-CONTROL	UNCLASSIFIED	N/A	N/A	ENTIRE ROOM OR SPACE	NOT REQUIRED	SEE NOTE 5



- GENERAL NOTES:**
- ELECTRICAL EQUIPMENT PLACED IN CLASS 1, DIV. 1 OR 2, GROUPS C & D LOCATIONS SHALL MEET "T3" TEMPERATURE RATINGS.
  - ALL OUTDOOR SPACES, BELOW GRADE STRUCTURES, & BASEMENTS ARE "WET" IN ADDITION TO THE HAZARDOUS CLASSIFICATION.
  - REFER TO THE DIVISION 26 SPECIFICATIONS AND SHEET E-7 FOR ADDITIONAL DETAILS AND REQUIREMENTS REGARDING EQUIPMENT AND ENCLOSURE RATINGS.
  - REFER TO SHEET E-1 FOR AREA CLASSIFICATION DETAILS.
  - AREA ENCLOSING LIQUID-PHASE ODOR CONTROL IS NOT CONSIDERED CLASSIFIED AS THERE IS NO POSSIBILITY OF HAZARDOUS GASSES ENTERING THE AREA THRU THE PIPING SYSTEM EVEN DURING A MALFUNCTION.



**SITE PLAN**  
1" = 5'

REV. NO.	DATE	DRWN	CHKD	REMARKS

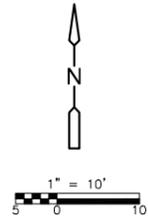
DESIGNED BY: G. WARD  
 DRAWN BY: J. OGDEN  
 SHEET CHK'D BY: G. WARD  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. CHARIS-MOLLING  
 DATE: SEPTEMBER 2024

3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 AREA CLASSIFICATION PLAN AND SCHEDULE

Bethany Charis-Molling  
 2024.09.06 12:08:17-04'00"  
 PROJECT NO. 141004-277870  
 FILE NAME: G004STPL.DWG  
 SHEET NO. G-4



**LEGEND:**

- PUMPING STATION NO. 4 LIMIT OF WORK
- LIMIT OF CLEARING AND GRUBBING
- LIMIT OF REMOVE AND DISPOSE OF EXISTING VEGETATION, SEE NOTE 1
- LIMIT OF REMOVE AND DISPOSE OF BITUMINOUS CONCRETE PAVEMENT
- LIMIT OF TEMPORARY CONSTRUCTION ENTRANCE
- COMPOST SOCK
- TREE PROTECTION FENCE

**NOTES:**  
 1. GRIND OR REMOVE ANY STUMPS TO DEPTH REQUIRED FOR NEW WORK.



XREFS: [CEP001SS\_CWP001-Borings\_39609 - Dennis, MA Additional areas, CDMs\_2436, CWP001ST-2, EWP002ST, CWZ001ST] Images: [Stamp\_Dedson\_NoDate]  
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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: Z. MILLER  
 DRAWN BY: Z. MILLER  
 SHEET CHK'D BY: J. HEIL  
 CROSS CHK'D BY: M. DODSON  
 APPROVED BY: M. GUIDICE  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

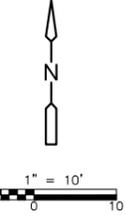
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 SITE PREPARATION PLAN  
 SHEET NO.  
 CD-11



Michael P. Guidice  
 2024.09.06 14:50:49-04'00"  
 PROJECT NO. 141004-277870  
 FILE NAME: CD011SPPL.DWG  
 SHEET NO.  
 CD-11

PLANT SCHEDULE					
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
27	JV	JUNIPERUS VIRGINIANA 'EMERALD SENTINEL'	EASTERN RED CEDAR	7-FT	B&B
2	QB	QUERCUS BICOLOR 'AMERICAN DREAM'	SWAMP WHITE OAK	2.5-3.0" CAL	B&B
10	AC	AMERLANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	6-FT	B&B; MULTI-STEM
11	LB	LINDERA BENZOIN	SPICEBUSH	#3 CONT	
28	VC	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	#3 CONT	
15	MP	MYRICA PENNSYLVANICA	NORTHERN BAYBERRY	#3 CONT	
7	RV	RHOODENDRON VISCOSUM	SWAMP AZALEA	#3 CONT	
32	CA	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHRA	#3 CONT	
16	IG	ILEX GLABRA	INKBERRY	#3 CONT	

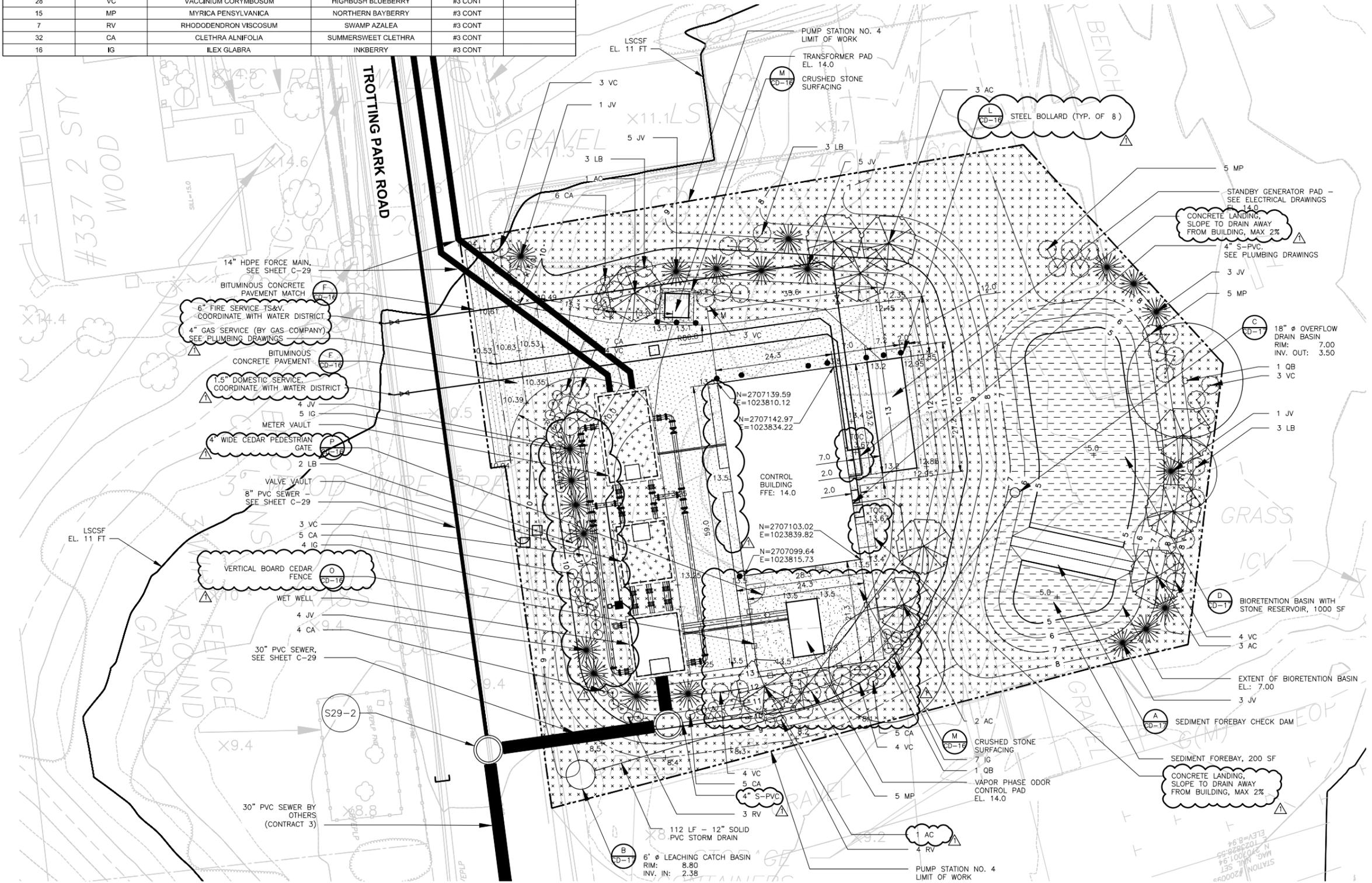


**LEGEND:**

- LIMIT OF WORK
- [Pattern] LIMIT OF BITUMINOUS CONCRETE PAVEMENT
- [Pattern] LIMIT OF CRUSHED STONE SURFACING
- [Pattern] LIMIT OF WILDFLOWER SEED MIX
- [Pattern] LIMIT OF BIORETENTION BASIN SEED MIX

**NOTE:**

- INSTALL EROSION CONTROL BLANKET ON ALL LOAM AND SEEDED SLOPES OF 4:1 (HORIZONTAL:VERTICAL) OR STEEPER TO MINIMIZE SOIL EROSION.



XREFS: [CEP001SS, CWP001-Boiling, 30609 - Dennis, MA Additional areas, CDMs\_2436, CWP001ST-2, EWP002ST, CWZ001ST, OCW001PL, APSWP001, CWZ002ST, CWP002ST, M008PSP], Images: [Dodson\_MA\_Stamp]  
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REV. NO.	DATE	DRWN	CHKD	REMARKS
1	09/18/24	ZM	JD	REVISED PER ADDENDUM NO. 1

DESIGNED BY: Z. MILLER  
 DRAWN BY: Z. MILLER  
 SHEET CHK'D BY: J. HEIL  
 CROSS CHK'D BY: M. DODSON  
 APPROVED BY: M. GUIDICE  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5380

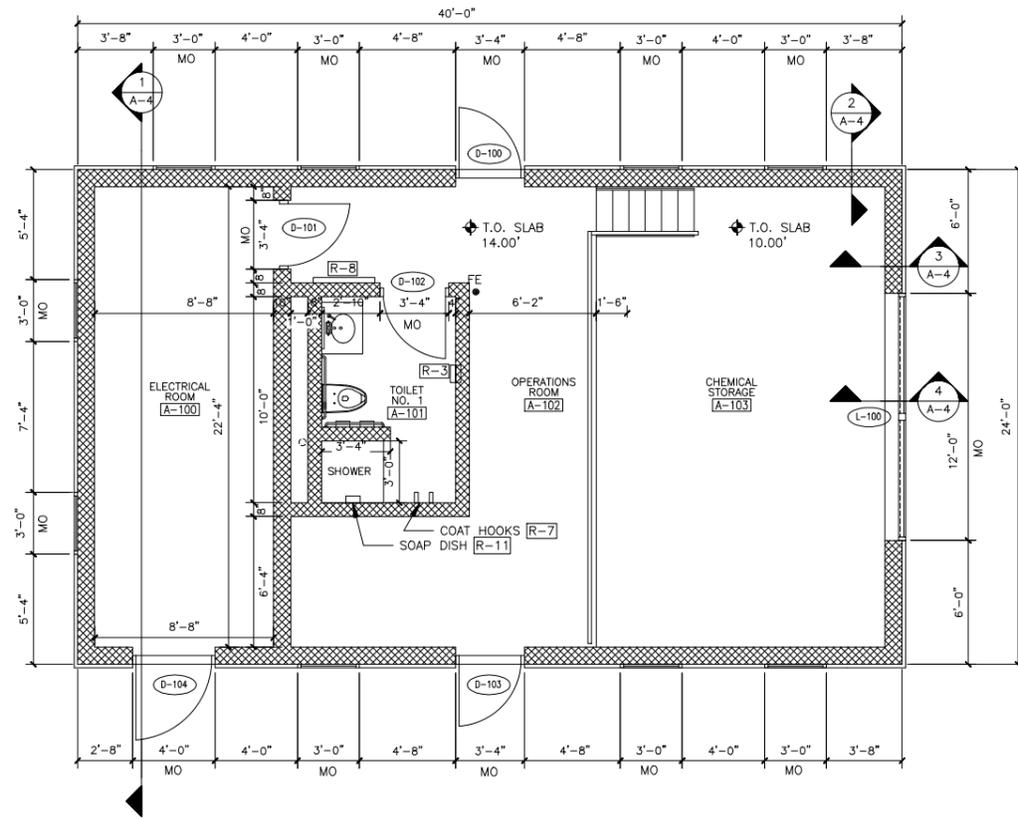
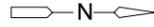
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 SITE IMPROVEMENTS PLAN  
 SHEET NO.  
 CD-12

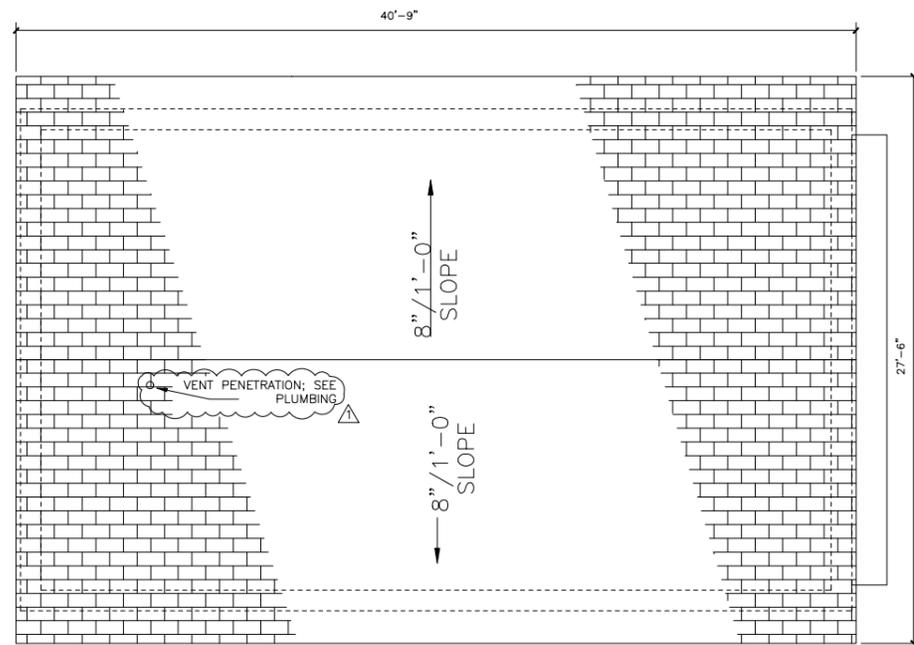
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 FILE NAME: CD012STPL.DWG  
 SHEET NO.  
 CD-12



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GROUND FLOOR  
PLAN  
1/4" = 1'-0"



ROOF PLAN  
PLAN  
1/4" = 1'-0"

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	CC	BG	REVISED PER ADDENDUM NO. 1

DESIGNED BY: B. GIORGI  
 DRAWN BY: C. CHAHANOVICH  
 SHEET CHK'D BY: M. GUIDICE  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. GIORGI  
 DATE: AUGUST 2024



TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 PLAN  
 A-2

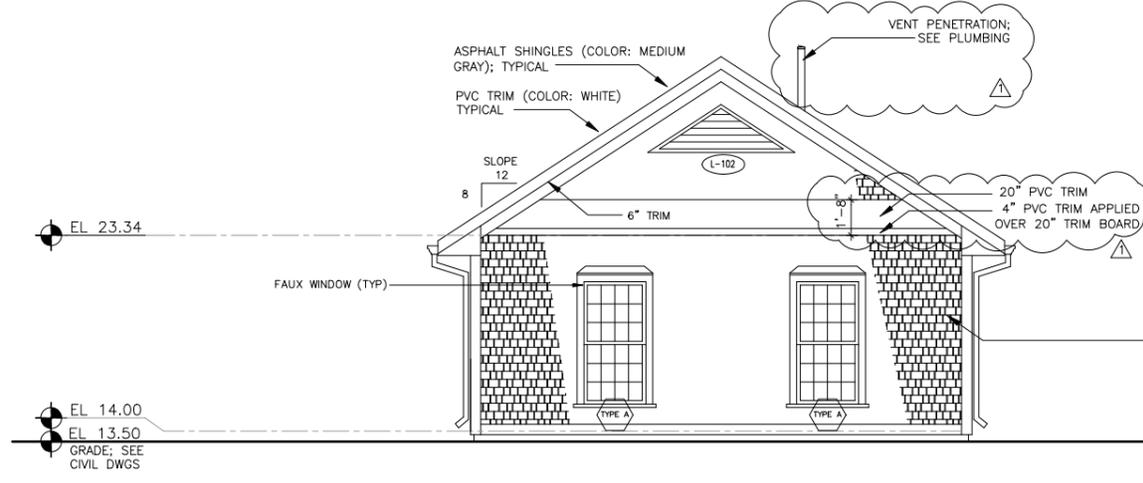
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CONFORMED DRAWINGS

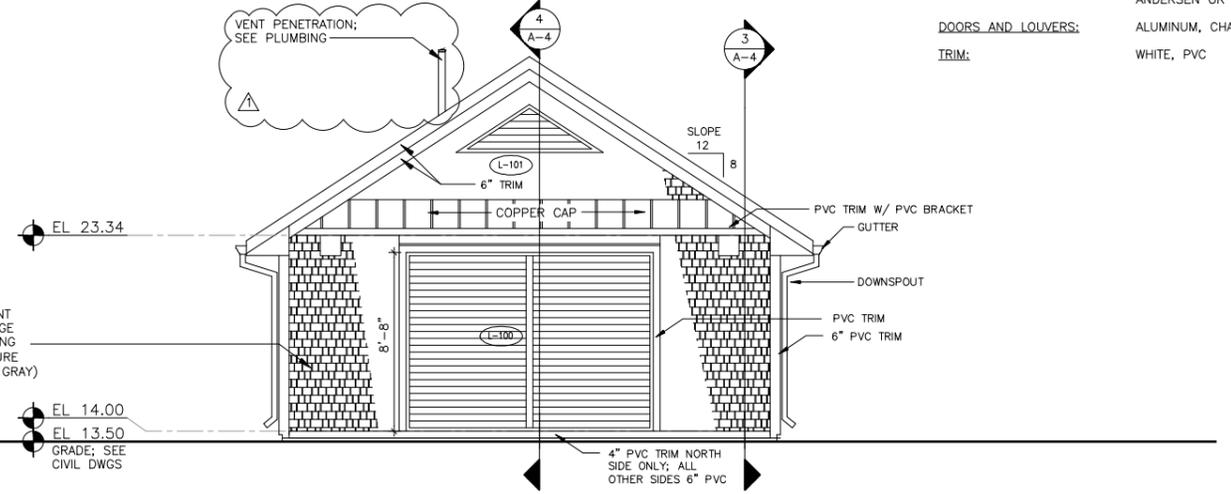
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**MATERIALS LEGEND:**

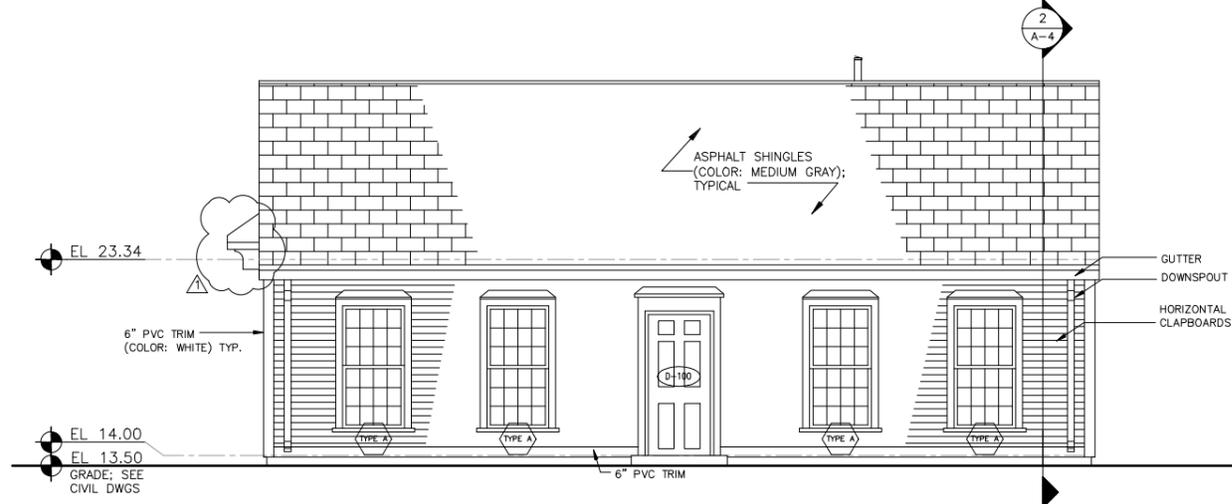
- SIDING:** LIGHT GRAY FIBER CEMENT CLAPBOARDS AND LIGHT GRAY FIBER CEMENT SHINGLES.
- ROOF:** MEDIUM GRAY ASPHALT SHINGLES
- WINDOWS:** 3'X6' DOUBLE HUNG AND FIXED WHITE ALUMINUM CLAD WOOD - ANDERSEN OR EQUAL
- DOORS AND LOUVERS:** ALUMINUM, CHARCOAL
- TRIM:** WHITE, PVC



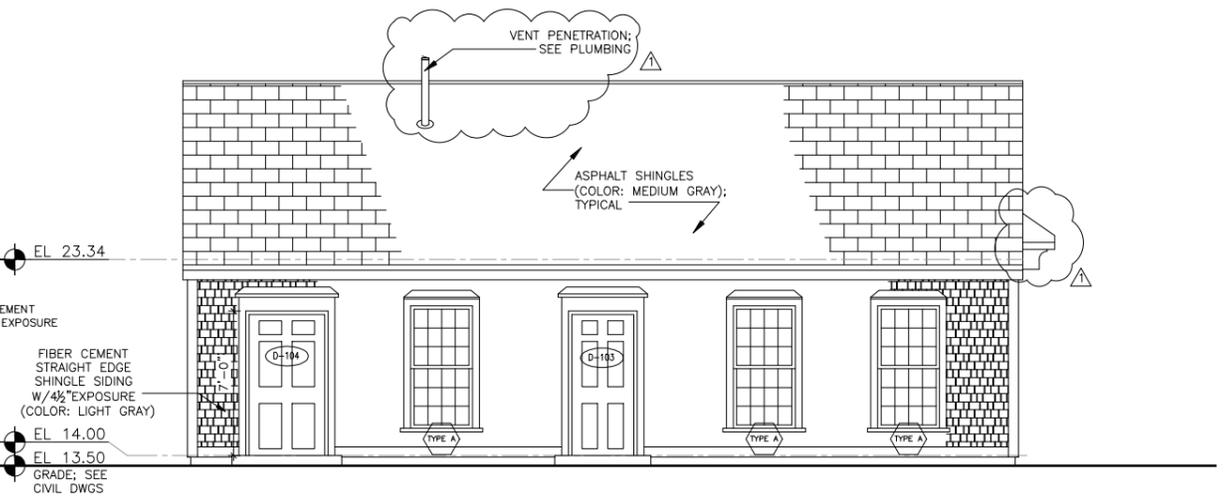
SOUTH  
ELEVATION  
1/4" = 1'-0"



NORTH  
ELEVATION  
1/4" = 1'-0"



WEST  
ELEVATION  
1/4" = 1'-0"



EAST  
ELEVATION  
1/4" = 1'-0"

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	CC	BG	REVISED PER ADDENDUM NO. 1

DESIGNED BY: B. GIORGI  
 DRAWN BY: C. CHAHANOVICH  
 SHEET CHK'D BY: M. GUIDICE  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. GIORGI  
 DATE: AUGUST 2024

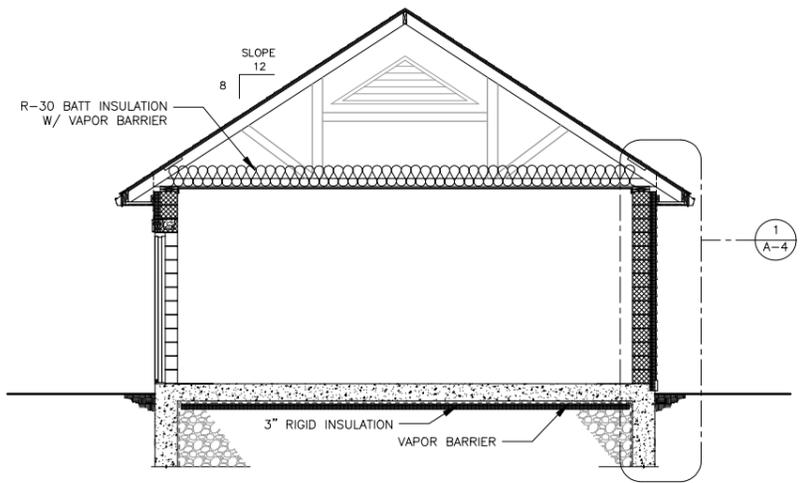


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

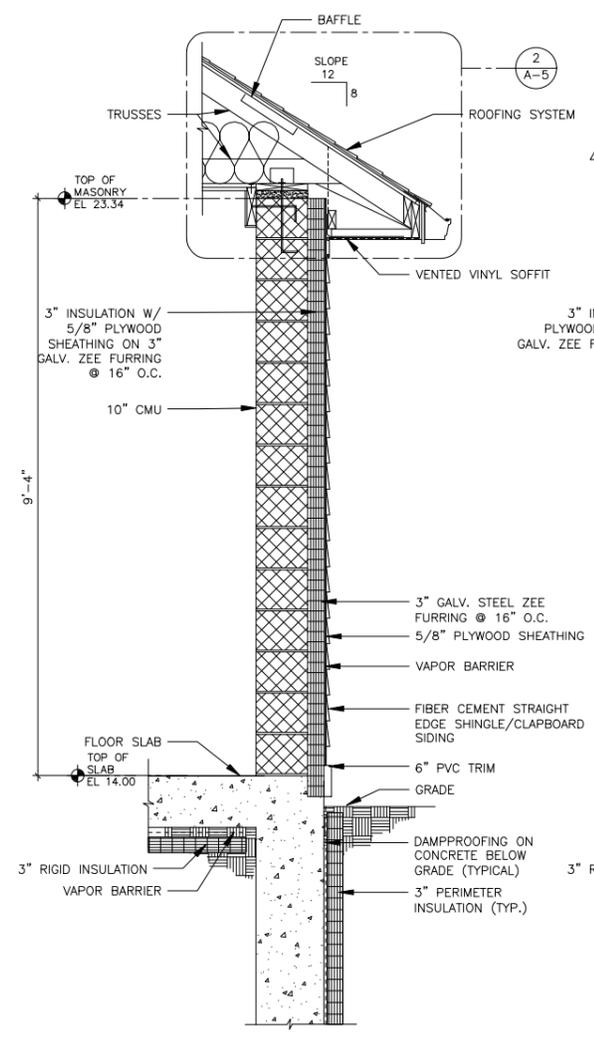
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 SHEET NO. A-3

PROJECT NO. 141004-277870  
 FILE NAME: APSEL100

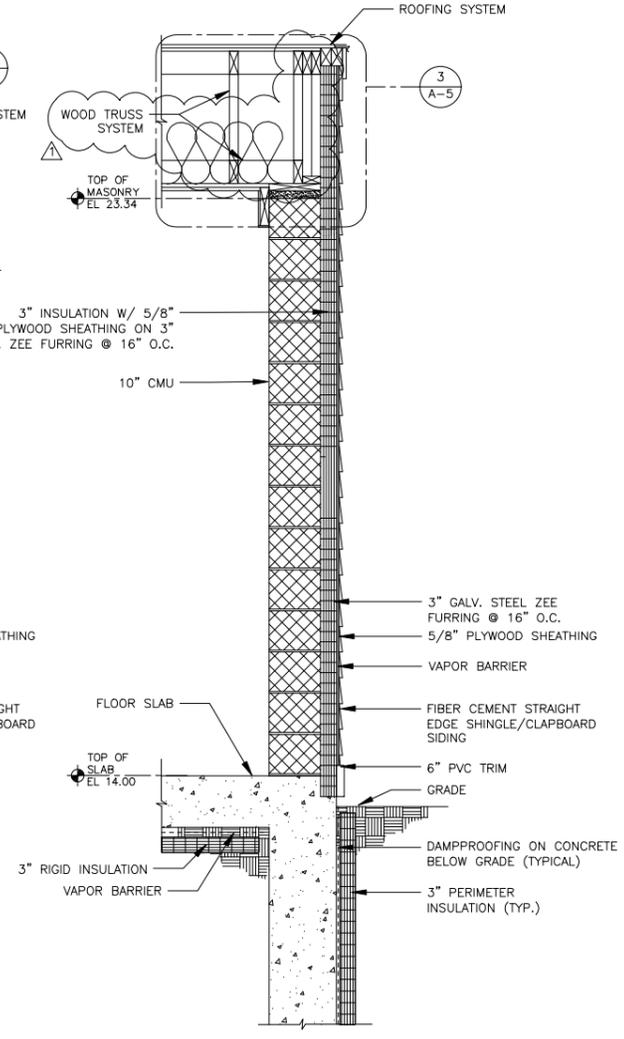
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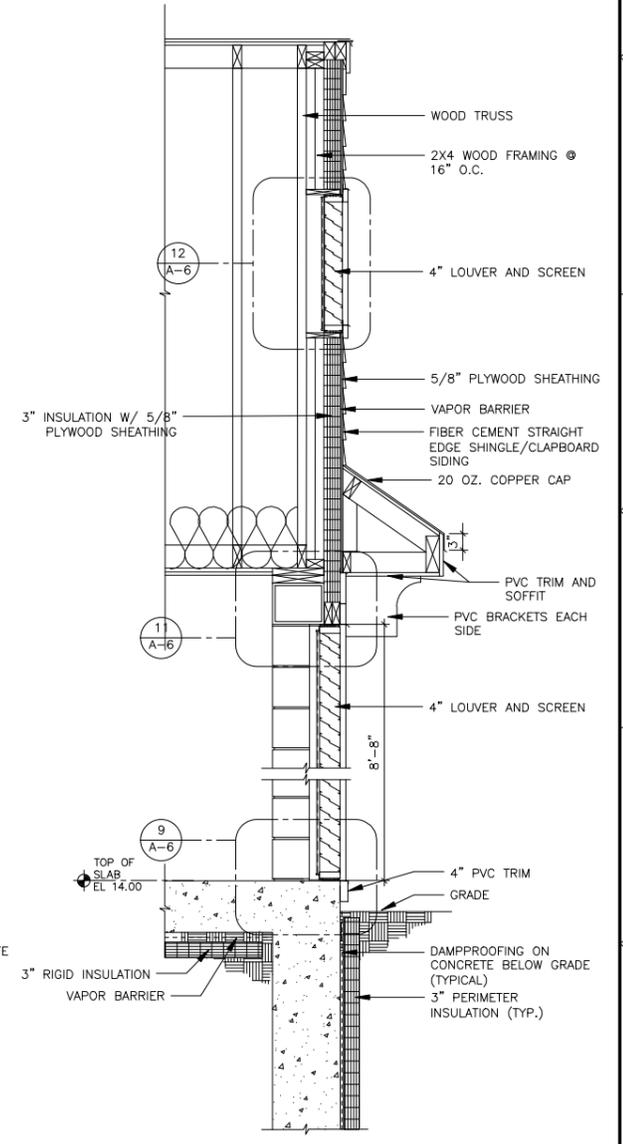
BUILDING SECTION  
SECTION 1  
1/4" = 1'-0"



WALL SECTION  
SECTION 2  
3/4" = 1'-0"



WALL SECTION  
SECTION 3  
3/4" = 1'-0"



WALL SECTION  
SECTION 4  
3/4" = 1'-0"

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	CC	BG	REVISED PER ADDENDUM NO. 1

DESIGNED BY: B. GIORGI  
 DRAWN BY: C. CHAHANOVICH  
 SHEET CHK'D BY: M. GUIDICE  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. GIORGI  
 DATE: AUGUST 2024

**CDM Smith**  
 3 Davol Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

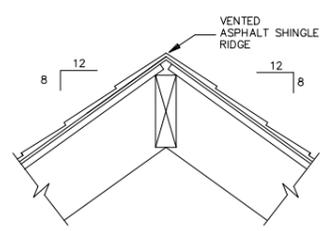
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 SECTIONS  
 A-4

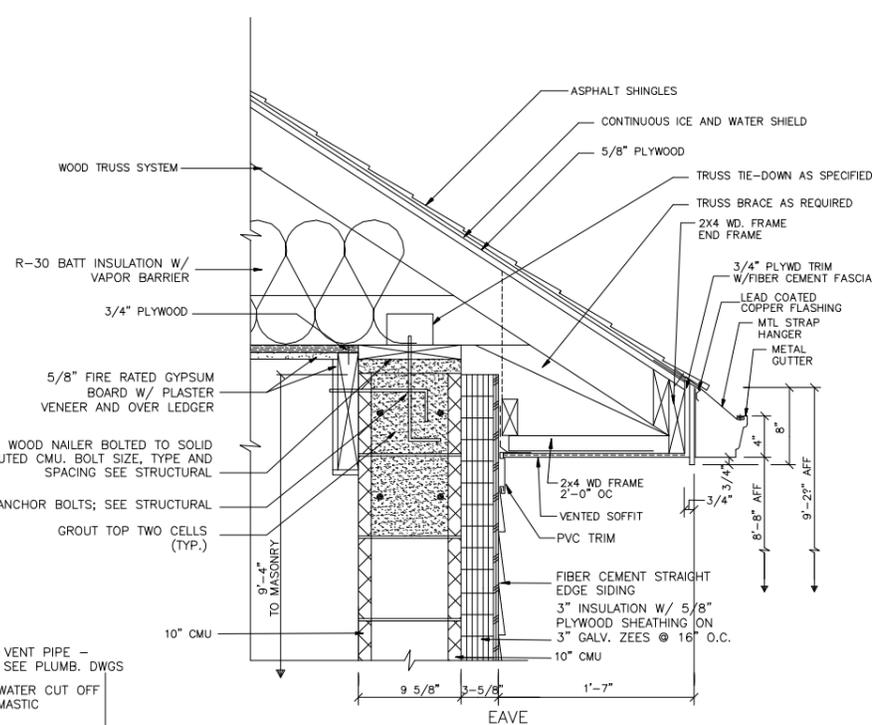
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FILE NAME: APSSC101
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CONFORMED DRAWINGS

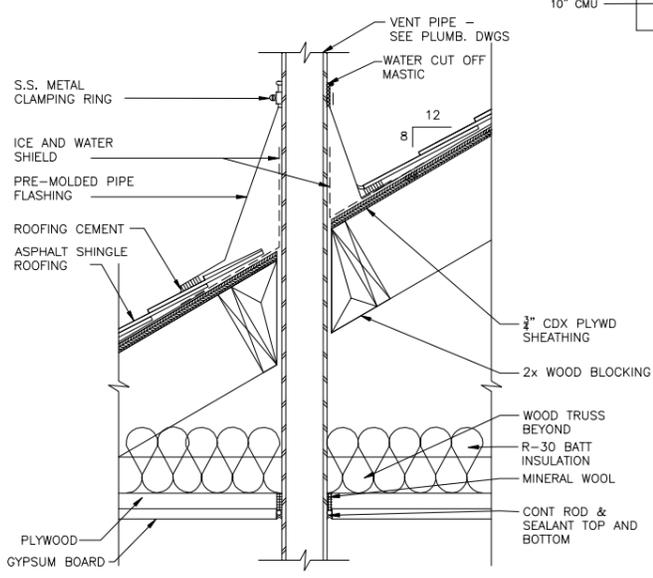
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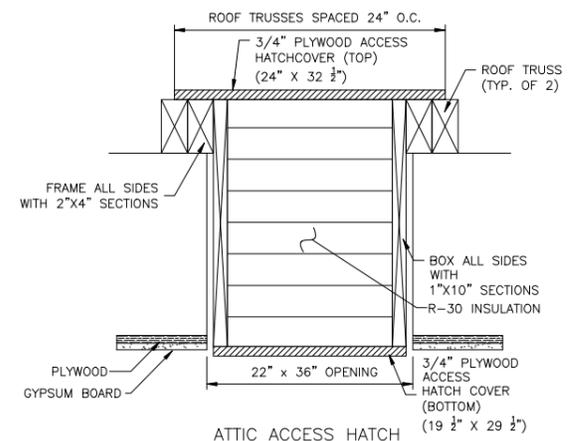
**DETAIL 1**  
RIDGE  
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PS-A-1



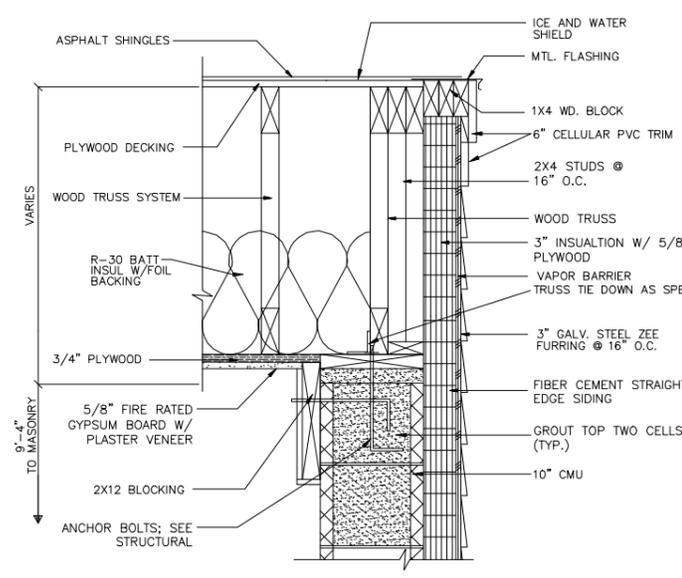
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EAVE  
1 1/2" = 1'-0"  
PS-A-1



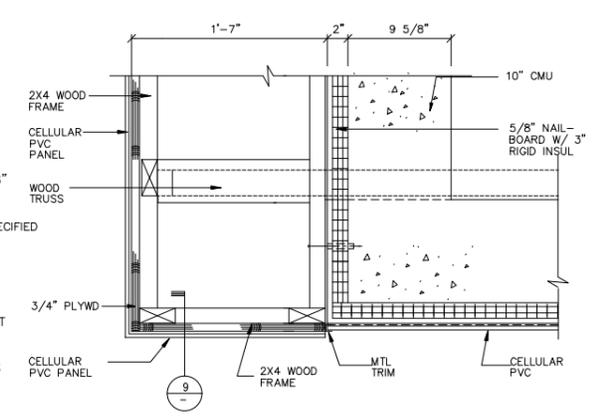
**DETAIL 5**  
VENT PIPE PENETRATION  
1 1/2" = 1'-0"  
PS-A-1



**DETAIL 6**  
ATTIC ACCESS HATCH  
1 1/2" = 1'-0"  
PS-A-1

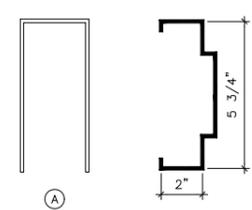


**DETAIL 3**  
END WALL  
1 1/2" = 1'-0"  
PS-A-1

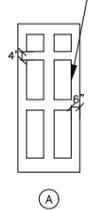


**DETAIL 4**  
END WALL  
1 1/2" = 1'-0"  
PS-A-1

**FRAME TYPES** **FRAME PROFILE**

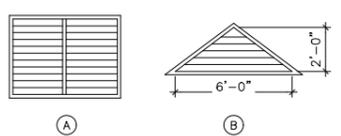


**DOOR TYPES**

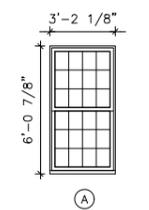


APPLIED FRP TRIM  
6" HORIZONTAL SPACING  
TYPICAL  
4" VERTICAL SPACING  
TYPICAL

**LOUVER TYPES**



**WINDOW TYPES**



**FAUX WINDOW**

- A. Provide aluminum-clad wood window.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/1.S.2/A440 as follows:
  - 1. Minimum Performance Class: CW.
  - 2. Minimum Performance Grade: 35.
- C. Operating Type: Fixed
- D. Frames: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/1.S.2/A440; kiln dried to a moisture content of not more than 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch-deep by 2 inches wide; water-repellent preservative treated.
  - 1. Exterior Finish: Aluminum-clad wood.
    - a. Aluminum Finish: Manufacturers standard fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight and complying with AAMA 2605.
    - b. Color: As selected by engineer from manufacturer's full range.
- E. Glass: Ceramic-Coated Spandrel Glass: ASTM C1048, Type I, Condition B, Quality-Q3.
- F. Or Equal



Barry L. Giorgi  
2024.09.06 13:04:00-04'00'  
PROJECT NO. 141004-277870  
FILE NAME: APSDT100

REV. NO.	DATE	DRWN	CHKD	REMARKS

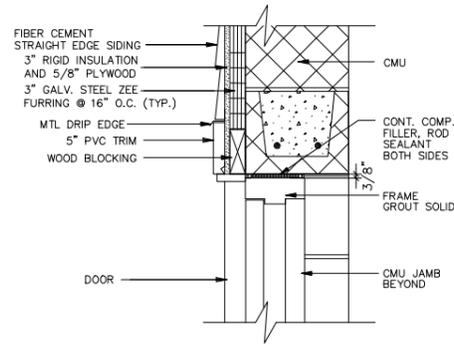
DESIGNED BY: B. GIORGI	<p>3 Davol Square, Building A, Suite A-425 Providence, RI 02903 Tel: (401) 751-5360</p>
DRAWN BY: C. CHAHANOVICH	
SHEET CHK'D BY: M. GUIDICE	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: B. GIORGI	
DATE: SEPTEMBER 2024	

TOWN OF DENNIS, MASSACHUSETTS  
WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
PHASE 1 - CONTRACT NO. 2  
PROJECT NO. CWSRF 16676/2

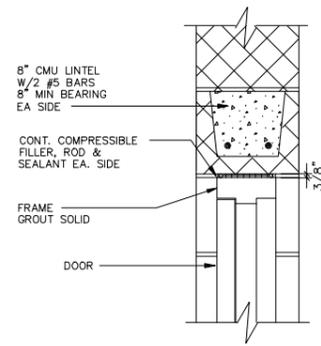
PUMPING STATION NO. 4  
DETAILS  
A-5

SHEET NO.  
A-5

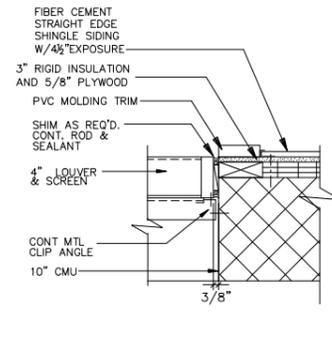
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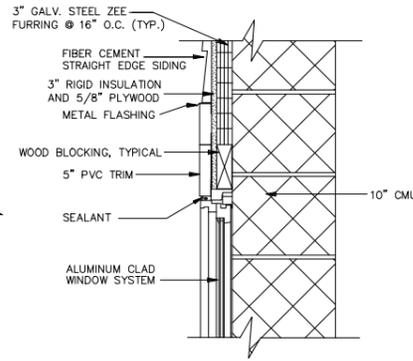
**DOOR HEAD**  
**DETAIL 1**  
1 1/2" = 1'-0" A-4



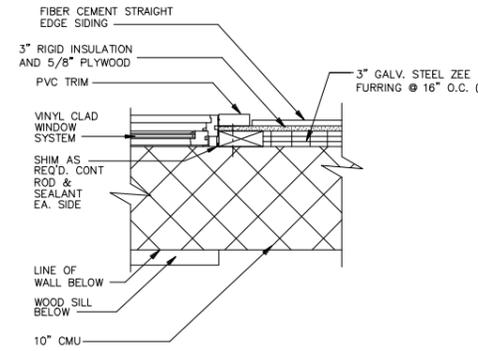
**DOOR HEAD**  
**DETAIL 2**  
1 1/2" = 1'-0" A-4



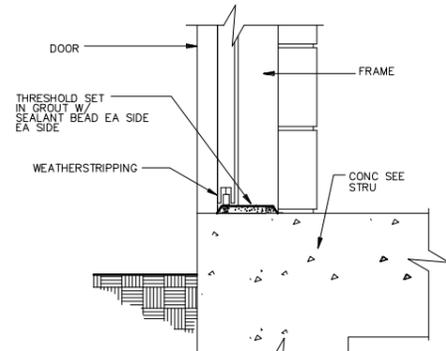
**LOUVER JAMB**  
**DETAIL 3**  
1 1/2" = 1'-0" A-4



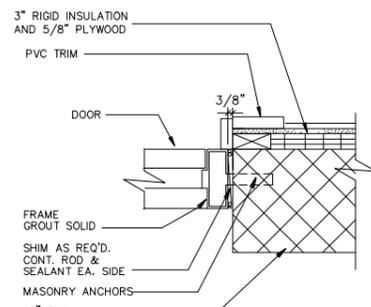
**WINDOW HEAD**  
**DETAIL 4**  
1 1/2" = 1'-0" A-4



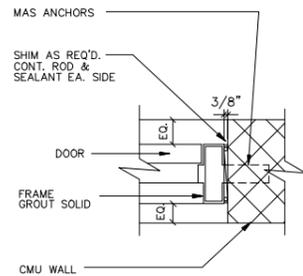
**WINDOW JAMB**  
**DETAIL 5**  
1 1/2" = 1'-0" A-4



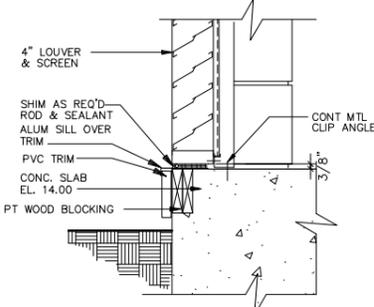
**DOOR THRESHOLD**  
**DETAIL 6**  
1 1/2" = 1'-0" A-4



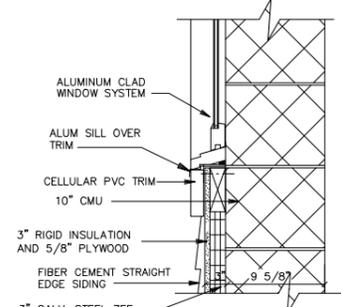
**DOOR JAMB**  
**DETAIL 7**  
1 1/2" = 1'-0" A-4



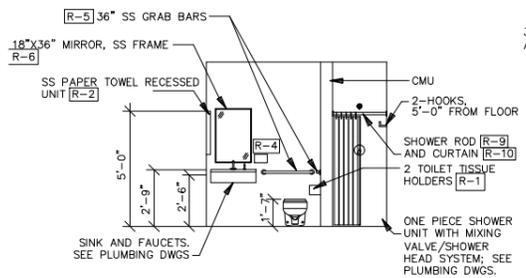
**DOOR JAMB**  
**DETAIL 8**  
1 1/2" = 1'-0" A-4



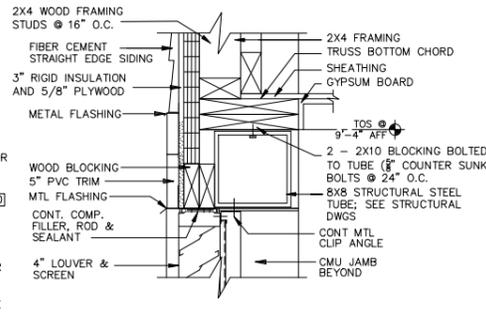
**LOUVER SILL**  
**DETAIL 9**  
1 1/2" = 1'-0" A-4



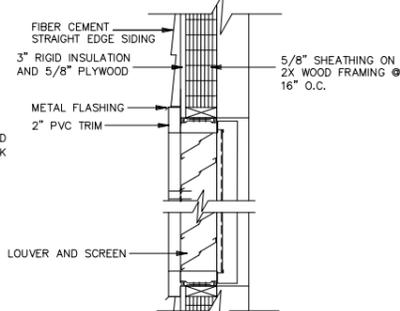
**WINDOW SILL**  
**DETAIL 10**  
1 1/2" = 1'-0" A-4



**ELEVATION 1**  
1/4" = 1'-0" A-2



**LOUVER HEAD**  
**DETAIL 11**  
1 1/2" = 1'-0" A-4



**LOUVER TYPE B**  
**DETAIL 12**  
1 1/2" = 1'-0" A-4

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. GIORGI  
DRAWN BY: C. CHAHANOVICH  
SHEET CHK'D BY: B. GIORGI  
CROSS CHK'D BY: J. O'DONNELL  
APPROVED BY: M. GUIDICE  
DATE: SEPTEMBER 2024



TOWN OF DENNIS, MASSACHUSETTS  
WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
PHASE 1 - CONTRACT NO. 2  
PROJECT NO. CWSRF 16676/2

PUMP STATION NO. 4  
DOOR, WINDOW, AND LOUVER DETAILS



Barry L. Giorgi  
2024.09.06 13:04:12-04'00"  
PROJECT NO. 141004-277870  
FILE NAME: APSDT100

SHEET NO.  
A-6

CONFORMED DRAWINGS

XREFS: [CDMS\_2436, SWPFS03, SWPFS03, AP5WPD01] Images: [ ]  
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A B C D E F G H

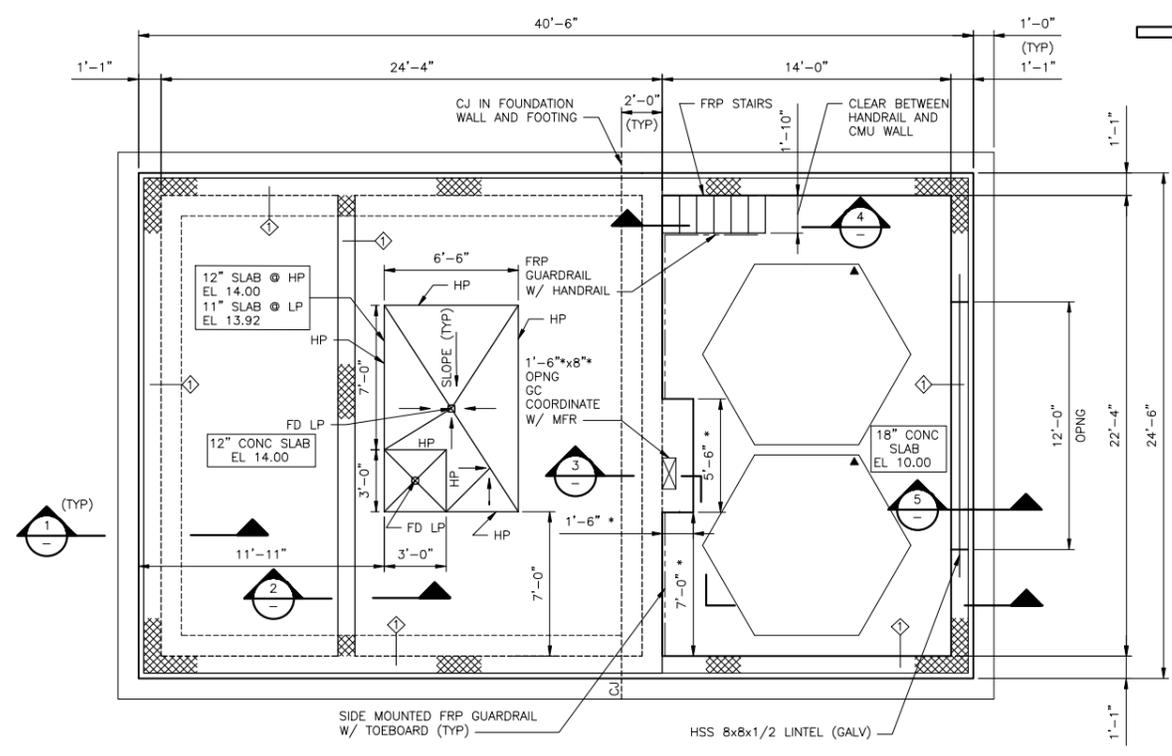
- GENERAL NOTES:**
- ◇ INDICATES 10" THK STRUCTURAL SHEAR WALL.
  - ▲ INDICATES EQUIPMENT PAD.
  - FD INDICATES FLOOR DRAIN.
  - CJ INDICATES CONSTRUCTION JOINT.
  - WHEN BACKFILLING AROUND FOUNDATION WALLS BRING UP BACKFILL UNIFORMLY AROUND THE WALL. CONTROL BACKFILL LEVELS AROUND THE ENTIRE PERIMETER OF THE FOUNDATION SUCH THAT THE GRADE DIFFERENTIAL DOES NOT EXCEED 2 FEET.

- FOUNDATION NOTES:**
- \* INDICATES DIMENSIONS AND/OR INFORMATION TO BE COORDINATED WITH THE MANUFACTURER OF THE APPROVED EQUIPMENT PRIOR TO FABRICATION AND CONSTRUCTION.
  - FOR FOUNDATION LOCATION AND ORIENTATION SEE CIVIL AND ARCH DRAWINGS, UNLESS OTHERWISE INDICATED.

