

VINES CREEK CROSSING

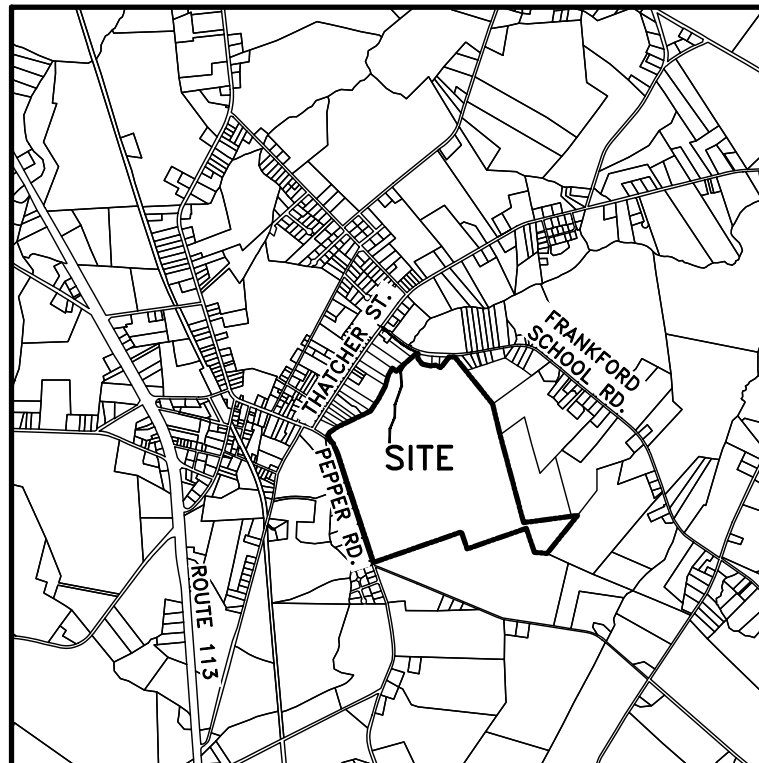
CONSTRUCTION PLANS FOR SEWAGE PUMP STATION BALTIMORE HUNDRED TOWN OF FRANKFORD SUSSEX COUNTY, DELAWARE

DBF PROJECT NO. 0700C004 SEPTEMBER 2024

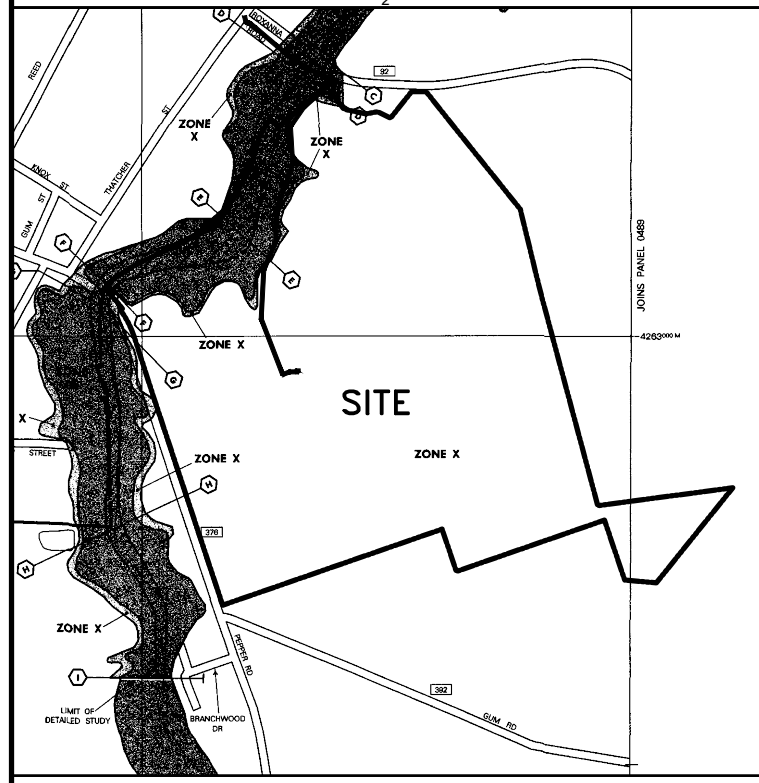


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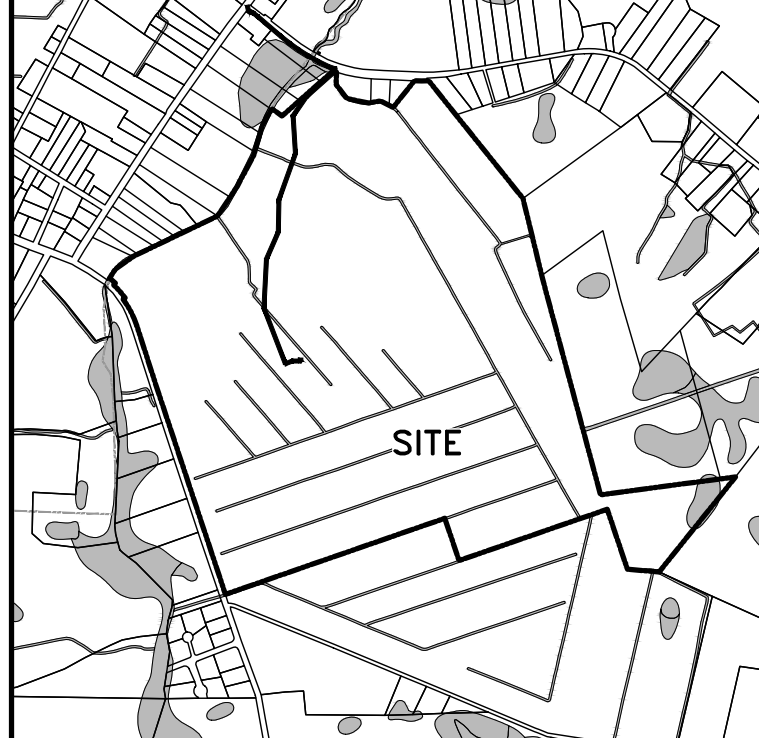
**VINES CREEK CROSSING
SEWAGE PUMP STATION**
PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE



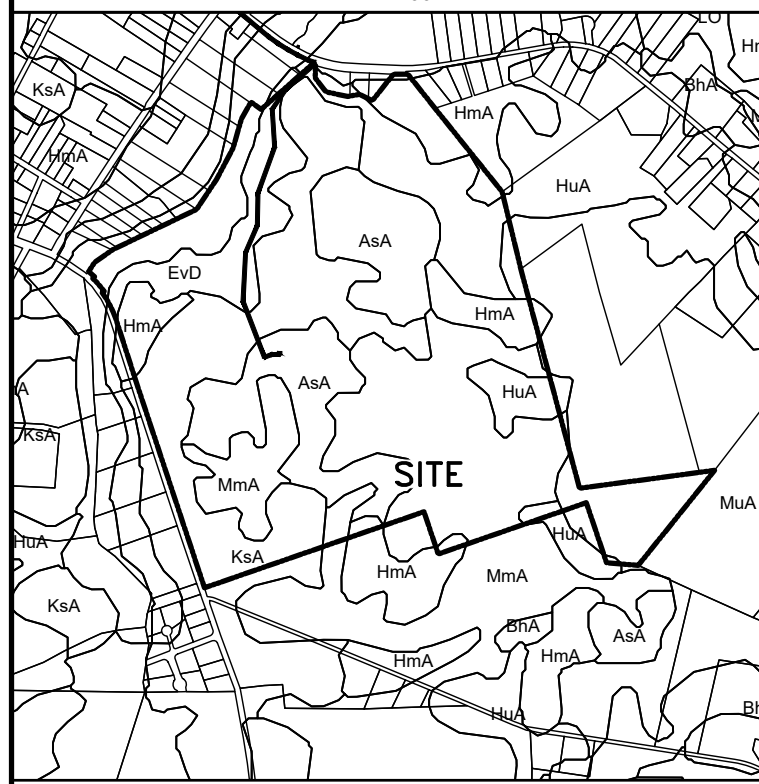
LOCATION MAP
1"=1/2 MILE



FEMA FLOOD MAP
PANEL#10005C488J(1/6/2005) 1"=1200'



NWI WETLAND MAP
1"=1200'

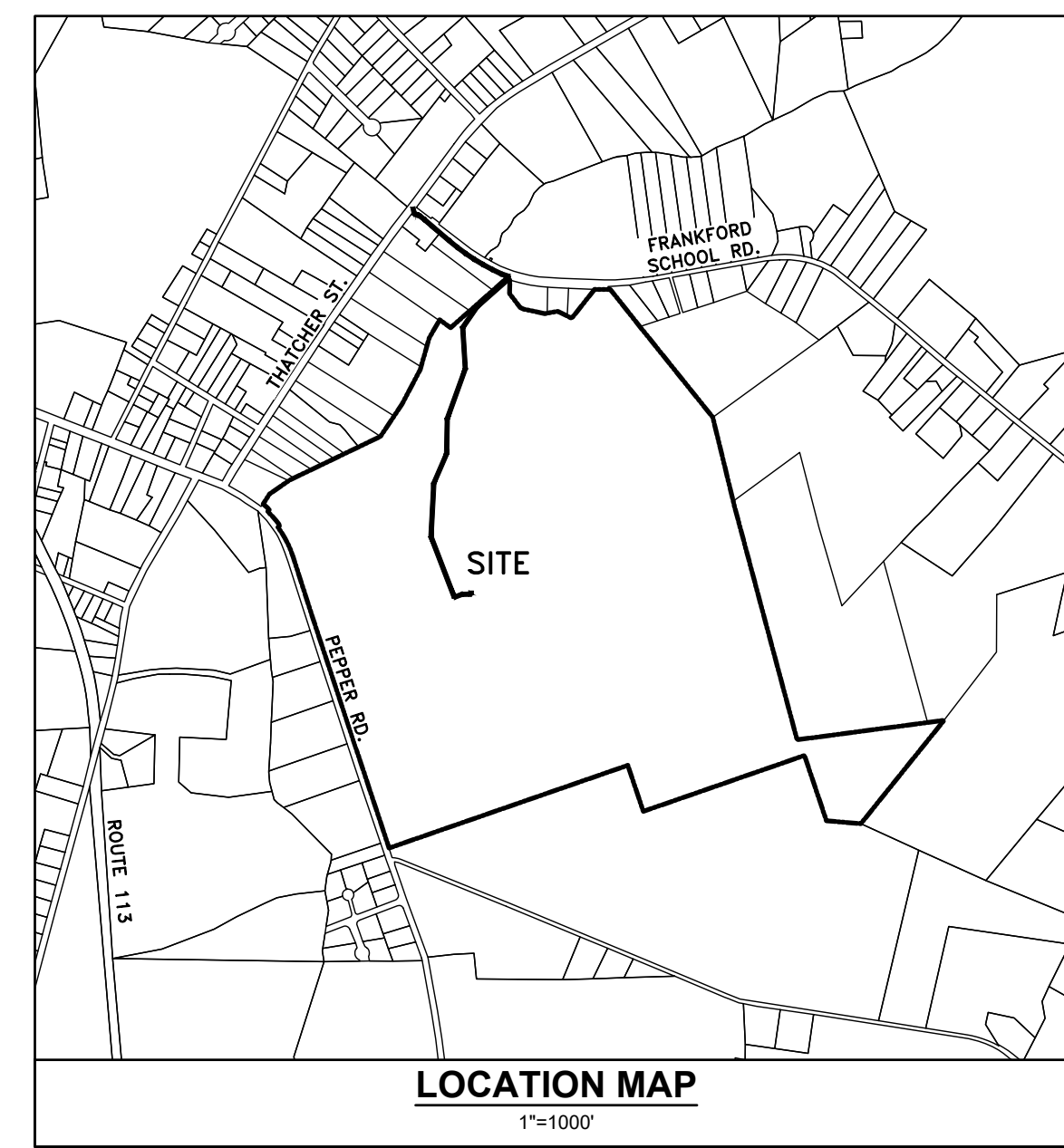


SOILS MAP
1"=1200'

LABEL	SOIL NAME	TYPE
AsA	Askecksy loamy sand, 0 to 2 percent slopes	A/D
EvD	Evesboro loamy sand, 5 to 15 percent slopes	A
HmA	Hammonton loamy sand, 0 to 2 percent slopes	B
HuA	Hurlock loamy sand, 0 to 2 percent slopes	A/D
KsA	Klej loamy sand, 0 to 2 percent slopes	A/D
MmA	Mullica mucky sandy loam, 0 to 2 percent slopes	A/D

DATA COLUMN

1 TAX MAP ID	533-1.00-38.00, 533-4.00-28.00, 28.01
2 APPROXIMATE PROJECT CENTER	LATITUDE 38.513317 LONGITUDE -75.224583
3 ENGINEER	DAVIS, BOWEN & FRIEDEL, INC. 1 PARK AVENUE MILFORD, DE 19963 CONTACT NAME PHONE: (302) 424-1441 EMAIL: sbk@dbfinc.com
4 DATUM	HORIZONTAL NAD 83 (DE STATE PLANE) VERTICAL NAVD 88
5 ZONING	EXISTING RPC PROPOSED RPC
6 LAND USE	EXISTING AGRICULTURE PROPOSED RESIDENTIAL
7 TOTAL PROPOSED UNITS (SECTION I)	SINGLE FAMILY 46 UNITS TOWNHOMES 64 UNITS TOTAL 110 UNITS
8 UTILITY PROVIDERS	SEWER SUSSEX COUNTY WATER ARTESIAN WATER COMPANY, INC. GAS ELECTRIC DELAWARE ELECTRIC COOP
9 STATE STRATEGIES MAP	INVESTMENT LEVEL AREA: 2 & 3
10 POSTED SPEED LIMIT	PEPPER ROAD (SCR 372) 45 MPH FRANKFORD SCHOOL ROAD (SCR 92) 25 MPH
11 FLOODPLAIN	THE PROPERTY IS IMPACTED BY THE 100 YEAR FLOODPLAIN AS DETERMINED BY FEMA PANEL 10005C488J, DATED 1/6/2005.
12 TRANSPORTATION IMPROVEMENT DISTRICT (TID)	THE PROPERTY IS NOT LOCATED IN A TRANSPORTATION IMPROVEMENT DISTRICT (TID).
13 GROUNDWATER RECHARGE	ALL OF THE PROPERTY IS NOT LOCATED IN AN AREA OF EXCELLENT GROUNDWATER RECHARGE.
14 WELLHEAD PROTECTION AREA	ALL OF THE PROPERTY IS NOT LOCATED IN A WELLHEAD PROTECTION AREA.
15 WETLANDS	THE PROPERTY IS IMPACTED BY FEDERALLY REGULATED WETLANDS.
16 COASTAL AREA	THE PROPERTY IS NOT WITHIN THE COASTAL AREA.
17 CODE COMPLIANCE	SINGLE FAMILY TOWNHOMES
FRONT SETBACK	10 FT 10 FT
SIDE SETBACK	5 FT (15 FT SUM OF BOTH) 10 FT
REAR SETBACK	30 FT 30 FT
MAXIMUM DENSITY	4 UNITS PER ACRE
MAXIMUM BUILDING HEIGHT	35 FT (2 1/2 STORIES)
18 AREAS	MIN. PROPOSED LOT AREA 2640 SF. MAX. PROPOSED LOT AREA 16,254 SF.
WOODS	EXISTING 11,8050 AC. REMAINING 7,305 AC. (62%)
19 REQUIRED PARKING	REQUIRED PARKING FOR SINGLE FAMILY DWELLINGS SHALL BE 2 PER UNIT. RPC ZONING ALSO REQUIRES .75 ON-STREET OR OVERFLOW PARKING PER UNIT. 110 SINGLE FAMILY DWELLINGS X 2 SPACES PER UNIT = 220 SPACES REQUIRED. 110 SINGLE FAMILY DWELLINGS X 0.75 SPACES PER UNIT OVERFLOW = 82.5 SPACES REQUIRED. GARAGES COUNT AS 1 SPACES AND 20' DRIVEWAYS COUNT AS 2 SPACES = 3 PER UNIT PROVIDED. 110 UNITS X 3 SPACES = 330 SPACES PROVIDED. 25 ADDITIONAL SPACES PROVIDE ON SAWTOOTH CIRCLE.
20 PROPOSED LAND USE AREAS	SECTION I
LOTS	14.313 AC. (9.3%)
RIGHT-OF-WAY	6.853 AC. (4.5%)
PUMP STATION	0.080 AC. (0%)
OPEN SPACE	22.777 AC. (14.9%)
ACTIVE OPEN SPACE	5.304 AC. (23.3%)
PASSIVE OPEN SPACE	11.225 AC. (49.3%)
WETLANDS (PASSIVE)	0.000 AC.
SWM (PASSIVE)	6.248 AC. (27.4%)
RESIDUAL LANDS	108.718 AC. (71.0%)
ROW DEDICATION	0.480 AC. (0.30%)
TOTAL	153.221 A.C.



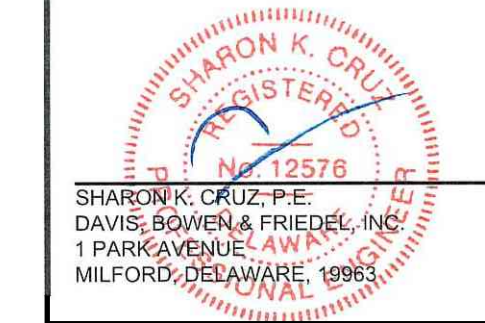
LOCATION MAP
1"=1000'



INDEX OF SHEETS	
C-001	TITLE
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C-003	GENERAL NOTES
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C-102	PUMP STATION ELEVATION PLANS & DETAILS
C-103	PUMP STATION PLAN VIEW
C-104 - C-105	DETAILS
C-401 - C-403	STORMWATER MANAGEMENT DETAILS
C-501 - C-502	PUMP STATION & FORCEMAIN
C-503	FORCEMAIN PROFILES
E-101	PUMP STATION SITE PLAN - ELECTRICAL
E-201	ELECTRICAL DETAILS
E-301	SINGLE LINE DIAGRAM & SCHEDULES
E-401	ELECTRICAL DIAGRAMS, SCHEDULES & DETAILS

ENGINEER'S STATEMENT

I, THE UNDERSIGNED, HEREBY STATE THAT I AM A REGISTERED ENGINEER IN THE STATE OF DELAWARE, THAT THE INFORMATION SHOWN HEREON HAS BEEN PREPARED UNDER MY SUPERVISION AND TO MY BELIEF REPRESENTS GOOD ENGINEERING PRACTICES AS REQUIRED BY THE APPLICABLE LAWS OF THE STATE OF DELAWARE.



OCT 10 2024
DATE

OWNER/DEVELOPER STATEMENT

I, THE UNDERSIGNED, CERTIFY THAT I AM THE OWNER/DEVELOPER OF THE PROPERTY DESCRIBED AND SHOWN ON THIS PLAN, THAT THE PLAN WAS MADE AT MY DIRECTION, AND THAT I ACKNOWLEDGE THE SAME TO BE ACT AND DESIRE THE PLAN TO BE RECORDED TO ORDINANCE.

Date: SEPTEMBER 2024
Scale: AS NOTED
Dwn By: DJR
Proj No.: 0700C004

BOBBY HORSEY
DOUBLE H DEVELOPMENT, LLC.
28107 BEAVER DAM BRANCH ROAD
LAUREL, DE 19956

DATE

OWNER/DEVELOPER STATEMENT

I, THE UNDERSIGNED, CERTIFY THAT I AM THE OWNER/DEVELOPER OF THE PROPERTY DESCRIBED AND SHOWN ON THIS PLAN, THAT THE PLAN WAS MADE AT MY DIRECTION, AND THAT I ACKNOWLEDGE THE SAME TO BE ACT AND DESIRE THE PLAN TO BE RECORDED TO ORDINANCE.

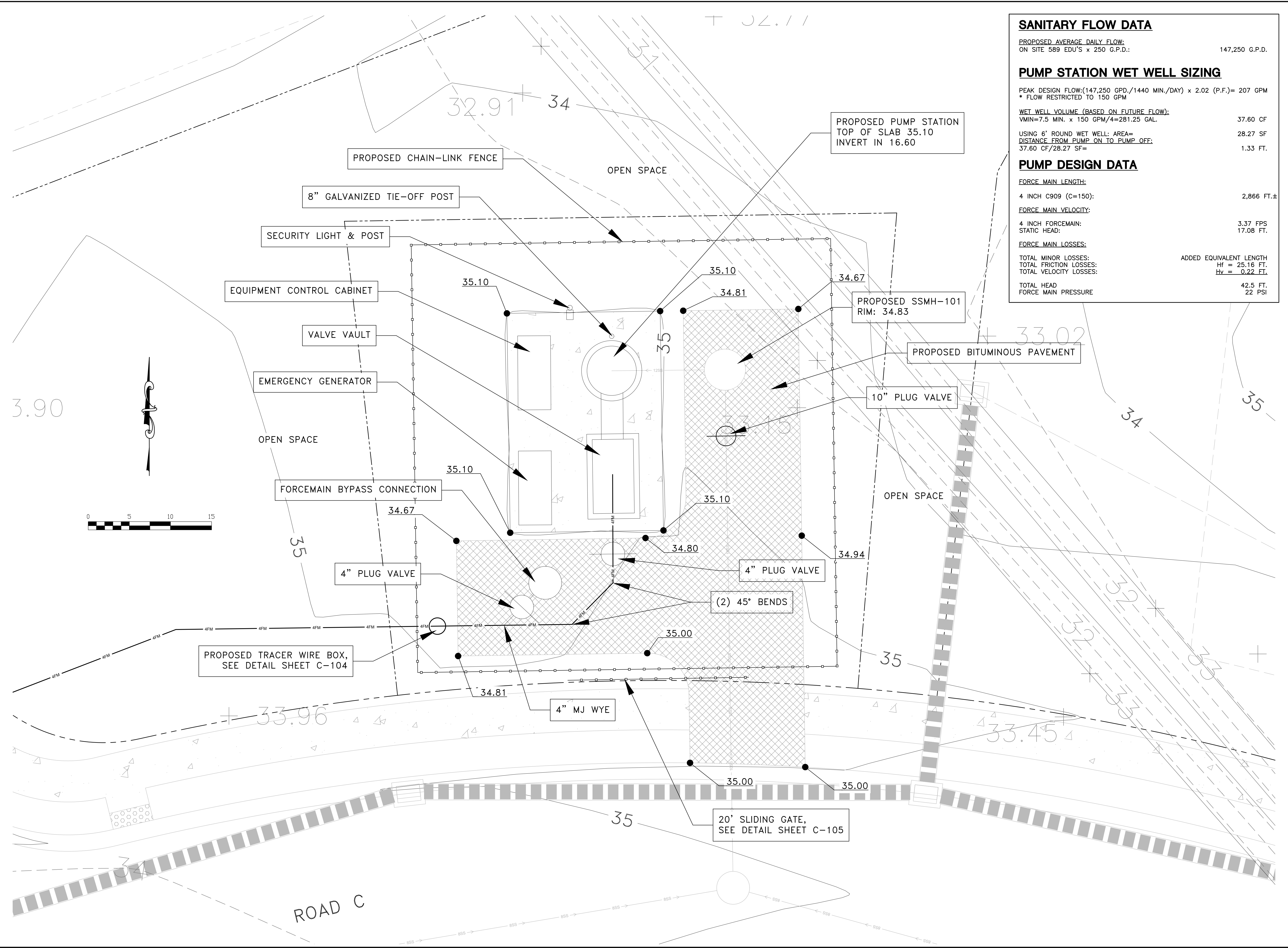
TITLE

Dwg No.:
C-001

APPROVED BY SUSSEX COUNTY ENGINEERING DEPARTMENT
SIGNATURE: _____
DATE: _____

DAVID STEELE
LENNAR MARYLAND/ DELAWARE
7035 ALBERT EINSTEIN DR.
COLUMBIA, MD 21046

DATE



SANITARY FLOW DATA	
PROPOSED AVERAGE DAILY FLOW: ON SITE 589 EDU'S x 250 G.P.D.:	147,250 G.P.D.
PUMP STATION WET WELL SIZING	
PEAK DESIGN FLOW:(147,250 GPD./1440 MIN./DAY) x 2.02 (P.F.)= 207 GPM * FLOW RESTRICTED TO 150 GPM	
WET WELL VOLUME (BASED ON FUTURE FLOW): VMIN=7.5 MIN. x 150 GPM/4=281.25 GAL.	37.60 CF
USING 6' ROUND WET WELL: AREA= DISTANCE FROM PUMP ON TO PUMP OFF: 37.60 CF/28.27 SF=	28.27 SF 1.33 FT.
PUMP DESIGN DATA	
FORCE MAIN LENGTH:	2,866 FT.±
4 INCH C909 (C=150):	
FORCE MAIN VELOCITY:	3.37 FPS
4 INCH FORCEMAIN: STATIC HEAD:	17.08 FT.
FORCE MAIN LOSSES:	
TOTAL MINOR LOSSES:	ADDED EQUIVALENT LENGTH
TOTAL FRICTION LOSSES:	Hf = 25.16 FT.
TOTAL VELOCITY LOSSES:	Hv = 0.22 FT.
TOTAL HEAD FORCE MAIN PRESSURE	42.5 FT. 22 PSI



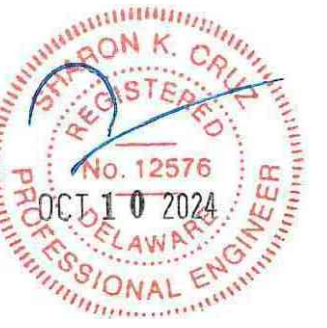
DAVIS BOWEN & FRIEDEL, INC.
ARCHITECTS - ENGINEERS - SURVEYORS
MILFORD, DELAWARE
BALTIMORE, MARYLAND
410.776.1744

**VINES CREEK CROSSING
SEWAGE PUMP STATION**
PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date:	SEPTEMBER 2024
Scale:	1"=5'
Dwn By:	RJL
Proj No.:	0700C004

