SHEET 1 OF 92

G-1

DRAWING

240618

COUNTY PROJECT No.

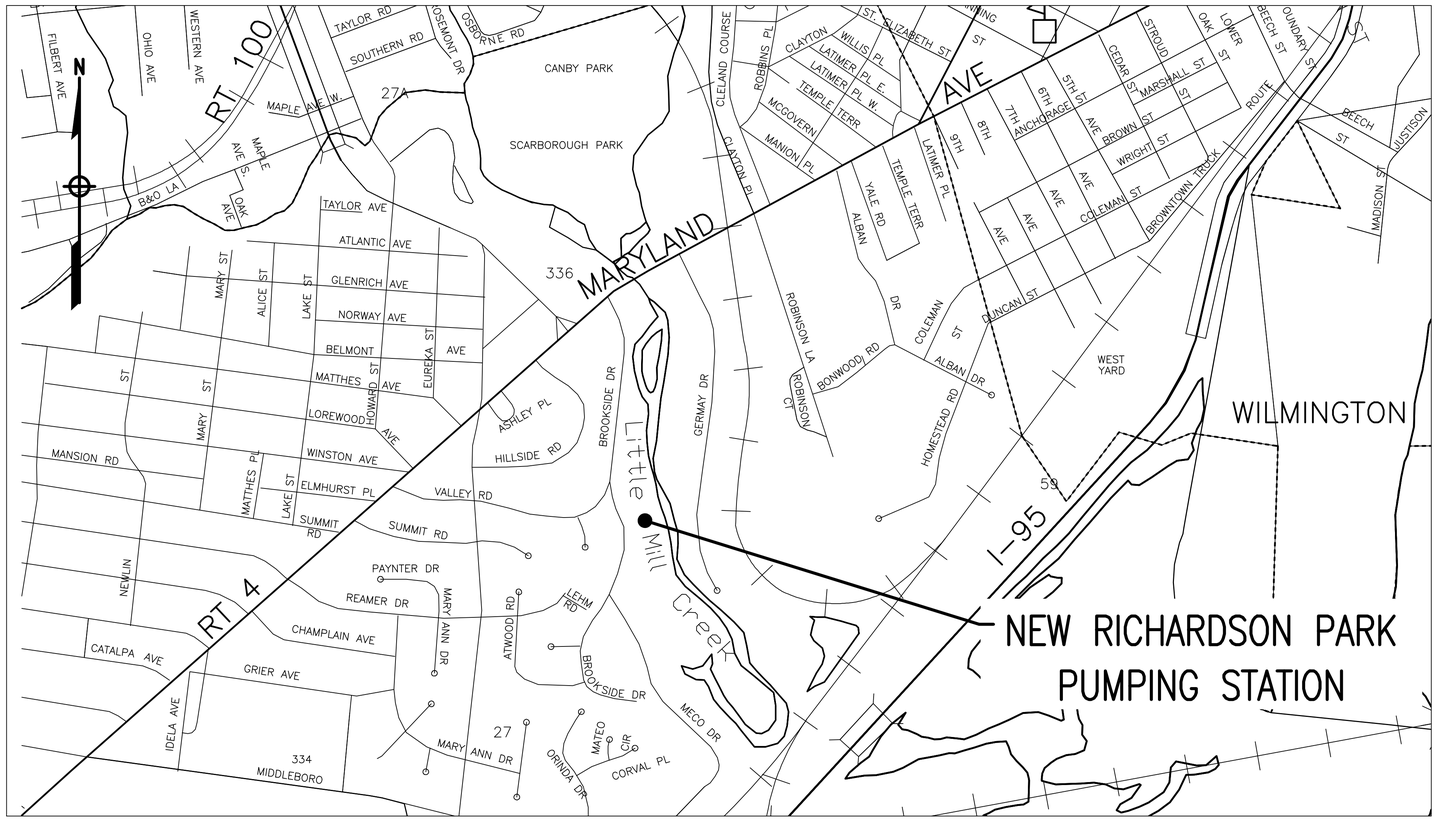
REVISION

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE HUNDRED

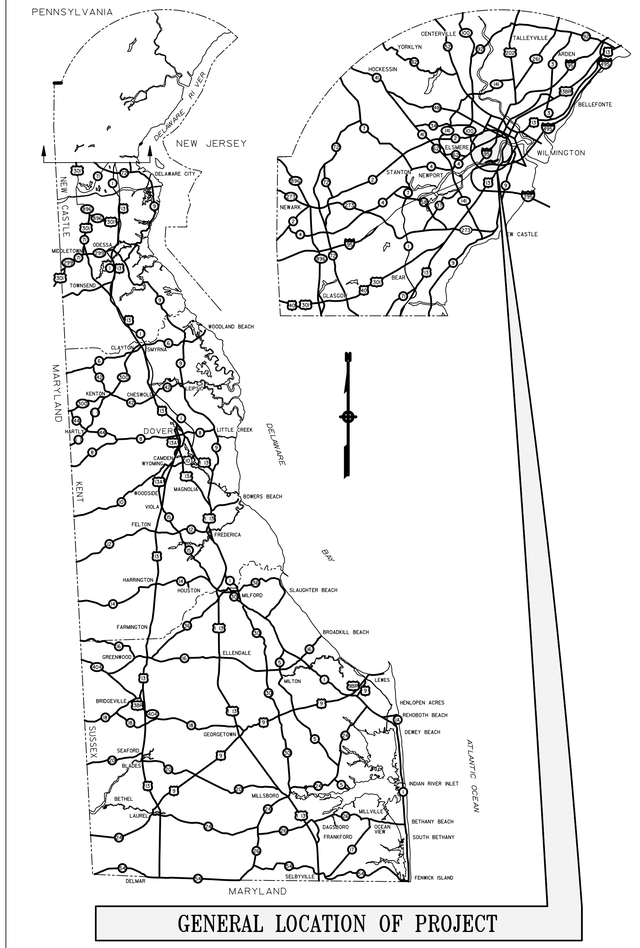
NEW CASTLE COUNTY, DELAWARE

CONTRACT NO. 2021-17



LOCATION MAP
SCALE: NTS

SITE ADDRESS:
100 BROOKSIDE DRIVE
WILMINGTON, DE 19804



GENERAL LOCATION OF PROJECT

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

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WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MISS UTILITY of DELMARVA
BEFORE YOU DIG CALL
1-800-282-8555 (In Del.)
1-800-441-8355 (Md., Va.)
PROTECT YOURSELF, GIVE TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY:
WILLIAM P. WAGNER LICENSE No. 14169 PROFESSIONAL ENGINEER DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	TW/KAH
DRAWN	TW/KAH
CHECKED	CAH
DATE	MAR 2025

TITLE, VICINITY AND LOCATION MAPS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING G-1

SHEET 1 OF 92

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Apr 01, 2025 - 8:51am

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

GENERAL NOTES

1. AS NOTED BY THE CONTRACT TITLE, THESE DOCUMENTS ARE FOR THE SECOND OF TWO PHASES REQUIRED TO CONSTRUCT THE NEW RICHARDSON PARK PUMPING STATION AND ITS ASSOCIATED UTILITIES. THESE DOCUMENTS INCLUDE SOME REFERENCES TO THE WORK TO BE COMPLETED UNDER THE FIRST PHASE, WHCIH IS CONSIDERED EXISTING AND IN PLACE.
2. VEHICULAR AND PERSONNEL ACCESS TO THE COUNTY'S EXISTING RICHARDSON PARK PS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE COUNTY OF ANY WORK WHICH MAY TEMPORARILY HINDER EXISTING STATION ACCESS A MINIMUM OF SEVEN (7) DAYS IN ADVANCE.
3. COORDINATES ARE BASED ON THE DELAWARE STATE PLANE COORDINATE SYSTEM (NAD 83/91). VERTICAL CONTROL BASED ON NAVD 88. ELEVATIONS SHOWN ON THESE DRAWINGS OBTAINED FROM EXISTING UTILITY RECORDS USING THE CITY OF WILMINGTON VERTICAL DATUM HAVE BEEN CONVERTED TO NAVD 88 USING THE FOLLOWING CONVERSION: THE CITY OF WILMINGTON DATUM – 4.53 = NAVD 88.
4. ALL FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEW CASTLE COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND DETAILS, OSHA REQUIREMENTS AND THE DELAWARE DEPARTMENT OF TRANSPORTATION (DelDOT) STANDARD SPECIFICATIONS. ALL SPECIFICATIONS, STANDARDS AND DETAILS SHALL BE THE LATEST REVISION. IN THE EVENT OF ANY DEVIATION AMONG THE SPECIFICATIONS, THE ENGINEERS DECISION SHALL PREVAIL.
5. PROPERTY OWNER: NEW CASTLE COUNTY DEPARTMENT OF PUBLIC WORKS 187A OLD CHURCHMANS ROAD, NEW CASTLE, DE 19720.
6. NO DEBRIS SHALL BE BURIED ON THE SITE. ALL TREES, STUMPS AND ORGANIC DEBRIS SHALL BE REMOVED OFF-SITE. ALL TREES FELLED WITHIN THE CONSTRUCTION ZONE SHALL BE REMOVED BY THE CONTRACTOR UNLESS SPECIFIED OTHERWISE.
7. EXISTING TREES AND PLANT MATERIALS DESIGNATED TO REMAIN ON THESE PLANS SHALL BE PRESERVED AND PROPERLY PROTECTED DURING CONSTRUCTION. IN THE CASE OF UTILITY RIGHTS-OF-WAY AND EASEMENTS, ANY DISTURBED AREA SHALL BE RESTORED SO AS TO ACHIEVE A RECURRENCE OF NATURAL VEGETATIVE COVER.
8. ALL SIGNALING TRAFFIC CONTROL AND SAFETY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL MEET THE DelDOT MUTCD.
9. EXISTING UTILITIES ARE LOCATED IN ACCORDANCE WITH PLANS SUPPLIED BY VARIOUS UTILITIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY UTILITY LOCATIONS AND ALLOW FOR THEIR LOCATIONS. BEFORE ANY EXCAVATION IS PERFORMED, CONTRACTOR SHALL CALL "MISS UTILITY" (1-800-282-8555) TO HAVE UNDERGROUND UTILITIES LOCATED AND MARKED S MINIMUM OF TWO (2) DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE DONE TO UTILITIES SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT THE CONTRACTOR'S EXPENSE.
10. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO ORDERING AND / OR FABRICATION OF ANY MATERIALS.
11. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION.
12. ALL CONSTRUCTION STAKEOUT SHALL BE PROVIDED BY THE CONTRACTOR. TOPOGRAPHIC SURVEY SHOWN ON PLANS WAS COMPLETED IN 2013. IF DISCREPANCIES EXIST BETWEEN THE CONTRACT DOCUMENTS AND THE FIELD CONDITIONS, THE CONTRACTOR SHALL ADVISE THE ENGINEER AND REQUEST A RESOLUTION.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY MATERIAL FOR THE PURPOSE OF EQUIPMENT ACCESS TO OR ALONG THE WORK AREA.
14. ALL MATERIALS AND WORKMANSHIP WITHIN THE STATE RIGHTS-OF-WAY SHALL BE IN ACCORDANCE WITH THE DelDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
15. IF AT ANYTIME THE WATER SUPPLY IS INTERRUPTED TO COUNTY PROPERTY, THE CONTRACTOR SHALL SUPPLY A TEMPORARY HOOKUP TO A POTABLE WATER SUPPLY.
16. THE CONTRACTOR SHALL MATCH PROPOSED PAVING ELEVATION TO EXISTING PAVING ELEVATION WHEREVER THEY ADJOIN.
17. THE CONTRACTOR SHALL MAINTAIN ALL WORK WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL NOT DISTURB ANY ITEMS OUTSIDE THE LIMITS OF DISTURBANCE. ANY ITEMS DISTURBED SHALL BE REPLACED IN KIND AT THE CONTRACTORS EXPENSE. THESE SHALL INCLUDE, BUT NOT BE LIMITED TO MAIL BOXES, SHRUBS, CULVERT PIPES, DRIVEWAYS ETC.
18. ALL EXISTING RIGHT-OF-WAY AND PROPERTY LINE INFORMATION SHOWN ON PLANS IS BASED ON THE RECORD PLAN FOR THIS TAX PARCEL FROM NEW CASTLE COUNTY LAND USE DEPARTMENT.
19. ONLY MANHOLE COVERS APPROVED BY N.C.C. MAY BE INSTALLED BY THE CONTRACTOR.
20. PER 1993 WATER RESOURCE PROTECTION AREA MAPS, THIS SITE IS OUTSIDE THE WRPA.
21. CRITICAL NATURAL AREAS (CNAs) AND WETLANDS WILL NOT BE IMPACTED BY THIS PROJECT. THE WETLANDS BOUNDARIES DEPICTED ON THESE PLANS WERE DELINEATED IN ACCORDANCE WITH THE PROCEDURE SET FORTH IN THE FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS, DATED JANUARY 10, 1989.
22. FIELD CONDITIONS MAY WARRANT THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES IN ADDITION TO THOSE SHOWN ON THESE PLANS. CONTRACTOR SHALL IMPLEMENT ADEQUATE EROSION AND SEDIMENT CONTROL MEASURES FOR ANY ADDITIONAL REQUIREMENTS. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE DELAWARE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
23. RESTRAIN ALL PIPE AND FITTINGS WHERE INDICATED ON THE PROFILES.
24. ALL PIPE ELEVATIONS SHOWN ON THESE DRAWINGS REFER TO INVERT ELEVATIONS UNLESS OTHERWISE NOTED.
25. FORCE MAIN AND GRAVITY SEWER SHALL BE TESTED IN ACCORDANCE WITH THE SPECIFICATIONS. FORCE MAIN TEST PRESSURE (HYDROSTATIC) SHALL BE 55 PSI.
26. DURING CONSTRUCTION, THE EXISTING RICHARDSON PARK PUMPING STATION OPERATION SHALL CONTINUE UNINTERRUPTED. CONTRACTOR SHALL NOT IMPACT OR INTERRUPT THE OPERATION OF THE EXISTING RICHARDSON PARK PUMPING STATION. CONTRACTOR SHALL NOT INTERFERE WITH ACCESS TO THE EXISTING RICHARDSON PARK PUMPING STATION.
27. CLASSIFICATION OF AREAS:

    ELECTRICAL FACILITIES FOR THE NEW PUMPING STATION WILL BE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CLASSIFICATIONS:
    - WET WELL – CLASS 1 DIVISION 1 HAZARDOUS LOCATION
    - PUMP ROOM LEVEL – UNCLASSIFIED, DAMP LOCATION
    - INTERMEDIATE LEVEL – UNCLASSIFIED, DAMP LOCATION
    - MOTOR ROOM – UNCLASSIFIED, DRY LOCATION

LIST OF DRAWINGS

SHT NO.	DWG NO.	TITLE
GENERAL		
1	G-1	TITLE, VICINITY AND LOCATION MAPS
2	G-2	GENERAL NOTES AND LIST OF DRAWINGS
3	G-3	SEQUENCE OF CONSTRUCTION, LEGEND, STAKEOUT & TEST HOLES
4	G-4	TRAVERSE RECOVERY DIAGRAMS AND BENCH MARK INFO
CIVIL		
5	C-1	OVERALL SITE PLAN
6	C-2	PRE-BULK EROSION & SEDIMENT CONTROL PLAN
7	C-3	POST-BULK EROSION & SEDIMENT CONTROL PLAN
8	C-4	GENERAL DEVELOPMENT LINES & GRADES PLAN
9	C-5	EROSION & SEDIMENT CONTROL NOTES & DETAILS
10	C-6	EROSION & SEDIMENT CONTROL DETAILS
11	C-7	EROSION & SEDIMENT CONTROL DETAILS
12	C-8	MISC. PAVING DETAILS
13	C-9	UTILITY PLAN
14	C-10	UTILITY PROFILES
15	C-11	FENCE, GATE & MISC. DETAILS
16	C-12	PRECAST MANHOLE & MISC. DETAILS
17	C-13	MISC. DETAILS
18	C-14	JUNCTION CHAMBER NO. 1
19	C-15	VALVE VAULT
20	C-16	BORING LOGS
21	C-17	BORING LOGS
22	C-18	BORING LOGS
LANDSCAPING		
23	L-1	SWM LANDSCAPE PLAN NOTES AND DETAILS
24	L-2	LANDSCAPE PLAN
STRUCTURAL		
25	S-1	GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES
26	S-2	TYPICAL STRUCTURAL DETAILS
27	S-3	TYPICAL STRUCTURAL DETAILS
28	S-4	TYPICAL STRUCTURAL DETAILS
29	S-5	TYPICAL STRUCTURAL DETAILS
30	S-6	LOWER LEVEL PLAN
31	S-7	INTERMEDIATE LEVEL PLAN
32	S-8	GRADE LEVEL PLAN
33	S-9	CRANE RAIL PLAN AND ROOF FRAMING PLAN
34	S-10	CROSS SECTION
35	S-11	CROSS SECTION
36	S-12	CROSS SECTION
37	S-13	LONGITUDINAL CROSS SECTION
38	S-14	STAIR PLANS, SECTIONS, AND DETAILS
39	S-15	SECTIONS AND DETAILS
40	S-16	SECTIONS AND DETAILS
41	S-17	JUNCTION CHAMBER
42	S-18	VALVE VAULT

SHT NO.	DWG NO.	TITLE
ARCHITECTURAL		
43	A-1	LEGEND, ABBREVIATIONS AND NOTES
44	A-2	BUILDING CODE ANALYSIS
45	A-3	GRADE LEVEL PLAN
46	A-4	ROOF PLAN AND DETAILS
47	A-5	BUILDING ELEVATIONS
48	A-6	BUILDING ELEVATIONS
49	A-7	BUILDING SECTIONS
50	A-8	BUILDING SECTIONS
51	A-9	WALL SECTIONS
52	A-10	EXTERIOR DETAILS
53	A-11	DOOR AND LOUVER SCHEDULES AND DETAILS
54	A-12	FINISH SCHEDULE AND PARTITION TYPES
MECHANICAL		
55	M-1	MECHANICAL NOTES, LEGEND AND DETAILS
56	M-2	TYPICAL MECHANICAL DETAILS
57	M-3	TYPICAL MECHANICAL DETAILS
58	M-4	PUMP/SYSTEM CURVES AND SCHEDULES
59	M-5	LOWER LEVEL PLAN
60	M-6	INTERMEDIATE LEVEL PLAN
61	M-7	GRADE LEVEL PLAN
62	M-8	CRANE LEVEL PLAN AND CROSS SECTION A
63	M-9	CROSS SECTION B
64	M-10	LONGITUDINAL SECTION C
65	M-11	LONGITUDINAL SECTION D
66	M-12	MECHANICAL EQUIPMENT SCHEDULES
ELECTRICAL		
67	E-1	LEGEND, ABBREVIATIONS AND GENERAL NOTES
68	E-2	ELECTRICAL GENERAL NOTES
69	E-3	ELECTRICAL SITE PLAN
70	E-4	SINGLE LINE DIAGRAM
71	E-5	SWITCH GEAR SEQUENCE AND INTERFACE
72	E-6	PUMP ROOM POWER PLAN
73	E-7	PUMP ROOM LIGHTING PLAN
74	E-8	INTERMEDIATE LEVEL POWER PLAN
75	E-9	INTERMEDIATE LEVEL LIGHTING PLAN
76	E-10	GRADE LEVEL POWER PLAN
77	E-11	GRADE LEVEL LIGHTING PLAN
78	E-12	SCHEDULES
79	E-13	DETAILS
80	E-14	DETAILS
INSTRUMENTATION		
81	I-1	ABBREVIATIONS, SCHEDULES AND GENERAL NOTES
82	I-2	SYMBOLS AND LEGENDS
83	I-3	PROCESS AND INSTRUMENTATION DIAGRAM (P&ID)
84	I-4	PUMP CONTROL PANEL DIAGRAM & ELEVATION
85	I-5	RVSS CONTROL DIAGRAM AND ELEVATION
86	I-6	VENTILATION PANEL DIAGRAM AND ELEVATION (1 OF 2)
87	I-7	VENTILATION PANEL DIAGRAM AND ELEVATION (2 OF 2)
88	I-8	LOWER LEVEL WELL I&C PLAN
89	I-9	INTERMEDIATE LEVEL I&C PLAN
90	I-10	GRADE LEVEL I&C PLAN
91	I-11	INSTALLATION DETAILS (1 OF 2)
92	I-12	INSTALLATION DETAIL (2 OF 2)

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
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WRA
Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805

WO: 70852-002

APPROVED BY: WILLIAM PATRICK WAGNER No. 14169 REGISTERED PROFESSIONAL ENGINEER STATE OF DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	TW/KAH
DRAWN	TW/KAH
CHECKED	WPW
DATE	MAR 2025

GENERAL NOTES AND LIST OF DRAWINGS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING G-2
SHEET 2 OF 92

N:\70852-002\CADD\DELIVERIES-002-PH2.dwg
Mar 20, 2025 - 2:16pm

LEGEND

EXISTING	PROPOSED	DESCRIPTION
385	(385)	MAJOR CONTOURS
SGGR	x 15.15	SPOT ELEVATIONS
EX. 6" SD		STORM DRAIN PIPE, MANHOLE AND HEADWALL
OHE		ELECTRICAL (OVERHEAD)
EX. 4"W (XX-XXXX)	NEW 4"W	WATER LINE (DRAWING NUMBER)
		WATER METER, VALVE AND HYDRANT
EX. 2"G		GAS LINE, GAS VALVE AND MANHOLE
EX. 8"S (XX-XXXX)	15"S	SANITARY SEWER LINE (DRAWING NUMBER), MANHOLE (MH), AND JUNCTION CHAMBER (JC)
		UTILITY POLE WITH GUY WIRE
		STREET LIGHT
		SIGN
		TREE LINE
		TREES
		FENCE
		PROPERTY LINE/RIGHT-OF-WAY/EASEMENT
		TEMPORARY CONSTRUCTION EASEMENT
		MAIL BOX
		SANITARY CLEANOUT
TH-2		TEST HOLE LOCATION AND NUMBER
B-2		BORING LOCATION AND NUMBER
I-2		INFILTRATION TEST HOLE AND NUMBER
		LIMITS OF DISTURBANCE
100-YEAR FLOODPLAIN		100-YEAR FLOOD PLAIN
TRAV. NO. 1		TRAVERSE MONUMENT POINT LOCATION AND NUMBER
BCO #577		BENCHMARK LOCATION AND NUMBER
EX.MH 1	MH 1	SANITARY SEWER MANHOLE DESIGNATION
		PROPOSED PAVEMENT, CURB AND GUTTER

UTILITY TEST HOLE INFORMATION

TEST HOLE (TH) NO.	DESCRIPTION	UTILITY TOP DEPTH	GROUND ELEVATION
1	6" WATER (DIP)	4'-1"	15.8'
2	6" WATER (DIP)	3'-5"	15.4'
3	1" WATER (COPPER)	3'-2"	13.3'
4	6" WATER (DIP)	3'-4"	12.1'
5	6" WATER (DIP)	4'-6"	11.4'
6	21" STORM DRAIN (CORRUGATED METAL)	2'-8"	10.5'
9	24" FORCE MAIN (METALLIC)	9'-4"	8.2'

NOTE: THE UTILITY TEST HOLE DATA SHEETS HAVE BEEN PROVIDED IN THE APPENDIX OF THE SPECIFICATIONS FOR THE CONTRACTOR'S INFORMATION AND USE.

INFILTRATION TEST INFORMATION

INFILTRATION TEST (I) NO.	INFILTRATION RATE (IN/HR)
1	51.0
2	83.6
3	16.7
4	26.6

NOTE: THE INFILTRATION TEST DATA SHEETS HAVE BEEN PROVIDED IN THE APPENDIX OF THE SPECIFICATIONS FOR THE CONTRACTOR'S INFORMATION AND USE.

ABBREVIATIONS

@	AT
ABAN.	ABANDON
ABV.	ABOVE
AC.	ACRE
APPROX.	APPROXIMATELY
ASPH.	ASPHALT
B	BEND
BC	BOLT CIRCLE, BOTTOM OF CURVE
BIT.	BITUMINOUS
BL.	BASELINE
BLDG.	BUILDING
B.M.	BENCH MARK
BOT.	BOTTOM
BTWN.	BETWEEN
C.	CONDUIT
CB	CATCH BASIN
CC	CENTER TO CENTER
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
CH	CHORD
CJ	CONSTRUCTION JOINT
C/L	CENTERLINE
CL	CLEAR, CLASS
CMP.	CORRUGATED METAL PIPE
C/O	CENTER OF
C.O.	CLEAN OUT
CONC.	CONCRETE
CONN.	CONNECTION
COUNTY, NCC	NEW CASTLE COUNTY
CY	CUBIC YARD
D.	DRAIN, DEGREE
DNREC	DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIA.	DIAMETER
D.I.P.	DUCTILE IRON PIPE
DR.	DRIVE
DWG., DRWG	DRAWING
E.	EAST, ELECTRICAL
EA.	EACH
ECC.	ECCENTRIC
EL., ELEV.	ELEVATION
ELECT., ELEC	ELECTRIC
EQ	EQUAL
ES	EROSION AND SEDIMENT CONTROL
EXIST., EX.	EXISTING
FC	FACE OF CURB
FH.	FIRE HYDRANT
FL., FLR	FLOOR
FLG.	FLANGE
FM	FORCE MAIN
FT.	FEET
G	GAS
G,GND., GR.	GROUND
GA.	GAUGE
GABC	GRADED AGGREGRATE BASE COURSE
GAL.	GALLON
GALV.	GALVANIZED
G&E	GAS AND ELECTRIC
HB.	HORIZONTAL BEND
HORZ.	HORIZONTAL
HP.	HIGH POINT
HR.	HOUR
I	INLET, INFILTRATION TEST
IN.	INCH
INC.	INCORPORATED
INV.	INVERT
K.V.	KILOVOLT
K.V.A.	KILOVOLT-AMPERES
KW.	KILOWATT
L.	LENGTH
LF., L.F.	LINEAR FOOT
LOD	LIMITS OF DISTURBANCE
LP.	LOW POINT
L.P.	LIGHT POLE
LT	LIGHT, LEFT
MAX.	MAXIMUM
MECH.	MECHANICAL
MFR	MANUFACTURER
M.H.	MANHOLE, MOUNTING HEIGHT
MIN.	MINIMUM
MISC	MISCELLANEOUS
MJ.	MECHANICAL JOINT
MO.	MASONRY OPENING
MOT.	MOTOR
NCCSD, N.C.C.S.D.	NEW CASTLE COUNTY STANDARD DETAIL
NCCSS. N.C.C.S.S.	NEW CASTLE COUNTY STANDARD SPECIFICATIONS
N.	NORTH
N/A	NOT APPLICABLE
NE	NORTHEAST
N.I.C.	NOT IN CONTRACT
NO. #	NUMBER
N.T.S.	NOT TO SCALE
NW	NORTHWEST
O/C.	ON CENTER
OD.	OUTSIDE DIAMETER
OH	OVERHEAD
OPNG.	OPENING
P	PARCEL
PC., POC.	POINT OF CURVE
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
P.E.	PLAIN END
P.I.	POINT OF INTERSECTION
POB	POINT OF BEGINNING
POE	POINT OF END
POL	POINT OF LINE
PRC	POINT OF REVERSE CURVE
PROP.	PROPOSED
P.S.	PUMPING STATION
P.S.F.	POUNDS PER SQUARE FOOT
P.S.I.	POUNDS PER SQUARE INCH
P.T.	POINT OF TANGENCY
PVC.	POLYVINYL CHLORIDE, POINT OF VERTICAL CURVE
PVI.	POINT OF VERTICAL INTERSECTION
PVT.	POINT OF VERTICAL TANGENCY
QUAN.	QUANTITY
R.	RISER, REDUCER, RADIUS
R/C	REBAR AND CAP
RCCP.	REINFORCED CONCRETE CULVERT PIPE
RCP.	REINFORCED CONCRETE PIPE
RED.	REDUCER
REIN., REINF.	REINFORCEMENT
REQD.	REQUIRED
RT.	RIGHT
R/W, RW, ROW	RIGHT OF WAY
RWGV	RESILIENT WEDGE GATE VALVE
S.	SOUTH, SEWER, SIGN
SAN.	SANITARY
SCE.	STABILIZED CONSTRUCTION ENTRANCE
SCH.	SCHEDULE
SD.	STORM DRAIN
SE	SOUTHEAST
SECT.	SECTION
SF	SQUARE FEET, SILT FENCE
S.O.S.	STONE OUTLET STRUCTURE
SPEC.	SPECIFICATIONS
SQ.	SQUARE
SS.	STAINLESS STEEL, SANITARY SEWER
SSF	SUPER SILT FENCE
STA.	STATION
STD	STANDARD
STL.	STEEL
STRUCT., STR.	STRUCTURAL
SW	SOUTHWEST
SWM	STORMWATER MANAGEMENT
SYM	SYMBOL
SYS	SYSTEM
T., TELE	T., TELEPHONE
TEMP.	TEMPORARY
T.C.	TOP OF CURVE
TH	TEST HOLE
TH., THK.	THICK
T.P.	TEST PIT
TRAV	TRAVERSE
TYP	TYPICAL
UG.	UNDERGROUND
UTIL	UTILITY
V.	VALVE
VB.	VERTICAL BEND
VERT.	VERTICAL
VV	VALVE VAULT
W.	WEST, WATER
W/	WITH
WP	WORKING POINT
WV.	WATER VALVE
XFMR. T	TRANSFORMER

SUGGESTED SEQUENCE OF CONSTRUCTION

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

1. EXISTING CONDITIONS ARE SHOWN IN THE "NEW RICHARDSON PARK PUMPING STATION - PHASE 1" AS-BUILTS.
2. NOTIFY NEW CASTLE COUNTY AND DNREC AT LEAST 7 DAYS PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES.
3. INSTALL EROSION AND SEDIMENT CONTROL MEASURES FOR THE ENTIRE SITE. SEE ES SEQUENCE OF CONSTRUCTION ON DRAWING C-5. PERFORM STEPS 1 THROUGH 7.
4. MAINTAIN ACCESS TO EXISTING STATION AND EXISTING BYPASS PUMPS THROUGHOUT CONSTRUCTION.
5. BUILD THE NEW PUMP STATION.
6. BUILD JUNCTION CHAMBER NO. 1 OVER EXISTING 42" SEWER. MAINTAIN FLOW IN THE 42" SEWER. BYPASS PUMPING AND PIPING IS NOT ANTICIPATED. IF THE CONTRACTOR ELECTS TO USE BYPASS PUMPING DURING THIS WORK, INCLUDE ASSOCIATED PRICE IN BID SUBMISSION.
7. BUILD MANHOLE NO. 6 OVER EXISTING 36" SEWER AND CONNECT TO THE 36" SEWER INSTALLED UNDER PHASE I. MAINTAIN FLOW IN EXISTING 36" SEWER.
8. INSTALL NEW 42-INCH SANITARY SEWER WITH MANHOLES TO THE LIMITS SHOWN HEREIN.
9. INSTALL NEW WATER LINE AND ELECTRIC SERVICE TO THE NEW PUMPING STATION.
10. INSTALL NEW STORM DRAIN SYSTEM AND STORM WATER MANAGEMENT BIO-POND (SEE DRAWING C-4).
11. INSTALL 24" STAND PIPE CONNECTION ON THE EXISTING 24" SILVERBROOK FORCE MAIN
12. VERIFY INVERT OF EX. 24" FM NEAR THE SURGE TOWER AT CONNECTION POINT TO CONFIRM ELEVATIONS FOR VALVE VAULT 1.
13. CLOSE VALVE EXISTING SILVERBROOK FORCE MAINS IN EXISTING VALVE VAULT. DIVERT ALL FLOW FROM THE EXISTING PUMP STATION TO THE SURGE TOWER. INSTALL NEW 30-INCH FORCE MAIN UP TO AND INCLUDING VALVE VAULT NO. 1. CONSTRUCT TIE-IN TO EXISTING 30" SILVERBROOK FORCE MAIN.
14. COMPLETE BUILDING THE NEW PUMP STATION AND COMPLETE INTERMEDIATE TESTING WITH WATER SUPPLIED BY THE CONTRACTOR* THROUGH THE 30" SILVERBROOK FORCEMAIN.
15. DIVERT FLOW AT JUNCTION CHAMBER NO. 1 AND MANHOLE NO. 6 TO THE NEW PUMPING STATION. MAINTAIN CONNECTION TO EXISTING PUMP STATION FOR REDUNDANCY UNTIL FINAL TESTING OF THE PUMP STATION IS COMPLETE.
16. COMPLETE PRE-FINAL TESTING WITH WASTEWATER* THROUGH THE 30" SILVERBROOK FORCEMAIN.
17. LOCATE FIRST ISOLATION VALVE AND DEWATER EXISTING SURGE TOWER AND EXISTING EFFLUENT 36" FORCE MAIN (APPROXIMATELY 70,000 GALLONS).
18. COMPLETE PREFINAL TESTING THROUGH THE NEW 30" FORCEMAIN CONNECTION TO THE EXISTING SURGE TOWER.
19. COMPLETE FINAL TESTING* OF THE PUMP STATION.
20. INSTALL THE 30" FORCEMAIN CONNECTION FROM THE VALVE VAULT TO THE EXISTING SURGE TANK INCLUDING THE 24" BYPASS FROM THE NEW FORCE MAIN TO THE EXISTING EFFLUENT 36-INCH FORCE MAIN.
21. PERMANENTLY DIVERT ALL WASTEWATER FLOW TO THE NEW PUMP STATION BY COMPLETING THE BENCH OF JUNCTION CHAMBER 1 AND MH 6. DEWATER THE WET WELL OF THE EXISTING PUMP STATION.
22. SEE EROSION AND SEDIMENT CONTROL SEQUENCE OF CONSTRUCTION ON DRAWING C-5. PERFORM STEPS 8 THROUGH 15.

*ALL PUMP STATION TESTING PHASES SHALL BE PERFORMED AS SPECIFIED IN SECTION 01650.

STAKEOUT DATA

42-INCH GRAVITY SEWER

FROM MANHOLE NO.	TO MANHOLE NO.	AZIMUTH	LENGTH	MANHOLE NO.	NORTHING	EASTING
42-IN STUB	MH 5	126° 21' 36"	52.4'	42-IN STUB	628891.96	610034.26
MH 5	JC 1	111° 55' 02"	61.7'	MH 5	610076.45	610076.45
				JC-1	628837.96	610133.48

36-INCH GRAVITY SEWER

FROM MANHOLE NO.	TO MANHOLE NO.	AZIMUTH	LENGTH	MANHOLE NO.	NORTHING	EASTING
36-IN STUB	MH 6	93° 24'35"	21.5'	36-IN STUB	629036.71	610005.24
				MH 6	629035.42	610026.70

30-INCH FORCE MAIN
EX. 30" STUB TO SURGE TANK

STA	NORTHING	EASTING	DESCRIPTION
0+00	610003.49	610003.49	POB - EX. 30" STUB
1+04.37	629128.42	610017.81	22.5° HORIZONTAL BEND
1+49.41	629089.49	610040.64	22.5° HORIZONTAL BEND
2+85.64	629007.07	610149.57	45° HORIZONTAL BEND
3+08.35	628984.50	610152.72	30"X30" TEE
3+45.76	628947.35	610157.84	45° HORIZONTAL BEND
3+77.87	628927.95	610183.54	30"X24" ECCENTRIC REDUCER
3+83.20	628924.75	610187.80	30"X24" TEE
3+87.89	628921.91	610191.53	24" RWGV
3+92.02	628919.59	610194.65	POE - DIP TO RCCP ADAPTER

30-INCH FORCE MAIN
24" SURGE TANK BY-PASS

STA	NORTHING	EASTING	DESCRIPTION
0+00	628924.75	610187.80	POB - 30"X24" TEE
0+05.04	628920.73	610184.77	24" RWGV
0+14.10	628913.44	610179.35	45° HORIZONTAL BEND
0+21.25	628906.23	610180.40	45° HORIZONTAL BEND
0+37.03	628896.73	610193.13	22.5° HORIZONTAL BEND
0+44.22	628894.85	610200.05	POE - 36"X30" TEE
	628900.44	610201.68	36" RWGV
	628903.73	610202.59	36" DIP TO RCCP ADAPTER
	628890.67	610198.74	36" DIP TO RCCP ADAPTER

30-INCH FORCE MAIN
VALVE VAULT 1 TO EX. 30-IN SILVERBROOK FM

STA	NORTHING	EASTING	DESCRIPTION
0+00	628984.50	610152.72	POB - 30"X30" TEE
0+19.06	628987.05	610171.60	45° VERTICAL BEND
0+23.51	628987.66	610176.02	45° VERTICAL BEND
0+42.21	628990.22	610194.54	POE - 30" DIP TO RCCP ADAPTER

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WARNING
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY: WILLIAM P. WARNER LICENSE No. 14169 PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	TW/KAH
DRAWN	TW/KAH
CHECKED	WPW
DATE	MAR 2025

SEQUENCE OF CONSTRUCTION, LEGEND, STAKEOUT & TEST HOLES

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

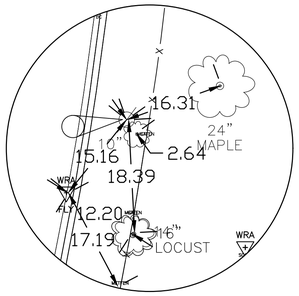
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING G-3
SHEET 3 OF 92

N:\70852-002\CAD\70852RPPS-002G-PHZ.dwg
Apr 01, 2025 - 9:40am

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

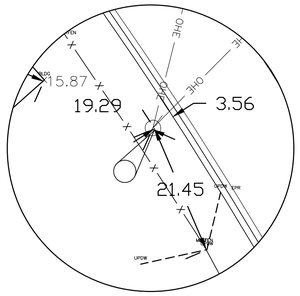
TRAVERSE RECOVERY DIAGRAMS



BENCH MARK NO. 1
SHEET C-10

RR SPIKE IN
ELECTRIC POLE

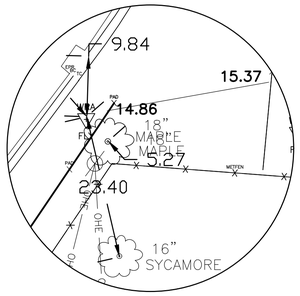
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EL:10.465'



BENCH MARK NO. 2
SHEET C-10

RR SPIKE IN
ELECTRIC POLE

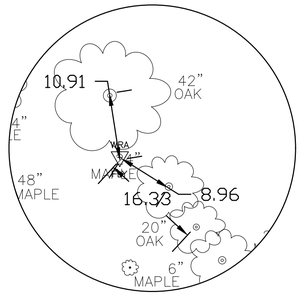
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E:609868.36
EL:17.313'



TRAVERSE PT. NO. WRA1A
SHEET C-10

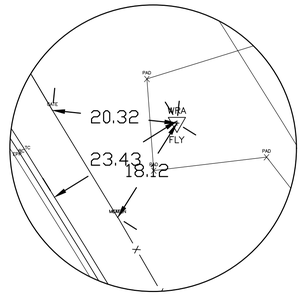
MAGNETIC NAIL
SET

N:629443.14
E:609916.21
EL:14.83'



TRAVERSE PT. NO. WRA1823
SHEET C-10

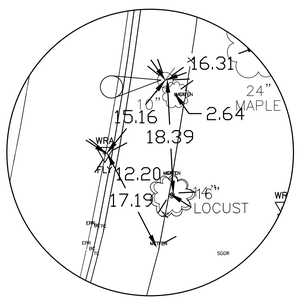
N:628820.96
E:610151.62
EL:6.93'



TRAVERSE PT. NO. WRA1B
SHEET C-10

MAGNETIC NAIL
SET

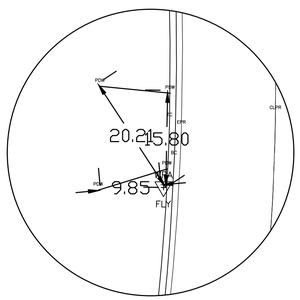
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SHEET C-10

MAGNETIC NAIL
SET

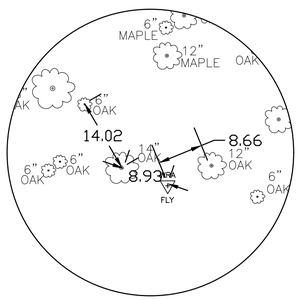
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TRAVERSE PT. NO. WRA 2D
SHEET C-10

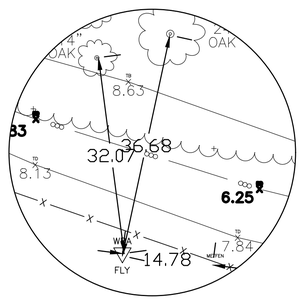
MAGNETIC NAIL SET

N:628878.26
E:609985.18
EL:10.33'



TRAVERSE PT. NO. WRA1805
SHEET C-10

N:628770.48
E:610097.90
EL:5.48'



TRAVERSE PT. NO. WRA2A
SHEET C-10

MAGNETIC NAIL
SET

N:629037.1374
E:610114.58
EL:8.39'

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805

WO: 70852-002

APPROVED BY:
WILLIAM P. WAGNER
LICENSE
No. 14169
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	TW/KAH
DRAWN	TW/KAH
CHECKED	WPW
DATE	MAR 2025

TRAVERSE RECOVERY DIAGRAMS & BENCH MARK INFO

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING G-4
SHEET 4 OF 92

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Mar 31, 2025 - 2:52pm

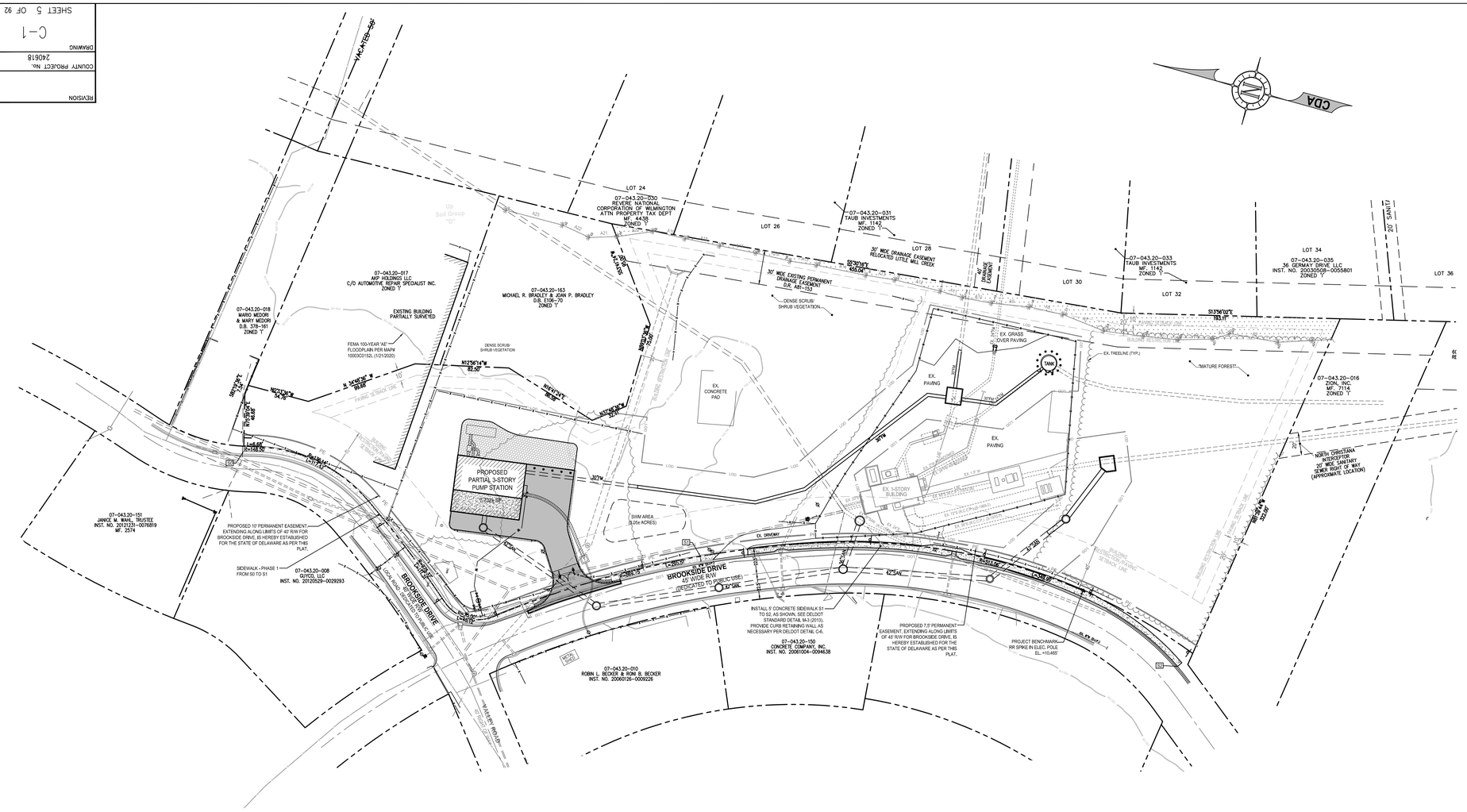
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

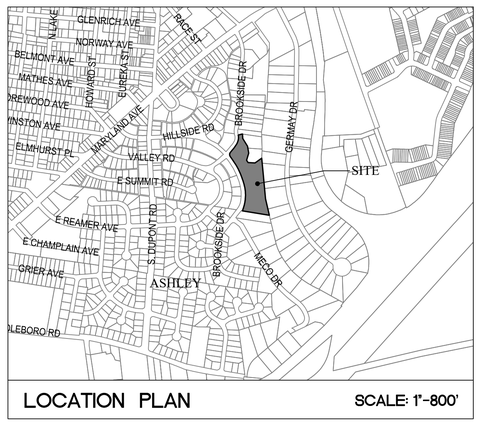
REVISION

COUNTY PROJECT No. 240618

DRAWING C-1

SHEET 5 OF 92





LOCATION PLAN SCALE: 1"=800'

LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	
	ADJOINER LINE	
	SETBACK	
SAN	SANITARY	SAN
	STORM	
W	WATER	W
G	GAS	
	FENCE	
58	MINOR CONTOUR	(61)
60	MAJOR CONTOUR	(65)
S	SANITARY MANHOLE	
	STORM DOWNSPOUT	DS
	LIGHT POLE	
x 32.85	SPOT GRADE	x 32.85
	LIMIT OF DISTURBANCE	LOD
	BUILDING	

Know what's **below.** **Call** before you dig.

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CERTIFICATION OF PLAN ACCURACY

I, COLMCILLE DEASCANIS, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER WITH A BACKGROUND IN CIVIL ENGINEERING IN THE STATE OF DELAWARE AND THAT ALL OF THE INFORMATION ON THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY ACCEPTED SURVEYING STANDARDS AND PRACTICES AND BY THE NEW CASTLE COUNTY UNIFIED DEVELOPMENT CODE.

COLMCILLE DEASCANIS — REGISTRATION #13049 — 4/16/25 DATE

CERTIFICATION OF OWNERSHIP

I, THE UNDERSIGNED, HEREBY CERTIFY: THAT I AM THE OWNER OF THE PROPERTY WHICH IS SUBJECT OF THIS PLAN; THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION; THAT I AUTHORIZE THIS PLAN TO BE RECORDED IN ACCORDANCE WITH THE REGULATIONS OF THE NEW CASTLE COUNTY UNIFIED DEVELOPMENT CODE; AND THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHALL BE PURSUANT TO THE APPROVED PLAN AND RESPONSIBLE PERSONS INVOLVED WILL HAVE A CERTIFICATE OF TRAINING FROM DNREC. DNREC AND NEW CASTLE COUNTY PERSONNEL SHALL HAVE THE RIGHT TO CONDUCT ON-SITE INSPECTIONS.

NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS — DATE

SITE DATA

1. PURPOSE OF THIS PLAN: TO CONSTRUCT A SANITARY SEWER PUMPING STATION WITH ASSOCIATED ACCESS ROAD AND PARKING AREAS

2. OWNER ADDRESS: NEW CASTLE COUNTY
ATTN: COMMUNITY SERVICES
77 READS WAY
NEW CASTLE, DE 19720

3. PROPERTY ADDRESS: 100 BROOKSIDE DRIVE
WILMINGTON, DE 19804

4. TAX PARCEL NUMBER: 07-043.20-152

5. AREA OF PARCEL: GROSS LOT AREA 4.46± ACRES

6. AREA BREAKDOWN:

	EXISTING (BUILT)	PROPOSED
BUILDING COVERAGE:	0.02± AC.	0.07± AC
IMPERVIOUS SURFACES:	0.72± AC.	0.39± AC.
STORMWATER MANAGEMENT AREA:	0.00± AC.	0.05± AC.
OPEN SPACE:	3.72± AC.	3.95± AC.
TOTAL:	4.46± AC.	4.46± AC. (100%)

6A. GROSS FLOOR AREA
EXISTING: 1-STORY — 1ST FLOOR: 775± SF — EXISTING GFA: 775± SF
PROPOSED: PARTIAL 3-STORY — 1ST FLOOR: 2,932± SF; 2ND FLOOR: 2,932± SF; 3RD FLOOR: 1,868± SF; TOTAL: 7,732± SF

7. ZONING: EXISTING: I - INDUSTRIAL

LOT AREA	LOT WIDTH	STREET YARD	SIDE YARD	REAR YARD	PAVING STREET/ OTHER YARD	BUILDING HEIGHT
1 AC	100'	40'	20'	20'	40'/10'	60/140'

8. PARKING: REQUIRED: N/A (USE: UTILITIES)
PROVIDED: 0

9. DEED REFERENCE: D.B. 0 PG. 0

10. LOTS: 1 (EXISTING)

11. DATUM: VERTICAL - NAVD 88
HORIZONTAL - COORDINATE SYSTEM AND BASIS OF BEARINGS; DELAWARE STATE PLANE NAD 83/91

12. BENCHMARK: RR SPIKE IN TELEPHONE POLE, ELEV. 10.465' (SEE PLAN FOR LOCATION)

13. DATE OF SURVEY: JUNE 2013 AND SUPPLEMENTED IN SEPTEMBER 2019 BY WHITMAN, REQUARDT AND ASSOCIATES, LLP

14. WATER SUPPLY: ARTESIAN WATER- WATER SUPPLY IS SUBJECT TO THE APPROVAL OF DELAWARE STATE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL AND THE DELAWARE DEPARTMENT OF PUBLIC HEALTH.

15. SEWER: SEWERAGE IS SUBJECT TO THE APPROVAL OF THE NEW CASTLE COUNTY DEPARTMENT OF PUBLIC WORKS, AT THE TIME OF APPROVAL OF THIS PLAN, SEWER CAPACITY EXISTED TO ACCOMMODATE THE ANTICIPATED FLOWS GENERATED BY THIS ADDITIONAL DEVELOPMENT, NEW CASTLE COUNTY HAS COMMITTED TO PROVIDE SEWER SERVICE IN ACCORDANCE WITH LAND DEVELOPMENT IMPROVEMENT AGREEMENT FOR THIS DEVELOPMENT, THE OWNER OF THIS PROPERTY, HIS SUCCESSORS OR ASSIGNS, SHALL BE RESPONSIBLE FOR EXTENDING SEWER SERVICE TO EACH LOT SHOWN ON OR CREATED BY THIS PLAN.
NO SEWER FLOWS PROPOSED BY THIS PLAN.

16. FLOODPLAIN: THIS PROPERTY LIES PARTIALLY WITHIN ZONE 'AE' 100-YEAR FLOODPLAIN ACCORDING TO THE NATIONAL FLOOD INSURANCE RATE MAP NUMBER 10003C0152L, DATED JANUARY 21, 2020.
A FLOODPLAIN PERMIT (APPLICATION #2015-0447) WAS APPROVED FOR THIS PROJECT BY NEW CASTLE COUNTY ON 4/12/2017.
THE FIRST (AT-GRADE) FLOOR OF THE PROPOSED PUMP STATION SHALL BE CONSTRUCTED IN PHASE 2 AND SHALL BE ELEVATED OR DRY FLOOD PROOFED TO THE BASE FLOOD ELEVATION PLUS A MINIMUM OF 18-INCHES PRIOR TO ISSUANCE OF A BUILDING PERMIT, IN ACCORDANCE WITH ASCE24 PURSUANT TO SECTION 1612.5 OF THE 2015 INTERNATIONAL BUILDING CODE AS ADOPTED BY NEW CASTLE COUNTY CODE CHAPTER 6. NO HABITABLE BUILDING SPACE SHALL BE CONSTRUCTED ABOVE GRADE IN PHASE 1.

17. WATER RESOURCE: THE SITE IS NOT WITHIN A WATER RESOURCE PROTECTION AREA (WRPA) ACCORDING TO THE WRPA MAP 1 OF 3, DATED MARCH 2022.

18. CRITICAL NATURAL AREA: THE SITE IS NOT WITHIN A CRITICAL NATURAL AREA PER DELAWARE INVENTORY OF NATURAL AREAS.

19. WETLANDS: A WETLANDS INVESTIGATION WAS CONDUCTED BY LANDMARK SCIENCE AND ENGINEERING ON MAY, 2013 AND WETLANDS WERE FOUND TO BE ON SITE IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS (USACE) WETLANDS DELINEATION MANUAL (TECHNICAL REPORT Y-87-1) AND THE REGIONAL SUPPLEMENT TO THE USACE WETLANDS DELINEATION MANUAL: ATLANTIC AND GULF COASTAL REGION.

20. SUPERSEDES NOTE: THIS PLAN SUPERSEDES, IN PART, THE RECORD MINOR LAND DEVELOPMENT PLAN OF RICHARDSON PARK PUMP STATION, LAST DATED 4/12/2017 AND RECORDED ON 5/2/2017 IN THE RECORDER OF DEEDS IN AND FOR NEW CASTLE COUNTY, STATE OF DELAWARE, AT INSTRUMENT #20170502-0021809.

21. DEBRIS DISPOSAL: NO DEBRIS SHALL BE BURIED ON THE SITE.

22. DRAINAGE: DRAINAGE AND EROSION AND SEDIMENT CONTROL, AND STORMWATER MANAGEMENT SHALL BE PROVIDED IN ACCORDANCE WITH THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS AND THE NEW CASTLE COUNTY DRAINAGE CODE.

23. LIMIT OF DISTURBANCE: 2.1± ACRES

24. DEED RESTRICTIONS: NONE

25. NON-COMPLIANCE: THE LOCATION OF AN EXISTING BUILDING IDENTIFIED ON THIS PLAN DOES NOT COMPLY WITH DIMENSIONAL REGULATIONS IN EFFECT AT THE TIME OF APPROVAL. THE BUILDING MAY OR MAY NOT HAVE NON-CONFORMING STATUS UNDER THE PROVISIONS OF CHAPTER 40 OF THE NEW CASTLE COUNTY CODE. RECORDATION OF THIS PLAN DOES NOT CONSTITUTE VERIFICATION OF NON-CONFORMING STATUS.

26. CONSERVATION EASEMENT: ANY AREA DESIGNATED FOR PROTECTION AS A NATURAL RESOURCE PURSUANT TO ARTICLE 10 OF THE NEW CASTLE COUNTY UNIFIED DEVELOPMENT CODE IS HEREBY PROTECTED BY A CONSERVATION EASEMENT THAT SHALL RUN IN PERPETUITY FOR THE BENEFIT OF NEW CASTLE COUNTY. ANY AREA ON THIS PLAN DELINEATED AS A CONSERVATION EASEMENT SHALL REMAIN IN ITS NATURAL STATE.

27. NATURAL RESOURCES:

PROTECTED RESOURCES	PROTECTION RATIO	TOTAL AREA	DISTURBED AREA	PROTECTED AREA	PROTECTED RATIO
WETLANDS	1.00	0.16 AC.	0.00 AC.	0.16 AC.	1.00
RIPARIAN BUFFER	1.00*	1.00 AC.	0.03 AC.	0.97 AC.	0.97
FLOODPLAIN	1.00**	4.10 AC.	1.48 AC.	2.62 AC.	0.64
MATURE FOREST	0.50*	0.99 AC.	0 AC.	0.99 AC.	1.00

*EXEMPT PER DIVISION 40.05.050.H OF THE NCCC
**PERMITTED USE PER SECTION 40.10.210 OF THE NCCC

28. LANDSCAPE PLAN: A LANDSCAPE PLAN, PREPARED BY WHITMAN, REQUARDT & ASSOCIATES, LP LAST DATED MAY 2016 OR AS AMENDED AND APPROVED IN WRITING BY THE DEPARTMENT OF LAND USE, IS HEREBY CONSIDERED A PART OF THE RECORD PLAN. WITH THE EXCEPTION OF THE BIO-RETENTION FACILITY LANDSCAPING, SITE LANDSCAPE REQUIREMENTS FOR THIS PROJECT SHALL BE EXEMPT AS INDICATED IN DIVISION 40.05.050.H OF THE NEW CASTLE COUNTY UNIFIED DEVELOPMENT CODE.

SEDIMENT & STORMWATER SHEET INDEX	DWG NO.	SHEET NO.
SEDIMENT & STORWMATER COVER SHEET	C-1	5
PRE-BULK EROSION &SEDIMENT CONTROL PLAN	C-2	6
POST-BULK EROSION & SEDIMENT CONTROL PLAN	C-3	7
GENERAL DEVELOPMENT LINES & GRADES PLAN	C-4	8
EROSION &SEDIMENT CONTROL NOTES & DETAILS	C-5	9
EROSION AND SEDIMENT CONTROL DETAILS	C-6	10
EROSION AND SEDIMENT CONTROL DETAILS	C-7	11
MISC. PAVING DETAILS	C-8	12

50 25 0 50 100
SCALE: 1" = 50'

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
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BEFORE YOU DIG CALL 1-800-282-8555 (In Del.) 1-800-441-8355 (Md., Va.) PROTECT YOURSELF, GIVE TWO WORKING DAYS NOTICE

WRA Whitman, Requardt & Associates, LLP
3 Mill Road, Suite 309, Wilmington, Delaware 19806

CDA ENGINEERING INC.
CIVIL/SITE ENGINEERING AND LAND PLANNING
6 LARCH AVENUE SUITE 401 WILMINGTON, DE 19804
Tel: 302 998 9202 Fax: 302 691 1314 cdaengineering.com
WO: 70852-002

APPROVED BY:

NEW CASTLE COUNTY DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____ PROFESSIONAL ENGINEER - DESIGN

SCALE 1"=50'
DESIGNED
DRAWN
CHECKED
DATE MAR 2025

OVERALL SITE PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
APPLICATION # 2013-0838
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING C-1
SHEET 5 OF 92

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

SHEET 6 OF 92
C-2
DRAWING
COUNTY PROJECT No.
240618
REVISION

LOT 24
07-043.20-030
REVERE NATIONAL CORPORATION OF WILMINGTON ATTN PROPERTY TAX DEPT
MF. 4438
ZONED 'I'

LOT 26
07-043.20-031
TAUB INVESTMENTS
MF. 1142
ZONED 'I'

LOT 28
30' WIDE DRAINAGE EASEMENT RELOCATED LITTLE MILL CREEK
30' WIDE EXISTING PERMANENT DRAINAGE EASEMENT D.R. A87-153
40' DRAINAGE EASEMENT

LOT 30
LOT 32
07-043.20-033
TAUB INVESTMENTS
MF. 1142
ZONED 'I'

LOT 34
07-043.20-035
36 GERMAY DRIVE LLC
INST. NO. 20030508-0055801
ZONED 'I'

07-043.20-017
AKP HOLDINGS LLC
C/O AUTOMOTIVE REPAIR SPECIALIST INC.
ZONED 'I'

07-043.20-018
MARIO MEDORI & MARY MEDORI
D.B. 378-161
ZONED 'I'

07-043.20-163
MICHAEL R. BRADLEY & JOAN P. BRADLEY
D.B. E106-70
ZONED 'I'

EXISTING BUILDING PARTIALLY SURVEYED

FEMA 100-YEAR 'AE' FLOODPLAIN PER MAP# 10003C0152L (1/21/2020)

Up Soil Group "D"

DENSE SCRUB/ SHRUB VEGETATION

DENSE SCRUB/ SHRUB VEGETATION

EX. GRASS OVER PAVING

EX. TREELINE (TYP.)

"MATURE FOREST"

TANK

EX. PAVING

EX. CONCRETE PAD

EX. CONC. PAD

EX. PAVING

EX. 1-STORY BUILDING

BRICK WALK

EX. SANITARY SEWER TO REMAIN

EX. SANITARY SEWER TO REMAIN

07-043.20-016
ZION, INC.
MF. 7114
ZONED 'I'

20'
NORTH CHRISTIANA INTERCEPTOR
20' WIDE SANITARY SEWER RIGHT OF WAY
(APPROXIMATE LOCATION)

INSTALL SILT FENCE PER DNREC STANDARDS (TYP.)
INSTALL STABILIZED CONSTRUCTION ENTRANCE PER DNREC STANDARDS (TYP.)

PROVIDE TEMPORARY STREAM DIVERSION AND PUMP-AROUND TO BYPASS STREAM FLOWS DURING CONSTRUCTION OF SANITARY CROSSING PER DNREC STANDARDS, SEE DETAIL (TYP.)

INSTALL AND MAINTAIN SILT FENCE AROUND SWM AREA AS NECESSARY TO PROTECT DURING SITE AND UTILITY CONSTRUCTION (TYP.)

SWM AREA (PHASE 1)

SOIL STOCKPILE AREA (SIZE & LOCATION APPROX.)

EX. DRIVEWAY

SCE

SCE

07-043.20-008
GUYCO, LLC
INST. NO. 20120529-0029293

BROOKSIDE DRIVE
40' WIDE R/W
LOCAL ROAD - DEDICATED TO PUBLIC USE

BROOKSIDE DRIVE
45' WIDE R/W
(DEDICATED TO PUBLIC USE)

INSTALL SILT FENCE PER DNREC STANDARDS (TYP.)

07-043.20-150
CONCRETE COMPANY, INC.
INST. NO. 20061004-0094638

07-043.20-010
ROBIN L. BECKER & RONI B. BECKER
INST. NO. 20060126-0009226

METAL SHED

EX. 12"S VALLEY ROAD
40' RIGHT OF WAY

30 15 0 30 60
SCALE: 1" = 30'

COLCHELLE DeVISCARIS LICENSE No. 13042 DELAWARE PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
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187-A OLD CHURCHMANS ROAD
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NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE 1"=30'
DESIGNED
DRAWN
CHECKED
DATE MAR 2025

PRE-BULK EROSION & SEDIMENT CONTROL PLAN

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING C-2
SHEET 6 OF 92

LX:\CDA_2012\Projects\12.153.00 Richardson Park PS\DWG\SCP\12.153.00 SCP.dwg
Mar 26, 2025 - 1:06pm

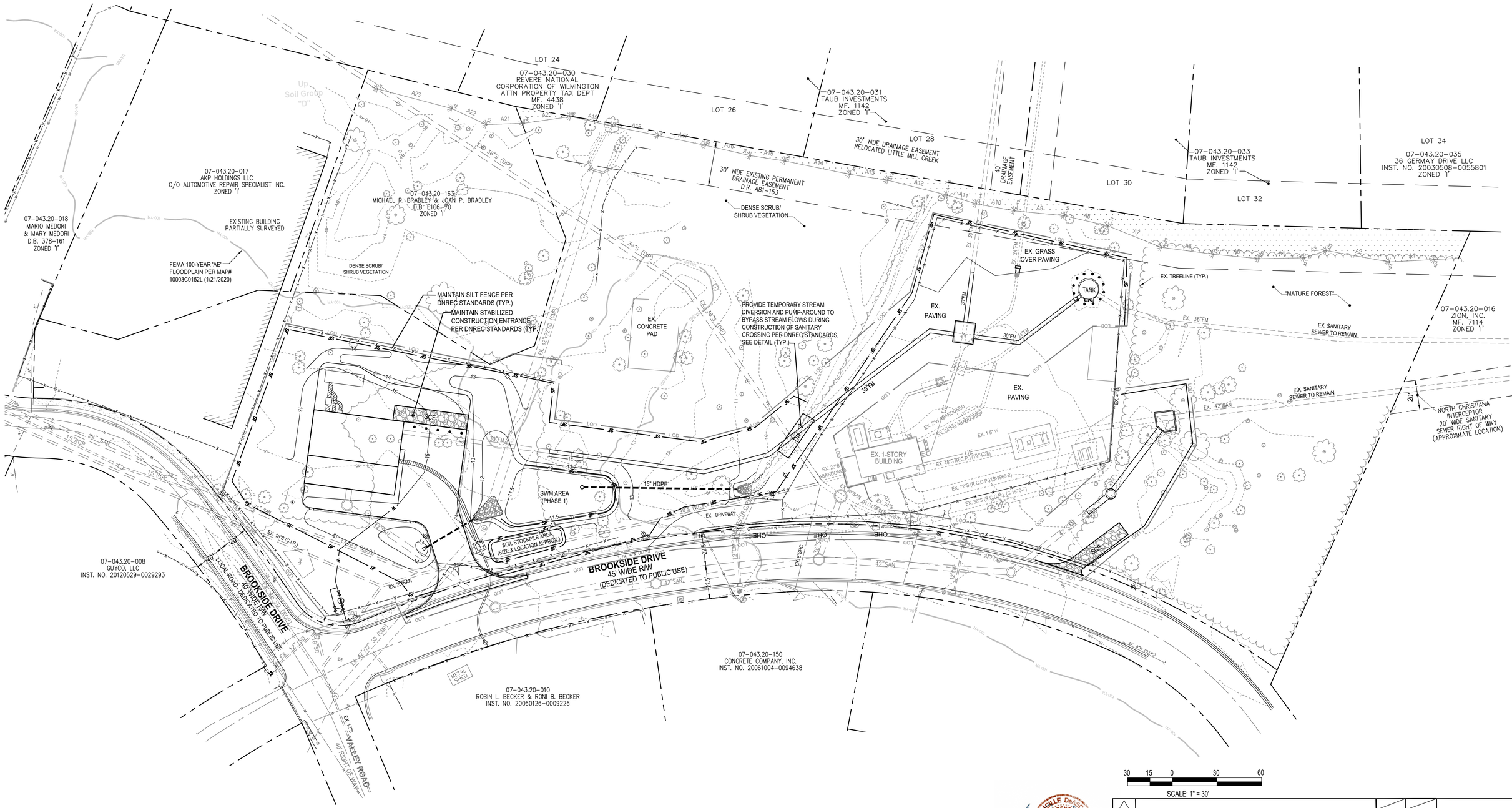
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REVISION

COUNTY PROJECT No.
240618

DRAWING
C-3

SHEET 7 OF 92





REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	1"=30'
DESIGNED	
DRAWN	
CHECKED	
DATE	MAR 2025

REVISION

POST-BULK EROSION & SEDIMENT CONTROL PLAN

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

COUNTY PROJECT No.
240618

DRAWING
C-3
SHEET 7 OF 92

LAYOUT: 2012 Project\12.153.00 Richardson Park PS\DWG\SUP\12.153.00 SCP.dwg
MAR 26, 2025 - 1:04pm

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REVISION	COUNTY PROJECT No.	DRAWING
	240618	C-4

SHEET 8 OF 92

LOT 24
07-043.20-030
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LOT 26

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TAUB INVESTMENTS
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EXISTING BUILDING PARTIALLY SURVEYED

FEMA 100-YEAR 'AE' FLOODPLAIN PER MAP# 10003C0152L (1/21/2020)

30' WIDE DRAINAGE EASEMENT RELOCATED LITTLE MILL CREEK

30' WIDE EXISTING PERMANENT DRAINAGE EASEMENT D.R. A81-153

40' DRAINAGE EASEMENT

DENSE SCRUB/ SHRUB VEGETATION

EX. GRASS OVER PAVING

EX. TREELINE (TYP.)

"MATURE FOREST"

EX. PAVING

EX. CONCRETE PAD

TANK

EX. 1-STORY BUILDING

EX. SANITARY SEWER TO REMAIN

EX. 42"SAN

EX. 4"W

EX. 8"W (D.I.P.)

EX. 12"W (D.I.P.)

EX. 36"S (D.I.P.)

EX. 42"S (D.I.P.)

EX. 30"FM

EX. 36"FM

EX. 20"SAN

EX. 24"SAN

EX. 15"RCP

EX. 18"S (V.C.P.)

EX. DRIVEWAY

EX. ELEC/TEL

EX. OHE

EX. GAS

EX. PE

EX. SAS

EX. SAN

EX. SWM

EX. WATER

EX. CURB

EX. SIDEWALK

EX. LANDSCAPED AREA

EX. METAL SHED

EX. RAMP

EX. CONC. STEPS

EX. CONC. WALL

EX. BUILDING

EX. CONC. PAD

EX. PAVING

EX. GUARDRAIL

EX. 1"S

EX. 2"S

EX. 6"S

EX. 8"S

EX. 10"S

EX. 12"S

EX. 15"S

EX. 18"S

EX. 24"S

EX. 30"S

EX. 36"S

EX. 42"S

EX. 48"S

EX. 54"S

EX. 60"S

EX. 72"S

EX. 96"S

EX. 108"S

EX. 120"S

EX. 144"S

EX. 156"S

EX. 168"S

EX. 180"S

EX. 192"S

EX. 204"S

EX. 216"S

EX. 228"S

EX. 240"S

EX. 252"S

EX. 264"S

EX. 276"S

EX. 288"S

EX. 300"S

EX. 312"S

EX. 324"S

EX. 336"S

EX. 348"S

EX. 360"S

EX. 372"S

EX.

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SHEET 9 OF 92
C-5
DRAWING
240618
COUNTY PROJECT No.
REVISION

SEQUENCE OF CONSTRUCTION

1. NOTIFY MISS UTILITY THREE (3) DAYS PRIOR TO COMMENCING CONSTRUCTION. (1-800-282-8555)
2. A PRE-CONSTRUCTION MEETING (UNLESS WAIVED BY NCC) MUST BE HELD PRIOR TO COMMENCING WITH CONSTRUCTION. CONTACT NEW CASTLE COUNTY ENGINEERING SECTION AT 395-5470 TO SCHEDULE MEETING. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER PLANS.
3. THIS SITE REQUIRES A CERTIFIED CONSTRUCTION REVIEWER (CCR). THE CONTRACTOR SHALL RETAIN AN INDEPENDENT THIRD PARTY CCR AND LICENSED ENGINEER/SURVEYOR WHO SHALL BE RESPONSIBLE FOR INSPECTING THE CONSTRUCTION OF THE STORMWATER MANAGEMENT FACILITY AND FOR SUBMITTING THE APPROPRIATE INSPECTION CHECKLISTS, AS-BUILT PLANS, AND ASSOCIATED DOCUMENTS IN CONFORMANCE WITH NCC REQUIREMENTS.

CONSTRUCTION PHASE #1 (PHASE 1 COMPLETED - SEE STEP #16 FOR PHASE 2 CONSTRUCTION)

4. CLEAR AND GRUB AS NECESSARY TO INSTALL PERIMETER CONTROLS WITHIN CONSTRUCTION PHASE #1. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE CONSTRUCTED AS PER THE APPROVED E+S PLAN. THE ELEMENTS OF THE EROSION AND SEDIMENT CONTROL DESIGN THAT ARE SHOWN ON THE PRE-BULK GRADING PLAN ARE CONSIDERED PERIMETER CONTROLS THAT MUST BE INSTALLED PRIOR TO ANY BULK GRADING ON-SITE. THOSE ITEMS INCLUDE: STABILIZED CONSTRUCTION ENTRANCE, PERIMETER SILT FENCE, AND SEDIMENT TRAPPING.
5. INSTALL PERIMETER CONTROLS FOR CONSTRUCTION PHASE #1:
   A. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON PRE-BULK GRADING PLAN.
   B. INSTALL PERIMETER SILT FENCE AS SHOWN ON PRE-BULK E&S PLANS.
   C. STRIP TOPSOIL FROM PROPOSED SEDIMENT BASIN AREA. STOCKPILE IN LOCATION SHOWN ON PLANS. INSTALL SILT FENCE AROUND STOCKPILE PERIMETER. APPLY TEMPORARY SEED AND MULCH PER PLAN SPECIFICATIONS.
   D. EXCAVATE PROPOSED BIO-RETENTION FACILITY TO FUNCTION AS A SEDIMENT BASIN DURING CONSTRUCTION (REFER TO BIO-RETENTION FACILITY SEQUENCE OF CONSTRUCTION). INSTALL OUTLET PIPE, TEMPORARY RISER OUTFALL STRUCTURE WITH 6" ORIFICE, AND TEMPORARY SKIMMER DEVICE. UTILIZE TEMPORARY SKIMMER THROUGHOUT DURATION OF CONSTRUCTION. PLACE EROSION CONTROL MATTING (SC 150BN) ALONG SIDE SLOPES AND EMBANKMENT. PLACE TURF REINFORCEMENT MATTING OVER SPILLWAY. APPLY TOPSOIL AND SEEDING FOR SPILLWAY AS SHOWN ON PLANS.
   E. CONSTRUCT STONE-LINES SUMP PITS AT LOW POINT OF TRAPS. PLACE DEWATERING DIRT BAGS. THE SEDIMENT TRAP SHALL BE PUMPED DOWN THROUGH AN APPROVED GEO-TEXTILE DEWATERING BAG (SEE DETAIL SHEETS) BETWEEN RAIN EVENTS SO THAT THE VOLUME IS RESTORED.
6. ONCE ALL OF THE PERIMETER CONTROLS HAVE BEEN COMPLETED THE CONTRACTOR MUST NOTIFY NCC THAT THE SITE IS READY FOR A PERIMETER CONTROL INSPECTION. NO FURTHER WORK ON-SITE MAY BEGIN UNTIL NCC HAS COMPLETED AND APPROVED THIS INSPECTION.
7. AFTER OBTAINING APPROVAL OF THE PERIMETER CONTROL INSPECTION BY NCC, CONTRACTOR MAY BEGIN SITE DEMOLITION AND BULK GRADING OF THE SITE ACCORDING TO THE APPROVED SEDIMENT AND STORMWATER PERMIT PLANS.
8. INSTALL STORM SEWER PIPE. PLACE RIP-RAP OUTLET PROTECTION ALL STORM OUTLET PIPES AS PER DNREC/NCC REQUIREMENTS AND AS SHOWN ON PLANS. INSTALL INLET PROTECTION AROUND NEW CATCH BASINS PER DNREC STANDARDS AND AS SHOWN ON PLANS.
   - ALL RCP PIPE SHALL BE CLASS IV REINFORCED CONCRETE PIPE (UNLESS OTHERWISE INDICATED ON PLANS).
   - ANY CORRUGATED HDPE STORM SEWER PIPING AND FITTINGS SHALL BE WATERTIGHT. PIPE SHALL BE ADS N-12 WT OR APPROVED EQUIVALENT.
   - ALL PVC STORM SEWER PIPING AND FITTINGS SHALL BE WATERTIGHT. PIPE SHALL BE SDR-26 PVC UNLESS OTHERWISE INDICATED ON PLANS.
   CONTRACTOR MAY INSTALL OTHER UTILITIES CONCURRENT WITH STORM INSTALLATION. SEE MEP DRAWINGS FOR EXACT LIMITS OF SANITARY SEWER AND FORCE MAIN CONSTRUCTION WITHIN PHASE 1.
9. START BULK GRADING AND CONSTRUCTION FOR PARKING, DRIVES, AND OPEN SPACE AREAS WITHIN LIMITS OF CONSTRUCTION PHASE #1.
10. ONCE FINAL GRADE IS ACHIEVED, THOSE AREAS MUST BE STABILIZED IMMEDIATELY WITH EITHER PERMANENT VEGETATIVE STABILIZATION OR EROSION CONTROL MATTING AS DIRECTED BY NEW CASTLE COUNTY.
11. ONCE ALL AREAS DRAINING TO THE BIO-RETENTION AREA HAVE BEEN PERMANENTLY VEGETATIVELY STABILIZED, AND AFTER RECEIVING A PASSING INSPECTION FROM NCC, CONSTRUCTION OF THE SWM FACILITY MAY COMMENCE (SEE SEQUENCE OF CONSTRUCTION FOR BIO-RETENTION FACILITY), THE CCR MUST BE ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE SWM FACILITIES. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE CCR WITH AT LEAST 48 HOURS NOTICE BEFORE PROCEEDING WITH CONSTRUCTION OF THE FACILITIES.
12. PROPERLY DE-WATER SEDIMENT TRAP, REMOVE ACCUMULATED SEDIMENT AND PLACE IN SEDIMENT DISPOSAL AREA OR NCC-APPROVED OFF-SITE LOCATION, BRING BIO-POND TO FINAL DESIGN GRADES. REMOVE TEMPORARY OUTLET STRUCTURE AND SKIMMER DEVICE. INSTALL PERMANENT OUTLET STRUCTURE AND UNDERDRAIN PIPING AND TRASH RACK (SEE DETAIL). APPLY PERMANENT SEEDING AND MULCHING OVER BIO-POND DISTURBED AREAS. REFER TO SEQUENCE OF CONSTRUCTION FOR CONVERSION OF SEDIMENT TRAP TO BIO-RETENTION FACILITY.
13. AFTER CONSTRUCTION OF BIO-RETENTION FACILITY IS COMPLETE, CONTRACTOR/OWNER MUST PROVIDE A COMPLETE AS-BUILT OF SWM FACILITY. AS-BUILT MUST BE COMPLETED AS PER NEW CASTLE COUNTY REQUIREMENTS. AS-BUILTS MUST BE SUBMITTED TO NEW CASTLE COUNTY FOR APPROVAL. CONTRACTOR MUST MAKE ANY REQUIRED MODIFICATIONS TO THE SWM FACILITY PRIOR TO COMMENCING WITH FINAL STABILIZATION OF THE SITE AND PROJECT CLOSEOUT.
14. IMMEDIATELY AFTER ALL SITE CONSTRUCTION WITHIN CONSTRUCTION IS COMPLETED (INCLUDING AS-BUILT APPROVALS OF SWM FACILITIES), PLACE TOPSOIL AND PERMANENT SEEDING AND MULCHING OVER ALL DISTURBED AREAS, STABILIZE ALL REMAINING DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION REQUIREMENTS SHOWN ON THE PLANS.
15. EROSION AND SEDIMENT CONTROL DEVICES CAN BE REMOVED ONLY AFTER WORK IN CONSTRUCTION PHASE #1 HAS BEEN COMPLETED AND STABILIZED WITH WRITTEN APPROVAL FROM THE NCC SITE INSPECTOR. PRIOR TO COMMENCING WITH A NEW PHASE OF CONSTRUCTION, THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE NCC SITE INSPECTOR THAT THE PREVIOUS PHASE HAS SUFFICIENTLY STABILIZED.

CONSTRUCTION PHASE #2

16. CLEAR AND GRUB AS NECESSARY TO INSTALL PERIMETER CONTROLS WITHIN CONSTRUCTION PHASE #2. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE CONSTRUCTED AS PER THE APPROVED E+S PLAN.
17. INSTALL PERIMETER CONTROLS FOR CONSTRUCTION PHASE #2 AS SHOWN ON PRE-BULK GRADING PLAN.
18. ONCE ALL OF THE PERIMETER CONTROLS HAVE BEEN COMPLETED THE CONTRACTOR MUST NOTIFY NEW CASTLE COUNTY THAT THE SITE IS READY FOR A PERIMETER CONTROL INSPECTION. NO FURTHER WORK ON-SITE MAY BEGIN UNTIL NCC HAS COMPLETED AND APPROVED THIS INSPECTION.
19. AFTER OBTAINING APPROVAL OF THE PERIMETER CONTROL INSPECTION BY NCC, CONTRACTOR MAY BEGIN SITE WORK WITHIN CONSTRUCTION PHASE #2 ACCORDING TO THE APPROVED SEDIMENT AND STORMWATER PERMIT PLANS.
20. INSTALL REMAINING PORTIONS OF SANITARY SEWER, FORCE MAIN, AND ASSOCIATED UTILITY WORK IN ACCORDANCE WITH MEP DRAWINGS. SEE UTILITY PLAN AND PROFILE DRAWINGS FOR EXACT LIMITS OF FORCE MAIN CONSTRUCTION WITHIN PHASE #2.
21. PRIOR TO ISSUANCE OF ANY BUILDING PERMITS AND AFTER COMPLETION OF BULK GRADING, PERMANENT STABILIZATION, AND INSTALLATION OF UTILITIES, THE CONTRACTOR MUST NOTIFY NCC THAT SITE IS READY FOR A POST-BULK GRADING INSPECTION. NO FURTHER WORK ON-SITE MAY BEGIN UNTIL NEW CASTLE COUNTY HAS COMPLETED AND APPROVED THIS INSPECTION.
22. FOLLOWING THE POST-BULK INSPECTION, CONSTRUCTION OF THE PUMP STATION BUILDING MAY BEGIN.
23. IMMEDIATELY AFTER ALL SITE CONSTRUCTION WITHIN CONSTRUCTION PHASE #2 IS COMPLETED, PLACE TOPSOIL AND PERMANENT SEEDING AND MULCHING OVER ALL DISTURBED AREAS. INSTALL LANDSCAPING PER THE APPROVED LANDSCAPE PLAN. STABILIZE ALL REMAINING DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION REQUIREMENTS SHOWN ON THE PLANS.
24. UPON COMPLETION OF ALL LAND DISTURBING ACTIVITIES FOR THE SITE AND ONCE ALL AREAS ARE STABILIZED AND APPROVED BY NCC, CONTRACTOR MUST REQUEST TO NCC FOR A RECORD PLAN COMPLIANCE INSPECTION. AFTER THIS NCC INSPECTION IS COMPLETE AND APPROVED, EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED.