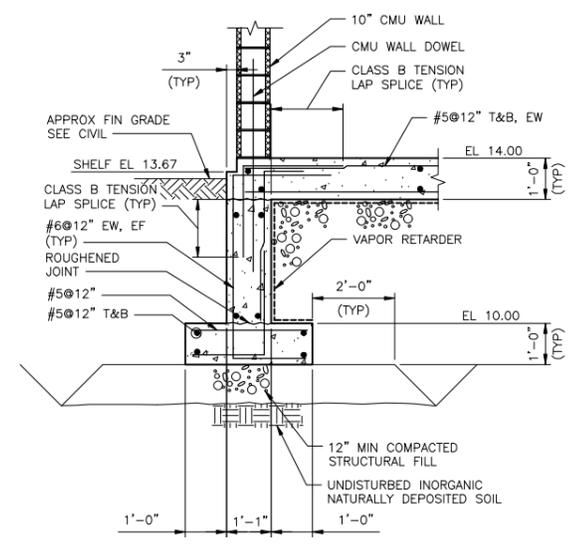
**GEOTECHNICAL NOTE:**

- NET ALLOWABLE BEARING PRESSURE 2800 PSF

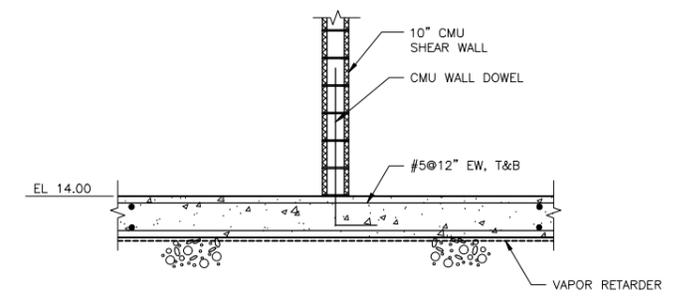
- DESIGN LIVE LOADS:**
- FRP STAIR DESIGN LIVE LOAD = 150 PSF



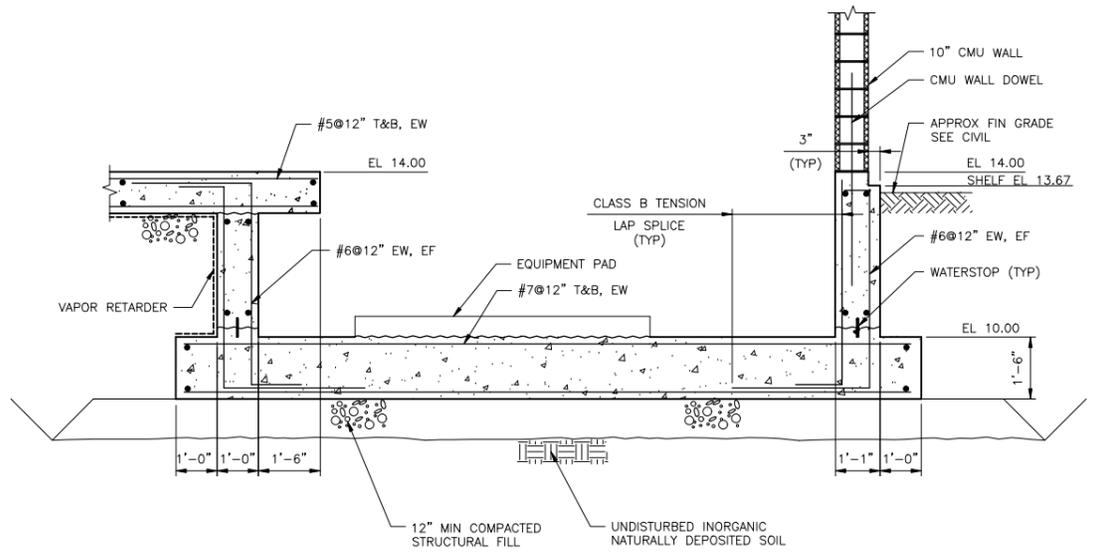
**FOUNDATION PLAN**  
1/4" = 1'-0"



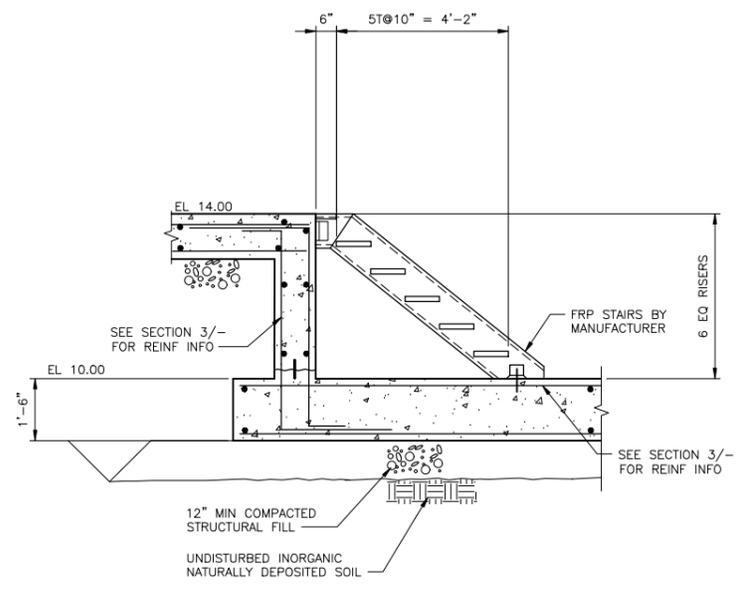
**TYPICAL WALL SECTION SECTION 1**  
1/2" = 1'-0"



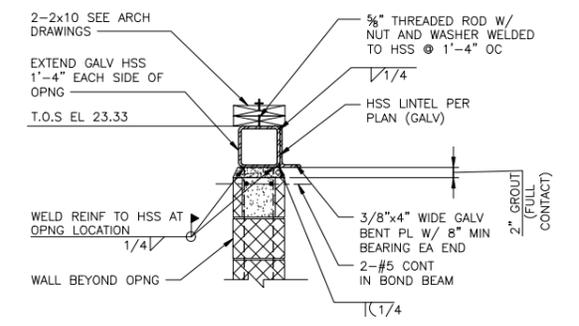
**SECTION 2**  
1/2" = 1'-0"



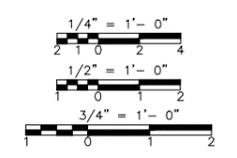
**SECTION 3**  
1/2" = 1'-0"



**SECTION 4**  
1/2" = 1'-0"



**HSS LINTEL OVER OPENING SECTION 5**  
3/4" = 1'-0"



Daniel L. Harris  
2024.09.06 13:09:28-04'00"  
PROJECT NO. 141004-277870  
FILE NAME: S003PSP.dwg

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. AVERIN  
 DRAWN BY: A. AVERIN  
 SHEET CHK'D BY: M.K. BIJU  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: D.L. HARRIS  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

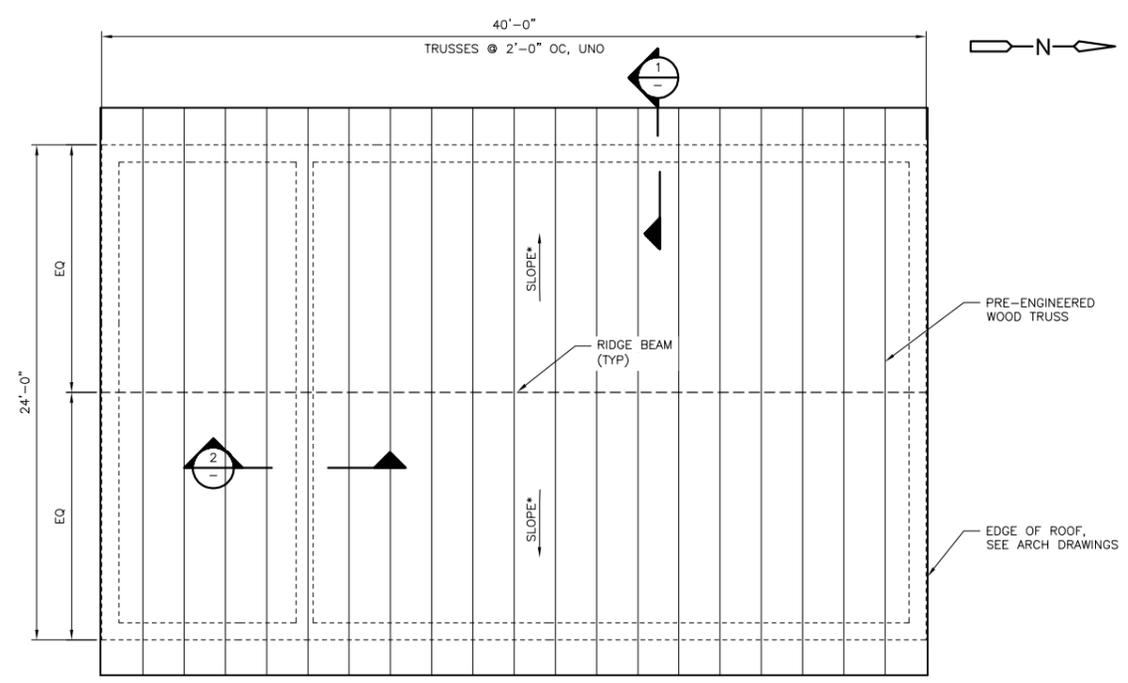
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 PLAN AND SECTIONS

SHEET NO.  
**S-1**

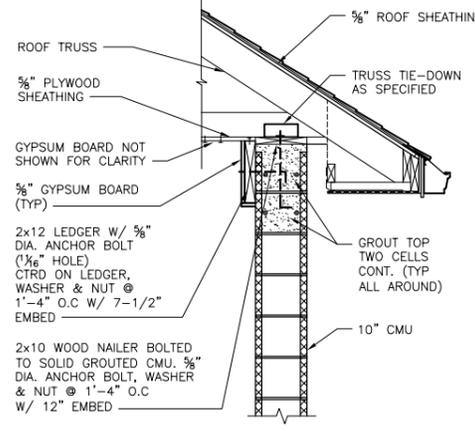
CONFORMED DRAWINGS

A B C D E F G H

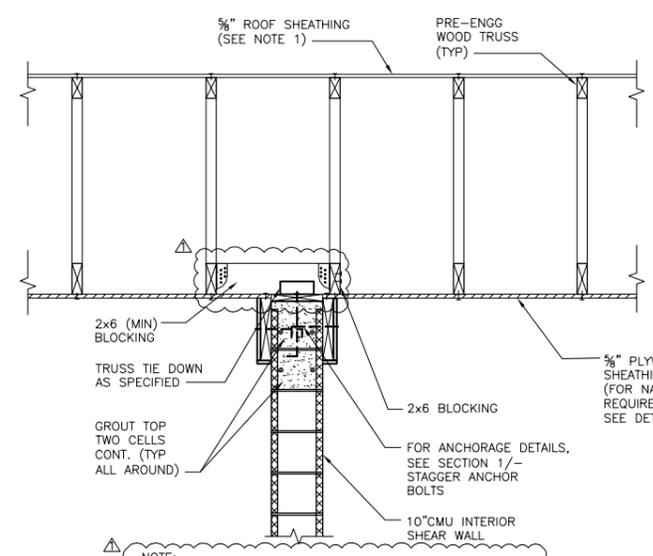


\* REFER ARCHITECTURE DRAWINGS FOR ROOF SLOPE

PLAN  
1/4" = 1'-0"

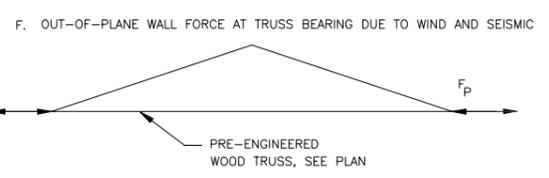
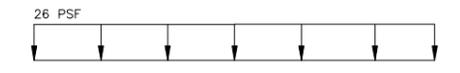


SECTION 1  
3/4" = 1'-0"



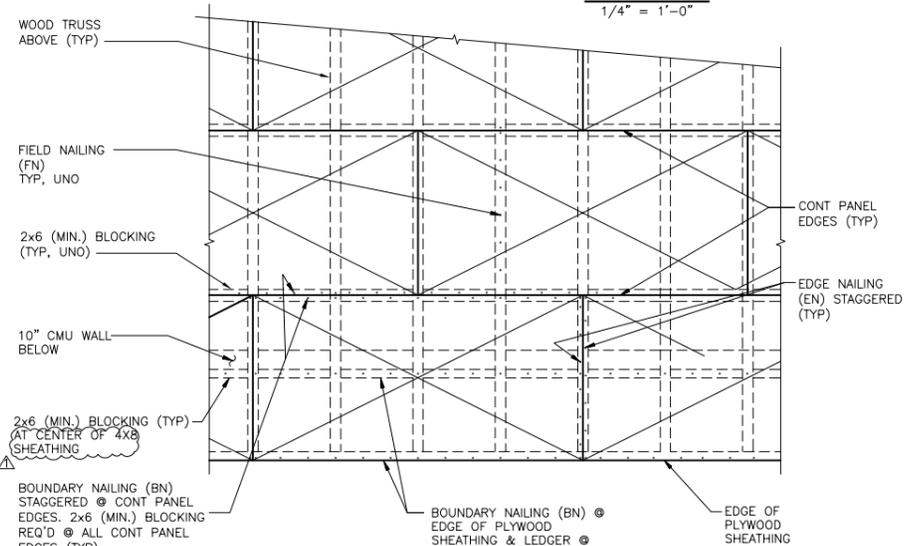
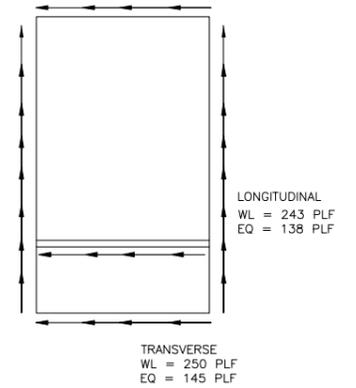
SECTION 2  
3/4" = 1'-0"

- WOOD TRUSS NOTES:**
- A. TRUSS MANUFACTURER'S ENGINEER SHALL DESIGN ALL TRUSSES, ALL TRUSS CONNECTIONS AND ALL TRUSS ANCHORAGES. TRUSS SHOWN IS ONLY SCHEMATIC.
  - B. TRUSS SHALL BE DESIGNED BY THE MANUFACTURER FOR THE FOLLOWING MINIMUM LOADS:
    - SUPERIMPOSED DEAD LOAD 30 PSF
    - HUNG LOAD BOTTOM CHORD OF TRUSS 200 lb ANYWHERE ALONG BOTTOM CHORD
    - LIVE LOAD 20 PSF
    - SNOW LOAD SEE NOTE E AND DIAGRAMS
    - WIND LOAD AND SEISMIC (PER ASCE 7-10 & MASS BUILDING CODE 9TH EDITION)
  - C. WALL TIE LOAD ACTS AT BASE OF SHOE AT WALL BEARING LOCATIONS. TRUSS DESIGN SHALL ACCOUNT FOR ADDED MOMENT DUE TO ECCENTRICITY FROM WALL TIE LOADS.
  - D. WIND AND SEISMIC LOADS ARE STRENGTH LEVEL, UNO.
  - E. SNOW LOAD
    - GROUND SNOW LOAD = 30 PSF
    - BALANCED SNOW LOAD = 26 PSF
    - UNBALANCED ROOF SNOW LOAD = 30 PSF



LOAD	(T/C) AXIAL LOAD F <sub>p</sub>
WL	971 LB
EQ	551 LB

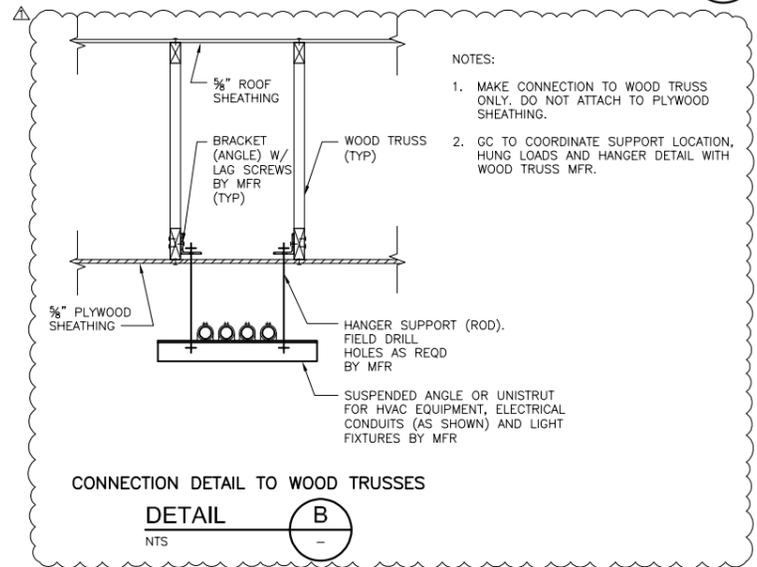
G. IN-PLANE DIAPHRAGM LOADS DUE TO WIND AND SEISMIC



- NOTES:**
1. STAGGER PLYWOOD SHEATHING AS SHOWN WHERE POSSIBLE.
  2. MINIMUM PLYWOOD DIMENSION SHALL BE 2'-0".
  3. PLYWOOD SHEATHING DIAPHRAGM UNDER THE TRUSS BOTTOM CHORD SHALL BE 3/4" CD-X W/ 24/0 SPAN RATING. PROVIDE 2x6 (MIN.) BLOCKING AT ALL EDGES. 6" OC BOUNDARY NAILING (BN) 6" OC EDGE NAILING (EN) 12" OC FIELD NAILING (FN)
  4. USE 10D RING SHANK NAILS UNO.

PLYWOOD SHEATHING DIAPHRAGM AND NAILING AT BOTTOM OF TRUSS

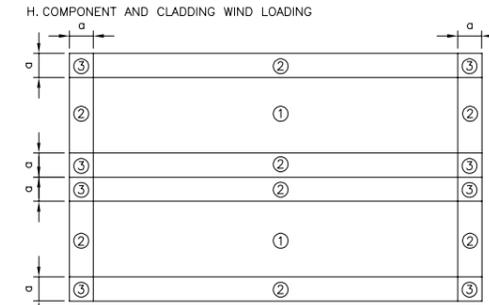
DETAIL A  
NTS



- NOTES:**
1. MAKE CONNECTION TO WOOD TRUSS ONLY. DO NOT ATTACH TO PLYWOOD SHEATHING.
  2. GC TO COORDINATE SUPPORT LOCATION, HUNG LOADS AND HANGER DETAIL WITH WOOD TRUSS MFR.

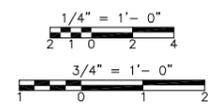
CONNECTION DETAIL TO WOOD TRUSSES

DETAIL B  
NTS



2015 INTERNATIONAL BUILDING CODE SECTION 1603.1.4-5

ROOFING MEMBRANE - TRUSS WIND PRESSURE (PSF)		
ZONE	MAXIMUM POSITIVE PRESSURE	MAXIMUM SUCTION PRESSURE
1 (INTERIOR)	63.9	-68.3
2 (EDGE STRIP)	63.9	-77.2
3 (CORNER)	63.9	-77.2
OVERHANG - JOIST WIND PRESSURE (PSF)		
2 (EDGE STRIP)	63.9	-88.2
3 (CORNER)	63.9	-88.2
WALL (30.1 SFT) WIND PRESSURE (PSF)		
4 (INTERIOR)	64.6	-69.0
5 (CORNER)	64.6	-78.5



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REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	AA	MKB	REVISED PER ADDENDUM NO. 1

DESIGNED BY: A. AVERIN	 3 Davol Square, Building A, Suite A-425 Providence, RI 02903 Tel: (401) 751-5360
DRAWN BY: A. AVERIN	
SHEET CHK'D BY: M.K. BIJU	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: D.L. HARRIS	
DATE: SEPTEMBER 2024	

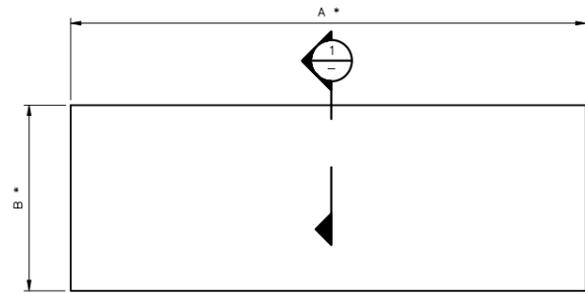
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 PLAN AND SECTIONS  
 SHEET NO. S-2

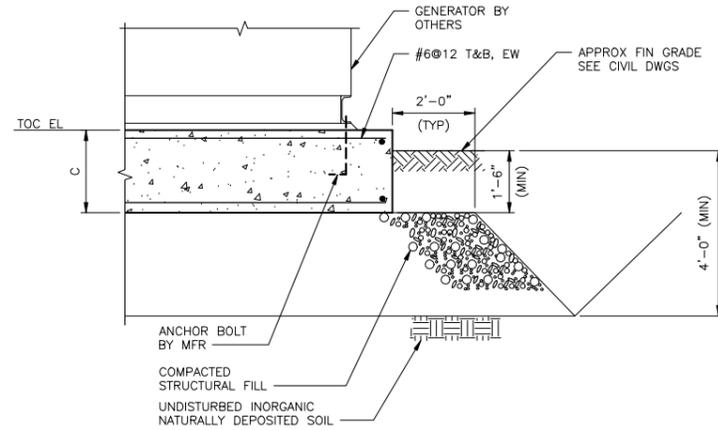
PROJECT NO. 141004-277870  
 FILE NAME: S003PSP.dwg  
 SHEET NO. S-2

CONFORMED DRAWINGS

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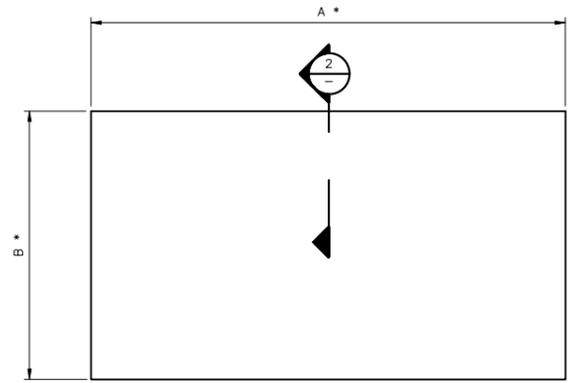
GENERATOR FDN  
PLAN  
1/2" = 1'-0"



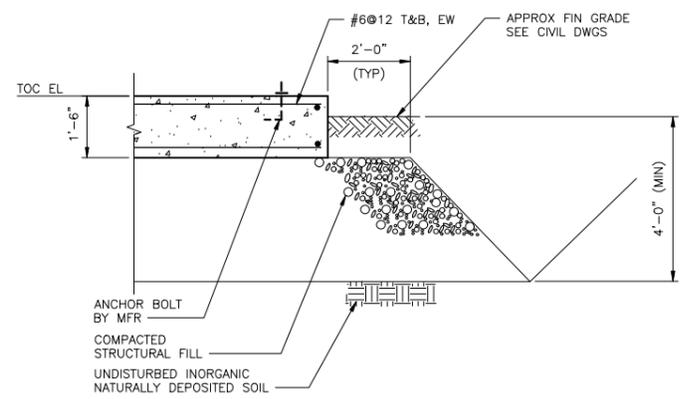
GENERATOR FDN  
SECTION 1  
1/2" = 1'-0"

PUMP STATION	GENERATOR FDN DIMENSIONS			TOC EL
	A	B	C	
PS-1	15'-0"	5'-6"	2'-6"	40.00
PS-3	12'-6"	5'-6"	2'-6"	32.50
PS-4	25'-0"	9'-6"	2'-6"	14.00

- FOUNDATION NOTES:**
- \* INDICATES DIMENSIONS AND/OR INFORMATION TO BE COORDINATED WITH THE MANUFACTURER OF THE APPROVED EQUIPMENT PRIOR TO FABRICATION AND CONSTRUCTION.
  - FOR FOUNDATION LOCATION AND ORIENTATION SEE CIVIL AND ELECTRICAL DRAWINGS, UNLESS OTHERWISE INDICATED.
  - FOUNDATIONS SHALL NOT BE FABRICATED OR CONSTRUCTED UNTIL THE GENERATOR, EQUIPMENT LOADS, ODOR CONTROL DUCT SUPPORT REACTIONS AND DIMENSIONS HAVE BEEN APPROVED AND ADJUSTMENTS TO THE FOUNDATION DETAILS, IF REQUIRED, HAVE BEEN MADE BY THE ENGINEER.
- GEOTECHNICAL NOTE:**
- NET ALLOWABLE BEARING PRESSURE 2800 PSF

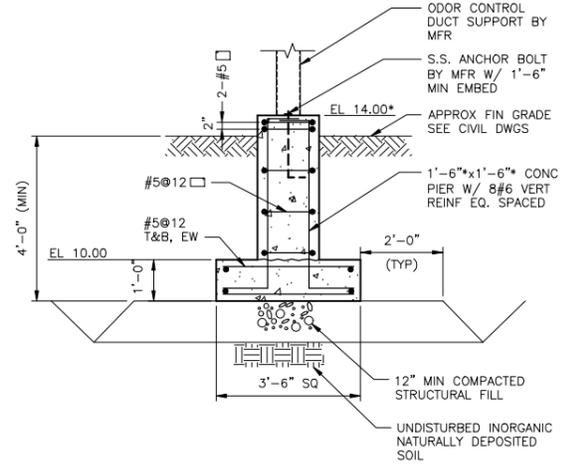


ODOR CONTROL FDN  
PLAN  
1/2" = 1'-0"

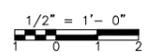


ODOR CONTROL FDN  
SECTION 2  
1/2" = 1'-0"

EQUIPMENT	FOUNDATION SCHEDULE		
	A	B	TOC EL
CARBON ADSORPTION SYSTEM	11'-6"	6'-6"	14.00
VPOC CONTROL PANEL	3'-0"	1'-6"	14.00



DUCT SUPPORT FOOTING  
DETAIL A  
1/2" = 1'-0"



Daniel L. Harris  
2024.09.06 13:09:53-04'00"

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. AVERIN  
 DRAWN BY: A. AVERIN  
 SHEET CHK'D BY: M.K. BIJU  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: D.L. HARRIS  
 DATE: SEPTEMBER 2024

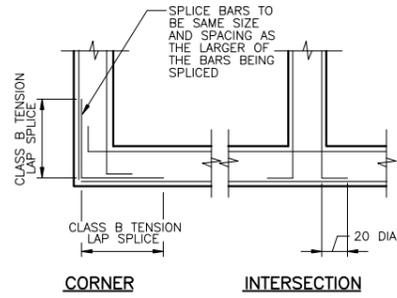


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

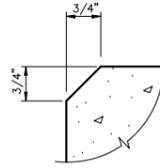
GENERATOR AND ODOR CONTROL FOUNDATIONS  
 PLANS AND SECTIONS

PROJECT NO. 141004-277870  
 FILE NAME: S001GPPL.dwg  
 SHEET NO.  
**S-3**

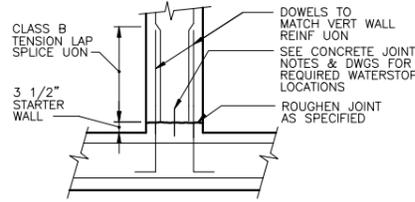
CONFORMED DRAWINGS



**WALL REINFORCEMENT DETAIL**  
NTS

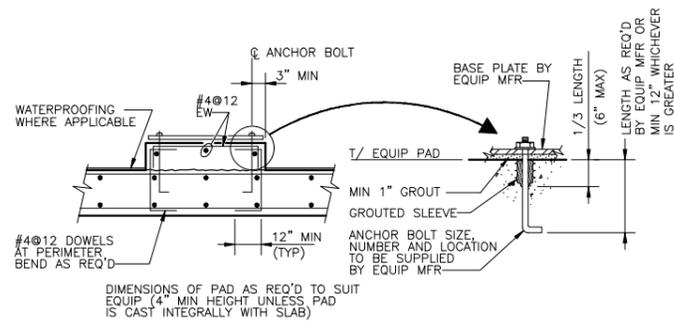


**CHAMFER**  
NTS

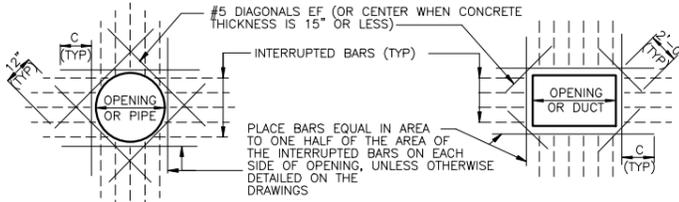


NOTE: STARTER WALL MAY BE ELIMINATED AT JOINTS WITHOUT WATERSTOP AT CONTRACTOR'S OPTION

**WALL CONSTRUCTION JOINT AT SLAB**  
NTS

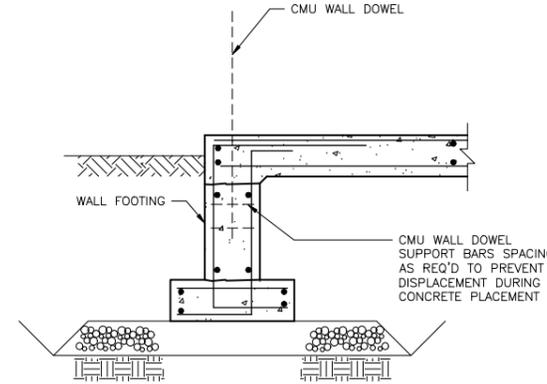


**EQUIPMENT PAD**  
NTS

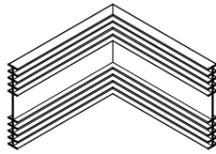


NOTES:  
1. DETAIL IS TYP FOR ALL OPENINGS 15" AND GREATER IN CONCRETE WALLS AND SLABS UNLESS OTHERWISE NOTED. SPREAD REINF AT SMALLER OPENINGS.  
2. BARS ARE NOT REQUIRED AT AN OPENING EDGE PARALLEL TO AND WITHIN 6 INCHES OF A WALL OR BEAM  
3. C = TENSION DEVELOPMENT LENGTH: PROVIDE STD HOOK IF FULL DEVELOPMENT LENGTH IS NOT POSSIBLE  
4. REINFORCING STEEL IS TO BE CARRIED ACROSS ALL CONSTRUCTION JOINTS

**REINFORCEMENT AT OPENINGS**  
NTS



**TYPICAL CMU WALL DOWEL SUPPORT**  
NTS



**VERTICAL ELL**

NOTES:  
1. PVC WATERSTOP SHOWN.  
2. ALL FITTINGS SHALL BE FACTORY MADE OR SHOP WELDED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.  
3. ONLY STRAIGHT BUTT SPLICES MAY BE MADE IN FIELD.

**PREFABRICATED WATERSTOP FITTING DETAILS**  
NTS

**GENERAL NOTES:**

- ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL, HEATING AND VENTILATING, PLUMBING DRAWINGS, SHOP DRAWINGS AND SPECIFICATIONS.
- SEE CIVIL, ARCHITECTURAL, MECHANICAL, HEATING AND VENTILATING, PLUMBING, AND ELECTRICAL DRAWINGS FOR REGLETS, PIPE SLEEVES, CONDUITS OR OTHER ITEMS TO BE EMBEDDED OR PASSED THROUGH THE CONCRETE.
- WHEN BACKFILLING AROUND STRUCTURES, BRING UP BACKFILL UNIFORMLY AROUND STRUCTURE UNLESS INDICATED OTHERWISE. CONTROL BACKFILL LEVELS AROUND THE ENTIRE PERIMETER OF THE STRUCTURE SUCH THAT THE GRADE DIFFERENTIAL DOES NOT EXCEED 1'-6".

**CAST IN PLACE CONCRETE NOTES:**

- REINFORCED CONCRETE SHALL COMPLY WITH ACI 318.
- MINIMUM CONCRETE STRENGTH AT 28 DAYS:  
STRUCTURAL CONCRETE  $f'c = 4000$  psi  
ELECTRICAL RACEWAY ENCASUREMENT  $f'c = 2500$  psi
- REINFORCING STEEL SHALL BE NEW STEEL CONFORMING TO ASTM SPECIFICATION A615 GRADE 60.
- REINFORCING STEEL FABRICATION SHALL BE IN COMPLIANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.
- DETERMINE CLEAR CONCRETE COVER BASED ON EXPOSURE TO THE ENVIRONMENT. REINFORCING STEEL SHALL HAVE THE FOLLOWING CLEAR CONCRETE COVER UNLESS OTHERWISE NOTED:  
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3 IN.  
CONCRETE SURFACES IN CONTACT WITH SOIL, WATER, CHEMICAL OR EXPOSED TO WEATHER:  
WALLS AND TOP OF FOOTINGS AND WALLS AND SLABS AT CHEMICAL CONTAINMENT AREA: 2 IN.  
CONCRETE SURFACE NOT IN CONTACT WITH SOIL, WATER, CHEMICAL OR EXPOSED TO WEATHER:  
TOP OF SLAB: 1 IN. BELOW LOW POINT ELEVATION
- SPLICED BARS SHALL HAVE A MINIMUM LAP OF CLASS B TENSION LAP SPLICE UNLESS OTHERWISE NOTED.
- CONSTRUCTION JOINTS SHALL NOT BE PLACED AT LOCATIONS OTHER THAN THOSE SHOWN ON THE DRAWINGS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ENGINEER.
- SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER.
- ALL EXPOSED CORNERS OF CONCRETE TO HAVE 3/4" MINIMUM CHAMFER UNLESS OTHERWISE NOTED.
- REINFORCING BARS TO EXTEND 12 BAR DIAMETERS BUT NOT LESS THAN 12" BEYOND BEND UNLESS OTHERWISE NOTED.

**CLASS B TENSION LAP SPLICE LENGTHS IN WALLS AND SLABS (INCHES)**

BAR SIZE	$f'c=4000$ psi	
	TOP BARS	OTHER BARS
3	16	16
4	20	16
5	29	23
6	40	31
7	65	50
7*	43	33
8	81	62
8*	49	37
9*	60	46
10*	74	57

**TENSION DEVELOPMENT LENGTHS IN WALLS AND SLABS (INCHES)**

BAR SIZE	$f'c=4000$ psi	
	TOP BARS	OTHER BARS
3	12	12
4	15	12
5	23	17
6	31	24
7	50	38
7*	33	25
8	62	48
8*	37	29
9*	46	36
10*	57	44

- NOTES:  
1. MINIMUM BAR SPACING= 6" INCHES ON CENTER.  
2. MINIMUM CONCRETE COVER = 1", EXCEPT AS NOTED BY \* .  
\* INDICATES MINIMUM CONCRETE COVER= 2".  
3. A TOP BAR IS A HORIZONTAL BAR WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST DIRECTLY BELOW THE BAR. WHERE HORIZONTAL WALL REINFORCEMENT IS UNIFORMLY SPACED IN A VERTICAL PLANE AT 12" MAXIMUM SPACING, LENGTHS MAY BE AS FOR "OTHER BARS".

**LAP SPLICE AND DEVELOPMENT LENGTHS BLACK REINFORCING STEEL**

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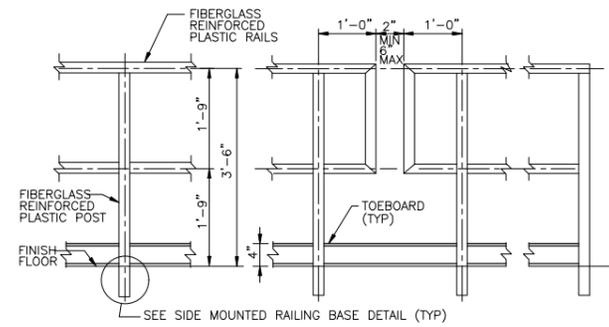
DESIGNED BY: A. AVERIN	<p>3 David Square, Building A, Suite A-425 Providence, RI 02903 Tel: (401) 751-5360</p>
DRAWN BY: A. AVERIN	
SHEET CHK'D BY: M.K. BIJU	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: D.L. HARRIS	
DATE: SEPTEMBER 2024	

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

GENERAL NOTES AND STANDARD DETAILS

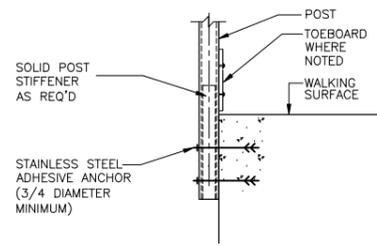
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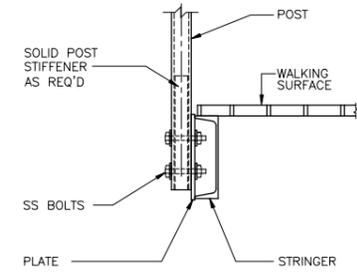


STANDARD RAILING DETAIL

FRP RAILING DETAILS  
NTS



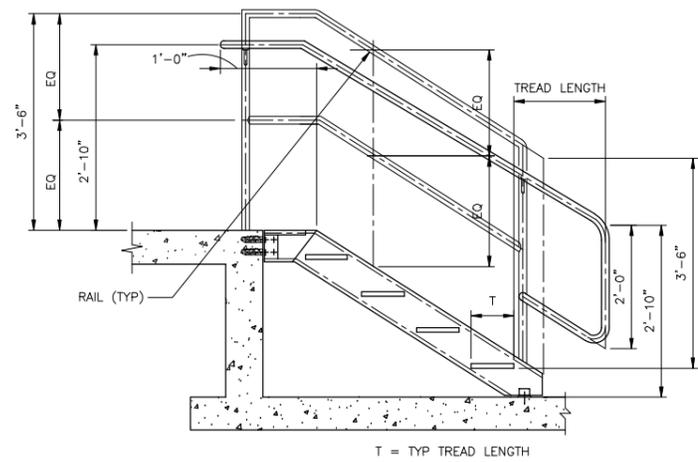
SIDE MOUNTED AT CONCRETE



SIDE MOUNTED AT STAIR

FRP RAILING BASE DETAIL  
NTS

- FRP RAILING NOTES:
1. MAXIMUM POST SPACING SHALL BE 6'-0" OC.
  2. POST AND RAILS SHALL BE 2" X 2" X 1/2" (MIN).
  3. RAILING SYSTEM AND ATTACHMENT DETAILS SHALL BE DESIGNED BY FRP MANUFACTURER, AS SPECIFIED.
  4. ALL RAILING SHALL BE SIDE MOUNTED.



FRP GUARDRAIL/HANDRAIL @ STAIRS  
NTS

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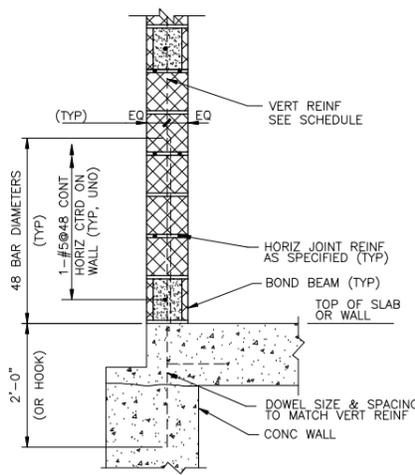
DESIGNED BY: A. AVERIN  
 DRAWN BY: A. AVERIN  
 SHEET CHK'D BY: M.K. BIJU  
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 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
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 Tel: (401) 751-5360

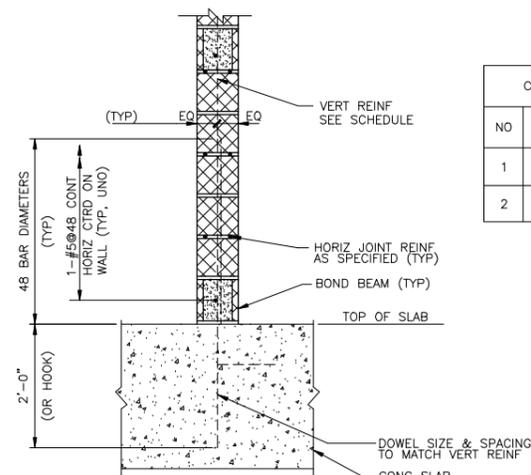
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

STANDARD FRP DETAILS  
 SHEET NO. S-5

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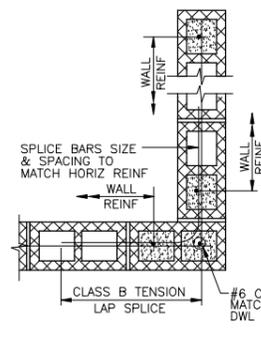
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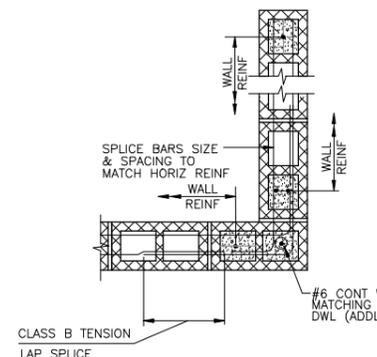
INTERIOR

**TYPICAL 8"/10" CMU WALL REINFORCING**  
NTS

CMU WALL VERT REINFORCING SCHEDULE		
NO	LOCATION	VERTICAL REINF
1	EXTERIOR AND INTERIOR SHEAR WALLS	#5@16 CTRD (TYP, UON)
2	INTERIOR PARTITION WALLS	#5@32 CTRD (TYP)



SINGLE BAR BOND BEAM

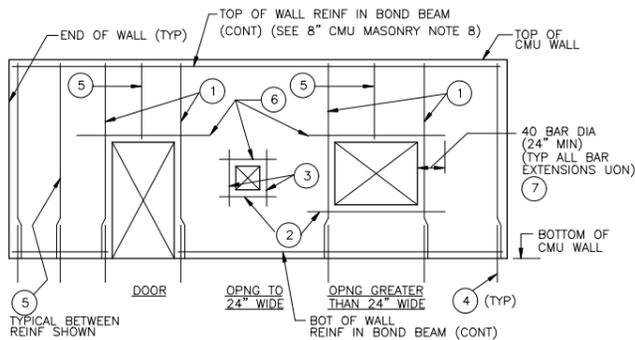


DOUBLE BAR BOND BEAM

**TYPICAL 8"/10" CMU WALL CORNER & END**  
NTS

**8"/10" CMU MASONRY NOTES**

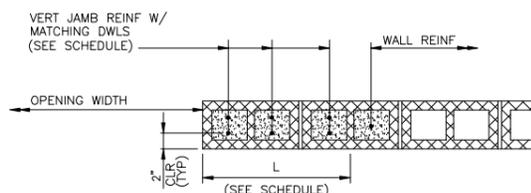
- f'm = 2000 psi.
- CMU MASONRY DETAILS, ELEVATIONS AND NOTES ON THIS SHEET APPLY TO ALL NEW 10" CMU EXTERIOR/INTERIOR AND 8" INTERIOR WALLS UON.
- WALLS CONSISTING OF AN EXTERIOR PORTION AND AN INTERIOR PORTION SHALL BE REINFORCED AS EXTERIOR WALLS OVER THEIR FULL HEIGHT.
- LOAD BEARING WALLS ARE WALLS UPON WHICH A ROOF OR FLOOR IS SUPPORTED. ALL OTHER WALLS ARE NON-LOAD BEARING WALLS.
- FULLY GROUT ALL CELLS AND COURSES WITH VERTICAL OR HORIZONTAL REINFORCING. PROVIDE 2" MINIMUM CLEAR COVER TO THE REINFORCING (UON).
- ALL HORIZONTAL REINFORCING, EXCEPT IN THE LINTELS, SHALL BE PLACED IN A CMU BOND BEAM BLOCK. PROVIDE GALVANIZED METAL LATH IN THE HORIZONTAL JOINT BELOW THE BLOCK TO RETAIN THE GROUT.
- VERTICAL REINFORCING SHALL EXTEND TO 2" BELOW THE TOP OF THE CMU WALL OR PARAPET.
- PROVIDE A CONTINUOUS BOND BEAM WITH 2-#5 CONTINUOUS HORIZONTAL BARS AT THE TOP OF ALL WALLS.
- REINFORCING LAP SPlice LENGTH = 48 BAR DIAMETERS (24" MINIMUM).
- PROVIDE HORIZONTAL JOINT REINFORCING AS SPECIFIED.
- REINFORCING BARS TO EXTEND 12 BAR DIAMETERS BUT NOT LESS THAN 12" BEYOND BEND UON.
- FOR PLAN LOCATION OF MASONRY WALLS AND OTHER MASONRY DETAILS SEE ARCHITECTURAL DRAWINGS.



**TYPICAL 8"/10" CMU WALL ELEVATION**  
NTS

**LEGEND**

- SEE TYPICAL 8"/10" CMU WALL OPENING DETAIL ON THIS SHEET.
- SILL BARS, 1-#5 IN BOND BEAM.
- 1 BAR MATCHING WALL VERT REINF EACH SIDE.
- SEE TYPICAL 10"/8" CMU WALL CORNER & END DETAIL ON THIS SHEET.
- BETWEEN BARS SHOWN, PROVIDE TYPICAL WALL REINFORCING PER TYPICAL 10"/8" CMU WALL REINFORCING DETAIL ON THIS SHEET.
- SEE TYPICAL 10"/8" CMU LINTEL DETAIL ON THIS SHEET, AND THE ARCHITECTURAL DRAWINGS.
- IF FULL LENGTH IS NOT AVAILABLE, EXTEND AS FAR AS POSSIBLE, HOOK 90 DEGREE, THEN EXTEND BEYOND BEND, REMAINDER OF LENGTH REQUIRED (BUT NOT LESS THAN 12").



**TYPICAL CMU JAMB**  
NTS

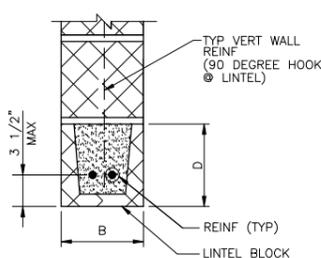
TYPICAL CMU JAMB REINF SCHEDULE					
WALL TYPE	OPENING WIDTH	L	VERTICAL JAMB REINF		NOTES
			BARS CENTERED	BARS E.F.	
INT	<=4'-0"	8"	2-#5, 1 EF		
EXT	<=4'-8"	16"	2-#5, PER CELL	1 EF	
EXT/INT	>4'-8" TO <=6'-0"	16"	2-#5, PER CELL	1 EF	
EXT/INT	>6'-0" TO <=12'-0"	32"	2-#5, PER CELL	1 EF	

BAR SIZE	MIN LAP LENGTH (in)	
	8"/10" BLOCK	
	BARS CENTERED	BARS E.F.
5	30"	39"
6	43"	74"

**NOTES:**

- MASONRY LAP SPLICES APPLICABLE FOR TMS 402-13.
- SPLICE LENGTHS ARE BASED ON MASONRY STRENGTH f'm=2000 PSI AND STEEL YIELD STRENGTH fy=60,000 PSI. MAXIMUM ALLOWABLE STRESS IN STEEL REINFORCEMENT IS LIMITED TO 24,000 PSI.
- LAP SPLICE FOR "EF" ARE BASED ON 2" MINIMUM CLEAR COVER TO THE REINFORCING.

**CMU LAP SPLICES**  
NTS



WALL TYPE	CLEAR SPAN	MARK	B	D	REINF
INTERIOR NONLOAD BEARING	<= 8'-0"		8"/10"	16"	2-#5
EXTERIOR	<= 3'-0"		10"	16"	2-#5

**CMU LINTEL NOTES:**

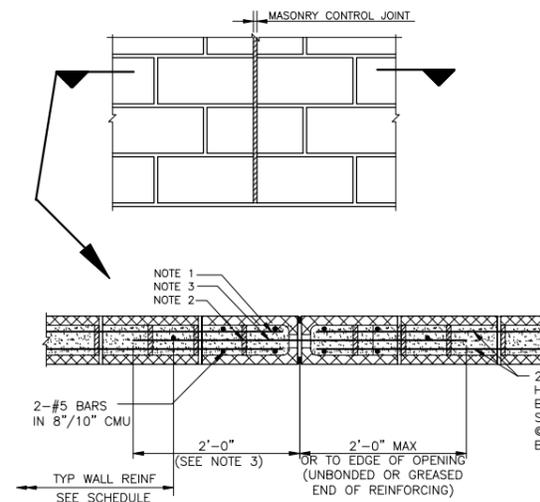
- PROVIDE 8" MINIMUM BEARING AT EACH SIDE OF CLEAR SPAN.
- FULLY GROUT CMU OVER DEPTH "D" TO ENDS OF BEARING.
- D OF 16" MAY CONSIST OF ONE FULLY GROUTED 16" CMU LINTEL BLOCK OR ONE FULLY GROUTED 8" CMU LINTEL BLOCK PLUS ONE FULLY GROUTED 8" CMU.

**TYPICAL 8"/10" CMU LINTEL**  
NTS

**CMU WALL ANCHORAGE NOTES:**

- WHERE POSSIBLE, ANCHORAGE SHALL BE PROVIDED IN THE SAME CELLS AS THE CONTINUOUS VERTICAL WALL REINFORCING.
  - BENT BAR ANCHOR BOLT DIMENSIONS:
- 
- THE NUTS ON THE BENT BAR ANCHOR BOLTS SHALL BE TIGHTENED AND TACK WELDED TO THE BOLTS.

**TYPICAL 8"/10" CMU WALL ANCHORAGE**  
NTS



**MASONRY CONTROL JOINT (MCJ)**  
NTS

**CONTROL JOINT NOTES:**

- TERMINATE HORIZONTAL REINFORCING WITH A STANDARD HOOK TWO INCHES FROM CONTROL JOINTS, UNLESS OTHERWISE NOTED.
- PROVIDE SMOOTH DOWELS IDENTICAL TO HORIZONTAL BAR DIAMETER ACROSS THE JOINT AT HORIZONTAL BAR LOCATIONS. PREVENT BOND BETWEEN BAR AND GROUT ON ONE SIDE OF JOINT WITH GREASE OR A PLASTIC SLEEVE. CAP ALL DOWELS TO ALLOW ONE INCH OF MOVEMENT.
- PROVIDE STD HOOK ON SIDE WITH BOND IF 2'-0" LENGTH IS NOT POSSIBLE.
- CONTINUE HORIZONTAL REINFORCING THROUGH MASONRY CONTROL JOINT AT TOP OF WALL BOND BEAMS AND LINTEL REINFORCING.
- DISCONTINUE HORIZONTAL JOINT REINFORCEMENT AT THE MCJ.



Daniel L. Harris  
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SHEET NO.

S-6

CONFORMED DRAWINGS

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 DRAWN BY: A. AVERIN  
 SHEET CHK'D BY: M.K. BIJU  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: D.L. HARRIS  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES

PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

STANDARD MASONRY DETAILS

REV. NO.	DATE	DRWN	CHKD	REMARKS

**SCHEDULE OF SPECIAL INSPECTIONS**

- NOTES:**
- THIS DRAWING IS PROVIDED TO OUTLINE THE MINIMUM LEVEL OF SPECIAL INSPECTIONS DURING CONSTRUCTION TO ENSURE CONFORMANCE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. A STATEMENT OF SPECIAL INSPECTIONS WILL BE PREPARED BY A REGISTERED DESIGN PROFESSIONAL AND SUBMITTED WITH THE BUILDING PERMIT APPLICATION.
  - SPECIAL INSPECTIONS WILL BE CONDUCTED IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE (IBC) AND CHAPTER 17 OF THE MASSACHUSETTS STATE BUILDING CODE (MSBC).
  - IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE AND CHAPTER 17 OF THE MASSACHUSETTS STATE BUILDING CODE (MSBC), THE OWNER WILL PROVIDE AN APPROVED AGENCY OR AGENCIES, INDEPENDENT FROM THE CONTRACTOR AND EMPLOYING QUALIFIED PERSONNEL TO PERFORM SPECIAL INSPECTIONS IDENTIFIED IN THE STATEMENT OF SPECIAL INSPECTIONS. THE APPROVED AGENCY WILL FURNISH INSPECTION REPORTS TO THE DP, RC AND BUILDING OFFICIAL.
  - SPECIAL INSPECTIONS SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR QUALITY CONTROL OF THE WORK OR FOR CONFORMANCE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. DETECTION, OR FAILURE TO DETECT, DEFECTS IN THE WORK SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO CORRECT ALL DEFECTS IN THE WORK, WHETHER DETECTED OR NOT, AND OF RESPONSIBILITY FOR CONFORMANCE TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
  - REMOVE AND REPLACE, OR REPAIR, DEFECTS IN THE WORK AND WORK NOT IN CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL BEAR THE COSTS FOR THE INSPECTION OF ANY REPLACED OR REPAIRED PORTIONS OF THE WORK.
  - CONTRACTOR SHALL COOPERATE WITH SPECIAL INSPECTIONS BY PROVIDING SUFFICIENT NOTICE FOR THE SCHEDULING OF PERSONNEL AND BY ALLOWING FREE AND SAFE ACCESS TO THE WORK FOR OBSERVATION, VERIFICATION, SAMPLING AND INSPECTION. PROVIDE AND PERMIT THE USE OF LADDERS, SCAFFOLDING, INCIDENTAL EQUIPMENT, AND SAFETY EQUIPMENT AS MAY BE REQUIRED TO CONDUCT SPECIAL INSPECTIONS. ALL SUCH PROVISIONS FOR FREE AND SAFE ACCESS AND EQUIPMENT SHALL BE SAFE, IN GOOD WORKING CONDITION, AND ERECTED, MAINTAINED, AND HANDLED BY QUALIFIED PERSONNEL.
  - SPECIAL INSPECTIONS DO NOT APPLY TO CONTRACTOR'S EQUIPMENT, TEMPORARY STRUCTURES USED FOR CONSTRUCTION, MEANS AND METHODS OF CONSTRUCTION, OR SITE SAFETY. CONTRACTOR SHALL REMAIN RESPONSIBLE FOR ADEQUACY AND SAFETY OF EQUIPMENT, TEMPORARY STRUCTURES USED FOR CONSTRUCTION, MEANS AND METHODS OF CONSTRUCTION AND SITE SAFETY.

