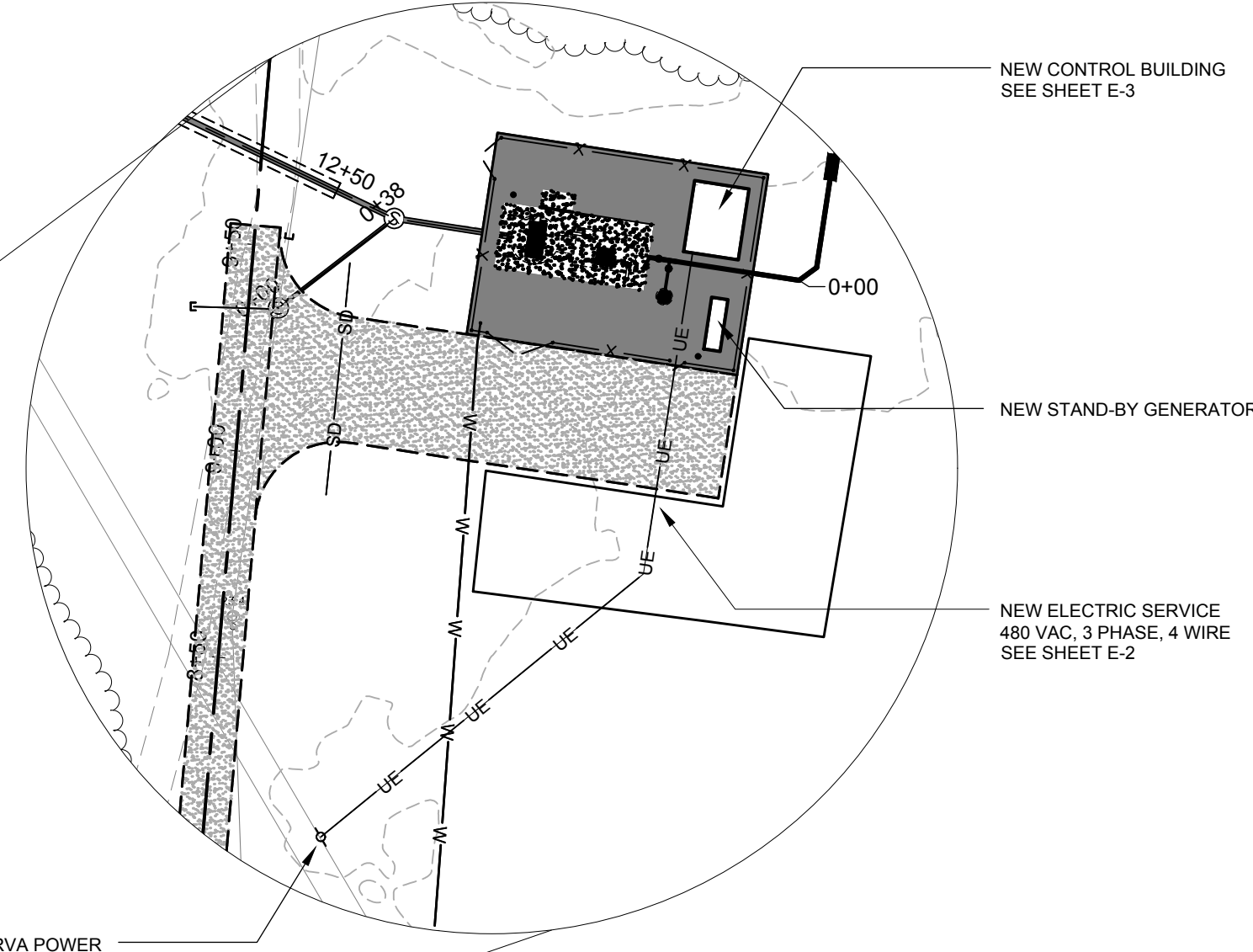
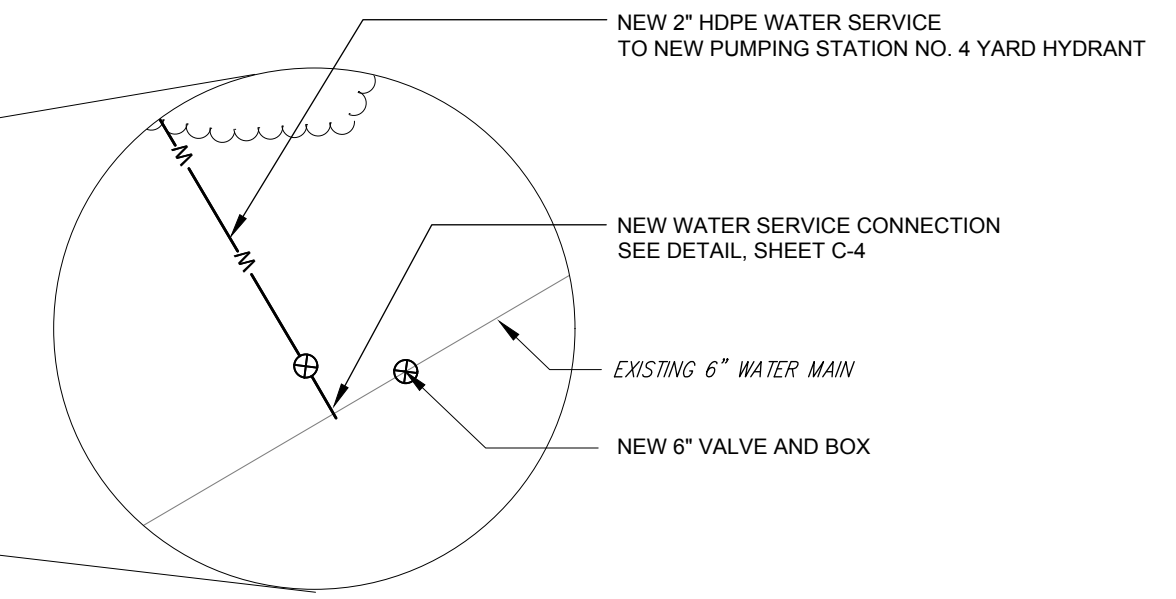


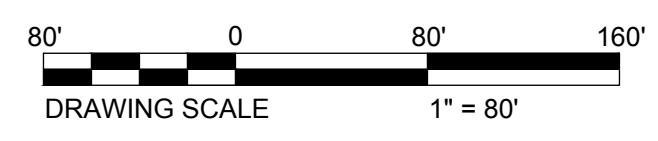
- NOTES:
1. CONTRACTOR SHALL COORDINATE ANY PROPOSED INTERRUPTION OR BYPASS OF FLOWS WITH THE OWNER AND ENGINEER. CONTRACTOR SHALL PROVIDE A MINIMUM SEVEN (7) DAYS NOTICE PRIOR TO ANY PROPOSED INTERRUPTION OF EXISTING SERVICE.
  2. EXECUTION OF THE WORK WITH MINIMAL DISRUPTION TO THE EXISTING FACILITIES' OPERATION IS A PRIORITY. CONTRACTOR SHALL FURNISH TEMPORARY EQUIPMENT AND LABOR FOR AND PROVIDE BYPASS PUMPING OF FLOWS AS NECESSARY TO EXECUTE THE WORK IN THE CONTRACT DOCUMENTS. THE PROPOSED BYPASS PUMPING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND COMMENT A MINIMUM OF 15 DAYS PRIOR TO ANY PROPOSED INTERRUPTION OF SERVICE.
  3. CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO OWNER AND ENGINEER FOR REVIEW AND COMMENT WITHIN 20 DAYS OF NOTICE TO PROCEED.



ELECTRIC SERVICE CONNECTION - DETAIL  
NO SCALE



WATER SERVICE CONNECTION - DETAIL  
NO SCALE



**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment  
5400 LIMESTONE ROAD  
WILMINGTON, DE 19808-1232  
TEL: 302.239.6634  
FAX: 302.239.8485

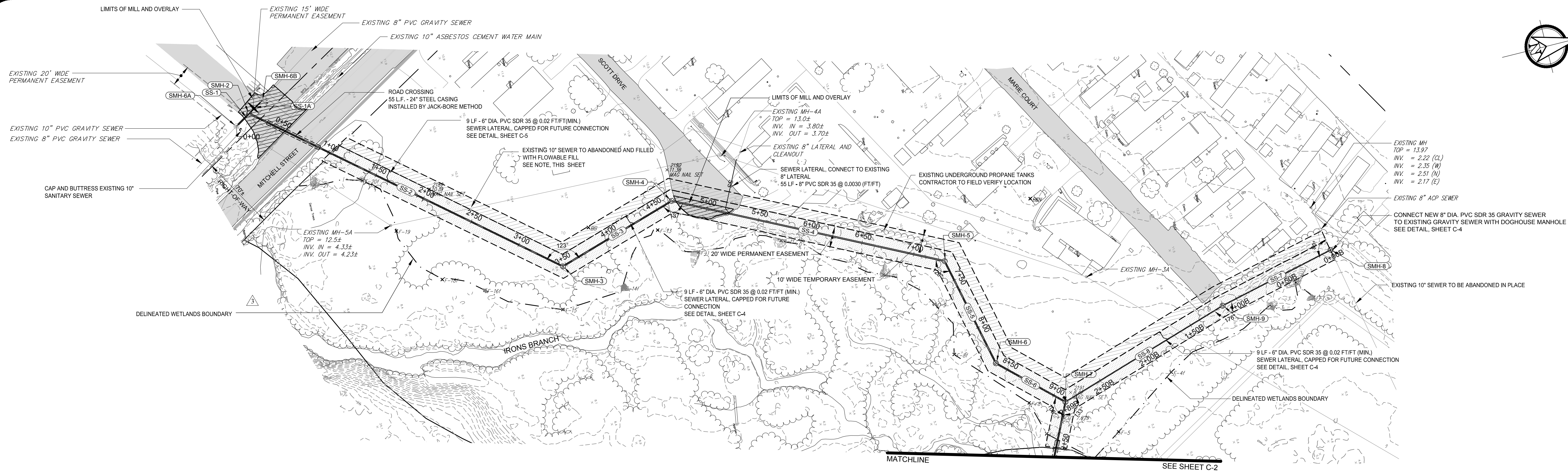
CHECKED BY: SCH  
DESIGNED BY: SHL  
DRAWN BY: SMC  
FILE NAME: UTILITY/SEWER/PROJECT  
STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE  
11-17-20  
P.E. 11578

NO.	REVISION	DATE	BY
1	ISSUED FOR PERMITTING	9/20/2022	SMC
2	ISSUED FOR BIDS		

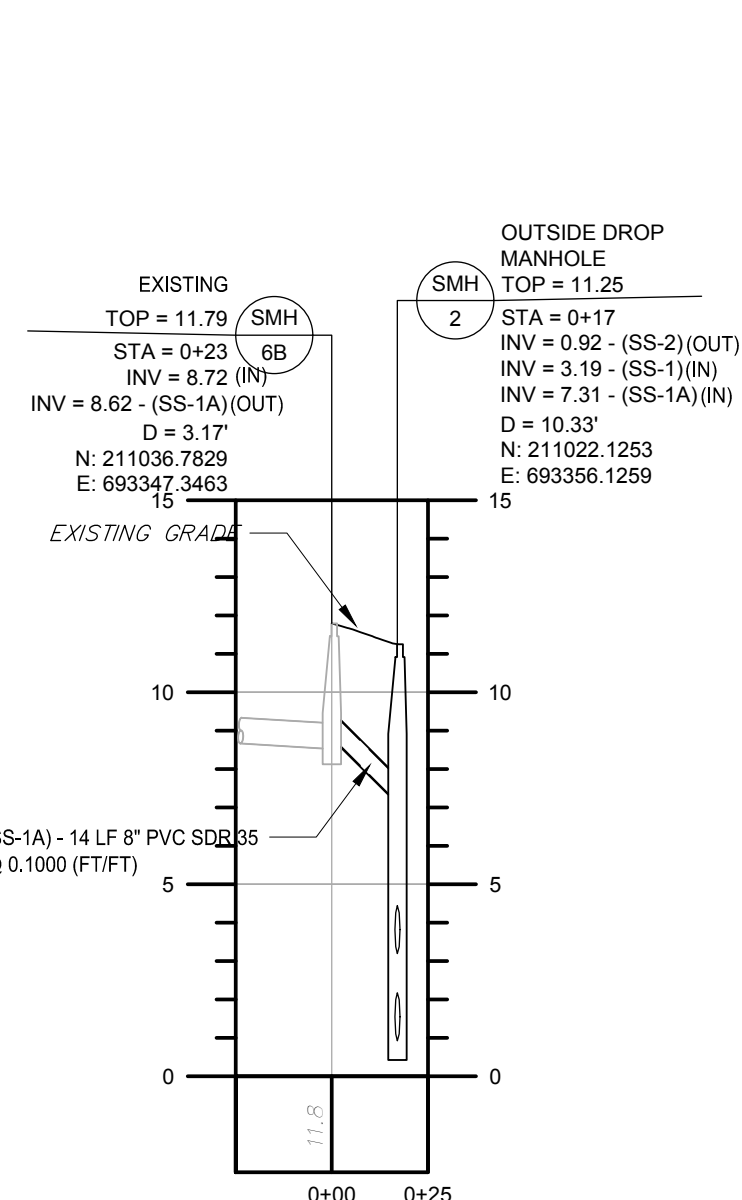
OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**BASE MAP**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: G-2

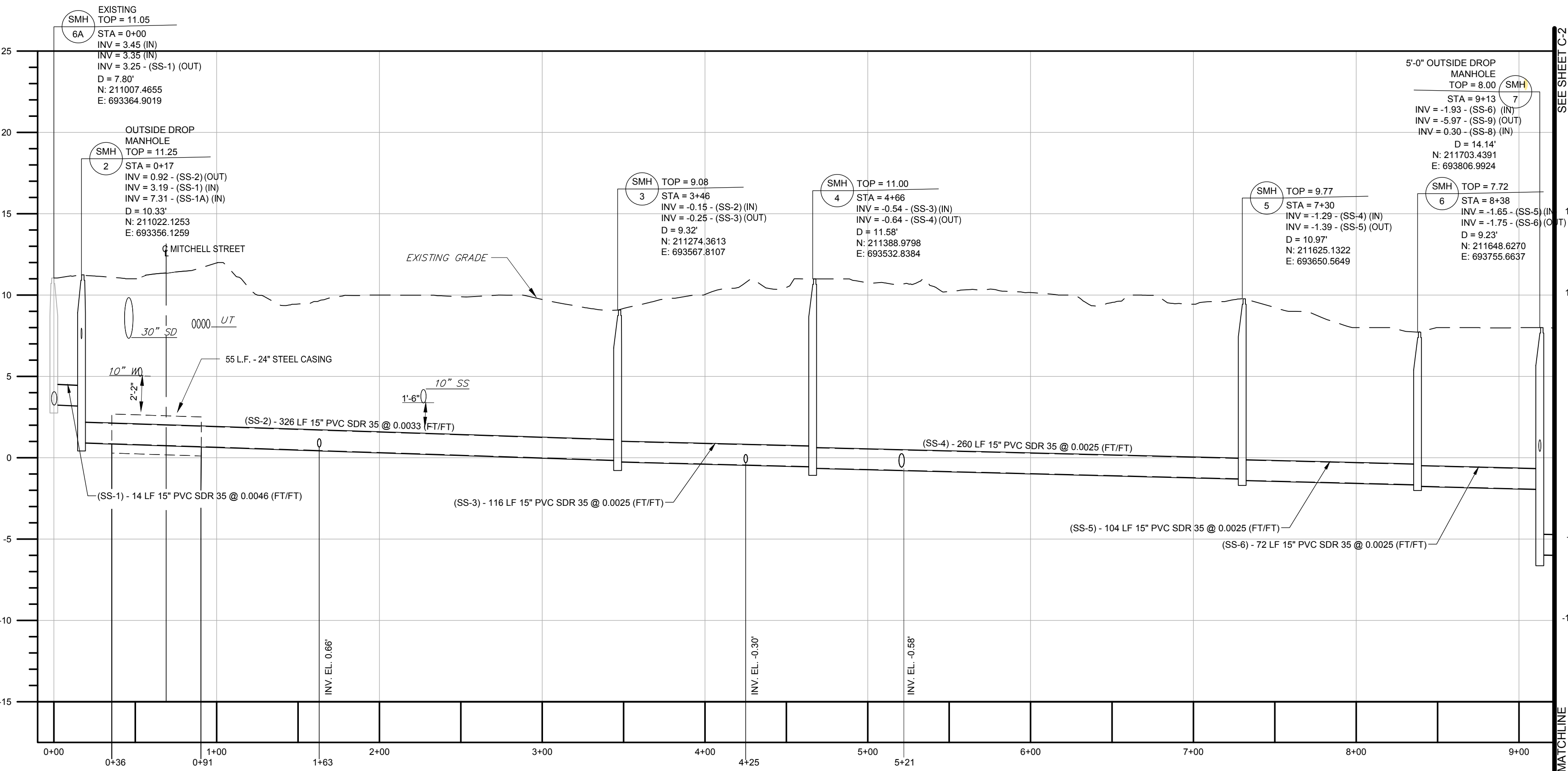


**GRAVITY SEWER - PLAN**  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'

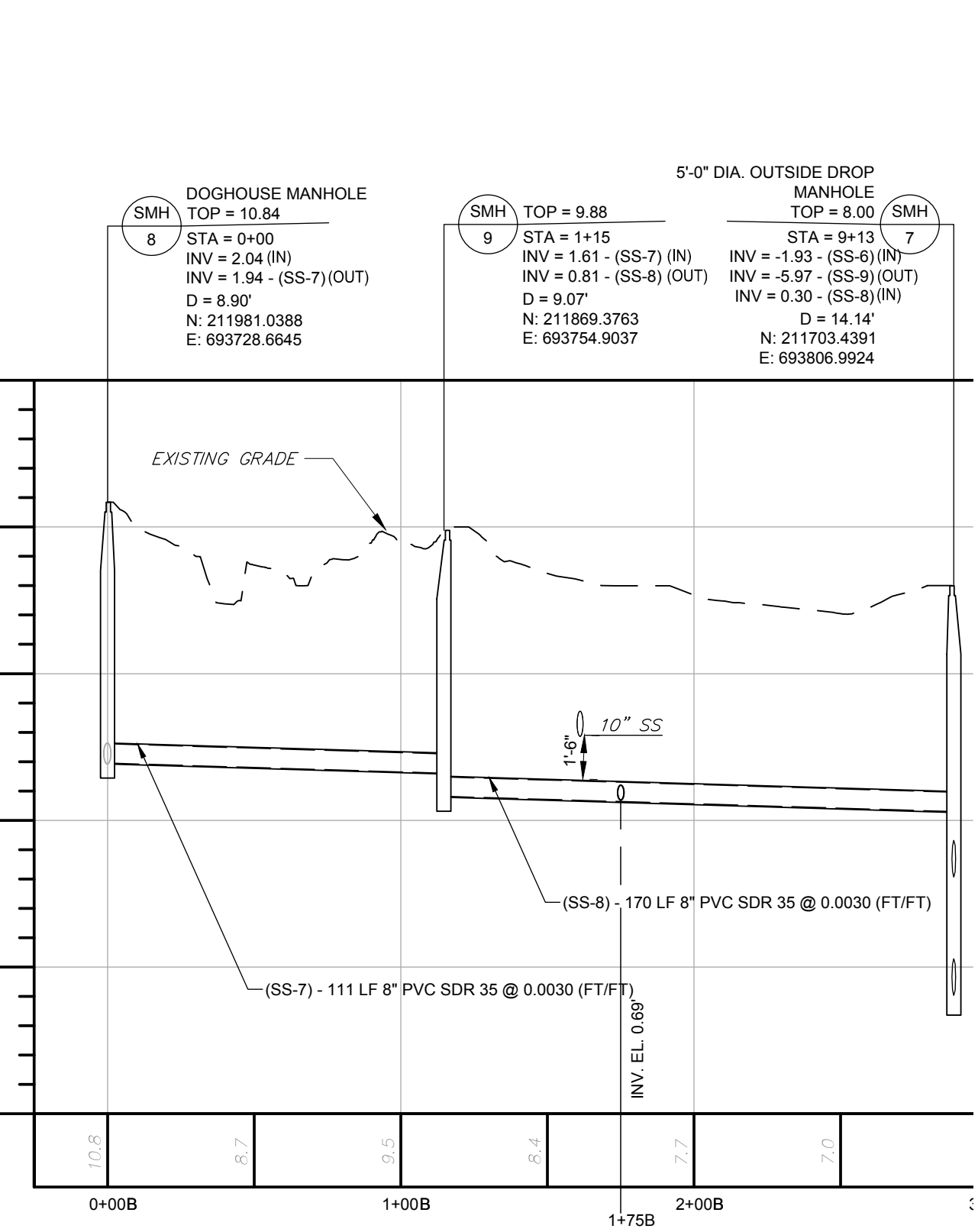


**GRAVITY SEWER - PROFILE**  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'

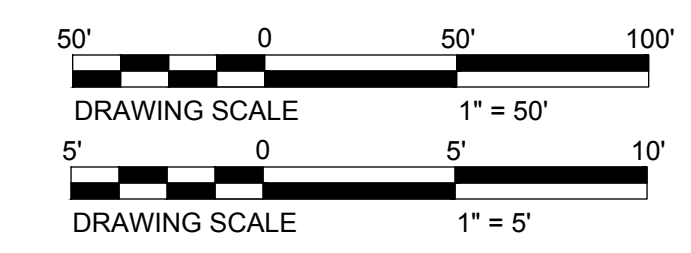
- NOTES:
- CONTRACTOR TO REMOVE EXISTING 8" PVC SANITARY SEWER FROM SMH-6A TO SMH-6B AND CORE DRILL EXISTING MANHOLE SMH-6A FOR NEW 18" DIA. SDR 35 SANITARY SEWER PIPE. SEAL WITH LINK-SEAL.
  - SEAL EXISTING 10" DOWNSTREAM SEWER AT MANHOLE 6A WITH BRICK AND NON-SHRINK GROUT
  - CONTRACTOR SHALL TEST PIT AT EXISTING UTILITY CROSSINGS TO VERIFY DEPTHS AND LOCATIONS OF EXISTING UTILITIES.
  - ABANDON EXISTING 10" SEWER IN PLACE AND FILL WITH FLOWABLE FILL FROM EXISTING MANHOLES 5A TO 4A AND EXISTING MANHOLES 3A TO 2A. REMOVE EXISTING MANHOLES 5A AND 4A TO 3'-0" BELOW GRADE AND FILL WITH FLOWABLE FILL. REMOVE FRAME AND COVER AND RISER RINGS FROM EXISTING MANHOLE 3A AND FILL WITH FLOWABLE FILL. SEE SHEET C-2 FOR EXISTING MANHOLE 2A LOCATION.
  - ALL NEW MANHOLES SHALL BE 48" DIAMETER UNLESS OTHERWISE NOTED.



**GRAVITY SEWER - PROFILE**  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'



**GRAVITY SEWER - PROFILE B**  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'



**DUFFIELD ASSOCIATES**  
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5400 LIMESTONE ROAD  
WILMINGTON, DE 19808-1232  
TEL: 302.239.6634  
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OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY  
WEB: HTTP://DUFFIELD.COM  
E-MAIL: DUFFIELD@DUFFIELD.COM

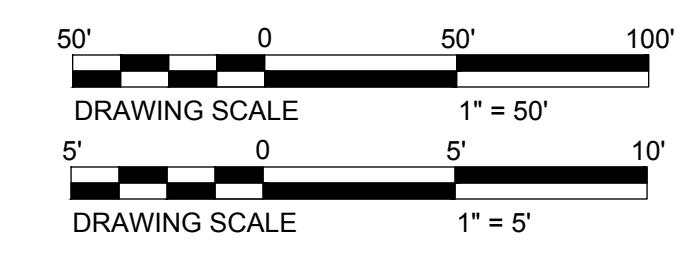
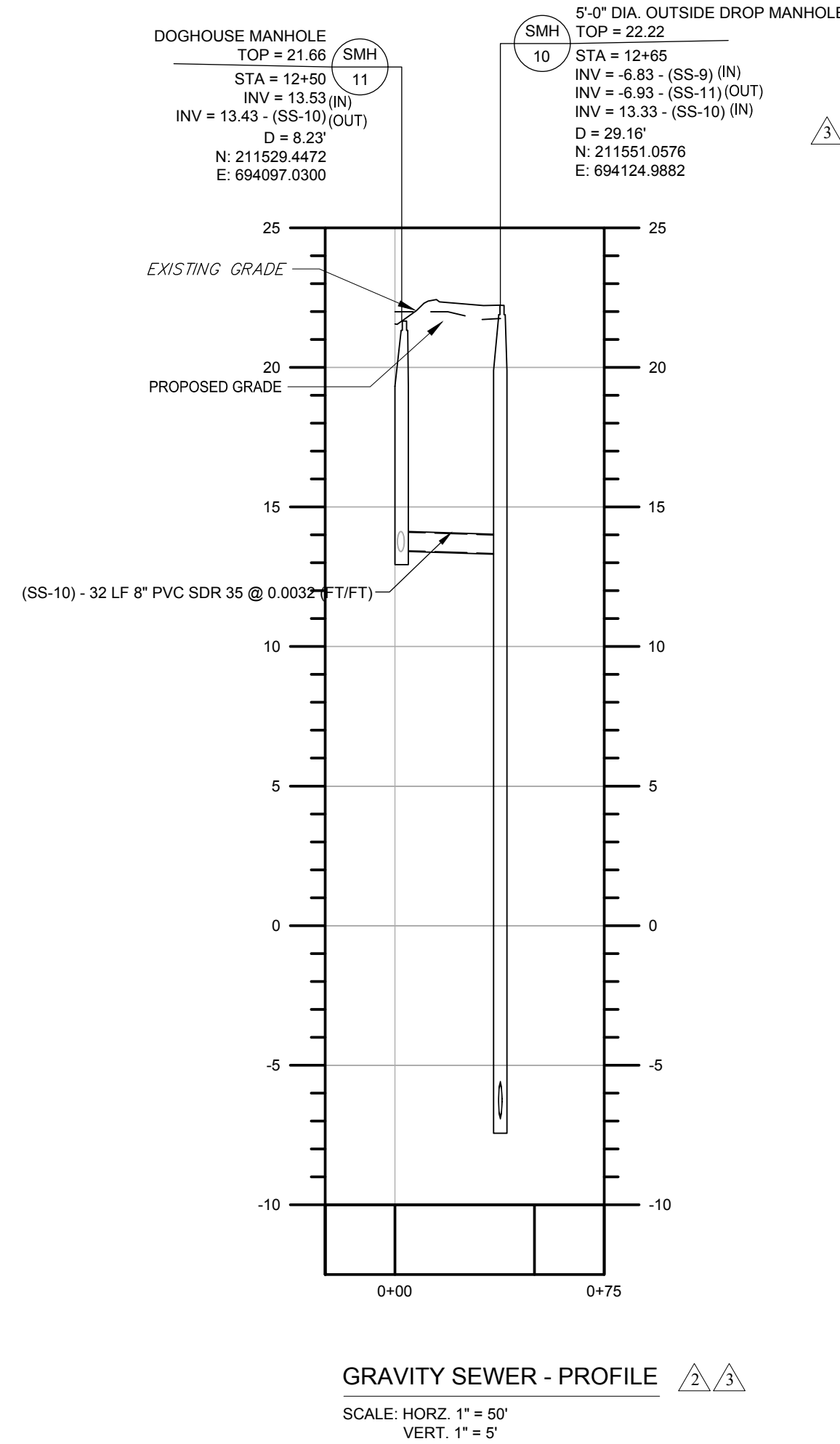
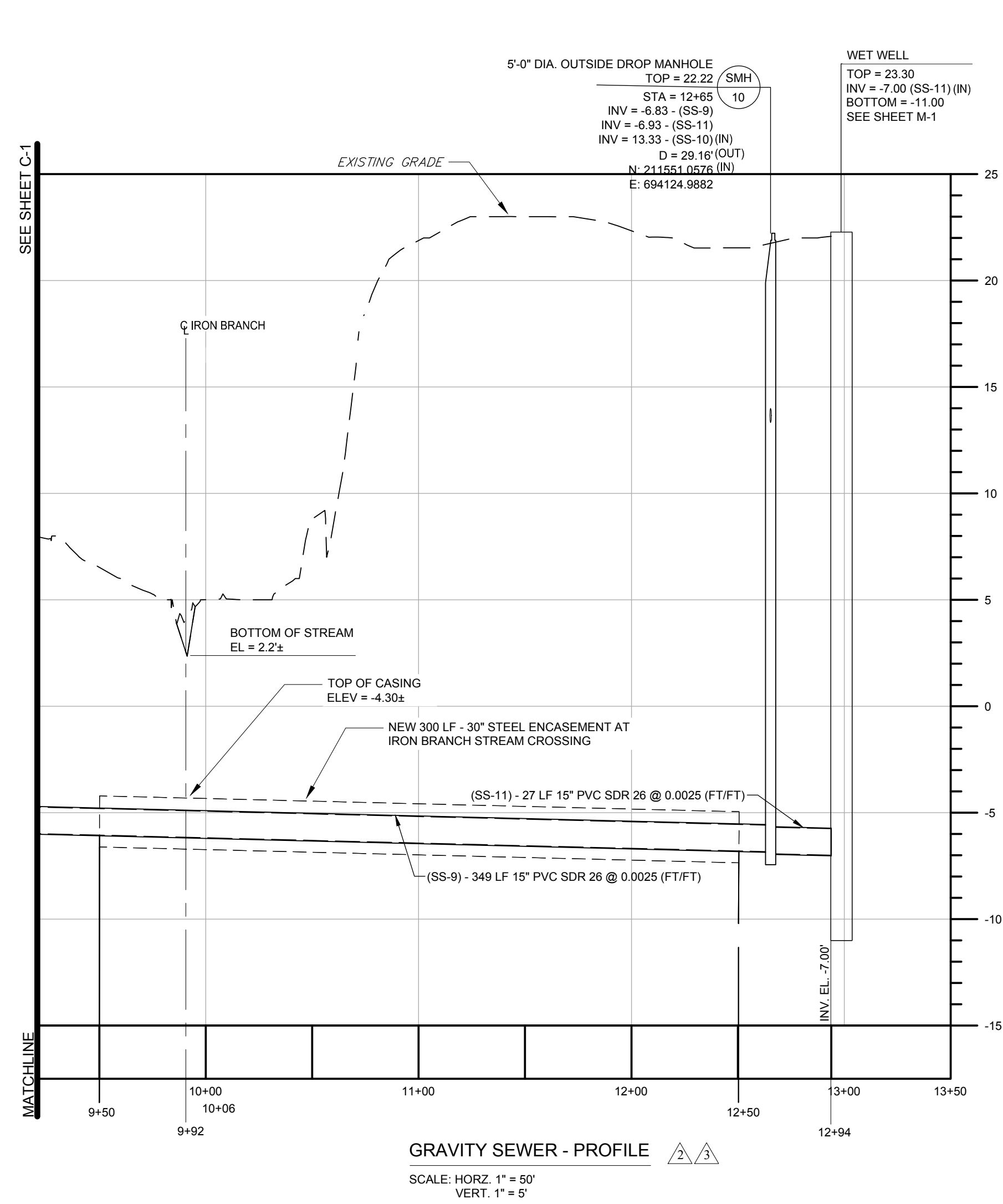
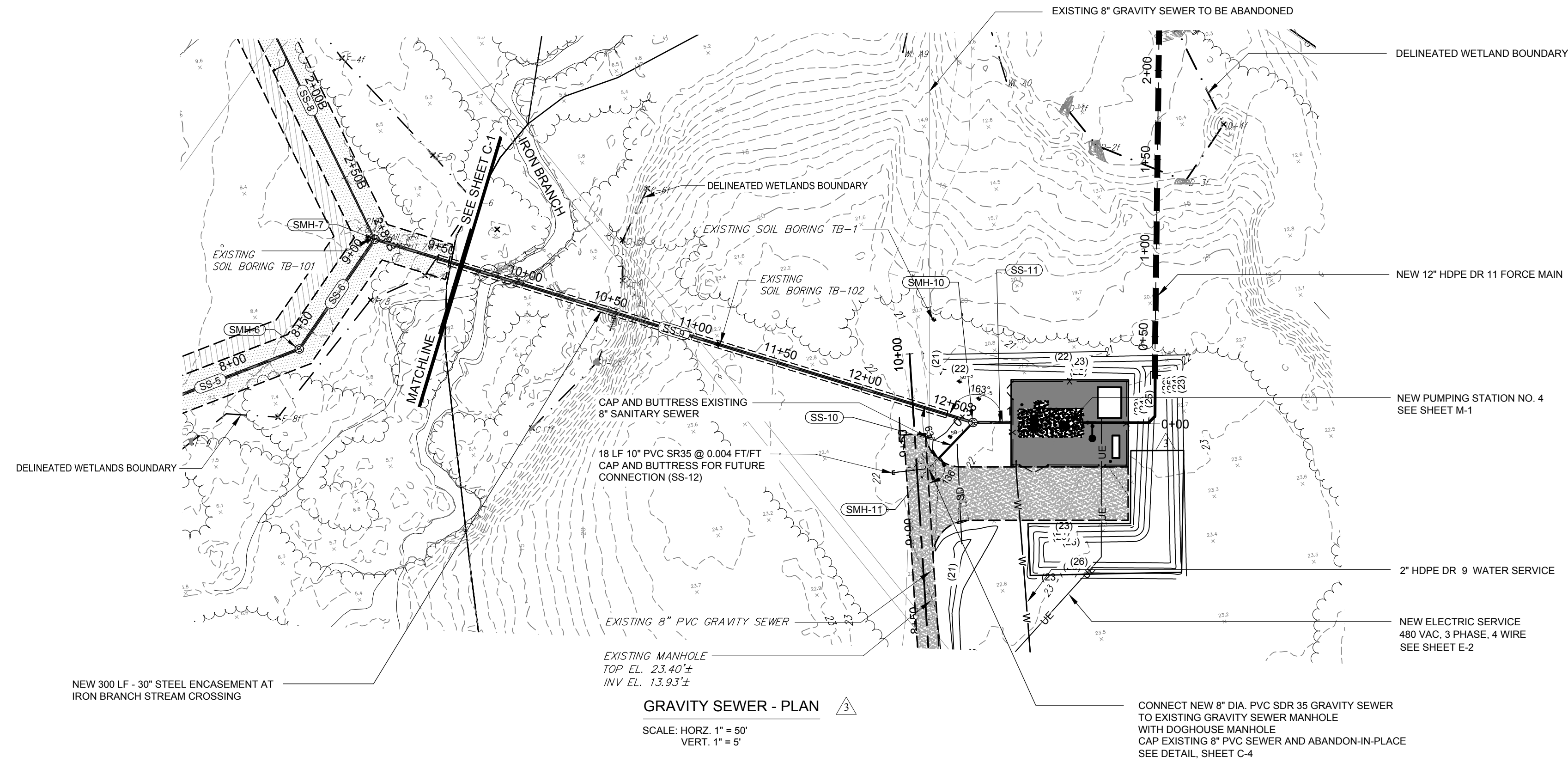
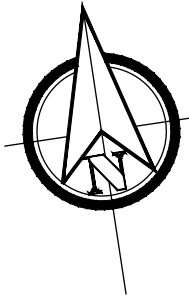
CHECKED BY: SCB  
DESIGNED BY: SMC  
DRAWN BY: SMC  
DATE: 12/7/2021  
FILE NAME: UTILITY IMPROVEMENT  
DESIGNER: STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE PROFESSIONAL ENGINEERING BOARD  
11-17-20  
STATE DELAWARE P.E. 11578

NO.	REVISION
1	ISSUED FOR PERMITTING
2	ISSUED FOR BIDS

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**GRAVITY SEWER PLAN AND PROFILE**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-1



**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment  
5400 LIMESTONE ROAD  
WILMINGTON, DE 19808-1232  
TEL: 302.239.6634  
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WEB: HTTP://DUFFNET.COM  
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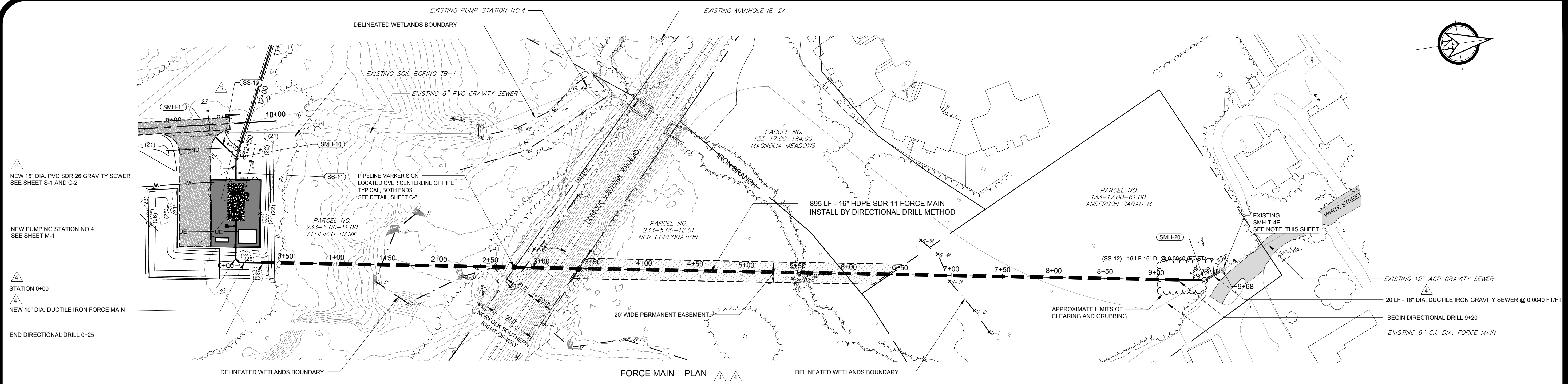
CHECKED BY: SCH  
DESIGNED BY: SHL  
DRAWN BY: SMC  
FILE NAME: UTILITY/SEWER/PROJ/001  
DESIGNED BY: STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE  
11-17-20  
P.E. 11578

NO.	REVISION	DATE	BY	APP.
1	ISSUED FOR PERMITTING	1/27/2021	SMC	
2	ISSUED FOR BIDS	2/20/2022	SMC	

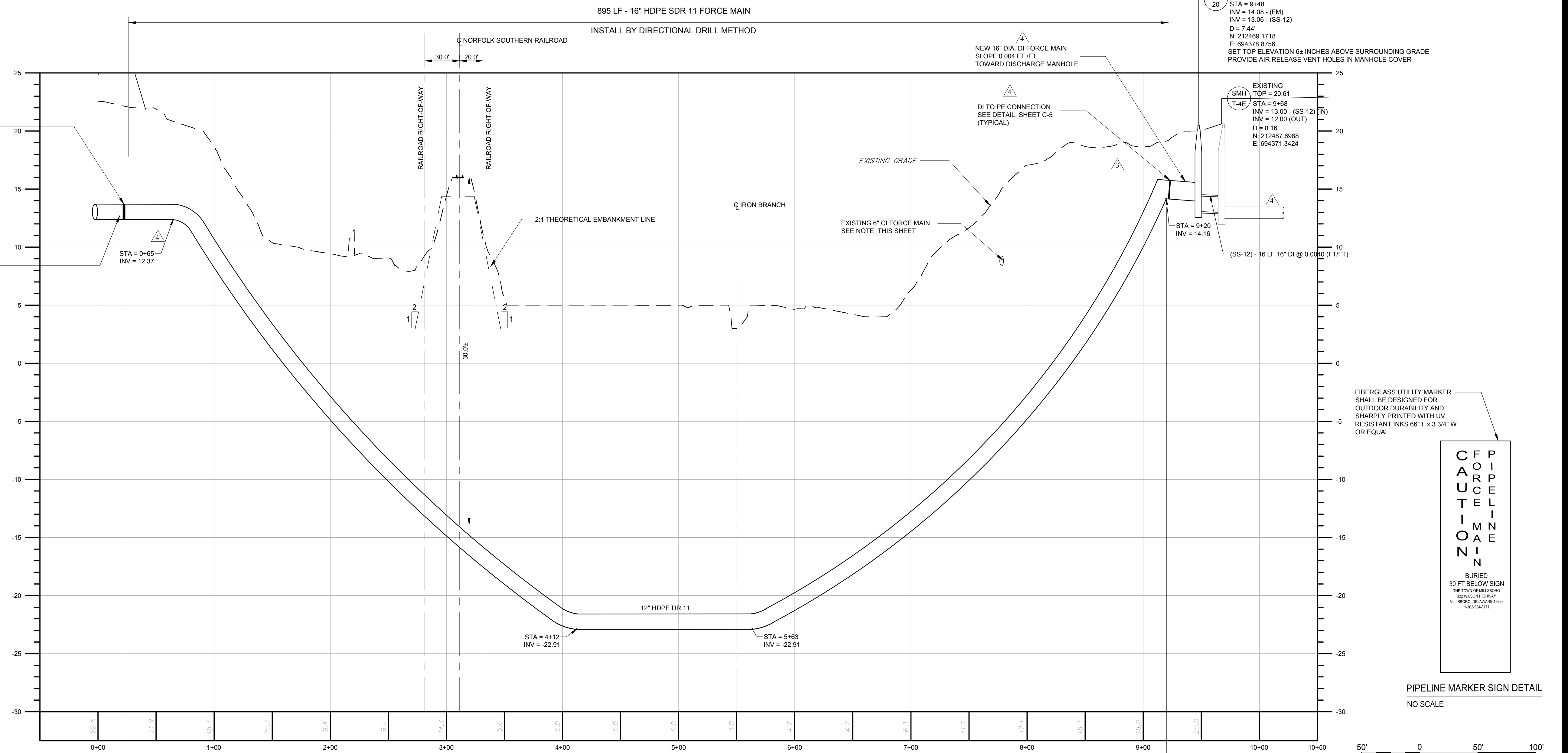
OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302.934.8171

**GRAVITY SEWER PLAN AND PROFILE**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-2



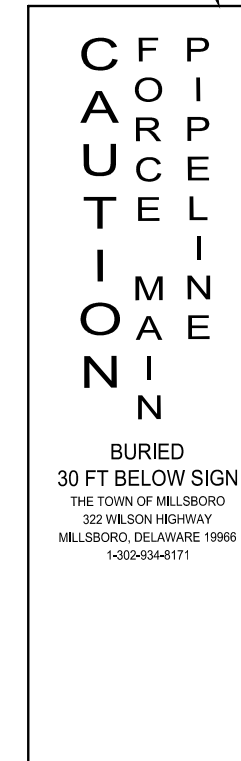
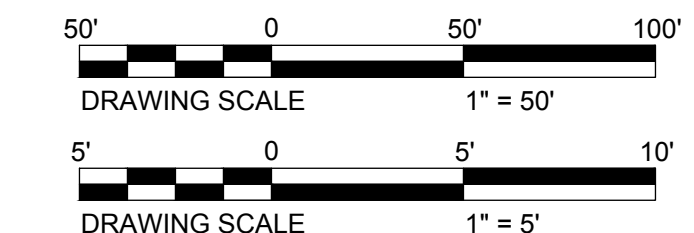
**FORCE MAIN - PLAN**  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



- NOTES:**
- CONTRACTOR SHALL TEST PIT AT EXISTING UTILITY CROSSINGS TO VERIFY DEPTHS AND LOCATIONS OF EXISTING UTILITIES.
  - CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY BYPASS PIPING AT EXISTING 6" CI FORCE MAIN DURING CONSTRUCTION.
  - CONTRACTOR SHALL CORE-DRILL EXISTING MANHOLE SMH-T-4E FOR NEW 15" DIA. PVC SDR 35 SEWER CONNECTION. SEAL WITH LINK SEAL.
  - CONTRACTOR SHALL INSTALL HORIZONTAL DIRECTIONAL DRILL IN ACCORDANCE WITH "SPECIFICATIONS FOR PIPELINE OCCUPANCY OF NORFOLK SOUTHERN CORPORATION PROPERTY".