EROSION AND SEDIMENT CONTROL GENERAL NOTES

1. A PRE-CONSTRUCTION MEETING (UNLESS WAIVED BY NCC) MUST BE HELD PRIOR TO COMMENCING CONSTRUCTION. CONTACT NCC ENGINEERING SECTION AT 395-5470 TO SCHEDULE THE MEETING. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN (S&S PLAN).
2. DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC) AND NCC PERSONNEL SHALL HAVE RIGHT TO CONDUCT ON-SITE INSPECTIONS OF LAND DISTURBING ACTIVITIES.
3. ALL PERIMETER CONTROLS MUST BE INSTALLED, STABILIZED AND INSPECTED AND APPROVED BY NCC PRIOR TO BULK GRADING, BUILDING PERMIT ISSUANCE, OR ANY UTILITY INSTALLATION ON NON-RESIDENTIAL SITES. PRIOR TO THIS PRE-BULK INSPECTION, NO DISTURBANCE MAY OCCUR ON-SITE OTHER THAN THOSE AREAS NECESSARY TO ESTABLISH THE PERIMETER EROSION AND SEDIMENT CONTROLS. INSTALL THE PERIMETER CONTROLS PURSUANT TO THIS PLAN. ALL PERIMETER CONTROLS, INCLUDING SOIL STOCKPILES, SHALL BE VEGETATIVELY STABILIZED.
4. BULK GRADING OF ROADWAYS, INDIVIDUAL LOTS, SEWER AND STORM UTILITY INSTALLATION MUST BE COMPLETED, INSPECTED, AND APPROVED PRIOR TO ANY BUILDING PERMIT ISSUANCE, WITH THE EXCEPTION OF MODEL HOMES. PRIOR TO SCHEDULING THIS POST-BULK INSPECTION, THE SITE MUST BE COMPLETELY AND FULLY COMPLIANT WITH THE LATEST APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
5. NCC SHALL RELEASE (AFTER APPROVAL OF THE POST-BULK INSPECTION) BUILDING PERMITS FOR THOSE LOTS WHICH ARE NOT CONSTRAINED BY ANY TEMPORARY SEDIMENT CONTROL PRACTICES (WHICH PERFORM A NECESSARY FUNCTION FOR A PARTICULAR PHASE OF CONSTRUCTION) AND ON LOT EROSION AND SEDIMENT CONTROLS HAVE BEEN ESTABLISHED.
6. AFTER THE POST-BULK INSPECTION, ADDITIONAL EROSION AND SEDIMENT CONTROLS WILL BE REQUIRED ON INDIVIDUAL LOTS UNDER CONSTRUCTION IN ORDER TO PREVENT SEDIMENT FROM ACCUMULATING ON ANY STREETS, IN STORM SEWERS OR DEVELOPED LOTS. THESE SHALL INCLUDE SILT FENCE AND STABILIZED CONSTRUCTION ENTRANCES FOR THOSE LOTS UNDER CONSTRUCTION AND ANY ADDITIONAL CONTROLS AS DEEMED NECESSARY BY THE NCC E&S INSPECTOR.
7. REVIEW AND APPROVAL OF THE S&S PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS ON THE APPROVED PLAN. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ACQUIRING ANY AND ALL AGREEMENTS, EASEMENTS, ETC. NECESSARY TO COMPLY WITH ALL APPLICABLE REGULATIONS, CODES, STANDARDS, GUIDELINES AND POLICIES. ANY DEVIATION FROM THE APPROVED PLANS REQUIRES WRITTEN APPROVAL FROM NCC.
8. UNLESS OTHERWISE AUTHORIZED BY NCC, ALL WORK MUST BE DONE IN ACCORDANCE WITH THE LATEST APPROVED S&S PLAN. IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER MANAGEMENT PRACTICES MAY BE REQUIRED AS DEEMED NECESSARY BY NCC. IF NCC DETERMINES THE APPROVED PLAN TO BE DEFICIENT, THE PLAN WILL BE VOIDED, THE SITE ISSUED A STOP WORK ORDER AND THE SUBMISSION OF A REVISED PLAN WILL BE REQUIRED FOR REVIEW AND APPROVAL BY NCC.
9. THE CCR IS RESPONSIBLE FOR INSPECTING THE CONSTRUCTION OF ANY PERMANENT STORMWATER MANAGEMENT FACILITY AND SUBMITTING AN APPROPRIATE INSPECTION CHECKLIST, SIGNED AND SEALED BY A P.E., FOR CERTIFICATION OF THAT WORK. IF THE SEQUENCE OF CONSTRUCTION CALLS FOR A PERMANENT STORMWATER MANAGEMENT FACILITY TO BE INSTALLED AS AN ELEMENT OF THE PERIMETER CONTROLS, THAT CHECKLIST AND STORMWATER AS-BUILT WILL BE REQUIRED PRIOR TO BUILDING PERMIT ISSUANCE.
10. ALL INSPECTION REPORTS FROM BOTH THE CCR AND THE NCC ENGINEER/E&S INSPECTOR SHALL BE FAXED WEEKLY TO ALL PARTIES INCLUDED ON THE CONSTRUCTION INFORMATION SHEET. THESE REPORTS SHALL INCLUDE A DATE BY WHICH ALL DEFICIENCIES MUST BE RESOLVED. FAILURE TO RESOLVE THE DEFICIENCIES INDICATED ON THE INSPECTION REPORT BY THE GIVEN DATE MAY RESULT IN ENFORCEMENT ACTION CONSIDERED APPROPRIATE BY THE DEPARTMENT.
11. THE NCC ENGINEER/E&S INSPECTOR MUST BE NOTIFIED 48 HOURS PRIOR TO ALL ELEMENTS OF SITE WORK WHICH REQUIRE INSPECTION. FAILURE TO PROVIDE THE APPROPRIATE NOTIFICATION MAY RESULT IN THE CONTRACTOR EXCAVATING SUFFICIENT MATERIAL TO VERIFY CONSTRUCTION IN ACCORDANCE WITH THE APPROVED S&S PLAN. SHOULD ANY PART OF A STORMWATER MANAGEMENT BASIN EMBANKMENT NEED TO BE EXCAVATED, THE ENTIRE EMBANKMENT MUST BE RECONSTRUCTED.
12. AS-BUILT PLANS AND PHOTOGRAPHIC DOCUMENTATION (AND ALL APPLICABLE SUPPLEMENTARY DOCUMENTS) SHALL BE SUBMITTED FOR ALL PERMANENT STORMWATER MANAGEMENT FACILITIES.
13. LIMITS OF DISTURBANCE MUST BE DELINEATED IN THE FIELD. THE LIMITS OF DISTURBANCE SHALL BE CLEARLY DEFINED AT ALL TIMES DURING CONSTRUCTION.
    TOTAL DISTURBED ACREAGE = 2.1± AC.
14. ALL DISTURBED SOIL SURFACES, INCLUDING SOIL STOCKPILES AND PERIMETER CONTROLS, ARE SUBJECT TO EROSION AND SHALL BE STABILIZED EITHER PERMANENTLY OR TEMPORARILY WITHIN FOURTEEN (14) DAYS.
15. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, 2003 OR AS AMENDED.
16. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED PERIODICALLY AND AFTER EACH RAINFALL. MAINTENANCE MUST BE PERFORMED AFTER EACH INSPECTION AS NECESSARY. ANY ERODED AREAS SHALL BE STABILIZED AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF ACCORDING TO THE S&S PLAN.
17. SHOULD QUESTIONS ARISE REGARDING THE MAINTENANCE OF EROSION AND SEDIMENT CONTROL PRACTICES, THE SITE CONTRACTOR SHALL CONTACT THE CONSULTING ENGINEER EXPEDITIOUSLY FOR TECHNICAL ASSISTANCE.
18. UPON RECEIPT OF TWO CONSECUTIVE UNSATISFACTORY CCR AND/OR NCC E&S CONTROL INSPECTION REPORTS, THE SITE MAY BE ISSUED A STOP WORK ORDER AND A SHOW CAUSE HEARING SCHEDULED.
19. PURSUANT TO SECTION 8, PLAN APPLICATION AND APPROVAL PROCESS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, AS AMENDED, ALL APPROVED S&S PLANS EXPIRE THREE (3) YEARS FROM THE DATE OF PLAN APPROVAL OR DATE OF PLAN RECORDATION IF NO PLAN APPROVALS ISSUED AFTER PLAN RECORDATION DATE, UNLESS SPECIFICALLY AUTHORIZED BY THE DEPARTMENT. ANY APPROVED S&S PLAN SUPERCEDED BY ANOTHER APPROVED S&S PLAN SHALL BE CONSIDERED EXPIRED AND WILL NOT BE RECOGNIZED UNLESS SPECIFICALLY AUTHORIZED BY THE DEPARTMENT.
20. THE APPROVED S&S PLAN INCORPORATES POLLUTION PREVENTION PRACTICES LISTED UNDER THE STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION SITE POLLUTION PREVENTION IN THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, DATED DECEMBER 2003 AND ITS REVISIONS.
21. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES PERIODICALLY AND AFTER EACH RAINFALL. MAINTENANCE MUST BE PERFORMED AFTER EACH INSPECTION AS NECESSARY. ANY ERODED AREAS SHALL BE STABILIZED AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF ACCORDING TO PLAN. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING AND STABILIZING EROSION AND SEDIMENT CONTROLS AND STORMWATER MANAGEMENT PRACTICES DURING CONSTRUCTION, INCLUDING AREAS DISTURBED BY UTILITY COMPANIES.
22. ALL PERIMETER CONTROLS FOR EROSION AND SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO ANY OTHER LAND DISTURBING ACTIVITIES.
23. WATER SHALL BE SPRAYED ON EXPOSED SURFACES SHOULD DUST BECOME EXCESSIVE AS DETERMINED BY NCC INSPECTOR OR NCC'S REPRESENTATIVE.
24. SOIL STOCKPILE AREAS SHALL BE SEEDED AND SURROUNDED BY SILT FENCE.
25. THE CONTRACTOR SHALL INSPECT SILT FENCE DAILY AND MAKE ALL REQUIRED REPAIRS IMMEDIATELY.
26. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING AND STABILIZING EROSION AND SEDIMENT CONTROLS AND STORMWATER MANAGEMENT PRACTICES DURING CONSTRUCTION, INCLUDING AREAS DISTURBED BY UTILITY COMPANIES.
27. THE OWNER IS RESPONSIBLE FOR INSPECTION AND MAINTENANCE AND/OR REPAIRS OF STORMWATER MANAGEMENT PRACTICES AFTER CONSTRUCTION.
28. SITE IMPROVEMENTS INCLUDING LANDSCAPING, PERMANENT SITE STABILIZATION, AND PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE IN PLACE AND APPROVED PRIOR TO ISSUANCE OF CERTIFICATION OF OCCUPANCY.

Standard Detail & Specifications

Construction Site Pollution Prevention

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

((Project Name))

((NOI Permit Number))

((Agency Plan Approval ID))

((Contact Name & Number for Additional Site Information))

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

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

1-800-662-8802

Example Construction General Permit (CGP) Signage

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

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

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes:

The Construction Site Pollution Prevention Plan includes the following elements:

1. **Material Inventory**

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

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

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes (cont.)

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

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

Standard Detail & Specifications

Construction Site Pollution Prevention

Notes (cont.)

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

CONTACT INFORMATION

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

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

COLMALLE DeFRANCHIS LICENSED PROFESSIONAL ENGINEER DELAWARE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MISS UTILITY of DELMARVA
BEFORE YOU DIG CALL
1-800-282-8555 (In Del.)
1-800-441-8355 (Md., Va.)
PROTECT YOURSELF, GIVE TWO WORKING DAYS NOTICE

WRA Whitman, Requardt & Associates, LLP
3 Mill Road, Suite 309, Wilmington, Delaware 19806

CDA ENGINEERING INC.
CIVIL/SITE ENGINEERING AND LAND PLANNING
6 LARCH AVENUE, SUITE 401, WILMINGTON, DE 19804
Tel: 302 998 9202
Fax: 302 691 1314
cdaengineering.com
WO: 70852-002

APPROVED BY:

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	AS SHOWN
DESIGNED	
DRAWN	
CHECKED	
DATE	MAR 2025

EROSION & SEDIMENT CONTROL NOTES & DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING C-5
SHEET 9 OF 92

LAYOUT: 2012_ProjectX.ctb 12:15:00 Richardson Park P:\SWG\SCP\12-15.00 SCP-DET.dwg
JUN 26, 2025 - 1:41pm

Standard Detail & Specifications

Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[3]	Seeding Rate		Optimum Seeding Dates [1] O = Optimum Planting Period; A = Acceptable Planting Period							Planting Depth[2]
				Coastal Plain		Piedmont		All			
	Certified Seed	lb/Ac [4]	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	
1	Barley	125	4	O	A	O	O	A	O		1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A		1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O		0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
5. Warm season grasses such as Millet 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		**DE-ESC-3.4.3** Sheet 1 of 4 Effective July 2023

Standard Detail & Specifications

Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures	Seeding Rate[1]		Optimum Seeding Dates [2] O = Optimum Planting Period; A = Acceptable Planting Period							Remarks
				Coastal Plain			Piedmont			All[3]	
	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	
1	Tall Fescue Canada Wild Rye	140 10	3.2 0.23	A	O	A	A	O	A	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tolerant of low fertility soils Good for droughty sites
2	Deertongue Sheep Fescue White Clover	30 30 10	0.69 0.69 0.35	A	O	A	A	O	A	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tolerant of low fertility soils Legume that flowers N into soil
3	Tall Fescue (Turf-type) or Strong Creeping Red Fescue or Perennial Ryegrass plus Flatpea[5]	50 50 50 15	1.15 1.15 1.15 0.34	O	A[4]	O	O	A[4]	O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass or Redtop plus White Clover[6]	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A[4]	O	O	A[4]	O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass[5,7] or Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
6	Tall Fescue (turftype) (Blend of 3 cultivars)	150	3.5	O	A[4]	O	O	A[4]	O		Managed filter strip for nutrient uptake
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A[4]	O	O	A[4]	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem[5] Indian Grass[5] Little Bluestem[5] Creeping Red Fescue plus one of: Partridge Pea Bush Clover Wild Indigo Showy Tick-trefoil	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A[4]		O	A[4]			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.

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

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

Standard Detail & Specifications

Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Seeding Mixtures	Seeding Rate[1]		Optimum Seeding Dates [2] O = Optimum Planting Period; A = Acceptable Planting Period							Remarks
				Coastal Plain			Piedmont			All[3]	
	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	
9	Redtop Creeping Evergrass Sheep Fescue Rough Bluegrass	75 20 30 45	1.72 0.8 0.69 1	O	A[4]	O	O	A[4]	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways
10	Switchgrass[5]	10	0.23	A		O	A		O		Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns										
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A[4]	O	O	A[4]	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A[4]	O	O	A[4]	O		Moderate value, low maintenance, traffic tolerant
13	Creeping Red Fescue Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 50 20 20	1.15 1.15 0.4 0.4	O	A[4]	O	O	A[4]	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass or Chewings Fescue	50 90	1.15 2.1	O	A[4]	O	O	A[4]	O		Shade tolerant, moisture tolerant.
15	K.31 Tall Fescue	150	3.5	O	A[4]	O	O	A[4]	O		Monoculture, but performs well alone in lawns. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Chapter 15, Title 3 of the Delaware Code.
4. Turftype species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. It is recommended that all leguminous seed be inoculated.
6. Warm season grass mix and Switchgrass cannot be mowed more than 4 times per year.
7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate and will remain dormant until then.

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

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

Standard Detail & Specifications

Vegetative Stabilization

Construction Notes:

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

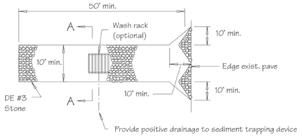
   It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
   a. Lime - Apply 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.
   b. 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 soils.
4. Seeding
   a. 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.
   b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
   c. 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.
5. Mulching

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

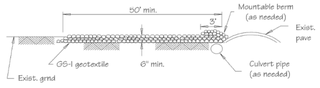
Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 4 of 4 Effective July 2023

Standard Detail & Specifications

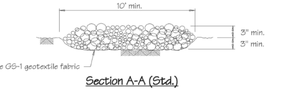
Stabilized Construction Entrance



Plan



Profile



Section A-A (Std.)

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

Standard Detail & Specifications

Stabilized Construction Entrance



Section A-A (Opt.)

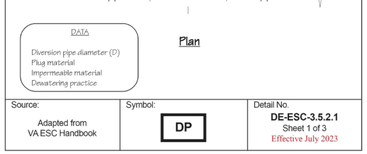
Construction Notes:

1. Stone size - Use DE #3 stone.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than size (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Geotextile - Type GS-I, placed over the entire area prior to placing of stone.
6. Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

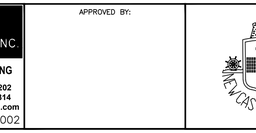
Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	**DE-ESC-3.4.7** Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Geotextile Dewatering Bag



Plan



Profile

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

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	GB	**DE-ESC-3.2.1.2** Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Geotextile Dewatering Bag

Construction Notes:

1. 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.
2. 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.
3. 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:

1. The geotextile fabric shall be a Type GD-IV.
2. 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 be 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.	GB	**DE-ESC-3.2.1.2** Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Mulching

1. Materials and Amounts

a. *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 feet sections and place 70-90 pounds (two bales) of mulch in each section.

b. *Woodchips* - 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).

c. *Hydraulically applied mulch* -The following conditions apply to hydraulically applied mulch:

i. Definitions:
   a. 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.
   b. 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 a hydraulic mulch for use with hydraulic seeding equipment.
   c. 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. BFMs shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.
   d. Refer to **Figure 3.4.5a** for conditions and limitations of use for each of the above categories of hydraulic mulch.

ii. 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.

iii. Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.

iv. Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.

iv. 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 & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications

Mulching

v. Application:
   a. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.
   b. Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.
   c. 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.
   d. 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.
   e. Minimum curing temperature is 40º F (4º C). The best results and more rapid curing are achieved at temperatures exceeding 60º F (15º C). Curing times may be accelerated in high temperature, low humidity conditions on dry soils.

vi. 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.

d. *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.

2. 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.

a. *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.
b. *Tracking* - Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on cleated tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with cleat marks running across the slope.
c. *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.
d. *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.
e. *Nettings* - Biodegradable nettings may be used to secure straw mulch. Install and secure according to the manufacturer's recommendations. Photodegradable or synthetic nettings are not acceptable.

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

Standard Detail & Specifications

Mulching

MULCHING MATERIAL SELECTION GUIDE

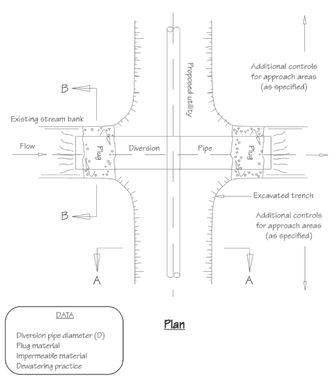
Percent Slope	Type of Mulch / Appl. Rate	Dec. 1 to Feb. 28(29)	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30
Less than 2%	Wood Fiber @ 2000 lbs/ac min. Blend @ 1500 lbs/ac min. Straw @ 2 Tons/ac. Min. Stabilizers Mailing* 1" Compost Blanket (CB)	xxxxxxxxxx OK OK OK	xxxxxxxxxx OK OK OK	xxxxxxxxxx OK OK OK	OK OK OK OK
2% to 5%	Wood Fiber @ 2500-3000 lbs/ac min. Blend @ 1500-2000 lbs/ac min. Straw @ 2 Tons/ac. min. Stabilizers Mailing* 1" Compost Blanket (CB)	OK OK OK OK OK	OK OK OK OK OK	xxxxxxxxxx OK OK OK OK	OK OK OK OK OK
5% to 10.9%	Wood Fiber @ 2500-3000 lbs/ac min. Blend @ 1500-2000 lbs/ac min. Straw @ 2 Tons/ac. min. Stabilizers Mailing* 1" Compost Blanket (CB)	OK OK OK OK OK	OK OK OK OK OK	xxxxxxxxxx OK OK OK OK	OK OK OK OK OK
11% to 24.9%	Wood Fiber @ 3000-4000 lbs/ac min. Blend @ 1500-4000 lbs/ac min. Straw @ 2 Tons/ac. min. Stabilizers Mailing* 1" Compost Blanket (CB)	OK OK OK OK OK	OK OK OK OK OK	xxxxxxxxxx OK OK OK OK	OK OK OK OK OK
25% to 33%	Wood Fiber @ 3000-4000 lbs/ac min. Blend @ 2000-4000 lbs/ac min. Straw @ 2 Tons/ac. min. Stabilizers Mailing* 1" Compost Blanket (CB)	OK OK OK OK OK	OK OK OK OK OK	xxxxxxxxxx OK OK OK OK	OK OK OK OK OK
33 and up	Wood Fiber @ 4000 lbs/ac min. Blend @ 4000 lbs/ac min. Straw @ 2 Tons/ac. min.** Stabilizers Mailing* 1" Compost Blanket (CB)	OK OK OK OK OK	OK OK OK OK OK	xxxxxxxxxx OK OK OK OK	OK OK OK OK OK

* Note: Manufacturers Recommended Rates for informational purposes only. Performance standard requires 100% soil coverage. Any areas with bare soil showing shall be top dressed until full coverage is achieved.
** Hydraulic mulches shall not be applied to slopes greater than 33% (3:1) unless tested (this does not apply to bound rectangles).
*** Application rates are minimums

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

Standard Detail & Specifications

Utility Crossing Diversion Pipe

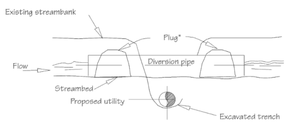


Plan

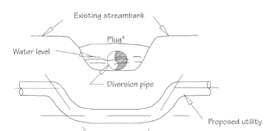
Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	DP	**DE-ESC-3.5.2.1** Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications

Utility Crossing Diversion Pipe



Section A-A



Section B-B

*NOTE: Plug shall consist of coarse aggregate, riprap, sandbags or other material capable of resisting expected flows. Upstream plug shall be made waterproof using Type GS-I geotextile or other means, as specified.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	DP	**DE-ESC-3.5.2.1** Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications

Utility Crossing Diversion Pipe

Construction Notes:

1. Pipe diversion shall be operational prior to start of in-stream construction.
2. Controls for approach areas shall be provided in accordance with the approved plan.
3. All materials used must be adequate to withstand expected hydraulic and equipment loads.
4. Pipe shall be of adequate size to convey the normal water channel flow and shall be installed in the stream bed across the proposed utility trench centerline.
5. Impervious plug shall be placed near each end ot pipe so as to dam off the channel flow and force it into the diversion pipe.
6. Water trapped between the plugs shall be pumped to an approved dewatering practice prior to excavation of the utility trench.
7. Once the diversion pipe has been made operational and checked for water tightness, excavation of the utility trench may begin. Installation of the utility shall proceed in a timely manner so as to minimize in-stream construction.
8. Once the utility has been installed, trench shall be backfilled and stabilized in accordance with the approved plan.
9. Diversion pipe shall remain in-place until stream bed and banks have been stabilized.

This practice limited to streams less than 10' wide; in-stream construction periods shall be less than 72 hours.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	DP	**DE-ESC-3.5.2.1** Sheet 3 of 3 Effective July 2023

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

REVISION
COUNTY PROJECT No. 240618
DRAWING C-6
SHEET 10 OF 92

COLCHELLE DeFRANCIS LICENSED No. 23043 DELAWARE PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1 THEN DRAWING IS NOT TO SCALE

MISS UTILITY of DELMARVA
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Whitman, Requardt & Associates, LLP
3 Mill Road, Suite 309, Wilmington, Delaware 19806

CDA ENGINEERING INC.
CIVIL/SITE ENGINEERING AND LAND PLANNING
6 LARCH AVENUE SUITE 401 WILMINGTON, DE 19804
Tel: 302 998 9202
Fax: 302 691 1314
cdaengineering.com
WO: 70852-002

APPROVED BY:

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

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EROSION & SEDIMENT CONTROL DETAILS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

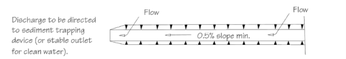
REVISION
COUNTY PROJECT No. 240618
DRAWING C-6
SHEET 10 OF 92

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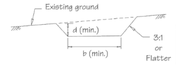
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Standard Detail & Specifications

Temporary Swale



Plan



	Type A (< 2 ac.)	Type B (2-10 ac.)
b - BOTTOM WIDTH	4'	6'
d - FLOW DEPTH	1'	1'

Typical Section

FLOW CHANNEL STABILIZATION CHART

Stabilization Method	Channel Grade	Type A	Type B
1	0.5-3.0%	Seed with stab. blanket	Seed with stab. blanket
2	3.1-5.0%	Seed with stab. blanket	Seed using stab. blanket; sod; DE #2 stone
3	5.1-8.0%	Seed with stab. blanket; sod; DE #2 stone	Lined R-4 riprap
4	8.1-20%	Lined R-4 riprap	Engineering design

a. Stone to be DE #2 inch stone in a layer at least 3 inches in thickness and underlain with GS-I geotextile.
b. Riprap to be R-4 in a layer at least 8 inches thickness and and underlain with GS-I geotextile.

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	TS- (A/B)(1-4)	DE-ESC-3.3.1 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Temporary Swale

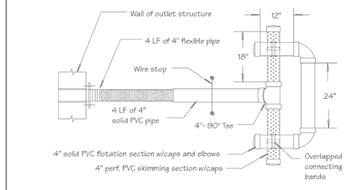
Construction Notes:

1. All temporary swales shall have uninterrupted positive grade to an outlet with a minimum of erosion.
2. Diverted runoff from a disturbed area shall be conveyed to a sediment trapping device.
3. Diverted runoff from an undisturbed area shall outlet directly into an undisturbed stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.
5. The swale shall be excavated or shaped to line, grade, and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fills shall be compacted by earth moving equipment.
7. All earth removed and not needed on construction shall be placed so that it will not interfere with the functioning of the swale.
8. Inspection and required maintenance shall be provided after each rain event.

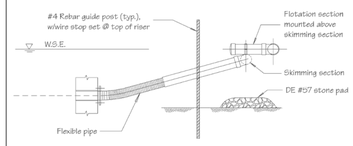
Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	TS- (A/B)(1-4)	DE-ESC-3.3.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Skimmer Dewatering Device



Plan



Profile thru ℄ of Pipe

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

Standard Detail & Specifications

Skimmer Dewatering Device

Construction Notes:

1. Pipe flotation section shall be solvent welded to ensure an airtight assembly. Contractor to conduct a test to check for leaks prior to installation.
2. Skimmer section shall have (12) rows of 1/2" dia. holes, 1-1/4" on center. If additional filtration is necessary, the filtering media shall consist of a Type GD-II geotextile fabric wrapped around the perforated portion of the skimmer and attached with plastic snap ties, bands, etc.
3. Flexible pipe shall be inserted into solid pipe and fastened with (2) #8 wood screws.
4. At a minimum, the structure shall be inspected after each rain and repairs made as needed. If vandalism is a problem, more frequent inspection may be necessary.
5. Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
6. The structure shall only be removed when the contributing drainage area has been properly stabilized.

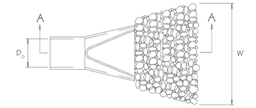
Materials:

1. Solid pipe - 4" Sched. 40 PVC
2. Perforated pipe - 4" Sched. 40 PVC
3. 90° Tee (1 ea.) - 4" Sched. 40 PVC
4. 90° Elbow (2 ea.) - 4" Sched. 40 PVC
5. Cap (4 ea.) - 4" Sched. 40 PVC, solid
6. Flexible pipe - 4" corrugated plastic tubing (non-perforated)

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

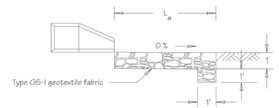
Standard Detail & Specifications

Riprap Outlet Protection - 1



Plan

NOTE: Depress centerline of apron slightly to prevent edge-cutting



DATA
Pipe diameter (D_o)
Apron length (L_a)
Apron width (W)
Riprap size (R No.)
Riprap thickness (T)

Section A-A

$T_w < 0.5\,D_o$

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

RIPRAP OUTLET PROTECTION SCHEDULE					
ROP NO.	PIPE DIA.	MIN. APRON LENGTH (La)	MIN. APRON WIDTH (W)	RIPRAP SIZE (R NO)	RIPRAP THICKNESS
ROP #1	15" RCP	8'	9'	R-4	18"
ROP #2	15" HDPE	8'	9'	R-4	18"

Standard Detail & Specifications

Riprap Outlet Protection - 1

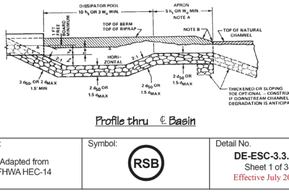
Construction Notes:

1. 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.
2. The riprap shall conform to the grading limits as shown on the plan.
3. 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.
4. 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	ROP-1	DE-ESC-3.3.10.1 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Temporary Earth Berm



Plan

Section A-A

	Type A (5 ac. or less)	Type B (5-10 ac.)
a - BERM HEIGHT	18"	36"
b - BERM TOP WIDTH	24"	36"
c - FLOW WIDTH	4'	6'
d - FLOW DEPTH	8"	15"

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	TB- (A/B)(1-4)	DE-ESC-3.3.2 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Temporary Earth Berm

FLOW CHANNEL STABILIZATION CHART

Stabilization Method	Channel Grade	Type A	Type B
1	0.5-3.0%	Seed with stab. blanket	Seed with stab. blanket
2	3.1-5.0%	Seed with stab. blanket	Seed with stab. blanket; sod; DE #2 stone
3	5.1-8.0%	Seed with stab. blanket; sod; DE #2 stone	Lined R-4 riprap
4	8.1-20%	Lined R-4 riprap	Engineering design

a. Stone to be DE #2 stone in a layer at least 3 inches in thickness and underlain with GS-I geotextile.
b. Riprap to be R-4 in a layer at least 8 inches thickness and underlain with GS-I geotextile.

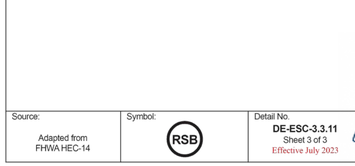
Construction Notes:

1. All berms shall be compacted by earth-moving equipment.
2. All berms shall have positive drainage to an outlet.
3. Top width may be wider and side slopes may be flatter if desired to facilitate crossing construction traffic.
4. Field location should be adjusted as needed to utilize a stabilized safe outlet.
5. Earth berms shall have an outlet that functions with a minimum of erosion. Runoff shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin where either the berm channel or the drainage area above the berm are not adequately stabilized.
6. Stabilization shall be: (a) In accordance with standard specifications for seed and straw mulch or straw mulch if not in seeding season, (b) Flow channel as per the chart above.
7. Inspection and required maintenance shall be provided after each rain event.

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	TB-(A/B)(1-4)	DE-ESC-3.3.2 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Super Silt Fence



Perspective

Section

DATA
Max. controlled slope

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SSF	DE-ESC-3.1.2.3 Sheet 1 of 2 Effective July 2023

Standard Detail & Specifications

Super Silt Fence

Construction Notes:

1. The poles do not need to be set in concrete.
2. Chain link fence shall be fastened securely to the fence posts with wire ties or staples.
3. Geotextile fabric shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Geotextile fabric shall be embedded a minimum of 8" into the ground.
5. When two sections of geotextile fabric adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence.

Materials:

1. Fencing: Fencing shall be 42 inches in height and constructed in accordance with the latest Delaware Department of Transportation (Del-DOT) Specifications for Chain Link Fencing (Section 727). The Del-DOT specification for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts.
2. Geosynthetic Fabric: Type GD-I

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SSF	DE-ESC-3.1.2.3 Sheet 2 of 2 Effective July 2023

Standard Detail & Specifications

Silt Fence



Section

Plan

DATA
Max. controlled slope

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

Standard Detail & Specifications

Silt Fence

Construction Detail

Top

Construction Notes:

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

Materials:

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

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

Standard Detail & Specifications

Riprap Stilling Basin

Half - Plan

NOTE A - IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS-SECTIONAL AREA AT SECTION A - A SUCH THAT Q_{MAX} ACROSS SECTION AREA AT SEC. A - A1 = SPECIFIED EXIT VELOCITY.

NOTE B - RIPRAP BASIN TO CONFORM TO NATURAL STREAM CHANNEL; TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT THE SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A - A.

Profile thru ℄ Basin

Source:	Symbol:	Detail No.
Adapted from FHWA HEC-14	RSB	DE-ESC-3.3.11 Sheet 1 of 3 Effective July 2023

Standard Detail & Specifications

Riprap Stilling Basin

DATA
Culvert dimension (w_o)
Depth of basin from culvert invert (h_b)
Riprap size (R No.)

Source:	Symbol:	Detail No.
Adapted from FHWA HEC-14	RSB	DE-ESC-3.3.11 Sheet 2 of 3 Effective July 2023

Standard Detail & Specifications

Riprap Stilling Basin

Construction Notes:

1. 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.
2. The riprap shall conform to the grading limits as shown on the plan.
3. Geotextile shall be a Type GS-I. Fabric 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 section.
4. Stone for the riprap or gabion outlets may be placed by equipment. Riprap shall be placed in a manner to prevent damage to the geotextile fabric. Hand placement will be required to the extent necessary to prevent damage to the conduits, structures, etc.

Source:	Symbol:	Detail No.
Adapted from FHWA HEC-14	RSB	DE-ESC-3.3.11 Sheet 3 of 3 Effective July 2023

COUNTY PROJECT No. 240618

DRAWING C-7

SHEET 11 OF 92

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WO: 70852-002

APPROVED BY:

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
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EROSION & SEDIMENT CONTROL DETAILS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING C-7

SHEET 11 OF 92

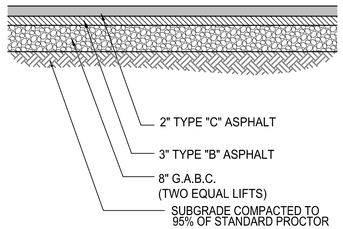
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REVISION

COUNTY PROJECT No.
240618

DRAWING



NOTES:

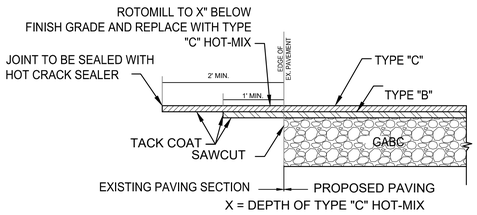
1. SAWCUT LIMITS OF PAVEMENT RESTORATION, PROVIDE BUTT-JOINT WHERE MATCHING NEW PAVEMENT WITH EXISTING.

2. APPLIES TO AREAS OUTSIDE OF DELDOT PAVING LIMITS

SECTION: PAVEMENT SECTION

NOT TO SCALE

(SEE ENTRANCE PLANS FOR PAVEMENT SECTION WITHIN DELDOT PAVING LIMITS)



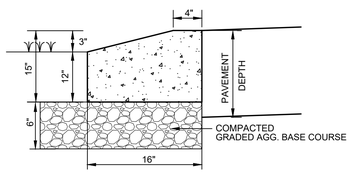
DETAIL: PAVEMENT TIE-IN

NOT TO SCALE



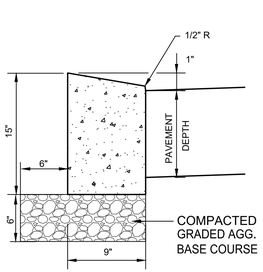
DETAIL: BUTT JOINT

NOT TO SCALE

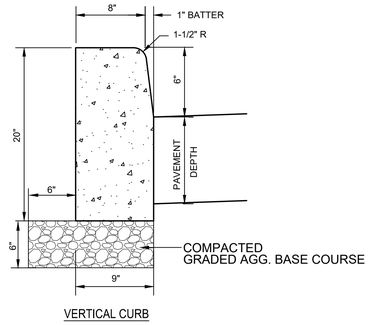


DETAIL: EDGER CURBING

NOT TO SCALE



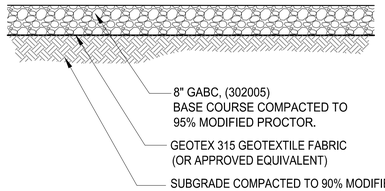
DEPRESSED CURB



VERTICAL CURB

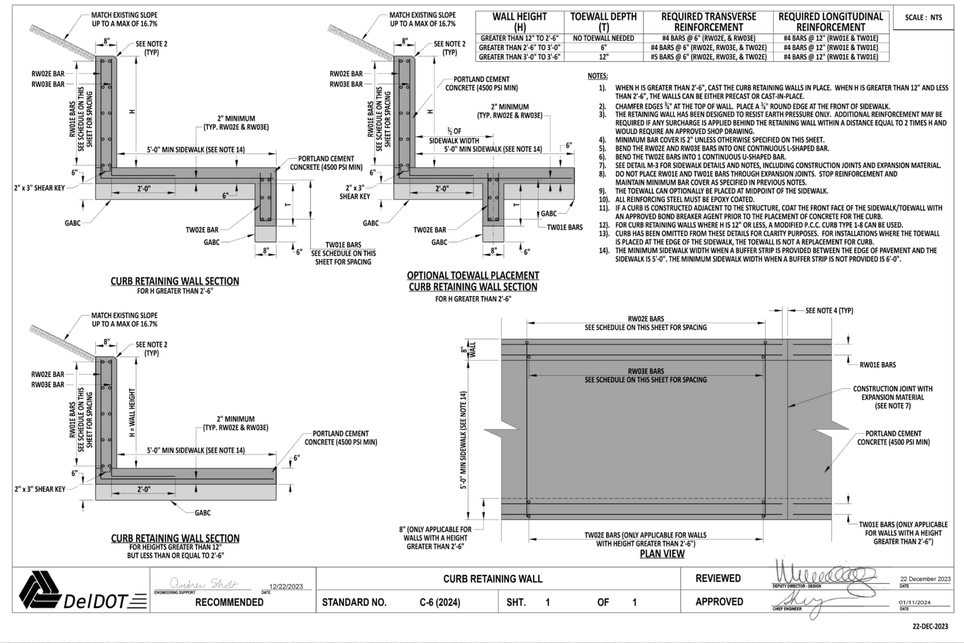
DETAIL: 6" PCC CURB

NOT TO SCALE



SECTION: GRAVEL ACCESS AREA

NOT TO SCALE



WALL HEIGHT (H)	TOEWALL DEPTH (T)	REQUIRED TRANSVERSE REINFORCEMENT	REQUIRED LONGITUDINAL REINFORCEMENT
GREATER THAN 12" TO 2'-6"	NO TOEWALL NEEDED	#4 BARS @ 12" (RW02E & RW03E)	#4 BARS @ 12" (RW01E & TW01E)
GREATER THAN 2'-6" TO 3'-0"	6"	#4 BARS @ 6" (RW02E, RW03E, & TW02E)	#4 BARS @ 12" (RW01E & TW01E)
GREATER THAN 3'-0" TO 3'-6"	12"	#5 BARS @ 6" (RW02E, RW03E, & TW02E)	#4 BARS @ 12" (RW01E & TW01E)

SCALE : NTS

NOTES:

1). WHEN H IS GREATER THAN 2'-6", CAST THE CURB RETAINING WALLS IN PLACE. WHEN H IS GREATER THAN 12" AND LESS THAN 2'-6", THE WALLS CAN BE EITHER PRECAST OR CAST-IN-PLACE.
2). CHAMFER EDGES ¾" AT THE TOP OF WALL. PLACE A ¾" ROUND EDGE AT THE FRONT OF SIDEWALK.
3). THE RETAINING WALL HAS BEEN DESIGNED TO RESIST EARTH PRESSURE ONLY. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IF ANY SURCHARGE IS APPLIED BEHIND THE RETAINING WALL WITHIN A DISTANCE EQUAL TO 2 TIMES H AND WOULD REQUIRE AN APPROVED SHOP DRAWING.
4). MINIMUM BAR COVER IS 2" UNLESS OTHERWISE SPECIFIED ON THIS SHEET.
5). BEND THE RW02E AND RW03E BARS INTO ONE CONTINUOUS L-SHAPED BAR.
6). BEND THE TW02E BARS INTO 1 CONTINUOUS U-SHAPED BAR.
7). SEE DETAIL M-3 FOR SIDEWALK DETAILS AND NOTES, INCLUDING CONSTRUCTION JOINTS AND EXPANSION MATERIAL.
8). DO NOT PLACE RW01E AND TW01E BARS THROUGH EXPANSION JOINTS. STOP REINFORCEMENT AND MAINTAIN MINIMUM BAR COVER AS SPECIFIED IN PREVIOUS NOTES.
9). THE TOEWALL CAN OPTIONALLY BE PLACED AT MIDPOINT OF THE SIDEWALK.
10). ALL REINFORCING STEEL MUST BE EPOXY COATED.
11). IF A CURB IS CONSTRUCTED ADJACENT TO THE STRUCTURE, CONT THE FRONT FACE OF THE SIDEWALK/TOEWALL WITH AN APPROVED BOND BREAKER AGENT PRIOR TO THE PLACEMENT OF CONCRETE FOR THE CURB.
12). FOR CURB RETAINING WALLS WHERE H IS 12" OR LESS, A MODIFIED P.C.C. CURB TYPE 1-8 CAN BE USED.
13). CURB HAS BEEN OMITTED FROM THESE DETAILS FOR CLARITY PURPOSES. FOR INSTALLATIONS WHERE THE TOEWALL IS PLACED AT THE EDGE OF THE SIDEWALK, THE TOEWALL IS NOT A REPLACEMENT FOR CURB.
14). THE MINIMUM SIDEWALK WIDTH WHEN A BUFFER STRIP IS PROVIDED BETWEEN THE EDGE OF PAVEMENT AND THE SIDEWALK IS 5'-0". THE MINIMUM SIDEWALK WIDTH WHEN A BUFFER STRIP IS NOT PROVIDED IS 6'-0".

DelDOT

Andrew Shiels 12/22/2023
ENGINEERING SUPPORT DATE
RECOMMENDED

CURB RETAINING WALL
STANDARD NO. C-6 (2024) SHT. 1 OF 1

REVIEWED
DEPUTY DIRECTOR - DESIGN 22 December 2023 DATE
CHIEF ENGINEER 01/11/2024 DATE
APPROVED

22-DEC-2023

COLVILLE DeSCHANIS LICENSE NO. 9913 DELAWARE PROFESSIONAL ENGINEER

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APPROVED BY:

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DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
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DELAWARE
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DATE MAR 2025

MISC. PAVING DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING C-8
SHEET 12 OF 92

LAYOUT: 2012 Projects\12-153.00 Richardson Park PS\DWG\CDA\12-153.00 SCP-DET.dwg
Mar 28, 2025 - 1:12pm

NOTES:

1. ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES SHOWN ON THESE DRAWINGS ARE BASED ON AVAILABLE RECORD DRAWINGS AND ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE COUNTY DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL TEST PIT WITH CAUTION ALL EXISTING UTILITIES TO VERIFY SIZE, LOCATION, ELEVATION, OUT-OF-ROUNDNESS, AND MATERIAL. RESULTS SHALL BE SUBMITTED IMMEDIATELY TO THE ENGINEER.
2. SEE DWG. C-10 FOR UTILITY PROFILES AND DWG. C-4 FOR PROPOSED GRADING AND PAVING.
3. FOR EROSION AND SEDIMENT CONTROL AND STORM WATER MANAGEMENT SEE DWG C-1 THROUGH C-8.
4. LOCATIONS OF SUCCESSFUL UTILITY TEST HOLES AND BORINGS ARE SHOWN IN PLAN. FOR SOIL BORING LOGS SEE DWG C-16 THROUGH C-18. SEE SPECIFICATIONS FOR A COPY OF THE GEOTECHNICAL REPORT. UTILITY TEST HOLE INFORMATION IS PROVIDED ON DWG G-3.
5. FOR LANDSCAPE PLANS SEE DWG. L-1 AND L-2.
6. SEE ELECTRICAL SITE PLAN DWG. E-3 FOR UNDERGROUND ELECTRICAL AND TELEPHONE DUCT BANKS.
7. PRECAST DOGHOUSE STYLE MANHOLE - COUNTY TO SUPPLY PRECAST SECTIONS, FRAME AND COVER FOR THIS MANHOLE ONLY.
8. EXISTING BYPASS PUMPS MAY BE ACTIVE AND ARE NOT TO BE DISTURBED. CLEAR ACCESS TO BYPASS PUMPS MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
9. REMOVE AND REPLACE EXISTING BOLLARDS IF DISTURBED BY CONNECTIONS TO THE EXISTING 36" FORCE MAINS AT THE SURGE TOWER. SEE DETAIL 3, SHEET C-11.
10. CONTRACTOR TO COORDINATE WITH ARTESIAN WATER TO PROVIDE AND INSTALL THE CONNECTION TO THE EX. 6" DIP WATER MAIN, 1" METER, 1 ½ " BYPASS AND GATE VALVES.
11. CONTRACTOR SHALL REMOVE 24" FORCE MAIN AS NEEDED AFTER FINAL TESTING OF THE NEW PUMP STATION FOR THE CONSTRUCTION OF VALVE VAULT 1 AND THE 30" FORCE MAIN. OTHERWISE ABANDON IN PLACE IN ACCORDANCE WITH DWG C-13. SEE SHEET G-03 FOR SEQUENCE OF CONSTRUCTION.

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SHEET 13 OF 92
C-9
DRAWING
COUNTY PROJECT No. 240618
REVISION

07-043.20-163
MICHAEL R. BRADLEY & JOAN P. BRADLEY
D.B. E106-70

07-043.20-152
NEW CASTLE COUNTY
D.R. 0-0

07-043.20-010
ROBIN L. BECKER & RONI B. BECKER
INST. NO. 20060126-0009226

07-043.20-150
CONCRETE COMPANY, INC.
D.R. P88-63

30' WIDE DRAINAGE EASEMENT
RELOCATED LITTLE MILL CREEK

30' WIDE EXISTING PERMANENT
DRAINAGE EASEMENT
D.R. A81-153

NEW RICHARDSON
PARK PUMPING
STATION

BROOKSIDE DRIVE

"REMAINING AREA"

"MAJOR LAND DEVELOPMENT PLAN"
MF. 2635

100 YEAR
FLOODPLAIN

SCALE: 1" = 20'

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WO: 70852-002

APPROVED BY:
WILLIAM P. WHITMAN IV
No. 14169
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

UTILITY PLAN

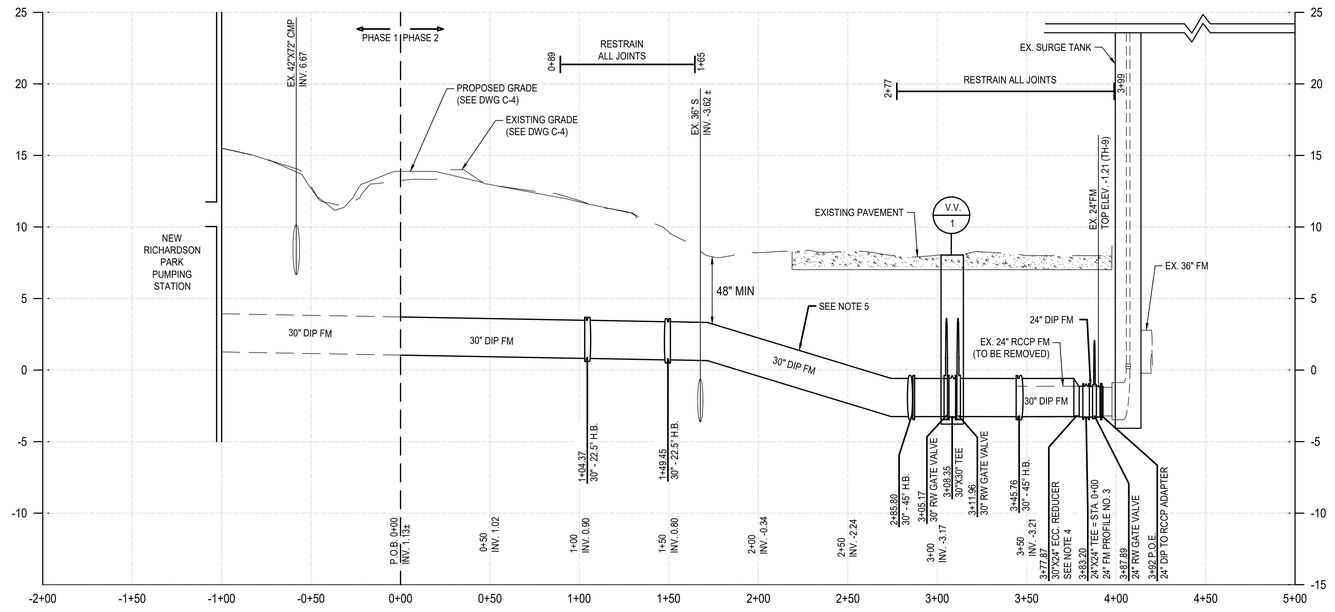
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

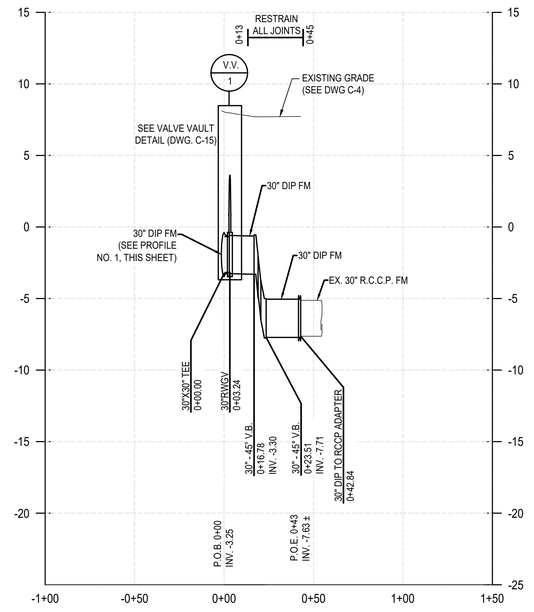
COUNTY PROJECT No. 240618
DRAWING C-9
SHEET 13 OF 92

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Apr 04, 2025 - 11:56am

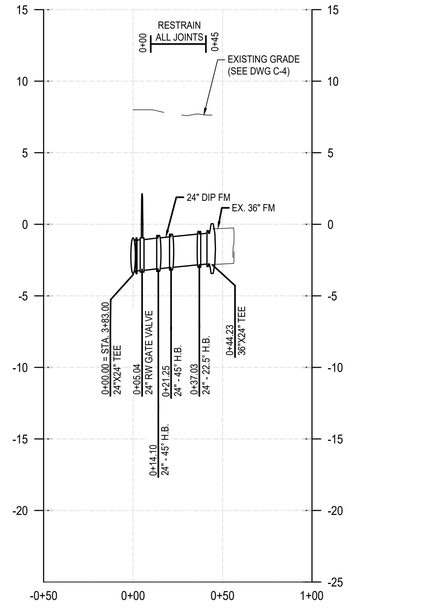
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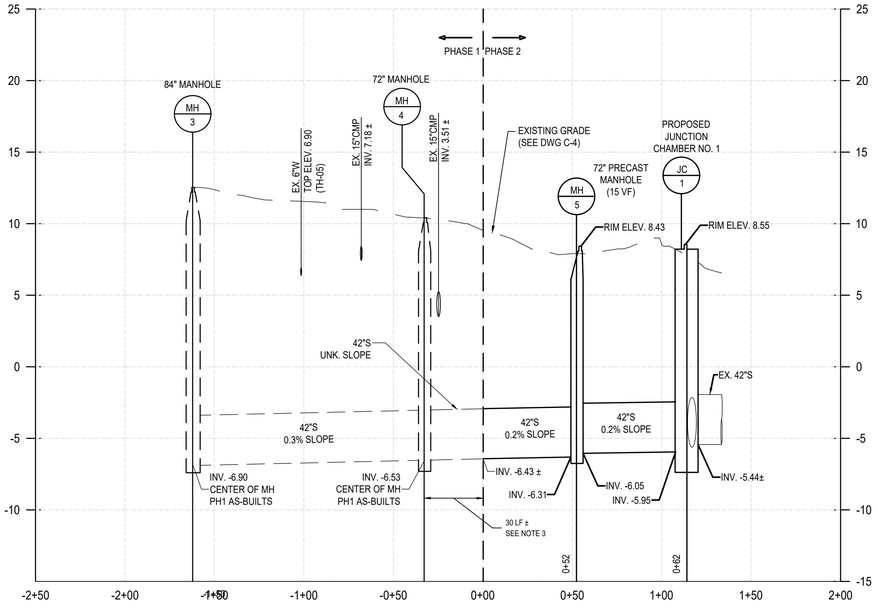
PROFILE NO. 1 - 30" FORCE MAIN
HORIZ: 1" = 40'
VERT: 1" = 5'



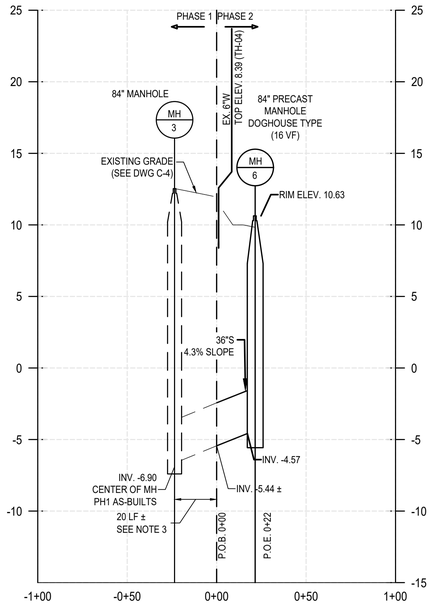
PROFILE NO. 2 - 30" FORCE MAIN
HORIZ: 1" = 40'
VERT: 1" = 5'



PROFILE NO. 3 - 24" FORCE MAIN BYPASS
HORIZ: 1" = 40'
VERT: 1" = 5'



PROFILE NO. 4 - 42" SEWER
HORIZ: 1" = 40'
VERT: 1" = 5'



PROFILE NO. 5 - 36" SEWER
HORIZ: 1" = 40'
VERT: 1" = 5'

NOTES

1. 72" PRECAST CONCRETE MANHOLES SHALL BE IN ACCORDANCE WITH NCC STANDARD DETAIL SHOWN ON DWG. C- 12.
2. 84" PRECAST CONCRETE DOGHOUSE TYPE MANHOLE SHALL BE IN ACCORDANCE WITH DETAILS SHOWN ON DWG C-12.
3. CONTRACTOR TO LOCATE AND REMOVE CAP AND CONNECT TO EXISTING SEWER. CONTRACTOR TO INSPECT, VERIFY LOCATION AND GRADE, AND TEST EXISTING SEWER PRIOR TO MAKING CONNECTION.
4. INSTALL ECCENTRIC REDUCER TO MATCH INVERT OF EX. 24"FM. MAINTAIN A FLAT OR NEGATIVE SLOPE TO SURGE TANK.
5. VERTICALLY DEFLECT JOINTS BETWEEN STA. 1+72 AND STA. 2+74. MAXIMUM ALLOWABLE JOINT DEFLECTION FOR 30" DIP SHALL BE 1.25°.

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WO: 70852-002

APPROVED BY: WILLIAM P. KENNEDY LICENSED No. 14169 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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UTILTY PROFILES

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION

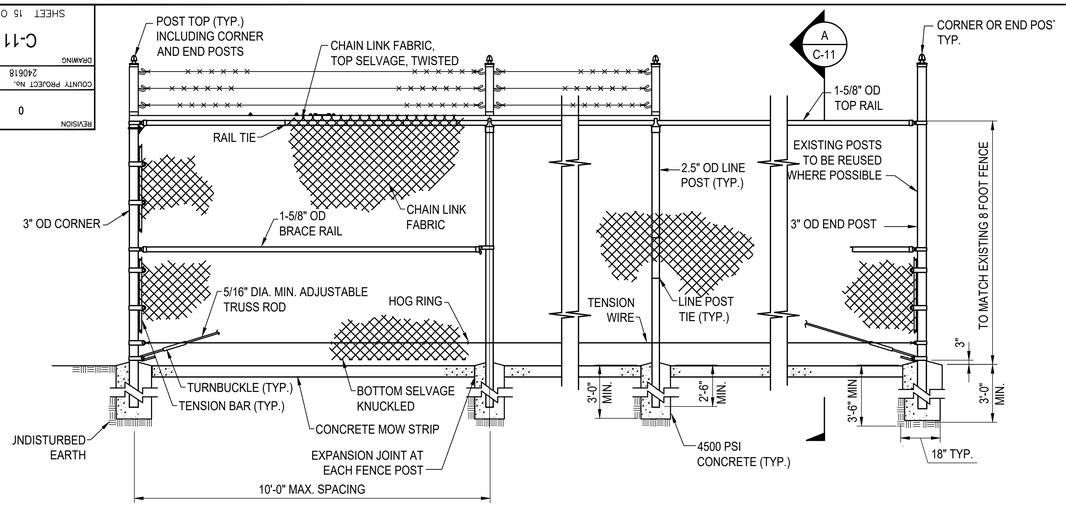
COUNTY PROJECT No. 240618

DRAWING C-10

SHEET 14 OF 92

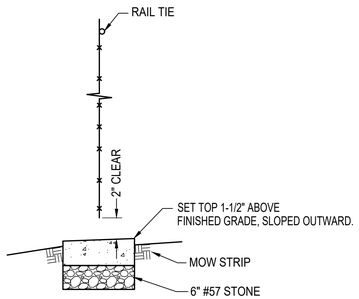
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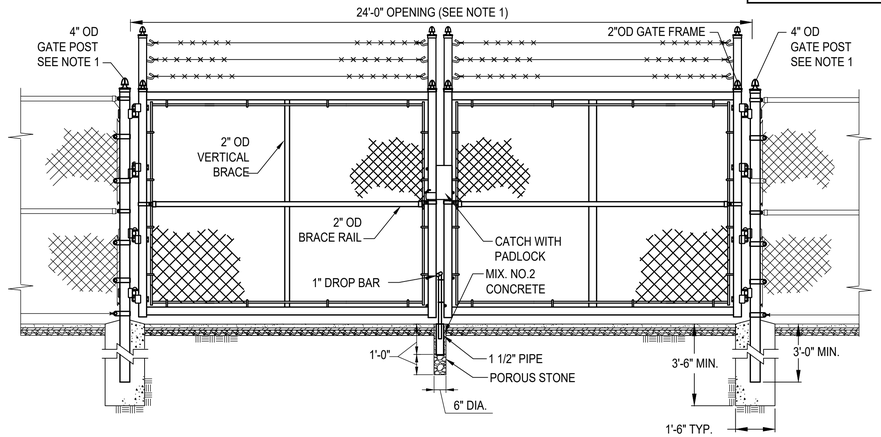


NOTES:
1. CONTRACTOR TO REPLACE ANY FENCE DAMAGED DURING CONSTRUCTION.

1 C-11 **DETAIL - 8'-0" CHAIN LINK FENCE**
SCALE: NONE



A C-11 **FENCE SECTION**
SCALE: NONE



NOTES:
1. CONTRACTOR TO INSTALL NEW GATE AND GATE POSTS TO ACCOMMODATE 24' DRIVEWAY.

2 C-11 **DETAIL - SWING GATE**
SCALE: NONE

3 C-11 **DETAIL - PIPE BOLLARD**
SCALE: NONE

4 C-11 **DETAIL - COLLAPSIBLE BOLLARD**
SCALE: NONE

B C-11 **COLLAPSIBLE BOLLARD SECTION**
SCALE: NONE

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DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

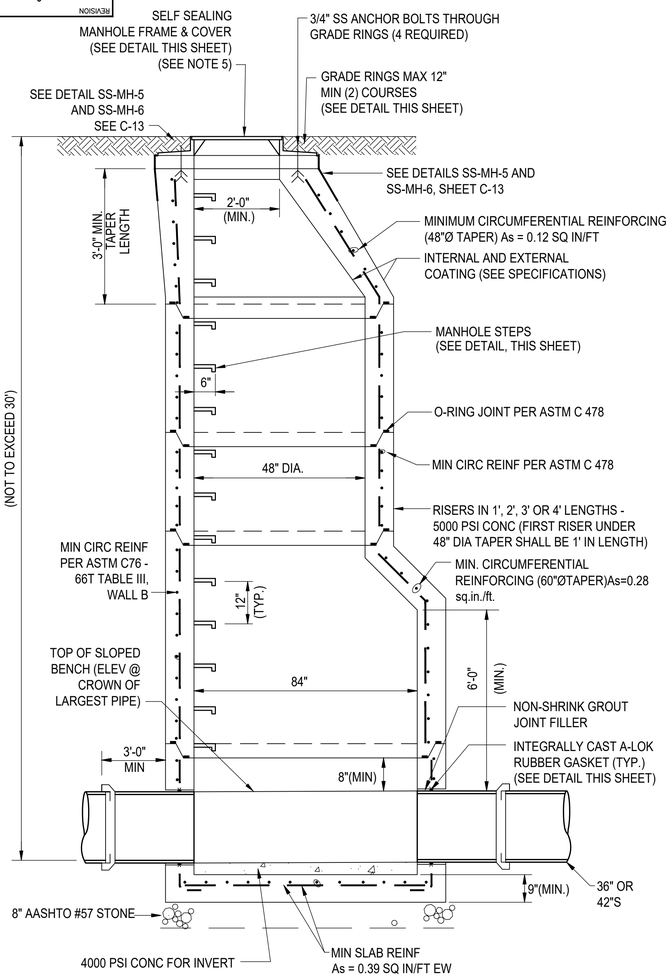
FENCE, GATE & MISC. DETAILS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING C-11
SHEET 15 OF 92

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Apr 14, 2025 - 11:18am

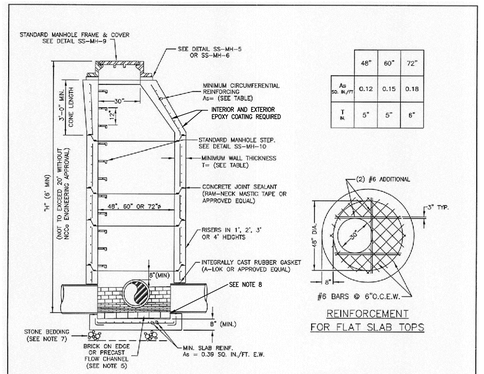


NOTES:

1. UNLESS OTHERWISE NOTED, MANHOLE TAPERS, RISERS, AND BASES SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C478 (LATEST) FOR PRECAST REINFORCED CONCRETE MANHOLES.
2. MANHOLE SHALL BE OF 5,000 PSI PRECAST CONCRETE.
3. MANHOLE STEPS SHALL BE SPACED AS SHOWN IN A SINGLE VERTICAL ALIGNMENT. THE STEPS SHALL NOT BE STAGGERED. CENTERLINE OF STEP ORIENTATION TO BE ALIGNED OVER TOP OF THE BENCH AND NOT FLOW CHANNEL. BOTTOM STEP SHALL BE WITHIN 12" OF THE BENCH.
4. PRECAST UNIT SHALL BE CAPABLE OF SUPPORTING HIGHWAY LIVE LOADS AS DEFINED BY AASHTO.
5. MANHOLE FRAME AND COVER SHALL BE SET 6-INCHES ABOVE FINAL GRADE IN ALL NON-IMPROVED AREAS.
6. FLOW CHANNEL IN MANHOLE MAY BE BRICK ON EDGE OR PRACAST CONCRETE (4,000 PSI MIN.) NO CAST IN PLACE FLOW CHANNELS. SLOPE OF BENCH TO BE 1/4"/FT. MIN. TOWARD CHANNEL.
7. SLOPE ACROSS MANHOLE CHANNEL TO BE 0.1' MIN.
8. STONE BEDDING SHALL CONFORM TO SPECIFICATION 20.04-1 OF THE NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION.
9. FALL PROTECTION LADDER SHALL BE REQUIRED FOR ALL MANHOLES GREATER THAN 20 FEET DEEP MEASURED FROM THE TOP OF FRAME AND COVER TO LOWEST PIPE INVERT. SEE NCC DETAIL SS-MH-10 (THIS SHEET) FOR MANHOLE STEP AND SPECIFICATION PART 2.01, SECTION K FOR FALL PROTECTION LADDER.

1 / C-12 DETAIL - 84" PRECAST CONCRETE MANHOLE

SCALE: NONE



	48"	60"	72"
As sq. in./ft	0.12	0.15	0.18
T in.	5"	5"	6"

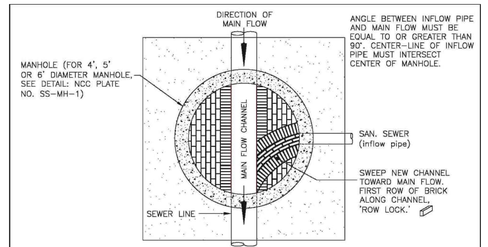
TYPE A-2 MANHOLE
MIN 6' DEPTH

NOTES:

1. UNLESS OTHERWISE NOTED, MANHOLE CONICAL AND FLAT SLAB TOPS, RISERS AND BASE SECTIONS SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C478 (OR LATEST) FOR PRECAST REINFORCED CONCRETE MANHOLES. FLAT SLAB TOPS ARE PERMITTED FOR 72"ø, TYPE A-2 MANHOLES.
2. ALL MANHOLES SHALL BE 4,000 PSI MIN. CONCRETE, TYPE II PORTLAND CEMENT.
3. REINFORCING FOR TYPE A-3 MANHOLE SAME AS TYPE A-2 MANHOLE, EXCEPT AS NOTED.
4. MANHOLE STEPS SHALL BE SPACED AS SHOWN IN A SINGLE VERTICAL ALIGNMENT. THE STEPS SHALL NOT BE STAGGERED. CENTERLINE OF STEP ORIENTATION TO BE ALIGNED OVER TOP OF BENCH AND NOT FLOW CHANNEL. BOTTOM STEP SHALL BE WITHIN 12" OF BENCH.
5. FLOW CHANNEL IN MANHOLE MAY BE BRICK ON EDGE OR PRECAST CONCRETE (4,000 PSI MIN.) NO CAST IN PLACE FLOW CHANNELS. SLOPE OF BENCH TO BE 1/4"/FT. MIN. TOWARD CHANNEL.
6. SLOPE ACROSS MANHOLE CHANNEL TO BE 0.1' MIN.
7. STONE BEDDING SHALL CONFORM TO SPECIFICATION 20.04-1 OF THE NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION.
8. PRECAST INVERTS SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATION SECTION 02605 PARAGRAPH 3.01 E.

2 / C-12 DETAIL - PRECAST MANHOLE

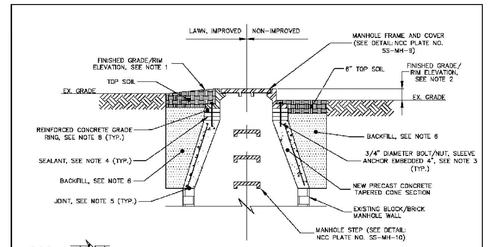
SCALE: NONE



NOTES:

1. STONE BEDDING SHALL CONFORM TO SECTION 20.04-1 OF THE NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION.
2. IF MANHOLE EXCAVATION BOTTOM IS IN UNSUITABLE MATERIAL, SUITABLE FILL MATERIAL AND MIRAFI 140N OR APPROVED EQUAL FILTER FABRIC WILL BE REQUIRED PRIOR TO PLACEMENT OF BEDDING.
3. THE PRECAST CONCRETE MANHOLE RISER SECTION MUST BE SUPPORTED WHILE THE CAST-IN-PLACE CONCRETE BASE IS POURED AND UNTIL ADEQUATELY CURED. SOLID CONCRETE BLOCKS MAY BE USED AS SUPPORT (NO LESS THAN THREE BLOCKS TO BE USED).

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	DOGHOUSE MANHOLE DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-MH-4 LAST REVISED 8/07/19

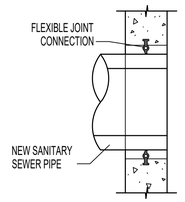


NOTES:

1. IN LAWN OR IMPROVED AREAS WHERE NO RIM ELEVATION IS SPECIFIED, SET RIM 1" TO 2" ABOVE EXISTING GRADE ELEVATION AND TAPER TOP SOIL TO RIM.
2. IN NON-IMPROVED AREAS WHERE NO RIM ELEVATION IS SPECIFIED, AND NOT SUBJECT TO FLOODING, SET RIM 6" ABOVE EXISTING GRADE ELEVATION. RIM ELEVATION IN AREAS SUBJECT TO FLOODING SHALL BE DETERMINED BY ENGINEER.
3. FASTEN FRAME TO PRECAST TAPERED CONE SECTION USING A MINIMUM OF TWO BOLTS. BOLT HOLES SHALL BE CAST INTO GRADE RINGS. NO FIELD DRILLING OF HOLES.
4. SEAL EVERY JOINT IN MANHOLE "CHIMNEY" BETWEEN THE FRAME AND GRADE RING, BETWEEN EACH GRADE RING AND BETWEEN GRADE RING AND TAPERED CONE SECTION USING ADHESIVE SEALANT CONFORMING TO ASTM D3498 AND SUITABLE FOR USE WITH MASONRY AND METAL MATERIALS. APPLY IN CONTINUOUS 1/2 INCH BEADS (MIN. TWO BEADS EVERY JOINT).
5. SEAL PRECAST CONE SECTION TO COMPETENT LAYER OF BLOCK OR BRICK USING CEMENT MORTAR. IF EXISTING MANHOLE IS PRE-CAST CONCRETE, SECURE BRICK IN GROOVED JOINT, WITH CEMENT MORTAR PRIOR TO PLACING CONE SECTION.
6. REPLACE ALL UNSUITABLE MATERIAL WITH SUITABLE FILL MATERIAL, COMPACTED IN ACCORDANCE WITH THE NEW CASTLE COUNTY STANDARD OR SUPPLEMENTAL SPECIFICATIONS.
7. ADJUSTMENT RISERS OF ANY TYPE (I.E. BRICK) MAY NOT BE USED AS A SUBSTITUTE FOR GRADE RINGS.
8. COMBINED HEIGHT OF GRADE RINGS NOT TO EXCEED 12" (SEE DETAIL: NCC PLATE NO. SS-MH-7).
9. TOP SOIL SHALL BE PERMANENTLY STABILIZED WITH PERENNIAL GRASS SEED MIXTURE, SOIL SUPPLEMENTS AND COVERED WITH MULCH, PER NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION.

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	NON-PAVED AREA MANHOLE CONE SECTION DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-MH-5 LAST REVISED 6/07/19

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.



NOTE :
TYPICAL DETAIL CONNECTION OF ALL NEW SANITARY PIPE TO STRUCTURE.

3 / C-12 DETAIL - FLEXIBLE JOINT CONNECTION

SCALE: NONE

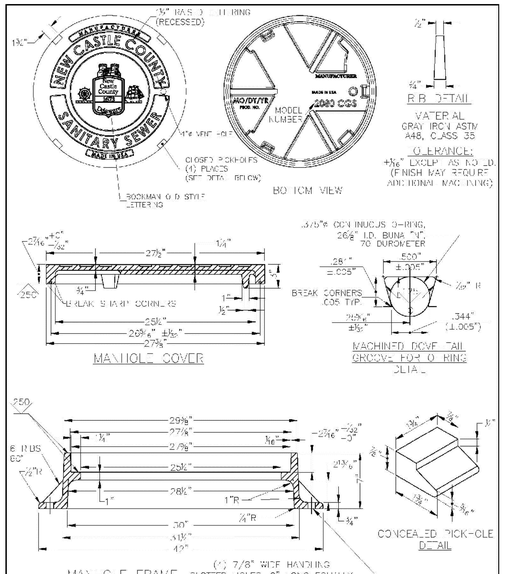
NOTES:

1. DESIGN MEETS REQUIREMENTS OF A.S.T.M. STANDARD C-478.
2. APPROXIMATE WEIGHT OF ONE REINFORCED CONCRETE GRADE RING:
   24"ø - 140 lbs.
   30"ø - 165 lbs.

NOTES:

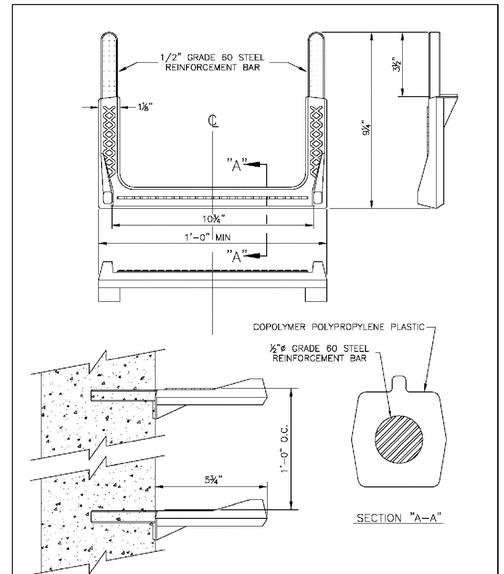
1. SEAL EACH JOINT BETWEEN FRAME, RUBBER GRADE RING AND PRECAST GRADE RINGS USING ADHESIVE SEALANT CONFORMING TO ASTM D3498 AND SUITABLE FOR USE WITH MASONRY, RUBBER AND METAL MATERIALS. APPLY IN CONTINUOUS 1/2 INCH BEADS.
2. UNDER NO CIRCUMSTANCE SHALL A RUBBER GRADE RING BE MODIFIED OR ALTERED IN LIEU OF USING THE APPROPRIATE TAPERED GRADE RING.

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	GRADE RING DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-MH-7 LAST REVISED 5/10/2019



NOTE: MANHOLE FRAME AND COVER SHALL BE BY EAST JORDAN IRON WORKS, NEENAH FOUNDRY OR APPROVED EQUAL.

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS SELF SEALING MANHOLE FRAME & COVER	ISSUED 5/27/10 REVISED 12/02/10 REVISED 12/8/12 PLATE SS-MH-3



NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	MANHOLE STEP DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-MH-10 LAST REVISED 5/10/2019

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MISS UTILITY of DELMARVA
BEFORE YOU DIG CALL 1-800-282-8555 (Del. Only) 1-800-441-8355 (Md., Va.) PROTECT YOURSELF, ONE, TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY:
WILLIAM PATRICK WAGNER
No. 14169
REGISTERED PROFESSIONAL ENGINEER
STATE OF DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
PROFESSIONAL ENGINEER - DESIGN

SCALE	NTS
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

PRECAST MANHOLE & MISC. DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING C-12
SHEET 16 OF 92

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Apr 28, 2025 - 2:16pm

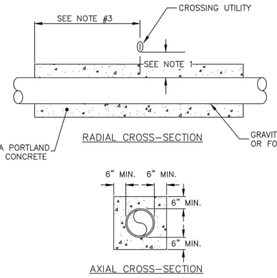
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

REVISION

COUNTY PROJECT No. 240618

DRAWING C-13

SHEET 17 OF 92



NOTES:

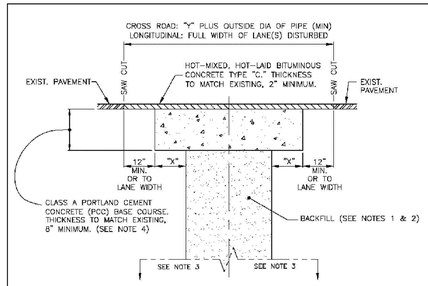
1. WHEN CROSSING UTILITY IS STORM SEWER
   IF STORM SEWER IS LESS THAN 18"ø AND WHERE THE VERTICAL SEPARATION FROM EITHER A GRAVITY SEWER OR FORCE MAIN IS LESS THAN 2', CONCRETE SHALL FILL THE VOID BETWEEN THEM WHILE CRADLING THE STORM SEWER.

   IF STORM SEWER IS EQUAL TO OR GREATER THAN 18"ø AND WHERE THE VERTICAL SEPARATION FROM EITHER A GRAVITY SEWER OR FORCE MAIN IS LESS THAN 3', CONCRETE SHALL FILL VOID BETWEEN THEM WHILE CRADLING THE STORM SEWER.

   CROSSING UTILITY OTHER THAN STORM SEWER:
   WHERE THE VERTICAL SEPARATION FROM EITHER A GRAVITY SEWER OR FORCE MAIN IS LESS THAN 12", CONCRETE SHALL FILL THE VOID BETWEEN THEM WHILE CRADLING THE CROSSING UTILITY.

   WHERE THE VERTICAL SEPARATION FROM EITHER A GRAVITY SEWER OR FORCE MAIN IS 12" OR GREATER, THE CROSSING UTILITY SHALL BE SUPPORTED WITH AASHTO #57 STONE OR EQUIVALENT.
2. WHEN CROSSING UTILITY IS A WATER MAIN, SEE NCC PLATE NO. SS-MISC-4.
3. CONCRETE ENCASEMENT SHALL SPAN A MINIMUM DISTANCE OF 10' TO EITHER SIDE OF CROSSING UTILITY.
4. ALL CONCRETE SHALL BE 4,000 P.S.I. MINIMUM.
5. THE VERTICAL SEPARATION SHALL NOT BE LESS THAN 6".

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	CONCRETE ENCASEMENT DETAIL FOR UTILITY CROSSING (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-UC-1 LAST REVISED: 5/10/2019



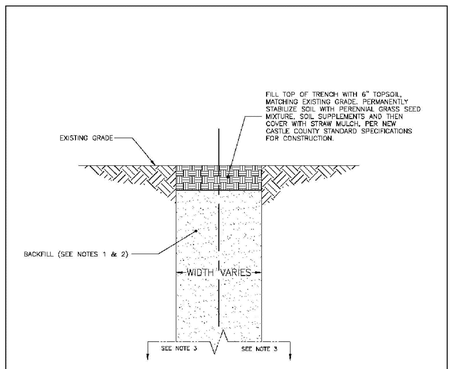
TYPICAL SECTION

NOTES:

1. FILL TRENCH WITH BORROW TYPE C "BACKFILL" IN COMPLIANCE WITH SECTION 20.03-2 OF THE NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION
2. "BACKFILL" TO BE COMPACTED IN 8" LIFTS TO 95% STANDARD PROCTOR DENSITY BY ASTM D698.
3. SEE DETAIL: NCC PLATE NO. SS-IN-2 FOR TRENCH WIDTH AND PIPE BEDDING REQUIREMENTS.
4. FOR EXISTING BITUMINOUS CONCRETE PAVEMENT, HOT-MIXED, HOT-LAID BITUMINOUS CONCRETE BASE COURSE (12" MINIMUM THICKNESS) MAY BE SUBSTITUTED FOR CLASS A PORTLAND CEMENT CONCRETE (PCC).

ROADWAY TABLE	DIMS	HOT-MIX	PCC
BASE COURSE WIDTH	X	12"	24"
WEAR COURSE WIDTH	Y	6'-0"	8'-0"

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	PAVING RESTORATION DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-IN-1 LAST REVISED: 5/10/2019

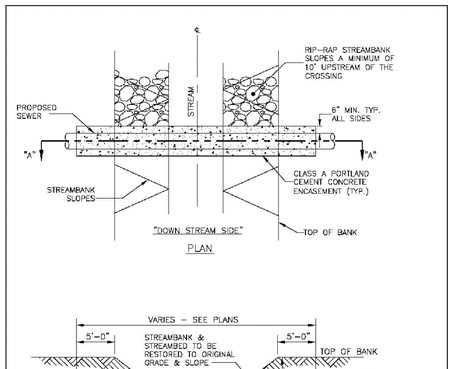


TYPICAL SECTION

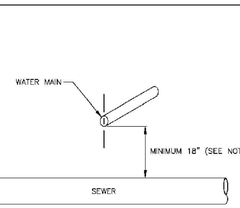
NOTES:

1. FILL TRENCH WITH BORROW TYPE C "BACKFILL" IN COMPLIANCE WITH SECTION 20.03-2 OF NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION.
2. ALL "BACKFILL" TO BE COMPACTED USING MECHANICAL TAMPER OR VIBRATORY COMPACTOR IN 8" LIFTS.
3. FOR TYPICAL TRENCH WIDTH AND PIPE BEDDING, SEE DETAIL: NCC PLATE NO. SS-IN-2.
4. FOR NON-PAVED AREAS IN WHICH A TURF TRAIL IS PROPOSED, SEE DETAIL: NCC PLATE NO. SS-MISC-2.

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	RESTORATION & TRENCH BACKFILL NON-PAVED AREA DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-IN-1A LAST REVISED: 5/10/2019



NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	STREAM CROSSING PLAN AND SECTION DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-IN-4 LAST REVISED: 5/10/2019



ELEVATION

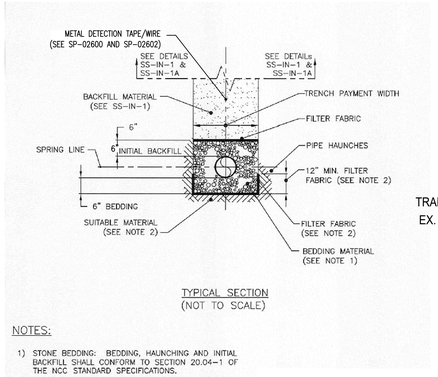
WATER MAIN/SEWER CROSSING

NOTES:

WHERE THE VERTICAL SEPARATION BETWEEN A WATER MAIN AND SEWER (WHETHER WATER MAIN IS LOCATED ABOVE OR BELOW THE SEWER) IS 18" OR LESS:

1) SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO WATER PIPE AND BE PRESSURE TESTED AT 150 p.s.i. TO ASSURE WATER TIGHTNESS, PRIOR TO BACKFILLING.
2) EITHER THE WATER MAIN OR SEWER MAY BE ENCASED IN A WATERTIGHT CARRIER PIPE WHICH EXTENDS 10 FEET ON BOTH SIDES OF THE CROSSING, AS MEASURED PERPENDICULAR TO THE WATER MAIN. THE CARRIER PIPE SHALL BE OF MATERIALS APPROVED BY NEW CASTLE COUNTY FOR USE IN WATER MAIN CONSTRUCTION.
3) THE JOINTS IN THE SEWER PIPELINE SHALL BE ARRANGED SUCH THAT THEY WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN CROSSING.
4) WHEN THE WATER MAIN CROSSES BELOW THE SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.

NEW CASTLE COUNTY, DELAWARE DEPARTMENT OF PUBLIC WORKS	WATER MAIN CROSSING DETAIL (NTS) THIS DETAIL IS SUBJECT TO REVISION. VERIFY WITH NEW CASTLE COUNTY, DEPARTMENT OF PUBLIC WORKS, CORRECTNESS OF DETAIL PRIOR TO IMPLEMENTATION.	NCC PLATE NO. SS-MISC-4 LAST REVISED: 5/10/2019



TYPICAL SECTION
(NOT TO SCALE)

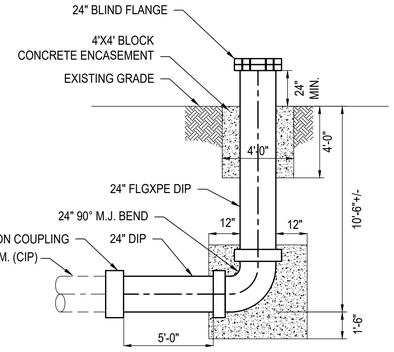
NOTES:

1) STONE BEDDING: BEDDING, HAUNCHING AND INITIAL BACKFILL SHALL CONFORM TO SECTION 20.04-1 OF THE NCC STANDARD SPECIFICATIONS.
2) BEDDING: PRIOR TO PIPE INSTALLATION, CAREFULLY BRING 6" OF BEDDING MATERIAL TO PROPOSED BOTTOM OF PIPE ALONG THE ENTIRE LENGTH OF PIPE TO BE INSTALLED. IF TRENCH BOTTOM IS IN UNSUITABLE MATERIAL, SUITABLE FILL MATERIAL AND MIRAFI 140N OR APPROVED EQUAL FILTER FABRIC WILL BE REQUIRED PRIOR TO PLACEMENT OF BEDDING.
3) PIPE HAUNCHES: CAREFULLY WORK, BY HAND, STONE BEDDING FROM THE EDGE OF THE TRENCH UP AND UNDER THE PIPE TO SUPPORT THE HAUNCHES. CONTINUE FILLING, BY HAND, TO THE SPRING LINE OF THE PIPE.

1 / C-13

DETAIL - SANITARY SEWER TRENCH WIDTH & PIPE BEDDING FOR DUCTILE IRON AND PVC SEWER PIPE

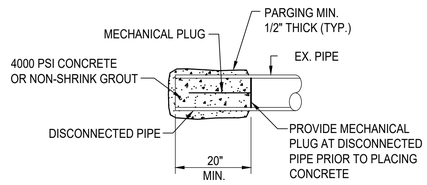
SCALE: NONE



2 / C-13

DETAIL - 24-INCH CONNECTION STANDPIPE

SCALE: 3"=1'-0"



3 / C-13

DETAIL - ABANDONMENT OF EXISTING PIPELINE

SCALE: NONE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
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MISS UTILITY of DELMARVA
BEFORE YOU DIG CALL 1-800-282-8555 (In Del.) 1-800-441-8355 (Md., Va.) PROTECT YOURSELF, GIVE TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY: WILLIAM PATRICK WAGNER, REGISTERED, No. 14169, PROFESSIONAL ENGINEER, STATE OF DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	NTS
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

MISC. DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

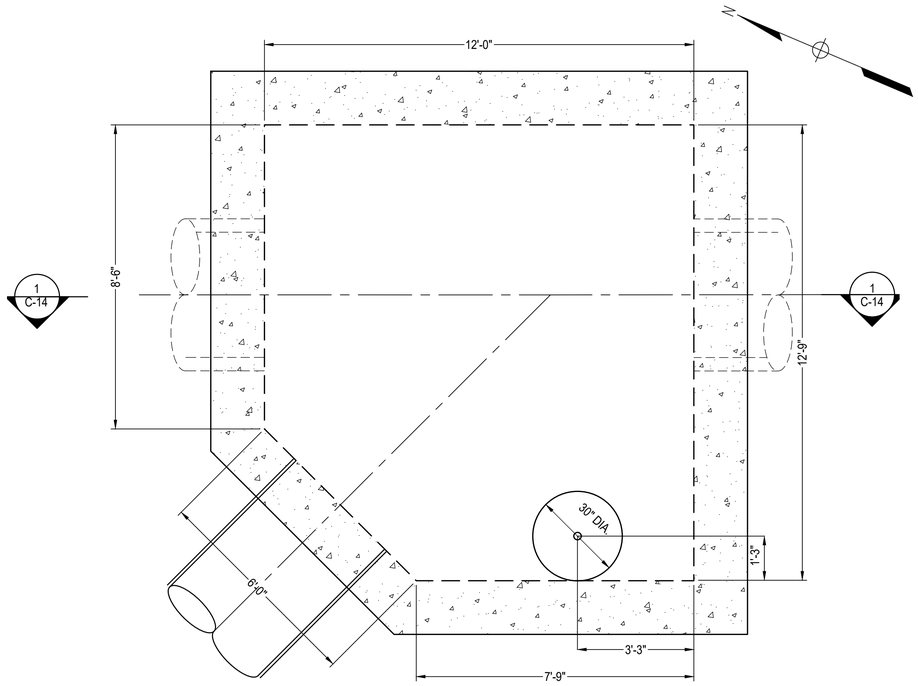
COUNTY PROJECT No. 240618

DRAWING C-13

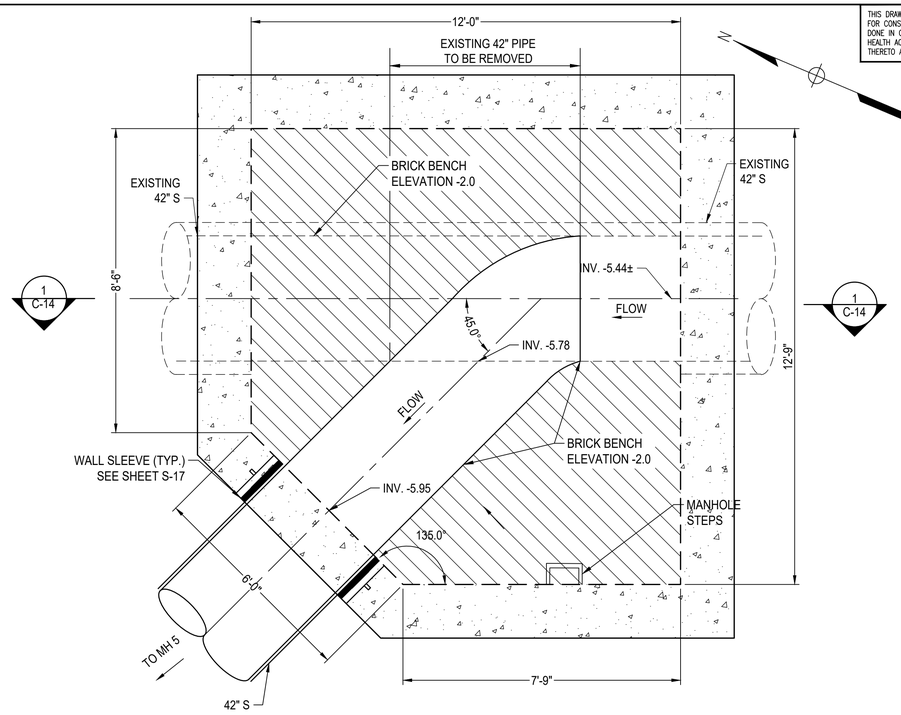
SHEET 17 OF 92

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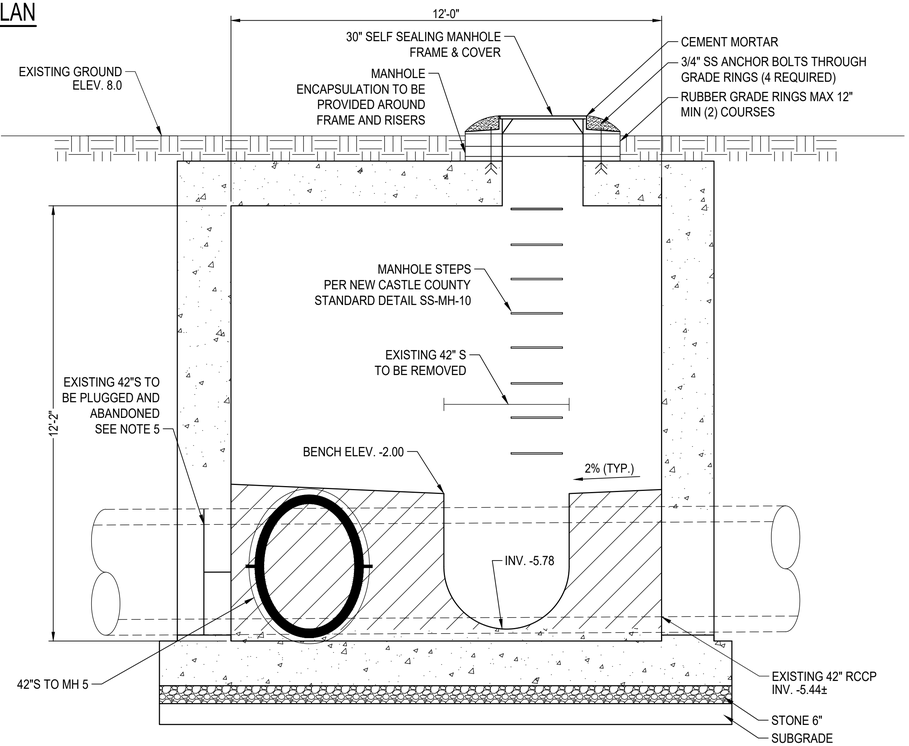
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.