VERIFICATION AND INSPECTION	IBC REFERENCE	INSPECTION FREQUENCY		REFERENCE STANDARD	REMARKS
		CONTINUOUS	PERIODIC		
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	1705.6		X	CONTRACT DOCUMENTS AND GEOTECHNICAL REPORT	REFER TO THE FOLLOWING TABLES FOR ADDITIONAL RELATED SPECIAL INSPECTIONS
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL			X		
PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS			X		
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL		X			
PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY			X		

VERIFICATION AND INSPECTION	IBC REFERENCE	INSPECTION FREQUENCY		REFERENCE STANDARD
		CONTINUOUS	PERIODIC	
INSPECTION OF ANCHORAGE AND CONNECTIONS OF MASS TIMBER CONSTRUCTION TO TIMBER DEEP FOUNDATION SYSTEMS.	1705.5		X	
INSPECT ERECTION OF MASS TIMBER CONSTRUCTION.	1705.5		X	
INSPECTION OF CONNECTIONS WHERE INSTALLATION METHODS ARE REQUIRED TO MEET DESIGN LOADS.	1705.5			
THREADED FASTENERS	1705.5		X	
			X	
			X	
BOLTED CONNECTIONS.	1705.5		X	
CONCEALED CONNECTIONS.	1705.5		X	

VERIFICATION AND INSPECTION	IBC REFERENCE	INSPECTION FREQUENCY		REFERENCE STANDARD
		CONTINUOUS	PERIODIC	
INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT	1705.3 1908.4		X	ACI 318: CHAPTER 20, SECTIONS 25.2–25.3, 26.6.1–26.6.3
INSPECTION OF BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE	1705.3		X	ACI 318: SECTION 17.8.2
VERIFYING USE OF REQUIRED DESIGN MIX	1705.3 1904.1 1904.2 1908.2 1908.3		X	ACI 318: CHAPTER 19, SECTIONS 26.4.3–26.4.4
PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	1705.3 1908.10	X		ASTM C172, ASTM C31 ACI 318: SECTIONS 26.5, 26.12
INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	1705.3 1908.6 1908.7 1908.8	X		ACI 318: SECTION 26.5
VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	1705.3 1908.9		X	ACI 318: SECTIONS 26.5.3–26.5.5
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED, SHORING AND RESHORING	1705.3 1903.2		X	ACI 318: SECTION 26.11.1.2(b)
REQUIRED VERIFICATION AND INSPECTION OF POST INSTALLED CONCRETE ANCHORS				
INSPECTION OF MECHANICAL ANCHORS INSTALLED IN HARDENED CONCRETE (EXPANSION ANCHORS)	1705.3 1901.3		X	ACI 318: SECTION 17.8.2 PER ICC TEST REPORT FOR EXPANSION ANCHORING SYSTEM
VERIFICATION AND INSPECTION OF ADHESIVE ANCHORS AND DOWELS INSTALLED IN HARDENED CONCRETE. ANCHOR PRODUCT NAME, TYPE, DIMENSIONS, HOLE DIMENSIONS, COMPLIANCE WITH DRILL BIT REQUIREMENTS, HOLE PREPARATION AND SURFACE ROUGHNESS, CLEANLINESS OF THE HOLE AND ANCHOR/ADHESIVE INSTALLATION, ANCHOR EMBEDMENT, AND TIGHTENING TORQUE	1705.3 1703.4.2	X		ACI 318: SECTION 17.8.2 PER ICC TEST REPORT FOR EXPANSION ANCHORING SYSTEM

VERIFICATION AND INSPECTION	IBC REFERENCE	INSPECTION FREQUENCY		REFERENCE STANDARD
		CONTINUOUS	PERIODIC	
VERIFY COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS	1705.4		X	ACI 530.1 ARTICLE 1.5
VERIFICATION OF $f'_m$ AND $f'_{m,0}$ PRIOR TO CONSTRUCTION EXCEPT WHERE SPECIFICALLY EXEMPTED BY CODE	1705.4		X	ACI 530.1 ARTICLE 1.4B
VERIFICATION OF SLUMP FLOW AND VSI AS DELIVERED TO THE SITE FOR SELF-CONSOLIDATING GROUT	1705.4	X		ACI 530.1 ARTICLE 1.5B.1.b.3
AS MASONRY CONSTRUCTION BEGINS, VERIFY THE FOLLOWING TO ENSURE COMPLIANCE:	1705.4		X	ACI 530.1 ARTICLE 2.6A
			X	ACI 530.1 ARTICLE 3.3B
			X	ACI 530.1 ARTICLES 3.4, 3.6A
DURING CONSTRUCTION, VERIFY:	1705.4		X	ACI 530.1 ARTICLE 3.3F
			X	ACI 530 SECTIONS 1.2.2(e), 1.16.1
			X	ACI 530 SECTIONS 1.15.1, 1.16.1, 1.17 ACI 530.1 ARTICLES 2.4, 3.4
		X		ACI 530 SECTIONS 2.1.9.7.2, 3.3.3.4(b)
e. PREPARATION, CONSTRUCTION AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F) OR HOT WEATHER (TEMPERATURE ABOVE 90°F)	1705.4		X	ACI 530.1 ARTICLES 1.8C, 1.8D
PRIOR TO GROUTING, VERIFY THE FOLLOWING TO ENSURE COMPLIANCE:	1705.4		X	ACI 530.1 ARTICLE 3.2D
			X	ACI 530 SECTION 1.15, 1.16, ACI 530.1 ARTICLES 3.4
			X	ACI 530.1 ARTICLE 3.3B
VERIFY GROUT PLACEMENT TO ENSURE COMPLIANCE	1705.4	X		ACI 530.1 ARTICLE 3.5
OBSERVE PREPARATION OF ANY REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS	1705.4		X	ACI 530.1 ARTICLE 1.4B

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. AVERIN  
 DRAWN BY: A. AVERIN  
 SHEET CHK'D BY: M.K. BIJU  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: D.L. HARRIS  
 DATE: SEPTEMBER 2024



TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

**SPECIAL INSPECTIONS**



Daniel L. Harris  
 2024.09.06 13:10:42-04'00'  
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 SHEET NO.  
**S-7**

XREFs: [CDMS\_2436] Images: [ ]  
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MECHANICAL PIPING GENERAL ABBREVIATIONS:

FLOW DIAGRAM AND MECHANICAL PIPING DRAWING LEGEND:

MECHANICAL PIPING GENERAL NOTES:

AB	ANCHOR BOLT	G	G	GROUND	R	R	RISERS
ABND	ABANDONED	GA	GA	GAUGE, GAGE	RD	RD	ROOF DRAIN
AC	ALTERNATING CURRENT	GALV	GALV	GALVANIZE, GALVANIZED (HOT DIPPED)	RED	RED	REDUCER
ADH	ADHESIVE	GLV	GLV	GLOBE VALVE	REHAB	REHAB	REHABILITATION
AFF	ABOVE FINISHED FLOOR	GPM	GPM	GALLONS PER MINUTE	REINF	REINF	REINFORCING
AG	ABOVE GRADE	GR	GR	GRADE	REQD	REQD	REQUIRED
AHS	AIR HOSE STATION	GRG	GRG	GRATING	RESIL	RESIL	RESILIENT
ALT	ALTERNATE	GV	GV	GATE VALVE	ROUGH	ROUGH	ROUGH
ALY	ALLOY	GVL	GVL	GRAVEL	RH	RH	RIGHT HAND
AMT	AMOUNT	H	H	HIGH	RLG	RLG	RAILING
ANOD	ANODIZED	HD	HD	HEAVY DUTY	RND	RND	ROUND
AP	ACCESS PANEL	HDR	HDR	HEAD	RO	RO	ROUGH OPENING
APPROX	APPROXIMATE	HDR	HDR	HEAD	RP	RP	REDUCED PRESSURE
AR	ACID RESISTANT PIPING	HDR	HDR	HEAD	RPP	RPP	BACK FLOW PREVENTER
ARCH	ARCHITECTURAL	HDR	HDR	HEAD	RPM	RPM	REVOLUTION PER MINUTE
ARD	ACID RESISTANT DRAIN	HDR	HDR	HEAD	RST	RST	REINFORCING STEEL
ARRGT	ARRANGEMENT	HDR	HDR	HEAD	RUB	RUB	RUBBER
ASSY	ASSEMBLY	HDR	HDR	HEAD			
AT	AIR TIGHT	HDR	HDR	HEAD			
AUTO	AUTOMATIC	HDR	HDR	HEAD			
AUX	AUXILIARY	HDR	HDR	HEAD			
AVG	AVERAGE	HDR	HDR	HEAD			
AWG	AMERICAN WIRE GAUGE	HDR	HDR	HEAD			
B	BEND	HDR	HDR	HEAD			
B&B	BELL AND BELL	HDR	HDR	HEAD			
B&F	BELL AND FLANGE	HDR	HDR	HEAD			
B&S	BELL AND SPIGOT, GENERIC	HDR	HDR	HEAD			
BC	BOLT CIRCLE	HDR	HDR	HEAD			
BET	BETWEEN	HDR	HDR	HEAD			
BFV	BUTTERFLY VALVE	HDR	HDR	HEAD			
B FLG	BLIND FLANGE	HDR	HDR	HEAD			
BHP	BRAKE HORSE POWER	HDR	HDR	HEAD			
BIT	BITUMINOUS	HDR	HDR	HEAD			
BLDG	BUILDING	HDR	HDR	HEAD			
BM	BENCH MARK	HDR	HDR	HEAD			
BOT	BOTTOM	HDR	HDR	HEAD			
BRG	BEARING	HDR	HDR	HEAD			
BRK	BRICK	HDR	HDR	HEAD			
BT	BENT	HDR	HDR	HEAD			
BV	BALL VALVE	HDR	HDR	HEAD			
C	CENTER TO CENTER	HDR	HDR	HEAD			
CAJ	CAULKED JOINT	HDR	HDR	HEAD			
CAT	CATALOG	HDR	HDR	HEAD			
CB	CATCH BASIN	HDR	HDR	HEAD			
CEM	CEMENT	HDR	HDR	HEAD			
CENT	CENTRIFUGAL	HDR	HDR	HEAD			
CF	CENTRIFUGAL	HDR	HDR	HEAD			
CFM	CUBIC FEET PER MINUTE	HDR	HDR	HEAD			
CFS	CUBIC FEET PER SECOND	HDR	HDR	HEAD			
CHAM	CHAMFER	HDR	HDR	HEAD			
CHEM	CHEMICAL	HDR	HDR	HEAD			
CHKD	CHECKERED	HDR	HDR	HEAD			
CR	CIRCLE	HDR	HDR	HEAD			
CLG	CENTER LINE	HDR	HDR	HEAD			
CLG	CEILING	HDR	HDR	HEAD			
CLKG	CAULKING	HDR	HDR	HEAD			
CLR	CLEARANCE	HDR	HDR	HEAD			
CMU	CONCRETE MASONRY UNIT	HDR	HDR	HEAD			
CO	CLEAN OUT	HDR	HDR	HEAD			
COL	COLUMN	HDR	HDR	HEAD			
COMP	COMPANION	HDR	HDR	HEAD			
CONC	CONCRETE	HDR	HDR	HEAD			
CONN	CONNECTION	HDR	HDR	HEAD			
CONST	CONSTRUCTION	HDR	HDR	HEAD			
CONT	CONTINUOUS, CONTINUE	HDR	HDR	HEAD			
CONTR	CONTRACTOR OR CONTRACT	HDR	HDR	HEAD			
COR	CORRUGATED	HDR	HDR	HEAD			
CORR	CORRIDOR	HDR	HDR	HEAD			
CPLG	COUPLING	HDR	HDR	HEAD			
CRE	CORROSION RESISTANT	HDR	HDR	HEAD			
CRS	COURSES	HDR	HDR	HEAD			
CSK	COUNTER SINK	HDR	HDR	HEAD			
CSTO	CASTING	HDR	HDR	HEAD			
CTR	CENTER	HDR	HDR	HEAD			
CV	CHECK VALVE	HDR	HDR	HEAD			
DBL	DOUBLE	HDR	HDR	HEAD			
DEMO	DEMOLITION	HDR	HDR	HEAD			
DEPT	DEPARTMENT	HDR	HDR	HEAD			
DIA	DIAMETER	HDR	HDR	HEAD			
DIAG	DIAGONAL	HDR	HDR	HEAD			
DIAP	DIAPHRAGM	HDR	HDR	HEAD			
DIR	DIRECTION	HDR	HDR	HEAD			
DISCH	DISCHARGE	HDR	HDR	HEAD			
DIST	DISTANCE	HDR	HDR	HEAD			
DN	DOWN	HDR	HDR	HEAD			
DWG	DRAWING	HDR	HDR	HEAD			
E	EAST	HDR	HDR	HEAD			
E TO E	END TO END	HDR	HDR	HEAD			
EACH	EACH	HDR	HDR	HEAD			
ECC	ECCENTRIC	HDR	HDR	HEAD			
EF	EACH FACE	HDR	HDR	HEAD			
ELEC	ELECTRICAL	HDR	HDR	HEAD			
ELEV	ELEVATION	HDR	HDR	HEAD			
ELL	ELBOW	HDR	HDR	HEAD			
EMERG	EMERGENCY	HDR	HDR	HEAD			
ENG	ENGINEER	HDR	HDR	HEAD			
EQ	EQUAL	HDR	HDR	HEAD			
EQUIP	EQUIPMENT	HDR	HDR	HEAD			
EW	EACH WAY	HDR	HDR	HEAD			
EWU	EYE WASH UNIT	HDR	HDR	HEAD			
EXH	EXHAUST	HDR	HDR	HEAD			
EXIST	EXISTING	HDR	HDR	HEAD			
EXP	EXPANSION	HDR	HDR	HEAD			
EXP JT	EXPANSION JOINT	HDR	HDR	HEAD			
EXT	EXTERNAL	HDR	HDR	HEAD			
F	FARENHEIT	HDR	HDR	HEAD			
FA	FLANGE ADAPTER	HDR	HDR	HEAD			
FAB	FABRICATED	HDR	HDR	HEAD			
FC	FLEXIBLE COUPLING	HDR	HDR	HEAD			
FD	OR CONNECTION	HDR	HDR	HEAD			
FDN	FLOOR DRAIN	HDR	HDR	HEAD			
FDN	FOUNDATION	HDR	HDR	HEAD			
FH	FIRE HYDRANT	HDR	HDR	HEAD			
FIN	FINISHED	HDR	HDR	HEAD			
FIN GR	FINISHED GRADE	HDR	HDR	HEAD			
FL	FLUSH	HDR	HDR	HEAD			
FLG	FLOOR	HDR	HDR	HEAD			
FLG	FLANGE	HDR	HDR	HEAD			
FLGD	FLANGED	HDR	HDR	HEAD			
FLV	FLAP VALVE	HDR	HDR	HEAD			
FM	FORCE MAIN	HDR	HDR	HEAD			
FFM	FEET PER MINUTE	HDR	HDR	HEAD			
FFS	FEET PER SECOND	HDR	HDR	HEAD			
FV	FOOT VALVE	HDR	HDR	HEAD			

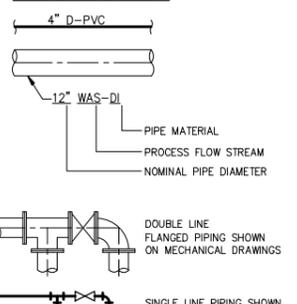
PROCESS FLOW STREAMS:

BYP	BYPASS
D	DRAIN
FA	FOUL AIR
FM	FORCE MAIN
INF	INFILTRANT
S	SEWAGE
SD	STORM DRAIN
VT	VENT
WM	WATER MAIN

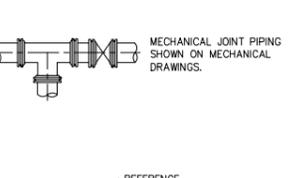
PIPE MATERIALS:

CI	CAST IRON
DI	DUCTILE IRON
CU	COPPER
CPVC	CHLORINATED POLYVINYLCHLORIDE
FRP	FIBERGLASS REINFORCED PLASTIC PIPE
GLDI	GLASS LINED DUCTILE IRON
GS	GALVANIZED STEEL PIPE
HDPE	HIGH DENSITY POLYETHYLENE
PVC	POLYVINYL CHLORIDE SEWER PIPE
PVC	POLYVINYL CHLORIDE PRESSURE PIPE
PVC	PERFORATED POLYVINYL CHLORIDE PIPE
POLYP	POLYPROPYLENE
RC	REINFORCED CONCRETE PIPE
STL	STAINLESS STEEL
STL	BLACK STEEL PIPE OR CARBON STEEL PIPE

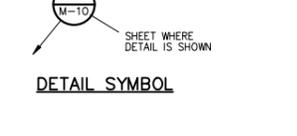
TYPICAL PIPE TAGS



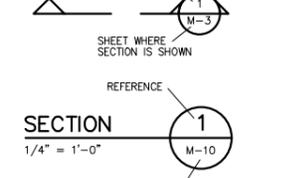
MECHANICAL JOINT PIPING SHOWN ON MECHANICAL DRAWINGS.



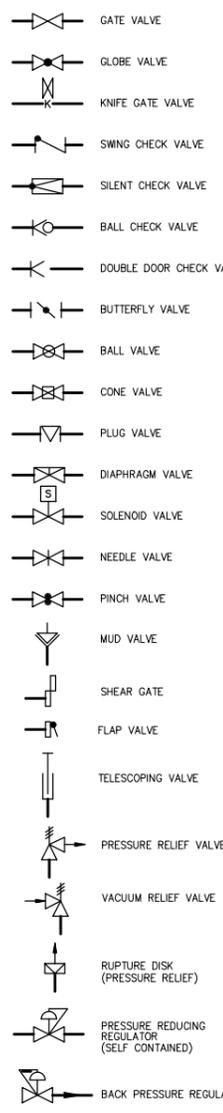
SECTION SYMBOL



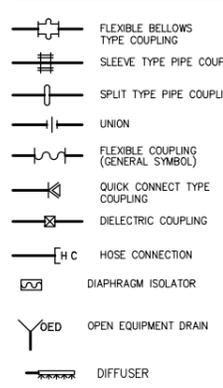
SECTION SYMBOLS



VALVE SYMBOLS



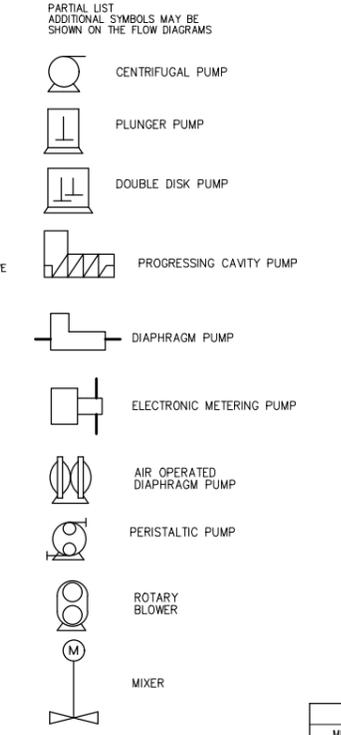
MISCELLANEOUS FITTINGS AND PIPING COMPONENTS



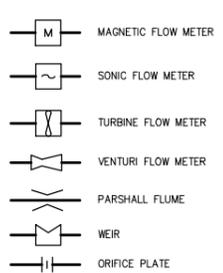
NOTE:

THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON THE CONTRACT DRAWINGS. ADDITIONAL LEGENDS AND/OR ABBREVIATIONS MAY APPEAR IN THIS SET OF DRAWINGS TO INDICATE SPECIFIC CONDITIONS.

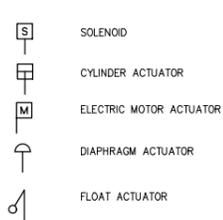
GENERAL EQUIPMENT SYMBOLS



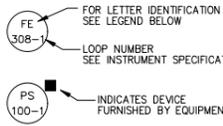
INSTRUMENTATION



VALVE OPERATORS



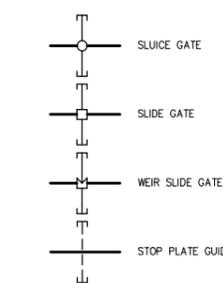
INSTRUMENT TAGS



NOTE:

MECHANICAL DRAWINGS SHOW ONLY PRIMARY INSTRUMENT ELEMENTS. FOR ADDITIONAL DETAILS REFER TO INSTRUMENTATION SPECIFICATIONS.

GATE SYMBOLS



INSTRUMENT LETTER IDENTIFICATION TABLE

FOR ADDITIONAL DETAILS SEE INSTRUMENTATION SPECIFICATIONS

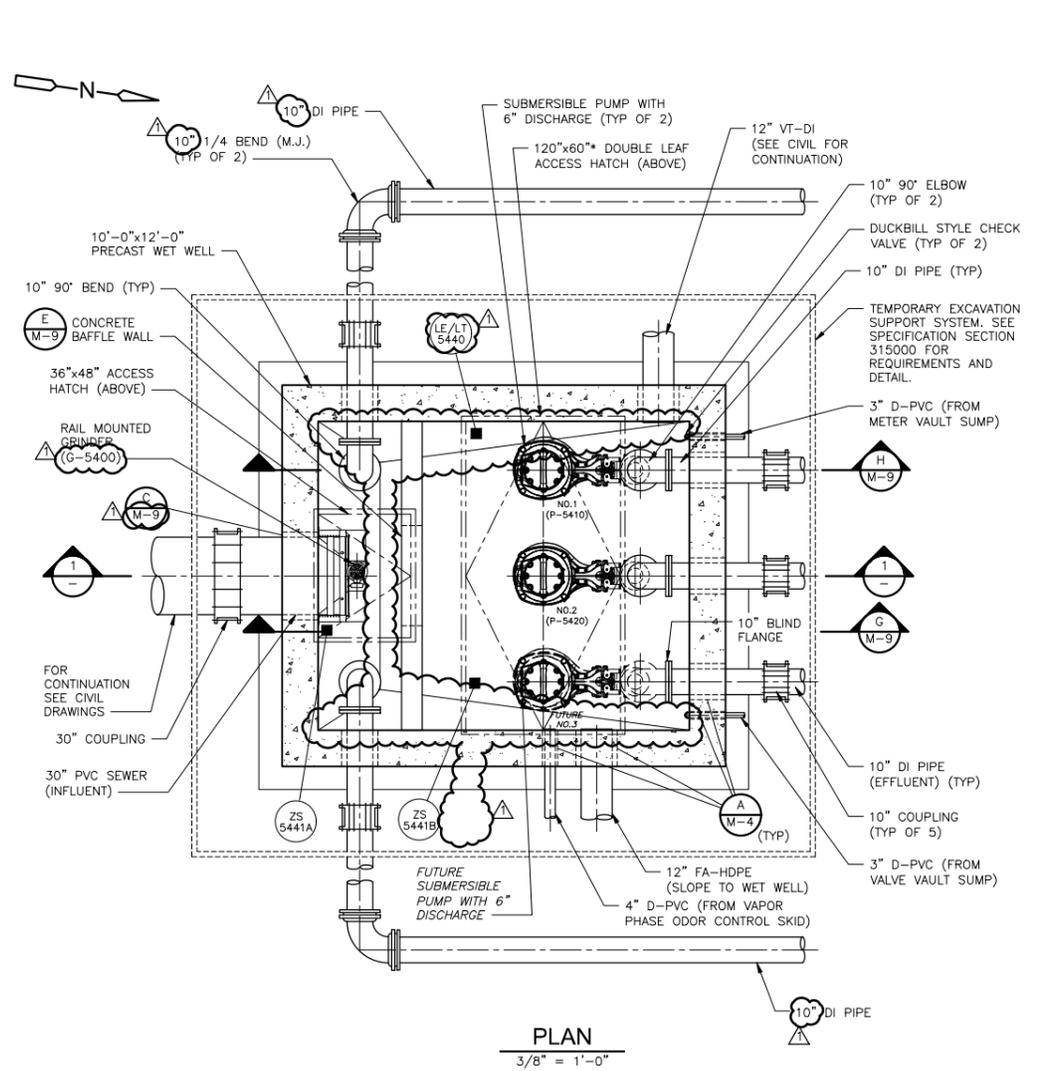
FIRST LETTER	SUCCEEDING LETTERS			
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION
A	ANALYSIS		ALARM	
B	BURNER FLAME		USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL		
E	VOLTAGE (EMF)		PRIMARY ELEMENT	
F	FLOW RATE	RATIO (FRACTION)		
G	GAGING (DIMENSIONAL)		GLASS	
H	HAND (MANUALLY INITIATED)			HIGH
I	CURRENT (ELECTRICAL)		INDICATE	
J	POWER	SCAN		
K	TIME OR TIME-SCHEDULE			CONTROL STATION
L	LEVEL		LIGHT (PILOT)	LOW
M	MOISTURE OR HUMIDITY			MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)	
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)	
Q	QUANTITY OR EVENT	INTEGRATE OR TOTALIZE		
R	RADIOACTIVITY		RECORD OR PRINT	
S	SPEED OR FREQUENCY	SAFETY		SWITCH
T	TEMPERATURE			TRANSMIT
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY			VALVE, DAMPER OR LOUVER
W	WEIGHT OR FORCE		WELL	
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED
Y	USER'S CHOICE			RELAY OR COMPUTE
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT

- PROCESS EQUIPMENT DIMENSIONS, LOCATIONS AND PIPING SYSTEM LAYOUTS ARE BASED ON EQUIPMENT SELECTED BY THE ENGINEER AND ALLOW FOR FUTURE EXPANSION OF THE FACILITIES. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT THAT REQUIRES AN ARRANGEMENT OR SPACE DIFFERING FROM THAT INDICATED ON THE DRAWINGS OR SPECIFIED, THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR APPROVAL DETAILED ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, INSTRUMENTATION, HVAC AND ELECTRICAL DRAWINGS AND EQUIPMENT LISTS SHOWING ALL NECESSARY CHANGES AND EMBODYING ALL FEATURES OF THE EQUIPMENT AND/OR PROCESS SYSTEM PROPOSED TO BE FURNISHED. SUCH CHANGES APPROVED BY THE ENGINEER SHALL BE AT NO EXTRA COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME THE COST OF, AND THE RESPONSIBILITY FOR, SATISFACTORILY ACCOMPISHING ALL THE NECESSARY CHANGES CORRESPONDING TO THE DIMENSIONS AND CHARACTERISTICS OF THE EQUIPMENT SUBMITTED AND APPROVED BY THE ENGINEER. REFER TO SPECIFICATIONS FOR FURTHER DETAILS.
- SIZES OF EQUIPMENT FOUNDATIONS INDICATED ON THE DRAWINGS ARE APPROXIMATE. EXACT DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FOR THE EQUIPMENT FURNISHED. ALL FLOOR MOUNTED EQUIPMENT SHALL BE SET ON CONCRETE PADS CONFORMING TO DETAILS SHOWN ON THE STRUCTURAL AND/OR MECHANICAL DRAWINGS.
- EXTERIOR PIPING IS SHOWN ON THE CIVIL DRAWINGS.
- DIELECTRIC COUPLINGS, FLANGES OR UNIONS SHALL BE INSTALLED AT ALL CONNECTIONS OF COPPER PIPE TO OTHER TYPES OF METALLIC PIPING.
- MECHANICAL PIPING DRAWINGS DO NOT SHOW ALL VALVES, GAUGES, SWITCHES, OPERATORS, DRAINS, VENTS, ETC. REQUIRED FOR THE COMPLETE SYSTEM. CERTAIN SMALL DIAMETER PROCESS PIPING RUNS (3" AND SMALLER) MAY NOT BE SHOWN IN THEIR ENTIRETY. GENERALLY SMALL PIPING IS SHOWN DIAGRAMMATICALLY. FIELD ROUTE TO AVOID INTERFERENCES, SUBJECT TO THE APPROVAL OF THE ENGINEER. APPURTENANCES MAY BE OMITTED FOR THE SAKE OF CLARITY. THE CONTRACTOR SHALL FURNISH, INSTALL AND TEST ALL PIPING SYSTEMS AS INDICATED ON THE PROCESS FLOW SCHEMATICS AND/OR AS DEFINED IN THE SPECIFICATIONS TO PROVIDE THE COMPLETE SYSTEM.
- UNLESS OTHERWISE SHOWN ON THE MECHANICAL DRAWINGS ALL FLOORSLAB, WALL AND TANK PENETRATIONS SHALL BE AS SHOWN ON THE PENETRATION DETAILS INCLUDED IN THE MECHANICAL CONSTRUCTION DETAILS. ABOVE GROUND EXTERIOR WALL AND ROOF PENETRATIONS SHALL BE AS SHOWN ON THE ARCHITECTURAL DRAWINGS. IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY SUBSTITUTE ALTERNATE METHODS PROVIDING THEY MEET INTENDED DESIGN REQUIREMENTS.
- NOT ALL AND ONLY CERTAIN TYPES OF SUPPORTS ARE SHOWN ON THE MECHANICAL DRAWINGS. UNLESS OTHERWISE DETAILED ON THE DRAWINGS ALL PIPE SUPPORTS SHALL BE DESIGNED, FURNISHED AND INSTALLED BY THE CONTRACTOR AS SPECIFIED AND TO THE APPROVAL OF ENGINEER. NOTE THAT ALL PIPING ADJACENT TO EQUIPMENT, VALVES, COUPLINGS, INSTRUMENT DEVICES AND OTHER APPURTENANCES SHALL BE PROPERLY SUPPORTED AND/OR ANCHORED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
- ALL EQUIPMENT BASES AND PIPING HAVING DRAIN OUTLETS SHALL BE PIPED TO THE NEAREST OPEN END DRAIN (OED) OR TRENCH DRAIN USING GALVANIZED STEEL PIPE OF APPROPRIATE DIAMETER AS INDICATED ON THE DRAWINGS OR AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- UNLESS OTHERWISE SHOWN ALL PIPES UNDER CONCRETE SLABS SHALL BE ENCASED IN CONCRETE AS SHOWN ON THE STRUCTURAL DRAWINGS.
- NOT ALL VALVE AND GATE OPERATORS ARE SHOWN (I.E. HANDWHEELS, CRANKS, CHAINWHEELS, MOTORS OR LEVERS). OPERATORS SHALL BE LOCATED TO ALLOW CONVENIENT OPENING AND CLOSING OF VALVES OR GATES. ORIENTATION OF OPERATORS SHALL BE TO APPROVAL OF ENGINEER. NO VALVE SHALL BE INSTALLED WITH THE OPERATING STEM IN THE VERTICAL DOWNWARD POSITION.
- PIPING SHALL BE INSTALLED SO THAT ANY PIPE, LAYER OF PIPING OR EQUIPMENT CAN BE REMOVED WITHOUT DISTURBING REMAINING PIPES AND SUPPORTS.
- THE NUMBER OF UNIONS AND OTHER TYPES OF DISMANTLING COUPLINGS SHOWN IS APPROXIMATE. THE CONTRACTOR SHALL PROVIDE UNIONS OR DISMANTLING COUPLINGS WHETHER THEY ARE SHOWN ON THE DRAWINGS OR NOT ON ALL PIPELINES WITH WELDED, THREADED OR SOLVENT CEMENTED JOINTS. AT ALL EQUIPMENT CONNECTIONS, AT A MINIMUM EVERY 50 FEET AND IN BRANCH LINES TO ALLOW CONVENIENT REMOVAL OF PIPING, EQUIPMENT AND APPURTENANCES.
- FURNISH AND INSTALL ESCUTCHEON PLATES OF SUITABLE SIZE ON ALL PROCESS LINES PASSING THROUGH INTERIOR WALLS OF NON-PROCESS AREAS SUCH AS OFFICES, LABS, LOCKER ROOMS, TOILETS AND PUBLIC CORRIDORS. ESCUTCHEON PLATES SHALL BE INSTALLED ON THE INTERIOR SIDE OF THE NON-PROCESS ROOMS. EXTERIOR, ABOVE GROUND WALL PENETRATIONS SHALL BE SPLIT AND MADE OF 316 SS UNLESS OTHERWISE SHOWN ON THE ARCHITECTURAL DETAILS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD LOCATING AND TAGGING ALL PROCESS VALVES. PROCESS VALVE IDENTIFICATION SYSTEM SHALL BE AS DETAILED IN THE SPECIFICATIONS.
- ALL PIPING ENCASED IN CONCRETE SHALL HAVE MECHANICAL JOINTS AT ALL STRUCTURAL EXPANSION JOINTS.
- PORTIONS OF NONPROCESS PIPING (HVAC & PLUMBING) ARE SHOWN FOR CLARITY AND FOR COORDINATION BETWEEN DISCIPLINES. REFER TO APPROPRIATE DRAWINGS AND SPECIFICATIONS.
- ALL PIPING AND PROCESS SYSTEMS SHALL BE CAPABLE OF BEING VENTED AND DRAINED. TYPICAL LOCATIONS ARE INDICATED BY (V) OR (D) ON THE DRAWINGS.
- ALL DIMENSIONS MARKED WITH \* INDICATE CONTRACTOR TO COORDINATE DIMENSION WITH MANUFACTURER OF APPROVED EQUIPMENT.
- ALL DIMENSIONS MARKED WITH @ INDICATE CONTRACTOR TO COORDINATE DIMENSION IN THE FIELD TO APPROVAL OF ENGINEER

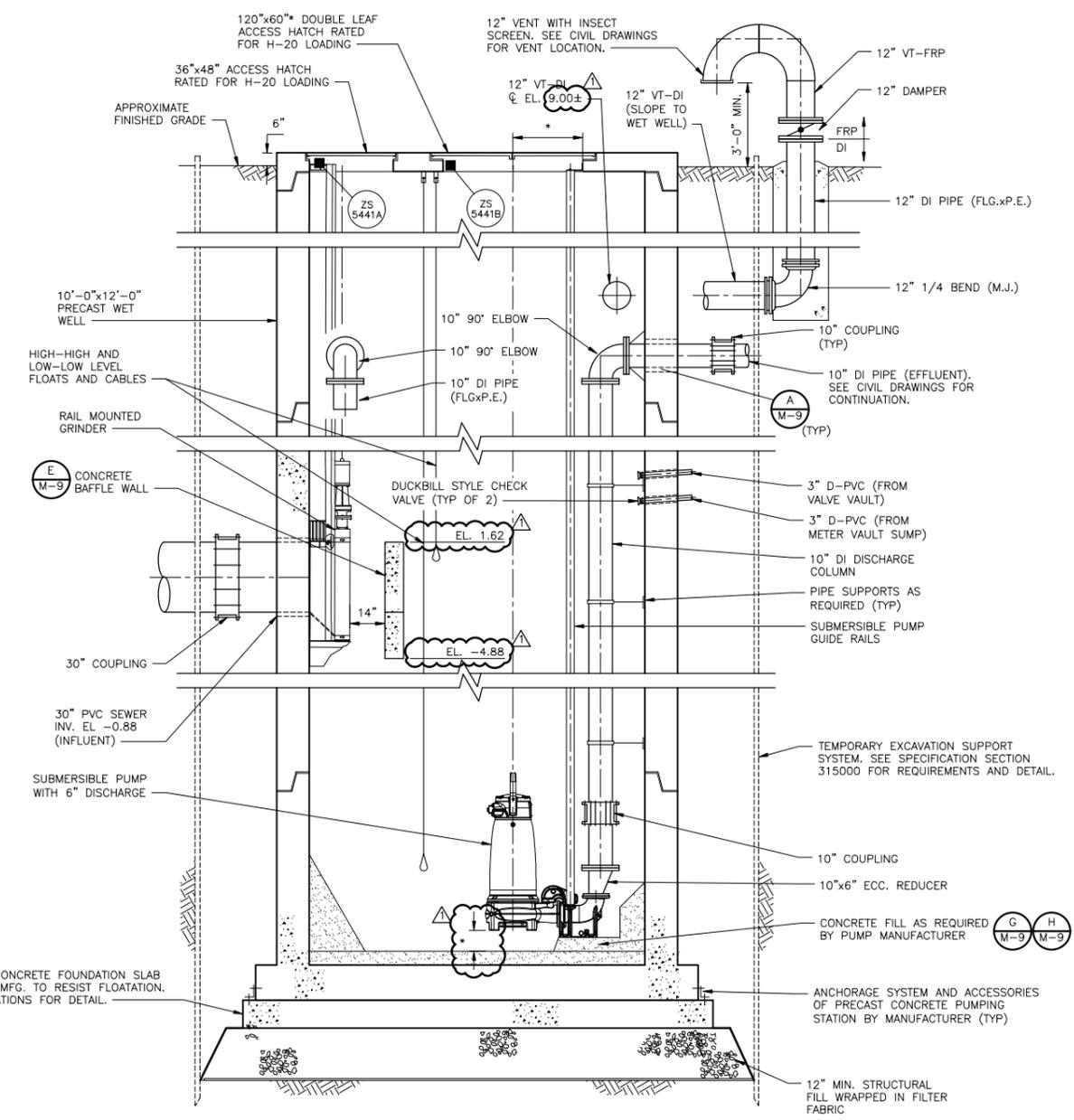


Michael P Guidice  
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SHEET NO.

XREFS: [CDMS\_2436] Images: [ ]  
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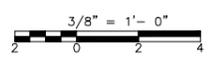
**PLAN**  
3/8" = 1'-0"



**SECTION 1**  
3/8" = 1'-0"

PUMPING STATION NO.4 TABLE	
TOP OF STATION ELEVATION	14.00
INFLUENT PIPE	30" PVC SEWER INV. EL. -0.88
HIGH-HIGH ALARM FLOAT ELEVATION	1.07
PUMP ON LEVEL ELEVATION	-1.88
PUMP OFF LEVEL ELEVATION	-7.88
LOW LEVEL ALARM ELEVATION	-8.88
INVERT OF STRUCTURE ELEVATION	-11.88
BOTTOM OF STRUCTURE ELEVATION	-13.13
DISCHARGE PIPE, VALVES AND ALL FITTINGS	AS NOTED ON DRAWINGS
FORCE MAIN	14" HDPE CL. EL. 4.70 (APPROX.)

- NOTES:**
- ELEVATIONS AND DIMENSIONS NOTED WITH \* ARE SUBJECT TO CHANGE BASED ON CONTRACTORS SUBMITTED EQUIPMENT AND SHALL BE APPROVED BY THE ENGINEER.
  - CONFIRM ACCESS HATCH SIZE WITH PUMP MANUFACTURER FOR REMOVAL/MAINTENANCE
  - PIPE SUPPORTS ARE SHOWN FOR CONCEPTUAL PURPOSES ONLY AND SHALL BE DESIGNED BY THE MANUFACTURER.
  - MINIMUM SUBMERGENCE SHALL BE AS RECOMMENDED BY PUMP MANUFACTURER.
  - FOR EXCAVATION SUPPORT REQUIREMENTS, SEE SPECIFICATION SECTION 315000 FOR DETAIL.



REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	AW	JD	REVISED PER ADDENDUM NO. 1.

DESIGNED BY: J. O'DONNELL  
 DRAWN BY: A. WELDON  
 SHEET CHK'D BY: J. O'DONNELL  
 CROSS CHK'D BY: R. LOF  
 APPROVED BY: M. GUIDICE  
 DATE: SEPTEMBER 2024

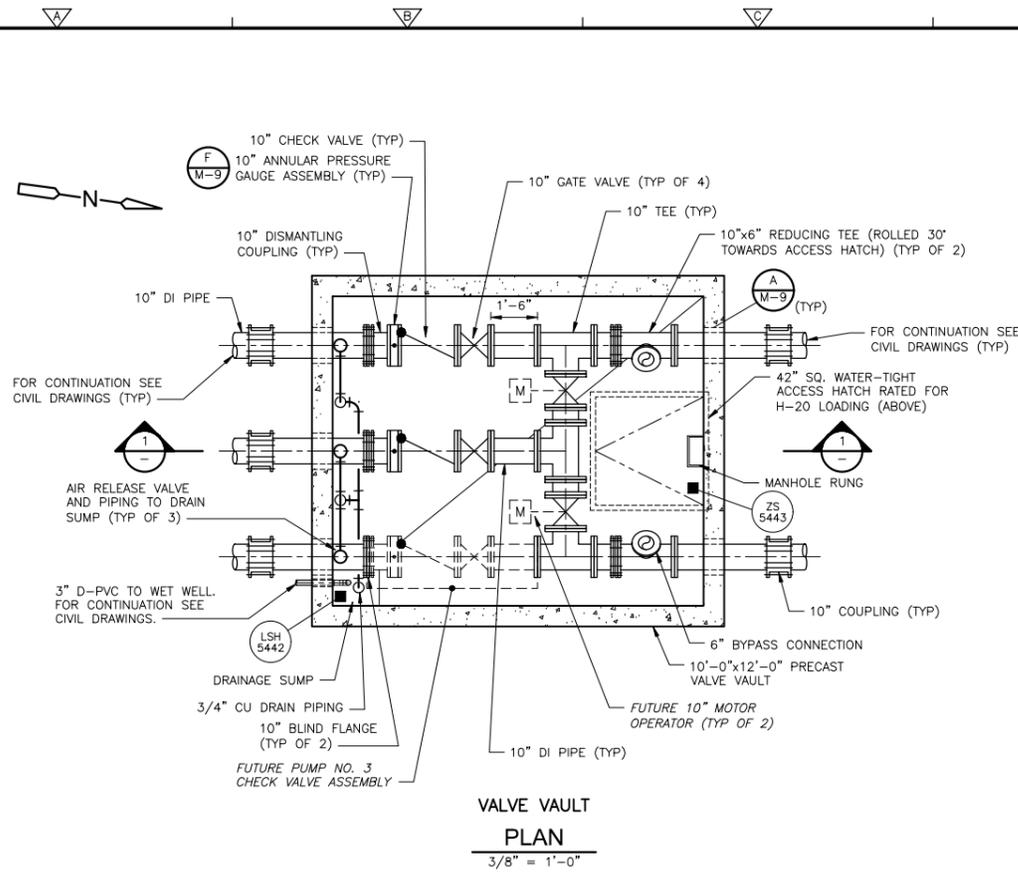


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

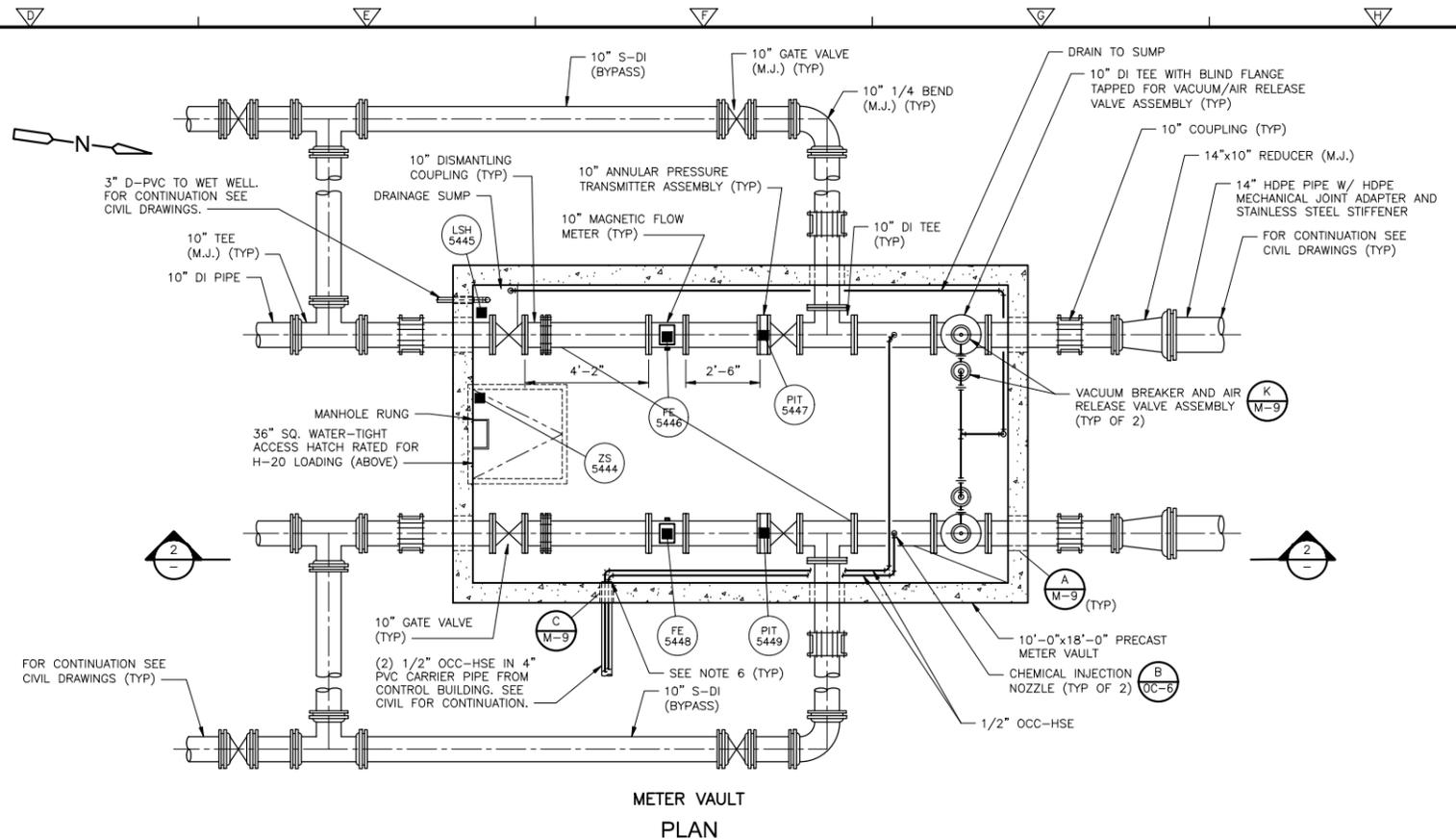
**PUMPING STATION NO.4**  
**PLAN AND SECTION**

PROJECT NO. 141004-277870  
 FILE NAME: M007PSP.DWG  
 SHEET NO.  
**M-7**

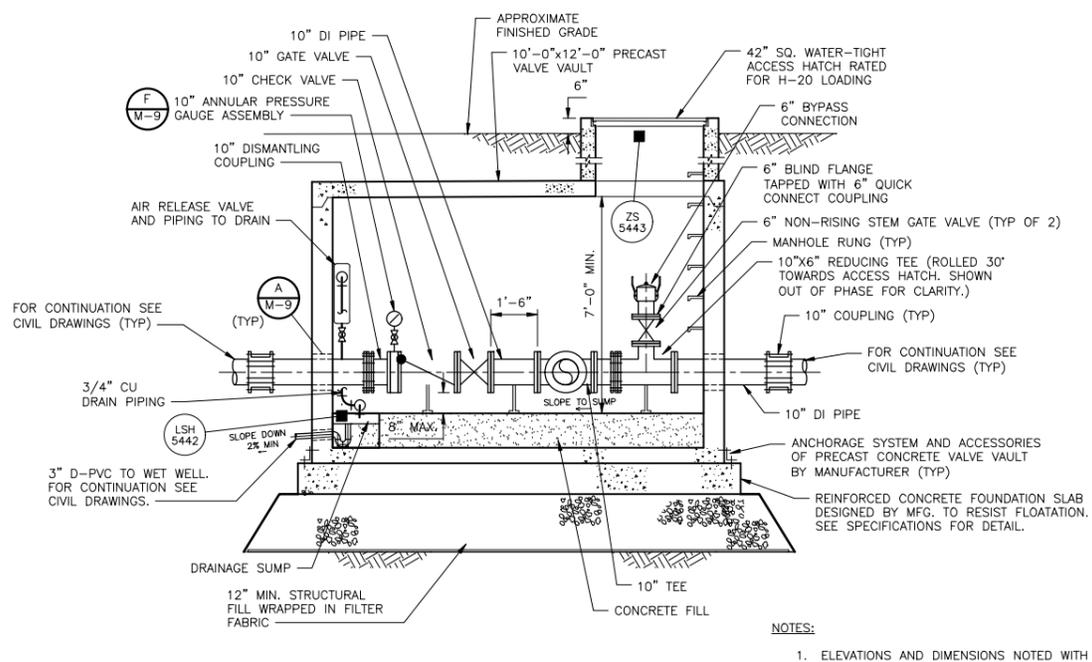
CONFORMED DRAWINGS



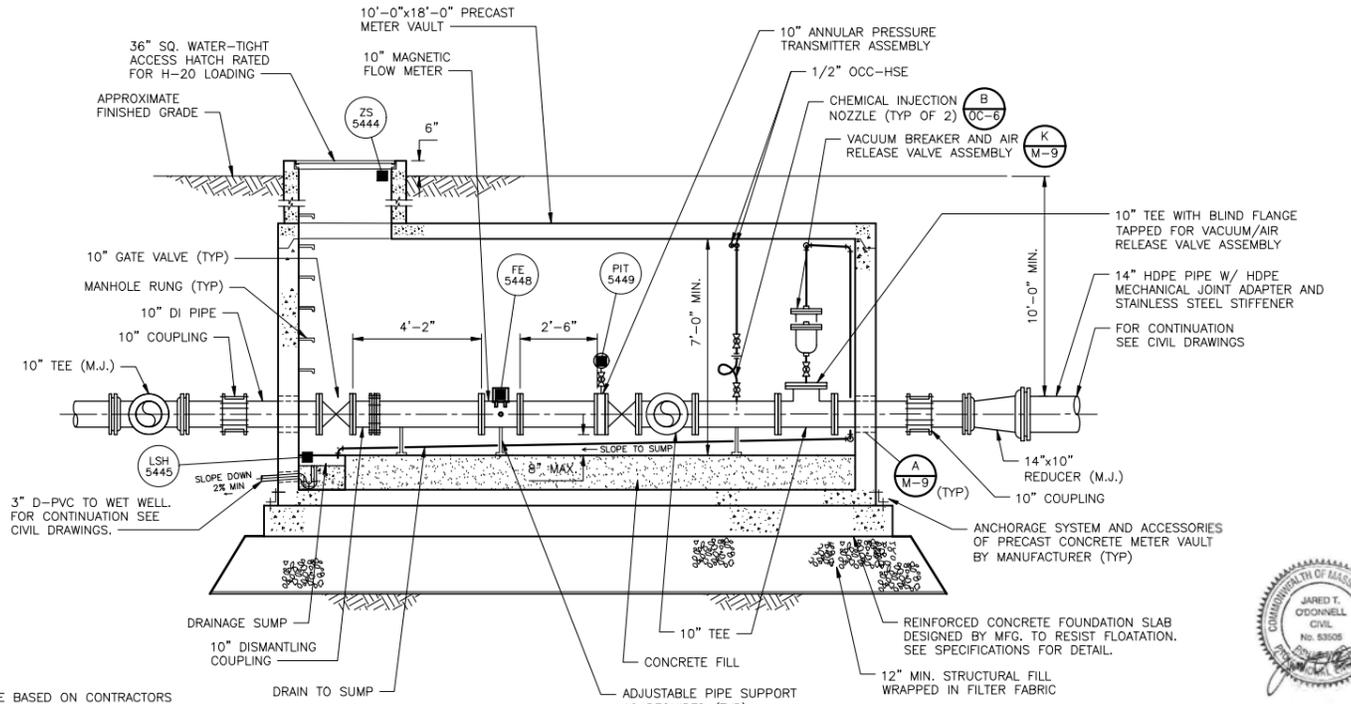
**VALVE VAULT  
PLAN**  
3/8" = 1'-0"



**METER VAULT  
PLAN**  
3/8" = 1'-0"

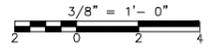


**VALVE VAULT  
SECTION 1**  
3/8" = 1'-0"



**METER VAULT  
SECTION 2**  
3/8" = 1'-0"

- NOTES:**
- ELEVATIONS AND DIMENSIONS NOTED WITH \* ARE SUBJECT TO CHANGE BASED ON CONTRACTORS SUBMITTED EQUIPMENT AND SHALL BE APPROVED BY THE ENGINEER.
  - CONFIRM ACCESS HATCH SIZE WITH PUMP MANUFACTURER FOR REMOVAL/MAINTENANCE.
  - PIPE SUPPORTS ARE SHOWN FOR CONCEPTUAL PURPOSES ONLY AND SHALL BE DESIGNED BY THE MANUFACTURER.
  - MINIMUM SUBMERGENCE SHALL BE AS RECOMMENDED BY PUMP MANUFACTURER.
  - FOR EXCAVATION SUPPORT REQUIREMENTS, SEE SPECIFICATION SECTION 315000 FOR DETAIL.
  - WALL PENETRATIONS SHALL BE SEALED AND AIR TIGHT TO PREVENT RELEASE OF HAZARDOUS LIQUIDS OR GASES.



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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. O'DONNELL  
 DRAWN BY: A. WELDON  
 SHEET CHK'D BY: J. O'DONNELL  
 CROSS CHK'D BY: R. LOF  
 APPROVED BY: M. GUIDICE  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

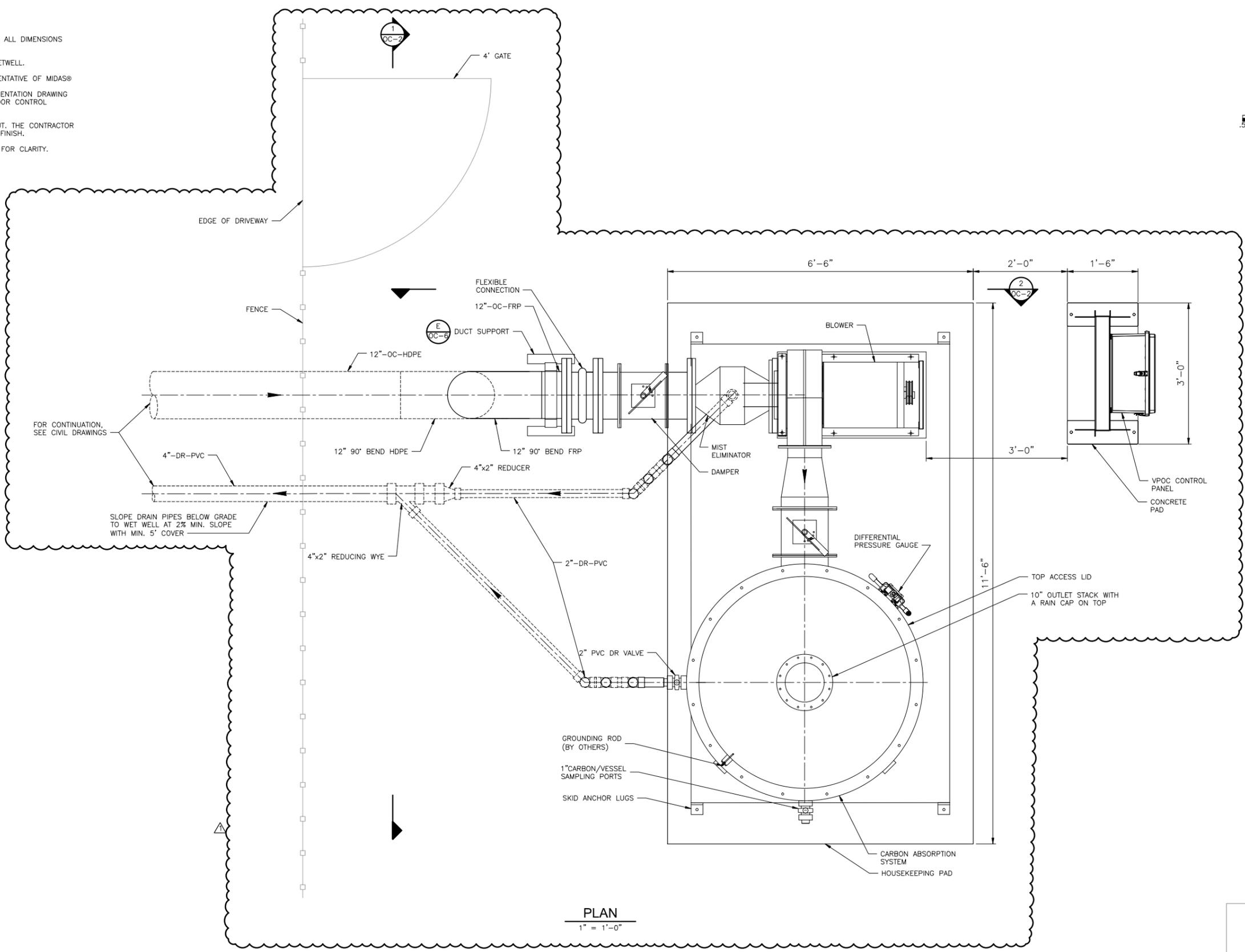
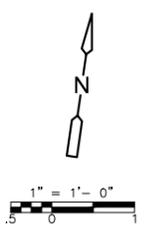
TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

**PUMPING STATION NO.4  
 VALVE AND METER VAULT  
 PLANS AND SECTIONS**

Michael P. Guidice  
 2024.09.06 14:52:45-04'00"  
 PROJECT NO. 141004-277870  
 FILE NAME: M008PSP.dwg  
 SHEET NO.  
**M-8**

CONFORMED DRAWINGS

- NOTES:
- COORDINATE WITH ODOR CONTROL MANUFACTURER AND VERIFY ALL DIMENSIONS PRIOR TO INSTALLATION AND CONSTRUCTION.
  - ALL OC PIPE SHALL BE 1% MINIMUM SLOPE TOWARDS THE WETWELL.
  - VAPOR PHASE ODOR CONTROL EQUIPMENT SHOWN IS REPRESENTATIVE OF MIDAS® C20 SERIES MANUFACTURED BY EVOQUA, NOT ALL REQUIRED INSTRUMENTATION AND VALVING IS SHOWN. REFER TO INSTRUMENTATION DRAWING I-9 AND SECTION 443116 ACTIVATED CARBON ADSORPTION ODOR CONTROL EQUIPMENT FOR ALL REQUIREMENTS.
  - DRAWINGS PORTRAY THE BEST RENDITION OF THE DUCT LAYOUT. THE CONTRACTOR IS RESPONSIBLE FOR FIELD-VERIFICATION FOR FINAL FIT AND FINISH.
  - SOUND ENCLOSURE FOR BLOWER REQUIRED BUT NOT SHOWN FOR CLARITY.



PLAN  
1" = 1'-0"

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REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	SBB	JRA	REVISED PER ADDENDUM NO. 1.

DESIGNED BY: J. ALVAREZ  
 DRAWN BY: S. BHOSALE  
 SHEET CHK'D BY: J. ALVAREZ  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. ALVAREZ  
 DATE: SEPTEMBER 2024

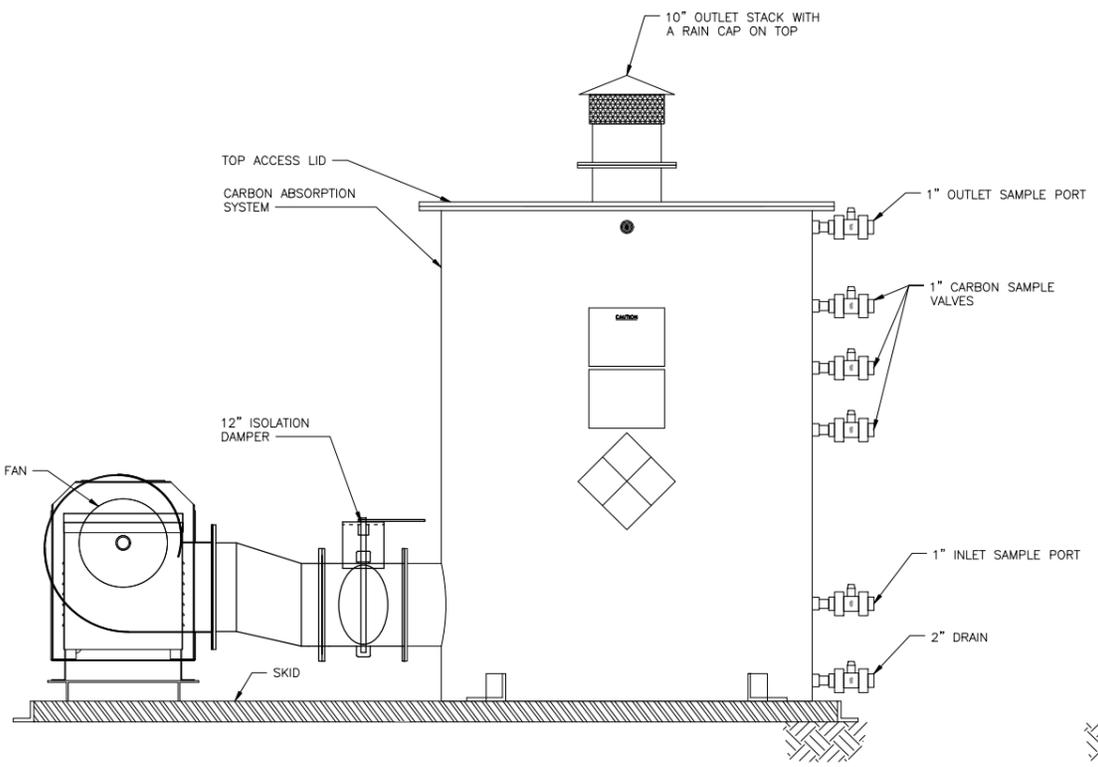
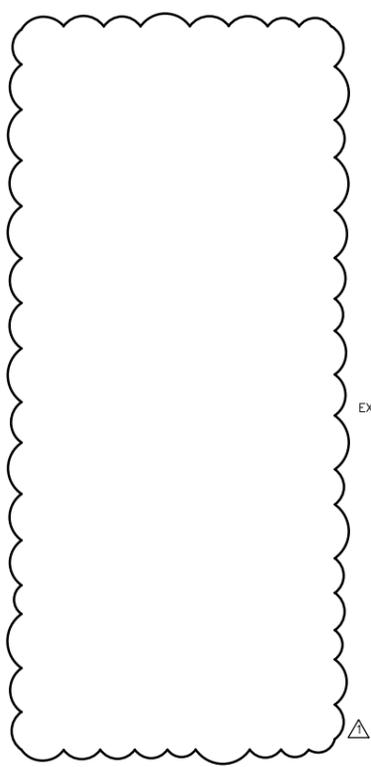
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TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

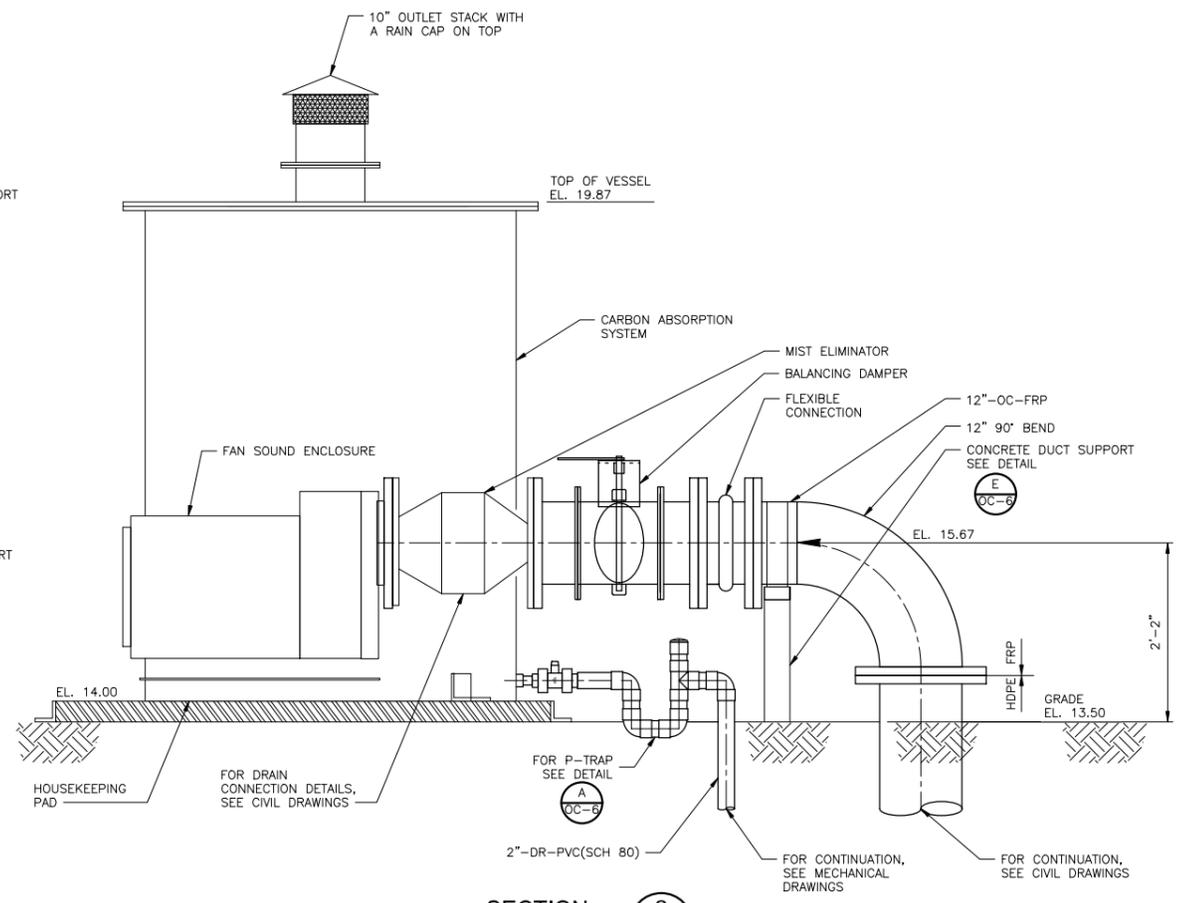
PUMPING STATION NO.4  
 VAPOR PHASE ODOR CONTROL SYSTEM  
 PLAN

PROJECT NO. 141004-277870  
 FILE NAME: OC001VPPL.DWG  
 SHEET NO.  
 OC-1

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SECTION 1  
1" = 1'-0"  
OC-1



SECTION 2  
1" = 1'-0"  
OC-1

1" = 1'-0"  
0 1

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	SBB	JRA	REVISED PER ADDENDUM NO. 1.