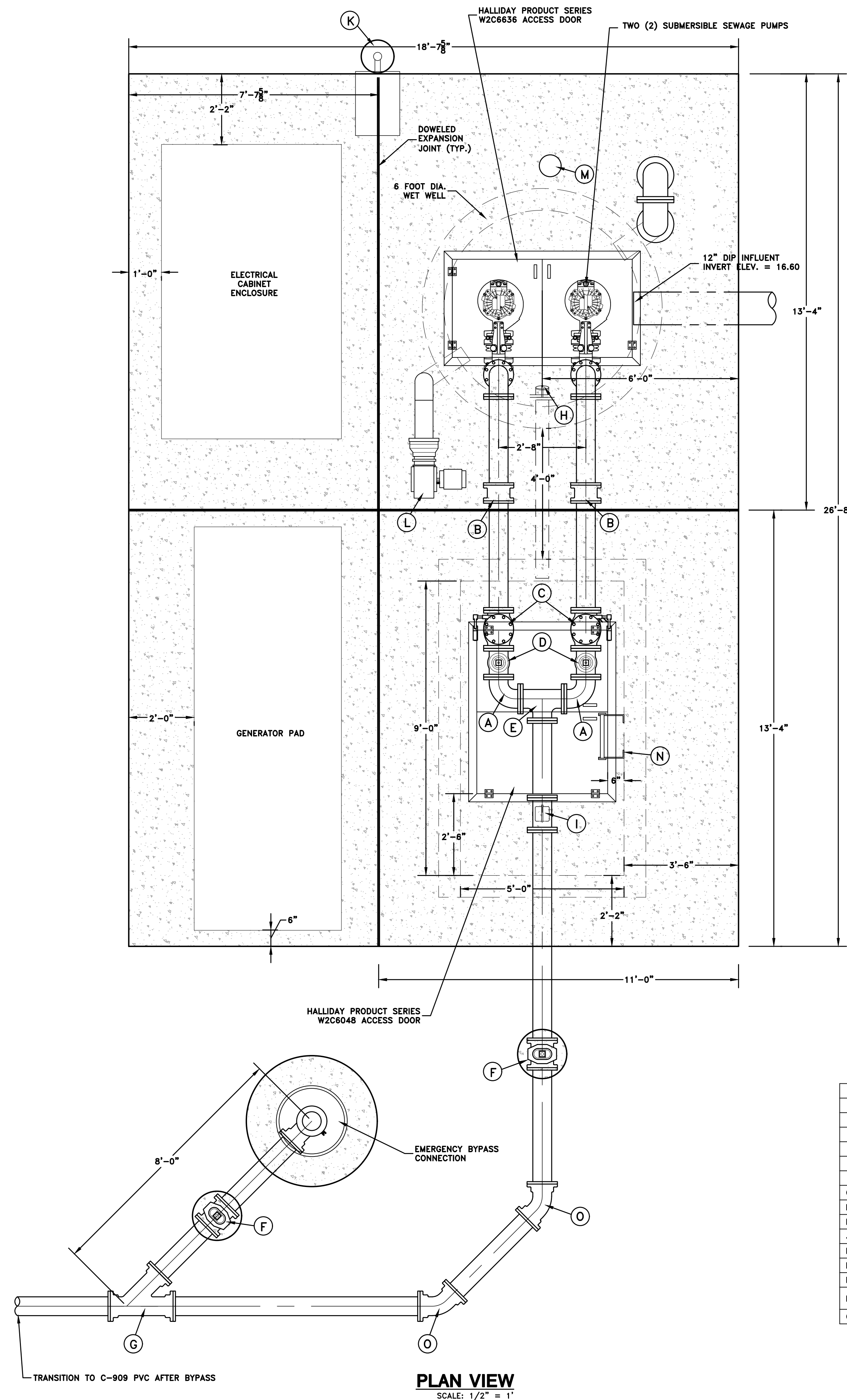
**PUMP STATION
SITE PLAN**

Dwg No.:
C-101



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 410.776.7444

**VINES CREEK CROSSING
 SEWAGE PUMP STATION**
 PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
 TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

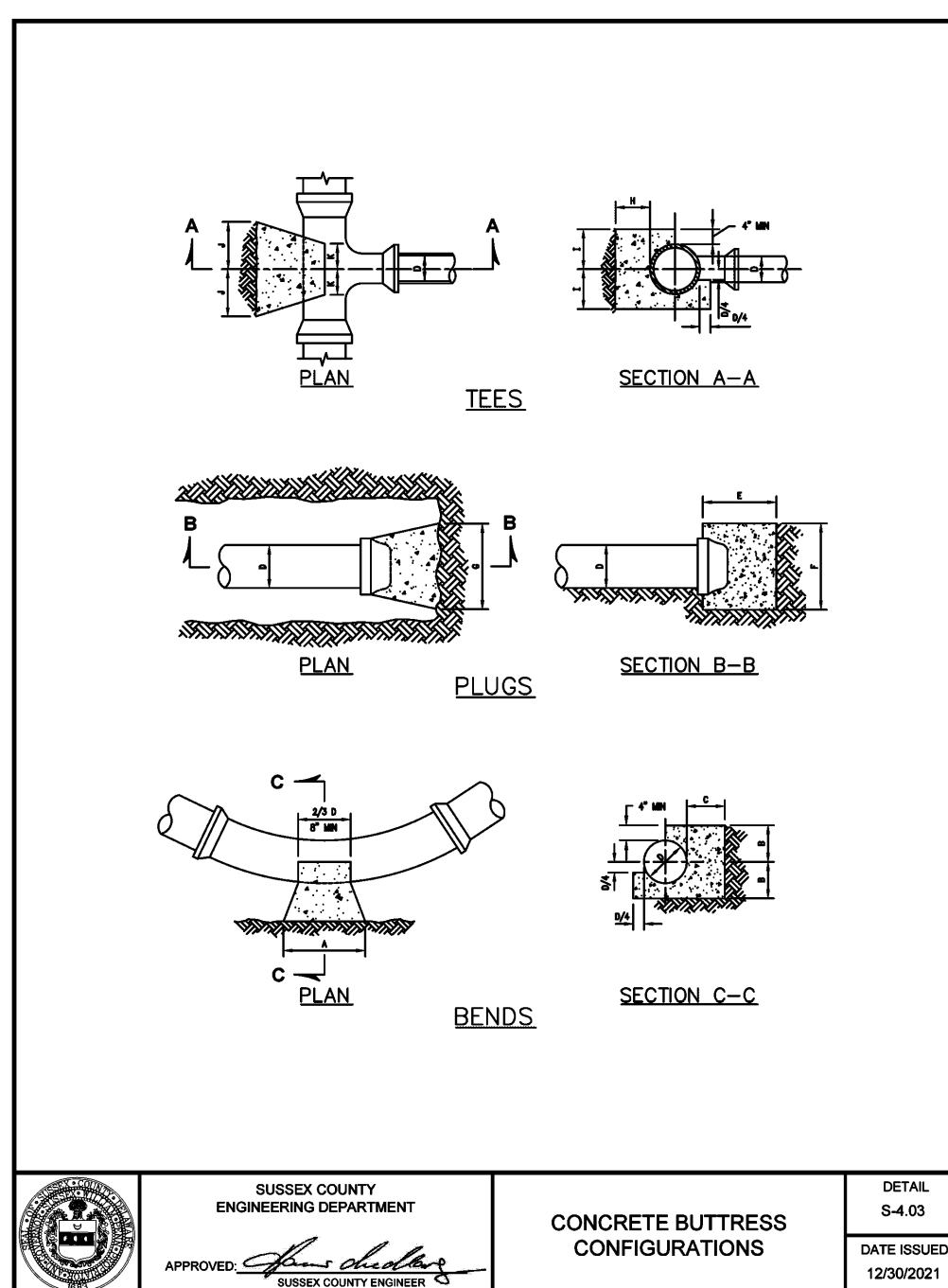
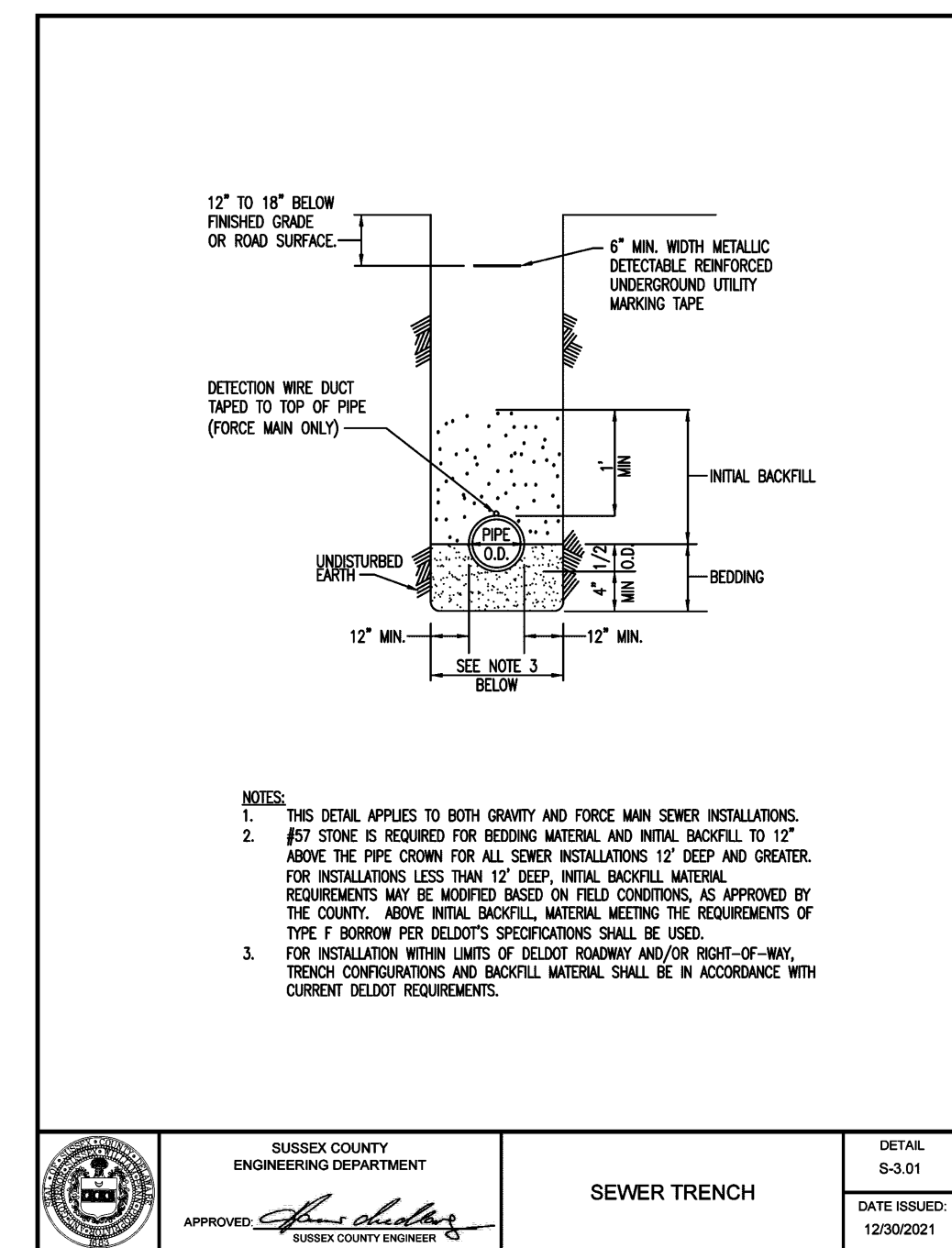
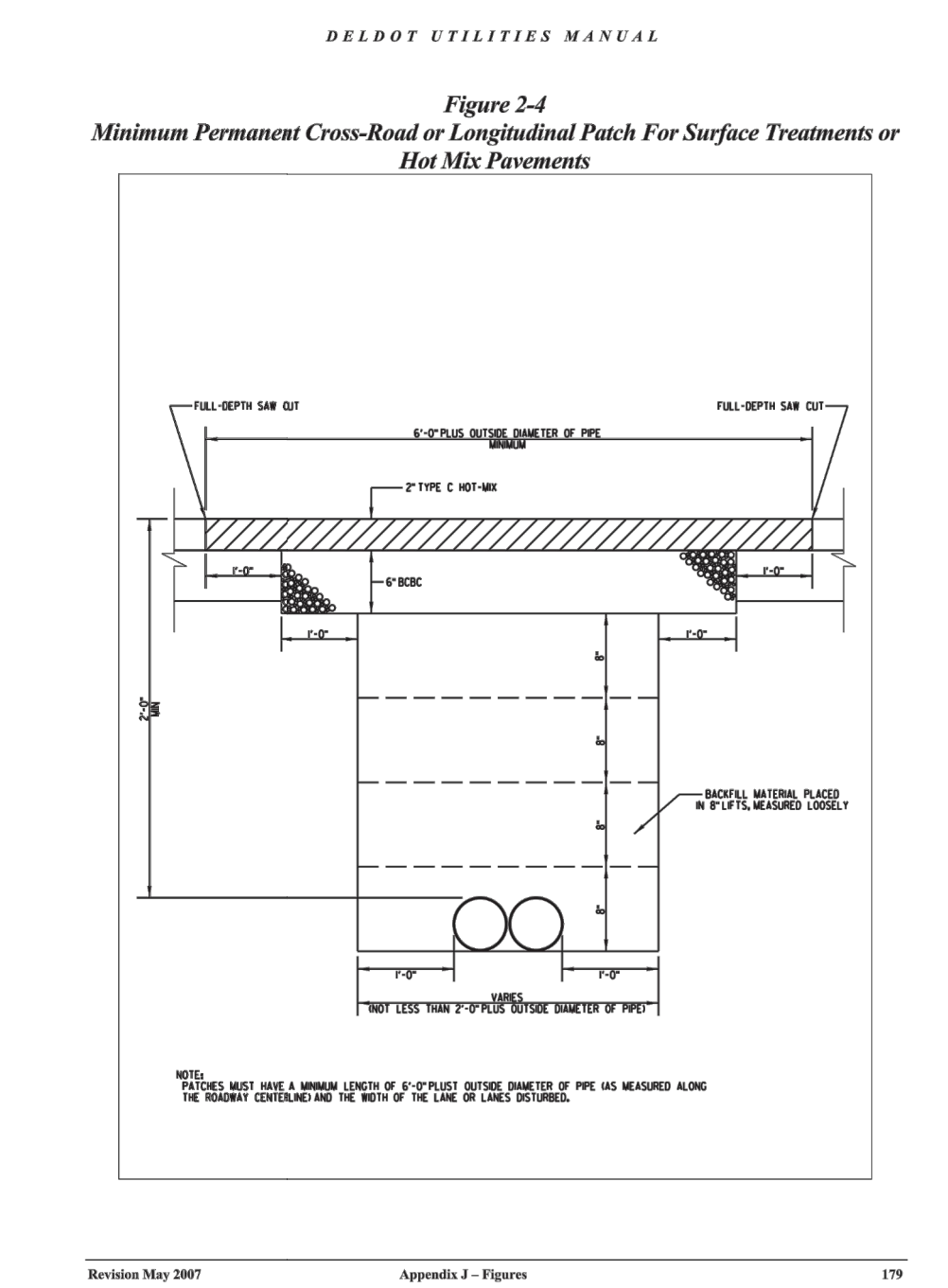
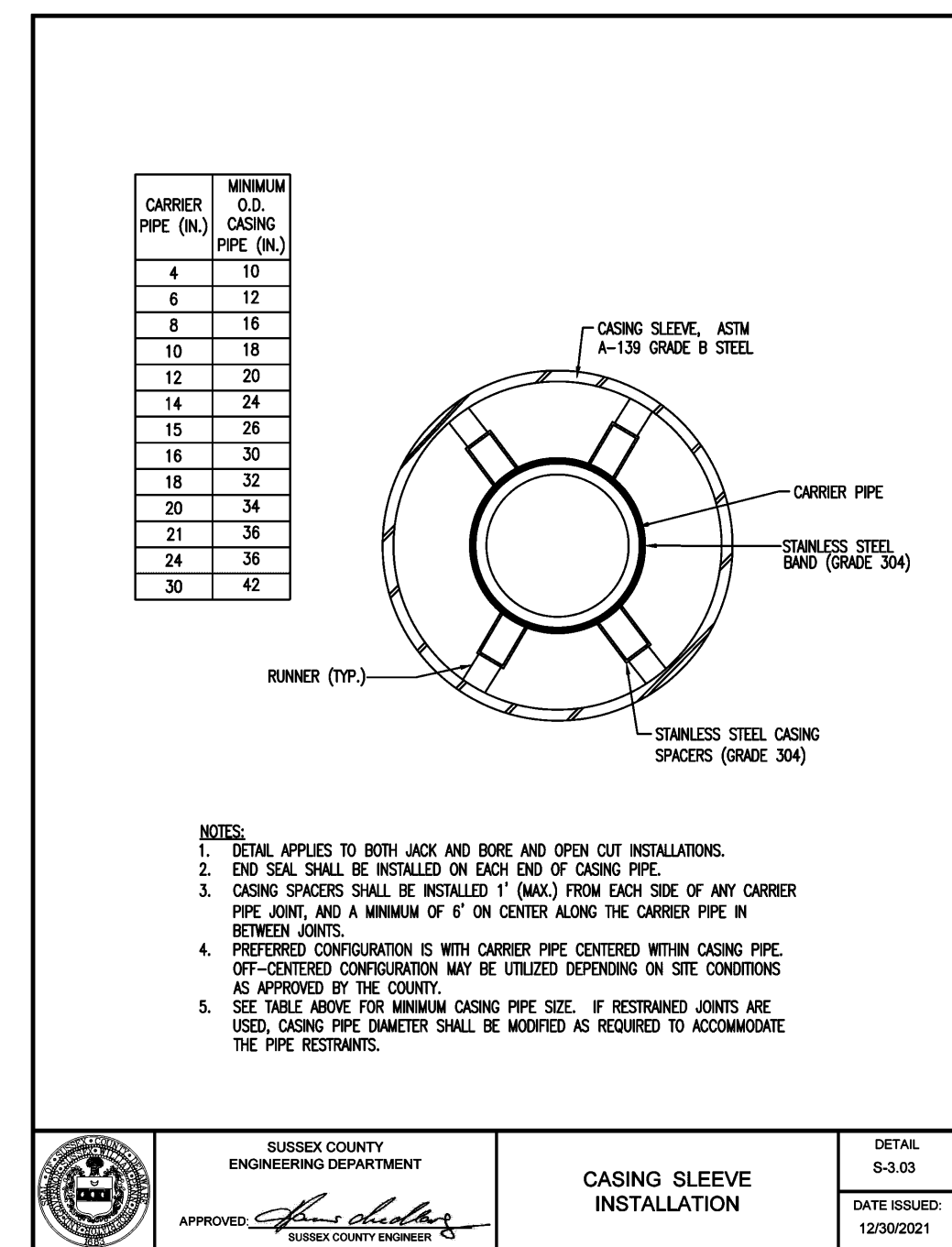
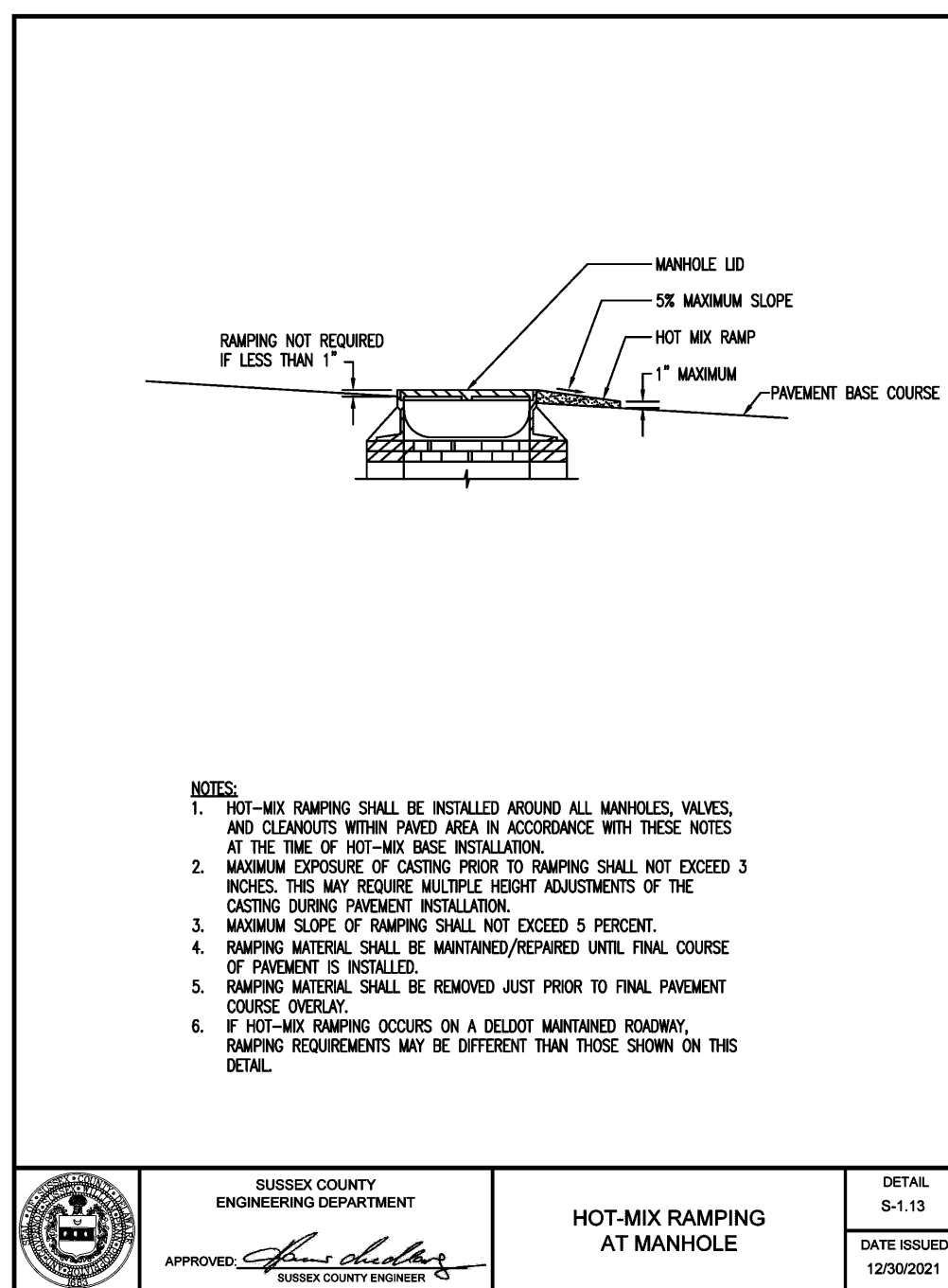
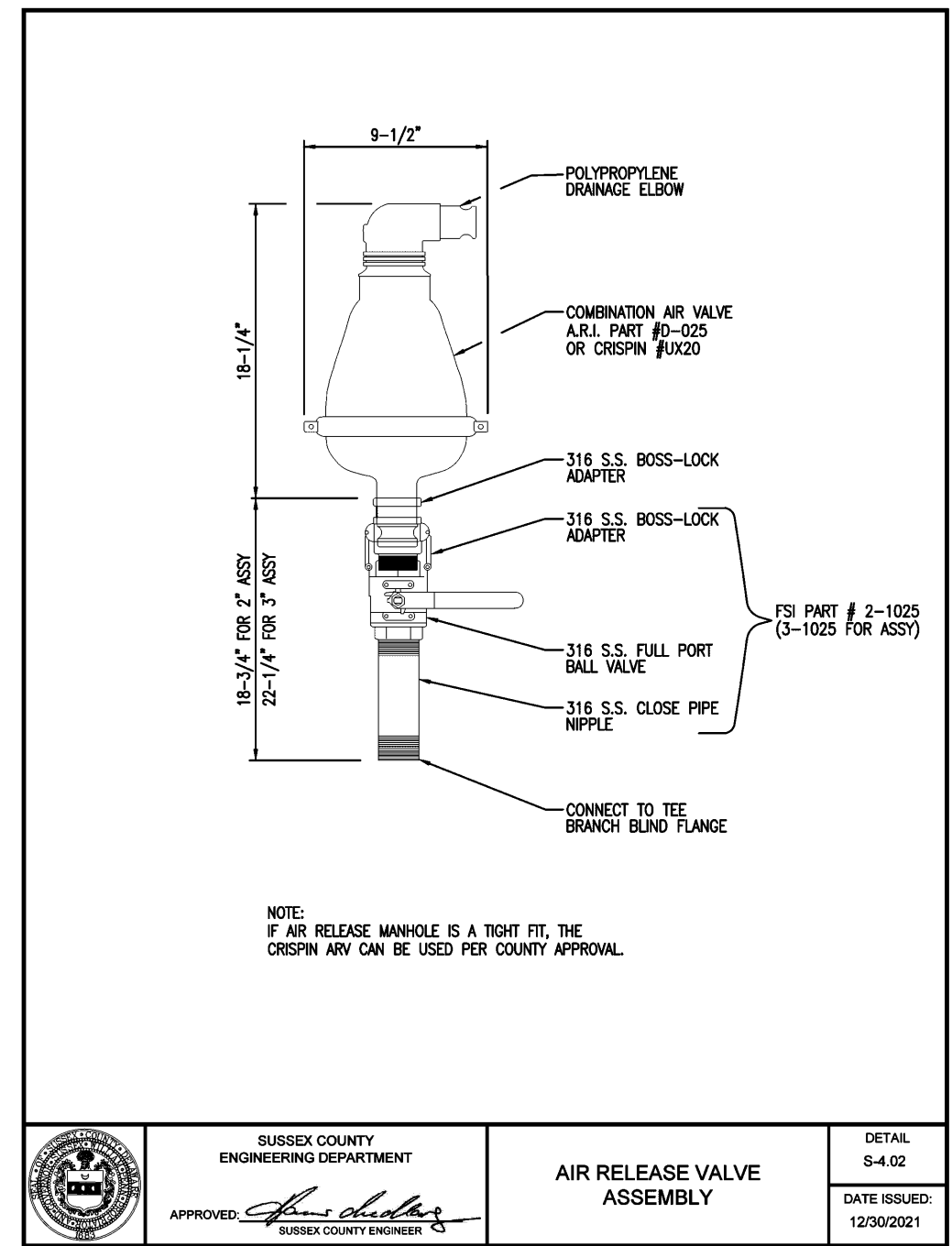
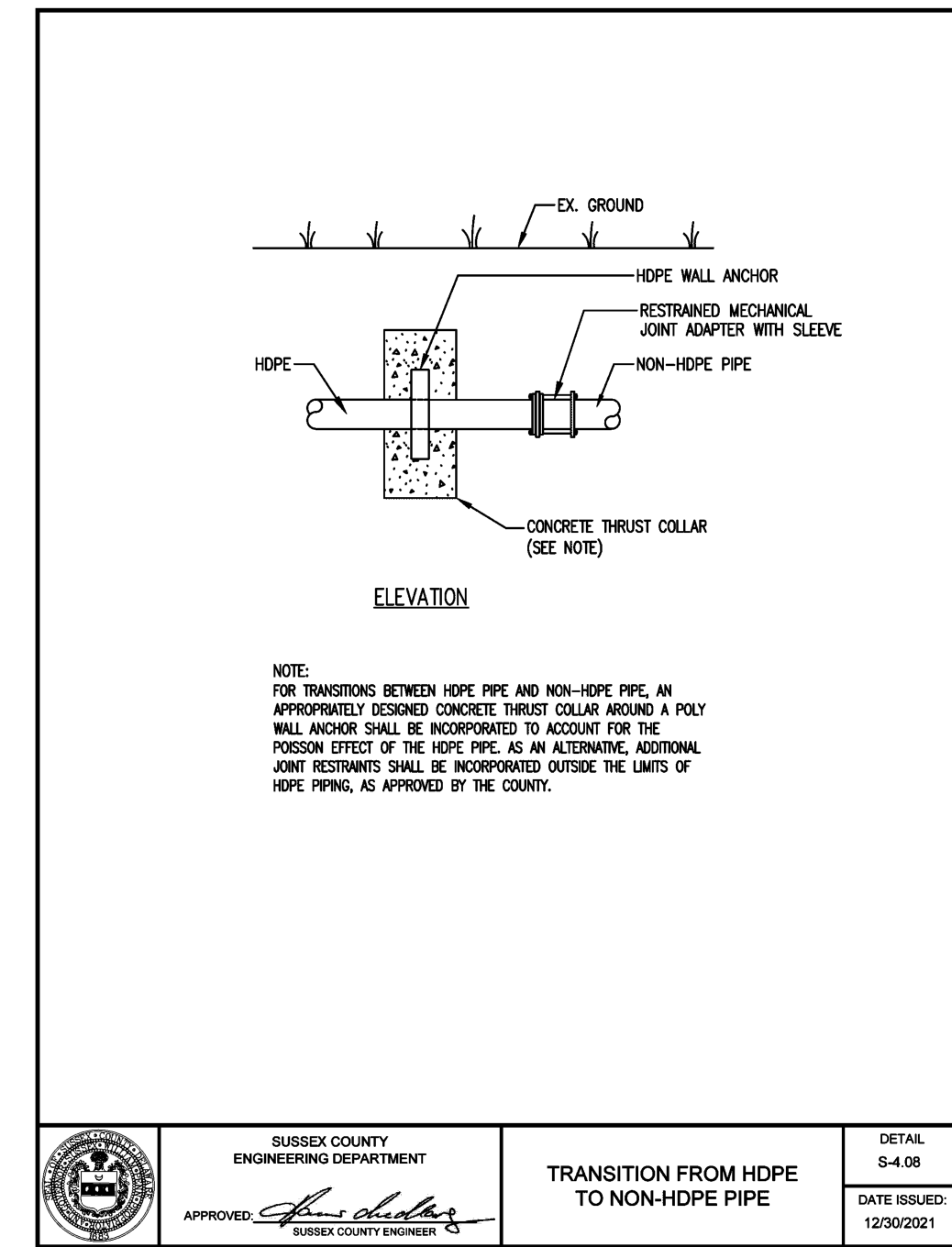
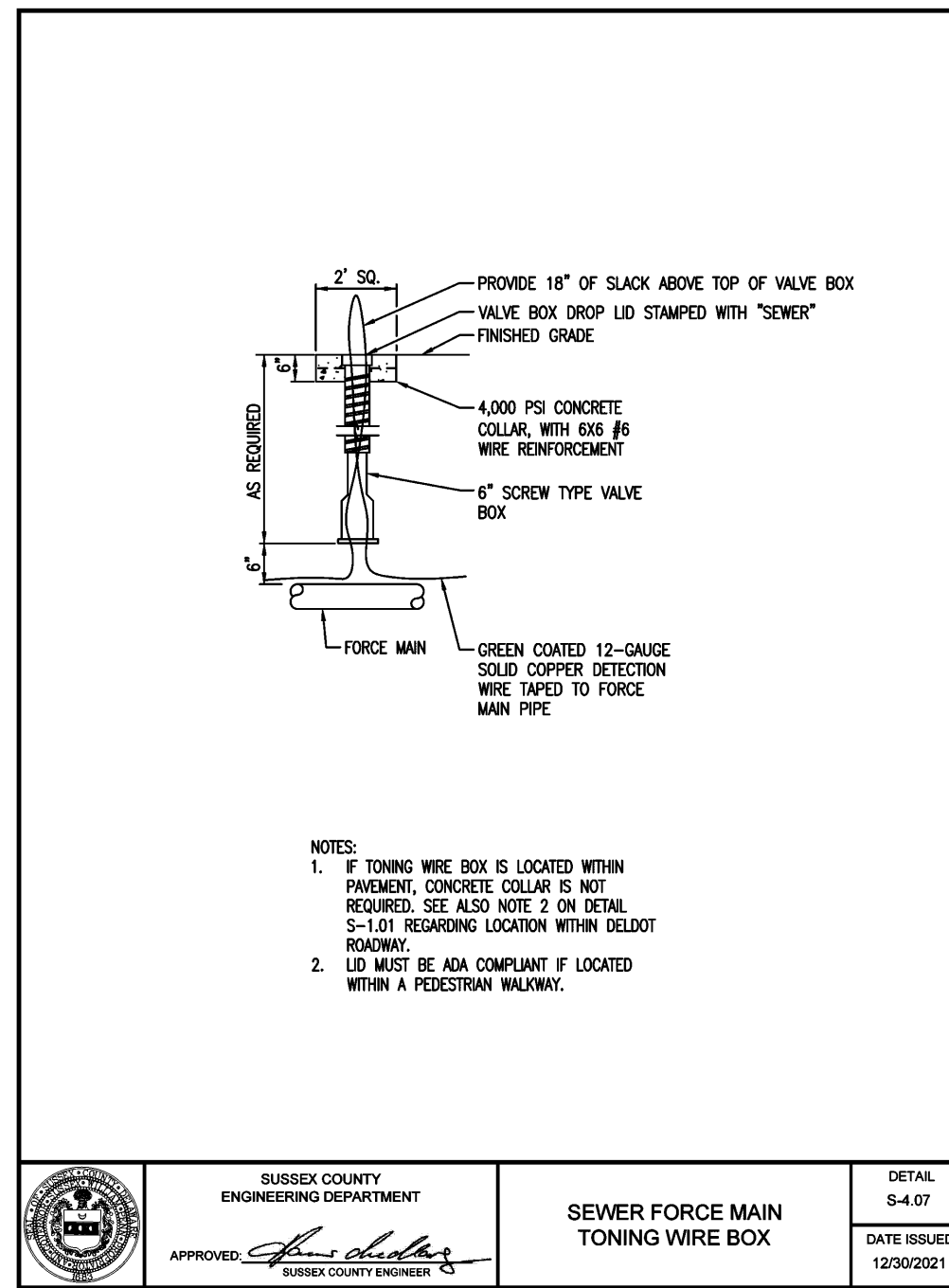
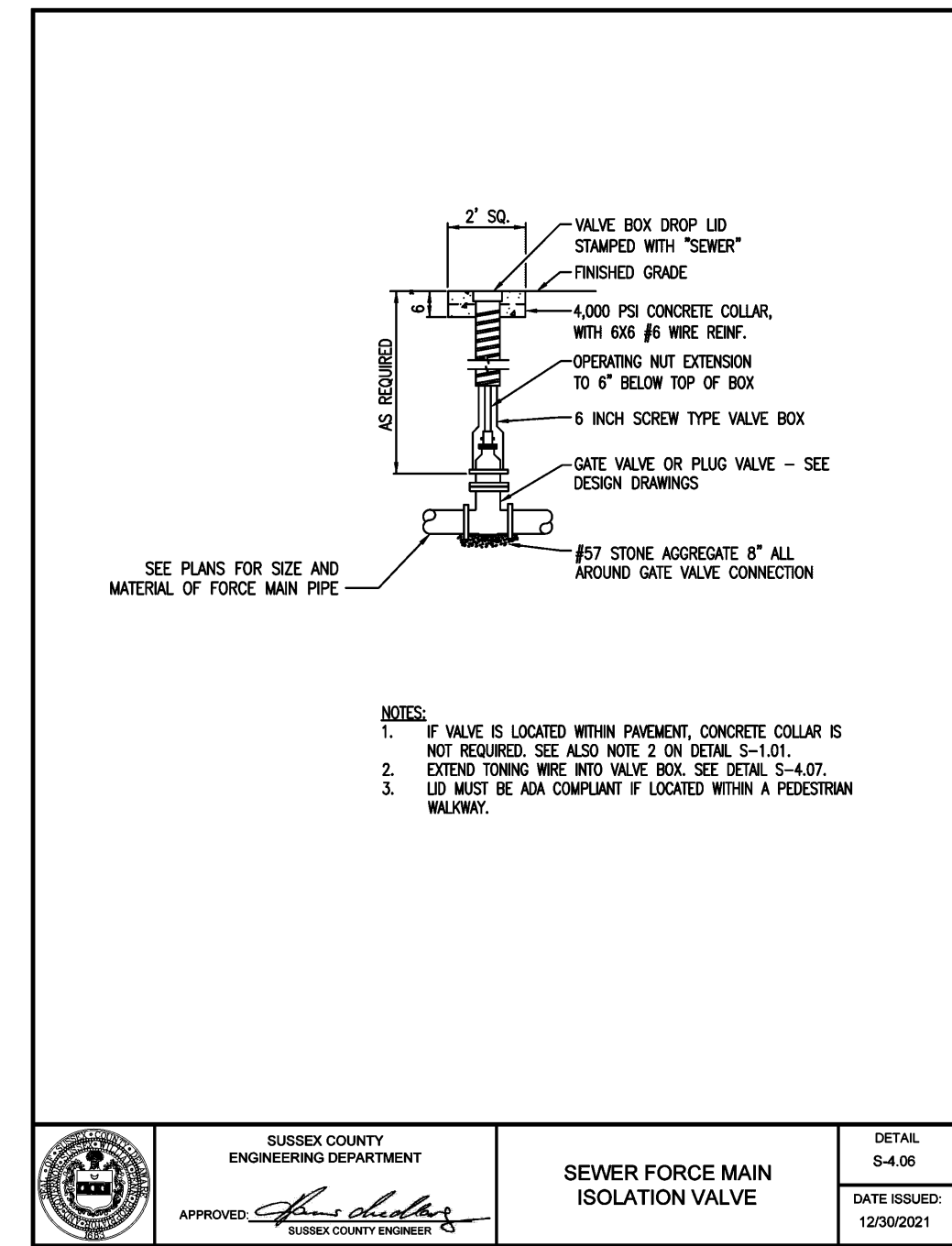
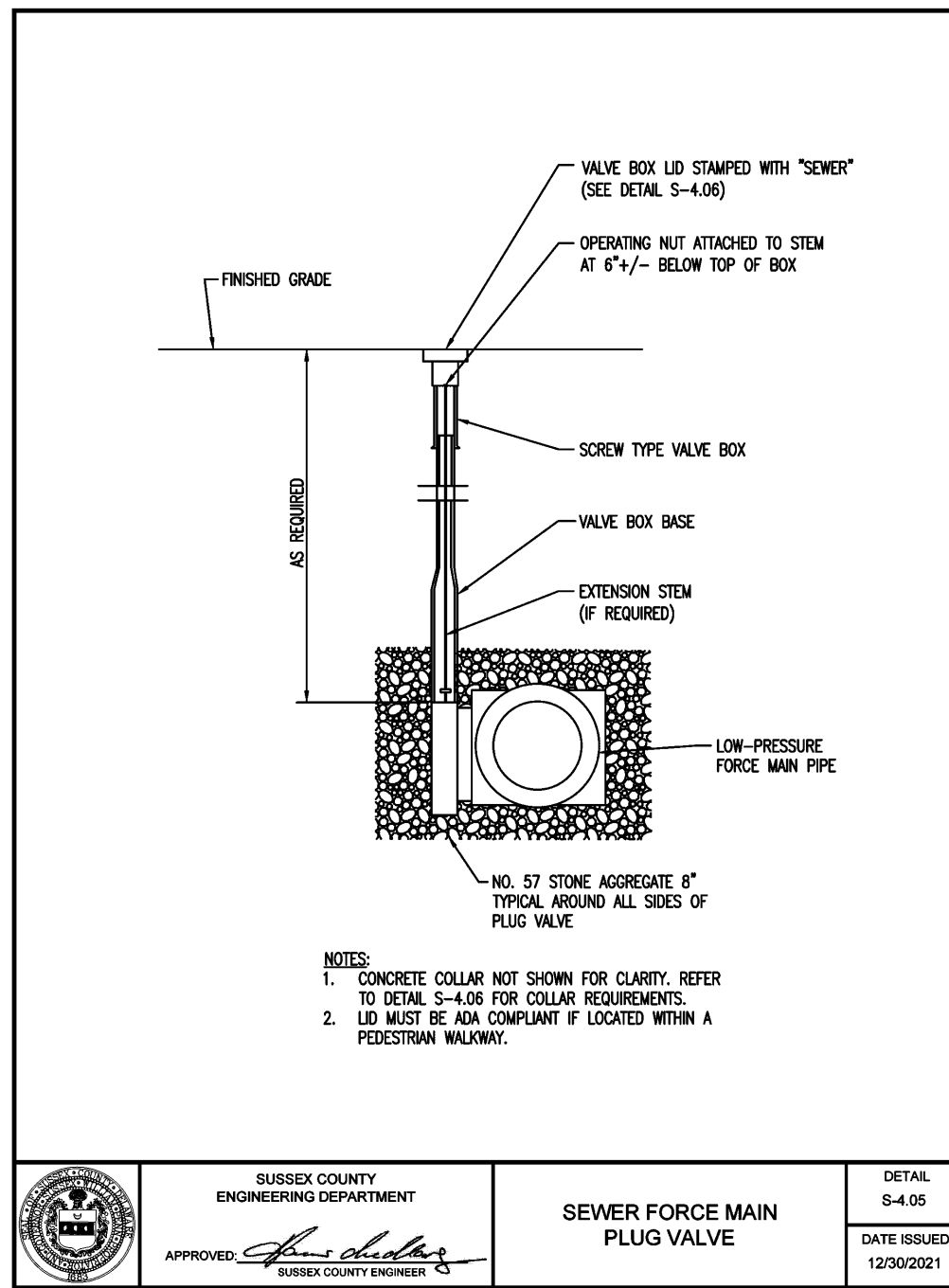