JUNCTION CHAMBER- TOP PLAN
SCALE: ½ " = 1'-0"



JUNCTION CHAMBER- TOP SLAB REMOVED
SCALE: ½ " = 1'-0"



SECTION THROUGH STRUCTURE
SCALE: ½ " = 1'-0"

NOTES:

1. SEE DWG S-17 FOR STRUCTURAL DETAILS.
2. MANHOLE STEPS SHALL BE SPACED AS SHOWN IN A SINGLE VERTICAL ALIGNMENT. THE STEPS SHALL NOT BE STAGGERED. CENTERLINE OF THE STEP ORIENTATION TO BE ALIGNED OVER TOP OF THE BENCH AND NOT FLOW CHANNEL. BOTTOM STEP SHALL BE WITHIN 12" OF THE BENCH.
3. MANHOLE FRAME AND COVER SHALL BE SET 6-INCHES ABOVE FINAL GRADE IN NON-IMPROVED AREA.
4. STONE BEDDING SHALL CONFORM TO SPECIFICATION 20.04-1 OF THE NEW CASTLE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION.
5. CONTRACTOR TO MEET WITH NEW CASTLE COUNTY PRIOR TO CONSTRUCTION OF THE CHANNEL. EX. PIPE BETWEEN NEW CHANNEL AND JUNCTION CHAMBER WALL IS TO BE REMOVED AND REPLACED WITH NEW BENCH. EX. 42"S TO BE PLUGGED AT THE JUNCTION CHAMBER WALL. EXISTING 42"S BETWEEN THE JUNCTION CHAMBER AND EXISTING PUMP STATION IS TO BE ABANDONED AFTER FINAL TESTING OF THE NEW PUMP STATION. SEE SHEET G-03 FOR SUGGESTED SEQUENCE OF CONSTRUCTION.

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY:
JULIAN P. CLARK
No. 14169
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
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APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	AS SHOWN
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DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

JUNCTION CHAMBER NO. 1

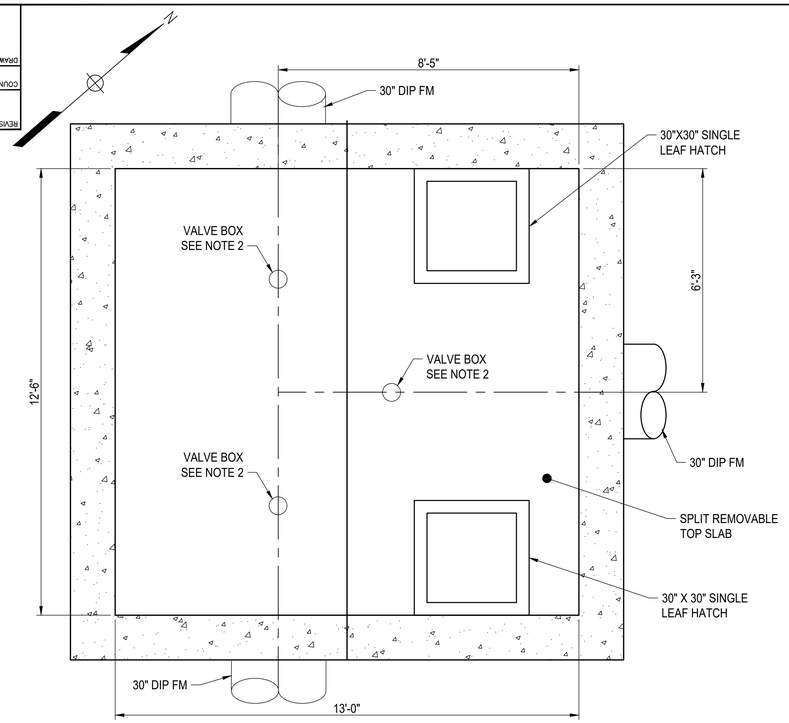
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

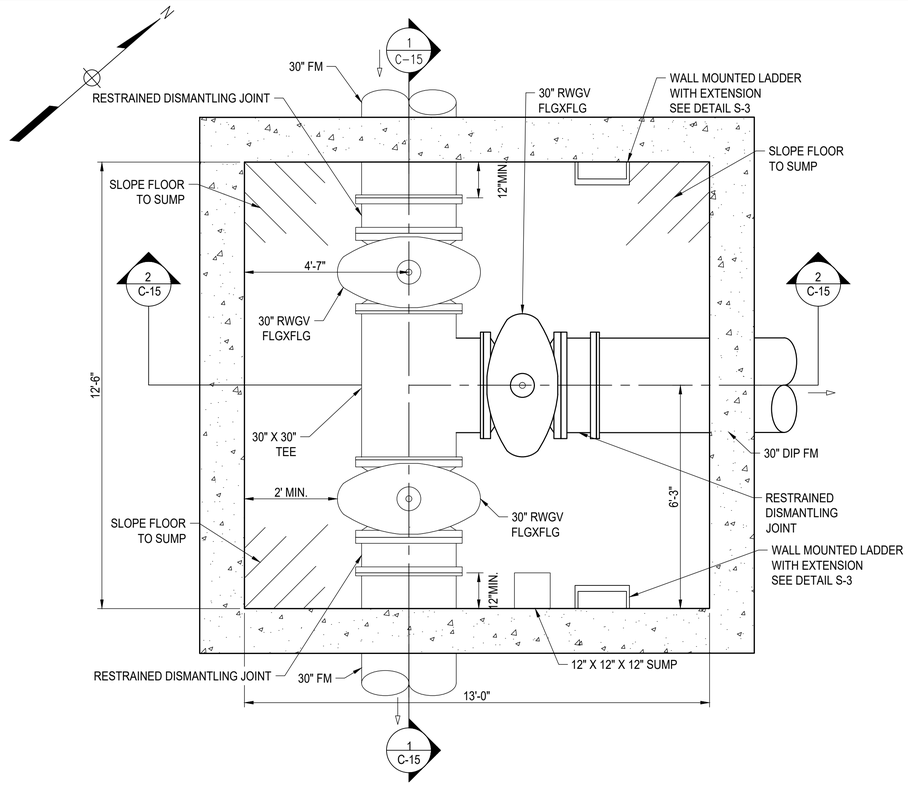
REVISION 0
COUNTY PROJECT No. 240618
DRAWING C-14
SHEET 18 OF 92

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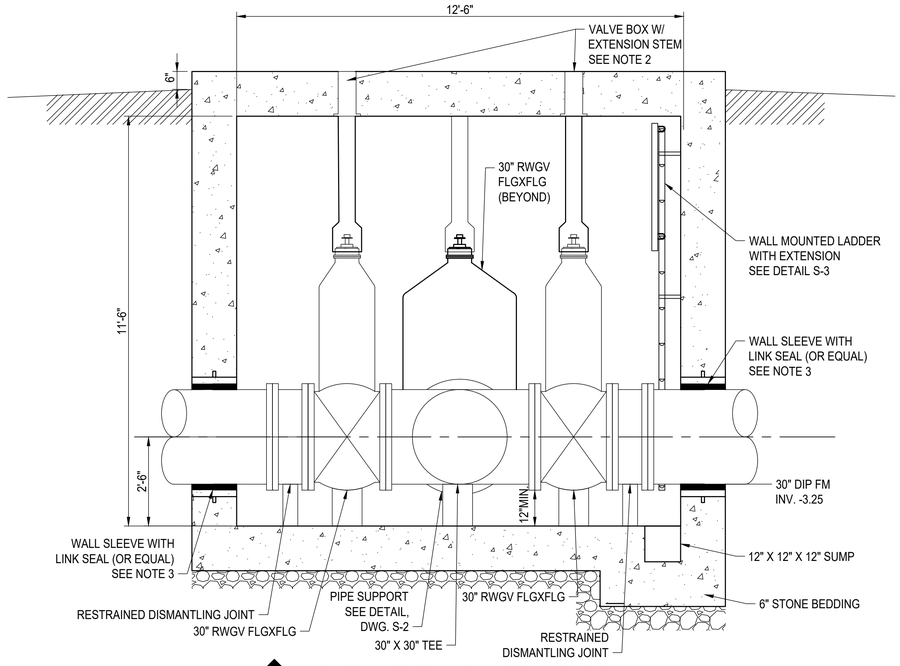
VALVE VAULT - TOP PLAN
SCALE: ½ " = 1'-0"



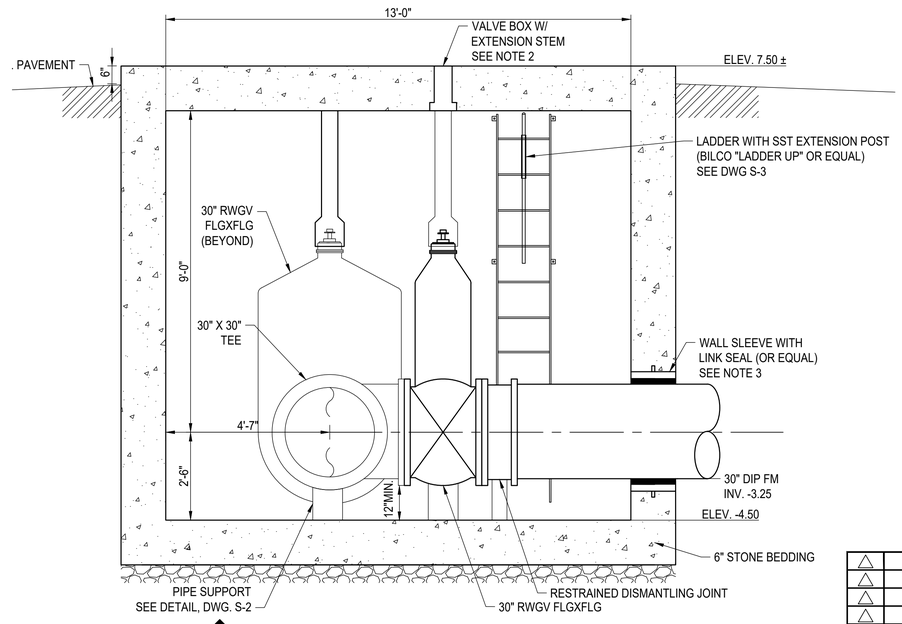
VALVE VAULT - TOP SLAB REMOVED
SCALE: ½ " = 1'-0"

NOTES

1. SEE DWG S-18 FOR STRUCTURAL DETAILS.
2. VALVE BOXES CENTERED OVER VALVE OPERATING NUTS. PROVIDE EXTENSION STEMS.
3. SEE SHEET S-17 FOR WALL SLEEVE DETAIL. WALL OPENING SHALL ACCOMMODATE WALL SLEEVE, LINK SEAL AND OD OF THE PIPE TO ACHIEVE THE INVERT OF THE FORCE MAIN ON SHEET C-10.



SECTION THROUGH STRUCTURE
1 C-15
SCALE: ½ " = 1'-0"



SECTION THROUGH STRUCTURE
2 C-15
SCALE: ½ " = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY: WILLIAM P. KINNEY, JR. — No. 14169 — DELAWARE — PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
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SCALE	AS SHOWN
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

VALVE VAULT

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING C-15
SHEET 19 OF 92

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Apr 14, 2025 - 12:16pm

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REVISION
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COUNTY PROJECT No.
240618

DRAWING
C-16

SHEET 20 OF 92

TEST BORING B-01

(Page 1 of 1)

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 18, 2014
Date Completed : March 18, 2014
Logged by : GW
Weather : Cloudy
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 15.49 feet

Sample Condition: Remolded; Rock Core
Water Levels: During Drilling; At completion

Depth in feet	Surf. Elev. 15.49 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				FILL: Brown SILT, trace gravel	☒	S-1	2-4-4	1.1			▼
				FILL: Black "Coal" mixed with gray SILT	☒	S-2	3-2-1	0.3			
				FILL: Gravel in spoon	☒	S-3	1-1-1	0.1			▽
				FILL: Gray, black, light gray SILT, some medium sand	☒	S-4	1-1-1	0.6			
5											
	2.0			Gray silty CLAY, trace fine sand , trace roots (marsh deposits)	☒	S-5	2-1-1	1.5			
10			CL	Light gray, dark gray CLAY, some fine sand, trace roots	☒	S-6	1/12"-1	1.5			
	-7.5			Tan SILT, some fine sand, trace decomposed rock	☒	S-7	3-4-5	1.0			
15			ML	Orange SILT/ weathered rock , lense of gravel	☒	S-8	3-7-10	1.5			
	-18.0			Auger refusal at 33.5'.							
20	-22.8			Blue gray granitic gneiss Recovery = 100%, RQD = 96%	■	RC-1		5.0			
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Wet on spoon at 5.4'. Water level noted through augers at 5.7'.
3. Upon completion, caved at 21', water level at 8'.
4. At approx. 24 hours after completion, water level at 7.5'.
5. Upon completion, borehole backfilled with bentonite grout.

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TEST BORING B-02

(Page 1 of 1)

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 20, 2014
Date Completed : March 21, 2014
Logged by : GW
Weather : Clear, Cold
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 16.52 feet

Sample Condition: Remolded; Rock Core
Water Levels: During Drilling; At completion

Depth in feet	Surf. Elev. 16.52 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				FILL: Brown SILT, some sand and gravel	☒	S-1	6-4-4	0.6			
				Miscellaneous Fill	☒	S-2	1-1-1	0.2			
5				Miscellaneous Fill	☒	S-3	1-1-1	0.2			
				Miscellaneous Fill	☒	S-4	1-1-1	0.1			▼
10	3.5			Gray silty CLAY, trace fine sand, trace roots (marsh deposits	☒	S-5	1-1-2	1.5			
			CL	Gray silty CLAY, some fine to medium sand, gravel	☒	S-6	1-5-6	0.6			
15	-6.5			Orange, red gray silty Weathered Rock	☒	S-7	6-5-4	0.4			
			ML	Auger refusal at 28.5'. Roller rock bit from 28.5' to 29'. Roller bit refusal at 29.0'.	☒	S-8	50/1"	0.0			
20	-12.5			Blue gray granite/ gneiss Recovery = 100%, RQD = 85%	■	RC-1		5.0			
	-17.5										
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Wet on spoon at 6.8'. Water level noted through augers at 5.8'.
3. Upon completion, caved at 18', water level at 6'.
4. At 22 hours, water level at 6.8'.
5. Upon completion, borehole backfilled with bentonite grout.

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TEST BORING B-03

(Page 1 of 1)

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 14, 2014
Date Completed : March 18, 2014
Logged by : GW
Weather : Cloudy
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 15.36 feet

Sample Condition: Rock Core; Remolded
Water Levels: During Drilling; At completion

Depth in feet	Surf. Elev. 15.36 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	14.9			Concrete Slab (6" thick)	▪						
				Miscellaneous FILL	☒	S-1	1-4-5-5	0.6			
				Miscellaneous FILL	☒	S-2	2-4-4	0.6			
5				FILL: Gray SILT and fine to coarse sand, some gravel	☒	S-3	1-2-2	0.4			▽
				(SAME)	☒	S-4	1-2-1	0.4			▼
10	2.4			Gray CLAY, some fine to coarse sand, little gravel	☒	S-5	3-1-1	0.9			
			CL								
15	-3.1			Brown, orange SILT, some sand, with lenses of gravel	☒	S-6	11-16-7				
				Orange gray SILT/ Weathered rock	☒	S-7	6-2-1	0.7			
20			ML								
				Varicolored SILT/ Weathered rock, little clay	☒	S-8	7-6-12	1.5			
25	-17.1			(NO Recovery) Auger refusal at 32.5'.		S-9	16-30-50/0"	0.0			
				Gray granite Recovery = 70%, RQD = 67%	■	RC-1		3.6			
30											
	-26.1			Gray/ blue granite Recover = 100% RQD = 100%	■	RC-2		4.3			
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. During drilling, water level at 7.5'.
3. Upon completion, caved at 23', water level at 6'.
4. At 22 hours , water level at 6.2'.
5. Upon completion, borehole backfilled with bentonite grout.

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TEST BORING B-04

(Page 1 of 1)

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 20, 2014
Date Completed : March 20, 2014
Logged by : GW
Weather : Clear, cold
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 14.66 feet

Sample Condition: Remolded; Rock Core
Water Levels: During Drilling; At completion

Depth in feet	Surf. Elev. 14.66 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				FILL: Brown SILT, trace roots, sand, gravel	☒	S-1	6-5-4	0.8			
				MISCELLANEOUS FILL	☒	S-2	1-1-1	0.2			
5				MISCELLANEOUS FILL	☒	S-3	1-1-1	0.2			▽
				MISCELLANEOUS FILL	☒	S-4	1-1-1	0.2			
10	1.7			Gray silty CLAY, trace fine sand, trace roots	☒	S-5	1-1-2	1.2			
			CL	Gray silty CLAY, with lenses of sand and gravel	☒	S-6	25-6-6	0.8			
15	-6.3			Orange gray SILT/ Weathered rock	☒	S-7	13-6-5	0.7			
			ML	Auger refusal at 25.8'.							
20	-11.1			Blue/ gray Granite/ gneiss Recovery = 95%, RQD = 80%	■	RC-1		3.3			
	-14.4										
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. During drilling, water level at 5.7'. Wet on spoon at 5.8'
3. Upon completion, caved at 26', water level at 5'.
4. At approx. 24 hours, water level at 6.2'.
5. Upon completion, borehole backfilled with bentonite grout.

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TEST BORING B-05

(Page 1 of 1)

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 27, 2014
Date Completed : March 27, 2014
Logged by : RM
Weather : Clear, cold
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 15.45 feet

Sample Condition: Remolded
Water Levels: During Drilling

Depth in feet	Surf. Elev. 15.45 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	15.0			Bituminous concrete pavement (6")							
	14.0			Graded Aggregate base course (12")							
				Brown, gray SILT	☒	S-1	5-8-6	1.0			
5				Brown, gray SILT	☒	S-2	5-6-6	0.8			
				Red, brown SILT, lenses of fine sand	☒	S-3	1-3-2	0.8			
10			ML	Red, brown SILT, lenses of red clay, lenses of fine sand	☒	S-4	1-2-3	0.5			▼
	2.0			Gray silty CLAY, with lenses of gravel	☒	S-5	5-14-13	0.6			
15			CL								
	-3.1			Orange SILT, and sand, with gravel	☒	S-6	6-9-13	1.0			
20				Orange clayey SILT and sand	☒	S-7	2-4-5	1.0			
25			ML								
				Orange, green, brown SILT/ Weathered rock	☒	S-8	2-3-5	1.1			
30											
				Varicolored weathered rock	☒	S-9	6-12-15	1.5			
35	-21.6			Spoon and auger refusal at 37.0'.							
40											
45											

NOTES:
1. Boring performed 8' east of staked location.
2. During drilling, water level at 8.2'. Wet on spoon at 8.5'.
3. Switched to mud rotary drilling at 20'
4. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch.

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TEST BORING B-06

(Page 1 of 1)

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 27, 2014
Date Completed : March 27, 2014
Logged by : RM
Weather : Clear, cold
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 12.33 feet

Sample Condition: Remolded
Water Levels:

Depth in feet	Surf. Elev. 12.33 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	11.7			Bituminous Concrete pavement							
	10.8			Graded aggregate base course							
				FILL: Gravel with lenses of red and black silt	☒	S-1	8-3-10	0.4			
5			ML	(SAME)	☒	S-2	9-14-21	0.6			
	4.3			FILL: Black silt with gravel Auger refusal at 8.0' on unknown obstruction.	☒	S-3	9-3-2	0.5			
10											
15											
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Encountered auger refusal at 8.0'. Boring terminated.
3. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch.

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1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY:
WILLIAM P. WORKS
No. 14169
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

BORING LOGS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING C-16
SHEET 20 OF 92

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Apr 14, 2025 - 1:22pm

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REVISION
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COUNTY PROJECT No.
240618

DRAWING
C-17

SHEET 21 OF 92

TEST BORING B-06B

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 27, 2014
Date Completed : March 27, 2014
Logged by : RM
Weather : Clear
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 12.3 feet

Depth in feet	Surf. Elev. 12.3 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				Augered. Spoon and auger refusal at 8.5' on unknown obstruction.							

NOTES:
1. Boring location offset 10' south from boring B-06, towards boring B-07.
2. Auger refusal encountered at 8.5' . Boring terminated.
3. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch.

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TEST BORING B-06C

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 27, 2014
Date Completed : March 27, 2014
Logged by : RM
Weather : Clear
Driller/Agency : W ProudW. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 12.3 feet

Depth in feet	Surf. Elev. 12.3 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				Augered. Auger refusal at 3.0' on unknown obstruction.							

NOTES:
1. Boring location offset 16' west from boring B-06A.
2. Auger refusal encountered at 3.0. Boring terminated.
3. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch.

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TEST BORING B-07

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 28, 2014
Date Completed : March 28, 2014
Logged by : RM
Weather : Cloudy, rainy
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 10.68 feet

Sample Condition: Remolded
Water Levels: During Drilling

Depth in feet	Surf. Elev. 10.68 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	10.1			Bituminous concrete pavement (7")							
	9.5			Graded aggregate base course (6")							
				Gray/ red SILT		S-1	6-12-14	1.0			
				Gray, red SILT, some gravel		S-2	11-40-18	0.5			
5	4.7			Gray, black CLAY, lenses of silt and gravel		S-3	6-15-10	0.9			
			CL	Gray silty CLAY, trace fine sand		S-4	5-8-7	1.3			
10											
15				Gray silty CLAY, trace fine sand		S-5	2-1-3	1.0			▼
	-5.4										
20				Orange fine to medium SAND, some silt, little gravel		S-6	9-10-14	0.6			
			SM								
25				Orange fine to medium SAND, some silt, little gravel		S-7	29-9-8	0.6			
	-17.8										
30			SM	Weathered rock		S-8	6-5-6	1.0			
	-22.5			Spoon and auger refusal at 33.2'.							
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. During drilling, water level at 13.2'. Wet on spoon at 13'.
3. Auger refusal at 33.2'. Boring terminated.
4. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch.

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TEST BORING B-08

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 14, 2014
Date Completed : March 14, 2014
Logged by : GW
Weather : Clear, 20s
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 ATV Mounted
Drilling Methods : Rig
Surface Elevation : HSA SPT
: 7.74 feet

Sample Condition: Remolded
Water Levels: During Drilling

Depth in feet	Surf. Elev. 7.74 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				FILL: SILT, little fine sand, little gravel, trace roots		S-1	2-1-4	0.4			
				FILL: Brown SILT, w lense of orange fine sand, trace roots		S-2	2-3-5	1.5			
5	0.7			FILL: silty gravel, lense of woody fibers		S-3	2-1-1	1.5			▼
				Gray silty CLAY, trace fine sand, trace gravel (marsh desposits)		S-4	1-1-1	1.5			
10			CL								
15				Gray silty CLAY, trace fine sand, trace gravel (marsh desposits)		S-5	1-1-2	1.5			
	-12.3										
20				Gray silty CLAY, some fine sand, trace gravel (marsh desposits)		S-6	1-2-2	1.5			
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. During drilling, water level at 5.7'. Wet on spoon at 5.8'
3. Upon completion, caved and dry at 2.9'.
4. Borehole backfilled with bentonite grout.

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TEST BORING B-09

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 26, 2014
Date Completed : March 26, 2014
Logged by : RM
Weather : Clear
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 14.23 feet

Sample Condition: Remolded
Water Levels: During Drilling

Depth in feet	Surf. Elev. 14.23 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	13.8			Bituminous Concrete (5")							
	13.4			Graded Aggregate Base Course (5")		S-1	5-6-5-4	0.8			
				Topsoil		S-2	3-3-2-3	0.6			
				FILL: Orange SILT, some sand (SAME)		S-3	2-2-1-1	0.5			
5	7.2			FILL: Orange silt, some sand, lenses of brown silt		S-4	6-2-2-1	0.6			▼
				Gray silty CLAY, some gravel		S-5	1-3-3-3	1.6			
10			CL	Gray / red silty CLAY, some gravel		S-6	1-2-2-1	1.7			
				Gray silty CLAY		S-7	WH/1.0'-2-2	1.9			
15	-0.8			Gray silty CLAY							
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. During drilling, water level at 6.0'. Wet on spoon at 7.0'.
3. Upon completion of boring, installed 2" diameter PVC well with gravel packed screened PVC from 5' to 15', bentonite grout from 0' to 5'.
4. Water level through well at 24 hours at 6.5' below ground surface.

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TEST BORING B-10

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 14, 2014
Date Completed : March 14, 2014
Logged by : GW
Weather :
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 ATV Mounted
Drilling Methods : Rig
Surface Elevation : HSA SPT
: 11.19 feet

Sample Condition: Remolded
Water Levels

Depth in feet	Surf. Elev. 11.19 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				FILL: Brown SILT, trace sand, trace asphalt		S-1	4-4-6	0.6			
				FILL: Brown SILT, trace sand trace asphalt		S-2	4-5-5	0.3			
5	4.9			FILL: possible concrete in upper 1" , transition to gray silty CLAY		S-3	7-4-4	0.7			
			CL	Gray silty CLAY, trace fine sand, trace gravel (marsh desposits)		S-4	2-1-1	1.5			
10											
15	-3.8			Gray silty CLAY, trace fine sand, trace woody fibers (marsh desposits)		S-5	1-2-1	1.5			
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Groundwater not observed during drilling.
3. Borehole backfilled with bentonite grout.

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1-800-441-8355 (Md., Va.)
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WRA
Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY:
WILLIAM P. WARNER
LICENSED
No. 14166
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NTS
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

BORING LOGS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0

COUNTY PROJECT No. 240618

DRAWING C-17

SHEET 21 OF 92

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Apr 14, 2025 - 1:23pm

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

REVISION
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COUNTY PROJECT No.
240618
DRAWING
C-18
SHEET 22 OF 92

TEST BORING B-10

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 14, 2014
Date Completed : March 14, 2014
Logged by : GW
Weather :
Driller/Agency : D. Wilson/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 ATV Mounted
Drilling Methods : Rig
Surface Elevation : HSA SPT
: 11.19 feet

Sample Condition: Remolded
Water Levels

Depth in feet	Surf. Elev. 11.19 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				FILL: Brown SILT, trace sand, trace asphalt	☒	S-1	4-4-6	0.6			
5				FILL: Brown SILT, trace sand trace asphalt	☒	S-2	4-5-5	0.3			
	4.9			FILL: possible concrete in upper 1" , transition to gray silty CLAY	☒	S-3	7-4-4	0.7			
10			CL	Gray silty CLAY, trace fine sand, trace gravel (marsh desposits)	☒	S-4	2-1-1	1.5			
15	-3.8			Gray silty CLAY, trace fine sand, trace woody fibers (marsh desposits)	☒	S-5	1-2-1	1.5			
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Groundwater not observed during drilling.
3. Borehole backfilled with bentonite grout.

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TEST BORING B-11

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 12, 2014
Date Completed : March 12, 2014
Logged by : RM
Weather : Cloudy
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 8.44 feet

Sample Condition: Remolded
Water Levels: During Drilling; 24 hrs

Depth in feet	Surf. Elev. 8.44 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	7.8			Bituminous Concrete pavement (7")							
	7.4			Graded aggregate base course (5")							
				FILL: Gray SILT, some gravel	☒	S-1	2-6-10	0.7			▼
5	3.4			FILL: Gray brown SILT, some gravel	☒	S-2	3-3-5	1.0			
				Gray silty CLAY	☒	S-3	3-2-4	1.4			
10			CL	Gray silty CLAY	☒	S-4	2-3-2	1.5			▼
15	-6.6			Gray silty CLAY	☒	S-5	1-1-2	1.4			
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. During drilling, water level at 10.0'. Wet on spoon at 13.0'.
3. Upon completion caved and dry at 12.5'
4. At 24 hours, water level at 3.4', caved at 9.8'
5. Upon completion, borhole backfilled with bentonite grout and patched at surface with asphalt cold patch

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TEST BORING B-12

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 12, 2014
Date Completed : March 12, 2014
Logged by : RM
Weather : Cloudy
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 7.74 feet

Sample Condition: Remolded
Water Levels

Depth in feet	Surf. Elev. 7.74 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	7.2			Bituminous Concrete pavement (6")							
	6.7			Graded aggregate base course (6")							
				FILL: Gray SILT, some gravel	☒	S-1	7-7-9	0.7			
5	3.7			FILL # 57 stone observed from 3.0' to 4.0'	☒	S-2	20-6-5	0.5			
				Gray silty CLAY	☒	S-3	2-2-2	1.0			
10			CL	Gray silty CLAY	☒	S-4	1-1-1	1.2			
15	-7.3			Gray silty CLAY	☒	S-5	WH/6"-1-1	1.3			
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Groundwater not observed during drilling.
3. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch

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TEST BORING B-12A

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 31, 2014
Date Completed : March 31, 2014
Logged by : RM
Weather : Clear
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 7.74 feet

Sample Condition: Remolded
Water Levels: During Drilling; At completion

Depth in feet	Surf. Elev. 7.74 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0				Augered to 18.5'. (See log for boring B-12 for conditions from 0 - 18'.)							
5											
10											
15											
	-10.8		CL	Gray silty CLAY	☒	S-1	6-5-5	1.0			
20	-13.3										▽
				Orange fine to medium SAND, little gravel	☒	S-2	17-24-17	1.1			
25			SM								
				Yellow fine to medium SAND, little gravel	☒	S-3	27-24-10	0.5			
30	-25.8										
35			SM	Orange/ green Weathered rock	☒	S-4	17-9-10	1.1			
	-31.0			(Spoon refusal, no recovery) Spoon and auger refusal at 38.7'.	▬	S-5	50/0.2	0.0			
40											
45											

NOTES:
1. Boring offset 8' east of boring TB-12. Redrilled to extend boring depth to evaluate depth to rock.
2. Wet on rods at 21.0'. During drilling, water level at 21.9'.
3. Boring terminated at spoon and auger refusal at 38.7'.
4. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch

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TEST BORING B-13

(Page 1 of 1)

CGC GEOSERVICES

New Richardson Park Pump Station
Department of Special Services
New Castle County, Delaware

Whitman Requardt & Associates, LLP

CG.1588.DA

Date Started : March 12, 2014
Date Completed : March 12, 2014
Logged by : RM
Weather : Cloudy
Driller/Agency : W. Proud/CGC Geoservices, LLC

Drilling Equipment : Diedrich D-50 Truck Mount
Drilling Methods : HSA SPT
Surface Elevation : 7.72 feet

Sample Condition: Remolded
Water Levels: 24 hrs

Depth in feet	Surf. Elev. 7.72 ft	GRAPHIC	USCS	DESCRIPTION	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
0	7.2			Bituminous Concrete pavement (6")							
	6.7			Graded aggregate base course (6")							
				FILL: Brown SILT, little sand, trace gravel	☒	S-1	4-4-8	0.9			▼
5				FILL: Gray SILT, some gravel, pieces of wood and brick observed at 3.0'	☒	S-2	7-4-9	1.0			
				FILL: Gray SILT, some gravel, trace wood	☒	S-3	2-5-2	0.6			
10	-0.8			Black silty CLAY, organics (peat)	☒	S-4	1-1-2	1.2			
			CL								
15	-7.3			Black silty CLAY, organics and root fibers (peat)	☒	S-5	1-1-2	1.2			
20											
25											
30											
35											
40											
45											

NOTES:
1. Boring performed at staked location.
2. Groundwater not observed during drilling.
3. At completion, boring caved and dry at 12.8'.
4. At 24 hrs, water level at 3.2', caved at 6.1' .
5. Upon completion, borehole backfilled with bentonite grout and patched at surface with asphalt cold patch

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1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY:
WILLIAM PAUL CRAVER
No. 14169
PROFESSIONAL ENGINEER
DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	NTS
DESIGNED	RD
DRAWN	RD
CHECKED	KAH
DATE	MAR 2025

BORING LOGS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING C-18
SHEET 22 OF 92

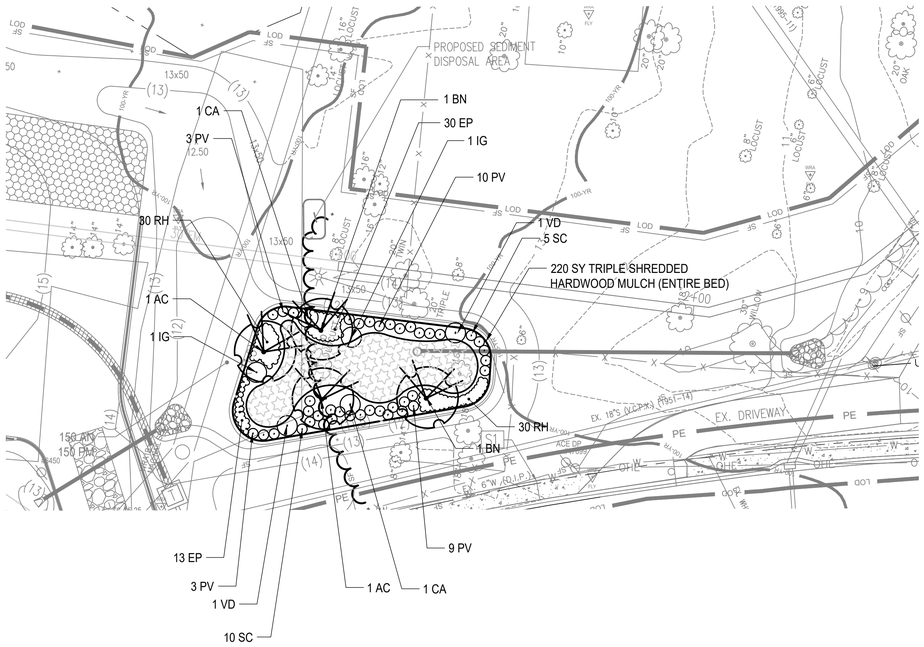
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Apr 14, 2025 - 11:54am

REVISION

COUNTY PROJECT No.
240618

DRAWING

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.



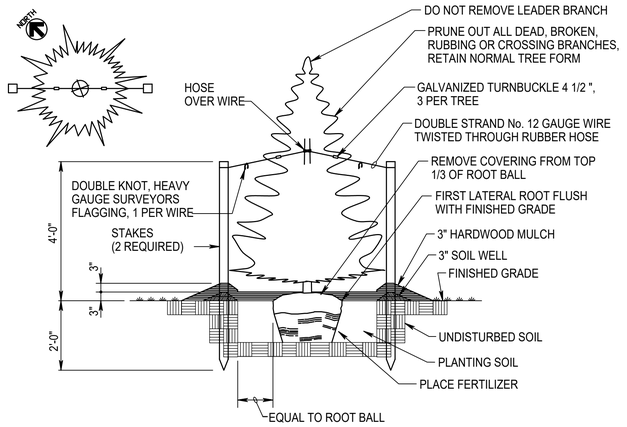
SWM #1 LANDSCAPE PLAN
SCALE: 1" = 20'

SWM #1 LANDSCAPE PLANTING SCHEDULE

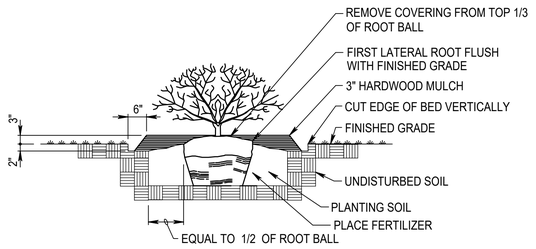
KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	METHOD	COMMENTS
UNDERSTORY TREES						
AC	2	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	2" CAL.	B&B	
BN	2	BETULA NIGRA	RIVER BIRCH	2" CAL.	B&B	MULTI-STEMMED
SHRUBS						
IG	2	ILEX VERTICILLATA	WINTERBERRY	NO. 3	CONTAINER	SPACE 3' O.C.
CA	2	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	NO. 3	CONTAINER	SPACE 3' O.C.
VD	2	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	NO. 5	CONTAINER	SPACE 3' O.C.
PERENNIALS/GRASSES						
AN	150	ASTER NOVAE-ANGELIAE	NEW ENGLAND ASTER	NO. 1	CONTAINER	SPACE 18" O.C., PLANT IN GROUPS OF 50
RH	60	RUDBECKIA HIRTA	BLACK-EYED SUSAN	NO. 2	CONTAINER	SPACE 18" O.C.
SC	15	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	NO. 2	CONTAINER	SPACE 18" O.C.
EP	43	ECHINACEA PURPUREA	PURPLE CONEFLOWER	NO. 2	CONTAINER	SPACE 18" O.C.
PM	150	PHLOX MACULATA	MEADOW PHLOX	NO. 1	CONTAINER	SPACE 18" O.C., PLANT IN GROUPS OF 50
PV	25	PANICUM VIRGATUM	SWITCHGRASS	NO. 3	CONTAINER	SPACE 3' O.C.

LANDSCAPE NOTES

1. CONTRACTOR IS RESPONSIBLE FOR CONTACTING MISS UTILITY PRIOR TO BEGINNING CONSTRUCTION FOR LOCATION OF ALL UTILITY LINES.
2. ALL PLANTS SHALL BE EQUAL TO OR BETTER THAN THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK," LATEST EDITION, AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, AND SHALL BE FIRST QUALITY, SOUND, VIGOROUS, WELL BRANCHED AND WITH HEALTHY, WELL-FURNISHED ROOT SYSTEMS, THEY SHALL BE FREE OF DISEASE, INSECTS, PESTS AND MECHANICAL INJURIES.
3. ALL PLANTS SHALL HAVE BEEN NURSERY GROWN AND SHALL HAVE BEEN GROWN UNDER THE SAME CLIMATIC CONDITIONS AS THE LOCATION OF THIS PROJECT FOR AT LEAST TWO YEARS BEFORE PLANTING. NEITHER HEELED IN PLANTS NOR PLANTS FROM COLD STORAGE WILL BE ACCEPTED.
4. ALL PLANTING OPERATIONS SHALL BE UNDER THE SUPERVISION OF A PERSON WITH KNOWLEDGE AND EXPERIENCE IN PLANT INSTALLATION TECHNIQUES.
5. ALL TREES SHALL BE PLACED IN A SIX FOOT (6') DIAMETER OR A CONTINUOUS SIX FOOT (6') WIDE MULCH BED. ALL SHRUBS SHALL BE PLACED IN A FOUR FOOT (4') DIAMETER OR A CONTINUOUS FOUR FOOT (4') WIDE MULCH BED.
6. NO PLANTS SHALL BE INSTALLED WITHIN TEN FEET (10') OF A FIRE HYDRANT.
7. THIS DRAWING IS FOR LANDSCAPE PURPOSES ONLY. AS-BUILT CONDITIONS MAY VARY. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND UTILITY LOCATIONS SHOWN WITHIN THE PROJECT LIMITS, AND SHALL INFORM THE ENGINEER OF ANY DISCREPANCIES OR POTENTIAL PROBLEMS PRIOR TO COMMENCING WORK.
8. DO NOT PLANT TREES WITHIN 10' OF THE CENTERLINE OF ALL UNDERGROUND AND OVERHEAD UTILITY LINES. "MISS UTILITY" (1-800-282-8555) MUST BE CONTACTED A MINIMUM OF 72 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION FOR PLANT MATERIAL INSTALLATION.
9. LANDSCAPE CONTRACTOR SHALL VERIFY PLANT MATERIAL QUANTITIES SHOWN ON PLANS WITH TOTALS IN PLANT SCHEDULE. WHERE DISCREPANCIES OCCUR BETWEEN THE PLANS AND SCHEDULE, THE PLANS SHALL GOVERN.
10. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR THREE FULL YEARS TO BE IN A HEALTHY GROWING CONDITION. PLANT MATERIALS WHICH DO NOT FULFILL THIS GUARANTEE SHALL BE REPLACED AT NO COST TO THE OWNER. REPLACEMENT SHALL BE GUARANTEED THROUGHOUT THE ORIGINAL GUARANTEE PERIOD. PLANTS THAT DIE WITHIN 30-60 DAYS SHALL BE REPLACED IMMEDIATELY.
11. THE THREE YEAR GUARANTEE PERIOD SHALL BEGIN UPON THE OWNER'S APPROVAL OF THE PLANTING INSTALLATION. THE LANDSCAPE CONTRACTOR SHALL ALSO PROVIDE LANDSCAPE MAINTENANCE DURING THIS PERIOD.
12. THE LANDSCAPE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL WATERING DURING CONSTRUCTION AND DURING THE THREE YEAR MAINTENANCE PERIOD.
13. ALL SUBSTITUTIONS OF PLANT MATERIAL SHALL BE REQUESTED IN WRITING TO THE LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE OWNER. FAILURE TO OBTAIN SUBSTITUTIONS IN WRITING MAY RESULT IN LIABILITY TO THE CONTRACTOR.
14. ALL PLANT MATERIALS, TOPSOIL, MULCH FERTILIZERS, SOIL AMENITIES, PLANTING SUPPLIES AND METHODS SHALL ADHERE TO THE REQUIREMENTS SET FORTH BY SPECIFICATION SECTION "02950 - TREES AND SHRUBS" AND ARE SUBJECT TO LANDSCAPE ARCHITECT'S APPROVAL. REJECTED MATERIAL SHALL BE REMOVED FROM THE SITE WITHOUT DELAY.
15. ALL TREE GUYING AND/OR STAKING MATERIALS SHALL BE REMOVED AT THE EXPIRATION OF THE THREE YEAR MAINTENANCE PERIOD.



PLANTING DETAIL - SHADE TREE/EVERGREEN TREE
NO SCALE



PLANTING DETAIL - SHRUB
NO SCALE

LANDSCAPE LEGEND

PROPOSED	DESCRIPTION
	UNDERSTORY TREE
	EVERGREEN TREE
	LARGE DECIDUOUS SHRUB
	MEDIUM DECIDUOUS SHRUB
	SMALL PERENNIAL GROUP
	PERENNIAL/GRASS MASS

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MISS UTILITY of DELMARVA
BEFORE YOU DIG CALL 1-800-282-8555 (In Del.) 1-800-441-8555 (Md., Va.) PROTECT YOURSELF, GIVE TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY: MICHAEL J. CAMPBELL No. ST-0000421 STATE OF DELAWARE REGISTERED LANDSCAPE ARCHITECT 04/15/2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	AS SHOWN
DESIGNED	MJC
DRAWN	MJC
CHECKED	WPW
DATE	MAR 2025

SWM LANDSCAPE PLAN NOTES AND DETAILS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

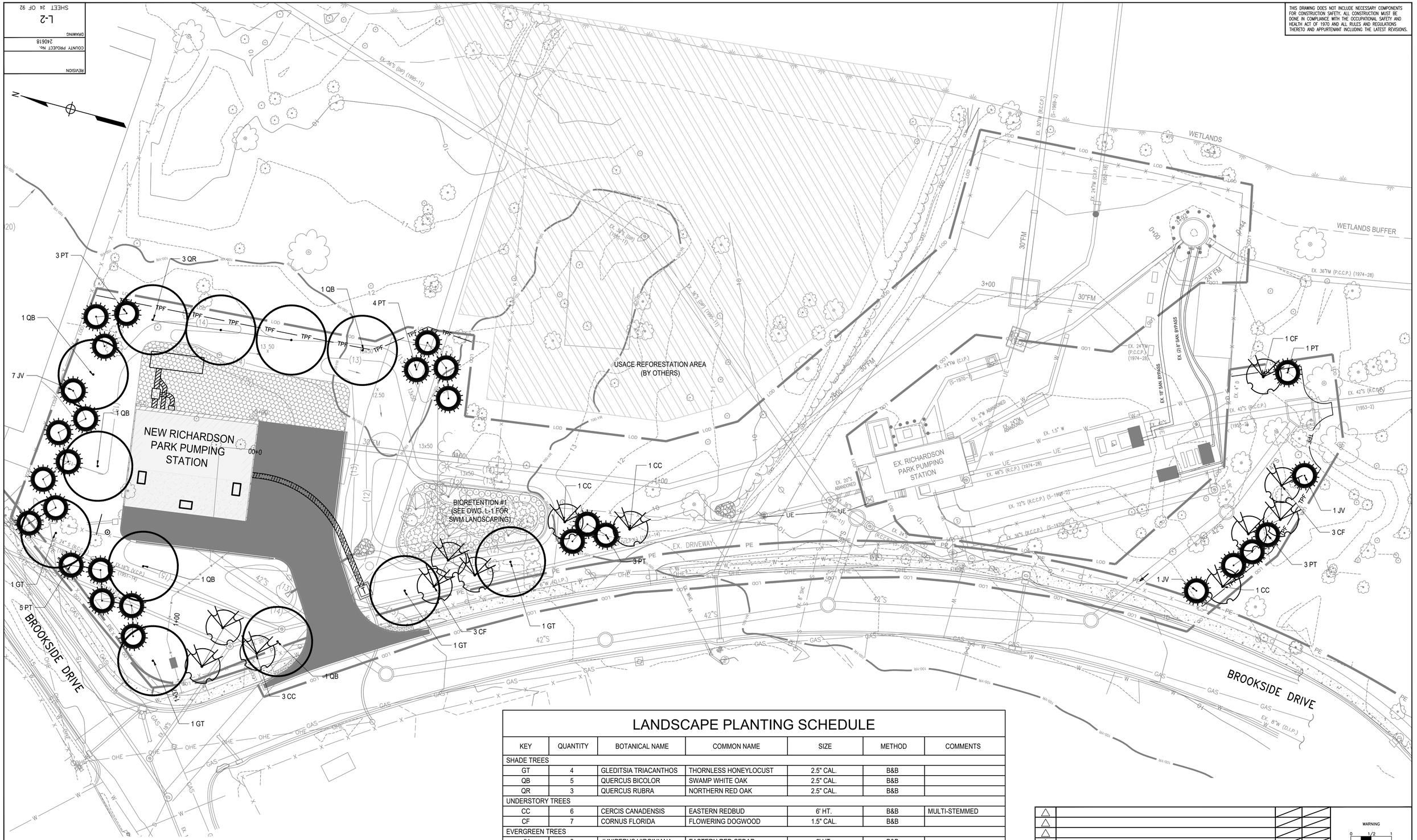
DRAWING L-1

SHEET 23 OF 92

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Apr 14, 2025 - 11:15am

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

REVISION	COUNTY PROJECT No.	DRAWING	SHEET
	240618	L-2	SHEET 24 OF 92


NEW RICHARDSON PARK PUMPING STATION
EX. RICHARDSON PARK PUMPING STATION
USACE REFORESTATION AREA (BY OTHERS)
BIORETENTION #1 (SEE DWG. L-1 FOR SWM LANDSCAPING)
BROOKSIDE DRIVE
BROOKSIDE DRIVE
WETLANDS
WETLANDS BUFFER
EX. DRIVEWAY
3 PT
3 QR
1 QB
4 PT
1 QB
7 JV
1 QB
1 GT
5 PT
1 QB
3 CC
1 GT
1 CC
1 CC
3 CF
1 GT
3 PT
1 CF
1 PT
1 JV
3 CF
3 PT
1 JV
1 CC
1 GT
EX. 30"S (DIP) (1995-11)
EX. 30"M (R.C.C.P.) (S-1959-2)
EX. 24"M (C.I.P.) (1957-18)
EX. 36"S (DIP) (1995-11)
EX. 36"M (P.C.C.P.) (1974-28)
EX. 24"M (P.C.C.P.) (1974-28)
EX. 18" SAN. BYPASS
EX. 42"S (R.C.C.P.) (1953-2)
EX. 4"D
EX. 42"S (R.C.C.P.) (1953-2)
EX. 2"W ABANDONED
EX. 1.5" W
EX. 48"S (R.C.P.) (1974-28)
EX. 72"S (R.C.C.P.) (S-1968-2)
EX. 36"S (R.C.C.P.) (S-1970-2)
EX. 8"W (D.I.P.)
EX. 24"S (R.C.P.) (1974-28)
EX. 20"S ABANDONED (1957-18)
EX. 24"M (C.I.P.) (S-1970-2)
EX. 24"S (R.C.P.) (1974-28)
EX. 18"S (V.C.P.) (1957-18)
EX. 24"S (R.C.P.) (1974-28)
EX. 42"S (R.C.P.) (1974-28)
EX. 8"W (D.I.P.)
EX. 6"W (D.I.P.)
EX. 12"W (D.I.P.)
EX. 8"W (D.I.P.)
EX. 6"W (D.I.P.)
EX. 8

GENERAL STRUCTURAL NOTES

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.

GENERAL:

1. FIELD VERIFY ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN ON CONTRACT DRAWINGS FOR EXISTING STRUCTURES. NOTIFY THE ENGINEER OF ALL DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
2. THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT-RELATED FLOOR AND WALL OPENINGS, ARE DEPENDENT ON THE ACTUAL EQUIPMENT FURNISHED. VERIFY AND COORDINATE ALL SUCH ITEMS. DO NOT ALTER DIMENSIONS ON THESE DRAWINGS WITHOUT APPROVAL OF THE ENGINEER. STRUCTURAL DRAWINGS MAY NOT SHOW ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS REQUIRED. REFER TO CIVIL, MECHANICAL AND PHASING DRAWINGS.
3. LOCATIONS OF BORINGS AND BORING LOGS ARE INCLUDED IN SPECIFICATIONS AND CIVIL DRAWINGS.
4. COORDINATE ALL ACTIVITIES, INCLUDING THOSE OF SUBCONTRACTORS, WITH THE OWNER'S ACTIVITIES.

FOUNDATION:

1. FOUNDATIONS SHALL BEAR UPON SOIL OR ENGINEERED FILL WITH A MINIMUM ALLOWABLE BEARING CAPACITY OF 3000 PSF. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF DELAWARE WHO IS RESPONSIBLE FOR VERIFICATION OF THE SPECIFIED MINIMUM ALLOWABLE BEARING CAPACITY.
2. BEFORE PLACING CONCRETE ON EXCAVATED STRATUM, THE BEARING SURFACE SHALL BE THOROUGHLY CLEANED OF MUCK AND DEBRIS AND KEPT DRY.
3. A MINIMUM 2" THICKNESS MUD MAT WITH A COMPRESSIVE STRENGTH OF f'c= 2500 PSI SHALL BE POURED WITHIN 12 HOURS OF BEARING SURFACE EXPOSURE AND APPROVAL OF BEARING CAPACITY BY CONTRACTOR'S GEOTECHNICAL ENGINEER. ANY BEARING SURFACE NOT PROTECTED WITHIN THE PRESCRIBED TIME SHALL BE RE-INSPECTED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER BEFORE CONCRETE PLACEMENT. FILL ALL OVER-EXCAVATED AREAS WITH CONCRETE TO ACHIEVE THE MINIMUM MUD MAT.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUPPORT FOR ALL EXCAVATIONS REQUIRED TO COMPLETE THE WORK SHOWN ON THE DRAWINGS. SUPPORT OF EXCAVATION SYSTEMS SHALL BE DESIGNED BY THE CONTRACTOR'S PROFESSIONAL ENGINEER.
5. DO NOT PLACE BACKFILL AGAINST SUBSTRUCTURE WALLS UNTIL UPPER BRACING FLOORS ARE IN PLACE FOR A MINIMUM OF SEVEN DAYS.

CONCRETE:

1. PROVIDE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS FOR THE VALVE VAULT STRUCTURE, 4500 PSI AT 28 DAYS FOR OTHER STRUCTURAL CONCRETE, AND 3,000 PSI FOR FILL CONCRETE.
2. DETAIL AND CONSTRUCT REINFORCED CONCRETE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE."
3. DETAIL REINFORCING STEEL IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" AND ACI SP-66, "ACI DETAILING MANUAL."
4. PROVIDE REINFORCEMENT CONFORMING TO ASTM A 615, GRADE 60, DEFORMED BARS. PROVIDE ASTM A706, GRADE 60 DEFORMED BARS FOR WELDED REINFORCEMENT.
5. PROVIDE WELDED WIRE FABRIC CONFORMING TO ASTM A 1064.
6. UNLESS NOTED OTHERWISE ON THE DRAWINGS, PROVIDE CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS:
   A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH OR OPEN GRADED COARSE AGGREGATE: 3"
   B. BEAMS, SLABS, COLUMNS AND WALLS EXPOSED TO GROUND, WEATHER, PROCESS LIQUID OR VAPORS AFTER REMOVAL OF FORMS: 2"
   C. BEAMS, COLUMNS, WALLS AND PIERS NOT EXPOSED TO WEATHER OR PROCESS LIQUID OR VAPORS: 1-1/2"
   D. STRUCTURAL SLABS NOT EXPOSED TO GROUND, WEATHER, PROCESS LIQUID, VAPORS OR TRUCK TRAFFIC: 1"
   E. STRUCTURAL SLABS NOT EXPOSED TO GROUND, WEATHER, PROCESS LIQUID OR VAPORS, BUT SUBJECT TO TRUCK TRAFFIC: TOP OF SLAB: 1-1/2" BOTTOM OF SLAB: 1"
7. SUBMIT REINFORCING STEEL DETAILS (SHOP DRAWINGS) AND RECEIVE APPROVAL BEFORE PROCEEDING WITH FABRICATION.
8. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" UNLESS OTHERWISE NOTED.
9. DETAIL ALL SPLICES FOR REINFORCING BARS NOT DIMENSIONED ON THE DRAWINGS AS TABULATED ON SHEET S-2.
10. POUR CONCRETE SLABS AND WALLS BETWEEN INDICATED JOINTS, ALLOWING A MINIMUM ELAPSED PERIOD OF 48 HOURS BETWEEN ADJACENT POURS.
11. PROVIDE JOINTS AS DETAILED ON THE DRAWINGS. NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED EXCEPT BY WRITTEN AUTHORIZATION FROM THE ENGINEER. APPROVED ADDITIONAL JOINTS SHALL NOT RESULT IN ADDITIONAL EXPENSE TO THE OWNER.

CONCRETE (CONTINUED):

12. WHERE A BEAM FRAMES INTO A WALL, IF A CONSTRUCTION JOINT IS NOT INDICATED AT THE BOTTOM OF THE BEAM, PROVIDE A POCKET IN THE WALL FOR BEAM BEARING. THE POCKET SHALL BE ACCORDING TO TYPICAL DETAILS.
13. MECHANICAL REINFORCEMENT COUPLERS SHALL BE COLD SWAGED, TAPER THREADED, TENSION-COMPRESSION TYPE. MECHANICAL COUPLERS SHALL DEVELOP 125% OF THE REINFORCEMENT YIELD CAPACITY IN TENSION AND COMPRESSION.
14. ROUGHEN THE SURFACE OF HORIZONTAL CONSTRUCTION JOINTS PRIOR TO THE SET OF CONCRETE TO A MINIMUM AMPLITUDE OF 1/4 ".
15. WHERE A SLAB IS SLOPED (TOP AND/OR BOTTOM), PROVIDE SLOPED REINFORCING PARALLEL TO THE SLOPING CONCRETE SURFACE.
16. PROVIDE 3/8" THICK PVC, 6" WIDE WATER STOP OF THE TWO-BULB TYPE AS SHOWN ON THE DRAWINGS.
17. SIZE AND LOCATE ANCHOR BOLTS AND EQUIPMENT PADS OR PEDESTALS TO SUIT EQUIPMENT FURNISHED.
18. REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS AND EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUIT, ETC. THAT WILL BE INCORPORATED INTO CONCRETE WORK.
19. PROVIDE BLINDSIDE WATERPROOFING BELOW MAT SLAB AND SELF-ADHERING SHEET WATERPROOFING AT ALL BELOW-GRADE EXTERIOR WALLS.
20. DO NOT DAMAGE EXISTING REINFORCING STEEL IN THE EXISTING CONCRETE WHEN CORING FOR PENETRATIONS. PRIOR TO CORING EXISTING CONCRETE, DETERMINE THE LOCATION OF EXISTING REINFORCING STEEL BY NON-DESTRUCTIVE MEANS AND NOTIFY THE ENGINEER OF ANY CONFLICTS PRIOR TO CORING.

STRUCTURAL STEEL:

1. FABRICATE AND ERECT STRUCTURAL STEEL CONFORMING TO THE REQUIREMENTS OF AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), "STEEL CONSTRUCTION MANUAL - 14 TH EDITION."
2. SUBMIT ERECTION PLANS AND SHOP DETAILS AND RECEIVE APPROVAL FROM THE ENGINEER BEFORE PROCEEDING WITH FABRICATION.
3. PROVIDE STRUCTURAL STEEL WIDE-FLANGE SHAPES CONFIRMING TO ASTM A992 AND ALL OTHER MEMBERS CONFORMING TO ASTM A36 UNLESS OTHERWISE NOTED.
4. HOT DIP GALVANIZE ALL STEEL SHAPES, PLATES, BARS, ETC. IN ACCORDANCE WITH ASTM A123. AND ALL STEEL HARDWARE IN ACCORDANCE WITH ASTM A153.
5. FIELD MODIFICATION OF THE STRUCTURAL STEEL IS NOT PERMITTED WITHOUT APPROVAL FROM THE ENGINEER.
6. PROVIDE HIGH STRENGTH BOLTS CONFORMING TO ASTM F3125, GRADE A325.
7. WELD IN COMPLIANCE WITH AMERICAN WELDING SOCIETY, AWS D1.1 "STRUCTURAL WELDING CODE."
8. WELD WITH CLASS E-70 SERIES ELECTRODES.
9. REPAIR ANY GALVANIZED AREAS THAT ARE DAMAGED FOR ANY REASON AFTER HOT DIPPING (FROM WELDING, ROUGH HANDLING, ETC.) IN ACCORDANCE WITH ASTM A780.

STEEL JOIST:

1. SUBMIT ERECTION PLANS, DETAILS, AND A SIGNED AND SEALED DESIGN CALCULATION PACKAGE AND RECEIVE APPROVAL BEFORE PROCEEDING WITH CUSTOM, NON-STANDARD GABLED ROOF JOIST FABRICATION.
2. DESIGN GABLE PROFILE JOISTS TO SUPPORT THE LOADS INDICATED ON THE JOIST LOADING DIAGRAMS INCLUDED IN THESE DRAWINGS. ALL LOADS ARE UNFACTORED. THESE JOISTS MUST BE DESIGNED BY THE JOIST MANUFACTURER'S ENGINEER. SUBMIT CALCULATIONS FOR APPROVAL, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF DELAWARE.
3. JOIST BRIDGING IS SHOWN SCHEMATICALLY. CONTRACTOR MUST COORDINATE REQUIRED JOIST BRIDGING WITH THE MANUFACTURER. BRIDGING MUST SUPPORT THE TOP AND BOTTOM JOIST CHORDS AGAINST LATERAL MOVEMENT DURING CONSTRUCTION AND DESIGN LOADS. BRIDGING MUST BE DESIGNED BY THE MANUFACTURER'S ENGINEER.
4. JOIST DEFLECTION MUST NOT EXCEED L/360 FOR LIVE LOAD AND L/240 FOR COMBINED DEAD AND LIVE LOAD.

ALUMINUM:

1. FABRICATE ALL STRUCTURAL ALUMINUM IN ACCORDANCE WITH THE SPECIFICATIONS OF THE ALUMINUM ASSOCIATION.
2. PROVIDE ALLOY 6061-T6 STRUCTURAL ALUMINUM.
3. COAT ALL ALUMINUM IN CONTACT WITH CONCRETE AND OTHER DISSIMILAR METALS WITH BITUMINOUS PAINT ON THE CONTACT SURFACE.
4. USE TYPE 316 STAINLESS STEEL CONNECTION BOLTS FOR CONNECTING ALUMINUM MEMBERS.

POST-INSTALLED ANCHORS:

1. POST-INSTALLED ANCHORS MUST BE AN ADHESIVE ANCHOR SYSTEM THAT CONFORMS TO THE REQUIREMENTS OF THE MOST RECENTLY PUBLISHED ACI 355.4 "ACCEPTANCE CRITERIA FOR QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE AND COMMENTARY." EACH ADHESIVE ANCHOR SYSTEM MUST SATISFY THE STRENGTH REQUIREMENTS FOR ITS USE. BULK-MIXED ADHESIVES ARE NOT PERMITTED. ADHESIVE ANCHORAGE DESIGN IS IN ACCORDANCE WITH ACI 318-14. ADHESIVE ANCHORS IN CONCRETE MUST BE QUALIFIED FOR USE IN CRACKED CONCRETE IN ACCORDANCE WITH ACI 355.4. PROVIDE THE FOLLOWING ANCHOR SYSTEMS, OR APPROVED EQUALS:
   A. ANCHORAGE TO CONCRETE: HILTI HIT-RE 500
2. PROVIDE TYPE 316 STAINLESS STEEL ANCHORS.
3. CONCRETE AT THE TIME OF ADHESIVE ANCHOR INSTALLATION MUST HAVE A MINIMUM AGE OF 21 DAYS.
4. INSTALL ANCHORS WITH A MINIMUM DISTANCE OF 3 INCHES TO ANY FREE EDGE OF CONCRETE, OR EDGE DISTANCE INDICATED ON DRAWINGS, WHICHEVER IS GREATER.
5. INSTALL ADHESIVE ANCHORS WITH TRAINED QUALIFIED PERSONNEL, IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
6. ANCHOR HOLES MUST BE THOROUGHLY CLEANED PRIOR TO ADHESIVE INJECTION, AS REQUIRED BY THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. PROTECT CLEAN HOLES FROM CONTAMINATION UNTIL ADHESIVE IS INSTALLED.
7. PROVIDE ANCHORS CLEAN, OIL-FREE AND FREE OF LOOSE RUST, PAINT, OR OTHER COATINGS.
8. SECURELY FIX ANCHORS IN PLACE TO PREVENT DISPLACEMENT WHILE THE ADHESIVE CURES.
9. ARRANGE FOR AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR THEIR ANCHORING PRODUCTS SPECIFIED. THE ENGINEER MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO INSTALLING ANY ANCHORS.
10. PERSONNEL INSTALLING HORIZONTAL OR OVERHEAD ANCHORS MUST BE QUALIFIED PER THE SPECIFICATIONS.
11. DO NOT DAMAGE EXISTING REINFORCING STEEL IN THE CONCRETE DURING ANCHOR INSTALLATION. PRIOR TO ANCHOR INSTALLATION, DETERMINE THE LOCATION OF EXISTING REINFORCING STEEL BY NON-DESTRUCTIVE MEANS AND NOTIFY THE ENGINEER OF ANY CONFLICTS PRIOR TO DRILLING.

PRECAST CONCRETE ROOF DECK:

1. PROVIDE PRECAST CONCRETE ROOF DECK CONSISTING OF LIGHTWEIGHT CONCRETE CAST INTO A GALVANIZED STEEL FRAME OF TONGUE AND GROOVE CONFIGURATION ON ALL SIDES TO FORM INDIVIDUAL PLANKS THAT ARE 2" THICK, 1'-3" OR 1'-6" WIDE, AND 10'-0" LONG.
2. SELF-WEIGHT OF PLANKS MUST NOT EXCEED 12 PSF UNLESS APPROVED BY ENGINEER.
3. ROOF DECK PLANKS MUST BE ADEQUATELY REINFORCED WITH GALVANIZED STEEL REINFORCING MESH TO RESIST AN UNFACTORED UNIFORM LOAD OF 150 PSF OVER A 6 FOOT SPAN AS INDICATED IN THE MANUFACTURER'S LOAD TABLE.
4. SUBMIT SHOP DRAWINGS AND ERECTION PLANS AND RECEIVE APPROVAL FROM THE ENGINEER BEFORE PROCEEDING WITH FABRICATION AND ERECTION.
5. INSTALL PRECAST PLANKS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ATTACHMENT TO THE SUPPORTING STRUCTURE MUST CONSIST OF WELDING THE LEADING EDGE OF EACH PLANK TO EACH SUPPORT USING 1/4" FILLET WELD WITH MINIMUM OF 1-INCH OF WELD AT EACH SUPPORT. REPAIR GALVANIZED SURFACES USING APPROVED MEANS AT LOCATION OF ALL WELDS.

METAL GRATING:

1. FABRICATE ALL GRATING IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM), "METAL BAR GRATING MANUAL " (ANSI/NAAMM MBG 531-17).
2. PROVIDE SWAGED ALUMINUM, ALLOY 6063-T6, GRATING CONFORMING TO ASTM B221.
3. PROVIDE GRATING DEPTH AND SECTION PROPERTIES AS INDICATED ON THE DRAWINGS.
4. PROVIDE SERRATED GRATING AT EXTERIOR LOCATIONS AND ABOVE SUMP PITS.
5. BAND OUTSIDE EDGES OF GRATING AND OPENINGS IN GRATING USING BARS OF THE SAME DEPTH AS THE BEARING BARS.

CONCRETE MASONRY:

1. CONSTRUCT MASONRY IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI-530/ ASCE 5/ TMS 402, (2013) "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES " AND ACI 530.1/ ASCE 6/ TMS 602 (2013) "SPECIFICATION FOR MASONRY STRUCTURES ".
2. PROVIDE HOLLOW LIGHTWEIGHT LOAD-BEARING CONCRETE MASONRY UNITS MEETING THE REQUIREMENTS OF ASTM C90.
3. PROVIDE MORTAR CONFORMING TO THE REQUIREMENTS OF ASTM C-270, TYPE M OR S . CEMENT USED FOR MORTAR MUST BE PORTLAND CEMENT.
4. PROVIDE GROUT CONFORMING TO THE REQUIREMENTS OF ASTM C476 COARSE OR FINE GROUT, WITH A MINIMUM COMPRESSIVE STRENGTH EQUAL TO OR GREATER THAN THE SPECIFIED COMPRESSIVE STRENGTH OF MASONRY (F'm) BUT NOT LESS THAN 2,000 PSI AT 28 DAYS.
5. PROVIDE CONCRETE MASONRY WITH A MINIMUM COMPRESSIVE STRENGTH (F'm) OF 2,000 PSI. PROVIDE CONCRETE MASONRY UNITS WITH A SPECIFIED MINIMUM NET AREA COMPRESSIVE STRENGTH OF 2,000 PSI .
6. PROVIDE REINFORCING STEEL CONFORMING TO ASTM A615, GRADE 60, DEFORMED BARS. REINFORCING STEEL REQUIRING WELDABILITY MUST CONFORM TO ASTM A706, GRADE 60, DEFORMED BARS.
7. FULLY GROUT CELLS CONTAINING REINFORCING STEEL OR CELLS IN CONTACT WITH EARTH OR FILL.
8. LAY MASONRY IN RUNNING BOND AND INTERLOCK MASONRY AT WALL INTERSECTIONS, UNLESS OTHERWISE NOTED.
9. REINFORCE MORTAR JOINTS OF MASONRY WALLS WITH HORIZONTAL JOINT REINFORCING AT 16 " ON CENTER MAXIMUM. PROVIDE 9 GAUGE LADDER-TYPE HORIZONTAL JOINT REINFORCING CONFORMING TO ASTM A951.
10. PROVIDE CONTINUOUS BOND BEAMS AT THE TOP OF WALLS, AT BEARING ELEVATIONS, AND AT OTHER LOCATIONS SPECIFIED ON THE DRAWINGS.

CRANE RAILS:

1. CRANE RAILS MUST BE STRAIGHT, PARALLEL, LEVEL, AT THE SAME ELEVATION AND AT THE SPECIFIED CENTER TO CENTER DISTANCE, WITHIN THE TOLERANCES GIVEN IN THE CRANE MANUFACTURERS ASSOCIATION OF AMERICA SPECIFICATION 70 (2015).
2. HORIZONTAL RAIL SEPARATION AT JOINTS MUST NOT EXCEED 1/16 INCH. RAIL JOINTS MUST BE GROUND FLUSH AS NECESSARY TO PROVIDE A SMOOTH TRANSITION FROM EACH RAIL SEGMENT TO THE NEXT.
3. FIXED CRANE RAIL CLAMPS MUST BE PROVIDED WITH A MAXIMUM SPACING OF 3'-0" ON CENTER AND TWO BOLTS PER CLAMP AND MUST BE DESIGNED FOR A LATERAL LOAD OF 5 KIPS PER FOOT.
4. PROVIDE WELDED CRANE RAIL SPLICES. LOCATE SPLICES SO THEY ARE NOT WITHIN 3'-0" OF THE CRANE RUNWAY GIRDER JOINTS AND STAGGER SPLICES AT LEAST ONE FOOT SO THAT SPLICES ON PARALLEL CRANE RAILS DO NOT ALIGN.

CODES AND STANDARDS:

1. INTERNATIONAL BUILDING CODE IBC (2021) INCLUDING THE MODIFICATIONS MADE BY LOCAL JURISDICTION.
2. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC 360) (2016) "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
3. AMERICAN CONCRETE INSTITUTE ACI-318 (2019), "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
4. AMERICAN CONCRETE INSTITUTE ACI-350 (2006), "ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."
5. THE MASONRY SOCIETY TMS 402, (2016) "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES."
6. ALUMINUM ASSOCIATION "ALUMINUM DESIGN MANUAL" (2020).
7. AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE 7 (2016), " MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES"
8. AMERICAN WELDING SOCIETY AWS D1.1 (2020), "STRUCTURAL WELDING CODE -STEEL."

PRECAST HOLLOW CORE PLANKS:

1. PROVIDE PRECAST STRUCTURAL HOLLOW CORE PLANKS CAPABLE OFF WITHSTANDING THE FOLLOW DESIGN LOADS FOR CONDITIONS INDICATED ON THE DRAWINGS:
   A. SUPERIMPOSED DEAD LOAD: 20 PSF
   B. LIVE LOAD: 60 PSF

DESIGN LOADS:

ALL LOADS INDICATED BELOW ARE UNFACTORED

1. BUILDING OCCUPANCY CATEGORY: III
2. DEAD LOADS:
   A. STRUCTURES: ACTUAL WEIGHT
   B. WEIGHT OF SOIL - 100 PCF FOR RESISTING UPLIFT
   C. WEIGHT OF SOIL - 120 PCF FOR DEAD LOAD
   D. HANGING MEP: 5 PSF
3. LIVE LOADS:
   A. FLOORS - 250 PSF IN AREAS NOT OCCUPIED BY EQUIPMENT OR TRUCK LOADING.
   B. EQUIPMENT - ACTUAL WEIGHT OF EQUIPMENT OR 250 PSF, WHICHEVER IS GREATER.
   C. STAIRS: 100 PSF
   D. PLATFORMS: 60 PSF
   E. HANDRAIL - 200 LBS AT EACH POST OR 50 PLF ALONG THE TOP RAIL, WHICHEVER IS GREATER.
   F. TRUCK: H-20 AASHTO LOADING AT GRADE LEVEL ONLY.
4. ROOF LIVE LOAD: 20 PSF
5. ROOF SNOW LOAD:
   A. GROUND SNOW LOAD (Pg): 25 PSF.
   B. EXPOSURE FACTOR (Ce): 1.0
   C. THERMAL FACTOR (Ct): 1.1
   D. SNOW LOAD IMPORTANCE FACTOR (I): 1.1
   E. FLAT ROOF LOAD (Pf): 0.7 (Is) (Ce) (Ct) (Pg) : 21.2 PSF
   F. BALANCED SLOPED ROOF LOAD: 18.2 PSF
   G. ADDITIONAL SNOW LOAD DUE TO SNOW DRIFT AND SLIDING SNOW PER ASCE 7-16 HAS BEEN CONSIDERED WHERE APPLICABLE.
6. WIND LOAD:
   A. ULTIMATE WIND SPEED (Vult) : 124 MPH
   B. NOMINAL WIND SPEED (Vasd): 96 MPH
   B. EXPOSURE CATEGORY: B
   C. INTERNAL PRESSURE COEFFICIENT: +/- 0.55
   D. COMPONENTS AND CLADDING: PER ASCE 7-16
7. SEISMIC LOAD:
   A. MAXIMUM EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS: Ss=0.179g
   B. MAXIMUM EARTHQUAKE SPECTRAL ACCELERATION AT ONE-SECOND: S1=0.046g
   C. SITE CLASSIFICATION: D
   D. SITE SEISMIC COEFFICIENT: Fa=1.6; Fv=2.4
   E. SPECTRAL RESPONSE COEFFICIENT: SDS = 0.190; SD1 = 0.074
   F. SEISMIC DESIGN CATEGORY: B
   G. SEISMIC IMPORTANCE FACTOR (I): 1.25
   H. BASIC SEISMIC FORCE RESISTING SYSTEM: MOMENT RESISTING FRAME SYSTEMS - ORDINARY REINFORCED CONCRETE MOMENT FRAMES
      RESPONSE MODIFICATION FACTOR (R): SUPERSTRUCTURE 3.0
      SYSTEM OVERSTRENGTH FACTOR (Ω): 3.0
      DEFLECTION AMPLIFICATION FACTOR (Cd): 2.5
   I. ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE.
8. BRIDGE CRANE LOADS:
   A. CRANE CAPACITY: 5 TON
   B. MAXIMUM WHEEL LOAD: 5.95 KIP; 2 WHEELS SPACED AT 5'-0" APART
   C. VERTICAL IMPACT FORCE: 0.60 KIP
   D. LONGITUDINAL FORCE: 0.60 KIP
   E. LATERAL FORCE: 0.60 KIP
9. FOR JUNCTION CHAMBER AND VALVE VAULT FLOTATION CALCULATIONS, GROUND WATER TABLE ELEVATION IS ASSUMED AT GRADE. A SAFETY FACTOR AGAINST FLOTATION OF 1.2 IS MAINTAINED.

DELEGATED DESIGN:

1. COORDINATE WITH THE CONTRACT DOCUMENTS FOR PROFESSIONAL LICENSURE AND SEALING REQUIREMENTS, DESIGN CRITERIA, DETAILS OF THE SYSTEMS AND COMPONENTS, SUBMITTAL REQUIREMENTS, AND CALCULATION REQUIREMENTS.
2. DESIGN RESPONSIBILITY FOR THE FOLLOWING ENGINEERED SYSTEMS AND COMPONENTS IS DELEGATED TO A QUALIFIED PROFESSIONAL ENGINEER, SELECTED AND HIRED BY THE CONTRACTOR. THESE SYSTEMS AND COMPONENTS INCLUDE, BUT ARE NOT LIMITED TO:
   A. LADDERS.
   B. GUARDRAIL AND HANDRAIL.
   C. TEMPORARY SUPPORT OF EXCAVATION AND STRUCTURES.
   D. DEWATERING.
   E. CONCRETE FORMWORK AND SHORING.
   F. NON-STANDARD GABLED JOISTS.
   G. PRECAST HOLLOW CORE PLANKS.
   H. MANUFACTURERED PIPE SUPPORTS AND HANGERS. REFER TO M-2.

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN DALEY No. 24091 DELAWARE PROFESSIONAL ENGINEER 3/24/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

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DATE	MAR 2025

GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING S-1
SHEET 25 OF 92

3/21/2025 4:12:07 PM

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.

LAP SPLICE LENGTH					MINIMUM TENSION EMBEDMENT			
BAR SIZE	SLAB AND WALL		BEAM		STD 90 HOOK		STD 180 HOOK	
ENGLISH	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	ldh	12db	ldh	4db
#3	12"	14"	12"	14"	6"	5"	6"	3"
#4	14"	19"	18"	23"	7"	6"	7"	3"
#5	18"	23"	26"	34"	8"	8"	8"	3"
#6	21"	28"	35"	46"	10"	9"	10"	3"
#7	35"	45"	51"	67"	11"	11"	11"	4"
#8	44"	57"	59"	76"	13"	12"	13"	4"
#9	54"	70"	66"	86"	15"	14"	15"	5"
#10	66"	86"	74"	96"	16"	16"	16"	6"
#11	79"	103"	82"	107"	18"	17"	18"	6"

ASSUMPTIONS:

CONCRETE: 4500 PSI COMPRESSIVE STRENGTH (NORMAL WEIGHT CONCRETE), CLASS B LAP SLICES

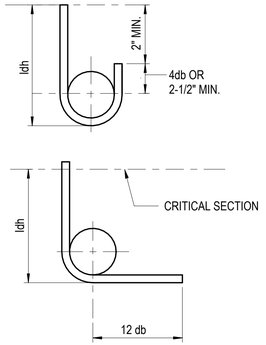
SLAB AND WALL: 6" MINIMUM REBAR SPACING WITH CONCRETE COVER = 1.5" CLEAR

BEAM: MINIMUM CLEAR SPACING BETWEEN BARS = 1.5db (BAR DIAMETER). MINIMUM CONCRETE COVER = 1.5" CLEAR. MINIMUM STIRRUP #4@12" PROVIDED.

TOP BAR: TOP BAR FOR SLAB AND BEAM SHALL BE DEFINED AS REINFORCEMENT SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST BELOW THE SPLICE

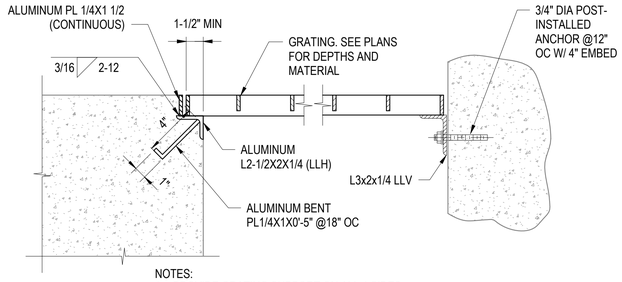
CONCRETE TENSION LAP SPLICE AND STANDARD HOOK LENGTH

(NON-EPOXY COATED)



STANDARD HOOKS:
SIDE COVER MORE THAN 2.5"
END COVER ON 90 DEGREE HOOK SHALL NOT BE LESS THAN 2"

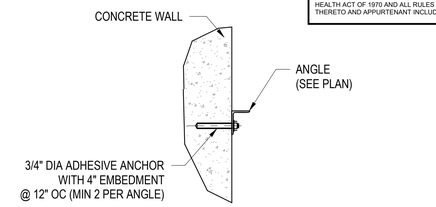
STANDARD 180 AND 90 END HOOKS



NOTES:
1. PROVIDE GRATING SUPPORT ON ALL 4 SIDES.
2. MITER, WELD, AND GRIND SMOOTH ANGLES AT ALL CORNERS.

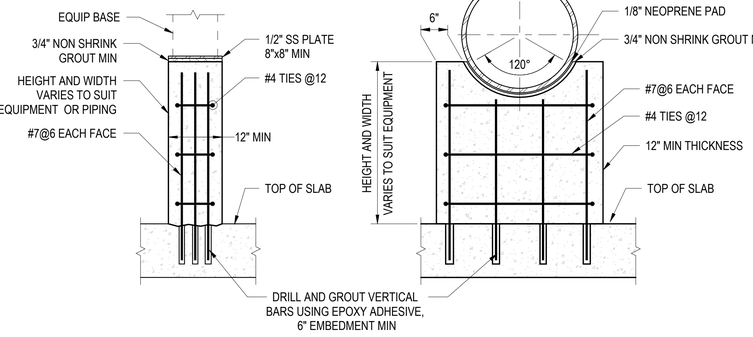
TYPICAL EDGE ANGLE DETAIL

NOT TO SCALE



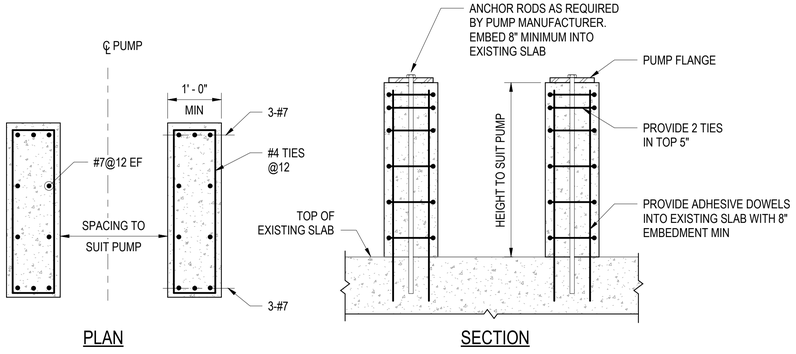
ANGLE CONNECTION TO WALL

NOT TO SCALE



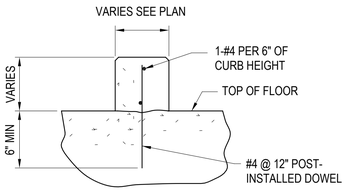
TYPICAL PIPE AND VALVE PEDESTAL DETAIL

NOT TO SCALE



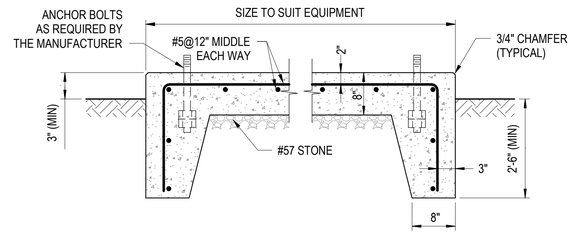
TYPICAL PUMP PEDESTAL DETAIL

NOT TO SCALE



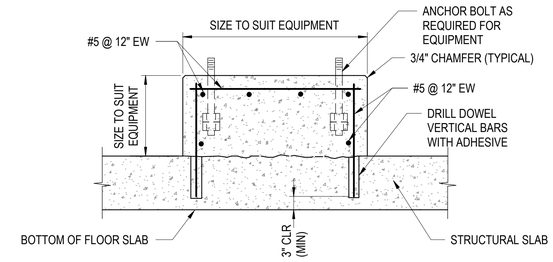
TYPICAL CONCRETE CURB

NOT TO SCALE



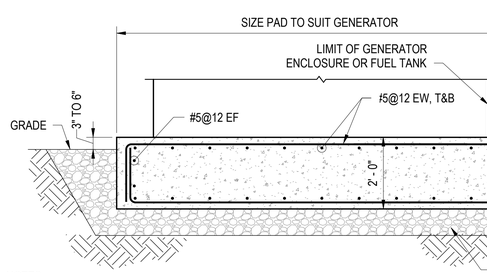
TYPICAL EXTERIOR EQUIPMENT PAD SUPPORT DETAIL

NOT TO SCALE



TYPICAL EQUIPMENT SUPPORT

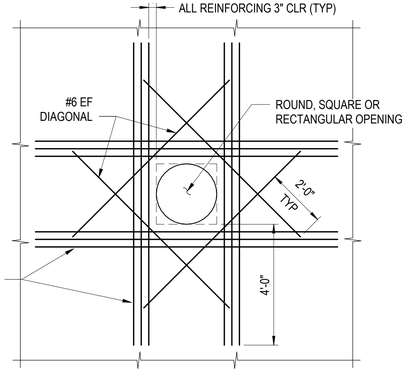
NOT TO SCALE



NOTES:
1. EXCAVATE TO THE LIMITS SHOWN HEREIN OR AS DIRECTED BY THE ENGINEER, AND BACKFILL WITH DENSE GRADED AGGREGATE BASE (DELDOT GABC STONE) TO THE BOTTOM OF FOUNDATION. THE ENGINEER MAY ALLOW THE USE OF CRUSHER RUN (CR-6) AND RECYCLED CONCRETE BASE MATERIAL WITH MAXIMUM PARTICLE SIZE OF 1" AND LESS THAN 6% FINES (#200 SIEVE) AS SUBSTITUTES FOR 21-A STONE.
2. COMPACT BACKFILL MATERIAL WITH MECHANICAL TAMPERS OR OTHER COMPACTION EQUIPMENT APROVED BY THE ENGINEER THAT PRODUCES AN UNYIELDING SURFACE TO THE SATISFACTION OF THE ENGINEER.
3. CONCRETE SHALL BE PLACED ON THE SAME DAY EXCAVATION TO THE SUBGRADE IS ACHIEVED IN ORDER TO MINIMIZE DISTURBANCE TO THE FOUNDATION SUBGRADE, AND ONLY AFTER THE ENGINEER APPROVES THE SUITABILITY OF THE SUBGRADE.
4. FOUNDATION SUBGRADES SHALL BE DRY AND UNYIELDING STATE AS DETERMINED BY THE ENGINEER.
5. SEE ELECTRICAL SHEETS FOR GENERATOR LOCATION AND DETAILS. COORDINATE FINAL DIMENIONS WITH APPROVED GENERATOR SHOP DRAWINGS AND MANUFACTURER REQUIREMENTS.

GENERATOR PAD DETAIL

NOT TO SCALE



NOTES:
1. FOR OPENINGS LESS THAN 12" DIAMETER, NO ADDITIONAL REINFORCING IS REQUIRED PROVIDED NO REINFORCING IS INTERRUPTED BY THE OPENING.
2. PROVIDE ADDITIONAL REINFORCING, (MINIMUM OF ONE-HALF THE NUMBER OF PRINCIPAL BARS INTERRUPTED BY THE OPENING) ON EACH SIDE AND EACH FACE OF THE OPENING.