- GENERAL NOTES:**
- CONTRACTOR SHALL FOLLOW ALL REQUIREMENTS OF NORFOLK SOUTHERN'S NSCE-8 SPECIFICATIONS
  - PIPELINE AND CROSSING TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH LAST APPROVED AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION SPECIFICATIONS FOR PIPELINES CONVEYING FLAMMABLE AND NON-FLAMMABLE SUBSTANCES
  - BLASTING NOT PERMITTED

**FORCE MAIN - PROFILE**  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



**PIPELINE MARKER SIGN DETAIL**  
NO SCALE

**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment  
5400 LIMESTONE ROAD  
WILMINGTON, DE 19808-1232  
TEL: 302.239.6634  
FAX: 302.239.8485

CHECKED BY: SCH  
DESIGNED BY: S  
DRAWN BY: S  
FILE NAME: UTILITY IMPROVEMENT  
STEVEN H. LEVANDOWSKI, P.E.  
9/20/2022  
2/16/2024

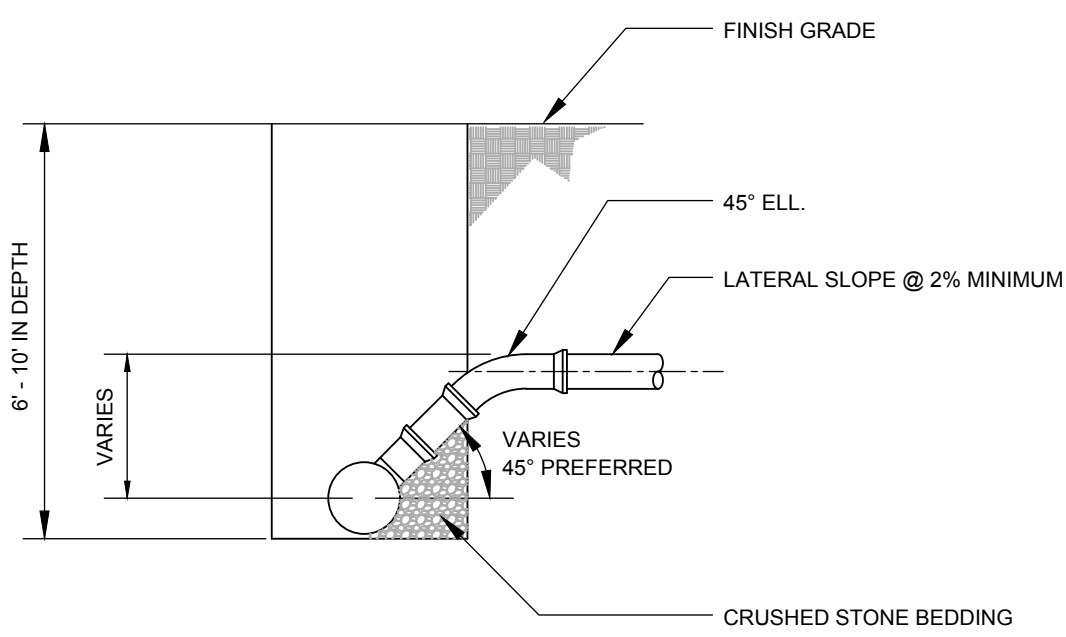
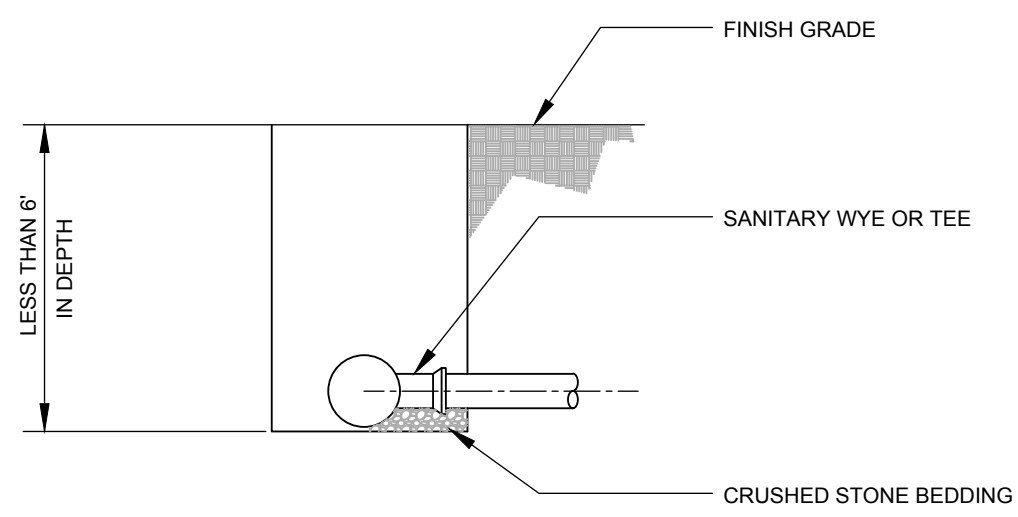
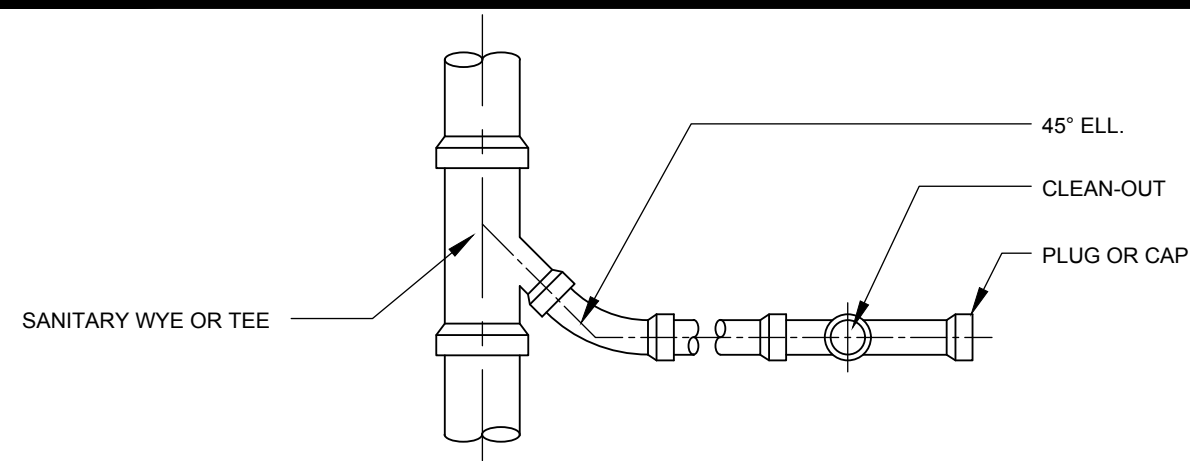


NO.	REVISION	DATE	DESCRIPTION
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2	INDIRECT COMMENTS	9/20/2022	
3	ISSUED FOR BIDS	2/16/2024	

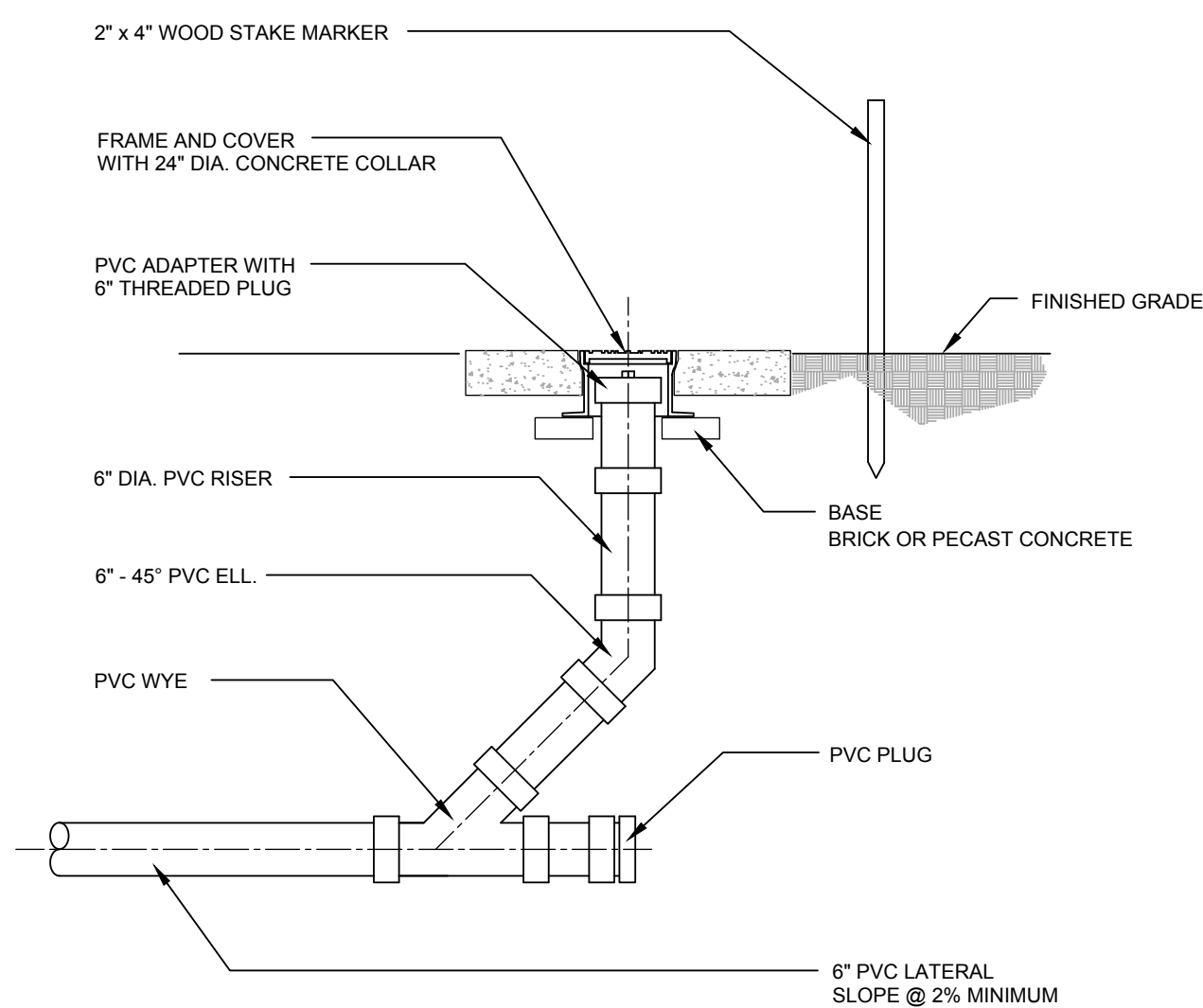
OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**FORCE MAIN PLAN AND PROFILE**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

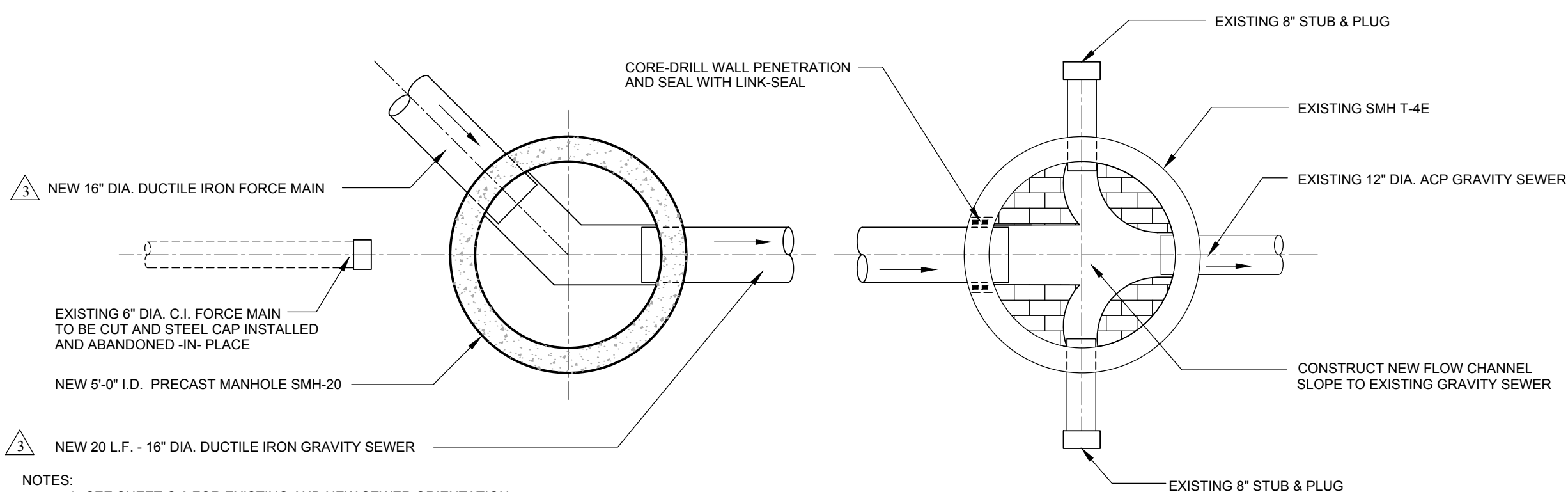
DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-3



**SEWER LATERAL DETAILS**  
NO SCALE

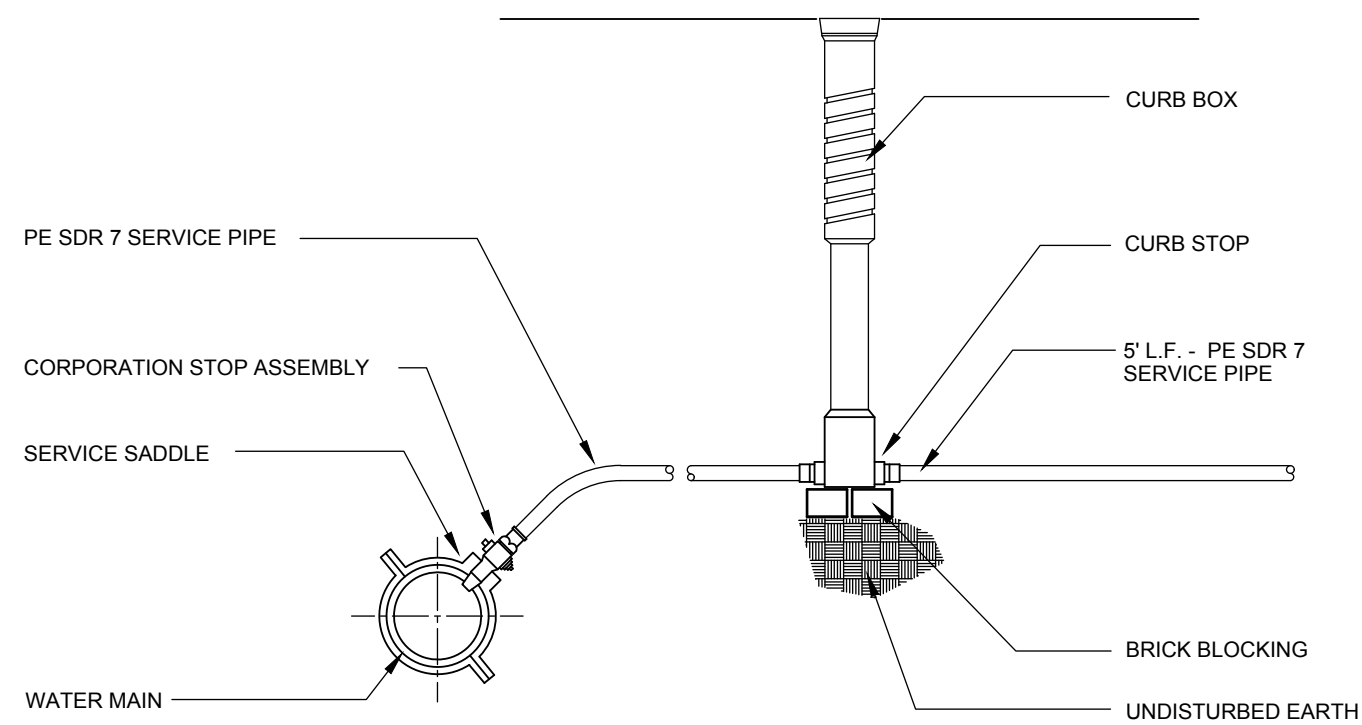


**LATERAL CLEAN-OUT DETAIL**  
NO SCALE

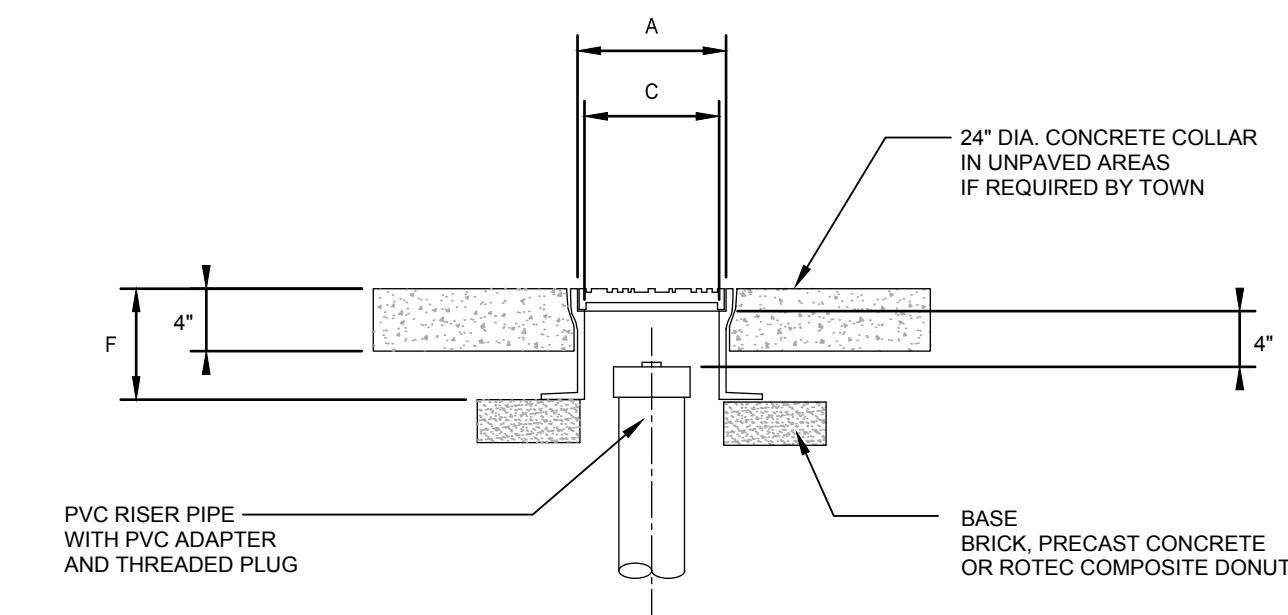
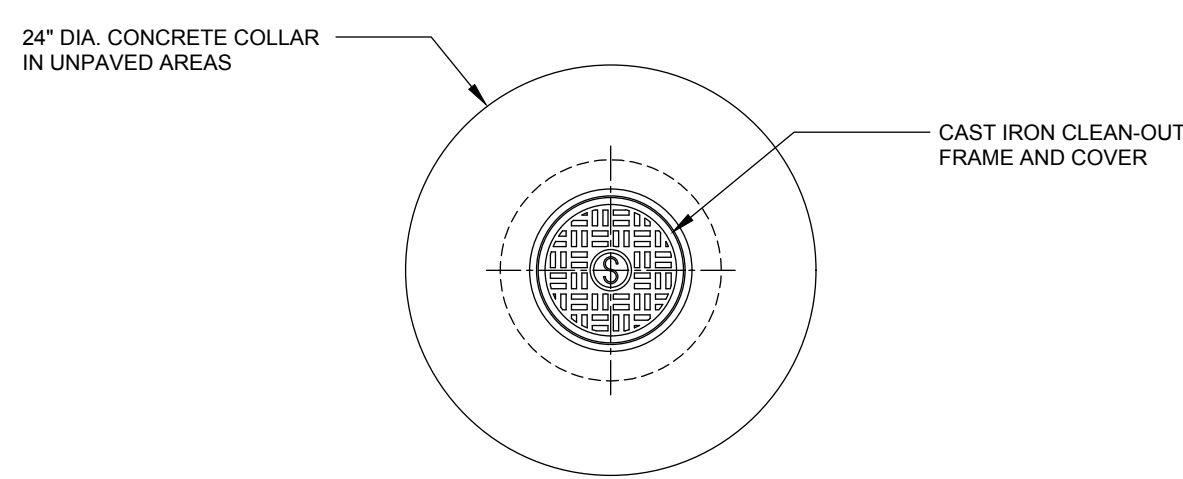


NOTES:  
1. SEE SHEET C-3 FOR EXISTING AND NEW SEWER ORIENTATION.  
2. CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY BY-PASS AT EXISTING 6" DIA. C.I. FORCE MAIN DURING CONSTRUCTION.

**SMH-20 TO SMH T-4E INTERCONNECTION DETAIL**  
NO SCALE

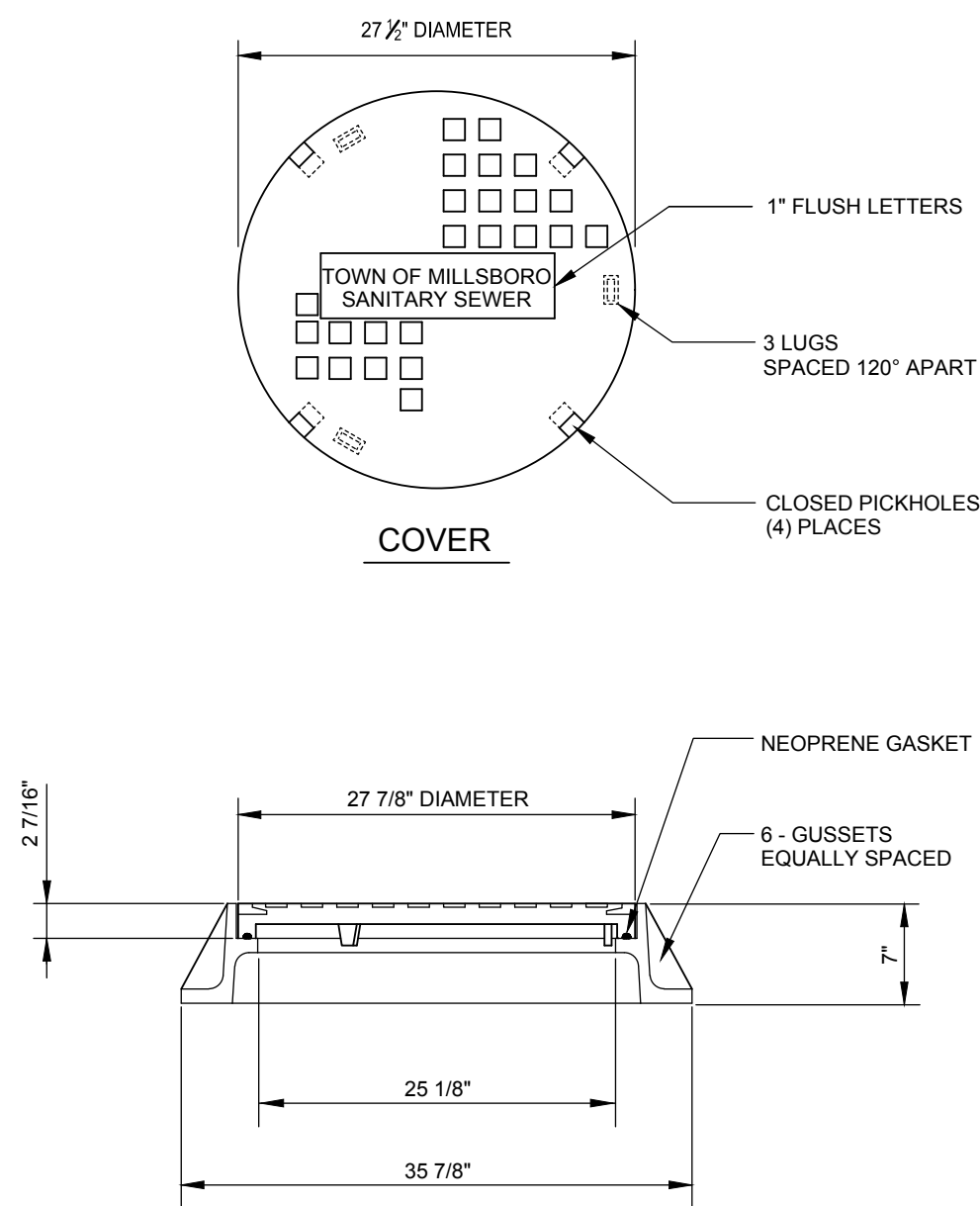


**WATER SERVICE CONNECTION**  
NO SCALE



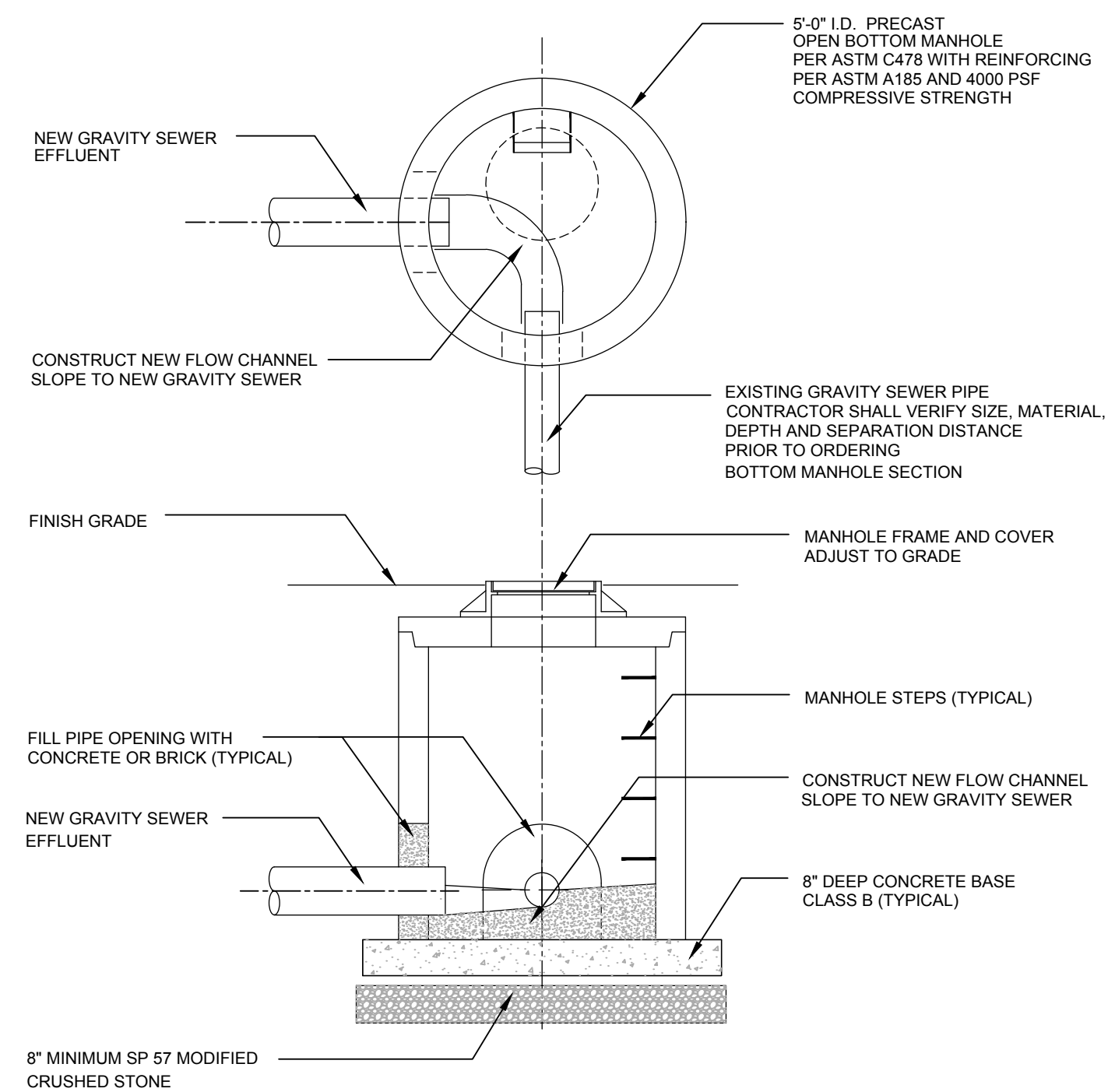
MANUFACTURERS	DIMENSION	6" CLEAN-OUT	8" CLEAN-OUT
	*A*	10 1/2"	11 1/4"
	*C*	9"	10"
	*F*	8"	8"
EAST JORDAN IRON WORKS		1565	1578
NEENAH FOUNDRY		R-1975-A2	R-1976

**CLEAN OUT FRAME AND COVER**  
NO SCALE



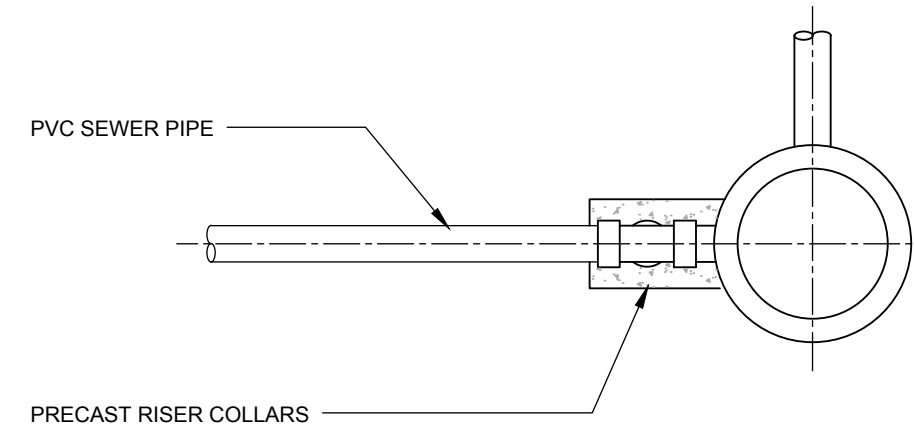
**FRAME**  
**MANHOLE FRAME AND COVER**  
NO SCALE

AVAILABLE PRODUCTS:  
1. EAST JORDAN IRON WORKS NO. 2080  
2. NEENAH FOUNDRY NO. 1683



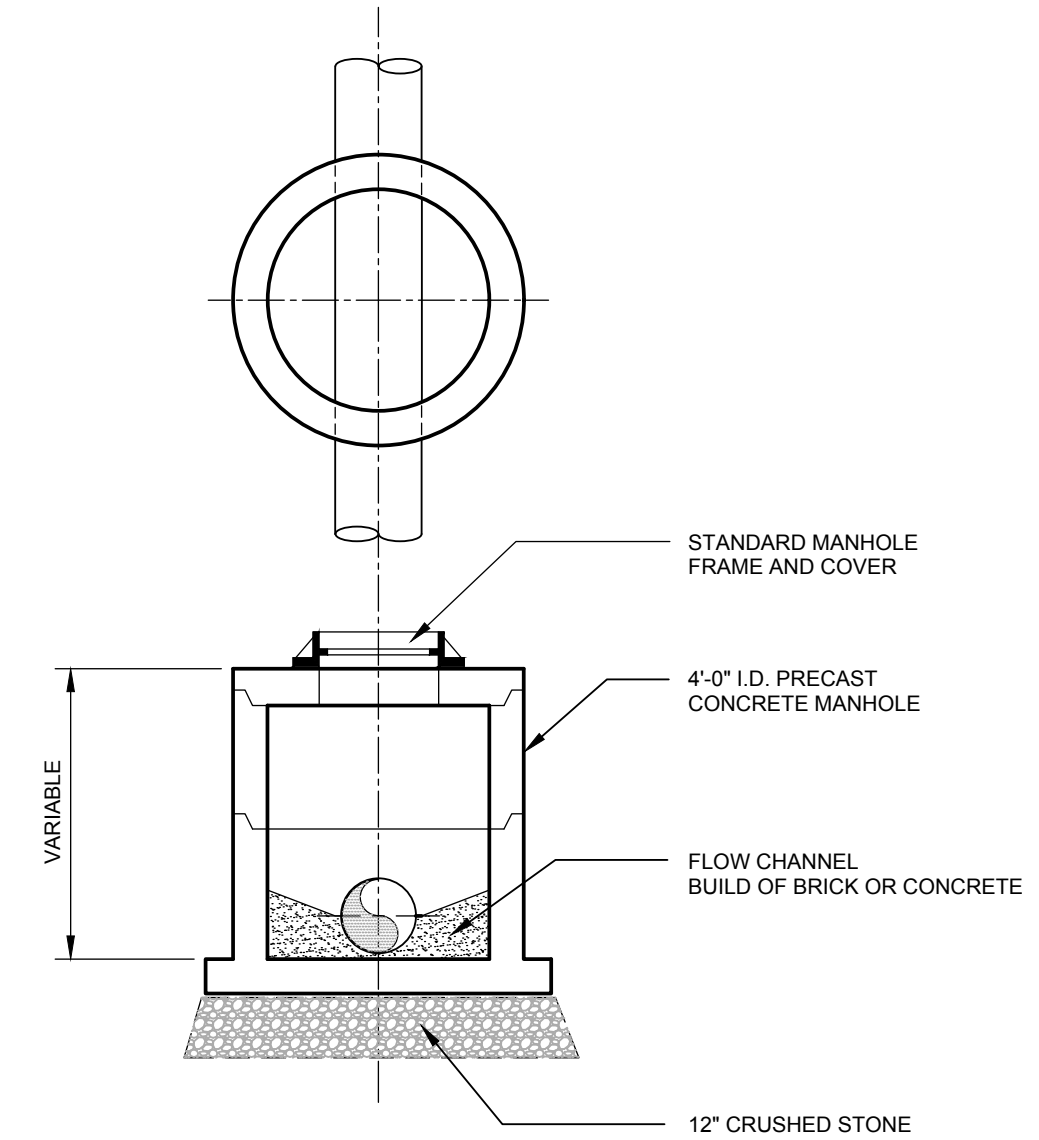
NOTE:  
PROVIDE PROTECTIVE COATING ON ALL EXTERIOR SURFACES.  
REFER TO SPECIFICATION SECTION 5B OF THIS STANDARD FOR ADDITIONAL DETAILS.

**DOGHOUSE MANHOLE DETAIL**  
NO SCALE

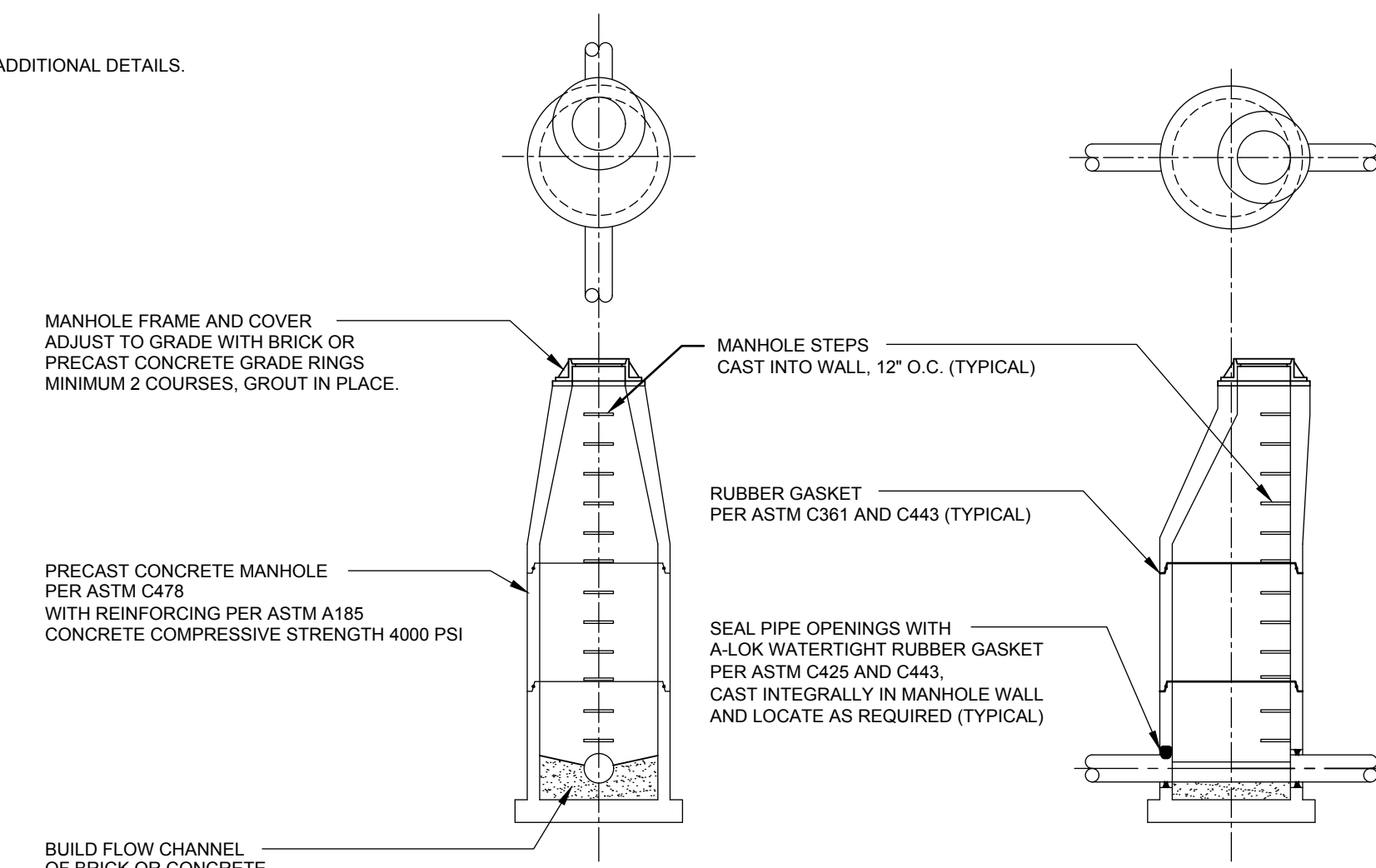


**MANHOLE OUTSIDE DROP CONNECTION**  
NO SCALE

NOTE:  
PROVIDE PROTECTIVE COATING ON ALL EXTERIOR SURFACES.  
REFER TO SPECIFICATION SECTION 5B OF THIS STANDARD FOR ADDITIONAL DETAILS.



**SHALLOW GRAVITY SEWER MANHOLE**  
NO SCALE



**GRAVITY SEWER MANHOLE DETAIL**  
NO SCALE

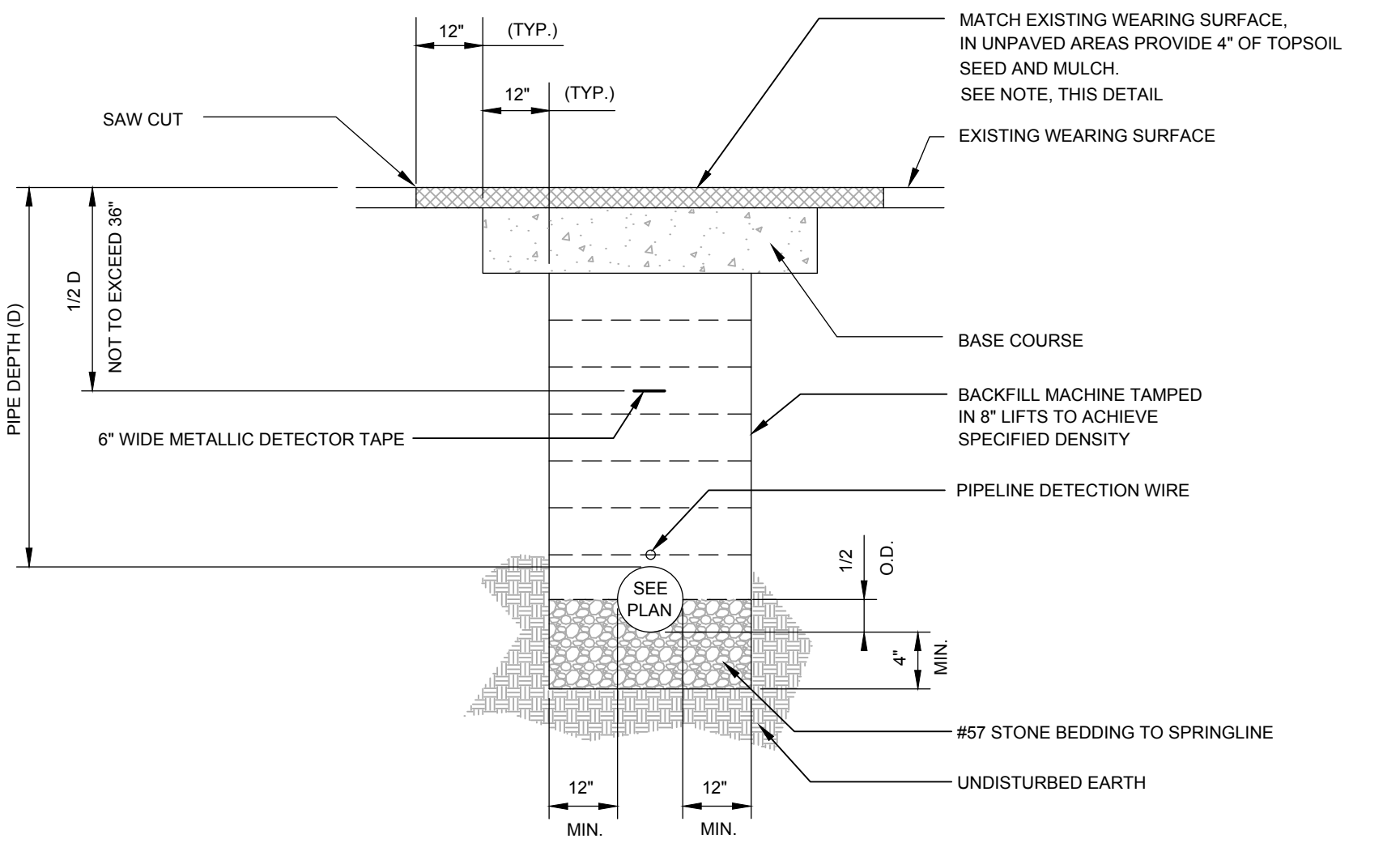
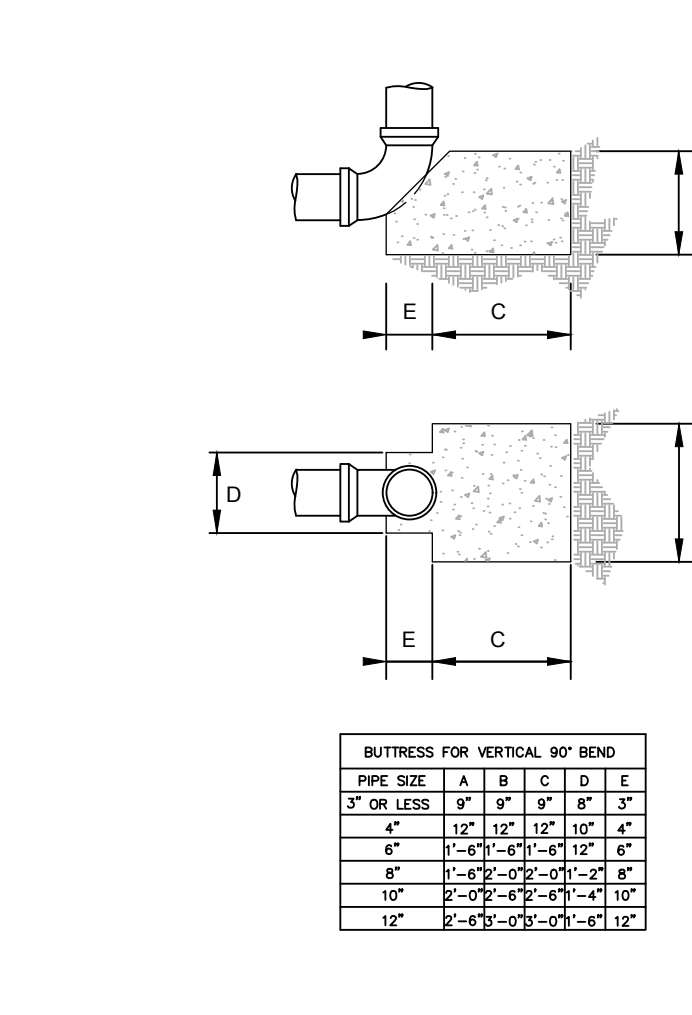
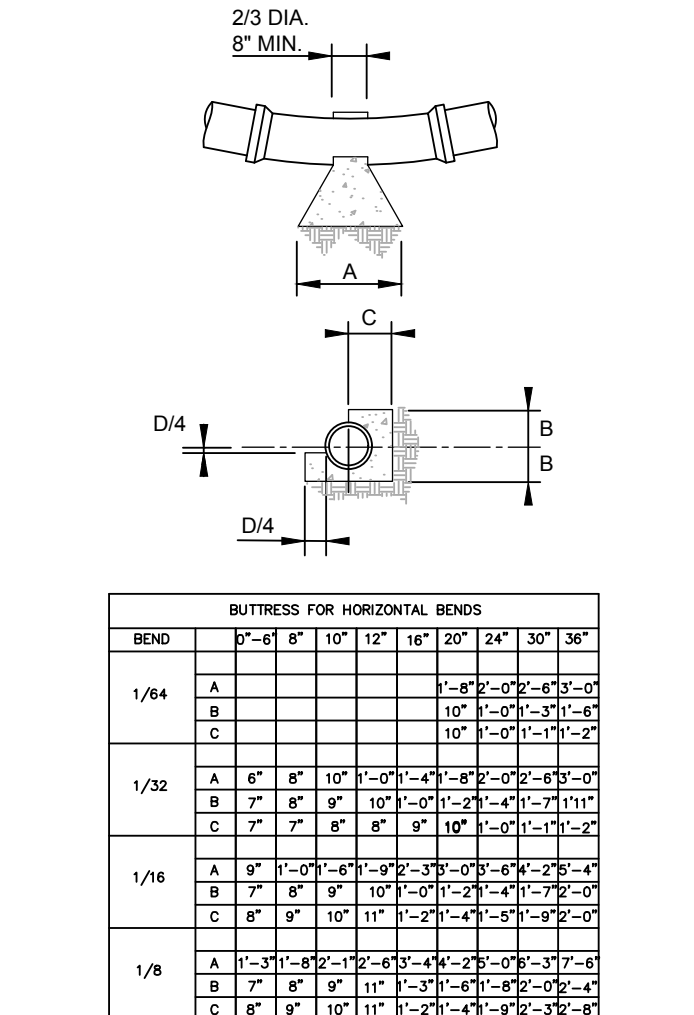
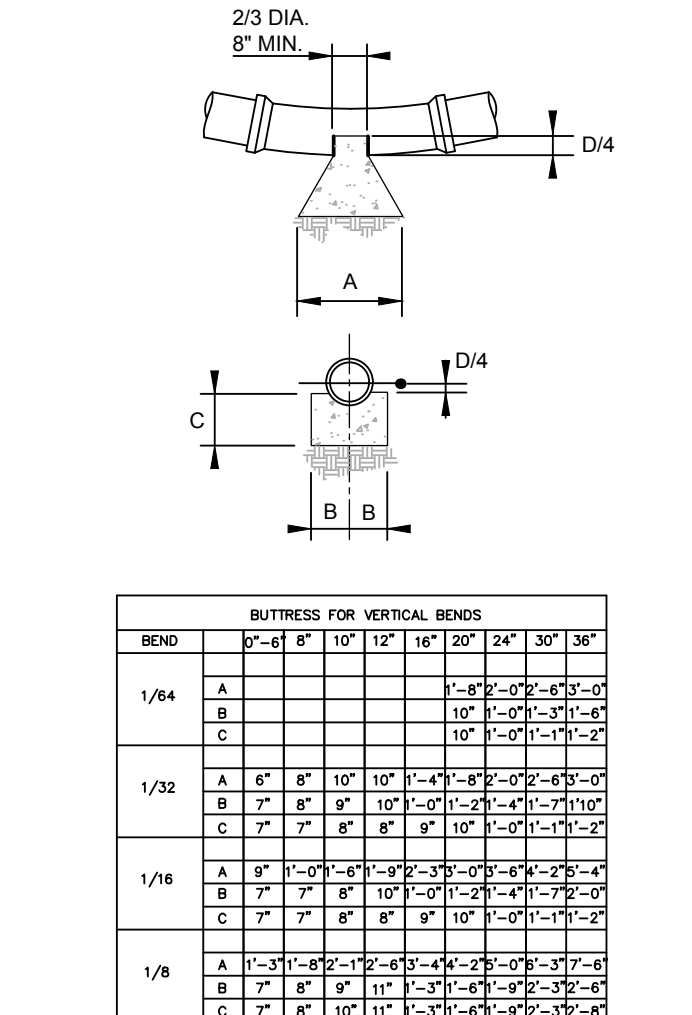
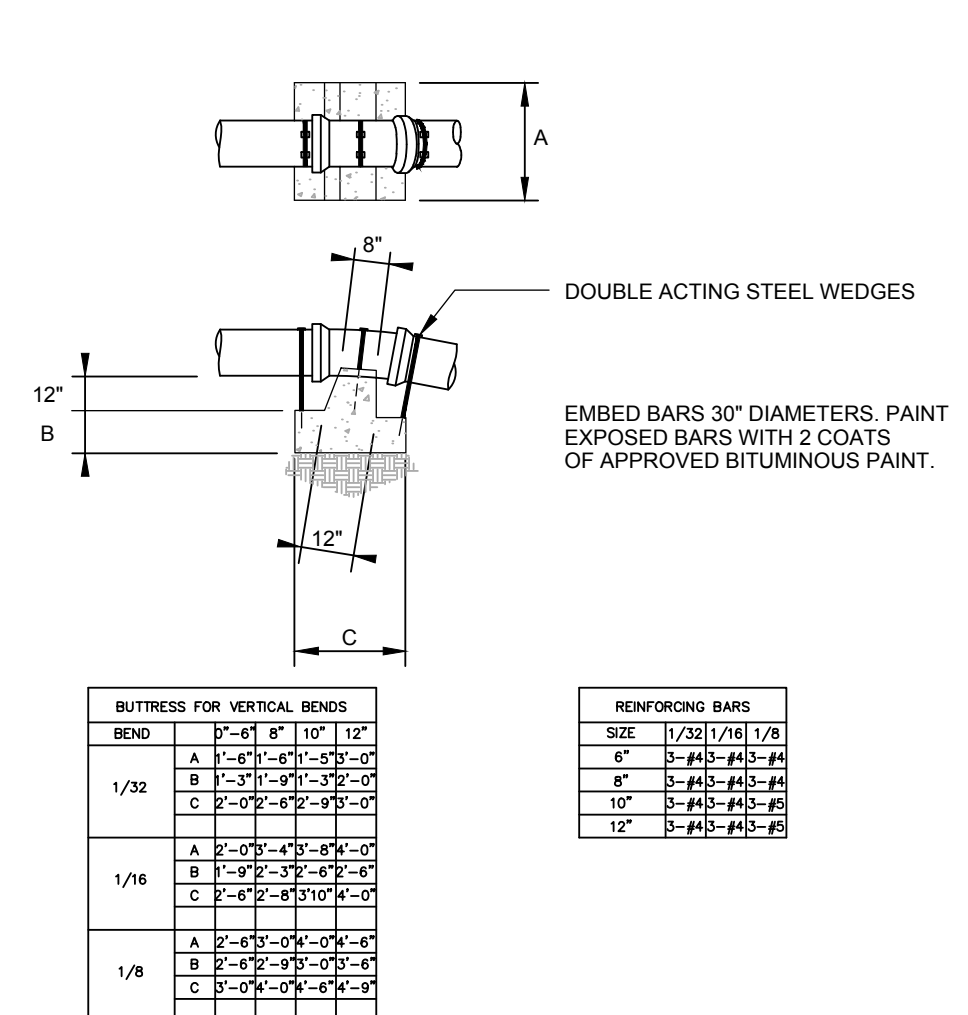
NOTE:  
PROVIDE PROTECTIVE COATING ON ALL EXTERIOR SURFACES.  
REFER TO SPECIFICATION SECTION 5B OF THIS STANDARD FOR ADDITIONAL DETAILS.