DESIGNED BY: J. ALVAREZ  
 DRAWN BY: S. BHOSALE  
 SHEET CHK'D BY: J. ALVAREZ  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. ALVAREZ  
 DATE: SEPTEMBER 2024

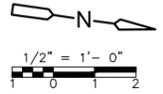
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TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO.4  
 VAPOR PHASE ODOR CONTROL  
 SYSTEM SECTIONS

PROJECT NO. 141004-277870  
 FILE NAME: OC002VPSCL.DWG  
 SHEET NO.  
 OC-2

CONFORMED DRAWINGS

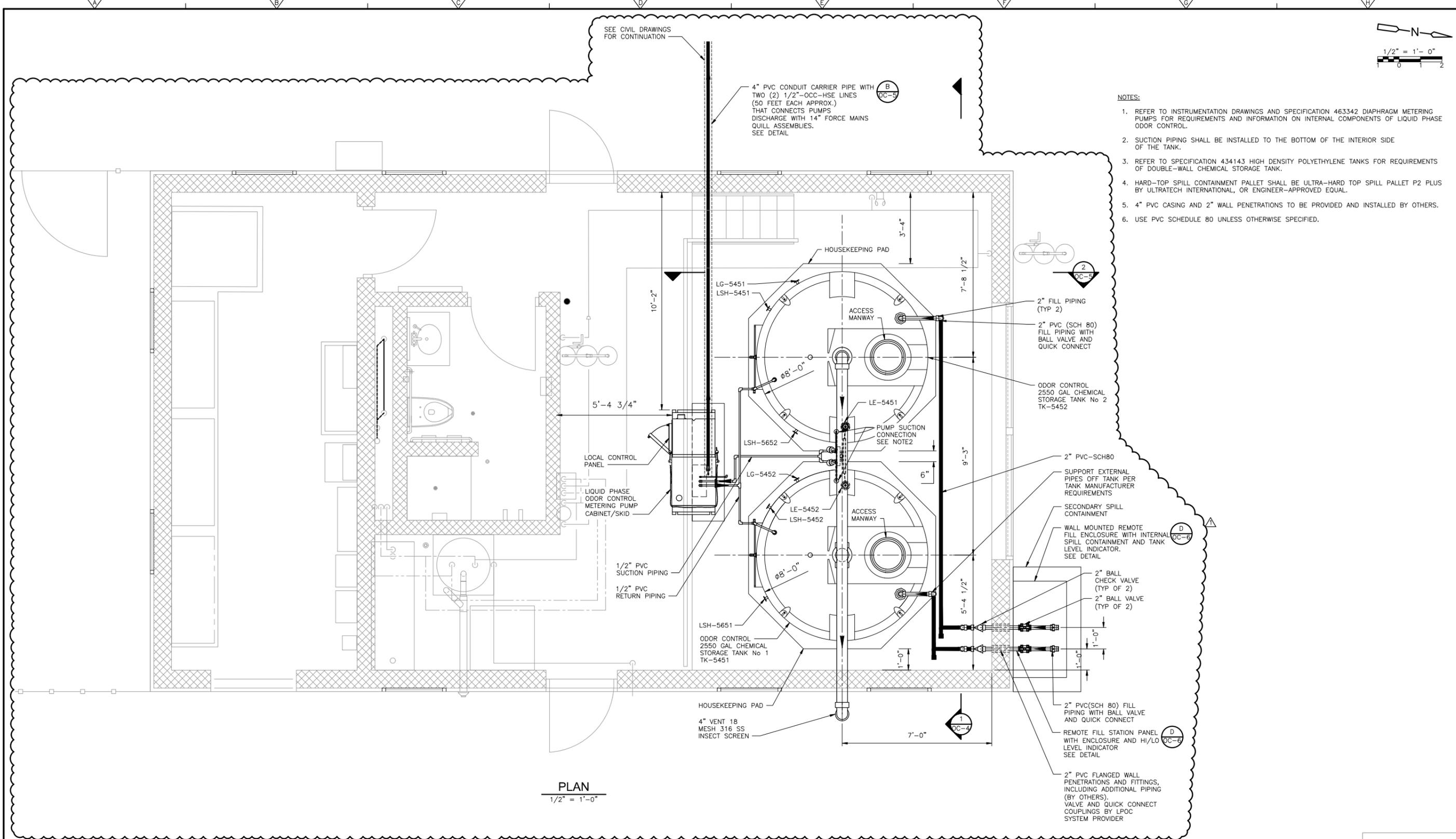


SEE CIVIL DRAWINGS FOR CONTINUATION

4" PVC CONDUIT CARRIER PIPE WITH TWO (2) 1/2" OCC-HSE LINES (50 FEET EACH APPROX.) THAT CONNECTS PUMPS DISCHARGE WITH 14" FORCE MAINS QUILL ASSEMBLIES. SEE DETAIL

**NOTES:**

1. REFER TO INSTRUMENTATION DRAWINGS AND SPECIFICATION 463342 DIAPHRAGM METERING PUMPS FOR REQUIREMENTS AND INFORMATION ON INTERNAL COMPONENTS OF LIQUID PHASE ODOR CONTROL.
2. SUCTION PIPING SHALL BE INSTALLED TO THE BOTTOM OF THE INTERIOR SIDE OF THE TANK.
3. REFER TO SPECIFICATION 434143 HIGH DENSITY POLYETHYLENE TANKS FOR REQUIREMENTS OF DOUBLE-WALL CHEMICAL STORAGE TANK.
4. HARD-TOP SPILL CONTAINMENT PALLET SHALL BE ULTRA-HARD TOP SPILL PALLET P2 PLUS BY ULTRATECH INTERNATIONAL, OR ENGINEER-APPROVED EQUAL.
5. 4" PVC CASING AND 2" WALL PENETRATIONS TO BE PROVIDED AND INSTALLED BY OTHERS.
6. USE PVC SCHEDULE 80 UNLESS OTHERWISE SPECIFIED.



**PLAN**  
1/2" = 1'-0"

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REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	SBB	JRA	REVISED PER ADDENDUM NO. 1.

DESIGNED BY: J. ALVAREZ  
 DRAWN BY: S. BHOSALE  
 SHEET CHK'D BY: J. ALVAREZ  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. ALVAREZ  
 DATE: SEPTEMBER 2024

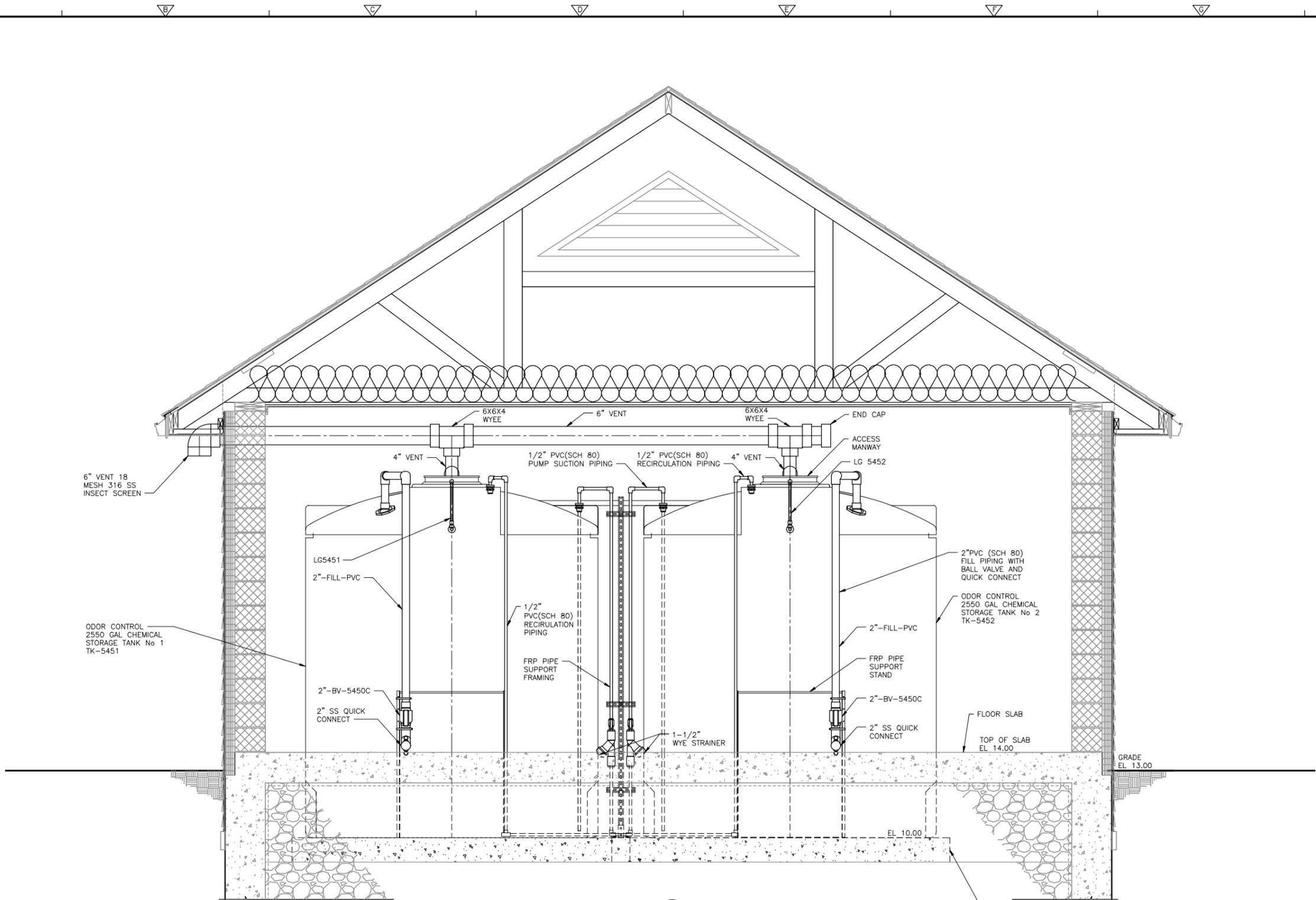
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TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

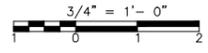
PUMPING STATION NO.4  
 LIQUID PHASE ODOR CONTROL SYSTEM  
 PLAN

PROJECT NO. 141004-277870  
 FILE NAME: 00003LPL.DWG  
 SHEET NO.  
 OC-3

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SECTION 1  
 1/4" = 1'-0" OC-3



JOSE R ALVAREZ CORENA  
 2024.09.06 14:27:28-04'00"  
 PROJECT NO. 141004-277870  
 FILE NAME: OC004LPSC.DWG

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. ALVAREZ  
 DRAWN BY: S. BHOSALE  
 SHEET CHK'D BY: J. ALVAREZ  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. ALVAREZ  
 DATE: SEPTEMBER 2024

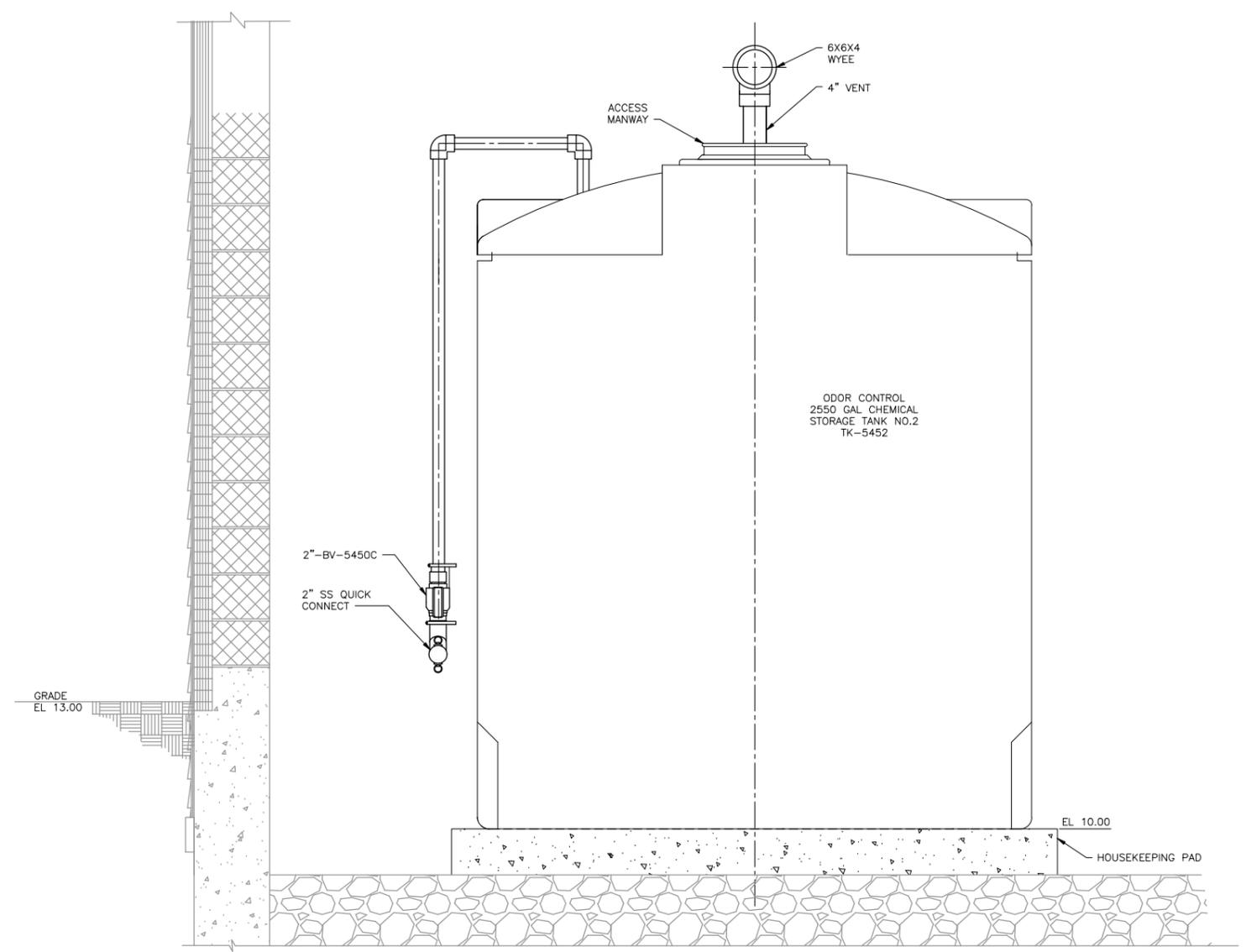
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TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

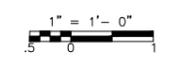
PUMPING STATION NO.4  
 LIQUID PHASE ODOR CONTROL  
 SYSTEM SECTION-I

SHEET NO.  
 OC-4

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SECTION 2  
 1" = 1'-0" OC-3



JOSE R ALVAREZ CORENA  
 2024.09.06 14:27:55-04'00"  
 PROJECT NO. 141004-277870  
 FILE NAME: OC005LPSC.DWG

SHEET NO.  
 OC-5

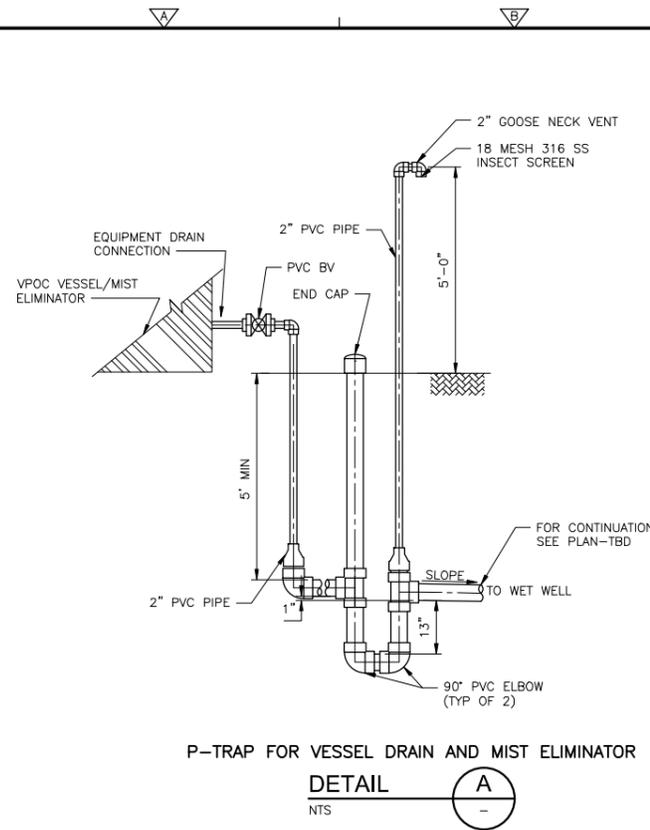
REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. ALVAREZ  
 DRAWN BY: S. BHOSALE  
 SHEET CHK'D BY: J. ALVAREZ  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. ALVAREZ  
 DATE: SEPTEMBER 2024

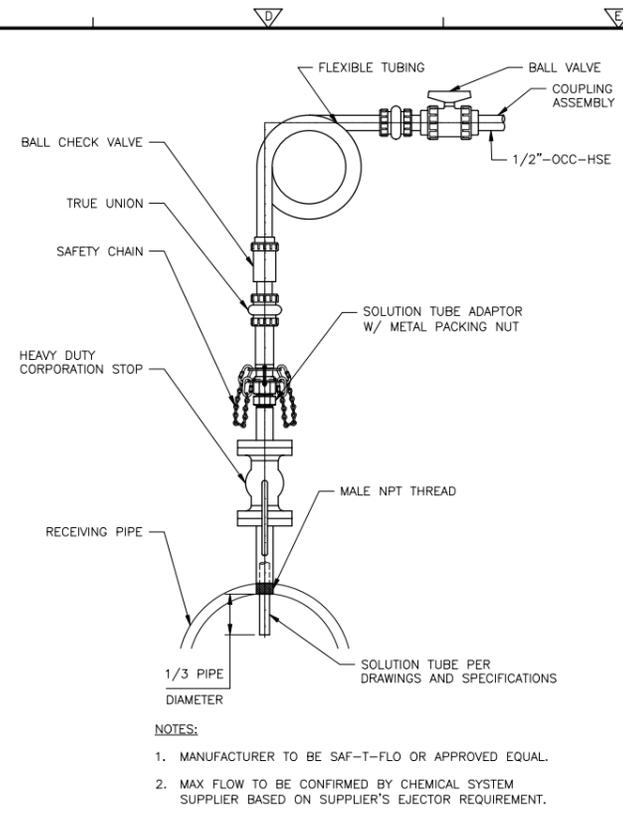


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO.4  
 LIQUID PHASE ODOR CONTROL  
 SYSTEM SECTION-II

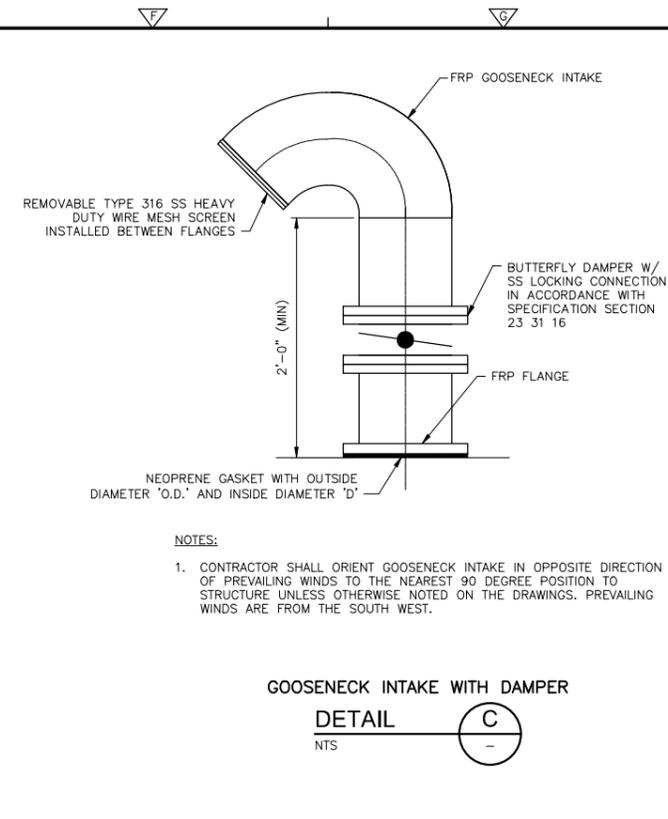


P-TRAP FOR VESSEL DRAIN AND MIST ELIMINATOR  
**DETAIL A**  
 NTS



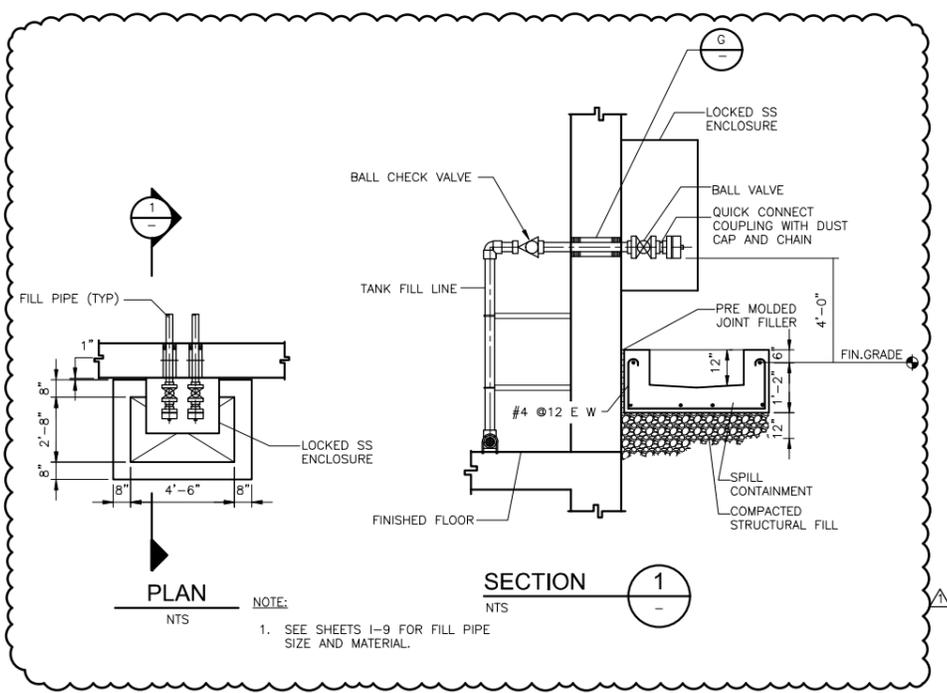
**NOTES:**  
 1. MANUFACTURER TO BE SAF-T-FLO OR APPROVED EQUAL.  
 2. MAX FLOW TO BE CONFIRMED BY CHEMICAL SYSTEM SUPPLIER BASED ON SUPPLIER'S EJECTOR REQUIREMENT.

CHEMICAL INJECTION NOZZLE  
**DETAIL B**  
 NTS

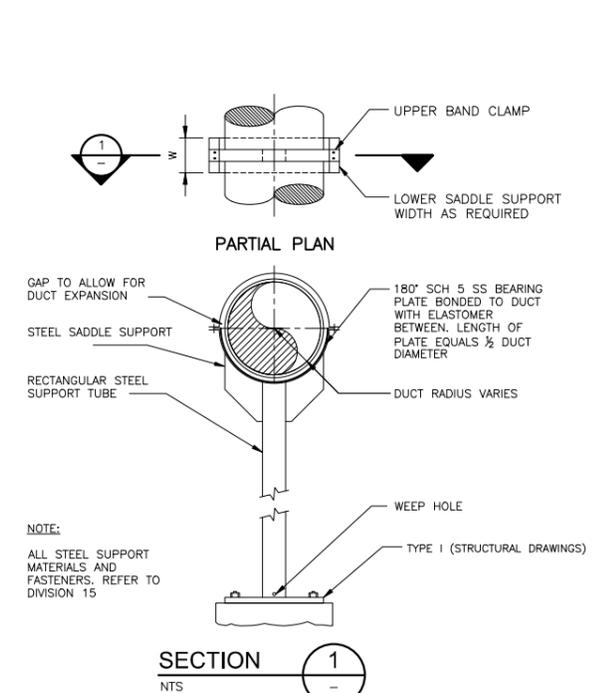


**NOTES:**  
 1. CONTRACTOR SHALL ORIENT GOOSENECK INTAKE IN OPPOSITE DIRECTION OF PREVAILING WINDS TO THE NEAREST 90 DEGREE POSITION TO STRUCTURE UNLESS OTHERWISE NOTED ON THE DRAWINGS. PREVAILING WINDS ARE FROM THE SOUTH WEST.

GOOSENECK INTAKE WITH DAMPER  
**DETAIL C**  
 NTS

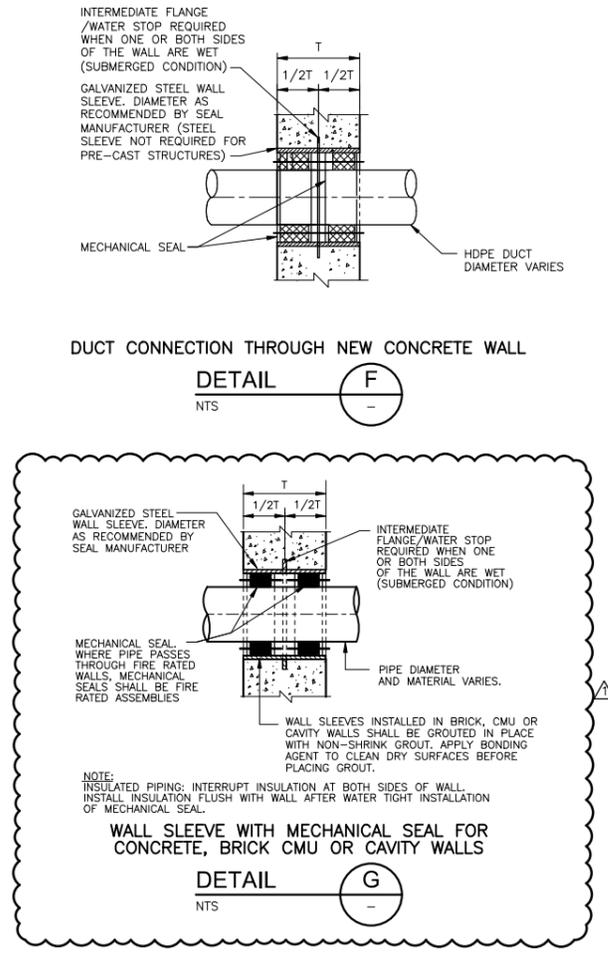


CHEMICAL FILL STATION  
**DETAIL D**  
 NTS



**NOTE:**  
 ALL STEEL SUPPORT MATERIALS AND FASTENERS, REFER TO DIVISION 15

DUCT SUPPORT FOR 24" FRP OC DUCTWORK OR SMALLER  
**DETAIL E**  
 NTS



DUCT CONNECTION THROUGH NEW CONCRETE WALL  
**DETAIL F**  
 NTS

**NOTE:**  
 INSULATED PIPING; INTERRUPT INSULATION AT BOTH SIDES OF WALL. INSTALL INSULATION FLUSH WITH WALL AFTER WATER TIGHT INSTALLATION OF MECHANICAL SEAL.

WALL SLEEVE WITH MECHANICAL SEAL FOR CONCRETE, BRICK CMU OR CAVITY WALLS  
**DETAIL G**  
 NTS

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1	09/18/24	SBB	JRA	REVISED PER ADDENDUM NO. 1.

DESIGNED BY:	J. ALVAREZ
DRAWN BY:	S.BHOSALE
SHEET CHK'D BY:	J. ALVAREZ
CROSS CHK'D BY:	J. O'DONNELL
APPROVED BY:	J. ALVAREZ
DATE:	SEPTEMBER 2024

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

ODOR CONTROL DETAILS  
 SHEET NO.  
 OC-6

PROJECT NO.	141004-277870
FILE NAME	OC006MSDT.DWG
SHEET NO.	OC-6

GENERAL ABBREVIATIONS

Table of abbreviations: A (AIR CONDITIONER, AIR COOLED CONDENSER, etc.), B (BRAKE HORSEPOWER, BOILER, etc.), C (CENTER TO CENTER, CHILLED WATER, etc.), D (TO DRAIN, DOOR GRILLE, etc.), E (ELECTRIC UNIT HEATER, EXHAUST AIR, etc.), F (FAHRENHEIT, FLOW BALANCE & SHUTOFF VALVE, etc.), G (GALLONS PER MINUTE, GRAVITY VENTILATOR), H (HEATING COIL, HAND-OFF-AUTO, etc.), I (INSIDE DIAMETER, INSULATE, etc.), K (KILOWATT), L (LEAVING AIR TEMPERATURE, POUNDS, etc.).

Table of abbreviations: M (MOTOR, MATERIAL, MAKEUP AIR UNIT, etc.), N (N/A, NORMALLY CLOSED, etc.), O (OUTSIDE AIR, ON CENTER, etc.), P (PUMP, PRESSURE DROP, PROPYLENE GLYCOL, etc.), R (RETURN AIR, RETURN AIR FAN, REGISTER, etc.), S (SUPPLY AIR, SUPPLY FAN, SCHEDULE, etc.), T (TRANSFER FAN, TEMPERATURE DIFFERENCE, etc.), U (HEAT TRANSFER COEFFICIENT, UNIT HEATER, etc.), V (VOLTS, VARIABLE AIR VOLUME, etc.), W (WITH, WITHOUT, WET BULB, etc.).

Table of abbreviations: C to C (CENTER TO CENTER, CENTER CLOCKWISE, etc.), COW (CENTER TO CENTER, COUNTER CLOCKWISE), CD (CONTROL DAMPER), CENT (CENTRIFUGAL), CFM (CUBIC FEET PER MINUTE), COP (CHILLED WTR GLYCOL PUMP), CHIL (AIR COOLED CHILLER), CGS (CHILLED GLYCOL SUPPLY), COR (CHILLED GLYCOL RETURN), CLG (CENTER LINE), CLC (CEILING), CLR (CLEAR), COND (CONDENSATE DRAIN), COP (CENTER OF PIPE), CTR (CONDENSING UNIT), CU (CABINET HEATER), CH (VALVE FLOW COEFFICIENT), CW (CLOCKWISE).

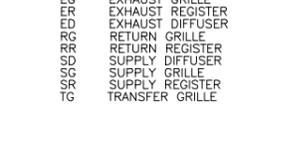
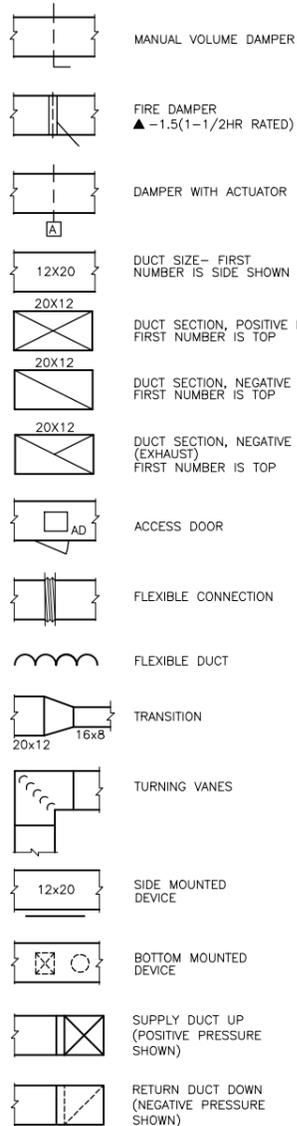
Table of abbreviations: D (TO DRAIN, DOOR GRILLE, DRY BULB/DEWATERING BUILDING, etc.), E (ELECTRIC UNIT HEATER, EXHAUST AIR, EXHAUST AIR FAN, etc.), F (FAHRENHEIT, FLOW BALANCE & SHUTOFF VALVE, FAN COIL UNIT, etc.), G (GALLONS PER MINUTE, GRAVITY VENTILATOR), H (HEATING COIL, HAND-OFF-AUTO, HGS/R, etc.), I (INSIDE DIAMETER, INSULATE, INSTRUMENT(ATION), etc.), K (KILOWATT), L (LEAVING AIR TEMPERATURE, POUNDS, LEAVING WATER TEMPERATURE, etc.).

Table of abbreviations: G (GALLONS PER MINUTE, GRAVITY VENTILATOR), H (HEATING COIL, HAND-OFF-AUTO, HGS/R, etc.), I (INSIDE DIAMETER, INSULATE, INSTRUMENT(ATION), etc.), K (KILOWATT), L (LEAVING AIR TEMPERATURE, POUNDS, LEAVING WATER TEMPERATURE, etc.).

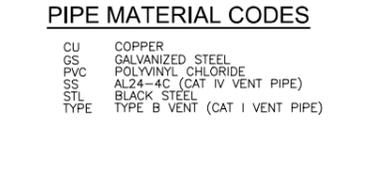
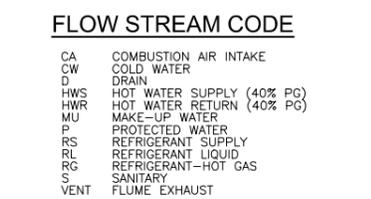
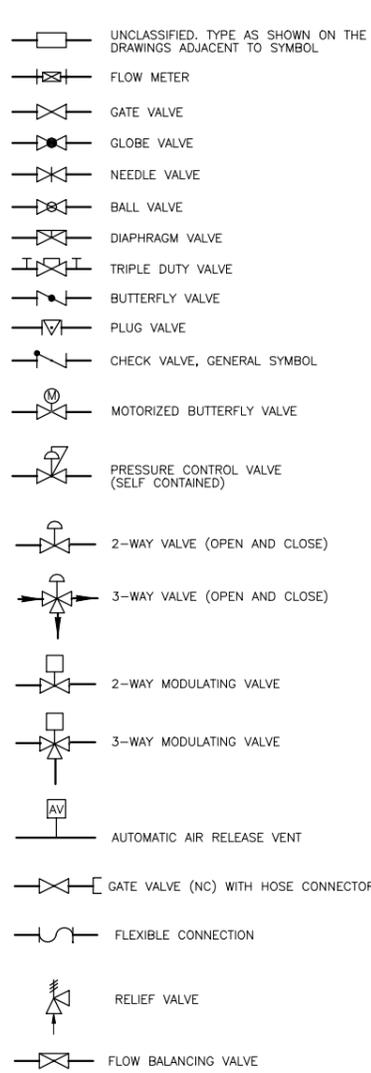
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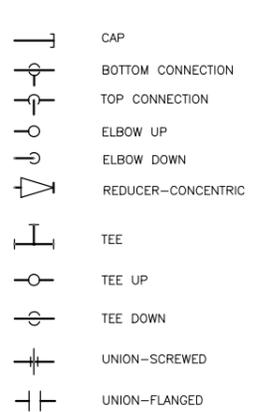
SYMBOLS DUCTWORK



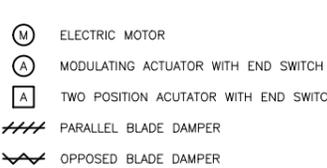
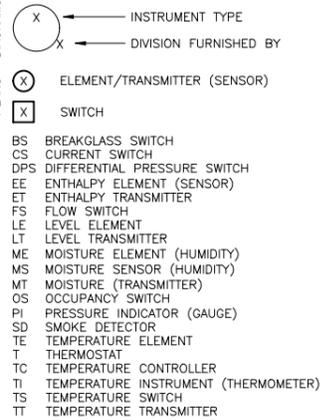
SYMBOLS VALVES



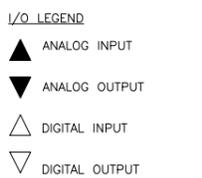
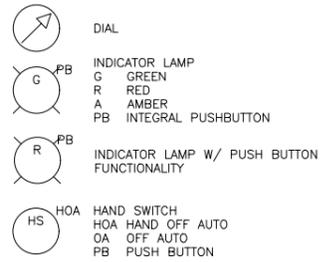
SYMBOLS PIPE FITTINGS



FIELD INSTRUMENT LEGEND



PANEL LEGEND



GENERAL NOTES:

- 1. HVAC EQUIPMENT LOCATIONS, DUCTWORK, AND PIPING SYSTEM LAYOUTS ARE BASED ON EQUIPMENT SELECTED BY THE ENGINEER. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT OF DIFFERENT SIZE, OR EQUIPMENT THAT REQUIRES AN ARRANGEMENT OR SPACE DIFFERING FROM THAT INDICATED ON THE DRAWINGS OR SPECIFIED, THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR APPROVAL, DETAILED ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, INSTRUMENTATION, HVAC, AND ELECTRICAL DRAWINGS AND EQUIPMENT SPECIFICATION SHEETS. THE SUBMITTALS SHALL SHOW ALL NECESSARY CHANGES AND INDICATE ALL FEATURES OF THE EQUIPMENT THE CONTRACTOR PROPOSES. THE DRAWINGS SHALL INCLUDE BUT NOT BE LIMITED TO PLANS, SECTIONS, DETAILS, AND SCHEMATICS OF ALL APPURTENANCES REQUIRED. DEVIATIONS FROM THE EQUIPMENT SPECIFIED AND SHOWN ON THE CONSTRUCTION DRAWINGS AND IN THE SPECIFICATIONS SHALL BE CLEARLY INDICATED. CHANGES SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK AND SHALL BE MADE AT NO EXTRA COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME THE COST OF, AND THE RESPONSIBILITY FOR SATISFACTORY ACCOMPLISHING ALL OF THE CHANGES AND THE FINAL OPERATION OF THE EQUIPMENT IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
2. PIPE HANGERS SUPPORTING COPPER PIPING SHALL BE CONSTRUCTED OF COPPER OR OTHER COPPER COMPATIBLE MATERIAL.
3. SOLDER CONTAINING LEAD IS NOT PERMITTED AND SHALL NOT BE BROUGHT ONTO THE CONSTRUCTION SITE.
4. HVAC PIPING AND DUCTWORK DRAWINGS DO NOT SHOW ALL DRAINS, VENTS, OFFSETS AND FITTINGS ETC. REQUIRED FOR THE COMPLETE SYSTEM. SUCH ITEMS SHALL BE PROVIDED AS CALLED FOR ON THE DETAILS AND IN THE SPECIFICATIONS.
5. SMALL PIPING IS SHOWN APPROXIMATELY TO SCALE BUT NOT EVERY FITTING AND OFFSET IS SHOWN. SOME VALVES AND APPURTENANCES MAY BE OMITTED FOR THE SAKE OF CLARITY. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SUCH ITEMS WHETHER SHOWN OR NOT SHOWN.
6. ALL PIPING PENETRATING OR IN CONTACT WITH CONCRETE, MASONRY, OR ANY OTHER CORROSIVE MATERIAL SHALL BE SLEEVED AS SPECIFIED OR DETAILED.
7. UNLESS SPECIFIC REQUIREMENTS ARE SHOWN ON THE DRAWINGS ALL FLOOR SLAB AND WALL PENETRATIONS SHALL BE AS SHOWN ON THE DETAILS. ABOVE GROUND EXTERIOR WALL AND ROOF PENETRATIONS SHALL BE AS SHOWN ON THE ARCHITECTURAL DRAWINGS. ALTERNATE DETAILS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE ENGINEER'S APPROVAL SHALL BE RECEIVED PRIOR TO STARTING THE WORK.
8. ALL PIPING SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO THE BUILDING WALLS AND FLOOR.
9. NOT ALL SUPPORTS ARE SHOWN ON THE DRAWINGS. UNLESS OTHERWISE DETAILED ON THE DRAWINGS ALL PIPE AND DUCT SUPPORTS SHALL BE DESIGNED, FURNISHED AND INSTALLED BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL PROVIDE A CONSTRUCTION SCHEDULE.
11. ALL WORK, INCLUDING BUILDING SERVICES AND UTILITY SHUTDOWNS, SHALL BE COORDINATED AND SCHEDULED WITH THE OWNER PRIOR TO BEGINNING CONSTRUCTION.
12. THE CONTRACTOR SHALL REMOVE CONSTRUCTION DEBRIS AND ALL OTHER DEBRIS MADE DURING THE WORK THEY HAVE COMPLETED, AT THE END OF EACH WORK DAY.
13. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY DAMAGED EQUIPMENT, CEILING, WALLS, ETC. WHICH HAVE BEEN DAMAGED BY THE WORK OF THIS PROJECT AT NO COST TO THE OWNER.
14. NOTED ELEVATIONS ARE GIVEN AS REFERENCE FOR THE INTENDED ROUTING OF SYSTEMS. THE CONTRACTOR SHALL COORDINATE THE EXACT ROUTING. ALL WORK SHALL BE INSTALLED WITH THE PROPER PITCH. COORDINATE WITH OTHER TRADES AND FIELD CONDITIONS TO AVOID INTERFERENCES.
15. COORDINATE ALL MOTOR SIZES, STARTERS, DISCONNECT SWITCHES, CONTROLS, ETC. WITH ELECTRICAL CONTRACTOR AND HVAC CONTROLS CONTRACTOR PRIOR TO THE RELEASE OF ANY EQUIPMENT.
16. CONTRACTOR SHALL PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS AS REQUIRED IN FINAL ROUTING OF PIPING.
17. REFER TO ELECTRICAL DRAWINGS FOR AREA CLASSIFICATIONS.

ATC SYSTEM NOTES.

- 1. SENSORS, TRANSMITTERS, SWITCHES, INSTRUMENTS, VALVES, ACTUATORS, EQUIPMENT, CONTROLLERS AND WIRING SHALL BE FURNISHED AND INSTALLED BY DIV. 23 UNLESS OTHERWISE INDICATED.
2. ALL THERMOSTATS SHALL BE MOUNTED IN LINE WITH CENTERLINE OF LIGHT SWITCH AT 48" A.F.F. UNLESS OTHERWISE NOTED. VERIFY MOUNTING HEIGHT IS 48" PRIOR TO BALANCING SYSTEMS. CONTRACTOR SHALL CALIBRATE ALL THERMOSTATS.

NOTE: THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON THE CONTRACT DRAWINGS.

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DESIGNED BY: J. DION
DRAWN BY: J. DION
SHEET CHK'D BY: B. BUCCHIANERI
CROSS CHK'D BY: J. O'DONNELL
APPROVED BY: B. BUCCHIANERI
DATE: SEPTEMBER 2024



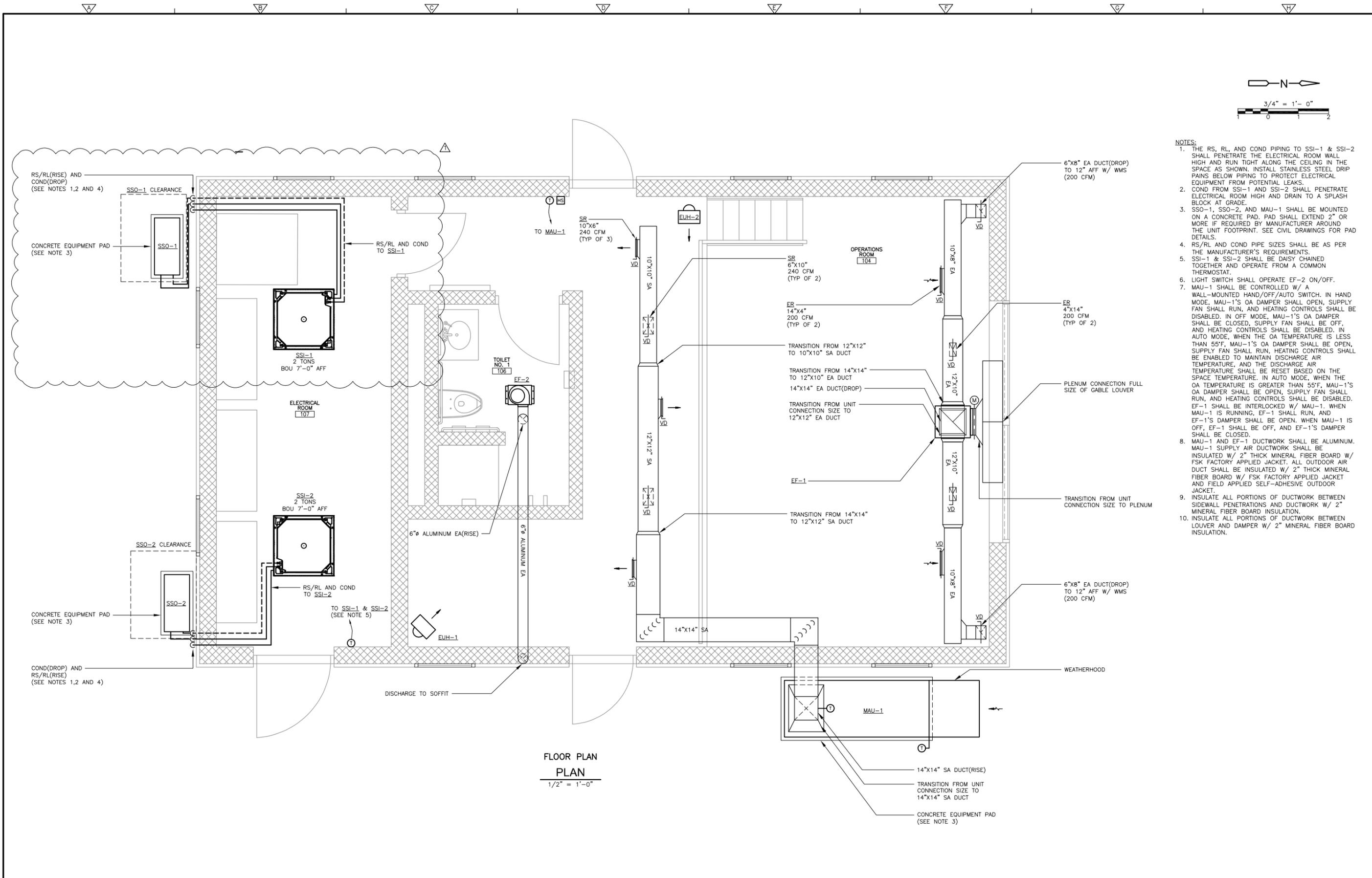
TOWN OF DENNIS, MASSACHUSETTS
WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES
PHASE 1 - CONTRACT NO. 2
PROJECT NO. CWSRF 16676/2

HVAC
LEGEND, SYMBOLS, ABBREVIATIONS, AND NOTES

Professional Engineer seal for Bryan P. Bucchianeri, No. 57330, Mechanical, State of Massachusetts. Project No. 141004-277870, File Name: H001LGND.DWG, Sheet No. H-1.

CONFORMED DRAWINGS

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- NOTES:**
1. THE RS, RL, AND COND PIPING TO SSI-1 & SSI-2 SHALL PENETRATE THE ELECTRICAL ROOM WALL HIGH AND RUN TIGHT ALONG THE CEILING IN THE SPACE AS SHOWN. INSTALL STAINLESS STEEL DRIP PAINS BELOW PIPING TO PROTECT ELECTRICAL EQUIPMENT FROM POTENTIAL LEAKS.
  2. COND FROM SSI-1 AND SSI-2 SHALL PENETRATE ELECTRICAL ROOM HIGH AND DRAIN TO A SPLASH BLOCK AT GRADE.
  3. SSO-1, SSO-2, AND MAU-1 SHALL BE MOUNTED ON A CONCRETE PAD. PAD SHALL EXTEND 2" OR MORE IF REQUIRED BY MANUFACTURER AROUND THE UNIT FOOTPRINT. SEE CIVIL DRAWINGS FOR PAD DETAILS.
  4. RS/RL AND COND PIPE SIZES SHALL BE AS PER THE MANUFACTURER'S REQUIREMENTS.
  5. SSI-1 & SSI-2 SHALL BE DAISY CHAINED TOGETHER AND OPERATE FROM A COMMON THERMOSTAT.
  6. LIGHT SWITCH SHALL OPERATE EF-2 ON/OFF.
  7. MAU-1 SHALL BE CONTROLLED W/ A WALL-MOUNTED HAND/OFF/AUTO SWITCH. IN HAND MODE, MAU-1'S OA DAMPER SHALL OPEN, SUPPLY FAN SHALL RUN, AND HEATING CONTROLS SHALL BE DISABLED. IN OFF MODE, MAU-1'S OA DAMPER SHALL BE CLOSED, SUPPLY FAN SHALL BE OFF, AND HEATING CONTROLS SHALL BE DISABLED. IN AUTO MODE, WHEN THE OA TEMPERATURE IS LESS THAN 55°F, MAU-1'S OA DAMPER SHALL BE OPEN, SUPPLY FAN SHALL RUN, HEATING CONTROLS SHALL BE ENABLED TO MAINTAIN DISCHARGE AIR TEMPERATURE, AND THE DISCHARGE AIR TEMPERATURE SHALL BE RESET BASED ON THE SPACE TEMPERATURE. IN AUTO MODE, WHEN THE OA TEMPERATURE IS GREATER THAN 55°F, MAU-1'S OA DAMPER SHALL BE OPEN, SUPPLY FAN SHALL RUN, AND HEATING CONTROLS SHALL BE DISABLED. EF-1 SHALL BE INTERLOCKED W/ MAU-1. WHEN MAU-1 IS RUNNING, EF-1 SHALL RUN, AND EF-1'S DAMPER SHALL BE OPEN. WHEN MAU-1 IS OFF, EF-1 SHALL BE OFF, AND EF-1'S DAMPER SHALL BE CLOSED.
  8. MAU-1 AND EF-1 DUCTWORK SHALL BE ALUMINUM. MAU-1 SUPPLY AIR DUCTWORK SHALL BE INSULATED W/ 2" THICK MINERAL FIBER BOARD W/ FSK FACTORY APPLIED JACKET. ALL OUTDOOR AIR DUCT SHALL BE INSULATED W/ 2" THICK MINERAL FIBER BOARD W/ FSK FACTORY APPLIED JACKET AND FIELD APPLIED SELF-ADHESIVE OUTDOOR JACKET.
  9. INSULATE ALL PORTIONS OF DUCTWORK BETWEEN SIDEWALL PENETRATIONS AND DUCTWORK W/ 2" MINERAL FIBER BOARD INSULATION.
  10. INSULATE ALL PORTIONS OF DUCTWORK BETWEEN LOUVER AND DAMPER W/ 2" MINERAL FIBER BOARD INSULATION.

**FLOOR PLAN**  
**PLAN**  
 1/2" = 1'-0"

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/19/24	MAD	BPB	REVISED PER ADDENDUM NO. 1

DESIGNED BY: J. DION  
 DRAWN BY: J. DION  
 SHEET CHK'D BY: B. BUCCHIANERI  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. BUCCHIANERI  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 FLOOR PLAN  
 SHEET NO. H-2

PROJECT NO. 141004-277870  
 FILE NAME: H002PSPL.DWG  
 SHEET NO. H-2

CONFORMED DRAWINGS

MAKEUP AIR UNIT																									
TAG	AREA SERVED	LOCATION	DISCHARGE	AIRFLOW (CFM)	ESP (IN WC)	HEATING COIL			SUPPLY FAN				ELECTRICAL			FILTER		WEIGHT (LBS)	MFR	MODEL	NOTES				
						TYPE	CAPACITY (MBH)	AIR			FAN		MOTOR		V	P	HZ					MCA	TYPE	DEPTH (IN)	
								EAT (F)	LAT (F)	TEMP RISE (F)	RPM	BHP	RPM	HP											ENCLOSURE
MAU-1	PUMPING STATION	GRADE	TOP	1200	1	GAS	78	10	70	60	1448	0.68	1448	1	ODP	208	3	60	6.4	MERV 8	2	818	GREENHECK	DXG-108-H12	1,2,3

- NOTES:
1. PROVIDE OPPOSED BLADE MOTOR OPERATED DAMPER FOR OUTDOOR AIR.
  2. PROVIDE W/ OUTDOOR AIR AND DISCHARGE AIR TEMPERATURE SENSORS.
  3. PROVIDE W/ SPACE TEMPERATURE RESET CAPABILITIES.

DAMPERS																
TAG	SERVICE	UNIT SERVED	BLADE TYPE	BLADE ACTION	FRAME MATERIAL	BLADE MATERIAL	AXLE AND LINKAGE MATERIAL	DIMENSIONS		ACTUATOR			MFR	MODEL	NOTES	
								WIDTH (IN)	HEIGHT (IN)	TYPE	VOLTAGE	NEMA ENCL				FAIL POSITION
MOD-EA-1	EXHAUST AIR	EF-1	3V	OPPOSED	GALVANIZED STEEL	GALVANIZED STEEL	PLATED STEEL	-	-	2 POSITION	24VAC	4X	OPEN	GREENHECK	VCD-23	1

- NOTES:
1. PROVIDE W/ ASSOCIATED FAN

SPLIT SYSTEM HEAT PUMP																			
UNIT	AREA SERVED	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	REFRIGERANT	INDOOR UNIT (SSI)				OUTDOOR UNIT (SSO)				MFR	NOTES					
					TYPE	CFM	WEIGHT (LBS)	MODEL	TYPE	V	P	HZ			MCA	FLA	MOCP	WEIGHT (LBS)	MODEL
SSI-1/SSO-1	ELECTRICAL RM	24	13	R410A	CEILING CASSETTE	810	57	PLA-A24EA8	HORIZONTAL	208	1	60	19	0.28	26	153	PUZ-A24NH47-BS	mitsubishi	1,2,3,4
SSI-2/SSO-2	ELECTRICAL RM	24	13	R410A	CEILING CASSETTE	810	57	PLA-A24EA8	HORIZONTAL	208	1	60	19	0.28	26	153	PUZ-A24NH47-BS	mitsubishi	1,2,3,4

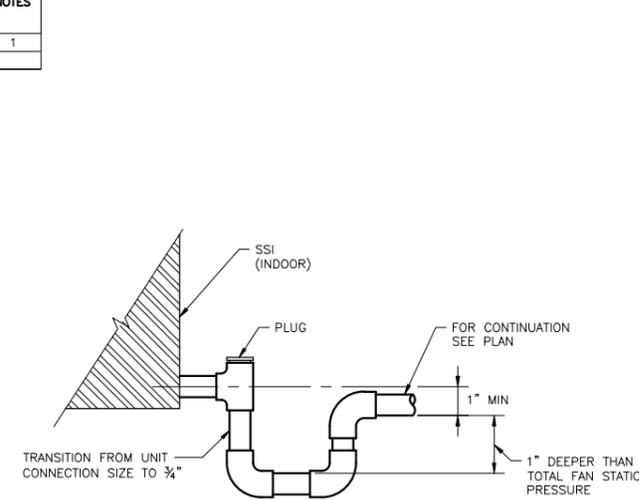
- NOTES:
1. LOW AMBIENT COOLING KIT
  2. WIRED REMOTE CONTROLLER
  3. PROVIDE W/ 18" HIGH MOUNTING STAND
  4. HEATING AND COOLING CAPCITIES ARE RATED FOR 5 DEGREES (F) AND 95 DEGREES (F) RESPECTIVELY.