TYPICAL ADDITIONAL REINFORCING AROUND OPENINGS

NOT TO SCALE

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WO: 70852-000

APPROVED BY: PATRICK O'BRIEN LICENSE No. 23991 DELAWARE PROFESSIONAL ENGINEER 3/24/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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DATE	MAR 2025

TYPICAL STRUCTURAL DETAILS

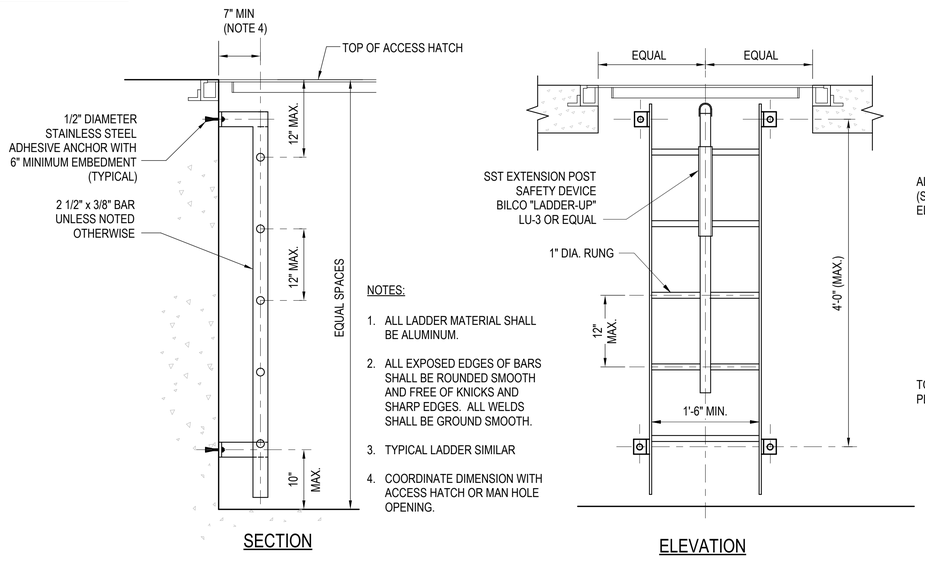
NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING S-2
SHEET 26 OF 92

3/21/2025 4:12:08 PM

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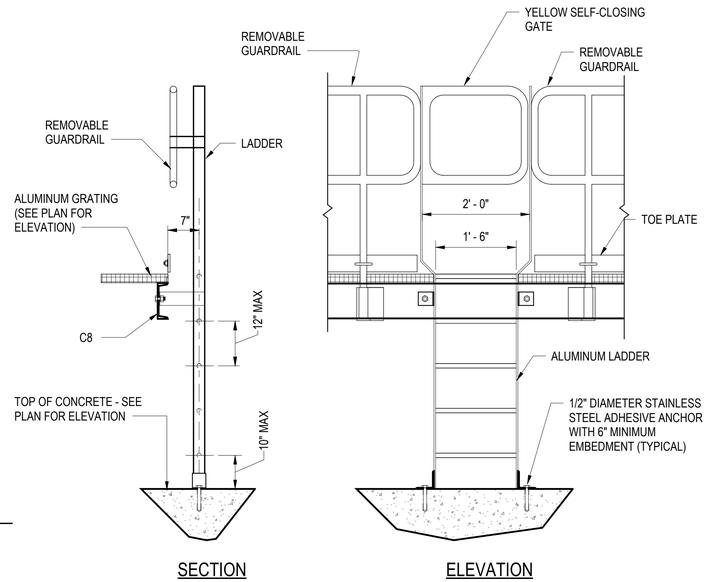


NOTES:

1. ALL LADDER MATERIAL SHALL BE ALUMINUM.
2. ALL EXPOSED EDGES OF BARS SHALL BE ROUNDED SMOOTH AND FREE OF KNICKS AND SHARP EDGES. ALL WELDS SHALL BE GROUND SMOOTH.
3. TYPICAL LADDER SIMILAR
4. COORDINATE DIMENSION WITH ACCESS HATCH OR MAN HOLE OPENING.

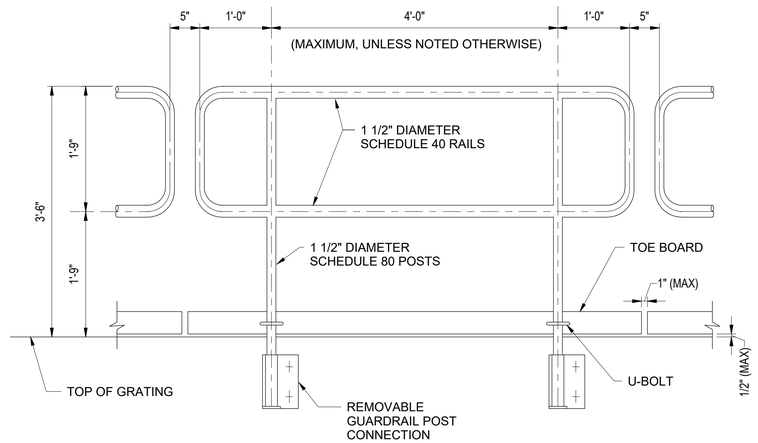
TYPICAL LADDER DETAILS AT ACCESS HATCH

NOT TO SCALE



TYPICAL LADDER TO PLATFORM

NOT TO SCALE

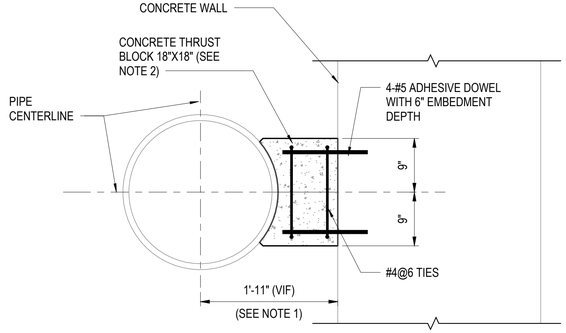


NOTES:

1. THE ABOVE DETAIL APPLIES TO SIDE MOUNTED REMOVABLE ALUMINUM GUARDRAIL. PROVIDE MANUFACTURER STANDARD SIDE MOUNTED CONNECTION BRACKETS TO CONCRETE WITH STAINLESS STEEL POST-INSTALLED ADHESIVE ANCHORS (MINIMUM TWO 5/8" DIAMETER AND 8" EMBEDMENT DEPTH).
2. TOP MOUNTED REMOVABLE ALUMINUM GUARDRAIL CONNECTION AT BASE SIMILAR TO "POST CONNECTION TO CONCRETE" DETAIL ON SHEET S-4 EXCEPT THE POST NOT WELDED TO THE PLATE. ALTERNATIVELY, PROVIDE MANUFACTURER STANDARD TOP MOUNTED CONNECTION BASE WITH STAINLESS STEEL POST-INSTALLED ADHESIVE ANCHORS (MINIMUM TWO 5/8" DIAMETER AND 8" EMBEDMENT DEPTH).

TYPICAL REMOVABLE GUARDRAIL

NOT TO SCALE

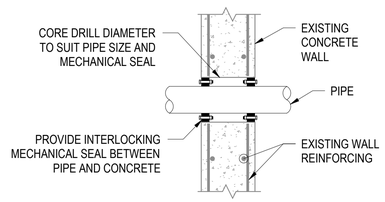


NOTES:

1. COORDINATE DIMENSION WITH ACTUAL PIPE LOCATION. ADJUST LENGTH OF CONCRETE THRUST BLOCK AND REINFORCING STEEL TO SUIT PIPE LOCATION AND FIELD CONDITION.
2. CONCRETE THRUST BLOCK MUST BE TIGHT AGAINST THE PIPE. PROVIDE CONCRETE AFTER PIPE INSTALLATION OR PROVIDE MAXIMUM 1" POURABLE NON-SHRINK GROUT TO FILL ANY GAP BETWEEN THE CONCRETE THRUST BLOCK AND PIPE.

TYPICAL CONCRETE THRUST BLOCK

NOT TO SCALE

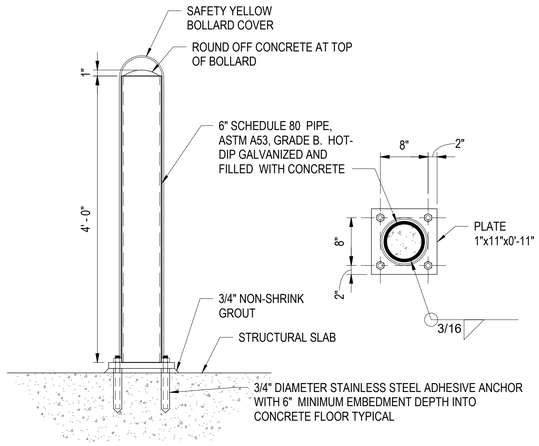


NOTES:

1. ONLY ONE REINFORCING BAR IN EACH VERTICAL OR HORIZONTAL DIRECTION MAY BE CUT AS PART OF THE CONCRETE CORE DRILLING.
1. BOLTS TO BE 316 STAINLESS STEEL.

TYPICAL CORE DRILLED PIPE PENETRATION

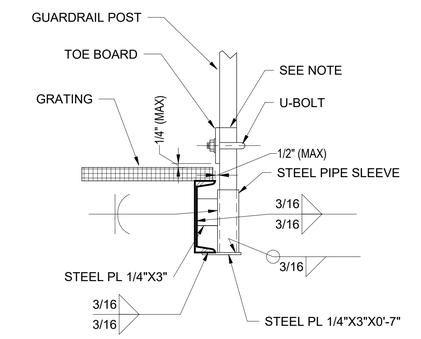
NOT TO SCALE



NOTE: REFER TO SHEET C-12 FOR EXTERIOR BOLLARD DETAIL

TYPICAL INTERIOR BOLLARD DETAIL

NOT TO SCALE



NOTE: AT LOCATIONS WHERE ONLY TOE BOARD IS REQUIRED, PROVIDE REMOVABLE GUARDRAIL POST AND STOP POST AT TOP OF TOE BOARD.

TYPICAL REMOVABLE GUARDRAIL POST CONNECTION

NOT TO SCALE

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APPROVED BY:
PATRICK O'BRIEN GREEN JR. No. 24391 3/21/25 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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DATE	MAR 2025

TYPICAL STRUCTURAL DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION

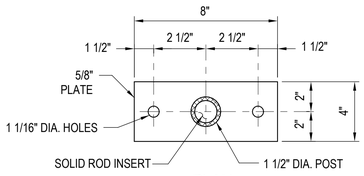
COUNTY PROJECT No. 240618

DRAWING S-3

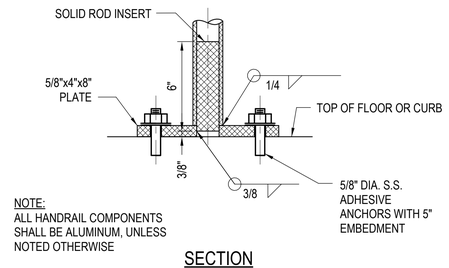
SHEET 27 OF 92

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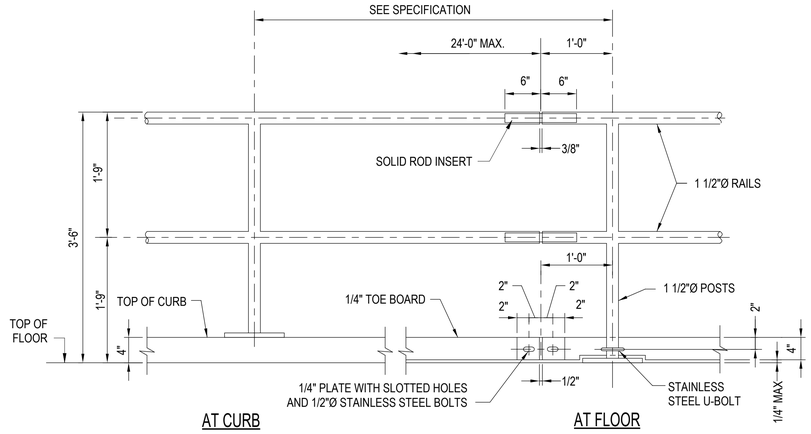
PLAN



SECTION

POST CONNECTION TO CONCRETE - ALUMINUM

NOT TO SCALE

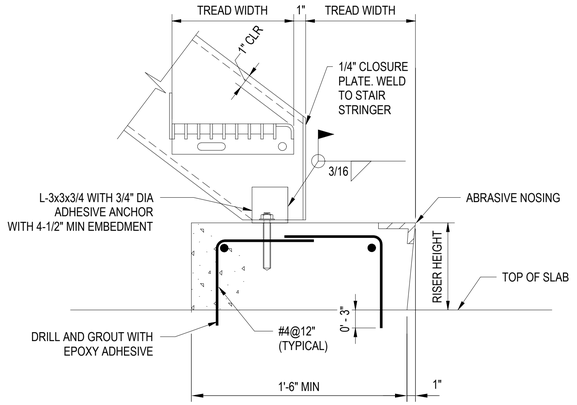


AT CURB AT FLOOR

NOTE: ALL GUARDRAIL AND HANDRAIL COMPONENTS SHALL BE ALUMINUM UNLESS NOTED OTHERWISE ON DRAWINGS

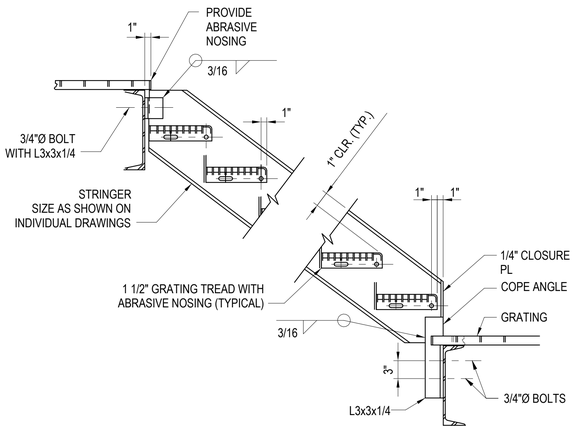
TYPICAL GUARDRAIL ELEVATION

NOT TO SCALE



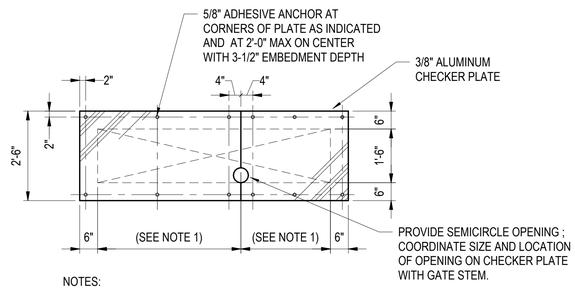
TYPICAL BASE OF METAL GRATING STAIR CONNECTION TO CONCRETE

NOT TO SCALE



STAIR CONNECTION TO BEAMS

NOT TO SCALE

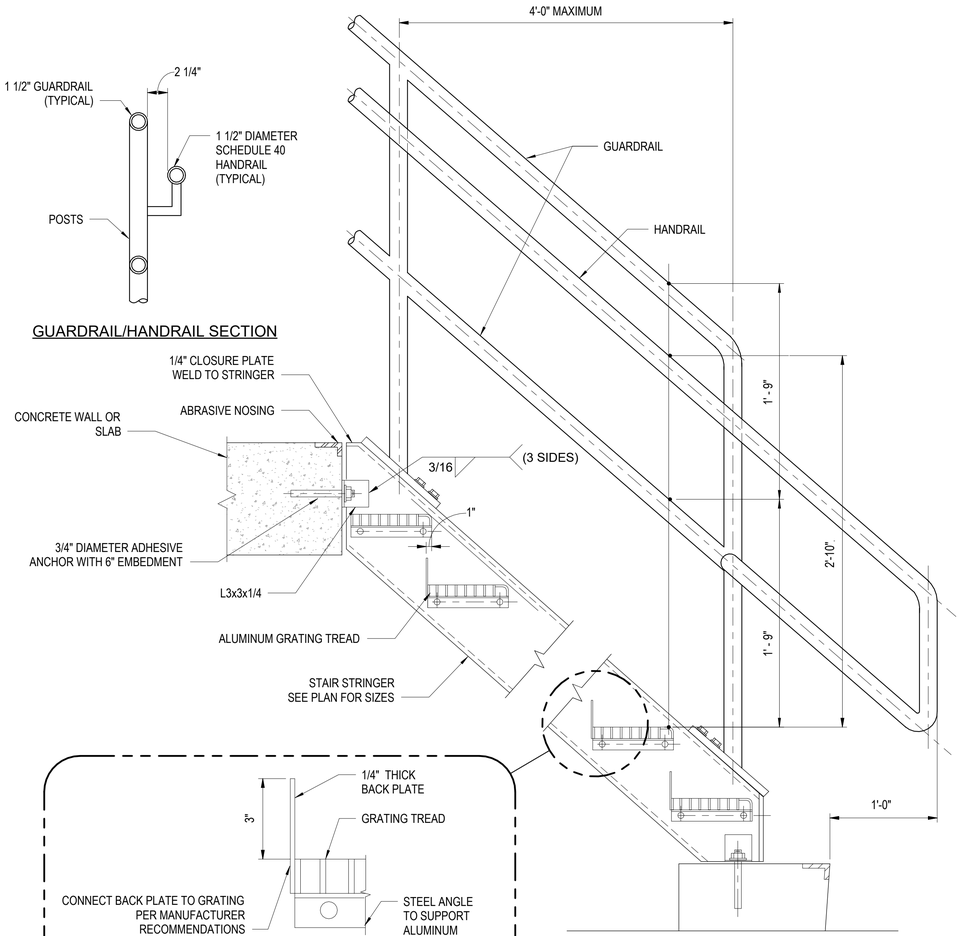


NOTES:
1. COORDINATE DIMENSION WITH GATE STEM.
2. SEE PLAN FOR EXISTING SLAB OPENING DIMENSION.

TYPICAL ALUMINUM CHECKER PLATE

NOT TO SCALE

GUARDRAIL/HANDRAIL SECTION



ELEVATION

TYPICAL ALUMINUM GRATING STAIR GUARDRAIL WITH HANDRAIL

NOT TO SCALE

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WARNING
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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN No. 23291 PROFESSIONAL ENGINEER DELAWARE 3/24/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE NOT TO SCALE
DESIGNED TDR
DRAWN AAB
CHECKED PSO
DATE MAR 2025

TYPICAL STRUCTURAL DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING S-4

SHEET 28 OF 92

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REVISION

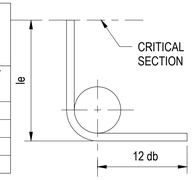
COUNTY PROJECT No. 240618

DRAWING S-5

SHEET 29 OF 92

CMU TENSION LAP SPLICE

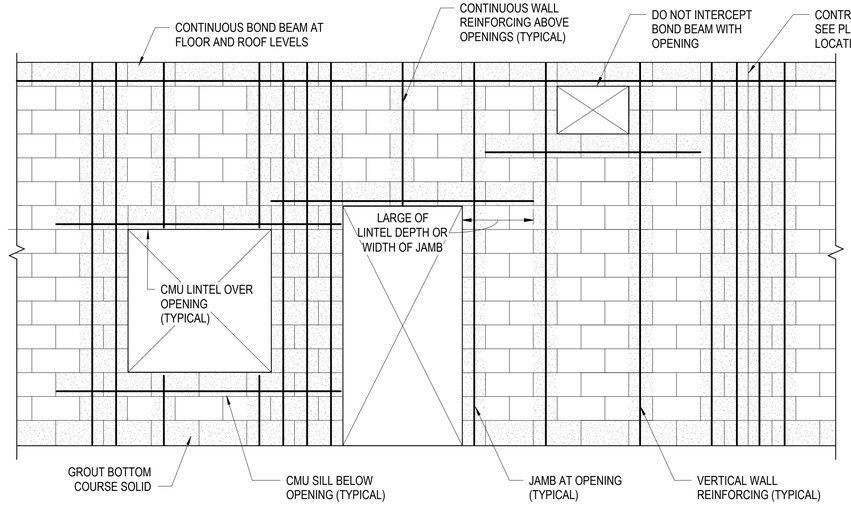
BAR SIZE	8" CMU		6" CMU		HOOK EMBEDMENT LENGTH (le)
	A	B	A	B	
#3	14"	15"	14"	17"	5"
#4	18"	25"	18"	30"	7"
#5	28"	39"	28"	50"	9"
#6	53"	73"	N/A	N/A	10"



NOTES:
1. A= ONE BAR PLACE AT THE CENTER OF MASONRY UNIT CELL FOR VERTICAL WALL.
2. B= TWO BARS IN A MASONRY UNIT CELL FOR VERTICAL WALL WITH 1 3/4" MINIMUM COVER FOR 8" CMU AND 2" MINIMUM COVER FOR 12" CMU, AND REINFORCEMENT IN LINTEL BLOCK WITH MINIMUM 3" COVER.
3. BAR SPLICED BY NON-CONTACT LAP SPLICES SHALL NOT BE SPACED FARTHER THAN ONE-FIFTH THE REQUIRED LENGTH OF LAP (LD) NOR MORE THAN 8".
4. MINIMUM GROUT BETWEEN THE REINFORCEMENT AND MASONRY UNIT WALL SHALL NOT BE LESS THAN 1/2".
5. REFER TO CONCRETE TENSION LAP SPLICE AND STANDARD HOOK LENGTH FOR STANDARD HOOK LENGTH AND DIAMETER. MINIMUM BENT DIAMETER = 6 db.
6. F'm = 2,000 psi
7. GRADE 60 REINFORCEMENT BAR.

CMU TENSION LAP SPLICE AND STANDARD HOOK LENGTH

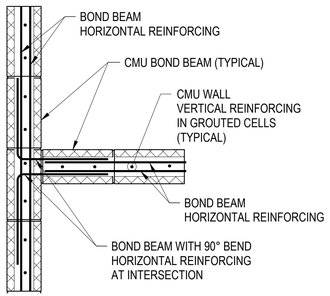
NOT TO SCALE



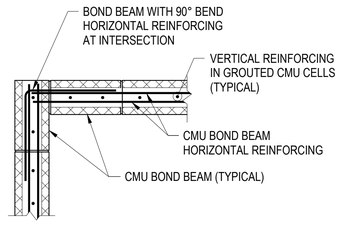
NOTE: PROVIDE REBAR DOWELS AT BASE OF WALL PER TYPICAL DETAIL.

TYPICAL CONCRETE MASONRY WALL REINFORCING DETAIL

NOT TO SCALE



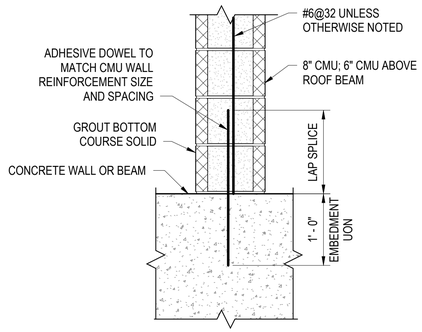
AT WALL INTERSECTIONS



AT CORNERS

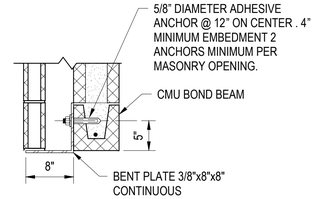
TYPICAL CMU BOND BEAM REINFORCING DETAIL

NOT TO SCALE



TYPICAL BASE OF CMU WALL DETAIL

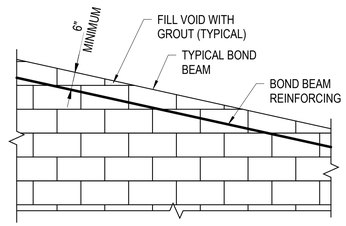
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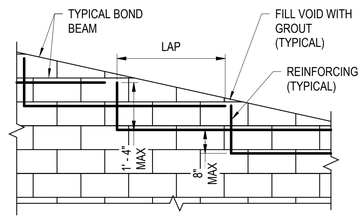
NOTE: PROVIDE SIMILAR BENT PLATE AT DOOR OR LOUVER OPENINGS' JAMB AND SILL. COORDINATE WITH ARCHITECTURAL.

TYPICAL STEEL LINTEL ATTACHMENT

NO TO SCALE



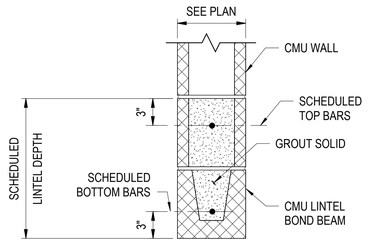
ALTERNATE 1



ALTERNATE 2

TYPICAL SLOPED CMU BOND BEAM DETAIL

NOT TO SCALE

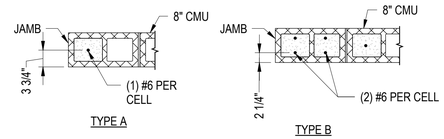


CLEAR SPAN (FT)	DEPTH (IN)	BOTTOM BARS	TOP BARS
UP TO 4'-0"	8	#5	-
4'-0" TO 12'-0"	24	#6	#6

NOTES:
1. PROVIDE LINTEL BEARING WIDTH EQUAL TO LARGER OF JAMB WIDTH OR LINTEL DEPTH.
2. PROVIDE SAME LINTEL AS INDICATED AT OPENING SILL (BOTTOM)

TYPICAL CMU LINTEL /SILL DETAILS

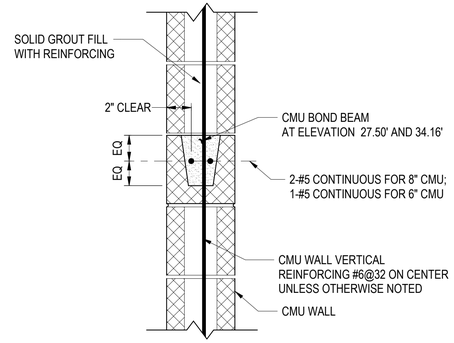
NOT TO SCALE



NOTES:
1. TYPE A FOR USE WITH OPENINGS UP TO 4'-0" WIDE.
2. TYPE B FOR USE WITH OPENINGS UP TO 12'-0" WIDE.

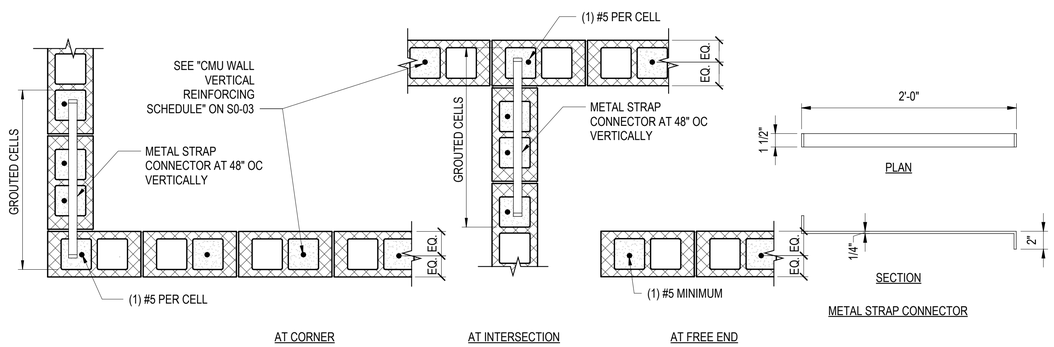
TYPICAL CMU JAMB DETAILS

NOT TO SCALE



TYPICAL CMU BOND BEAM DETAIL

NOT TO SCALE



NOTE: ALTERNATIVE TO THE METAL STRAP CONNECTOR, AT LEAST FIFTY PERCENT OF MASONRY UNITS AT THE INTERSECTION SHALL INTERLOCK.

TYPICAL CMU WALL REINFORCING DETAILS AT CORNERS AND INTERSECTION

NOT TO SCALE

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APPROVED BY: PATRICK O'BRIEN No. 24091 DELAWARE PROFESSIONAL ENGINEER 3/24/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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SCALE	NOT TO SCALE
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

TYPICAL STRUCTURAL DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING S-5

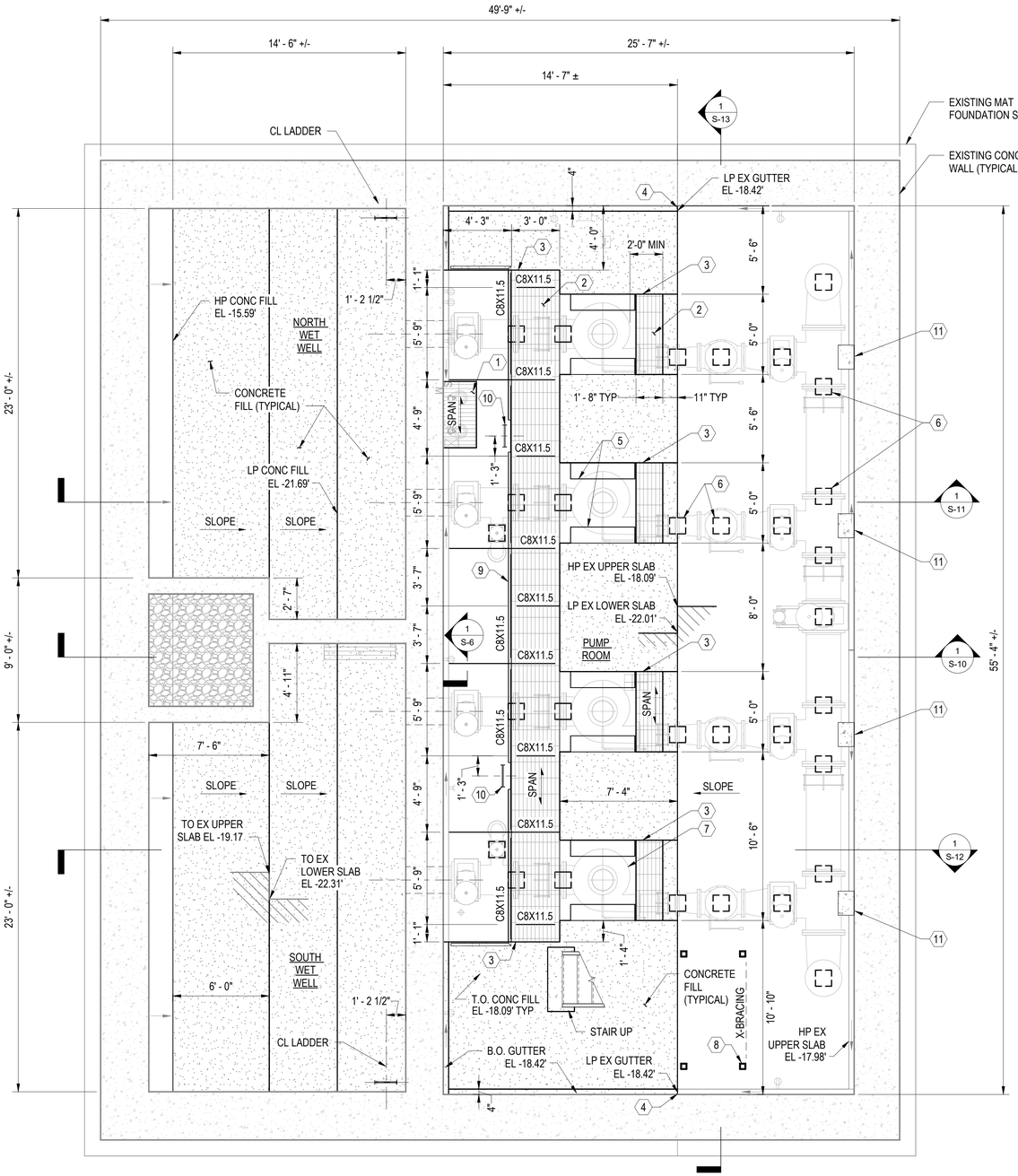
SHEET 29 OF 92

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REVISION

COUNTY PROJECT No.
240618

DRAWING



LOWER LEVEL PLAN AT ELEVATION -14.71'

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

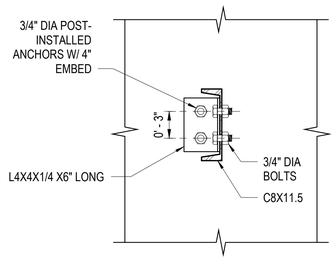
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SHEET NOTES

1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. COORDINATE FINAL GEOMETRY OF CONCRETE FILL, GRATING, GRATING EDGE ANGLES, EQUIPMENT SUPPORTS IN THE PUMP ROOM WITH MECHANICAL PIPING.
4. WET WELL WALLS, BASE SLABS AND GUTTERS ARE EXISTING. REFER TO PHASE 1 AS BUILT DRAWINGS.

SHEET KEYNOTES

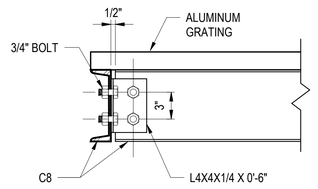
1. 1 1/2" ALUMINUM GRATING OVER EXISTING 4'X2' SUMP PIT WITH EXISTING GRATING SUPPORT EDGE ANGLES.
2. 2" ALUMINUM GRATING (TYPICAL). MATCH TOP OF GRATING ELEVATION WITH TOP OF CONCRETE FILL. COORDINATE OPENINGS IN GRATING WITH MECHANICAL EQUIPMENT.
3. PROVIDE EDGE ANGLE IN CONCRETE FILL TO SUPPORT GRATING (TYPICAL). SEE TYPICAL DETAIL.
4. MATCH BOTTOM OF GUTTER IN FILL WITH LOW POINT OF EXISTING GUTTER IN UPPER SLAB.
5. PUMP SUPPORT PEDESTALS (TYPICAL). SEE TYPICAL DETAIL. FOR BIDDING PURPOSES ASSUME PEDESTALS ARE 12"W x 48"L x 5'-6"H. COORDINATE FINAL DIMENSIONS WITH APPROVED EQUIPMENT.
6. PIPE AND VALVE SUPPORT PEDESTAL (TYPICAL). SEE TYPICAL DETAIL. FOR BIDDING PURPOSES ASSUME PEDESTALS ARE 12"W x 12"L x 1'-3"H (AVERAGE). COORDINATE FINAL LOCATIONS AND DIMENSIONS WITH MECHANICAL PIPING.
7. MECHANICAL EQUIPMENT AND PIPING (TYPICAL). SEE MECHANICAL DRAWINGS.
8. HSS4X4X1/4 STAIR LANDING POST (TYPICAL).
9. REMOVABLE ALUMINUM GUARDRAIL (TYPICAL).
10. LADDER.
11. PROVIDE CONCRETE THRUST BLOCK (TYPICAL OF 4).



NOTE: PLACE L4X4 ON SIDE OF CHANNEL THAT MAXIMIZES DISTANCE FROM POST-INSTALLED ANCHORS TO EDGE OF CONCRETE FILL (EDGE DISTANCE) WHERE APPLICABLE.

1 S-6 SECTION

SCALE: 1 1/2" = 1'-0"
REF: S-6



NOTE: COPE CHANNEL FLANGE AS NECESSARY.

TYPICAL CHANNEL TO CHANNEL CONNECTION

NOT TO SCALE

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

0 3" 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

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NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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LOWER LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

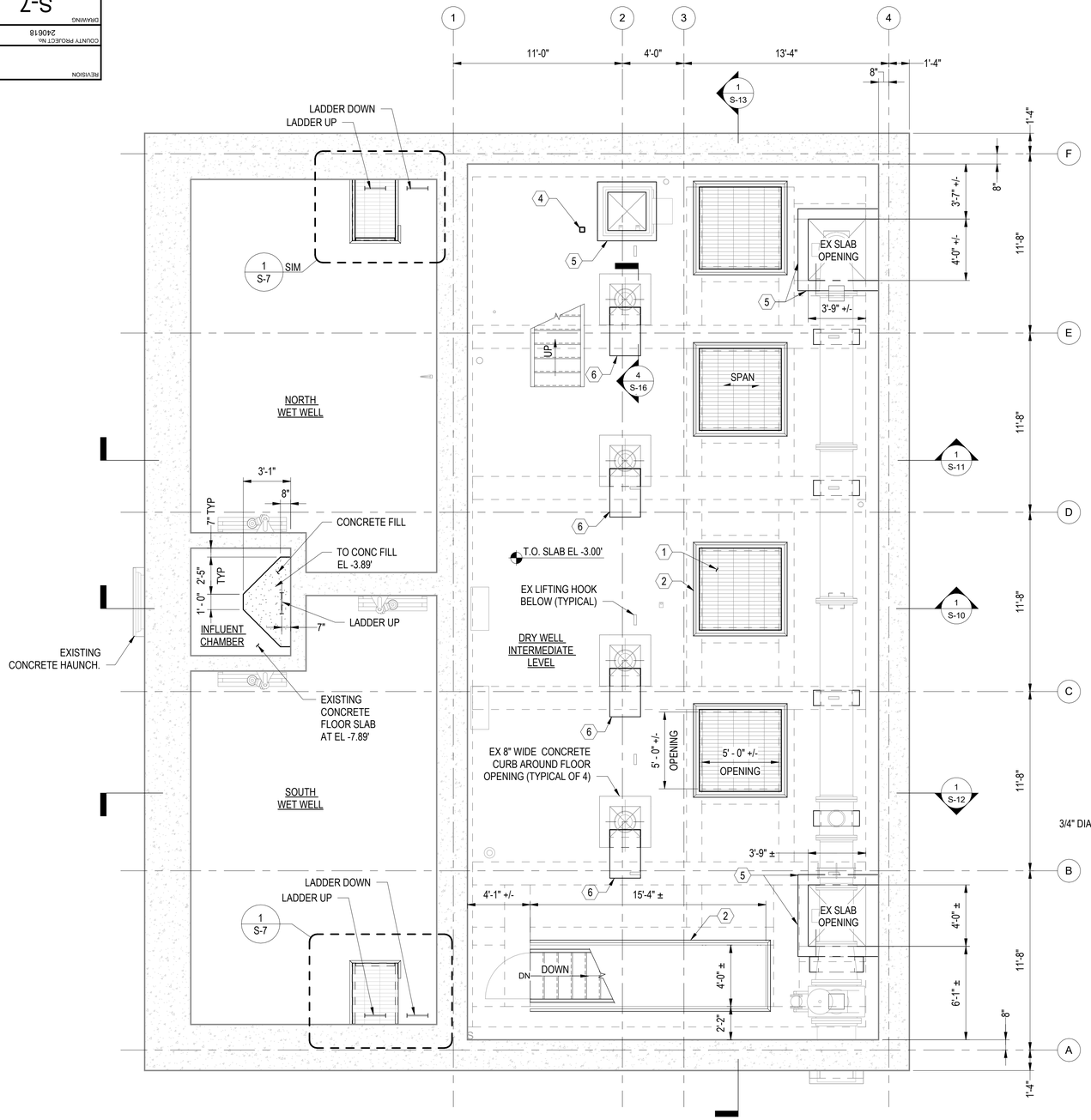
COUNTY PROJECT No: 240618

DRAWING S-6

SHEET 30 OF 92

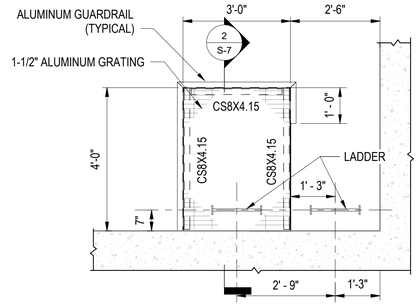
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INTERMEDIATE LEVEL PLAN

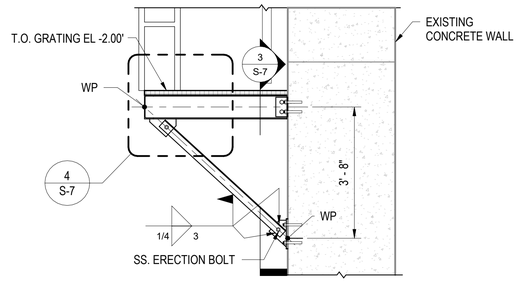
SCALE: 1/4" = 1'-0"



NOTE: ALL FRAMING IS ALUMINUM.

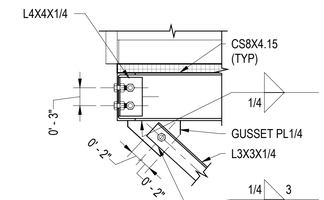
1 S-7 ENLARGED PARTIAL PLAN

SCALE: 1/2" = 1'-0"
REF: S-7



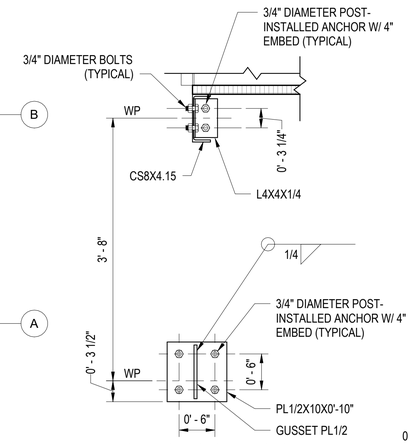
2 S-7 SECTION

SCALE: 1/2" = 1'-0"
REF: S-7



4 S-7 DETAIL

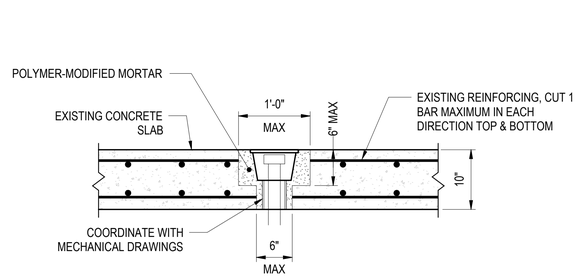
SCALE: 1" = 1'-0"
REF: S-7



NOTE: ANGLE NOT SHOWN FOR CLARITY.

3 S-7 SECTION

SCALE: 1" = 1'-0"
REF: S-7



NOTE: COORDINATE WITH MECHANICAL DRAWINGS. INSTALLATION OF FLOOR DRAIN IS SIMILAR.

TYPICAL VALVE BOX AT INTERMEDIATE SLAB

NOT TO SCALE

SHEET NOTES

1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. EXISTING INTERMEDIATE LEVEL CONCRETE SLAB IS 10" THICK WITH #5@9" TOP AND BOTTOM, EACH WAY, UNLESS NOTED OTHERWISE.
4. COCNRETE WALLS, ELEVATED SLABS, AND BEAMS ARE EXISTING. REFER TO PHASE 1 AS BUILT DRAWINGS.

SHEET KEYNOTES

1. 1 1/2" ALUMINUM GRATING (TYPICAL). COORDINATE FINAL DIMENSIONS WITH EXISTING SLAB OPENINGS AND EDGE ANGLES.
2. ALUMINUM GUARD RAIL AROUND SLAB OPENINGS (TYPICAL).
3. PIPE AND VALVE SUPPORT PEDESTAL (TYPICAL). SEE TYPICAL DETAIL. COORDINATE FINAL LOCATION AND ELEVATIONS WITH MECHANICAL PIPING.
4. HSS4X4X1/4 STAIR LANDING POST.
5. PROVIDE 6" WIDE BY 6" HIGH CONCRETE CURB AROUND THE EXISTING SLAB OPENING.
6. 2'-0"x2'-0" DRIVE SHAFT SUPPORT BLOCK (TYPICAL).

0 2' 4' 8"
SCALE: 1/4" = 1'-0"

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

0 6" 1' 2'
SCALE: 1" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
△			

WARNING
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APPROVED BY: PATRICK O'BRIEN LICENSE NO. 21991 DELAWARE PROFESSIONAL ENGINEER 3/24/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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SCALE	As indicated
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

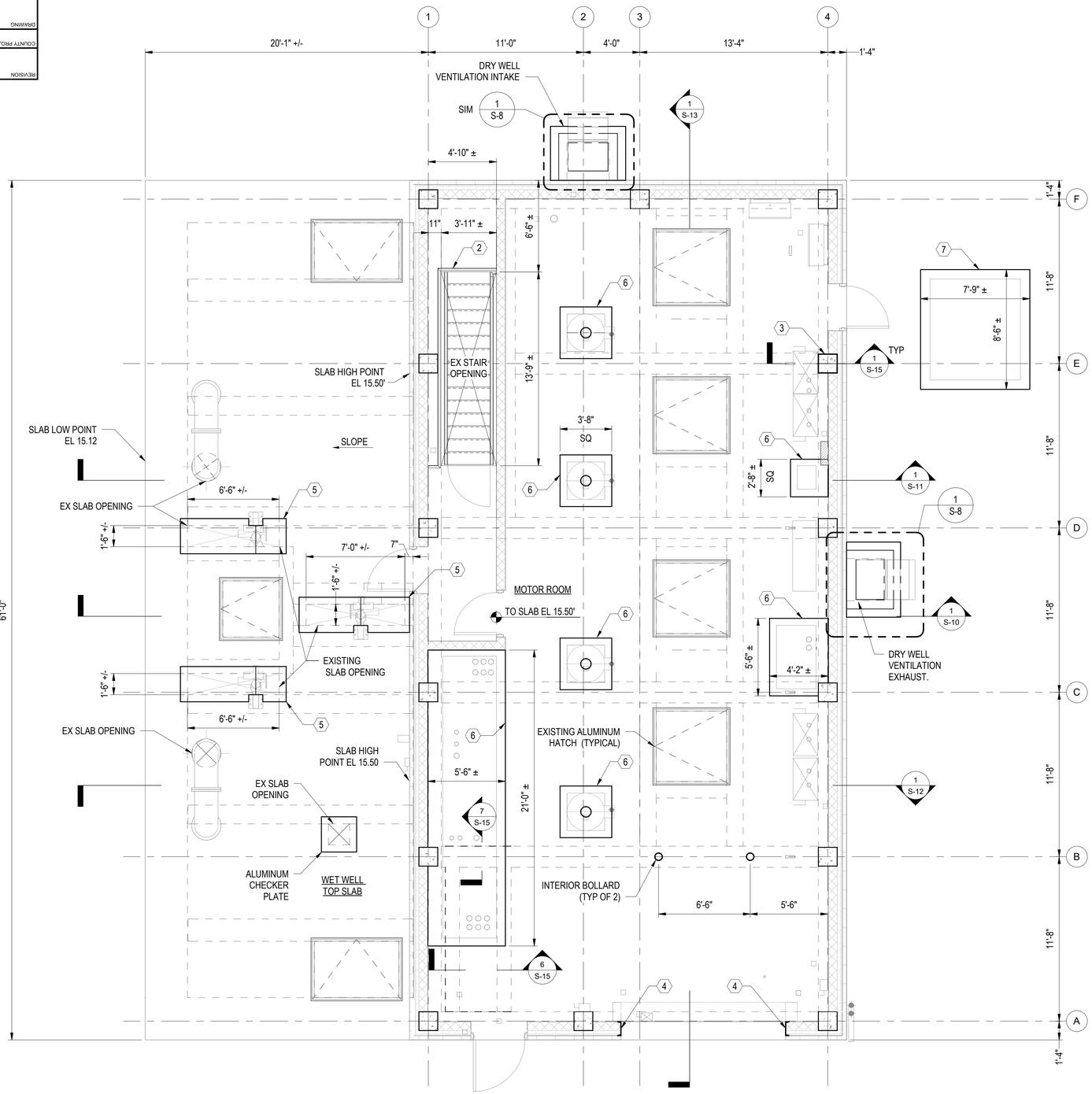
INTERMEDIATE LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING S-7
SHEET 31 OF 92

3/21/2025 4:12:12 PM

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GRADE LEVEL PLAN AT ELEVATION 15.50'

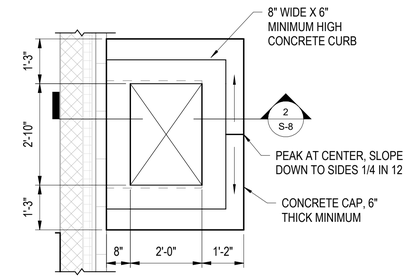
SCALE: 1/4" = 1'-0"

SHEET NOTES

1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. TOP OF EXISTING CONCRETE SLAB ELEVATION IS AS NOTED ON THE PLANS.
4. PROVIDE CMU WALLS WITH #6@32" VERTICAL REINFORCING. PROVIDE CONDITION AT BASE PER TYPICAL DETAIL. PROVIDE 8" EMBEDMENT FOR POST-INSTALLED DOWELS AT INTERIOR CMU WALLS .
5. REMOVE ALL EXISTING STEEL PLATE COVERS OVER EXISTING SLAB OPENINGS.
6. CONCRETE ELEVATED SLABS AND BEAMS ARE EXISTING. REFER TO PHASE 1 AS BUILT DRAWINGS.

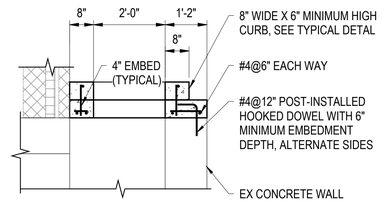
SHEET KEYNOTES

1. 1 1/2" ALUMINUM GRATING. COORDINATE FINAL DIMENSIONS WITH EXISTING SLAB OPENINGS. PROVIDE EDGE ANGLES AS NECESSARY IN ACCORDANCE WITH TYPICAL DETAIL.
2. ALUMINUM GUARD RAIL AROUND SLAB OPENINGS.
3. 16"X16" CONCRETE COLUMN (TYPICAL).
4. C12X20.7 AT EACH SIDE OF OVERHEAD DOOR OPENING FROM GRADE LEVEL TO UNDERSIDE OF CMU LINTEL. ANCHOR C12 TO CMU JAMB WITH STRAPS. COORDINATE WITH ARCHITECTURAL.
5. PROVIDE ALUMINUM CHECKER PLATE WITH NOTCH FOR SLUICE GATE OPERATING STEMS. NOTCH AROUND ACTUATOR STAND AS REQUIRED. SEE TYPICAL DETAIL ON S-4.
6. INTERIOR EQUIPMENT PAD. SEE TYPICAL DETAIL ON S-2. ASSUME 6" PAD HEIGHT AND PLAN DIMENSIONS SHOWN FOR BIDDING PURPOSE ONLY. COORDINATE FINAL DIMENSIONS WITH APPROVED EQUIPMENT. PROVIDE ISOLATION JOINT BETWEEN EQUIPMENT PAD AND BUILDING COLUMNS OR WALLS. PROVIDE CORE HOLE FOR DRIVE SHAFTS AT EQUIPMENT PADS FOR MOTORS.
7. EXTERIOR EQUIPMENT PAD. SEE TYPICAL DETAIL ON S-2. PLAN DIMENSIONS SHOWN ARE FOR BIDDING PURPOSE ONLY. COORDINATE FINAL DIMENSIONS WITH APPROVED EQUIPMENT.
8. EXTERIOR GENERATOR PAD. SEE TYPICAL DETAIL ON S-2. PLAN DIMENSIONS SHOWN ARE FOR BIDDING PURPOSE ONLY. COORDINATE FINAL DIMENSIONS WITH APPROVED EQUIPMENT.



NOTE: ENLARGED PLAN AND SECTION APPLY TO VENTILATION INTAKE AND EXHAUST.

1/S-8 ENLARGED PARTIAL PLAN
SCALE: 1/2" = 1'-0"
REF: S-8



2/S-8 SECTION
SCALE: 1/2" = 1'-0"
REF: S-8

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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APPROVED BY:
PATRICK O'BRIEN
No. 21191
PROFESSIONAL ENGINEER
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3/21/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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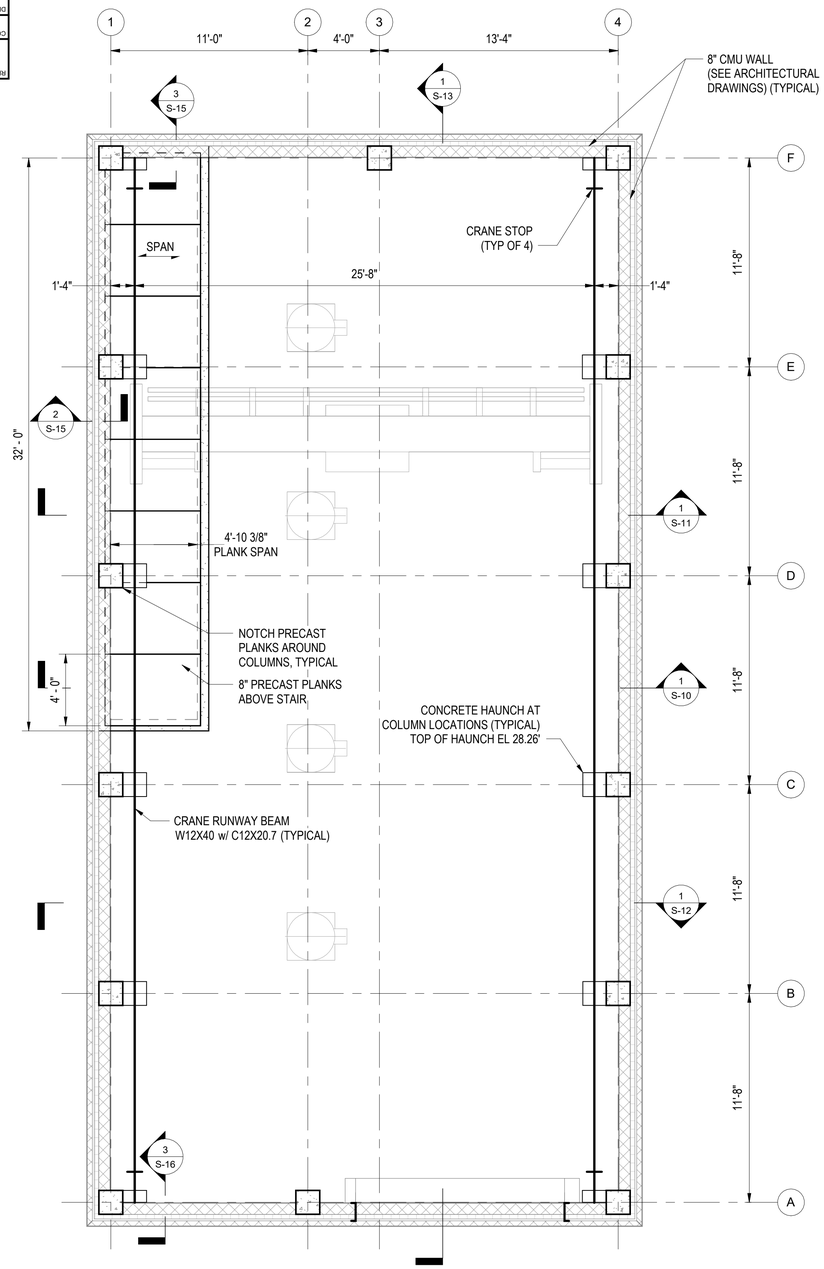
GRADE LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING S-8
SHEET 32 OF 92

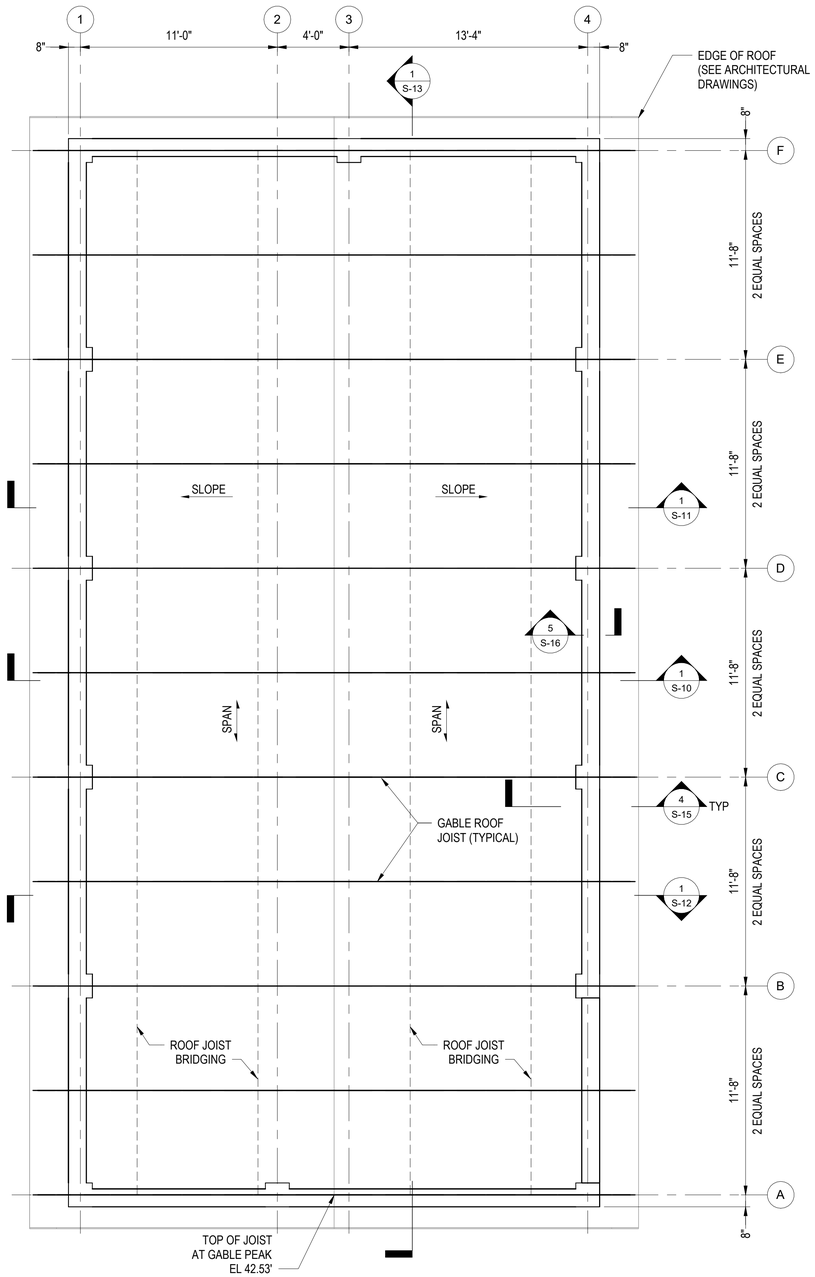
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CRANE RAIL RUNWAY PLAN

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



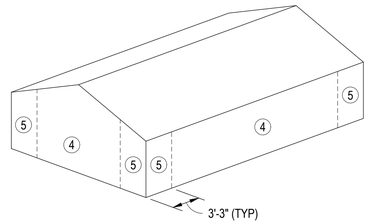
NOTE:
ROOF JOIST DESIGN BY JOIST MANUFACTURER.

ROOF FRAMING PLAN

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

SHEET NOTES

1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. ROOF SYSTEM IS METAL EDGED TONGUE AND GROOVE, LIGHTWEIGHT CONCRETE PLANKS SUPPORTED BY GABLE STEEL ROOF JOISTS.
4. GABLE ROOF JOISTS TO BE DESIGNED BY JOIST MANUFACTURER.
5. JOIST BEARING ELEVATION IS TOP OF CONCRETE BEAMS AT ELEVATION 36.17'



WALLS

LRFD WIND LOADS ON WALLS - COMPONENTS AND CLADDING

ZONE	EFFECTIVE AREA (SF)	(+) PRESSURE (PSF)	(-) PRESSURE (PSF)
4	<=10	33.5	-35.7
4	50	30.8	-33.0
4	200	28.5	-30.7
4	>500	27.0	-29.2
5	<=10	33.5	-42.1
5	50	30.8	-36.8
5	200	28.5	-32.2
5	>500	27.0	-29.2

NOTES:
1. POSITIVE VALUES INDICATE PRESSURES ACTING INWARD TOWARD WALL SURFACES AND NEGATIVE VALUES INDICATE PRESSURES ACTING OUTWARD AWAY FROM WALL SURFACES.
2. SEE SHEET S-10 FOR COMPONENT AND CLADDING WIND LOADS FOR ROOF.

COMPONENTS AND CLADDING WIND LOAD - WALLS

NOT TO SCALE

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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3/4/25

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CRANE RAIL PLAN AND ROOF FRAMING PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

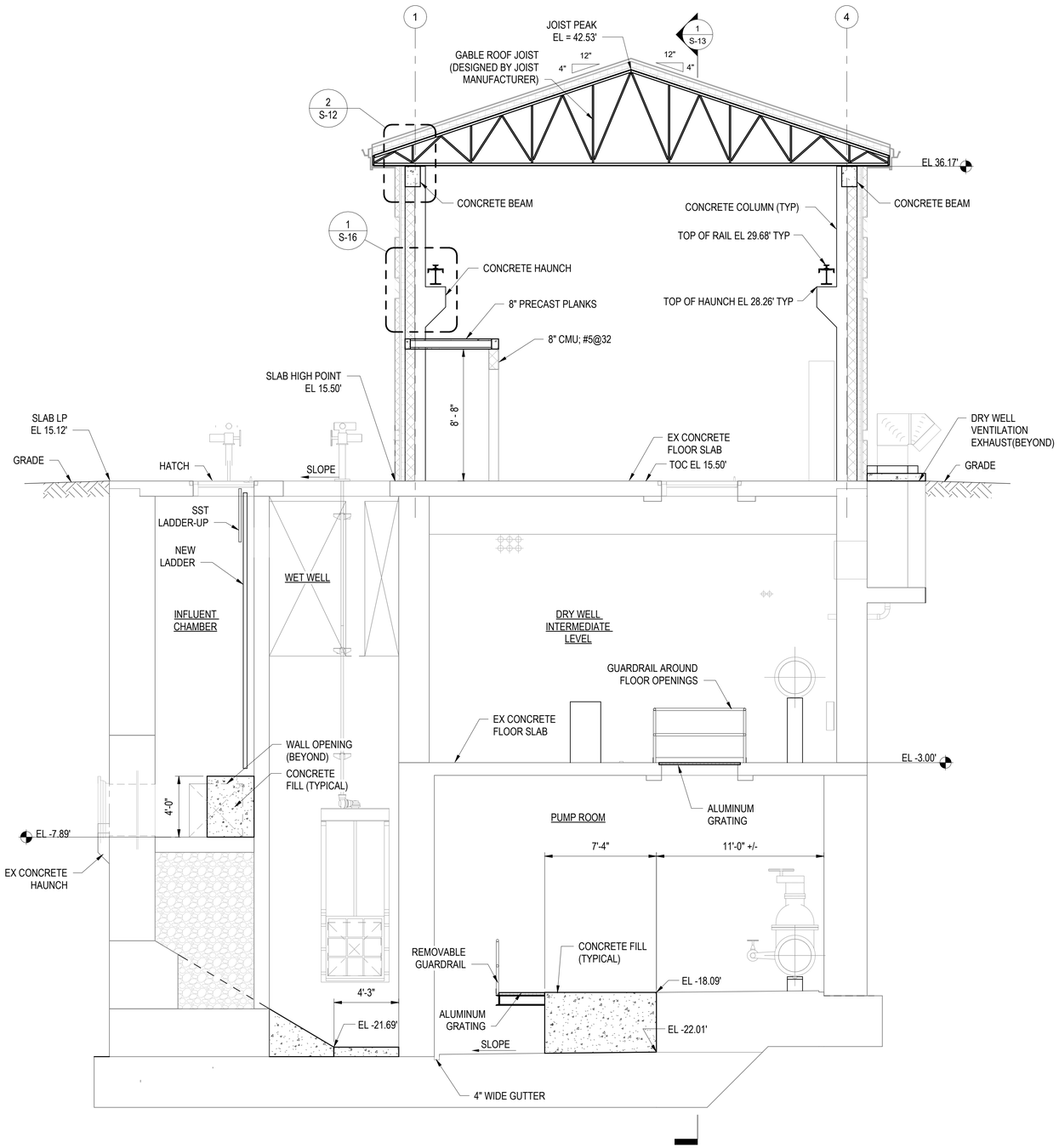
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DRAWING S-9
SHEET 33 OF 92

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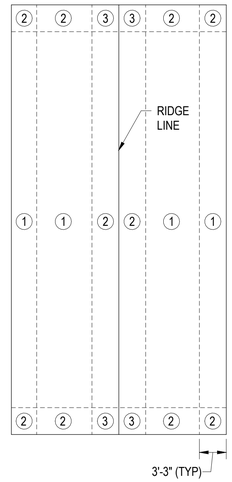
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2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. PUMP ROOM AND WET WELL UNDERGROUND CONCRETE FOUNDATION SLABS, WALLS, ELEVATED BEAMS AND SLABS ARE EXISTING. REFER TO PHASE 1 AS BUILT DRAWINGS.



1 / S-10 CROSS SECTION

SCALE: 1/4" = 1'-0"
REF: S-6



ROOF

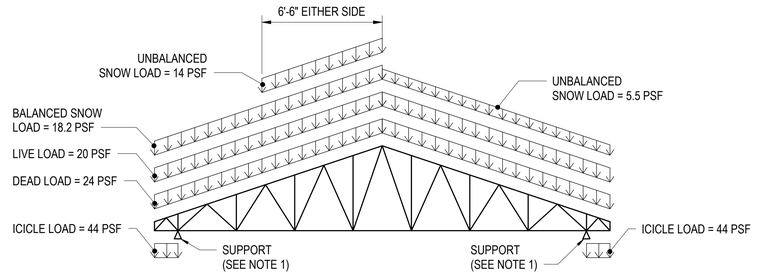
LRFD WIND LOADS ON ROOFS - COMPONENTS AND CLADDING

ZONE	EFFECTIVE AREA (SF)	(+) PRESSURE (PSF)	(-) PRESSURE (PSF)	(-) OVERHANG PRESSURE (PSF)
1	<=2	27.0	-55.1	-65.9
1	20	23.5	-55.1	-65.9
1	50	19.9	-36.7	-53.6
1	>100	18.4	-22.7	-44.3
2	<=2	27.0	-76.7	-100.5
2	20	23.5	-76.7	-100.5
2	50	19.9	-55.1	-72.4
2	>100	18.4	-45.8	-60.3
3	<=2	27.0	-89.7	-113.5
3	20	23.5	-89.7	-113.5
3	50	19.9	-62.5	-77.2
3	>100	18.4	-50.8	-61.6

NOTES:
1. POSITIVE VALUES INDICATE PRESSURES ACTING INWARD TOWARD ROOF SURFACES AND NEGATIVE VALUES INDICATE PRESSURES ACTING OUTWARD AWAY FROM ROOF SURFACES.
2. ONLY WIND LOADS ARE SHOWN. USE LOADS PROVIDED IN DESIGN LOADS ON S-1 AND JOIST LOADING DIAGRAM INDICATED BELOW WITH LOAD COMBINATIONS ACCORDING TO ASCE 7-16 TO DETERMINE TOTAL NOMINAL COMBINED LOAD.
3. SEE SHEET S-9 FOR COMPONENT AND CLADDING WIND LOADS FOR WALLS.

COMPONENTS AND CLADDING WIND LOAD - ROOF

NOT TO SCALE



NOTES:
1. THE NON-STANDARD GABLE JOIST SEAT MUST BE DESIGNED FOR THE FOLLOWING ROLL-OVER (IN-AND-OUT OF PAGE) AND AXIAL (IN PLANE) FACTORED LOADS; APPLIED AT THE UNDERSIDE OF THE PRECAST ROOF PLANKS ABOVE THE SUPPORT.
   A. ROLL-OVER: 0.5 KIPS
   B. AXIAL: 0.5 KIPS.

JOIST LOADING DIAGRAM

NOT TO SCALE

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

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2	DNREC WATER DIVISION COMMENTS	JCL 11/17/17	PSO 11/17/17

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CROSS SECTION

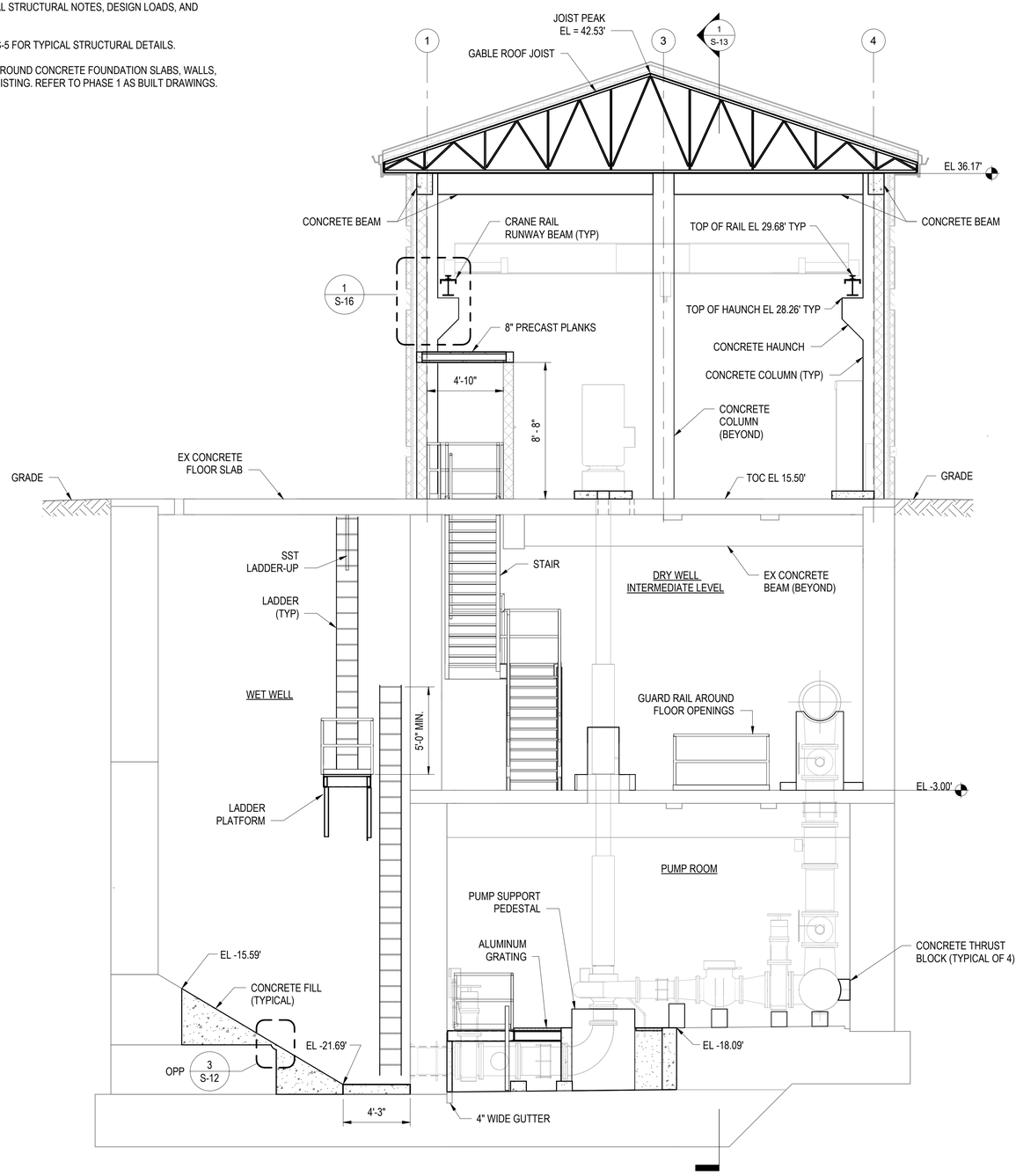
NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING S-10
SHEET 34 OF 92

3/21/2025 4:12:16 PM

SHEET NOTES

1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. PUMP ROOM AND WET WELL UNDERGROUND CONCRETE FOUNDATION SLABS, WALLS, ELEVATED BEAMS AND SLABS ARE EXISTING. REFER TO PHASE 1 AS BUILT DRAWINGS.



1 S-11 **CROSS SECTION**
SCALE: 1/4" = 1'-0"
REF: S-6

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

STRUCTURAL ABBREVIATIONS

ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
ADDL	ADDITIONAL
ADJ	ADJACENT
AGGR	AGGREGATE
ALT	ALTERNATE
ALUM	ALUMINUM
ACI	AMERICAN CONCRETE INSTITUTE
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASWG	AMERICAN STEEL WIRE GAUGE
AWG	AMERICAN WIRE GAGE
AWS	AMERICAN WELDING SOCIETY
APPROX	APPROXIMATE
ARCH	ARCHITECT
BLDG	BUILDING
BM	BEAM
BRG	BEARING
B PL	BASE PLATE
BSMT	BASEMENT
BITUM	BITUMINOUS
BO	BOTTOM OF
BOT	BOTTOM
BOS	BOTTOM OF STEEL
BRG	BEARING
CAM	CAMBER
CAP	CAPACITY
CEM	CEMENT
CHFR	CHAMFER
CLR	CLEAR
C TO C	CENTER TO CENTER
CIR	CIRCLE
CIRC	CIRCULAR
CIP	CAST-IN-PLACE
COL	COLUMN
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONSTR JT	CONSTRUCTION JOINT
CONT	CONTINUE, CONTINUOUS
COORD	COORDINATE
COND	CONDITION
CONN	CONNECT, CONNECTION
CONSTR	CONSTRUCTION
CTR	CENTER
CTRL JT	CONTROL JOINT
DEG	DEGREES
DEMO	DEMOLITION/DEMOLISH
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL, DIAGRAM
DIM	DIMENSION
DIST	DISTANCE
DWG	DRAWING
EA	EACH
EF	EACH FACE
EL	ELEVATION
ELEC	ELECTRIC, ELECTRICAL
EOS	EDGE OF SLAB
EQ	EQUAL
EQL SP	EQUALLY SPACED
EQUIP	EQUIPMENT
EW	EACH WAY
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EX	EXISTING
EX	EXTERIOR
FD	FLOOR DRAIN
FNDN	FOUNDATION
FLG	FLANGE
FLR	FLOOR
FRMG	FRAMING
FRP	FIBER REINFORCED PLASTIC
FS	FAR SIDE
FT	FOOT/FEET
FTG	FOOTING
GA	GAGE
GALV	GALVANIZE/GALVANIZED
GRTG	GRATING
HEX	HEXAGON/HEXAGONAL
HORIZ	HORIZONTAL
HT	HEIGHT
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IF	INSIDE FACE
INV	INVERT
JT	JOINT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MID	MIDDLE
MIN	MINIMUM
MO	MASONRY OPENING
NF	NEAR FACE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPNG	OPENING
OPP	OPPOSITE
PART	PARTIAL
PAT	PATTERN
PERIM	PERIMETER
PRCST	PRECAST
PRELIM	PRELIMINARY
PREP	PREPARATION
PREV	PREVIOUS
PVC	POLYVINYL CHLORIDE
QA/QC	QUALITY ASSURANCE QUALITY CONTROL
QTY	QUANTITY
R	RADIUS
REBAR	REINFORCING STEEL BAR
REINF	REINFORCE/REINFORCEMENT/REINFORCING
REQD	REQUIRE/REQUIRED
RO	ROUGH OPENING
SCHED	SCHEDULE
SDI	STEEL DECK INSTITUTE
SECT	SECTION
SF	SQUARE FOOT
SIM	SIMILAR
SJI	STEEL JOIST INSTITUTE
SST	STAINLESS STEEL
STAG	STAGGERED
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STL JST	STEEL JOIST
STRUCT	STRUCTURAL
SYM	SYMBOL
SYMM	SYMMETRICAL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TEMP	TEMPORARY
THK	THICKNESS
TO	TOP OF
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UGND	UNDERGROUND
UNFIN	UNFINISHED
UON	UNLESS OTHERWISE NOTED
UTIL	UTILITY
VENT	VENTILATION
VERT	VERTICAL
VIF	VERIFY IN FIELD
WP	WORKING POINT
X-SECT	CROSS SECTION

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CROSS SECTION AND STRUCTURAL ABBREVIATIONS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

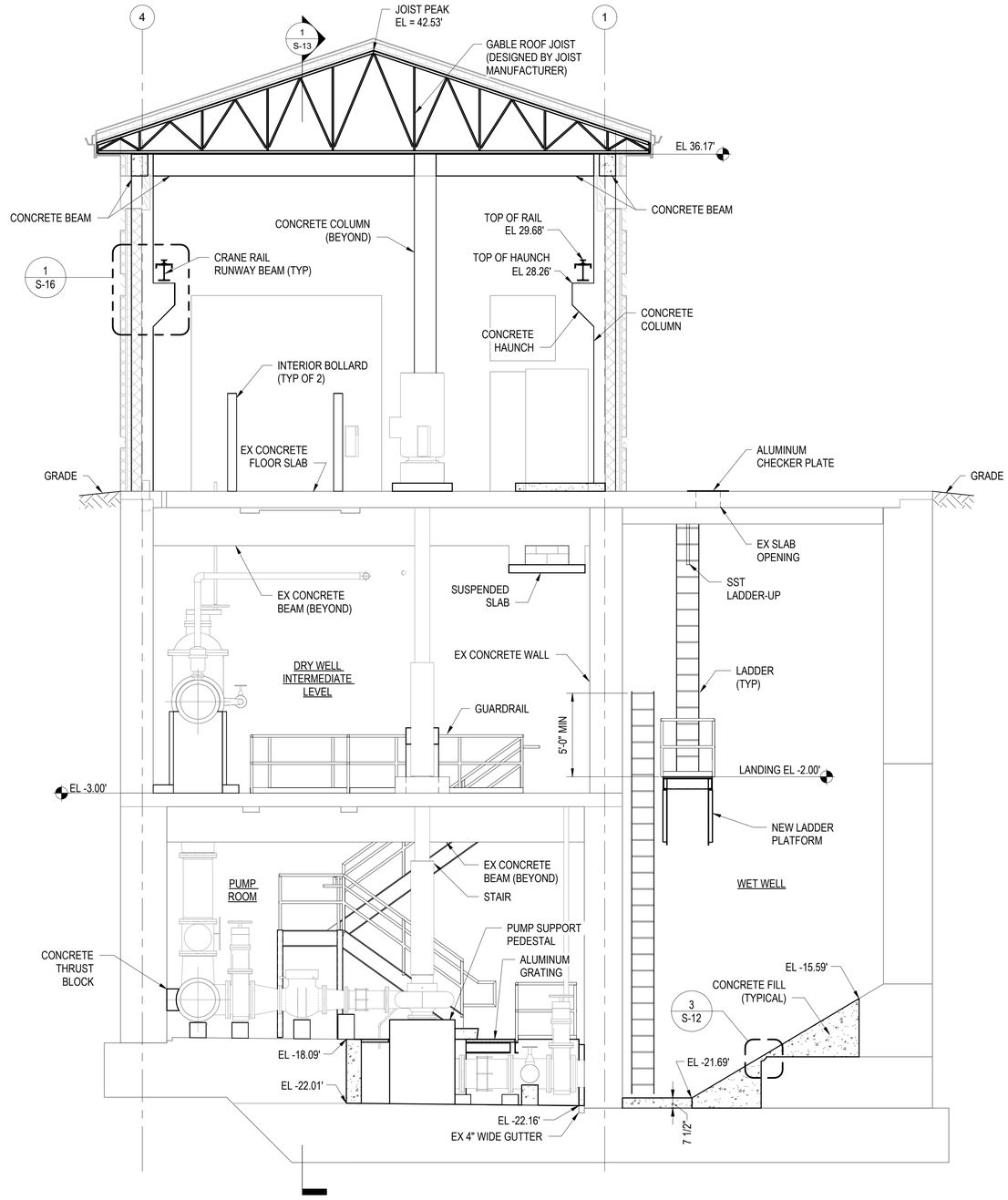
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SHEET 35 OF 92

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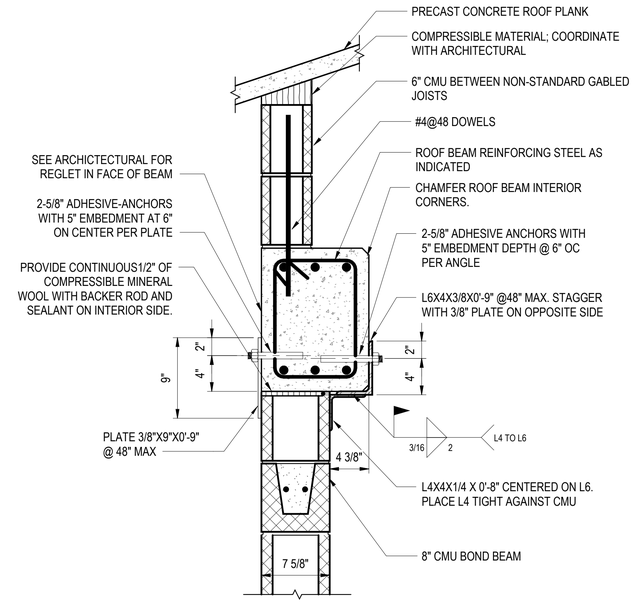
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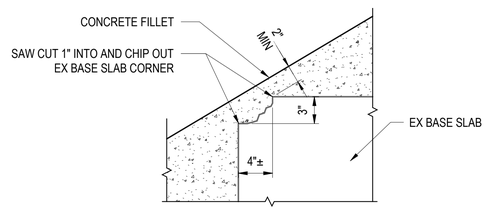
1 S-12 CROSS SECTION

SCALE: 1/4" = 1'-0"
REF: S-6



2 S-12 TYPICAL CMU BRACING AT ROOF BEAM

SCALE: 1 1/2" = 1'-0"
REF: S-10



3 S-12 DETAIL

SCALE: 1 1/2" = 1'-0"
REF: S-11

0 3" 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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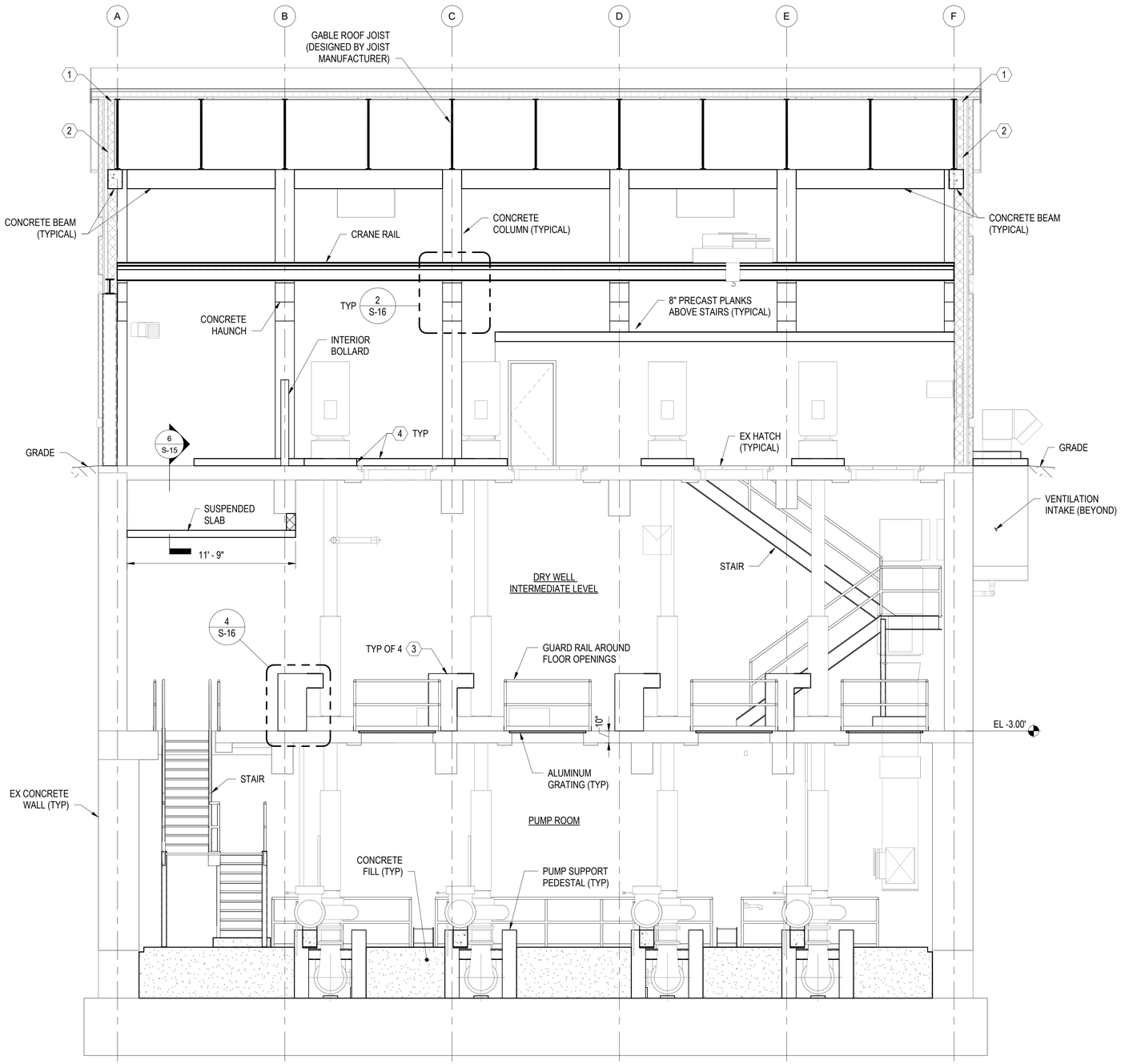
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SHEET 36 OF 92

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1 S-13 CROSS SECTION
SCALE: 1/4" = 1'-0"
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2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.
3. PUMP ROOM AND WET WELL UNDERGROUND CONCRETE FOUNDATION SLABS, WALLS, ELEVATED BEAMS AND SLABS ARE EXISTING. REFER TO PHASE 1 AS BUILT DRAWINGS.

SHEET KEYNOTES

1. PROVIDE SLOPED CMU BOND BEAM (6" THICK) AT GABLED END, SEE TYPICAL DETAIL ON S-5. PROVIDE 1/2" COMPRESSIBLE MINERAL WOOL BETWEEN THE PRECAST CONCRETE ROOF PLANKS AND CMU BOND BEAM.
2. 6" CMU WALL; PROVIDE #5@32 ON CENTER. DOWELS INTO CONCRETE BEAM TO MATCH VERTICAL WALL REINFORCING STEEL, SEE DETAIL 2 ON S-12.
3. 2'-0"x2'-0" DRIVE SHAFT SUPPORT BLOCK (TYPICAL).
4. INTERIOR EQUIPMENT PAD (TYPICAL).

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THE DRAWING IS NOT TO SCALE

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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN STATE OF DELAWARE No. 23491 PROFESSIONAL ENGINEER 3/24/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	1/4" = 1'-0"
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

LONGITUDINAL CROSS SECTION

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

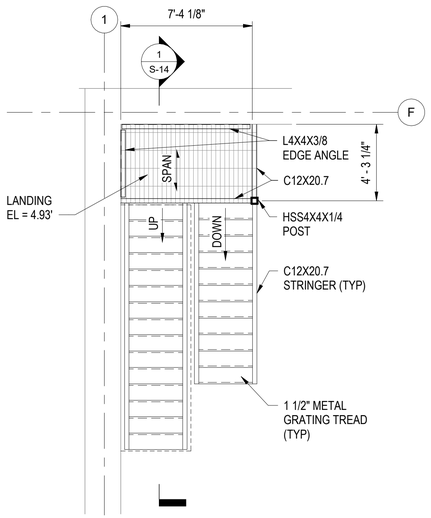
REVISION
COUNTY PROJECT No. 240618
DRAWING S-13
SHEET 37 OF 92

3/21/2025 4:12:20 PM

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.

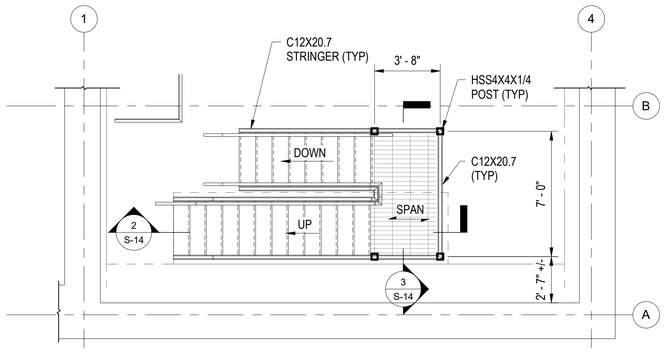
SHEET NOTES

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2. REFER TO DRAWINGS S-2 THROUGH S-5 FOR TYPICAL STRUCTURAL DETAILS.