FITTINGS LEGEND	
A	4" FLANGED 90° BEND
B	4" MJ SLEEVE
C	4" GA INDUSTRIES FL SWING CHECK VALVE
D	4" FLANGED ECCENTRIC PLUG VALVE
E	4"x4"x4" FLANGED TEE
F	4" MILLIKEN MJ PLUG VALVE
G	4" MJ WYE FOR BYPASS CONNECTION
H	4" TIDEFLEX CHECK VALVE
I	4" MUELLER ELECTROMAGNETIC FLOW METER
J	NOT USED
K	SECURITY LIGHT & POLE
L	VENTILATION FAN
M	8" GALVANIZED TIE-OFF POST
N	HALLIDAY SERIES L1B ALUM. LADDER. SEE MOUNTING DETAIL ON DWG. C-105
O	4" MJ 45° BEND

Date: SEPTEMBER 2024
 Scale: 1/2" = 1'-0"
 Dwn By: RJL
 Proj No.: 0700C004

**PUMP STATION
 PLAN VIEW**

Dwg No.:
C-103



CONCRETE BUTTRESS DIMENSIONS

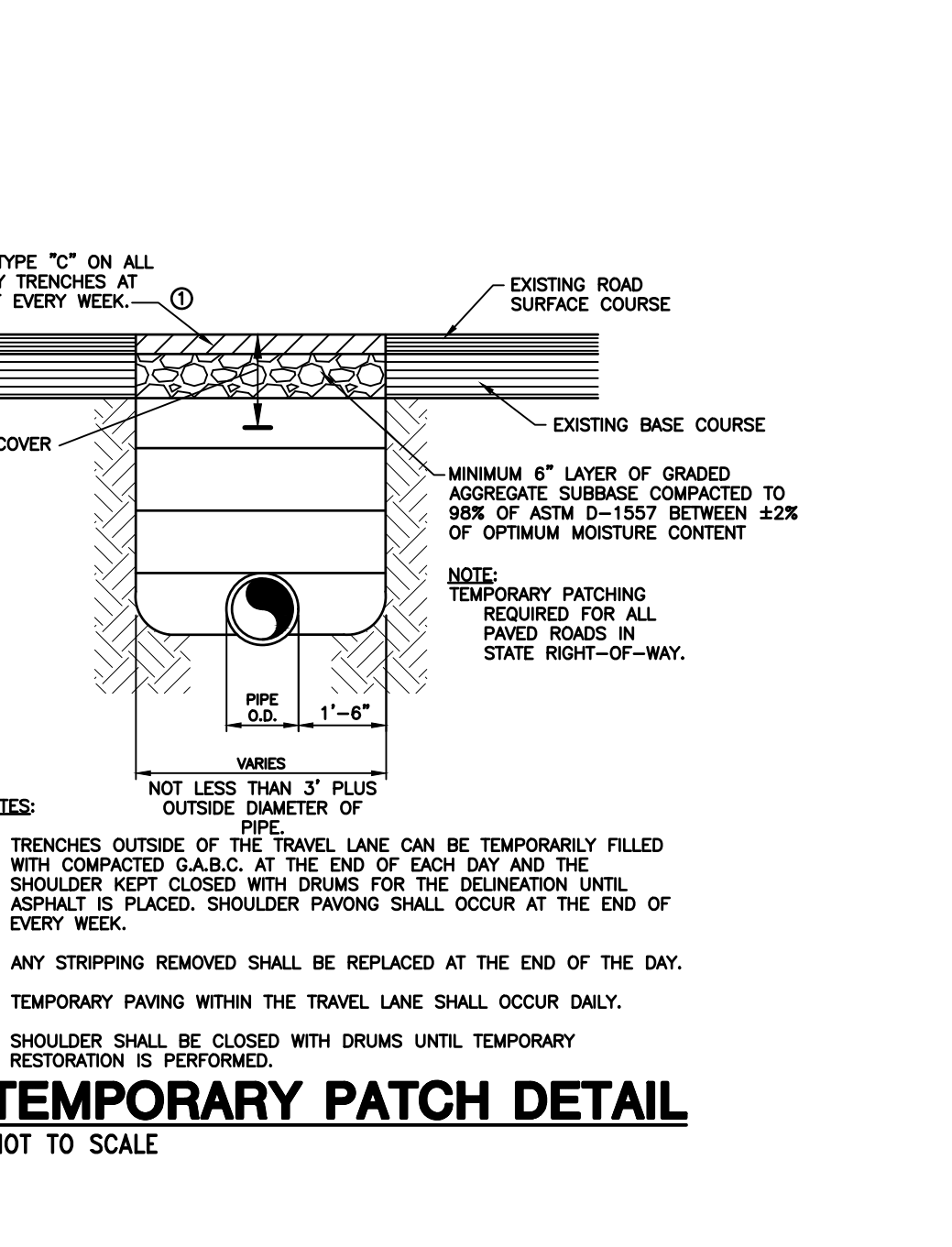
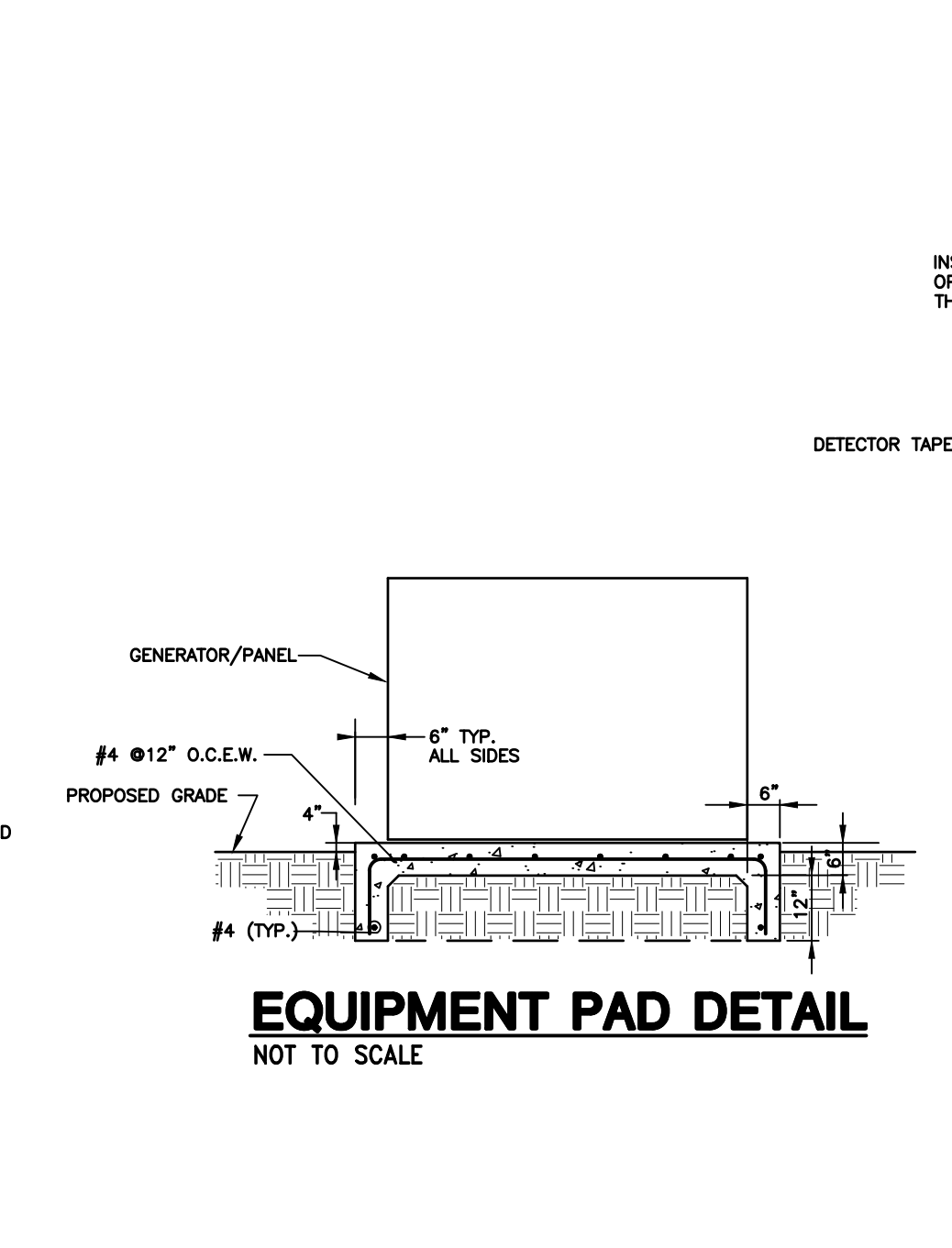
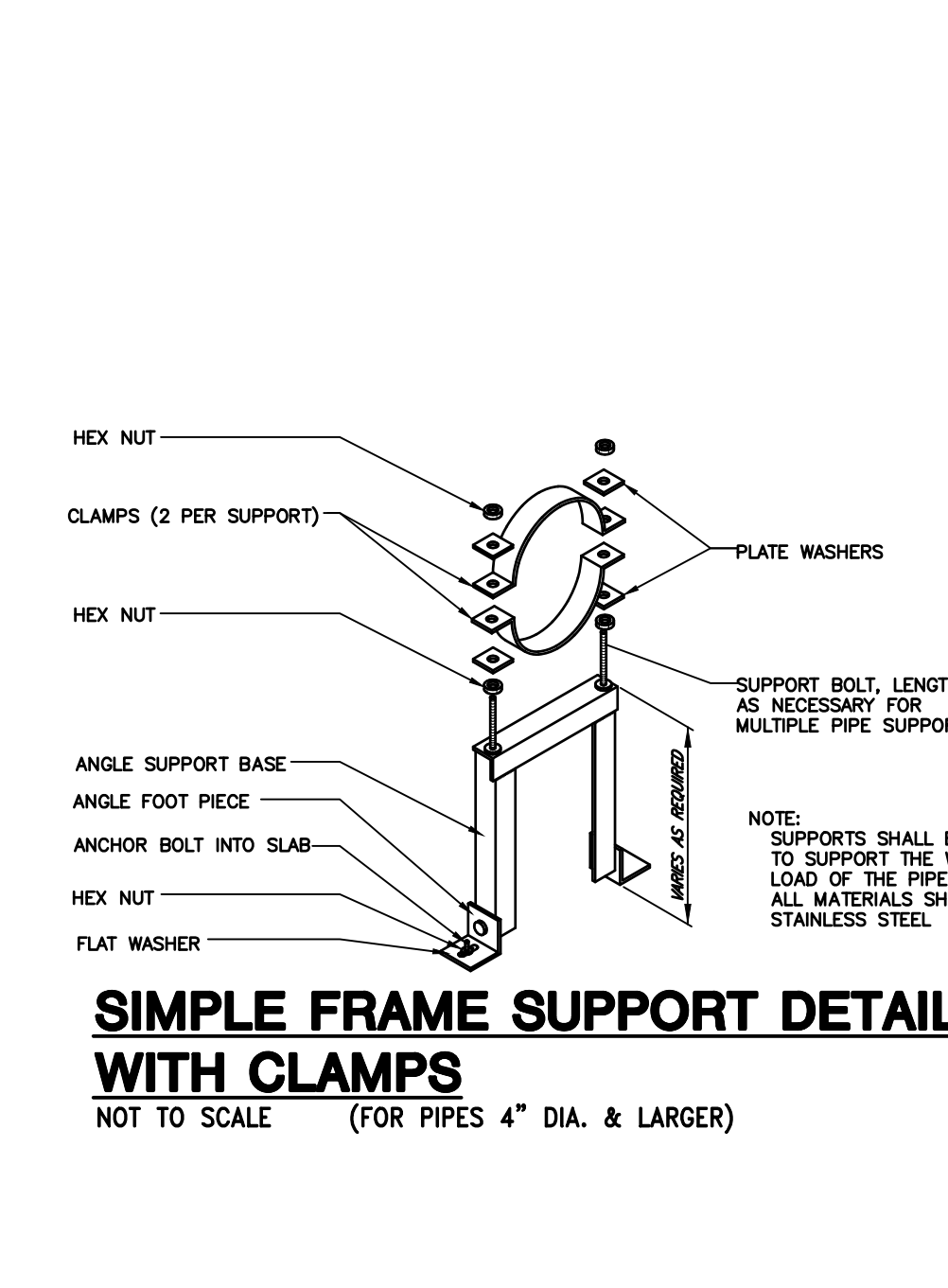
CONFIGURATION	PIPE DIAMETER (D) IN INCHES (I.D.)													
	1.5	2	3	4	6	8	10	14	18	24	30	36	48	60
90°	A	12	15	24	24	30	49	69						
	B	3	3	4	6	6	9	15	18					
	C	12	18	18	22	22	21	24	24					
45°	A	8	8	11	15	15	20	37	51					
	B	2	4	6	7	7	8	16	26					
	C	9	12	12	8	8	9	22	22					
22.5°	A	4	6	8	9	9	12	26	37					
	B	1	3	4	7	7	8	13	19					
	C	6	9	9	8	8	9	12	12					
11.25°	A	3	4	6	6	6	8	19	26					
	B	1	2	3	7	7	8	10	13					
	C	6	9	9	7	7	7	10.5	10.5					
PLUG	E	6	8	9	8	8	8	10.5	10.5					
	F	6	8	9	8	8	8	10.5	10.5					
	G	4	5	7	15	17	23	21	29					
TEE	H	12	18	18	8	8	8	21	21					
	I	4	5	7	9	8	10	21	29					
	J	2	3	4	4	7	7	9	11	15				
K	2	3	4	4	6	6	8	12	14					

NOTE: ALL CONCRETE TO HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI. BUTTRESS DIMENSIONS GIVEN ARE MINIMUM DIMENSIONS BASED UPON 3000 PSI MINIMUM CUL BEARING CAPACITY AND 150 PSI MINIMUM INTERNAL PIPE PRESSURE. PARAMETERS OUTSIDE OF THESE TOLERANCES WILL REQUIRE A SPECIAL BUTTRESS DESIGN APPROVED BY THE COUNTY.

NOTE: ALL CONCRETE SHALL BE POURED AGAINST UNDISTURBED EARTH.

NOTE: TEE DIMENSIONS IN TABLE SHALL BE USED FOR WYES.