NO.	REVISION	DATE	BY	CHKD BY
1	ISSUED FOR PERMITTING	11/17/20	SCH	SCH
2	ISSUED FOR BIDS	9/20/2021	SCH	SCH
3	ISSUED FOR BIDDING	2/20/24	SCH	SCH

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**GRAVITY SEWER DETAILS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

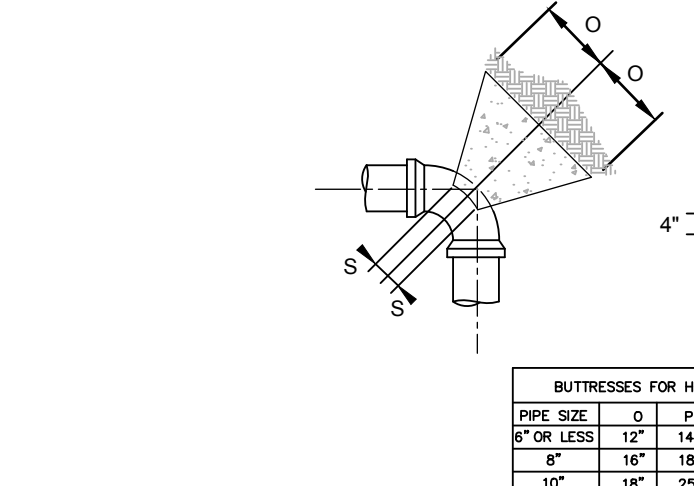
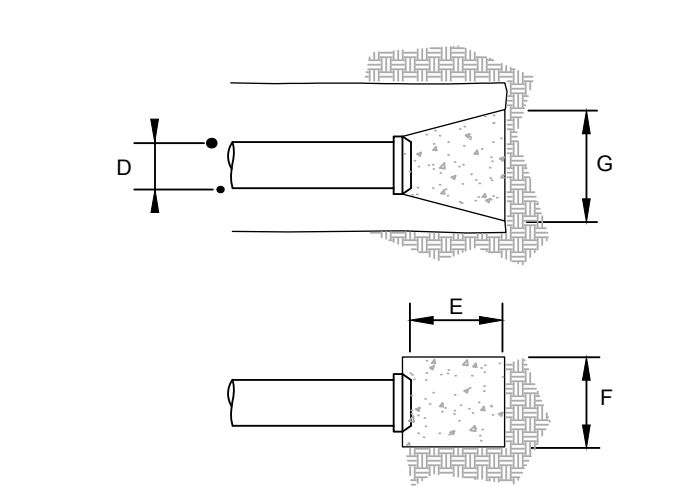
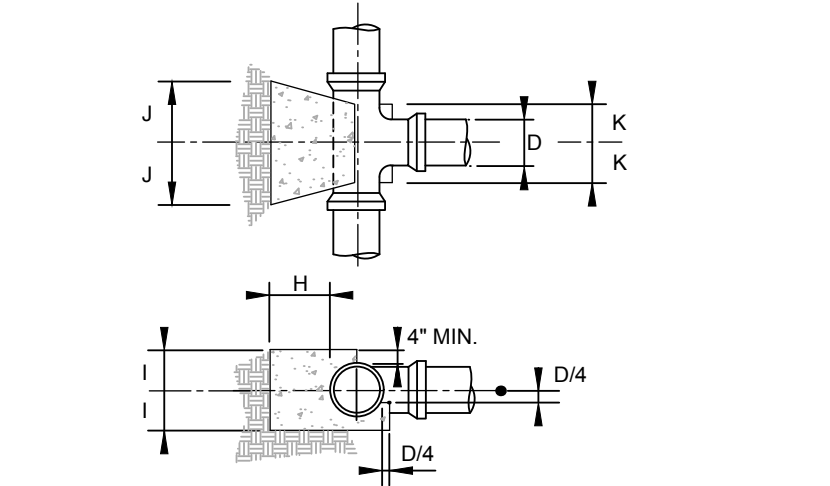


ANCHORAGE & CONCRETE BUTTRESSES FOR VERTICAL BENDS  
NO SCALE

CONCRETE BUTTRESSES FOR VERTICAL BENDS  
NO SCALE

CONCRETE BUTTRESSES FOR HORIZONTAL BENDS  
NO SCALE

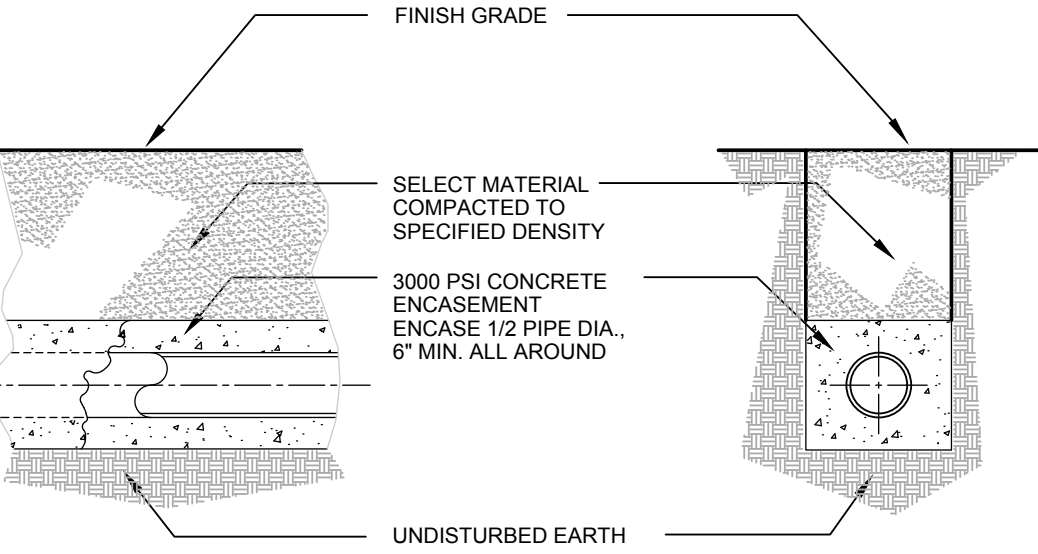
CONCRETE BUTTRESSES FOR VERTICAL 90° BENDS  
NO SCALE



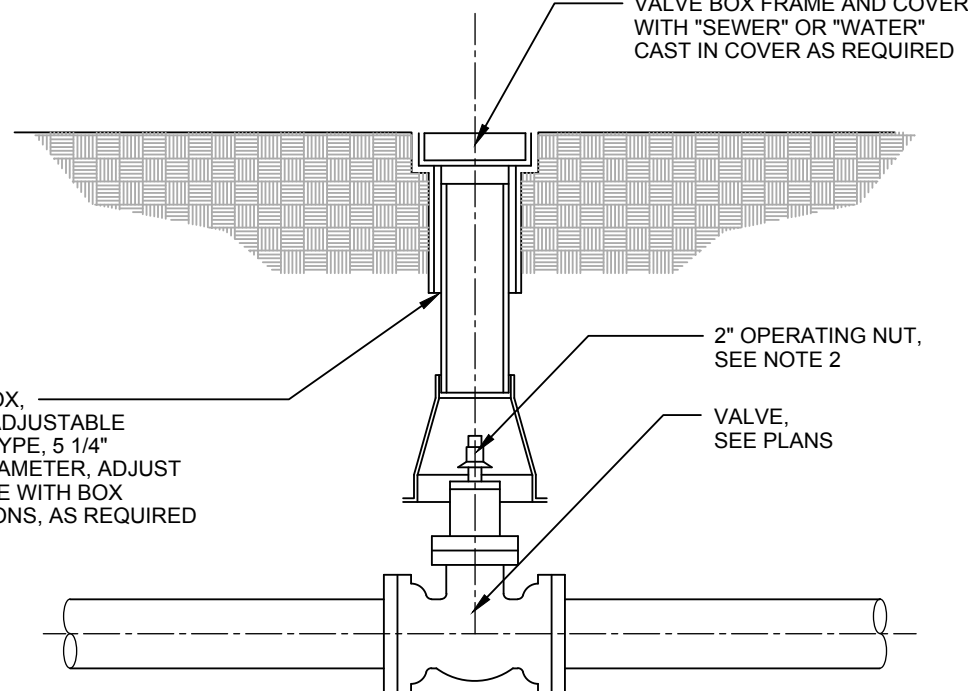
CONCRETE BUTTRESSES FOR HORIZONTAL & VERTICAL TEES  
NO SCALE

CONCRETE BUTTRESSES FOR CAPS  
NO SCALE

CONCRETE BUTTRESSES FOR HORIZONTAL 90° BENDS  
NO SCALE

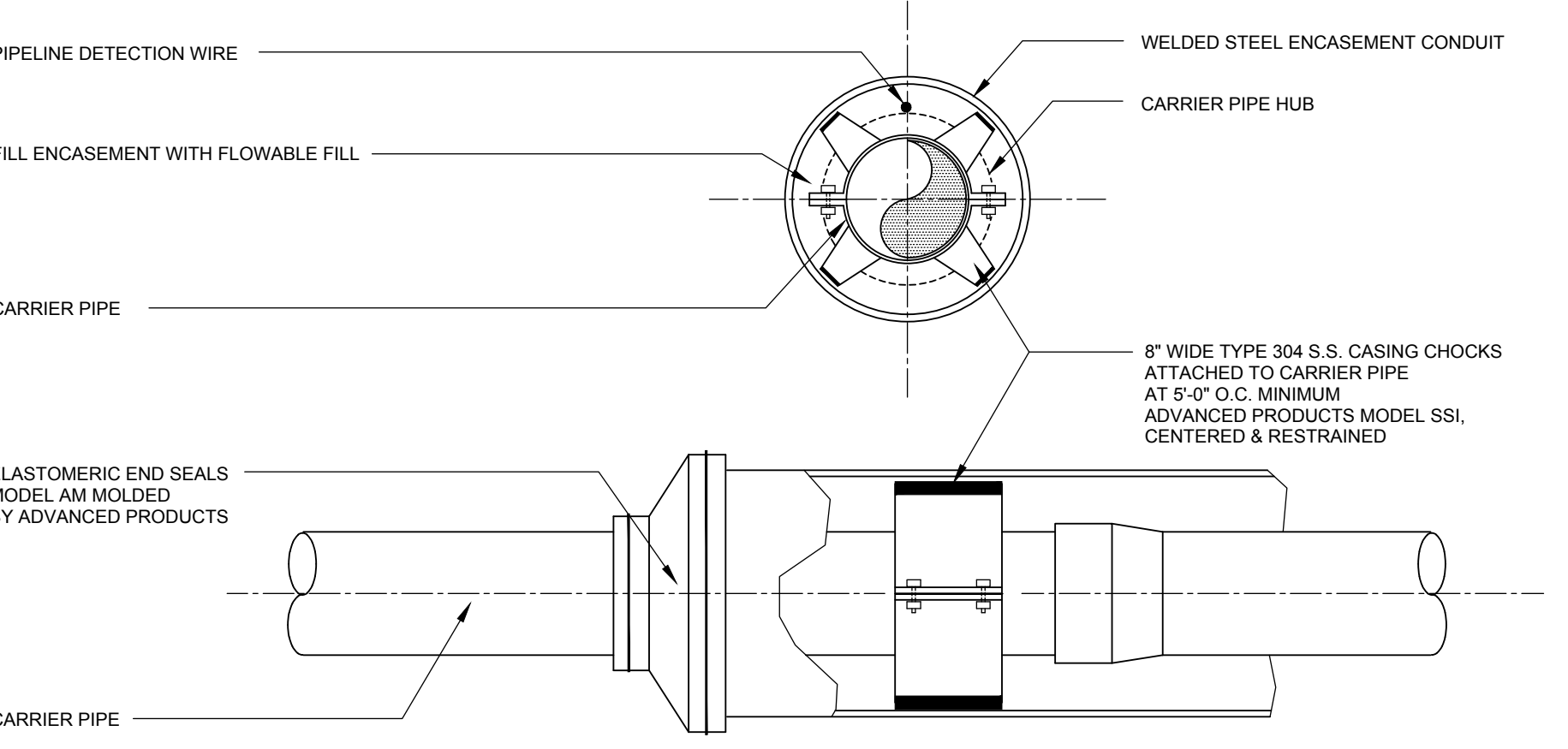


CONCRETE ENCASEMENT DETAIL  
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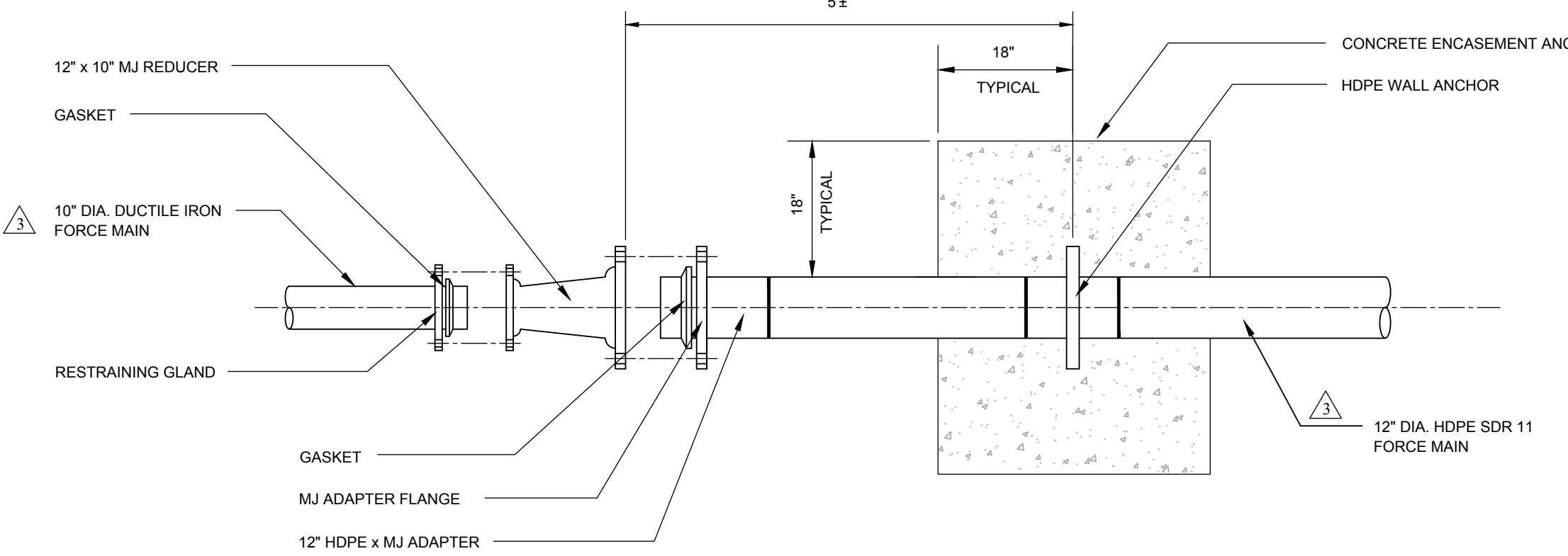
VALVE BOX DETAIL  
NO SCALE

REPAVING AND TRENCH DETAIL  
NO SCALE

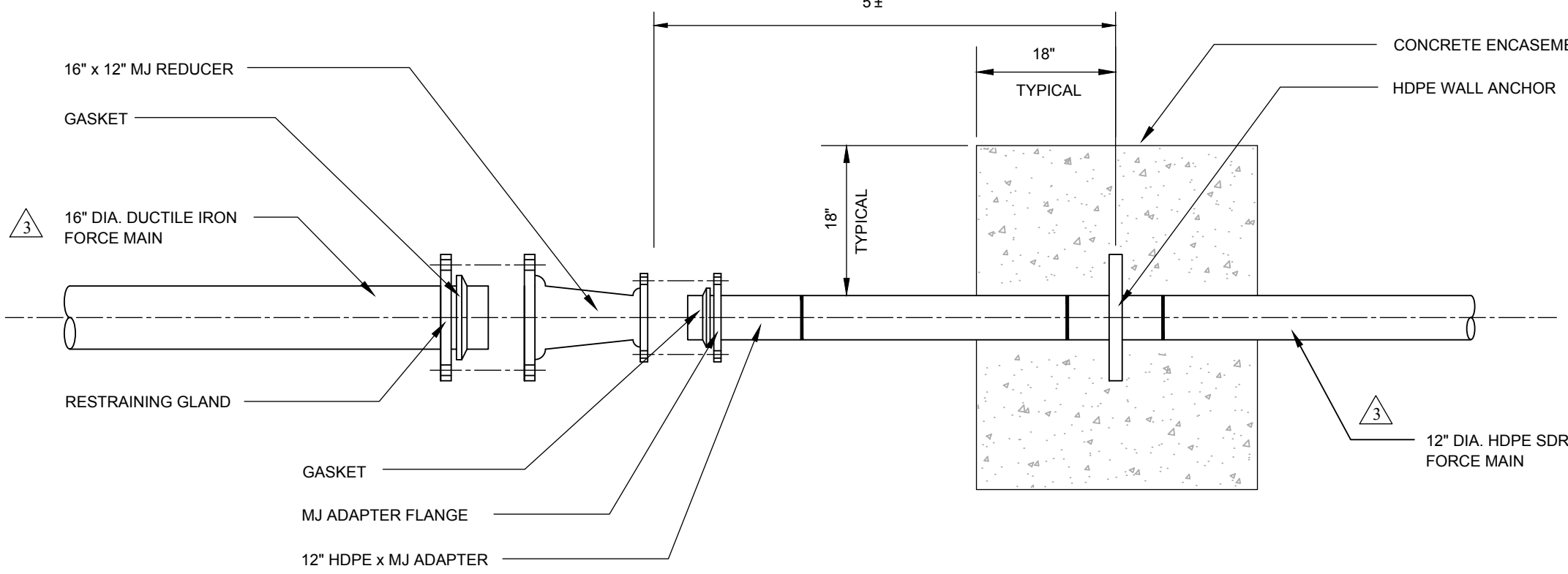


CROSSING TYPE	ENCASEMENT CONDUIT	CARRIER PIPE
18" DIA. PVC SDR 35 ROAD CROSSING	24" DIA. WELDED STEEL, 0.500" MIN. WALL THICKNESS	18" DIA. PVC SDR 35 PIPE
18" DIA. PVC SDR 26 STREAM CROSSING	30" DIA. WELDED STEEL, 0.500" MIN. WALL THICKNESS	18" DIA. PVC SDR 26 PIPE

ENCASEMENT CONDUIT DETAIL  
NO SCALE



DUCTILE IRON TO PE PIPE CONNECTION DETAIL - STATION 0+25  
NO SCALE



DUCTILE IRON TO PE PIPE CONNECTION DETAIL - STATION 9+20  
NO SCALE

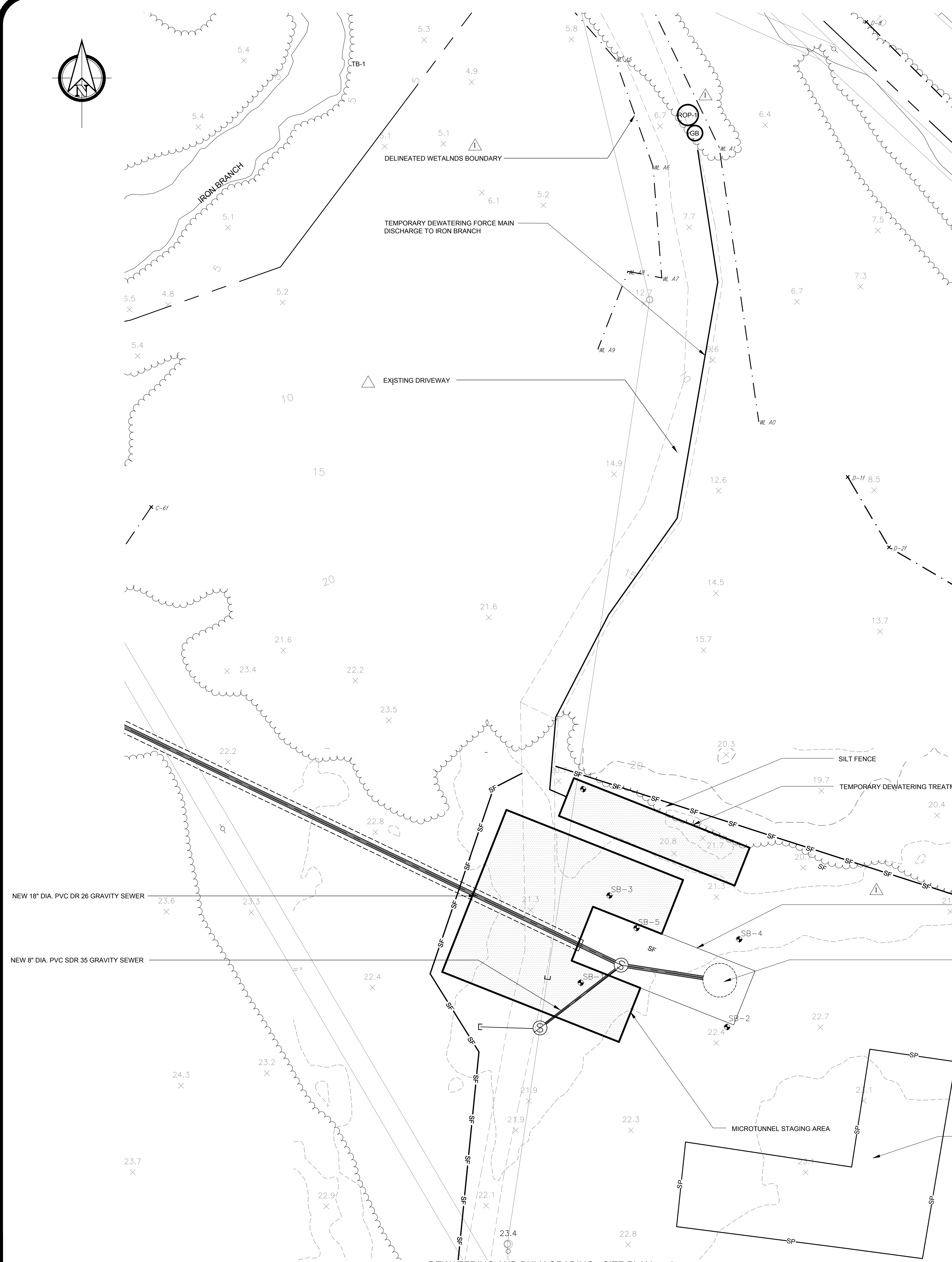
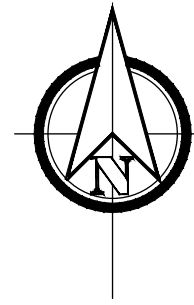
**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment  
5600 LIMESTONE ROAD  
WILMINGTON, DE 19808-1232  
TEL: 302.239.6634  
FAX: 302.239.8485  
OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY  
WEB: HTTP://DUFFIELD.COM  
E-MAIL: DUFFIELD@DUFFIELD.COM

CHECKED BY: SCB  
DESIGNED BY: DAC  
FILE NAME: 11373\_GEN  
DRAWN BY: DAC  
STEVEN H. LEVANDOWSKI, P.E.  
Professional Engineer  
Professional Seal  
11-17-20  
STATE DELAWARE  
P.E. 11578

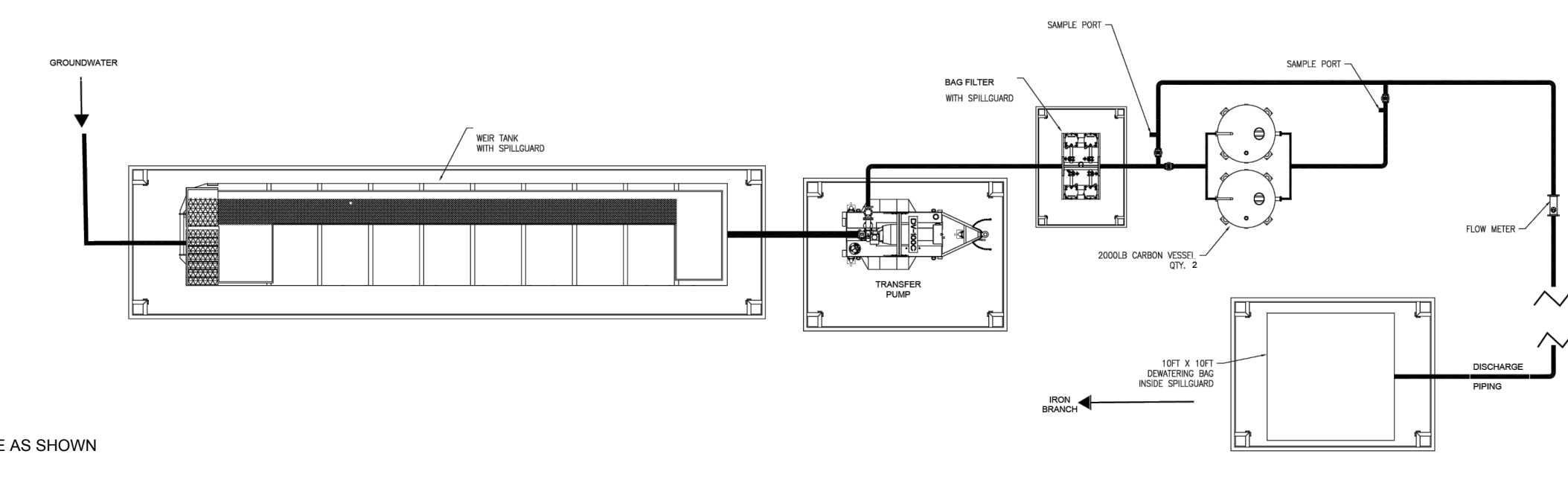
NO.	REVISION	DATE	BY	APP.
1	ISSUED FOR PERMITTING	9/20/2020	SCB	
2	ISSUED FOR BIDS	9/20/2020	SCB	
3	ISSUED FOR BIDDING	2/20/21	SCB	

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**FORCE MAIN AND GRAVITY SEWER DETAILS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

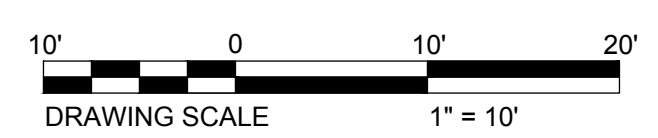


- NOTES:
- OSHA 40-HOUR HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE STANDARD (HAZWOPER) TRAINING IS REQUIRED FOR WORKERS DIRECTLY IN THE "CONTACT ZONE" OF EARTH-DISTURBING ACTIVITIES, DRILLING, AND GROUNDWATER HANDLING.
  - CONTRACTORS SHALL CEASE WORK AND NOTIFY DNREC AND NCR'S CONSULTANT IF CONDITIONS OF OBVIOUS ENVIRONMENTAL IMPACT OR CONCERN ARE OBSERVED DURING WORK AT THE SITE.
  - THE CONTRACTOR SHALL PREPARE AND PROVIDE A SITE-SPECIFIC HASP IN ACCORDANCE WITH OSHA HAZWOPER STANDARDS PROVIDED IN 29 CFR 1910.20 (B).
  - SOILS MAY BE REUSED ON THE SITE AS DIRECTED BY THE OWNER UNLESS THE SOILS ARE DETERMINED TO BE IMPACTED BY CONTAMINANTS. IN THE EVENT THAT IMPACTED SOILS ARE ENCOUNTERED AND EXCAVATED FOR THE PURPOSE OF CONSTRUCTION, THE SOILS MUST BE HANDLED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN THE CONTAMINATED MATERIALS MANAGEMENT PLAN (CMMP).
  - ANY SOILS THAT ARE TO BE REMOVED FROM THE SITE MUST BE APPROPRIATELY MANAGED UNDER DNREC'S SOIL/MATERIAL REUSE POLICY (DNREC, MAY 2010). THIS POLICY MUST ALSO BE FOLLOWED IF ANY FILL MATERIAL (E.G. SOIL, SAND, OR GRAVEL) IS TO BE BROUGHT TO THE SITE. PRIOR WRITTEN APPROVAL FROM DNREC MUST BE OBTAINED PRIOR TO REMOVING OR IMPORTING ANY FILL MATERIAL.
  - SOILS AND/OR MATERIALS REMOVED FROM THE SITE MAY (1) BE ALLOWED FOR REUSE AT OTHER HAZARDOUS SUBSTANCE CLEANUP ACT (HSCA) SITE FOLLOWING APPROVALS THROUGH THE SOIL/MATERIAL REUSE POLICY, OR (2) MAY BE DISPOSED OF AT AN OFF-SITE DISPOSAL FACILITY.
  - THE CONSULTANT AND DNREC-REMEDIATION SECTION (RS) MUST BE NOTIFIED AT LEAST FIVE BUSINESS DAYS (ONE WEEK) IN ADVANCE PRIOR TO SOIL DISTURBING ACTIVITIES AT THE SITE. CONTRACTOR SHALL LOCATE ALL APPLICABLE UNDERGROUND UTILITIES PRIOR TO INITIATING SOIL DISTURBING ACTIVITIES.
  - THE CONTRACTOR SHALL MONITOR THE INTRUSIVE ACTIVITIES FOR SIGNS OF POTENTIAL IMPACT, INCLUDING THE FOLLOWING:
    - PETROLEUM OR CHEMICAL PRODUCTS (OILS, FUELS, SHEENS).
    - SOLID OR LIQUID MATERIALS THAT DO NOT APPEAR TO BE NATURALLY OCCURRING.
    - DRUMS OR OTHER CONTAINERS.
    - SOIL OR GROUNDWATER IMPACTED BY APPARENT PETROLEUM OR CHEMICALS (STAINS OR ODORS).
    - OTHER CONDITIONS THAT MAY SUGGEST ADVERSE ENVIRONMENTAL IMPACT FROM HUMAN ACTIVITIES.
  - THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY OF THE ABOVE CONDITIONS ARE OBSERVED DURING INTRUSIVE ACTIVITIES AND CEASE WORK IN THE AREA UNTIL THE ENGINEER AND OWNER DETERMINE THAT WORK CAN RESUME. DEPENDING ON CONDITIONS ENCOUNTERED BY THE CONTRACTOR, THE OWNER MAY PERFORM AIR MONITORING OR OTHER FIELD SCREENING METHODS TO DETERMINE IF ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT (PPE) IS WARRANTED.
  - THE DNREC EMERGENCY RESPONSE TEAM MUST BE NOTIFIED IF FREE PRODUCT AND/OR NON-AQUEOUS PHASE LIQUID (NAPL) IS ENCOUNTERED DURING CONSTRUCTION ACTIVITIES.
  - THE PROJECT GOAL IS NO VISIBLE AIRBORNE DUST. IF NECESSARY, DUST CONTROL MEASURES SHALL BE IMPLEMENTED TO MINIMIZE THE AMOUNT OF PARTICULATE MATTER IN THE AIR. DUST SUPPRESSION SHALL OCCUR IF VISIBLE AIRBORNE DUST IS PERSISTENT. TYPICAL DUST SUPPRESSION MEASURES INCLUDE WETTING DOWN THE DISTURBED SOILS AS NECESSARY.
  - ANY NON-REUSABLE SOILS THAT ARE GENERATED BUT CANNOT BE REUSED AS FILL OR COVER ON-SITE CANNOT BE CONSIDERED AS "CLEAN FILL" AND MUST BE CHARACTERIZED PRIOR TO OFFSITE REUSE OR DISPOSAL. THE DNREC-RS AND ENGINEER SHOULD BE CONTACTED TO DETERMINE TESTING AND SOIL DISPOSAL REQUIREMENTS. REGARDLESS OF THE SOIL CONDITIONS, THE OFF-SITE DISPOSITION OF THE SOIL MUST FOLLOW THE DNREC-RS POLICY SOIL / MATERIAL RE-USE POLICY AT HSCA REGULATED SITES (SOIL REUSE POLICY) DATED MAY 19, 2010.
  - DNREC-RS MUST AUTHORIZE THE USE OF ALL IMPORTED FILL MATERIAL BEFORE IT IS TRANSPORTED TO THE SITE. IF FILL MATERIAL (E.G., SOIL, SAND, AGGREGATE WITH FINES, OR CRUSHED CONCRETE) FROM ANY OFFSITE SOURCE IS REQUIRED AT THE SITE, THE FILL SOIL SHALL BE CERTIFIED AS "CLEAN FILL" AS APPROVED BY DNREC-RS. THIS MAY REQUIRE SAMPLING AND APPROVAL BY DNREC UNDER THE DNREC SOIL REUSE POLICY.
  - THE CONTRACTOR SHALL IDENTIFY THE SOURCE OF THE FILL MATERIALS TO THE ENGINEER AND SHALL ALSO, IF REQUIRED BY DNREC-RS, ARRANGE FOR LABORATORY ANALYSIS OF THE REPRESENTATIVE FILL SAMPLES. THE RESULTS OF THE LABORATORY ANALYSIS WILL BE COMPARED TO THE CURRENT HSCA SCREENING LEVELS. THE CONTRACTOR SHALL PROVIDE THE RESULTS TO THE OWNER, ENGINEER AND DNREC FOR REVIEW AND APPROVAL. THE CONTRACTOR WILL THEN BE NOTIFIED WHETHER THE PROPOSED FILL MATERIALS ARE ACCEPTABLE FOR PLACEMENT ON THE SITE.
  - IN THE EVENT THAT UNEXPECTED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL STOP ALL WORK AND NOTIFY ENGINEER AND OWNER IMMEDIATELY IN ACCORDANCE WITH THE GENERAL CONDITIONS. EXAMPLES OF UNEXPECTED CONDITIONS INCLUDE UNDERGROUND STORAGE TANKS (UST), DRUMS, OTHER CHEMICAL CONTAINERS AND HAZARDOUS WASTE.
  - THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND OPERATE A TREATMENT SYSTEM TO TREAT THE GROUNDWATER DISCHARGE. THE MINIMUM TREATMENT COMPONENTS INCLUDE SETTLING FRAC TANK, TRANSFER PUMP, 10-MICRON BAG FILTER, FLOW METER, BYPASS TO TWO (2) STANDBY, IN-SERIES GRANULAR ACTIVATED CARBON (GAC) VESSELS INCLUDING INTEGRAL BACKWASH SYSTEM WITH PRESSURE GAUGES AND APPURTENANCES, AND DEWATERING BAG ON A STONE APRON AT DISCHARGE POINT. THE CARBON VESSELS SHALL BE PROVIDED AS PART OF THE TREATMENT SYSTEM AND WILL ONLY BE PLACED ON-LINE IF WATER QUALITY SAMPLING AND ANALYSIS INDICATE THE PRESENCE OF VOCs AT LEVELS REQUIRING TREATMENT.
  - THE CONTRACTOR SHALL VISUALLY MONITOR THE DEWATERING SYSTEM DISCHARGE WATER AND PERFORM FIELD REVIEW WHERE GROUNDWATER IS EXPOSED IN EXCAVATIONS FOR OVERT SIGNS OF POTENTIAL IMPACT ACCORDING TO THE FOLLOWING INDICATORS: 1) DISCOLORATION OR SHEEN ASSOCIATED WITH PETROLEUM OR OTHER CHEMICALS 2) FLOATING NON-AQUEOUS LIQUID PRODUCTS ON THE WATER 3) UNNATURAL ODORS 4) OTHER OVERT INDICATIONS OF CONTAMINATION.
  - THE CONTRACTOR SHALL METER DISCHARGE RATES AND THE TOTAL VOLUME FOR ALL WATER DISCHARGED. CONTRACTOR SHALL LOG THE DATES AND HOURS OF DISCHARGE, THE RATE OF DISCHARGE, AND THE CUMULATIVE GALLONS DISCHARGED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND OWNER IF ANY INDICATIONS OF CONTAMINATION ARE OBSERVED IN THE DEWATERING STREAM.
  - IN THE EVENT THAT NON-AQUEOUS PHASE LIQUID (NAPL) BEGINS TO BE RECOVERED THROUGH THE DEWATERING SYSTEM, THE CONTRACTOR SHALL CEASE THE DEWATERING OPERATIONS AND CONTACT THE ENGINEER AND OWNER. ANY COLLECTED NAPL INADVERTENTLY COLLECTED BY DEWATERING SHALL BE REMOVED FROM THE SETTLING TANK AND SEPARATELY CONTAINERIZED FOR OFFSITE DISPOSAL AT A PERMITTED DISPOSAL OR TREATMENT FACILITY. DEWATERING SHOULD NOT CONTINUE UNTIL THE DEWATERING SYSTEM IS APPROPRIATELY DECONTAMINATED AND DNREC AUTHORIZES TO CONTINUE DEWATERING.
  - SEDIMENT GENERATED IN THE SETTLING TANK AND FILTER BAGS DURING DEWATERING WILL BE SPREAD AND STABILIZED AT A DESIGNATED AREA ON-SITE. UNLESS CONDITIONS OBSERVED DURING THE DEWATERING AND MONITORING PROCESS WARRANT CHARACTERIZATION AND SPECIALIZED ONSITE MANAGEMENT OR OFFSITE DISPOSAL AT A LICENSED DISPOSAL / TREATMENT FACILITY.
  - WASTE PROFILE CHARACTERIZATION WILL BE REQUIRED FOR ANY OFFSITE DISPOSAL OF SEDIMENT. MATERIALS SUBJECT TO OFF-SITE DISPOSAL WILL BE SAMPLED FOR WASTE CHARACTERIZATION PRIOR TO TRANSPORTING THE MATERIALS TO ANOTHER HSCA SITE OR A LICENSED DISPOSAL FACILITY APPROVED BY DNREC-RS.
  - THE CONTRACTOR SHALL MONITOR AND RECORD DAILY ACTIVITIES DURING IMPLEMENTATION OF THE SOIL AND/OR GROUNDWATER MANAGEMENT ACTIVITIES IN CONTAMINATED AREAS. THE VOLUME OF EXCAVATED SOIL AND/OR DISCHARGED GROUNDWATER SHALL BE TRACKED AND RECORDED. ANY MANIFESTS AND DISPOSAL DOCUMENTATION (IF APPLICABLE) SHALL BE MAINTAINED BY THE APPLICABLE PARTIES AND PROVIDED TO THE OWNER. COPIES OF DISPOSAL DOCUMENTATION (IF APPLICABLE) SHALL BE PREPARED AND SUBMITTED TO DNREC-RS FOLLOWING THE CONCLUSION OF THE CONTAMINATED MATERIAL MANAGEMENT ACTIVITIES.
  - THE CONTRACTOR SHALL DESIGN AND INSTALL SHORING REQUIRED TO INSTALL SUBGRADE IMPROVEMENTS SHOWN HEREON INCLUDING THE WET WELL AND UPSTREAM SANITARY SYSTEM IMPROVEMENTS INCLUDING, BUT NOT LIMITED TO, THE ENCASUREMENT AND CARRIER PIPE CROSSING IRON BRANCH. THE SHORING SYSTEM LAYOUT AS SHOWN ON THIS SHEET IS CONCEPTUAL ONLY. THE CONTRACTOR SHALL DESIGN THE SHORING SYSTEM IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.