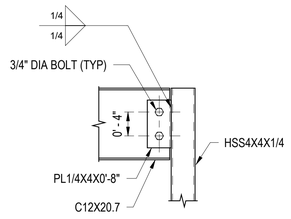
ENLARGED PARTIAL PLAN NORTH STAIR

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



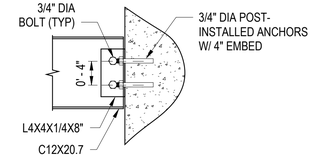
ENLARGED PARTIAL PLAN SOUTH STAIR

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



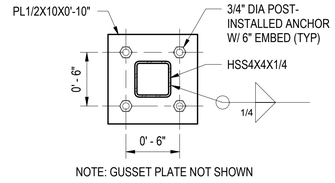
CHANNEL TO POST

SCALE: 1" = 1'-0"



CHANNEL TO WALL

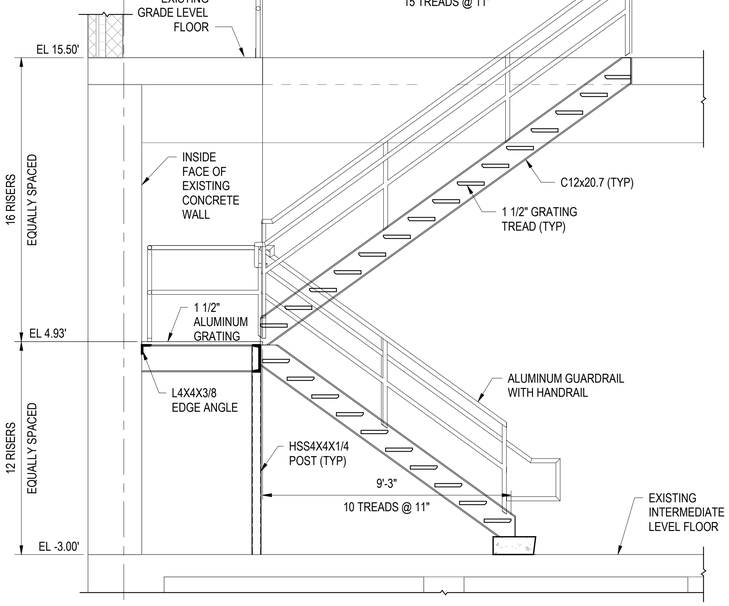
SCALE: 1" = 1'-0"



NOTE: GUSSET PLATE NOT SHOWN

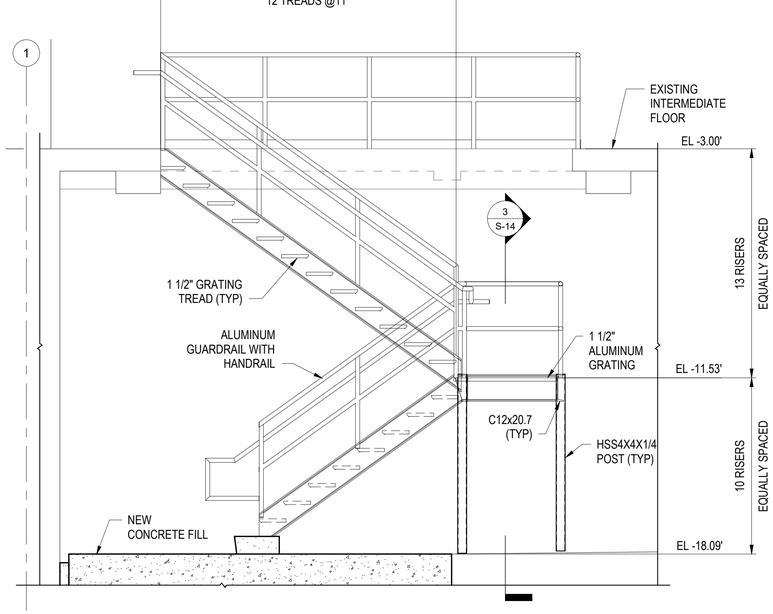
6 S-14 SECTION

SCALE: 1 1/2" = 1'-0"
REF: S-14



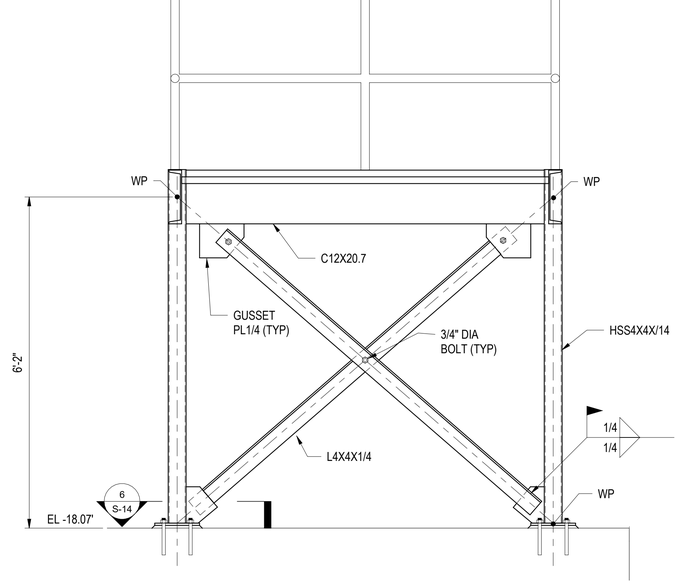
1 S-14 SECTION - NORTH STAIR

SCALE: 3/8" = 1'-0"
REF: S-14



2 S-14 SECTION - SOUTH STAIR

SCALE: 3/8" = 1'-0"
REF: S-14



3 S-14 SECTION

SCALE: 3/4" = 1'-0"
REF: S-14

SCALE: 1/4" = 1'-0" (0 2' 4' 8')
SCALE: 3/4" = 1'-0" (0 1' 2' 3')
SCALE: 3/8" = 1'-0" (0 1' 2' 3' 5')
SCALE: 1" = 1'-0" (0 6" 1' 2')
SCALE: 1 1/2" = 1'-0" (0 3" 6" 1' 2')

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN No. 24091 DELAWARE 3/21/25 PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	As indicated
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

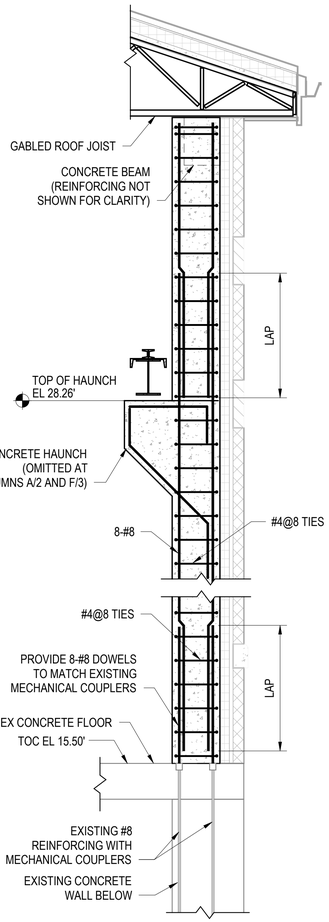
STAIR PLANS, SECTIONS, AND DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

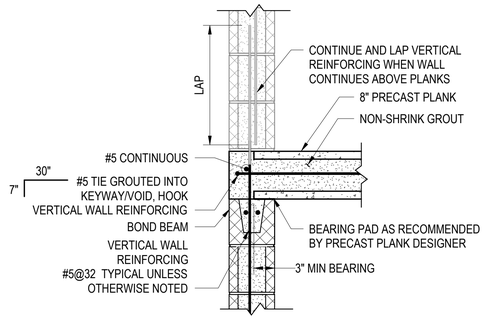
REVISION
COUNTY PROJECT No. 240618
DRAWING S-14
SHEET 38 OF 92

3/21/2025 4:12:21 PM

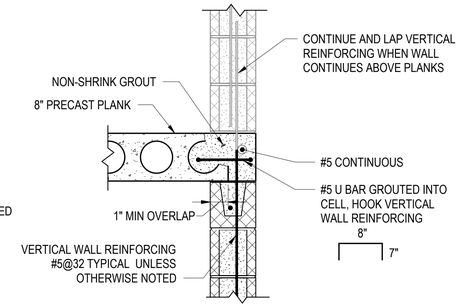
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.



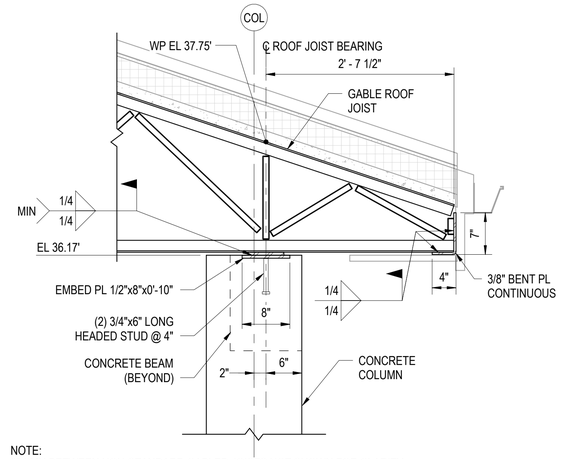
1 S-15 **SECTION**
SCALE: 1/2" = 1'-0"
REF: S-8



2 S-15 **SECTION**
SCALE: 1" = 1'-0"
REF: S-9

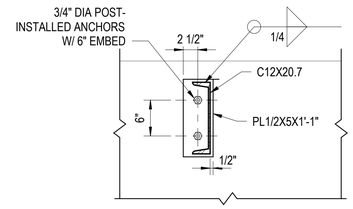


3 S-15 **SECTION**
SCALE: 1" = 1'-0"
REF: S-9

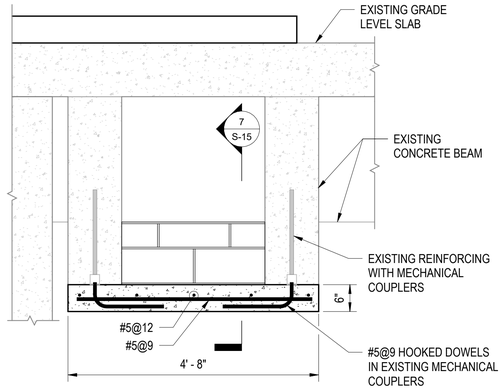


NOTE:
6" CMU BETWEEN NON-STANDARD GABLED JOISTS NOT SHOWN FOR CLARITY. PROVIDE #5@48 ON CENTER. PROVIDE 1/2" MINIMUM COMPRESSIBLE MINERAL WOOL BETWEEN PRECAST CONCRETE ROOF PLANKS AND TOP OF 6" CMU. COORDINATE WITH ARCHITECTURAL.

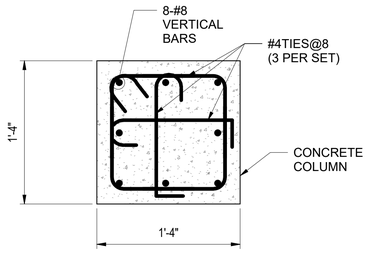
4 S-15 **SECTION**
SCALE: 1" = 1'-0"
REF: S-9



5 S-15 **SECTION**
SCALE: 1" = 1'-0"
REF:



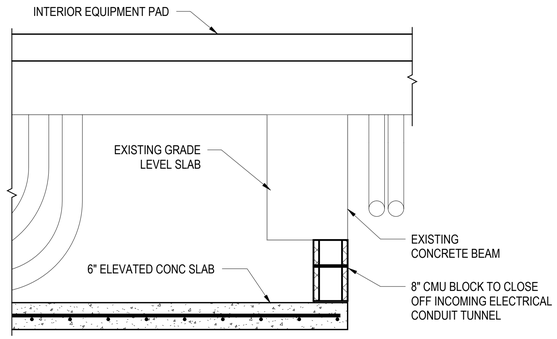
6 S-15 **SECTION**
SCALE: 3/4" = 1'-0"
REF: S-8



16"X16"

TYPICAL CONCRETE COLUMN DETAIL

NOT TO SCALE



7 S-15 **SECTION**
SCALE: 3/4" = 1'-0"
REF: S-8

HAUNCH ELEVATION

ANCHOR BAR WELDING DETAILS

TYPICAL CRANE RAIL HAUNCH REINFORCING

NOT TO SCALE

0 6" 1' 2'
SCALE: 1" = 1'-0"
0 1' 2' 4'
SCALE: 1/2" = 1'-0"

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WARNING
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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN, No. 21221, 8/21/25, PROFESSIONAL ENGINEER, DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	As indicated
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

SECTIONS AND DETAILS

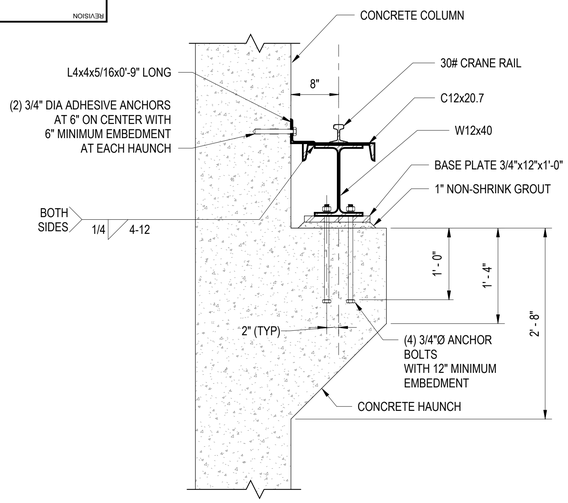
NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

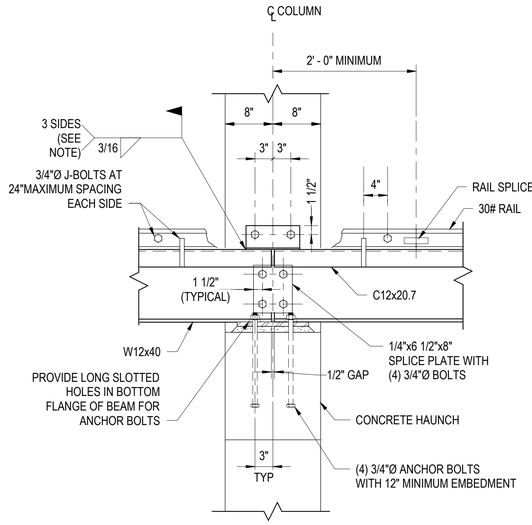
REVISION
COUNTY PROJECT No. 240618
DRAWING S-15
SHEET 39 OF 92

3/21/2025 4:12:23 PM

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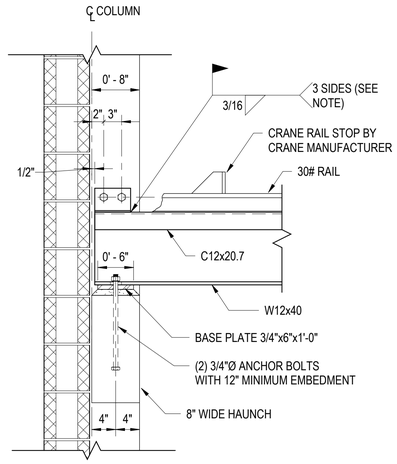


1 S-16 **SECTION**
SCALE: 1" = 1'-0"
REF: S-10



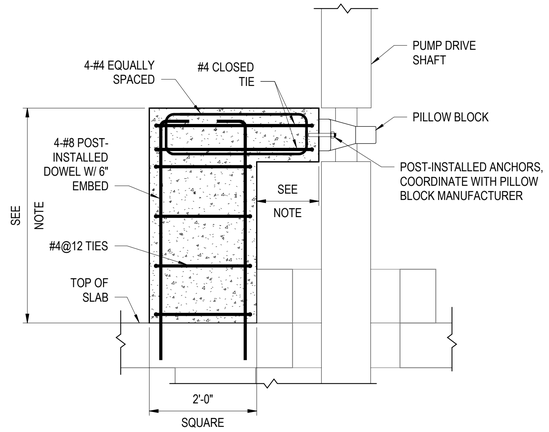
NOTE: WELD L4 TO C12 AFTER GRANE GIRDER ALIGNMENT

2 S-16 **DETAIL**
SCALE: 1" = 1'-0"
REF: S-13



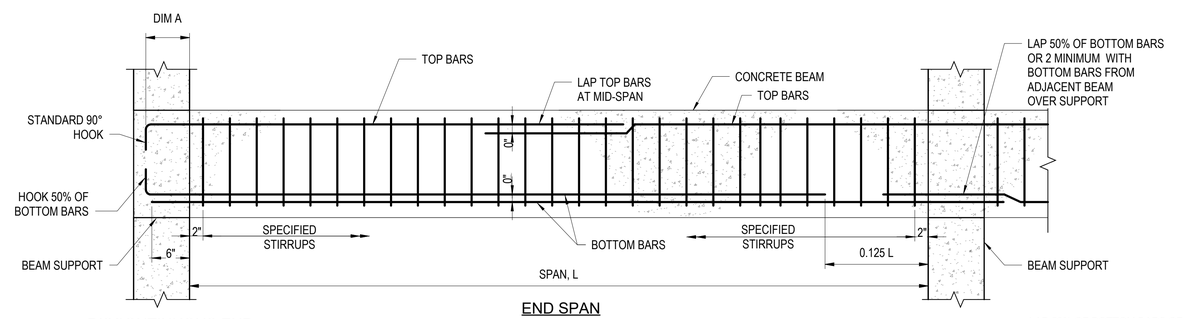
NOTE: WELD L4 TO C12 AFTER GRANE GIRDER ALIGNMENT

3 S-16 **DETAIL**
SCALE: 1" = 1'-0"
REF: S-9



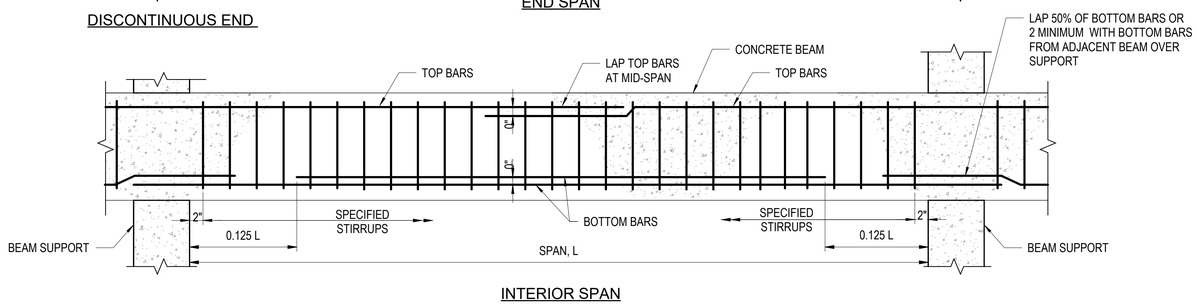
NOTE: COORDINATE DIMENSIONS WITH FINAL CONFIGURATION OF PUMP DRIVE SHAFTS AND PILLOW BLOCK PROVIDED. SUBMIT FINAL LAYOUT FOR APPROVAL PRIOR TO CONSTRUCTION.

4 S-16 **SECTION**
SCALE: 3/4" = 1'-0"
REF: S-7



DISCONTINUOUS END

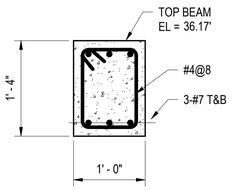
END SPAN



INTERIOR SPAN

TYPICAL CONCRETE BEAM SPAN - ELEVATION

NOT TO SCALE



NOTE: COORDINATE LOCATION OF REINFORCING TO AVOID CONFLICT WITH POST-INSTALLED ANCHORS. SEE DETAIL 2 / S-12.

5 S-16 **TYPICAL CONCRETE ROOF BEAM**
SCALE: 1" = 1'-0"
REF: S-9

0 6" 1' 2'
SCALE: 1" = 1'-0"

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WARNING
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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN LICENSE NO. 19191 STATE OF DELAWARE PROFESSIONAL ENGINEER 3/21/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	As indicated
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

SECTIONS AND DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING S-16
SHEET 40 OF 92

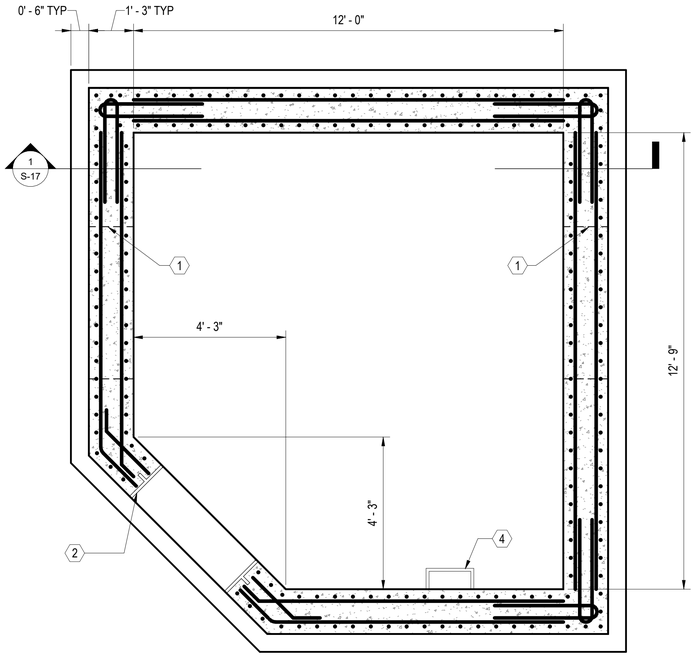
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REVISION

COUNTY PROJECT No.
240618

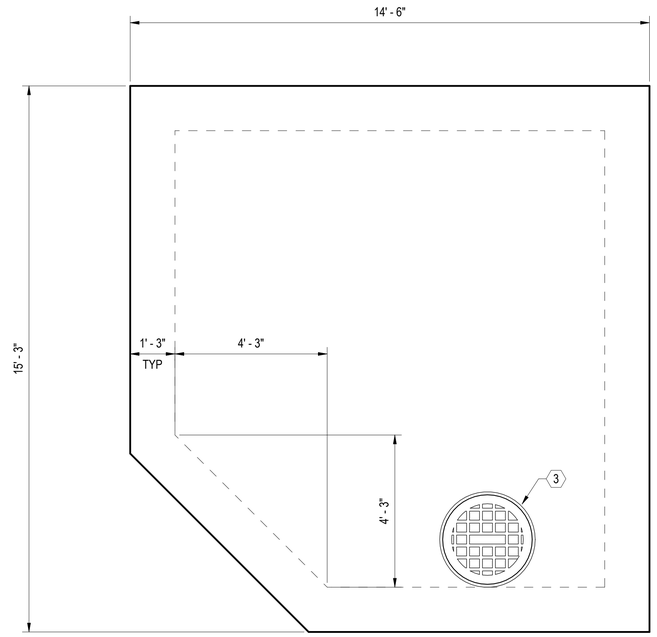
DRAWING

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BOTTOM SLAB PLAN

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



TOP SLAB PLAN

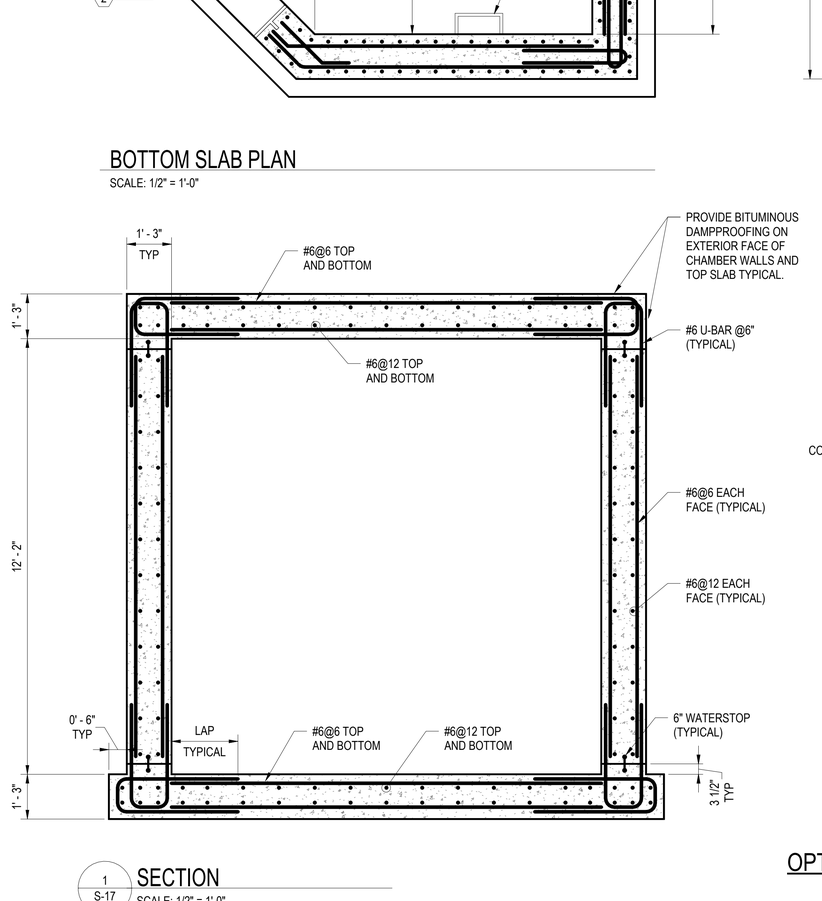
SCALE: 1/2" = 1'-0"

SHEET NOTES

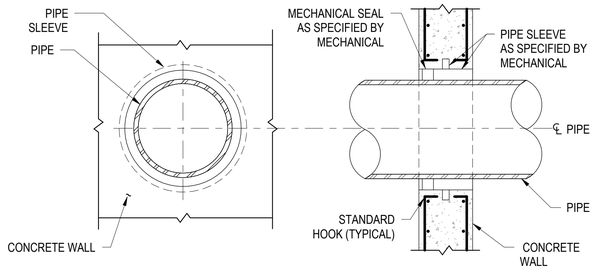
1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-6 FOR TYPICAL STRUCTURAL DETAILS.
3. COORDINATE JUNCTION CHAMBER WITH OTHER DISCIPLINES DRAWINGS.

SHEET KEYNOTES

1. CAST WALL AROUND EXISTING 42" DIAMETER PIPE, COORDINATE WITH CIVIL DRAWINGS. PROVIDE ADDITIONAL REINFORCING AROUND OPENING IN ACCORDANCE WITH TYPICAL DETAIL.
2. PROVIDE WALL SLEEVE FOR 42" DIAMETER PIPE PENETRATION . COORDINATE WITH CIVIL DRAWINGS. PROVIDE ADDITIONAL REINFORCING AROUND OPENING IN ACCORDANCE WITH TYPICAL DETAIL.
3. 30" MANHOLE OPENING, COORDINATE WITH CIVIL DRAWINGS. PROVIDE ADDITIONAL REINFORCING AROUND OPENING IN ACCORDANCE WITH TYPICAL DETAIL.
4. MANHOLE STEPS.



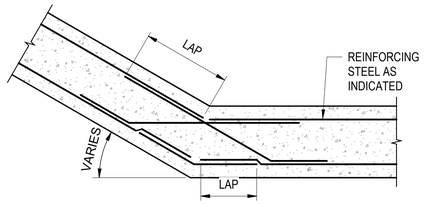
1 S-17 SECTION
SCALE: 1/2" = 1'-0"
REF: S-17



ELEVATION SECTION

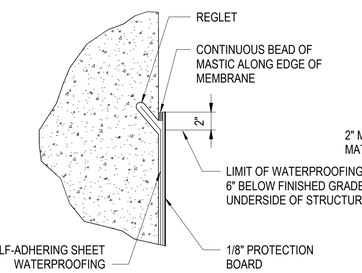
TYPICAL WALL SLEEVE DETAIL

NOT TO SCALE

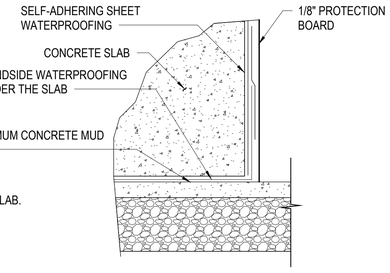


OPTIONAL HORIZONTAL REINFORCING STEEL ARRANGEMENT AT ANGLED TRANSITION FOR SLABS AND WALLS

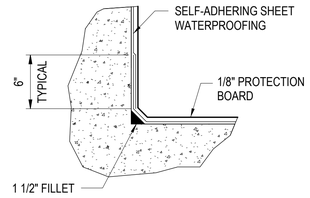
NOT TO SCALE



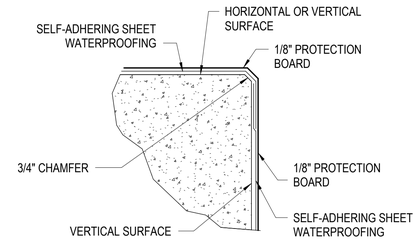
TOP TERMINATION



AT CONCRETE MAT SLAB



AT INSIDE CORNER



AT OUTSIDE CORNER

TYPICAL SELF-ADHERING SHEET WATERPROOFING DETAILS

NOT TO SCALE

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: PATRICK O'BRIEN No. 24091 3/21/25 PROFESSIONAL ENGINEER DELAWARE

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	As indicated
DESIGNED	TDR
DRAWN	AAB
CHECKED	PSO
DATE	MAR 2025

JUNCTION CHAMBER

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING S-17

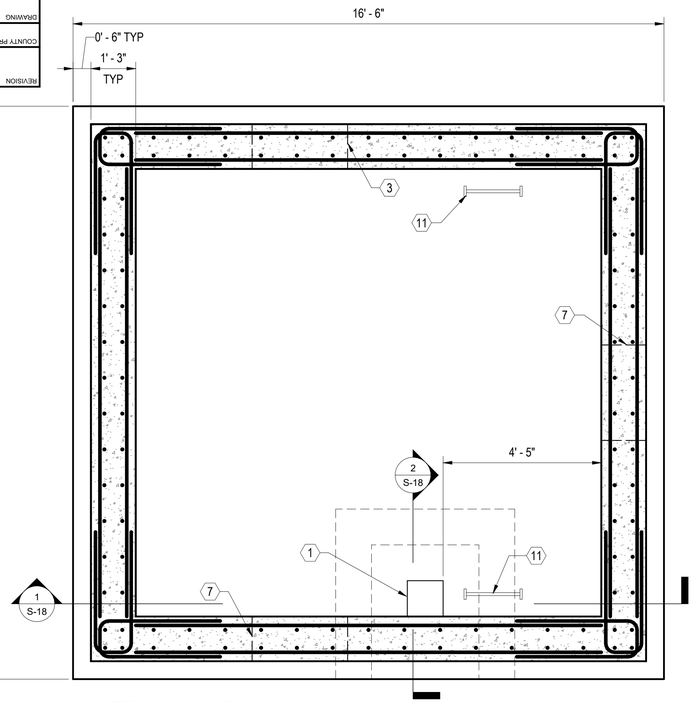
SHEET 41 OF 92

REVISION

COUNTY PROJECT No. 240618

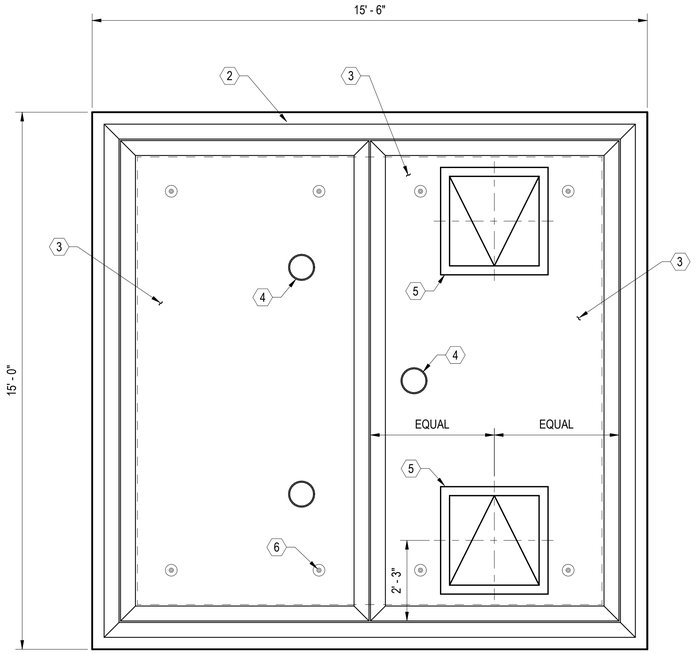
DRAWING

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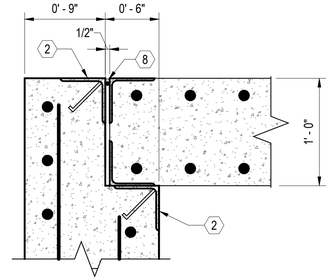
BOTTOM SLAB PLAN

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



TOP SLAB PLAN

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



3 S-18 **DETAIL**

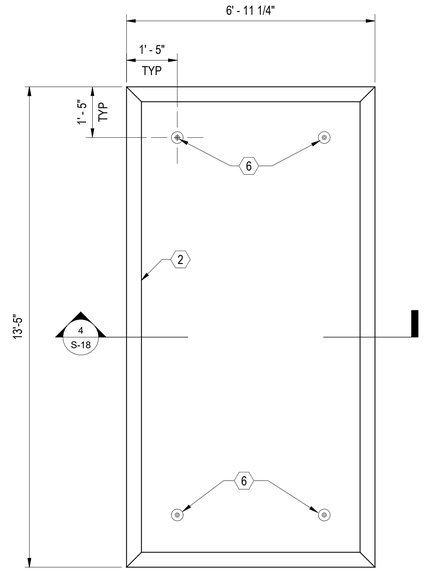
SCALE: 1 1/2" = 1'-0"
REF: S-18

SHEET NOTES

1. REFER TO DRAWING S-1 FOR GENERAL STRUCTURAL NOTES, DESIGN LOADS, AND CODES.
2. REFER TO DRAWINGS S-2 THROUGH S-6 FOR TYPICAL STRUCTURAL DETAILS. REFER TO DRAWING S-17 FOR TYPICAL SELF-ADHERING WATERPROOFING MEMBRANE DETAILS.
3. COORDINATE VALVE VAULT WITH OTHER DISCIPLINES DRAWINGS.

SHEET KEYNOTES

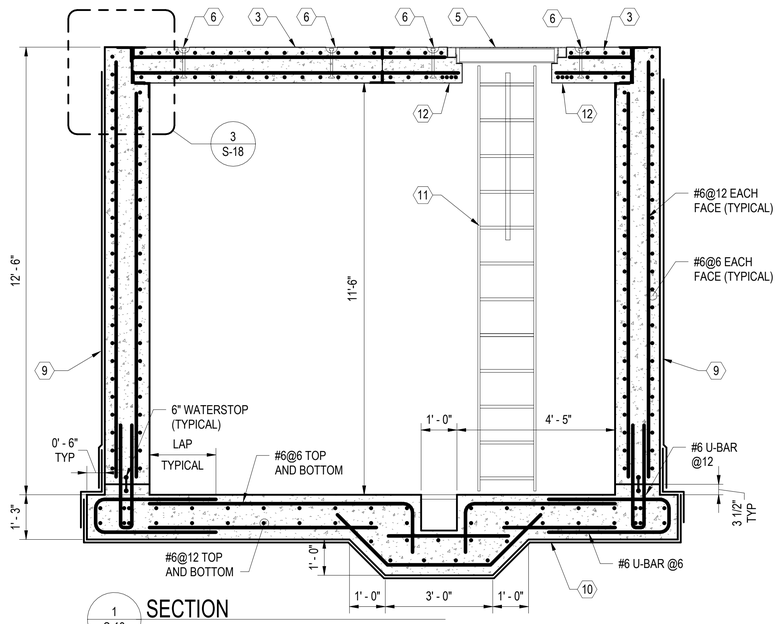
1. 1'-0"X1'-0"X1'-0" DEEP SUMP PIT.
2. GALVANIZED L5X5X5/16 CONTINUOUS. WELD MITER JOINTS AT CORNERS.
3. 13'-4 1/2" X 6'-11 1/4" X 1'-0" THICK PRECAST REMOVABLE TOP SLAB. SEE DETAILS.
4. EMBEDDED 8" DIAMETER GALVANIZED PIPE SLEEVE TO CREATE OPENING THROUGH PANEL FOR VALVE STEM. FIELD DETERMINE LOCATIONS OF OPENING TO CENTER OVER VALVES AFTER VALVE INSTALLATION. COORDINATION WITH OTHER DISCIPLINES DRAWINGS.
5. 2'-6" X 2'-6" ALUMINUM FLOOR ACCESS DOOR RATED FOR H-20 TRUCK LOADING.
6. PROVIDE STAINLESS STEEL TYPE 316 SWIFT-LIFT ANCHORS 4 TONS X 9-1/2 INCH WITH RUBBER RECESS PLUG, SWIFT LIFT SETTING PLATE AND COUNTERSUNK SCREW BY DAYTON SUPERIOR. PROVIDE ANCHOR, CONCRETE RECESS, AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
7. CAST-IN WALL SLEEVE FOR PIPE PENETRATION - SEE TYPICAL DETAIL ON S-17. COORDINATE WITH OTHER DISCIPLINES DRAWINGS.
8. 1/2" JOINT WITH BACKER ROD AND SEALANT AROUND ENTIRE PERIMETER OF PRECAST REMOVABLE TOP SLAB PANELS.
9. PROVIDE SELF-ADHERING WATERPROOFING MEMBRANE ON WALLS. SEE DETAILS ON S-17.
10. PROVIDE BLINDSIDE SELF-ADHERING WATERPROOFING MEMBRANE. SEE DETAILS ON S-17.
11. PROVIDE ACCESS LADDER UNDER FLOOR ACCESS DOOR.
12. ADDITIONAL 2-#6 ON BOTH SIDES OF FLOOR ACCESS DOOR.



NOTE: OPENINGS IN PANEL ARE NOT SHOWN.

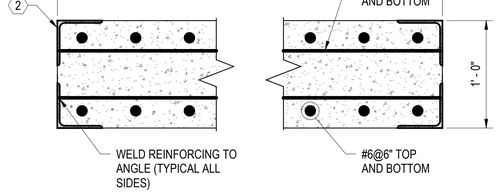
ENLARGED PLAN - REMOVABLE TOP SLAB PANEL

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



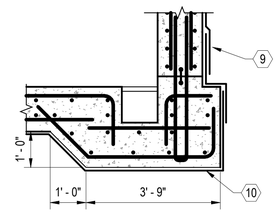
1 S-18 **SECTION**

SCALE: 1/2" = 1'-0"
REF: S-18



4 S-18 **SECTION**

SCALE: 1 1/2" = 1'-0"
REF: S-18



2 S-18 **SECTION**

SCALE: 1/2" = 1'-0"
REF: S-18

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

0 3" 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
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WO: 70852-000

APPROVED BY: PATRICK O'BRIEN No. 23991 DELAWARE PROFESSIONAL ENGINEER 3/4/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
PROFESSIONAL ENGINEER - DESIGN

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DATE	MAR 2025

REVISION
VALVE VAULT
NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

COUNTY PROJECT No. 240618
DRAWING S-18
SHEET 42 OF 92

3/21/2025 4:12:26 PM

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ARCHITECTURAL ABBREVIATIONS

ABV	ABOVE
AC	AIR CONDITIONING (CONDITIONER)
AD	ACCESS DOOR (OR PANEL)
ADA	AMERICAN WITH DISABILITIES ACT
ADD	ADDENDUM
ADJ	ADJACENT
AES	ABOVE EXISTING SLAB
AF	ACCESS FLOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APC	ACOUSTICAL PANEL CEILING (LAY-IN)
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASB	ASBESTOS
ASP	ASPHALT
ATC	ACOUSTICAL TILE CEILING (CONCEALED SUSPENSION)
AWP	ACOUSTICAL WALL PANEL
BB	BULLETIN BOARD (GLASS COVERED)
BC	BOTTOM OF CURB
BD	BOARD
BEN	BENCH
BETW	BETWEEN
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOT	BOTTOM
BR	BRICK
BR/S	BACKER ROD AND SEALANT
C	CONDUIT
C/C	CENTER TO CENTER
CAB	CABINET
CARP	CARPET
CARPT	CARPET TILE
CB	CHALK BOARD
CEM	CEMENT
CER	CERAMIC
CG	CORNER GUARD
CH	CEILING HEIGHT
CI	CAST IRON
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLOS	CLOSET
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEAR OPENING
COL	COLUMN
COMP	COMPACTED
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CONV	CONVECTOR
CR	COLD ROLLED
CSK	COUNTERSUNK
CSPE	CHLOROSULFONATED POLYETHYLENE ELASTOMER
CT	CERAMIC TILE
CTR	COUNTER
CW	COLD WATER
CX	CONNECT TO EXISTING
D	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIR	DIRECTORY
DN	DOWN
DO	DOOR OPENING
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
E	EAST
EA	EACH
EF	EACH FACE
EFS	EXTERIOR FINISH SYSTEM
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC OR ELECTRICAL
ELEV	ELEVATOR
EM	ENTRY MAT
EP	ETHYLENE PROPYLENE-BASED (SINGLE PLY ROOFING)
EPB	ELECTRIC PANEL BOX
EPDM	ETHYLENE-PROPYLENE-DIENE MEMBRANE
EPS	EXPANDED POLYSTYRENE
EPX	EPOXY
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE
EUH	ELECTRIC UNIT HEATER
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EWCA	ELECTRIC WATER COOLER - ACCESSIBLE
EXIST	EXISTING
EXP	EXPANSION OR EXPOSED
EXT	EXTERIOR
F	FILLER
FC	FAN COIL UNIT
FD	FLOOR DRAIN OR FIRE DAMPER
FDR	FOLDING DOOR (WOOD OR FABRIC)
FE	FIRE EXTINGUISHER ON BRACKET
FEC	FIRE EXTINGUISHER CABINET
FH	FLAT HEAD
FIN	FINISH OR FINISHED
FIRE T	FIRE TREATED
FIX	FIXTURE
FL	FLASHING
FLM	FULL LENGTH MIRROR
FLR	FLOOR
FR	FIRE RATED
FRC	FIBER-REINFORCED COATING
FS	FOLDING SHELF
FSS	FOLDING SHOWER SEAT
FT	FOOT OR FEET
FTG	FOOTING
FWP	FABRIC-WRAPPED PANEL (FABRICATED TACKABLE ACOUSTICAL PANEL)
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GEN	GENERAL
GL	GLASS
GLM	GLASS UNIT MASONRY (GLASS BLOCK)
GMU	GLAZED MASONRY UNIT
GP	GYPSUM PLASTER
GRD	GROUND
GRT	GROUT
GVP	GYPSUM VENEER PLASTER
GYPB	GYPSUM BOARD (WALL OR CEILING)
GYPBS	GYPSUM BOARD SHAFT-WALL ASSEMBLY
H	HEAD
HB	HORIZONTAL BLIND
HDW	HARDWARE
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HOT WATER
ID	INSIDE DIAMETER
IN	INCH
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
J	JAMB
JC	JANITOR'S CLOSET
JT	JOINT
KIT	KITCHEN
L	LINTEL
LAB	LABORATORY
LAV	LAVATORY
LG	LONG
LIN	LINOLEUM FLOOR COVERING
LLV	LONG LEG VERTICAL
LOC	LOCATION
LOCK	LOCKER
LP	LOW POINT
LT	LIGHT
LTG	LIGHTING
LV	LOUVER
M	MIRROR OR MEN
MACH	MACHINE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MC	MEDICINE CABINET
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MET	METAL
MFB	MINERAL FIBER BLANKET
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MK	MARK
MO	MASONRY OPENING
MP	METAL PANEL
MR	MOP RACK
MTD	MOUNTED
MTL	METAL
N	NORTH
NA	NOT APPLICABLE
ND	SANITARY NAPKIN DISPENSER
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFF	OFFICE
OHD	OVERHEAD COILING DOOR
OHG	OVERHEAD COILING GRILLE
OP	OPERABLE PANEL PARTITION (HUNG FROM OVERHEAD TRACK)
OPNG	OPENING
OPP	OPPOSITE
OZ	OUNCE
PAV	PAVER TILE
PC	PIECE
PF	PLASTIC FABRICATION
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PREFAB	PREFABRICATED
PREST	PRESSURE TREATED
PT	PAINT
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
QTY	QUANTITY
R	RISER OR RADIUS
RB	RESILIENT WALL BASE AND ACCESSORIES (VINYL BASE RUBBER BASE TREADS NOSINGS EDGINGS)
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN OR ROUND
REBAR	REINFORCING BAR
REINF	REINFORCED OR REINFORCING
REQ	REQUIRED
REQ'D	REQUIRED
RESF	RESINOUS FLOORING
RET	RETURN
REV	REVISION
RF	RESILIENT FLOORING (VINYL RUBBER VINYL COMPOSITION SHEET FLOORING)
RH	ROBE HOOK
RM	ROOM
RO	ROUGH OPENING
RV	ROOF VENT
RWR	RECESSED WASTE RECEPTACLE
RX	REMOVE EXISTING
S	SILL, SOUTH OR SINGLE
SC	SPECIAL COATING (OTHER THAN PAINT SYSTEMS)
SCH	SCHEDULE OR SCHEDULED
SCR	SHOWER CURTAIN ROD
SD	SOAP DISPENSER OR STORM DRAIN
SECT	SECTION
SF	SQUARE FOOT
SFT	STRUCTURAL FACING TILE
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SJ	STEEL JOIST
SND	SANITARY NAPKIN DISPOSAL
SOD	SECTIONAL OVERHEAD DOOR (STEEL ALUMINUM: PLASTIC PANEL)
SP	STAND PIPE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL OR SERVICE SINK
SSM	SOLID SURFACING MATERIAL
STAT	STATIONARY
STL	STEEL
STRUCT	STRUCTURAL OR STRUCTURE
SUSP	SUSPENDED
SWR	SURFACE-MOUNTED WASTE RECEPTACLE
SYS	SYSTEM
T	TILE
T&B	TOP & BOTTOM
T&G	TONGUE & GROOVE
TC	TOP OF CURB
TCD	TOILET SEAT COVER DISPENSER
TEL	TELEPHONE
TER	TERRAZZO
TH	THICK
TO	TOP OF
TOB	TOWEL BAR
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TOILET PARTITION (WATER CLOSET URINAL SHOWER: SCREEN)
TPD	TOILET PAPER DISPENSER
TR	TREAD
TYP	TYPICAL
U	UNIT
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
V	VENT
VB	VERTICAL BLIND
VDB	VISUAL DISPLAY BOARD (HINGED CONFERENCE UNIT)
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VP	VAPOR BARRIER
VS	VERTICAL STANDPIPE
W	WOMEN, WIDTH, WEST OR WOVEN
W/	WITH
WC	WATER CLOSET OR WALL COVERING (VINYL OR TEXTILE WALL COVERING WALL PAPER)
WD	WOOD
WH	WEEP HOLE
WHT	WHITE
WO	WINDOW OPENING
WP	WATERPROOF OR WORKING POINT
WR	WATER RESISTANT OR WASTE RECEPTACLE
WT	WEIGHT
WWF	WOVEN WIRE FABRIC
YD	YARD
YR	YEAR
F6	FIBERGLASS

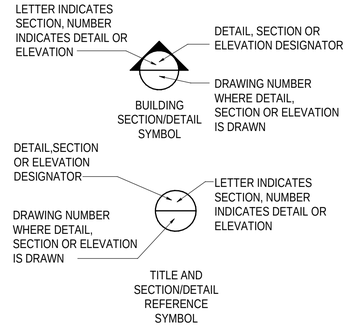
ARCHITECTURAL GENERAL NOTES:

1. ARCHITECTURAL GENERAL NOTES APPLY TO ALL SHEETS WHICH BEGIN WITH "A" IN THE DRAWING NUMBER. "NOTES THIS SHEET" APPLY TO THE ENTIRE SHEET IN WHICH THEY APPEAR. KEYED CONSTRUCTION NOTES APPLY WHERE SYMBOL IS USED.
2. ALL DIMENSIONS ARE TO FINISHED FACE UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS. REFER TO DIMENSIONS INDICATED.
4. ENTIRE STRUCTURE CONSISTS OF TWO LEVELS BELOW GRADE AND ONE LEVEL AT GRADE.

LEGEND

BRICK
CONCRETE MASONRY UNITS
STRUCTURAL CLAY UNITS
GYPSUM BOARD PARTITIONS
WOOD-FINISH GRADE
WOOD BLOCKING
RIGID WALL/ PERIMETER INSULATION
RIGID ROOF INSULATION
BATT INSULATION
CONCRETE
POROUS FILL
EARTH
METAL PATTERN

101 — DOOR NUMBER SYMBOL
1i — LOUVER AND WINDOW NUMBER SYMBOL
TITLE / 1/8" = 1'-0" — TITLE SYMBOL
A — NUMBER-DRAWING NOTE
1 — REVISION
NORTH ARROW (CONSTRUCTION NORTH)
1A.1 — PARTITION TAG



REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
△			
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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: FREDERICK A RISER NO. 5S-0007973 STATE OF DELAWARE REGISTERED ARCHITECT
3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____ PROFESSIONAL ENGINEER - DESIGN

SCALE	1" = 1'-0"
DESIGNED	RZH
DRAWN	RZH
CHECKED	DBB
DATE	MAR 2025

LEGEND, ABBREVIATIONS AND NOTES

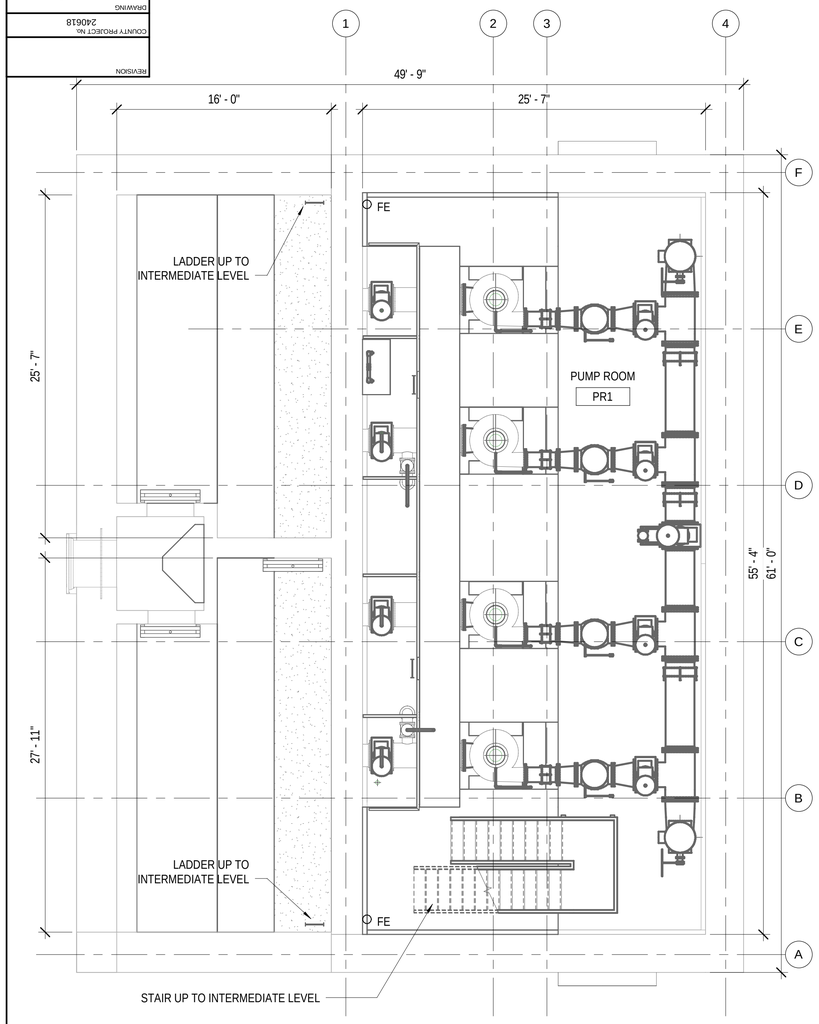
NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

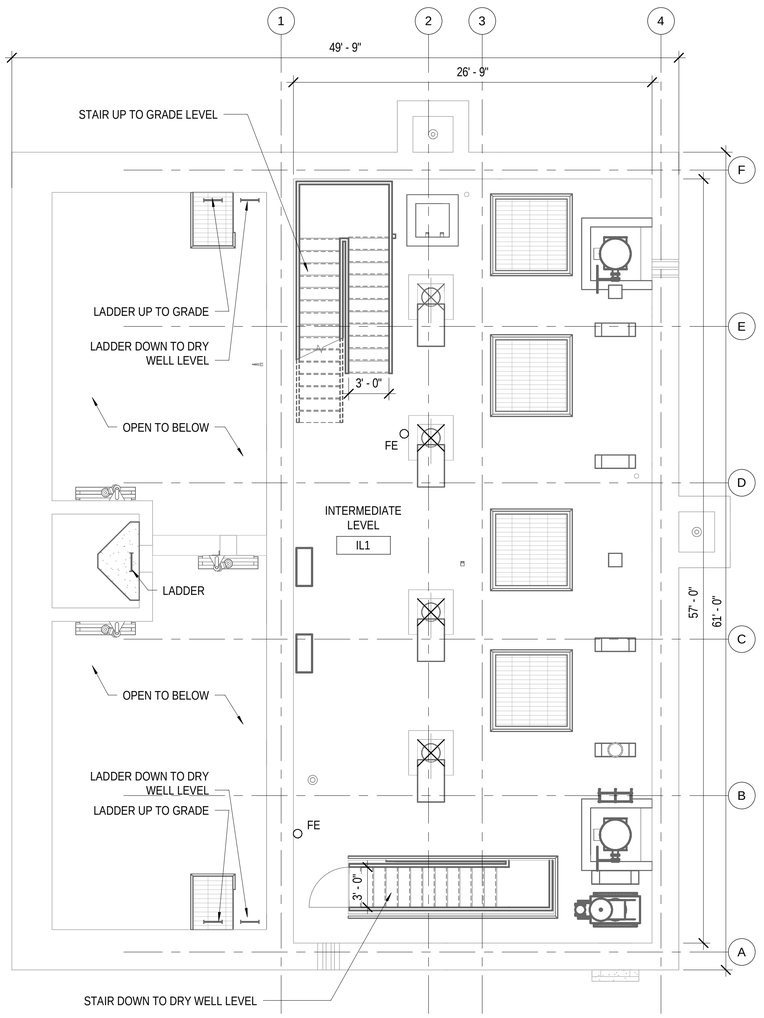
REVISION
COUNTY PROJECT No. 240618
DRAWING A-1
SHEET 43 OF 92

REVISION
COUNTY PROJECT No. 240618
DRAWING A-1
SHEET 43 OF 92

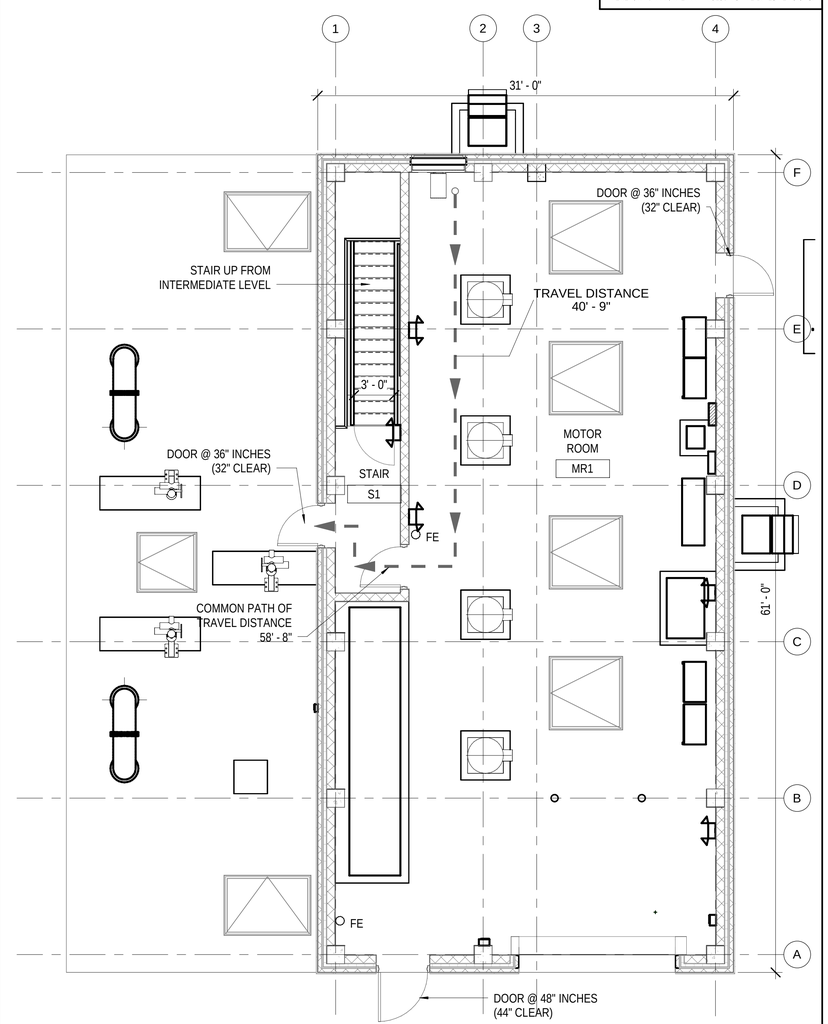
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3 A-2 DRY WELL LEVEL - BUILDING CODE ANALYSIS
SCALE: 3/16" = 1'-0"



2 A-2 INTERMEDIATE LEVEL - BUILDING CODE ANALYSIS
SCALE: 3/16" = 1'-0"



1 A-2 GRADE LEVEL - BUILDING CODE ANALYSIS
SCALE: 3/16" = 1'-0"

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Building Code Analysis

The proposed structure has a footprint of 2,880 square feet, including wet well. The building structure is approximately 1,840 gross square feet. The building is normally not occupied; periodic visits are made daily to ascertain pump operation; other periodic visits are made to perform maintenance on the pumps and other equipment.

Type of Construction (IBC - 2021)

Type II-B (Unprotected, non-combustible) construction.

Use and Occupancy Classification (IBC - 2021)

Group F-2 Low-hazard factory industrial.
Fire Protection Systems (IBC - 2021)
Automatic sprinkler system is not required (903.2.4) No automatic sprinkler system has been included.

Floor Area Limitations (IBC - 2021)

The basic allowable area for this building occupancy and construction is thus 15,500 sq. ft.: (Table 506.2).

The first floor area of the building is 1,840 sq. ft., which is within the allowable area.

Building Height (IBC-2021)

The allowable height for Type II-B, Non-combustible, Non-protected construction is 55 feet (Table 504.3) and two stories (Table 504.4).
The proposed one story building is approximately 27 feet above grade at the designated point of measurement for a gable roof.

Fire Protection Criteria (IBC - 2021)

a. Fire Barrier Walls - Since the building is one fire area, no fire separation or fire barrier walls are required.
b. Fire Resistance Rating for Building Elements for Type II-B Construction (Table 601)

Component	Requirement
Permanent Partitions	No Requirement
Floor	No Requirement
Structural Framing	No Requirement
Shaft Enclosures	1 Hour (Less than 4 Stories)
Exit Enclosures	1 Hour
Roof / Ceiling	No Requirement
Exterior Bearing Walls	No Requirement
Interior Bearing Walls	No Requirement
Exterior Doors	No Requirement

c. Occupancy Separation: None Required (Single Occupancy)

d. Interior Finishes: (Table 803.5)
Exits: Class B, Flame Spread Index of 26-75; Smoke Developed Index of 0-450.
Rooms or Occupied Areas: Class C, Flame Spread Index of 76-200; Smoke Developed Index of 0-450.

e. Roof covering: (Table 15.05)
Class C, per ASTM E-108 or UL 790.

Means of Egress (NFPA 101 - Life Safety Code - 2021)

a. Occupancy Classification and Loading: Motor Room: Special Purpose Industrial Occupancy
The definition of a Special Purpose Industrial Occupancy is "Industrial occupancies that are characterized by a relatively low density of employee population, with much of the area occupied by machinery or equipment." Special Purpose Industrial Occupancies do not have a specific Occupant Load Factor (Table 7.3.1.2). For the purposes of calculating exit requirements, the Occupant Load Factor for General and High Hazard Industrial Occupancies will be used.

b. Occupant Loading:

Area	Calculation	Occupants	
Motor Room -	Grade Level	1,840 sf / 100 sf	19
Discharge Header –	Intermediate Level	1,840 sf / 100 sf	19
Pump Room –	Dry Well Level	1,840 sf / 100 sf	19
Total Building Occupancy			57

c. Required Exit Capacity & Size:
Grade Level: Minimum Number of Exits: 1; Number of Exits Provided: 3
Total Exit Width Required: (19 persons x 0.2 in./person) = 3.8 inches (Use minimum width of 32 inches clear)
Total Exit Width Provided: 64 inches

Intermediate Level: Minimum Number of Exits: 1; Number of Exits Provided: 1
Total Exit Width Required: (19 persons x 0.2 in./person) = 3.8 inches (Use minimum width of 32 inches)
Total Exit Width Provided: 32 inches

Pump Room (Dry Well Level): Minimum Number of Exits: 1; Number of Exits Provided: 1
Total Exit Width Required: (19 persons x 0.2 in./person) = 3.8 inches (Use minimum width of 32 inches)
Total Exit Width Provided: 32 inches

d. Maximum Travel Distance
Maximum Travel Distance Permitted: Special Purpose Industrial Occupancy: 300 feet
Maximum Travel Distances Provided: Grade Level 48 feet; Intermediate Level 95 feet; Dry Well Level 195 feet

Accessibility and Usefulness for the Disabled

Pursuant to Paragraph 203.5 of the ADA, this facility is not required to be accessible.

CHAPTER REFERENCES

1) International Building Code, International Code Council, 2021, (with New Castle County amendments).
2) NFPA 101 – Life Safety Code, National Fire Protection Association, 2021.
3) ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings
4) IECC 2018 - International Energy Conservation Code, adopted 01/2021.

0 2' 4' 6' 10'
SCALE: 3/16" = 1'-0"

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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
FREDERICK A. HIGER, NO. SA-0000179, STATE OF DELAWARE, LICENSED ARCHITECT
3·21·2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
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BUILDING CODE ANALYSIS

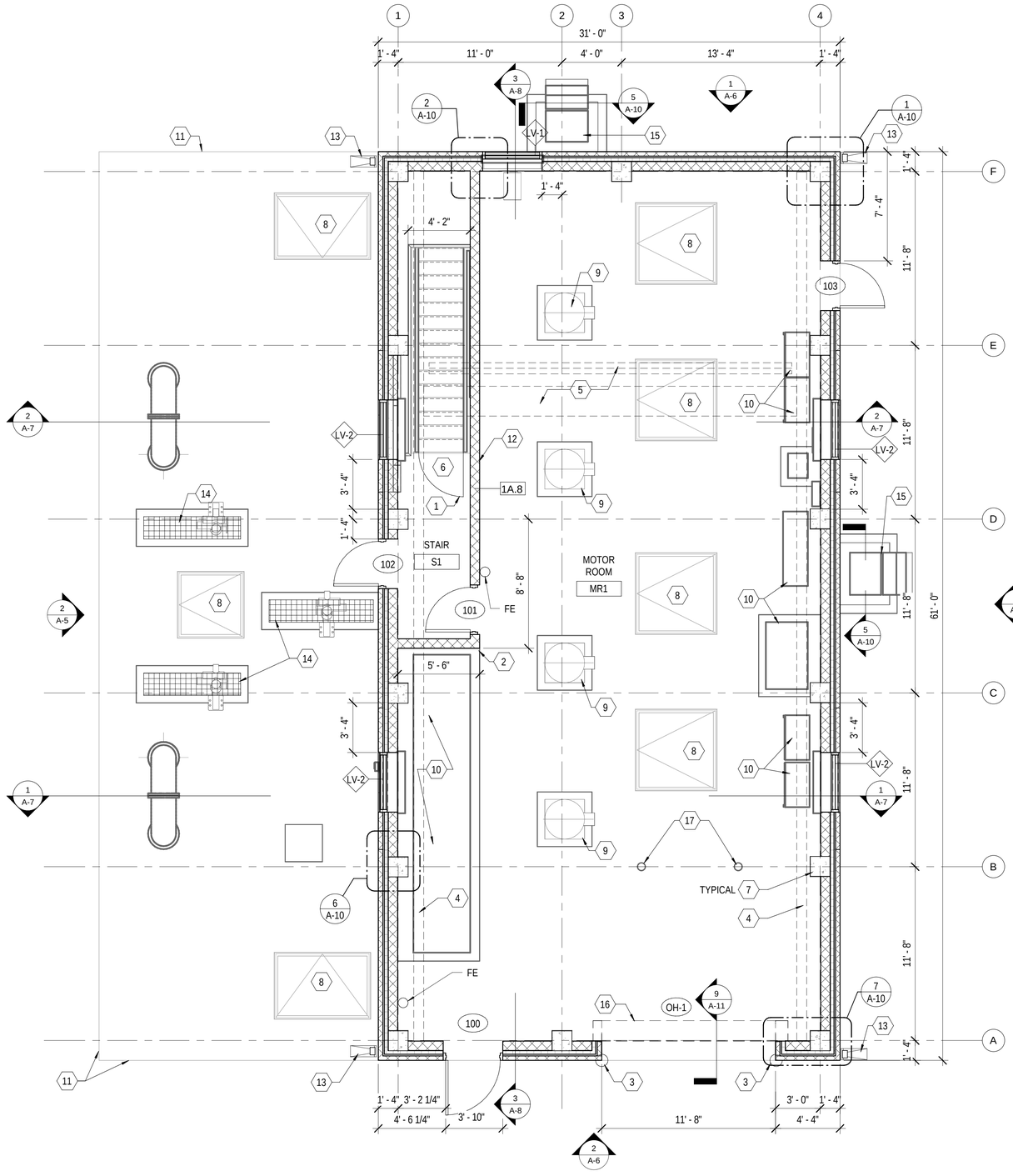
NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING A-2
SHEET 44 OF 92

3/21/2025 8:15:47 AM

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.



1 A-3 GRADE LEVEL PLAN
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. PAINT ALL EXPOSED STEEL. SEE FINISH LIST A-12.
2. PAINT CRANE RAIL SAFETY YELLOW.
3. PAINT ALL CONCRETE MASONRY AND EXPOSED CAST IN PLACE CONCRETE SEE FINISH LIST.
4. SEE ELEVATIONS FOR LOUVER SILL HEIGHTS.
5. PROVIDE FIRE EXTINGUISHERS ON WET WELL LEVEL AND INTERMEDIATE LEVEL WHERE INDICATED ON DRAWING A-2.

KEYED CONSTRUCTION NOTES:

1. PROVIDE ONE WAY SWING GATE AT TOP OF STAIRS.
2. STAINLESS STEEL CORNER GUARD, 4' HIGH
3. CAST IRON WHEEL GUARD
4. CRANE RAIL ABOVE. (SEE STRUCTURAL)
5. BRIDGE CRANE ABOVE. (SEE MECHANICAL)
6. SEE STRUCTURAL DRAWINGS FOR STAIRS
7. CAST IN PLACE CONCRETE COLUMN WITH HAUNCH FOR CRANE RAIL
8. EXISTING FLOOR ACCESS HATCH TO LEVEL BELOW
9. PUMP MOTOR, TYP. OF 4 (SEE MECHANICAL)
10. ELECTRICAL EQUIPMENT (SEE ELECTRIAL)
11. EXTENT OF PUMP STATION BELOW (SEE STRUCTURAL)
12. 8'-8" WALL ABOVE FINISHED FLOOR; PROVIDE PRECAST CONCRETE ROOF. (SEE STRUCTURAL)
13. DOWNSPOUT WITH SPLASH BLOCK
14. ALUMINUM CHECKER PLATE OVER OPENING. (SEE STRUCTURAL)
15. AIR INTAKE WELL, SEE DETAIL 5/A-10
16. HOOD FOR OVERHEAD COILING DOOR ABOVE
17. INTERIOR BOLLARD, SEE STRUCTURAL

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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DRAWING A-3

SHEET 45 OF 92

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3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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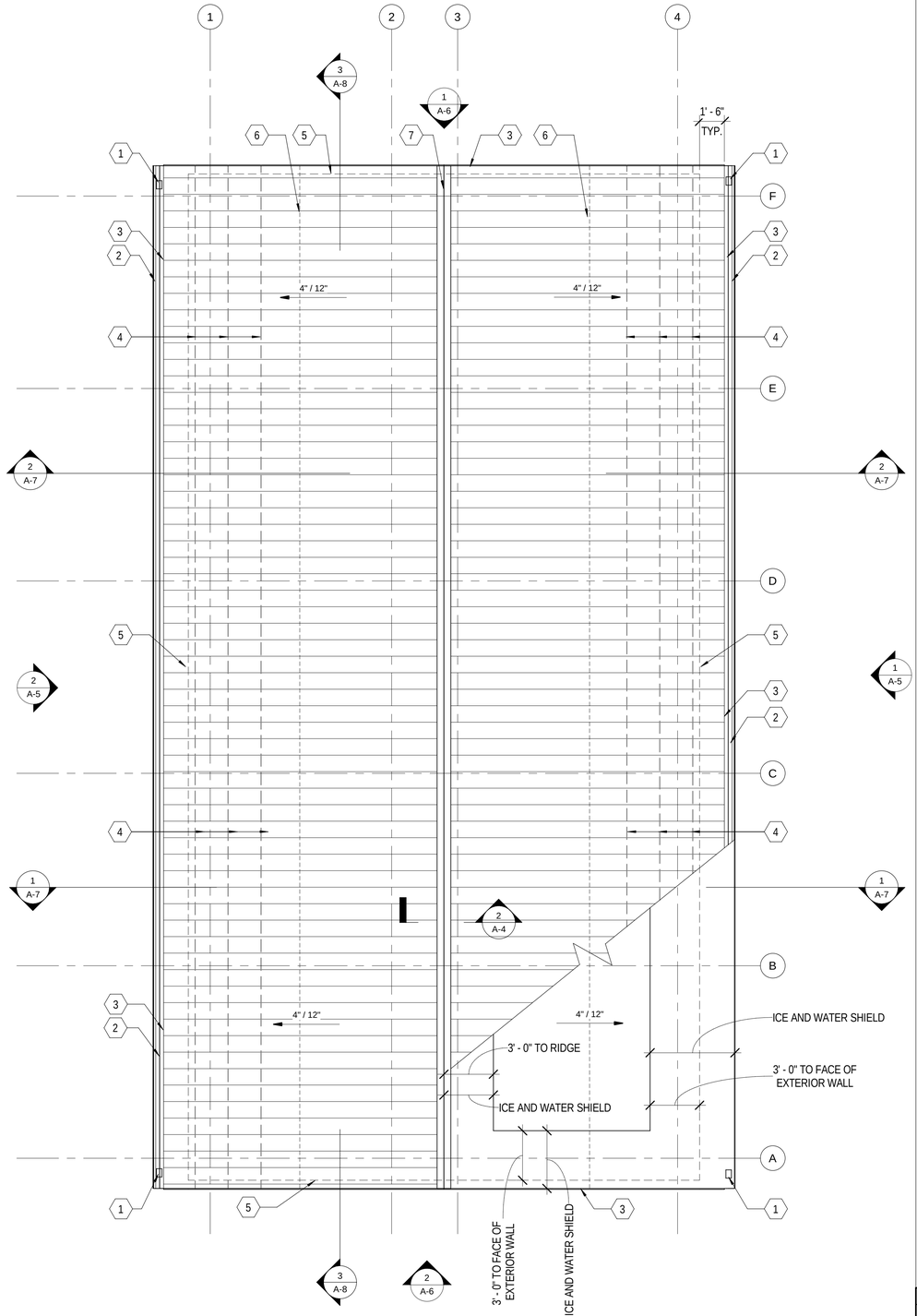
GRADE LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

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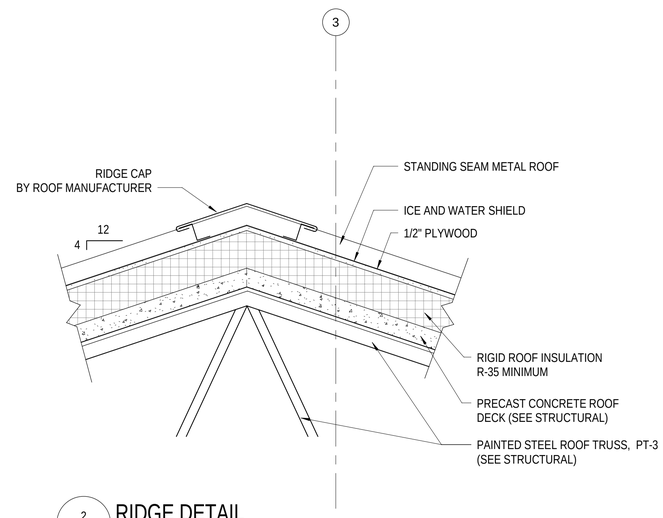
1 A-4 **ROOF PLAN**
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. SNOW GUARDS SHALL BE DESIGNED AND LOCATED BY SNOWGUARD MANUFACTURER.
2. SLOPE ALL GUTTERS TO DOWNSPOUTS.
3. REFER TO TYPICAL DETAILS FOR ROOF PENETRATIONS. INDIVIDUAL ROOF PENETRATIONS NOT SHOWN.

KEYED CONSTRUCTION NOTES:

1. DOWNSPOUT, 2"X3" RECTANGULAR
2. GUTTER MIN. 5"W X 4"D
3. FASCIA - 5/4" TRIM BOARD WRAPPED IN ALUMINUM
4. SNOW GUARDS (THREE ROWS) UNLESS OTHERWISE REQUIRED BY SNOWGUARD MANUFACTURER.
5. EXTENT OF BUILDING WALL BELOW
6. LINE OF FIXATION FOR STANDING SEAM PANELS
7. RIDGE CAP (BY ROOF MANUFACTURER)



2 A-4 **RIDGE DETAIL**
SCALE: NOT TO SCALE
REF: A-4

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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APPROVED BY: FREDERICK A. FISHER, JR. No. 55-0007978 STATE OF DELAWARE REGISTERED ARCHITECT
3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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ROOF PLAN AND DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

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COUNTY PROJECT No. 240618
DRAWING A-4
SHEET 46 OF 92

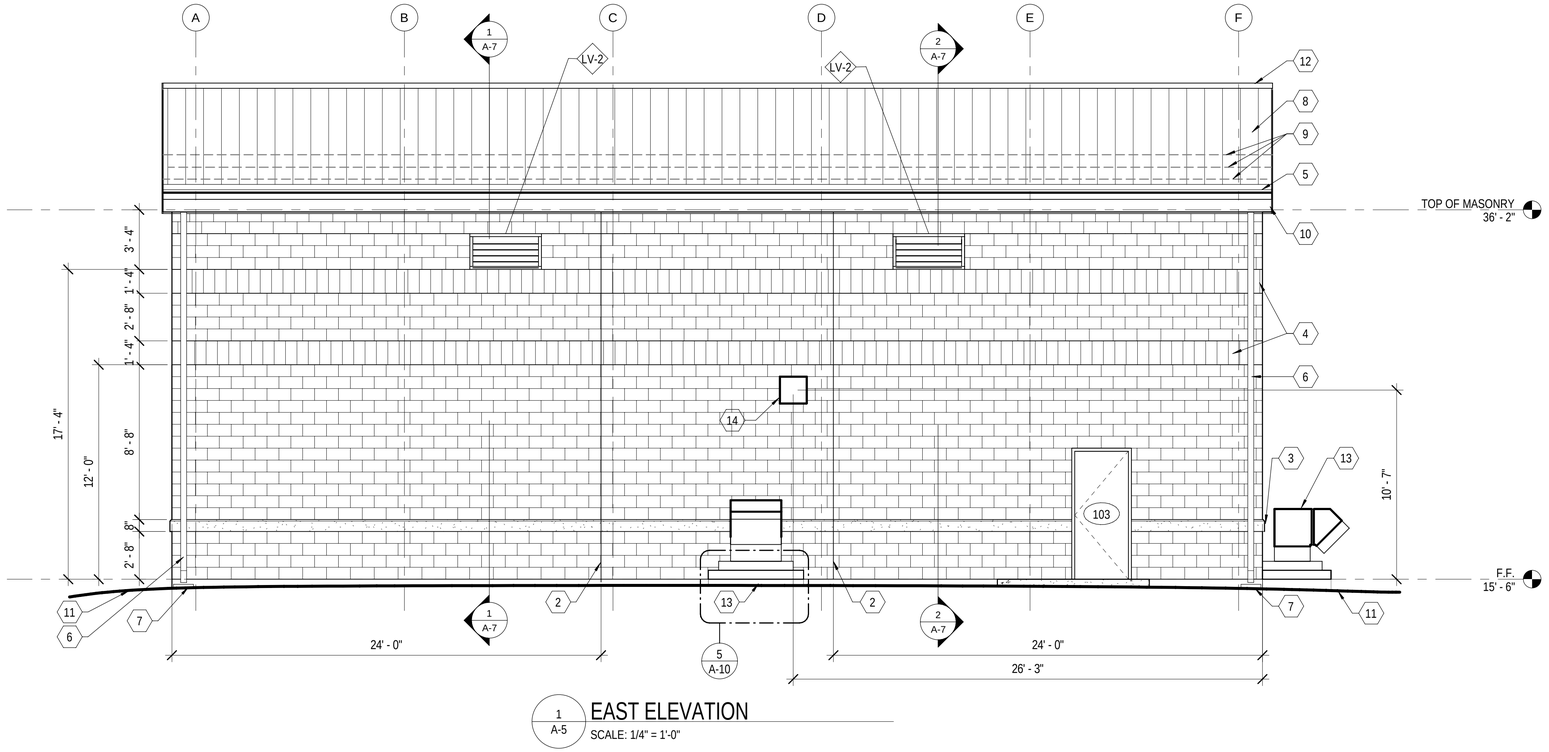
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SHEET 46 OF 92

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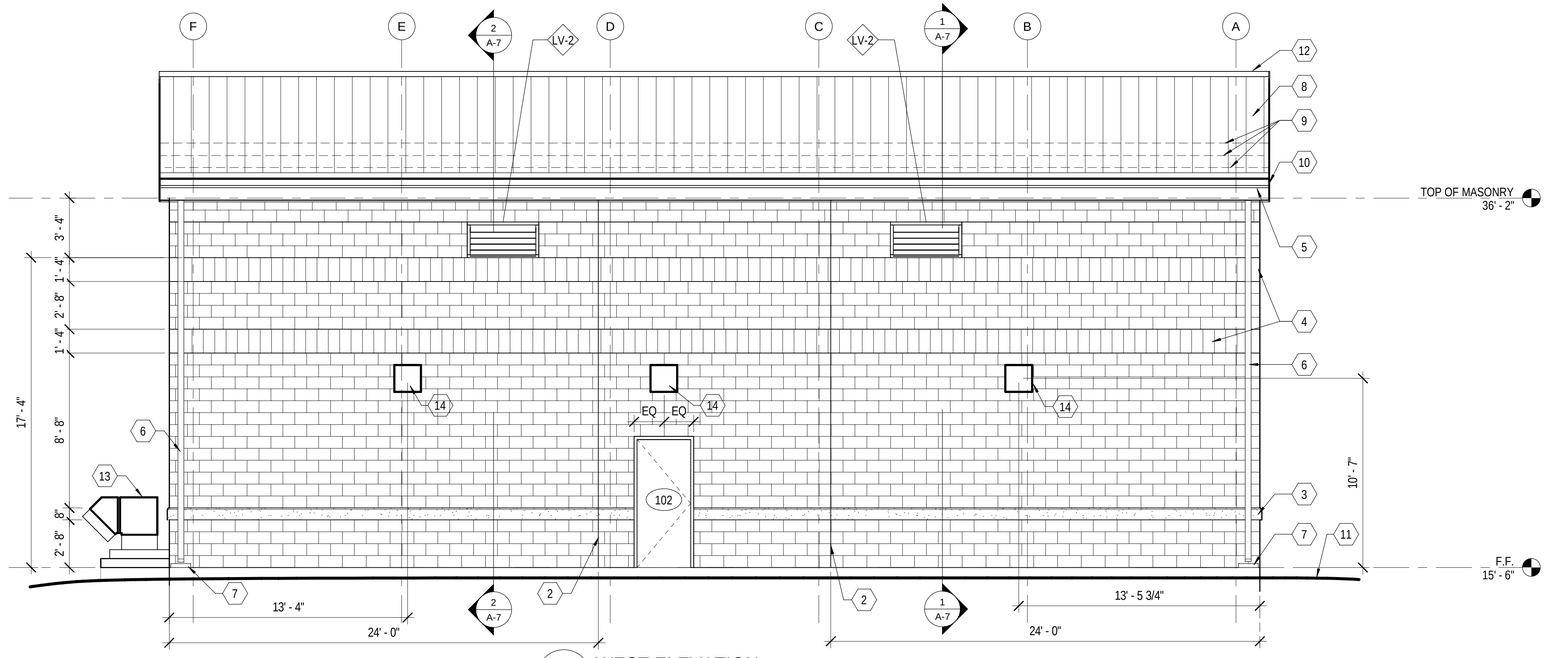
COUNTY PROJECT No.
240618

DRAWING



1 A-5 EAST ELEVATION

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



2 A-5 WEST ELEVATION

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

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GENERAL NOTES:

1. KEYED CONSTRUCTION NOTES APPLY TO ALL INSTANCES SHOWN IN THE ELEVATION VIEW, UNLESS OTHERWISE NOTED.
2. ALL RUNNING BOND CMU VENEER SHALL BE SPLIT FACE PER EXTERIOR ELEVATION FINISH SCHEDULE.

KEYED CONSTRUCTION NOTES:

1. NOT USED
2. 1/2" CONTROL JOINT
3. PRECAST CONCRETE WATERTABLE - SEE WALL SECTIONS
4. SOLDIER COURSE, GROUND FACE CMU
5. GUTTER - SEE ROOF PLAN
6. DOWNSPOUT - SEE ROOF PLAN
7. SPLASH BLOCK
8. STANDING SEAM METAL ROOF
9. SNOW GUARDS
10. FASCIA - SEE 4/A-10
11. FINISHED GRADE, SEE CIVIL
12. RIDGE CAP (BY ROOF PANEL MANUFACTURER)
13. AIR INTAKE WELL, SEE DETAIL 5/A-10
14. LIGHT FIXTURE - SEE ELECTRICAL

EXTERIOR FINISH SCHEDULE

MATERIAL	FINISHES	COLORS
SPLIT-FACE CONCRETE MASONRY UNITS	YORK SPLIT FACE	SANDSTONE
PRECAST CONCRETE	ARRIS CRAFT	OAK RIDGE
GROUND-FACE CONCRETE MASONRY UNITS	YORK SMOOTH FACE	YBP-16
LOUVERS	2 COAT FLUOROPOLYMER FACTORY FINISH	DARK BROWN
PERSONNEL DOORS -FIBERGLASS DOORS	FACTORY FINISHED	DARK BROWN
PERSONNEL DOORS - FIBERGLASS FRAMES	FACTORY FINISHED	DARK BROWN
OVERHEAD DOORS	POWDER COAT	MATCH PERSONNEL DOORS
CMU MORTAR	WORK RITE	WR358X
ROOFING	ZIP RIB	COLONIAL RED
GUTTER AND DOWNSPOUT	WILCO	NORWEGIAN WOOD

0 2' 4' 8'

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

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APPROVED BY:

FREDERICK A RISER NO. 55-0007974 REGISTERED PROFESSIONAL ENGINEER STATE OF DELAWARE LICENSED LANDSCAPE ARCHITECT

3-21-2025

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NEW CASTLE, DELAWARE 19720

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BUILDING ELEVATIONS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

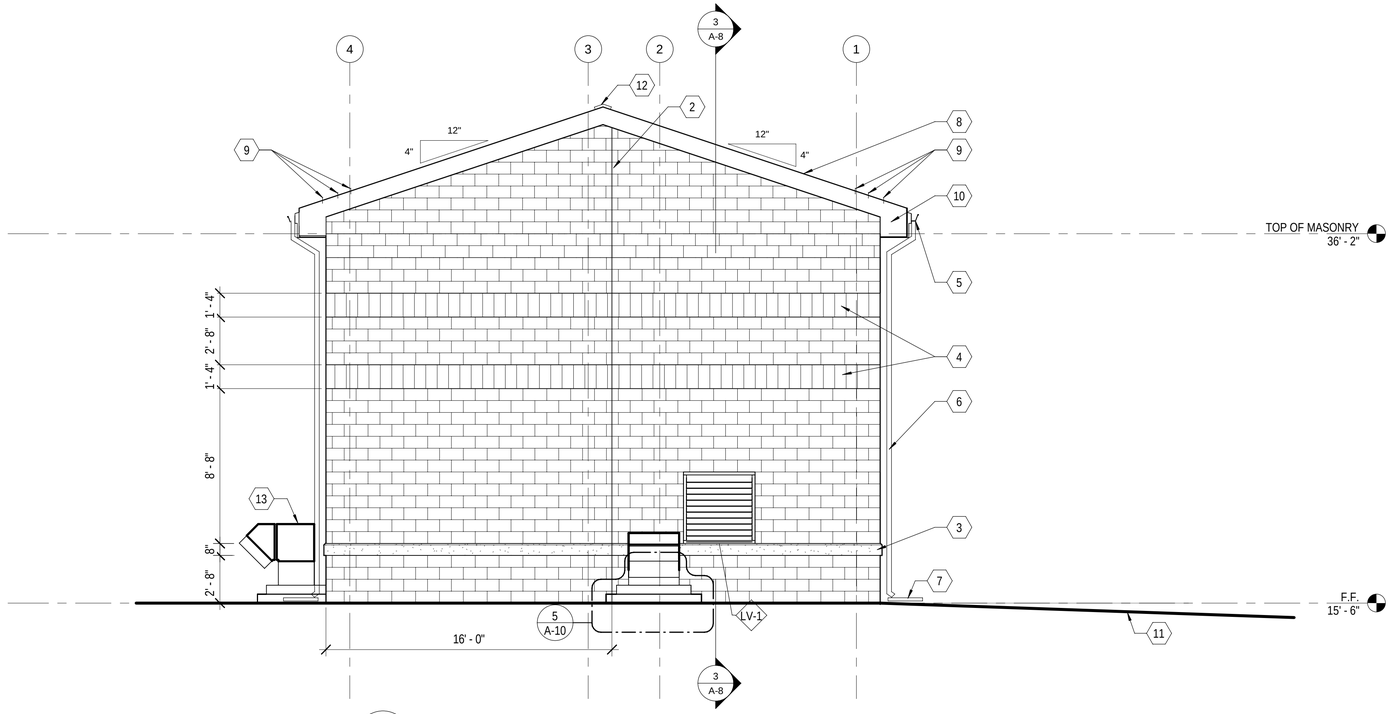
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DRAWING A-5

SHEET 47 OF 92

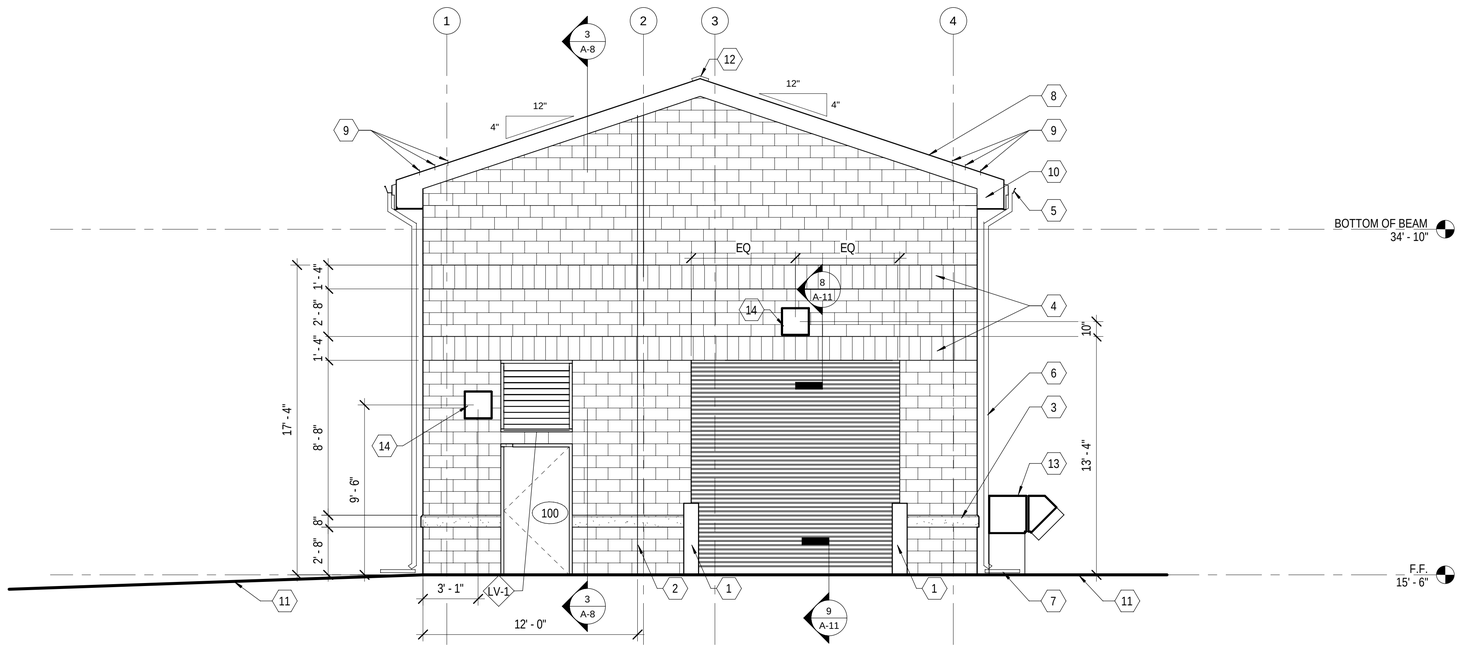
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1
A-6

NORTH ELEVATION

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



2
A-6

SOUTH ELEVATION

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

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GENERAL NOTES:

1. KEYED CONSTRUCTION NOTES APPLY TO ALL INSTANCES SHOWN IN THE ELEVATION VIEW, UNLESS OTHERWISE NOTED.
2. ALL RUNNING BOND CMU VENEER SHALL BE SPLIT FACE PER EXTERIOR ELEVATION FINISH SCHEDULE.