DETAIL S-4.04
DATE ISSUED: 12/30/2021



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VINES CREEK CROSSING SEWAGE PUMP STATION
PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date: SEPTEMBER 2024
Scale: AS SHOWN
Dwn By: RJL
Proj No.: 0700C004

DETAILS

Dwg No.: **C-104**



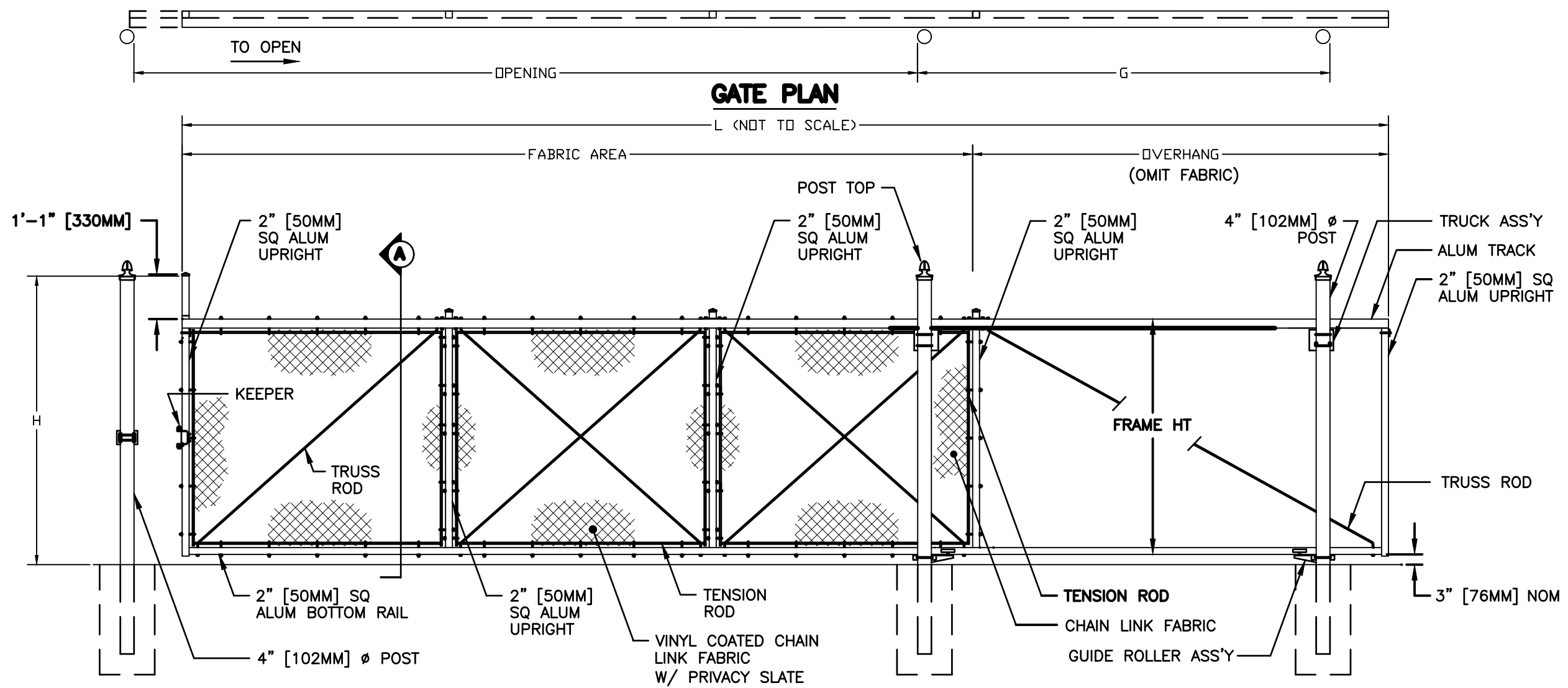
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VINES CREEK CROSSING SEWAGE PUMP STATION
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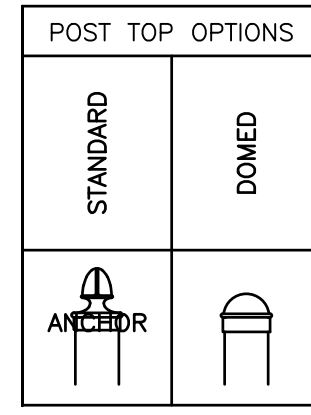
Date:	SEPTEMBER 2024
Scale:	AS SHOWN
Dwn By:	RJL
Proj No.:	0700C004

DETAILS

Dwg No.: **C-105**



GATE ELEVATION - (3) BAYS SHOWN

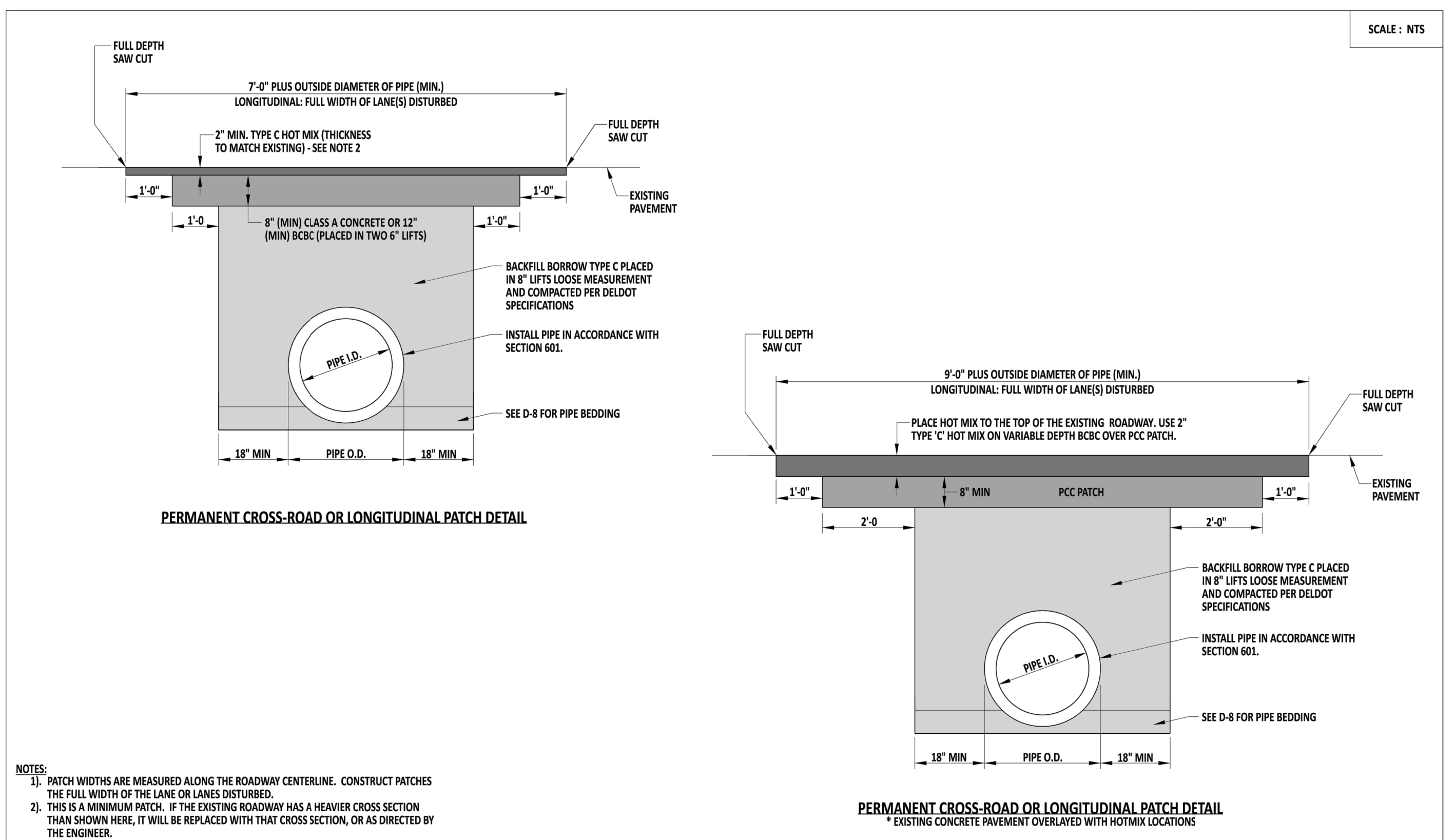


- NOTES:
- METRIC DIMENSIONS ARE NOMINAL EQUIVALENTS TO U.S. DIMENSIONS.
 - SPECIFICATIONS SHOWN CAN BE CHANGED BY THE MANUFACTURER ONLY.
 - FOOTING WIDTH TO BE (4)X POST WIDTH. MIN DEPTH TO BE 36" [914MM].
 - GATES MAY BE MANUALLY OR ELECTRICALLY OPERATED. HARDWARE WILL VARY FOR ELECTRICALLY OPERATED GATES.
 - DWGS FOR DOUBLE OPENING GATES AVAILABLE ON REQUEST.

NOM HEIGHT (H)
6'-0" [1829MM]
7'-0" [2134MM]
8'-0" [2438MM]

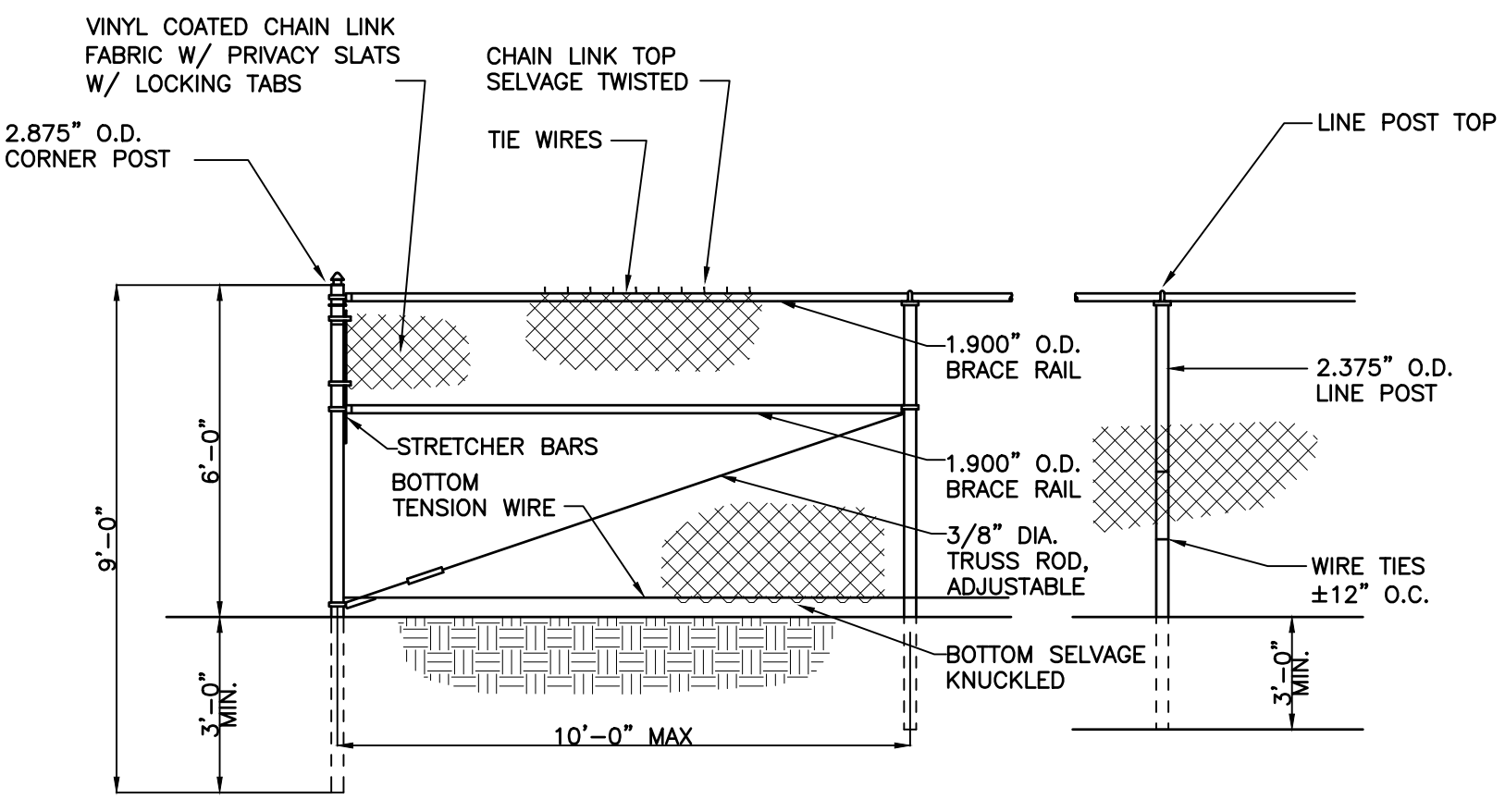
OPENING
6'-0" [1829MM] THROUGH
22'-0" [6706MM]

SLIDING GATE DETAIL
 NOT TO SCALE



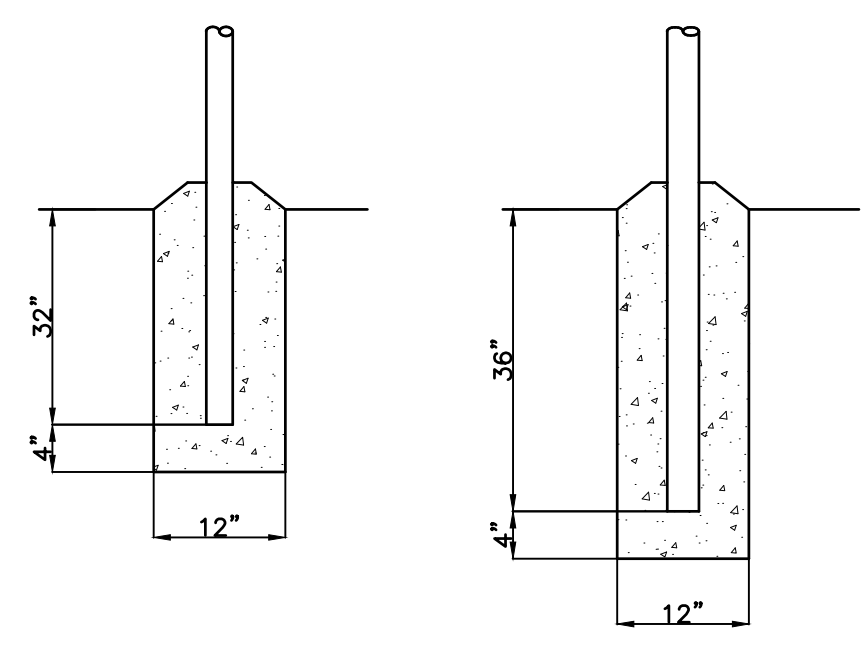
- NOTES:
- PATCH WIDTHS ARE MEASURED ALONG THE ROADWAY CENTERLINE. CONSTRUCT PATCHES THE FULL WIDTH OF THE LANE OR LANES DISTURBED.
 - THIS IS A MINIMUM PATCH. IF THE EXISTING ROADWAY HAS A HEAVIER CROSS SECTION THAN SHOWN HERE, IT WILL BE REPLACED WITH THAT CROSS SECTION, OR AS DIRECTED BY THE ENGINEER.

DeIDOT	RECOMMENDED	PERMANENT CROSS-ROAD PATCH OVER PIPE TRENCH	REVIEWED	22 December 2023
	DATE: 12/22/2023	STANDARD NO. P-4 (2024)	APPROVED	01/11/2024
		SHT. 1 OF 1	DATE: 22-DEC-2023	



ELEVATION (VIEWED FROM INSIDE FENCE)

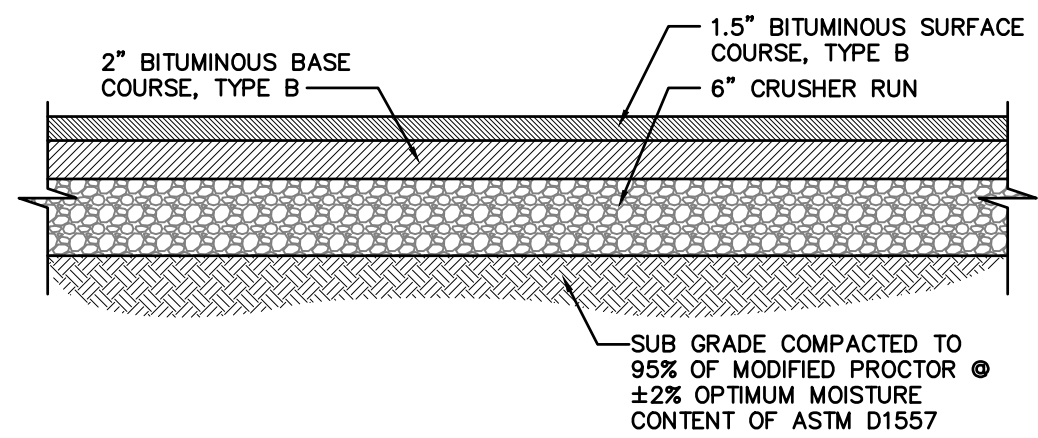
CHAIN LINK FENCE DETAIL
 NOT TO SCALE



LINE POST CORNER AND END POST

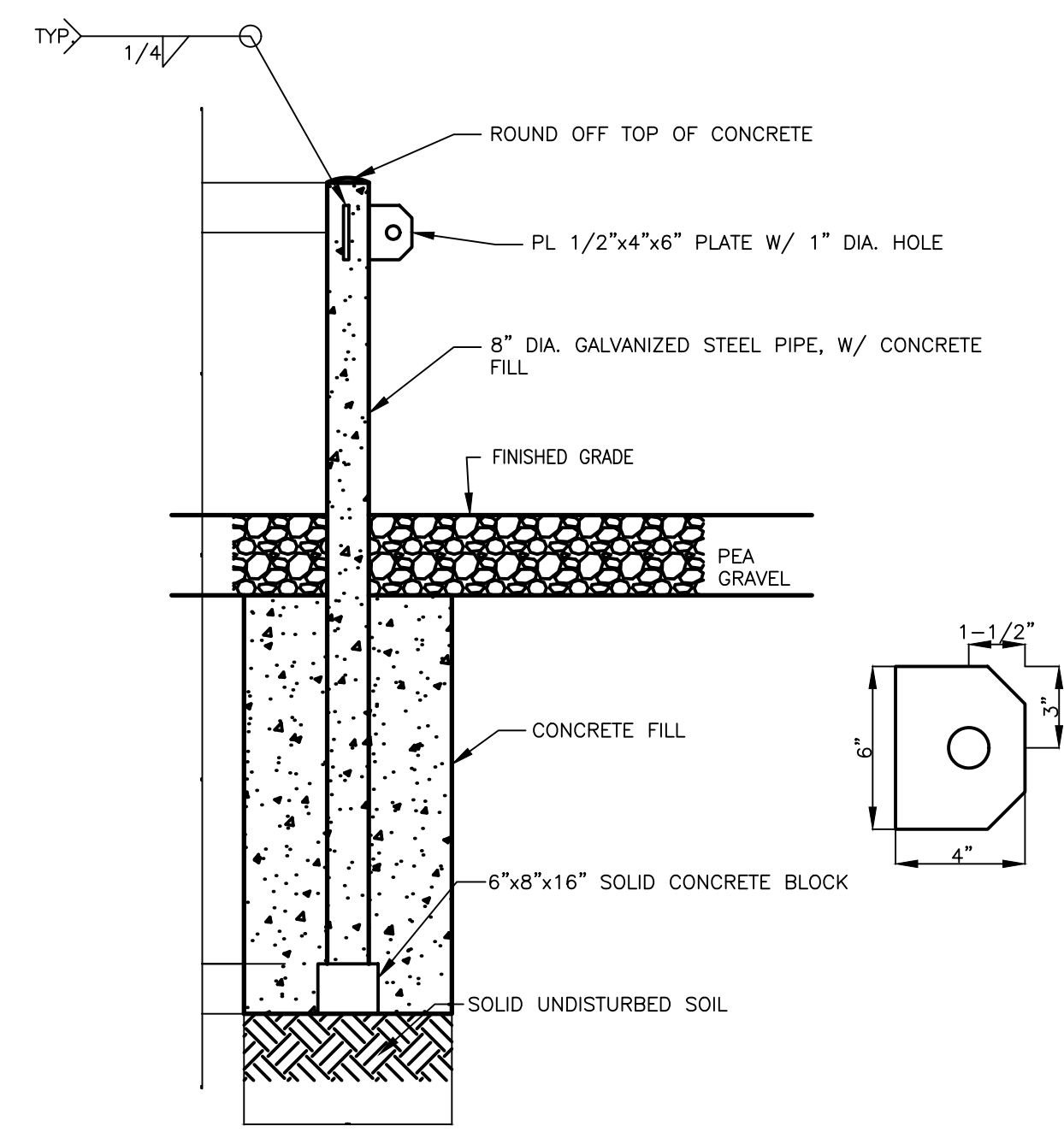
NOTE: 3,000 PSI CONCRETE FOOTINGS.

POST ANCHORAGE

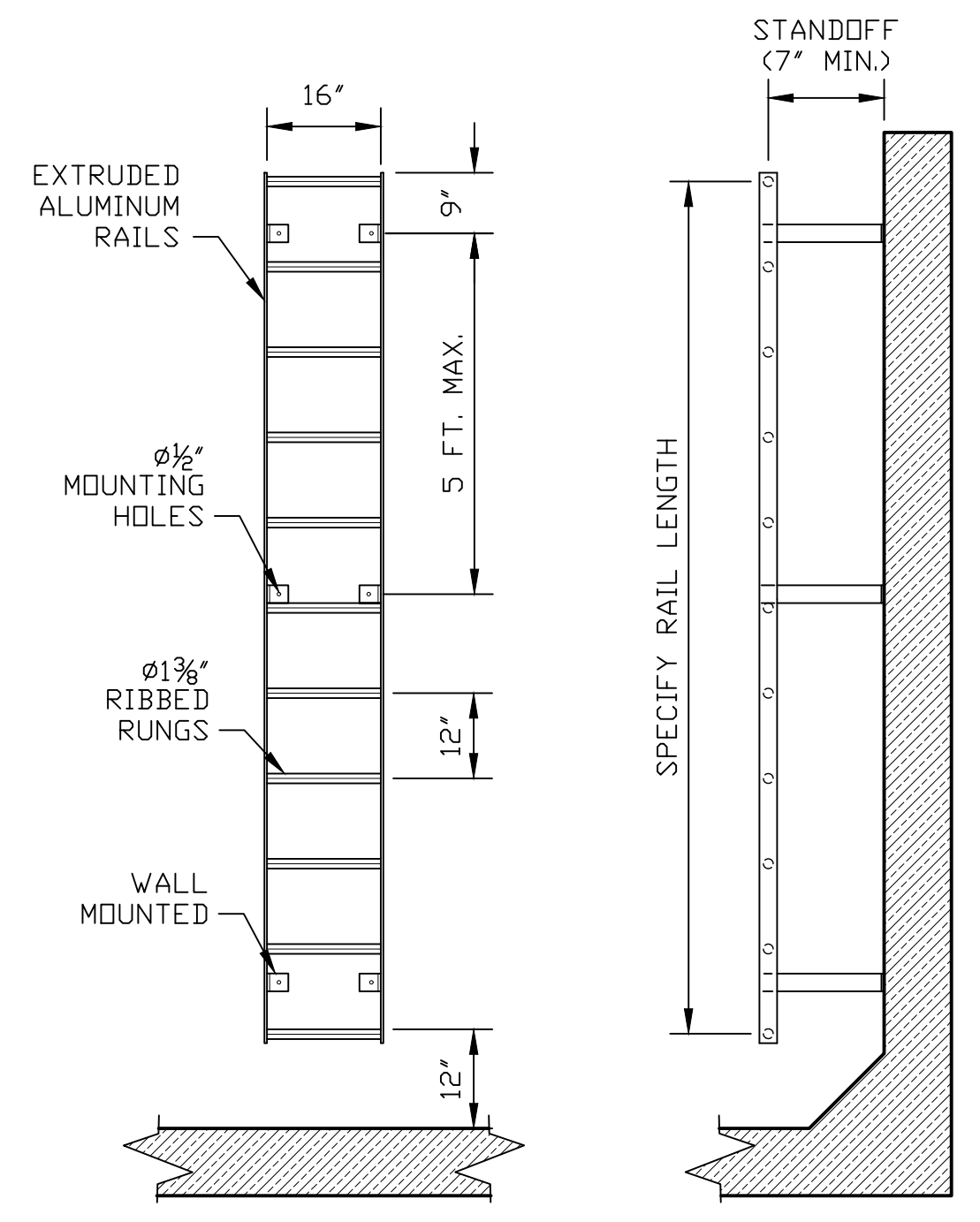


- NOTES:
- ALL THICKNESS ARE MINIMUM, COMPACTED, IN PLACE
 - SLOPE PAVING FOR POSITIVE DRAINAGE

PUMP STATION PAVEMENT DETAIL



8" GALVANIZED TIE-OFF POST FOR FALL PROTECTION DETAIL
 NOT TO SCALE



WALL MOUNTED LADDER
 NO SCALE

- STANDARD FEATURES:
- ALL ALUMINUM WELDED CONSTRUCTION
 - SLIP RESISTANT RIBBED RUNG DESIGN
 - CUSTOM FIT WALL MOUNTED STANDOFFS
 - WALL-ONLY MOUNTING
 - ROUND WALL MOUNTING
 - WELDED STAINLESS STEEL CONSTRUCTION

P:\Honey\0700C004 Vines Creek Crossing\Design\0700C004-PUMP STATION - FORCEMAIN.dwg Sep 23, 2024, 10:01 am loc

Standard Detail & Specifications

Silt Fence

Section

Min. 40' stake length
Reinforcing strip over geosynthetic fabric (typ. each stake)
Min. 24" stake length above ground
Flow
Embed fabric min. 8" vertically into ground
Min. 10" stake length driven into ground

Plan

Ends placed up slope to contain runoff
6' Max.
2" x 2" wooden post (typ.)
DATA
Max. controlled slope

Source: Adapted from MD Stds. & Specs. for ESC
Symbol: SF
Detail No. DE-ESC-3.1.2.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Silt Fence

Construction Detail

Posts
Staple
Method for joining continuous sections

Section

Construction Notes:

- Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
- When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
- Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

- Stakes: Steel (either T or U) or 2" x 2" wood
- Geosynthetic Fabric: Type GD-I
- Reinforcing strip: Wooden lath or plastic strip

Source: Adapted from MD Stds. & Specs. for ESC
Symbol: SF
Detail No. DE-ESC-3.1.2.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Culvert Inlet Protection

Plan View - Compost Log Option

Top of Slope (Typ.)
Culvert
6" min.
Flow
2" x 2" x 20' hardwood stake placed 5' on center
18" compost log (see Compost Filter Log specifications for additional information). Stone option may also be used, reference section below.

Section View - Stone Option

Flow
12" 12"
12" 12"
DE No. 3 stone
Type GD-II geotextile fabric
K-4 Riprap

Source: Adapted from VA ESC Handbook & Filtrex™ International
Symbol: CIP
Detail No. DE-ESC-3.1.6 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Culvert Inlet Protection

Construction Notes

- Compost logs shall be designed and installed in accordance with the Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- If compost logs can not be installed properly or flow conditions exceed the design capabilities of the compost logs, the stone option shall be employed. Additional filtration may be provided by using a Type GD-II geotextile incorporated into the design as an option.
- Placement of the compost log or stone barrier should be in a "horseshoe" shape and provide a minimum of 6 feet of clearance from the culvert inlet.