TEMPORARY DEWATERING TREATMENT SYSTEM SCHEMATIC  
NO SCALE

DEWATERING AND BULK GRADING - SITE PLAN  
SCALE: 1" = 20'



**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment

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FAX: 302.239.8485

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CHECKED BY:	SCH	FILE NAME:	UTLTIAGEN.DWG
DESIGNED BY:	SHL	DRAWN BY:	SMC
CHECKED BY:	SHL	DATE:	9/20/2021
DESIGNED BY:	SHL	DATE:	9/20/2021

STEVEN H. LEWANDOWSKI, P.E.  
STATE DELAWARE P.E. 11578

NO.	REVISION	ISSUED FOR BIDS
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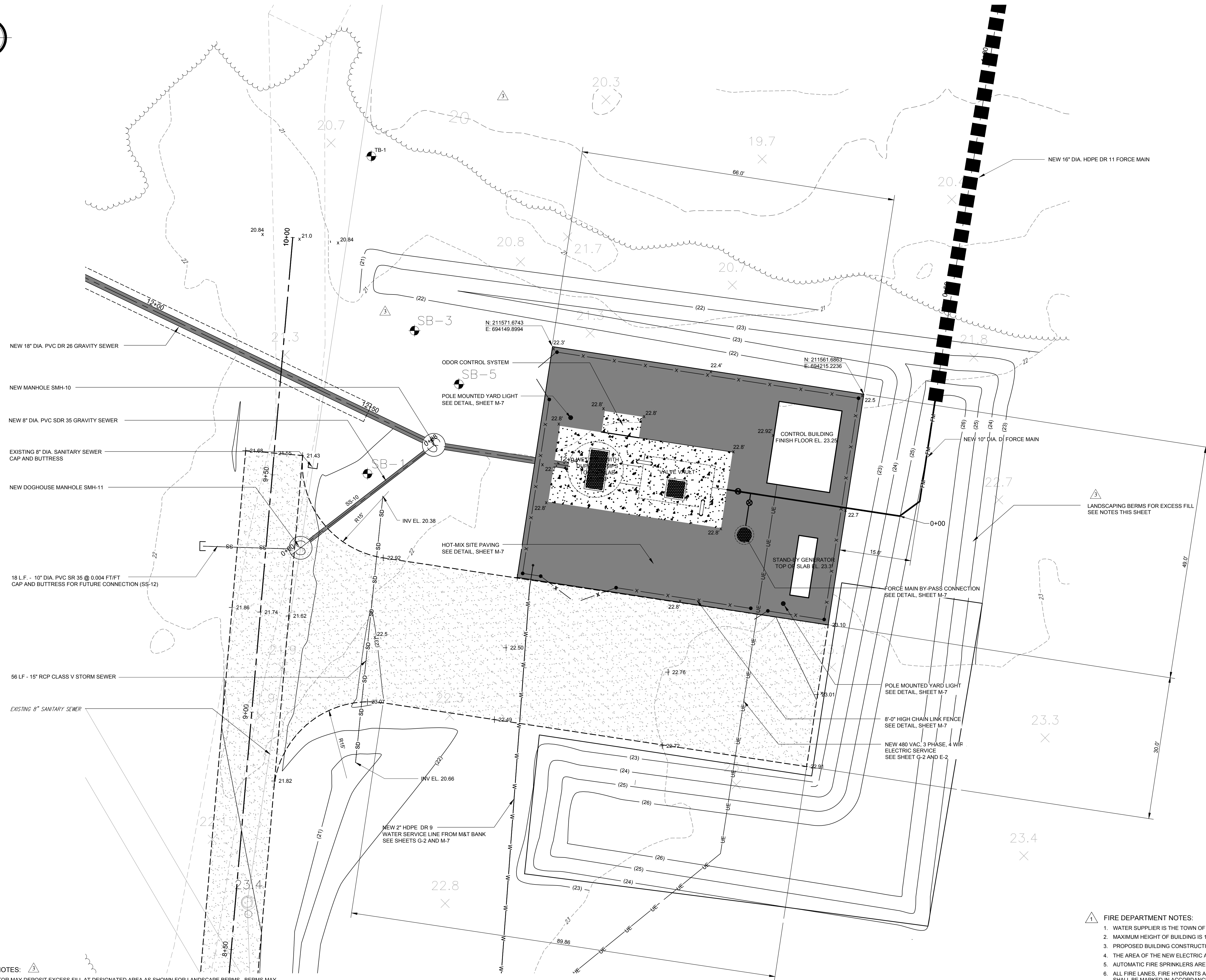
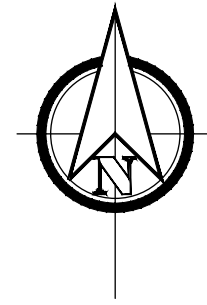
OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**PUMPING STATION - DEWATERING AND CONSTRUCTION  
SITE EROSION AND SEDIMENT CONTROL - SITE PLAN  
SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

**THE TOWN OF MILLSBORO**  
MILLSBORO - SUSSEX COUNTY, DELAWARE

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-6



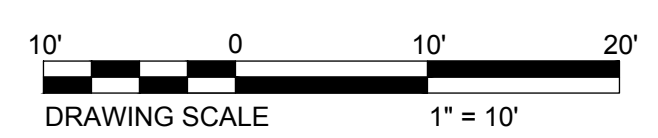


**GENERAL NOTES:**

- CONTRACTOR MAY DEPOSIT EXCESS FILL AT DESIGNATED AREA AS SHOWN FOR LANDSCAPE BERMS. BERMS MAY INCLUDE EXCESS FILL, SEDIMENT GENERATED FROM THE TEMPORARY GROUNDWATER TREATMENT SYSTEM AND DEWATERING SPOILS FROM MICROTUNELLING.
- ALL EXCESS FILL SHALL BE DEWATERED PRIOR TO PLACEMENT AND COMPACTION TO 90% MODIFIED PROCTOR.
- LANDSCAPE BERMS SHALL BE STABILIZED IN ACCORDANCE WITH THE SEDIMENT AND STORMWATER DETAILS.

**GRADING, PAVING, AND DRAINAGE - SITE PLAN**  
SCALE: 1" = 10'

- FIRE DEPARTMENT NOTES:**
- WATER SUPPLIER IS THE TOWN OF MILLSBORO
  - MAXIMUM HEIGHT OF BUILDING IS 13'-6"
  - PROPOSED BUILDING CONSTRUCTION TYPE PER NFPA 20 IS TYPE II
  - THE AREA OF THE NEW ELECTRIC AND CONTROL BUILDING SIZE IS 177.7± S.F.
  - AUTOMATIC FIRE SPRINKLERS ARE NOT PROPOSED FOR THIS STRUCTURE
  - ALL FIRE LANES, FIRE HYDRANTS AND FIRE DEPARTMENT CONNECTIONS SHALL BE MARKED IN ACCORDANCE WITH THE DELAWARE STATE FIRE PREVENTION REGULATIONS.



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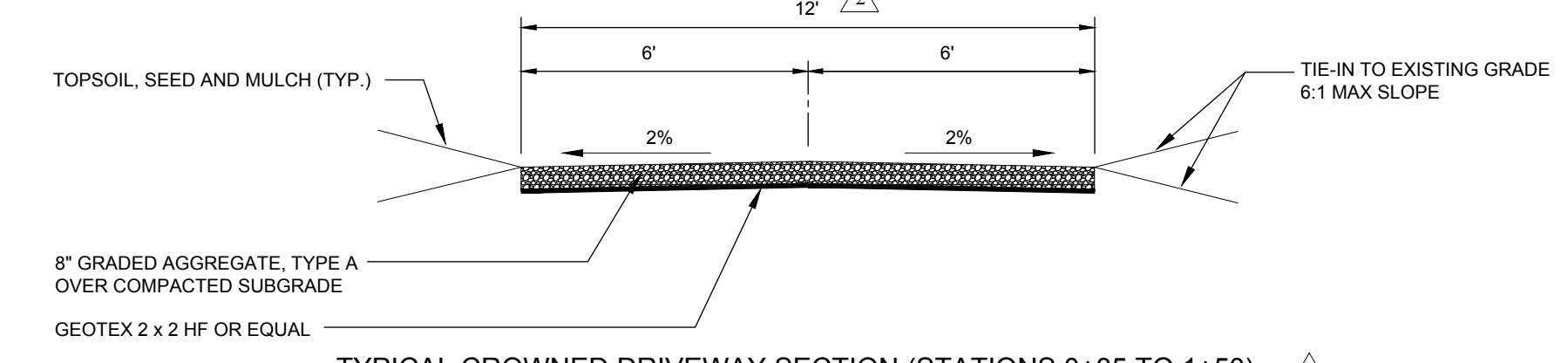
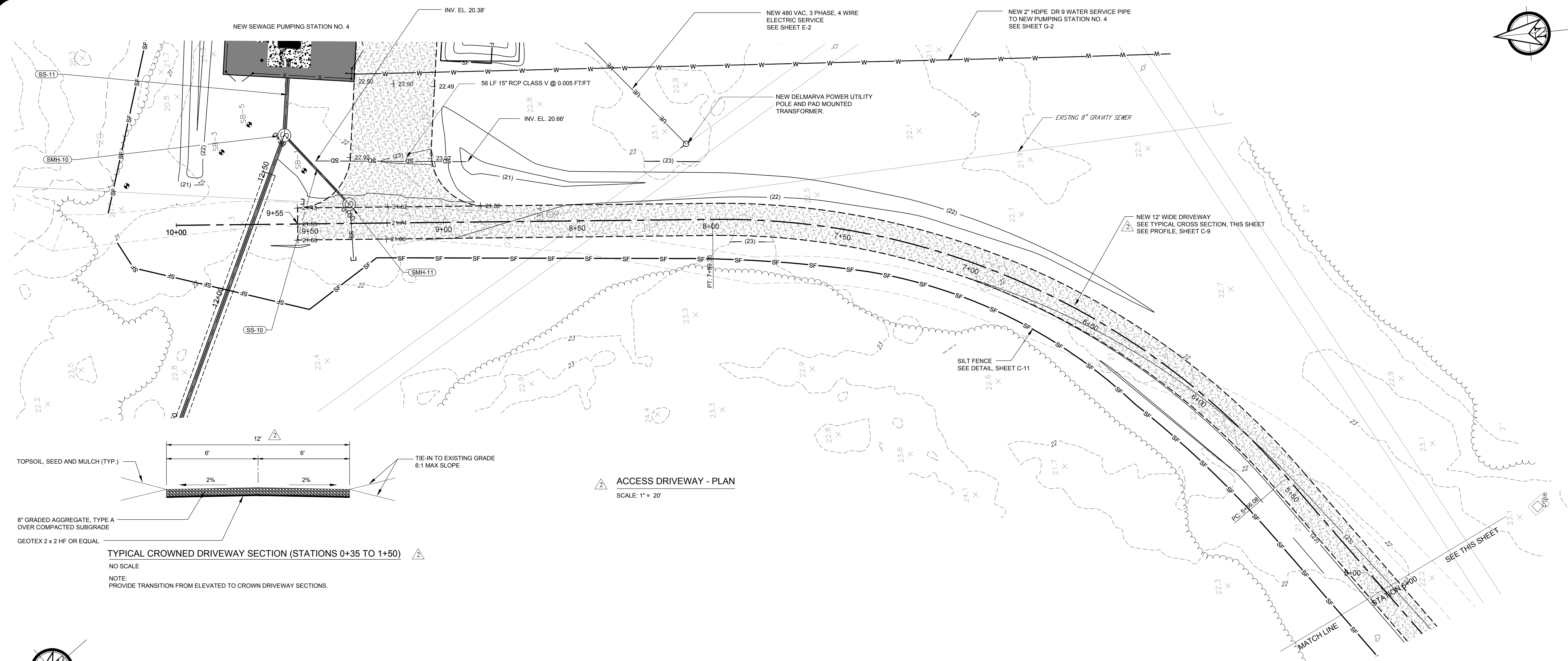
CHECKED BY: SCH  
DESIGNED BY: SML  
DRAWN BY: SMC  
FILE NAME: UTILITY/SEWER/STATION  
DESIGNED BY: STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE  
11-17-20  
P.E. 11578

NO.	REVISION	DATE	BY	DESCRIPTION
1	ISSUED FOR PERMITTING	11/17/2020	SMC	
2	ISSUED FOR BIDS	9/20/2022	SMC	

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
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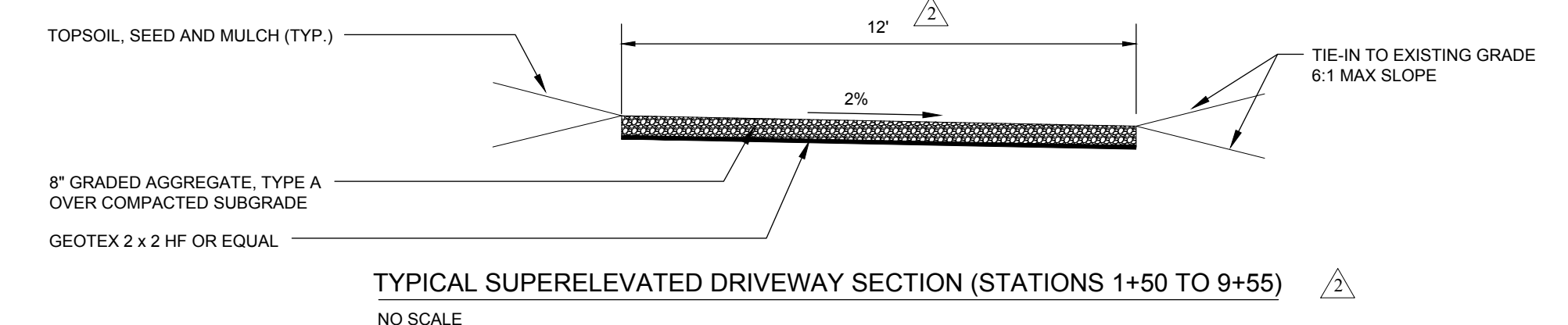
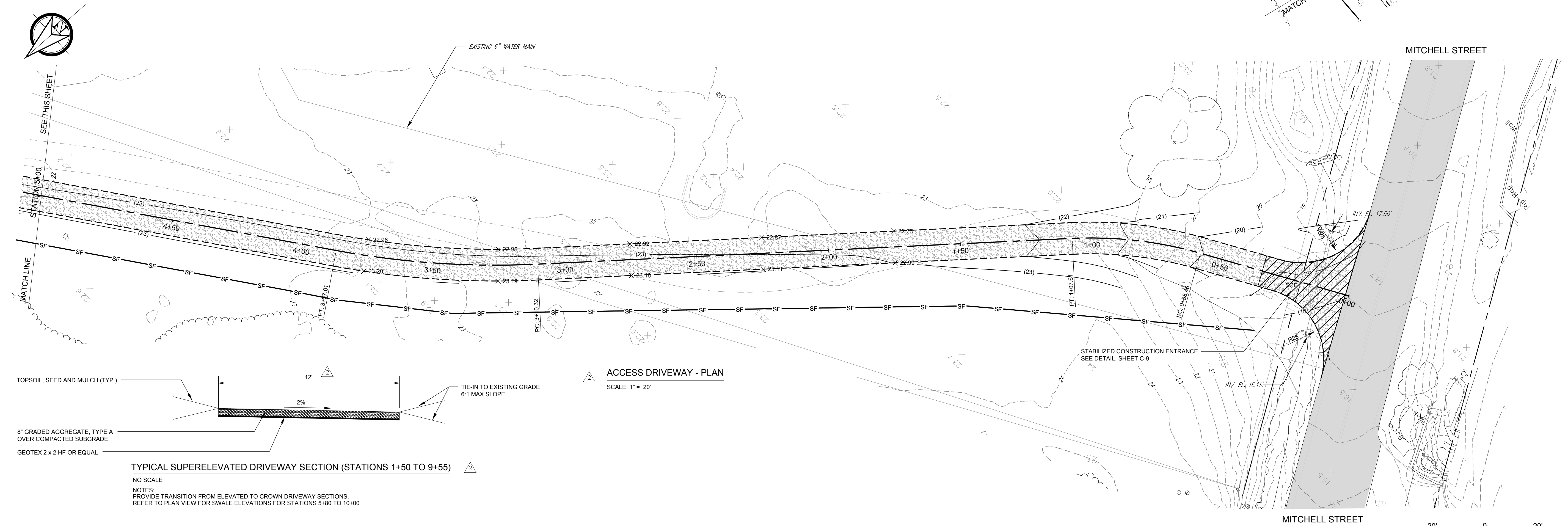
**GRADING, PAVING, AND DRAINAGE**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-7



ACCESS DRIVEWAY - PLAN  
SCALE: 1" = 20'

TYPICAL CROWNED DRIVEWAY SECTION (STATIONS 0+35 TO 1+50)  
NO SCALE  
NOTE:  
PROVIDE TRANSITION FROM ELEVATED TO CROWN DRIVEWAY SECTIONS.



ACCESS DRIVEWAY - PLAN  
SCALE: 1" = 20'

TYPICAL SUPERELEVATED DRIVEWAY SECTION (STATIONS 1+50 TO 9+55)  
NO SCALE  
NOTES:  
PROVIDE TRANSITION FROM ELEVATED TO CROWN DRIVEWAY SECTIONS.  
REFER TO PLAN VIEW FOR SWALE ELEVATIONS FOR STATIONS 5+80 TO 10+00

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CHECKED BY: SCH  
DESIGNED BY: SMC  
DRAWN BY: SMC  
DATE: 9/20/2022  
FILE NAME: ULTRACARBON DRIVEWAY  
DESIGNED BY: STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE PROFESSIONAL ENGINEERING BOARD  
11-17-20  
STATE DELAWARE P.E. 11578

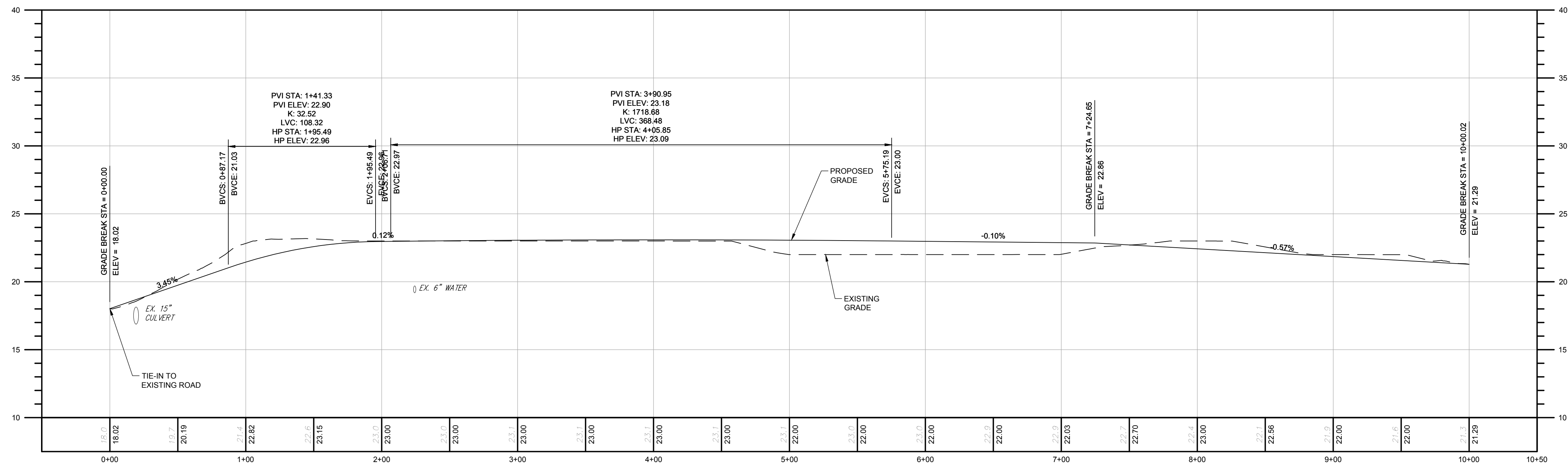
NO.	REVISION
1	ISSUED FOR PERMITTING
2	ISSUED FOR BIDS

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**ACCESS DRIVEWAY PLAN**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-8





ROAD: STA. -0+50 TO STA. 10+50  
SCALE: HORIZONTAL 1" = 50', VERTICAL 1" = 5'

ACCESS DRIVEWAY - PROFILE  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'



**ACCESS DRIVEWAY PROFILE**

**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
MILLSBORO--SUSSEX COUNTY, DELAWARE

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-9

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

No.	REVISION
1	ISSUED FOR PERMITTING
2	ISSUED FOR BIDS

CHECKED BY: SCH

DESIGNED BY: SHL

DRAWN BY: SMC

FILE NAME: UTTRACREEM.DWG

STEVEN H. LEVANDOWSKI, P.E.

11-17-20

STATE DELAWARE

P.E. 11578



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**Standard Detail & Specifications**  
**Vegetative Stabilization**



TEMPORARY SEEDING BY RATES, DEPTHS AND DATES												
Mix #	Species <sup>a</sup>	Seeding Rate <sup>b</sup>	Optimum Seeding Dates <sup>1</sup>									Planting Depth <sup>3</sup>
			Coastal Plain			Piedmont			All <sup>4</sup>			
1	Certified Seed	lb/Ac <sup>c</sup>	lb/1000 sq.ft.	2/1-4/00	5/1-8/14	8/15-10/31	3/1-4/00	5/1-7/31	8/1-10/31	10/31-2/1	1-2 inches	
1	Barley	125	4	O	A	O	O	A	O	O	2.3" sandy soils	
2	Oats	125	4	O	A	A	O	A	A	A	1.2 inches	
3	Rye	125	4	O	A	O	O	A	O	A	2.3" sandy soils	
4	Perennial Ryegrass	125	4	O	A	O	O	A	O	A	1.2 inches	
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	1.2" sandy soils	
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1.2" sandy soils	
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches	
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches	

- Winter seeding requires 3 tons per acre 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.
- Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seeding rate of any of the above species.
- Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
- Warm season grasses such as Millet or Weeping Lovgrass may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low 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		<b>DE-ESC-3.4.3</b> Sheet 1 of 4 Effective FEB 2019

**Standard Detail & Specifications**  
**Vegetative Stabilization**



PERMANENT SEEDING AND SEEDING DATES														
Seeding Mixtures	Seeding Rate <sup>a</sup>	Optimum Seeding Dates <sup>2</sup>											Remarks	
		Coastal Plain					Piedmont							
1	Well Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1				Good erosion control mix. Tolerant of low fertility soils. Germinates only in wet weather.
1	Hill Fescue	100	3.2	A	O	A	A	O	A	O				Good erosion control mix. Tolerant of low fertility soils. Germinates only in wet weather.
	Weeping Lovgrass	10	0.23											

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

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 2 of 4 Effective FEB 2019

**Standard Detail & Specifications**  
**Vegetative Stabilization**



PERMANENT SEEDING AND SEEDING DATES (cont.)														
Seeding Mixtures	Seeding Rate <sup>a</sup>	Optimum Seeding Dates <sup>2</sup>											Remarks	
		Coastal Plain					Piedmont							
9	Poorly Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1				Quick stabilization of disturbed sites and waterways.
9	Redtop	75	2.3	O	A	O	A	O	A	O				Quick stabilization of disturbed sites and waterways. Add 100 lbs./Ac. Winter Rye.
	Creeping Bentgrass	35	0.8											

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

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 3 of 4 Effective FEB 2019

**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.
  - Seedbed Preparation

It is important to prepare a good seedbed to insure 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 600 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 or 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.

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

Source:	Symbol:	Detail No.
Delaware ESC Handbook		<b>DE-ESC-3.4.3</b> Sheet 4 of 4 Effective FEB 2019

DETAIL: VEGETATIVE STABILIZATION  
NO SCALE

**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 noxious 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.
  - Wood chips - Apply at the rate of approximately 6 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 10-10-10 or 66 pounds of 30-0-0 per acre).
  - Hydraulically applied mulch - The following conditions apply to hydraulically applied mulch:
    - Definitions:
      - 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 fibrous state and is packaged for sale as hydraulic mulch for use with hydraulic seeding equipment.
      - A bonded fiber matrix (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. BFM's shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.
    - Refer to Figure 3.4.5a 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 manufacturers recommendations to ensure the proper results.
  - Hydraulic 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 manufacturers recommendations.
  - Materials within this category shall only be used when hydraulically applied mulch has been specified for use on 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 & Filtrax™ International		<b>DE-ESC-3.4.5</b> Sheet 1 of 3 Effective FEB 2019

DETAIL: MULCHING  
NO SCALE

**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 visual metering.
      - Step Two - Mix and apply mulch at manufacturers 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 showing shall be top dressed until full coverage is achieved.
  - Compost 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 mulch anchoring.
- 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 size of area, erosion hazard, and cost.
    - Crimping - A crimper is a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This practice affords maximum erosion control but is limited to flatter slopes where equipment can operate safely. On sloping land, crimping 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 deeded 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./ac. 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.
    - Nettings - Synthetic or organic nettings may be used to secure straw mulch. Install and secure according to the manufacturers recommendations.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrax™ International		<b>DE-ESC-3.4.5</b> Sheet 2 of 3 Effective FEB 2019

Percent Slope	Type of Mulch / App. Rate*	MULCHING MATERIAL SELECTION GUIDE			
		Dec. 1 to Feb. 28/29	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30
Less than 2%	Blended Fiber @ 2000 lbs./ac. minimum Wood Fiber @ 2000 lbs./ac. min. BFM @ 2000 lbs./ac. min. Straw @ 2 Tons/ac. Min. Stabilization Matting** 1" Compost Blanket (CB)	XXXXXXXXXXXXXXXXXXXX	OK (2:1 ac.) OK OK OK OK OK	XXXXXXXXXXXXXXXXXXXX	OK (2:1 ac.) OK OK OK OK OK
2% to 5.9%	Wood Fiber @ 2000 lbs./ac. min. BFM @ 3000-3500 lbs./ac. min. Straw @ 2 Tons/ac. min. Stabilization Matting** 1" Compost Blanket (CB)	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK
6% to 10.9%	Wood Fiber @ 2000-2500 lbs./ac. min. BFM @ 3500-4000 lbs./ac. min. Straw @ 2 Tons/ac. min. Stabilization Matting** 1" Compost Blanket (CB)	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK
11% to 24.9%	Wood Fiber @ 2500-3000 lbs./ac. min. BFM @ 3500-4000 lbs./ac. min. Straw @ 2 Tons/ac. min. Stabilization Matting** 1" Compost Blanket (CB)	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK
25% to 33%	Wood Fiber @ 2500-3000 lbs./ac. min. BFM @ 4000 lbs./ac. min. Straw @ 2 Tons/ac. min. Stabilization Matting** 1" Compost Blanket (CB)	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK OK
33% and up	BFM @ 4000-4500 lbs./ac. min. Straw @ 2 Tons/ac. min.** Stabilization Matting** 1" Compost Blanket (CB)	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK	XXXXXXXXXXXXXXXXXXXX	OK OK OK OK

\* Note: Manufacturers Recommended Rates for informational purposes only. Performance standard requires 100% soil coverage.  
\*\* Note: Stabilization Matting must be applied in accordance with Section 3.4.6 of the Delaware ESC Handbook.  
\*\*\* Note: Straw applied on slopes greater than 3:1 must be netted (this does not apply to topsoil stockpiles).  
OK = Acceptable to use during this time period.  
xxx = Not acceptable to use during this time period.  
All application rates are minimums.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrax™ International		<b>DE-ESC-3.4.5</b> Sheet 3 of 3 Effective FEB 2019

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CHECKED BY:	DESIGNED BY:	DATE:	DATE:
SCHE	FILE NAME:	9/20/2020	9/20/2020
11373_GEN	SMC		

REVISION	NO.	DESCRIPTION	DATE
ISSUED FOR PERMITTING	1		
ISSUED FOR BIDS	2		

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302.934.8171

**CONSTRUCTION DETAILS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-11

**Standard Detail & Specifications**  
**Topsoiling**

**Construction Notes:**

1. **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.

a. Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.

b. 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.

c. 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.

2. **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 Experimental Station.

Source:	Symbol:	Detail No.
USDA - NRCS		<b>DE-ESC-3.4.1</b> Sheet 1 of 2 Effective FEB 2019

**Standard Detail & Specifications**  
**Topsoiling**

**Construction Notes (cont.)**

a. 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 or higher. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

**Note:** No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.

b. 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 sodding 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 water 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 14.0 Soil Amendments.**

Source:	Symbol:	Detail No.
USDA - NRCS		<b>DE-ESC-3.4.1</b> Sheet 2 of 2 Effective FEB 2019

**Standard Detail & Specifications**  
**Silt Fence**

**Section**

**Plan**

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	<b>SF</b>	<b>DE-ESC-3.1.2.1</b> Sheet 1 of 2 Effective FEB 2019

**Standard Detail & Specifications**  
**Silt Fence**

**Construction Detail**

Method for joining continuous sections

**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" hardwood
- Geosynthetic Fabric: Type GD-1
- Reinforcing strip: Wooden lath or plastic strip

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	<b>SF</b>	<b>DE-ESC-3.1.2.1</b> Sheet 2 of 2 Effective FEB 2019

DETAIL: TOPSOILING  
NO SCALE

DETAIL: SILT FENCE  
NO SCALE

**Standard Detail & Specifications**  
**Geotextile Dewatering Bag**

**Plan**

**Profile**

**Materials:**

- The geotextile fabric shall be a Type GD-IV.
- The dewatering bag shall be sewn with a double needle machine using high strength thread. All structural seams will be sewn with high strength, double stitched "J" type. Seam strength test will have the following minimum average roll values:

Type	TEST METHOD	TEST RESULT
Heavy duty	ASTM D-4884	100 lb / in

3. The dewatering bag shall have an opening large enough to accommodate a four (4) inch discharge hose with attached strap to tie off the hose to prevent the pumped water from escaping from the bag without being filtered.

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	<b>GB</b>	<b>DE-ESC-3.2.1.2</b> Sheet 1 of 2 Effective FEB 2019

**Standard Detail & Specifications**  
**Geotextile Dewatering Bag**

**Construction Notes:**

- The dewatering bag should be placed so the incoming water flows into and through the bag, and then flow off the site without creating more erosion. The neck should be tied off tightly to stop the water from flowing out of the bag without going through the walls. The dewatering bag should be placed on a gravel bed to allow water to flow in all directions.
- The dewatering bag is considered full and should be disposed when it is impractical for the bag to filter the sediment out at a reasonable flow rate. At this point, it should be replaced with a new bag.
- Disposal may be accomplished as directed by the construction reviewer. If the site allows, the bag may be buried on site and seeded, visible fabric removed and seeded or removed from site to a proper disposal area.

**Materials:**

- The geotextile fabric shall be a Type GD-IV.
- The dewatering bag shall be sewn with a double needle machine using high strength thread. All structural seams will be sewn with high strength, double stitched "J" type. Seam strength test will have the following minimum average roll values:

Type	TEST METHOD	TEST RESULT
Heavy duty	ASTM D-4884	100 lb / in

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Adapted from ACF Products, Inc.	<b>GB</b>	<b>DE-ESC-3.2.1.2</b> Sheet 2 of 2 Effective FEB 2019

**Standard Detail & Specifications**  
**Riprap Outlet Protection - 1**

**Plan**

**Section A-A**

**Materials:**

- The 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:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	<b>ROP-1</b>	<b>DE-ESC-3.3.10.1</b> Sheet 1 of 2 Effective FEB 2019

**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:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	<b>ROP-1</b>	<b>DE-ESC-3.3.10.1</b> Sheet 2 of 2 Effective FEB 2019

DETAIL: GEOTEXTILE DEWATERING BAG  
NO SCALE

DETAIL: RIPRAP OUTLET PROTECTION  
NO SCALE

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SCALE: [ ]  
FILE NAME: 11373.BB  
DRAWN BY: SMC  
ISSUED FOR PERMITTING: [ ]  
ISSUED FOR BIDS: [ ]

STEVEN H. LEVANDOWSKI, P.E.  
Professional Engineer  
No. 11-17-20  
STATE OF DELAWARE

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302.934.8171

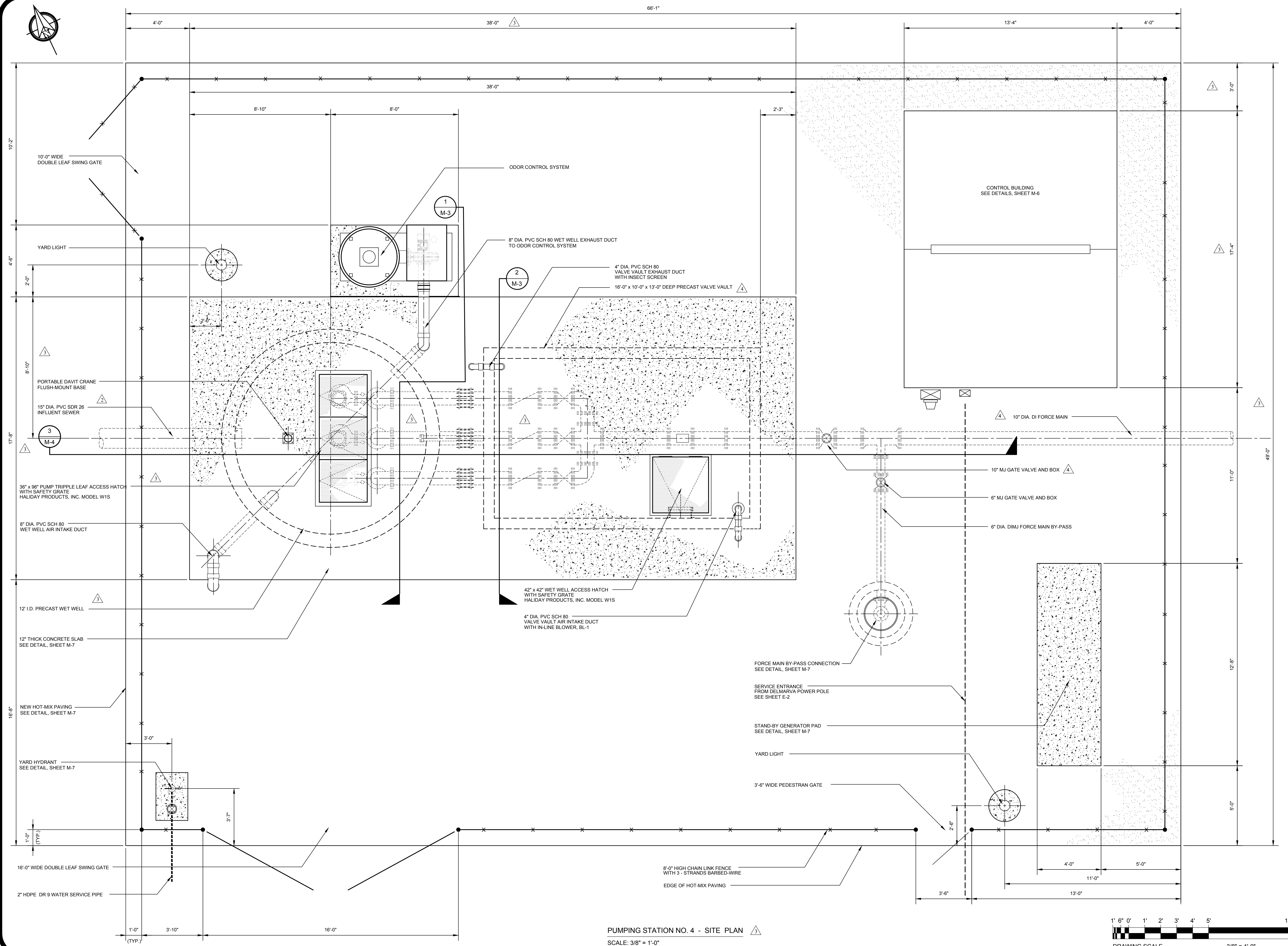
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**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

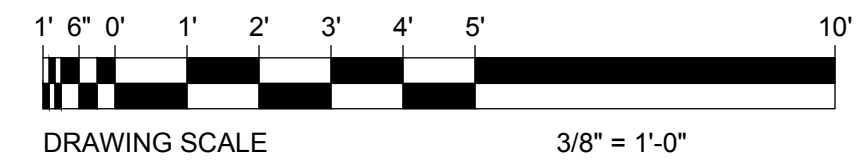
**THE TOWN OF MILLSBORO**

**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: C-12



PUMPING STATION NO. 4 - SITE PLAN



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CHECKED BY:	SCH	FILE NAME:	SPS_PLANS
DESIGNED BY:	SHL	DRAWN BY:	DAC
CHECK DATE:	11/20/20	DATE:	7/20/20
DATE:	9/30/2023	DATE:	2/20/24

DESIGNED BY: STEVEN H. LEVANDOWSKI, P.E.

NO.	REVISION
1	ISSUED FOR PERMITTING
2	ISSUED FOR BIDS
3	PUMPING STATION REVISIONS PER OWNER
4	ISSUED FOR BIDDING

OWNER: THE TOWN OF MILLSBORO  
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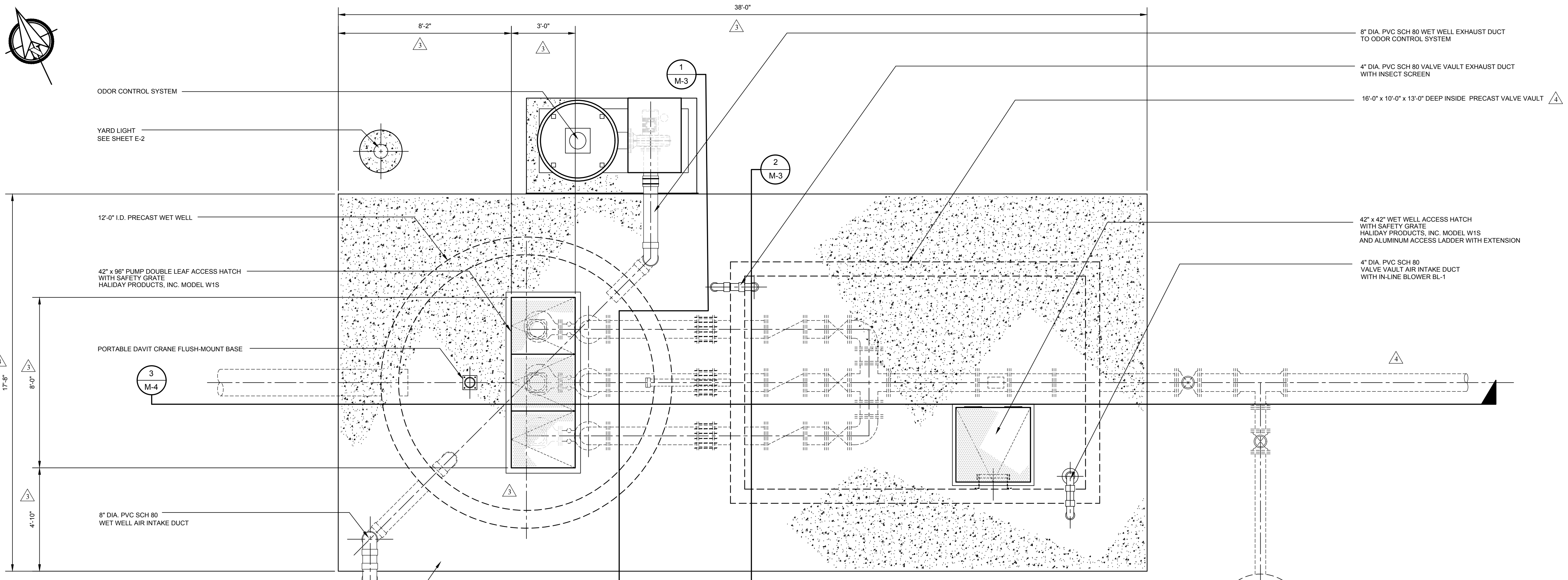
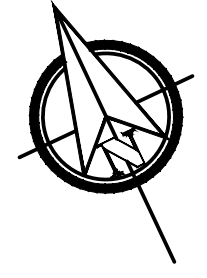
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**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

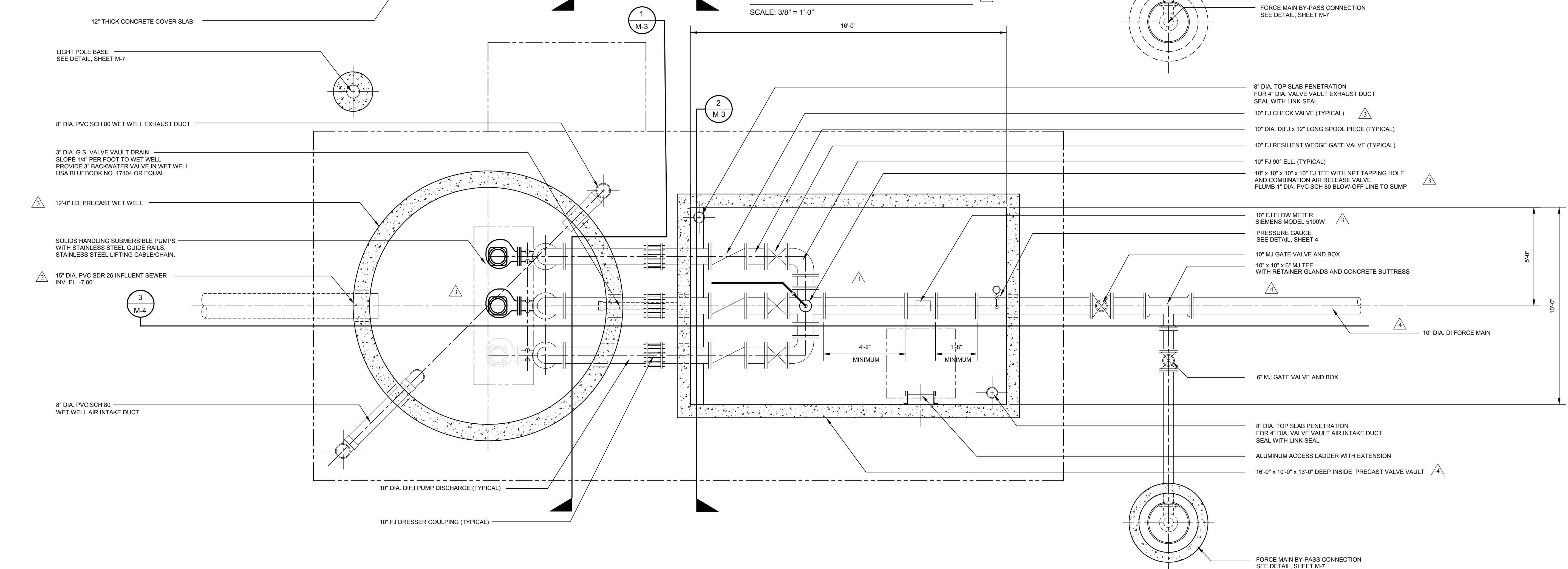
**THE TOWN OF MILLSBORO**

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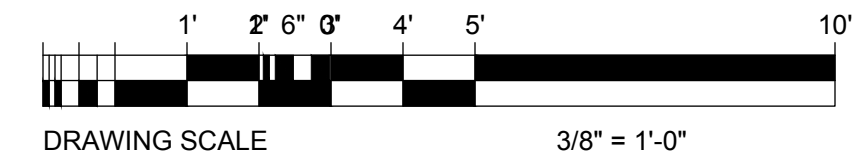
DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: M-1



**PUMPING STATION NO. 4 COVER SLAB - PLAN VIEW**  
SCALE: 3/8" = 1'-0"



**PUMPING STATION NO. 4 BELOW GRADE - PLAN VIEW**  
SCALE: 3/8" = 1'-0"



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CHECKED BY: SCH  
DESIGNED BY: SHL  
DRAWN BY: DAC  
FILE NAME: SPS PLANS  
DESIGNER: STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE  
11-17-20  
P.E. 11578