FANS SCHEDULE														
UNIT	AREA SERVED	FAN TYPE	FAN DATA				MOTOR				V/P/HZ	MFR	MODEL	NOTES
			WHEEL TYPE	CFM	ESP (IN WG)	RPM	HP	RPM	MOTOR ENCLOSURE	DRIVE				
EF-1	GENERATOR RM	EXHAUST	INLINE	1200	0.25	1725	1/4	1725	ODP	DIRECT	115/1/60	GREENHECK	SQ-100	1,2,3
EF-2	RESTROOM	EXHAUST	CEILING	150	0.5	1050	1/5	1050	ODP	DIRECT	115/1/60	GREENHECK	SP-B150	-

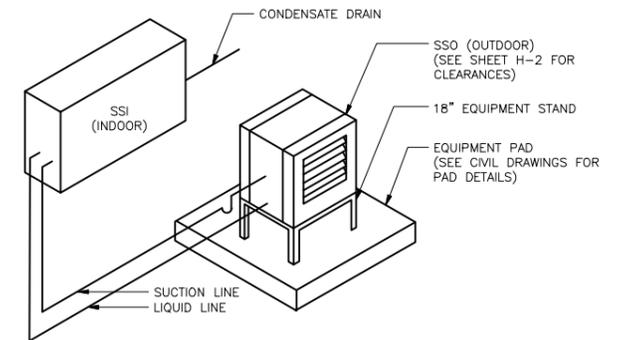
- NOTES:
1. MOTOR ACCESS FROM INTERIOR OF BUILDING
  2. PROVIDE W/ MOTOR OPERATED DAMPER
  3. BLADE TYPE: BACKWARD INCLINED

ELECTRIC UNIT HEATERS														
UNIT	AREA SERVED	MTG. HEIGHT (FT)	COIL		FAN		ELECTRICAL				WEIGHT	MFR	MODEL	NOTES
			CAPACITY (KW)	TEMP. RISE (F)	AIRFLOW (CFM)	THROW (FT)	V	P	HZ	FLA				
EUH-1	CONTROL RM	8	2.5	23	350	15	208	1	60	12.3	25	INDEECO	UHIR	1
EUH-2	STORAGE	8	2.5	23	350	15	208	1	60	12.3	25	INDEECO	UHIR	1

- NOTES:
1. PROVIDE DISCONNECT SWITCH AND UNIT MOUNTED RETURN AIR THERMOSTAT

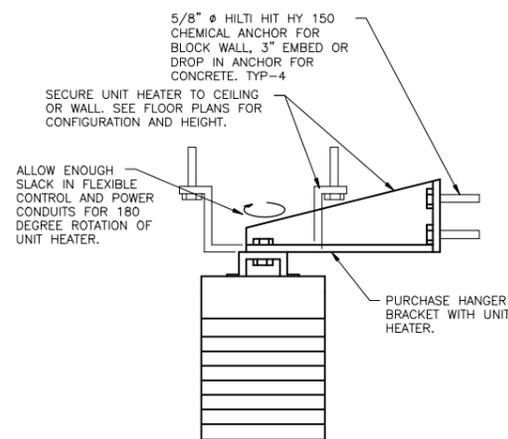


CONDENSATE TRAP  
DETAIL A  
NTS

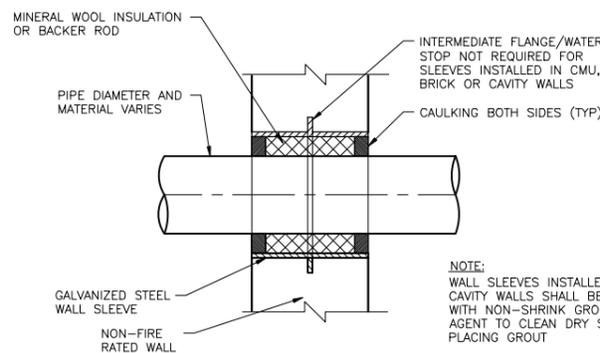


- NOTES:
1. REFRIGERANT PIPING LAYOUT AND SIZES ARE SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL LAYOUT FOR SUBMITTAL AND CONSTRUCTION SHALL BE APPROVED BY THE EQUIPMENT MANUFACTURER.
  2. REFER TO THE MANUFACTURER'S INSTALLATION MANUAL FOR REFRIGERANT PIPING, VALVES, AND APPURTENANCES.
  3. PROVIDE SCHEDULE 40 SS PIPE SLEEVE FOR REFRIGERANT PIPING PENETRATIONS THROUGH WALLS. SEAL AROUND THE PIPING IN THE SLEEVE AT BOTH ENDS WITH WATERPROOF CAULKING.

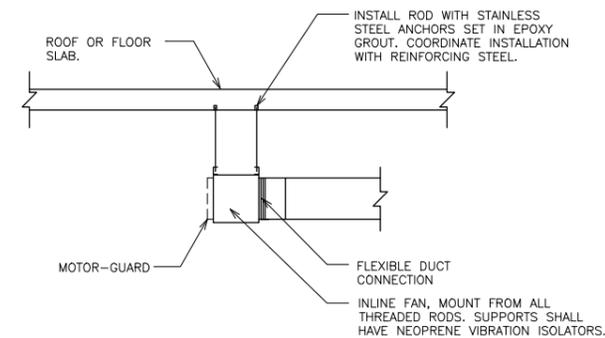
SPLIT SYSTEM  
DETAIL B  
NTS



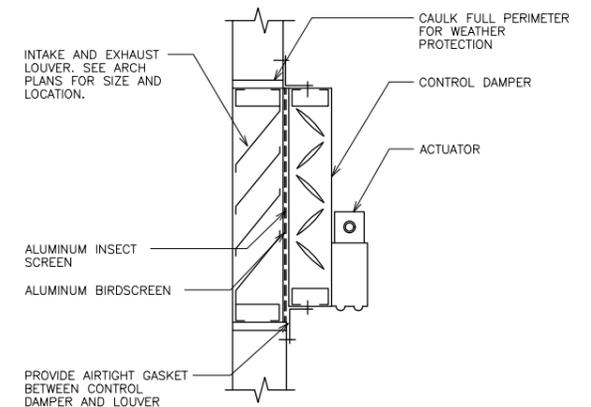
HORIZONTAL ELECTRIC UNIT HEATER  
DETAIL C  
NTS



PIPE PENETRATION THROUGH CONCRETE WALL  
DETAIL D  
NTS



INLINE EXHAUST FAN  
DETAIL E  
NTS



LOUVER W/ MOTORIZED DAMPER MOUNTING  
DETAIL F  
NTS

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 DRAWN BY: J. DION  
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 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. BUCCHIANERI  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

SCHEDULES AND DETAILS



Bryan Bucchianeri  
2024.09.06 12:24:04-0400

PROJECT NO. 141004-277870  
FILE NAME: H003SDDT.DWG

SHEET NO.

H-3

CONFORMED DRAWINGS

PLUMBING ABBREVIATIONS

(E)	EXISTING TO REMAIN
⊙	AT
AC	AIR COMPRESSOR
AD	AREA DRAIN, AIR DRYER
AFF	ABOVE FINISHED FLOOR
ANT	ACID NEUTRALIZATION TANK
ATF	AUTOMATIC TRANSMISSION FLUID
AV	AUTOMATIC AIR RELEASE VENT, ACID VENT
AW	ACID WASTE
BFP	BACKFLOW PREVENTER
BUDG	BUILDING
BOP	BOTTOM OF PIPE
BP	BOOSTER PUMP
BTM	BOTTOM
BWV	BACKWATER VALVE
CA	COMPRESSED AIR
CD	CAVITY DRAIN
CG	CHASSIS GREASE
CI	CAST IRON
CL	CENTERLINE
CN	CONDUCTOR NOZZLE
CO	CLEANOUT
COND	CONDENSATE DRAIN
CONT	CONTINUOUS / CONTINUE
COP	CENTER OF PIPE
CP	CONTROL PANEL
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CUP SINK
CU FT	CUBIC FEET
CV	CHECK VALVE
CW	COLD WATER
DCO	DOUBLE CLEANOUT
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DI	DUCTILE IRON/ DEIONIZED
DIA	DIAMETER
DN	DOWN
DO	DIESEL OIL
DR	DRAIN/ DRYER
DW	DISHWASHER
DWG	DRAWING
DWV	DRAIN WASTE VENT
E	EMERGENCY WATER
ECO	EXTERIOR CLEANOUT
EFBS	EMERGENCY FACE BODY SPRAY
EFF	EFFICIENCY
EL	ELEVATION
EO	ENGINE OIL
ES	EMERGENCY SHOWER
ES/EW	EMERGENCY SHOWER AND EYEWASH
EW	ELECTRIC WATER COOLER
EWST	EMERGENCY WATER STORAGE TANK
EWV	ENTERING WATER TEMPERATURE
EWU	EYEWASH UNIT
F	FAHRENHEIT
F/BS	FACE / BODY SPRAY
FAS	FLOW ALARM SWITCH
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FHC	FIRE HOSE CABINET
FHV&C	FIRE HOSE VALVE AND CABINET
FIN	FINISHED
FL	FLOOR
FLA	FULL LOAD AMPS
FLEX	FLEX CONNECTION
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FV	FIRE VALVE
G	GAS
GC	GENERAL CONTRACTOR
GO	GEAR OIL
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HEV	HOSE END VALVE
HP	HORSEPOWER
HS	HOSE STATION
HTHW	HIGH TEMPERATURE HOT WATER
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HZ	HERTZ
I.E.	INVERT ELEVATION
ID	INSIDE DIAMETER
IM	ICE MAKER
INV	INVERT
IOS	INSTALLED BY OTHER SECTION
IPS	IRON PIPE SIZE
KS	KITCHEN SINK
KU	KITCHEN UNIT
KW	KILLOWATT
LAB	LABORATORY
LAV	LAVATORY

PLUMBING ABBREVIATIONS

LBV	LOCKABLE BALL VALVE
LOW	LAB COLD WATER
LHW	LAB HOT WATER
LRA	LOCKED ROTOR AMPS
LS	LAB SINK
LWT	LEAVING WATER TEMPERATURE
M	MOTOR
MAX	MAXIMUM
MB	MOP BASIN
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MXV	MIXING VALVE
NC	NORMALLY CLOSED
NG	NATURAL GAS
NO	NORMALLY OPEN
NPW	NON-POTABLE WATER
O.C.	ON CENTER
OD	OUTSIDE DIAMETER
OED	OPEN END OR OPEN EQUIPMENT DRAIN
ORD	OVERFLOW ROOF DRAIN
ORL	OVERFLOW RAIN LEADER
P	PROTECTED WATER
P&T	PRESSURE & TEMPERATURE
PC	PLUMBING CONTRACTOR
PD	PUMP DISCHARGE
PG	PRESSURE GAUGE
PH	POST HYDRANT / PHASE
PHW	PROTECTED HOT WATER
PP	POLYPROPYLENE
PRV	PRESSURE REDUCING VALVE
PRW	PRESSURE WASTE
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
PVC	POLYVINYL CHLORIDE
PW	PLANT WATER / POTABLE WATER
PWT	PROTECTED WATER
RCP	RECIRCULATION PUMP
RD	ROOF DRAIN
RH	RADIANT HEATER
RL	RAINLEADER
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RTU	ROOF TOP UNIT
RWC	ROOF WATER CONDUCTOR
S	SOIL
SB	SERVICE BASIN
SCO	SANITARY CLEAN OUT
SH	SHOWER
SH	SHEET
SP	SPRINKLER
SQ	SQUARE
SS	STAINLESS STEEL / SANITARY SEWER
SSK	SERVICE SINK
ST	SAND TRAP / STORM
T	THERMOMETER
TD	TRENCH DRAIN
THK	THICKNESS
TMV	THERMOSTATIC MIXING VALVE
TPV	TRAP PRIMER VALVE
TW	TEPID WATER
TWH	TANKLESS WATER HEATER
TWR	TEPID WATER RETURN
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
V	VENT
VAC	VACUUM
VB	VACUUM BREAKER
VE	VACUUM EXHAUST
VTR	VENT THROUGH ROOF
W	WASTE
W&V	WASTE & VENT
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WCO	WALL CLEANOUT
WF	WASH FOUNTAIN
WH	WALL HYDRANT / WATER HEATER
WHA	WATER HAMMER ARRESTOR
WHS	WASH HOSE STATION
WM	WASHING MACHINE
WO	WASTE OIL
WOB	WASTE OIL BURNER
WWS	WINDSHIELD WASHER SOLVENT

PLUMBING SYMBOLS

	COLD WATER (POTABLE)
	HOT WATER (POTABLE)
	TEMPERED WATER
	TEMPERED WATER RETURN
	VENT
	FLOW ARROW
	FIRE SERVICE
	PROTECTED WATER (NON-POTABLE)
	GAS
	BALL VALVE
	LOCKABLE BALL VALVE
	CHECK VALVE
	PLUG VALVE
	STRAINER
	PRESSURE REDUCING VALVE
	BALANCING VALVE
	DOUBLE CHECK BACKFLOW PREVENTOR
	FLOW ALARM SWITCH
	AUTOMATIC AIR RELEASE VENT
	GATE VALVE (NC) WITH HOSE CONNECTOR
	SINGLE LINE PIPING REPRESENTATION SHOWN FOR 4" AND SMALLER PIPES
	CLEANOUT
	REDUCER-CONCENTRIC
	REDUCER-ECCENTRIC STRAIGHT INVERT
	REDUCER-ECCENTRIC STRAIGHT CROWN
	TEE UP
	TEE DOWN
	PRESSURE GAGE AND COCK
	UNION - SCREWED
	THERMOMETER
	ES/EW- EMERGENCY SHOWER/EYEWASH
	EYE FACE BODY SPRAY (EFBS)

PLUMBING SYMBOLS (CONTINUED)

	WATER PROOF SLEEVE THROUGH STRUCTURE
	PUMP
	CLEANOUT
	FLOOR DRAINS
	OPEN END DRAIN
	TRAP
	EQUIPMENT PROVIDED UNDER PLUMBING SECTION
	EQUIPMENT PROVIDED BY OTHERS REQUIRING PLUMBING CONNECTION
	SUPERVISORY SWITCH
	BOTTOM CONNECTION
	TOP CONNECTION
	ELBOW UP OR RISE
	ELBOW DN OR DROP
	"UP" DENOTES PIPES WHICH PENETRATE THE FLOOR ABOVE. "RISE" DENOTES PIPES WHICH DO NOT.
	"DN" DENOTES PIPES WHICH PENETRATE THE FLOOR BELOW. "DROP" DENOTES PIPES WHICH DO NOT.
	45' DROP
	NOTE: THE TERMS "DN" "DROP" "UP" & "RISE" ARE USED TO INDICATE THE VERTICAL DIRECTION IN WHICH A PIPE LINE THE TERMS HAVE NO RELEVANCE TO THE DIRECTION OF FLOW WITHIN THE PIPE LINE.
	WATER METER
	THERMOSTATIC MIXING VALVE
	WALL HYDRANT
	WASH HOSE STATION
	HOSE BIBB
	POINT WHERE NEW CONSTRUCTION CONNECTS TO EXISTING CONSTRUCTION
	POINT BETWEEN EXISTING CONSTRUCTION TO REMAIN AND EXISTING CONSTRUCTION TO BE DEMOLISHED

GENERAL NOTES

- EQUIPMENT AND PIPING SYSTEM LAYOUTS ARE DIAGRAMMATIC AND INTENDED TO SHOW PIPING AND DUCT BASIS OF DESIGN. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT THAT REQUIRES AN ARRANGEMENT OR SPACE DIFFERING FROM THAT INDICATED ON THE DRAWINGS OR SPECIFIED, THEY SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR APPROVAL. DETAILED ARCHITECTURAL, STRUCTURAL, PLUMBING, HVAC AND ELECTRICAL DRAWINGS AND EQUIPMENT LISTS SHOWING ALL NECESSARY CHANGES TO ALL DISCIPLINES AND EMBODYING ALL FEATURES OF THE EQUIPMENT HE PROPOSES TO FURNISH. THIS INFORMATION SHALL INCLUDE BUT NOT BE LIMITED TO PLANS, SECTIONS, DETAILS, AND SCHEMATICS OF ALL APPURTENANCES REQUIRED BY ALL DISCIPLINES. SUCH CHANGES IF APPROVED BY THE ENGINEER SHALL BE AT NO EXTRA COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME THE COST OF, AND THE RESPONSIBILITY FOR SATISFACTORILY ACCOMPLISHING ALL THE NECESSARY CHANGES CORRESPONDING TO THE DIMENSIONS AND CHARACTERISTICS OF THE EQUIPMENT SUBMITTED INCLUDING CHANGES TO ALL OTHER TRADES TO SATISFACTION OF ENGINEER. REFER TO SPECIFICATIONS FOR FURTHER DETAILS.
- ALL WORK, INCLUDING BUILDING SERVICES AND UTILITY SHUTDOWNS, SHALL BE COORDINATED AND SCHEDULED WITH THE OWNER.
- PLUMBING CONTRACTOR SHALL REMOVE CONSTRUCTION DEBRIS AND ALL OTHER DEBRIS MADE DURING THE WORK THEY HAVE COMPLETED, AT THE END OF EACH WORK DAY.
- ELEVATIONS ARE GIVEN AS REFERENCE FOR THE INTENDED ROUTING OF THE NEW WORK. THE PLUMBING CONTRACTOR SHALL COORDINATE THE EXACT ROUTING. ALL WORK SHALL BE INSTALLED WITH THE PROPER PITCH. COORDINATE WITH OTHER TRADES AND EXISTING CONDITIONS TO AVOID INTERFERENCES.
- PLUMBING EQUIPMENT, PIPING, ETC. SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS OR IN ELECTRICAL ROOMS.
- COORDINATE ALL MOTOR SIZES, STARTERS, DISCONNECT SWITCHES, CONTROLS, ETC. WITH ELECTRICAL PRIOR TO THE RELEASE OF ANY EQUIPMENT.
- WHERE PIPING PENETRATES A RATED PARTITION THE CONTRACTOR SHALL MAINTAIN INTEGRITY OF THE PARTITIONS USING U.L. APPROVED SEALING METHODS TO MATCH THE PARTITION RATING.
- PLUMBING CONTRACTOR SHALL PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS AS REQUIRED IN FINAL ROUTING OF PIPING.
- REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- EXISTING GRADES, STRUCTURES, ELEVATIONS, PIPING AND UTILITIES ARE INDICATED IN THEIR APPROXIMATE LOCATIONS ON THE PLANS; HOWEVER, THE INFORMATION IS NOT GUARANTEED TO BE CORRECT AND/OR COMPLETE, HAVE BEEN PLOTTED FROM AVAILABLE DRAWINGS, RECORDS, AND SURVEYS. ALL SUCH DATA SHALL BE VERIFIED IN THE FIELD BY THE PLUMBING CONTRACTOR PRIOR TO FABRICATION AND CONSTRUCTION. THE EXISTENCE OF STRUCTURES, PIPING, ETC WHICH ARE NOT SHOWN AND WHICH MAY BE ENCOUNTERED WILL NOT BE A BASIS FOR A CLAIM FOR EXTRA WORK.
- ALL PLUMBING PIPE, FITTINGS, FIXTURES AND EQUIPMENT CONNECTED TO OR PART OF THE PLUMBING SYSTEM SHALL RECEIVE AN APPROVAL CODE FROM THE ACCEPTED PLUMBING PRODUCTS ONLINE SYSTEM BY THE MASSACHUSETTS BOARD OF REGISTERED PLUMBERS AND GAS FITTERS IN ACCORDANCE WITH THE 12/8/2023 REVISION OF THE 2023 EDITION OF THE MASSACHUSETTS FUEL GAS AND PLUMBING CODE.

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. DION  
 DRAWN BY: J. DION  
 SHEET CHK'D BY: B. BUCCHIANERI  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. BUCCHIANERI  
 DATE: SEPTEMBER 2024



3 Davol Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

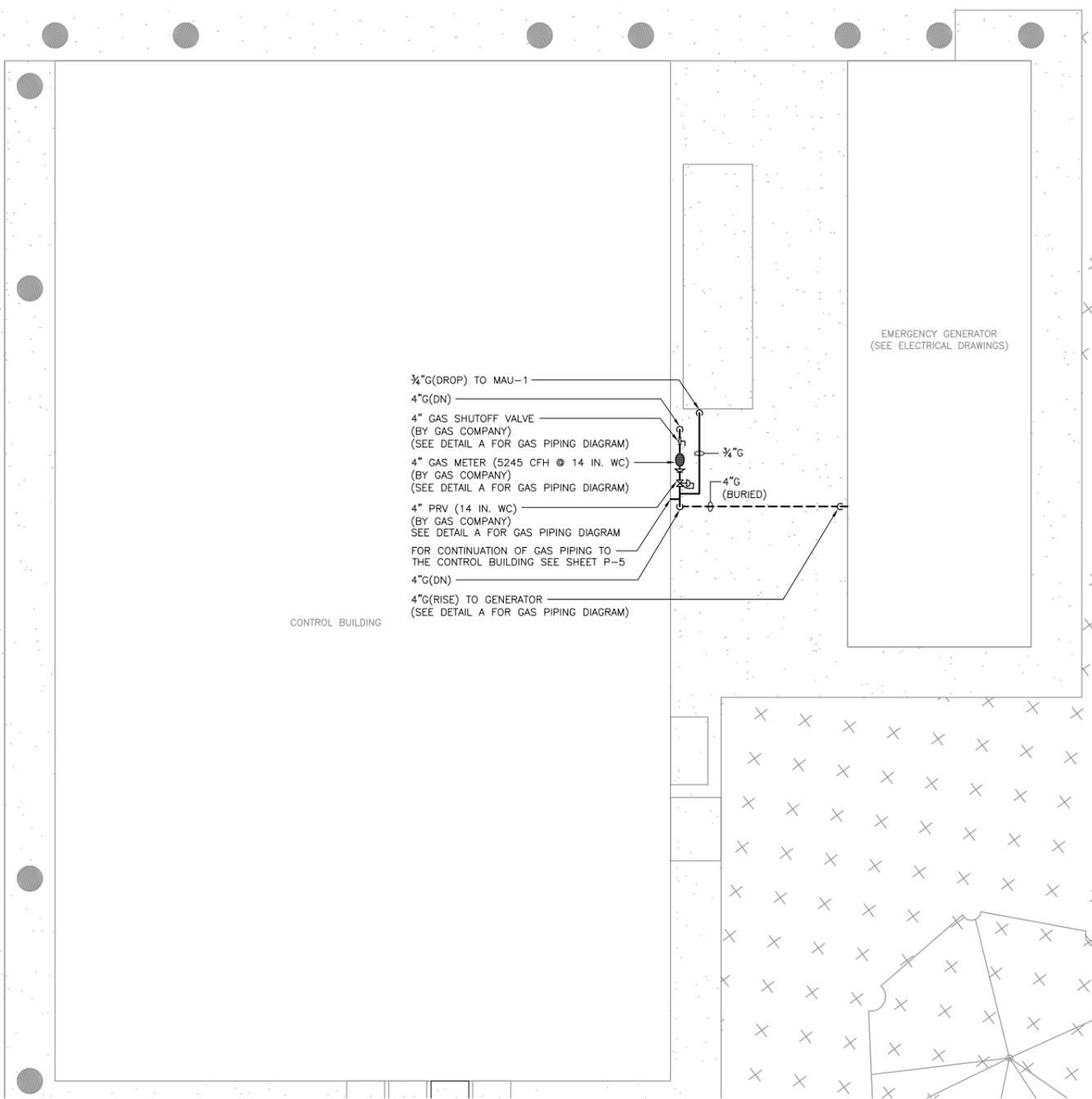
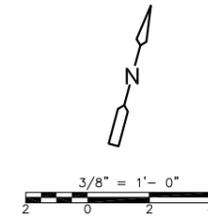
PLUMBING  
 LEGEND, SYMBOLS, ABBREVIATIONS, AND NOTES



Bryan P. Bucchianeri  
 2024.09.06 12:24:19-0400  
 PROJECT NO. 141004-277870  
 FILE NAME: P001LGND.DWG  
 SHEET NO. P-1

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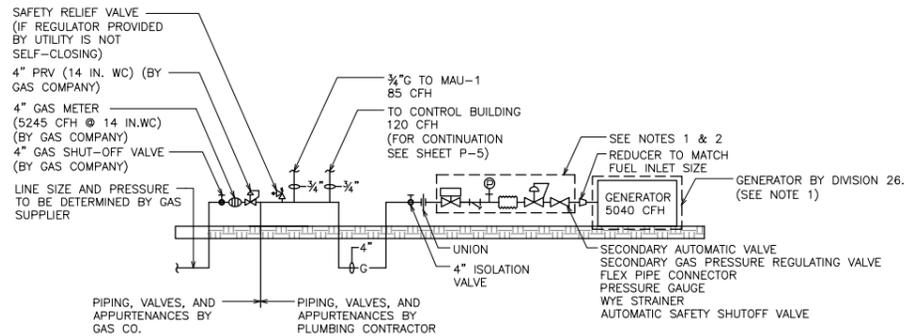
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CONTROL BUILDING

EMERGENCY GENERATOR  
(SEE ELECTRICAL DRAWINGS)

- 3/4" G(DROP) TO MAU-1
- 4" G(DN)
- 4" GAS SHUTOFF VALVE  
(BY GAS COMPANY)  
(SEE DETAIL A FOR GAS PIPING DIAGRAM)
- 4" GAS METER (5245 CFH @ 14 IN. WC)  
(BY GAS COMPANY)  
(SEE DETAIL A FOR GAS PIPING DIAGRAM)
- 4" PRV (14 IN. WC)  
(BY GAS COMPANY)  
SEE DETAIL A FOR GAS PIPING DIAGRAM
- FOR CONTINUATION OF GAS PIPING TO  
THE CONTROL BUILDING SEE SHEET P-5
- 4" G(DN)
- 4" G(RISE) TO GENERATOR  
(SEE DETAIL A FOR GAS PIPING DIAGRAM)



**GENERATOR GAS PIPING  
DETAIL A**

- NOTE:
- THE GENERATOR, GAS TRAIN COMPONENTS, PIPE, AND FITTINGS SHALL RECEIVE AN APPROVAL CODE FROM THE ACCEPTED PLUMBING PRODUCTS ONLINE SYSTEM BY THE MASSACHUSETTS BOARD OF REGISTERED PLUMBERS AND GAS FITTERS IN ACCORDANCE WITH THE 12/8/2023 REVISION OF THE 2023 EDITION OF THE MASSACHUSETTS FUEL AND GAS PLUMBING CODE.
  - GAS TRAIN COMPONENTS SHALL BE PROVIDED BY THE GENERATOR MANUFACTURER AND INSTALLED BY THE PLUMBING CONTRACTOR.

**PLUMBING SITE  
PLAN**  
3/8" = 1'-0"

- NOTES:
- REFER TO CIVIL DRAWINGS FOR SITE ORIENTATION OF THE BUILDING.
  - FINAL LOCATION OF GAS SERVICE TO BE COORDINATED WITH UTILITIES.
  - FINAL LOCATION OF GAS CONNECTION TO GENERATOR TO BE COORDINATED WITH THE GENERATOR MANUFACTURER.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. DION  
 DRAWN BY: J. DION  
 SHEET CHK'D BY: B. BUCCHIANERI  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. BUCCHIANERI  
 DATE: SEPTEMBER 2024

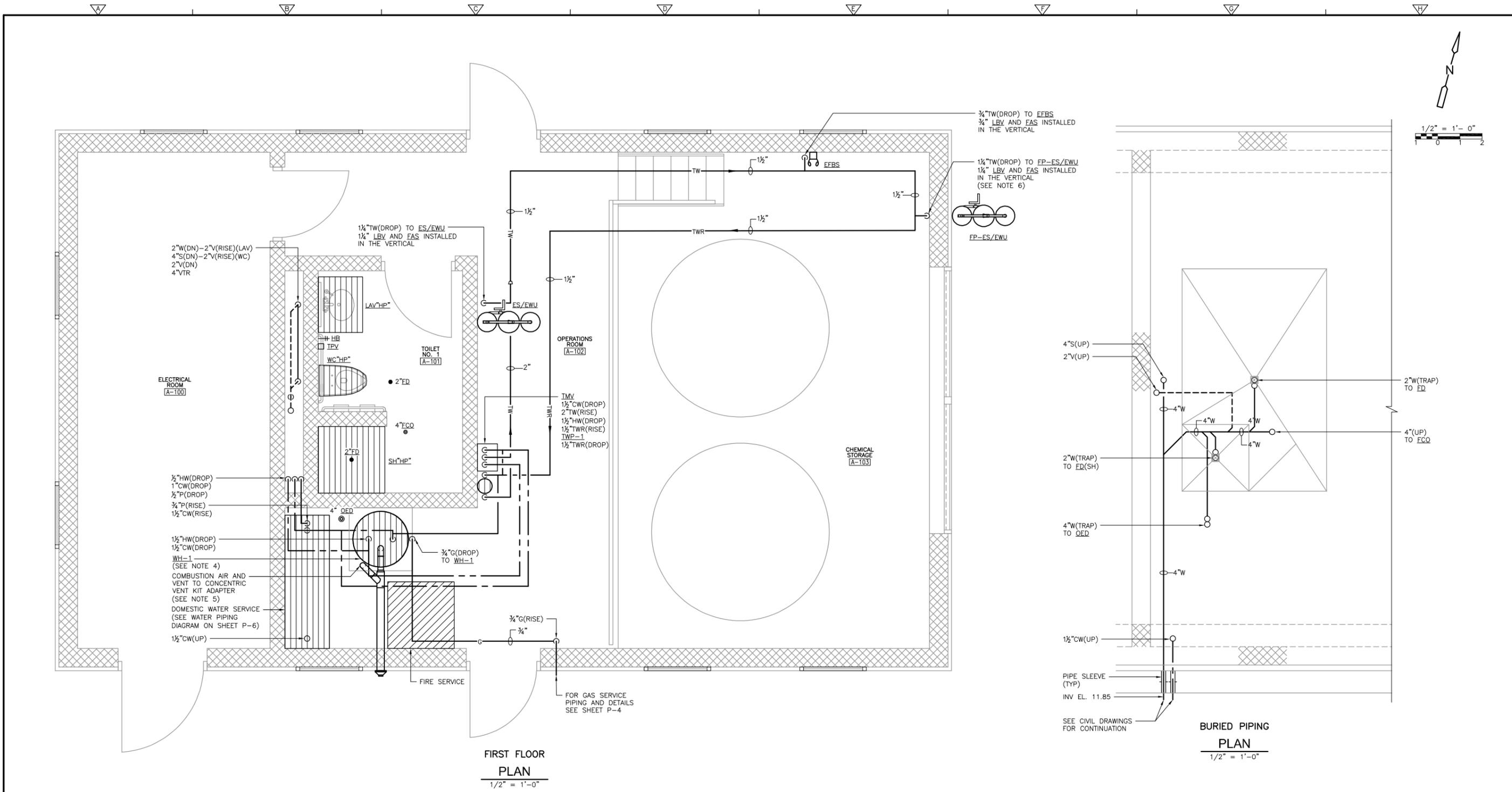
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 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 PLAN AND GAS PIPING DIAGRAM  
 SHEET NO.  
**P-4**

Bryan P. Bucchaneri  
 2024.09.06 12:24:54-0400  
 PROJECT NO. 141004-277870  
 FILE NAME: P004PSPL.DWG  
 SHEET NO.  
**P-4**

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- NOTES:**
- REFER TO CIVIL DRAWINGS FOR SITE ORIENTATION OF THE BUILDING.
  - FINAL LOCATION OF GAS SERVICE TO BE COORDINATED WITH UTILITIES.
  - FINAL LOCATION OF GAS CONNECTION TO GENERATOR TO BE COORDINATED WITH THE GENERATOR MANUFACTURER.
  - CONDENSATE FROM WH-1 SHALL BE PIPED TO NEAREST FLOOR DRAIN OR OPEN END DRAIN.
  - CONCENTRIC VENT SHALL BE INSTALLED PER MANUFACTURER'S INSTALLATION MANUAL.
  - PROVIDE WITH MIDDLE SUPPLY CONNECTION, DRAIN CONNECTION, AND FREEZE VALVE CONFIGURATION.
  - THE WATER LINES FOR THE DOMESTIC WATER FOR PLUMBING AND THE FIRE SERVICE FOR FIRE PROTECTION SHALL BE BROUGHT INTO THE BUILDING UP THROUGH THE SLAB OR THROUGH THE WALL BY THE CIVIL/GENERAL CONTRACTOR AND LEFT AS A CAPPED OR FLANGED CONNECTION 8-12-INCHES ABOVE THE FLOOR SLAB FOR CONTINUATION BY THE PLUMBING CONTRACTOR.
  - ALL BURIED PIPING SHALL BE ENCASED IN CONCRETE, AS SHOWN ON THE STRUCTURAL DRAWINGS, BY THE GENERAL CONTRACTOR.
  - COPPER PIPING FROM THE TRAP PRIMER VALVE TO THE FLOOR DRAINS AND OPEN END DRAINS SHALL BE 1/2" TYPE L ROLLED COPPER TUBING AND SHALL BE WRAPPED WITH ARMAFLEX INSULATION FOR PROTECTION FROM THE CONCRETE.
  - FOR PURPOSES OF CLARITY, THE BURIED WATER PIPING FROM THE TRAP PRIMER VALVE TO THE TRAPS ARE NOT SHOWN ON THE PLAN BUT SHALL BE INSTALLED BY THE PLUMBING CONTRACTOR AS NOTED ABOVE. FINAL ROUTING OF THE WATER PIPING FROM THE TRAP PRIMER VALVE TO THE TRAPS SHALL BE DETERMINED IN THE FIELD IN ACCORDANCE WITH CODE AND THE TRAP MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  - ALL PIPES PASSING THROUGH THE FOUNDATION WALL SHALL BE INSTALLED IN A SLEEVE THAT IS 2-INCHES IN DIAMETER LARGER THAN THE PIPE AND SHALL EXTEND THROUGH THE WALL 2-INCHES ON EITHER SIDE OF THE FOUNDATION WALL IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS.
  - ALL PIPES PASSING UNDERNEATH THE FOUNDATION WALL SHALL BE INSTALLED IN A SLEEVE THAT IS 2-INCHES IN DIAMETER LARGER THAN THE PIPE AND SHALL EXTEND 12-INCHES BEYOND THE ANGLE OF REPOSE OF THE FOUNDATION FOOTING ON BOTH SIDES OF THE FOOTING.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. DION  
 DRAWN BY: J. DION  
 SHEET CHK'D BY: B. BUCCHIANERI  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. BUCCHIANERI  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 Davol Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 FLOOR PLAN AND BURIED PIPING PLAN  
 SHEET NO. P-5

BRYAN P. BUCCHIANERI  
 MECHANICAL  
 No. 57300  
 REGISTERED PROFESSIONAL ENGINEER

Bryan Bucchianeri  
 2024.09.06 12:25:06-0400

PROJECT NO. 141004-277870  
 FILE NAME: P005PSPL.DWG  
 SHEET NO. P-5

CONFORMED DRAWINGS

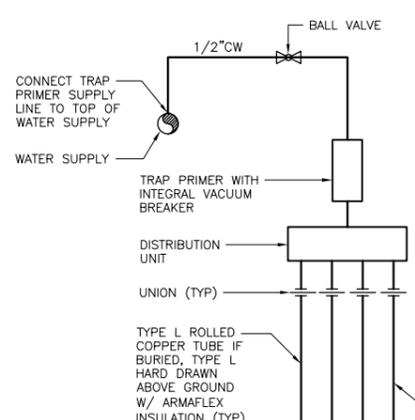
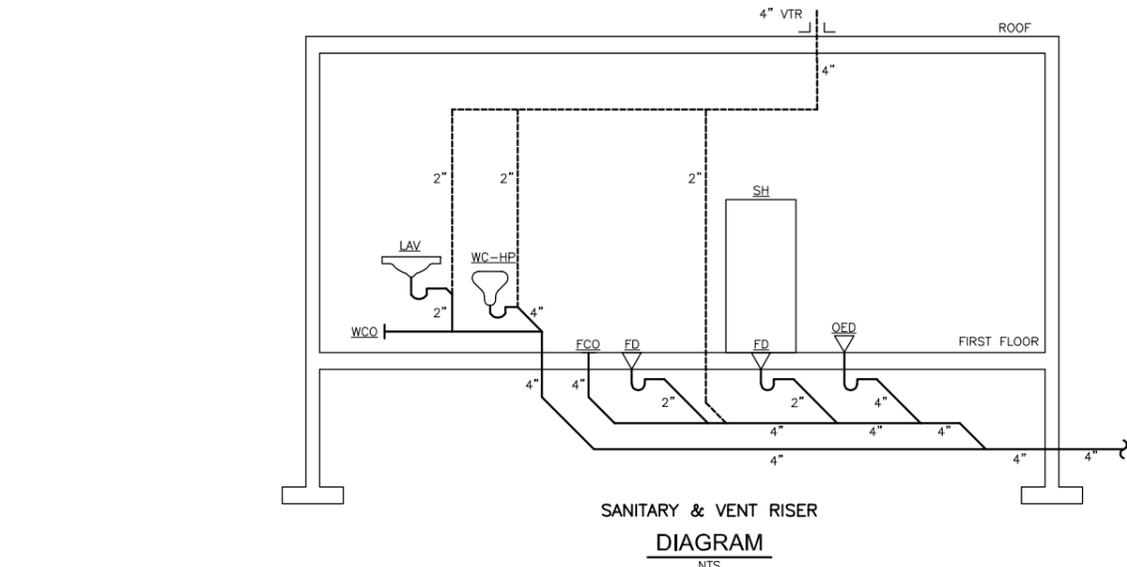
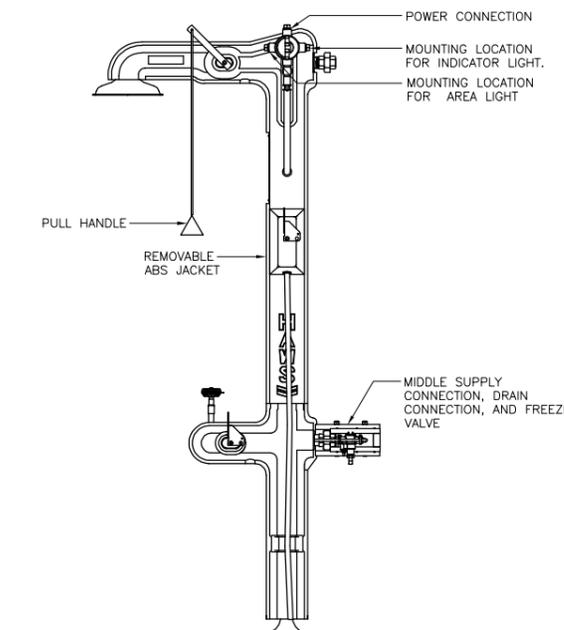
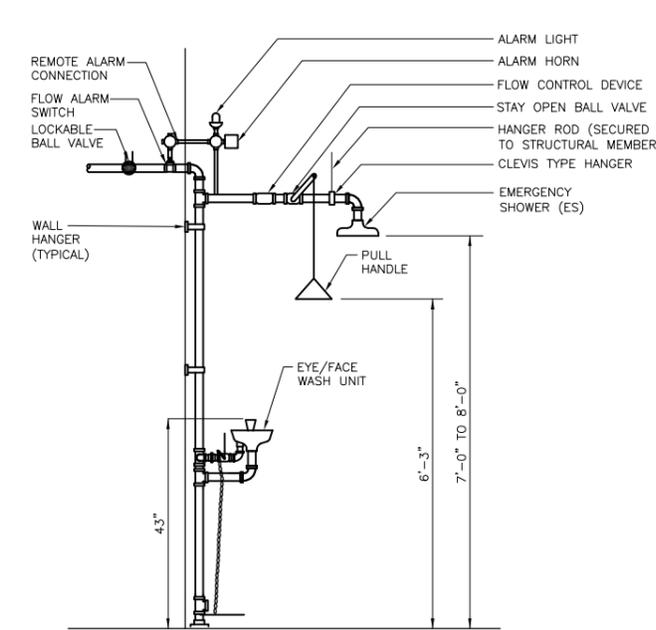
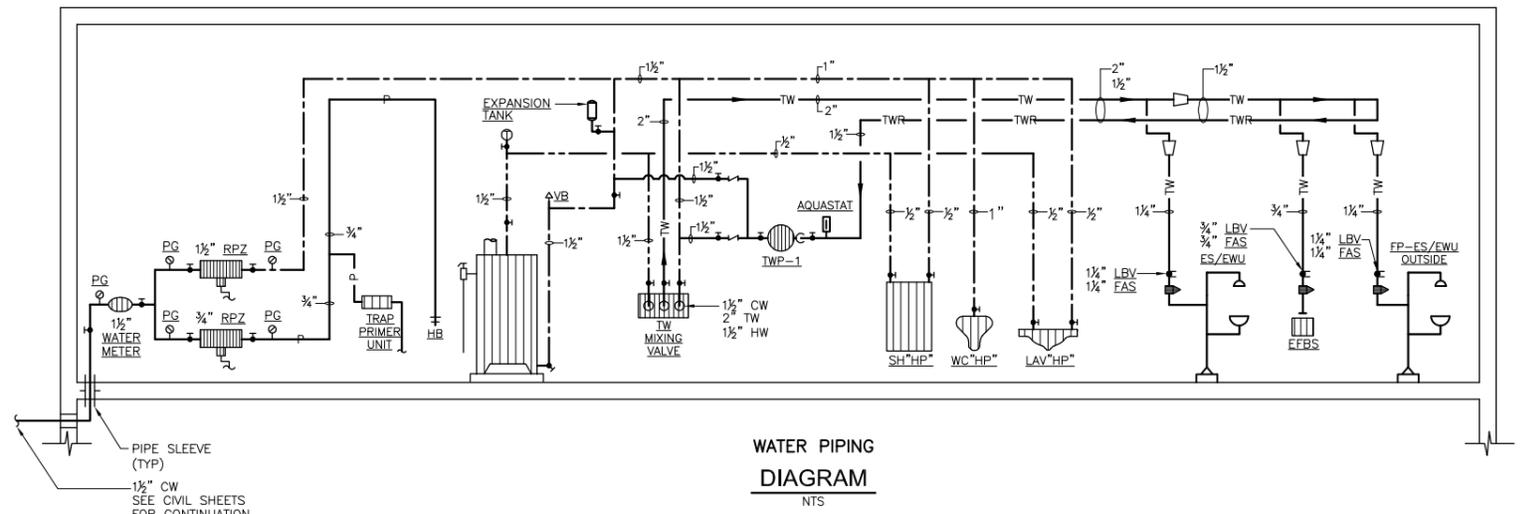
PLUMBING FIXTURES								
MARK	DESCRIPTION	WASTE (IN) MIN	VENT (IN) MIN	TRAP (IN) MIN	CW (IN) MIN	HW (IN) MIN	TW (IN) MIN	REMARKS
WC-HP	WATER CLOSET, FLUSH VALVE, WALL MOUNTED, HANDICAPPED	4	2	-	1	-	-	SEE SPECIFICATION SECTION 224213.13
LAV-HP	LAVATORY, COUNTER MOUNTED, HANDICAPPED	2	2	2	1/2	1/2	-	SEE SPECIFICATION SECTION 224216.13
SH-HP	SHOWER, HANDICAPPED	2	2	2	1/2	1/2	-	SEE SPECIFICATION SECTION 224223.
ES/EWU	EMERGENCY SHOWER/EYEWASH UNIT	-	-	-	-	-	1-1/4	SEE SPECIFICATION SECTION 224500.
FP-ES/EWU	EMERGENCY SHOWER/EYEWASH UNIT	-	-	-	-	-	1-1/4	SEE SPECIFICATION SECTION 224500.
EFBS	EMERGENCY SHOWER/EYEWASH UNIT	-	-	-	-	-	3/4	SEE SPECIFICATION SECTION 224500.

GAS-FIRED WATER HEATER											
TAG	LOCATION	TANK CAPACITY (GAL)	RECOVERY RATE (GAL/HR)	TEMPERATURE RISE (°F)	INPUT CAPACITY (MBH)	EFFICIENCY	MAXIMUM INLET PRESSURE (IN. W.C.)	APPROX OPERATIONAL WEIGHT (LBS)	MANUFACTURER	MODEL	NOTES
WH-1	OPERATIONS ROOM A-102	60	138	100	120	95%	14	490	AO SMITH	BTH-120	1,2

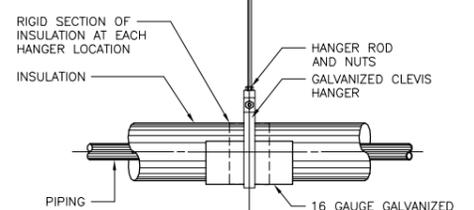
- NOTES:  
 1. PROVIDE WITH CONCENTRIC VENT KIT.  
 2. PROVIDE WITH ACID NEUTRALIZATION KIT.

PUMPS													
TAG	LOCATION	SYSTEM	FLOW		MOTOR		ELECTRICAL			APPROX. OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL	NOTES
			FLOW (GPM)	HEAD (FT)	RPM	HP	VOLTAGE	PH	HZ				
TWP-1	OPERATIONS ROOM A-102	TEPID WATER	25	20	-	1/8	120	1	60	14	TACO	GENIE 0011-CF	1

- NOTES:  
 1. PROVIDE WITH AQUASTAT FOR THERMOSTATIC ON-OFF CONTROL. THE PUMP SHALL TURN OFF WHEN THE WATER TEMPERATURE IS GREATER THAN 90°F AND SHALL TURN ON WHEN THE WATER TEMPERATURE IS LESS THAN 70°F.



- NOTES:  
 1. INSTALL TRAP PRIMER ASSEMBLY PER MFG. RECOMMENDATIONS.  
 2. REFER TO LOCAL PLUMBING CODE REQUIREMENTS.  
 3. LOCATE TRAP PRIMER ASSEMBLY IN AN ACCESSIBLE AREA FOR MAINTENANCE PURPOSES.  
 4. PROVIDE REQUIRED NUMBER OF TRAP PRIMERS AND DISTRIBUTION UNITS FOR NUMBER OF DRAINS.  
 5. TRAP PRIMER SHALL BE PRECISION PLUMBING PRODUCTS OR EQUAL.



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 DRAWN BY: J. DION  
 SHEET CHK'D BY: B. BUCCHIANERI  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. BUCCHIANERI  
 DATE: SEPTEMBER 2024

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 3 Davol Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 SCHEDULES, DETAILS, AND PIPING DIAGRAMS

BRYAN P. BUCCHIANERI  
 MECHANICAL  
 No. 5730  
 PROFESSIONAL ENGINEER

Bryan Bucchianeri  
 2024.09.06 12:25:19-0400

PROJECT NO. 141004-277870  
 FILE NAME: P006SDDG.DWG  
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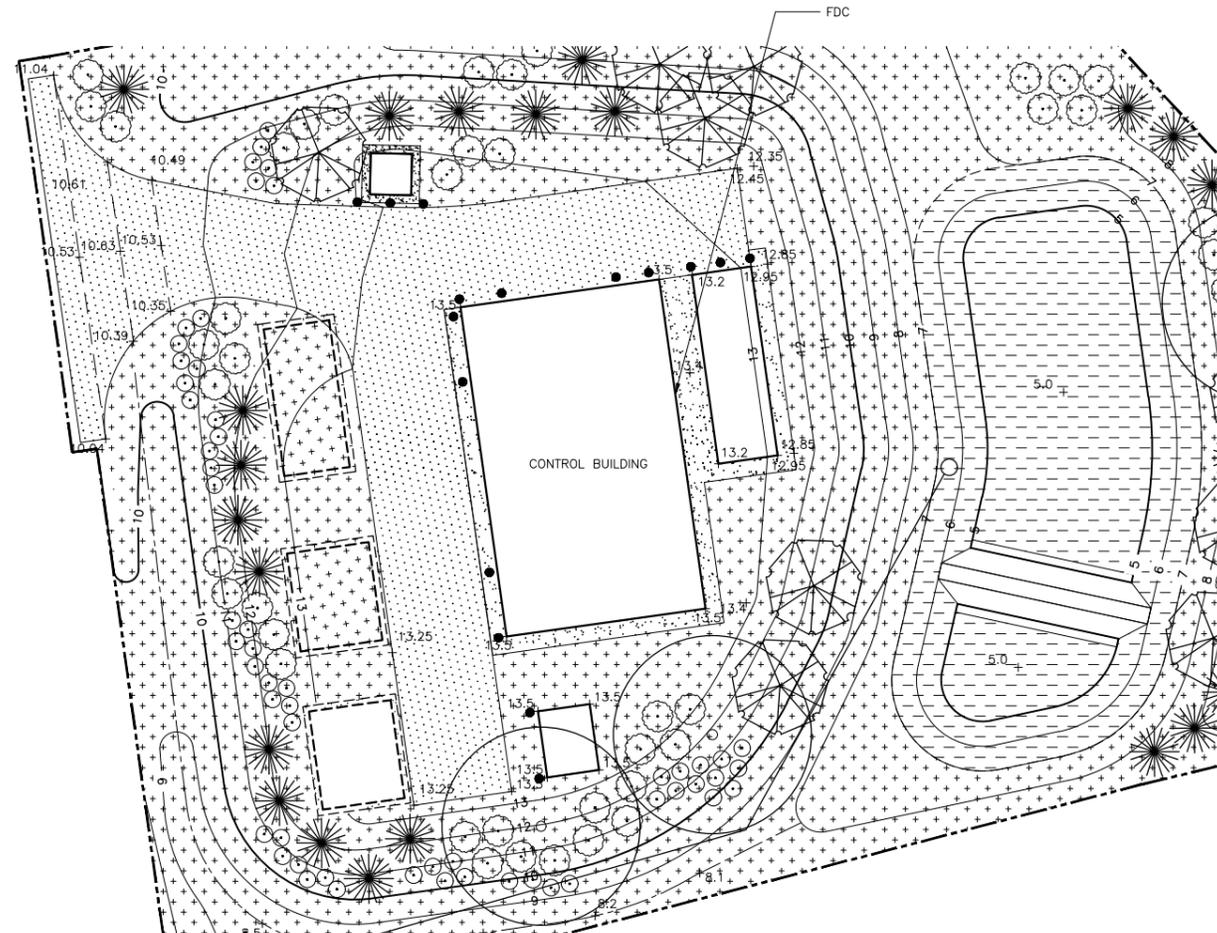
FIRE PROTECTION LEGEND

- FW FIRE WATER
- RPZ REDUCED PRESSURE ZONE BACKFLOW PREVENTER
- PG PRESSURE GAUGE
- SS SUPERVISORY SWITCH
- FS FLOW SWITCH
- PIV POST-INDICATOR VALVE
- SS PRESSURE SWITCH
- ▲ RISER CHECK VALVE
- ↻ FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- ▨ DENOTES SPRINKLERED AREAS
- F — FIRE SPRINKLER PIPING
- Z CHECK VALVE
- FS FLOW SENSOR WITH ADJUSTABLE RETARD
- ▲ ANGLE VALVE
- ▭ FLANGED OR GROOVE CONNECTION
- ⌞ BACKFLOW PREVENTER
- PRESSURE GAUGE WITH COCK
- ⌞ OS&Y VALVE WITH TAMPER SWITCH
- ▲ RISER CHECK WITH INTEGRAL MAIN DRAIN AND PRESSURE GAUGE TAPPINGS
- ▭ REDUCER
- TS TAMPER SWITCH
- AHJ AUTHORITY HAVING JURISDICTION
- FDC FIRE DEPARTMENT CONNECTION
- SPDT SINGLE POLE DOUBLE THROW
- FM FACTORY MUTUAL
- OED OPEN END DRAIN
- UL UNDERWRITERS LABORATORY
- NFPA NATIONAL FIRE PROTECTION ASSOCIATION
- IN INCHES
- PSI POUNDS PER SQUARE INCH
- GPM GALLONS PER MINUTE

FIRE SUPPRESSION SYSTEM SCHEDULE					
SUPPRESSION ZONE	DESCRIPTION	SYSTEM TYPE	SPRINKLER DESIGN DENSITY	MINIMUM CALCULATED DESIGN AREA	COMBINED HOSE STREAM
▨	RESTROOM & ELECTRICAL ROOM	WET SPRINKLER	LIGHT HAZARD 0.10 GPM/SQ FT	1500 SQ FT	100 GPM
▨	OPERATIONS ROOM	WET SPRINKLER	ORDINARY HAZARD GROUP II 0.20 GPM/SQ FT	3000 SQ FT	250 GPM

NOTES:

- LOCATE FIRE DEPARTMENT CONNECTIONS PER THE REQUIREMENT OF THE LOCAL FIRE DEPARTMENT. PROPOSED LOCATION IS SHOWN ON THE FIRE PROTECTION DRAWINGS. VERIFY SIZE AND THREADS OF THE FDC REQUIRED BY THE AHJ.
- CONTRACTOR SHALL VERIFY WITH THE AUTHORITY HAVING JURISDICTION AND THE OWNER'S INSURANCE CARRIER (IF APPLICABLE). THE DENSITIES AND OCCUPANCY CLASSIFICATION IN THIS BUILDING.
- HOSE STREAM ALLOWANCE SHALL BE APPLIED AT EACH RISER. TOTALS ARE NOT CUMULATIVE.
- HAZARD OCCUPANCY AND HOSE STREAM DEMANDS LISTED ARE ESTIMATIONS. ACTUAL CRITERIA TO BE DETERMINED BY THE FIRE SPRINKLER SYSTEM DESIGNER PER NFPA 13 REQUIREMENTS.



FIRE PROTECTION GENERAL NOTES

- THESE DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATE; IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR FOR VERIFICATION OF ALL DIMENSIONS, MEASUREMENTS, AND LOCATIONS OF EXISTING FACILITIES, UTILITIES, EQUIPMENT, AND OTHER EXISTING CONDITIONS WHICH MAY AFFECT CONSTRUCTION PRIOR TO SHOP DRAWINGS AND INSTALLATION. HOWEVER, IN THE EVENT OF DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS, CONTACT THE CONTRACTING OFFICER IMMEDIATELY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES, PERMITS, AND INSPECTIONS REQUIRED TO PERFORM THE WORK DESCRIBED IN THE CONTRACT DOCUMENTS.
- ALL HANGERS SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH NFPA 13.
- ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY NFPA 13 AS APPLICABLE.
- THE SPRINKLER SYSTEM SHALL BE MONITORED BY THE FIRE ALARM SYSTEM.
- COORDINATE ANY SHUTDOWNS AND INTERRUPTIONS IN SPRINKLER PROTECTION WITH THE BUILDING OWNER AND THE AUTHORITY HAVING JURISDICTION.
- PROVIDE SLEEVES AND FIRESTOP SEALANTS WHERE PIPES PENETRATE FIRE RATED FLOORS AND WALLS. COMPLY WITH ASTM E-814 AND UL 1479. PROVIDE PIPE SLEEVES WITH FIRE STOP SEALANTS FOR ALL PIPING PENETRATING DRYWALL PARTITIONS, MASONRY PARTITIONS, AND FLOORS.
- COORDINATE WITH OTHERS THE FINAL LOCATIONS OF SPRINKLER HEADS, PIPING, AND ALL NEW WORK WITH EXISTING AND NEW LIGHT FIXTURES, DIFFUSERS, GRILLES, REGISTERS, SMOKE DETECTORS, SPEAKERS, AND OTHER CEILING MOUNTED DEVICES.
- PIPING SHALL BE AS FOLLOWS:
  - SCHEDULE 40 WITH CAST IRON THREADED FITTINGS FOR BRANCH PIPING 1"-2" DIAMETER, OR APPROVED EQUAL.
  - SCHEDULE 10 WITH GROOVED FITTINGS FOR SUPPLY AND MAIN PIPING 2-1/2" DIAMETER AND LARGER, U.O.N.
  - ALL HEADS SHALL BE FED USING 1-INCH DIAMETER PIPING MINIMUM SIZE.
- LIGHT HAZARD OCCUPANCIES, MAXIMUM OF 225 SQ FT PER HEAD, MAXIMUM SPACING IS 15 FT, MINIMUM SPACING IS 6 FT, MINIMUM DISTANCE FROM WALLS IS 4 INCH. ORDINARY HAZARD OCCUPANCIES, MAXIMUM OF 130 SQ FT PER HEAD, MAXIMUM SPACING IS 15', MINIMUM SPACING IS 6', MINIMUM DISTANCE FROM WALL IS 4'.
- PROVIDE PROTECTION BENEATH ANY FIXED OBSTRUCTIONS IN EXCESS OF 4FT WIDE.
- CONTRACTOR TO PERFORM FLOW TEST IN ACCORDANCE WITH NFPA 291 THAT IS LESS THAN ONE YEAR OLD AT TIME OF PERMIT SUBMITTAL FOR SIZING OF SPRINKLER SYSTEM.
- FINAL SIZE, TYPE, AND LOCATION FOR FIRE DEPARTMENT CONNECTION TO BE COORDINATED WITH LOCAL FIRE DEPARTMENT.
- THE ENTIRE DESIGN AND INSTALLATION OF THE FIRE PROTECTION SYSTEMS SHALL BE IN STRICT ACCORDANCE WITH THE 9TH EDITION OF THE MASSACHUSETTS STATE BUILDING CODE 780, THE MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE 527 CMR, AND THE 2019 EDITION OF NFPA 13.