Materials

- Stakes: 2" x 2" x 20' hardwood.
- Compost media: See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- Filter sock: See requirements in Standard Detail and Specifications for Compost Logs (DE-ES-3.1.7).
- Geotextile: Type GD-II for stone/riprap option.
- Stone: DE No. 3 for stone/riprap option.
- Riprap: R-6 for stone/riprap option.

Source: Adapted from VA ESC Handbook & Filtrex™ International
Symbol: CIP
Detail No. DE-ESC-3.1.6 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Inlet Protection - Type 1

Plan

Grate
5% Slope or flatter

Section A-A

Attach GD-II geotextile fabric securely to 2"x4" wood frame provide overlap at least section
Top frame required
Rising height
2"x4" wood frame wire mesh backing, all 4 sides
12" Min., 18" Max.
36" Max.
12" Min.
Inlet
NOTE: Pre-manufactured products installed in accordance with manufacturer's recommendations may be used as an equivalent substitute with Departmental approval.

Source: Adapted from Erosion Draw Manual J. McCullah & Assoc.
Symbol: IP-1
Detail No. DE-ESC-3.1.5.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Inlet Protection - Type 1

Construction Notes:

- Excavate completely around inlet to a depth of 18" below grade elevation.
- Drive 2" x 4" post 1 into ground at four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2" x 4" frame using overlap joint shown. Top of frame (weir) must be 6" below edge of roadway adjacent to inlet.
- Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
- Stretch geotextile fabric tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet grade elevation. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
- Backfill around inlet in compacted 6" layers until at least 12" of geotextile fabric is buried.
- If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weir).
- This structure must be inspected frequently and the filter fabric replaced when clogged.

Materials:

- Wooden frame is to be constructed of 2" x 4" construction grade lumber.
- Wire mesh must be of sufficient strength to support filter fabric with water fully impounded against it.
- Geotextile fabric: Type GD-II

Source: Adapted from Erosion Draw Manual J. McCullah & Assoc.
Symbol: IP-1
Detail No. DE-ESC-3.1.5.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Inlet Protection - Type 2

Bag Detail

Dump straps, 2 ea.
Expansion restraints (1/4" nylon rope w/2" flat washers)
Dump strap
1" rebar for bag removal from inlet
Dump strap
GD-III geotextile inlet insert

Perspective

NOTE: Pre-manufactured products installed in accordance with manufacturer's recommendations may be used as an equivalent substitute with Departmental approval.

Source: Adapted from ACF Products, Inc.
Symbol: IP-2
Detail No. DE-ESC-3.1.5.2 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Inlet Protection - Type 2

Notes:

- This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
- It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
- For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbent pillow or shall be made completely from an oil absorbent material with a woven pillow.

Materials:

The geotextile inlet insert shall meet or exceed the specifications of Type GD-III geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source: Adapted from ACF Products, Inc.
Symbol: IP-2
Detail No. DE-ESC-3.1.5.2 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Sensitive Area Protection

Location of Sensitive Area Protection

Drip line
Protective device
Limit of disturbance
Proposed grading
15' min. setback applies to all sensitive areas covered by this specification.

Methods of Sensitive Area Protection

Drip line
Snow fence
Board fence
Cord fence
Plastic fence

Source: Adapted from VA ESC Handbook
Symbol: SAP
Detail No. DE-ESC-3.7.2 Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications

Sensitive Area Protection

Construction Notes:

Fencing shall be installed at the extents of all sensitive areas. For trees, the fencing shall be installed outside the drip line (mature canopy) and at no time within 5 feet of the trunk. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained. If silt fence is to be used for demarcation purposes, appropriate signage shall be provided a minimum of every 20 feet denoting the area as a sensitive area protection zone.

Materials:

- Snow Fence - Standard 40-inch high snow fence shall be placed at the limits of clearing or construction on standard steel posts set 6 feet apart.
- Board Fence - Board fencing consisting of 4-inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. For tree protection, if it is not practical to erect a fence at the drip line, construct a triangular fence nearer the trunk. The limits of clearing will still be located at the drip line, since the root zone within the drip line will still require protection.
- Plastic Fencing - 40-inch high "International orange" plastic (polyethylene) web fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:
 - Tensile yield: Average 2,000 lbs. per 4-foot width (ASTM D638)
 - Ultimate tensile yield: Average 2,900 lbs. per 4-foot width (ASTM D638)
 - Elongation at break (%): Greater than 1000% (ASTM D638)
 - Chemical resistance: Inert to most chemicals and acids

Source: Adapted from VA ESC Handbook
Symbol: SAP
Detail No. DE-ESC-3.7.2 Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications

Sensitive Area Protection

- Cord Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of cord 14-inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the strip at intervals no greater than 3 feet.
- Earth Berms - Temporary earth berms shall be constructed according to specifications for a Temporary Earth Dike with the base of the berm on the sensitive area side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.

Maintenance:

Fencing and arborizing devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

Source: Adapted from VA ESC Handbook
Symbol: SAP
Detail No. DE-ESC-3.7.2 Sheet 3 of 3 Effective July 2023

Standard Detail & Specifications

Dust Control

Temporary Methods:

- Mulches - See DE-ESC-3.4.5, Standard Detail and Specifications for Mulching.
- Vegetative cover - See DE-ESC-3.4.3, Std. Detail and Specifications for Vegetative Stabilization.
- Adhesives - Use on mineral soils only (not effective on muck soils). Keep traffic off these areas. The following table may be used for general guidance.

Type of Emulsion	Water Dilution	Type of Nozzle	Apply Gal/500
Latex emulsion	12.5:1	Fine spray	235
Resin-in-water emulsion	4:1	Fine spray	300
Acrylic emulsion (non-traffic)	7:1	Coarse spray	450
Acrylic emulsion (traffic)	3.5:1	Coarse spray	350

- Tillage - For emergency temporary treatment, scarify the soil surface to prevent or reduce the amount of blowing dust until more appropriate solution can be implemented. Begin the tillage operation on the windward side of the site using a chisel-type plow for best results.
- Sprinkling - Sprinkle site with water until the surface is moist. Repeat as needed.
- Calcium Chloride - Apply as flakes or granular material with a spreader at a rate that will keep the soil surface moist. Re-apply as necessary.
- Barriers - Place barriers such as solid board fences, snow fences, hay bales, etc. at right angles to the prevailing air currents at intervals of approx. 100' their height.

Permanent Methods:

- Vegetative cover - See DE-ESC-3.4.3, Std. Detail and Specifications for Vegetative Stabilization.
- Stone - Apply layer of crushed stone or coarse gravel to protect soil surface.

Source: Adapted from VA ESC Handbook
Symbol: SAP
Detail No. DE-ESC-3.4.8 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Skimmer Dewatering Device

Plan

Wall of outlet structure
4 LF of 4" flexible pipe
Wire stop
4" 90° Tee
4" solid PVC flotation section w/caps and allows
4" port PVC skimming section w/caps
Overlapped connecting bands

Profile thru C of Pipe

#4 Kahar guide post (typ.)
Flotation section mounted above skimming section
W.S.E.
Skimming section
DE #57 stone pad
Flexible pipe

Source: Adapted from drawing by Vandemark & Lynch, Inc.
Symbol: SDD
Detail No. DE-ESC-3.2.3.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Skimmer Dewatering Device

Construction Notes:

- Pipe flotation section shall be solvent welded to ensure an airtight assembly. Contractor to conduct a test to check for leaks prior to installation.
- Skimmer section shall have (12) rows of 1/2" dia. holes, 1-1/4" on center. If additional filtration is necessary, the filtering media shall consist of a Type GD-II geotextile fabric wrapped around the perforated portion of the skimmer and attached with plastic strap, ties, bands, etc.
- Flexible pipe shall be inserted into solid pipe and fastened with (2) #3 wood screws.
- At a minimum, the structure shall be inspected after each rain and repairs made as needed. If vandalism is a problem, more frequent inspection may be necessary.
- Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
- The structure shall only be removed when the contributing drainage area has been properly stabilized.

Materials:

- Solid pipe - 4" Sched. 40 PVC
- Perforated pipe - 4" Sched. 40 PVC
- 90° Tee (1 ea.) - 4" Sched. 40 PVC
- Elbow (2 ea.) - 4" Sched. 40 PVC
- Cap (4 ea.) - 4" Sched. 40 PVC, solid
- Flexible pipe - 4" corrugated plastic tubing (non-perforated)

Source: Dataware ESC Handbook
Symbol: SDD
Detail No. DE-ESC-3.2.3.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Riprap Outlet Protection - 1

Plan

NOTE: Depress centerline of apron slightly to prevent edge cutting

Section A-A

Type GS-I geotextile fabric
NOTE: Key into exist. grad

DATA
Pipe diameter (D_p)
Apron length (L_a)
Apron width (W)
Bottom width (B)
Riprap depth (d)
Riprap size (R No.)
Riprap thickness (T)

$T_w < 0.5 D_p$

Source: Adapted from MD Stds. & Specs. for ESC
Symbol: ROP-1
Detail No. DE-ESC-3.3.10.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Riprap Outlet Protection - 1

Construction Notes:

- The subgrade for the riprap shall be prepared to the required lines and grades as shown on the plan. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
- The riprap shall conform to the grading limits as shown on the plan.
- Filter cloth shall be protected from punching, cutting or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.
- Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the filter cloth. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.

Source: Adapted from MD Stds. & Specs. for ESC
Symbol: ROP-1
Detail No. DE-ESC-3.3.10.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Riprap Outlet Protection - 2

Plan

NOTE: Key into exist. grad

Section A-A

Type GS-I geotextile fabric
NOTE: Width of bottom (D) to vary from pipe diameter or and section width to existing ground level at end of apron.

Section B-B

Type GS-I geotextile fabric

DATA
Pipe diameter (D_p)
Apron length (L_a)
Apron width (W)
Bottom width (B)
Riprap depth (d)
Riprap size (R No.)
Riprap thickness (T)

$T_w \geq 0.5 D_p$

Source: Adapted from MD E&S Manual
Symbol: ROP-2
Detail No. DE-ESC-3.3.10.2 Sheet 1 of 2 Effective July 2023

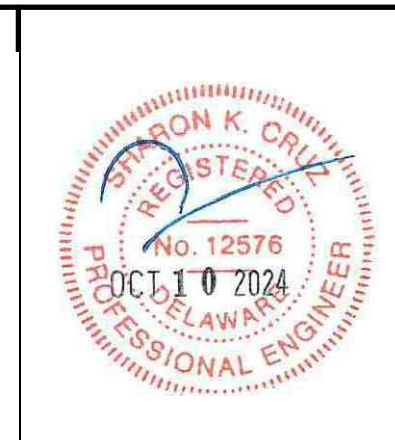
Standard Detail & Specifications

Riprap Outlet Protection - 2

Construction Notes:

- The subgrade for the riprap shall be prepared to the required lines and grades as shown on the plan. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
- The riprap shall conform to the grading limits as shown on the plan.
- Filter cloth shall be protected from punching, cutting or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.
- Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the filter cloth. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.

Source: Adapted from MD E&S Manual
Symbol: ROP-2
Detail No. DE-ESC-3.3.10.2 Sheet 2 of 2 Effective July 2023



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VINES CREEK CROSSING SEWAGE PUMP STATION
PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date:	SEPTEMBER 2024
Scale:	AS SHOWN
Dwn By:	RJL
Proj No.:	0700C004
Dwg No.:	C-401

STORM WATER MANAGEMENT DETAILS

Standard Detail & Specifications Topsoiling

Construction Notes:

- Site Preparation (Where Topsoil is to be added)**

Note: When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, waterways, and sediment basins.

 - Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.
 - Liming - Where the topsoil is either highly acid or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet). Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
 - Tilling - After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or by scarifying to a depth of at least 3 inches to permit bonding of the topsoil to the subsoil. Pack by passing a bulldozer up and down over the entire surface area of the slope to create horizontal erosion check slots to prevent topsoil from sliding down the slope.
- Topsoil Material and Application**

Note: Topsoil salvaged from the existing site may often be used but it should meet the same standards as set forth in these specifications. The depth of topsoil to be salvaged shall be no more than the depth described as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experiment Station.

Source:	Symbol:	Detail No.
USDA - NRCS		DE-ESC-3.4.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications Topsoiling

Construction Notes (cont.)

- Materials** - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand or other soil as approved by an agronomist or soil scientist. It shall not have a mixture of contrasting textured subsoil and contain no more than 5 percent by volume of cinders, stones, slag, coarse fragment, gravel, sticks, roots, trash or other extraneous materials larger than 1-1/2 inches in diameter. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistles, or others as specified. All topsoil shall be tested by a reputable laboratory for organic matter content, pH and soluble salts. A pH of 6.0 to 7.5 and an organic content of not less than 1.5 percent by weight is required. If pH value is less than 6.0 lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 higher.
- Grading** - The topsoil shall be placed on soil which has been treated with soil sterilant or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.
- Grading** - The topsoil shall be uniformly distributed and compacted to a minimum of four (4) inches. Spreading shall be performed in such a manner that seeding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or surface pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

Note: Topsoil substitutes or amendments as approved by a qualified agronomist or soil scientist, may be used in lieu of natural topsoil. Compost material used to improve the percentage of organic matter shall be provided by a certified supplier.

Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.9 Soil Amendments.

Source:	Symbol:	Detail No.
USDA - NRCS		DE-ESC-3.4.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species ¹	Seeding Rate	Optimum Seeding Dates ²	Planting Depth ³
1	Barley	125	4/15/23 - 5/15/23	1.2 inches
2	Grass	125	4/15/23 - 5/15/23	1.2 inches
3	Rye	125	4/15/23 - 5/15/23	1.2 inches
4	Perennial Ryegrass	125	4/15/23 - 5/15/23	1.2 inches
5	Annual Ryegrass	125	4/15/23 - 5/15/23	1.2 inches
6	Winter Wheat	125	4/15/23 - 5/15/23	1.2 inches
7	Foxtail Millet	30 PLS	0.7	0.5 inches
8	Plant Millet	20 PLS	0.5	0.5 inches

- Water seeding requires 3 tons or more of straw mulch for proper stabilization.
- May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- Applicable on slopes 3:1 or less.
- Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
- Warm season grasses such as Millet may be used between 5/1 and 9/1 if needed. Seed at 0.5 lb. per acre. Good soil fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: Alternative seed mixes may be used with prior approval from the Department of Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.4.3 Sheet 1 of 4 Effective July 2023

Standard Detail & Specifications Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Species ¹	Seeding Rate	Optimum Seeding Dates ²	Planting Depth ³	Remarks
1	Barley	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
2	Grass	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
3	Rye	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
4	Perennial Ryegrass	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
5	Annual Ryegrass	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
6	Winter Wheat	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
7	Foxtail Millet	30 PLS	0.7	0.5 inches	Good erosion control, low maintenance, quick establishment.
8	Plant Millet	20 PLS	0.5	0.5 inches	Good erosion control, low maintenance, quick establishment.

- Water seeding requires 3 tons or more of straw mulch for proper stabilization.
- May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- Applicable on slopes 3:1 or less.
- Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
- Warm season grasses such as Millet may be used between 5/1 and 9/1 if needed. Seed at 0.5 lb. per acre. Good soil fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.4.3 Sheet 2 of 4 Effective July 2023

Standard Detail & Specifications Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Species ¹	Seeding Rate	Optimum Seeding Dates ²	Planting Depth ³	Remarks
9	Barley	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
10	Grass	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
11	Rye	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
12	Perennial Ryegrass	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
13	Annual Ryegrass	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
14	Winter Wheat	125	4/15/23 - 5/15/23	1.2 inches	Good erosion control, low maintenance, quick establishment.
15	Foxtail Millet	30 PLS	0.7	0.5 inches	Good erosion control, low maintenance, quick establishment.
16	Plant Millet	20 PLS	0.5	0.5 inches	Good erosion control, low maintenance, quick establishment.

- Water seeding requires 3 tons or more of straw mulch for proper stabilization.
- May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- Applicable on slopes 3:1 or less.
- Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
- Warm season grasses such as Millet may be used between 5/1 and 9/1 if needed. Seed at 0.5 lb. per acre. Good soil fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.4.3 Sheet 3 of 4 Effective July 2023

Standard Detail & Specifications Vegetative Stabilization

Construction Notes:

- Site Preparation
 - Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
 - Final grading and shaping is not necessary for temporary seedings.
- Seeded Preparation

It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
- Soil Amendments
 - Lime - Apply liming materials based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
 - Fertilizer - Apply fertilizer based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 800 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soil.
- Seeding
 - For temporary stabilization, select a mixture from Sheet 1. For a permanent stabilization, select a mixture from Sheet 2 (Sheet 3 depending on the conditions). Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
 - Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
 - Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
- Mulching

All mulching shall be done in accordance with detail DE-ESC-3.4.5.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.4.3 Sheet 4 of 4 Effective July 2023

Standard Detail & Specifications Mulching

Materials and Amounts

- Straw** - Straw shall be unrotted small grain straw applied at the rate of 1-1/2 to 2 tons per acre, or 70 to 90 pounds (two bales) per 1,000 square feet. Mulch materials shall be relatively free of weeds and shall be free of rotting weeds such as thistles, Johnsongrass, and quackgrass. Spread mulch uniformly by hand or mechanically. For uniform distribution of hand spread mulch, divide area into approximately 1,000 square foot sections and place 70-90 pounds (two bales) of mulch in each section.
- Woodchips** - Apply at the rate of approximately 10 tons per acre or 275 pounds per 1,000 square feet when available and when feasible. These are particularly well suited for utility and road rights-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre (200 pounds of 15-15-15 or 66 pounds of 30-0-0 per acre).
- Hydraulically applied mulch** - The following conditions apply to hydraulically applied mulch:
 - Definition:**
 - Wood fiber mulch shall consist of specially prepared wood that has been processed to a uniform state, is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment, and consists of a minimum of 70% virgin or recycled wood fiber combined with 30% paper fiber and additives.
 - Blended fiber mulch shall consist of any hydraulic mulch that contains greater than 30% paper fiber. The paper component must consist of specially prepared paper that has been processed to a uniform fluff state and is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment.
 - A baled fiber mat (BFM) consists of long strand, specially prepared wood fibers that have been processed to a uniform state held together by a water resistant bonding agent. BFMs shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.
 - Refer to Figure 3.4.6a for conditions and limitations of use for each of the above categories of hydraulic mulch.
 - All components of the hydraulically applied mulches shall be pre-packaged by the manufacturer to assure material performance. Field mixing of the mulch components is acceptable, but must be done per manufacturer recommendations to ensure the proper results.
 - Hydraulically applied mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.
 - Hydraulically applied mulches and additives shall be mixed according to manufacturer recommendations.
 - Materials within this category shall only be used when hydraulically applied mulch has been specified for use in the approved Sediment and Stormwater Plan, or supplemental approval from the plan approval agency has been obtained in writing for a specific area.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrac™ International		DE-ESC-3.4.5 Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications Mulching

Application:

- Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.
- Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.
- During the spring (March 1 to May 31) and fall (September 1 to November 30) seasons, hydraulic mulches may be applied in a one-step process where all components are mixed together in single-tank loads. It is recommended that the product be applied from opposing directions to achieve optimum soil coverage.
- During the summer (June 1 to August 31) and winter (December 1 to February 28) seasons, the following two-step process is required:
 - Step One:** Mix and apply seed and soil amendments with a small amount of mulch for initial metering.
 - Step Two:** Mix and apply mulch at manufacturer's recommended rates over freshly seeded surfaces. Apply from opposing directions to achieve optimum soil coverage.
- Minimum curing temperature is 40°F (4°C). The best results and more rapid curing are achieved at temperatures exceeding 60°F (15°C). Curing times may be accelerated in high temperature, low humidity conditions on dry soils.
- Recommended application rates are for informational purposes only. Conformance with this standard and specification shall be performance-based and requires 100% soil coverage. Any areas with bare soil remaining shall be top dressed until full coverage is achieved.
- Control Blanket (CB) - Loosely applied with a pneumatic blower so that a 1" compost blanket uniformly covers the soil with 100% coverage. This application can be used with seed to promote germination by applying the approved seed mix directly into the loosely blown compost. The compost blanket performs best on slopes less than 2:1 and requires no mesh anchoring.

MULCHING MATERIAL SELECTION GUIDE

Material	Application	Notes
Straw	Hand spread	Apply at 1.5 to 2 tons per acre
Woodchips	Hand spread	Apply at 10 tons per acre
Hydraulically applied mulch	Hydraulic seeding	Follow manufacturer's application rates

NOTE: Hydraulic mulches must be applied to slopes that are geotechnically stable and designed to divert runoff away from the face of the slope. All application rates are minimum rates.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrac™ International		DE-ESC-3.4.5 Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications Mulching

Application (cont.)

- Anchoring mulch** - Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon slope of area, erosion hazard, and cost:
 - Croping:** A crop or a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This practice allows maximum erosion control but is limited to flatter slopes where equipment can operate safely. On sloping land, cropping should be done on the contour whenever possible.
 - Tracking:** Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on cleared tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with clear marks running across the slope.
 - Liquid mulch binders:** Applications of liquid mulch binders should be heavier at edges, in valleys, and at crests of banks and other areas where the mulch will be moved by wind or water. All other areas should have a uniform application of binder. The use of synthetic binders is the preferred method of mulch binding and should be applied at the rates recommended by the manufacturer.
 - Paper fiber:** The fiber binder shall be applied at a net dry weight of 750 lbs/acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons.
 - Netting:** Biodegradable nettings may be used to secure straw mulch. Install and secure according to the manufacturer's recommendations. Photodegradable or synthetic nettings are not acceptable.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrac™ International		DE-ESC-3.4.5 Sheet 3 of 3 Effective July 2023

Standard Detail & Specifications Construction Site Pollution Prevention

Delaware NPDES Discharge Permit
General Permit for Discharge of Stormwater from Construction Activities

(Project Name)

(NOI Permit Number)

(Agency Plan Approval ID)

(Contact Name & Number for Additional Site Information)

(Contact Name & Number to Obtain Copy of Approved Plan)

If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, call the DNREC Spill Notification 24 HR Hotline at 1-800-662-8802

Example Construction General Permit (CGP) Signage

NOTES:

- Minimum sign size 2' x 2'
- Minimum text size 1"
- Sign must be posted at a safe, publicly accessible location close to construction site
- Sign must be visible from the public road nearest the active construction site
- Signs posted within a 500' or other public road right-of-way (ROW) must be in accordance with all local and/or State requirements in regards to safety, location, orientation, etc.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.6.1 Sheet 1 of 4 Effective July 2023

Standard Detail & Specifications Construction Site Pollution Prevention

Notes:

The Construction Site Pollution Prevention Plan includes the following elements:

- Material Inventory**

Document the storage and use of the following materials:

 - Concrete
 - Detergents
 - Paints (enamel and latex)
 - Cleaning solvents
 - Pesticides
 - Wood scraps
 - Fertilizers
 - Herbicide based products
- Good housekeeping practices**
 - Store only enough product required to do the job.
 - Store all materials in a neat, orderly manner in their original labeled containers and covered.
 - Do not mix different substances.
 - When possible, use all of a product prior to disposal of the container.
 - Manufacturers' instructions for disposal should be strictly adhered to.
 - Designate someone to inspect all BMPs daily.
- Waste management practices**
 - Collect and store all waste materials in securely lidded dumpsters in a location that does not drain to a waterbody.
 - Save and/or recycle waste materials whenever possible.
 - The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		DE-ESC-3.6.1 Sheet 2 of 4 Effective July 2023

Standard Detail & Specifications Construction Site Pollution Prevention

Notes (cont.)

- Dispose of all trash in accordance with all applicable Delaware laws.
- Littering is strictly prohibited. Trash cans should be placed at all lunch spots and recycle bins should be placed near the construction trailer.
- If fertilizer bags can not be stored in a weather-proof location, they should be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.
- Equipment maintenance practices**
 - If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
 - If performed on-site, wash vehicles with high-pressure water spray without detergents in an area contained by an impervious berm.
 - Use drip pans for all equipment maintenance.
 - Inspect equipment for leaks on a daily basis.
 - Direct washout from concrete trucks into a temporary pit for hardening and proper disposal.
 - Equip fuel nozzles with automatic shut-off valves.
 - Dispose of all used products such as oil, antifreeze, solvents and tires in accordance with manufacturers' recommendations and local, state and federal laws and regulations.
- Spill prevention practices**
 - Identify potential spill areas and contain them in covered areas with no connection to the storm drain system.
 - Post warning signs in hazardous material storage areas.
 - Perform preventive maintenance on all tanks, valves, pumps, pipes and other equipment as necessary.
 - Prioritize low or non-toxic substances for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		DE-ESC-3.6.1 Sheet 3 of 4 Effective July 2023

Standard Detail & Specifications Construction Site Pollution Prevention

Notes (cont.)

- Prominently post contact information for reporting spills through the DNREC 24-Hour Toll Free Number.
- Education**
 - Include Best Management Practices (BMPs) for construction site pollution control as part of regular progress meetings.
 - Information regarding waste management, equipment maintenance and spill prevention should be prominently posted in the construction trailer.

CONTACT INFORMATION

DNREC 24-Hour Toll Free Number: 800-662-8802
DNREC Solid & Hazardous Waste Management Section: 302-739-9403

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		DE-ESC-3.6.1 Sheet 4 of 4 Effective July 2023

Standard Detail & Specifications Stabilization Matting - Slope

Note: Use manufacturer's recommendations for stapling patterns for slope installations.

Construction Notes:

- Prepare soil before installing matting, including application of lime, fertilizer, and seed.
- Begin at the top of the slope by anchoring the mat in a deep X 6" wide trench. Backfill and compact trench after stapling.
- Roll the mats (A) down or (B) horizontally across the slope.
- The edges of parallel mats must be stapled with approx. 2" overlap.
- When mats must be stapled down the slope, place mats end over end (single staple) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications Stabilization Matting - Slope

NOTE: These patterns are provided for general guidance only. They shall not be used as a substitute for manufacturer's recommendations.