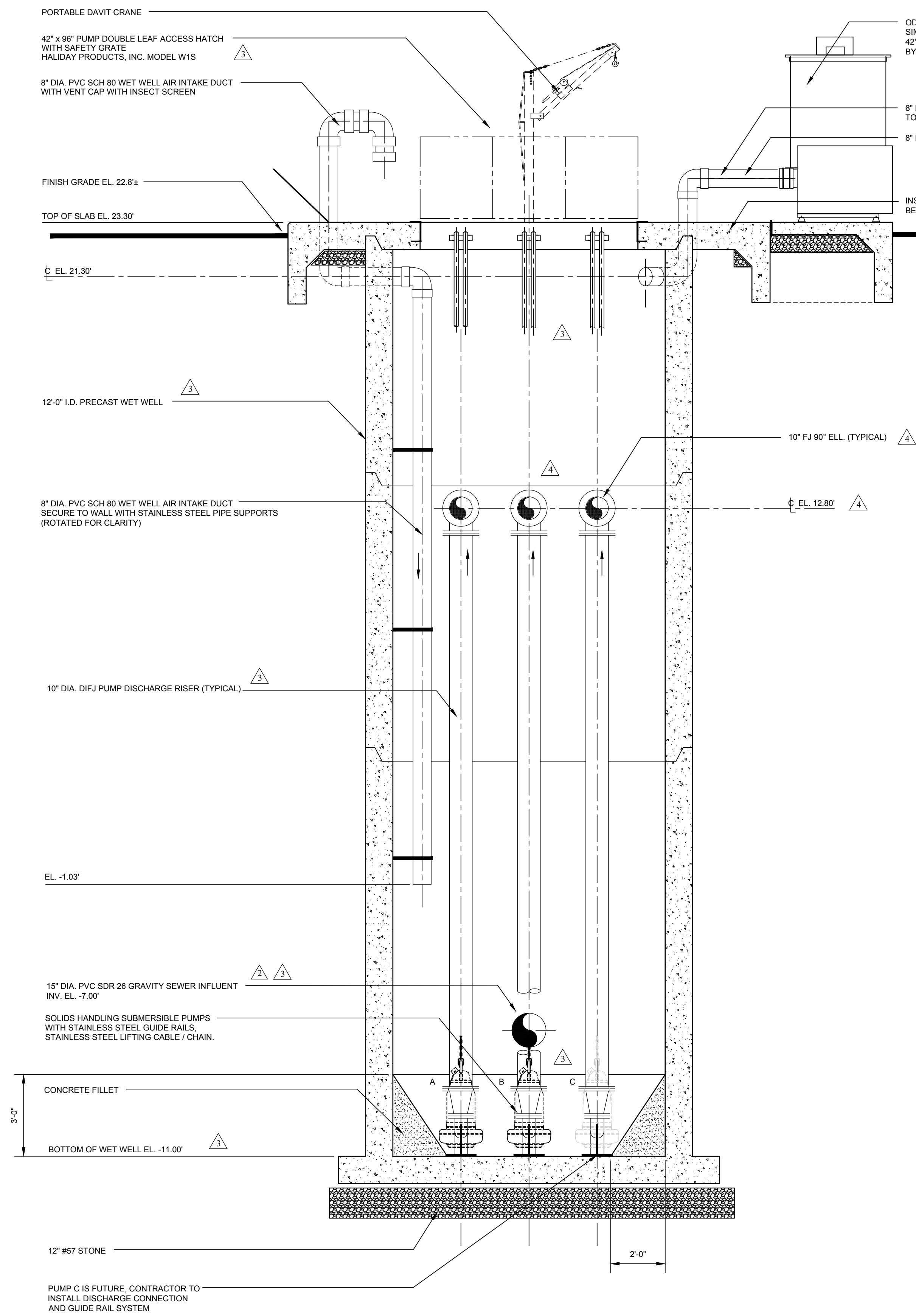
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2	ISSUED FOR BIDS	9/20/2020
3	PUMPING STATION REVISIONS PER OWNER	7-2023
4	ISSUED FOR BIDDING	2-2024

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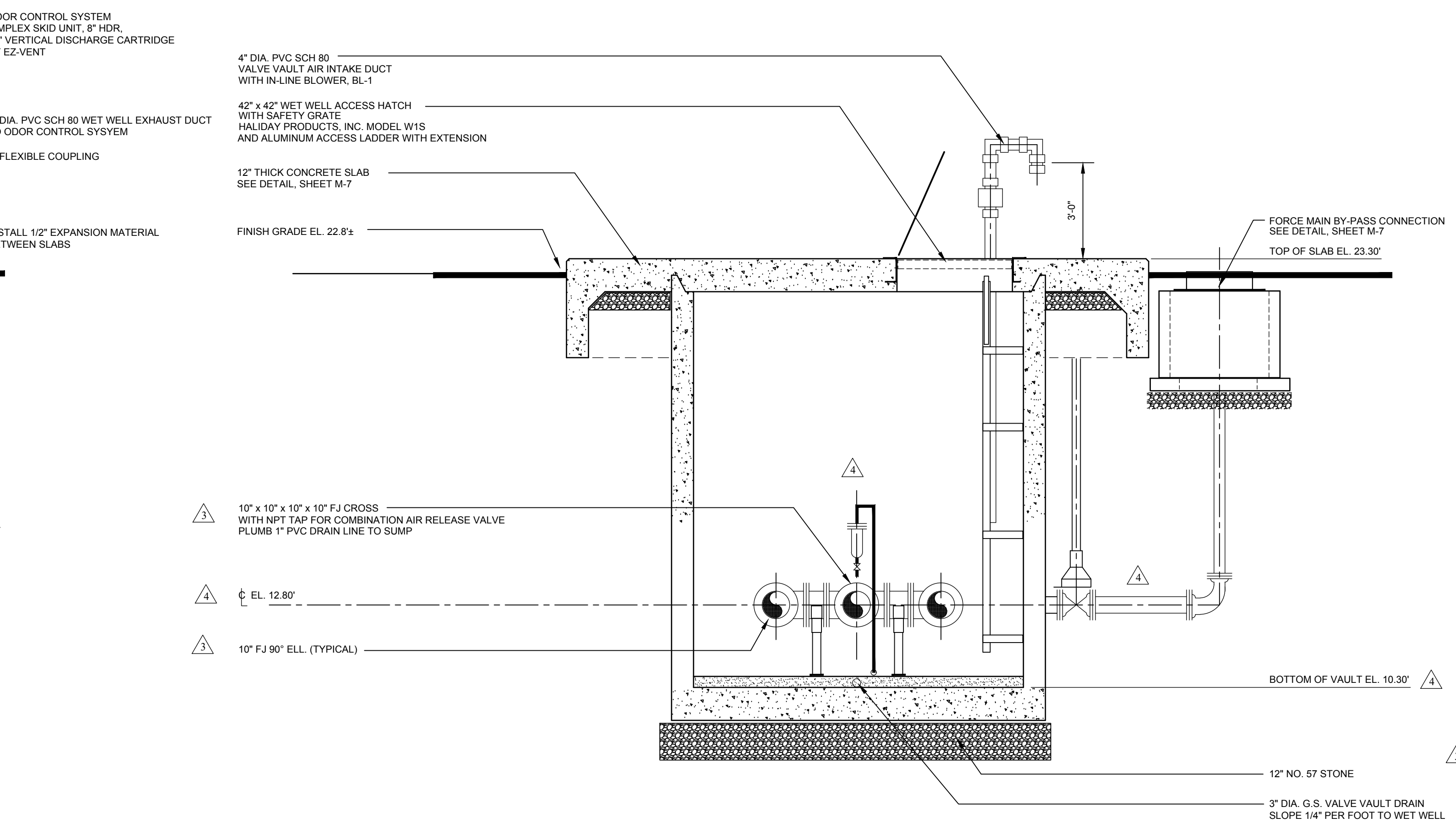
**PUMPING STATION - PLANS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
MILLSBORO-SUSSEX COUNTY, DELAWARE

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: M-2

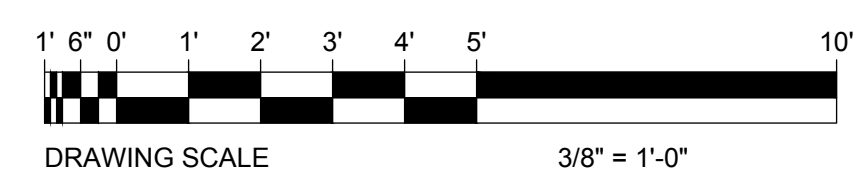
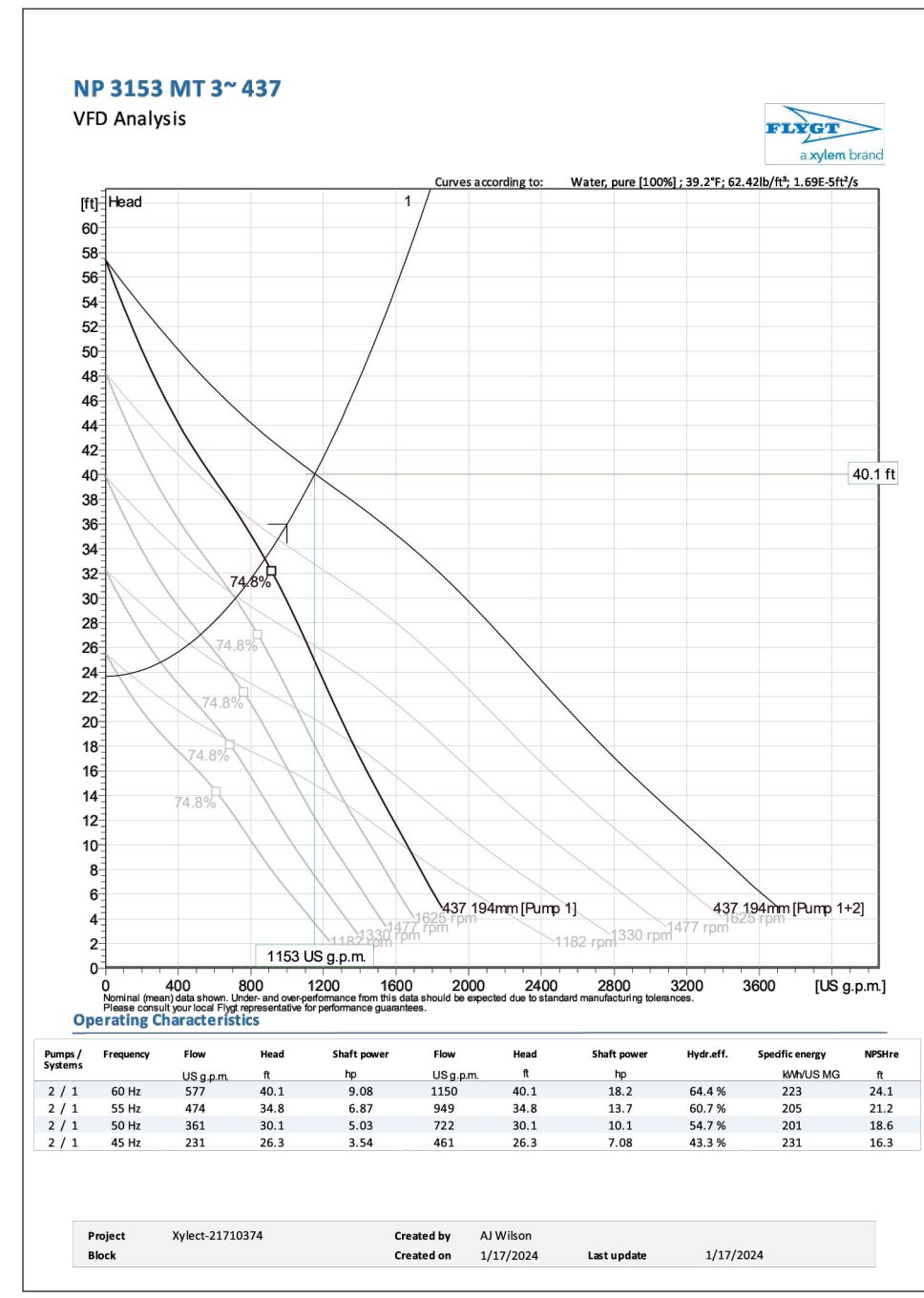




SECTION 1  
SCALE: 3/8" = 1'-0"  
SEE SHEETS M-1 AND M-2



SECTION 2  
SCALE: 3/8" = 1'-0"  
SEE SHEETS M-1 AND M-2



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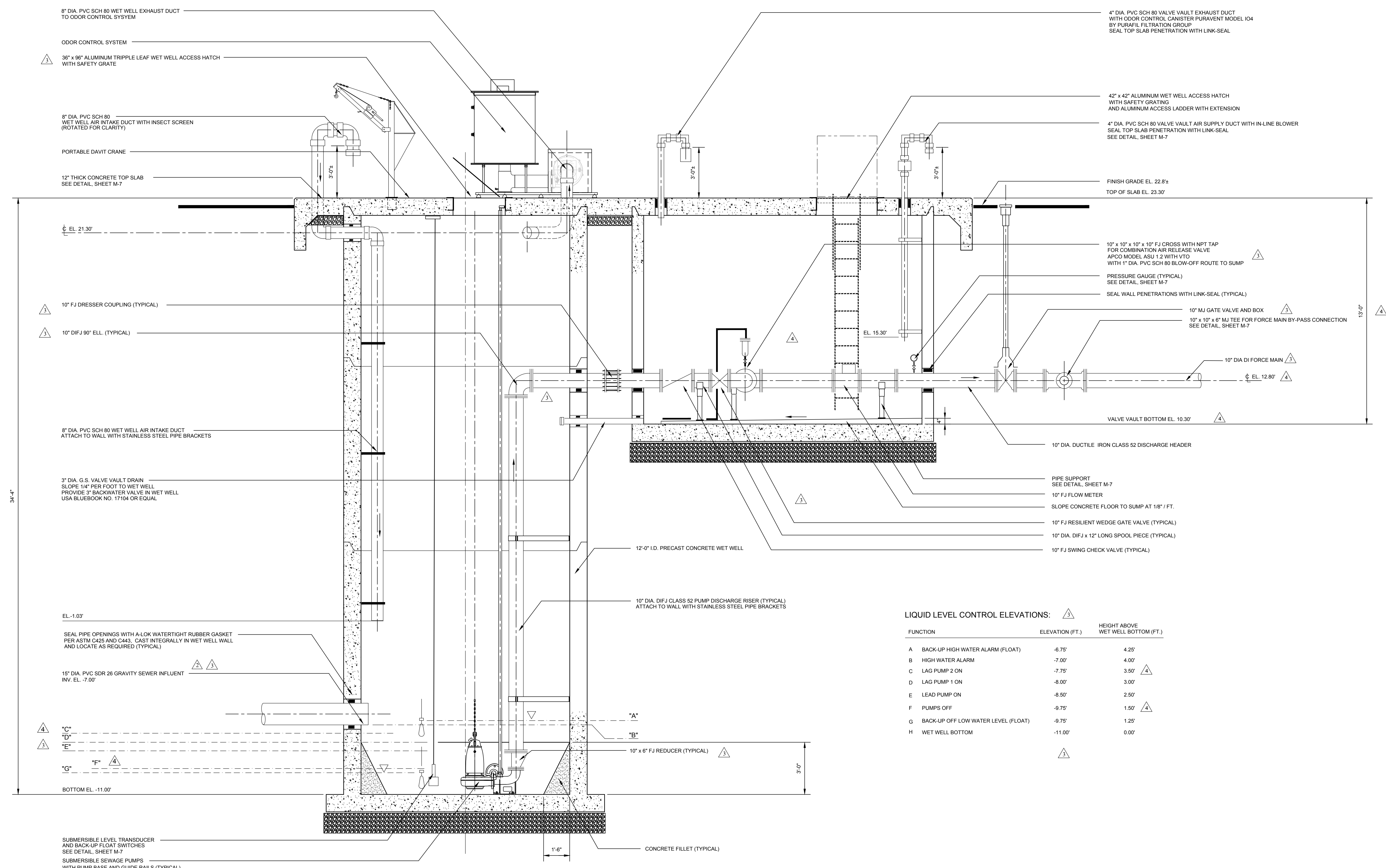
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DESIGNED BY: SHL  
DATE: 7-2023  
FILE NAME: SPS\_PLANS  
DRAWN BY: DAC  
STEVEN H. LEVANDOWSKI, P.E.  
11-17-20  
STATE DELAWARE  
P.E. 11578

NO.	REVISION
1	ISSUED FOR PERMITTING
2	ISSUED FOR BIDS
3	PUMPING STATION REVISIONS PER OWNER
4	ISSUED FOR BIDDING

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322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
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**PUMPING STATION - SECTIONS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: M-3



8" DIA. PVC SCH 80 WET WELL EXHAUST DUCT TO ODOR CONTROL SYSTEM

ODOR CONTROL SYSTEM

36" x 96" ALUMINUM TRIPPLE LEAF WET WELL ACCESS HATCH WITH SAFETY GRATE

8" DIA. PVC SCH 80 WET WELL AIR INTAKE DUCT WITH INSECT SCREEN (ROTATED FOR CLARITY)

PORTABLE DAVIT CRANE

12" THICK CONCRETE TOP SLAB SEE DETAIL, SHEET M-7

EL. 21.30'

10" FJ DRESSER COUPLING (TYPICAL)

10" DIFJ 90° ELL. (TYPICAL)

8" DIA. PVC SCH 80 WET WELL AIR INTAKE DUCT ATTACH TO WALL WITH STAINLESS STEEL PIPE BRACKETS

3" DIA. G.S. VALVE VAULT DRAIN SLOPE 1/4" PER FOOT TO WET WELL PROVIDE 3" BACKWATER VALVE IN WET WELL USA BLUEBOOK NO. 17104 OR EQUAL

EL. -1.03'

SEAL PIPE OPENINGS WITH A-LOK WATERTIGHT RUBBER GASKET PER ASTM C425 AND C443, CAST INTEGRALLY IN WET WELL WALL AND LOCATE AS REQUIRED (TYPICAL)

15" DIA. PVC SDR 26 GRAVITY SEWER INFLUENT INV. EL. -7.00'

"C"

"D"

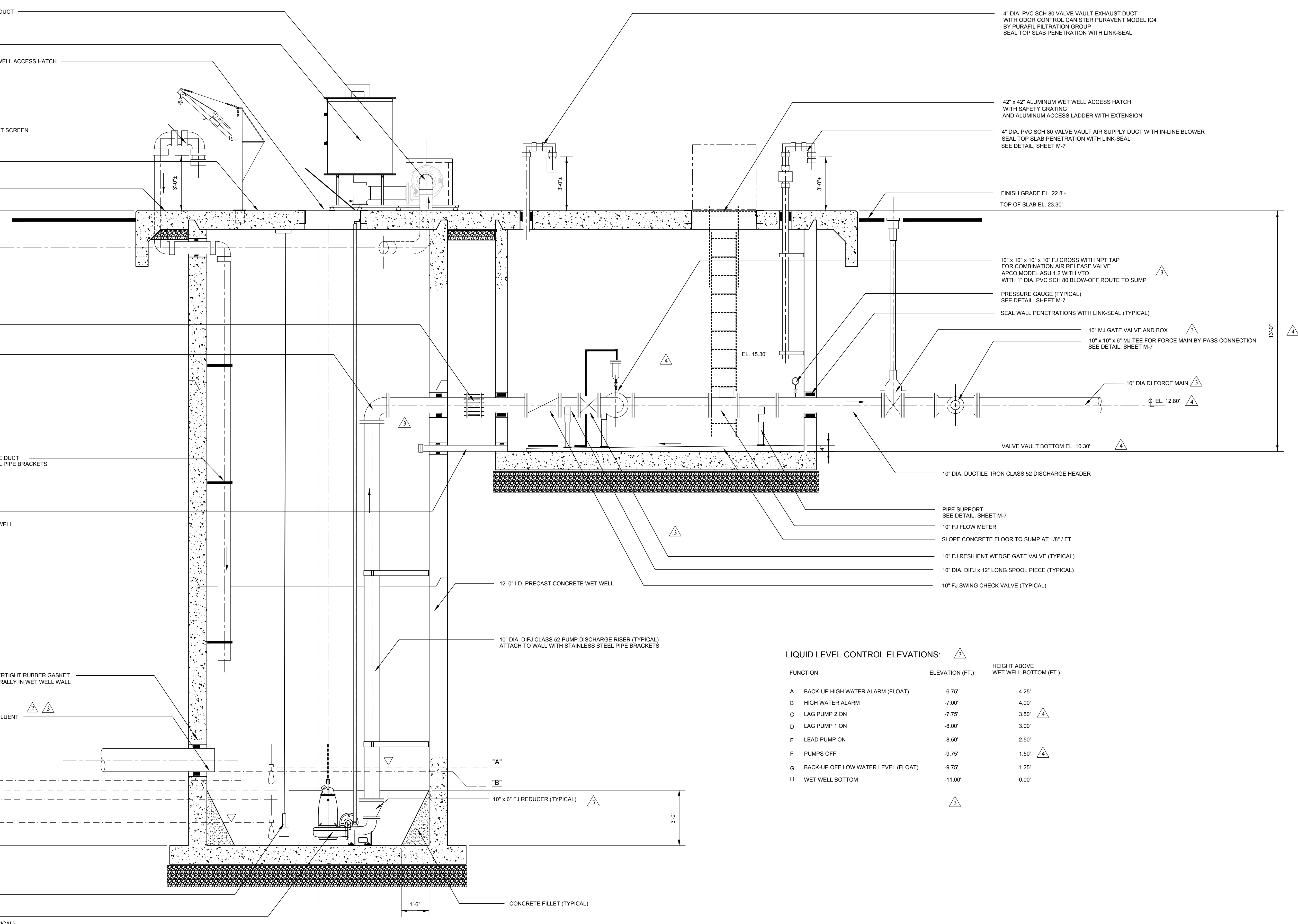
"E"

"G"

BOTTOM EL. -11.00'

SUBMERSIBLE LEVEL TRANSDUCER AND BACK-UP FLOAT SWITCHES SEE DETAIL, SHEET M-7

SUBMERSIBLE SEWAGE PUMPS WITH PUMP BASE AND GUIDE RAILS (TYPICAL)



42" x 42" ALUMINUM WET WELL ACCESS HATCH WITH SAFETY GRATING AND ALUMINUM ACCESS LADDER WITH EXTENSION

4" DIA. PVC SCH 80 VALVE VAULT EXHAUST DUCT WITH ODOR CONTROL CANISTER PURAVENT MODEL 104 BY PURAFIL FILTRATION GROUP SEAL TOP SLAB PENETRATION WITH LINK-SEAL

4" DIA. PVC SCH 80 VALVE VAULT AIR SUPPLY DUCT WITH IN-LINE BLOWER SEAL TOP SLAB PENETRATION WITH LINK-SEAL SEE DETAIL, SHEET M-7

FINISH GRADE EL. 22.8±

TOP OF SLAB EL. 23.30'

10" x 10" x 10" x 10" FJ CROSS WITH NPT TAP FOR COMBINATION AIR RELEASE VALVE APCO MODEL ASU 1.2 WITH VTO WITH 1" DIA. PVC SCH 80 BLOW-OFF ROUTE TO SUMP

PRESSURE GAUGE (TYPICAL) SEE DETAIL, SHEET M-7

SEAL WALL PENETRATIONS WITH LINK-SEAL (TYPICAL)

10" MJ GATE VALVE AND BOX

10" x 10" x 6" MJ TEE FOR FORCE MAIN BY-PASS CONNECTION SEE DETAIL, SHEET M-7

10" DIA. DI FORCE MAIN

EL. 15.30'

EL. 12.80'

VALVE VAULT BOTTOM EL. 10.30'

10" DIA. DUCTILE IRON CLASS 52 DISCHARGE HEADER

PIPE SUPPORT SEE DETAIL, SHEET M-7

10" FJ FLOW METER

SLOPE CONCRETE FLOOR TO SUMP AT 1/8" / FT.

10" FJ RESILIENT WEDGE GATE VALVE (TYPICAL)

10" DIA. DIFJ x 12" LONG SPOOL PIECE (TYPICAL)

10" FJ SWING CHECK VALVE (TYPICAL)

12" O.D. PRECAST CONCRETE WET WELL

10" DIA. DIFJ CLASS 52 PUMP DISCHARGE RISER (TYPICAL) ATTACH TO WALL WITH STAINLESS STEEL PIPE BRACKETS

"A"

"B"

10" x 6" FJ REDUCER (TYPICAL)

3'-0"

1'-6"

CONCRETE FILLET (TYPICAL)

LIQUID LEVEL CONTROL ELEVATIONS:

FUNCTION	ELEVATION (FT.)	HEIGHT ABOVE WET WELL BOTTOM (FT.)
A BACK-UP HIGH WATER ALARM (FLOAT)	-6.75'	4.25'
B HIGH WATER ALARM	-7.00'	4.00'
C LAG PUMP 2 ON	-7.75'	3.50'
D LAG PUMP 1 ON	-8.00'	3.00'
E LEAD PUMP ON	-8.50'	2.50'
F PUMPS OFF	-9.75'	1.50'
G BACK-UP OFF LOW WATER LEVEL (FLOAT)	-9.75'	1.25'
H WET WELL BOTTOM	-11.00'	0.00'

SECTION 3 M-4

SCALE: 3/8" = 1'-0"

SEE SHEETS M-1 AND M-2



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CHECKED BY: SCH  
DESIGNED BY: SHL  
DRAWN BY: DAC  
FILE NAME: SPS\_PLANS  
DRAWN BY: STEVEN H. LEVANDOWSKI, P.E.  
11-17-20  
STATE DELAWARE

OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**PUMPING STATION - SECTIONS**

**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

**THE TOWN OF MILLSBORO**

**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020

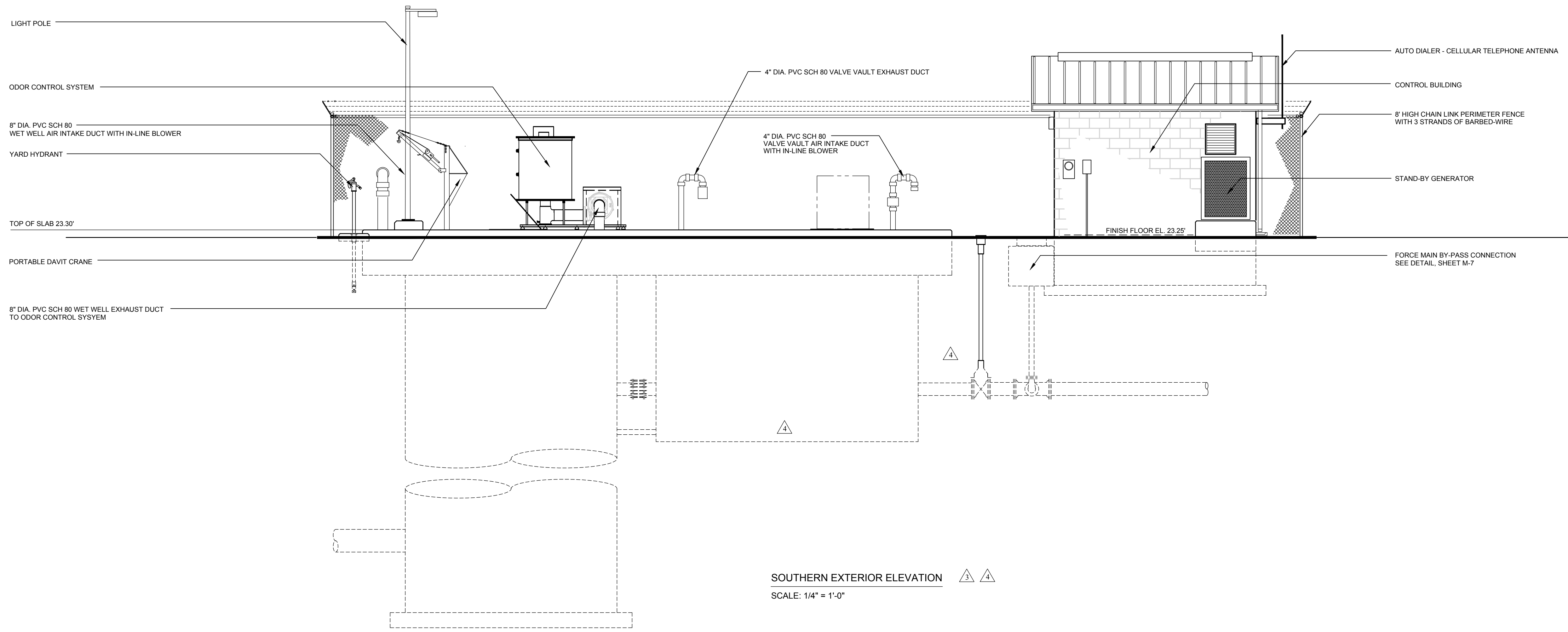
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PROJECT NO. 11373.BB

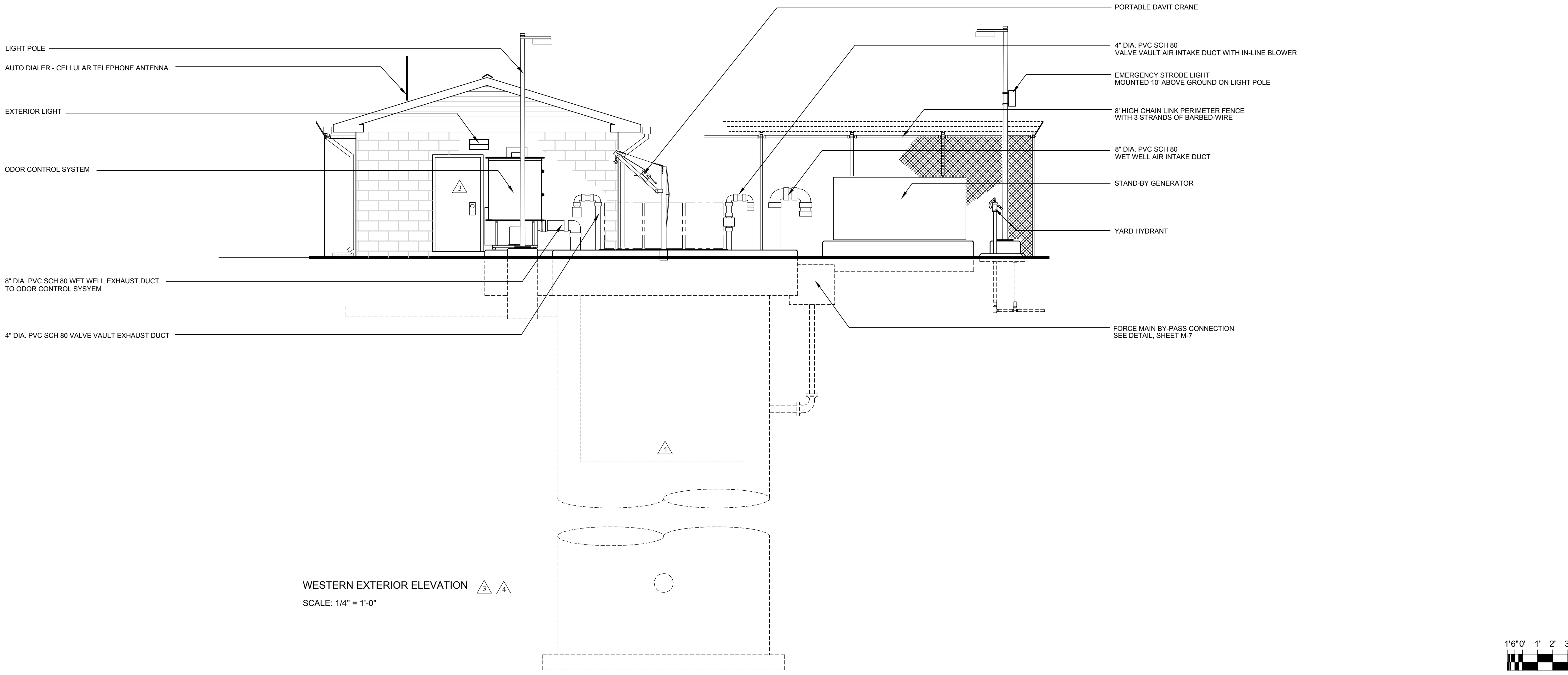
SHEET: M-4

REVISION

No.	REVISION
1	ISSUED FOR PERMITTING
2	ISSUED FOR BIDS
3	PUMPING STATION REVISIONS PER OWNER
4	ISSUED FOR BIDDING



SOUTHERN EXTERIOR ELEVATION  $\triangle$   $\triangle$   
SCALE: 1/4" = 1'-0"



WESTERN EXTERIOR ELEVATION  $\triangle$   $\triangle$   
SCALE: 1/4" = 1'-0"



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FILE NAME: SPS\_PLANS  
DESIGNED BY: STEVEN H. LEVANDOWSKI, P.E.  
11-17-20  
STATE DELAWARE  
P.E. 11578

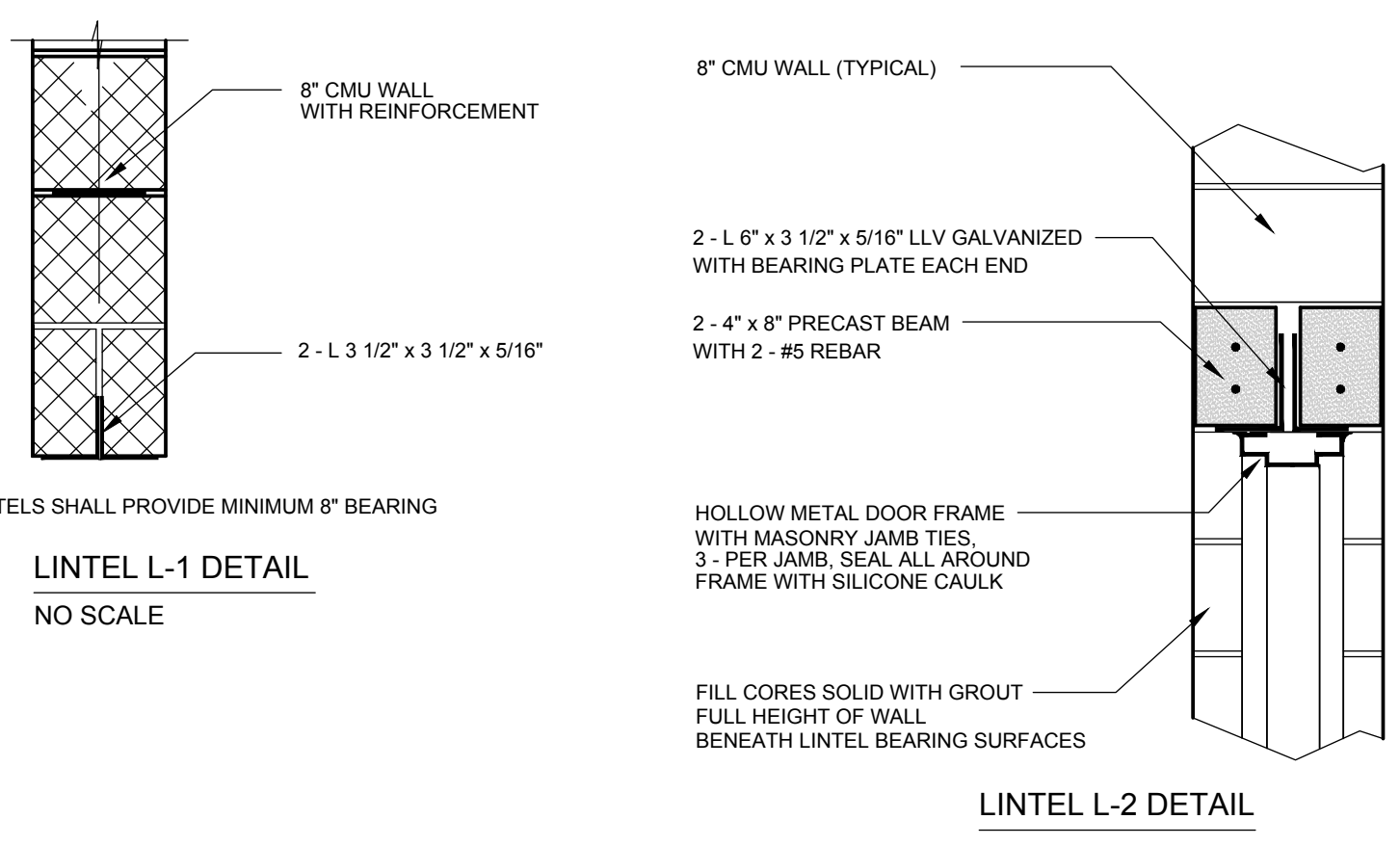
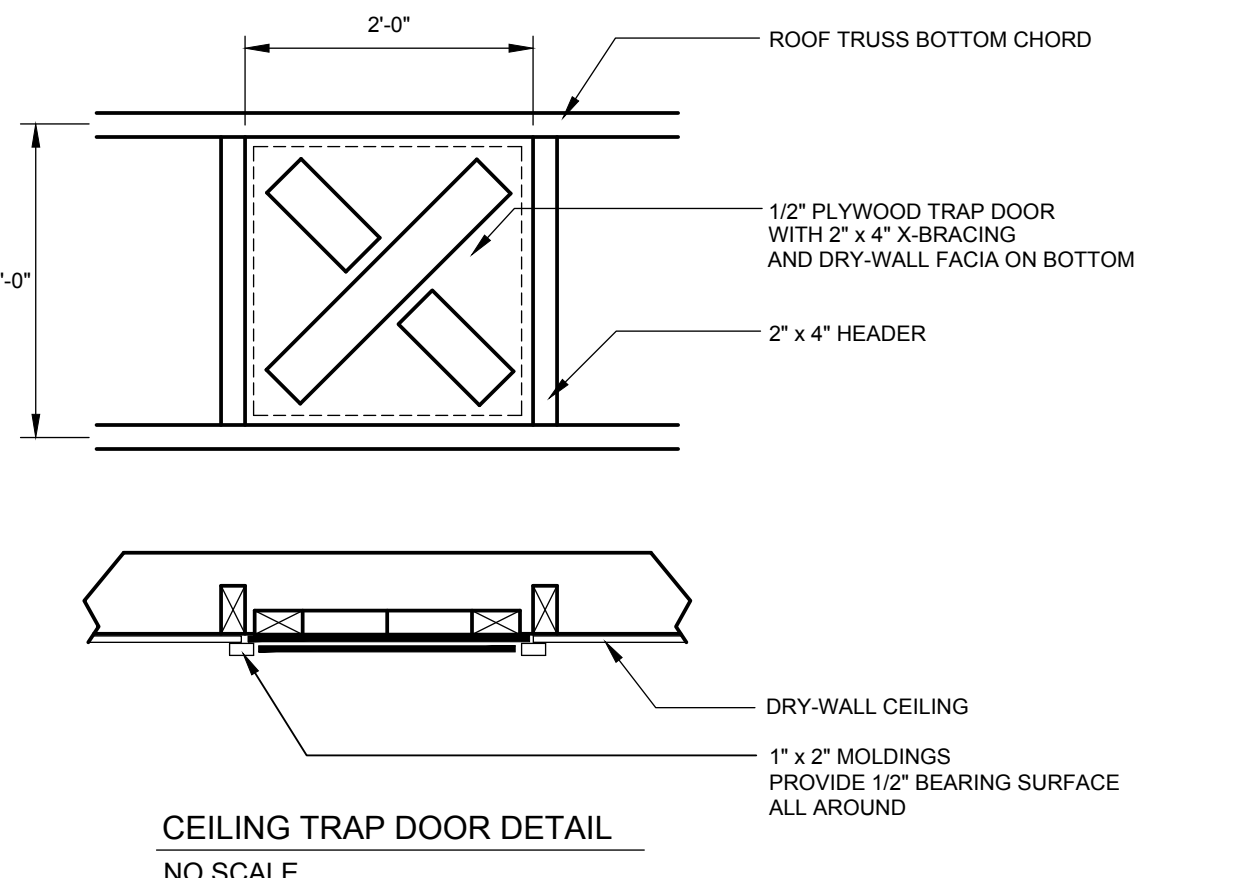
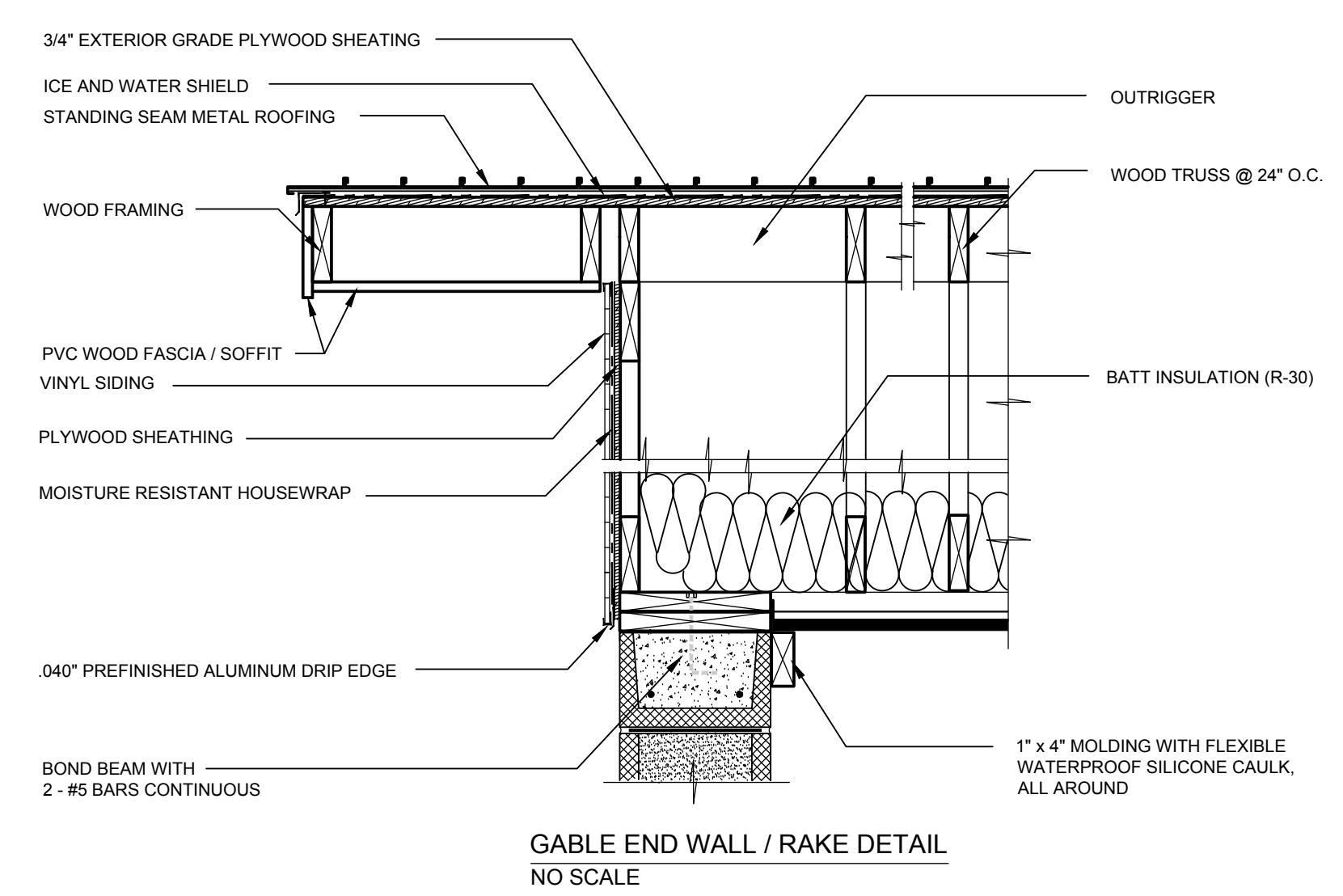
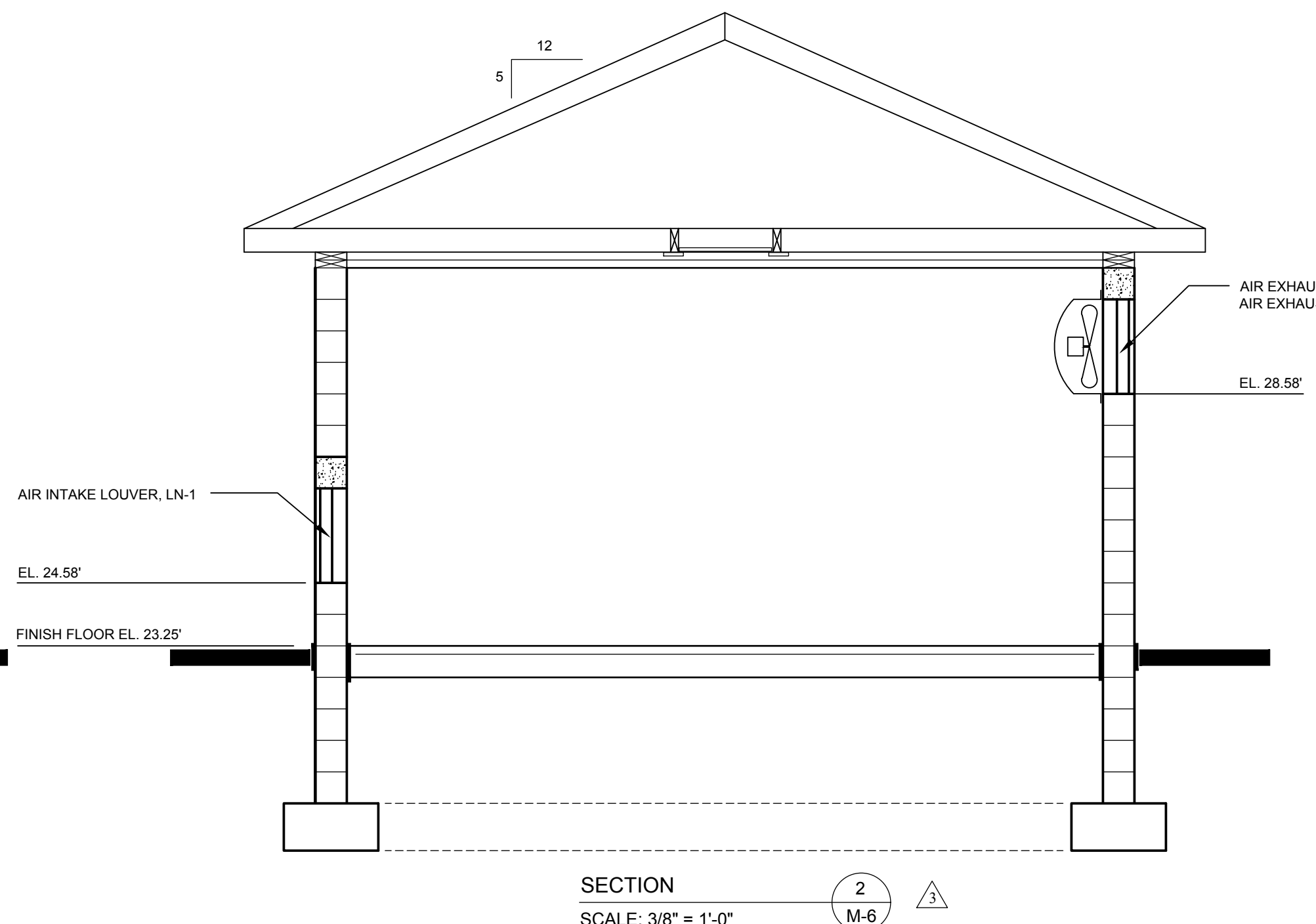
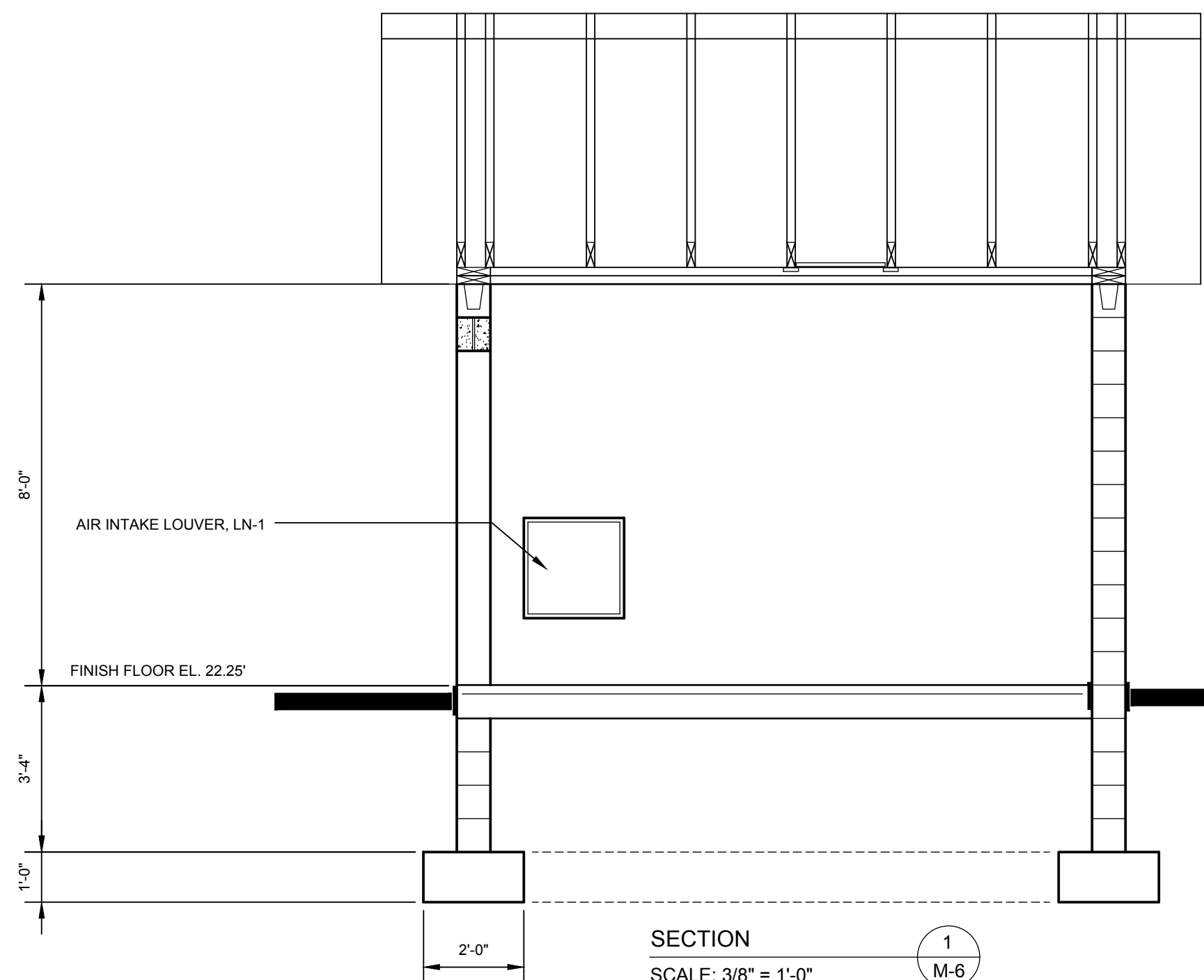
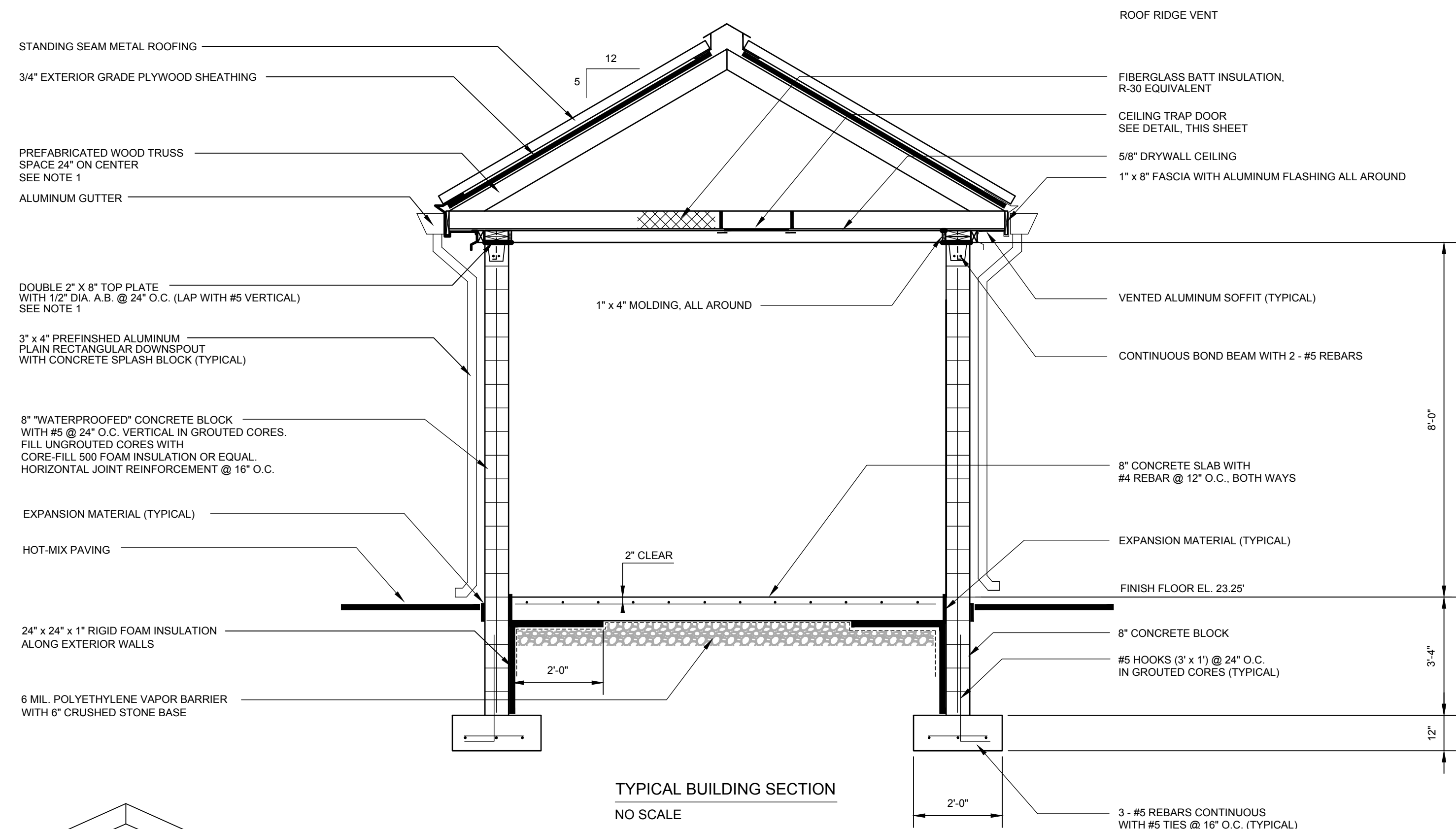
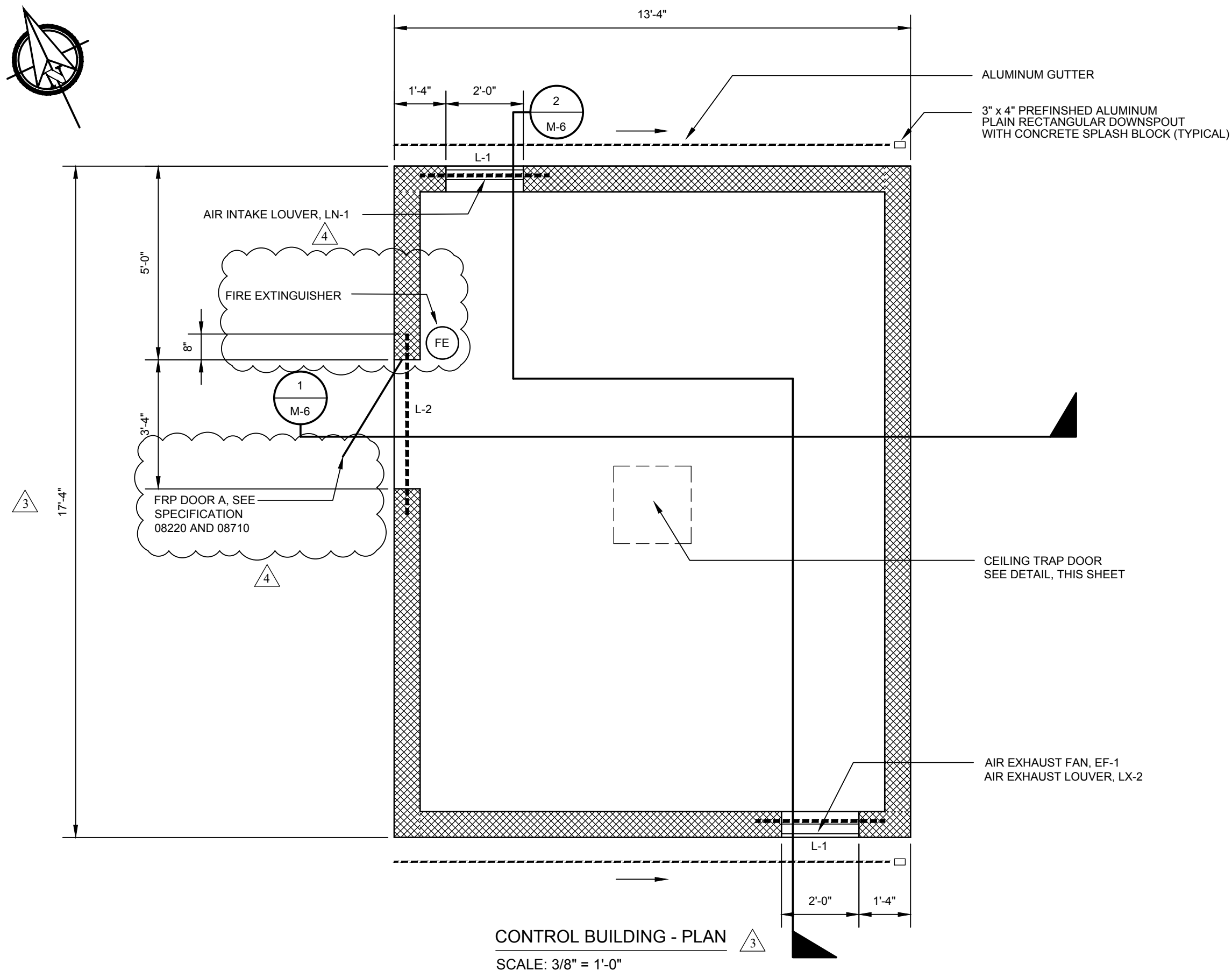