KEYED CONSTRUCTION NOTES:

1. CAST IRON WHEEL GUARD
2. 1/2" CONTROL JOINT
3. PRECAST CONCRETE WATERTABLE - SEE WALL SECTIONS
4. SOLDIER COURSE, GROUND FACE CMU
5. GUTTER - SEE ROOF PLAN
6. DOWNSPOUT - SEE ROOF PLAN
7. SPLASH BLOCK
8. STANDING SEAM METAL ROOF
9. SNOW GUARDS
10. FASCIA - SEE 4/A-10
11. FINISHED GRADE, SEE CIVIL
12. RIDGE CAP (BY ROOF PANEL MANUFACTURER)
13. TOP OF AIR INTAKE WELL, SEE DETAIL 5/A-10
14. LIGHT FIXTURE - SEE ELECTRICAL

EXTERIOR FINISH SCHEDULE

MATERIAL	FINISHES	COLORS
SPLIT-FACE CONCRETE MASONRY UNITS	YORK SPLIT FACE	SANDSTONE
PRECAST CONCRETE	ARRIS CRAFT	OAK RIDGE
GROUND-FACE CONCRETE MASONRY UNITS	YORK SMOOTH FACE	YBP-16
LOUVERS	2 COAT FLUOROPOLYMER FACTORY FINISH	DARK BROWN
PERSONNEL DOORS -FIBERGLASS DOORS	FACTORY FINISHED	DARK BROWN
PERSONNEL DOORS - FIBERGLASS FRAMES	FACTORY FINISHED	DARK BROWN
OVERHEAD DOORS	POWDER COAT	MATCH PERSONNEL DOORS
CMU MORTAR	WORK RITE	WR358X
ROOFING	ZIP RIB	COLONIAL RED
GUTTER AND DOWNSPOUT	WILCO	NORWEGIAN WOOD

0 2' 4' 8'

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

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187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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BUILDING ELEVATIONS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

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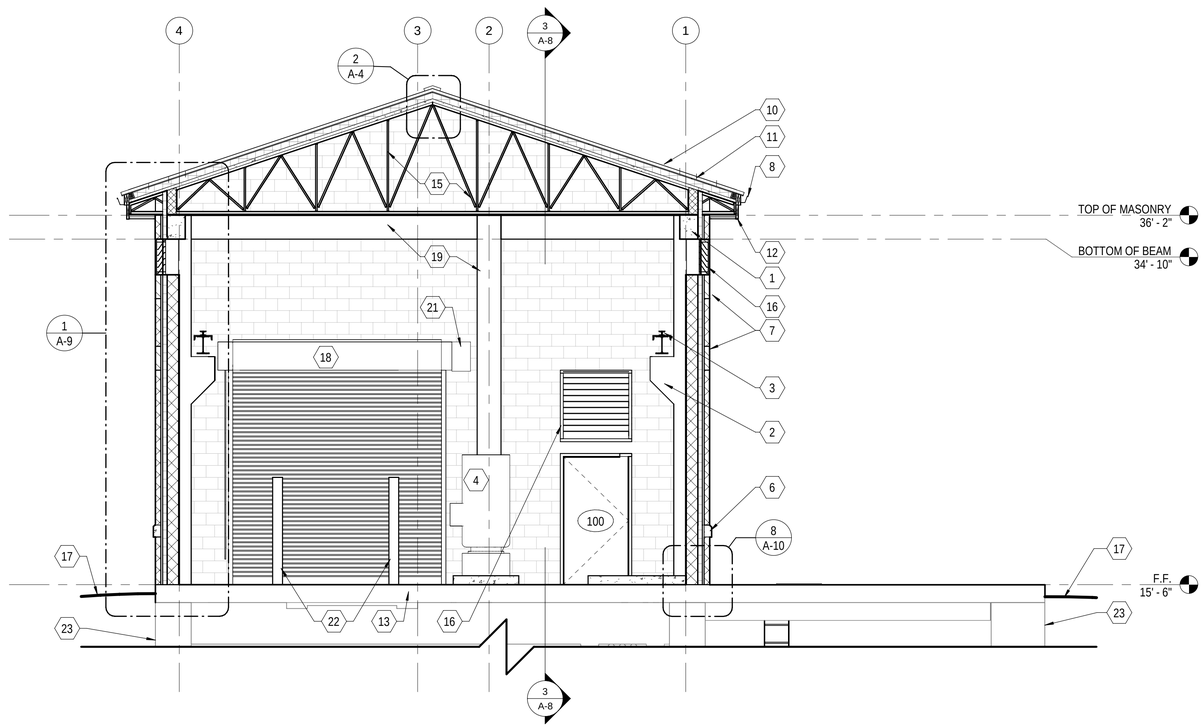
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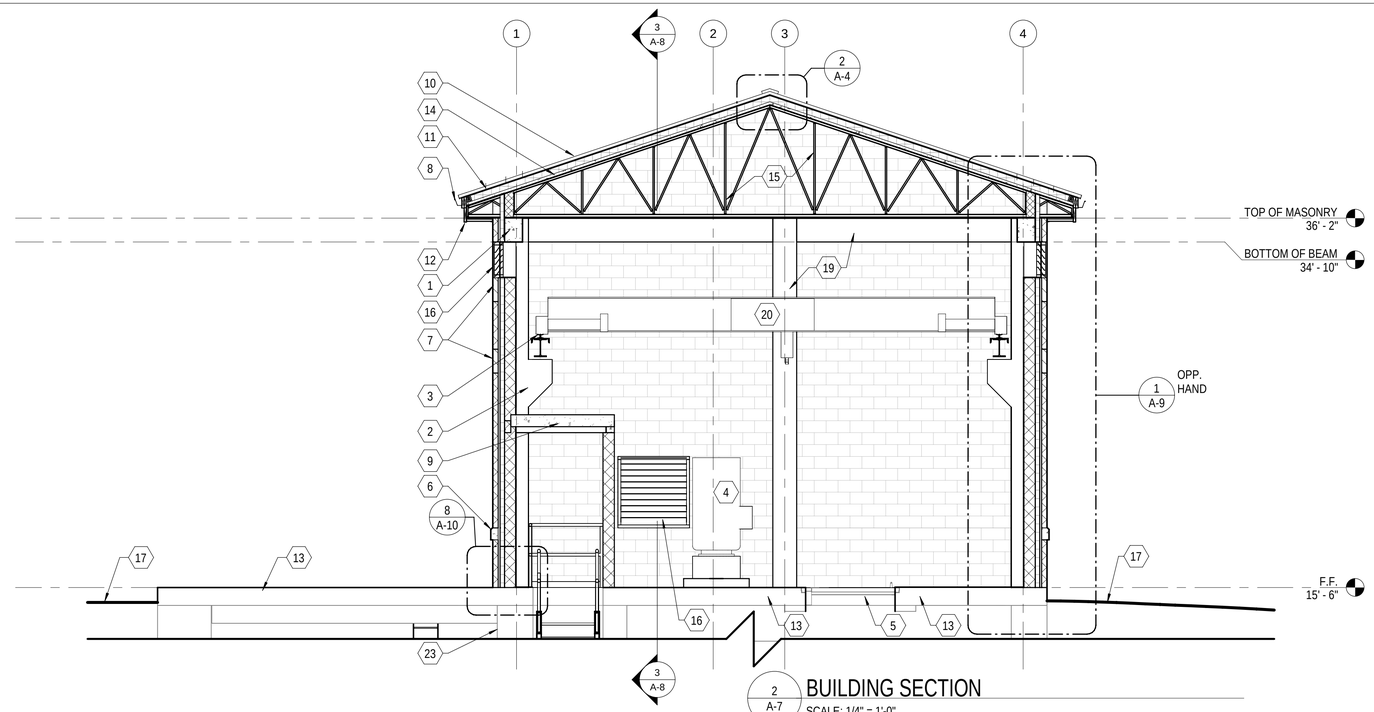
COUNTY PROJECT No.
240618

DRAWING



1 A-7 BUILDING SECTION

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



2 A-7 BUILDING SECTION

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

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GENERAL NOTES:

1. KEYED CONSTRUCTION NOTES APPLY TO ALL INSTANCES SHOWN IN THE BUILDING SECTION, UNLESS OTHERWISE NOTED.
2. FOR ROOM FINISH SCHEDULE AND FINISH SCHEDULE, REFERENCE A-12.

KEYED CONSTRUCTION NOTES:

1. CAST IN PLACE CONCRETE BEAM (SEE STRUCTURAL)
2. CAST IN PLACE COLUMN WITH CRANE RAIL HAUNCH BEYOND (SEE STRUCTURAL)
3. CRANE RAIL
4. MOTOR (SEE MECHANICAL)
5. EXISTING FLOOR ACCESS HATCH TO LEVEL BELOW
6. PRECAST CONCRETE WATERTABLE
7. SOLDIER COURSE - GROUND FACE PER FINISH SCHEDULE, REFERENCE ELEVATIONS ON A-5 AND A-6
8. GUTTER
9. PRECAST CONCRETE PLANK (SEE STRUCTURAL)
10. STANDING SEAM METAL ROOF
11. SNOW GUARDS
12. FASCIA / SOFFIT
13. EXISTING CONCRETE FLOOR SLAB
14. PRECAST CONCRETE ROOF DECK (SEE STRUCTURAL)
15. ROOF TRUSS - PT-3 (SEE STRUCTURAL)
16. LOUVER - SEE ELEVATION FOR TYPE
17. FINISHED GRADE (SEE CIVIL)
18. OVERHEAD COILING DOOR HOOD
19. BEAM AND COLUMN BEYOND (SEE STRUCTURAL)
20. BRIDGE CRANE (SEE MECHANICAL)
21. OVERHEAD DOOR MOTOR SIDE MOUNT
22. BOLLARDS
23. EXISTING CONCRETE WALL

0 2' 4' 8'

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

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NO. 55-0007972
REGISTERED
STATE OF DELAWARE
ARCHITECT
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187-A OLD CHURCHMANS ROAD
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NEW CASTLE COUNTY
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DEPARTMENT OF PUBLIC WORKS

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BUILDING SECTIONS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

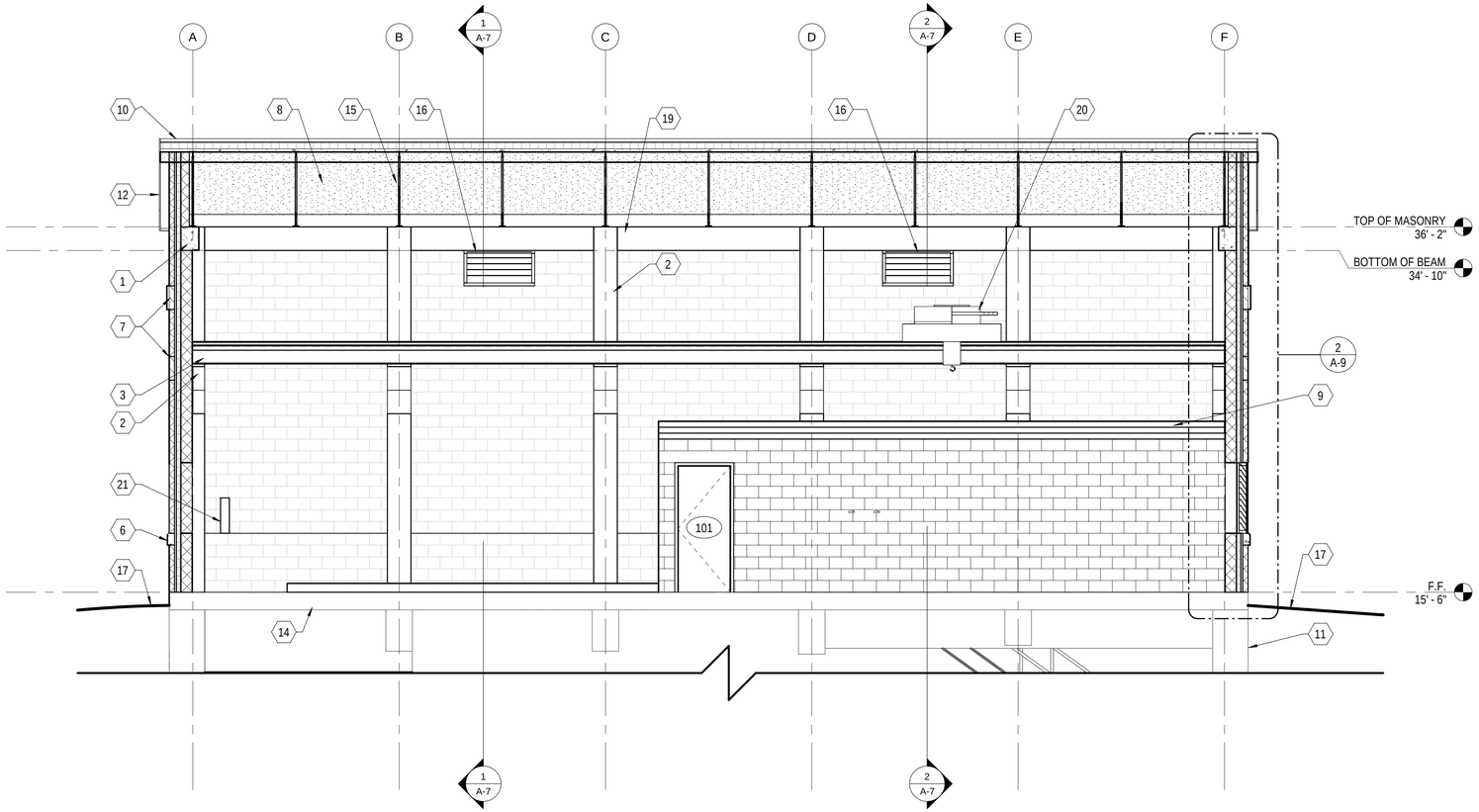
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SHEET 49 OF 92

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3 A-8 BUILDING SECTION

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GENERAL NOTES:

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2. FOR ROOM FINISH SCHEDULE AND FINISH SCHEDULE, REFERENCE A-12.

KEYED CONSTRUCTION NOTES:

1. CAST IN PLACE CONCRETE BEAM (SEE STRUCTURAL)
2. CAST IN PLACE COLUMN (SEE STRUCTURAL)
3. CRANE RAIL
4. NOT USED ON THIS SHEET
5. NOT USED ON THIS SHEET
6. PRECAST CONCRETE WATERTABLE
7. SOLDIER COURSE
8. PRECAST CONCRETE ROOF DECK (SEE STRUCTURAL)
9. PRECAST CONCRETE PLANK (SEE STRUCTURAL)
10. STANDING SEAM METAL ROOF
11. EXISTING CONCRETE WALL
12. FASCIA / SOFFIT
13. NOT USED ON THIS SHEET
14. EXISTING CONCRETE FLOOR SLAB
15. ROOF TRUSS - PT-3 (SEE STRUCTURAL)
16. LOUVER - SEE ELEVATION FOR TYPE
17. FINISHED GRADE (SEE CIVIL)
18. NOT USED ON THIS SHEET
19. BEAM BEYOND (SEE STRUCTURAL)
20. BRIDGE CRANE (SEE MECHANICAL)
21. FIRE EXTINGUISHER

0 2' 4' 8'

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

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THE DRAWING IS NOT TO SCALE

REVISION

COUNTY PROJECT No. 240618

DRAWING A-8

SHEET 50 OF 92

MISS UTILITY OF DELMARVA

BEFORE YOU DIG CALL 1-800-282-8555 (or DE) 1-800-441-8355 (MD, VA) PROTECT YOURSELF: GIVE TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
FREDERICK A RISER JR. NO. 55-0007911 STATE OF DELAWARE LICENSED ARCHITECT
3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	1/4" = 1'-0"
DESIGNED	RK
DRAWN	BC
CHECKED	DBB
DATE	MAR 2025

BUILDING SECTIONS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

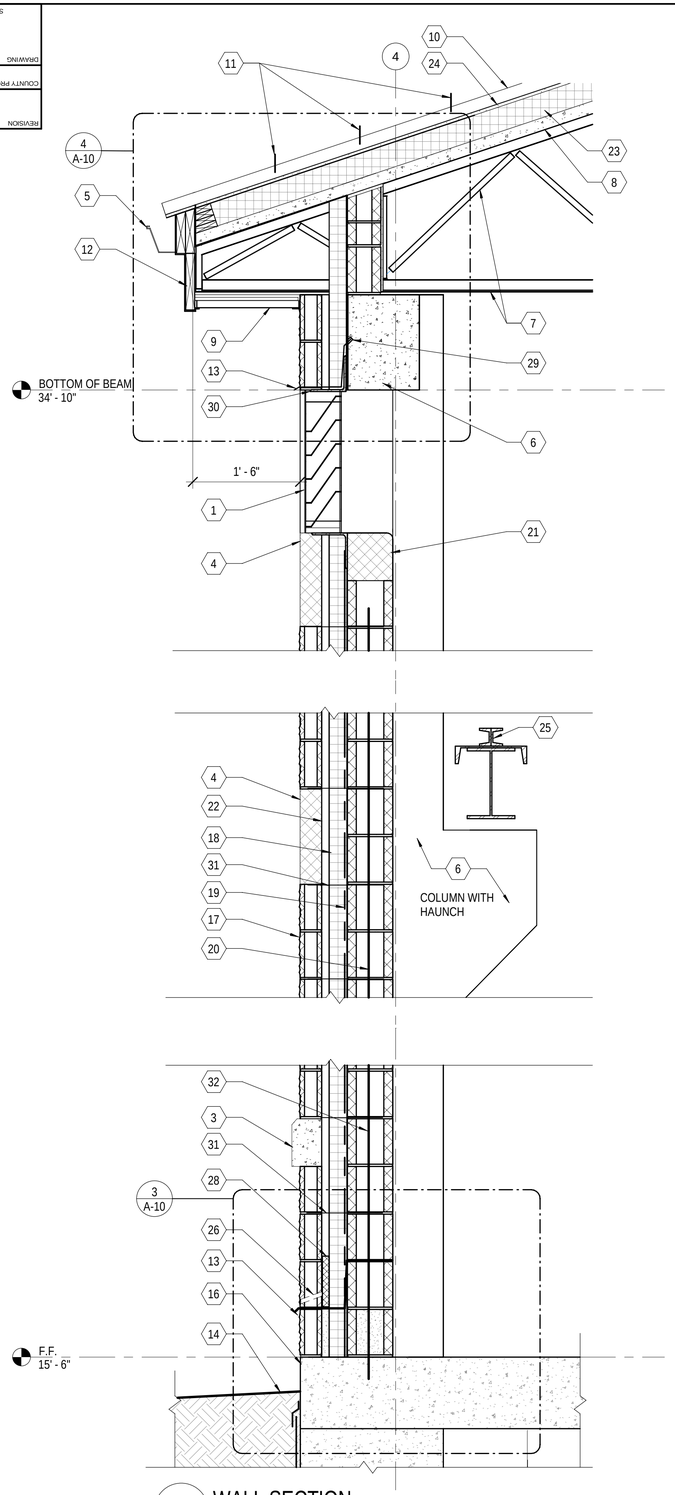
REVISION

COUNTY PROJECT No. 240618

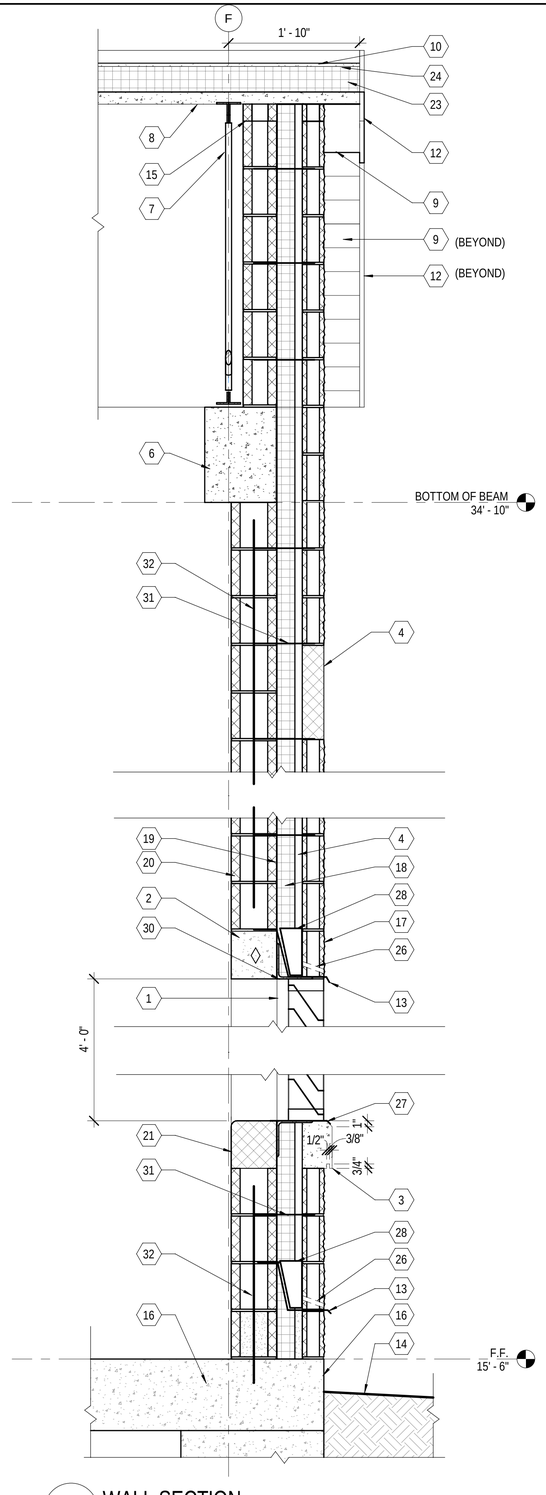
DRAWING A-8

SHEET 50 OF 92

3/21/2025 8:15:53 AM



1 A-9 WALL SECTION
SCALE: 1" = 1'-0"



2 A-9 WALL SECTION
SCALE: 1" = 1'-0"

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.

GENERAL NOTES:

1. KEYED CONSTRUCTION NOTES APPLY TO ALL INSTANCES SHOWN IN THE WALL SECTIONS, UNLESS OTHERWISE NOTED.
2. ALL RUNNING BOND CMU VENEER SHALL BE SPLIT FACE PER EXTERIOR ELEVATION FINISH SCHEDULE.

KEYED CONSTRUCTION NOTES:

1. SCHEDULED LOUVER
2. SCHEDULED LINTEL (SEE STRUCTURAL)
3. PRECAST CONCRETE WATER TABLE, 5"X8"
4. SOLDIER COURSE, CMU, GROUND FACE
5. GUTTER MIN. 5"W X 4"D
6. CAST IN PLACE CONCRETE BEAM (SEE STRUCTURAL)
7. ROOF TRUSS - PT-3 (SEE STRUCTURAL)
8. PRECAST CONCRETE ROOF DECK (SEE STRUCTURAL)
9. METAL SOFFIT PANEL
10. STANDING SEAM METAL ROOF
11. SNOW GUARDS
12. FASCIA
13. THROUGH-WALL FLASHING
14. FINISHED GRADE (SEE CIVIL)
15. CMU BOND BEAM AT GABLE END (SEE STRUCTURAL)
16. EXISTING CONCRETE FLOOR SLAB
17. 4" NOMINAL CMU VENEER - SPLIT FACED PER EXTERIOR FINISH SCHEDULE, UNLESS NOTED OTHERWISE
18. RIGID WALL INSULATION R10 MINIMUM
19. FLUID APPLIED AIR AND WATER BARRIER ON FACE OF BACK-UP WALL
20. 8" NOMINAL CMU BACK-UP WALL
21. SOLID CMU WITH BULLNOSE EDGE
22. AIR SPACE
23. RIGID ROOF INSULATION R35 MINIMUM
24. 1/2" PLYWOOD
25. CRANE RAIL FOR BRIDGE CRANE (SEE STRUCTURAL)
26. WEEP HOLES - SPACED AT 16" O.C.
27. FLASHING WITH DRIP EDGE
28. MORTAR NET
29. CONCRETE REGLET, RETURN FLASHING INTO REGLET CAST IN CONCRETE
30. BENT PLATE (SEE STRUCTURAL)
31. MASONRY VENEER TIES AND ANCHORS AT 16" OC EACH WAY, TYPICAL
32. REINFORCING (SEE STRUCTURAL)

0 6" 1' 2'
SCALE: 1" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
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WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
FREDERICK A HISER
SR-0000178
NO. 178
STATE OF DELAWARE
LICENSED ARCHITECT
3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
PROFESSIONAL ENGINEER - DESIGN

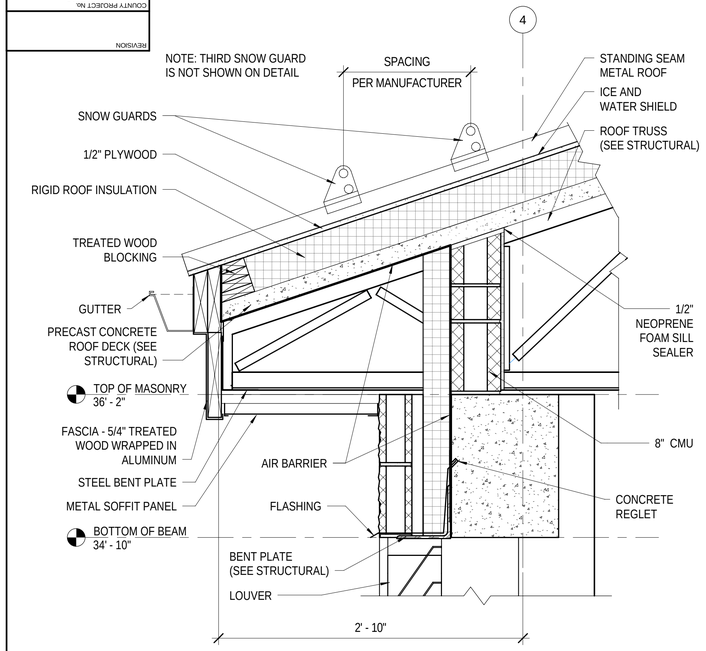
SCALE	1" = 1'-0"
DESIGNED	RK
DRAWN	BC
CHECKED	DBB
DATE	MAR 2025

WALL SECTIONS

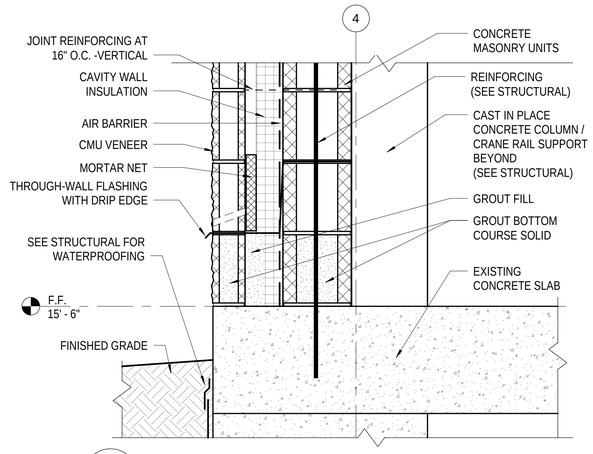
NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING A-9
SHEET 51 OF 92

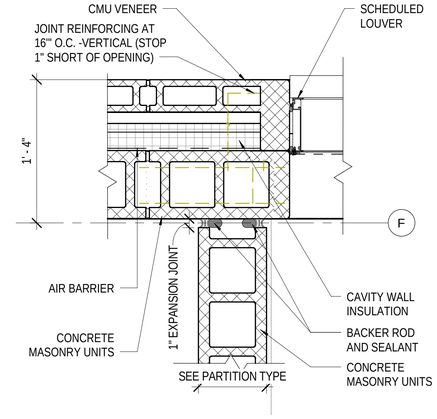
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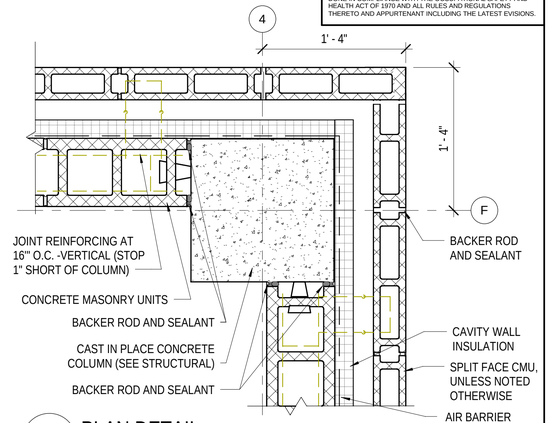
4 / A-10 SECTION DETAIL
SCALE: 1 1/2" = 1'-0"



3 / A-10 SECTION DETAIL
SCALE: 1 1/2" = 1'-0"

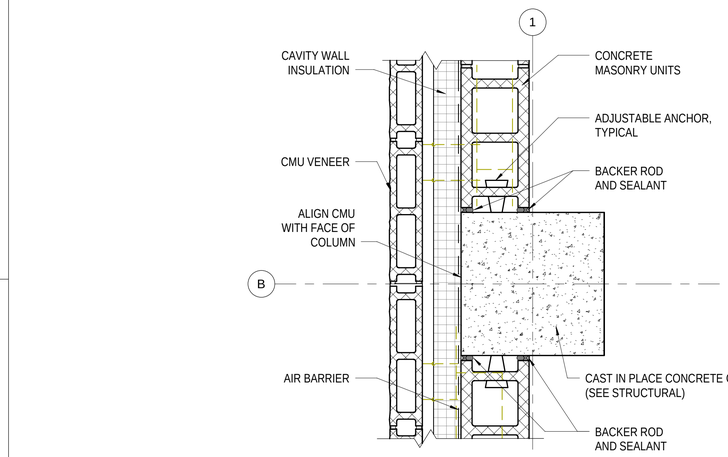


2 / A-10 PLAN DETAIL
SCALE: 1 1/2" = 1'-0"

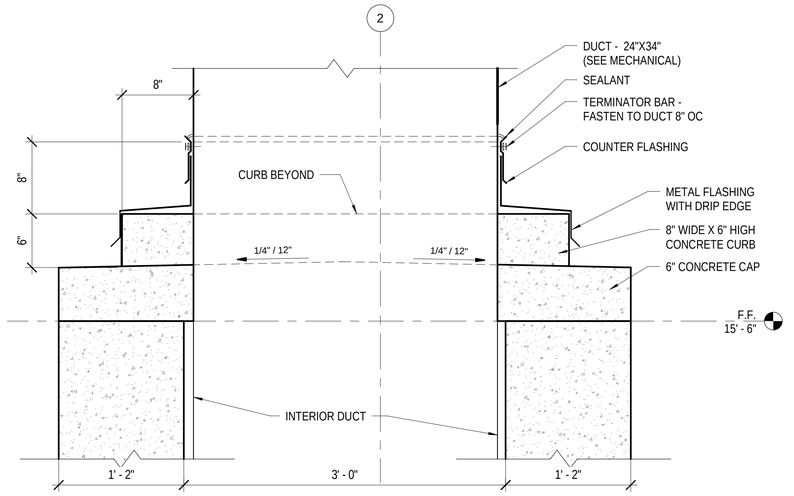


1 / A-10 PLAN DETAIL
SCALE: 1 1/2" = 1'-0"

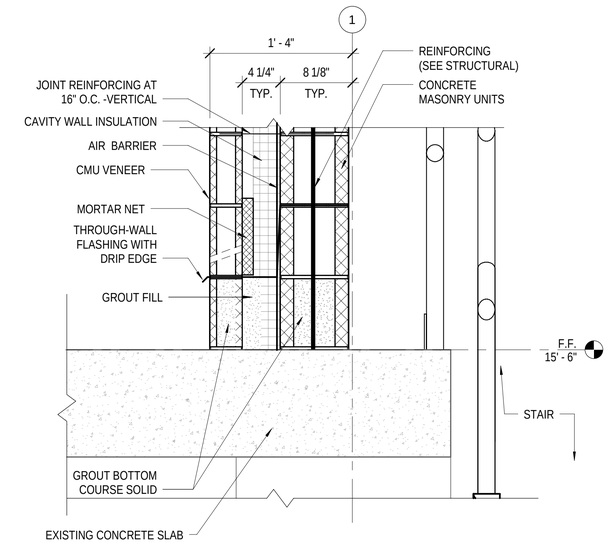
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.



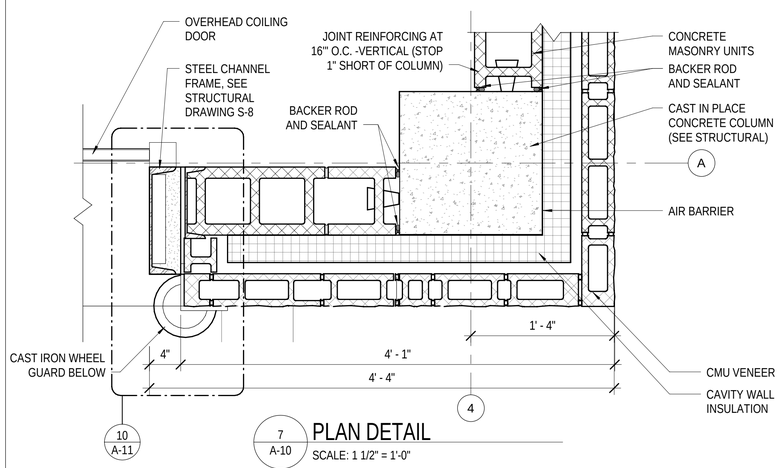
6 / A-10 PLAN DETAIL
SCALE: 1 1/2" = 1'-0"



5 / A-10 TOP OF AIR INTAKE WELL
SCALE: 1 1/2" = 1'-0"



8 / A-10 SECTION DETAIL
SCALE: 1 1/2" = 1'-0"



7 / A-10 PLAN DETAIL
SCALE: 1 1/2" = 1'-0"

0 3" 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: FREDERICKA A. KISER, NO. 55-0007978, STATE OF DELAWARE, LICENSED ARCHITECT, 3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
PROFESSIONAL ENGINEER - DESIGN

SCALE	1 1/2" = 1'-0"
DESIGNED	RK
DRAWN	BC
CHECKED	DBB
DATE	MAR 2025

EXTERIOR DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING A-10
SHEET 52 OF 92

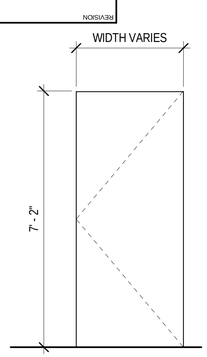
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REVISION

COUNTY PROJECT No. 240618

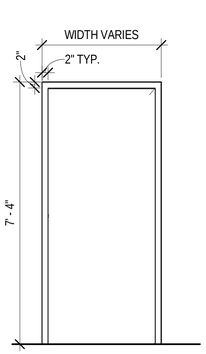
DRAWING

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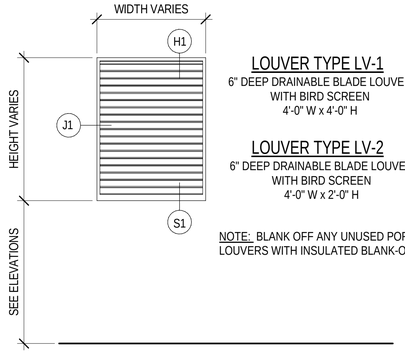
DOOR TYPE D1

FLUSH PANEL
FIBERGLASS DOOR



FRAME TYPE F1

FIBERGLASS FRAME



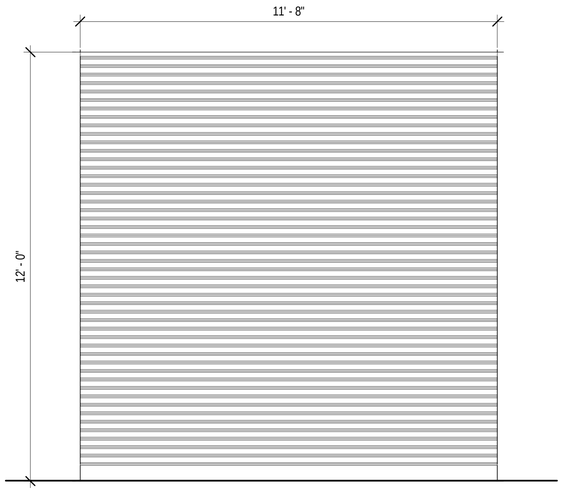
LOUVER TYPE LV-1

6" DEEP DRAINABLE BLADE LOUVER
WITH BIRD SCREEN
4'-0" W x 4'-0" H

LOUVER TYPE LV-2

6" DEEP DRAINABLE BLADE LOUVER
WITH BIRD SCREEN
4'-0" W x 2'-0" H

NOTE: BLANK OFF ANY UNUSED PORTION OF LOUVERS WITH INSULATED BLANK-OFF PANEL



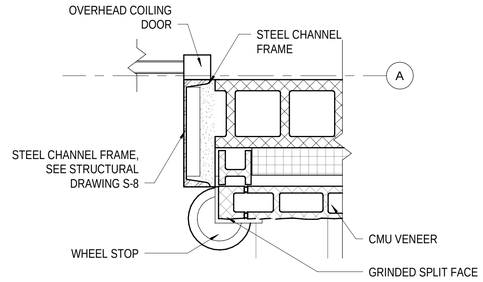
DOOR TYPE OH-1

MOTOR OPERATED OVERHEAD COILING DOOR

ARCHITECTURAL - DOOR SCHEDULE

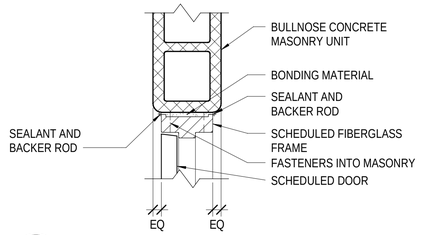
MARK	HARDWARE	DOORS WIDTH	DOORS HEIGHT	DOORS ROOM NAME	DOORS ROOM NUMBER	DOORS TYPE	DOORS MATERIAL	FRAMES TYPE	FRAMES MATERIAL	FRAMES HEAD	FRAMES JAMB	FRAMES SILL	FIRE RATING	LINTEL	COMMENTS	FINISH DOOR	FINISH FRAME
100	HW-1	3' - 8"	7' - 2"	MOTOR ROOM	MR1	D1	FG	F1	FG	H3	J4	S3	NONE	NOTE 1		PREFIN	PREFIN
101	HW-2	3' - 0"	7' - 2"	STAIR	S1	D2	FG	F1	FG	H2	J2	N/A	1HR	NOTE 1		PREFIN	PREFIN
102	HW-1	3' - 0"	7' - 2"	STAIR	S1	D1	FG	F1	FG	H3	J4	S3	NONE	NOTE 1		PREFIN	PREFIN
OH-1	-	11' - 8"	12' - 0"	MOTOR ROOM	MR1	OH1	STL	-	STL	H4	J3	S4	NONE	NOTE 2		PAINT	PAINT
103	HW-1	3' - 0"	7' - 2"	MOTOR ROOM	MR1	D1	FG	F1	FG	H3	J4	S4	NONE	NOTE 1		PREFIN	PREFIN

NOTES:
1. SEE STRUCTURAL DRAWING S-4 FOR LINTEL DETAILS. CONCRETE FRAMING MAY BE USED FOR CONCRETE MASONRY WALL LINTELS WHERE APPLICABLE.
2. SEE STRUCTURAL/FRAMING S-16 FOR LINTEL.



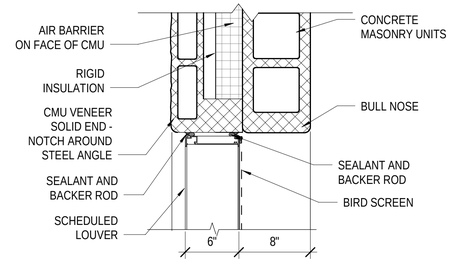
10 / A-11 J3 JAMB DETAIL - OVERHEAD DOOR

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



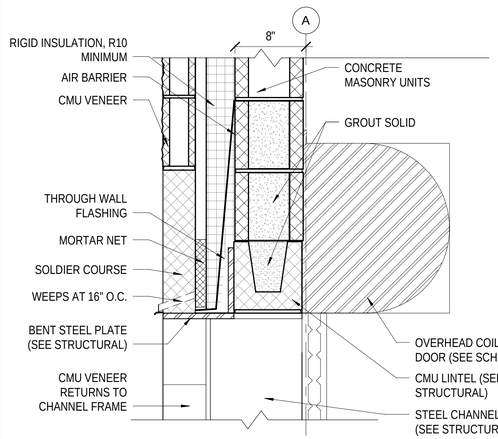
5 / A-11 J2 JAMB DETAIL - DOOR

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



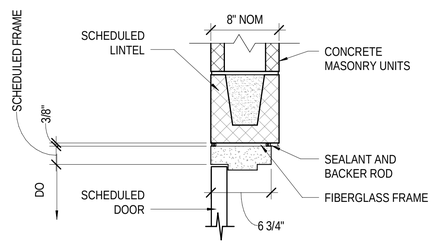
4 / A-11 J1 JAMB DETAIL - LOUVER

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



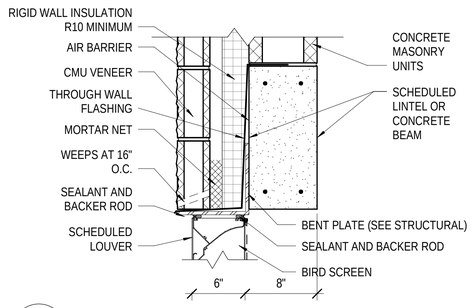
8 / A-11 H4 HEAD DETAIL - OVERHEAD DOOR

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



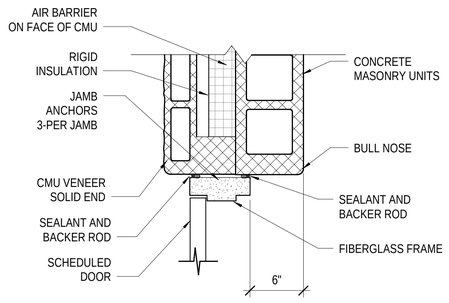
2 / A-11 H2 HEAD DETAIL - DOOR

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



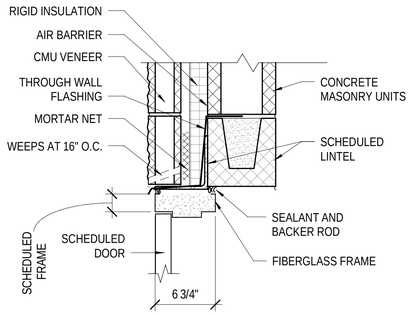
1 / A-11 H1 HEAD DETAIL - LOUVER

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



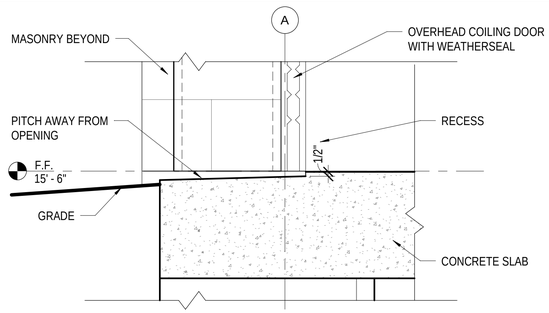
11 / A-11 J4 JAMB DETAIL - DOOR

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



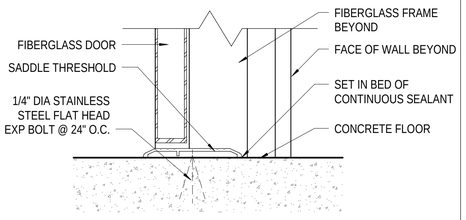
3 / A-11 H3 HEAD DETAIL - DOOR

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



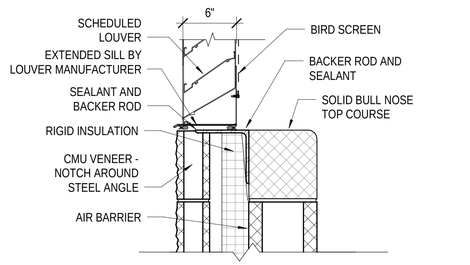
9 / A-11 S4 SILL DETAIL - OVERHEAD DOOR

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



7 / A-11 S3 SILL DETAIL - DOOR

SCALE: 3" = 1'-0"



6 / A-11 S1 SILL DETAIL - LOUVER

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

0 2" 4" 8"
SCALE: 3" = 1'-0"

0 3" 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
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WRA
Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
FREDERICKA HESS
NO. 35-0007758
STATE OF DELAWARE
REGISTERED ARCHITECT
3-21-2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
PROFESSIONAL ENGINEER - DESIGN

SCALE	As indicated
DESIGNED	RK
DRAWN	BC
CHECKED	DBB
DATE	MAR 2025

DOOR AND LOUVER SCHEDULES AND DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

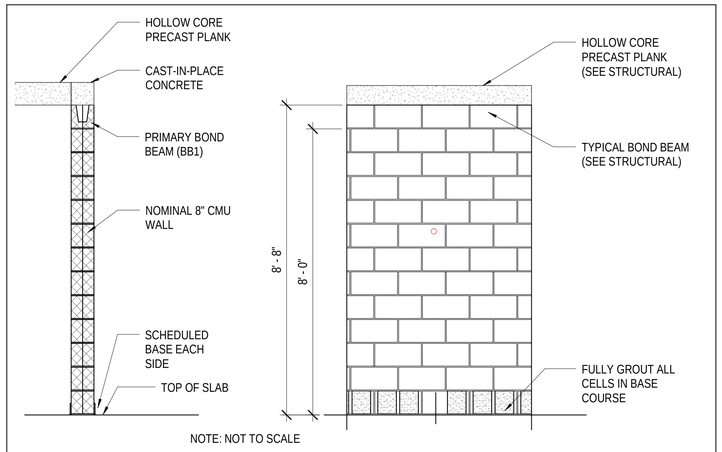
COUNTY PROJECT No. 240618

DRAWING A-11

SHEET 53 OF 92

3/21/2025 8:15:57 AM

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NOTE: NOT TO SCALE

TYPE MARK	PARTITION PROPERTIES				
	FIRE-RATING	UL NUMBER	STC RATING	FILLED CELLS	COMMENTS
1A.8	1 HR	U906	N/A	-	SEE S-5 FOR ADDITIONAL DETAIL.

INTERIOR PARTITION NOTES:

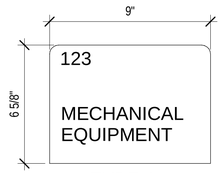
1. REFER TO FLOOR PLANS FOR LOCATIONS OF EACH PARTITION TYPE. CMU PARTITION TYPES ARE LOCATED ON FLOOR PLANS.
2. INTERIOR MASONRY PARTITIONS SHALL BE ANCHORED AT THE FLOOR AS INDICATED IN THE DETAILS AND BRACED AT THE FLOOR OR ROOF ABOVE AS INDICATED IN THE DETAILS. OTHER MEANS OF ANCHORING OR BRACING THE WALLS ARE NOT PERMITTED WITHOUT PRIOR APPROVAL.
3. SEE STRUCTURAL DRAWINGS FOR PARTITION HEAD AND BASE DETAILS.
4. ANY CONDUIT PENETRATION SHALL HAVE FIRE STOPPING PER SPECIFICATION 16091.

ARCHITECTURAL - ROOM SCHEDULE

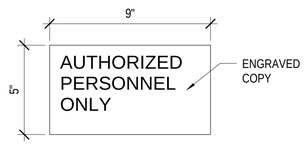
ROOM NUMBER	ROOM NAME	FLOOR FINISH	BASE FINISH	WALL FINISH	CEILING		COMMENTS
					FINISH	HEIGHT	
MR1	MOTOR ROOM	CONC-S	PT-2	PT-2	PT-1	22' - 0" TO 27' - 2" VARIES	CEILING IS UNDERSIDE OF SLOPED CONCRETE DECK
S1	STAIR	CONC-S	PT-2	PT-2	PT-1		CEILING IS UNDERSIDE OF CONCRETE PLANK
IL1	INTERMEDIATE LEVEL	ETR (CONC-S)	ETR (CONC)	ETR (CONC)	ETR (CONC)	18' - 0"	
PR1	PUMP ROOM	ETR (CONC-S)	ETR (CONC)	ETR (CONC)	ETR (CONC)	15' - 1"	

SIGNAGE SCHEDULE

DOOR NUMBER	DOORS		SIGN COPY		
	ROOM NAME	ROOM NUMBER	TYPE	LOCATION	TEXT/MESSAGE
100	MOTOR ROOM	MR1	B	EXTERIOR	
101	STAIR	S1	A	STAIR S1	MOTOR ROOM
102	STAIR	S1	B	EXTERIOR	
103	MOTOR ROOM	MR1	B	EXTERIOR	



TYPE A



TYPE B

SIGNAGE TYPES

SCALE: 3" = 1'-0"

FINISHES LIST

LOCATION	DESIGNATION	MANUFACTURER	DESCRIPTION
FLOORS	ETR (CONC-S)		ETR
	CONC-S	SURFHARD	SURFACE HARDENER AND DENSIFIER
BASES	ETR (CONC)		ETR
	PT-2	TNEMEC	30GR COMET
WALLS	ETR (CONC)		ETR
	PT-2	TNEMEC	30GR COMET
CEILINGS	ETR (CONC)		ETR
	PT-1	TNEMEC	02WH ICEBERG
MISC	PT-3	TNEMEC	-27BR BROWN SUGAR

ABBREVIATIONS:
ETR EXISTING TO REMAIN
CONC CONCRETE
PT PAINT

0 2" 4" 8"
SCALE: 3" = 1'-0"

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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PROTECT YOURSELF: GIVE TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
FREDERICK A. RASER
NO. S5-0007978
STATE OF DELAWARE
REGISTERED ARCHITECT
3·21·2025

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE As indicated
DESIGNED RK
DRAWN BC
CHECKED DBB
DATE MAR 2025

FINISH SCHEDULE AND PARTITION TYPES

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING A-12
SHEET 54 OF 92

3/21/2025 8:15:58 AM

SHEET 55 OF 92

M-1

DRAWING

COUNTY PROJECT No.
240618

REVISION

GENERAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ADF	AVERAGE DAILY FLOW
AFF	ABOVE FINISHED FLOOR
ASTM	AMERICAN STANDARD FOR TESTING MATERIALS
BD	BACKDRAFT DAMPER
BFV	BUTTERFLY VALVE
BOC	BOTTOM OF CONCRETE
CFM	CUBIC FEET PER MINUTE
CL	CENTER LINE
CP	CONTROL PANEL
CH	CHECK VALVE
DEG	DEGREES
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DN	DOWN
DO	DISSOLVED OXYGEN
EA	EXHAUST AIR
ED	EXHAUST AIR DIFFUSER
EF	EXHAUST FAN
EL	ELEVATION
EX	EXISTING
FD	FLOOR DRAIN
FF	FINISHED FLOOR
FLG	FLANGE
FM	FORCE MAIN
FS	FLOW SWITCH
FT	FEET
GA.	GAUGE
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GS	GRIT REMOVAL FACILITY SUMP
HC	HEATING COIL
HP	HORSEPOWER
HF	HIGH FLOW
H/P	HIGH POINT
HWL	HIGH WATER LEVEL
HZ	HERTZ
ID	INSIDE DIAMETER
INV	INVERT
KW	KILOWATT
LB/LBS	POUND/POUNDS
LBS/HR	POUNDS PER HOUR
LF	LOW FLOW
LWL	LOW WATER LEVEL
MAX	MAXIMUM
MF	MAXIMUM FLOW
MGD	MILLION GALLONS PER DAY
MIN	MINIMUM
MJ	MECHANICAL JOINT
MOD	MOTOR OPERATED DAMPER
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NRS	NON RISING STEM
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
OD	OUTSIDE DIAMETER
PE	PLAIN END
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
RJ	RESTRAINED JOINT
RPM	REVOLUTIONS PER MINUTE
RVSS	REDUCED VOLTAGE SOLID STATE
SA	SUPPLY AIR
SCH	SCHEDULE
SD	SUPPLY AIR DIFFUSER
SF	SUPPLY FAN
SHT	SHEET
S.P.	STATIC PRESSURE
SG	SLUICE GATE
SS	STAINLESS STEEL
TOW	TOP OF WALL
TDH	TOTAL DYNAMIC HEAD
TYP	TYPICAL
UH	UNIT HEATER
W.L.	WATER LEVEL
WSE	WATER SURFACE ELEVATION

FLOW STREAM IDENTIFIERS

IDENTIFIER	DESCRIPTION
AHP	AIR HIGH PRESSURE
ALP	AIR LOW PRESSURE
CW	CITY WATER (POTABLE)
D	DRAIN
——→	FLOW ARROW
OF	OVERFLOW
PW	POTABLE WATER
RD	ROOF DRAIN
S	SANITARY DRAIN OR SEWER
SPD	SUMP PUMP DISCHARGE
SW	SEAL WATER

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		WELDED JOINT
		GROOVED END JOINT
		FLANGED JOINT
		MECHANICAL JOINT
N/A		SCREWED JOINT
		HUB & SPIGOT JOINT (RUBBER GASKET)
ADAPTOR SIDE		GROOVED END ADAPTER FLANGE
		MECHANICAL COUPLING ALL W/TIE RODS
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		ELBOW, 90 DEGREE
		CROSS
		TEE
		ELBOW, 45 DEGREE
		LATERAL
		PIPE GUIDE/SLEEVE
WATERSTOP		
WATERSTOP OR THRUST COLLAR AS INDICATED ON PLANS OR SECTIONS		WALL CASTING WITH VARIOUS CONNECTIONS TYPES AS INDICATED ON PLANS OR SECTIONS
		SUPPLY/OUTSIDE AIR DUCTWORK, PERPENDICULAR TO PAGE
		EXHAUST AIR DUCTWORK, PERPENDICULAR TO PAGE
		INLINE FAN
		INLINE FAN WITH FILTER BOX

VALVE SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		GATE
		BUTTERFLY
OR		BALL
SEAT END		ECCENTRIC PLUG
		SWING CHECK
M	M	VALVE ELECTRIC MOTOR ACTUATOR
		DUCKBILL CHECK VALVE
	S	VALVE SOLENOID ACTUATOR
	S	SOLENOID VALVE, 2 WAY
		PRESSURE RELIEF
		AIR AND/OR VACUUM RELEASE
	REGULATED SIDE	PRESSURE CONTROL OR REDUCING VALVE
		NEEDLE VALVE

GENERAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CENTRIFUGAL PUMP		NEGATIVE PRESSURE AIR FLOW
	WATER SURFACE MARKER		POSITIVE PRESSURE AIR FLOW
	SLUICE GATE	M	MOTOR OPERATED DAMPER
			MANUAL BALANCING DAMPER
	LOUVER		HOSE REEL
	HOSE BIB		DUCT MOUNTED HEATING COIL
	SUPPLY AIR DEVICE		FLEXIBLE DUCT CONNECTOR
			FLEXIBLE CONNECTION

FIELD INSTRUMENT SYMBOLS

SYMBOL	
M	MAGNETIC FLOWMETER
	ROTAMETER
S	DUCT MOUNTED SMOKE DETECTOR
FS	AIR FLOW MONITORING SWITCH
T	DUCT MOUNTED TEMPERATURE SENSOR
T_H	WALL MOUNTED THERMOSTAT (HIGH TEMP)
T_L	WALL MOUNTED THERMOSTAT (LOW TEMP)
	FLOAT SWITCH
	PRESSURE GAUGE

GENERAL NOTES

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

1. MECHANICAL DRAWINGS SHOW BUILDING NORTH WHICH IS RELATIVE TO EACH STRUCTURE. SEE CIVIL DRAWINGS FOR TRUE NORTH.
2. REFER TO SEQUENCE OF CONSTRUCTION FOR STAGED INSTALLATION OF WORK AND SCHEDULING REQUIREMENTS.
3. COORDINATE ALL SHUTDOWNS AND SEQUENCING WITH THE OWNER.
4. OWNER SHALL MAINTAIN AND OPERATE EXISTING EQUIPMENT. CONTRACTOR SHALL NOT OPERATE EXISTING VALVES OR EQUIPMENT.
5. UNLESS OTHERWISE NOTED, ITEMS ARE NEW UNLESS CALLED OUT AS EXISTING.
6. COORDINATE ALL WORK TO AVOID EQUIPMENT CLEARANCE CONFLICTS.
7. STRUCTURE ELEVATIONS PROVIDED FOR CLARITY. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR FF ELEVATIONS AND FLOOR SLOPE.
8. SEE STRUCTURAL DRAWINGS FOR CONCRETE PIPE SUPPORT AND PEDESTAL DETAILS.
9. COORDINATE ALL PENETRATIONS WITH OTHER DISCIPLINES. ALL PENETRATIONS SHALL BE WATER TIGHT.
10. COORDINATE WITH THE EXISTING CONDITIONS SHOWN IN THE "NEW RICHARDSON PARK PUMPING STATION – PHASE 1" AS-BUILTS FOR THE LOCATIONS OF HATCHES, GRATES, AND CLEAR OPENINGS IN THE CONCRETE SUBSTRUCTURE.
11. UNLESS OTHERWISE NOTED, ALL PIPING PASSING THRU FLOORS AND WALLS SHALL BE SLEEVED AND SEALED WITH A SEGMENTED RUBBER MECHANICAL SLEEVE SEAL ON BOTH SIDES UNLESS WALL IS LESS THAN 10" THICK. SLEEVES AND SEALS SHALL BE MADE WATERTIGHT. SLEEVES SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
12. UNLESS OTHERWISE NOTED, WALL CASTINGS SHALL HAVE A WATERSTOP POSITIONED IN THE CENTER OF THE WALL OR FLOOR. SEE TYPICAL DETAILS FOR CASTING CONFIGURATION. CASTINGS SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
13. PIPING CONNECTIONS 3 INCH AND SMALLER HAVE BEEN SCHEMATICALLY SHOWN ON PLAN AND SECTION DRAWINGS. PROVIDE PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE SCHEMATICS. PROVIDE ALL NECESSARY FITTINGS TO MAKE CONNECTIONS.
14. SCHEMATIC DRAWINGS SHOW PROCESS CONNECTIONS AND NOT SPATIAL ORIENTATION.
15. ALL EXPANSION JOINTS, FLANGE ADAPTERS, FLEXIBLE AND SOLID SLEEVE COUPLINGS SHALL HAVE TIE-RODS AS SHOWN ON TYPICAL DETAILS.
16. UNLESS OTHERWISE NOTED, ECCENTRIC REDUCERS SHALL BE INSTALLED STRAIGHT SIDE ON TOP.
17. UNLESS OTHERWISE NOTED, ALL DUCTILE IRON PIPING INTERNAL TO FACILITY(IES) SHALL HAVE FLANGED CONNECTIONS.
18. VALVES ARE NORMALLY OPEN (N.O.) UNLESS NOTED AS NORMALLY CLOSED (N.C.).
19. COORDINATE THE LOCATION OF VALVE SUPPORTS SO THAT ACCESS TO THE VALVE BEARINGS IS NOT RESTRICTED.
20. UNLESS OTHERWISE NOTED, ALL EQUIPMENT SHALL BE PROVIDED WITH A MINIMUM 4-INCH CONCRETE HOUSEKEEPING PAD SIZED TO SUIT EQUIPMENT.
21. SUPPORTS AND HANGERS ARE ONLY SHOWN WHERE SPECIFIC TYPES OR LOCATIONS ARE REQUIRED. ADDITIONAL SUPPORTS AND HANGERS SHALL BE REQUIRED AS SPECIFIED.
22. UNLESS OTHERWISE NOTED, MINIMUM SLOPE FOR DRAINS SHALL BE 1/4 INCH PER LINEAR FOOT.
23. THE SIZE OF THE PIPE CONNECTIONS AT THE PROCESS EQUIPMENT ARE SHOWN TO DEMONSTRATE INTENT, SIZES MAY VARY FROM WHAT IS SHOWN. COORDINATE THE SIZE OF CONNECTIONS TO ALL APPROVED PROCESS EQUIPMENT.
24. PROVIDE PROCESS PIPING DRAINS WHERE INDICATED AND AT THE FOLLOWING: LOW POINTS; FLOW METERS AND BETWEEN PUMP SUCTION AND DISCHARGE ISOLATION VALVES. PUMP DRAINS SHALL BE ON THE SUCTION SIDE OF CENTRIFUGAL PUMPS AND ON THE SUCTION AND DISCHARGE OF PROGRESSIVE CAVITY PUMPS.
25. METAL FABRICATIONS WITH BURS, SHARP EDGES OR POSE A HAZARD SHALL BE MADE DULL/BLUNT OR SHALL BE PROVIDED WITH AN APPROPRIATE COVERING THAT SHALL MITIGATE AND DRAW ATTENTION TO THE HAZARD.
26. THE CONTRACTOR SHALL MAKE ALL REQUIRED FIELD MEASUREMENTS TO VERIFY EXISTING AND CONTRACT INTERFACE DIMENSIONS, LOCATIONS, AND OTHER CONDITIONS.
27. WHEN MAKING NEW CONNECTIONS TO EXISTING PIPING, THE CONTRACTOR MAY, AT THEIR OPTION:
    A. REPLACE PIPING BACK TO NEAREST FITTING.
    B. USE RESTRAINING SLEEVE COUPLING.
    C. USE GROOVED COUPLINGS, PROVIDED EXISTING PIPES WALL THICKNESS COMPLIES WITH SPECIFIED LIMITS.
    D. USE BOLTED SPLIT SLEEVE COUPLINGS.
29. ALL PIPING UNDER CONCRETE SLABS OR STRUCTURES SHALL BE ENCASED IN CONCRETE, UNLESS OTHERWISE NOTED, REFER TO STRUCTURAL DRAWINGS.
30. ALL PIPING ENCASED IN CONCRETE SHALL HAVE PUSH-ON JOINTS AT ALL STRUCTURAL EXPANSION JOINTS.
31. ALL DIMENSIONS LOCATING EQUIPMENT ARE FROM FINISHED WALL SURFACES OR COLUMN CENTERLINES.
32. REFER TO INSTRUMENTATION DRAWINGS FOR INSTRUMENTATION AND CONTROL SYSTEMS. INSTRUMENT LOCATIONS ARE INDICATED ON MECHANICAL-PROCESS DRAWINGS IN APPROXIMATE LOCATION ONLY.
33. FOR THE CONTINUATION OF PIPING OUTSIDE STRUCTURES SEE THE CIVIL DRAWINGS.
34. CONTRACTOR SHALL PROTECT ALL EQUIPMENT, PIPING, AND VALVES FROM DAMAGE DURING DEMOLITION, CONSTRUCTION, OR RENOVATION. ALL REPAIRS TO EQUIPMENT, PIPE, AND VALVES SHALL BE PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
35. FOUR (4) 20-INCH GATE VALVES FOR DISCHARGE ISOLATION HAVE BEEN PRE-PURCHASED AND ARE LOCATED AT DOVER PLUMBING SUPPLY CO.
36. ALL HAND WHEELS HIGHER THAN 6' ABOVE FINISHED FLOOR ELEVATION SHALL HAVE CHAINFALLS.
37. NEW PIPE PENETRATIONS THROUGH CONCRETE WALL SHALL BE CORE DRILLED IN ACCORDANCE WITH TYPICAL STRUCTURAL DETAILS.

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
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WO: 70852-002

APPROVED BY: WILLIAM P. WAGNER LICENSE No. 14164 STATE OF DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
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APPROVED BY: _____
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DATE	MAR 2025

MECHANICAL NOTES, LEGEND AND DETAILS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION

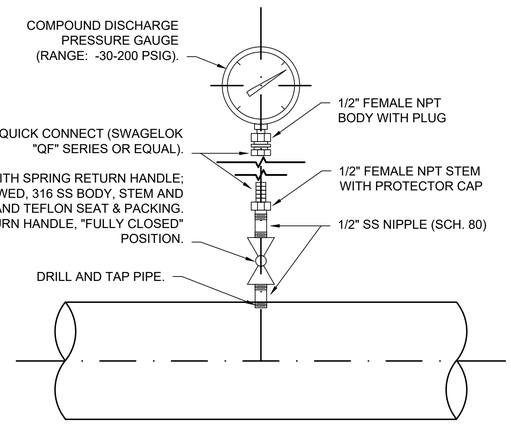
COUNTY PROJECT No. 240618

DRAWING M-1

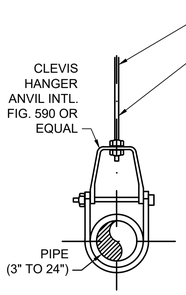
SHEET 55 OF 92

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Mar 18, 2025 - 10:47am

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1 / M-2 PRESSURE GAUGE DETAIL
SCALE: NTS



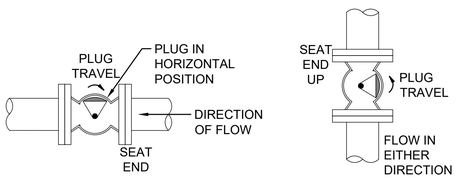
SUPPORT RODS AND BRACKET SPACING (FOR STANDARD WEIGHT PIPE) (SEE GENERAL NOTE 1)

PIPE SIZE (INCHES)	MINIMUM ROD Ø (INCHES)	MAX SPAN IN FEET (SEE GENERAL NOTE 4)			
	PROCESS PIPING	COPPER	PLASTIC	STEEL	DIP (SEE GENERAL NOTE 3)
UP TO 1	3/8	5	5	6	-
1 1/4-2	3/8	8	5	10	-
2 1/2-3 1/2	3/8	8	5	12	6
4-5	1/2	-	5	14	8
6	5/8	-	5	15	9
8-12	3/4	-	5	15	9

TYPICAL CLEVIS HANGER PIPE SUPPORT DETAIL

2 / M-2 SCALE: NTS

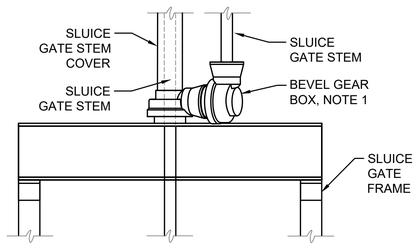
NOTES:
1. USE HEAVY DUTY BEAM CLAMP (ANVIL INTL. FIG. 134 WITH WELDLESS EYE NUT FIG 290). FOR CONCRETE USE S.S. WEDGE ANCHORS.
2. PIPE SHOWN WITHOUT INSULATION.
3. ALL PARTS OF THE CLEVIS HANGER PIPE SUPPORT ASSEMBLY ARE TO BE HOT-DIP GALVANIZED.



PLUG VALVE SEAT ORIENTATION

3 / M-2 SCALE: NTS

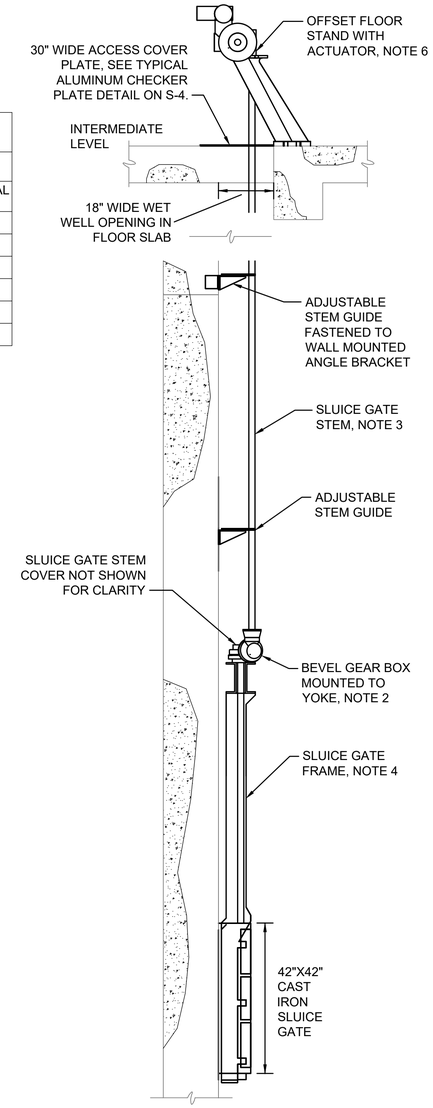
NOTES:
1. VALVES SHOWN IN FULL OPEN POSITION.
2. DIAGRAMS ARE SECTION VIEW.



ENLARGED BEVEL GEAR BOX ON SLUICE GATE DETAIL

4 / M-2 SCALE: NTS

NOTES:
1. BEVEL GEAR BOX ON SG-3 TO BE AT LEAST 6 INCHES ABOVE HIGH WATER ALARM LEVEL. SEE M-9 FOR WET WELL OPERATING ELEVATIONS.



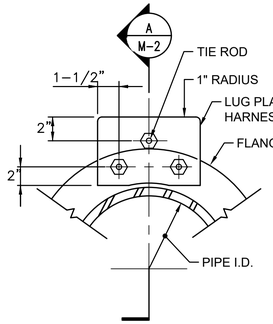
SLUICE GATE DETAIL

7 / M-2 SCALE: NTS

NOTES:
1. MINIMUM YOLK HEIGHT IS 6" ABOVE THE 3RD LAG PUMP START HEIGHT.
2. BEVEL GEAR BOX SHOWN IN DRAWINGS ROTATE 20 DEGREES COUNTERCLOCKWISE FROM PARALLEL TO THE SLUICE GATE YOKE. CONTRACTOR TO FIELD VERIFY ACTUAL DIMENSIONAL REQUIREMENTS NECESSARY TO INSTALL THE SLUICE GATE SYSTEM (GATE, BEVEL GEARBOX, STEMS AND GUIDES, ETC.). CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER(S) TO FURNISH THE REQUIRED FLANGE BOLT PATTERN(S) TO MAKE ALL NECESSARY CONNECTIONS.
3. STEM LENGTH AND STEM GUIDE LOCATION VARIES BETWEEN SLUICE GATES. CONTRACTOR TO COORDINATE STEM CONNECTIONS AND ALIGNMENT TO COMPLY WITH MANUFACTURER RECOMMENDATIONS.
4. SLUICE GATE FRAME HEIGHT VARIES (SEE ELEVATIONS ON M-9).
5. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PERTAINING TO SLUICE GATE CONFIGURATION INCLUDING, BUT NOT LIMITED TO: FLOOR STAND, ACTUATOR, STEM AND ADJUSTABLE STEM GUIDES, BEVEL GEAR BOX, AND SLUICE GATE AND FRAME. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURES TO ASSURE THAT ALL MOUNTING HARDWARE AND APPURTENANCES PROVIDE THE NECESSARY EQUIPMENT CLEARANCES.
6. OFFSET FLOOR STAND USED FOR BASIS OF DESIGN HAS A STEM HORIZONTAL OFFSET RANGE OF 6-10". OFFSET FLOOR STAND TO BE FASTENED TO FLOOR USING STAINLESS STEEL ANCHORS EMBEDDED WITH HILTI HIT RE5000 V3 EPOXY ADHESIVE.

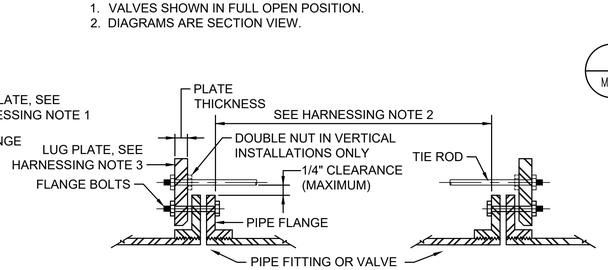
GENERAL NOTES:

1. CONTRACTOR SHALL DESIGN THE SUPPORT SYSTEMS BASED ON ACTUAL WEIGHTS AND CONDITIONS AS SPECIFIED OR AS SHOWN ON THE CONTRACT DRAWINGS. PIPE HANGERS, SUPPORTS AND BRACKETS SHOWN HERE IN VARIOUS COMBINATIONS REPRESENT MINIMUM REQUIREMENTS FOR ACCEPTABLE SUPPORTS AS TO TYPES, MATERIALS, THICKNESSES, ORIENTATION, AND QUALITY. WHEN SUBMITTING PROPOSED PIPE SUPPORTS AND SUPPORT LOCATIONS, THE CONTRACTOR SHALL USE APPROVED PIPING LAYOUT SUBMITTAL DRAWINGS TO SHOW PROPOSED PIPE SUPPORT TYPE AND LOCATION WITH ACCURATE DIMENSIONS TO DEMONSTRATE THAT SUPPORTS DO NOT EXCEED THE MAXIMUM SPACING REQUIREMENTS OF SECTION 15060. THIS ENSURES THAT SUPPORTS HAVE BEEN COORDINATED WITH ACTUAL PIPE INSTALLATION DRAWINGS AND THAT SPACING DOES NOT EXCEED MAXIMUM ALLOWABLE SPACING. THE PIPE SUPPORTS SHOWN AND REFERENCED ARE DESIGNED AND DETAILED FOR GRAVITY LOADING ONLY. RESULTING LATERAL LOADS FROM CONSTRUCTION CONDITIONS, DESIGN SEISMIC EVENT OR OTHER RELATED CONDITIONS SHALL BE APPLIED TO THE PIPE AND OTHER NON-STRUCTURAL COMPONENTS IN ACCORDANCE WITH THE GOVERNING BUILDING CODE. SUPPLEMENTAL LATERAL STIFFNESS, RESISTANCE AND MEMBERS (WHEN NECESSARY) SHALL BE PROVIDED ALONG PIPE OR AT GRAVITY SUPPORTS AND CONNECTIONS WHEN REQUIRED BY CALCULATIONS.
2. MINIMUM OF ONE HANGER PER PIPE SECTION, CLOSE TO JOINT, ON THE BARREL. ALSO AT CHANGE IN DIRECTION AND BRANCH CONNECTIONS.
3. RODS AND SPACING ARE BASED ON STANDARD WEIGHT MATERIALS ACCORDING TO MSS SP-69. AND ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL SPACE HANGERS BASED ON ACTUAL CONDITIONS.
4. ALL REFERENCES TO A PARTICULAR MANUFACTURER ARE ONLY TO PROVIDE THE DESIGN INTENT. THE CONTRACTOR MAY SUBMIT AN OR-EQUAL PRODUCT FOR APPROVAL.



NOTES: END VIEW

1. THE SURFACE IN CONTACT WITH LUG PLATE SHALL BE GROUND SMOOTH AND SQUARE TO CLEAR THE CASTING IRREGULARITY AND EMBOSSED LETTERING.
2. MINIMUM LENGTH SHALL NOT BE LESS THAN 3 TIMES THE LENGTH OF THE ASSOCIATED COUPLING.
3. LUG PLATE MAY BE PLACED ALONG INSIDE FLANGE FACE IF REQUIRED.
4. ALL FLEXIBLE MECHANICAL COUPLINGS AND FLANGED ADAPTERS TO BE HARNESSED.
5. ALL HARNESSES INSTALLED ON VERTICAL PIPING SHALL BE DOUBLE NUTTED.
6. ALL HARNESSING MATERIALS SHALL BE HOT-DIP GALVANIZED STEEL.



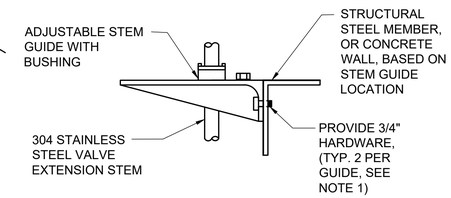
A / M-2 SECTION
SCALE: NONE

PIPE SIZE	NUMBER OF RODS	DIAMETER OF RODS	PLATE THICKNESS	DESIGN PRESSURE PSI
2"	2	3/4"	3/4"	100
4"	2	3/4"	3/4"	100
6"	2	3/4"	3/4"	100
8"	2	3/4"	3/4"	100
12"	4	3/4"	3/4"	100
16"	4	3/4"	1"	100
18"	4	3/4"	1 1/8"	100
20"	4	3/4"	1 1/4"	100
24"	4	7/8"	1 1/2"	100
30"	4	1 1/8"	2"	100
36"	4	1 1/4"	2 1/2"	100

ROD MATERIAL - ASTM A193 - B7
PLATE MATERIAL - ASTM A123

HARNESSING DETAIL

5 / M-2 SCALE: NTS



TYPICAL EXTENSION STEM GUIDE

6 / M-2 SCALE: NTS

NOTES:
1. PROVIDE NUT AND BOLT OR EPOXY ANCHOR AS REQUIRED TO FOR ATTACHEMENT, TO SUIT.
2. MIN. SIZE STRUCTURAL MEMBER FOR ATTACHMENT IS A L6 X 4 X 5/16.
3. EXTENSION STEM TO BE 304 STAINLESS STEEL.
4. ALL HARDWARE TO BE 304 STAINLESS STEEL.



ENLARGED SG-3 STEM GUIDE ON SLUICE GATE DETAIL

8 / M-2 SCALE: NTS

NOTES:
1. ANGLE BRACKET TO BE MOUNTED TO VERTICAL WALL COLUMN AND STEM GUIDE TO BE FASTENED TO ANGLE BRACKET.
2. ANGLE BRACKET FASTENED TO WALL USING STAINLESS STEEL ANCHORS EMBEDDED WITH HILTI HIT RE500 V3 EPOXY ADHESIVE.
3. BEVEL GEAR BOX ORIENTATION VARIES BETWEEN SLUICE GATES.

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WO: 70852-002

APPROVED BY: WILLIAM P. WAGNER LICENSE No. 14168 PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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TYPICAL MECHANICAL DETAILS

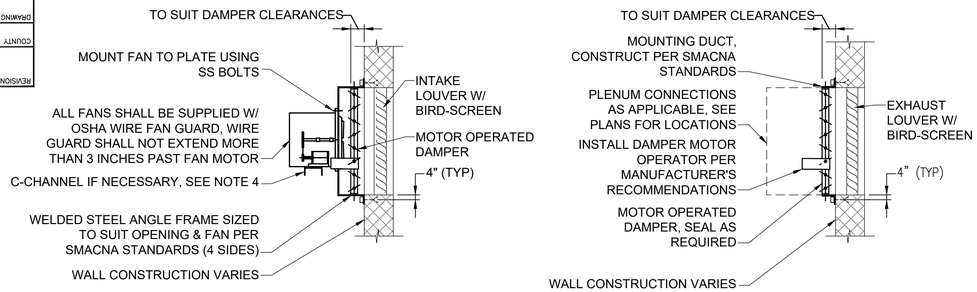
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING M-2
SHEET 56 OF 92

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Mar 18, 2025 - 11:46am

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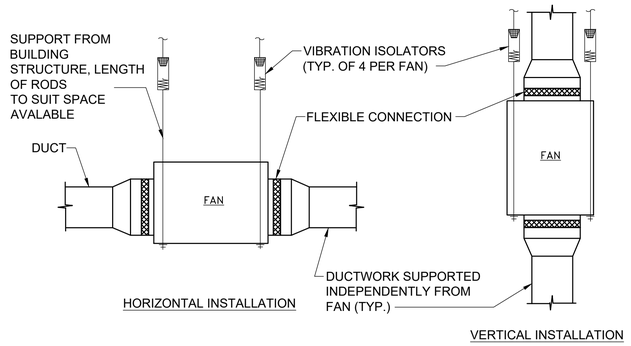


1 / M-3 TYPICAL SUPPLY FAN AND EXHAUST LOUVER DETAIL

SCALE: NTS

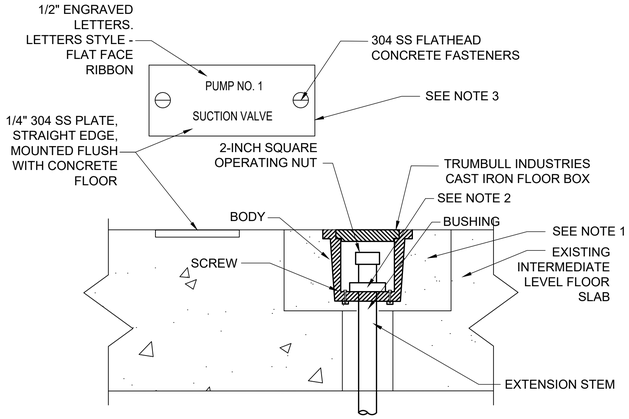
NOTES:

1. FRAME AND PLATE SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
2. ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS UNLESS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS. WHERE MULTIPLE FANS SHARE A LOUVER, THE DAMPERS SHALL BE PARTITIONED FOR EACH RESPECTIVE FAN. SEAL AS REQUIRED.
3. WALL CONNECTIONS SHALL BE MADE USING THE FOLLOWING METHODS, OR APPROVED EQUALS PER THE MANUFACTURER'S INSTRUCTIONS:
   - BRICK: HILTI HIT-HY 270 MASONRY ANCHORING SYSTEM WITH ½" DIAMETER STAINLESS STEEL ANCHORS WITH 2" MINIMUM EMBEDMENT.
   - CMU: HILTI HIT-HY 270 MASONRY ANCHORING SYSTEM WITH ½" DIAMETER STAINLESS STEEL ANCHORS WITH 2" MINIMUM EMBEDMENT. PROVIDE MESH SLEEVE AT HOLLOW MASONRY LOCATIONS.
4. WHERE WALL CONSTRUCTION DOES NOT ALLOW STRUCTURAL ATTACHMENT, PROVIDE SMALL C-CHANNEL AND SUPPORT FROM ABOVE USING TIE RODS AND BRACKETS CONNECTED TO ROOF FRAMING MEMBERS.



2 / M-3 INLINE CENTRIFUGAL FAN

SCALE: NTS

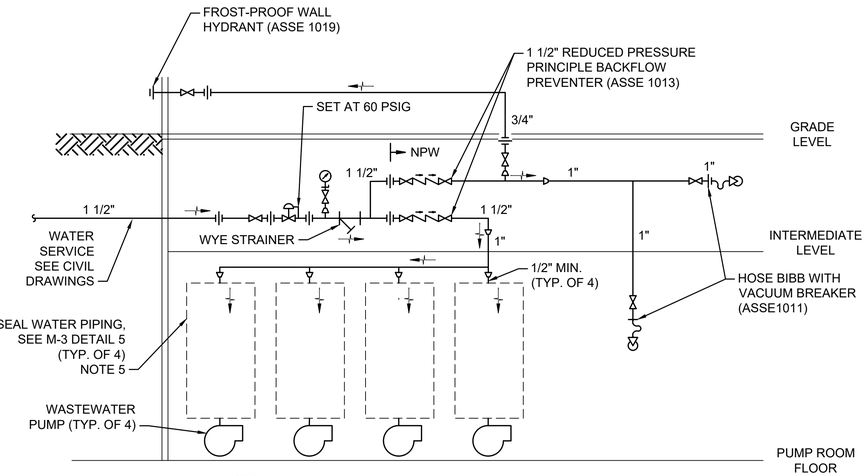


3 / M-3 TYPICAL VALVE BOX AND IDENTIFICATION LABEL DETAIL

SCALE: NTS

NOTES:

1. SEE STRUCTURAL FOR CONCRETE WORK, AT THE NEW VALVE BOX LOCATIONS.
2. INSTALL POSITION INDICATOR, MANUFACTURED BY TRUMBULL OR APPROVED EQUAL.
3. ROUTE OUT SPACE FOR NAMEPLATE INSTALLATION BY SAW CUTTING, ANGLE GRINDING, AND CHISELING THE EXISTING CONCRETE.