Stapling Patterns

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications Stabilized Construction Entrance

Construction Notes:

- Stone size - Use DE #3 stone.
- Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
- Thickness - Not less than size (B) inches.
- Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
- Geotextile - Type GS-1; placed over the entire area prior to placing of stone.
- Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 6:1 slopes will be permitted.
- Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleaned of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
- Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications Stabilized Construction Entrance

Construction Notes:

- Stone size - Use DE #3 stone.
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Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 2 of 2 Effective July 2023

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ARCHITECTS • ENGINEERS • SURVEYORS

1000 W. DELAWARE AVENUE, SUITE 200
MILFORD, DELAWARE 19967
410-776-7441

VINES CREEK CROSSING
SEWAGE PUMP STATION

PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date: SEPTEMBER 2024
Scale: AS SHOWN
Dwn By: RJL
Proj No.: 0700C004

STORM WATER MANAGEMENT DETAILS

Dwg No.: C-402



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 ARCHITECTS • ENGINEERS • SURVEYORS
 BALTIMORE, MARYLAND
 410.767.7474

**VINES CREEK CROSSING
 SEWAGE PUMP STATION**
 PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
 TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date: SEPTEMBER 2024
 Scale: 1"=50'
 Dwn By: RJL
 Proj No.: 0700C004

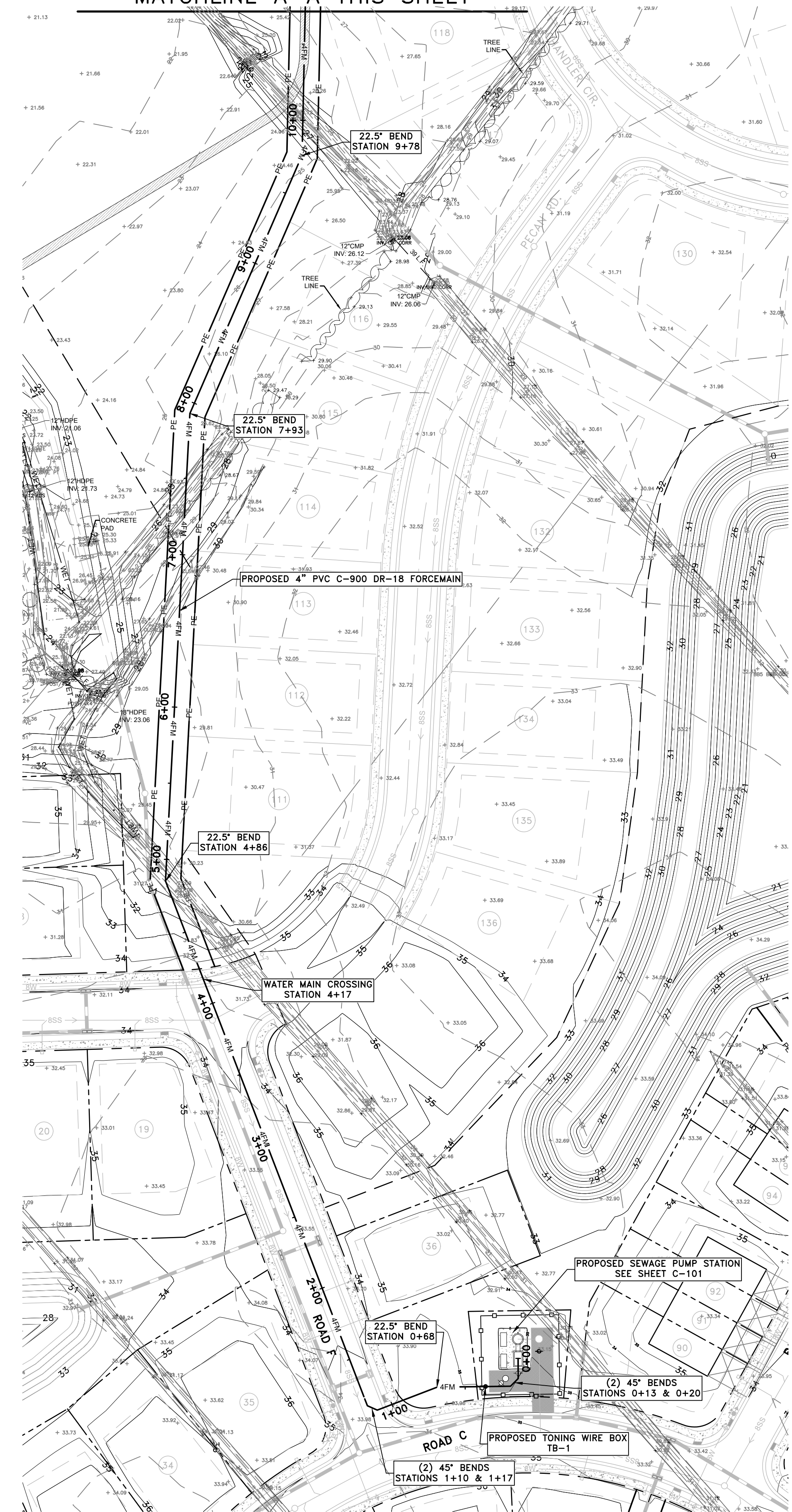
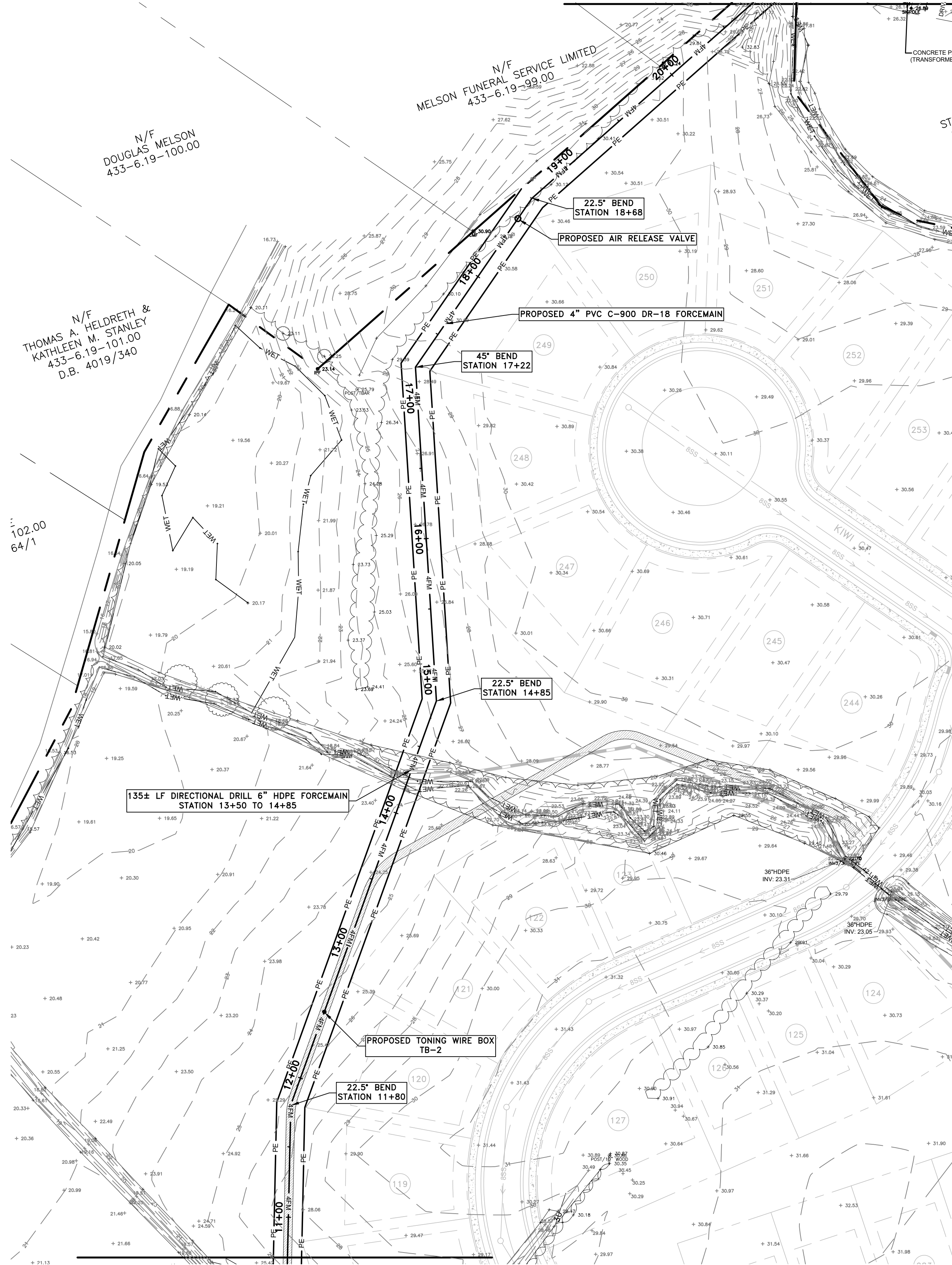
**PUMP STATION
 &
 FORCEMAIN**

Dwg No.:

C-501

MATCHLINE B-B SHEET C-502

MATCHLINE A-A THIS SHEET



MATCHLINE A-A THIS SHEET

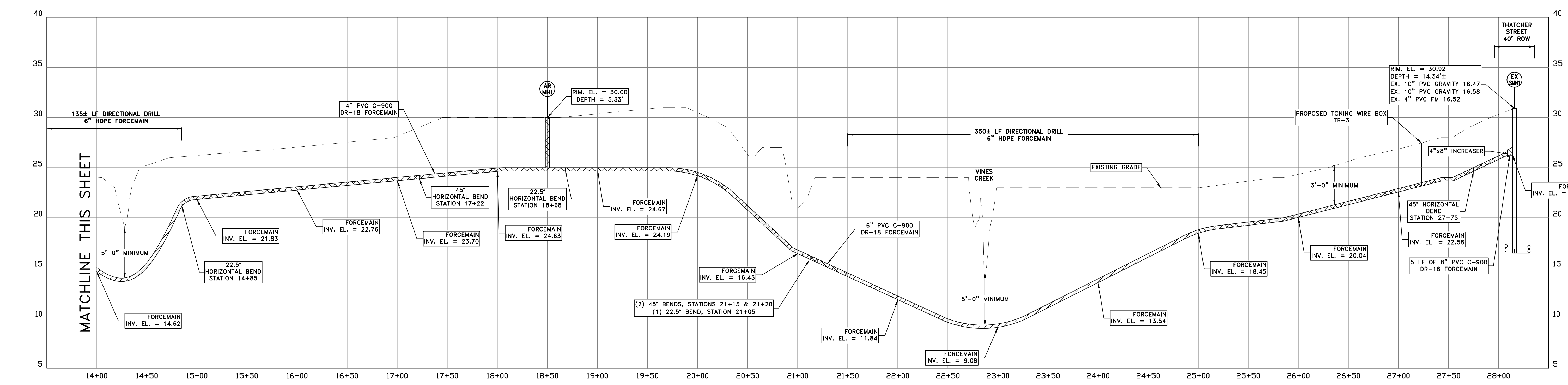
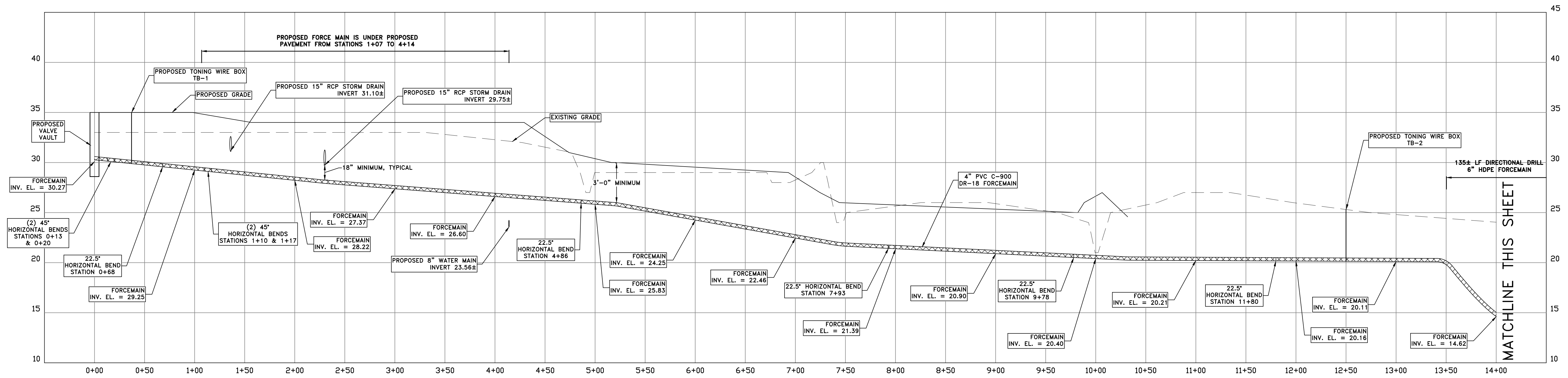


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 ARCHITECTS • ENGINEERS • SURVEYORS
 MILLERSVILLE, DELAWARE
 410.324.1441

VINES CREEK CROSSING SEWAGE PUMP STATION
 PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
 TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE



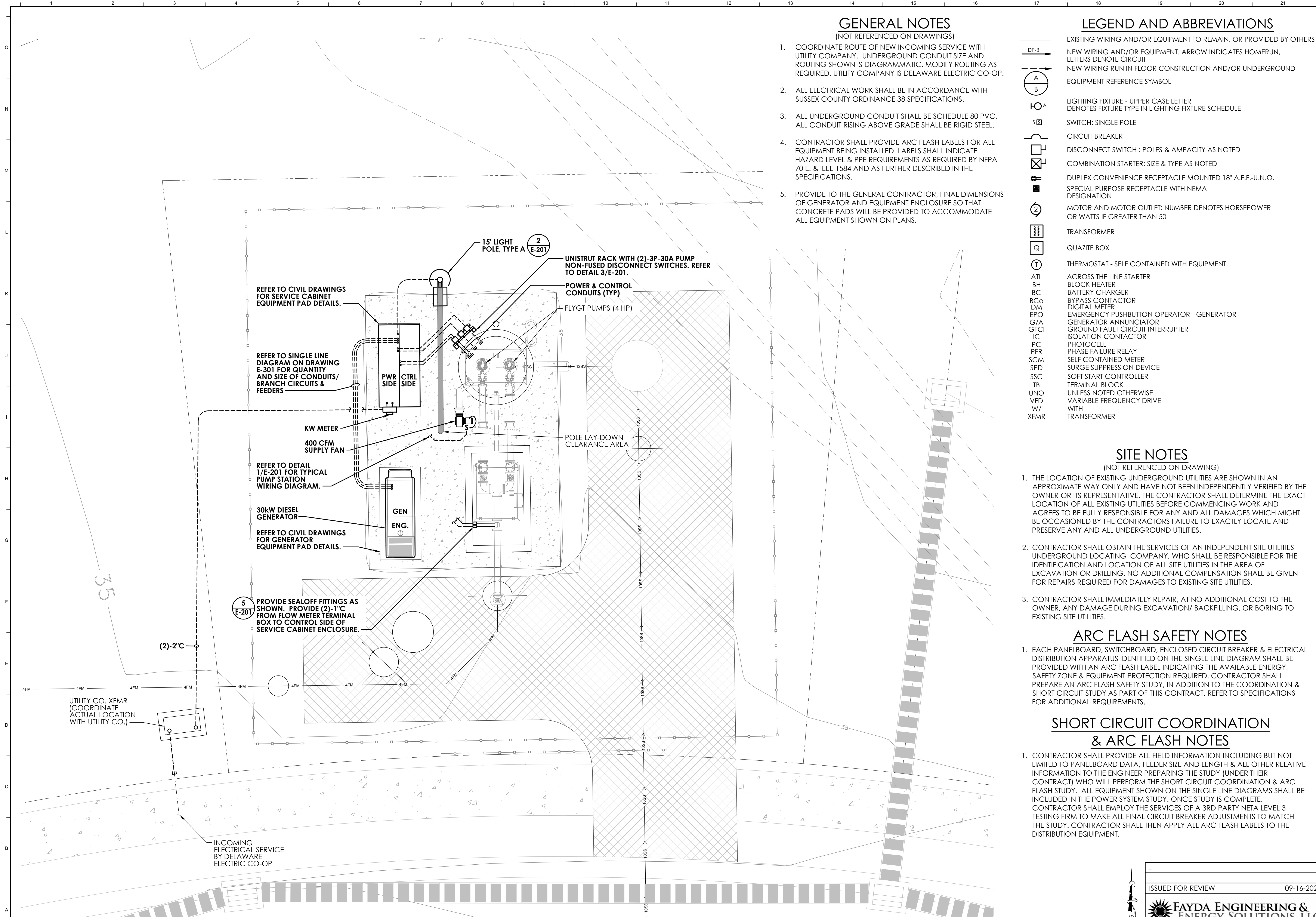
FORCEMAIN PROFILES

SCALE: 1" = 50' HORIZONTAL
 1" = 5' VERTICAL

Date: SEPTEMBER 2024
 Scale: AS SHOWN
 Dwn By: RJL
 Proj No.: 0700C004

FORCEMAIN PROFILES

Dwg No.: **C-503**



GENERAL NOTES

(NOT REFERENCED ON DRAWINGS)

- COORDINATE ROUTE OF NEW INCOMING SERVICE WITH UTILITY COMPANY. UNDERGROUND CONDUIT SIZE AND ROUTING SHOWN IS DIAGRAMMATIC. MODIFY ROUTING AS REQUIRED. UTILITY COMPANY IS DELAWARE ELECTRIC CO-OP.
- ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH SUSSEX COUNTY ORDINANCE 38 SPECIFICATIONS.
- ALL UNDERGROUND CONDUIT SHALL BE SCHEDULE 80 PVC. ALL CONDUIT RISING ABOVE GRADE SHALL BE RIGID STEEL.
- CONTRACTOR SHALL PROVIDE ARC FLASH LABELS FOR ALL EQUIPMENT BEING INSTALLED. LABELS SHALL INDICATE HAZARD LEVEL & PPE REQUIREMENTS AS REQUIRED BY NFPA 70 E. & IEEE 1584 AND AS FURTHER DESCRIBED IN THE SPECIFICATIONS.
- PROVIDE TO THE GENERAL CONTRACTOR, FINAL DIMENSIONS OF GENERATOR AND EQUIPMENT ENCLOSURE SO THAT CONCRETE PADS WILL BE PROVIDED TO ACCOMMODATE ALL EQUIPMENT SHOWN ON PLANS.

LEGEND AND ABBREVIATIONS

- EXISTING WIRING AND/OR EQUIPMENT TO REMAIN, OR PROVIDED BY OTHERS
- NEW WIRING AND/OR EQUIPMENT. ARROW INDICATES HOMERUN. LETTERS DENOTE CIRCUIT
- NEW WIRING RUN IN FLOOR CONSTRUCTION AND/OR UNDERGROUND
- EQUIPMENT REFERENCE SYMBOL
- LIGHTING FIXTURE - UPPER CASE LETTER DENOTES FIXTURE TYPE IN LIGHTING FIXTURE SCHEDULE
- SWITCH: SINGLE POLE
- CIRCUIT BREAKER
- DISCONNECT SWITCH : POLES & AMPACITY AS NOTED
- COMBINATION STARTER: SIZE & TYPE AS NOTED
- DUPLEX CONVENIENCE RECEPTACLE MOUNTED 18" A.F.F.-U.N.O.
- SPECIAL PURPOSE RECEPTACLE WITH NEMA DESIGNATION
- MOTOR AND MOTOR OUTLET: NUMBER DENOTES HORSEPOWER OR WATTS IF GREATER THAN 50
- TRANSFORMER
- QUAZITE BOX
- THERMOSTAT - SELF CONTAINED WITH EQUIPMENT
- ATL ACROSS THE LINE STARTER
- BH BLOCK HEATER
- BC BATTERY CHARGER
- BCo BYPASS CONTACTOR
- DM DIGITAL METER
- EPO EMERGENCY PUSHBUTTON OPERATOR - GENERATOR
- G/A GENERATOR ANNUNCIATOR
- GFCI GROUND FAULT CIRCUIT INTERRUPTER
- IC ISOLATION CONTACTOR
- PC PHOTOCCELL
- PFR PHASE FAILURE RELAY
- SCM SELF CONTAINED METER
- SPD SURGE SUPPRESSION DEVICE
- SSC SOFT START CONTROLLER
- TB TERMINAL BLOCK
- UNO UNLESS NOTED OTHERWISE
- VFD VARIABLE FREQUENCY DRIVE
- W/ WITH
- XFMR TRANSFORMER

SITE NOTES

(NOT REFERENCED ON DRAWING)

- THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
- CONTRACTOR SHALL OBTAIN THE SERVICES OF AN INDEPENDENT SITE UTILITIES UNDERGROUND LOCATING COMPANY, WHO SHALL BE RESPONSIBLE FOR THE IDENTIFICATION AND LOCATION OF ALL SITE UTILITIES IN THE AREA OF EXCAVATION OR DRILLING. NO ADDITIONAL COMPENSATION SHALL BE GIVEN FOR REPAIRS REQUIRED FOR DAMAGES TO EXISTING SITE UTILITIES.
- CONTRACTOR SHALL IMMEDIATELY REPAIR, AT NO ADDITIONAL COST TO THE OWNER, ANY DAMAGE DURING EXCAVATION/ BACKFILLING, OR BORING TO EXISTING SITE UTILITIES.

ARC FLASH SAFETY NOTES

- EACH PANELBOARD, SWITCHBOARD, ENCLOSED CIRCUIT BREAKER & ELECTRICAL DISTRIBUTION APPARATUS IDENTIFIED ON THE SINGLE LINE DIAGRAM SHALL BE PROVIDED WITH AN ARC FLASH LABEL INDICATING THE AVAILABLE ENERGY, SAFETY ZONE & EQUIPMENT PROTECTION REQUIRED. CONTRACTOR SHALL PREPARE AN ARC FLASH SAFETY STUDY, IN ADDITION TO THE COORDINATION & SHORT CIRCUIT STUDY AS PART OF THIS CONTRACT. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SHORT CIRCUIT COORDINATION & ARC FLASH NOTES

- CONTRACTOR SHALL PROVIDE ALL FIELD INFORMATION INCLUDING BUT NOT LIMITED TO PANELBOARD DATA, FEEDER SIZE AND LENGTH & ALL OTHER RELATIVE INFORMATION TO THE ENGINEER PREPARING THE STUDY (UNDER THEIR CONTRACT) WHO WILL PERFORM THE SHORT CIRCUIT COORDINATION & ARC FLASH STUDY. ALL EQUIPMENT SHOWN ON THE SINGLE LINE DIAGRAMS SHALL BE INCLUDED IN THE POWER SYSTEM STUDY. ONCE STUDY IS COMPLETE, CONTRACTOR SHALL EMPLOY THE SERVICES OF A 3RD PARTY NETA LEVEL 3 TESTING FIRM TO MAKE ALL FINAL CIRCUIT BREAKER ADJUSTMENTS TO MATCH THE STUDY. CONTRACTOR SHALL THEN APPLY ALL ARC FLASH LABELS TO THE DISTRIBUTION EQUIPMENT.

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed Professional Engineer in the State of Delaware.
DAVIS BOWEN & FRIEDEL, INC.
 ARCHITECTS - ENGINEERS - SURVEYORS
 WILMINGTON, DELAWARE
 BALTIMORE, MARYLAND
 302-241-1441
 410-543-9991

VINES CREEK CROSSING SEWAGE PUMP STATION
 PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
 TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

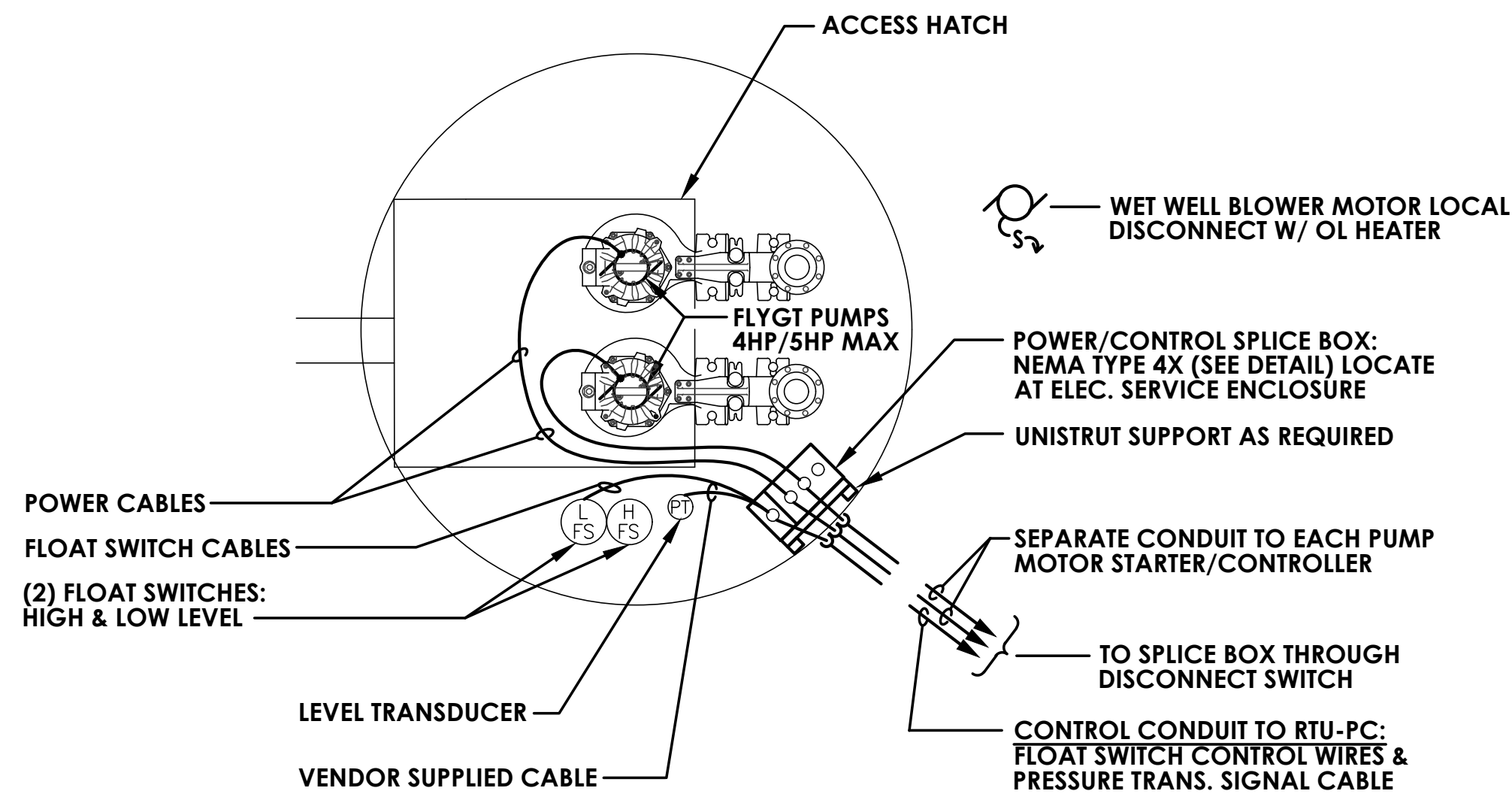
Date:	SEPTEMBER 2024
Scale:	AS NOTED
Dwn By:	EF/JMG
Proj No.:	0700C004