NO.	REVISION	DATE	BY
1	ISSUED FOR PERMITTING	7-2023	SHL
2	ISSUED FOR BIDS	9-2023	DAC
3	PUMPING STATION REVISIONS PER OWNER	7-2023	SHL
4	ISSUED FOR BIDDING	2-2024	SHL

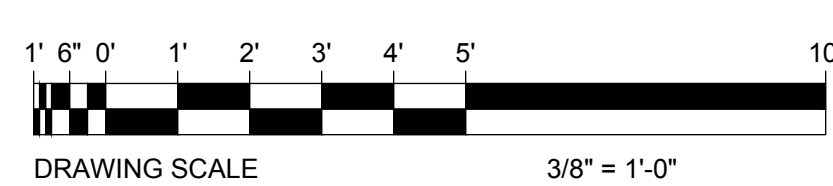
OWNER: THE TOWN OF MILLSBORO  
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**PUMPING STATION - EXTERIOR ELEVATIONS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
MILLSBORO-SUSSEX COUNTY DELAWARE

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: M-5



NOTES:  
1. CONNECT TO TRUSS WITH H10A TIE BY SIMPSON STRONG TIE OR EQUAL (TYPICAL BOTH SIDE OF TRUSS)



Labels include: ROOF RIDGE VENT; FIBERGLASS BATT INSULATION, R-30 EQUIVALENT; CEILING TRAP DOOR SEE DETAIL, THIS SHEET; 5/8" DRYWALL CEILING; 1" x 8" FASCIA WITH ALUMINUM FLASHING ALL AROUND; VENTED ALUMINUM SOFFIT (TYPICAL); CONTINUOUS BOND BEAM WITH 2 - #5 REBARS; 8" CONCRETE SLAB WITH #4 REBAR @ 12" O.C., BOTH WAYS; EXPANSION MATERIAL (TYPICAL); FINISH FLOOR EL. 23.25'; 8" CONCRETE BLOCK; #5 HOOKS (3" x 1") @ 24" O.C. IN GROUTED CORES (TYPICAL); 3 - #5 REBARS CONTINUOUS WITH #5 TIES @ 16" O.C. (TYPICAL); 2" CLEAR; 24" x 24" x 1" RIGID FOAM INSULATION ALONG EXTERIOR WALLS; 6 MIL. POLYETHYLENE VAPOR BARRIER WITH 6" CRUSHED STONE BASE; HOT-MIX PAVING; EXPANSION MATERIAL (TYPICAL); 8" "WATERPROOFED" CONCRETE BLOCK WITH #5 @ 24" O.C. VERTICAL IN GROUTED CORES. FILL UNGROUTED CORES WITH CORE-FILL 500 FOAM INSULATION OR EQUAL. HORIZONTAL JOINT REINFORCEMENT @ 16" O.C.; 3" x 4" PREFINISHED ALUMINUM PLAIN RECTANGULAR DOWNSPOUT WITH CONCRETE SPLASH BLOCK (TYPICAL); 3" x 4" PREFINISHED ALUMINUM PLAIN RECTANGULAR DOWNSPOUT WITH CONCRETE SPLASH BLOCK (TYPICAL); DOUBLE 2" x 8" TOP PLATE WITH 1/2" DIA. A.B. @ 24" O.C. (LAP WITH #5 VERTICAL) SEE NOTE 1; PREFABRICATED WOOD TRUSS SPACE 24" ON CENTER SEE NOTE 1; 3/4" EXTERIOR GRADE PLYWOOD SHEATHING; STANDING SEAM METAL ROOFING; ALUMINUM GUTTER.

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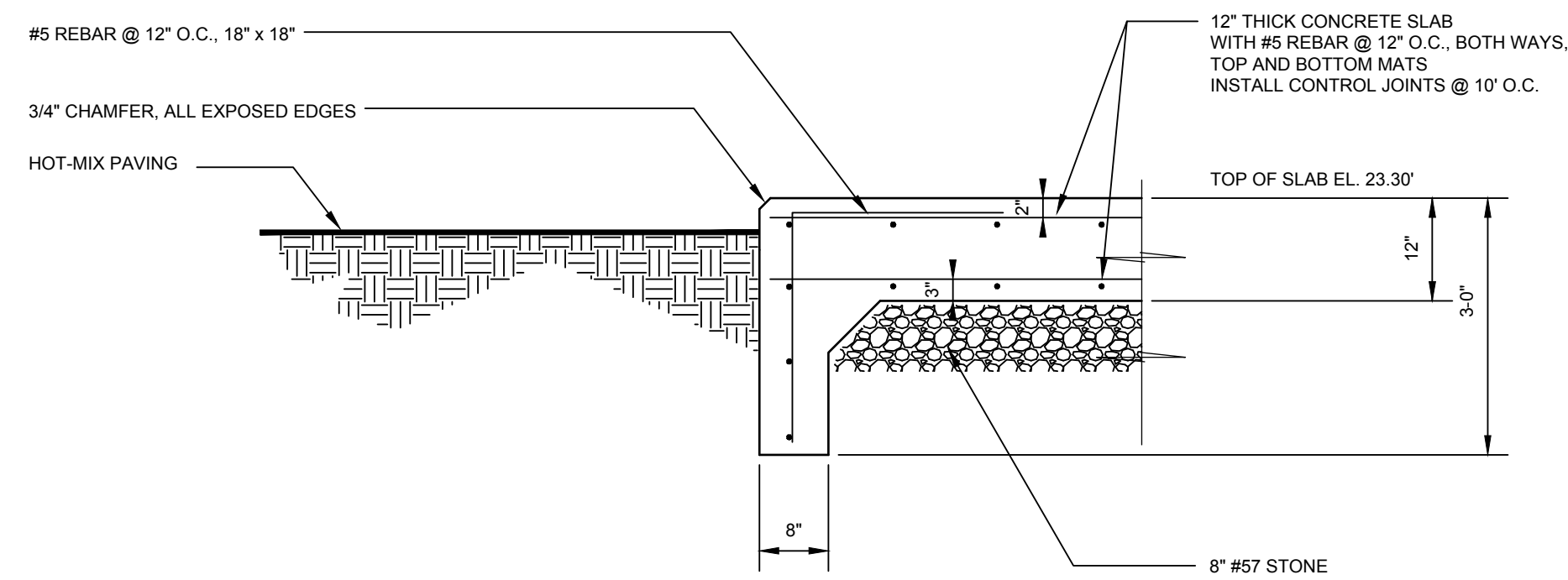
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DESIGNED BY: DAC  
DRAWN BY: DAC  
FILE NAME: SPS\_PLANS  
STEVEN H. LEVANDOWSKI, P.E.  
11-17-20  
STATE DELAWARE  
P.E. 11578

NO.	REVISION	DATE	BY	DESCRIPTION
1	ISSUED FOR PERMITTING	7-2023	SCH	
2	ISSUED FOR BIDS	9/20/2023	SCH	
3	PUMPING STATION REVISIONS PER OWNER	1-2024	SCH	
4	FIRE MARSHAL COMMENTS	2-2024	SCH	
5	ISSUED FOR BIDDING	2-2024	SCH	

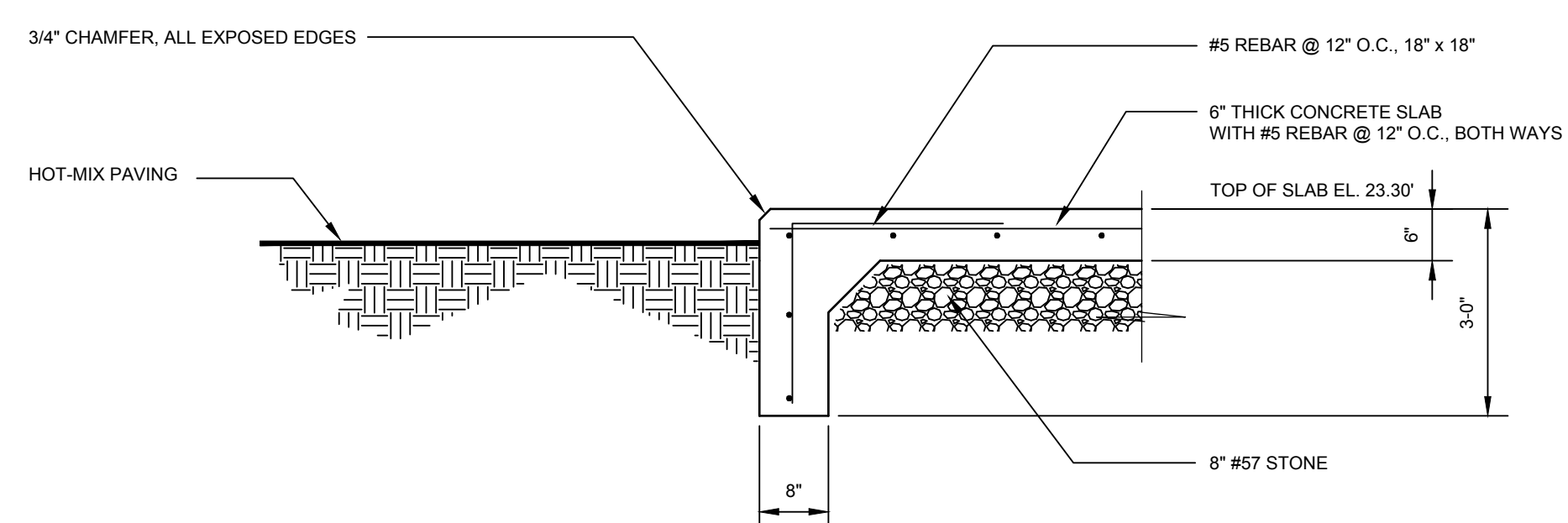
OWNER: THE TOWN OF MILLSBORO  
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MILLSBORO, DELAWARE 19966  
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**CONTROL BUILDING**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

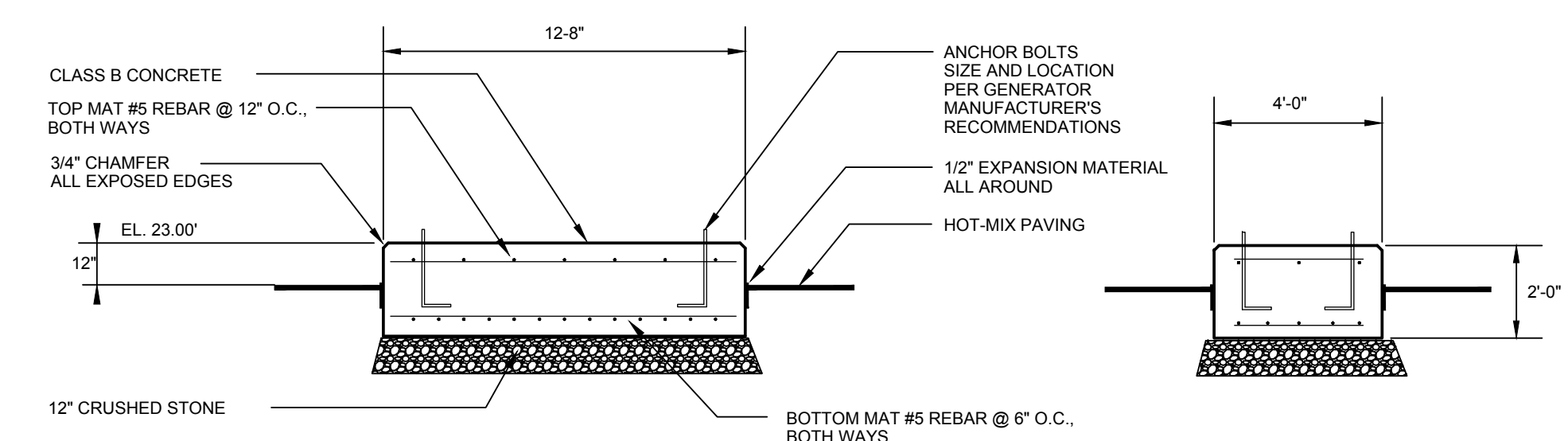
DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: M-6



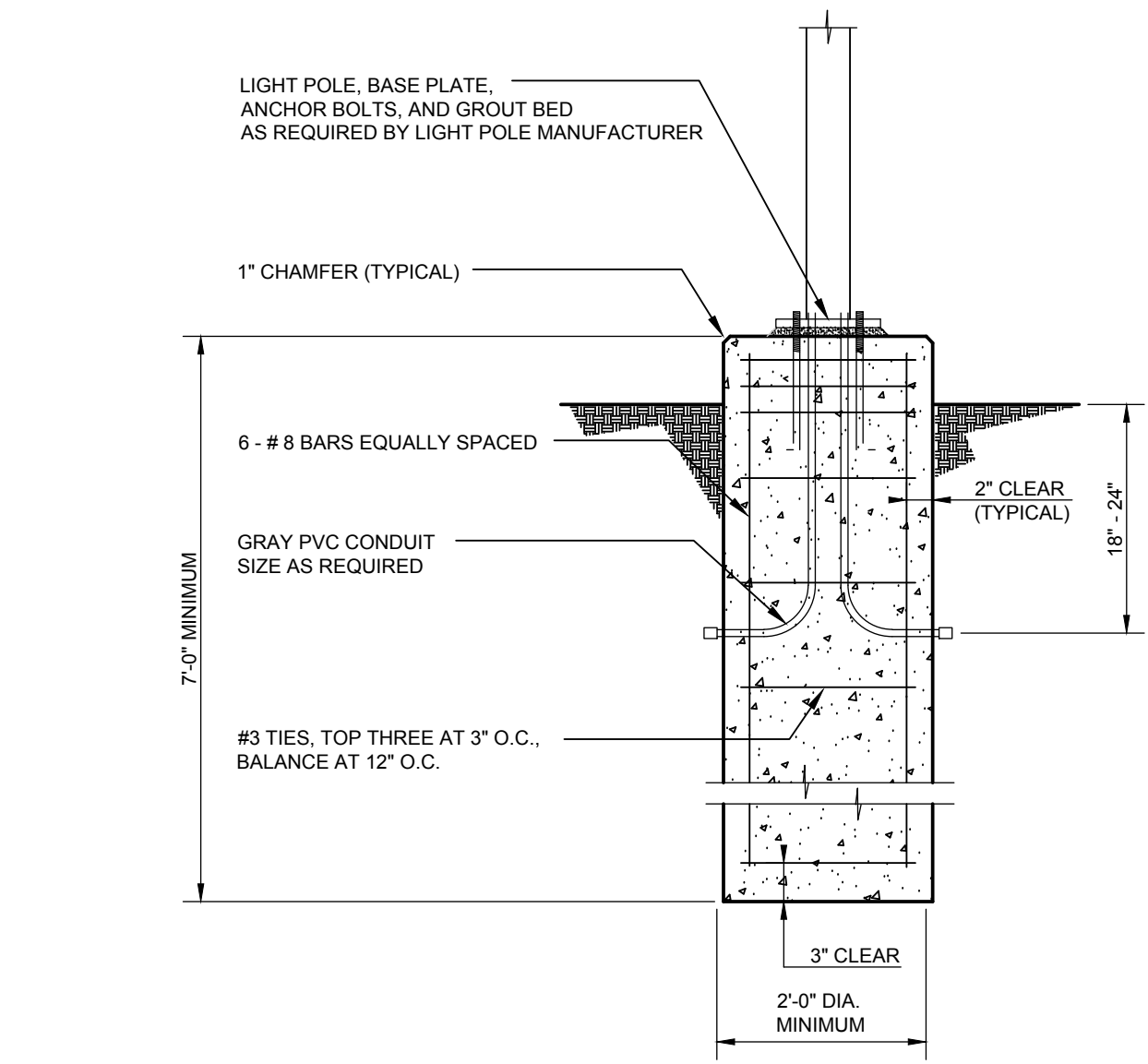
PUMPING STATION TOP SLAB TURN-DOWN FOOTER DETAIL  
NO SCALE



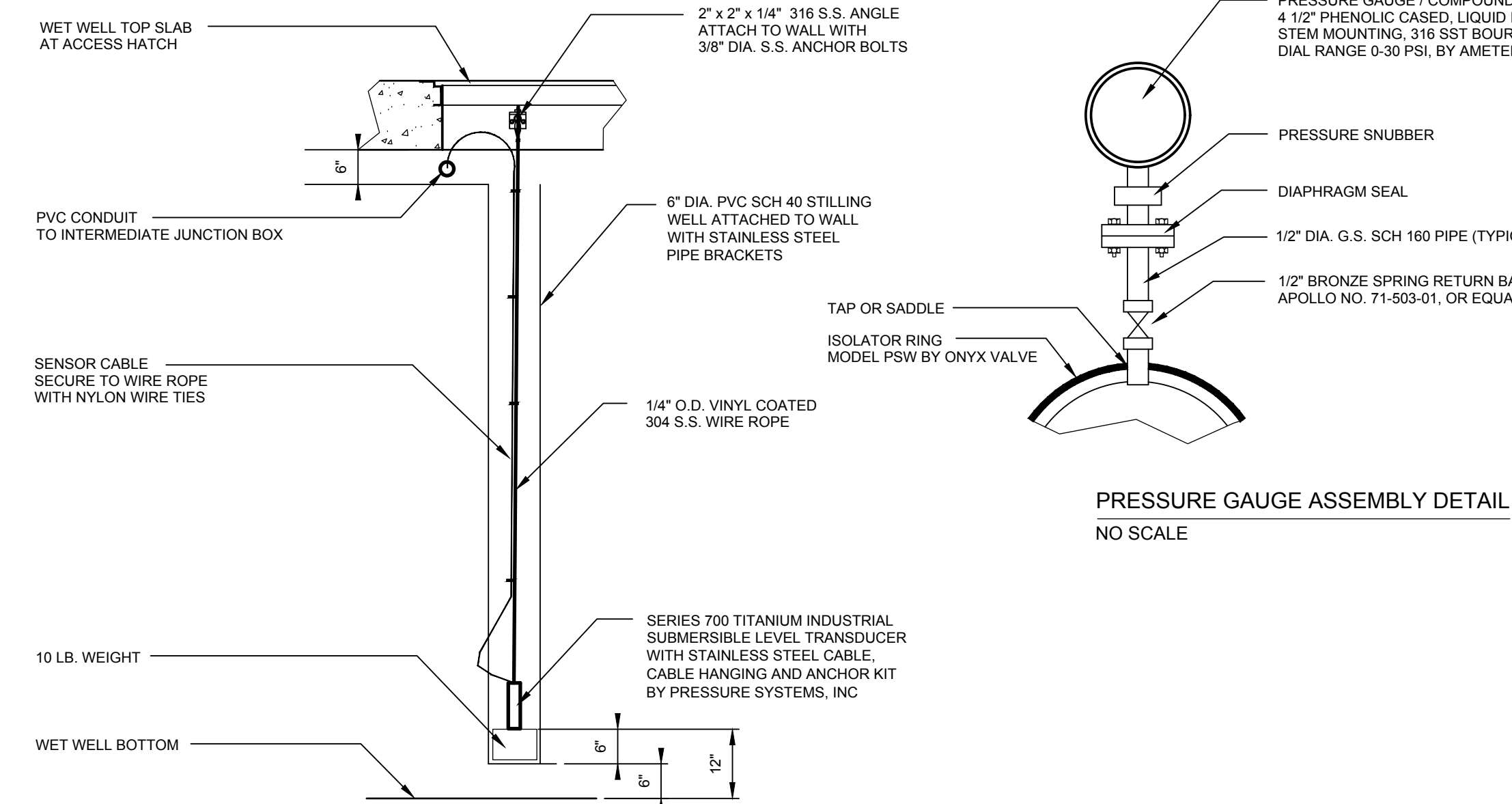
ODOR CONTROL SLAB TURN-DOWN FOOTER DETAIL  
NO SCALE



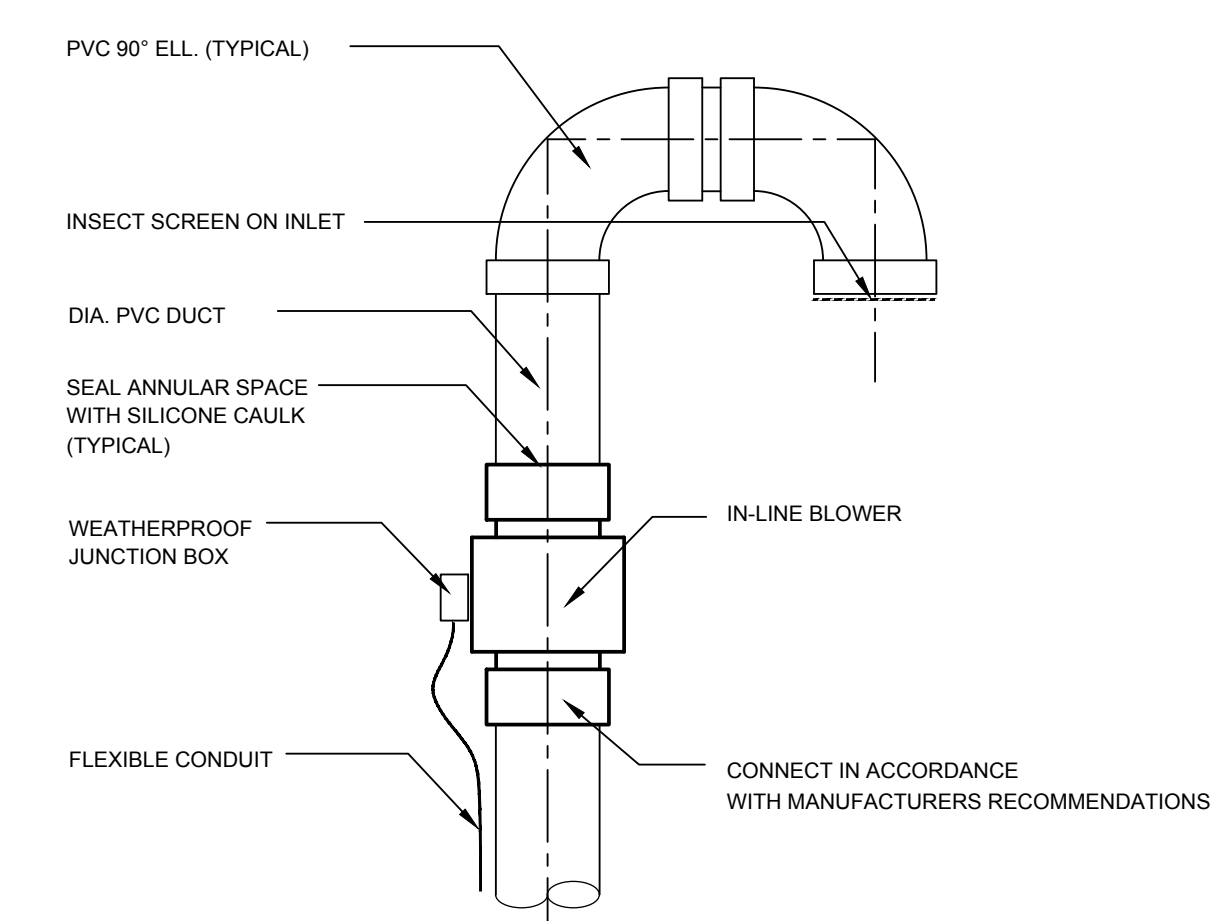
STAND-BY GENERATOR PAD DETAIL  
NO SCALE



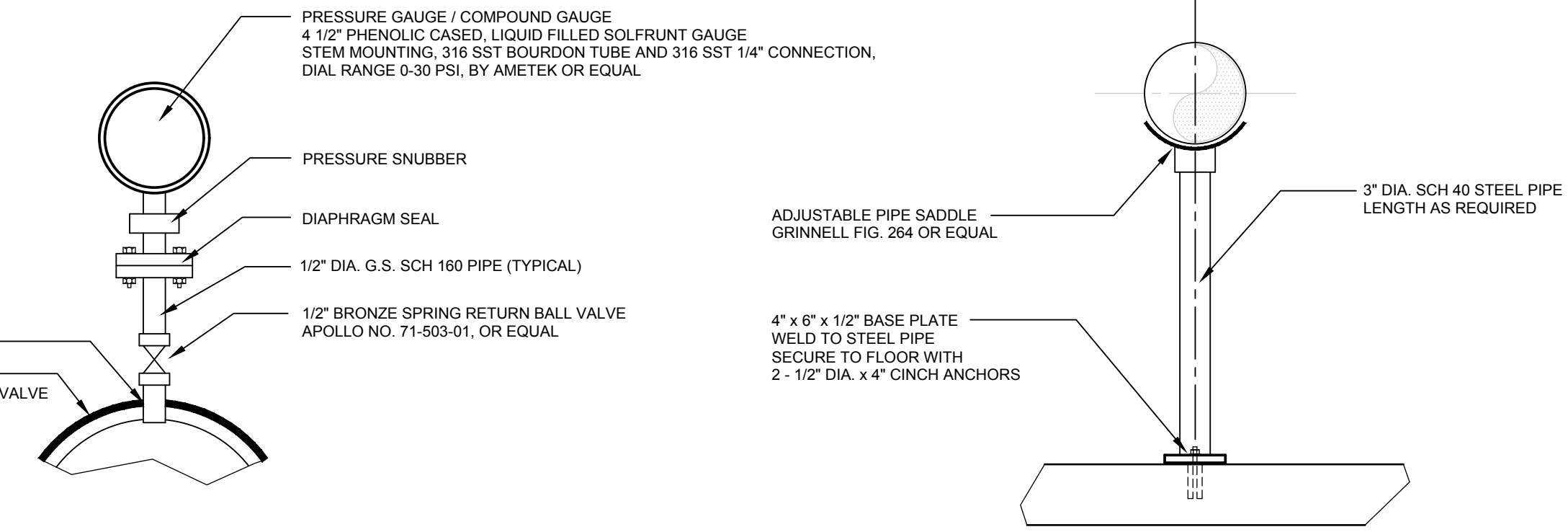
LIGHT POLE BASE DETAIL  
NO SCALE



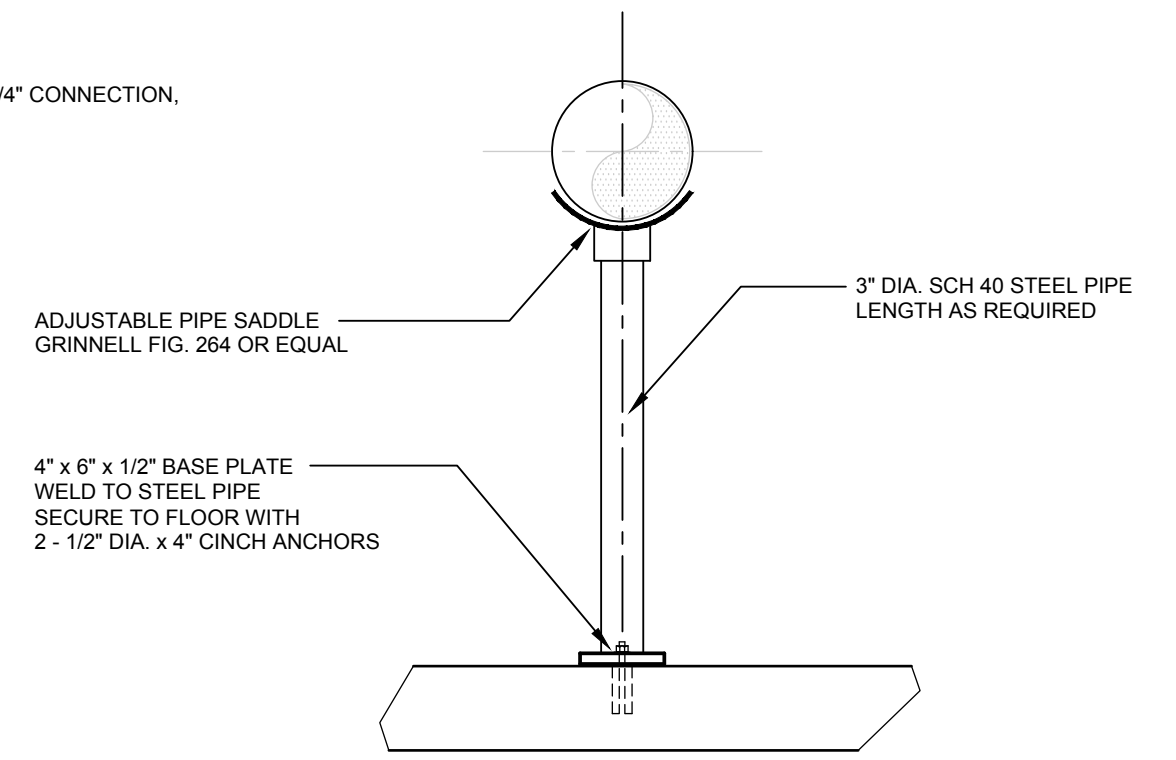
SUBMERSIBLE LEVEL TRANSDUCER DETAIL  
NO SCALE



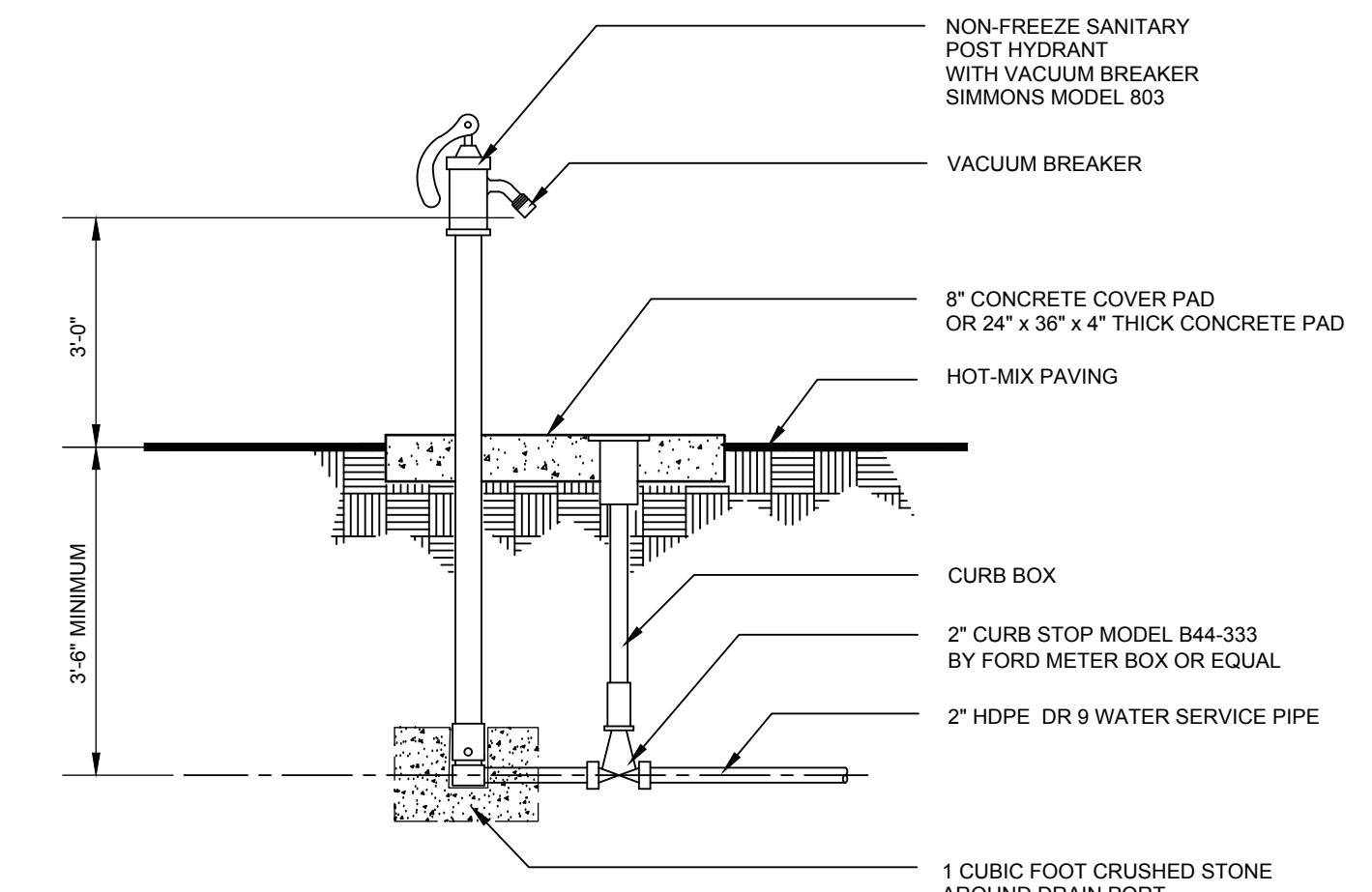
TYPICAL IN-LINE BLOWER DETAIL  
NO SCALE