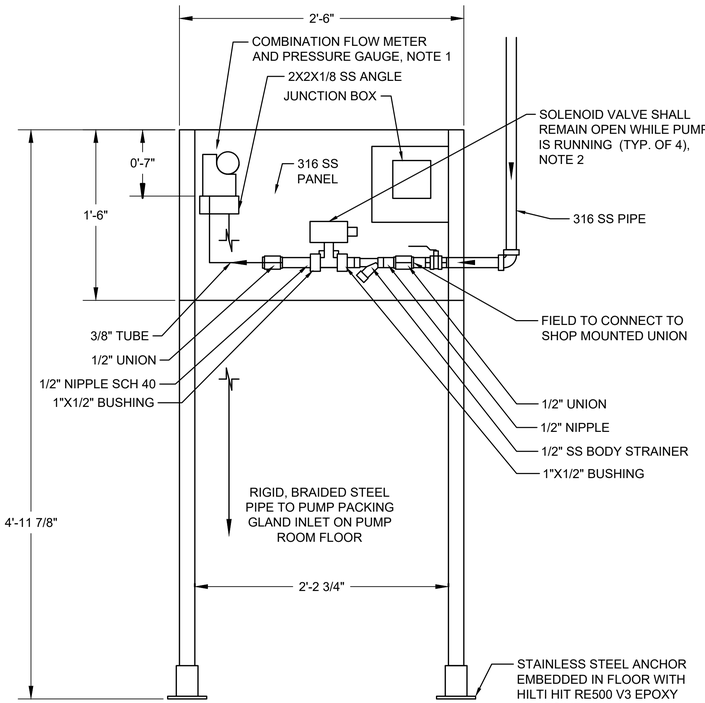


4 / M-3 PLUMBING RISER DIAGRAM

SCALE: NTS

NOTES:

1. PROVIDE 316 STAINLESS STEEL WATER PIPING UNLESS OTHERWISE NOTED.
2. SEE NEW WORK PLANS FOR HOSE REEL AND FIXTURE LOCATIONS.
3. ISOLATE WATER SERVICE AT THE METER, SEE CIVIL DRAWINGS.
4. CONTRACTOR SHALL INSTALL BACKFLOW PREVENTERS, PRESSURE REDUCING VALVES, PRESSURE GAUGE NO HIGHER THAN 4 FEET FROM ASSOCIATED FINISHED FLOOR FOR EASE OF MAINTENANCE ACCESS.
5. PUMP SEAL WATER PIPING AND APPURTENANCES SHALL BE MOUNTED ON A 316 STAINLESS STEEL SELF SUPPORTING STAND ADJACENT TO THE PUMPS.
6. CONSTRUCT PUMP SEAL WATER PIPING TO THE PUMP SHAFT SEALS PER APPROVED PUMP MANUFACTURER'S RECOMMENDATIONS.
7. COORDINATE LOCATION OF PIPING WITH BUILDING STRUCTURE.
8. PIPING SHALL BE RUN TO AVOID CONFLICTS WITH OTHER TRADES.
9. RISER DIAGRAMS INDICATE FLOW AND OPERATION CONCEPT AS WELL AS GENERAL ARRANGEMENT OF EQUIPMENT. VALVES, PRESSURE GAUGES, ETC. ARE INDICATED FOR THIS PURPOSE. ADDITIONAL VALVES, PRESSURE GAUGES, ETC. SHALL BE PROVIDED AS SHOWN ON VARIOUS EQUIPMENT DETAILS. SEE PLANS AND DETAILS FOR PIPE SIZES NOT INDICATED ON FLOW SCHEDULE AND RISER DIAGRAMS.

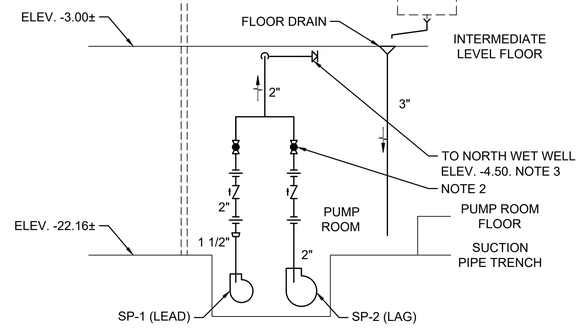


5 / M-3 SEAL WATER ASSEMBLY AND MONITORING PANEL

SCALE: NTS

NOTES:

1. DESIGN IS BASED OFF OF SP50 FLOW GUARDIAN COMBINATION FLOW METER AND PRESSURE GAUGE (RANGE: 0-145 PSIG) WITH INTEGRAL FLOW SWITCH BY CHESTERTON.
2. DESIGN IS BASED OFF OF ASCO SOLENOID 8017G1.
3. PROVIDE 316 STAINLESS STEEL WATER PIPING UNLESS OTHERWISE NOTED.



6 / M-3 SANITARY RISER DIAGRAM

SCALE: NTS

NOTES:

1. SEE DRAWING M-12 FOR SUMP PUMP SCHEDULE
2. BALL VALVES SHALL BE NO HIGHER THAN 5 FEET FROM PUMP ROOM FLOOR
3. PROVIDE DUCKBILL CHECK VALVE ON WET WELL DISCHARGE
4. SP-1 SETTINGS:
   HIGH LEVEL: -23.16' (ON)
   LOW LEVEL: -23.66' (OFF)
5. SP-2 SETTINGS:
   HIGH LEVEL: -22.66' (ON)
   LOW LEVEL: -23.66' (OFF)
6. SEE DRAWING M-5 FOR LOCATION

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TYPICAL MECHANICAL DETAILS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

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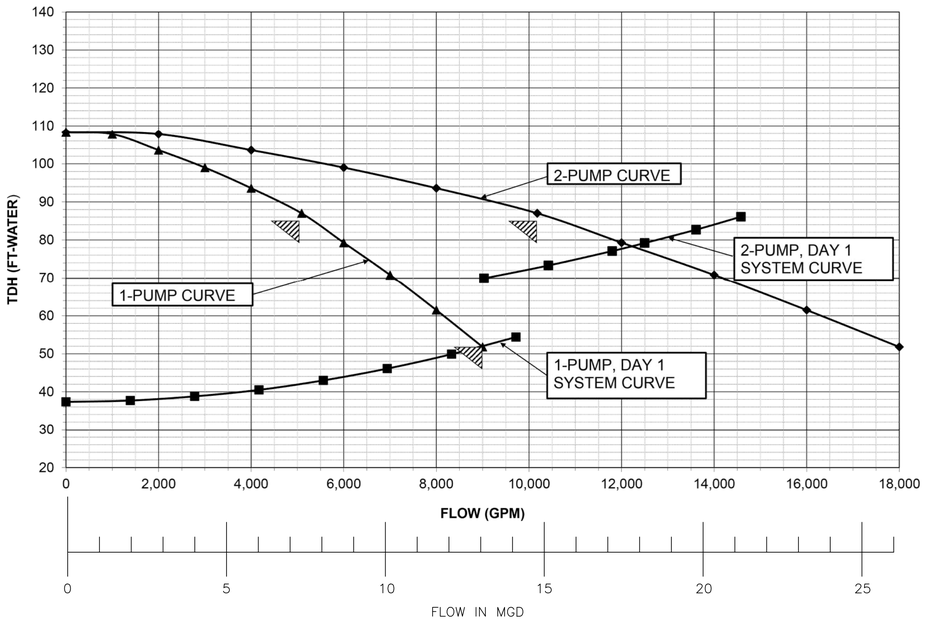
DRAWING M-3

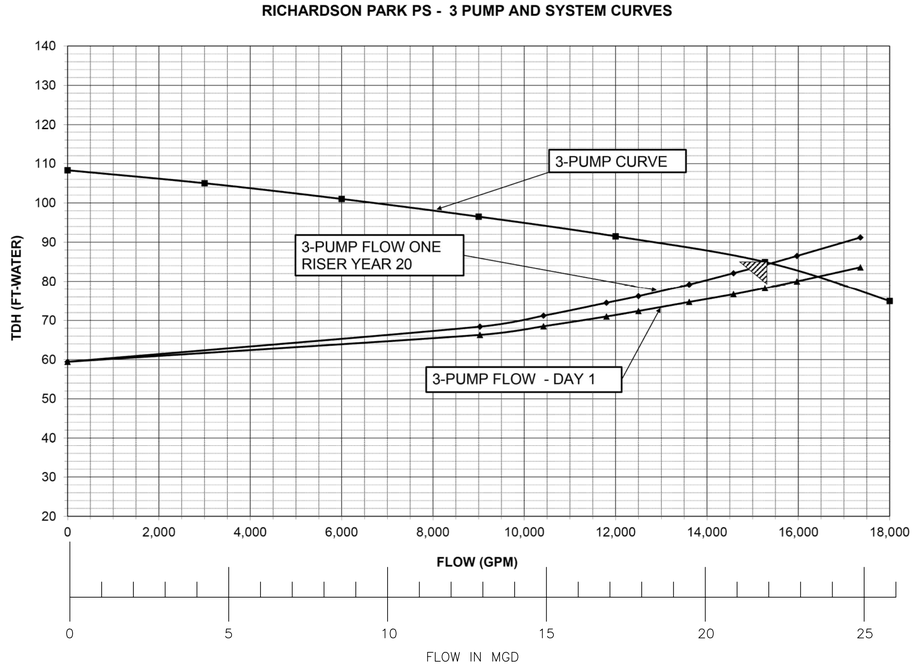
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WASTEWATER PUMP AND SYSTEM CURVES





WASTEWATER PUMPING UNIT SCHEDULE

PARAMETER	VALUE
DISCHARGE DIAMETER:	12-INCH MINIMUM
SUCTION DIAMETER:	14-INCH MINIMUM
DESIGN PUMP SPEED (NOMINAL):	880 RPM
MINIMUM SHUTOFF CONDITION TOTAL DYNAMIC HEAD (TDH)	108 FEET-WATER
DESIGN TOTAL DYNAMIC HEAD (TDH):	85 FEET-WATER
FLOWRATE AT THE DESIGN TDH (MINIMUM):	5,090 GPM
MINIMUM EFFICIENCY AT THE DESIGN TDH:	71.00%
SUPPLEMENTARY POINT TDH (NOTE 1)	48 FEET-WATER
MINIMUM FLOWRATE AT THE SUPPLEMENTARY TDH	7,800 GPM
MINIMUM EFFICIENCY AT THE SUPPLEMENTARY TDH:	67%
MAXIMUM NET POSITIVE SUCTION HEAD REQUIRED (NPSHR) AT THE SUPPLEMENTARY TDH:	29.0 FEET
MAXIMUM BRAKE HORSEPOWER REQUIREMENT AT ANY POINT ON THE OPERATING CURVE:	200 HP
MINIMUM PASSING SOLID SIZE (MIN. DIAMETER):	4 INCHES
MOTOR MOUNTING ARRANGEMENT:	EXTENDED SHAFT
MINIMUM STATIC OPERATING HEAD (2):	37.3 FEET
STATIC HEAD AT DESIGN TDH	65.0 FEET

NOTES:
(1) FOR PUMPING UNITS INTERSECTING THE ONE-PUMP SYSTEM CURVE, AS SHOWN IN THE DRAWINGS, AT A FLOW GREATER THAN 8,800 GPM, THE SUPPLEMENTARY HEAD SHALL BE 52 FEET WATER. EFFICIENCY AND NPSH REQUIRED PARAMETERS AS STATED ABOVE SHALL REMAIN THE SAME.

(2) STATIC HEAD VARIES WITH LEVEL IN EXISTING SURGE TANK. MINIMUM STATIC DETERMINED BY THE TOP ELEVATION OF THE SURGE TANK'S' INTERNAL INLET STANDPIPE. IF LEVEL IN THE TANK EXCEEDS THE STANDPIPE HEIGHT, THEN THE 'STATIC' ELEVATION INCREASES AS FLOW THROUGH THE TANK INCREASES.

DRAWING NOTES

1. FOR DETAILED PUMPING UNIT SPECIFICATIONS, SEE SECTION 11310.
2. STATION DESIGN FLOW ACHIEVED WITH 3–PUMP OPERATION IS 15,270 GPM, (22.0 MGD NOMINAL),
3. 'DAY 1' SYSTEM CURVE CONDITIONS:
   A. HAZEN–WILLIAMS STATION PIPING AND FORCE MAIN C–FACTOR = 140,
   B. SURGE TOWER AT MINIMUM STATIC HEAD, OPERATING LEVEL EQUAL TO OR BELOW TOP OF INTERNAL STANDPIPE EL. 25.47FT.
   C. FLOW THROUGH BOTH 20–INCH VERTICAL MAGMETER LINES INSIDE STATION
4. 'YEAR 20' SYSTEM CURVE CONDITIONS:
   A. HAZEN–WILLIAMS STATION PIPING AND FORCE MAIN C–FACTOR = 120,
   B. MINIMUM SURGE TOWER STATIC HEAD = ABOVE INTERNAL STANDPIPE HEIGHT AT EL. 25.47 AND INCREASES AS THE HEIGHT OF FLUID RISES ABOVE THE STANDPIPE HEIGHT. THE CHRISTINA FORCE MAIN TIE–IN IS AT HYDRAULIC GRADE EL. –11.87 BUT MUST ALSO PUMP THE FLUID UP TO THE TOP OF THE STANDPIPE HEIGHT.
   C. FLOW THROUGH ONLY ONE 20–INCH VERTICAL MAGMETER LINE INSIDE STATION

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PUMP/SYSTEM CURVES AND SCHEDULES

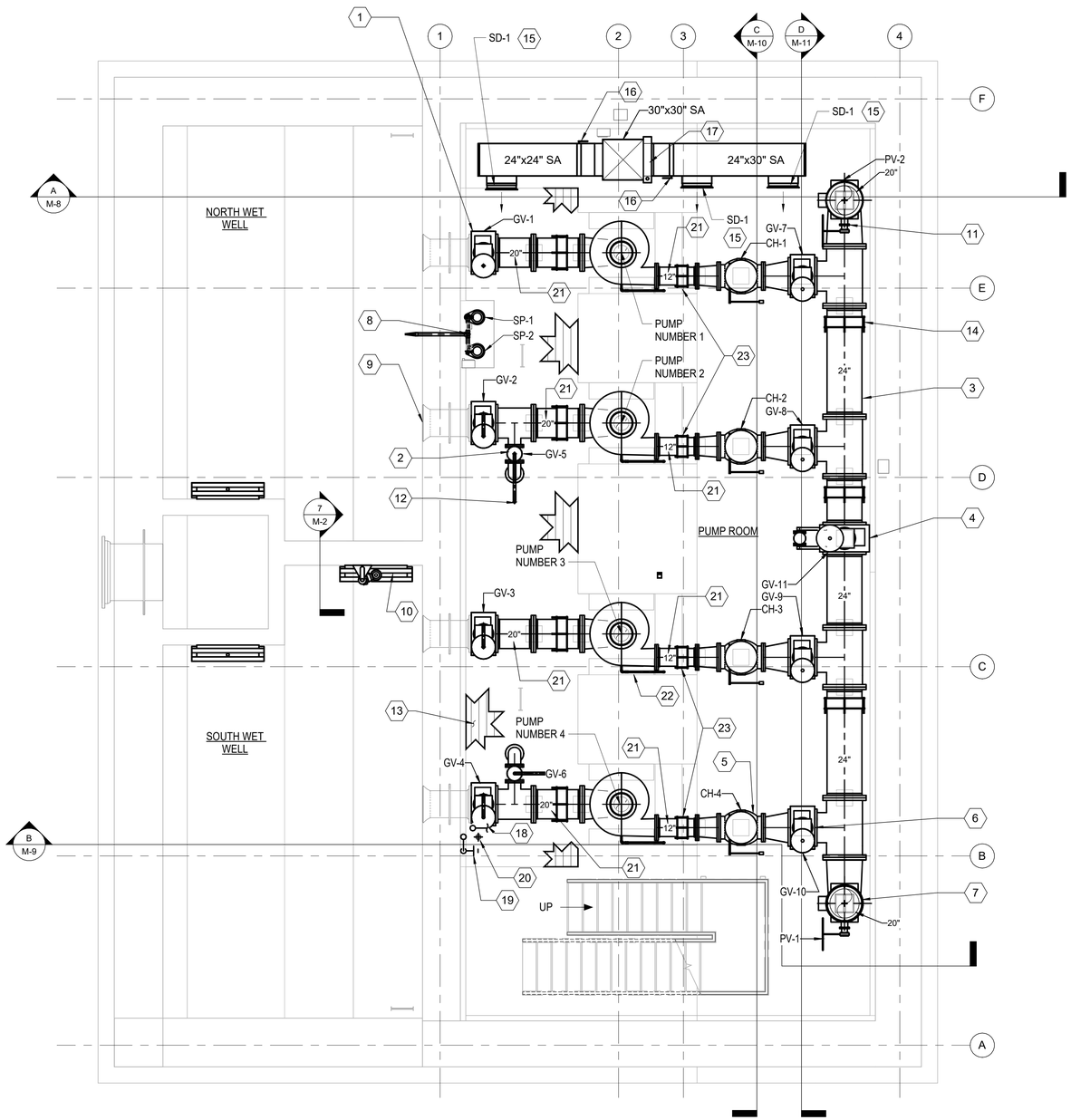
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

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PUMP ROOM FLOOR

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

GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.
6. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PERTAINING TO SLUICE GATE CONFIGURATION INCLUDING, BUT NOT LIMITED TO: OFFSET FLOOR STAND, ACTUATOR, STEM AND ADJUSTABLE STEM GUIDES, BEVEL GEAR BOX, AND SLUICE GATE AND FRAME. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURERS TO ASSURE THAT ALL MOUNTING HARDWARE AND APPURTENANCES PROVIDE THE NECESSARY EQUIPMENT CLEARANCES.

KEYED CONSTRUCTION NOTES:

1. 20" GATE VALVE (TYP OF 4.)
2. 8" DEWATERING VALVE UNDER GRATING (TYP. OF 2)
3. 24" LOWER DISCHARGE HEADER
4. 24" DIVISION GATE VALVE
5. 14" CHECK VALVE
6. 20" GATE VALVE (TYP. OF 4). THESE WILL BE PROVIDED BY THE OWNER AS NOTED ON M-1.
7. 24" X 20" REDUCING BASE ELBOW, TURNED UP (TYP.)
8. DUPLEX SUMP PUMPS
9. EX. 20" FLARED PUMP SUCTION WALL PIPE (TYP.)
10. SLUICE GATE, SEE SCHEDULE M-12 (TYP.)
11. 20" PLUG VALVE IN VERTICAL (TYP.)
12. VALVE STEM CONTINUES UPWARDS TO FLOOR BOX (TYP.)
13. GRATING OMITTED FOR CLARITY
14. MECHANICAL COUPLING (TYP.) SEE HARNESSING DETAIL 5/M-2
15. SUPPLY AIR DIFFUSER. SEE SCHEDULE FOR FOR ADDITIONAL INFORMATION.
16. BALANCING DAMPER.
17. DUCT MOUNTED HEATING COIL HC-1 IN VERTICAL. REFER TO SCHEDULE ON M-12.
18. 1" NPW PIPING TO PUMP SEAL WATER SYSTEM. SEE PLUMBING RISER DIAGRAM ON M-3.
19. 1" NPW PIPING TO HOSE BIBB AND REEL. MOUNT HOSE BIBB 3'-0" ABOVE FINISHED FLOOR.
20. 3" DRAIN PIPING FROM INTERMEDIATE LEVEL FLOOR DRAIN ABOVE. TERMINATE WITH OPEN END PIPE 1'-0" ABOVE TOP OF SUCTION PIPE TRENCH FLOOR SLAB
21. PRESSURE GAUGE ON TOP OF PIPE (TYP. OF 8) , SEE DETAIL 1/M-2. PROCESS DRAIN (HOSE VALVE) LOCATION ON BOTTOM OF PIPE (TYP. OF 8).
22. 3/4" SEAL WATER DRAIN TO BELOW GRATING.
23. MECHANICAL COUPLING WITHOUT HARNESSING (TYP. FOR EACH PUMP DISCHARGE).

0 2' 4' 8'

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

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NEW CASTLE, DELAWARE 19720

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LOWER LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

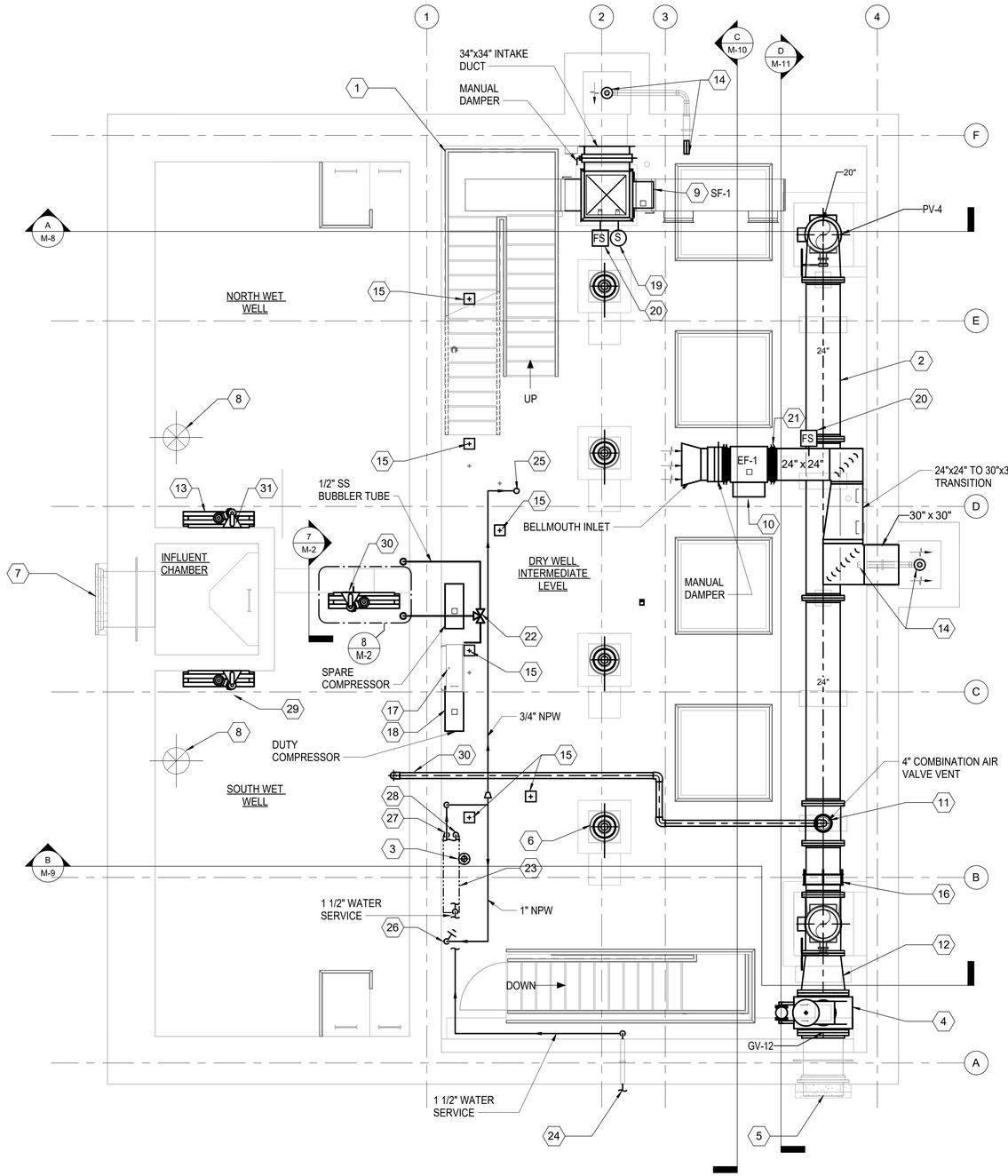
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DRAWING M-5

SHEET 59 OF 92

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INTERMEDIATE LEVEL FLOOR

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

0 2' 4' 8'

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

GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.
6. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PERTAINING TO SLUICE GATE CONFIGURATION INCLUDING, BUT NOT LIMITED TO: FLOOR STAND, ACTUATOR, STEM AND ADJUSTABLE STEM GUIDES, BEVEL GEAR BOX, AND SLUICE GATE AND FRAME. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURERS TO ASSURE THAT ALL MOUNTING HARDWARE AND APPURTENANCES PROVIDE THE NECESSARY EQUIPMENT CLEARANCES.
7. NEW PIPE PENETRATIONS THROUGH CONCRETE WALL SHALL BE CORE DRILLED IN ACCORDANCE WITH TYPICAL STRUCTURAL DETAILS.

KEYED CONSTRUCTION NOTES:

1. STAIRS UP TO MOTOR ROOM.
2. 24" UPPER DISCHARGE HEADER.
3. 3" FLOOR DRAIN. TERMINATE DRAINS FROM ADJACENT BACKFLOW PREVENTERS WITH AIR GAP OVER FLOOR DRAIN.
4. 30" GATE VALVE.
5. EX. 30" STATION EFFLUENT WALL FITTING.
6. EXTENDED DRIVE SHAFT (TYP.).
7. EX. 42" WET WELL INFLUENT WALL FITTING
8. 20" INTAKE DUCT.
9. DRY WELL SUPPLY FAN, IN VERTICAL. SEE FAN SCHEDULE ON M-12.
10. DRY WELL EXHAUST FAN. SEE FAN SCHEDULE ON M-12.
11. 4" X 1/2" COMBINATION AIR VALVE MOUNTED ON 20" X 4" TEE. VENT TO WET WELL.
12. 24" X 30" REDUCER.
13. SLUICE GATE (TYP. OF 3), SEE SCHEDULE M-12.
14. PLUG EXISTING AREAWAY DRAINS. CAP PIPING INSIDE OF DRYWELL AND FILL EXISTING FLOOR DRAIN WITH CONCRETE.
15. VALVE STEM FLOOR PENETRATION WITH FLOOR BOX (TYP. OF 6).
16. MECHANICAL COUPLING (TYP.) SEE DETAIL 5/M-2.
17. BUBBLER PRESSURE CONTROL PANEL
18. BUBBLER AIR COMPRESSOR (TYP. OF 2).
19. DUCT MOUNTED SMOKE DETECTOR.
20. FLOW INDICATING SWITCH MOUNTED WITHIN DUCTWORK.
21. FLEXIBLE DUCT CONNECTOR.
22. VALVE SHALL BE LABELED TO INDICATED WHICH WET WELL EACH POSITION CORRESPONDS TO.
23. SERVICE WATER BACKFLOW PREVENTER ASSEMBLIES. REFER TO PLUMBING RISER DIAGRAM ON M-3 FOR INFORMATION.
24. REFER TO CIVIL DRAWINGS FOR WATER SERVICE CONTINUATION.
25. 3/4" NPW PIPING UP TO EXTERIOR GRADE LEVEL WALL HYDRANT.
26. HOSE BIBB AND HOSE REEL, MOUNT 3'-0" ABOVE FINISHED FLOOR.
27. 1" PIPE DOWN TO HOSE BIBB AND HOSE REEL ON LOWER LEVEL.
28. 1" PIPE DOWN TO PUMP SEAL WATER SYSTEM.
29. BEVEL GEAR BOX (TYP. OF 3).
30. ANGLE BRACKET.
31. ADJUSTABLE STEM GUIDE.

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: WILLIAM P. WARNER LICENSE No. 14169 PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY:
PROFESSIONAL ENGINEER - DESIGN

SCALE	1/4" = 1'-0"
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DATE	MAR 2025

INTERMEDIATE LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING M-6

SHEET 60 OF 92

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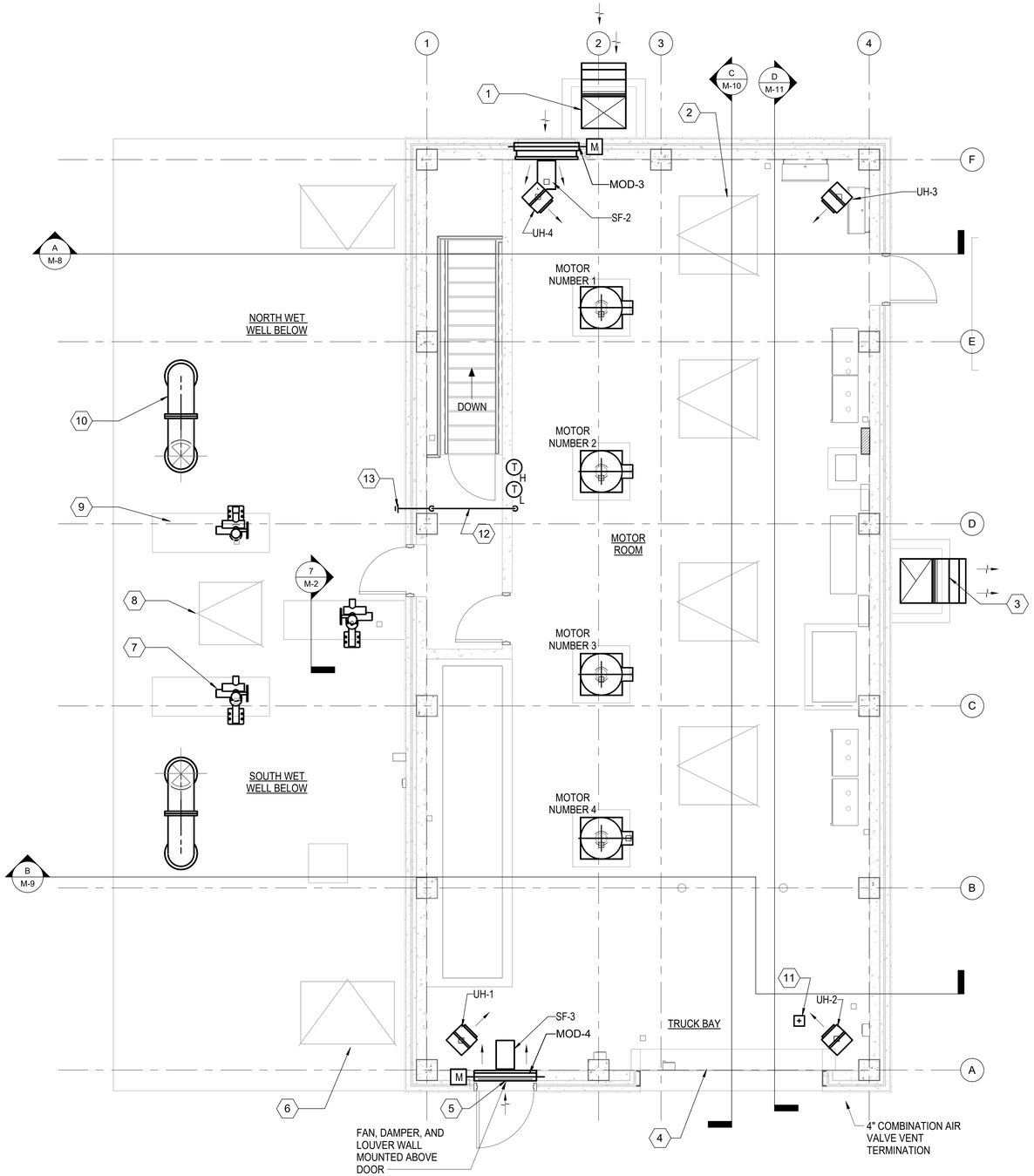
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SHEET 60 OF 92

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MOTOR ROOM FLOOR

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

GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.
6. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PERTAINING TO SLUICE GATE CONFIGURATION INCLUDING, BUT NOT LIMITED TO: FLOOR STAND, ACTUATOR, STEM AND ADJUSTABLE STEM GUIDES, BEVEL GEAR BOX, AND SLUICE GATE AND FRAME. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURERS TO ASSURE THAT ALL MOUNTING HARDWARE AND APPURTENANCES PROVIDE THE NECESSARY EQUIPMENT CLEARANCES.

KEYED CONSTRUCTION NOTES:

1. DRY WELL VENTILATION INTAKE DUCT. 36"X24" GOOSENECK WITH SS MESH#4. REFER TO SECTION VIEWS FOR ADDITIONAL INFORMATION.
2. EXISTING 5'x5' EQUIPMENT HATCH (TYP.)
3. DRY WELL VENTILATION EXHAUST DUCT. 36"X24" GOOSENECK WITH SS MESH#4. REFER TO SECTION VIEWS FOR ADDITIONAL INFORMATION.
4. VEHICLE ACCESS DOOR 11'-8"x12'
5. 48"x48" INTAKE LOUVER (TYP.)
6. EXISTING 4'x6' WET WELL ACCESS HATCH (TYP.)
7. OFFSET FLOOR STAND AND ACTUATOR (TYP. OF 3)
8. EXISTING INFLUENT CHAMBER ACCESS HATCH
9. SLUICE GATE ACCESS COVER (TYP. OF 3). SEE TYPICAL ALUMINUM CHECKER PLATE ON S-4.
10. 20" DIAMETER GOOSENECK WITH FLANGED CONNECTION AND SS MESH#4 SCREEN COVERING ON OUTLET (TYP. OF 2)
11. EXISTING VALVE BOX FOR ACTUATING GV-13.
12. 3/4" NPW PIPING FROM FLOOR BELOW. ROUTE TIGHT TO TOP OF STAIRWELL ROOF SLAB AND DOWN THROUGH SLAB TO 3'-0" ABOVE MOTOR ROOM FLOOR WITHIN UPPER LANDING OF STAIRWELL. SEAL PENETRATIONS IN STAIRWELL ROOF AND MOTOR ROOM FLOOR.
13. FROST-PROOF WALL HYDRANT, 3'-0" ABOVE SLAB.

0 2' 4' 8'

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

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APPROVED BY: WILLIAM P. WAGNER LICENSE No. 14166 PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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GRADE LEVEL PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

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DRAWING M-7

SHEET 61 OF 92

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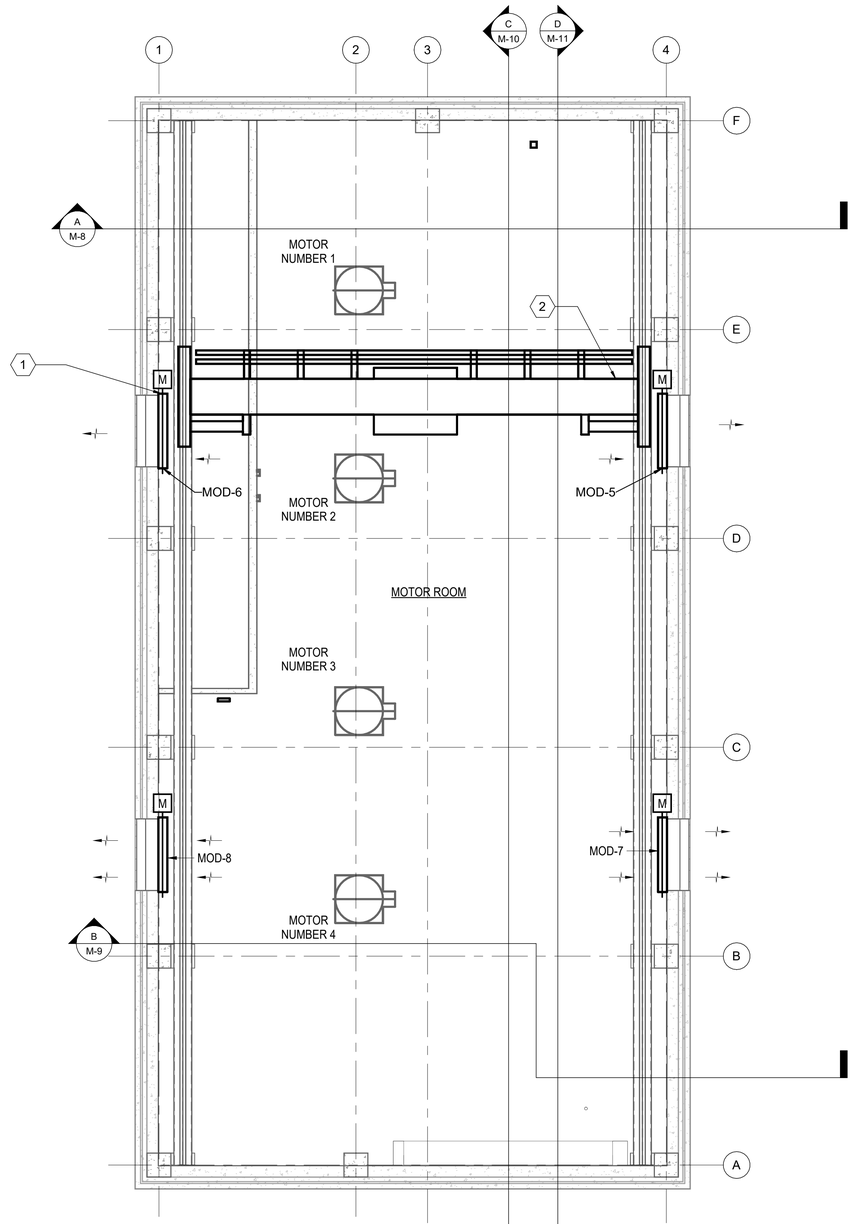
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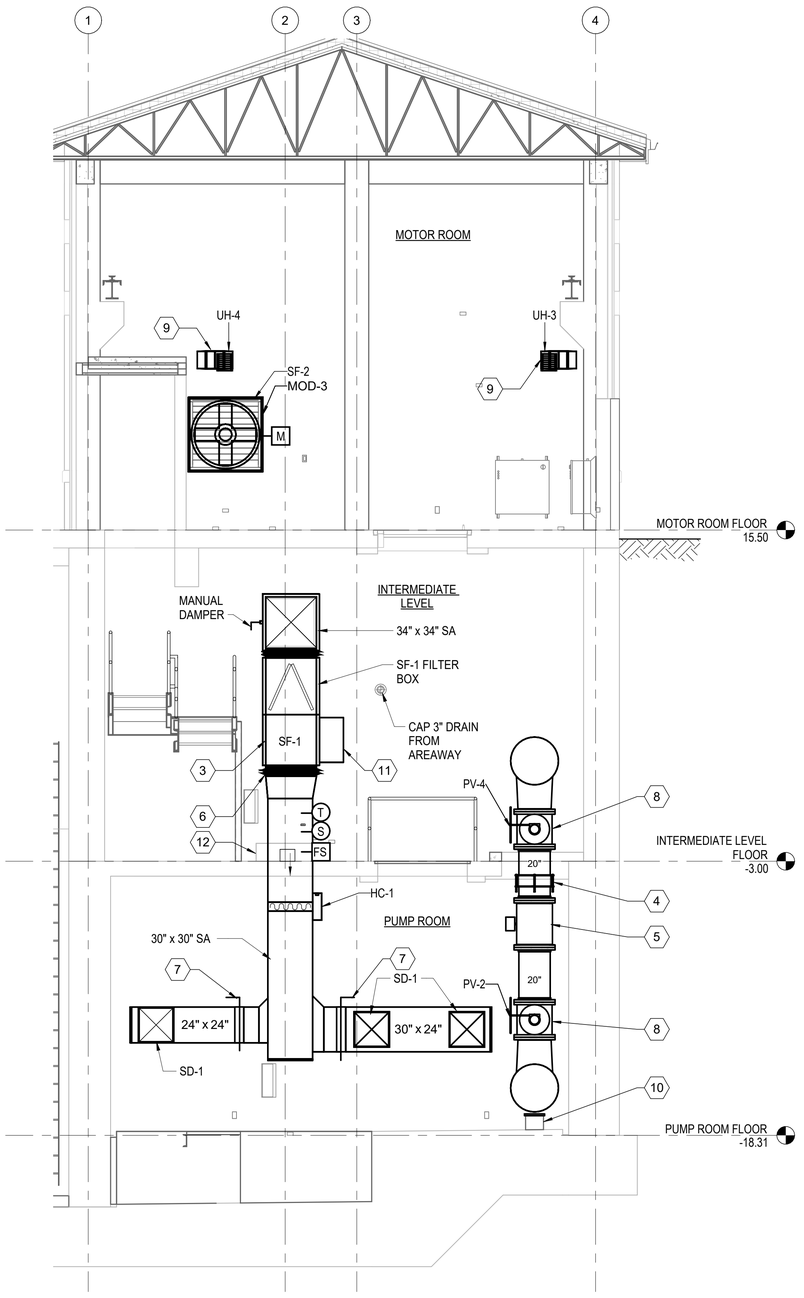
DRAWING M-8

SHEET 62 OF 92



BRIDGE CRANE LEVEL PLAN

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



A M-8 CROSS SECTION A

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

GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.

KEYED CONSTRUCTION NOTES:

1. 24" x 48" MOTOR OPERATED DAMPER (TYP.).
2. 5-TON BRIDGE CRANE WITH UNDER-RUNNING TROLLEY.
3. DRY WELL SUPPLY FAN. SEE SCHEDULE ON DRAWING M-12.
4. FLEXIBLE MECHANICAL COUPLING (TYP.). SEE DETAIL 5/M-2.
5. 20" MAGNETIC FLOWMETER.
6. FLEXIBLE DUCT CONNECTOR.
7. BALANCING DAMPER.
8. PLUG VALVES IN THE VERTICAL POSITION SHALL BE INSTALLED SO THAT SEAT END IS ORIENTED UPWARDS WHILE THE VALVE IS CLOSED.
9. UNIT HEATER MOUNTED AT 9'-0" ABOVE FINISHED FLOOR.
10. CONCRETE PIPE SUPPORT. SEE DETAIL ON S-2 (TYP.).
11. COORDINATE MOTOR POSITION FOR ACCESSIBILITY. ROTATE ORIENTATION AS NECESSARY TO FOR MAINTENANCE ACCESS.
12. 12 GAUGE COLD FORMED BENT PLATE AT DUCT PENETRATION FOR PROTECTION.

0 2' 4' 8'

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

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NEW CASTLE COUNTY
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187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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CRANE LEVEL PLAN AND CROSS SECTION A

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

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DRAWING M-8

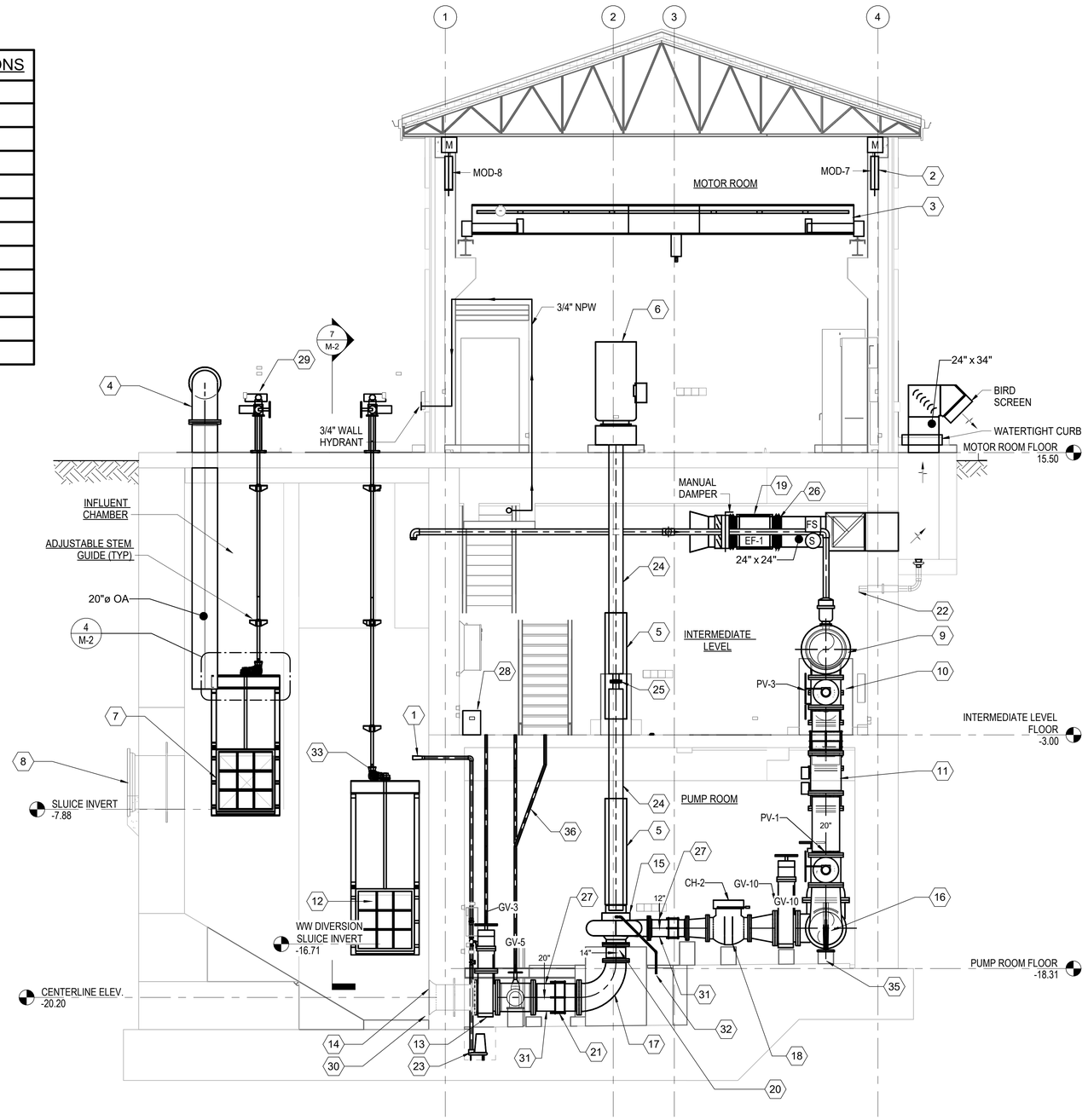
SHEET 62 OF 92

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DRAWING M-9
SHEET 63 OF 92

WET WELL OPERATING ELEVATIONS

HIGH HIGH WATER ALARM (BACKUP FLOAT)	-6.00
HIGH WATER ALARM	-6.50
3RD LAG PUMP START	-7.17
2ND LAG PUMP START	-7.84
1ST LAG PUMP START	-8.50
LEAD PUMP START	-9.17
3RD LAG PUMP STOP	-11.17
2ND LAG PUMP STOP	-11.84
1ST LAG PUMP STOP	-12.50
LEAD PUMP STOP	-13.17
LOW WATER ALARM	-14.17
LOW LOW WATER ALARM (BACKUP FLOAT)	-14.67



B
M-9
CROSS SECTION B
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.
6. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PERTAINING TO SLUICE GATE CONFIGURATION INCLUDING, BUT NOT LIMITED TO: FLOOR STAND, ACTUATOR, STEM AND ADJUSTABLE STEM GUIDES, BEVEL GEAR BOX, AND SLUICE GATE AND FRAME. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURERS TO ASSURE THAT ALL MOUNTING HARDWARE AND APPURTENANCES PROVIDE THE NECESSARY EQUIPMENT CLEARANCES.
7. NEW PIPE PENETRATIONS THROUGH CONCRETE WALL SHALL BE CORE DRILLED IN ACCORDANCE WITH TYPICAL STRUCTURAL DETAILS.

KEYED CONSTRUCTION NOTES:

1. DUCKBILL CHECK VALVE.
2. 24" x 48" MOTOR OPERATED DAMPER (TYP.)
3. 5-TON BRIDGE CRANE WITH UNDER-RUNNING TROLLEY.
4. 20" DIAMETER GOOSENECK. PROVIDE MINIMUM 2 FT CLEARANCE BETWEEN OUTLET AND CONCRETE SLAB.
5. WIRE FRAME GUARD (TYP.). WIRE FRAME GUARD SHALL CONFORM TO OSHA REQUIREMENTS AND PROVIDE ACCESS TO THE INTERMEDIATE BEARING.
6. PUMP MOTOR (TYP. OF 4).
7. INFLUENT SLUICE GATE 42" SQ. (TYP.)
8. EX. 42" WET WELL INFLUENT WALL FITTING
9. UPPER DISCHARGE HEADER
10. 20" PLUG VALVE (TYP.). PLUG VALVES IN THE VERTICAL POSITION SHALL BE INSTALLED SO THAT THE SEAT END IS ORIENTED UPWARDS WHILE THE VALVE IS CLOSED.
11. 20" MAGNETIC FLOWMETER
12. DIVISION SLUICE GATE OPENING 42" SQ.
13. 20" GATE VALVE
14. EX. 20" FLARED INLET WALL PIPE
15. 14"x12" PUMP. PUMP BASE NOT SHOWN FOR CLARITY.
16. LOWER DISCHARGE HEADER
17. 20"x14" LONG RADIUS REDUCING ELBOW
18. 14" CHECK VALVE
19. DRY WELL EXHAUST FAN. SEE FAN SCHEDULE ON M-12.
20. SPOOL PIECE
21. FLEXIBLE MECHANICAL COUPLING (TYP.) SEE DETAIL 5/M-2
22. CAP EXISTING AREA WAY DRAINS AT EXISTING PIPE STUB.
23. SUMP PUMP (TYP. OF 2). SEE SCHEDULE ON M-12 FOR DETAILS..
24. 10-1/2" DIA EXTENDED DRIVE SHAFT (TYP.). EXTENDED DRIVE SHAFT MANUFACTURER SHALL DESIGN STRUCTURAL CONNECTION TO EX. FLOOR.
25. INTERMEDIATE BEARING ELEVATION SHALL BE HALF WAY BETWEEN THE PUMP KEYWAY AND THE MOTOR CONNECTION SUCH THAT THE TWO LENGTHS OF THE EXTENDED DRIVE SHAFT ARE OF EQUAL LENGTH FOR ALL PUMPS.
26. FLEXIBLE DUCT CONNECTOR.
27. PRESSURE GAUGE, SEE DETAIL 1/M-2 (TYP. OF 8)
28. AIR BUBBLER COMPRESSOR.
29. OFFSET FLOOR STAND AND ACTUATOR (TYP. OF 3)
30. 2" CONCRETE FILLET IN CORNER.
31. PROCESS DRAIN, 3/4" HOSE VALVE (TYP. OF 8)
32. 3/4" SEAL WATER DRAIN TO BELOW GRATING.
33. BEVEL GEAR BOX MOUNTED TO YOKE (TYP. OF 3) TO BE AT LEAST 6" ABOVE HIGH WATER ALARM LEVEL.
34. FLOOR STAND WALL BRACKET (TYP. OF 3).
35. CONCRETE PIPE SUPPORT. SEE DETAIL ON S-2 (TYP.).
36. VALVE EXTENSION STEMS (UNIVERSAL JOINTS) AND ADJUSTABLE STEM GUIDES WITH BUSHING TO NEW INTERMEDIATE LEVEL VALVE BOXES IN FLOOR. SEE DETAILS ON 6/M-2 AND 3/M-3.

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SCALE: 1/4" = 1'-0" (0, 2', 4', 8')

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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: WILLIAM P. WAGNER, No. 14184, PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

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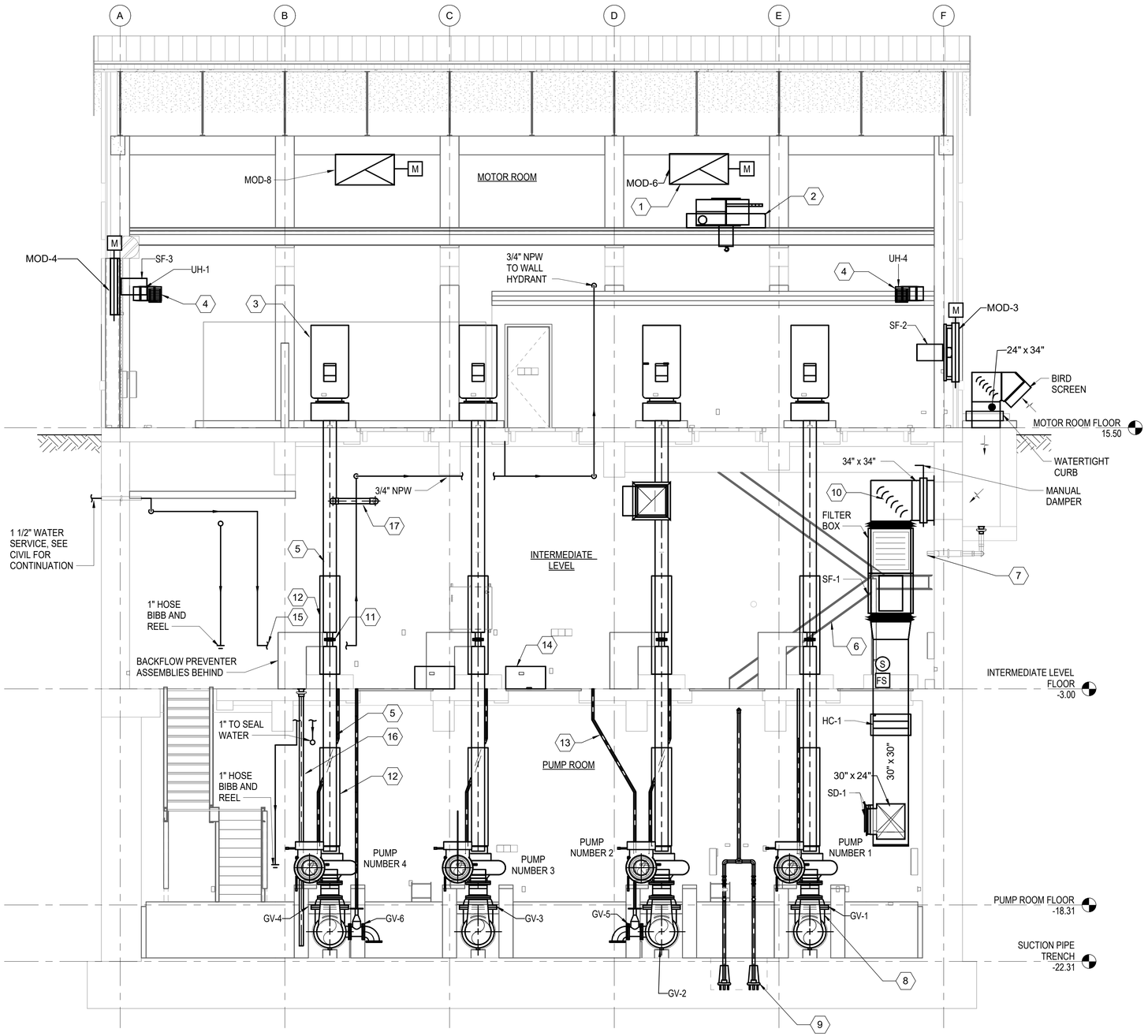
CROSS SECTION B

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
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SHEET 63 OF 92

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C M-10 LONGITUDINAL SECTION C
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.

KEYED CONSTRUCTION NOTES:

1. 24" x 48" MOTOR OPERATED DAMPER (TYP.)
2. 5-TON BRIDGE CRANE WITH UNDER-RUNNING TROLLEY.
3. PUMP MOTOR (TYP.). SEE TYPICAL EQUIPMENT SUPPORT DETAIL ON S-2.
4. UNIT HEATER MOUNTED AT 9'-0" ABOVE FINISHED FLOOR (TYP.)
5. 10-1/2" DIA EXTENDED DRIVE SHAFT (TYP.). EXTENDED DRIVE SHAFT MANUFACTURER SHALL DESIGN STRUCTURAL CONNECTION TO EX. FLOOR.
6. STAIRS UP TO MOTOR ROOM - SEE STRUCTURAL FOR DETAILS.
7. CAP EXISTING DRAINAGE PIPE AND DRAIN
8. SUCTION GATE VALVE BEHIND/OUT OF VIEW (TYP. OF 4)
9. SUMP PUMP (TYP. OF 2). SEE SCHEDULE ON M-12 FOR DETAILS.
10. DUCTWORK TURNING VANES (TYP).
11. INTERMEDIATE BEARING ELEVATION SHALL BE HALF WAY BETWEEN THE PUMP KEYWAY AND THE MOTOR CONNECTION SUCH THAT THE TWO LENGTHS OF THE EXTENDED DRIVE SHAFT ARE OF EQUAL LENGTH FOR ALL PUMPS.
12. WIRE FRAME GUARD (TYP.) WIRE FRAME GUARD SHALL CONFORM TO OSHA REQUIREMENTS AND PROVIDE ACCESS TO THE INTERMEDIATE BEARING.
13. VALVE EXTENSION STEMS (UNIVERSAL JOINTS) AND ADJUSTABLE STEM GUIDES WITH BUSHING TO NEW INTERMEDIATE LEVEL VALVE BOXES. SEE DETAILS ON 6/M-2 AND 3/M-3.
14. AIR BUBBLER COMPRESSOR (TYP. OF 2)
15. 1 1/2" WATER SERVICE TO BACKFLOW PREVENTER ASSEMBLIES. REFER TO PLUMBING RISER DIAGRAM ON M-3.
16. 3" DRAIN PIPING FROM INTERMEDIATE LEVEL FLOOR DRAIN ABOVE. TERMINATE WITH OPEN END PIPE 1'-0" ABOVE TOP OF SUCTION PIPE TRENCH FLOOR SLAB.
17. AIR VALVE VENT TO WET WELL.

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

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APPROVED BY: WILLIAM P. WAGNER No. 14169 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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LONGITUDINAL SECTION C

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

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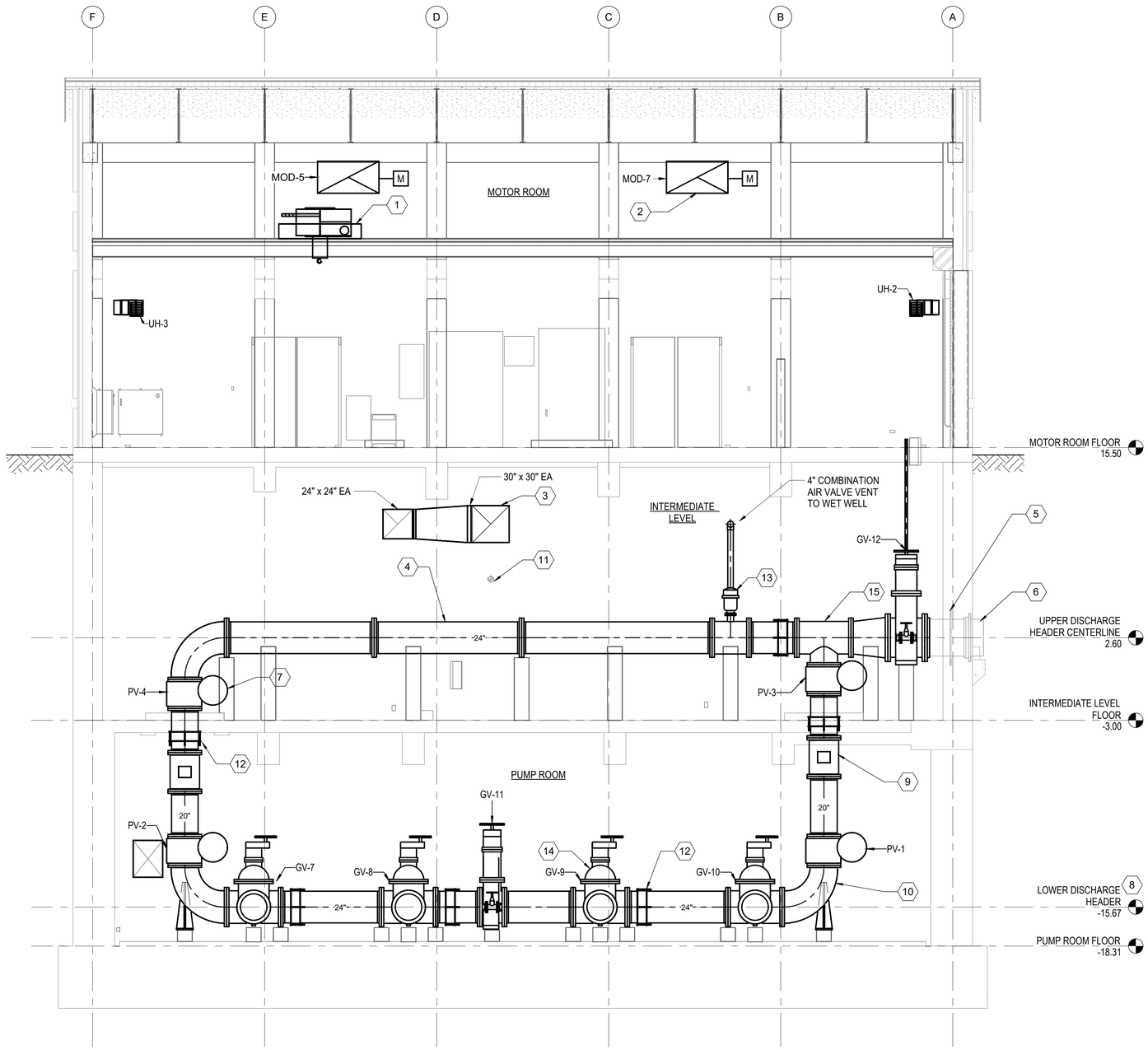
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GENERAL NOTES:

1. ALL WASTEWATER PIPING SHALL BE DIP CLASS 53 WITH DOUBLE THICKNESS INTERIOR CEMENT LINING AND CLASS 125 FLAT FACE FLANGES, UNLESS OTHERWISE NOTED.
2. ALL WASTEWATER PIPING FLEXIBL E MECHANICAL COUPLINGS SHALL BE HARNESSED. SEE DETAIL ON DRAWING M-2.
3. FOR EQUIPMENT SCHEDULES, SEE DRAWING M-12.
4. HANDRAILS NOT SHOWN FOR CLARITY.
5. ALL MECHANICAL EQUIPMENT INCLUDING PUMPS, PIPING, VALVES, FANS, DUCT, HEATERS, ETC. IS NEW UNLESS OTHERWISE NOTED.
6. ALL HAND WHEELS HIGHER THAN 6' ABOVE FINISHED FLOOR ELEVATION SHALL HAVE CHAINFALLS.

KEYED CONSTRUCTION NOTES:

1. 5-TON BRIDGE CRANE WITH UNDER-RUNNING TROLLEY.
2. 24" x 48" MOTOR OPERATED DAMPER (TYP.)
3. 30"x30" EXHAUST DUCT THROUGH EXISTING WALL OPENING.
4. 24" UPPER DISCHARGE HEADER
5. EX. FLANGE BY MJ FITTING WITH WATERSTOP. SEE STRUCTURAL DRAWINGS OR MJ BELL HAUNCH DETAIL.
6. TO EX. 30" FORCE MAIN. SEE CIVIL DRAWINGS
7. PLUG VALVE HANDWHEEL (TYP.)
8. LOWER DISCHARGE HEADER. CENTERLINE ELEVATION WILL VARY WITH PUMP FURNISHED
9. 20" MAGNETIC FLOWMETER (TYP. OF 2)
10. 24"x20" LONG RADIUS REDUCING ELBOW (TYP. OF 3)
11. CAP 3" DRAIN FROM AREAWAY
12. FLEXIBLE MECHANICAL COUPLING (TYP.) SEE DETAIL 5/M-2
13. 4" X 1/2" COMBINATION AIR VALVE MOUNTED ON 20" X 4" TEE. VENT TO WET WELL.
14. 20" GATE VALVE
15. 24"x20" REDUCING TEE

D / M-11 LONGITUDINAL SECTION D
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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LONGITUDINAL SECTION D

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING M-11

SHEET 65 OF 92

3/17/2025 10:57:56 AM

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

PROCESS EQUIPMENT SCHEDULES

ISOLATION VALVE SCHEDULE – GATE AND PLUG

MARK NO.	SIZE (IN.)	LOCATION	FUNCTION	VALVE TYPE	PIPELINE ORIENTATION	STEM/SHAFT ORIENTATION	OPERATOR TYPE	END TYPE
GV-1	20	PUMP ROOM	PUMP #1 SUCTION ISOLATION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
GV-2	20	PUMP ROOM	PUMP #2 SUCTION ISOLATION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
GV-3	20	PUMP ROOM	PUMP #3 SUCTION ISOLATION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
GV-4	20	PUMP ROOM	PUMP #4 SUCTION ISOLATION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
GV-5	8	PUMP ROOM	EMERGENCY DRY WELL SUCTION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
GV-6	8	PUMP ROOM	EMERGENCY DRY WELL SUCTION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
GV-7*	20	PUMP ROOM	PUMP #1 DISCHARGE ISOLATION	GATE	HORIZONTAL	VERTICAL	HAND WHEEL	FLANGED
GV-8*	20	PUMP ROOM	PUMP #2 DISCHARGE ISOLATION	GATE	HORIZONTAL	VERTICAL	HAND WHEEL	FLANGED
GV-9*	20	PUMP ROOM	PUMP #3 DISCHARGE ISOLATION	GATE	HORIZONTAL	VERTICAL	HAND WHEEL	FLANGED
GV-10*	20	PUMP ROOM	PUMP #4 DISCHARGE ISOLATION	GATE	HORIZONTAL	VERTICAL	HAND WHEEL	FLANGED
GV-11	24	PUMP ROOM	DIVISION VALVE - LOWER HEADER	GATE	HORIZONTAL	VERTICAL	HAND WHEEL	FLANGED
GV-12	30	DRY WELL INT. LEVEL	FORCE MAIN ISOLATION	GATE	HORIZONTAL	VERTICAL	EXTENSION STEM	FLANGED
PV-1	20	PUMP ROOM	SOUTH FLOWMETER UPSTREAM ISOLATION	PLUG	VERTICAL	HORIZONTAL	HAND WHEEL	FLANGED
PV-2	20	PUMP ROOM	NORTH FLOWMETER UPSTREAM ISOLATION	PLUG	VERTICAL	HORIZONTAL	HAND WHEEL	FLANGED
PV-3	20	DRY WELL INT. LEVEL	SOUTH FLOWMETER DOWNSTREAM ISOLATION	PLUG	VERTICAL	HORIZONTAL	HAND WHEEL	FLANGED
PV-4	20	DRY WELL INT. LEVEL	NORTH FLOWMETER DOWNSTREAM ISOLATION	PLUG	VERTICAL	HORIZONTAL	HAND WHEEL	FLANGED

*REFER TO GENERAL NOTE 35 ON M-1.

NOTES:

1. ALL HAND WHEELS HIGHER THAN 6' ABOVE FINISHED FLOOR ELEVATION SHALL HAVE CHAINFALLS.

CHECK VALVE SCHEDULE

MARK NO.	SIZE (IN.)	LOCATION	FUNCTION	VALVE TYPE	LEVER & WEIGHT	AIR CUSHION	OIL DASHPOT	END TYPE
CH-1	14	PUMP ROOM	PUMP DISCHARGE CHECK	CHECK	YES	NO	NO	FLANGED
CH-2	14	PUMP ROOM	PUMP DISCHARGE CHECK	CHECK	YES	NO	NO	FLANGED
CH-3	14	PUMP ROOM	PUMP DISCHARGE CHECK	CHECK	YES	NO	NO	FLANGED
CH-4	14	PUMP ROOM	PUMP DISCHARGE CHECK	CHECK	YES	NO	NO	FLANGED

SLUICE GATE SCHEDULE

MARK NO.	SIZE (IN.)	LOCATION	FUNCTION	GATE TYPE	SEATING / UNSEATING HEAD (FT.)	GATE OPEN DIRECTION	MOUNTING	WALL THIMBLE (YES / NO)	SELF-CONTAINED (YES / NO)	OPERATOR TYPE
SG-1	42" x 42"	WET WELL - INFLUENT CHAMBER	NORTH WET WELL ISOLATION	SLUICE	20/20	UPWARD	WALL	NO	YES	FLOOR STAND WITH ACTUATOR
SG-2	42" x 42"	WET WELL - INFLUENT CHAMBER	SOUTH WET WELL ISOLATION	SLUICE	20/20	UPWARD	WALL	NO	YES	FLOOR STAND WITH ACTUATOR
SG-3	42" x 42"	WET WELL DIVIDER WALL	WET WELL DIVISION	SLUICE	30/30	UPWARD	WALL	NO	YES	FLOOR STAND WITH ACTUATOR

HEATING AND VENTILATION EQUIPMENT SCHEDULES

VENTILATION FAN SCHEDULE

MARK NO.	AREA	MAX FLOW (CFM)	MIN FLOW (CFM)	STATIC PRESSURE (IN. W.C.)	MAX FAN RPM	MIN. WHEEL DIAMETER (IN.)	DRIVE TYPE	MAX. MOTOR HP	VOLT/PHASE	MAKE/MODEL
EF-1	INTERMEDIATE LEVEL	5,150	2,575	1.2	2010	24	MOTOR/DIRECT	3	3/480	GREENHECK SQ-16-VG (NOTE 2)
SF-1	INTERMEDIATE LEVEL	4,900	2,450	1.6	1400	24	MOTOR/DIRECT	3	3/480	GREENHECK SQ-15-VG(NOTE 1,2)
SF-2	MOTOR ROOM	5,500	-	0.45	1000	20	MOTOR/BELT	1	3/480	GREENHECK SBS-3H30
SF-3	MOTOR ROOM	5,500	-	0.45	1000	20	MOTOR/BELT	1	3/480	GREENHECK SBS-3H30

NOTES:

1. PROVIDE MANUFACTURER RECOMMENDED FILTER BOX ATTACHMENT AND MERV 7 DISPOSABLE FILTERS.
2. PROVIDE WITH VARIABLE SPEED MOTOR OPTION AND HOA CONTROLLER FOR TWO SPEED OPERATION.

VENTILATION DAMPER SCHEDULE

MARK NO.	AREA	ROUND OR RECTANGULAR	SIZE	MAX. AIRFLOW (CFM)	MAX. ALLOWABLE AIR PRESSURE DROP (IN. W.G.)	ASSOCIATED WITH FAN	INTAKE OR EXHAUST	ISOLATING OR BALANCING	WALL OR DUCT MOUNTED	DAMPER ARRANGEMENT
MOD-1	NOT USED									
MOD-2	NOT USED									
MOD-3	MOTOR ROOM	RECTANGULAR	48"x 48"	5,500	0.03	SF-2	SUPPLY	ISOLATING	WALL	POWER OPEN/SPRING CLOSE
MOD-4	MOTOR ROOM	RECTANGULAR	48"x 48"	5,500	0.03	SF-3	SUPPLY	ISOLATING	WALL	POWER OPEN/SPRING CLOSE
MOD-5	MOTOR ROOM	RECTANGULAR	48" X 24"	2,250	0.03	SF-2 or SF-3	EXHAUST	ISOLATING	WALL	POWER OPEN/SPRING CLOSE
MOD-6	MOTOR ROOM	RECTANGULAR	48" X 24"	2,250	0.03	SF-2 or SF-3	EXHAUST	ISOLATING	WALL	POWER OPEN/SPRING CLOSE
MOD-7	MOTOR ROOM	RECTANGULAR	48" X 24"	2,250	0.03	SF-2 or SF-3	EXHAUST	ISOLATING	WALL	POWER OPEN/SPRING CLOSE
MOD-8	MOTOR ROOM	RECTANGULAR	48" X 24"	2,250	0.03	SF-2 or SF-3	EXHAUST	ISOLATING	WALL	POWER OPEN/SPRING CLOSE

UNIT HEATER SCHEDULE

MARK NO.	AREA	CAPACITY (KW)	VOLTAGE/PHASE	REMOTE THERMOSTAT	THERMOSTAT SETPOINT	MAKE/MODEL
UH-1	MOTOR ROOM	3	480/3	YES	50 °F	CHROMALOX / HD3D
UH-2	MOTOR ROOM	3	480/3	YES	50 °F	CHROMALOX / HD3D
UH-3	MOTOR ROOM	3	480/3	YES	50 °F	CHROMALOX / HD3D
UH-4	MOTOR ROOM	3	480/3	YES	50 °F	CHROMALOX / HD3D

SUMP PUMP SCHEDULE

MARK NO.	POSITION	AREA	FLOW (GPM)	HEAD (FT)	DISCHARGE DIAMETER (IN.)	MAX. MOTOR HP	PHASE/VOLT	MAKE/MODEL
SP-1	LEAD	PUMP ROOM	20	20	1 1/2	1/3	1/120	HYDROMATIC / SW/SD/VS33
SP-2	LAG	PUMP ROOM	120	20	2	1	3/480	HYDROMATIC / SPD50

AIR DEVICE SCHEDULE

MARK NO.	AREA	ROUND OR RECTANGULAR	SIZE	SERVICE	FLOWRATE (CFM)	ALLOWABLE PRESSURE DROP (IN. W.G.)	MAKE/MODEL
SD-1	DRY WELL - LOWER LEVEL	RECTANGULAR	22" x 22"	SUPPLY	1,720	0.10	TITUS 301-RL-SS

DUCT MOUNTED HEATING COIL SCHEDULE

MARK NO.	AREA	DIMENSIONS	CAPACITY (KW)	AIRFLOW (CFM)	MAX. ALLOWABLE AIR PRESSURE DROP (IN. W.G.)	VOLTAGE /PHASE	REMOTE THERMOSTAT	ROWS	ENTERING AIR TEMP. (°F)	LEAVING AIR TEMP. (°F)	MAKE/MODEL
HC-1	DRY WELL	30" x 30"	73	5,150	0.10	480/3	YES	1	10 °F	55 °F	GREENHECK IDHE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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APPROVED BY:
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STATE OF DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	N/A
DESIGNED	TEW
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MECHANICAL EQUIPMENT SCHEDULES

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING M-12
SHEET 66 OF 92

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MAR 17, 2025 - 10:06am

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REVISION

COUNTY PROJECT No. 240618

DRAWING E-1 SHEET 67 OF 92

ELECTRICAL LEGEND

LIGHTS

- 3 — 1'x4' SUSPENDED OR SURFACE MOUNTED LIGHTING FIXTURE. NUMBER ADJACENT TO LIGHT DENOTES RESPECTIVE CIRCUIT NUMBER.
- 3 — 1'x4' WALL MOUNTED LIGHTING FIXTURE. NUMBER ADJACENT TO LIGHT DENOTES RESPECTIVE CIRCUIT NUMBER.
- WALL MOUNTED LIGHTING FIXTURE.
- A — LIGHTING FIXTURE TYPE, SEE LIGHTING FIXTURE SCHEDULE.
- WALL MOUNTED SINGLE FACE EXIT SIGN
- EMERGENCY BATTERY POWERED LIGHTING UNIT
- POLE MOUNTED LIGHTING FIXTURE.

SWITCHES

- S — SINGLE POLE SWITCH, 20A, 120-277V, INSTALL 4'-0" AFF.
- S_a — SINGLE POLE SWITCH, 20A, 120-277V, SUBSCRIPT INDICATES FIXTURES CONTROLLED. INSTALL 4'-0" AFF.
- S_2 — TWO POLE SWITCH - SINGLE THROW 20A, 120-277V. INSTALL 4'-0" AFF.
- S_3 — THREE WAY SWITCH, 20A, 120-277V. INSTALL 4'-0" AFF.
- S_4 — FOUR WAY SWITCH - 20A, 120-277V. INSTALL 4'-0" AFF.
- S_{MW} — MANUAL MOTOR STARTER SWITCH WITH OVERLOAD, PROVIDE HOA. "W" INDICATES WEATHERPROOF.
- C — CONTACTOR. INSTALL 4'-0" AFF.

RECEPTACLES

- W — SINGLE RECEPTACLE (120V, 20A) MOUNT 24" AFF UON "W" INDICATES WEATHERPROOF.
- W G EXP — DUPLEX RECEPTACLE (120V, 20A), SUBSCRIPT "G" INDICATES GFI TYPE, MOUNT 24" AFF UON, "W" INDICATES WHILE-IN-USE WEATHERPROOF COVER, "EXP" INDICATES EXPLOSION PROOF.
- G — DUPLEX RECEPTACLE (120V, 20A), SUBSCRIPT "G" INDICATES GFI TYPE, MOUNT 12" ABOVE COUNTER UON.
- G — DOUBLE DUPLEX RECEPTACLE (120V, 20A), SUBSCRIPT "G" INDICATES GFI TYPE, MOUNT 24" AFF UON.
- SPECIAL PURPOSE RECEPTACLE

PANELBOARD

- ELECTRICAL PANELBOARD (208/120V) 3-PHASE 4W
- ELECTRICAL PANELBOARD (480/277V) 3-PHASE 4W

EQUIPMENT CONNECTION

- J — JUNCTION BOX
- T — DRY TYPE TRANSFORMER, SIZE AS INDICATED.
- H — ELECTRICAL UNIT HEATER
- CP — CONTROL PANEL
- VCP — VENTILATION CONTROL PANEL
- FIT — FLOW INDICATING TRANSMITTER
- M 5 — MOTOR, HORSEPOWER AS INDICATED
- MOD — MOTOR OPERATED DAMPER

GROUNDING

- B — 3/4" DIA x10' LONG GROUND ROD
- A — GROUND ROD WITH TEST WELL
- G — GROUND CONDUCTOR #4/0 COPPER BCSD

UNDERGROUND/SITE WORK

- CONCRETE ENCASED DUCTS/CONDUITS IN BUILDING
- POLE
- DB — DIRECT BURIAL PVC SCHEDULE 40 CONDUIT

WIRING

- RACEWAY BELOW SLAB, DIRECT BURIED OR IN DUCTBANK WHERE INDICATED
- RACEWAY EXPOSED
- RACEWAY WITH CLASSIFIED SEALS
- RACEWAY TURNED UP OR TOWARDS VIEWER
- RACEWAY TURNED DOWN OR AWAY FROM VIEWER
- LP1-1,3,5 — BRANCH CIRCUIT HOME RUN TO PANELBOARD, LP1 DENOTES TO PANEL LP1 AND NUMERALS IDENTIFY CIRCUIT NUMBERS, 1,3,5. 3#12, 1#12 GND. AWG CONDUCTORS IN 3/4" CONDUIT U.O.N.

SCHEMATICS

- POTENTIAL TRANSFORMER
- CURRENT TRANSFORMER
- S — NEMA RATED STARTER, SIZE 1 U.O.N
- 200/225 — MOLDED CASE CIRCUIT BREAKER, TRIP VALUE INDICATED ABOVE LINE AND FRAME SIZE BELOW, 3 POLES UNLESS OTHERWISE NOTED. LSIG
- DRAWOUT CIRCUIT BREAKER, ELECTRICALLY OPERATED UON.
- 3 PHASE, 3 WIRE, DELTA
- 3 PHASE, 4 WIRE, GROUNDED WYE
- GROUND CONNECTION
- SPD — SURGE PROTECTIVE DEVICE
- DRY TYPE TRANSFORMER
- R — RED INDICATING LIGHT
- G — GREEN INDICATING LIGHT
- CS — CONTROL SWITCH
- RVSS — REDUCED VOLTAGE SOLID STATE STARTER
- 2 — TIMER
- 86 — LOCKOUT RELAY
- 27/47 — THREE PHASE UNDERVOLTAGE AND PHASE SEQUENCE VOLTAGE RELAY

MISCELLANEOUS

- A — SPECIFIC NOTES
- PM — POWER MONITOR
- TELEPHONE OUTLET-24" AFF. PROVIDE 1" EMPTY CONDUIT TO NEAREST TELEPHONE NETWORK INTERFACE DEVICE.
- X1 / X2 — X1 - DESIGNATION OF SECTION (A, B, C,..) X2 - DRAWING WHERE PLAN/SECTION IS LOCATED
- X3 / X4 — X3 - DESIGNATION OF DETAIL (1, 2, 3,....) X4 - DRAWING WHERE DETAIL IS LOCATED

SAFETY SWITCHES/BREAKERS/STARTERS

- 30/3 — DISCONNECT SWITCH, NON-FUSED, SUBSCRIPT INDICATES AMPACITY AND NUMBER OF POLES, 30A, 3P, UON
- STARTER NEMA SIZE 1 UON
- COMBINATION STARTER, 3P-30A DISCONNECT SWITCH, NEMA SIZE 1 STARTER, UON
- ENCLOSED CIRCUIT BREAKER, SIZE AS INDICATED
- F 30/3 — DISCONNECT SWITCH FUSED, SUBSCRIPT INDICATES AMPACITY AND NUMBER OF POLES, 30A, 3P, UON
- M W — LOCAL MOTOR STARTER, "W" INDICATED WEATHERPROOF

ABBREVIATIONS

#	NUMBER
A	AMPERE
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AIC	AMPS INTERRUPTING CAPACITY
AMP	AMPERES
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BCSD	BARE COPPER SOFT DRAWN
BLDG	BUILDING
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLP	CITY LIGHT & POWER
CND	CONDUIT
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
CONT	CONTINUE
CP	CONTROL PANEL
CPT	CONTROL PANEL TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
CTB	CONTROL TERMINLA BLOCK
DACT	DIGITAL ALARM COMMUNICATOR TRANSMITTER
DIA	DIAMETER
DISC SW	DISCONNECT SWITCH
DIV	DIVISION
DVdT	DVDT FILTER
DWG	DRAWING
EC	EMPTY CONDUIT
EF	EXHAUST FAN
EL	ELECTRIC, ELECTRICAL
ELEC	ELECTRIC, ELECTRICAL
ENCL	ENCLOSURE
ETBR	EXISTING TO BE REMOVED
ETR	EXISTING TO REMAIN
FA	FULL LOAD AMPERES
FCP	FIRE CONTROL PANEL
FF	FINISHED FLOOR
FT	FEET
FVNR	FULL VOLTAGE, NON REVERSING
G, GND	GROUND
GFI	GROUND FAULT INTERRUPTER
GRS	GALVANIZED RIGID STEEL CONDUIT
HID	HIGH INTENSITH DISCHARGE LTG
HOA	HAND OFF AUTO SELECTOR SWITCH
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HTR	HEATER
HVAC	HEATING VENTILATION AND AIR CONDITIONING
JB	JUNCTION BOX
kA	KILO AMPERES
kCMIL	THOUSAND CIRCULAR MILS
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kWH	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LO	LOCKOUT
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDS	MAIN DISTRIBUTION SWITCHBOARD
MH	MOUNTING HEIGNT
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
MV	MEDIUM VOLTAGE
N	NEUTRAL
NAC	NOTIFICATION APPLIANCE POWER EXTENDER PANEL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NFSS	NON FUSED SAFETY SWITCH
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN, NUMBERS
NTS	NOT TO SCALE
P	POLE
PB STA	PUSHBUTTON STATION
PCB	PUMP CONNECTION BOX
PH	PHASE
PNL	PANEL
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PTB	POWER TERMINAL BLOCK
PVC	POLYVINYL CHLORIDE
RMS	ROOT MEAN SQUARE
RVSS	REDUCED VOLTAGE SOLID STATE STARTER
RX	REMOVE EXISTING
SPD	SERGE PROTECTIVE DEVICE
SSS	SOLID STATE STARTER
SW	SWITCH
SWGR	SWITCHGEAR
SYMM	SYMMETRICAL
TBR	TO BE REMOVED
TDOE	TIME DELAY ON ENERGIZATION
TDR	TIME DELAY RELAY
THU	THROUGH
UL	UNDERWRITERS LABORATORY
UON	UNLESS OTHERWISE NOTED
UV	ULTRAVIOLET
V	VOLTS
VA	VOLT AMPS
VCP	VENTILATION CONTROL PANEL
VFD	VARIABLE FREQUENCY DRIVE
W	WATT
W	WIRE
WP	WEATHERPROOF CONSTRUCTION
XFMR	TRANSFORMER
Z	IMPEDANCE

LIGHTNING PROTECTION NOTES

1. INSURE COMPATABILITY OF MATERIALS AT ROOF, INCLUDING BOOT, SPECIAL ADHESIVE, SEALS, MOUNTING PADS, ETC.
2. THE INSTALLING CONTRACTOR SHALL FIELD VERIFY REMOVAL OF FIREPROOFING FROM THE AREA WHERE STRUCTURAL STEEL BONDING IS TO OCCUR. CLEAN AND BRIGHTEN STEEL TO INSURE A GOOD ELECTRICALLY CONTINUOUS CONNECTION. REPLACEMENT OF FIREPROOFING IS REQUIRED TO INSURE STRUCTURAL INTEGRITY OF THE STRUCTURAL STEEL FRAMING.
3. METAL BODIES OF INDUCTANCE LOCATED ABOUT THE ROOF SUCH AS METAL FLASHINGS, GRAVEL STOPS, ROOF DRAINS, SOIL PIPE VENTS, INSULATION VENTS, LOUVERS AND DOOR FRAMES SITUATED WITHIN 6'-0" OF A LIGHTNING CONDUCTOR OR BONDED METAL BODY SHALL BE INTERCONNECTED TO THE LIGHTNING CONDUCTOR SYSTEM.
4. NO BEND OF A CONDUIT SHALL FORM A FINAL ANGLE OF LESS THAN 90 DEGREES, NOR SHALL A CONDUIT HAVE A RADIUS OF BEND OF LESS THAN 8".
5. CONDUCTORS SHALL INTERCONNECT ALL AIR TERMINALS AND SHALL FORM A TWP-WAY PATH FROM EACH AIR TERMINAL HORIZONTALLY OR DOWNWARD TO CONNECTIONS WITH GROUND TERMINALS.
6. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE FASTENED AT NOT MORE THAN 3'-0" MAXIMUM SPACING.
7. CONNECTIONS TO GROUND ROD OR GROUND LOOP CONDUCTOR SHALL BE MADE AT A POINT NOT LESS THAN 1'-0" BELOW GRADE AND 2'-0" AWAY FROM FOUNDATION WALL.
8. ACTUAL JOBSITE CONDITIONS MAY NECESSITATE SLIGHT ALTERATIONS IN AIR TERMINAL AND GROUND ROD LOCATIONS.
9. AIR TERMINALS SHALL BE PLACED AT ALL UNPROTECTED OUTSIDE CORNERS AND LOCATED INTERMEDIATELY ON 20'-0" MAXIMUM SPACING AROUND THE ROOF PERIMETER AND WITHIN 2'-0" OF OUTSIDE EDGE.
10. BOND ALL METALLIC PIPES INCLUDING WATER, FIRE, GAS, SEWER, STORM, ETC. WHICH ENTER THE STRUCTURE TO THE NEAREST DOWNLEAD, GROUND ROD OR GROUND LOOP.
11. BARE LIGHTNING PROTECTION MATERIALS SHALL NOT BE INSTALLED ON ALUMINUM SURFACES.
12. THE LIGHTNING PRETECTION SYSTEM SHALL BE INSTALLED IN A NEAT AND INCONSPICUOUS MANNER SO THAT ALL COMPONENTS WILL BLEND IN WITH THE APPEARANCE OF THE BUILDING.
13. SEAL ENDS OF CONDUT MOISTURE TIGHT WITH DUCT SEAL OR LEAD WEDGE.
14. ALL CONDUIT, CONDUIT FASTENERS AND MISCELLANEOUS ACCESSORIES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
15. ADHESIVE TYPE FITTINGS ON ROOF SHALL BE SET IN PLACE WITH AN APPLICATION OF COMPATIBLE ROOF CEMENT.
16. COAT UNDERGROUND CONNECTORS WITH COAL TAR EPOXY.
17. THE LIGHTNING PROTECTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF NFPA 780.
18. FOR GROUNDING AND LIGHTNING PROTECTION SYSTEM DETAILS, SEE DRAWING AND SPECIFICATIONS.
19. PROVIDE SUITABLE BRACES FOR AIR TERMINALS OVER 24" HIGH.
20. LIGHTNING PROTECTION SYSTEM DOWN CONDUCTORS FROM ROOF TO GROUND SHALL BE INSTALLED IN PVC SCHEDULE 80 CONDUIT AND EXPOSED ON EXTERIOR WALLS.
21. LIGHTNING PROTECTION SYSTEM SHALL BE PROVIDED WITH U.L. MASTER LABEL.