PUMP STATION SITE PLAN

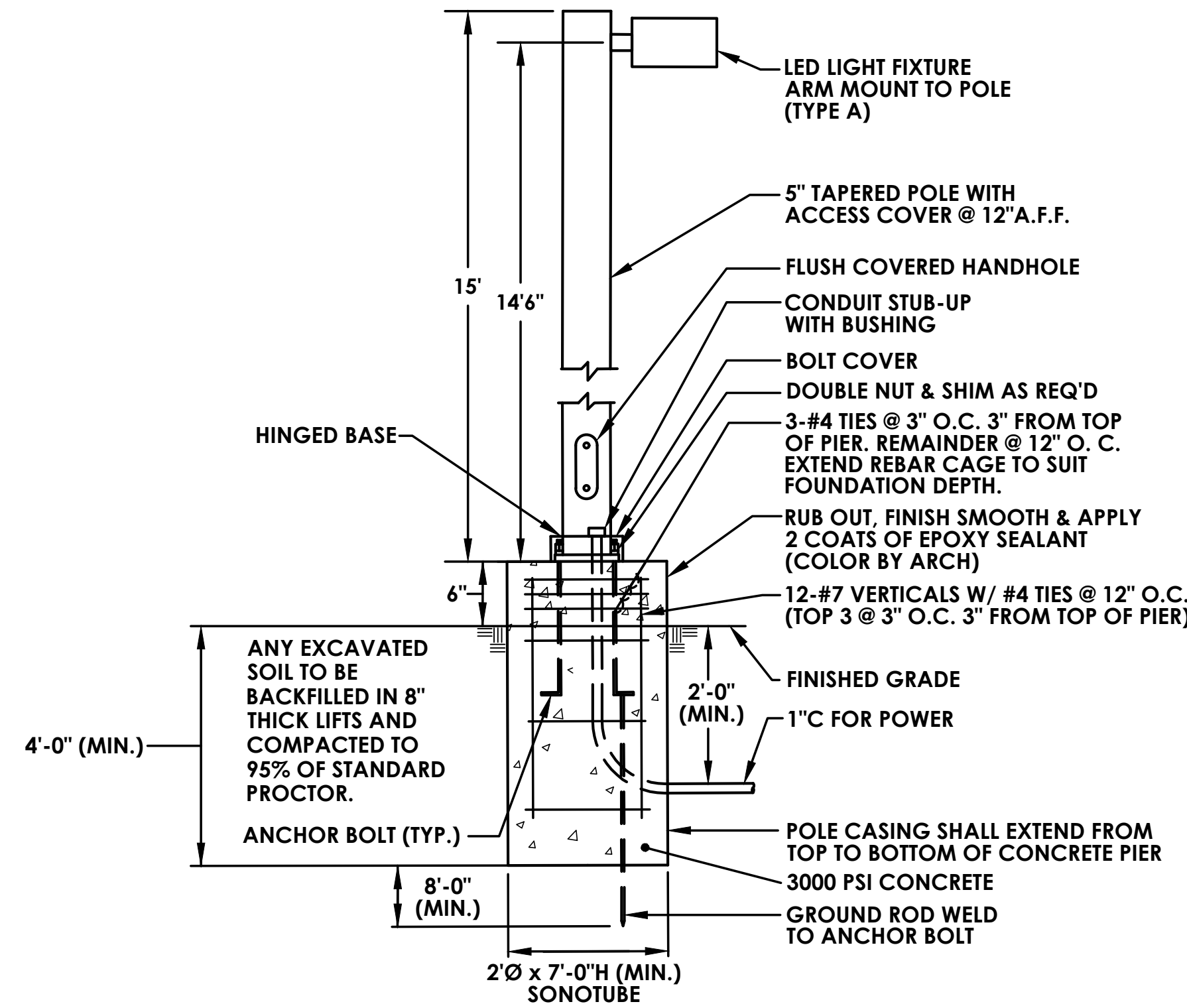
ISSUED FOR REVIEW 09-16-2024

FAYDA ENGINEERING & ENERGY SOLUTIONS, LLC
 801 W. Newport Pike, Wilmington, DE 19804
 Tel: 302-999-1060, Fax: 302-999-1053
 www.FaydaEES.com FE&ES COMM. NO: 24-1631

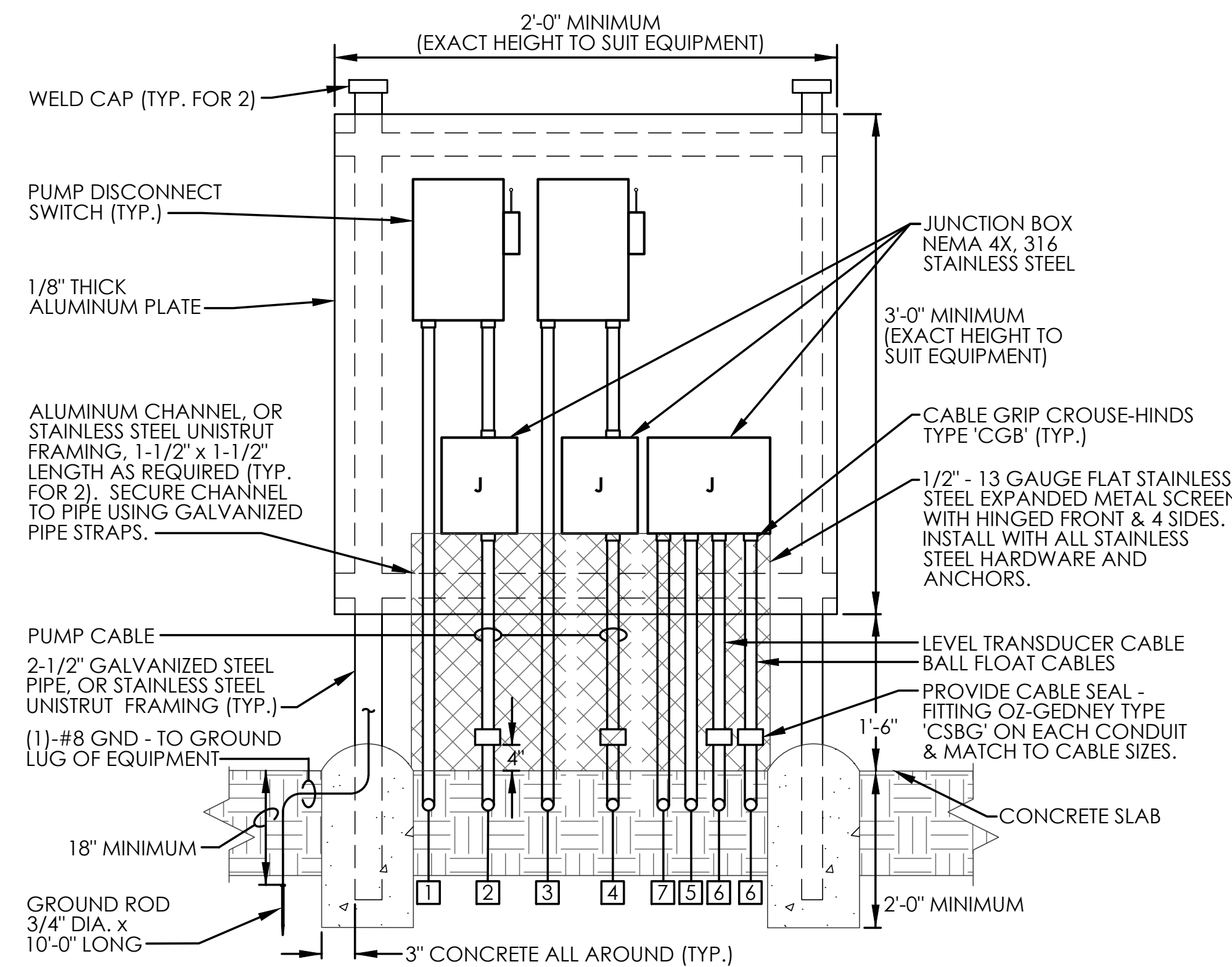
Dwg No.: **E-101**



1 TYPICAL PUMPSTATION WIRING DIAGRAM
E-201 NO SCALE

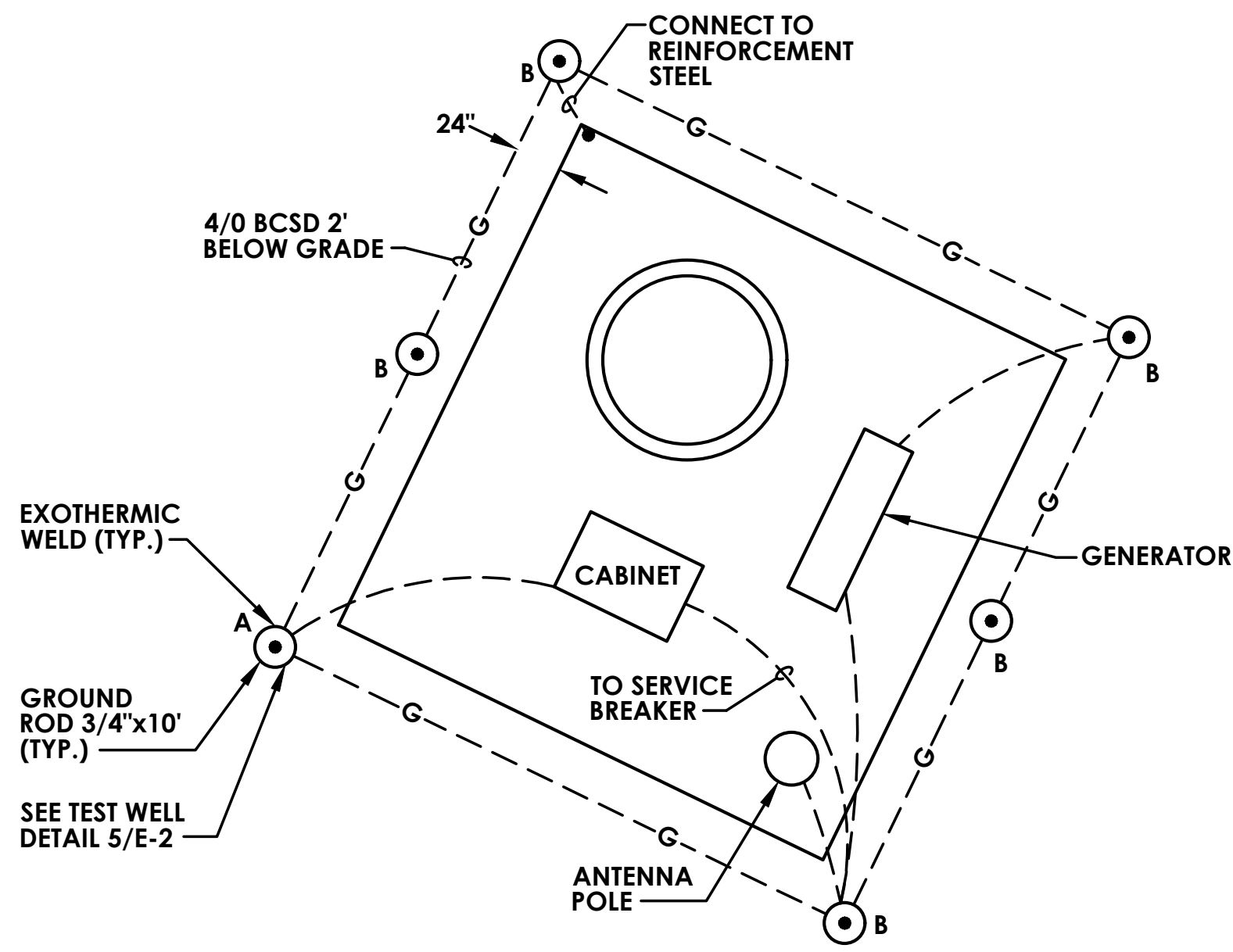


2 LIGHT POLE DETAIL
E-201 NO SCALE

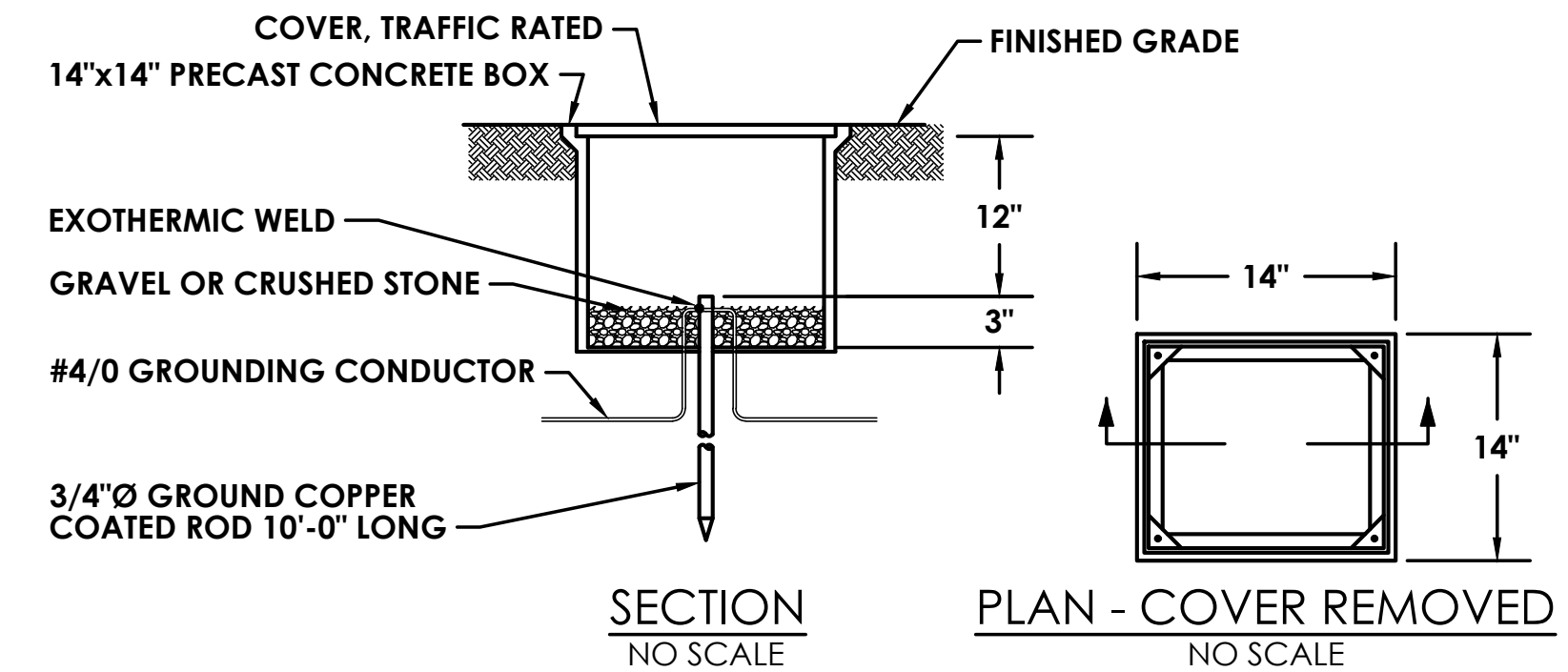


3 EQUIPMENT SUPPORT STRUCTURE
E-201 NO SCALE

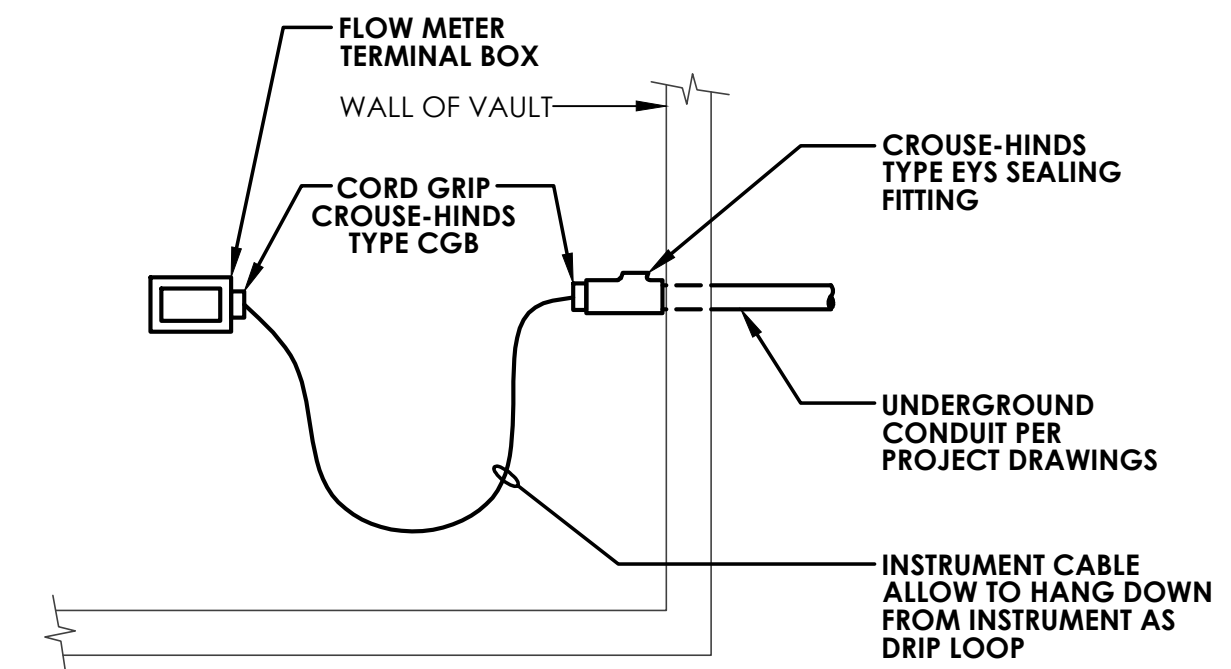
- 1 PUMP #1 CONDUIT TO SERVICE ENCLOSURE
- 2 PUMP #1 CONDUIT/CABLE TO WET WELL
- 3 PUMP #2 CONDUIT TO SERVICE ENCLOSURE
- 4 PUMP #2 CONDUIT/CABLE TO WET WELL
- 5 TRANSDUCER CONDUIT TO SERVICE ENCL.
- 6 TRANSDUCER CABLE TO WET WELL
- 7 FLOAT CABLE TO SERVICE ENCLOSURE



4 TYPICAL GROUND PLAN
E-201 NO SCALE



5 TEST WELL DETAIL
E-2 NO SCALE



5 ELEVATION - WIRING TO INSTRUMENT LOCATED IN UNDERGROUND VAULT
E-201 NO SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed Professional Engineer in the State of Delaware. License No. 8240. Expiration Date: 09-30-2024.

DAVIS BOWEN & FRIEDEL, INC.
ARCHITECTS - ENGINEERS - SURVEYORS
WILMINGTON, DELAWARE
BALTIMORE, MARYLAND
302.421.1441
410.542.9991

VINES CREEK CROSSING SEWAGE PUMP STATION
PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date: SEPTEMBER 2024
Scale: AS NOTED
Dwn By: EF/MJG
Proj No.: 0700C004

DETAILS

ISSUED FOR REVIEW 09-16-2024

FAYDA ENGINEERING & ENERGY SOLUTIONS, LLC
801 W. Newport Pike, Wilmington, DE 19804
Tel: 302-999-1060, Fax: 302-999-1053
www.FaydaEES.com FE&S COMM. NO: 24-1631

Dwg No.: **E-201**

GENERAL NOTES

1. WIRING ENTERING FROM CONCRETE PAD SHALL BE IN RIGID GALVANIZED STEEL CONDUIT.
2. ALL INTERCONNECT WIRING WITHIN ENCLOSURE SHALL BE IN SCHEDULE 40 PVC OR RIGID ALUMINUM CONDUIT. LIQUID-TIGHT FLEXIBLE NONMETALLIC CONDUIT IN LENGTHS NOT EXCEEDING 12' MAY BE USED WHERE INSTALLATION OF RIGID CONDUIT IS IMPRACTICAL.
3. SEAL FAILURE AND OVERTEMPERATURE MODULES TO BE FURNISHED BY PUMP MANUFACTURER.
4. **EQUIPMENT ENCLOSURE:** PROVIDE A NEMA 3R ENCLOSURE TO HOUSE ALL ELECTRICAL EQUIPMENT AS SHOWN ON SINGLE-LINE DIAGRAM. ENCLOSURE SHALL BE COMPLETELY ASSEMBLED BY A U.L. LISTED PANEL SHOP. PROVIDE INTERNAL HVAC EQUIPMENT AS NECESSARY TO CONTROL ENVIRONMENTAL CONDITIONS WITHIN SUITABLE RANGE OF ALL EQUIPMENT IN ENCLOSURE. ENCLOSURE DIMENSIONS SHOWN ON PLAN ARE APPROXIMATE - VERIFY ACTUAL SIZE REQUIRED AND COORDINATE LOCATION WITH OWNER. PROVIDE POWDERCOAT PAINT FINISH IN COMPLIANCE WITH SUSSEX COUNTY ENGINEERING ORDINANCE 38.
5. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH SUSSEX COUNTY ORDINANCE 38 SPECIFICATIONS.
6. ALL PUMP CONTROL SHALL BE PERFORMED THROUGH A MODICON PROGRAMMABLE CONTROLLER, PROGRAMMED BY A SUSSEX COUNTY ENGINEERING APPROVED SYSTEMS INTEGRATOR, TO MEET THE REQUIREMENTS OF A SUSSEX COUNTY ORDINANCE 38 COMPLIANT PUMP STATION. CONTRACTOR SHALL OBTAIN A COPY OF THE LATEST REVISION OF THAT SPEC IN ORDER TO INCORPORATE THE LATEST DESIGN DETAILS. ORDINANCE 38, SECTIONS 13318, 13320, AND 13440 PROVIDE THE ELECTRICAL CONTROL DETAILS OF THE CURRENT REQUIREMENTS.

SHEET NOTES

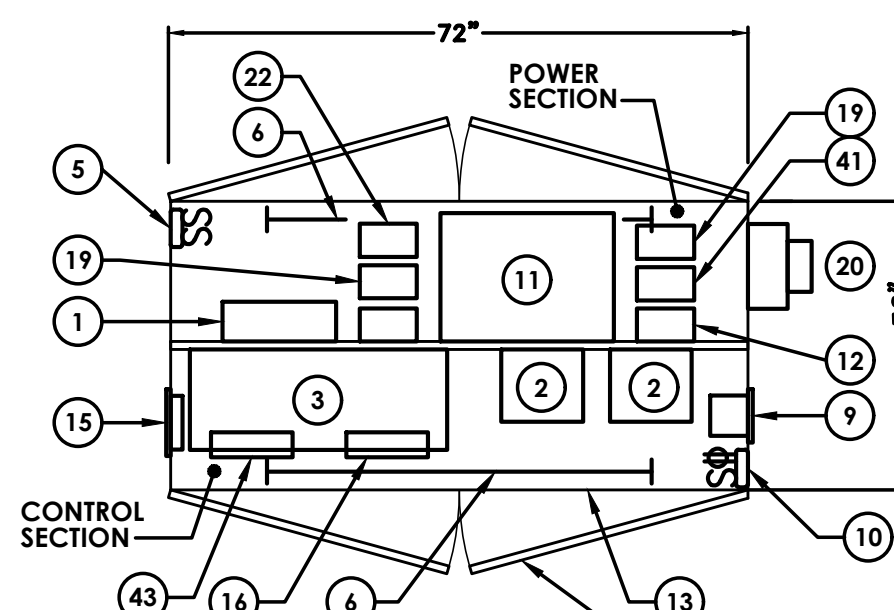
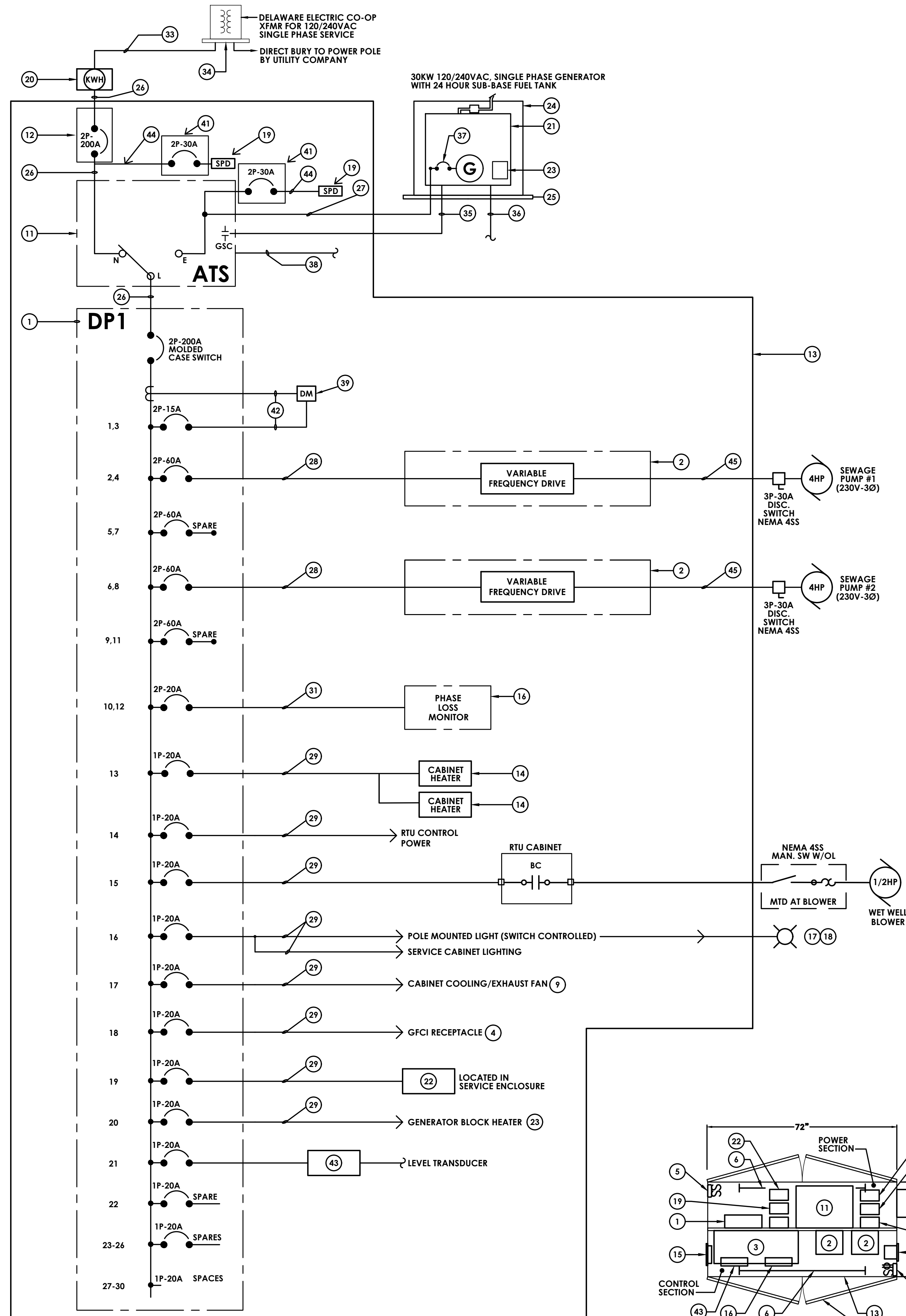
1. PROVIDE REINFORCEMENT OF SERVICE CABINET TO ACCOMMODATE WEIGHT OF VFD'S.
2. PROVIDE INTEGRAL LIFTING EYE OVER EACH VFD TO ACCOMMODATE FUTURE REPLACEMENT OF EACH VFD.
3. CENTER MULLION IS NOT PREFERRED BUT IF REQUIRED SHALL BE REMOVABLE.
4. ELECTRICAL CONTRACTOR IS ENCOURAGED TO CONSOLIDATE PANEL EQUIPMENT, AND/OR PRESENT AN ALTERNATE LAYOUT FOR REVIEW BY SUSSEX COUNTY ENGINEERING.