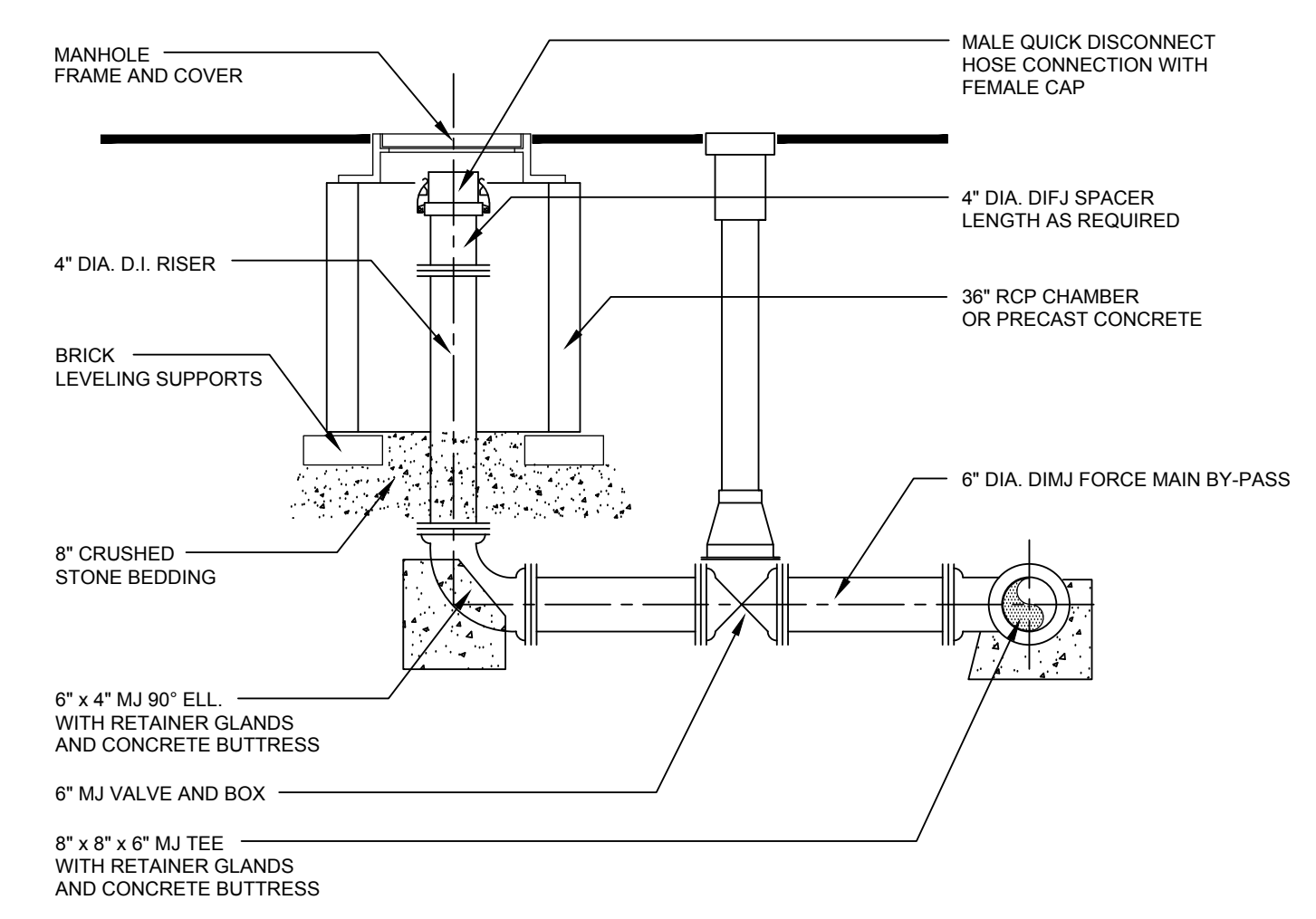
PRESSURE GAUGE ASSEMBLY DETAIL  
NO SCALE



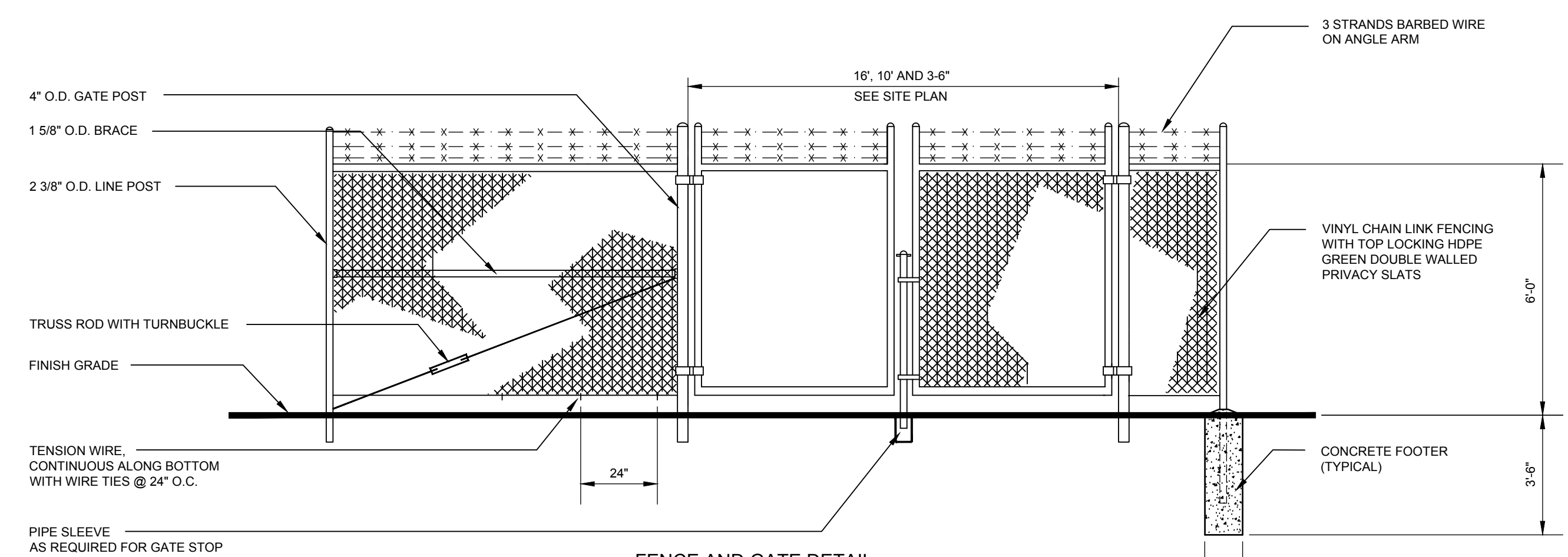
PIPE SUPPORT DETAIL  
NO SCALE



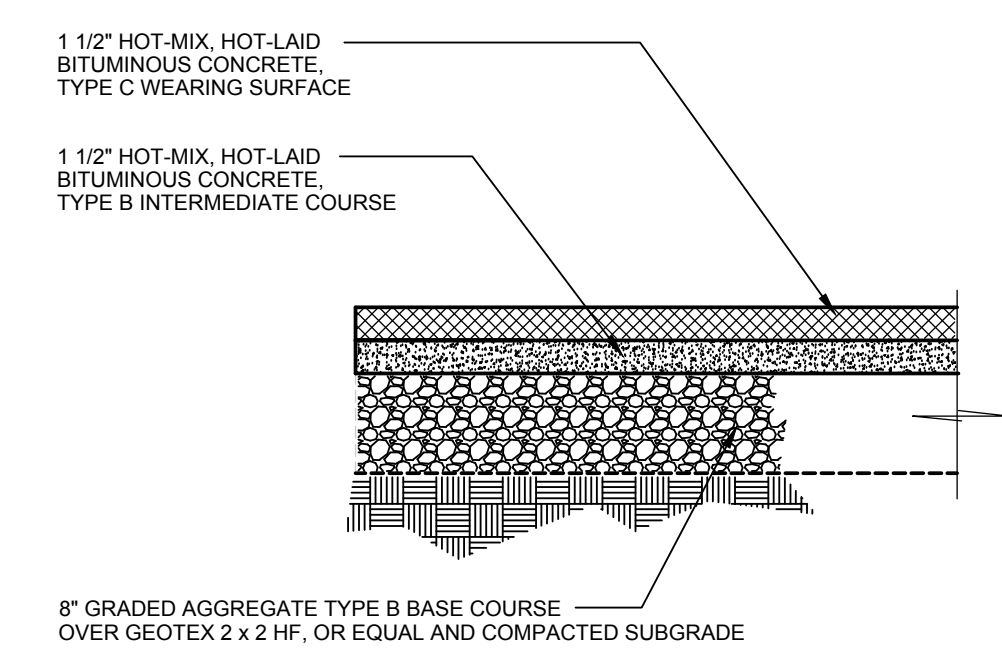
YARD HYDRANT DETAIL  
NO SCALE



FORCE MAIN BY-PASS CONNECTION DETAIL  
NO SCALE



FENCE AND GATE DETAIL  
NO SCALE



SITE PAVING DETAIL  
NO SCALE

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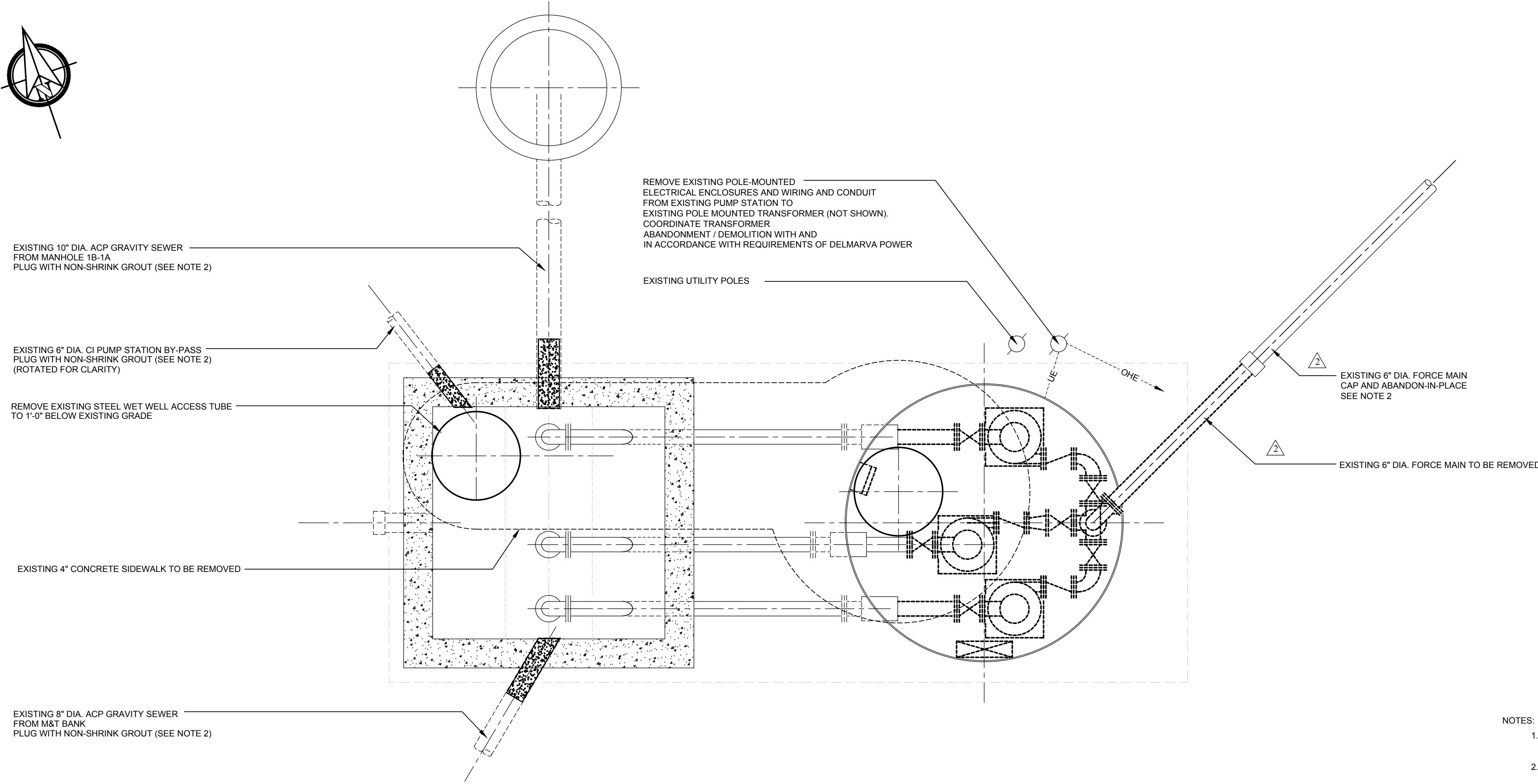
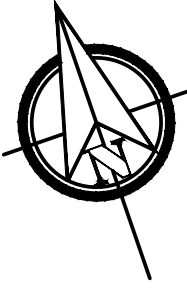
CHECKED BY: SCH  
DESIGNED BY: SHL  
DRAWN BY: DAC  
FILE NAME: SPS\_PLANS  
STEVEN H. LEVANDOWSKI, P.E.  
PROFESSIONAL ENGINEER  
STATE OF DELAWARE  
11-17-20  
P.E. 11578

NO.	REVISION	DATE	BY	APP.
1	ISSUED FOR PERMITTING	9/20/2020	SHL	
2	ISSUED FOR BIDS			

OWNER: THE TOWN OF MILLSBORO  
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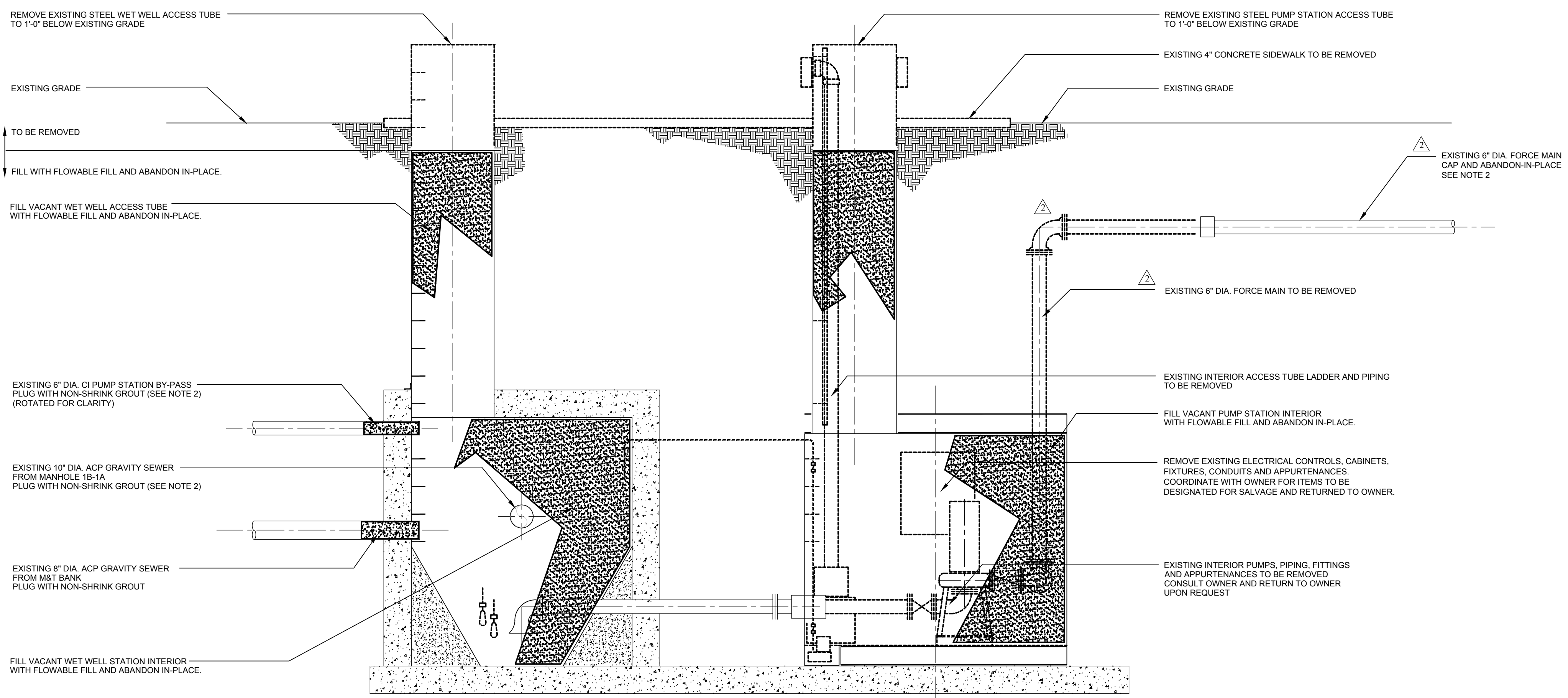
**PUMP STATION DETAILS**  
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: M-7

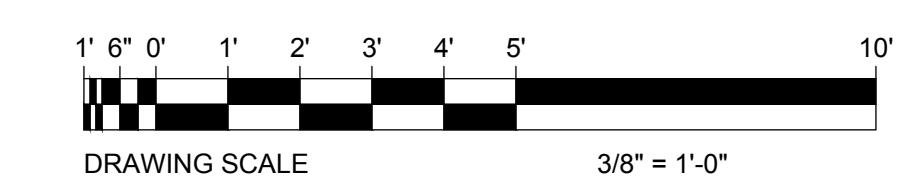


EXISTING SEWAGE PUMPING STATION NO. 4 - DEMOLITION PLAN  
SCALE: 3/8" = 1'-0"

- NOTES:
1. EXISTING PUMP STATION NO. 4 WET WELL AND PUMP PIT ARE SHOWN FOR ILLUSTRATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY SIZE, DEPTH, MATERIAL AND INTERNAL EQUIPMENT, PRIOR TO REMOVAL.
  2. EXISTING PUMP STATION NO. 4 WET WELL AND PUMP PIT PIPING ARE SHOWN FOR ILLUSTRATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY SIZE, MATERIAL AND ACTUAL LOCATION AND DEPTH.
  3. CONTRACTOR TO REMOVE EXISTING ELECTRICAL ENCLOSURES AND WIRING BACK TO THE EXISTING TRANSFORMER. COORDINATE SCOPE OF DEMOLITION WITH DELMARVA POWER.



EXISTING SEWAGE PUMPING STATION NO. 4 - DEMOLITION SECTION  
SCALE: 3/8" = 1'-0"



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DRAWN BY: DAC  
DESIGNED BY: STEVEN H. LEWANDOWSKI, P.E.  
STATE: DELAWARE  
11-17-20  
P.E. 11578

NO.	REVISION	DATE
1	ISSUED FOR PERMITTING	9/20/2022
2	ISSUED FOR BIDS	9/20/2022

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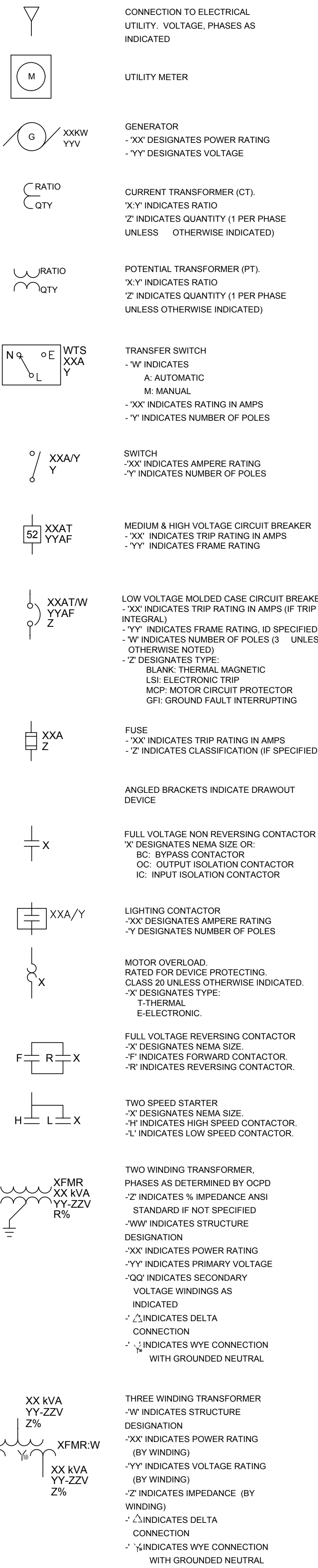
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**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: D-1

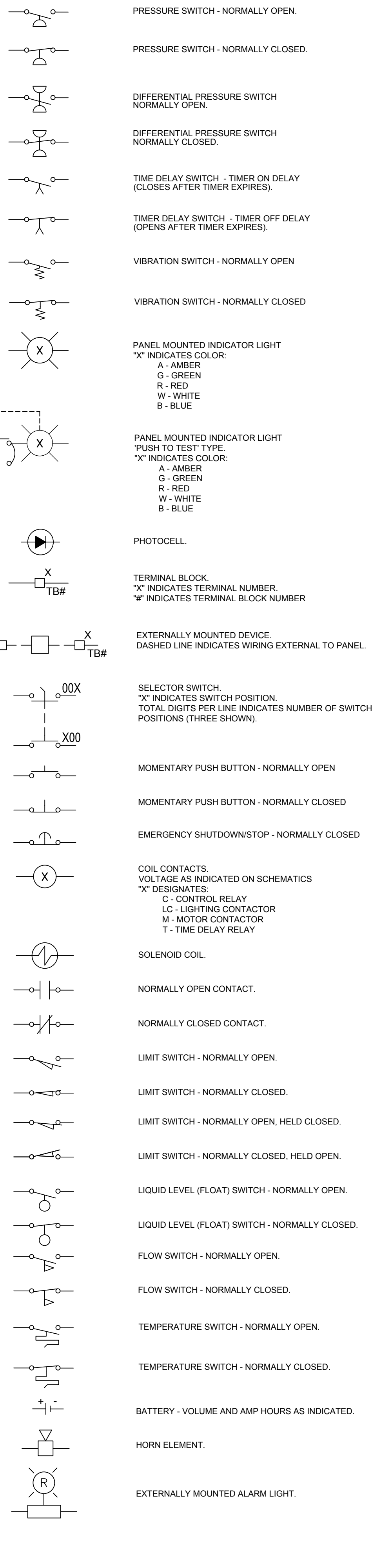
ABBREVIATIONS:

Table of abbreviations for electrical symbols, including terms like AMPERES, AMP FRAME, AIR HANDLING UNIT, etc.

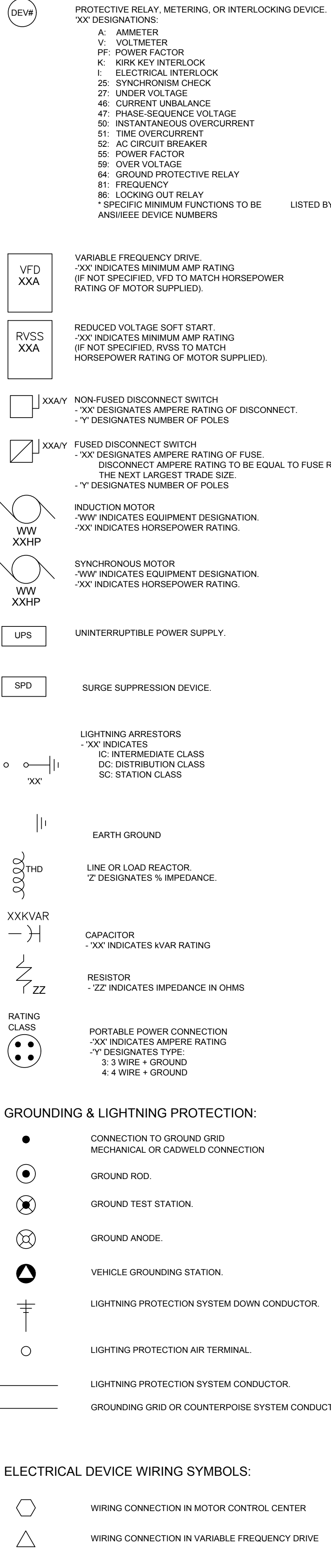
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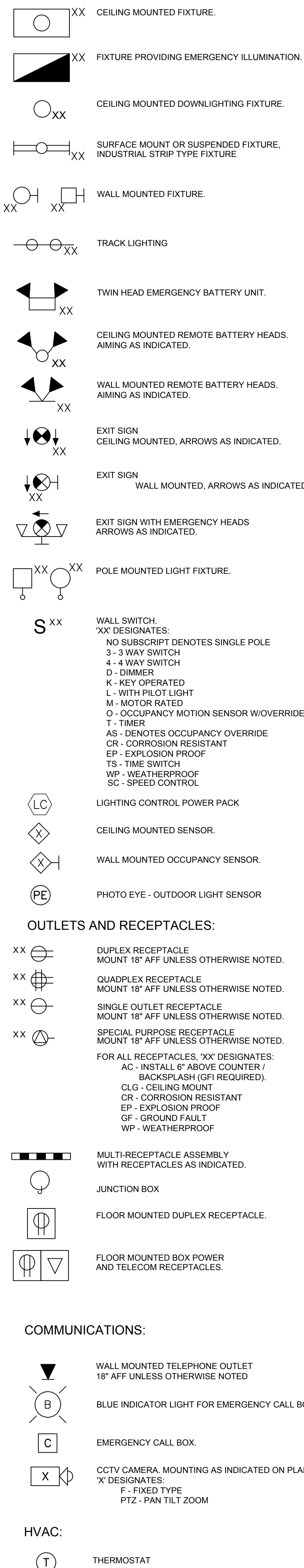
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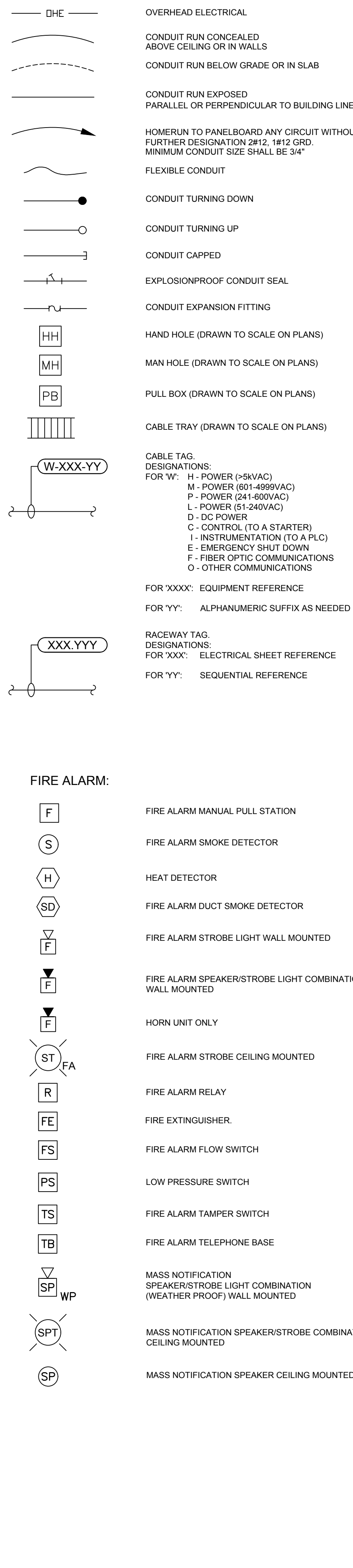
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LIGHTING:



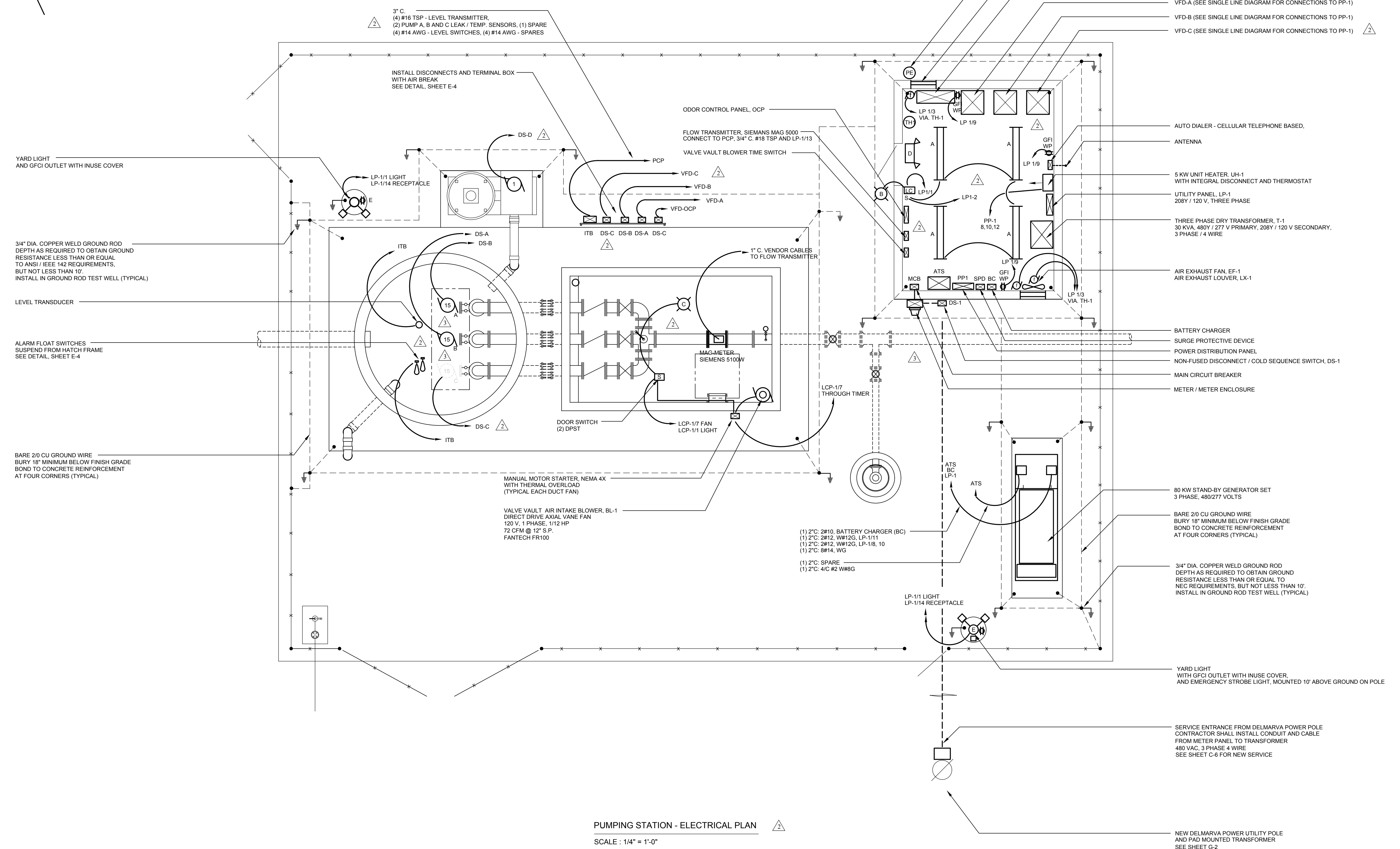
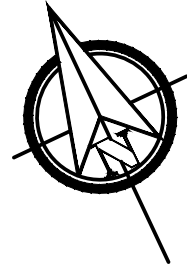
RACEWAYS:



Project information block containing the title 'SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS', owner 'THE TOWN OF MILLSBORO', and project details like date, scale, and sheet number.

ELECTRICAL SYMBOLS LEGEND table listing symbols for fire alarm, outlets, and communications.

Project details: DATE: MAY 15, 2020; SCALE: AS SHOWN; PROJECT NO. 11373.BB; SHEET: E-1



PUMPING STATION - ELECTRICAL PLAN  
SCALE: 1/4" = 1'-0"

- EXTERIOR LIGHT CONTROL PHOTOEYE, CONNECT TO LIGHTING CONTACTOR (LC) MOUNT UNDER EAVE AND SHIELD FROM EXTERIOR LIGHT
- AIR INTAKE LOUVER, LN-1
- PUMP CONTROL PANEL, PCP
- VFD-A (SEE SINGLE LINE DIAGRAM FOR CONNECTIONS TO PP-1)
- VFD-B (SEE SINGLE LINE DIAGRAM FOR CONNECTIONS TO PP-1)
- VFD-C (SEE SINGLE LINE DIAGRAM FOR CONNECTIONS TO PP-1)

- AUTO DIALER - CELLULAR TELEPHONE BASED,
- ANTENNA
- 5 KW UNIT HEATER, UH-1 WITH INTEGRAL DISCONNECT AND THERMOSTAT
- UTILITY PANEL, LP-1 208Y / 120 V, THREE PHASE
- THREE PHASE DRY TRANSFORMER, T-1 30 KVA, 480Y / 277 V PRIMARY, 208Y / 120 V SECONDARY, 3 PHASE / 4 WIRE
- AIR EXHAUST FAN, EF-1 AIR EXHAUST LOUVER, LX-1
- BATTERY CHARGER
- SURGE PROTECTIVE DEVICE
- POWER DISTRIBUTION PANEL
- NON-FUSED DISCONNECT / COLD SEQUENCE SWITCH, DS-1
- MAIN CIRCUIT BREAKER
- METER / METER ENCLOSURE

- 80 KW STAND-BY GENERATOR SET 3 PHASE, 480/277 VOLTS
- BARE 2/0 CU GROUND WIRE BURY 18" MINIMUM BELOW FINISH GRADE BOND TO CONCRETE REINFORCEMENT AT FOUR CORNERS (TYPICAL)
- 3/4" DIA. COPPER WELD GROUND ROD DEPTH AS REQUIRED TO OBTAIN GROUND RESISTANCE LESS THAN OR EQUAL TO NEC REQUIREMENTS, BUT NOT LESS THAN 10'. INSTALL IN GROUND ROD TEST WELL (TYPICAL)
- YARD LIGHT WITH GFCI OUTLET WITH INUSE COVER, AND EMERGENCY STROBE LIGHT, MOUNTED 10' ABOVE GROUND ON POLE
- SERVICE ENTRANCE FROM DELMARVA POWER POLE CONTRACTOR SHALL INSTALL CONDUIT AND CABLE FROM METER PANEL TO TRANSFORMER 480 VAC, 3 PHASE 4 WIRE SEE SHEET C-6 FOR NEW SERVICE
- NEW DELMARVA POWER UTILITY POLE AND PAD MOUNTED TRANSFORMER SEE SHEET G-2

YARD LIGHT AND GFCI OUTLET WITH INUSE COVER

LP-1/1 LIGHT LP-1/14 RECEPTACLE

3/4" DIA. COPPER WELD GROUND ROD DEPTH AS REQUIRED TO OBTAIN GROUND RESISTANCE LESS THAN OR EQUAL TO ANSI / IEEE 142 REQUIREMENTS, BUT NOT LESS THAN 10'. INSTALL IN GROUND ROD TEST WELL (TYPICAL)

LEVEL TRANSDUCER

ALARM FLOAT SWITCHES SUSPEND FROM HATCH FRAME SEE DETAIL, SHEET E-4

BARE 2/0 CU GROUND WIRE BURY 18" MINIMUM BELOW FINISH GRADE BOND TO CONCRETE REINFORCEMENT AT FOUR CORNERS (TYPICAL)

MANUAL MOTOR STARTER, NEMA 4X WITH THERMAL OVERLOAD (TYPICAL EACH DUCT FAN)

VALVE VAULT AIR INTAKE BLOWER, BL-1 DIRECT DRIVE AXIAL VANE FAN 120 V, 1 PHASE, 1/12 HP 72 CFM @ 12" S.P. FANTECH FR100

(1) 2" C. 2#10, BATTERY CHARGER (BC)

(1) 2" C. 2#12, W#12G, LP-1/11

(1) 2" C. 2#12, W#12G, LP-1/8, 10

(1) 2" C. 2#14, WG

(1) 2" C. SPARE

(1) 2" C. 4" C. #2 W#8G

**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment

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WEB: HTTP://DUFFNET.COM  
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CHECKED BY: SCH  
DESIGNED BY: DAC  
DRAWN BY: DAC

FILE NAME: SPS\_PLANS

DESIGNED BY: DAC

DATE: 7-2023

PROJECT NO. 11373.BB

DATE: MAY 15, 2020

SCALE: AS SHOWN

PROJECT NO. 11373.BB

SHEET: E-2

NO.	REVISION	DATE	BY	DESCRIPTION
1	ISSUED FOR PERMITTING			
2	PUMPING STATION REVISIONS PER OWNER			

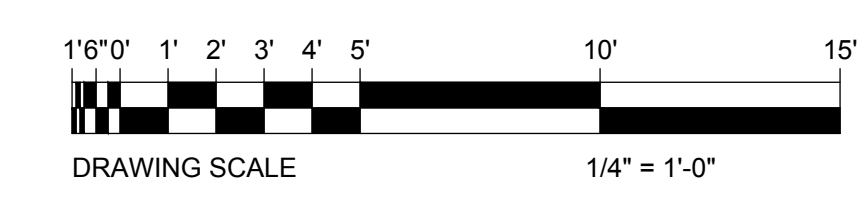
OWNER: THE TOWN OF MILLSBORO  
322 WILSON HIGHWAY  
MILLSBORO, DELAWARE 19966  
302-934-8171

**PUMPING STATION - ELECTRICAL PLAN**

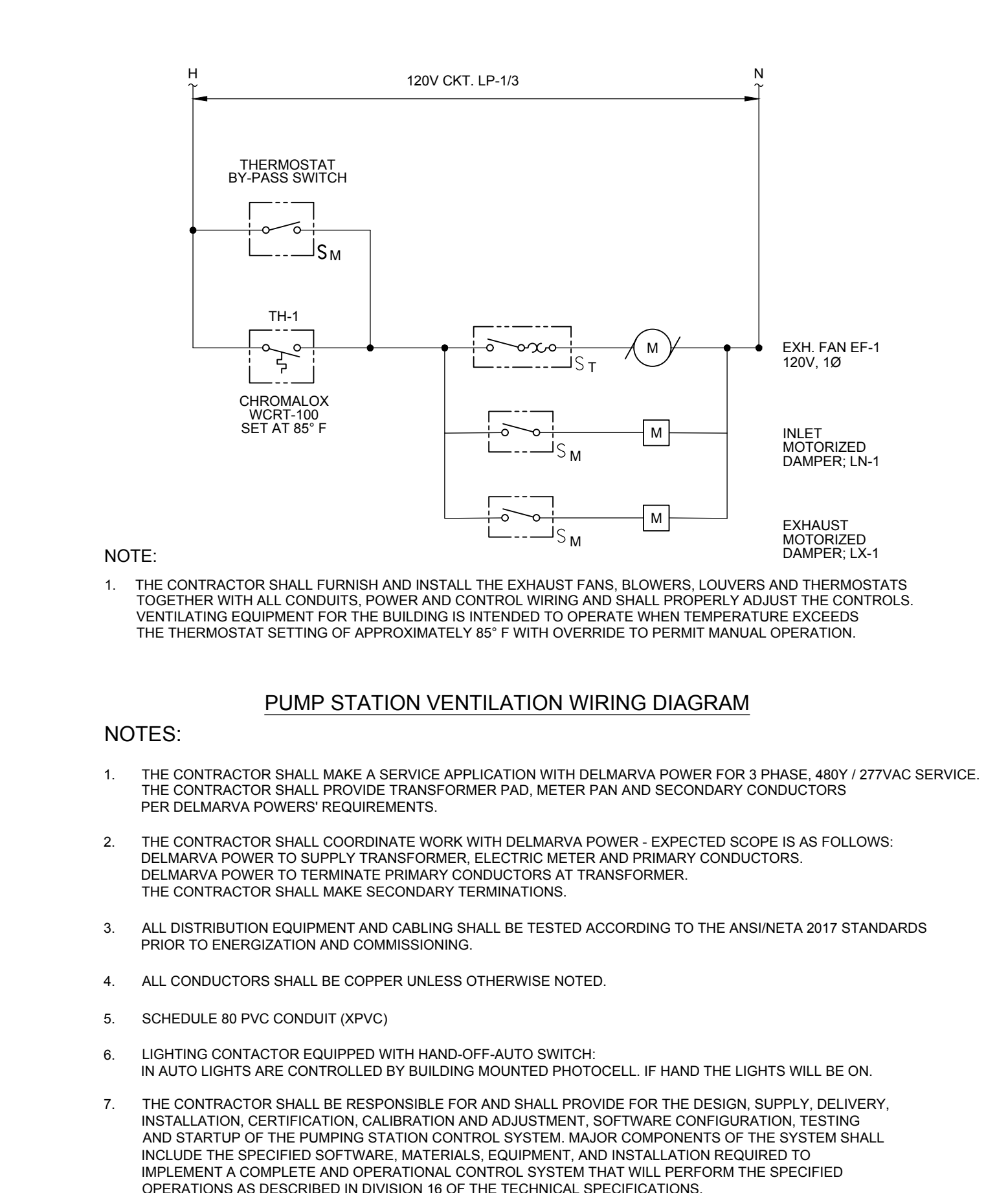
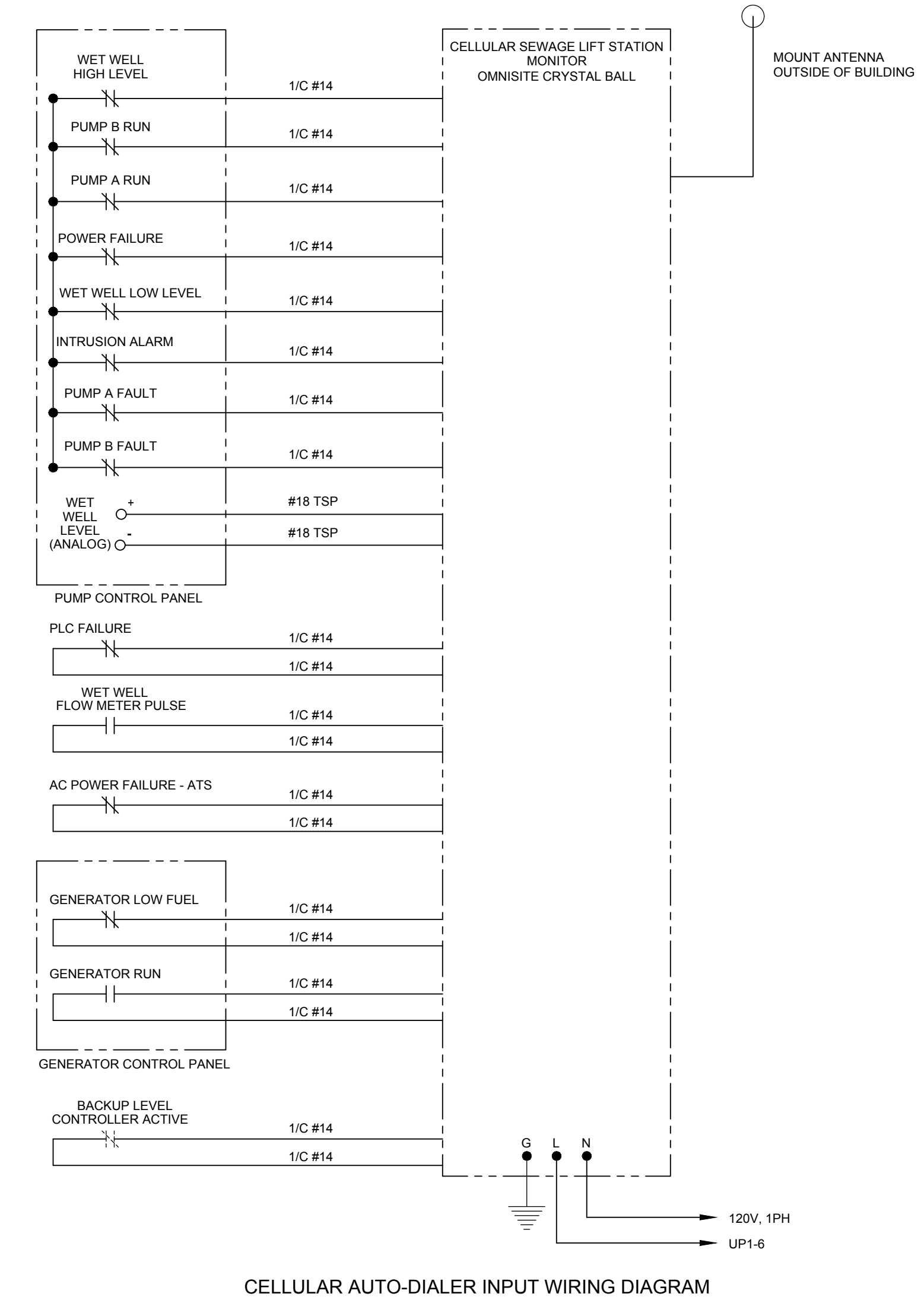
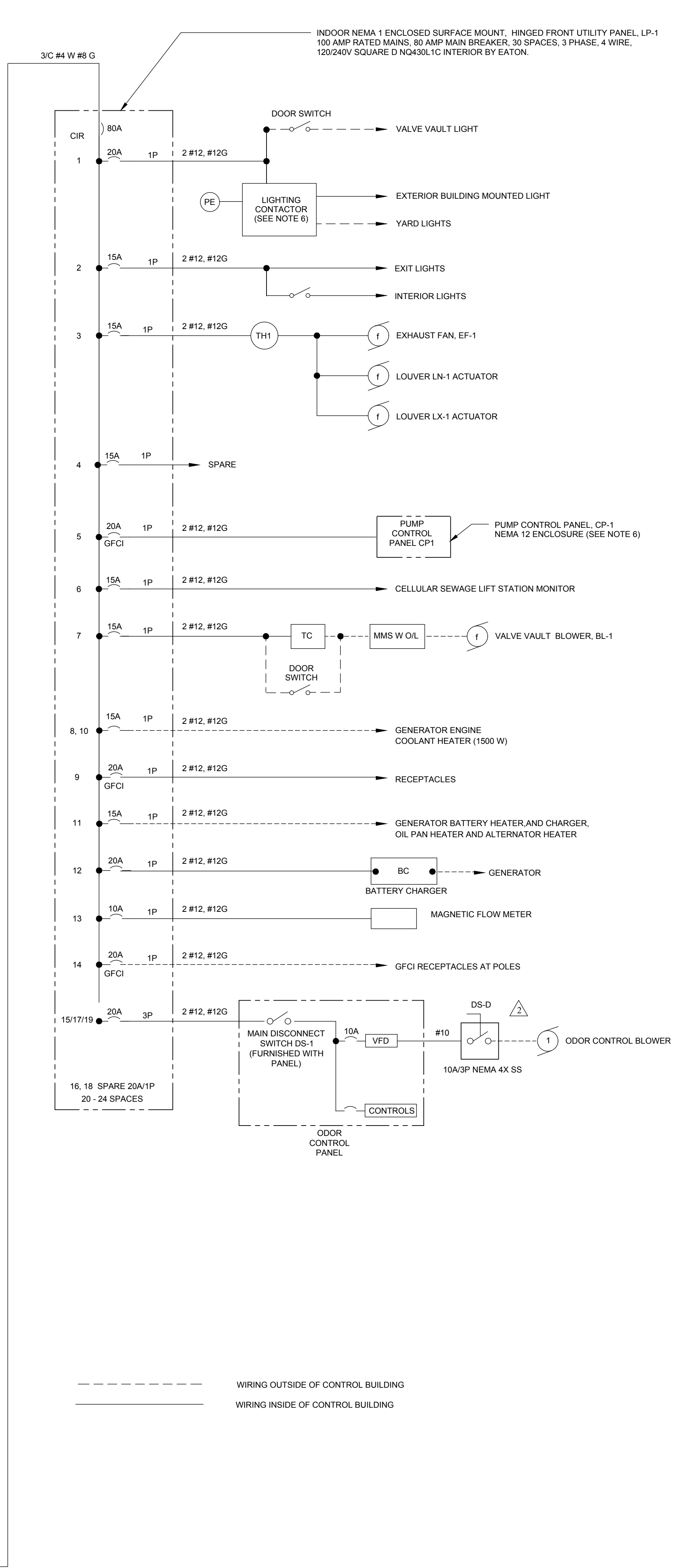
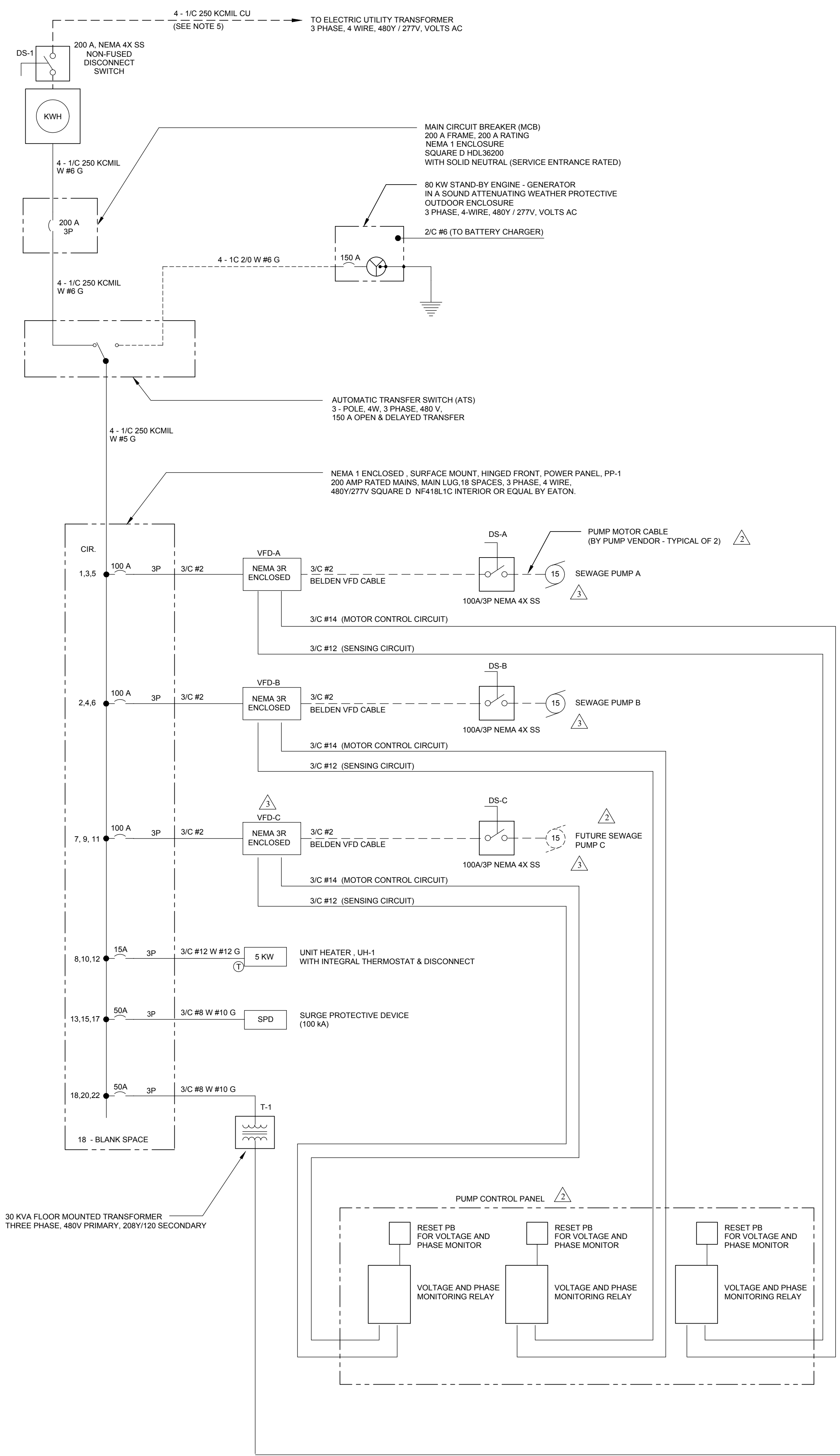
**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