APPLICABLE ORDINANCES, CODES, AND STANDARDS

BUILDING CODE	9TH EDITION OF THE MASSACHUSETTS STATE BUILDING CODE 780 (2015 IBC)
FIRE / LIFE SAFETY CODE	MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE 527 CMR (2021 NFPA 1)
OTHER	2019 NFPA 72 & 2019 NFPA 291
SPRINKLER STANDARD	2019 NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. MUSSER  
 DRAWN BY: J. DION  
 SHEET CHK'D BY: A. MUSSER  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. GASS  
 DATE: SEPTEMBER 2024

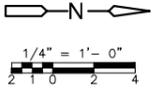
3 David Square, Building A, Suite A-425  
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 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

FIRE PROTECTION  
 LEGEND, SYMBOLS, ABBREVIATIONS, AND NOTES

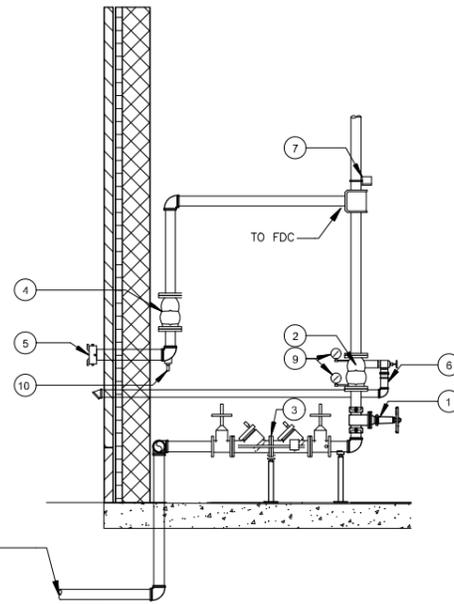
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**F-1**



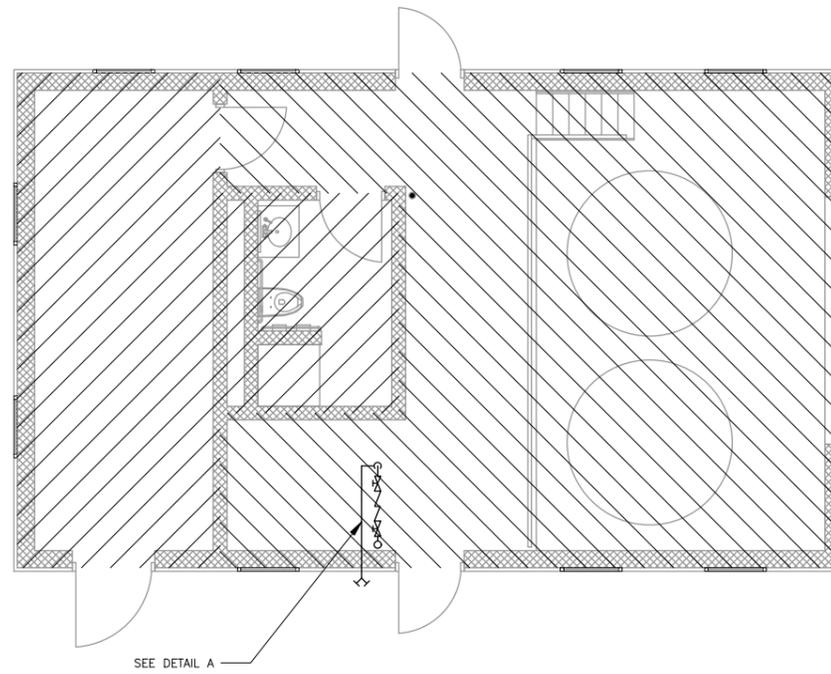


FIRE SUPPRESSION SYSTEM SCHEDULE					
SUPPRESSION ZONE	DESCRIPTION	SYSTEM TYPE	SPRINKLER DESIGN DENSITY	MINIMUM CALCULATED DESIGN AREA	COMBINED HOSE STREAM
	RESTROOM & ELECTRICAL ROOM	WET SPRINKLER	LIGHT HAZARD 0.10 GPM/SQ FT	1500 SQ FT	100 GPM
	OPERATIONS ROOM	WET SPRINKLER	ORDINARY HAZARD GROUP II 0.20 GPM/SQ FT	3000 SQ FT	250 GPM

- DETAIL LEGEND :
1. CONTROL VALVE (OS&Y OR BUTTERFLY)
  2. ALARM CHECK VALVE
  3. REDUCED PRESSURE BACKFLOW PREVENTER
  4. SWING CHECK VALVE
  5. FIRE DEPARTMENT CONNECTION (4" STORZ)
  6. 2" MAIN DRAIN (ROUTED TO FLOOR DRAIN OR TO EXTERIOR)
  7. WATERFLOW ALARM SWITCH
  8. NOT USED
  9. PRESSURE GAUGE
  10. 1/2" BALL DRIP



BACKFLOW PREVENTER  
DETAIL A  
NTS



FIRST FLOOR  
PLAN  
1/4" = 1'-0"

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. MUSSER  
 DRAWN BY: J. DION  
 SHEET CHK'D BY: A. MUSSER  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: J. GASS  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

CONTROL BUILDING  
 FLOOR PLAN  
 SHEET NO.  
**F-2**

PROJECT NO. 141004-277870  
 FILE NAME: F002PSPL.DWG  
 SHEET NO.  
**F-2**

Digitally signed by Jarron J. Gass  
 Reason: License #52926  
 Date: 2024.09.06 13:25:06-0400

**GENERAL INSTRUMENT OR FUNCTION SYMBOLS**

SHARED DISPLAY/SHARED CONTROL	PRIMARY CHOICE	SECONDARY CHOICE	COMPUTER SOFTWARE	DISCRETE	LOCATION AND ACCESSIBILITY
					FIELD MOUNTED AND NORMALLY OPERATOR ACCESSIBLE
					PRIMARY CONTROL PANEL MOUNTED AND NORMALLY OPERATOR ACCESSIBLE
					PRIMARY CONTROL PANEL MOUNTED AND NOT NORMALLY OPERATOR ACCESSIBLE
					SECONDARY CONTROL PANEL MOUNTED AND NORMALLY OPERATOR ACCESSIBLE
					SECONDARY CONTROL PANEL MOUNTED AND NOT NORMALLY OPERATOR ACCESSIBLE

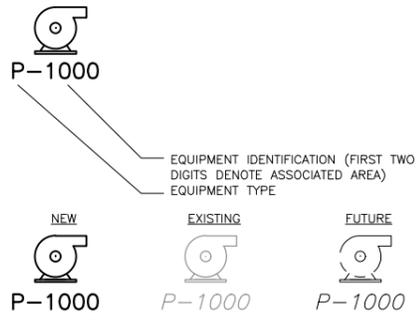


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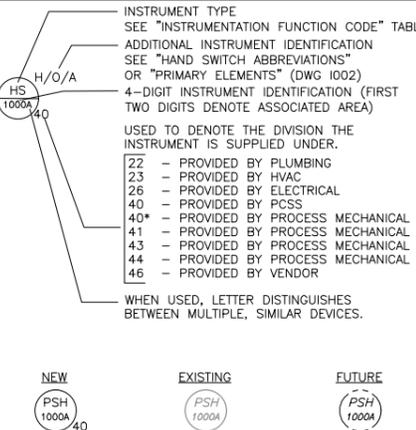
	FIRST LETTERS		SUCCEEDING LETTERS		
	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
	MEASURED/INITIATING VARIABLE	VARIABLE MODIFIER	READOUT/PASSIVE FUNCTION	OUTPUT/ACTIVE FUNCTION	FUNCTION MODIFIER
A	ANALYSIS		ALARM (2)		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	COMMUNICATION			CONTROL	CLOSED
D	USER'S CHOICE	DIFFERENCE, DIFFERENTIAL			DEVIATION
E	VOLTAGE		SENSOR, PRIMARY ELEMENT		
F	FLOW, FLOW RATE	RATIO			FAULT
G	USER'S CHOICE		GLASS, GAUGE, VIEWING DEVICE		HIGH
H	HAND				
I	CURRENT		INDICATE (2)		
J	POWER		SCAN		
K	TIME, SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (2)		LOW
M	MOISTURE				MIDDLE, INTERMEDIATE
N	TORQUE		ENABLE (READY)	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE, TOTALIZE	INTEGRATE, TOTALIZE		
R	RADIATION		RECORD		RUN
S	SPEED, FREQUENCY	SAFETY		SWITCH (2)	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL, ANALYSIS		WELL, PROBE		WARNING
W	WEIGHT, FORCE		ACCESSORY DEVICES, UNCLASSIFIED (1)	UNCLASSIFIED (1)	UNCLASSIFIED (1)
X	UNCLASSIFIED (1)	X-Axis			
Y	EVENT, STATE, PRESENCE	Y-Axis		AUXILIARY DEVICES	
Z	POSITION, DIMENSION	Z-Axis, SAFETY INSTRUMENT SYSTEM		DRIVER, ACTUATOR, UNCLASSIFIED, FINAL CONTROL ELEMENT	

TABLE NOTES:  
 1. WHEN USED SYMBOL OR SIGNAL LINE IS ANNOTATED.  
 2. FUNCTION ALLOWS FOR MODIFIER (COLUMN 5).

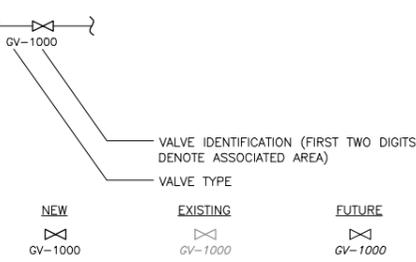
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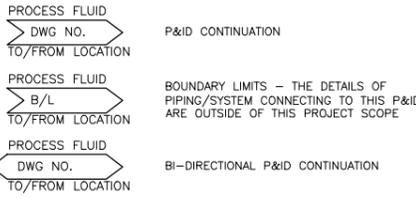
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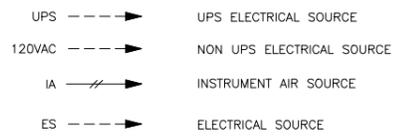
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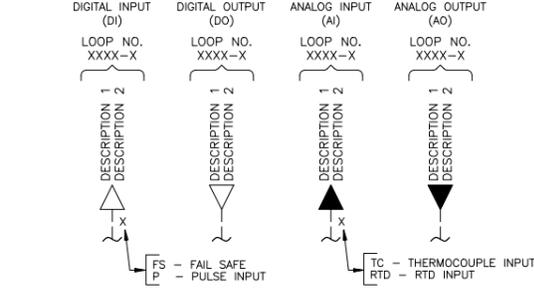
**OFF PAGE CONNECTORS**



**ELECTRICAL / AIR SOURCES**

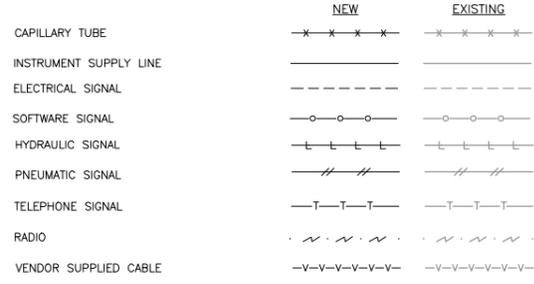


**I/O SIGNALS**

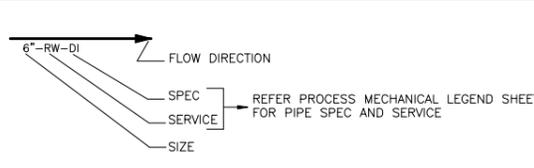


\*\* MEASURED VARIABLE OR OUTPUT FUNCTION FROM "INSTRUMENTATION FUNCTION CODE" TABLE.  
 \*\* FAIL SAFE - NORMALLY CLOSED CONTACT UNDER NORMAL PROCESS CONDITIONS.

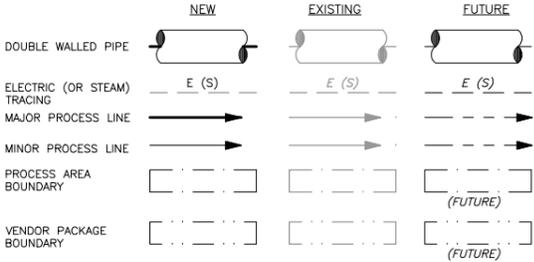
**INSTRUMENT LINE SYMBOLS**



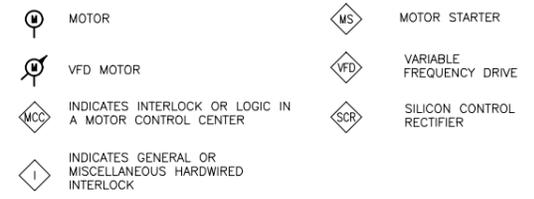
**PIPE TAG DESIGNATION**



**PROCESS LINES TYPES**



**MOTOR CONTROL SYMBOLS**



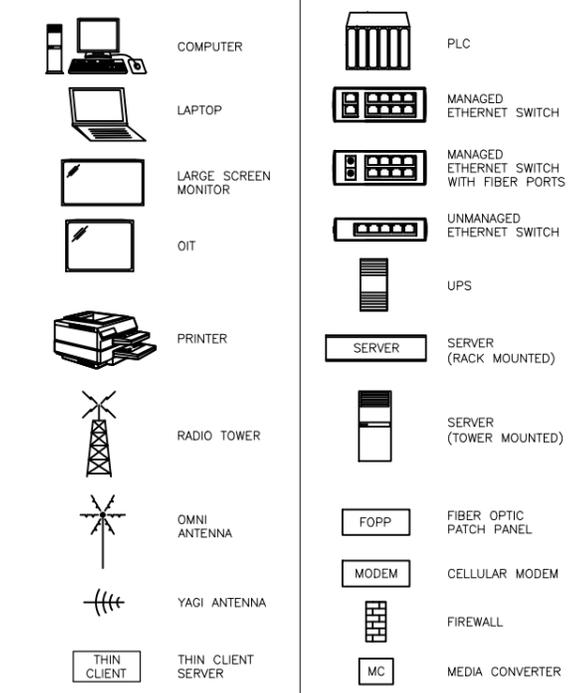
**GENERAL ABBREVIATIONS**

- AI ANALOG IN
- AO ANALOG OUT
- CCTV CLOSED CIRCUIT TELEVISION
- CPU CENTRAL PROCESSING UNIT
- DI DIGITAL OR DISCRETE INPUT
- DO DIGITAL OUTPUT
- DVR DIGITAL VIDEO RECORDER
- ES ETHERNET SWITCH (UNMANAGED) OR ELECTRICAL SOURCE
- ETM ELAPSED TIME METER
- FC FAIL CLOSED
- FO FAIL OPEN OR FIBER OPTIC
- FOCE FIBER OPTIC COMMUNICATION ENCLOSURE
- FOES FIBER OPTIC ETHERNET SWITCH
- FOPP FIBER OPTIC PATCH PANEL
- FW FIREWALL
- HIM HUMAN INTERFACE MODULE
- HMI HUMAN MACHINE INTERFACE
- I/O INPUT/OUTPUT
- ISP INTERNET SERVICE PROVIDER
- KVM KEYBOARD VIDEO MONITOR
- LCP LOCAL CONTROL PANEL
- LCS LOCAL CONTROL STATION
- MBS MAINTENANCE BYPASS SWITCH
- MC MEDIA CONVERTER
- MCC MOTOR CONTROL CENTER
- MES MANAGED ETHERNET SWITCH
- MS MOTOR STARTER
- NC NORMALLY CLOSED
- NO NORMALLY OPEN
- NVR NETWORK VIDEO RECORDER
- OED OPEN EQUIPMENT DRAIN
- OIT OPERATOR INTERFACE TERMINAL
- OWS OPERATOR WORKSTATION
- PLC PROGRAMMABLE LOGIC CONTROLLER
- PS POWER SUPPLY
- RAD RADIO
- RTD REMOTE INPUT/OUTPUT
- RT RUN TIME
- RTU REMOTE TERMINAL UNIT
- SPD SURGE PROTECTION DEVICE
- TC THIN CLIENT
- TKC THICK CLIENT
- UPS UNINTERRUPTIBLE POWER SUPPLY
- VFD VARIABLE FREQUENCY DRIVE
- VPN VIRTUAL PRIVATE NETWORK

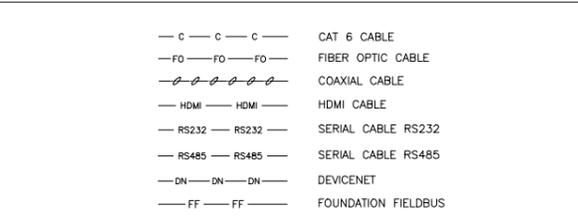
**GENERAL NOTES**

- THIS LEGEND APPLIES TO P&IDS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.
- IN GENERAL THIS LEGEND SHEET AND THE P&IDS ARE BASED ON THE INTERNATIONAL SOCIETY OF AUTOMATION (ISA) STANDARDS AND RECOMMENDED PRACTICES FOR INSTRUMENTATION AND CONTROL. SOME MODIFICATIONS, ADDITIONS AND ALTERATIONS HAVE BEEN MADE AS REQUIRED TO ACCOMMODATE PROJECT REQUIREMENTS.
- SOME PROCESS ITEMS SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS ARE NOT SHOWN ON THE P&IDS.
- SEE ELECTRICAL AND MECHANICAL SHEETS AND SPECIFICATIONS FOR ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS.

**SYSTEM ARCHITECTURE SYMBOLS**



**SYSTEM ARCHITECTURE LINETYPES**



**HAND SWITCH ABBREVIATIONS**

- A/O - AUTO/OFF
- A/M - AUTO/MANUAL
- C/L - COMPUTER/LOCAL
- C/M - COMPUTER/MANUAL
- E-STOP - EMERGENCY STOP
- F/R - FORWARD/REVERSE
- F/O/R - FORWARD/OFF/REVERSE
- F/S - FAST/SLOW
- F/O/S - FAST/OFF/SLOW
- H/O/A - HAND/OFF/AUTO
- H/O/R - HAND/OFF/REMOTE
- L/A - LOCAL/AUTO
- L/R - LOCAL/REMOTE
- L/L/S - LEAD/LAG/STANDBY
- L/O/A - LOCAL/OFF/AUTO
- L/O/R - LOCAL/OFF/REMOTE
- LO/S - LOCKOUT/STOP
- O/C - OPEN/CLOSE
- O/C/A - OPEN/CLOSE/AUTO
- O/C/R - OPEN/CLOSE/REMOTE
- O/O - ON/OFF
- O/O/A - ON/OFF/AUTO
- O/O/R - ON/OFF/REMOTE
- O/S/C - OPEN/STOP/CLOSE
- R/S/L - RAISE/STOP/LOWER
- S/O/R - START/OFF/RESET
- S/S - START/STOP

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: C. WASHINGTON  
 DRAWN BY: S. SILVESTER  
 SHEET CHK'D BY: F. ALCALA  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: M. POPTANI  
 DATE: SEPTEMBER 2024

3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES

PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

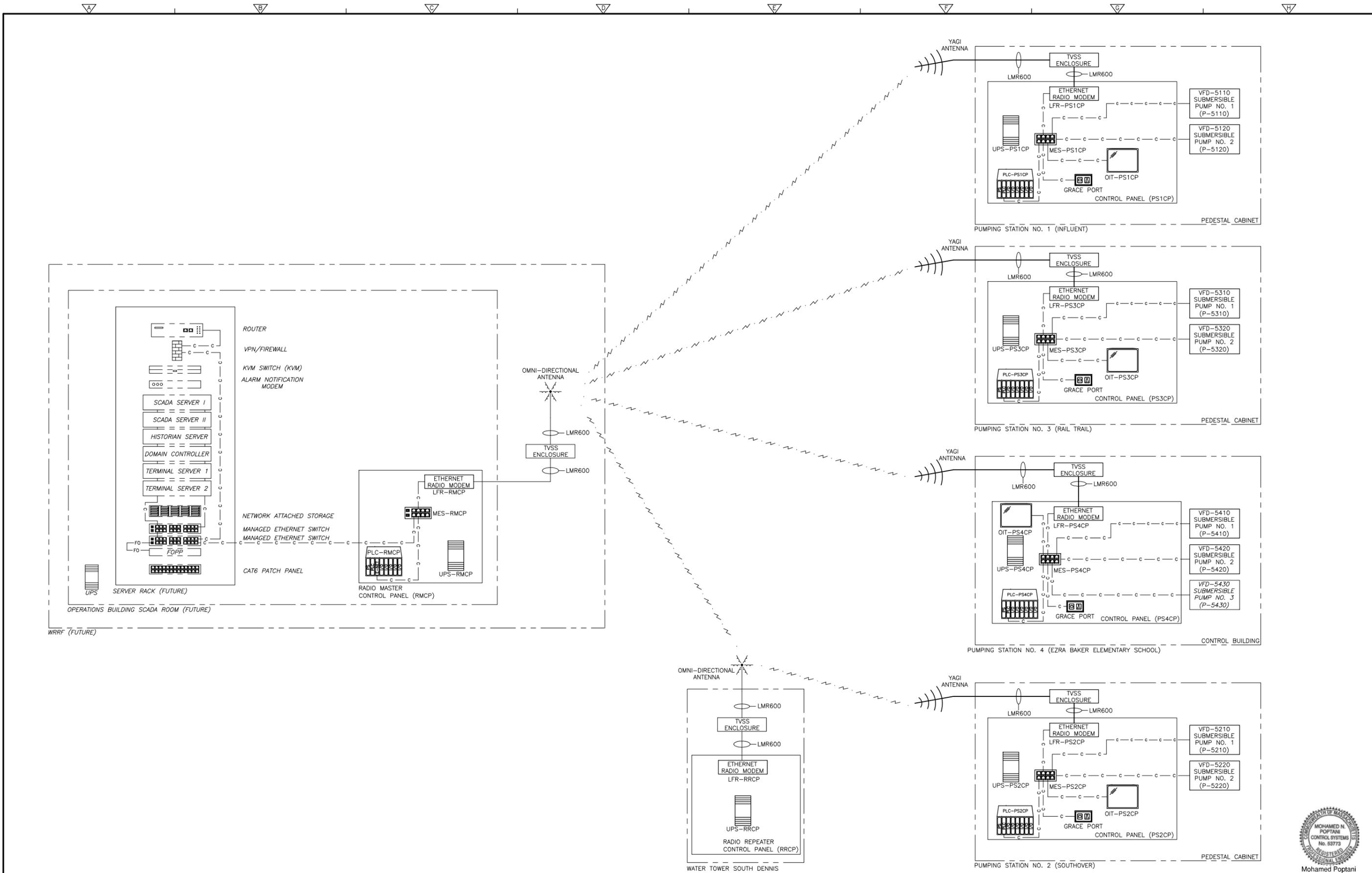
LEGEND I

SHEET NO.  
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REV. NO.	DATE	DRWN	CHKD	REMARKS

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 DRAWN BY: A. MAXWELL  
 SHEET CHK'D BY: F. ALCALA  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: M. POPTANI  
 DATE: SEPTEMBER 2024

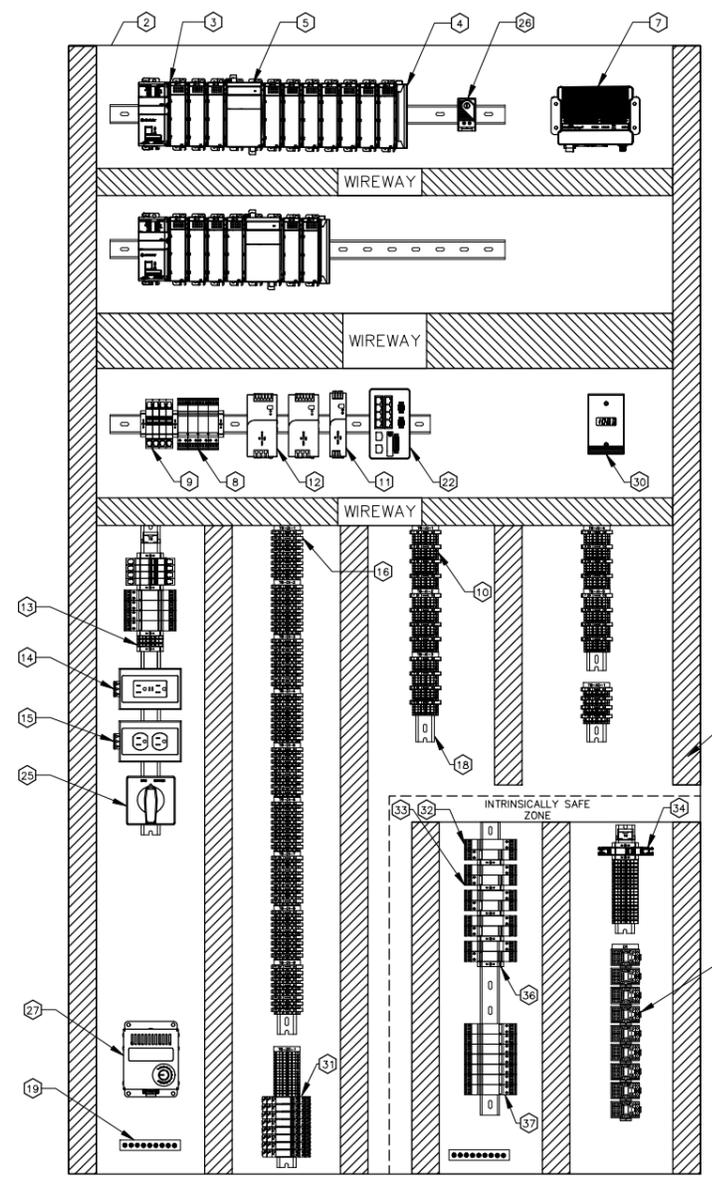
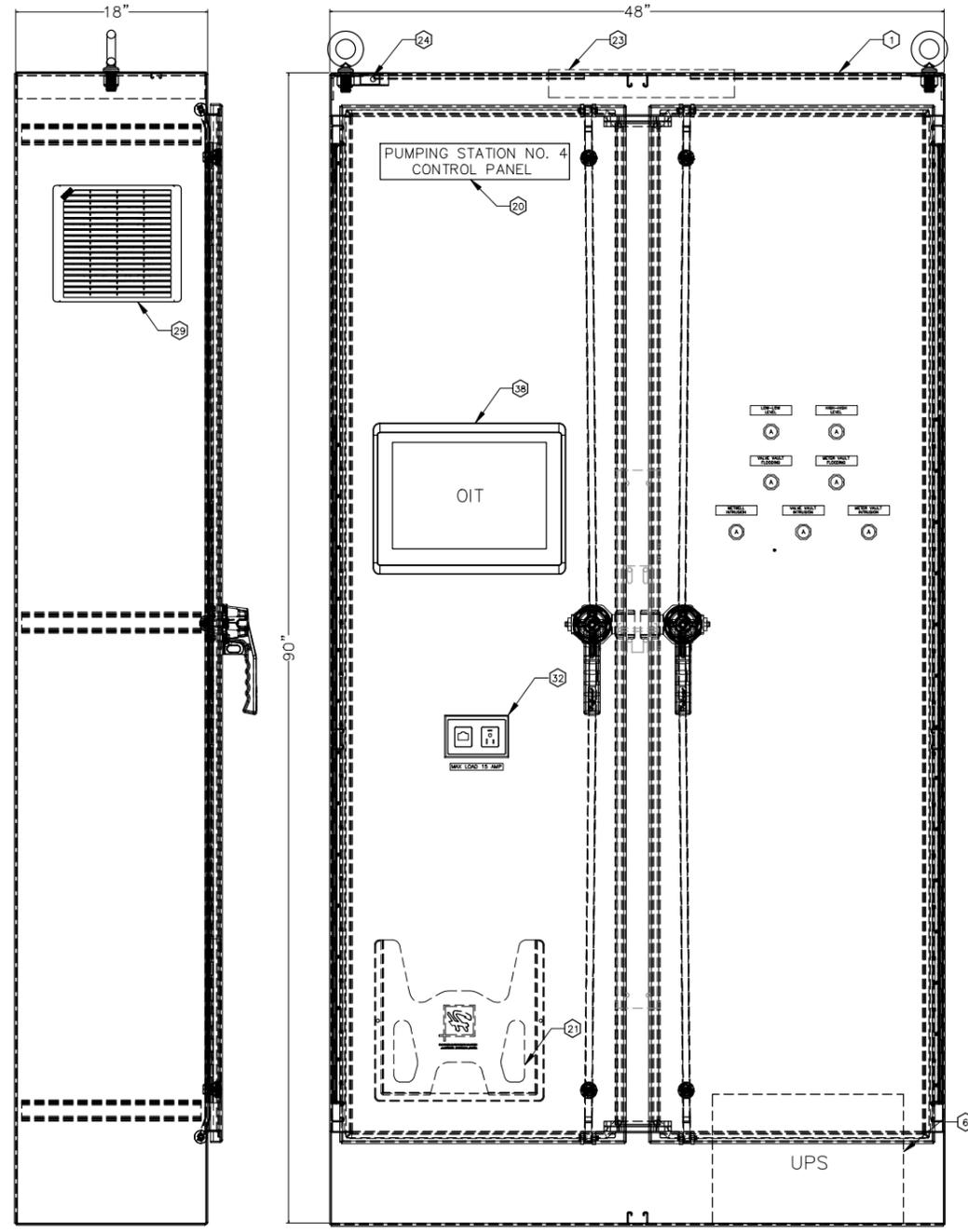


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

NETWORK SYSTEM ARCHITECTURE  
 SHEET NO. I-3

Mohamed N. Poptani  
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QTY.	DESCRIPTION	SPECIFICATION
1	PANEL ENCLOSURE (MIN. 72" X 48" X 18")	406717
2	BACK PANEL	-
3	COMPACTLOGIX PROCESSOR	406343
4 AS REQ.	COMPACTLOGIX MODULES	406343
5	COMPACTLOGIX POWER SUPPLY	406343
6	1500VA UPS	406763
7	RADIO MODEM - IP BASED	406650
8 AS REQ.	SURGE PROTECTOR	407856
9 AS REQ.	CIRCUIT BREAKERS	406733
10 AS REQ.	FUSED TERMINAL BLOCKS	406733
11	24V DC POWER SUPPLY REDUNDANT MODULE	407859
12	24V REDUNDANT DC POWER SUPPLY	407859
13	LINE NEUTRAL GROUND	-
14	120 VAC DUPLEX GFCI RECEPTACLE	406733
15	120 VAC DUPLEX GFCI CONVENIENCE RECEPTACLE	406733
16 AS REQ.	TERMINAL BLOCKS	406733
17 AS REQ.	WIRE WAY	406733
18 AS REQ.	DIN RAIL EQUIPMENT MOUNTING RACK	-
19 AS REQ.	GROUND BUSBAR	406733
20	NAMEPLATE	406717
21	METALLIC DATA POCKET	406717
22	MANAGED ETHERNET SWITCH	406263
23	LED LIGHT	406733
24	INTRUSION SWITCH	406733
25	UPS MAINTENANCE BYPASS SWITCH	406763
26	TEMPERATURE SWITCH	406717
27	HEATER	406717
28	EXHAUST FAN	406717
29	LOUVER (EXHAUST GRILLE)	406717
30	TEMPERATURE INDICATOR	407463
31 AS REQ.	INTERPOSING RELAYS	406733
32 AS REQ.	SURGE PROTECTOR	407856
33 AS REQ.	INTRINSIC SAFETY BARRIER (ISB)	407856
34 AS REQ.	FUSE	-
35 AS REQ.	INTERPOSING RELAYS	406733
36 AS REQ.	END TERMINAL	406733
37 AS REQ.	INTRINSIC SAFETY RELAY (ISR)	407856
38	OPERATOR INTERFACE TERMINAL	406263

NOTES  
 1. GENERAL PANEL LAYOUT SHOWN. REFER TO SPECIFICATION FOR DETAILED REQUIREMENT.

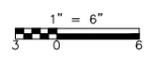
LEFT SIDE VIEW

FRONT VIEW

RIGHT SIDE VIEW

BACKPANEL LAYOUT

TYPICAL ENCLOSURE LAYOUT  
 (PSACP PUMPING STATION CONTROL PANEL)  
 DETAIL A  
 1:6



Mohamed Poptani  
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REV. NO.	DATE	DRWN	CHKD	REMARKS

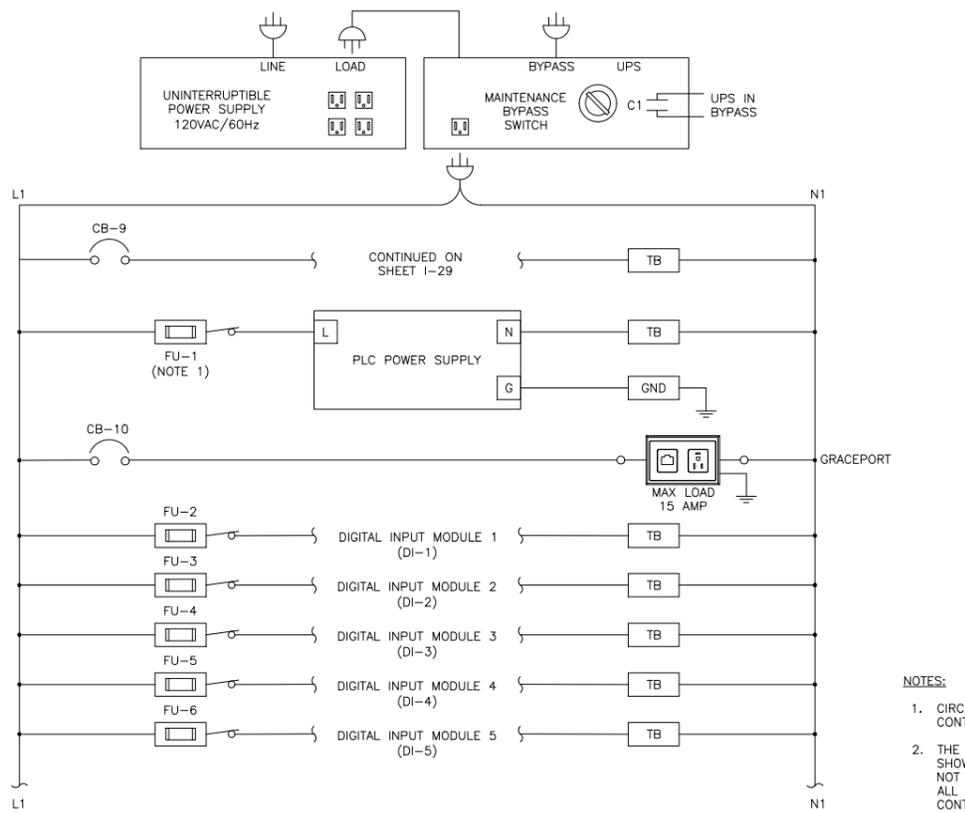
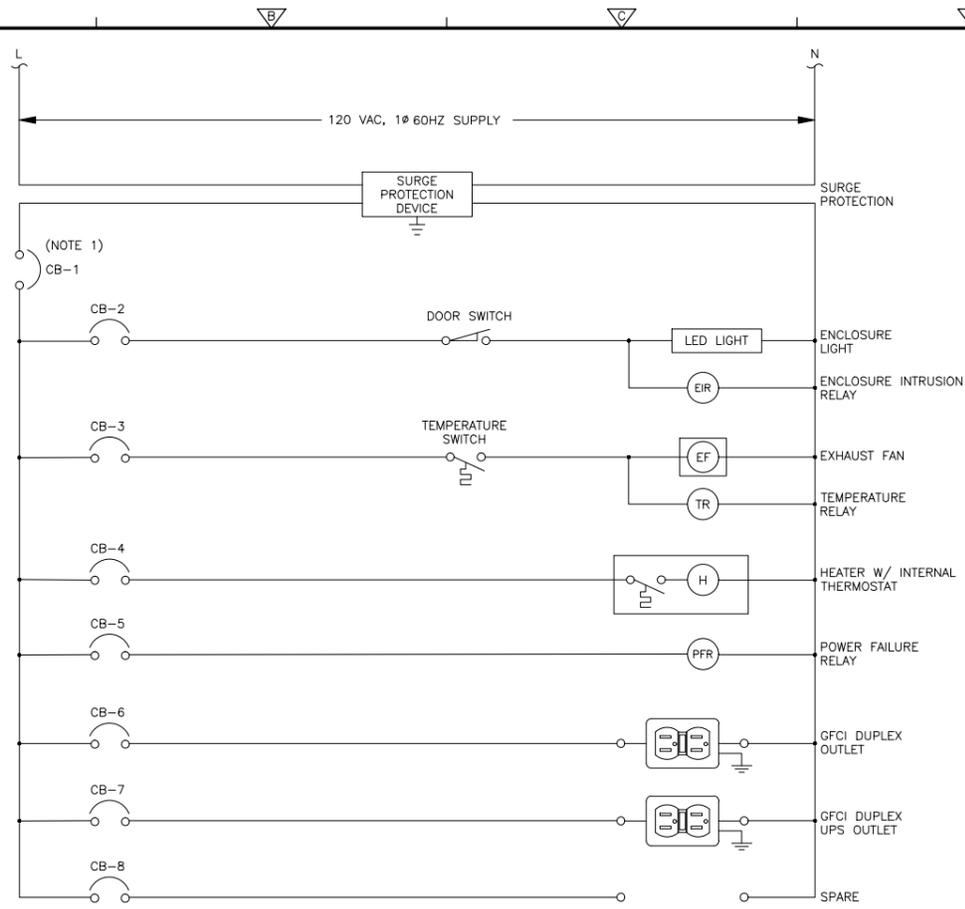
DESIGNED BY: A. MAXWELL	 3 David Square, Building A, Suite A-425 Providence, RI 02903 Tel: (401) 751-5360
DRAWN BY: A. MAXWELL	
SHEET CHK'D BY: F. ALCALA	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: M. POPTANI	
DATE: SEPTEMBER 2024	

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

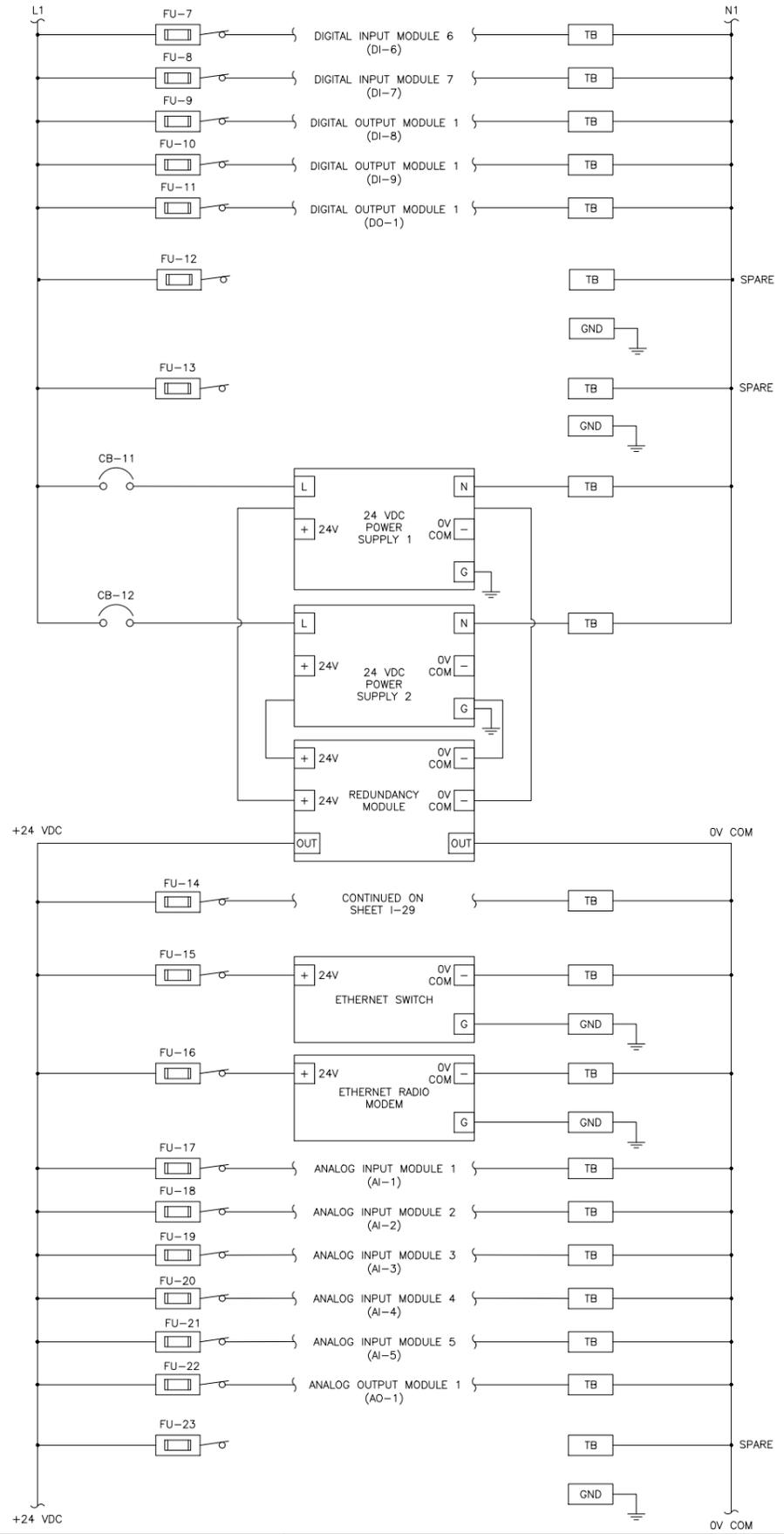
TYPICAL CONTROL PANEL LAYOUT  
 FOR PUMPING STATION NO. 4  
 SHEET NO. I-27

PROJECT NO. 141004-277870  
 FILE NAME: I027DET.DWG  
 SHEET NO. I-27

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- NOTES:**
- CIRCUIT BREAKERS AND FUSES SHALL BE SIZED BY THE CONTROL PANEL SUPPLIER.
  - THE SCHEMATIC INFORMATION HEREIN IS DIAGRAMMATIC TO SHOW FUNCTIONAL REQUIREMENTS OF A TYPICAL PANEL. IT IS NOT AN ELECTRICAL CIRCUIT DETAIL. PANEL MAY NOT HAVE ALL COMPONENTS SHOWN IN THIS SCHEMATIC. REFER TO THE CONTROL SYSTEM ARCHITECTURE AND SPECIFICATIONS FOR DETAILED DESIGN.



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. MAXWELL  
 DRAWN BY: A. MAXWELL  
 SHEET CHK'D BY: F. ALCALA  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: M. POPTANI  
 DATE: SEPTEMBER 2024

**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES

PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

TYPICAL POWER DISTRIBUTION WIRING DIAGRAM 1  
 FOR PUMPING STATION NO. 4

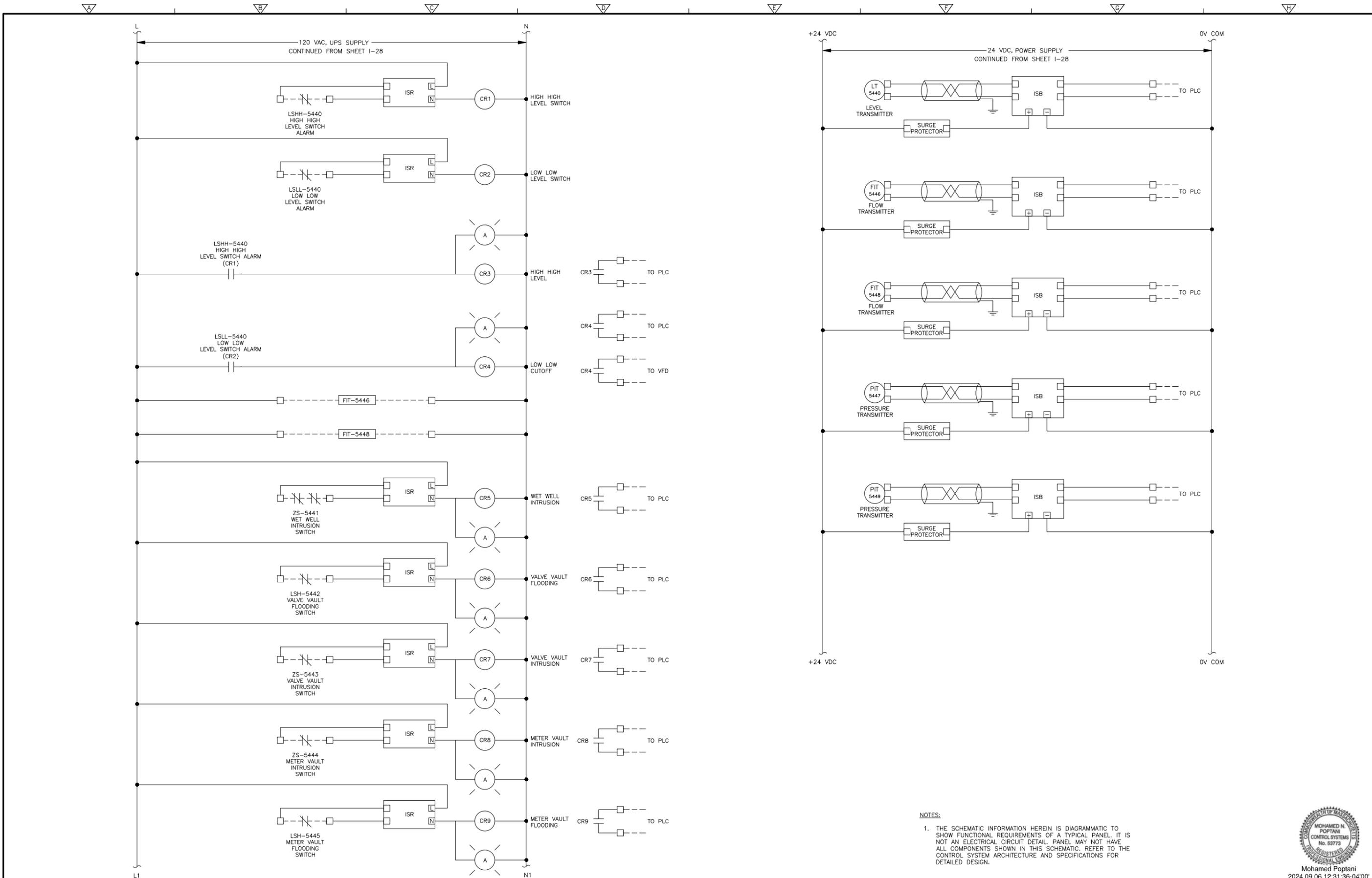
Mohamed Poptani  
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PROJECT NO. 141004-277870  
 FILE NAME: I028DET1.DWG

SHEET NO.  
 I-28

CONFORMED DRAWINGS

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**NOTES:**  
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Mohamed Poptani  
 2024.09.06 12:31:36-04'00'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. MAXWELL  
 DRAWN BY: A. MAXWELL  
 SHEET CHK'D BY: F. ALCALA  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: M. POPTANI  
 DATE: SEPTEMBER 2024

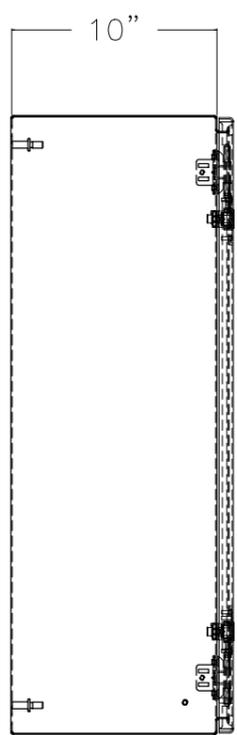


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

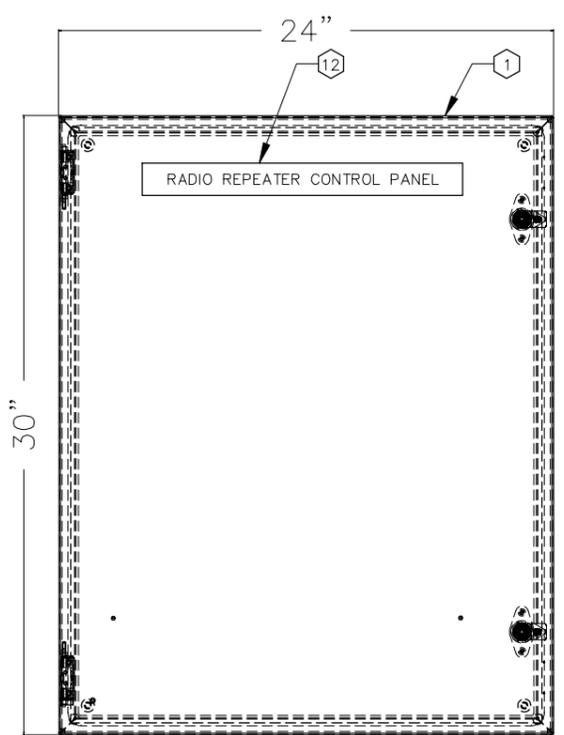
TYPICAL POWER DISTRIBUTION WIRING DIAGRAM 2  
 FOR PUMPING STATION NO. 4

PROJECT NO. 141004-277870  
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 SHEET NO.  
 I-29

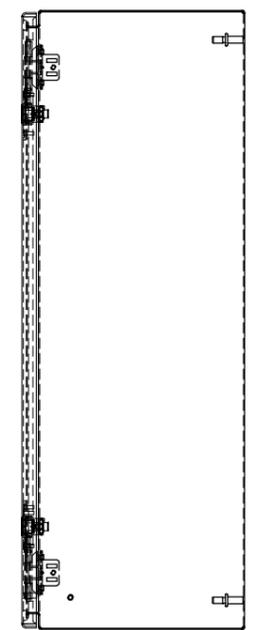
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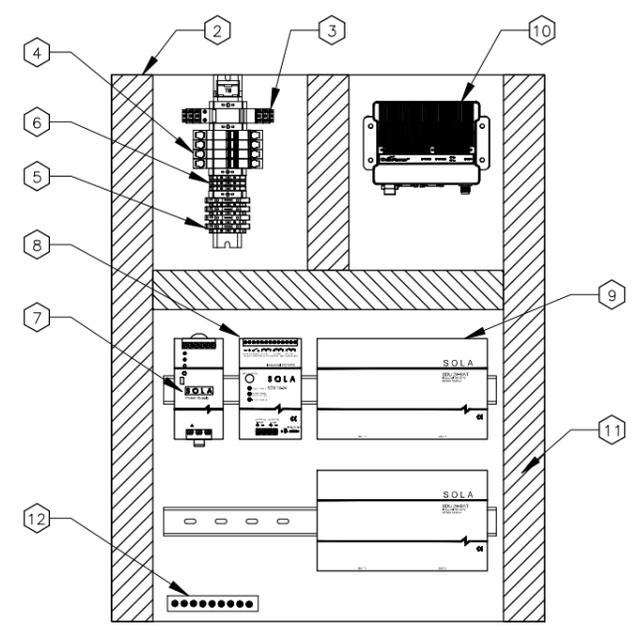
LEFT SIDE VIEW



FRONT VIEW



RIGHT SIDE VIEW



BACKPANEL LAYOUT

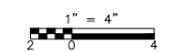
RADIO REPEATER CONTROL PANEL LAYOUT



QTY.	DESCRIPTION	SPECIFICATION
1	PANEL ENCLOSURE (MIN. 30" X 24" X 10")	406717
1	BACK PANEL	-
AS REQ.	SURGE PROTECTOR	407856
AS REQ.	CIRCUIT BREAKERS	406733
AS REQ.	FUSED TERMINAL BLOCKS	406733
1	LINE NEUTRAL GROUND	-
1	24VDC POWER SUPPLY	407859
1	24VDC UPS POWER MODULE	407859
2	BATTERY MODULE	407859
1	RADIO MODEM - IP BASED	406650
AS REQ.	WIRE WAY	406733
1	NAMEPLATE	406717

NOTES

- GENERAL PANEL LAYOUT SHOWN. REFER TO SPECIFICATION FOR DETAILED REQUIREMENT.



Mohamed Poptani  
 2024.09.06 12:31:47-04'00'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: A. MAXWELL  
 DRAWN BY: A. MAXWELL  
 SHEET CHK'D BY: F. ALCALA  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: M. POPTANI  
 DATE: SEPTEMBER 2024

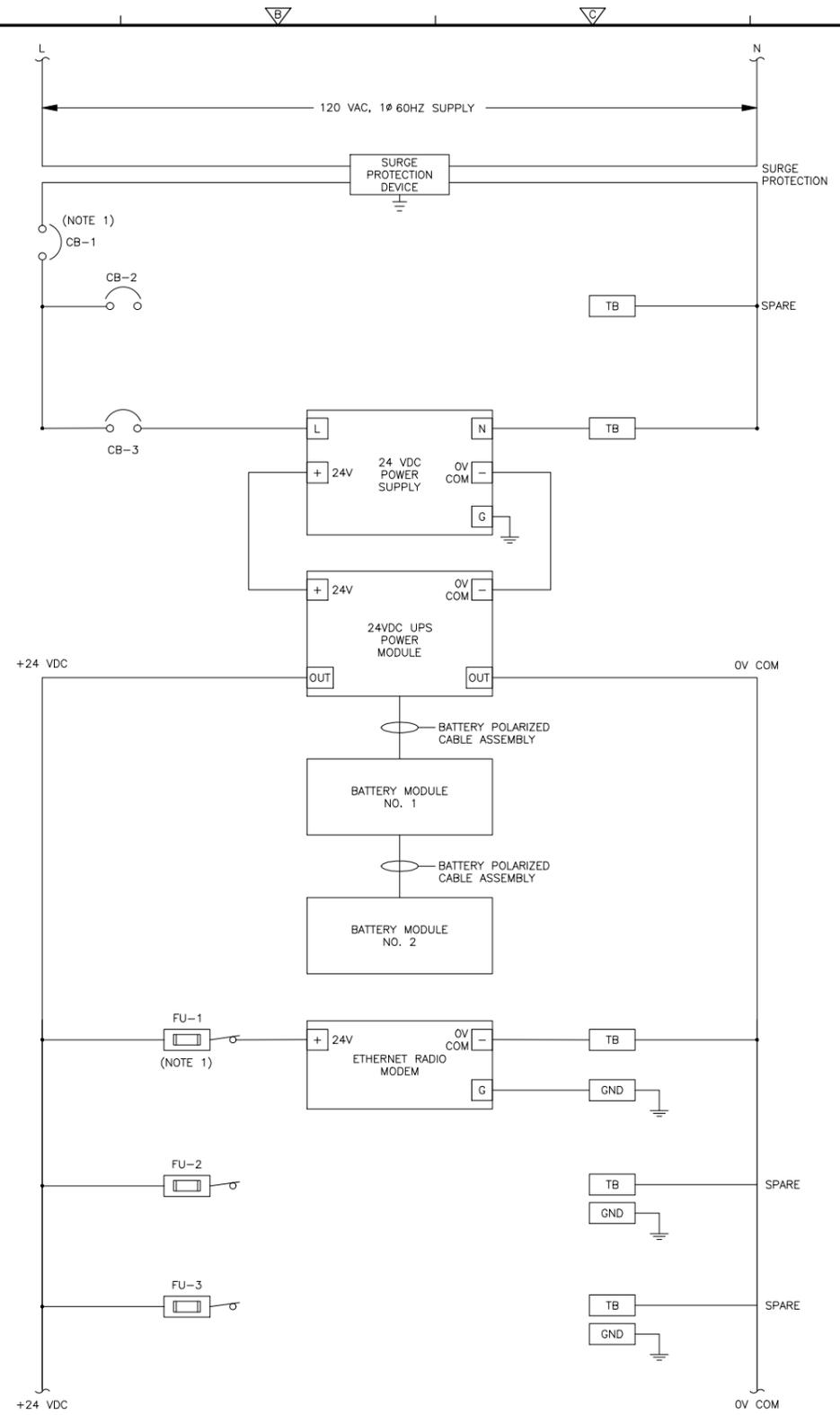
3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

WATER TOWER RADIO REPEATER  
 CONTROL PANEL LAYOUT  
 SHEET NO. I-30

PROJECT NO. 141004-277870  
 FILE NAME: I030DET.DWG  
 SHEET NO. I-30

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- NOTES:
1. CIRCUIT BREAKERS AND FUSES SHALL BE SIZED BY THE CONTROL PANEL SUPPLIER.
  2. THE SCHEMATIC INFORMATION HEREIN IS DIAGRAMMATIC TO SHOW FUNCTIONAL REQUIREMENTS OF A TYPICAL PANEL. IT IS NOT AN ELECTRICAL CIRCUIT DETAIL. PANEL MAY NOT HAVE ALL COMPONENTS SHOWN IN THIS SCHEMATIC. REFER TO THE CONTROL SYSTEM ARCHITECTURE AND SPECIFICATIONS FOR DETAILED DESIGN.



Mohamed Poptani  
2024.09.06 12:31:57-04'00'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: C. WASHINGTON  
 DRAWN BY: A. MAXWELL  
 SHEET CHK'D BY: F. ALCALA  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: M. POPTANI  
 DATE: SEPTEMBER 2024



TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

POWER DISTRIBUTION WIRING DIAGRAM  
 FOR WATER TOWER RADIO REPEATER  
 CONTROL PANEL

PROJECT NO. 141004-277870  
 FILE NAME: 1031DET.DWG  
 SHEET NO.  
 I-31

**SCOPE OF WORK:**

1. PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED; INSTALL COMPLETE; AND MAKE OPERATIONAL THE ELECTRICAL AND PROCESS SYSTEMS ASSOCIATED WITH THE NEW WASTEWATER COLLECTION SYSTEMS IN THE TOWN OF DENNIS, MA.
2. DELEGATED DESIGN: PROVIDE A POWER SYSTEM STUDY IN ACCORDANCE WITH SECTION 260573 "POWER SYSTEM STUDIES".
3. DELEGATED DESIGN: PROVIDE A COMPLETE LIGHTNING PROTECTION SYSTEM IN ACCORDANCE WITH SECTION 261113 "LIGHTNING PROTECTION FOR STRUCTURES".
4. PROVIDE ONE TRAILER MOUNTED PORTABLE DIESEL GENERATOR FOR PUMPING STATION NO. 2:
  - 4.1. GENERATOR SHALL BE 60KVA, 240/120V, 1PH, 60HZ. GENERAC MMG55DF4 OR EQUAL.
  - 4.2. PROVIDE WITH THE FOLLOWING:
    - 4.2.1. TURBOCHARGED TIER 4 FINAL ENGINE.
    - 4.2.2. DIGITAL SET MOUNTED CONTROLLER.
    - 4.2.3. PACKAGE MOUNTED RADIATOR.
    - 4.2.4. HEAVY DUTY ALTERNATOR.
    - 4.2.5. 24HR DUAL WALL FUEL TANK WITH 3-WAY DIRECTIONAL VALVE FOR EXTERNAL SUPPLY.
    - 4.2.6. CIRCUIT BREAKER.
    - 4.2.7. MINIMUM TWO CONVENIENCE GFCI RECEPTACLES.
    - 4.2.8. HEAVY DUTY STEEL BASE FRAME WITH INTEGRAL FUEL TANK.
    - 4.2.9. SOUND ATTENUATING ENCLOSURE.
    - 4.2.10. TRAILER SHALL BE INCLUDED WITH GENERATOR.
    - 4.2.11. GENERATOR CONTROL PANEL SHALL CONTAIN AUXILIARY CONTACTS FOR GENERATOR RUNNING AND FAULT SIGNALS TO SCADA.
    - 4.2.12. PROVIDE WITH CABLES AND CAM-LOK CONNECTORS COMPATIBLE WITH THE PORTABLE GENERATOR CONNECTION BOX.