EQUIPMENT LIST

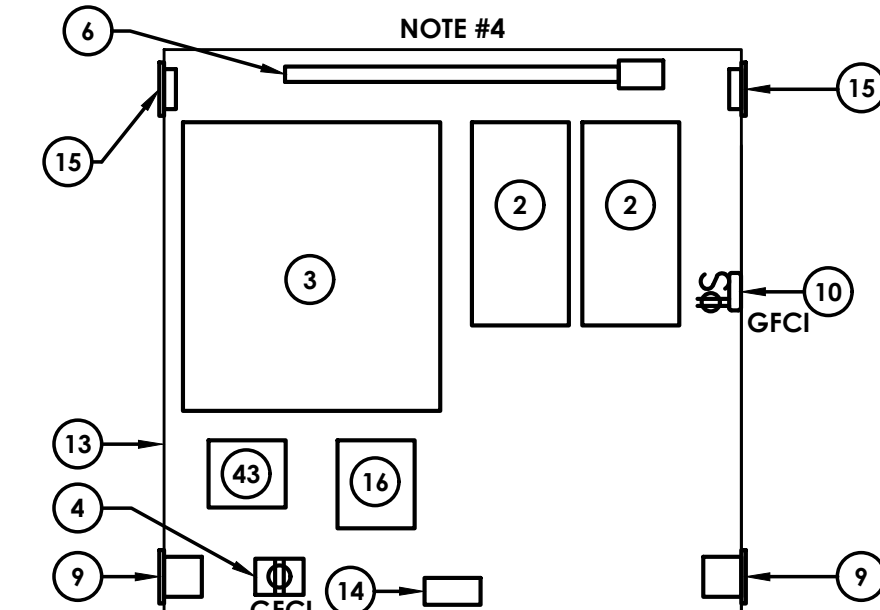
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1	BACK PANEL	NP-4836	WIEGMANN
2	SEAL FAIL	14-40-7113	FLYGT
2	SELECTOR SWITCH 3 POSITION	9001KS438	SQUARE D
2	INDICATOR LIGHT GREEN	9001KT1G31	SQUARE D
3	INDICATOR LIGHT RED	9001KT1R31	SQUARE D
3	PUSH BUTTON	9001KR1B	SQUARE D
3	FUSES	KLDR1	LITTELFUSE
1	TRANSFORMER 120/24	TF50 D13	SQUARE D
79	6MM TERMINAL	UK5N	PHOENIX
2	3A FUSE	KLDR3A	LITTELFUSE
8	FUSE HOLDER	LPSM	LITTELFUSE
1	M340 8 SLOT RACK	BMX XBP 0800	MODICON
1	M340 POWER SUPPLY 120 VAC, 20W	BMX CPS 2000	MODICON
1	M340 PROCESSOR w/MODBUS PORT AND ETHERNET PORT	BMX P34 2020	MODICON
2	M340 16PT. 24VDC D.I. MODULE	BMX DDI 1602	MODICON
1	M340 16PT. 24VDC D.O. MODULE	BMX DDO 1602	MODICON
1	M340 4PT. A.I. MODULE	BMX AMI 0410	MODICON
11	CONTROL RELAYS	RH1B-U 24VDC	IDEC
27	CONTROL RELAYS BASE	SH1B-05	IDEC
1	COLOR TOUCH SCREEN OIT. 5.7", 24VDC	HMI020310	MODICON
9	CONTROL RELAYS	RH1B-U-120VAC	IDEC
2	STARTER	SD03V025	SQUARE D
1	ROUTER 150M, NO WIFI (5 YEAR NetCloud LICENSE)	T85-650C150M-NON	CRADLEPOINT
1	FAST ETHERNET SWITCH	FS 105	NET GEAR
2	BREAKER	FAL36030-15M	SQUARE D
1	BELLOWS	815-000-000	KPSI
2	INTERBUS CABLE	170 MCI 00700	MODICON
2	SELECTOR SWITCH	KS11B	SQUARE D
3	TERMINAL KIT	170XTS001 00	MODICON
1	ETHERNET HUB	499-NEH10410	MODICON
1	SURGE ARRESTOR	TDF-20A-120V	ERICO
2	LOUVERS	WAVK0304	WIEGMANN
2	RECEPTACLE	991548	WEIDMULLER
2	10A FUSE	FLM 10A	LITTELFUSE
4	1A FUSE	FLM 1A	LITTELFUSE
1	MMS	FG1	SQUARE D
1	24VDC POWER SUPPLY	P55R-D24	IDEC
1	GROUND BAR	PK9 GTA	SQUARE D
1	DIST. BLOCK	LD0402-3	SQUARE D
1	PHASE LOSS RELAY	252B	TIME MARK
1	CONTACTOR	C06V20	SQUARE D
6	4A FUSE	3AG 4A 312	LITTELFUSE
1	3/10 A GLASS FUSE	3AG 3/10A 312	LITTELFUSE
1	5A FUSE	3AG 5A 312	LITTELFUSE
2	OVERLOAD MODULE W/ALARM	S04	SQUARE D
10	GLASS FUSE HOLDER	C383THS	CUTLER-HAMMER
1	24V POWER SUPPLY	P55R-A24	IDEC
1	TVSS	UL LISTED	APT
1	UPS	89341	MGE PULSAR
1	LOW PROFILE MIMO LTE ANTENNA	LPAM-BC3G-26-3SP	PANORAMA

PARTIAL BILL OF MATERIAL - PUMP CONTROL & TELEMETRY PANEL

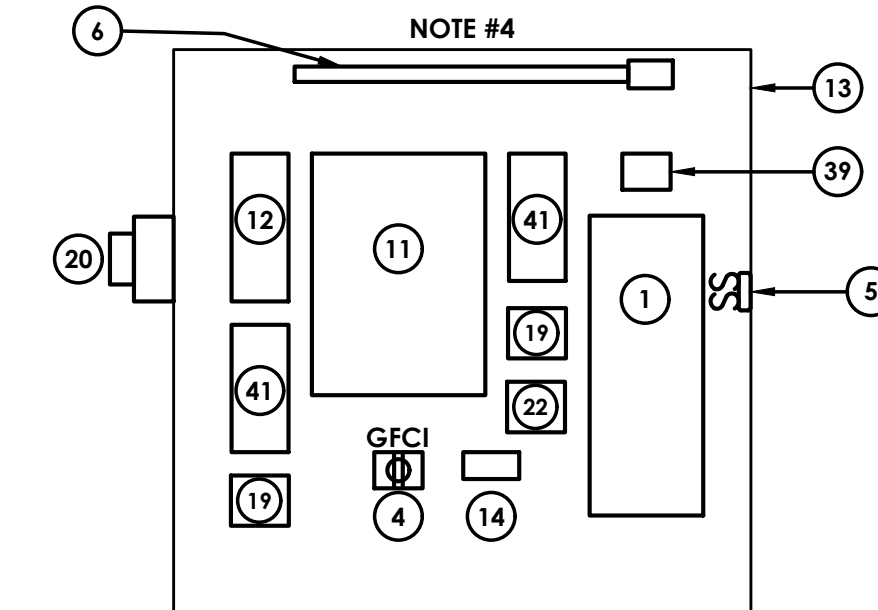
QUAN.	DESCRIPTION	CATALOG NO.	MANUFACTURER
1	ENCLOSURE NEMA 1	NIC-364811	WIEGMANN
1	BACK PANEL	NP-4836	WIEGMANN
2	SEAL FAIL	14-40-7113	FLYGT
2	SELECTOR SWITCH 3 POSITION	9001KS438	SQUARE D
2	INDICATOR LIGHT GREEN	9001KT1G31	SQUARE D
3	INDICATOR LIGHT RED	9001KT1R31	SQUARE D
3	PUSH BUTTON	9001KR1B	SQUARE D
3	FUSES	KLDR1	LITTELFUSE
1	TRANSFORMER 120/24	TF50 D13	SQUARE D
79	6MM TERMINAL	UK5N	PHOENIX
2	3A FUSE	KLDR3A	LITTELFUSE
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1	M340 POWER SUPPLY 120 VAC, 20W	BMX CPS 2000	MODICON
1	M340 PROCESSOR w/MODBUS PORT AND ETHERNET PORT	BMX P34 2020	MODICON
2	M340 16PT. 24VDC D.I. MODULE	BMX DDI 1602	MODICON
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1	M340 4PT. A.I. MODULE	BMX AMI 0410	MODICON
11	CONTROL RELAYS	RH1B-U 24VDC	IDEC
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1	COLOR TOUCH SCREEN OIT. 5.7", 24VDC	HMI020310	MODICON
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2	STARTER	SD03V025	SQUARE D
1	ROUTER 150M, NO WIFI (5 YEAR NetCloud LICENSE)	T85-650C150M-NON	CRADLEPOINT
1	FAST ETHERNET SWITCH	FS 105	NET GEAR
2	BREAKER	FAL36030-15M	SQUARE D
1	BELLOWS	815-000-000	KPSI
2	INTERBUS CABLE	170 MCI 00700	MODICON
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3	TERMINAL KIT	170XTS001 00	MODICON
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1	SURGE ARRESTOR	TDF-20A-120V	ERICO
2	LOUVERS	WAVK0304	WIEGMANN
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2	10A FUSE	FLM 10A	LITTELFUSE
4	1A FUSE	FLM 1A	LITTELFUSE
1	MMS	FG1	SQUARE D
1	24VDC POWER SUPPLY	P55R-D24	IDEC
1	GROUND BAR	PK9 GTA	SQUARE D
1	DIST. BLOCK	LD0402-3	SQUARE D
1	PHASE LOSS RELAY	252B	TIME MARK
1	CONTACTOR	C06V20	SQUARE D
6	4A FUSE	3AG 4A 312	LITTELFUSE
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2	OVERLOAD MODULE W/ALARM	S04	SQUARE D
10	GLASS FUSE HOLDER	C383THS	CUTLER-HAMMER
1	24V POWER SUPPLY	P55R-A24	IDEC
1	TVSS	UL LISTED	APT
1	UPS	89341	MGE PULSAR
1	LOW PROFILE MIMO LTE ANTENNA	LPAM-BC3G-26-3SP	PANORAMA



PLAN VIEW- SERVICE CABINET ENCLOSURE NO SCALE



CONTROL SIDE ELEVATION- SERVICE CABINET ENCLOSURE NO SCALE



POWER SIDE ELEVATION- SERVICE CABINET ENCLOSURE NO SCALE

ISSUED FOR REVIEW 09-16-2024

FAYDA ENGINEERING & ENERGY SOLUTIONS, LLC
 801 W. Newport Pike, Wilmington, DE 19804
 Tel: 302-999-1060, Fax: 302-999-1053
 www.FaydaEES.com FE&ES COMM. NO: 24-1631

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed Professional Engineer in the State of Delaware. License No. 8242. Expiration Date: 09/30/2024.

DAVIS BOWEN & FRIEDEL, INC.
 ARCHITECTS - ENGINEERS - SURVEYORS
 WILMINGTON, DELAWARE
 410.702.7474

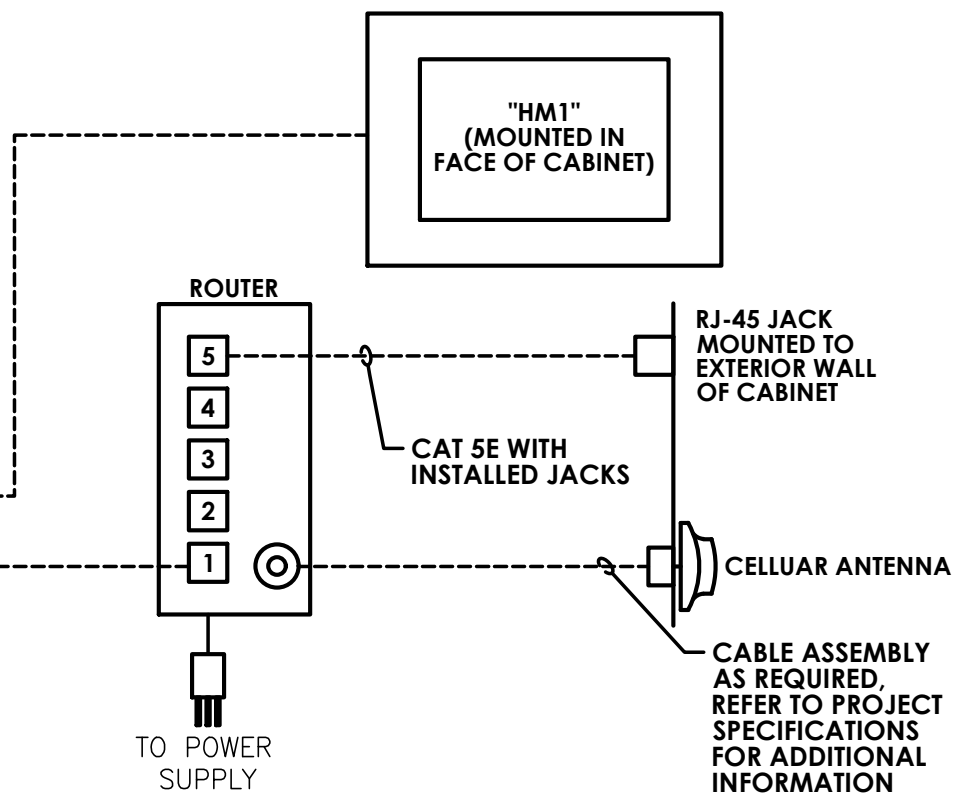
VINES CREEK CROSSING SEWAGE PUMP STATION
 PEPPER RD. (SCR 376) & FRANKFORD SCHOOL RD. (SCR 092)
 TOWN OF FRANKFORD, SUSSEX COUNTY, DELAWARE

Date: SEPTEMBER 2024
 Scale: AS NOTED
 Dwn By: EF/IMG
 Proj No.: 0700C004

SINGLE LINE DIAGRAM & SCHEDULES

Dwg No.: E-301

SCADA PLC		
CPU		
I/O LISTING		
DATA FIELD 1 / DATA FIELD 2	DATA FIELD 1 / DATA FIELD 2	DATA FIELD 1 / DATA FIELD 2
PUMP #1 STATUS	DI RUNNING / STOPPED	ALARM / NORMAL
PUMP #1 HIGH TEMP.	DI ALARM / NORMAL	START / STOP
PUMP #1 SEAL LEAK	DI TROUBLE / NORMAL	RESET
PUMP #1 IN AUTO	DI AUTO	RUNNING / STOP
PUMP #1 IN HAND	DI HAND	START / STOP
PUMP #2 STATUS	DI RUNNING / STOPPED	RESET
PUMP #2 HIGH TEMP.	DI ALARM / NORMAL	RUNNING / STOP
PUMP #2 SEAL LEAK	DI TROUBLE / NORMAL	START / STOP
PUMP #2 IN AUTO	DI AUTO	START / STOP
PUMP #2 IN HAND	DI HAND	START / STOP
PUMP SELECTOR SW.	DI PUMP #1 / PUMP #2	START / STOP
SPARE / SPARE	DI SPARE / SPARE	RESET
SPARE / SPARE	DI SPARE / SPARE	RESET
GENERATOR	DI RUNNING / STOPPED	SPARE / SPARE
ATS IN NORMAL POSITION	DI NORMAL	SPARE / SPARE
ATS IN EMERGENCY POSITION	DI EMERGENCY	SPARE / SPARE
GENERATOR COMMON ALARM	DI ALARM / NORMAL	0-100%
WET WELL HLA	DI ALARM / NORMAL	0-100%
WET WELL LLA	DI ALARM / NORMAL	0-100%
PUMP NO. 1 VFD RUN	DI RUNNING / STOPPED	0-100%
PUMP NO. 2 VFD RUN	DI RUNNING / STOPPED	INCHES
PUMP NO. 1 VFD FAULT	DI ALARM / NORMAL	SPARE / SPARE
PUMP NO. 2 VFD FAULT	DI ALARM / NORMAL	SPARE / SPARE
	DI SPARE / SPARE	SPARE / SPARE
	DI SPARE / SPARE	SPARE / SPARE
PUMP NO. 1 VFD SPEED REFERENCE	AI 0-100%	
PUMP NO. 2 VFD SPEED REFERENCE	AI 0-100%	
WASTE WATER FLOW METER	AI GPM	
DOMESTIC WATER FLOW METER	AI GPM	
SPARE / SPARE	AI SPARE	
SPARE / SPARE	AI SPARE	



LIGHTING FIXTURE SCHEDULE										
TYPE	MANUF.	CATALOG NUMBER	LAMP DATA			FIXTURE TYPE			MOUNTING	REMARKS
			CRI	TEMP	WATT	FLUOR	LED	H.I.D.		
A	BEACON	FIXTURE CRZ/24L-27/4K7/SQM/UNV/PCU/AM/BLS	80+	4K	27	-	X	-	CONCRETE BASE	LED CUTOFF, CORROSION RESISTANT DIE CAST ALUMINUM HOUSING & DOOR, BLACK FINISH, TEMPERED IMPACT RESISTANT GLASS LENS, TWIN S.S. LATCHES, 120V ELECTRONIC DRIVER, 20KA, SURGE PROTECTION, ARM MOUNTED ON 5" TAPERED ALUMINUM POLE WITH HINGED BASE AT 14'-6"TT ABOVE BASE, BLACK FINISH (0.156" SHAFT THICKNESS)
B	HAPCO	POLE RTA-15-C-5-A-4-BA								
B	COLUMBIA	LXEM4-40ML-RFP-EU-SWH-SSL	80+	4K	42	-	X	-	UNISTRUT/ENCLOSURE	48" LED ENCLOSED AND GASKETED CABINET LED FIXTURE **

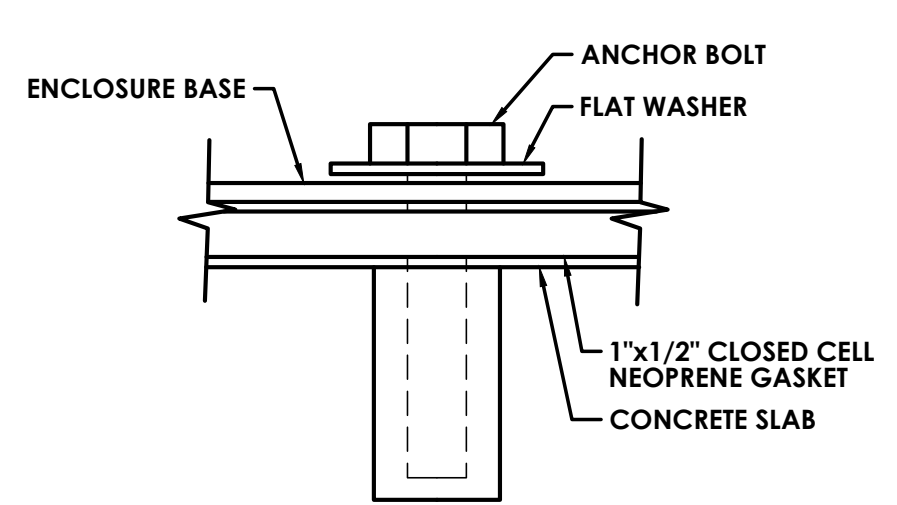
** PROVIDE UNISTRUT BRACKET TO MOUNT FIXTURE TO BACK PANEL, MAKE NO PENETRATIONS IN TOP OF ENCLOSURE.

SUPPLY FAN SCHEDULE											
UNIT No.	SERVICE	ARRANGEMENT	CFM	S.P. (IN. W.G.)	FAN/MOTOR RPM	DRIVE	HP	VOLTS/Ø/HZ	WEIGHT (LBS.)	MANUFACTURER MODEL	REMARKS
SF-1	WET WELL VENTILATION	RD-90 CENTRIFUGAL CCW-HORIZONTAL	400	0.5	2900/1800	BELT	1/2	115/1/60	120	INDUSTRIAL PLASTIC FAN CMV-125	① ② ③ ④ ⑤

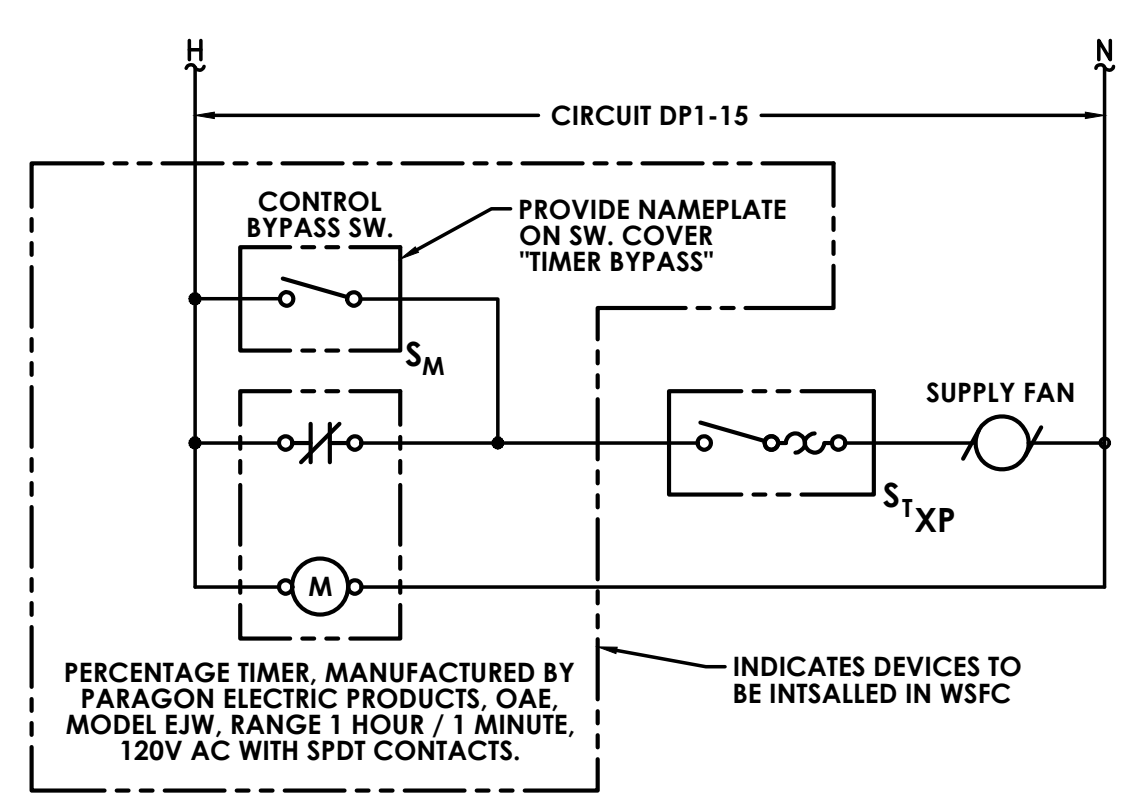
NOTES: FURNISH UNIT WITH: ① FRP ② WEATHERPROOF MOTOR COVER ③ 1/2" STAINLESS STEEL SCREEN ON INLET ④ SPARK-PROOF WHEEL ⑤ PROVIDE TWO (2) SPARE BELTS

VENTILATION FAN SIZING		
TOP OF WET WELL INVERT	34.27	FT
BOTTOM OF WET WELL INVERT	10.14	FT
WET WELL DIAMETER	6.00	FT
VOLUME	682.26	FT ³
SUPPLY FAN	400	CFM
AIR EXCHANGES PER HOUR	35	EXCHANGES
MIN. AIR CHANGES/HR. - INTERMITTENT	30	117%

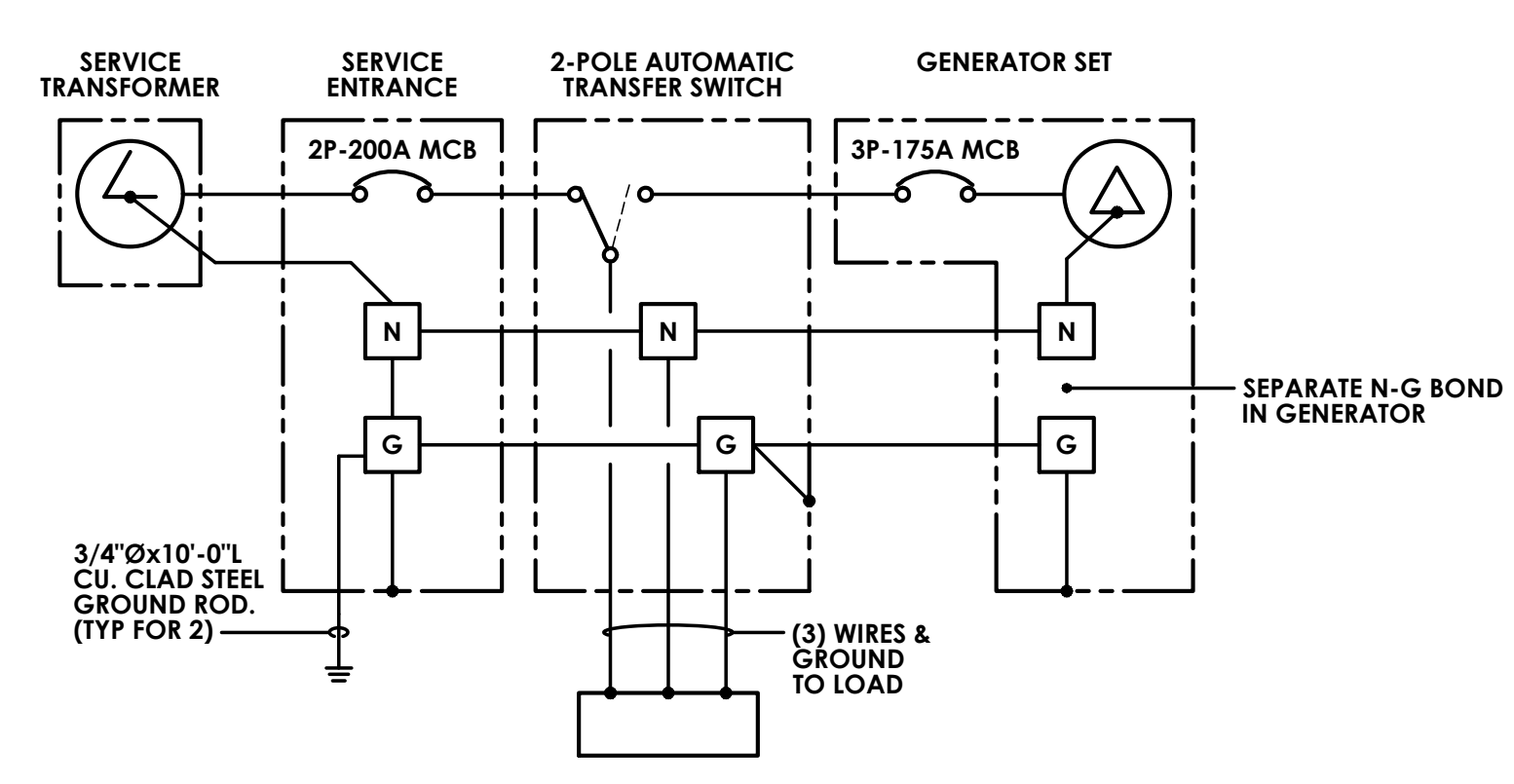
1 SCADA CONTROL DIAGRAM
E-106 NO SCALE



2 ANCHOR BOLT DETAIL
E-4 NO SCALE



3 WELL SUPPLY FAN CONTROL (WSFC) DIAGRAM
E-4 NO SCALE



4 ELECTRICAL: SERVICE/GENERATOR NEUTRAL/ GROUNDING DIAGRAM
E-4 NO SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed Professional Engineer in the State of Delaware. License No. 8242 - Expiration Date: 09-30-2024.

DAVIS BOWEN & FRIEDEL, INC.
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BALTIMORE, MARYLAND 21201
302-424-1441
410-354-9991

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Date:	SEPTEMBER 2024
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ELECTRICAL DIAGRAMS, SCHEDULES & DETAILS

ISSUED FOR REVIEW 09-16-2024

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Dwg No.: **E-401**