**THE TOWN OF MILLSBORO**

**MILLSBORO-SUSSEX COUNTY DELAWARE**







ONE LINE POWER DIAGRAM

CELLULAR AUTO-DIALER INPUT WIRING DIAGRAM

PUMP STATION VENTILATION WIRING DIAGRAM

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CHECKED BY: SCH  
DESIGNED BY: DAC  
DRAWN BY: DAC  
DATE: 7/20/23

STEVEN H. LEVANDOWSKI, P.E.  
PROFESSIONAL ENGINEER  
STATE OF DELAWARE

NO.	REVISION	DATE	DESCRIPTION
1	ISSUED FOR PERMITTING		
2	PUMPING STATION REVISIONS PER OWNER		
3	ISSUED FOR BIDDING		

OWNER: THE TOWN OF MILLSBORO  
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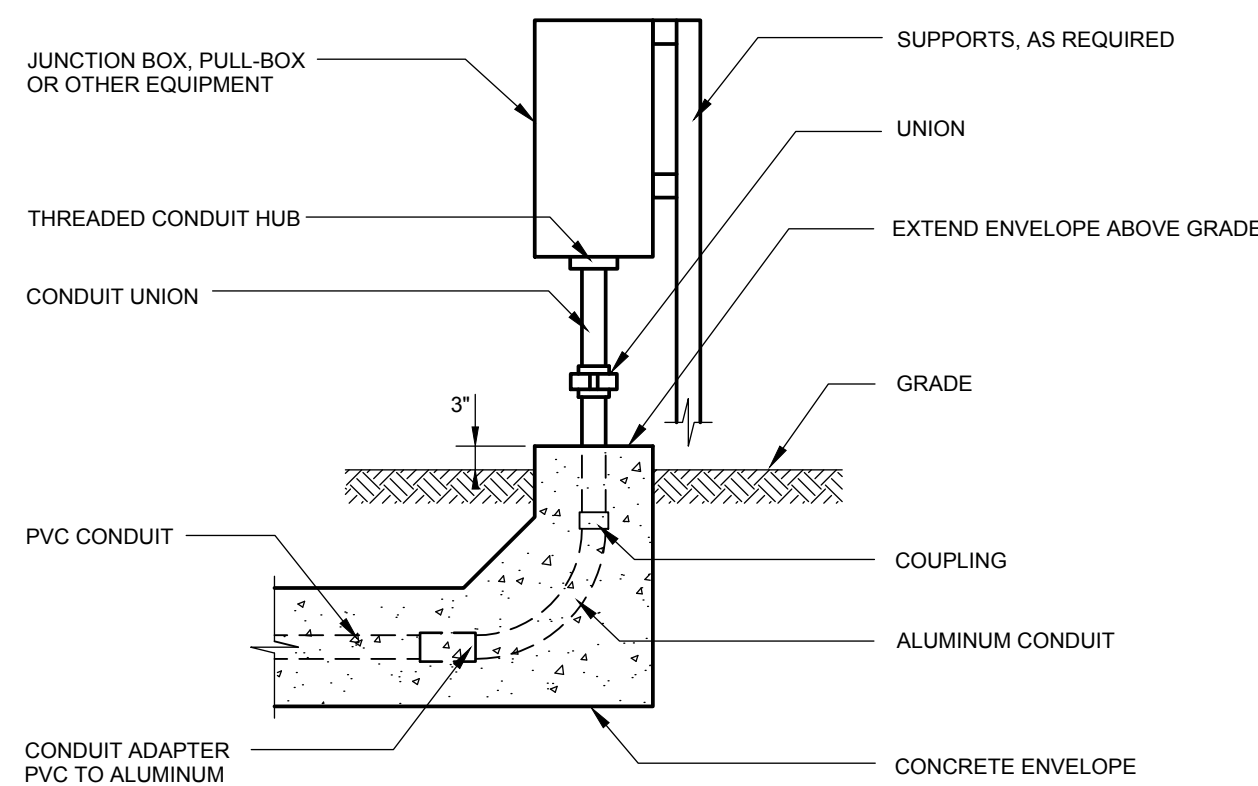
**ELECTRICAL SINGLE LINE DIAGRAMS**

**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

**THE TOWN OF MILLSBORO**

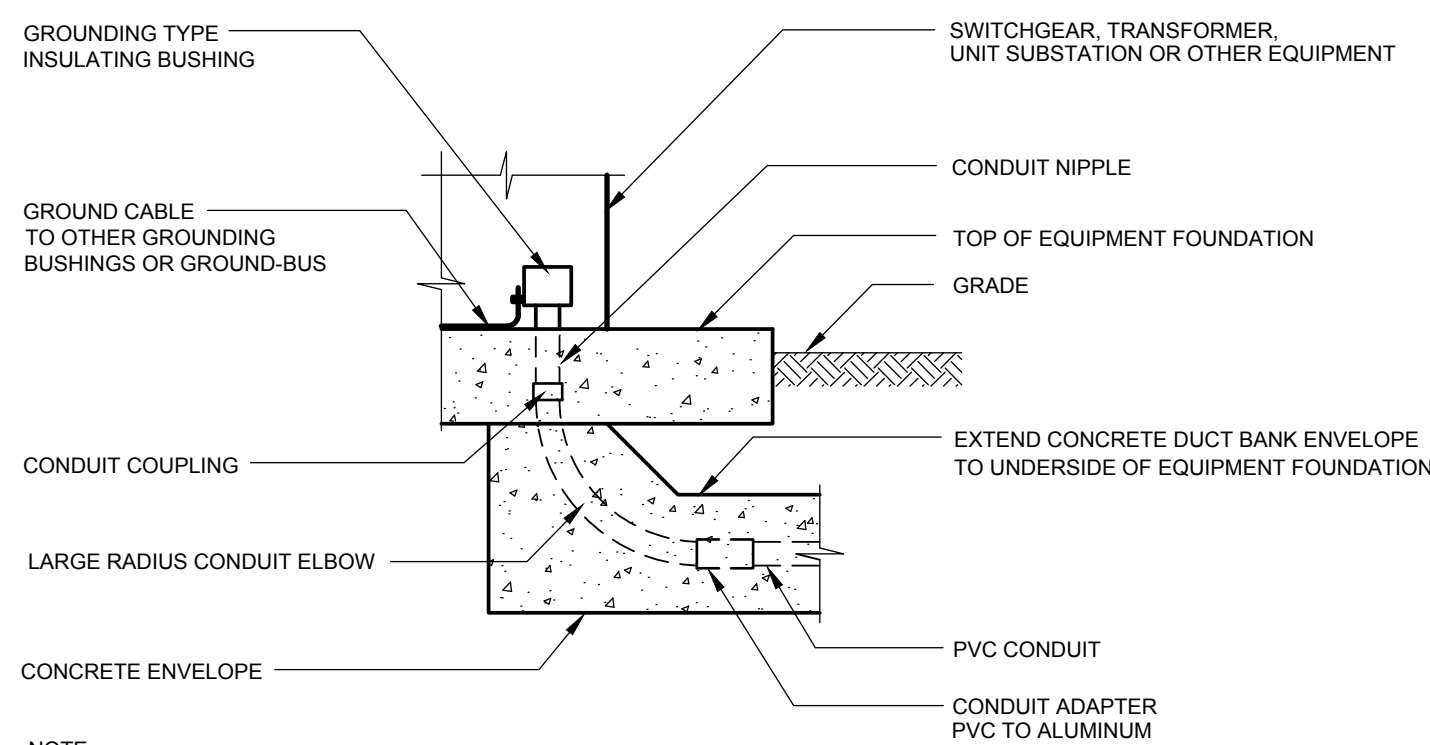
**MILLSBORO-SUSSEX COUNTY, DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: E-3



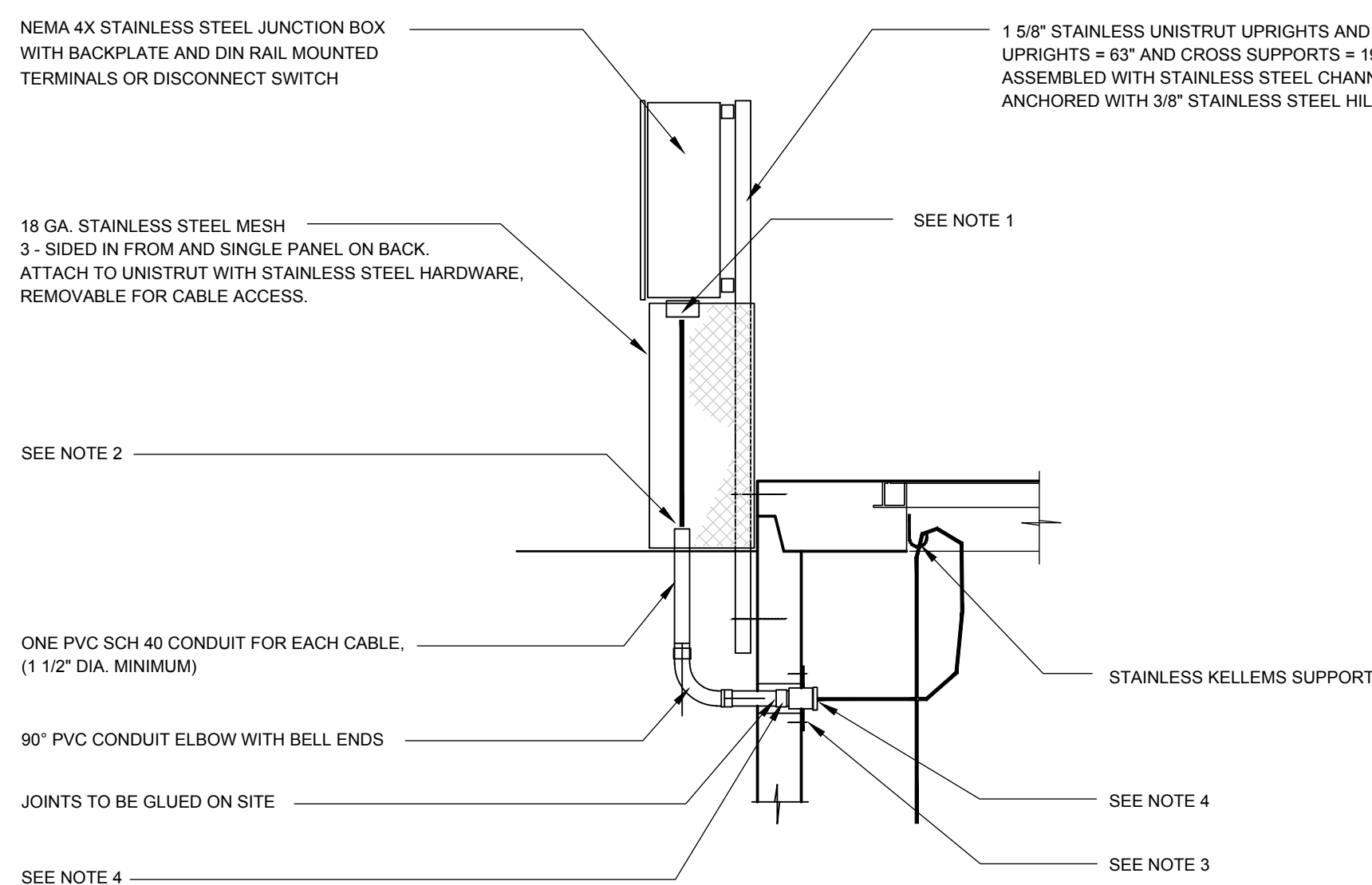
NOTE:  
ALUMINUM CONDUIT IN CONTACT WITH CONCRETE SHALL BE COATED WITH TWO COATS OF 3M SCOTCHRAP PRIMER AND ONE LAYER OF 3M SCOTCHRAP CORROSION TAP.

**CONDUIT TERMINATION AT OUTDOOR EQUIPMENT**  
NO SCALE



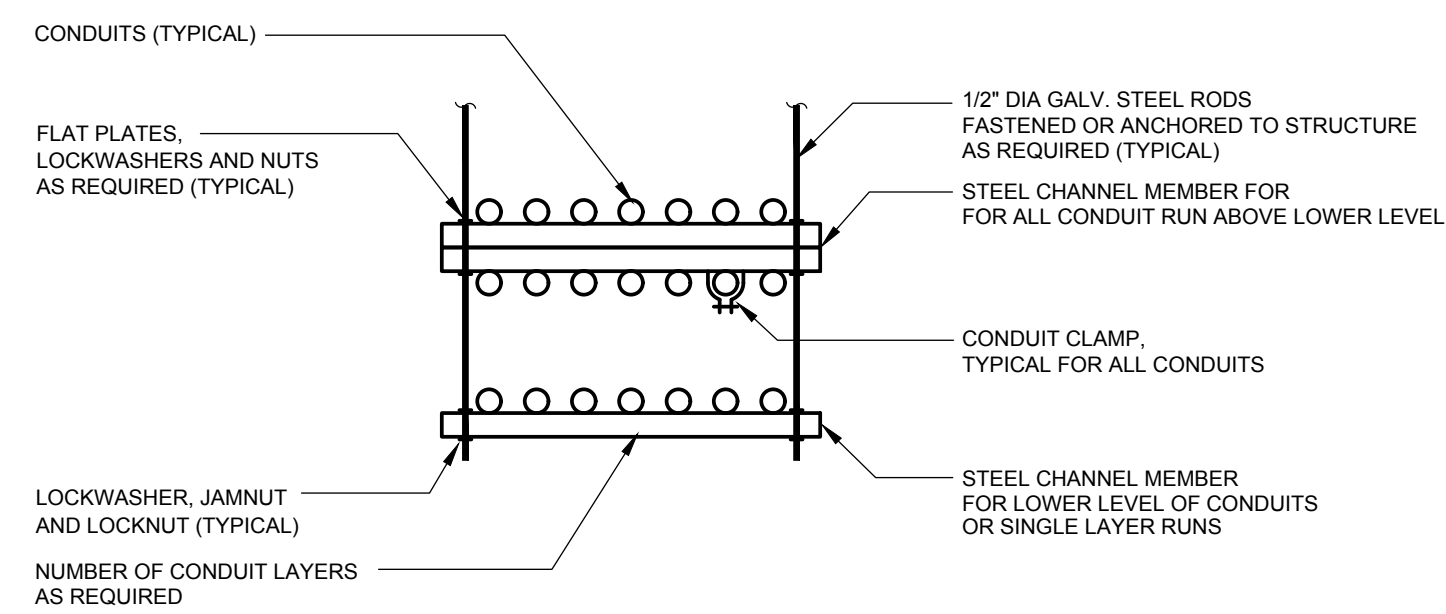
NOTE:  
ALUMINUM CONDUIT IN CONTACT WITH CONCRETE SHALL BE COATED WITH TWO COATS OF 3M SCOTCHRAP PRIMER AND ONE LAYER OF 3M SCOTCHRAP CORROSION TAP.

**UNDERGROUND CONDUIT TERMINATION**  
NO SCALE

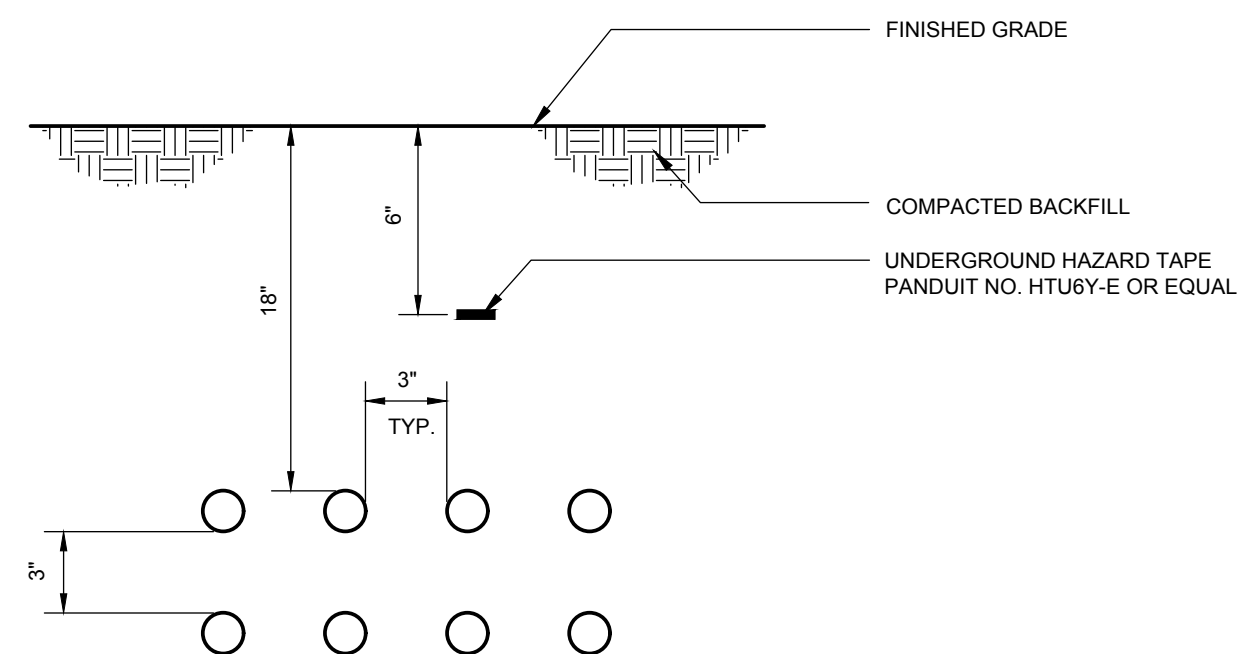


- NOTES:
- INSTALL APPROPRIATELY SIZED LIQUID TIGHT CABLE CONNECTORS, APPLETON CG (CORD GRIP) STYLE OR EQUAL AT TERMINAL BOW ENTRY POINTS (ONE PER CABLE).
  - INSTALL APPROPRIATELY SIZED CONDUIT SEALING BUSHINGS, OZ GEDNEY CSBE SERIES OR EQUAL AT CONDUIT ENDS INSTALLED IN CORE-DRILLED HOLES (ONE PER CABLE).
  - STAINLESS STEEL COUPLING PLATE ANCHORED TO WET WELL WALL.
  - PROVIDE BUSHING NIPPLES, TERMINAL ADAPTERS AND FITTINGS AS REQUIRED TO SECURELY ATTACH EACH CONDUIT TO THE COUPLING PLATE.

**AIR BREAK TERMINAL BOX / DISCONNECT WITH SUPPORT AND CABLE ASSEMBLY**  
NO SCALE



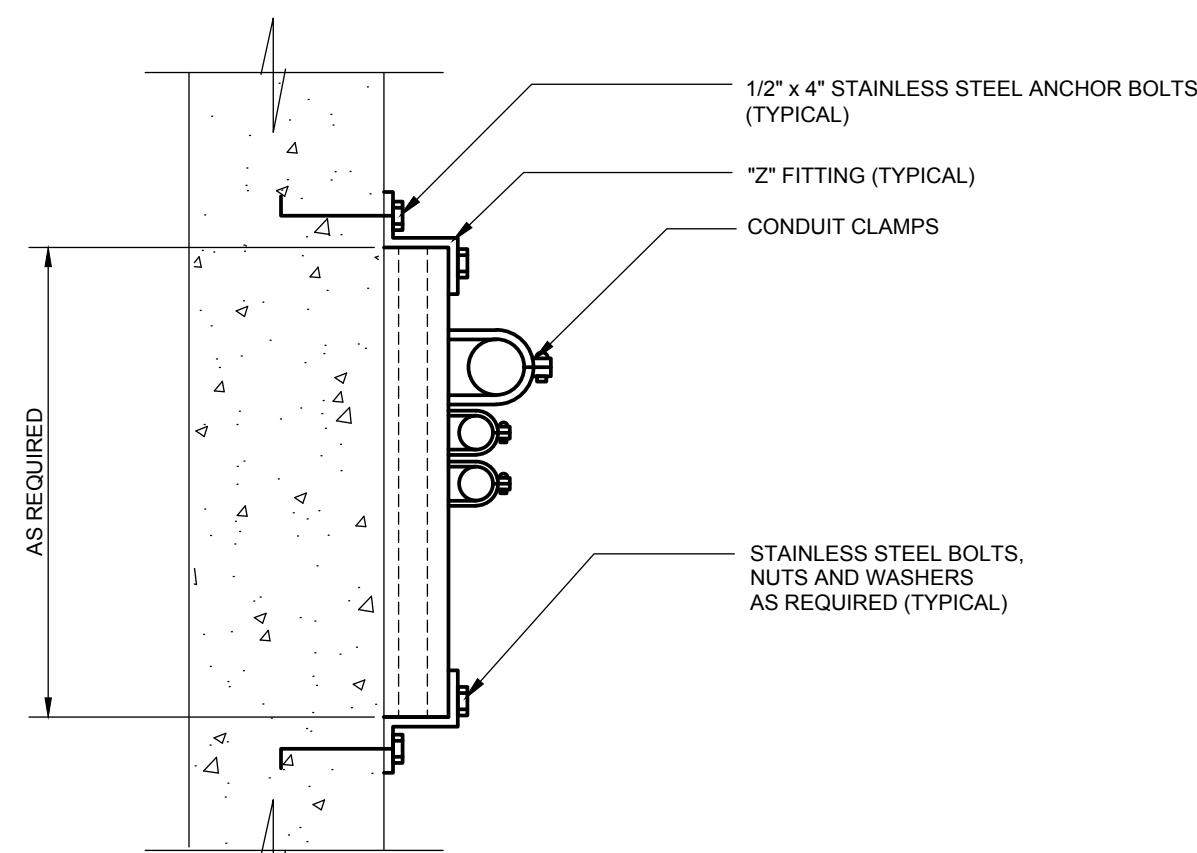
**CONDUIT SUPPORT**  
NO SCALE



NOTES:

- CONDUITS INSTALLED UNDERGROUND SHALL BE PROVIDED WITH CARLON "SNAP-N-STAC" COMBO SPACERS DESIGNED TO PROVIDE 3" CONDUIT SEPARATION. SPACERS SHALL BE INSTALLED PER MFG. RECOMMENDATIONS.
- CONDUIT SEPARATION MAY BE REDUCED TO 1-1/2" WITHIN 10' OF HANDHOLE/MANHOLE PROVIDED "FLOWABLE FILL" IS USED AROUND CONDUIT FOR COMPACTION.
- POWER AND CONTROL DUCT BANKS SHALL BE SEPARATED BY A MIN. OF 12".
- CONCRETE (IF USED) SHALL BE 3000 PSI FIBER REINFORCED (RED IN COLOR).

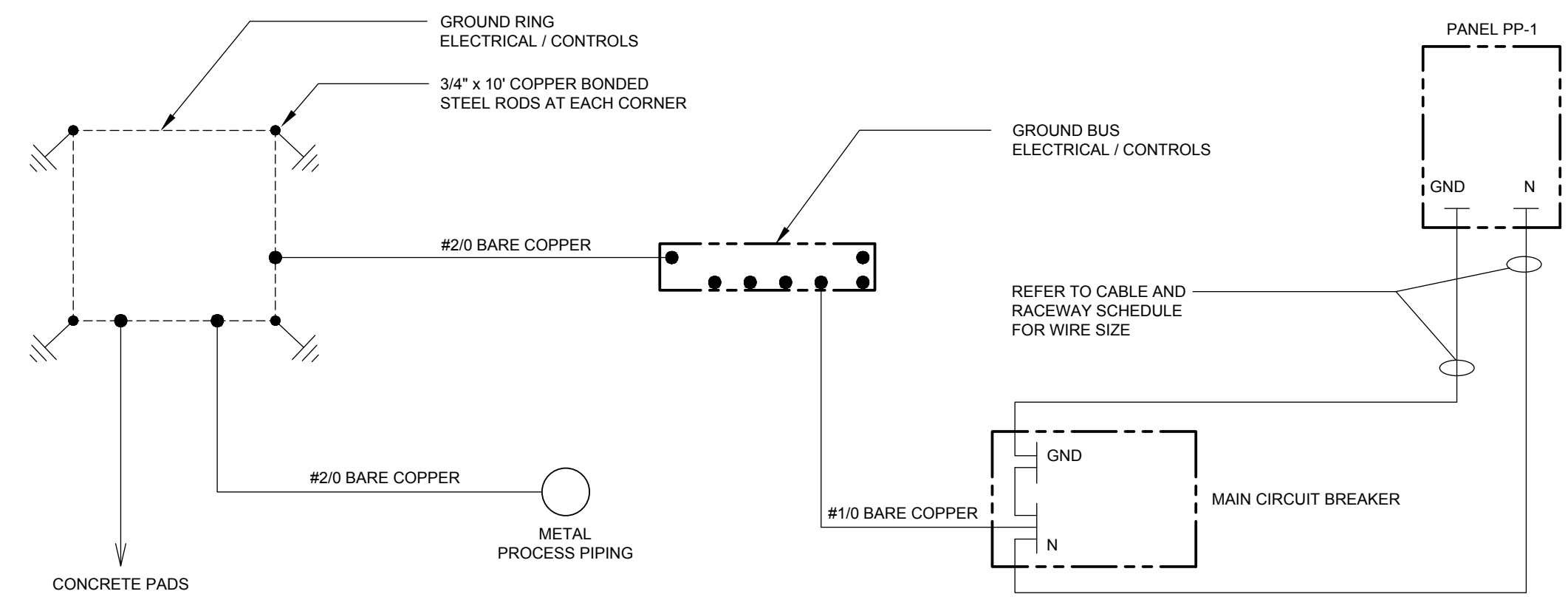
**UNDERGROUND NON-PROTECTED CONDUIT INSTALLATION**  
NO SCALE



NOTES:

- THIS DETAIL TYPICAL FOR BOTH VERTICAL AND HORIZONTAL MOUNTING
- CHANNEL AND ALL SUPPORT DEVICES TO BE STAINLESS STEEL
- CHANNEL TO BE SPACED 5' MAXIMUM

**CONDUIT SUPPORT**  
NO SCALE



**PUMP STATION GROUNDING SCHEMATIC**  
NO SCALE

**DUFFIELD ASSOCIATES**  
Soil, Water & the Environment

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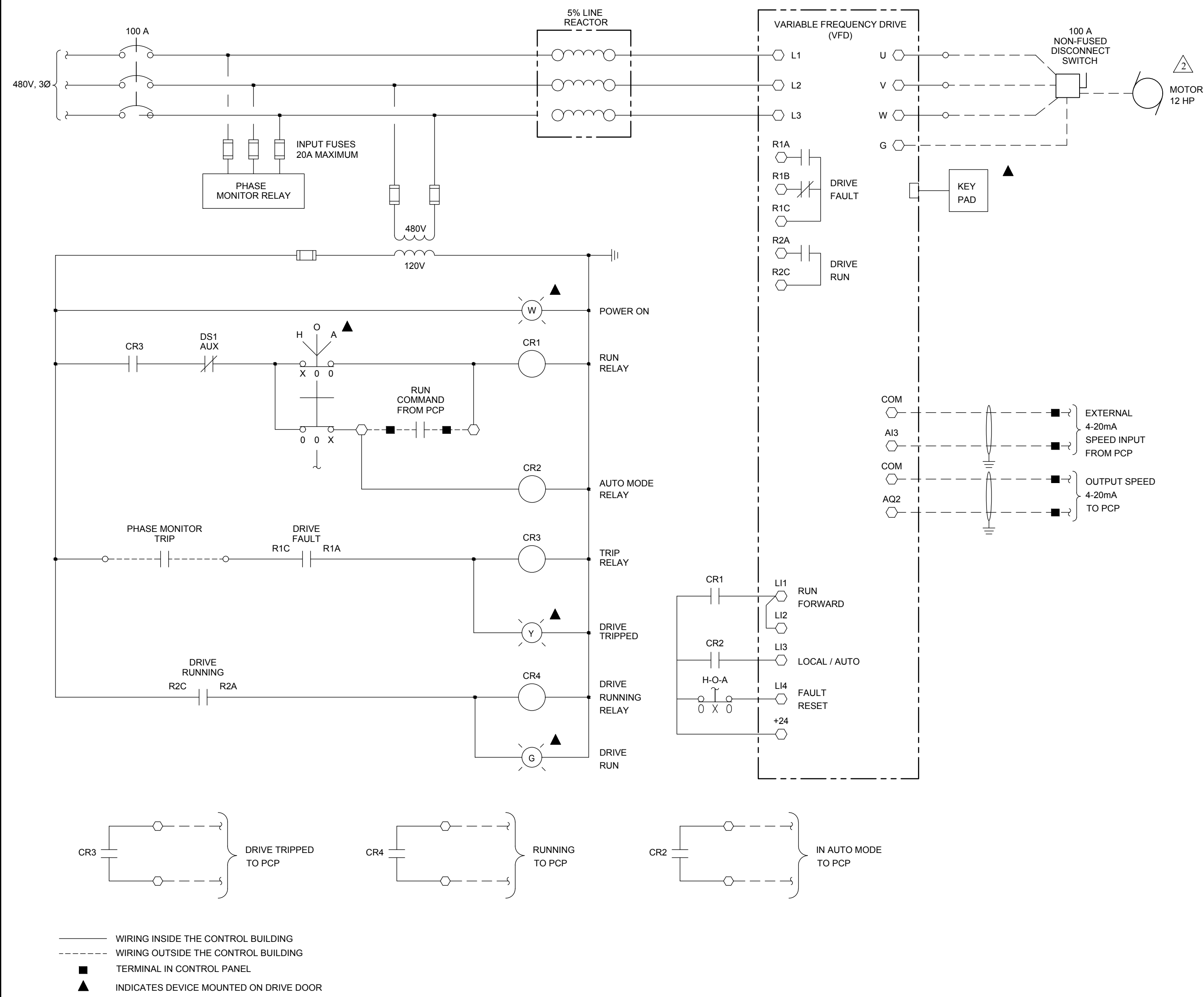
**ELECTRICAL DETAILS**

**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**

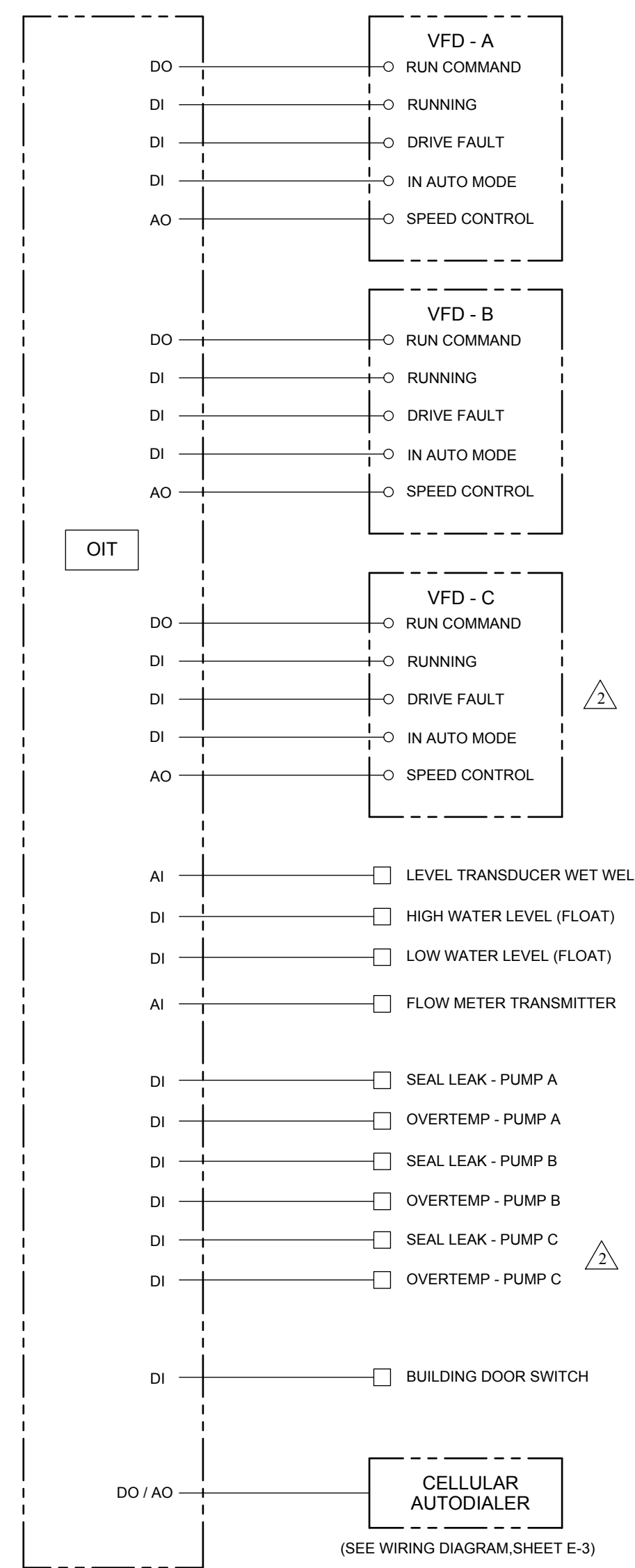
**THE TOWN OF MILLSBORO**

**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020  
SCALE: AS SHOWN  
PROJECT NO. 11373.BB  
SHEET: E-4



**PHASE AND VOLTAGE MONITORING RELAY DIAGRAM**  
TYPICAL FOR: SEWAGE PUMPS A AND B



**PLC I/O WIRING SCHEMATIC**

FAN SCHEDULE										
UNIT NO.	SERVICE	ARRANGEMENT	CFM	S.P. (IN. W.G.)	RPM	DRIVE	HP/VOLTS/Ø	WEIGHT (LBS.)	MANUFACTURER & MODEL NO.	REMARKS
EF-1	CONTROL BUILDING	SIDEWALL	117	0.047	838	DIRECT	0.25/115/1	16	GREENHECK SIDEWALL EXHAUST FAN SE1-8-440-VG	CLOSURE ANGLES AND WALL HOUSING
BL-1	VALVE VAULT AIR INTAKE	TOP SLAB	72	12"	838	DIRECT	1.5/120/1		FANTECH FR 100	INSTALLED ON 4" DIA. PVC DUCT

LOUVER SCHEDULE					
LOUVER NO.	SERVICE	MANUFACTURER & MODEL NO.	SIZE H x W x D	FREE AREA (FT²)	DESCRIPTION
LN-1	CONTROL BUILDING	GREENHECK ECD-601	24" x 24" x 6"	1.64	COMBINATION LOUVER/DAMPER WITH INSECT SCREEN, SECURITY BARS, MOTOR ACTUATOR (FAIL CLOSE) AND 70% KYNAR 500 FINISH
LX-1	CONTROL BUILDING	GREENHECK ECD-601	24" x 24" x 6"	1.64	COMBINATION LOUVER/DAMPER WITH INSECT SCREEN, SECURITY BARS, MOTOR ACTUATOR (FAIL CLOSE) AND 70% KYNAR 500 FINISH

UNIT HEATER SCHEDULE					
HEATER NO.	MANUFACTURER MODEL NO.	POWER INPUT	POWER OUTPUT	MOUNTING	DESCRIPTION
UH-1	QMARK MUH0541	480V, 3 PHASE	5 kW	WALL, AT CEILING	BUILT-IN THERMOSTAT AND SWITCH, UHMT1 AND MPDS25 3-POLE DISCONNECT SWITCH.

LIGHTING FIXTURE SCHEDULE			
IDENT.	VOLTS	LAMP	DESCRIPTION
A	120	LED	CEILING MOUNTED, 4 FOOT, WET LOCATION FIXTURE WITH A MINIMUM 3500 LUMEN OUTPUT PER FIXTURE 4000 K CCT, AND INSTANT ON WITH FULL LIGHT OUTPUT, COLUMBIA LXEW-4-40ML-FAW-EU OR EQUAL
B	120	12 LEDS	WALL MOUNTED PERIMETER LIGHT WITH ACRYLIC DIFFUSER, HUBBELL MODEL LNC2-12L1-4K-2-1 OR EQUAL
C	120	LED	CEILING MOUNTED HAZARDOUS AREA LIGHTING FIXTURE, HOLOPHANE MODEL HRLL-8L-AS-GG OR EQUAL
D	120	LED	EXIT LIGHT WITH MAINTENANCE-FREE NICKEL CADMIUM BATTERY, LITHONIA MODEL LQMSW3R 120/277 ELN OR EQUAL
E	120	55 W LED (EACH FIXTURE) 110 W LED (EACH POLE)	POLE MOUNTED LIGHT WITH FIELD REPLACEABLE LED LIGHT ENGINE AND OPTICAL BEZEL SYSTEM OPTIONS: PHOTOCELL, ARM MOUNT, BASIC BLACK FINISH HUBBELL MODEL CRZ 24NB-55 4K T4 UNV PEC AM BBT OR EQUAL MOUNTED ON A 14" HIGH, 4" TAPERED ALUMINUM POLE WITH BLACK FINISH AND CAPPED TOP, SIDE MOUNTING HOLES FOR TWO FIXTURES AT 90° SEPARATION, AND BLACK TEXTURED FINISH, HUBBELL MODEL RTA-H-14-40-A2L-BL

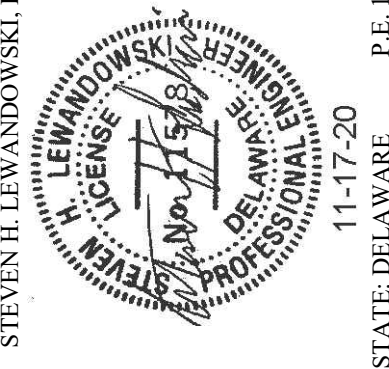
**ELECTRICAL DIAGRAMS AND SCHEDULES**

**SEWAGE PUMPING STATION NO. 4 IMPROVEMENTS**  
**THE TOWN OF MILLSBORO**  
**MILLSBORO-SUSSEX COUNTY DELAWARE**

DATE: MAY 15, 2020  
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SHEET: E-5

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CHECKED BY: SCH  
DESIGNED BY: SML  
DRAWN BY: SMC  
DATE: 7-2023  
FILE NAME: SEE DRAWING  
DESIGNED BY: STEVEN H. LEVANDOWSKI, P.E.  
STATE OF DELAWARE  
11-17-20  
P.E. 11578



NO.	REVISION
1	ISSUED FOR PERMITTING
2	PUMPING STATION REVISIONS PER OWNER

OWNER: THE TOWN OF MILLSBORO  
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