**GENERAL NOTES:**

2. ELECTRICAL DRAWINGS ARE INTENDED TO SHOW THE GENERAL LAYOUT OF WORK TO BE INSTALLED UNDER THIS CONTRACT WITHOUT ATTEMPTING TO SHOW ALL DETAILS. FURNISH LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE CONTRACT DOCUMENTS.
3. COORDINATE WORK WITH OTHER TRADES AND THE OWNER.
4. FIELD VERIFY EXISTING UNDERGROUND ELECTRICAL CONDUIT, CONCRETE DUCT BANKS, MANHOLES, PULL BOXES, ETC., AND MECHANICAL PIPING. CONTRACTOR SHALL INCLUDE IN BID COSTS ASSOCIATED WITH RELOCATION OR REMOVAL OF UNDERGROUND EQUIPMENT AS REQUIRED BY THIS CONTRACT. USE DUE CARE IN CONGESTED AREAS TO AVOID DAMAGE TO EXISTING UNDERGROUND UTILITIES.
5. CONTRACTOR'S WORK SHALL INCLUDE COMPLETE TESTING OF EQUIPMENT AND WIRING INCLUDING MAKING MINOR CORRECTIONS, CHANGES, OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT. WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY; SUBSTANDARD WORK WILL BE REJECTED.
6. DO NOT SCALE ELECTRICAL DRAWINGS. REFER TO MECHANICAL, STRUCTURAL DRAWINGS, AND APPROVED MANUFACTURER'S SHOP DRAWINGS FOR EXACT LOCATION OF EQUIPMENT, EXCEPT WHERE DIMENSIONS ARE SHOWN, LOCATIONS OF EQUIPMENT, FIXTURES, OUTLETS, AND SIMILAR DEVICES ARE APPROXIMATE.
7. WORK SHALL COMPLY WITH NATIONAL ELECTRICAL CODE AND LOCAL CODES.
8. DO NOT SPLICE CONDUCTORS EXCEPT AS NOTED.
9. POWER AND CONTROL CONDUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR WIRE SIZED PER TABLE 250.122 OF THE NATIONAL ELECTRICAL CODE (UNLESS OTHERWISE NOTED).
10. COORDINATE SEQUENCE OF CONSTRUCTION WITH CIVIL, MECHANICAL, AND STRUCTURAL DISCIPLINES. VERIFY EXISTING UTILITIES IN AREA OF CONSTRUCTION. REFER TO CIVIL DRAWINGS FOR ADDITIONAL UNDERGROUND INFORMATION.
11. REPAIR, IN ACCORDANCE WITH SPECIFICATIONS, SIDEWALKS, WALLS, ROADWAYS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES WHETHER OR NOT SHOWN FOR REPAIR/REPAVING ON CIVIL DRAWINGS.
12. WHERE LOCAL DISCONNECTS AND CONTROL PANELS ARE SHOWN ON PLAN VIEWS, LOCATIONS ARE APPROXIMATE. ADJUST LOCATION AS REQUIRED TO COMPLY WITH NATIONAL ELECTRICAL CODE ARTICLE 110 FOR WORKING CLEARANCES.
13. INTRUSION SWITCHES PROVIDED BY DIV. 26. INTRUSION DETECTION SWITCHES SHALL BE UL 639 LISTED AND RATED FOR THE CLASSIFICATION OF THE AREA.

**SUBMITTALS:**

1. SUBMIT RECORD DOCUMENTATION TO ACCURATELY SHOW COMPLETED INSTALLATION. INCLUDE MODIFICATIONS TO CONTRACT DOCUMENTS (ONE LINE POWER DIAGRAMS, EQUIPMENT ELEVATIONS, PANEL SCHEDULES, ELEMENTARY CONTROL DIAGRAMS, RISER DIAGRAMS, PLANS, CONDUIT AND DUCT BANK ROUTING, ETC) ALONG WITH ADDITIONAL DRAWINGS OR SKETCHES CREATED TO CONVEY COMPLETED INSTALLATION.

**INTERPRETATION OF CONTRACT DOCUMENTS:**

1. IN GENERAL, DRAWINGS DO NOT SHOW CONDUIT ROUTING. PLAN AND ROUTE CONDUITS IN COMPLIANCE WITH SPECIFICATIONS AND DRAWING DETAILS. COORDINATE INSTALLATION WITH OTHER TRADES AND ACTUAL SUPPLIED EQUIPMENT.
2. DUCT BANK ROUTING SHOWN ON ELECTRICAL SITE PLANS IS DIAGRAMMATIC IN NATURE AND MAY NOT INCLUDE INTERFERENCES THAT MAY BE PRESENT.
3. SEE ADDITIONAL NOTES ON ELECTRICAL LEGEND II SHEET.

**ENCLOSURE TYPES:**

- PROVIDE THE FOLLOWING NEMA TYPE ELECTRICAL ENCLOSURES, UNLESS OTHERWISE NOTED:
1. NEMA 1 IN DRY, NON-PROCESS INDOOR LOCATIONS.
  2. NEMA 4X IN OUTDOOR LOCATIONS, ROOMS BELOW GRADE INCLUDING BASEMENTS AND BURIED VAULTS AND "DAMP" OR "WET" LOCATIONS SHOWN ON THE DRAWINGS.
  3. NEMA 7 AND LISTED FOR THE SPECIFIC NATIONAL ELECTRICAL CODE HAZARDOUS AREA CLASSIFICATION AS SHOWN ON THE DRAWINGS.

**NEC CLASSIFIED HAZARDOUS AREAS:**

1. THIS PROJECT INCLUDES NEC CLASSIFIED HAZARDOUS AREAS. THE FOLLOWING NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS APPLY:
  - NFPA 820 - STANDARD FOR FIRE PROTECTION IN WASTEWATER TREATMENT AND COLLECTION FACILITIES
2. EQUIPMENT, MATERIALS, AND INSTALLATION SHALL COMPLY WITH NEC ARTICLES 500, 501, 502, AND 503.

**MATERIALS AND EQUIPMENT:**

1. PROVIDE NEW MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY NOTED OTHERWISE.
2. ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC., AND SHALL BEAR APPROPRIATE UL LISTING MARK OR CLASSIFICATION MARKING. EQUIPMENT, MATERIALS, ETC. UTILIZED NOT BEARING A UL CERTIFICATION SHALL BE FIELD OR FACTORY UL CERTIFIED PRIOR TO EQUIPMENT ACCEPTANCE AND USE.
3. PROVIDE MAJOR ELECTRICAL EQUIPMENT BY A SINGLE MANUFACTURER: I.E. UNIT SUBSTATIONS, SWITCHGEAR, MOTOR CONTROL CENTERS, DISCONNECT SWITCHES, TRANSFORMERS, PANELBOARDS, ETC.

**EQUIPMENT SIZE, HANDLING AND STORAGE:**

1. COORDINATE WITH EQUIPMENT MANUFACTURER SHIPPING SPLITS TO PERMIT SAFE HANDLING AND PASSAGE OF EQUIPMENT TO FINAL INSTALLATION LOCATION.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS FOR UPRIGHT EQUIPMENT ORIENTATION DURING TRANSPORTATION.
3. PROTECT EQUIPMENT FROM MECHANICAL INJURY, OR EXPOSURE TO MOISTURE, CHEMICALS, OR CORROSIVE GASES. DO NOT STORE ELECTRICAL EQUIPMENT OUTDOORS.
4. PROVIDE AND ENERGIZE TEMPORARY SPACE HEATERS IF REQUIRED TO CONTROL MOISTURE DURING STORAGE.

**CUTTING AND PATCHING:**

1. CUT AND PATCH IN A WORKMANLIKE MANNER AS REQUIRED TO INSTALL ELECTRICAL WORK.
2. CUTTING OF STRUCTURAL MEMBERS SUCH AS JOISTS, BEAMS, GIRDERS OR COLUMNS IS PROHIBITED.
3. PATCH SURFACES TO RESTORE TO ORIGINAL INTEGRITY (WATERPROOF OR FIREPROOF AS REQUIRED) AND APPEARANCE.

**SERVICE AND METERING:**

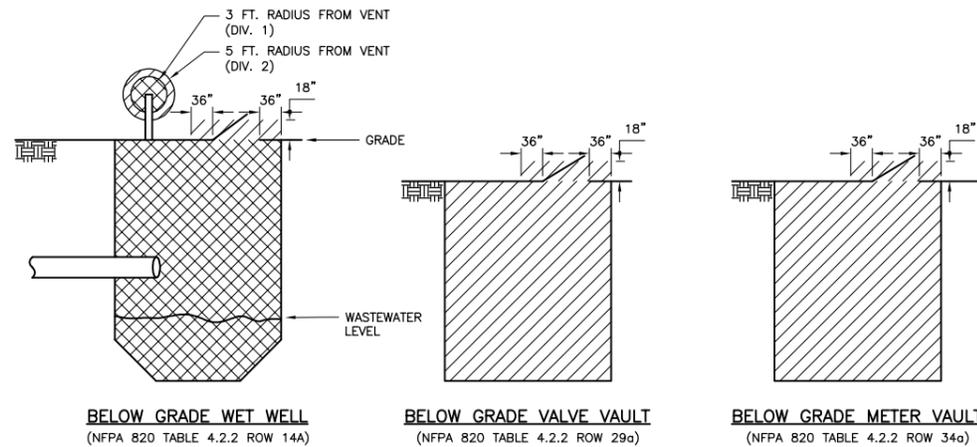
1. ELECTRIC POWER COMPANY SERVING THIS PROJECT IS EVERSOURCE. POWER COMPANY CONTACT IS BRIAN MELLO, TELEPHONE (508) 441-5832, EMAIL BRIAN.MELLO@EVERSOURCE.COM. COMPLY WITH POWER COMPANY STANDARDS.
  - PS-1 WORK REQUEST WO#17795956
  - PS-2 WORK REQUEST WO#17794995
  - PS-3 WORK REQUEST WO#17795420
  - PS-4 WORK REQUEST WO#17844113
2. PAY FOR FEES AND CHARGES AS REQUIRED FOR TEMPORARY/CONSTRUCTION POWER FOR CONTRACTOR'S USE.
3. COORDINATE PERMANENT SERVICE WITH THE POWER COMPANY AND SUBMIT UTILITY CHARGES TO OWNER.
4. POWER COMPANY WORK:
  - FURNISH CONDUIT MATERIALS FOR UNDERGROUND SERVICE TO UTILITY TRANSFORMER(S).
  - PROVIDE PRIMARY CONDUCTORS (OVERHEAD AND UNDERGROUND) TO UTILITY TRANSFORMER(S).
  - PROVIDE UTILITY TRANSFORMER PAD(S) AND GROUNDING.
  - PROVIDE UTILITY TRANSFORMER(S).
  - TERMINATE UNDERGROUND PRIMARY CABLES AT THE UTILITY TRANSFORMER(S).
  - TERMINATE UNDERGROUND SECONDARY CABLES AT THE UTILITY TRANSFORMER(S).
  - PROVIDE METERING CURRENT TRANSFORMERS (CT'S), METER(S) AND METER WIRING.
5. CONTRACTOR WORK:
  - ARRANGEMENTS WITH POWER COMPANY TO OBTAIN SERVICE, AND PROVIDE LABOR AND MATERIALS REQUIRED FOR ELECTRICAL SERVICE.
  - INSTALL PRIMARY UNDERGROUND CONDUITS.
  - PROVIDE SECONDARY UNDERGROUND CONDUITS AND CABLE FROM UTILITY TRANSFORMER(S) TO SERVICE ENTRANCE EQUIPMENT.
  - PROVIDE POWER COMPANY APPROVED METERING CURRENT TRANSFORMER (CT) ENCLOSURE.
  - INSTALL METER BASE ENCLOSURE.
  - PROVIDE EMPTY CONDUIT WITH PULL LINE FROM THE METERING CT ENCLOSURE TO THE METER BASE ENCLOSURE.

**CLEANING:**

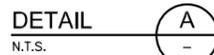
1. REMOVE ALL RUBBISH AND DEBRIS FROM INSIDE AND AROUND ELECTRICAL EQUIPMENT AND ENCLOSURES.
2. REMOVE DIRT, DUST OR CONCRETE SPATTER FROM INTERIOR AND EXTERIOR OF EQUIPMENT USING BRUSHES, VACUUM CLEANER OR CLEAN LINT-FREE RAGS. DO NOT USE COMPRESSED AIR.

**DELEGATED DESIGN / PROFESSIONAL ENGINEERING SERVICES:**

1. WHEN ENGINEERING SERVICES ARE SPECIFIED TO BE PROVIDED BY CONTRACTOR, CONTRACTOR SHALL RETAIN A LICENSED PROFESSIONAL ENGINEER TO PERFORM THE SERVICES. ENGINEER SHALL BE LICENSED AT THE TIME SERVICES ARE PERFORMED AND LICENSED IN THE STATE IN WHICH PROJECT IS LOCATED. IF THE STATE ISSUES DISCIPLINE SPECIFIC LICENSES, ENGINEER SHALL BE LICENSED IN THE APPLICABLE DISCIPLINE. ENGINEER SHALL BE EXPERIENCED IN THE TYPE OF WORK BEING PERFORMED.
2. ENGINEERING WORK SHALL BE DONE ACCORDING TO THE APPLICABLE REGULATIONS FOR PROFESSIONAL ENGINEERS TO INCLUDE SIGNING, SEALING AND DATING DOCUMENTS.



ELECTRICAL AREA CLASSIFICATION



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REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	GDW	BCM	REVISED PER ADDENDUM NO. 1

DESIGNED BY:	G. WARD
DRAWN BY:	J. OGDEN
SHEET CHK'D BY:	G. WARD
CROSS CHK'D BY:	J. O'DONNELL
APPROVED BY:	B. CHARIS-MOLLING
DATE:	SEPTEMBER 2024

**CDM Smith**  
 3 Davol Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

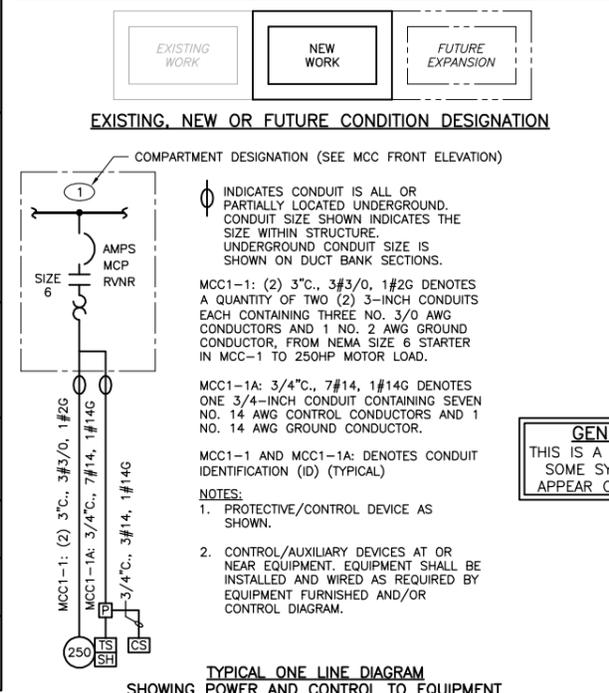
**ELECTRICAL GENERAL NOTES**  
 SHEET NO.  
**E-1**

PROJECT NO.	141004-277870
FILE NAME:	E001NFNT.DWG
SHEET NO.	E-1

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ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION	ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION	ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION	ONE LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION																
	—	MEDIUM VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER CS=CONTROL SWITCH		—	METER * WM - WATTMETER WHM - WATTHOUR METER WHDM - WATTHOUR DEMAND METER WHDR - WATTHOUR DEMAND RECORDER PF - POWER FACTOR METER DMU - DIGITAL METERING UNIT		—	PILOT LIGHT, COLOR AS NOTED * R - RED G - GREEN B - BLUE W - WHITE A - AMBER		—	LIGHTNING ARRESTER																
	CB	LOW VOLTAGE AIR OR MOLDED CASE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED.		—	TRANSUDCER AX - CURRENT TRANSUDCER WX - WATT TRANSUDCER WHX - WATTHOUR TRANSUDCER		—	PILOT LIGHT, PUSH-TO-TEST TYPE, COLOR AS NOTED ABOVE.		—	GROUND OR GROUND ROD																
	—	COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC MOTOR STARTER, FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE NOTED: * FVR - FULL VOLTAGE REVERSING RVNR - REDUCED VOLTAGE NON-REVERSING RVAT - REDUCED VOLTAGE AUTOTRANSFORMER RVSS - REDUCED VOLTAGE SOLID STATE 2S1W - TWO SPEED, ONE WINDING 2S2W - TWO SPEED, TWO WINDING (DIAGRAMMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)		—	RELAY, NO. AS INDICATED 25 - SYNCHRONISM CHECK RELAY 27 - UNDERVOLTAGE RELAY 32 - DIRECTIONAL POWER RELAY 38 - BEARING PROTECTIVE DEVICE 40 - LOSS OF EXCITATION RELAY 42 - RUNNING CONTACTOR/PILOT RELAY 46 - REVERSE PHASE/PHASE BALANCE/CURRENT RELAY 47 - PHASE SEQUENCE VOLTAGE RELAY 49 - MACHINE OR TRANSFORMER THERMAL RELAY 50/51 - INSTANTANEOUS/TIME OVERCURRENT RELAY 50G - INSTANTANEOUS GROUND 51 - TIME OVERCURRENT RELAY 51G - TIME OVERCURRENT RELAY, GROUNDING RESISTOR TYPE 51N - TIME OVERCURRENT RELAY, RESIDUAL TYPE 51V - TIME OVERCURRENT RELAY WITH VOLTAGE RESTRAINT 51X - AUXILIARY RELAY (TRIPS CB AND ALARMS) 59 - OVERVOLTAGE RELAY 60 - NEGATIVE SEQUENCE VOLTAGE RELAY 62 - TIME DELAY RELAY 63 - OVERPRESSURE RELAY 64 - GENERATOR FIELD GROUND RELAY 67 - AC DIRECTIONAL OVERCURRENT RELAY 74 - ALARM LATCHING RELAY 83 - AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY 86 - LOCKING-OUT RELAY 87 - DIFFERENTIAL PROTECTIVE RELAY B - SUFFIX INDICATES "BUS" G - SUFFIX INDICATES "GENERATOR" GF - GROUND FAULT ST - SHUNT TRIP T - SUFFIX INDICATES "TRANSFORMER" X - SUFFIX INDICATES "AUXILIARY"		—	NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE * AMPERE RATING NOTED IF OTHER THAN 30A (DIAGRAMMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)		—	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD HEATER, 1 POLE UNLESS OTHERWISE NOTED * AMPERE RATING NOTED IF OTHER THAN 30A FUSE RATING (DIAGRAMMATICALLY SHOWN, CONTRACTOR SHALL FIELD LOCATE)																
	—	DRAWOUT TYPE EQUIPMENT OR DEVICE		—	SPECIAL CAPACITOR * SC - SURGE CAPACITOR PF - POWER FACTOR CORRECTION CAPACITOR		LS OR ■	LIQUID LEVEL (FLOAT) SWITCH  NORMALLY OPEN, CLOSSES ON RISING LEVEL  NORMALLY CLOSED, OPENS ON RISING LEVEL		—	TERMINAL OR TEST BLOCK																
	—	MEDIUM VOLTAGE CABLE TERMINATION		—	TUNED POWER FACTOR CORRECTION CAPACITOR		PS OR ■	PRESSURE OR VACUUM SWITCH  NORMALLY OPEN, CLOSSES ON RISING PRESSURE  NORMALLY CLOSED, OPENS ON RISING PRESSURE  NORMALLY CLOSED, OPENS ON DROPPING PRESSURE		—	RESISTANCE TEMPERATURE DETECTOR																
	—	MEDIUM VOLTAGE AIR INTERRUPTER SWITCH		—	PUSHBUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED		TS OR (T) OR ■	TEMPERATURE SWITCH OR THERMOSTAT  NORMALLY OPEN, CLOSSES ON RISING TEMPERATURE  NORMALLY OPEN, CLOSSES ON DROPPING TEMPERATURE  NORMALLY CLOSED, OPENS ON RISING TEMPERATURE  NORMALLY CLOSED, OPENS ON DROPPING TEMPERATURE		VE OR ■	VIBRATION DETECTOR																
	—	MEDIUM VOLTAGE FUSED AIR INTERRUPTER SWITCH * FUSE RATING		ES	EMERGENCY STOP PUSHBUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT)		FS OR ■	FLOW SWITCH (AIR, WATER, ETC.)  NORMALLY OPEN, CLOSSES ON INCREASED FLOW  NORMALLY CLOSED, OPENS ON INCREASED FLOW		DM	DAMPER MOTOR																
	—	MEDIUM VOLTAGE FUSED MOTOR CONTROLLER		PBL	START-STOP PUSHBUTTON CONTROL STATION (MOMENTARY CONTACT) WITH LOCKOUT DEVICE ON STOP		ZS OR ■	POSITION (LIMIT) SWITCH  NORMALLY OPEN  NORMALLY OPEN - HELD CLOSED  NORMALLY CLOSED  NORMALLY CLOSED - HELD OPEN		WS OR ■	TORQUE SWITCH  NORMALLY OPEN, CLOSSES ON HIGH TORQUE  NORMALLY CLOSED, OPENS ON HIGH TORQUE																
	T	TRANSFORMER, RATINGS AND CONNECTIONS AS NOTED. UNLESS OTHERWISE NOTED ON THE SINGLE LINE DIAGRAMS, ALL DRY TYPE TRANSFORMERS SERVING ADMINISTRATIVE AND LABORATORY SPACES SHALL HAVE A K FACTOR OF 4. ISOLATION TRANSFORMERS SHALL HAVE A K-20 RATING		—	3 POSITION SELECTOR SWITCH, MAINTAINED CONTACT O-OPEN X-CLOSED <table border="1"> <tr> <th>POSITION</th> <th>TOP CONTACT</th> <th>MIDDLE CONTACT</th> <th>BOTTOM CONTACT</th> </tr> <tr> <td>A</td> <td>X</td> <td>O</td> <td>O</td> </tr> <tr> <td>B</td> <td>O</td> <td>X</td> <td>O</td> </tr> <tr> <td>C</td> <td>O</td> <td>O</td> <td>X</td> </tr> </table>	POSITION	TOP CONTACT	MIDDLE CONTACT	BOTTOM CONTACT	A	X	O	O	B	O	X	O	C	O	O	X		—	UTILIZED IN CONJUNCTION WITH OTHER CONTROL SCHEMATIC SYMBOLS TO DEPICT THE PHYSICAL LOCATION OF THE DEVICE # REPRESENTS LOCATION SEE LOCATION LEGEND ON DRAWING		—	CONDUCTORS OR CONDUITS CROSSING PATHS BUT NOT CONNECTED
POSITION	TOP CONTACT	MIDDLE CONTACT	BOTTOM CONTACT																								
A	X	O	O																								
B	O	X	O																								
C	O	O	X																								
	—	CURRENT TRANSFORMER * QUANTITY A = PRIMARY AMPERES		S/S	OFF/ON SELECTOR SWITCH		GD/VF	GAS DETECTOR / VENTILATION FAILURE ALARM # INDICATES TYPE OF UNIT 1=MASTER, 2=REMOTE		—	CONDUCTORS ELECTRICALLY CONNECTED																
	—	POTENTIAL TRANSFORMER * QUANTITY V = PRIMARY VOLTAGE		LR	LOCAL/REMOTE SELECTOR SWITCH		—	MOTOR STARTER COIL, NUMBER AS INDICATED TO DENOTE INTERLOCKING ONLY		S	SOLENOID VALVE																
	G	GENERATOR, RATINGS AND CONNECTIONS AS NOTED		—	NAMEPLATE (A/B/C) HOA - HAND/OFF/AUTO HOR - HAND/OFF/REMOTE LOR - LOCAL/OFF/REMOTE RSL - RAISE/STOP/LOWER TOA - TEST/OFF/AUTO		—	UNIT HEATER - ELECTRIC HEATING COIL AND FAN # - RATING		—	UNIT HEATER - GAS FIRED, STEAM OR WATER HEATING COIL AND FAN																
	—	AUTOMATIC OR MANUAL TRANSFER SWITCH NO.1 (ATS-1), (MTS-1) "N" INDICATES NORMAL OR PREFERRED SOURCE "S" INDICATES STANDBY OR ALTERNATE SOURCE 100A INDICATES CONTINUOUS CURRENT RATING		—	VARIABLE SPEED DRIVE CONTROLLER * D.C. = D.C. DRIVE CONTROLLER SCR = SILICON CONTROLLED RECTIFIER VFD = VARIABLE FREQUENCY DRIVE		M	MOTOR, NUMERAL INDICATES HORSEPOWER		—	VOLTMETER WITH SWITCH, 3 PHASE																
	—	UNIT HEATER - ELECTRIC HEATING COIL AND FAN # - RATING		—	AMMETER WITH SWITCH, 3 PHASE		—	MOTOR, NUMERAL INDICATES HORSEPOWER		—	AMMETER WITH SWITCH, 3 PHASE																
	—	UNIT HEATER - GAS FIRED, STEAM OR WATER HEATING COIL AND FAN		—	AMMETER WITH SWITCH, 3 PHASE		—	MOTOR, NUMERAL INDICATES HORSEPOWER		—	AMMETER WITH SWITCH, 3 PHASE																
	—	MOTOR, NUMERAL INDICATES HORSEPOWER		—	AMMETER WITH SWITCH, 3 PHASE		—	MOTOR, NUMERAL INDICATES HORSEPOWER		—	AMMETER WITH SWITCH, 3 PHASE																
	—	VOLTMETER WITH SWITCH, 3 PHASE		—	AMMETER WITH SWITCH, 3 PHASE		—	MOTOR, NUMERAL INDICATES HORSEPOWER		—	AMMETER WITH SWITCH, 3 PHASE																
	—	AMMETER WITH SWITCH, 3 PHASE		—	AMMETER WITH SWITCH, 3 PHASE		—	MOTOR, NUMERAL INDICATES HORSEPOWER		—	AMMETER WITH SWITCH, 3 PHASE																

- NOTES:**
- IN GENERAL CONDUIT ROUTING FOR EQUIPMENT AND DEVICES IS NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS WHICH SHALL INCLUDE CONDUITS SHOWN ON ONE-LINE AND RISER DIAGRAMS AND HOME-RUNS SHOWN ON PLAN DRAWINGS. REFER TO SPECIFICATIONS FOR MATERIALS AND INSTALLATION REQUIREMENTS.
  - THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL SIZE MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
  - SWITCHGEAR AND MOTOR CONTROL CENTER COMPARTMENT DESIGNATIONS AS INDICATED BELOW:  
BLANK: NOT INTENDED FOR USE. PLATE ON  
SPACE: EQUIPPED WITH REQUIRED BUS AND HARDWARE FOR THE FUTURE ADDITION OF BREAKERS AND/OR STARTERS WITHIN THE SIZE AND RANGE SHOWN  
SPARE: CONTAINS A COMPLETELY INSTALLED BREAKER AND/OR STARTER OF SIZE AND TYPE INDICATED FOR FUTURE USE.
  - INTERPRETATION OF ELECTRICAL DRAWINGS: CIRCUIT IDENTIFICATION, ROUTING, AND SIZES OF CONDUITS AND WIRES ARE SHOWN ON THE FOLLOWING DRAWINGS:  
A. ONE LINE POWER DIAGRAMS: POWER, CONTROL AND SIGNAL WIRING REQUIREMENTS FOR ELECTRICAL DISTRIBUTION EQUIPMENT AND UTILIZATION EQUIPMENT POWERED FROM SWITCHGEAR, SWITCHBOARDS, MOTOR CONTROL CENTERS AND MAJOR POWER DISTRIBUTION PANELBOARDS ARE TYPICALLY SHOWN ON THE ONE LINE DIAGRAMS. THE PARAMETERS IDENTIFIED ON THE ONE LINE DIAGRAMS ARE: CIRCUIT IDENTIFICATION, CIRCUIT ORIGIN AND DESTINATION, CONDUIT SIZE, WIRE SIZE AND QUANTITY FOR COMPLETE CIRCUIT LENGTH, AND AUXILIARY DEVICES ASSOCIATED WITH THE CONTROL/PROTECTION OF THE POWERED EQUIPMENT.  
B. INSTRUMENTATION AND CONTROL RISER DIAGRAMS: POWER, CONTROL, SIGNAL AND DATA HIGHWAY WIRING REQUIREMENTS FOR INSTRUMENTS AND CONTROL DEVICES CONTROLLED/MONITORED FROM INSTRUMENTATION AND CONTROL PANELS SUCH AS RTUS, PLCs, TERMINAL CABINETS, AND REMOTE I/O PANELS ARE TYPICALLY SHOWN ON THE INSTRUMENTATION AND CONTROL ONE LINE DIAGRAMS. THE PARAMETERS IDENTIFIED ON THE ONE LINE DIAGRAMS ARE: CIRCUIT IDENTIFICATION, CIRCUIT ORIGIN AND DESTINATION, CONDUIT SIZE, WIRE SIZE, QUANTITY AND TYPE FOR COMPLETE CIRCUIT LENGTH, AND AUXILIARY DEVICES ASSOCIATED WITH THE CONTROL/PROTECTION OF THE POWERED EQUIPMENT.  
C. FLOOR PLANS: FOR DETERMINING THE LENGTH OF CIRCUITS LOCATED WITHIN STRUCTURES, FLOOR PLANS SHOW THE LOCATION OF ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, UTILIZATION EQUIPMENT, INSTRUMENTS, ANCILLARY EQUIPMENT AND DEVICES AND THE ANTICIPATED PENETRATION LOCATIONS WHERE CONDUITS EXIT/ENTER THE STRUCTURE. HOMERUNS MAY ALSO BE SHOWN FROM MISCELLANEOUS EQUIPMENT NOT SHOWN ON A ONE LINE OR RISER DIAGRAM.  
D. SITE PLANS: FOR DETERMINING THE LENGTH OF CIRCUITS EXTERIOR TO STRUCTURES AND TO IDENTIFY THE SPECIFIC REQUIREMENTS OF THE UNDERGROUND CONDUITS OR DUCT BANKS, SITE PLANS SHOW THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS WITH SECTIONS INDICATING THE CONDUIT SIZE, ARRANGEMENT AND CIRCUIT IDENTIFICATION.  
E. NOTE THAT CONDUIT SIZE WITHIN THE STRUCTURE IS INDICATED ON ONE-LINE DIAGRAM AND UNDERGROUND SIZE IS INDICATED ON DUCT BANK SECTIONS.



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SYMBOL	DESCRIPTION
	LIGHTING FIXTURE "A" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "B" - CONTROLLED BY SWITCH "B" "3" - CIRCUIT NUMBER
	LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
	WALL MOUNTED TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
	CROSS HATCH INDICATES LIGHTING FIXTURE THAT IS UNSWITCHED AND SHALL REMAIN ON AT ALL TIMES. NOTATIONS SAME AS ABOVE.
	SHADED AREA INDICATES LIGHTING FIXTURE THAT IS EQUIPPED WITH EMERGENCY BACKUP POWER SOURCE. NOTATIONS SAME AS ABOVE.
	POLE MOUNTED AREA TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
	POLE MOUNTED ROADWAY TYPE LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
	EMERGENCY LIGHTING BATTERY UNIT WITH TWO LAMP HEADS "EM" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "3" - SUPERVISORY CIRCUIT "*" - FIXTURE TAG #
	REMOTE EMERGENCY ADJUSTABLE WALL LIGHTING FIXTURE WITH TWO LAMP HEADS "R-2" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "BU-1(*)" - HOME RUN TO BATTERY UNIT INDICATED. CONDUIT SHALL BE 3/4" AND CONTAIN (2) NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND (1) NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE INDICATED.
	COMBINATION BATTERY UNIT AND EXIT SIGN. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN.
	CEILING MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE. WHEN USED, ARROW INDICATES DIRECTION OF EGRESS. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN. (DOUBLE FACE DOUBLE CHEVRONS SHOWN)
	WALL MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE. WHEN USED, ARROW INDICATES DIRECTION OF EGRESS. FILLED QUADRANT REPRESENTS FACE SIDE OF SIGN.
	REMOTE EMERGENCY CEILING LIGHTING FIXTURE. "RH-3" - FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE) "3" - SUPERVISORY CIRCUIT "BU-1(*)" - HOME RUN TO BATTERY UNIT INDICATED. CONDUIT SHALL BE 3/4" AND CONTAIN 2 NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND 1 NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE INDICATED.
	HOME RUN TO DESIGNATED EQUIPMENT. BRANCH CIRCUIT CONDUIT WITH 2 NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND 1 NO. 12 AWG GROUND CONDUCTOR UNLESS OTHERWISE NOTED. NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS. FOR MINIMUM SIZE CONDUIT PERMITTED REFER TO THE SPECIFICATIONS.
	CONDUIT CONCEALED IN WALL, IN SLAB ABOVE, OR ABOVE CEILING.
	CONDUIT CONCEALED IN OR BELOW FLOOR OR UNDERGROUND.
	CONDUIT RUN EXPOSED. RUN PARALLEL OR PERPENDICULAR TO STRUCTURE OR WALL.
	"X" INDICATES EXPLOSION PROOF CONDUIT SEAL FITTING.
	CONCRETE ENCASED DUCTBANK. WIDTH VARIES, SEE DUCTBANK SECTION/DETAILS FOR REQUIREMENTS AND WIDTH
	CONDUIT STUBBED OUT AND CAPPED
	DENOTES A QUANTITY OF TWO (2) 3-INCH CONDUITS EACH CONTAINING THREE NO. 3/0 AWG CONDUCTORS AND 1 NO. 2 AWG GROUND CONDUCTOR.
	DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CABLE TO CONSIST OF TWO NO. 16 AWG CONDUCTORS TWISTED TOGETHER AND COVERED WITH A METALLIC SHIELD AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
	SAME AS ABOVE EXCEPT CABLE TO CONSIST OF THREE NO. 16 AWG CONDUCTORS TWISTED, SHIELDED AND COVERED WITH AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
	THREE 4-INCH CONDUITS
	FLEXIBLE METAL CONDUIT "WHIP" (3/4"C., 2#12, 1#12G UNLESS OTHERWISE NOTED) FOR LIQUID TIGHT MOTOR CONNECTIONS
	"X" INDICATES CONDUIT SEAL FITTING IN OTHER THAN CODE REQUIRED LOCATIONS.
	INDICATES MOTOR STARTER AND/OR MOTOR CONTROL EQUIPMENT WITHIN THE ENCLOSURE.

SYMBOL	DESCRIPTION
	SINGLE POLE SWITCH "a" INDICATES FIXTURES CONTROLLED.
	DOUBLE POLE SWITCH "a" INDICATES FIXTURES CONTROLLED.
	THREE WAY SWITCH "c" INDICATES FIXTURES CONTROLLED.
	FOUR WAY SWITCH "a" INDICATES FIXTURES CONTROLLED.
	DIMMER SWITCH "a" INDICATES FIXTURES CONTROLLED
	SINGLE POLE SWITCH "OS" INDICATES A PASSIVE INFRARED OCCUPANCY SENSOR
	DOUBLE POLE SWITCH "OS" INDICATES PROGRAMMABLE OCCUPANCY SENSOR CAPABLE OF INBOARD/OUTBOARD SWITCHING
	SINGLE POLE SWITCH "DT" INDICATES DUAL TECHNOLOGY PROGRAMMABLE OCCUPANCY SENSOR CAPABLE OF SENSING MOTION AND SOUND
	LIGHTING CONTACTOR WITH NUMBER OF POLES AS INDICATED
	TIME SWITCH
	PUSH BUTTON STATION
	INDICATES ALL LIGHTING FIXTURES WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE TYPE "A" UNLESS OTHERWISE NOTED. SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
	LIGHTING PANELBOARD (LP-#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
	POWER PANELBOARD (PP-#) OR DISTRIBUTION PANELBOARD (DP-#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
	LIGHTING CONTACTOR PANELBOARD (LCP-#) SHOWN ON PLAN PER ACTUAL PANEL DIMENSIONS
	DUPLEX RECEPTACLE 20A, 120V, 2P, 3W * GFCI - GROUND FAULT CIRCUIT INTERRUPTER TYPE WP - WEATHERPROOF XP - EXPLOSION PROOF T - TRANSIENT VOLTAGE SURGE SUPPRESSOR IC - ISOLATED GROUND 4 - CIRCUIT NUMBER
	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W MOUNTED ABOVE COUNTER-TOP OR 42" AFF NOTATIONS SAME AS ABOVE
	SPECIAL PURPOSE RECEPTACLE * - VOLT RATING "3" - NUMBER OF POLES "60" - AMPERE RATING "4W" - 4 WIRES IN ADDITION TO GROUND
	MULTI-OUTLET ASSEMBLY, SYMBOL DENOTES RECEPTACLE TYPE
	FLUSH FLOOR OUTLET BOX WITH TYPE OUTLET INDICATED
	UNDER FLOOR DUCT SYSTEM WITH TYPE OUTLETS INDICATED
	JUNCTION BOX
	PULL BOX
	TERMINAL CABINET
	OCCUPANCY SENSOR
	PHOTOCELL
	EMERGENCY EYEWASH/SHOWER ALARM STATION WITH FLOW SWITCH(ES)
	INDICATED EQUIPMENT AND MATERIALS TO BE DEMOLISHED
	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 12 CONSTRUCTION (OR GASKETED AND SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X, 316 STAINLESS STEEL, CONSTRUCTION (OR GASKETED AND SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X, 316 STAINLESS STEEL, CONSTRUCTION (OR CORROSION RESISTANT CONSTRUCTION SUITABLE FOR USE IN A WET LOCATION WHERE NEMA STANDARDS DO NOT APPLY) UNLESS OTHERWISE NOTED.
	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL CONFORM TO N.E.C. REQUIREMENTS FOR THE HAZARDOUS AREA CLASSIFICATION SHOWN AND BE OF 316 STAINLESS STEEL CONSTRUCTION.

SYMBOL	DESCRIPTION
	GROUND SYSTEM GRID OR LOOP, 36" BELOW FINISHED GRADE UNLESS OTHERWISE NOTED.
	EXOTHERMIC WELD CONNECTION
	3/4" x 10'-0" GROUND ROD, UNLESS SPECIFIED OTHERWISE.
	GROUND ROD TEST WELL STATION (SEE DETAIL SHEET FOR REQUIREMENTS)
COMMUNICATION SYSTEMS	
	TELEPHONE OUTLET FOR DESK TYPE HANDSET K = KEY SYSTEM
	TELEPHONE OUTLET FOR WALL TYPE HANDSET (MOUNT UP 4'-6") K = KEY SYSTEM
	PAGE/PARTY TELEPHONE OUTLET FOR DESK TYPE HANDSET
	PAGE/PARTY TELEPHONE OUTLET FOR WALL TYPE HANDSET, MOUNT UP 4'-6"
	PAGING SPEAKER, WALL MOUNTED H = HORN TYPE W = WIDE ANGLE TYPE
	PAGING SPEAKER, WALL MOUNTED, BI-DIRECTIONAL, HORN TYPE W = WIDE ANGLE TYPE
	PAGING SPEAKER, FLUSH MOUNTED CEILING TYPE
	PAGING SPEAKER, SURFACE MOUNTED CEILING TYPE
	REMOTE WALL MOUNTED VOLUME CONTROL FOR CEILING SPEAKER, MOUNT UP 5'-0"
	PAGING SPEAKER AMPLIFIER ASSEMBLY
	TELEPHONE CABINET OR BACKBOARD AS NOTED
	"C" - DATA INPUT/OUTPUT CABLE OUTLET "P" - PROCESS COMPUTER SYSTEM (CAT6 RJ-45 JACK)
	GAS DETECTOR/VENTILATION FAILURE ALARM, # INDICATES TYPE OF UNIT. 1 = MASTER, 2 = REMOTE
	GAS DETECTION/VENTILATION FAILURE WEATHERPROOF DUAL-LITE BEACON MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
	GAS DETECTION/VENTILATION FAILURE HORN/STROBE MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
	GAS DETECTION/VENTILATION FAILURE HORN, MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
	GAS DETECTION/VENTILATION FAILURE STROBE, MOUNT TOP OF DEVICE UP 6'-8" A.F.F.
SECURITY SYSTEMS	
	SECURITY ALARM CONTROL PANEL
	SECURITY ALARM DOOR SWITCH
	SECURITY ALARM KEY PAD
	SECURITY SYSTEM CARD ACCESS READER
	SECURITY ALARM WINDOW SWITCH
	SECURITY ALARM MOTION DETECTOR
	CLOSED CIRCUIT TV CAMERA
	PAN, TILT, ZOOM CAMERA LENS CONTROLS
	GLASS BREAK DETECTOR
FIRE ALARM SYSTEMS	
	FIRE ALARM HEAT DETECTOR 135 FIXED TEMPERATURE UNLESS OTHERWISE NOTED. "200" - 200 FIXED TEMPERATURE "R" - FIXED TEMPERATURE RATE-OF-RISE TYPE
	FIRE ALARM SMOKE DETECTOR PHOTOELECTRIC TYPE UNLESS OTHERWISE NOTED. "I" - IONIZATION TYPE.
	FIRE ALARM DUCT SMOKE DETECTOR
	FIRE ALARM CONTROL PANEL
	FIRE ALARM VENTILATION PANEL WITH GRAPHIC PANEL
	REMOTE FIRE ALARM ANNUCIATOR PANEL

SYMBOL	DESCRIPTION
	FIRE ALARM MASTER BOX
	FIRE ALARM HORN, MOUNT UP 7'-6"
	FIRE ALARM STROBE, MOUNT UP 6'-8" 15 = CANDELA RATING
	FIRE ALARM HORN AND STROBE LIGHT COMBINATION, MOUNT UP 6'-8" 15 = CANDELA RATING
	FIRE ALARM MANUAL PULL STATION, MOUNT UP 4'-0"
	SPRINKLER VALVE SUPERVISORY SWITCH
	SPRINKLER FLOW ALARM SWITCH
	FIRE ALARM BELL
	WEATHERPROOF HI-INTENSITY FIRE ALARM STROBE LIGHT WITH HORN
	PASSIVE INFRARED DETECTOR
	SMOKE BEAM DETECTOR (RECEIVER)
	SMOKE BEAM DETECTOR (TRANSMITTER)
	FIRE ALARM SMOKE DETECTOR REMOTE INDICATOR AND TEST SWITCH

ABBREVIATIONS (CONTINUED)	
ELEV	ELEVATION
EM	EMERGENCY
ENCL	ENCLOSURE OR ENCLOSED
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EW	ELECTRIC WATER HEATER
EX	EXISTING
FO	FIBER OPTIC
FU	FUSE
GCP	GENERATOR CONTROL PANEL
GEN	GENERATOR
G, GND	GROUND
GRS	GALVANIZED RIGID STEEL
GFI	GROUND FAULT INTERRUPTER
HACR	HEATING & AIR CONDITIONING RATED
HH	HANDHOLE
HT	HEIGHT
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
HZ	HERTZ
ID	IDENTIFICATION
INSTR	INSTRUMENT
K	KILO (PREFIX)
kmil	1000 CIRCULAR MILS
KVA	KILOVOLT AMPERES
KW	KILOWATTS
LA	LIGHTNING ARRESTER
LTG	LIGHTNING
LP	LIGHTING PANEL
LV	LOW VOLTAGE
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDF	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
ML	MAIN LUGS ONLY
MLD	MOUNTED
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN OR NUMBER
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOAD
PB	PULL BOX
PCP	PUMP CONTROL PANEL
PH	PHASE
PMH	POWER MANHOLE
PNL	PANEL OR PANELBOARD
PR	PAIR
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RECPT	RECEPTACLE
REQD	REQUIRED
QTY	QUANTITY
SA	SURGE ARRESTER
SEC	SECONDS OR SECONDARY
SH	SHIELDED OR SPACE HEATER
SHH	SIGNAL HANDHOLE
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TC	TIME TO CLOSE OR TRAY CABLE
TEL	TELEPHONE
TO	TIME TO OPEN
TS	TWISTED SHIELDED OR THERMAL SWITCH
TYP	TYPICAL
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPS
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS, WIDTH, WITH, WIRE
WP	WEATHERPROOF
XP	EXPLOSION PROOF
XFMR	TRANSFORMER

ABBREVIATIONS	
A	AMPS
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AL	ALUMINUM
AIC	AMPERE INTERRUPTING CAPACITY
AMP	AMPERE
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CGD	COMBUSTIBLE GAS DETECTOR
CKT	CIRCUIT
CLB	CURRENT LIMITING BREAKER
CLF	CURRENT LIMITING FUSE
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL SWITCH/CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
CWS	CONDUIT WALL SEAL
DC	DIRECT CURRENT
DIA	DIAMETER
DMU	DIGITAL METERING UNIT
DN	DOWN
EC	EMPTY CONDUIT
ELEC	ELECTRICAL

SHEET NO. WHERE DETAIL IS DRAWN  
SYMBOL WHERE THERE IS A DETAIL

SHEET NO. WHERE THERE IS A DETAIL  
DETAIL  
1/4" = 1'-0"

SHEET NO. WHERE THERE IS A DETAIL  
SYMBOL WHERE DETAIL IS DRAWN

SHEET NO. WHERE SECTION IS DRAWN  
SYMBOL WHERE THERE IS A SECTION

SHEET NO. WHERE SECTION IS DRAWN  
SECTION  
1/4" = 1'-0"

SYMBOL WHERE SECTION IS DRAWN  
SECTION SYMBOL

**GENERAL NOTE**  
THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: G. WARD	 3 Davol Square, Building A, Suite A-425 Providence, RI 02903 Tel: (401) 751-5360
DRAWN BY: J. OGDEN	
SHEET CHK'D BY: G. WARD	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: B. CHARIS-MOLLING	
DATE: SEPTEMBER 2024	

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

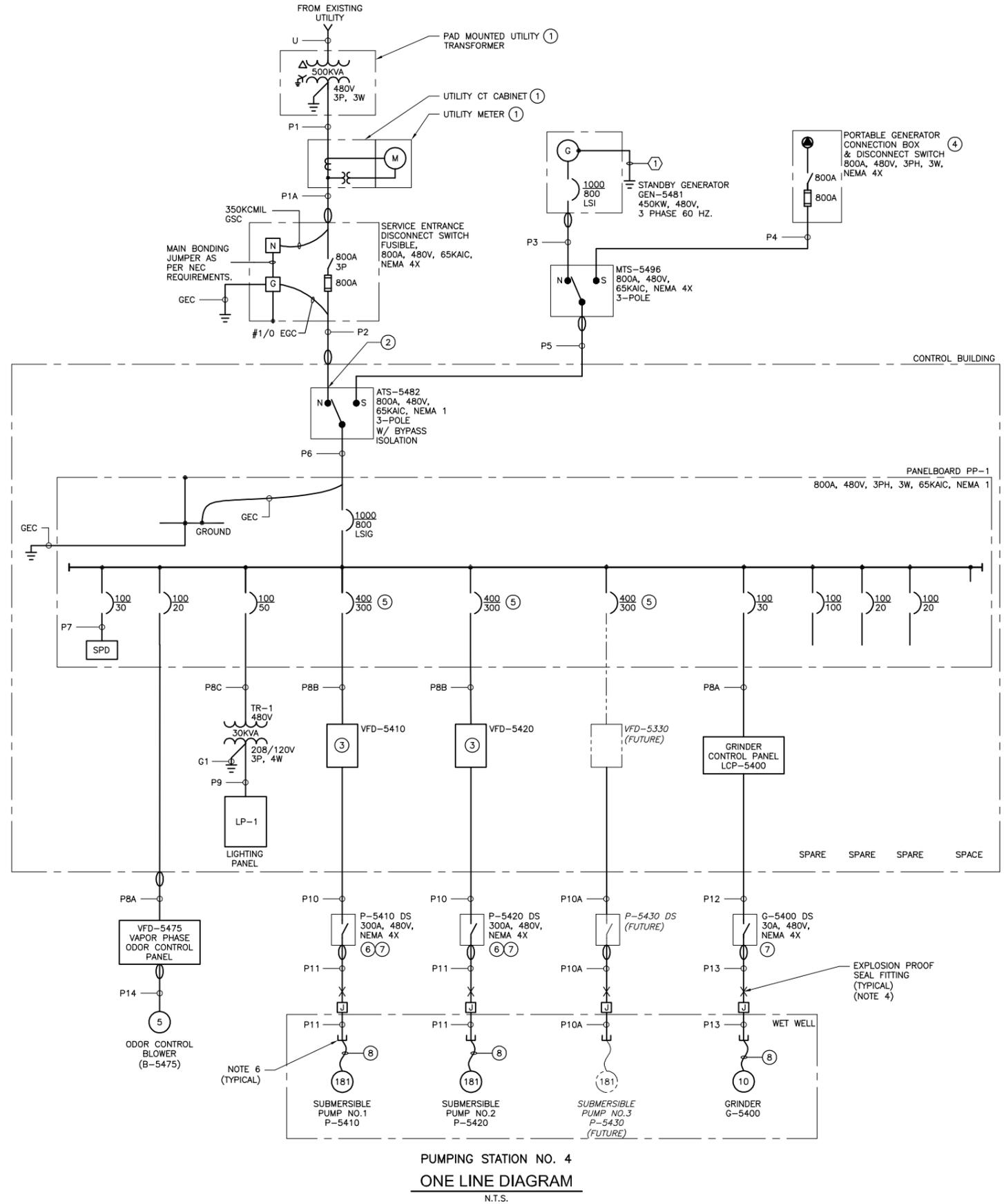
ELECTRICAL LEGEND II	Bethany Charis-Molling 2024.09.06 12:08:50-04'00" PROJECT NO. 141004-277870 FILE NAME: E003NFLG.DWG SHEET NO. <b>E-3</b>
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CONFORMED DRAWINGS



WIRING SCHEDULE

CONDUIT TAG	(QTY.)	SIZE	WIRE (PER CONDUIT) QTY.	SIZE	REMARKS (NOTE 1)
U	(2)	4"	-	-	EMPTY WITH PULL STRING, COORDINATE REQUIREMENTS WITH UTILITY
P1	(3)	4"	4	350KCMIL	MAIN FEEDER (SERVICE FEEDER)
P1A	(3)	4"	4	350KCMIL	MAIN FEEDER (SERVICE FEEDER)
P2	(3)	4"	3	350KCMIL #2	ATS NORMAL POWER FEEDER
P3	(3)	4"	3	350KCMIL #1/0	MTS NORMAL POWER FEEDER
P4	(3)	4"	3	350KCMIL #1/0	MTS STANDBY POWER FEEDER
P5	(3)	4"	3	350KCMIL #1/0	ATS STANDBY POWER FEEDER
P6	(3)	4"	3	350KCMIL #1/0	ATS TO PP-1
P7	3/4"	3	1	#10 #10G	PP-1 TO SPD
P8A	3/4"	3	1	#10 #10G	BRANCH CIRCUIT WIRING FROM PP-1
P8B	3"	3	1	350KCMIL #4G	PP-1 TO PUMP VFD
P8C	1"	3	1	#6 #10G	PP-1 TO TR-1
P9	2"	4	1	#1 #6G	TR-1 TO LP-1
P10	3"	3	1	350KCMIL #4G	PUMP MOTOR POWER CABLES
P10A	3"	1	-	-	SPARE WITH PULL STRING, FOR FUTURE PUMP
P11	3"	1	-	-	VENDOR PUMP MOTOR POWER CABLE AND MOTOR THERMAL AND MOISTURE PROTECTION CABLES FURNISHED UNDER DIVISION 46, INSTALLED UNDER DIVISION 26
P12	2"	3	1	#10 #10G	GRINDER PUMP MOTOR POWER CABLES
P13	2"	1	-	-	VENDOR PUMP MOTOR POWER CABLE CABLES FURNISHED UNDER DIVISION 46, INSTALLED UNDER DIVISION 26
P14	2"	1	-	-	VENDOR PUMP MOTOR POWER CABLE CABLES FURNISHED UNDER DIVISION 46, INSTALLED UNDER DIVISION 26
GEC	1"	1	1	#1/0GEC	GROUNDING ELECTRODE CONDUCTOR
G1	3/4"	1	1	#6	XFMR GROUNDING ELECTRODE CONDUCTOR



- NOTES:**
- SEE EQUIPMENT LOCATIONS, SECTIONS, AND UNDERGROUND RACEWAY SCHEDULE ON ELECTRICAL SITE PLAN SHEET E-7.
  - ALL WORK SHALL CONFORM TO THE LATEST EDITION OF STATE AND LOCAL ELECTRICAL CODES. PROVIDE ALL EQUIPMENT GROUNDS AS INDICATED.
  - SEE HAZARDOUS AREA CLASSIFICATIONS ON SHEET G-4.
  - PROVIDE EXPLOSION PROOF SEALS FOR ALL CONDUIT BETWEEN CONTROL BUILDING AND WET WELL, VALVE VAULT, AND METER VAULT. SEAL OFF FITTINGS INSTALLED ON THE SPARE CONDUITS SHALL BE ACCESSIBLE FOR FUTURE USE OF THE CONDUIT.
  - ALL ELECTRICAL EQUIPMENT SHALL BE RATED TO WITHSTAND SHORT CIRCUIT CURRENT OF 10 KA RMS MINIMUM OR AS SPECIFIED.
  - PROVIDE AND INSTALL 316 STAINLESS STEEL HOOK (SIZED AS REQUIRED) IN WET WELL AND SET HOOK USING ADHESIVE CAPSULE ANCHOR. MANUFACTURER SUBMERSIBLE CABLES SHALL BE SUPPORTED USING STRAIN RELIEF (KELLUM GRIP OR EQUAL).
- KEYED NOTES:**
- COORDINATE REQUIREMENTS WITH UTILITY. PROVIDE CONCRETE PAD FOR UTILITY TRANSFORMER. PROVIDE EQUIPMENT RACK FOR UTILITY CT CABINET AND METER.
  - CONTRACTOR SHALL INSTALL CONDUIT AND WIRES INTO BUILDING STRUCTURE AND MAKE FINAL CONNECTIONS.
  - CONTRACTOR SHALL INSTALL VFD INSIDE THE BUILDING STRUCTURE AND MAKE FINAL CONNECTIONS. PROVIDE LUG-KITS FOR OVERSIZED FEEDERS.
  - PORTABLE GENERATOR CONNECTION BOX SHALL UTILIZE CAM-LOK OUTLETS WITH WHILE-IN-USE LOCKABLE COVER.
  - COORDINATE TRIP SIZE WITH FINAL VFD AND WET WELL PUMP SELECTIONS.
  - PROVIDE DISCONNECT WITH AUXILIARY CONTACTS TO SHUTDOWN VFD PRIOR TO DISCONNECT OPENING.
  - DISCONNECT SHALL BE LOCKABLE.
  - SUBMERSIBLE VENDOR CABLE SHALL BE PROVIDED WITH SUFFICIENT LENGTH TO EXTEND FROM THE MOTOR TO THE ASSOCIATED DISCONNECT SWITCH. DO NOT SPLICE VENDOR CABLES.

PUMPING STATION NO. 4  
ONE LINE DIAGRAM  
N.T.S.

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DESIGNED BY: G. WARD  
 DRAWN BY: J. OGDEN  
 SHEET CHK'D BY: G. WARD  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. CHARIS-MOLLING  
 DATE: SEPTEMBER 2024

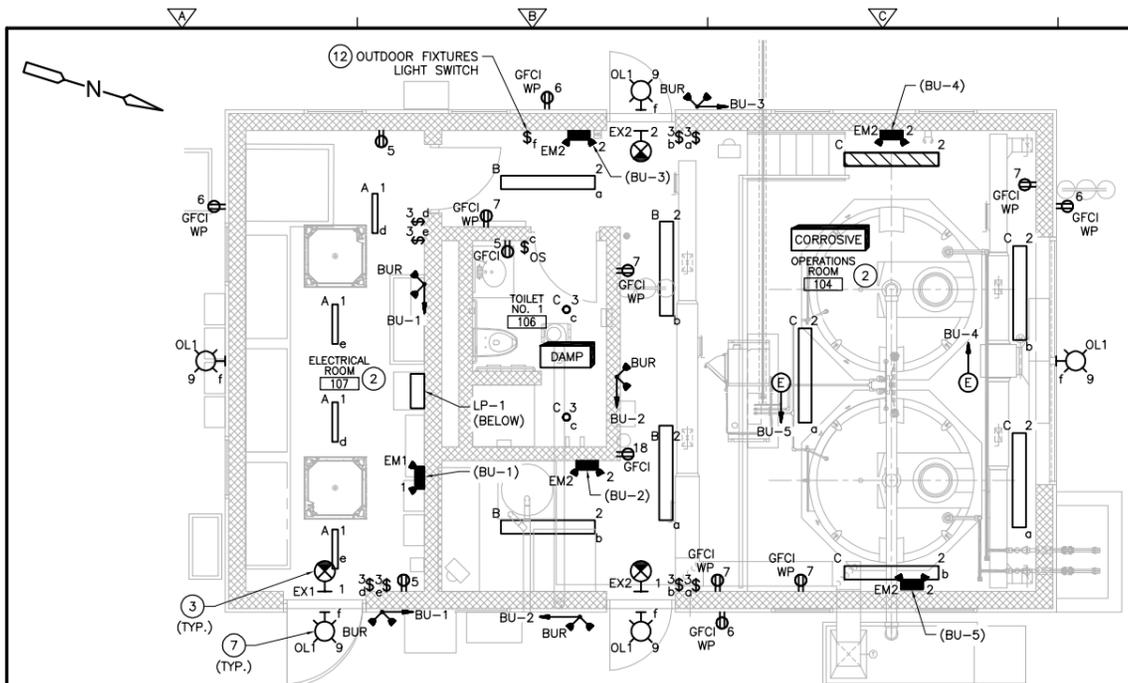


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

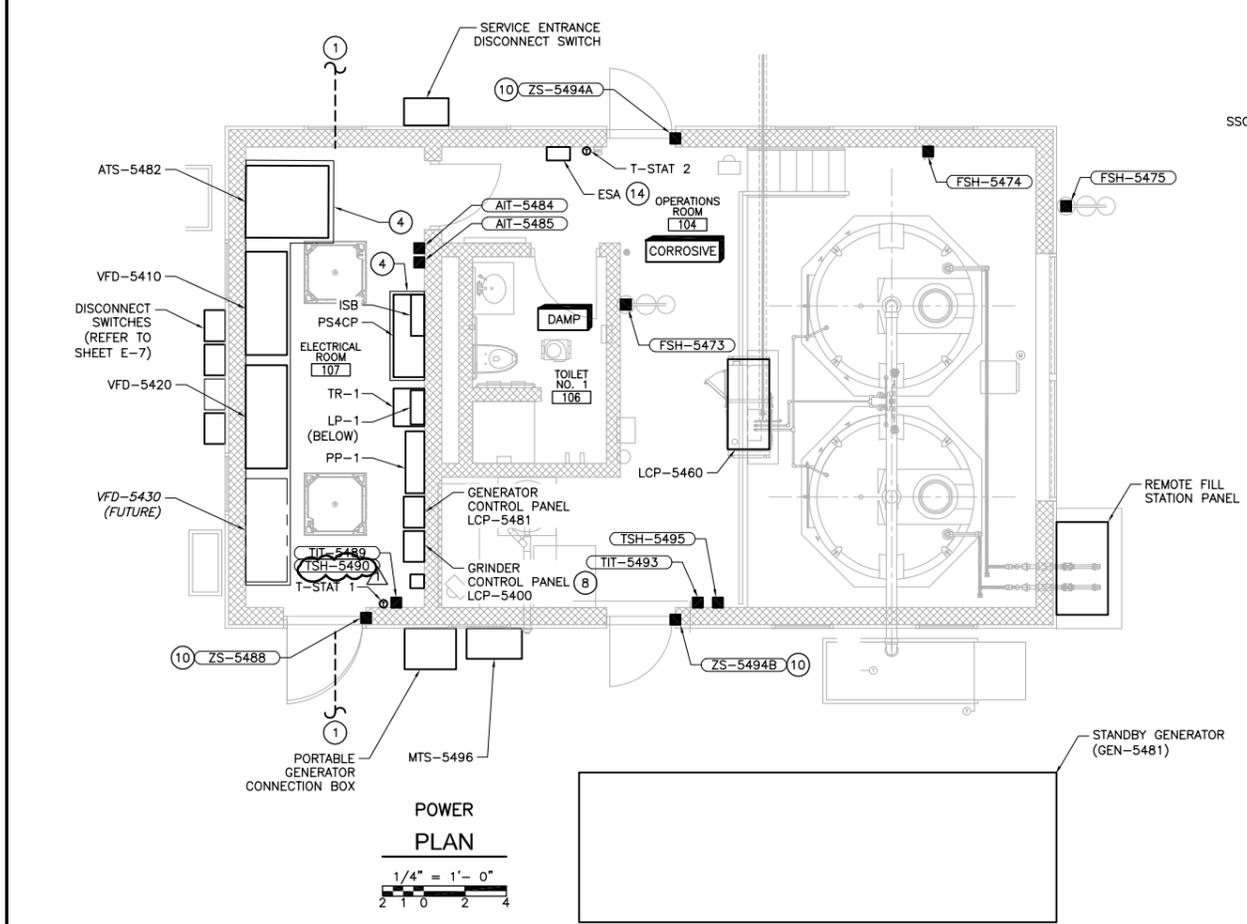
PUMPING STATION NO. 4  
 ELECTRICAL ONE LINE DIAGRAM

Bethany Charis-Molling  
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 PROJECT NO. 141004-277870  
 FILE NAME: E011PSOL.DWG  
 SHEET NO.  
**E-11**

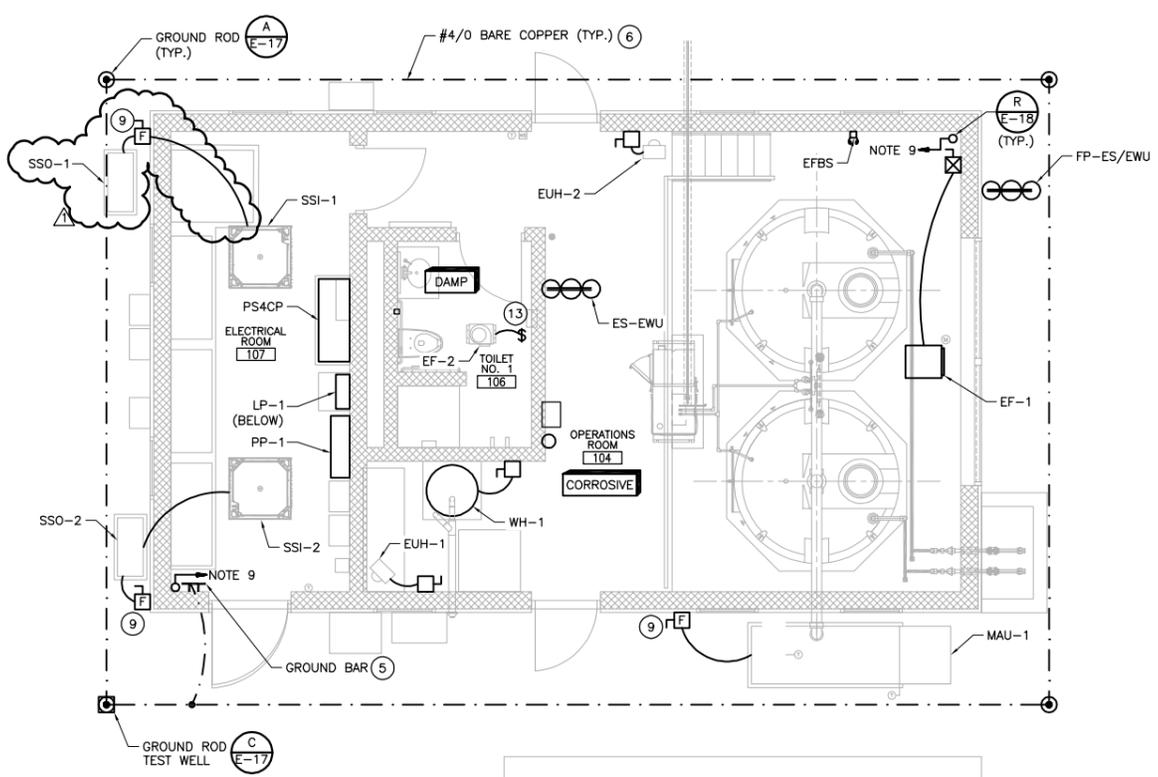
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**LIGHTING PLAN**  
 1/4" = 1'-0"  
 2 1 0 2 4



**POWER PLAN**  
 1/4" = 1'-0"  
 2 1 0 2 4



**BUILDING MECHANICAL AND GROUNDING PLAN**  
 1/4" = 1'-0"  
 2 1 0 2 4

- NOTES:**
1. ALL LIGHTING AND RECEPTACLE CIRCUITS SHALL BE WIRED BACK TO PANELBOARD LP-ERZA LOCATED IN CONTROL ROOM.
  2. REFER TO SHEET G-4 FOR AREA CLASSIFICATIONS.
  3. REFER TO SHEET E-7 FOR SITE PLAN AND UNDERGROUND RACEWAY SCHEDULE.
  4. REFER TO SHEET E-11 FOR ONE LINE DIAGRAM.
  5. REFER TO SHEET E-13 FOR PANELBOARD AND LIGHTING FIXTURE SCHEDULES.
  6. REFER TO SHEET E-15 FOR INSTRUMENTATION RISER DIAGRAM.
  7. ALL BURIED GROUND CONDUCTORS CONNECTIONS SHALL BE EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION.
  8. ALL DISCONNECT SWITCHES AND COMBINATION STARTERS SHALL BE FURNISHED AND INSTALLED BY DIV. 26 UNLESS OTHERWISE NOTED.
  9. TO LIGHTNING PROTECTION SYSTEM. REFER TO SECTION 264113 "LIGHTNING PROTECTION FOR STRUCTURES" FOR ADDITIONAL INFORMATION.

- KEYED NOTES:**
- 1 REFER TO ELECTRICAL SITE PLAN FOR UNDERGROUND CONDUIT AND WIRE.
  - 2 PENDANT MOUNT THE BOTTOM OF LUMINARIES 1'-0" BELOW CEILING.
  - 3 WALL MOUNT FIXTURE 1'-0" ABOVE TOP OF DOOR.
  - 4 CONCRETE EQUIPMENT PAD BY DIVISION 03.
  - 5 ALL METALLIC PARTS OF EQUIPMENTS AND PANELS LOCATED IN STORAGE ROOM AND CONTROL ROOM SHALL BE CONNECTED TO GROUND BAR WHICH IS EXOTHERMICALLY WELDED TO GROUNDING LOOP.
  - 6 REFER TO ELECTRICAL SITE PLAN FOR ADDITIONAL GROUNDING REQUIREMENTS.
  - 7 OUTDOOR WALL PACK LIGHTS ARE MOUNTED AT 8'-0" A.F.F. OR 1'-0" ABOVE DOOR FRAME.
  - 8 VENDOR SUPPLIED, INSTALLED BY DIVISION 26.
  - 9 FUSE SIZE PER MANUFACTURER'S RECOMMENDATION.
  - 10 DOOR SWITCH WIRED TO PLC. DOOR SWITCH SHALL BE PROVIDED UNDER DIVISION 26. DOOR SWITCHES SHALL BE COMPATIBLE WITH SECURITY SYSTEM AT MAIN FACILITY FOR FUTURE SECURITY UPGRADES.
  - 11 PROVIDE KNOCKOUT BOX FOR FUTURE CARD READER AND 3/4" CONDUIT FROM KNOCKOUT BOX TO INTERIOR OF BUILDING, PROVIDE PULL-STRING AND CAP CONDUIT.
  - 12 TIMER SWITCH WITH SETTINGS FOR UP TO 6 HOURS.
  - 13 MOTOR RATED SWITCH WITH OVERLOADS AND RED INDICATOR LIGHT.
  - 14 REFER TO DIAGRAM '2' ON SHEET E-16 FOR WIRING DIAGRAM.

DESIGNED BY: G. WARD	<p>3 Davol Square, Building A, Suite A-425          Providence, RI 02903          Tel: (401) 751-5360</p>
DRAWN BY: J. OGDEN	
SHEET CHK'D BY: G. WARD	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: B. CHARIS-MOLLING	
DATE: SEPTEMBER 2024	

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

PUMPING STATION NO. 4  
 CONTROL BUILDING PLANS  
 SHEET NO. E-12

PROJECT NO. 141004-277870
FILE NAME: E012COPL.DWG
SHEET NO. E-12

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100 AMP MAINBREAKER										PANELBOARD LP-1										CONTROL BUILDING									
100 AMP BUS RATING 42 POLES										10 KA SHORT CIRCUIT RATING										LOCATION: ELECTRICAL ROOM									
208/120 VOLTS 3 PHASE 4 WIRE 60 Hz.										ELECTRONIC GRADE, NO.										ENCLOSURE RATING: NEMA 1, MOUNTING: SURFACE									
CIRCUIT NO.	DESCRIPTION	LOAD KVA			BREAKER AMPS/POLES	NOTES	CIRCUIT NO.	DESCRIPTION	LOAD KVA			BREAKER AMPS/POLES	NOTES																
		PHASE A	PHASE B	PHASE C					PHASE A	PHASE B	PHASE C																		
1	LIGHTING - ELECTRICAL ROOM	0.1			20 /1	7	2	LIGHTING - OPERATIONS ROOM	0.5			20 /1	7																
3	LIGHTING - TOILET ROOM		0.1		20 /1	7	4	LIGHTING - EXTERIOR		0.1		20 /1	7																
5	RECEPTS - ELECTRICAL & TOILET ROOM			0.54	20 /1	7	6	RECEPTS - EXTERIOR			0.72	20 /1	7																
7	RECEPTS - OPERATIONS ROOM	1.08			20 /1	7	8	GENERATOR JACKET WH RECEPT	1.88			20 /1	7																
9	GENERATOR CONTROL PANEL		0.5		20 /1	7	10	GENERATOR BATTERY CHARGER		0.25		20 /1	7																
11	PS4CP			1	20 /1	7	12	GENERATOR BLOCK HEATER			0.25	20 /1	7																
13	POLE MOUNTED AREA LIGHT	0.19			20 /1	7	14	EXHAUST FAN EF-1	0.9			20 /1	7																
14	RFMOTF F11 STATION PANFI		0.1		20 /1	7	16	EXHAUST FAN EF-2		0.13		20 /1	7																
17	EM SHOWER EYEWASH RP-ES/EWU			0.1	20 /1	7	18	RECEPT - TEPID WATER PUMP TWP-1			0.6	20 /1	7																
19	SPLIT SYSTEM SSO-1, SSI-1	1.5			30 /2	8,9	20	SPLIT SYSTEM SSO2, SSI-2	1.5			30 /2	8,9																
21			1.3				22			1.5																			
23	WATER HEATER WH-1			0.6	20 /1	7	24				0.8	20 /3	5																
25	EYEWASH EFBS	0.1			20 /1	7	26	MAKEUP AIR UNIT MAU-1		0.6		20 /1	7																
27	EM SHOWER EYEWASH ES-EWU		0.1		20 /1	7	28																						
29	T-STAT 1, T-STAT 2			0.1	20 /1	7	30	EMERGENCY SHOWER ALARM ESA			0.5	20 /1	7																
31	SPACE				20 /1		32	SPACE				20 /1																	
33	ELEC UNIT HEATER EUH-1		1.25		20 /2	7	34	ELEC UNIT HEATER EUH-2		1.25		20 /2	7																
35				1.25			36				1.25																		
37	SPACE				20 /1		38	SPACE				20 /1																	
39	SPACE				20 /1		40	SPACE				20 /1																	
41	SPACE				20 /1		42	SPACE				20 /1																	
TOTAL PHASE KVA THIS SIDE		2.97	3.95	3.59									TOTAL PHASE KVA THIS SIDE		5.58	4.03	4.12												
										TOTAL KVA PER PHASE		8.55	7.98	7.71															
										TOTAL THREE PHASE KVA		24.24																	

- |   |   |
|---|---|
| NOTES:  | NOTES CONT:   |
| 1. PROVIDE LOCKING HARDWARE   | 2. 5 ma GROUND FAULT INTERRUPTER (GFI) CIRCUIT BREAKER        |
| 3. 30 ma GFI CIRCUIT BREAKER FOR EQUIPMENT PROTECTION ONLY (HEAT TRACE) | 4. PROVIDE LOCKING HARDWARE & FAINT BREAKER HANDLE RED (FACP) |
| 5. BRANCH CIRCUIT WIRING: 3/4" C, 3#12 & #12G                           | 6. BRANCH CIRCUIT WIRING: 3/4" C, 3#0 & 1#10G                 |
| 7. BRANCH CIRCUIT WIRING: 3/4" C, 2#12 & #12G                           | 8. BRANCH CIRCUIT WIRING: 3/4" C, 2#0 & 1#10G                 |
| 9. PROVIDE SIMILAR BRANCH CIRCUIT WIRING FROM SSO UNIT TO SSI UNIT      | 10.   |

LIGHTING FIXTURE SCHEDULE						
TYPE	LOCATION	LIGHT SOURCE	MOUNTING	DESCRIPTION	ACCEPTABLE MANUFACTURERS & MODELS	
A	INDUSTRIAL DRY	LED	SURFACE/PENDANT	STRIP LED LIGHT FIXTURE, 24" LENGTH, STEEL CHANNEL, DIFFUSE LENS, 3500 LUMENS, L70 AT 100,000 HOURS, 140 LUMENS PER WATT, 4000K COLOR TEMPERATURE, 80 CRI, 2500 LUMENS. DAMP LOCATION RATED.	LITHONIA LIGHTING CLX-L24-3500LM-HEF-FDL-MVOLT-GZ10-40K-80CRI OR EQUAL	
B	CORROSIVE	LED	SURFACE/PENDANT	48" LINEAR SURFACE MOUNTED LED LIGHT FIXTURE, GASKETED INDUSTRIAL, IP65/IP66/IP67, NEMA 4X, 4000 LUMENS, 4000K COLOR TEMPERATURE, 80+ CRI, FROSTED ACRYLIC LENS, 316 STAINLESS STEEL LATCHES	LITHONIA LIGHTING FEM-L48-4000LM-IMAF-LMD-MVOLT-GZ10-40K-80CRI-STSL OR EQUAL	
C	CORROSIVE	LED	SURFACE/PENDANT	48" LINEAR SURFACE MOUNTED LED LIGHT FIXTURE, GASKETED INDUSTRIAL, IP65/IP66/IP67, NEMA 4X, 10000 LUMENS, 4000K COLOR TEMPERATURE, 80+ CRI, FROSTED ACRYLIC LENS, 316 STAINLESS STEEL LATCHES	LITHONIA LIGHTING FEM-L48-10000LM-IMAF-LMD-MVOLT-GZ10-40K-80CRI-STSL OR EQUAL	
D	DAMP	LED	RECESSED DOWNLIGHT	4" ROUND RECESSED DOWNLIGHT LED LIGHT FIXTURE, 500 LUMEN, 4000 COLOR TEMPERATURE.	LITHONIA LIGHTING LDN4-05LM-40K-LO4-WR-TRW-LD-WD-MVOLT OR EQUAL	
OL1	OUTDOOR	LED	WALL	ARCHITECTURAL WALL SCONCE, ALUMINUM HOUSING, THERMO-SET POWDER COAT FINISH, L70 AT 100,000 HOURS, 120 LUMENS PER WATT, 3000K COLOR TEMPERATURE, 80 CRI, 1300 LUMENS. WET LOCATION RATED, IP65 RATED, INTERNATIONAL DARK-SKY ASSOCIATION COMPLIANT & LABELED, 0-0-0 BUG RATING.	LITHONIA LIGHTING ARC1-P1-30K-MVOLT-DBTDX OR EQUAL	
OL2	OUTDOOR	LED	POLE MOUNTED	LED AREA LIGHT FIXTURE, 20" LENGTH, 4000K COLOR TEMPERATURE, 8000 TO 14000 LUMENS, 70 CRI, WET LOCATED RATED AND IP66 RATED. INCLUDES PHOTOCELL SENSOR. PROVIDE WITH COMPATIBLE 15" POLE.	LITHONIA LIGHTING ESX1-LED-P4-40K-R3-MVOLT-UPA-BLS-DDXB-M2 OR EQUAL	
EM1	INDUSTRIAL DRY	LED	WALL	UL924 LISTED EMERGENCY LIGHT WITH MINIMUM 90 MINUTES OF RUN TIME. INJECTION MOLDED COLOR STABLE, HIGH IMPACT THERMOPLASTIC MATERIAL WITH SEALED LITHIUM IRON PHOSPHATE BATTERY WITH 640 LUMEN LED EMERGENCY HEADS. SELF-DIAGNOSTICS AND REMOTE TEST. HIGH-OUTPUT BATTERY SIZED TO POWER REMOTE HEADS BELOW.	LITHONIA LIGHTING CZQ4L-LTP-SDRT-EHO OR EQUAL	
EM2	CORROSIVE	LED	WALL	NEMA 4X RATED, UL924 LISTED EMERGENCY LIGHT WITH MINIMUM 90 MINUTES OF RUN TIME. INJECTION MOLDED COLOR STABLE, HIGH IMPACT THERMOPLASTIC MATERIAL WITH SEALED LITHIUM IRON PHOSPHATE BATTERY WITH 640 LUMEN LED EMERGENCY HEADS. SELF-DIAGNOSTICS AND REMOTE TEST. HIGH-OUTPUT BATTERY SIZED TO POWER REMOTE HEADS.	LITHONIA LIGHTING EXTL-SP640L-UVOLT-LTP-SDRT-EHO OR EQUAL	
EX1	INDUSTRIAL DRY	LED	WALL	INDUSTRIAL, UL924 LISTED EXIT SIGN WITH MINIMUM 90 MINUTES OF RUN TIME. WITH SELF-DIAGNOSTICS AND REMOTE TEST.	LITHONIA LIGHTING LV-S-W-1-R-120/277-ELN-UM OR EQUAL	
EX2	CORROSIVE	LED	WALL	NEMA 4X RATED, UL924 LISTED EXIT SIGN WITH MINIMUM 90 MINUTES OF RUN TIME. WITH SELF-DIAGNOSTICS AND REMOTE TEST.	LITHONIA LIGHTING LV-S-W-1-R-120/277-ELN-UM-4X OR EQUAL	
BUR1	INDOOR & OUTDOOR	LED	WALL	UL924 LISTED LED REMOTE TWIN-HEAD COMPATIBLE WITH ASSOCIATED EMERGENCY UNIT. DIE-CAST LAMP HEAD HOUSING WITH YOKE. 640 LUMEN OUTPUT, UL LISTED FOR WET LOCATIONS.	LITHONIA LIGHTING INDRE-SP640L-T OR EQUAL	
BUR2	CORROSIVE	LED	CEILING	NEMA 4X, UL924 LISTED LED REMOTE TWIN-HEAD COMPATIBLE WITH ASSOCIATED EMERGENCY UNIT. DIE-CAST LAMP HEAD HOUSING WITH YOKE. 640 LUMEN OUTPUT, UL LISTED FOR WET LOCATIONS.	LITHONIA LIGHTING EXTLRE-SP640L-T OR EQUAL	
VLX	INDUSTRIAL HAZARDOUS CLASS I, DIVISION 2	LED	WALL	LINEAR LED FIXTURE, 24" LENGTH, LUMENS. 5000K COLOR TEMPERATURE, 4200 LUMENS, STAINLESS STEEL HARDWARE. EXPLOSION PROOF, UL LISTED WET LOCATION AND CLASS 1, DIV 2 GROUP D T6.	PHEONIX LIGHTING LFXB OR EQUAL	

NOTE: FIXTURE FINISHES SHOWN FOR REFERENCE ONLY, COORDINATE FIXTURE FINISHES WITH ARCHITECT AND OWNER.



Bethany Charis-Molling  
2024.09.06 12:10:00-04'00'  
PROJECT NO. 141004-277870  
FILE NAME: E013NFSD.DWG

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: G. WARD  
 DRAWN BY: J. OGDEN  
 SHEET CHK'D BY: G. WARD  
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 APPROVED BY: B. CHARIS-MOLLING  
 DATE: SEPTEMBER 2024

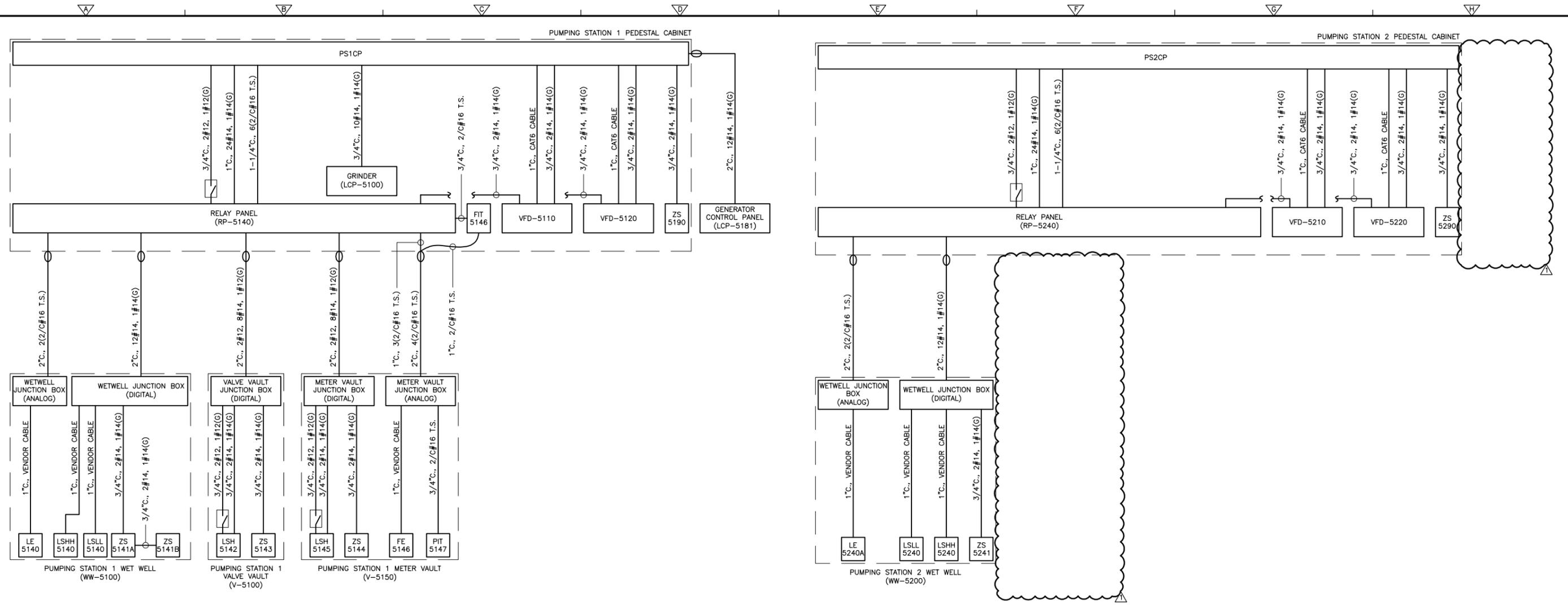
3 Davol Square, Building A, Suite A-425  
Providence, RI 02903  
Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

ELECTRICAL SCHEDULES  
 SHEET NO. E-13

CONFORMED DRAWINGS

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REV. NO.	DATE	DRWN	CHKD	REMARKS
1	9/18/24	GDW	BCM	REVISED PER ADDENDUM NO. 1

DESIGNED BY: G. WARD  
 DRAWN BY: M. COMPERCHIO  
 SHEET CHK'D BY: G. WARD  
 CROSS CHK'D BY: J. O'DONNELL  
 APPROVED BY: B. CHARIS-MOLLING  
 DATE: SEPTEMBER 2024

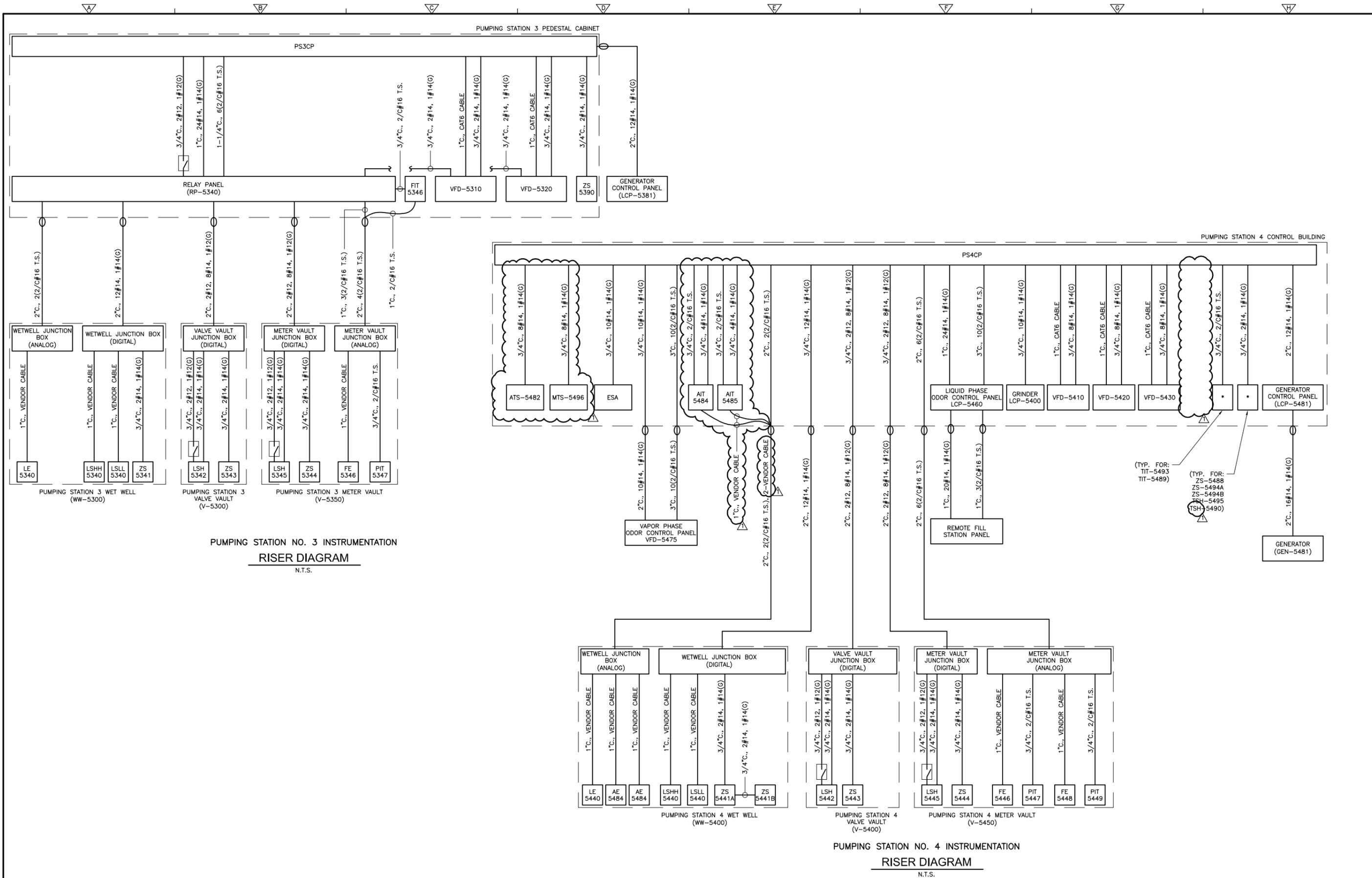


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

INSTRUMENTATION RISER DIAGRAM I  
 SHEET NO. E-14

PROJECT NO. 141004-277870  
 FILE NAME: E014NFRD.DWG  
 SHEET NO. E-14

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PUMPING STATION NO. 3 INSTRUMENTATION  
RISER DIAGRAM  
N.T.S.

PUMPING STATION NO. 4 INSTRUMENTATION  
RISER DIAGRAM  
N.T.S.

REV. NO.	DATE	DRWN	CHKD	REMARKS
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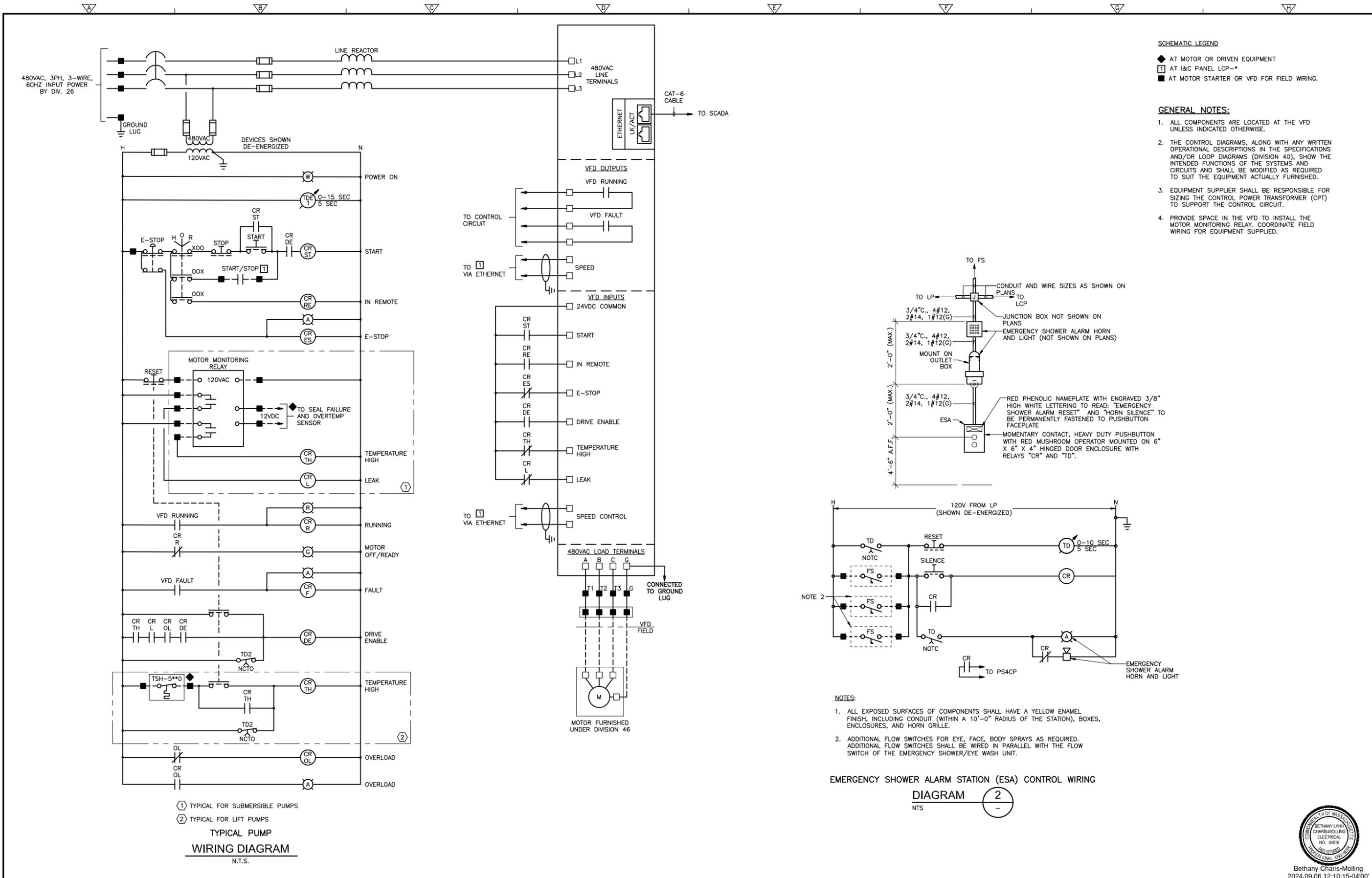


TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

INSTRUMENTATION RISER DIAGRAM II  
 SHEET NO. E-15

PROJECT NO. 141004-277870  
 FILE NAME: E015NFRD.DWG  
 SHEET NO. E-15

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① TYPICAL FOR SUBMERSIBLE PUMPS  
 ② TYPICAL FOR LIFT PUMPS  
**TYPICAL PUMP WIRING DIAGRAM**  
 N.T.S.

**DIAGRAM 2**  
 NTS

REV. NO.	DATE	DRWN	CHKD	REMARKS

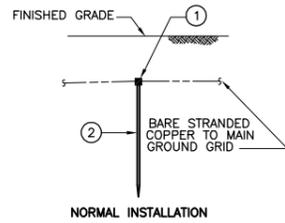
DESIGNED BY: G. WARD	<b>CDM Smith</b> 3 David Square, Building A, Suite A-425 Providence, RI 02903 Tel: (401) 751-5360
DRAWN BY: J. OGDEN	
SHEET CHK'D BY: G. WARD	
CROSS CHK'D BY: J. O'DONNELL	
APPROVED BY: B. CHARIS-MOLLING	
DATE: SEPTEMBER 2024	

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES  
 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

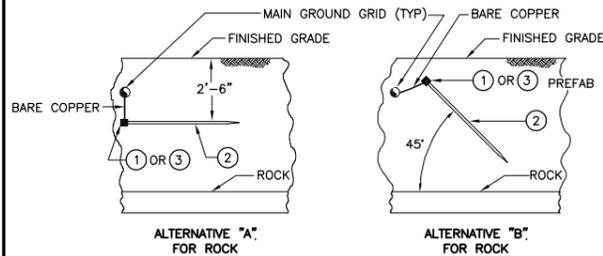
**ELECTRICAL CONTROL SCHEMATICS**  
 SHEET NO. E-16

Bethany Charis-Molling  
 2024.09.06 12:10:15-04'00"  
 PROJECT NO. 141004-277870  
 FILE NAME: E016NFCD.DWG  
 SHEET NO. E-16

ITEM NUMBER	QUANTITY	DESCRIPTION	MANUFACTURER	CAT #
1	1	CADWELD CABLE TO ROD	CADWELD	TYPE GT
2	1	GROUND ROD, COPPER CLAD, 8 FT MIN.	ERITECH	
3	1	CADWELD CABLE TO ROD	CADWELD	TYPE GS

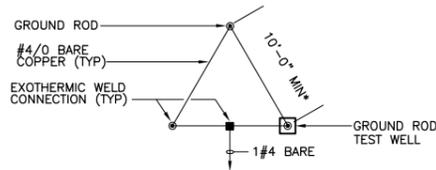


NORMAL INSTALLATION

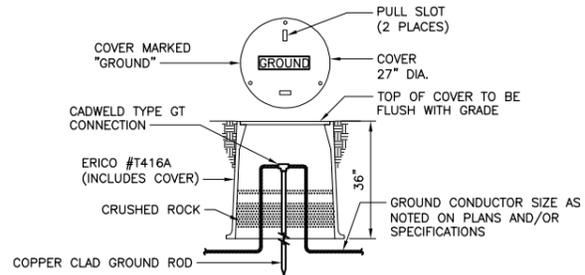


GROUND ROD INSTALLATIONS PER NEC 250-53(A)(4)

DETAIL A  
N.T.S.

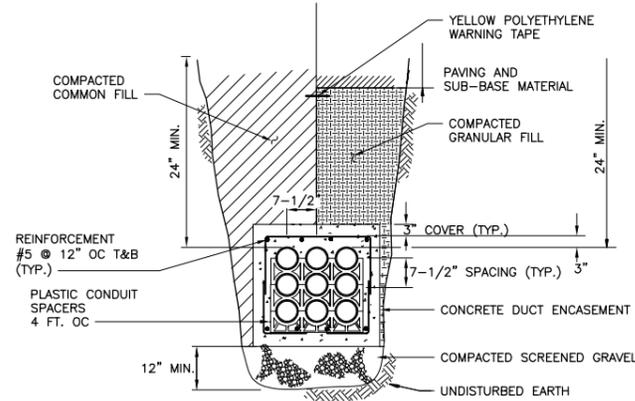


\* WHERE PRACTICABLE  
GROUND GRID  
DETAIL B  
N.T.S.

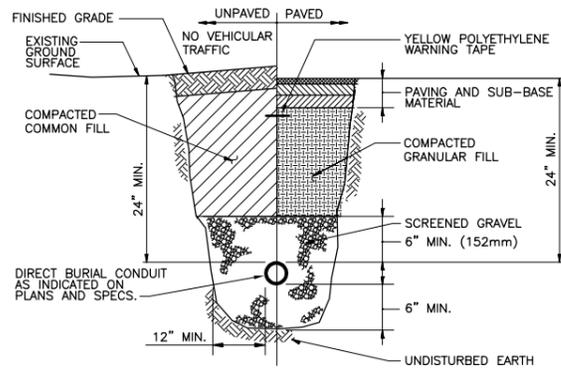


GROUND ROD TEST WELL  
DETAIL C  
N.T.S.

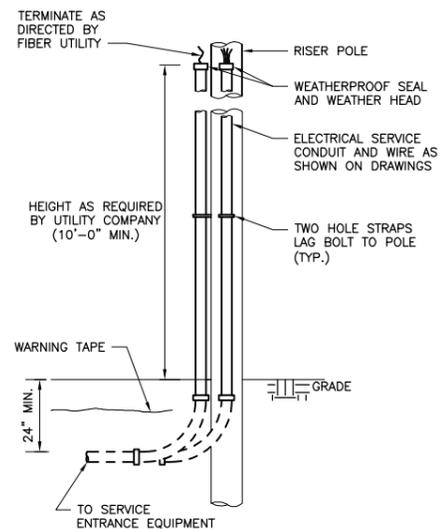
NOTE:  
1. TO IMPROVE SYSTEM RESISTANCE, ERICO GEM MAY BE USED AS A BACKFILL MATERIAL IN AN AUGERED HOLE



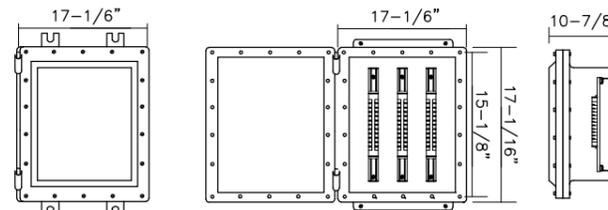
UNDERGROUND DUCT BANK  
DETAIL D  
N.T.S.



TYPICAL DIRECT BURIAL CONDUIT INSTALLATION  
DETAIL E  
N.T.S.



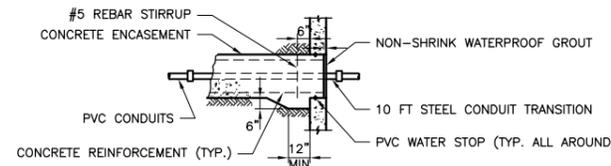
POWER COMPANY RISER POLE  
DETAIL F  
N.T.S.



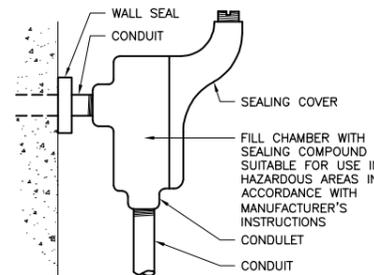
NOTES:

1. PROVIDE AND INSTALL NEMA 7 ENCLOSURE. SIZE SHOWN IS MINIMUM AND SHALL BE INCREASED WHERE NECESSARY PER NEC.
2. MOUNT ENCLOSURE ON 316SS STRUT UNLESS NOTED OTHERWISE.
3. PROVIDE AND INSTALL ENOUGH TERMINALS TO SUPPORT DEVICES SHOWN ON CORRESPONDING SHEETS. PROVIDE SPARE TERMINALS PER DIV 16 SPECIFICATIONS. PROVIDE POWER BLOCKS FOR LARGER CONDUCTOR SETS.
4. UNIQUELY LABEL AND TERMINATE ALL CONDUCTORS.

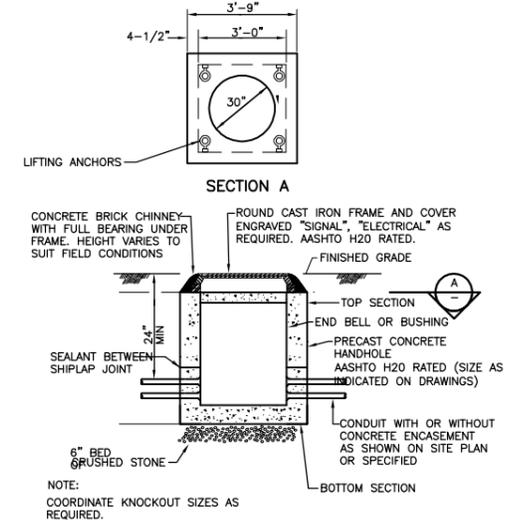
NEMA 7 JUNCTION BOX  
DETAIL G  
N.T.S.



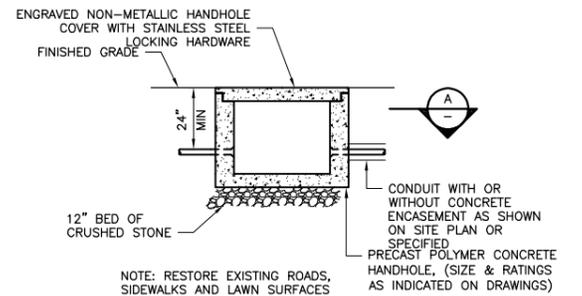
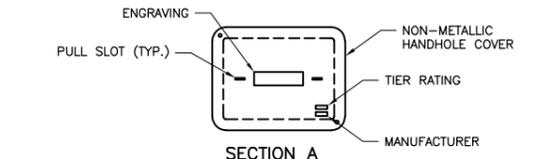
CONCRETE ENCASED CONDUIT PENETRATION AT STRUCTURE  
DETAIL H  
N.T.S.



CONDUIT SEALOFF FITTING  
DETAIL J  
N.T.S.



ELECTRICAL HANDHOLE  
DETAIL K  
N.T.S.



ELECTRICAL HANDHOLE  
DETAIL L  
N.T.S.



Bethany Charis-Molling  
2024.09.06 12:10:20-04'00'

PROJECT NO. 141004-277870

FILE NAME: E017NFDT.DWG

SHEET NO.

E-17

CONFORMED DRAWINGS

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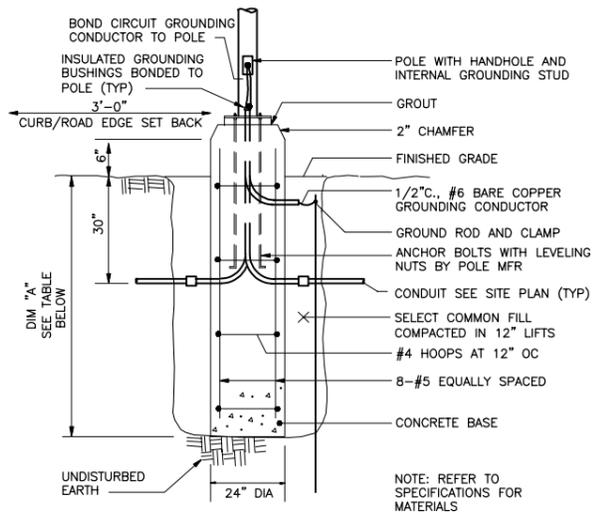
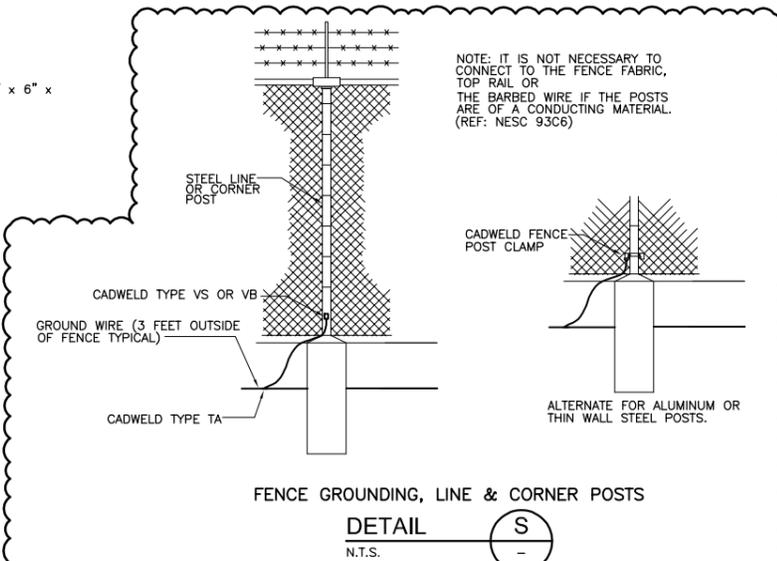
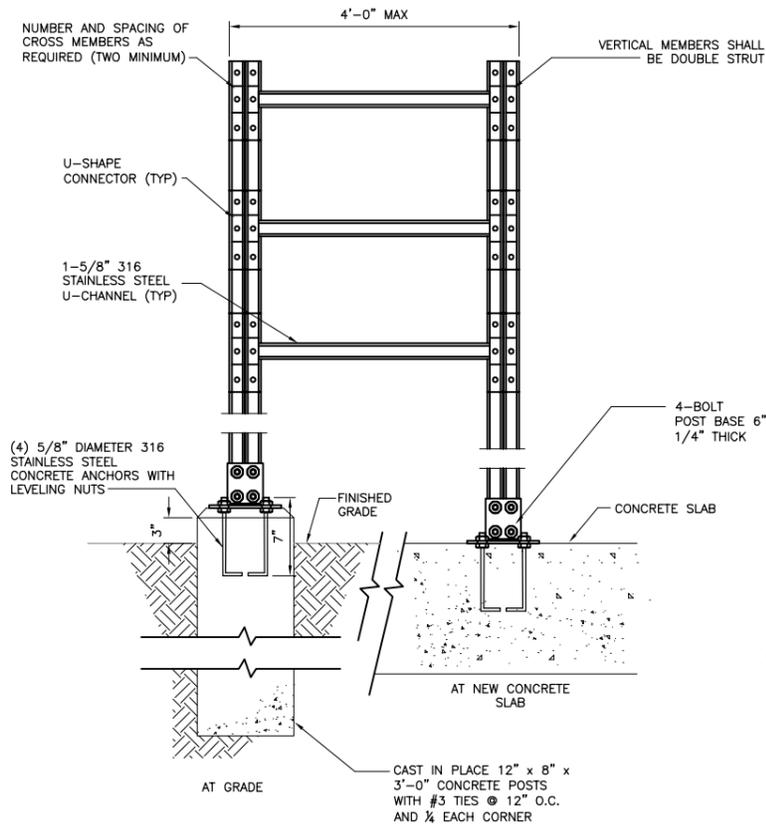
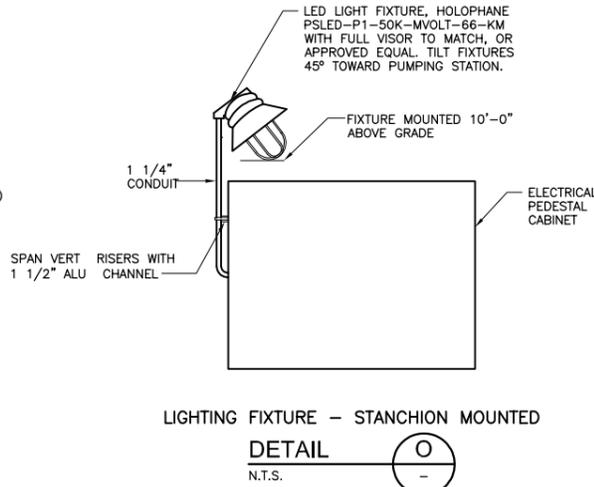
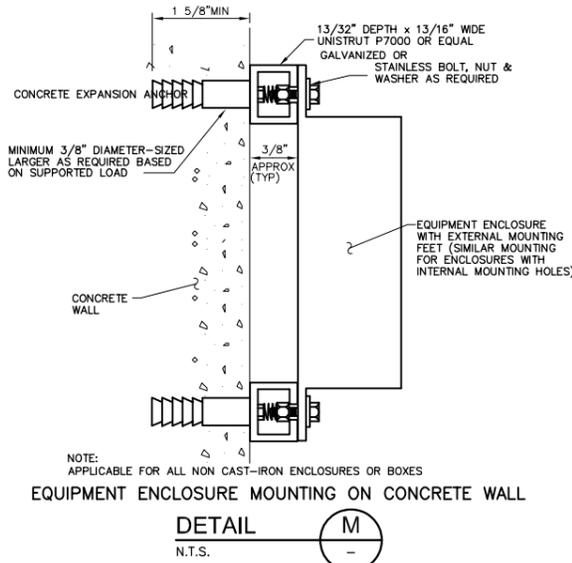
**CDM Smith**  
 3 David Square, Building A, Suite A-425  
 Providence, RI 02903  
 Tel: (401) 751-5360

TOWN OF DENNIS, MASSACHUSETTS  
 WASTEWATER COLLECTION AND WATER RESOURCE RECOVERY FACILITIES

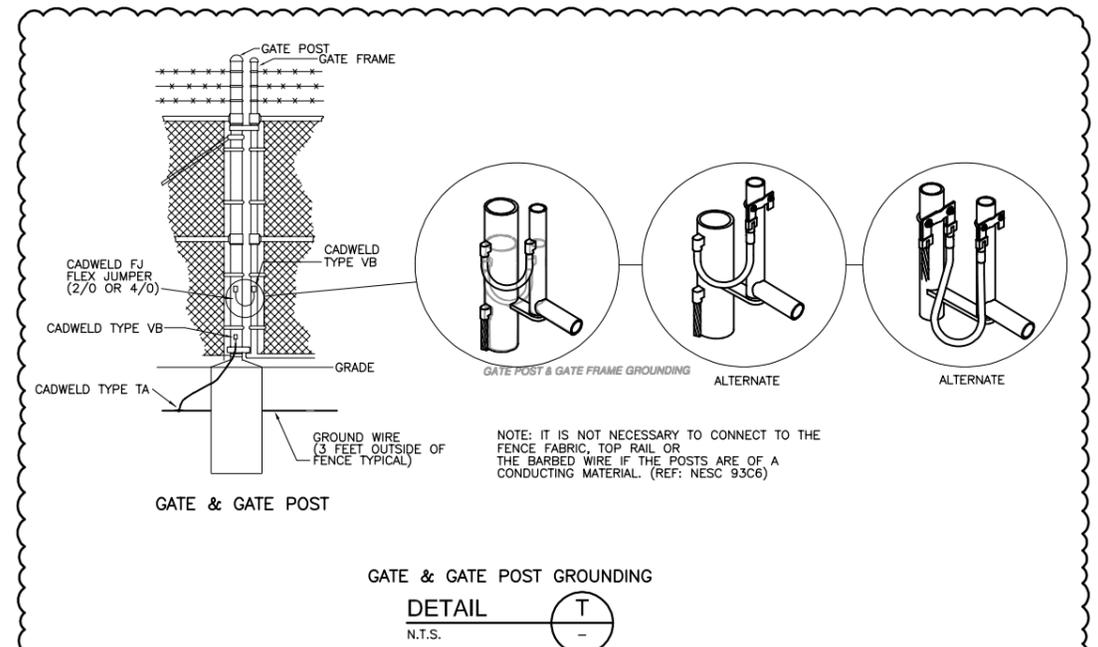
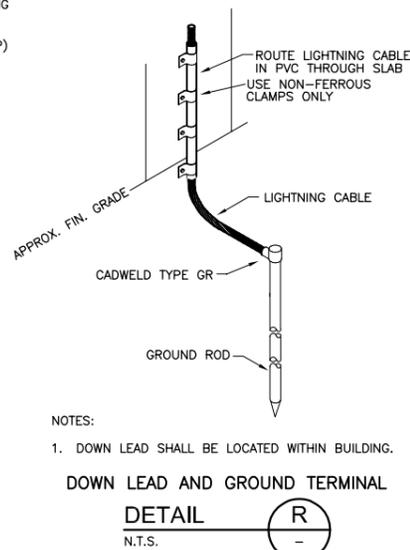
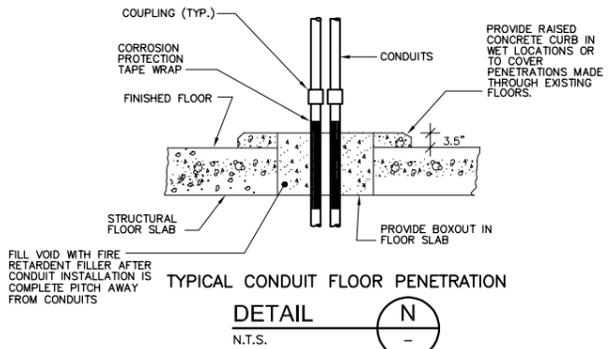
PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

ELECTRICAL  
 DETAILS I

REV. NO.	DATE	DRWN	CHKD	REMARKS



POLE HEIGHT	DIMENSION "A"
10'-0"	4'-6"
20'-0"	4'-6"
30'-0"	6'-6"
40'-0"	6'-6"



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 PHASE 1 - CONTRACT NO. 2  
 PROJECT NO. CWSRF 16676/2

ELECTRICAL  
 DETAILS II  
 SHEET NO.  
 E-18

PROJECT NO. 141004-277870  
 FILE NAME: E018NFDT.DWG  
 SHEET NO.  
 E-18