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801 South Caroline Street, Baltimore, Maryland 21231
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APPROVED BY: H. JOHAN KIM — No. 19294 — DELAWARE — PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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DELAWARE
DEPARTMENT OF PUBLIC WORKS
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LEGEND, ABBREVIATIONS AND GENERAL NOTES

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

COUNTY PROJECT No. 240618

DRAWING E-1

SHEET 67 OF 92

3/21/2025 8:29:38 AM

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REVISION

COUNTY PROJECT No.
240618

DRAWING
E-2

SHEET 68 OF 92

GENERAL NOTES

1. INSTALLATION OF ALL ELECTRICAL WORK SHALL CONFORM WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NFPA 70) AND ALL APPLICABLE LOCAL CODES.
2. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO THE BEAMS AND WALLS.
3. PROVIDE ALL REQUIRED PULL BOXES AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS.
4. FINAL LOCATIONS FOR ALL ELECTRICAL EQUIPMENT, INCLUDING RECEPTACLES, JUNCTION BOXES FOR SPECIFIED EQUIPMENT, LIGHTING FIXTURES, SWITCHES, ETC. SHALL BE APPROVED BY THE COUNTY PRIOR TO INSTALLATION.
5. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS ARE BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS APPROVED BY THE COUNTY MAY BE MADE BY THE CONTRACTOR AT HIS EXPENSE TO ACCOMODATE EQUIPMENT ACTUALLY PURCHASED.
6. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY COMPONENTS REQUIRED FOR MAKING FINAL CONNECTOR OF ALL EQUIPMENT INSTALLED OR MODIFIED AS PART OF THIS CONTRACT.
7. ALL ALARM INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
8. ALL ELECTRICAL EQUIPMENT INSTALLED AGAINST CONCRETE OR MASONRY WALLS SHALL BE INSTALLED WITHIN A 1/4" SPACE BETWEEN THE EQUIPMENT AND THE MOUNTING SURFACE. SPACERS SHALL BE STAINLESS STEEL, PVC OR NYLON.
9. ELECTRICAL ENCLOSURES LOCATED OUTDOORS AND INDOORS IN WET AND DAMP LOCATIONS SHALL BE WEATHERPROOF NEMA 4X 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.
10. DRAWINGS ARE DIAGRAMMATIC. ACTUAL LOCATION OF EQUIPMENT TO BE DETERMINED IN THE FIELD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE EQUIPMENT WHICH MEETS THE SPACE REQUIREMENT.
11. THE CONTRACTOR SHALL SUBMIT A LIST OF ALL MAJOR EQUIPMENT AND FIXTURES TO THE ENGINEER FOR REVIEW AND APPROVAL. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT THE PERMISSION OF THE ENGINEER IN WRITING. ALL EQUIPMENT SHALL BE NEW AND BEAR THE MANUFACTURER'S NAME AND TRADE NAME. ALL EQUIPMENT SHALL BE UL LISTED.
12. ALL DRAWINGS ARE PREPARED IN ENGLISH UNITS. WIRE SIZE IS INDICATED IN THE AMERICAN WIRE GAUGE. ALL CONDUIT SIZES ARE INDUSTRY STANDARD.
13. THE CIRCUIT NUMBERS ARE FOR IDENTIFICATION PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS AND CORRECTLY PHASING THE CIRCUITS IN PANELBOARDS.
14. ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT ARE BASED ON EQUIPMENT SPECIFIED. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL SHOP DRAWINGS PRIOR TO ORDERING AND INSTALLING EQUIPMENT.
15. CONTRACTOR SHALL VERIFY ALL DOOR SWINGS BEFORE SETTING SWITCHES. INSTALL SWITCHES ON THE LOCK SIDE OF DOORS 4'-0" AFF, UNLESS OTHERWISE NOTED.
16. WHERE ELECTRICAL INSTALLATIONS DEPEND UPON WORK OF OTHER TRADES, THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT NECESSARY INSTRUCTIONS, TEMPLATES, MATERIALS, ETC. ARE PROVIDED AND SUPERVISE THE WORK OF THE OTHER TRADES FOR QUALITY AND CODE COMPLIANCE.
17. THE CONTRACTOR SHALL VISIT THE JOB SITE AND EXAMINE THE EXISTING CONDITIONS THAT MAY AFFECT HIS WORK.
18. OPENINGS AND PASSAGE OF CONDUITS OR WIREWAYS THROUGH FLOOR SLABS AND FIRE RATED WALLS OR PARTITIONS SHALL BE PROVIDED WITH UL LISTED FIRE RATED SLEEVING SYSTEMS AS MANUFACTURED BY PROSET SYSTEMS INC., OR APPROVED EQUAL.
19. ALL JUNCTION AND PULL BOXES SHALL BE LABELED WITH THEIR VOLTAGE, PANEL AND CIRCUIT DESIGNATORS.
20. CUT AND PATCH SLABS, CEILING, ROOF, FLOOR, WALL, ROADWAY AND OTHER SURFACES AS NECESSARY TO ACCOMPLISH CONSTRUCTION WORK UNDER THIS CONTRACT.
21. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 4X 316 STAINLESS STEEL, UON.
22. SERIES RATING OF CIRCUIT BREAKERS SHALL NOT BE ALLOWED.
23. MINIMUM WIRE SIZE SHALL BE #12 UON AND MINIMUM CIRCUIT WIRES SHALL BE 2#12, 1#12G. MINIMUM CONDUIT SIZE SHALL BE 3/4" UON.
24. ALL EMERGENCY AND EXIT LIGHTING FIXTURES SHALL BE CONNECTED TO UN-SWITCHED LEG OF LOCAL LIGHTING CIRCUIT.
25. ALL INDOOR CONDUITS IN NON-CORROSIVE AND/OR DRY AREAS SHALL BE RIGID GALVANIZED STEEL, UON.
26. ALL CONDUITS INSTALLED OUTDOORS, IN CORROSIVE AND/OR DAMP AREAS SHALL BE PVC COATED RIGID GALVANIZED STEEL, UON.
27. PROVIDE 4" HIGH CONCRETE HOUSE KEEPING PAD FOR ALL MAJOR EQUIPMENT.
28. COORDINATE AND OBTAIN APPROVAL OF ALL WORK RELATED TO ELECTRICAL SERVICE FROM DELMARVA POWER. CONTRACTOR SHALL OBTAIN REQUIRED ELECTRICAL PERMIT FOR "SERVICE" RELATED WORK.
29. DO NOT USE MORE THAN 3 FEET OF FLEXIBLE METAL CONDUIT AND LIQUID TIGHT FLEXIBLE CONDUIT.
30. DO NOT INSTALL MORE THAN THREE SINGLE PHASE CIRCUITS IN ONE HOMERUN, UON.
31. PROVIDE PULL STRINGS IN ALL EMPTY CONDUITS TO FACILITATE PULLING OF CABLES IN FUTURE.
32. ALL EXISTING TO REMAIN STRUCTURES, PAVEMENTS, EQUIPMENT AND UTILITIES SHALL BE PROTECTED AGAINST DAMAGE AND IF DAMAGED SHALL BE RESTORED TO ORIGINAL CONDITION AT NO COST TO THE OWNER.
33. ALL SINGLE PHASE CIRCUITS SHALL HAVE AN INDIVIDUAL NEUTRAL CONDUCTOR.
34. TEST PIT TO DETERMINE LOCATION OF EXISTING UTILITIES BEFORE CONSTRUCTION OF NEW DUCTBANK. SUBMIT PROFILE AND PLAN DRAWINGS FOR APPROVAL BY THE ENGINEER. NEW DUCTBANK SHALL COORDINATE WITH EXISTING AND OTHER NEW UTILITIES INDICATED ON CIVIL DRAWINGS.
35. CONTRACTOR SHALL COORDINATE AND OBTAIN APPROVAL FROM OWNER FOR ALL POWER OUTAGES A MINIMUM OF TEN DAYS BEFORE OUTAGE.
36. ALL BURIED GROUND RING CONDUCTORS SHALL BE 4/0 BCSD.
37. ALL GROUND RODS SHALL BE 3/4" COPPER PLATED STEEL GROUND RODS WITH LENGTH OF 10'-0" AND BURIED 24" BELOW FINISHED GRADE.
38. ALL CONNECTIONS FROM GROUND RING TO COPPER GROUND BUS AND UNDERGROUND PIPE TO GROUND BUS SHALL BE INSULATED 4/0.
39. ALL GROUND RODS SHALL BE EXOTHERMICALLY WELDED TO 4/0 BCSD RING CONDUCTORS.
40. CONTRACTOR SHALL COORDINATE IN FIELD ALL GROUND ROD LOCATIONS WITH EXISTING AND NEW PIPING PRIOR TO THE START OF WORK.

DEFINITIONS

FURNISH: SUPPLY AND DELIVER TO PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS.

INSTALL: UNLOAD, TEMPORARILY STORE, UNPACK, ASSEMBLE, ERECT, PLACE, ANCHOR, APPLY, WORK TO DIMENSION, FINISH, CURE, PROTECT, CLEAN AND SIMILAR OPERATIONS AT PROJECT SITE.

PROVIDE: FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

WIRING: INSTALL CONDUIT AND WIRES/CONDUCTORS

INDICATED: REQUIREMENTS EXPRESSED BY GRAPHIC REPRESENTATIONS OR IN WRITTEN FORM ON DRAWINGS, IN SPECIFICATIONS AND IN CONTRACT DOCUMENTS. OTHER ITEMS INCLUDING SHOWN, "NOTED," "SCHEDULED," AND SPECIFIED" HAVE THE SAME MEANING AS INDICATED.

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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
IL KWAN KIM
LICENSE
No. 19294
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
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APPROVED BY:
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SCALE:
DESIGNED JPS
DRAWN ACK
CHECKED IHK
DATE MAR 2025

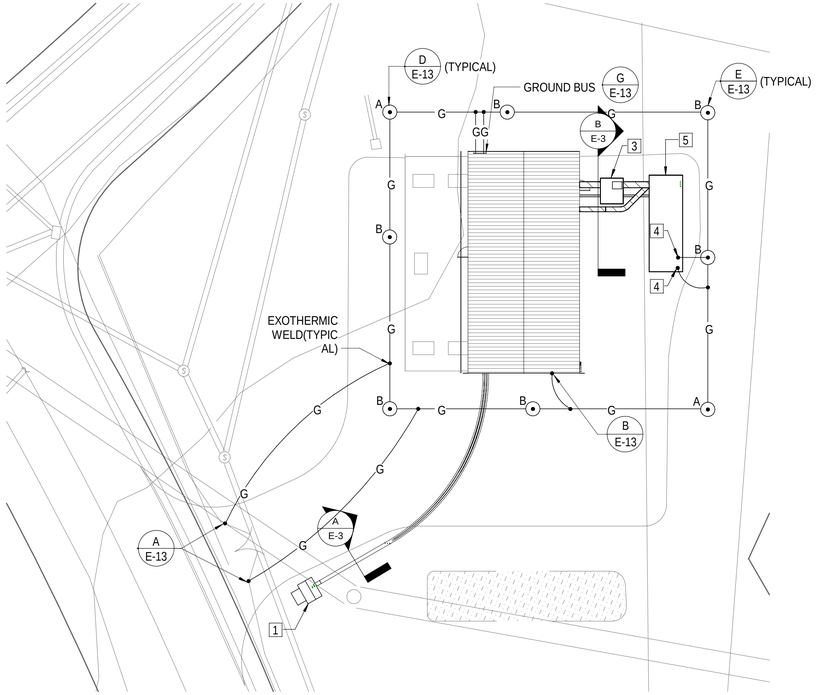
ELECTRICAL GENERAL NOTES

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-2
SHEET 68 OF 92

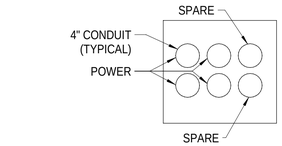
3/21/2025 8:29:38 AM

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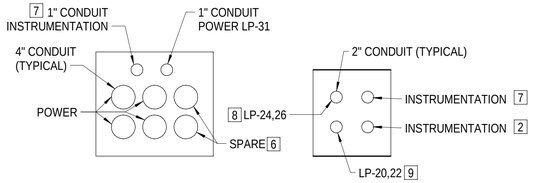
ELECTRICAL SITE PLAN

SCALE: 1" = 20'-0"



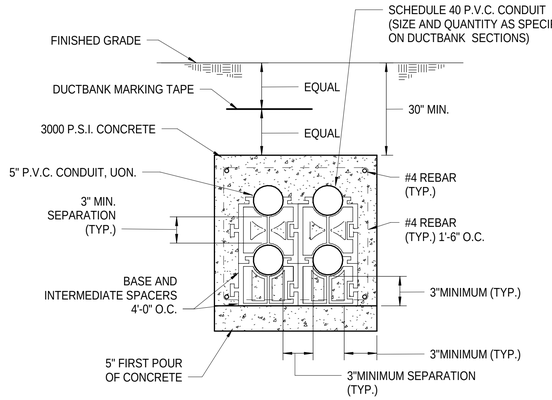
A E-3 INCOMING SERVICE DUCTBANK SECTION

SCALE: NOT TO SCALE
REF: E-3



B E-3 GENERATOR DUCTBANK SECTION

SCALE: NOT TO SCALE
REF: E-3



C E-3 TYPICAL DUCTBANK DETAIL

SCALE: NOT TO SCALE
REF:

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-14 FOR GROUNDING RISER DIAGRAM.

SPECIFIC NOTES

1. DELMARVA POWER PAD MOUNTED TRANSFROMER, CT'S AND METER. APPROXIMATE LOCATION SHOWN. COORDINATE WITH DELMARVA POWER.
2. TERMINATE AT GENERATOR REMOTE ANNUNCIATOR.
3. MANUAL TRANSFER SWITCH AND LOAD BANK CAM LOCKS. REFER TO TYPICAL EXTERIOR EQUIPMENT PAD DETAIL ON DRAWING S-2.
4. CONNECT TO GENERATOR GROUND BUS.
5. STANDBY GENERATOR - REFER TO GENERATOR PAD DETAIL ON DRAWING S-2.
6. EXTEND 6" INTO INTERMEDIATE LEVEL AND CAP. TURN-UP INTO GENERATOR CONTROL PANEL CONDUIT AREA AND CAP.
7. TERMINATE AT PUMP CONTROL PANEL.
8. GENERATOR JACKET WATER HEATER. PROVIDE 3#4 + 1#10G.
9. GENERATOR BATTERY CHARGER AND MISCELLANEOUS LOADS. PROVIDE 2 SETS OF (2#12 + 1#12G).

0 10' 20' 40'
SCALE: 1" = 20'-0"
GRAPHIC SCALE

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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: I. KWAN KIM LICENSE No. 19294 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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DATE	MAR 2025

ELECTRICAL SITE PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

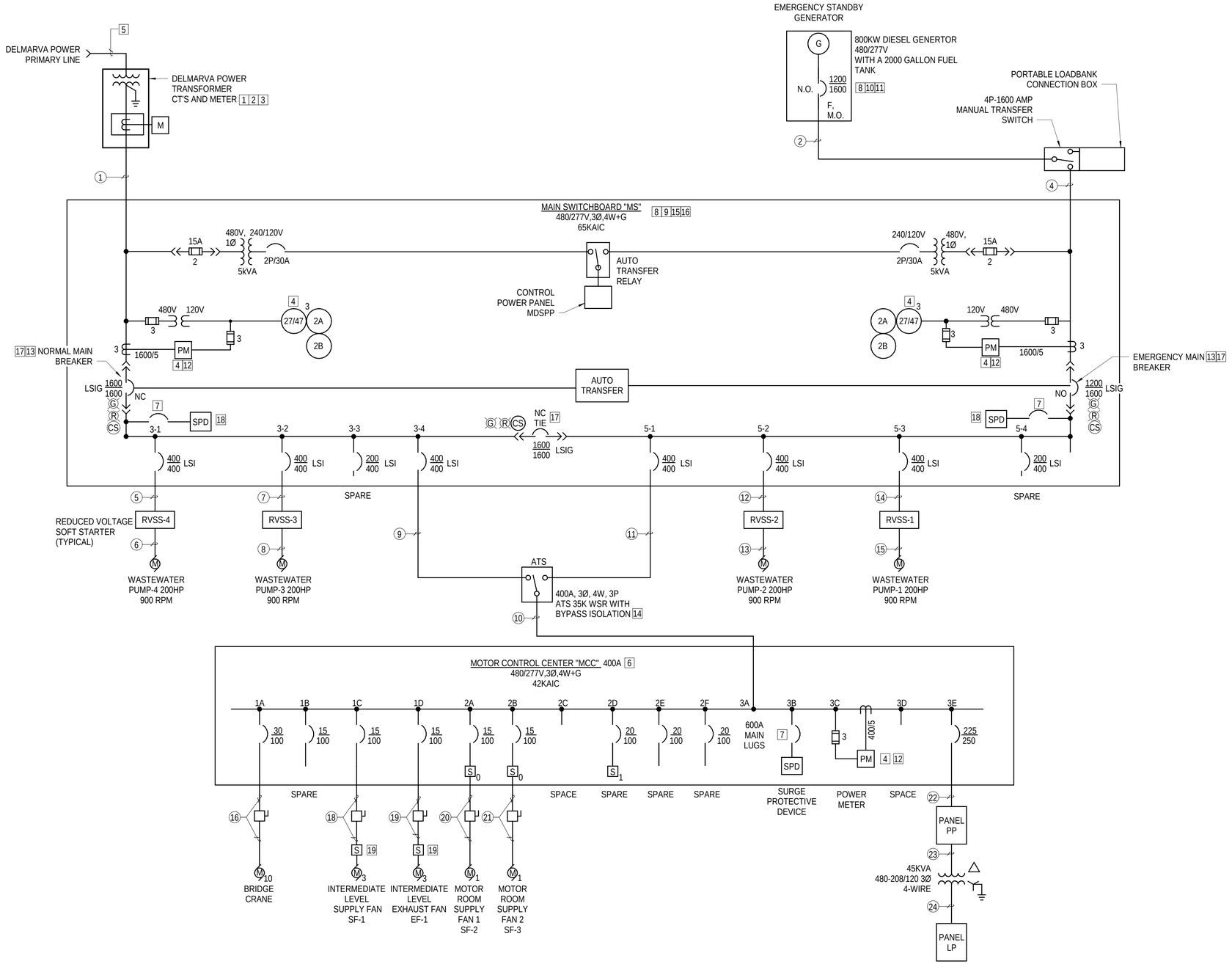
COUNTY PROJECT No. 240618

DRAWING E-3

SHEET 69 OF 92

3/21/2025 8:29:39 AM

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SINGLE LINE DIAGRAM - POWER DISTRIBUTION SYSTEM

SCALE:NONE

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR CONDUIT AND CABLE SCHEDULE.

SPECIFIC NOTES

1. PROVIDED BY DELMARVA POWER.
2. COORDINATE TRANSFORMER LOCATION WITH DELMARVA POWER PRIOR TO INSTALLATION FOR CONDUIT AND METER.
3. PROVIDE TRANSFORMER PAD ACCORDING TO DELMARVA POWER STANDARDS.
4. PROVIDE ADDITIONAL CONTACTS FOR SENDING SIGNAL TO PCP (SCADA) INDICATING INCOMING POWER STATUS.
5. PROVIDE 2-5" DIRECT BURIED SCHEDULE 80 EMPTY CONDUITS FROM TRANSFORMER PAD TO DELMARVA ELECTRIC POLE FOR PRIMARY CABLES. DIRECT BURIAL CONDUITS SHALL BE PROVIDED IN ACCORDANCE WITH DELMARVA POWER STANDARDS. PROVIDE PULL STRINGS PER DELMARVA POWER STANDARDS.
6. BUS SHALL BE RATED FOR 42 KAIC AND CIRCUIT BREAKERS SHALL BE RATED FOR 42 KAIC.
7. CIRCUIT BREAKER SIZE AS RECOMMENDED BY MANUFACTURER.
8. PROVIDE CONTROL WIRES FROM GENERATOR CONTROL PANEL TO SWITCHBOARD "MS" FOR GENERATOR START SIGNAL.
9. PROVIDE RELAYS IN "MS" AS NECESSARY FOR PROPER OPERATION OF SWITCHBOARD AS DESCRIBED IN DWG E-5.
10. CONNECT MANUFACTURER'S GENERATOR PROTECTION RELAY CONTACTS TO EMERGENCY MAIN BREAKER TRIP CIRCUIT.
11. GENERATOR SHALL HAVE TWO 100% RATED BREAKERS, ONE FOR FEEDING SWITCHBOARD AND OTHER FOR LOAD BANK CONNECTIONS.
12. POWER MONITOR SHALL HAVE DEVICE-NET OR ETHERNET IP COMMUNICATION CAPABILITY.
13. BREAKER SHALL BE CAPABLE OF PROVIDING THE STATUS SIGNAL FOR THE FOLLOWING: BREAKER CLOSED, BREAKER OPEN AND BREAKER FAULTED. PROVIDE CONDUIT AND CONDUCTORS TO RELAY THE STATUS SIGNALS TO PCP.
14. PROVIDE CONTACTS FOR INDICATION OF AVAILABILITY OF UTILITY POWER AND GENERATOR POWER. PROVIDE CONDUIT AND CONDUCTORS TO PCP FOR STATUS OF NORMAL AND EMERGENCY POWER.
15. ALL CIRCUIT BREAKERS SHALL HAVE LSIG TRIP, UON.
16. REFER TO ELEVATION AND SEQUENCE OF OPERATION ON DRAWING E-5.
17. TYPE MTZ2 CIRCUIT BREAKER, UON.
18. SPD SHALL BE MOUNTED WITHIN 3' (CABLE LENGTH) OF MAIN CIRCUIT BREAKER.
19. 2-SPEED STARTER BY MANUFACTURER, INSTALLED BY CONTRACTOR.

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WO: 70852-000

APPROVED BY: I. KHAN KIM VICENTE No. 19294 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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CHECKED	IHK
DATE	MAR 2025

SINGLE LINE DIAGRAM

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-4
SHEET 70 OF 92

3/21/2025 8:29:40 AM

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MAIN SWITCHBOARD "MS" SEQUENCE OF OPERATION

1. NORMAL AUTOMATIC OPERATION

   A. THE SWITCHBOARD WILL NORMALLY OPERATE FROM THE "NORMAL" FEEDER. UNDER THIS ARRANGEMENT, THE NORMAL MAIN BREAKER WILL BE CLOSED AND THE TIE BREAKER IS CLOSED SO THAT THE POWER COMPANY PROVIDES SERVICE TO THE PUMPING STATION. THE EMERGENCY MAIN BREAKER WILL BE OPEN AND THE EMERGENCY GENERATOR WILL BE DE-ENERGIZED.

   B. A LOSS OF VOLTAGE OF THE "NORMAL" FEEDER WILL START THE EMERGENCY GENERATOR AND OPEN THE NORMAL MAIN BREAKER. EMERGENCY GENSET BREAKER AND EMERGENCY MAIN CIRCUIT BREAKER WILL CLOSE AND THE TIE BREAKER WILL REMAIN CLOSED TO TRANFER LOADS TO EMERGENCY GENERATOR.

   C. RETRANSFER TO NORMAL CONDITIONS WILL BE DONE IN OPEN TRANSITION UPON RESTORATION OF PROPER VOLTAGE TO THE "NORMAL" FEEDER.

2. ABNORMAL AUTOMATIC OPERATION

   A. TRANSFER CANCELLATION: IF THE GENERATOR FAILS TO ACHIEVE FULL VOLTAGE, THE TRANSFER, AS PREVIOUSLY DESCRIBED, WILL NOT TAKE PLACE. THE NORMAL MAIN BREAKER WILL REMAIN OPEN AND THE TIE BREAKER WILL REMAIN CLOSED UNTIL NORMAL VOLTAGE IS RETURNED, WHERE UPON NORMAL OPERATION WILL BE RESTORED AUTOMATICALLY.

   B. RETRANSFER FROM "EMERGENCY" TO "NORMAL".

      IF, AFTER TRANSFER TO THE "EMERGENCY" FEEDER, THE VOLTAGE HAS RETURNED TO NORMAL ON THE "NORMAL" FEEDER, THE SYSTEM WILL AUTOMATICALLY RETRANSFER IN AN OPEN TRANSITION SCHEME AFTER 30 MINUTE TIME DELAY. THE GENERATOR WILL AUTOMATICALLY SHUT DOWN AFTER A COOL DOWN TIME DELAY. THE TIE BREAKER WILL REMAIN CLOSED.

   C. LOSS OF VOLTAGE ON GENERATOR BUS WHILE BEING FED FROM THE GENERATOR (NORMAL FEEDER DE-ENERGIZED).

      GENERATOR AND EMERGENCY MAIN BREAKER WILL OPEN. BREAKER WILL RE-CLOSE AUTOMATICALLY ON THE ENERGIZED FEEDER, WHICH IS DE-ENERGIZED FIRST.

   D. FAULT OR OVERLOAD ON NORMAL BUS IN THE SWITCHBOARD WHILE BEING FED FROM THE "NORMAL" FEEDER:

      1. NORMAL MAIN BREAKER OPENS AND LOCKS OUT.
      2. TIE BREAKER OPENS AND LOCKS OUT.
      3. GENERATOR STARTS AND REACHES FULL VOLTAGE.
      4. GENERATOR AND EMERGENCY BREAKERS CLOSE.

   E. FAULT OR OVERLOAD ON THE NORMAL BUS IN THE SWITCHBOARD WHILE BEING FED FROM THE "EMERGENCY" FEEDER:

      1. NORMAL BREAKER REMAINS OPEN AND LOCKS OUT.
      2. TIE BREAKER OPEN AND LOCKS OUT.
      3. EMERGENCY MAIN BREAKER REMAINS CLOSED.

   F. FAULT OR OVERLOAD ON THE EMERGENCY BUS IN THE SWITCHBOARD WHILE BEING FED FROM THE "EMERGENCY" FEEDER:

      1. EMERGENCY MAIN BREAKER OPENS AND LOCKS OUT.
      2. GENERATOR SHUTS DOWN AFTER A TIME DELAY.
      3. TIE BREAKER OPENS AND LOCKS OUT.
      4. NORMAL MAIN BREAKER REMAINS OPEN UNTIL VOLTAGE RETURNS TO THE NORMAL FEEDER.

   G. FAULT OR OVERLOAD ON THE EMERGENCY BUS IN THE SWITCHBOARD WHILE BEING FED FROM THE "NORMAL" FEEDER:

      1. EMERGENCY MAIN BREAKER REMAINS OPEN AND LOCKS OUT.
      2. TIE BREAKER OPENS AND LOCKS OUT.
      3. NORMAL MAIN BREAKER REMAINS CLOSED.

   H. FOLLOWING AN AUTOMATIC TRANSFER OPERATION INITIATED BY AN OVERCURRENT DEVICE AND SUBSEQUENT CLEARING OF FAULT OR CORRECTION OF OVERLOAD ON THE BUS FROM WHICH THE LOAD HAD BEEN TRANSFERRED, RETRANSFER TO NORMAL OPERATION BY OPENING THE EMERGENCY BREAKER CLOSING THE NORMAL MAIN BREAKER AND CLOSING THE TIE BREAKER CAN BE DONE MANUALLY TO NORMAL CAN BE INSTITUTED BY LEAVING THE AUTOMATIC-MANUAL SWITCH IN "AUTOMATIC" AND RESETTING THE LOCKOUT RELAY.

3. MANUAL OPERATION

   A. AFTER AN AUTOMATIC TRANSFER DUE TO AN OVERLOAD OR FAULT, THE SYSTEM MAY BE MANUALLY RETRANSFERRED BACK TO NORMAL OPERATING CONDITIONS.

   B. MANUAL TRANSFER FROM THE EMERGENCY STANDBY FEEDER TO THE NORMAL FEEDER CAN BE PERFORMED AS FOLLOWS:

      1. MOVE BREAKER TRANSFER CONTROL SWITCHES TO "MANUAL" POSITION.
      2. RESET LOCK OUT DEVICE 86.
      3. OPEN EMERGENCY MAIN BREAKER.
      4. CLOSE NORMAL MAIN BREAKER.
      5. CLOSE TIE BREAKER.
      6. MOVE BREAKER TRANSFER CONTROL SWITCHES TO "AUTO" POSITION.

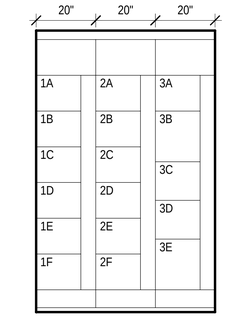
   C. TO PERFORM MAINTENANCE ON THE "NORMAL" FEEDER, THE SYSTEM CAN BE MANUALLY TRANSFERRED TO THE EMERGENCY STANDBY FEEDER AFTER THE GENERATOR IS STARTED MANUALLY AS FOLLOWS:

      1. MOVE THE AUTOMATIC-MANUAL SELECTOR SWITCH TO "MANUAL" POSITION.
      2. OPEN NORMAL MAIN BREAKER.
      3. CLOSE EMERGENCY MAIN BREAKER.

   D. AFTER MAINTENANCE WORK IS COMPLETE, THE SYSTEM CAN BE RETRANSFERRED TO THE NORMAL FEEDER BY REVERSING EACH OF THE STEPS IN THE PREVIOUS SEQUENCE. IF THE PUMPING STATION IS TO REMAIN ON THE "EMERGENCY" FEEDER, THE MANUAL AUTOMATIC SELECTOR SWITCH MUST BE LEFT IN THE "MANUAL" POSITION.

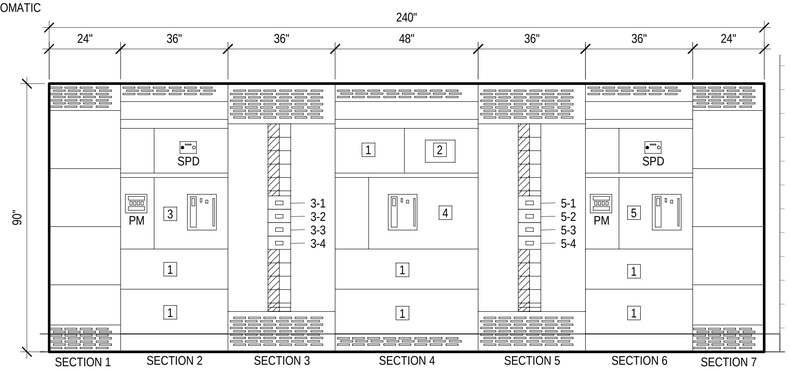
SPECIFIC NOTES

1. INSTRUMENTATION COMPARTMENT.
2. TOUCH SCREEN (HMI.)
3. UTILITY POWER CIRCUIT BREAKER.
4. TIE CIRCUIT BREAKER.
5. GENERATOR POWER CIRCUIT BREAKER.



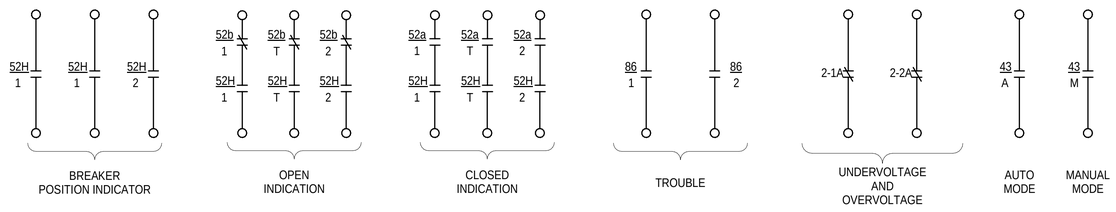
1 / E-5 ELEVATION - MOTOR CONTROL CENTER - "MCC"

SCALE: NOT TO SCALE
REF: E-10 AND E-4



2 / E-5 ELEVATION - SWITCHBOARD - "MS"

SCALE: NOT TO SCALE
REF: E-10 AND E-4



3 / E-5 MAIN TIE MAIN BREAKER FOR PLC INTERFACE

SCALE: NOT TO SCALE
REF:

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SWITCH GEAR SEQUENCE AND INTERFACE

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

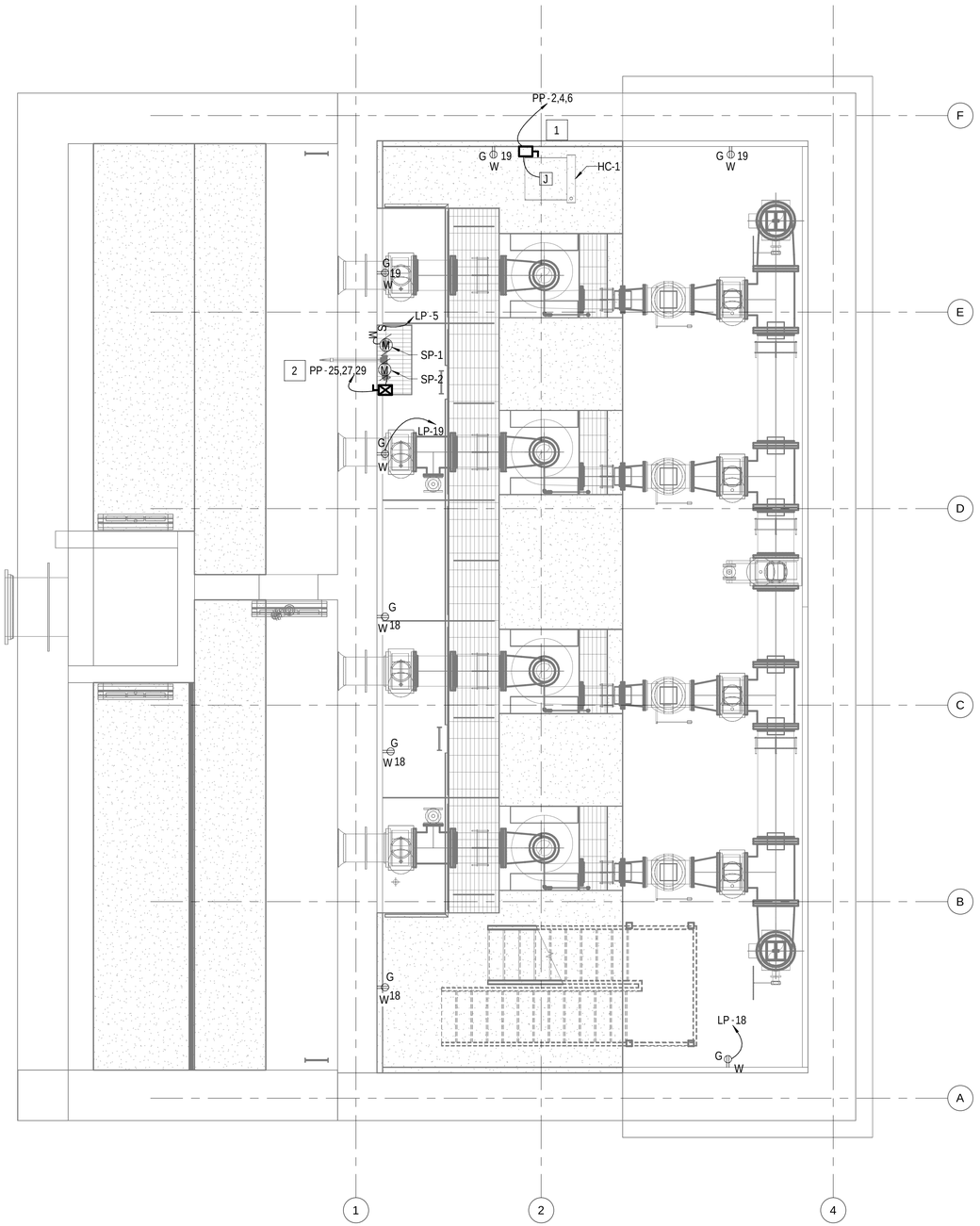
COUNTY PROJECT No. 240618

DRAWING E-5

SHEET 71 OF 92

3/21/2025 8:29:41 AM

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PUMP ROOM POWER PLAN

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

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR CONDUIT,CABLE SCHEDULE AND PANELBOARD SCHEDULES.
4. ALL CONDUIT SHALL BE PVC COATED GRS.
5. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL WORK.
6. ALL ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE NEMA 4X, UON.

SPECIFIC NOTES

1 PROVIDE 200A, 3P DISCONNECT SWITCH AND 3#1 + 1#6G IN 1-1/2" CONDUIT.

2 PROVIDE 3#12 + 1#12G IN 3/4' CONDUIT.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
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COUNTY PROJECT No. 240618

DRAWING E-6

SHEET 72 OF 92

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Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY: IL KYUN KIM LICENSE No. 19294 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER - DESIGN

SCALE	1/4" = 1'-0"
DESIGNED	JPS
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DATE	MAR 2025

PUMP ROOM POWER PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

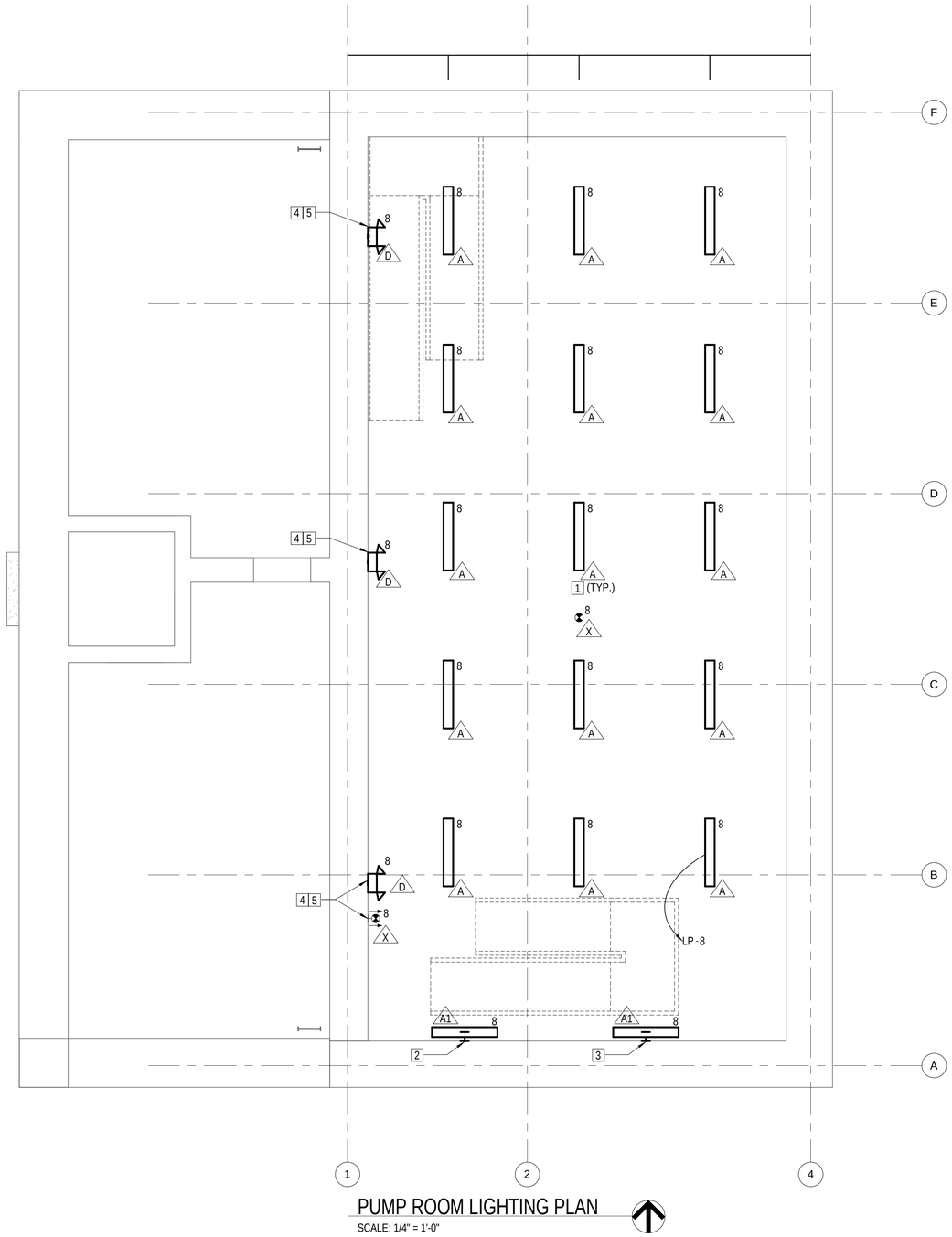
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DRAWING E-6

SHEET 72 OF 92

3/21/2025 8:29:42 AM

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PUMP ROOM LIGHTING PLAN
SCALE: 1/4" = 1'-0"

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR PANELBOARD SCHEDULES AND LIGHTING FIXTURE SCHEDULE.
4. ALL CONDUIT SHALL BE PVC COATED GRS.

SPECIFIC NOTES

1. STEM SUSPENDED TYPE A LIGHT FIXTURES AT 8'-6" TO BOTTOM OF FIXTURE ABOVE FINISHED FLOOR, (TYPICAL).
2. WALL MOUNT TYPE A1 LIGHT FIXTURE AT 8'-6" TO BOTTOM OF FIXTURE ABOVE FINISHED FLOOR.
3. WALL MOUNT TYPE A1 LIGHT FIXTURE AT 12'-10" TO BOTTOM OF FIXTURE ABOVE FINISHED FLOOR.
4. CONNECT TO UNSWITCHED HOT LEG OF LIGHTING CIRCUIT.
5. MOUNT TYPE D FIXTURES AT 10'-0" ABOVE FINISHED FLOOR (TYPICAL).

0 2' 4' 8'
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
0 1/2 1
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COUNTY PROJECT No. 240618

DRAWING E-7

SHEET 73 OF 92

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WO: 70852-000

APPROVED BY:
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NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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SCALE	1/4" = 1'-0"
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DATE	MAR 2025

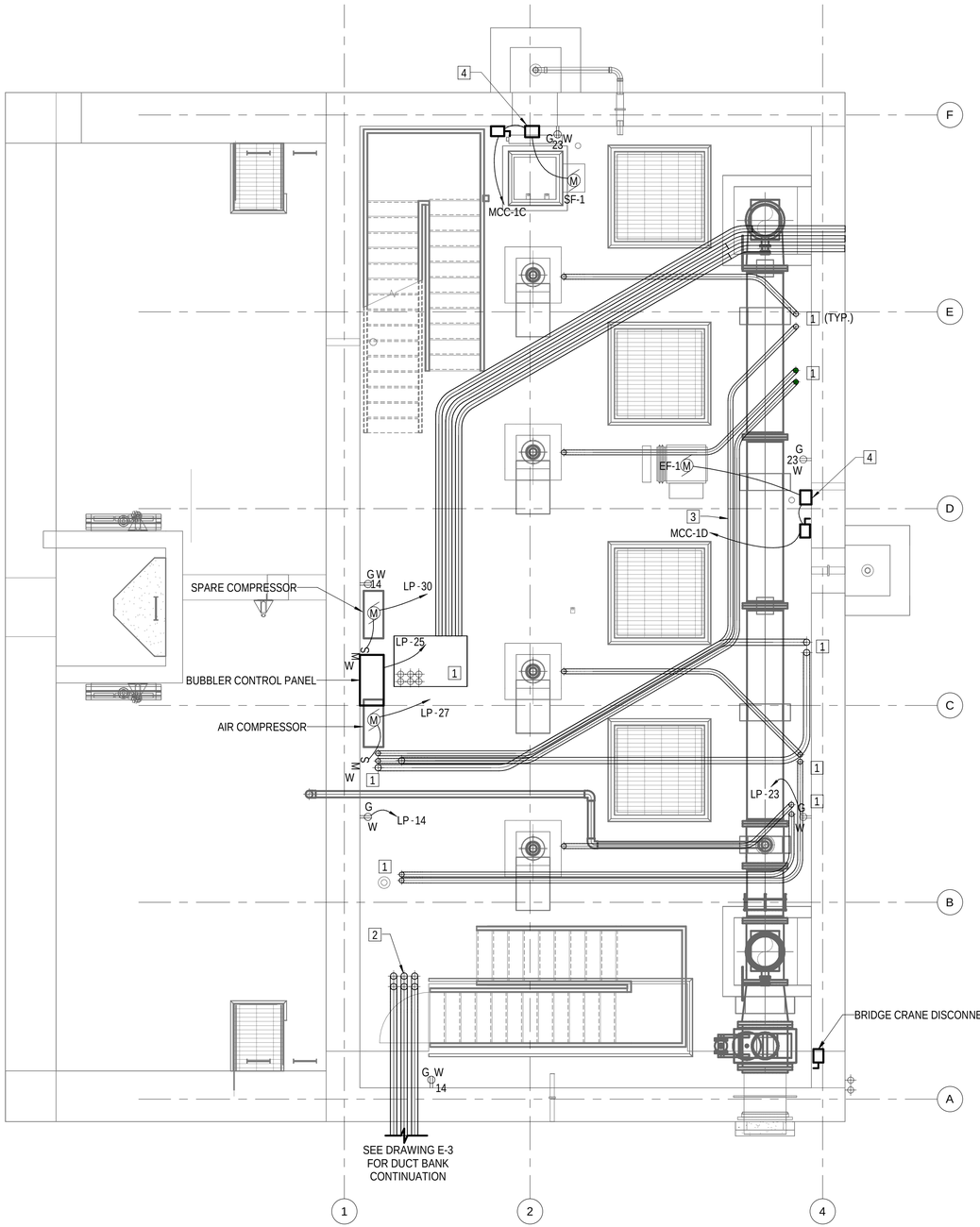
PUMP ROOM LIGHTING PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

3/21/2025 8:29:43 AM

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INTERMEDIATE LEVEL POWER PLAN

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

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR CONDUIT, CABLE SCHEDULE AND PANELBOARD SCHEDULES.
4. ALL CONDUIT SHALL BE PVC COATED GRS.
5. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL WORK.
6. ALL ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE NEMA 4X, UON.

SPECIFIC NOTES

1. CORE DRILL FLOOR SLAB FOR CONDUIT STUB-UPS INTO BOTTOM OF EQUIPMENT. COORDINATE WITH PHASE 1 AND PHASE 2 STRUCTURAL DRAWINGS; AND ELECTRICAL EQUIPMENT. TYPICAL FOR ALL CONDUIT STUB-UPS INTO MAIN SWITCHBOARD "MS", RVSS-1 THROUGH RVSS-4, AUTOMATIC TRANSFER SWITCH, MOTOR CONTROL CENTER AND PANEL LP. REFER TO DRAWING E-10 FOR CONDUIT TERMINATIONS.
2. CONCRETE ENCASE INCOMING SERVICE DUCTS. COORDINATE WITH PHASE 1 AND PHASE 2 STRUCTURAL DRAWINGS.
3. CONTRACTOR SHALL ROUTE CONDUIT ABOVE NEW DUCTWORK IN THIS AREA (SEE MECHANICAL PLANS FOR LOCATION).
4. 2-SPEED STARTER BY MANUFACTURER, INSTALLED BY CONTRACTOR.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

WARNING
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WO: 70852-000

APPROVED BY: IL HYAN KIM No. 19294 LICENSE DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
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DATE	MAR 2025

INTERMEDIATE LEVEL POWER PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-8
SHEET 74 OF 92

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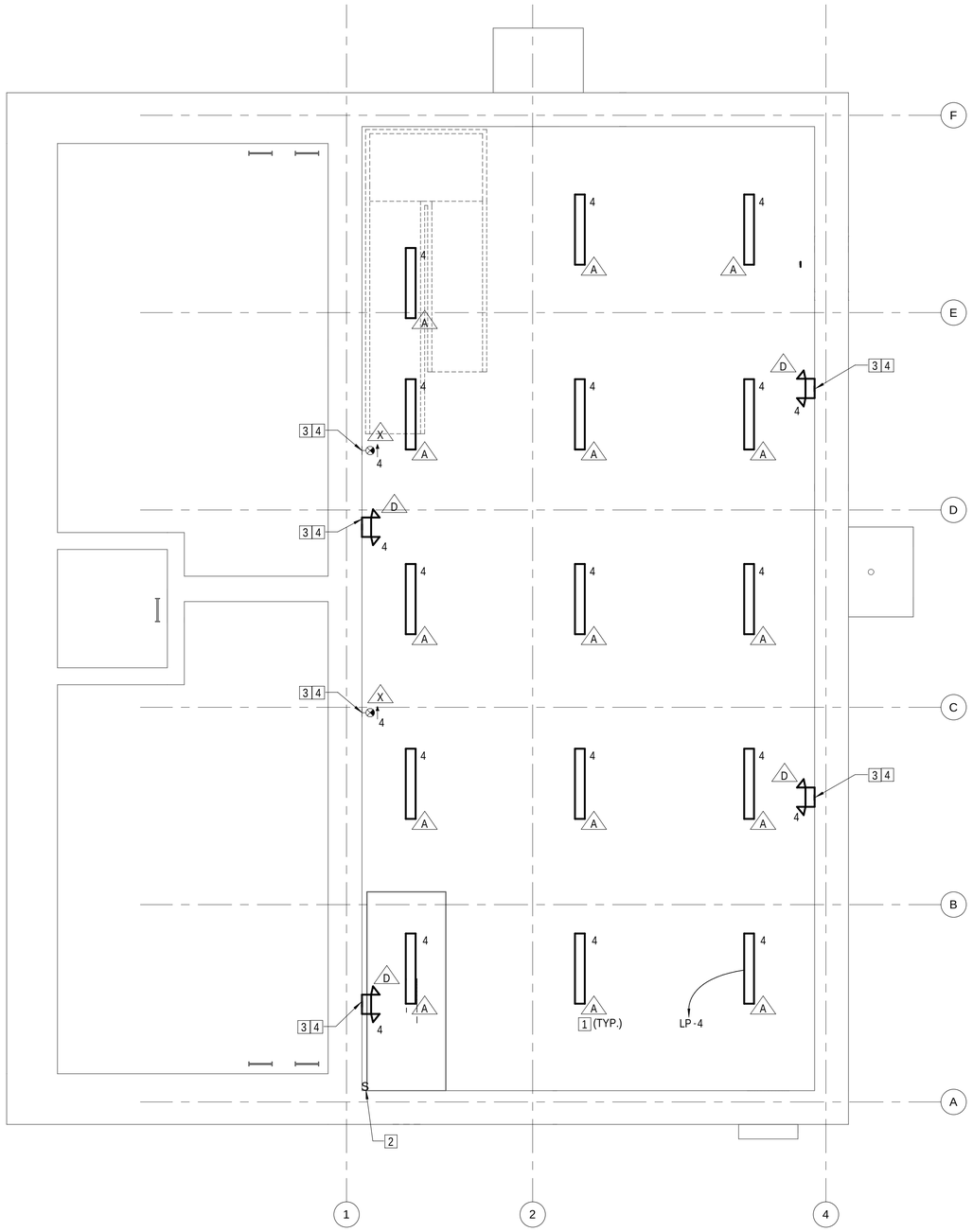
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REVISION

COUNTY PROJECT No.
240618

DRAWING
E-9

SHEET 75 OF 92



INTERMEDIATE LEVEL LIGHTING PLAN

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

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR PANELBOARD SCHEDULES AND LIGHTING FIXTURE SCHEDULE.
4. ALL CONDUIT SHALL BE PVC COATED GRS.
5. COORDINATE FINAL LIGHT FIXTURE LOCATION WITH DUCTWORK LOCATION.

SPECIFIC NOTES

1 STEM SUSPENDED TYPE A LIGHT FIXTURES AT 8'-6" TO BOTTOM OF FIXTURE ABOVE FINISHED FLOOR, (TYPICAL).

2 SWITCH FOR DRY WELL LEVEL LIGHTS. CONTROL CONTACTOR IN MOTOR ROOM, SEE DRAWING E-11.

3 MOUNT TYPE D LIGHT FIXTURE AT 10'-0" ABOVE FINISHED FLOOR.

4 CONNECT TO UNSWITCHED HOT LEG OF LIGHTING CIRCUIT.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

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WO: 70852-000

APPROVED BY:
IL JOAN KIM
LICENSE
No. 19294
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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SCALE	1/4" = 1'-0"
DESIGNED	JPS
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CHECKED	IHK
DATE	MAR 2025

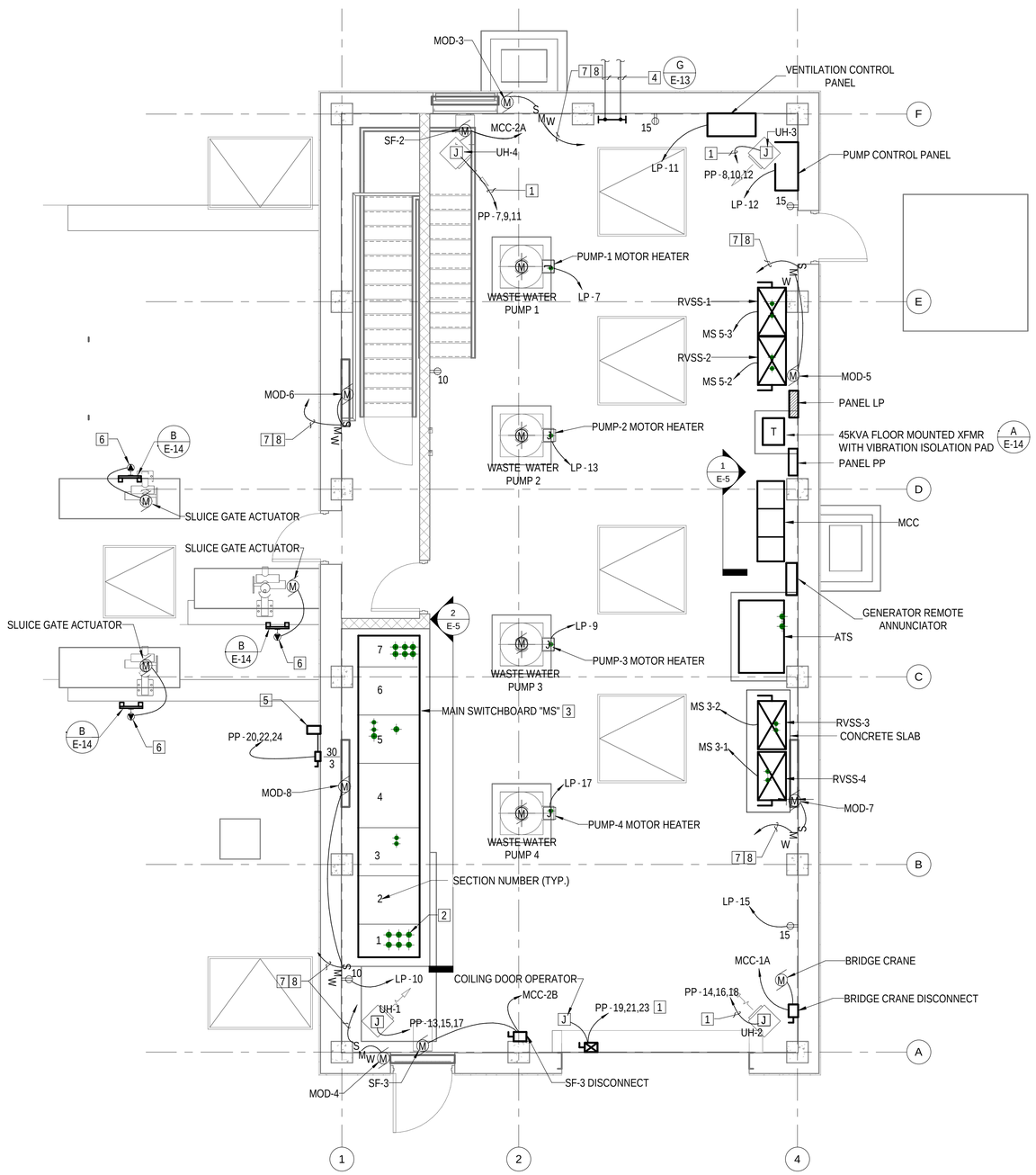
INTERMEDIATE LEVEL LIGHTING PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-9
SHEET 75 OF 92

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MOTOR ROOM POWER PLAN

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

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR CONDUIT, CABLE SCHEDULE AND PANELBOARD SCHEDULES.
4. ALL CONDUIT SHALL BE PVC COATED GRS.
5. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL WORK.
6. REFER TO DRAWING E-8 FOR CONDUIT ROUTING.
7. ALL ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE NEMA 4X, UON.

SPECIFIC NOTES

[1] EXTEND BRANCH CIRCUIT 3 #12, 1 #12 IN 3/4" CONDUIT TO CIRCUIT INDICATED.

[2] CONCRETE ENCASE INCOMING SERVICE DUCTS. COORDINATE WITH PHASE 1 AND PHASE 2 STRUCTURAL DRAWINGS. SEE DUCTBANK DETAIL ON E-3.

[3] CORE DRILL FLOOR SLAB FOR CONDUIT STUB-UPS INTO BOTTOM OF EQUIPMENT. COORDINATE WITH PHASE 1 AND PHASE 2 STRUCTURAL DRAWINGS; AND ELECTRICAL EQUIPMENT. TYPICAL FOR ALL CONDUIT STUB-UPS INTO MAIN SWITCHBOARD "MS", RVSS-1 THROUGH RVSS-4, AUTOMATIC TRANSFER SWITCH, MOTOR CONTROL CENTER AND PANEL LP. SEE DUCTBANK DETAILS ON E-3 FOR CONDUIT SIZE AND QUANTITY FROM GENERATOR.

[4] REFER TO CONTROL DIAGRAM ON INSTRUMENTATION "I" DRAWINGS.

[5] SLUICE GATE OPERATOR RETRACTABLE POWER CABLE REEL MOUNTING HEIGHT= MINIMUM 36" TO BOTTOM ABOVE TOP OF WET WELL SLAB. PROVIDE KH INDUSTRIES MODEL# RTFD4L-WW-B12G. NEMA 4X, 16 AMPS, 4 CONDUCTOR #12 AWG SOOW-BLACK 30' LONG CORD, LIFT/DRAG (RATCHET LOCK) OPERATION AND CROUSE-HINDS MODEL# GH420P7W PLUG. (TYP. OF 3).

[6] IEC 309 PIN AND SLEEVE MECHANICAL INTERLOCK AND RECPTACLE. PROVIDE CROUSE-HINDS MODEL# GH420MI17W NEMA 4X, 20 AMPS, 3Ø-480-VOLTS 3 WIRE-4 POLE RECEPTACLE.

[7] TO VENTILATION CONTROL PANEL, PROVIDE 2#12 + 1#12G IN 3/4"C.

[8] ALL MOD's ARE POWERED BY VENTILATION CONTROL PANEL.

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

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE

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WO: 70852-000

APPROVED BY:
IL ROAN KIM LICENSE No. 19294 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
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DATE	MAR 2025

GRADE LEVEL POWER PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-10
SHEET 76 OF 92

3/21/2025 8:29:46 AM

REVISION
COUNTY PROJECT No. 240618
DRAWING E-10
SHEET 76 OF 92

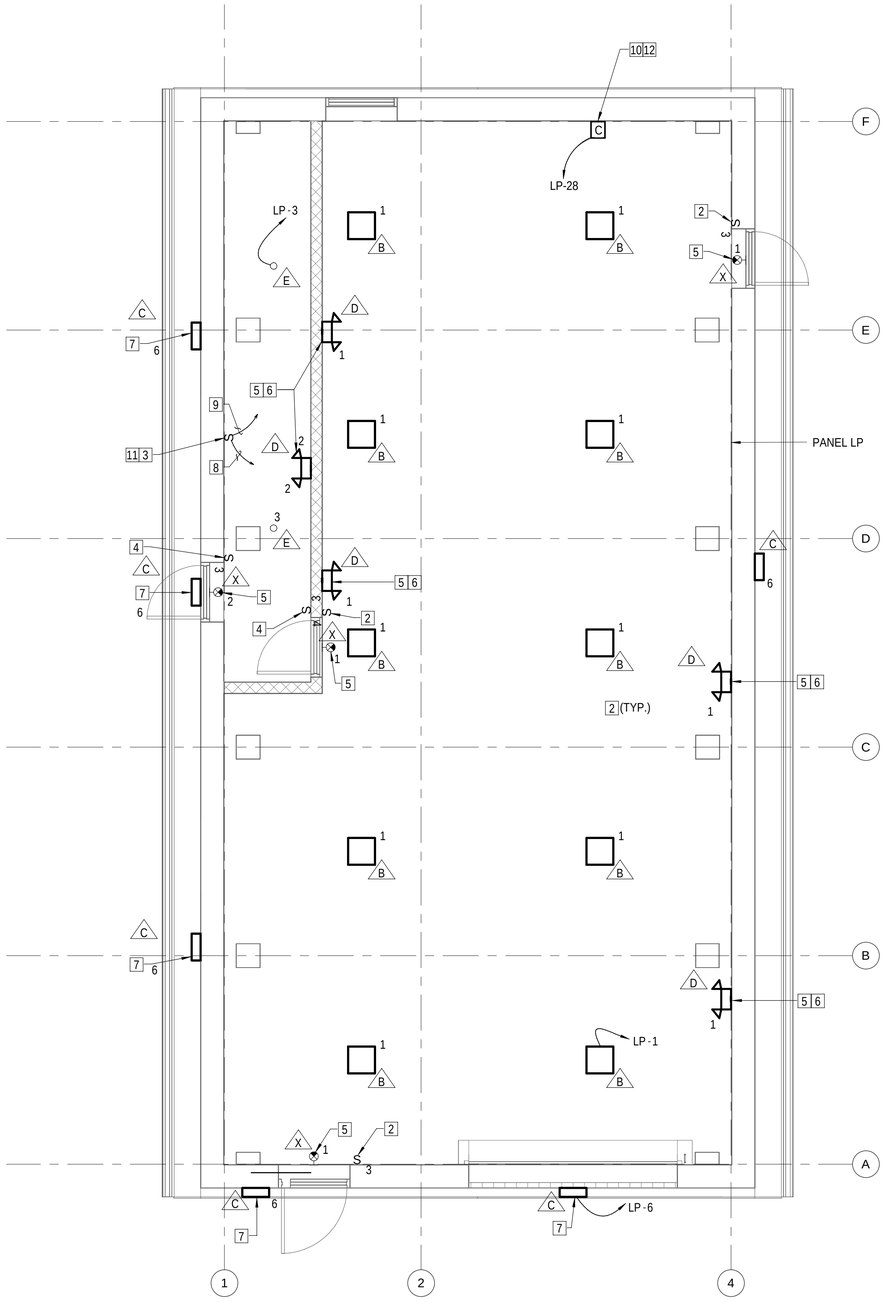
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REVISION

COUNTY PROJECT No.
240618

DRAWING
E-11

SHEET 77 OF 92



MOTOR ROOM LIGHTING PLAN

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

DRAWING NOTES

1. REFER TO DRAWING E-1 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
2. REFER TO DRAWING E-2 FOR GENERAL NOTES.
3. REFER TO DRAWING E-12 FOR PANELBOARD SCHEDULES AND LIGHTING FIXTURE SCHEDULE.
4. ALL CONDUIT SHALL BE PVC COATED GRS.

SPECIFIC NOTES

1. STEM SUSPEND TYPE B FIXTURES AT 17'-0" TO BOTTOM OF FIXTURE ABOVE FINISHED FLOOR. COORDINATE FIXTURE HEIGHT WITH BRIDGE CRANE.
2. SWITCH FOR MOTOR ROOM LIGHTS.
3. SWITCH FOR INTERMEDIATE LEVEL LIGHTS.
4. SWITCH FOR STAIRWAY LIGHTS.
5. CONNECT TO UNSWITCHED HOT LEG OF LIGHTING CIRCUIT.
6. MOUNT TYPE D LIGHT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR.
7. MOUNT TYPE C LIGHT FIXTURE AT 17'-0" ABOVE FLOOR.
8. TO CONTACTOR, PROVIDE 2 #12 + 1 #12G IN 3/4"C.
9. TO INTERMEDIATE LEVEL LIGHTS, PROVIDE 2 #12 + 1 #12G IN 3/4"C.
10. CONTACTOR CONTROLLED BY LIGHT SWITCH FOR DRY WELL LEVEL LIGHTS AT INTERMEDIATE LEVEL. CONTACTOR TO CLOSE WHEN DRY WELL LIGHTS ARE TURNED OFF. SEE DRAWING E-9.
11. PROVIDE A RED PLASTIC LOCK-OUT LIGHT SWITCH COVER PLATE. THE COVER PLATE SHALL ACCEPT PADLOCKS WITH SHACKLES OF UP TO 3/8" IN DIAMETER AND SHALL LOCK THE SWITCH IN THE "ON" OR "OFF" POSITIONS. PROVIDE ZING SAFETY PRODUCTS, CATALOG NUMBER 6064 OR APPROVED EQUAL.
12. REFER TO CONTROL DIAGRAM ON INSTRUMENTATION "I" DRAWINGS.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

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SCALE	1/4" = 1'-0"
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DATE	MAR 2025

GRADE LEVEL LIGHTING PLAN

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-11
SHEET 77 OF 92

3/21/2025 8:29:47 AM

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COUNTY PROJECT No. 240618

DRAWING E-12

SHEET 78 OF 92

PANELBOARD: PP

LOCATION: MOTOR ROOM
SUPPLY FROM: MCC
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTAGE: 480/277 3Ø
PHASE: 3
WIRES: 4

A.I.C. RATING: 35K
PANEL TYPE: MLO
BUS RATING: 250 A

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	45KVA XFMR	75 A	3	10.1 kVA	24.3 kVA					3	110 A	HEATER COIL HC-1	2
3	--	--	--			3.9 kVA	24.3 kVA			--	--	--	4
5	--	--	--					11.6 kVA	24.3 kVA	--	--	--	6
7	UNIT HTR UH-4	20 A	3	1.0 kVA	1.0 kVA					3	20 A	UNIT HTR UH-3	8
9	--	--	--			1.0 kVA	1.0 kVA			--	--	--	10
11	--	--	--					1.0 kVA	1.0 kVA	--	--	--	12
13	UNIT HTR UH-1	20 A	3	1.0 kVA	1.0 kVA					3	20 A	UNIT HTR UH-2	14
15	--	--	--			1.0 kVA	1.0 kVA			--	--	--	16
17	--	--	--					1.0 kVA	1.0 kVA	--	--	--	18
19	COILING DOOR OPERATOR	15 A	3	0.5 kVA	0.5 kVA					3	20 A	SLUICE GATE OPERATOR	20
21	--	--	--			0.5 kVA	0.5 kVA			--	--	--	22
23	--	--	--					0.5 kVA	0.5 kVA	--	--	--	24
25	SP-2	15 A	3	0.7 kVA	0.0 kVA					3	20 A	SPARE	26
27	--	--	--			0.7 kVA	0.0 kVA			--	--	--	28
29	--	--	--					0.7 kVA	0.0 kVA	--	--	--	30
31	SPARE	20 A	3	0.0 kVA	0.0 kVA					3	20 A	SPARE	32
33	--	--	--			0.0 kVA	0.0 kVA			--	--	--	34
35	--	--	--					0.0 kVA	0.0 kVA	--	--	--	36
37	SPACE	--	1	--	--					1	--	SPACE	38
39	SPACE	--	1			--	--			1	--	SPACE	40
41	SPACE	--	1					--	--	1	--	SPACE	42
		TOTAL LOAD:		39.9 kVA		33.7 kVA		41.2 kVA					
		TOTAL AMPS:		147 A		122 A		152 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANELBOARD TOTALS	
HVAC	85.0 kVA	100.00%	85.0 kVA		
LIGHTING	3.4 kVA	100.00%	3.4 kVA	TOTAL CONN. LOAD:	114.8 kVA
Other	0.4 kVA	100.00%	0.4 kVA	TOTAL EST. DEMAND:	114.8 kVA
POWER	22.9 kVA	100.00%	22.9 kVA	TOTAL CONN. CURRENT:	138 A
				TOTAL EST. DEMAND...	138 A

PANELBOARD: LP

LOCATION: MOTOR ROOM
SUPPLY FROM: 45KVA XFMR
MOUNTING: Surface
ENCLOSURE: Type 1

VOLTAGE: 208/120 3Ø
PHASE: 3
WIRES: 4

A.I.C. RATING: 10K
PANEL TYPE: MCB
BUS RATING: 225 A
MCB RATING: 150 A

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	LIGHTING MOTOR ROOM	20 A	1	0.9 kVA	0.0 kVA					1	20 A	LIGHTING	2
3	LIGHTING	20 A	1			0.4 kVA	0.9 kVA			1	20 A	LIGHTING	4
5	SP-1	20 A	1					0.4 kVA	0.5 kVA	1	20 A	LIGHTING	6
7	PUMP-1 MOTOR HEATER	20 A	1	0.3 kVA	1.0 kVA					1	20 A	LIGHTING	8
9	PUMP-3 MOTOR HEATER	20 A	1			0.3 kVA	0.4 kVA			1	20 A	RECEPTACLE	10
11	VENTALATION CNTRL PANEL	20 A	1					3.4 kVA	0.8 kVA	1	20 A	PUMP CONTROL PANEL	12
13	PUMP-2 MOTOR HEATER	20 A	1	0.3 kVA	0.5 kVA					1	20 A	RECEPTACLE	14
15	RECEPTACLE	20 A	1			0.5 kVA	0.0 kVA			1	20 A	SPARE	16
17	PUMP-4 MOTOR HEATER	20 A	1					0.3 kVA	0.7 kVA	1	20 A	RECEPTACLE	18
19	RECEPTACLE	20 A	1	0.7 kVA	0.8 kVA					1	20 A	GENERATOR BATTERY...	20
21	SPARE	20 A	1			0.0 kVA	0.5 kVA			1	20 A	GENERATOR ANTI-COND....	22
23	RECEPTACLE	20 A	1					0.5 kVA	5.0 kVA	2	60 A	GENERATOR COOLANT...	24
25	BUBBLER CONTROL PANEL	20 A	1	0.5 kVA	5.0 kVA					--	--	--	26
27	AIR COMPRESSOR	20 A	1			0.5 kVA	0.5 kVA			1	20 A	DRY WELL LEVEL LIGHTS	28
29	SPARE	20 A	1					0.0 kVA	0.5 kVA	1	20 A	SPARE COMPRESSOR	30
31	SPARE	20 A	1	0.0 kVA	0.0 kVA					1	20 A	SPARE	32
33	SPARE	20 A	1			0.0 kVA	0.0 kVA			1	20 A	SPARE	34
35	SPARE	20 A	1					0.0 kVA	0.0 kVA	1	20 A	SPARE	36
37	SPACE	--	1	--	--					1	--	SPACE	38
39	SPACE	--	1			--	--			1	--	SPACE	40
41	SPACE	--	1					--	--	1	--	SPACE	42
		TOTAL LOAD:		10.1 kVA		3.9 kVA		11.6 kVA					
		TOTAL AMPS:		92 A		32 A		104 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANELBOARD TOTALS	
HVAC	0.0 kVA	0.00%	0.0 kVA		
LIGHTING	3.4 kVA	100.00%	3.4 kVA	TOTAL CONN. LOAD:	25.4 kVA
POWER	18.2 kVA	100.00%	18.2 kVA	TOTAL EST. DEMAND:	25.4 kVA
RECEPTACLE	3.4 kVA	100.00%	3.4 kVA	TOTAL CONN. CURRENT:	70 A
				TOTAL EST. DEMAND...	70 A

FEEDER SCHEDULE

FEEDER ID	CONDUIT SIZE	CONDUIT TYPE	SETS	# COND/CABLE SIZE	#COND/CABLE GROUND	CB RATING	SOURCE NAME (FROM)	LOAD NAME(TO)
1	4"	PVC	4	4-#600KCMIL	1-#3/0	1600 A	DELMARVA POWER XFMR W/CT'S	MAIN SWITCHBOARD "MS"
2	4"	PVC	4	4-#500KCMIL	1-#4/0	1200 A	GENERATOR	MANUAL TRANSFER SWITCH
4	4"	PVC	4	4-#500KCMIL	1-#4/0	1200 A	MANUAL TRANSFER SWITCH	MAIN SWITCHBOARD "MS"
5	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	MAIN SWITCHBOARD "MS"	RVSS-4
6	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	RVSS-4	WASTE WATER PUMP 4
7	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	MAIN SWITCHBOARD "MS"	RVSS-3
8	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	RVSS-3	WASTE WATER PUMP 3
9	2 1/2"	GRS-PVC COATED	2	4-#4/0	1-#3	400 A	MAIN SWITCHBOARD "MS"	ATS (NORMAL)
10	2 1/2"	GRS-PVC COATED	2	4-#4/0	1-#3	400 A	ATS	MCC
11	2 1/2"	GRS-PVC COATED	2	4-#4/0	1-#3	400 A	MAIN SWITCHBOARD "MS"	ATS(ALTERNATE)
12	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	MAIN SWITCHBOARD "MS"	RVSS-2
13	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	RVSS-2	WASTE WATER PUMP 2
14	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	MAIN SWITCHBOARD "MS"	RVSS-1
15	3"	GRS-PVC COATED	1	3-#350KCMIL	1-#1	400 A	RVSS-1	WASTE WATER PUMP 1
16	3/4"	GRS-PVC COATED	1	3-#10	1-#10	30 A	MCC	BRIDGE CRANE
18	3/4"	GRS-PVC COATED	1	3-#12	1-#12	15 A	MCC	SF-1
19	3/4"	GRS-PVC COATED	1	3-#12	1-#12	15 A	MCC	EF-1
20	3/4"	GRS-PVC COATED	1	3-#12	1-#12	15 A	MCC	SF-2
21	3/4"	GRS-PVC COATED	1	3-#12	1-#12	15 A	MCC	SF-3
22	2 1/2"	GRS-PVC COATED	1	4-#4/0	1-#6	225 A	MCC	PANEL PP
23	1 1/2"	GRS-PVC COATED	1	3-#3	1-#8	75 A	PP	45KVA XFMR
24	2"	GRS-PVC COATED	1	4-#1/0	1-#6	100 A	45KVA XFMR	PANEL LP

LIGHTING FIXTURE SCHEDULE

FIXTURE ID	DESCRIPTION	MOUNTING	Count	LAMPS NO.	LAMPS WATTS	LAMPS TYPE	MANUFACTURER AND CATALOG NO.	VOLTAGE
A	1' X 4' LED,UL LISTED FOR DAMP LOCATIONS	SUSPENDED	30	1	38	LED	LITHONIA CDS-L48-MVOLT-DM-50K-80CRI-WH	120
A1	4' WALL/SURFACE LED STRIP LIGHT	WALL	2	1	39.5	LED	LITHONIA WL4-40L-GZ1-LP840	120
B	FLOOD LIGHT LED LUMINAIRE HAZARDOUS LOCATION	SUSPENDED	10	1	73	LED	AMLED67YBU1_HIGHBAY	120
C	FLOOD LIGHT LED LUMINAIRE HAZARDOUS LOCATION	<varies>	6	1	73	LED	APPLETON AREAMASTER AMLG-L6-C-F-6-BU	120
D	EMERGENCY LIGHT INDUSTRIAL LED NEMA 4X	WALL	14	1	11	LED	LITHONIA EXTL-SP2200L-UVOLT-LTP-SDRT-EHO	120
E	LED IP RATED HIGH BAY	PENDANT	2	1	83	HPS	JHBL-12000LM-ACL-MD-MVOLT-40K-80CRI	120
X	EXIT SIGN LED WITH EMERGENCY BATTERY BACKUP UL LISTED FOR WET LOCATIONS	<varies>	8	1	1.3	LED	LITHONIA WTLE-W-1-G-EL-SD	120

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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801 South Caroline Street, Baltimore, Maryland 21231
WO: 70852-000

APPROVED BY:
IL JOAN KIM LICENSE No. 19294 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
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CHECKED IHK
DATE MAR 2025

SCHEDULES

NEW RICHARDSON PARK PUMPING STATION - PHASE 2
NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-12
SHEET 78 OF 92

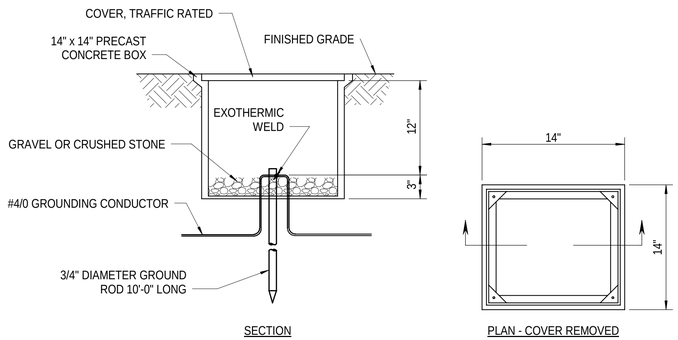
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REVISION

COUNTY PROJECT No.
240618

DRAWING

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST EVISIONS.

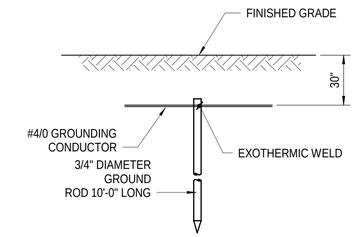


SECTION

PLAN - COVER REMOVED

D E-13 GROUND ROD TYPE "A" DETAIL

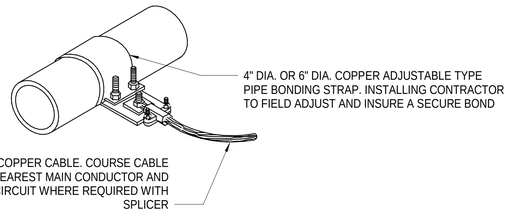
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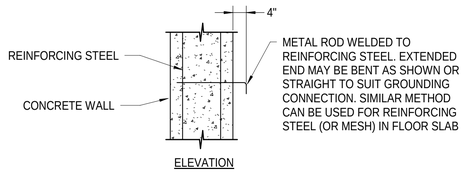
E E-13 GROUND ROD TYPE "B" DETAIL

SCALE: NOT TO SCALE
REF: E-3



C E-13 TYPICAL PIPE GROUNDING DETAIL

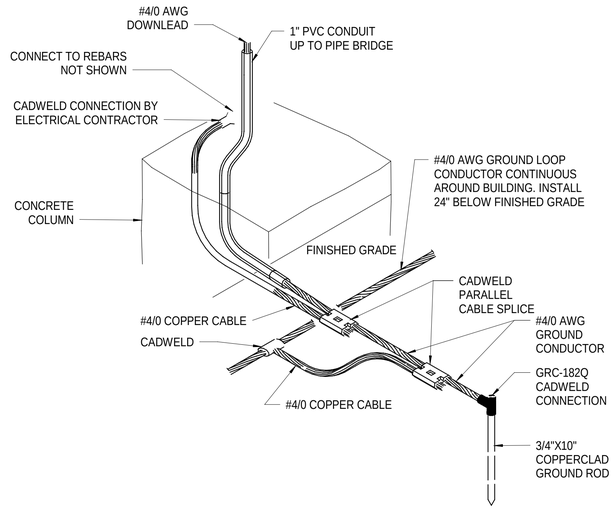
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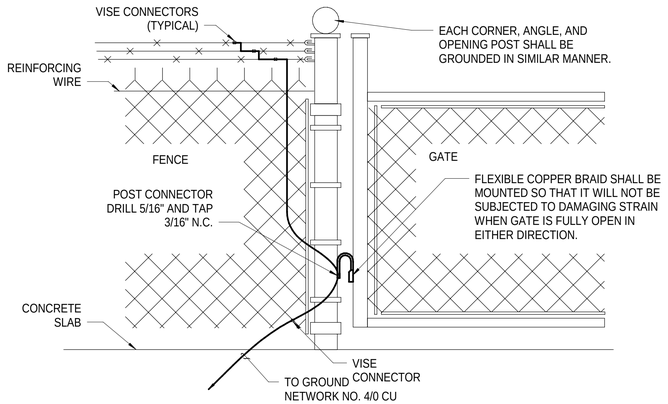
B E-13 DETAIL - METHOD FOR GROUNDING OF RE-INFORCING STEEL

SCALE: NOT TO SCALE
REF: E-3



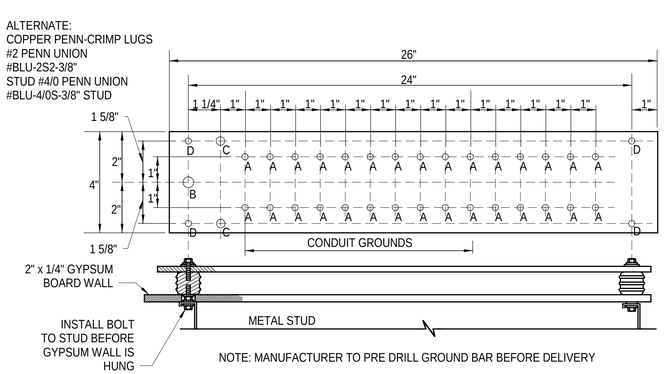
F E-13 DOWNLEAD TO GROUNDING CONNECTION

SCALE: NOT TO SCALE
REF:



A E-13 FENCE GROUNDING DETAIL

SCALE: NOT TO SCALE
REF: E-3



NOTE: MANUFACTURER TO PRE DRILL GROUND BAR BEFORE DELIVERY

NOTE: MOUNTING ARRANGEMENT IS SHOWN FOR GYPSUM BOARD WALL ONLY. PROVIDE MOUNTING ACCESSORIES AS REQUIRED FOR ALL TYPES OF WALL.

G E-13 GROUND BUS DETAIL

SCALE: NOT TO SCALE
REF: E-3

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WO: 70852-000

APPROVED BY:
IL JOAN KIM LICENSE No. 19294 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
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DATE	MAR 2025

DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION

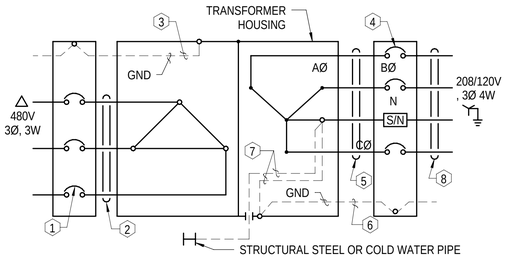
COUNTY PROJECT No. 240618

DRAWING E-13

SHEET 79 OF 92

3/21/2025 8:29:49 AM

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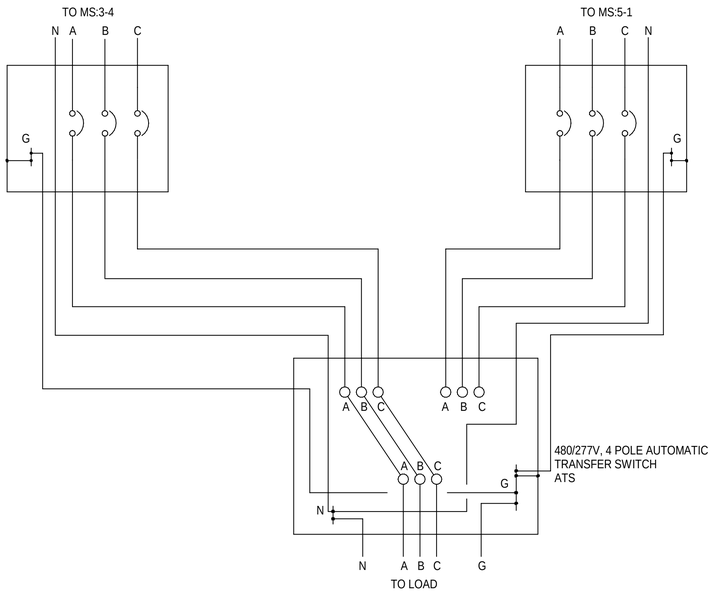


NOTES:

1. PRIMARY CIRCUIT BREAKER INIDCATED ON DRAWING E-12 PANELBOARD SCHEDULES.
2. PRIMARY CONDUCTORS, SIZE PER FEEDER SCHEDULE ON DRAWING E-12.
3. PRIMARY GROUND, SIZE PER FEEDER SCHEDULE ON DRAWING E-12.
4. SECONDARY CIRCUIT BREAKER INIDCATED ON DRAWING E-12 PANELBOARD SCHEDULES.
5. SECONDARY CONDUCTORS; SIZE PER FEEDER SCHEDULE ON DRAWING E-12. MUST NOT BE LESS THAN 1/3 PRIMARY CIRCUIT BREAKER RATING TIMES THE RATIO OF 480/208.NOT MORE THAN 25 FOOT LONG PER NEC 240-20.
6. SECONDARY GROUND SIZE PER FEEDER SCHEDULE ON DRAWING E-12
7. THE SERVICE GROUND #6 AWG FROM THE SECONDARY NEUTRAL TO SERVICE ELECTRODE NEAR THE XFMR LOCATION. THE SIZE IS BASED ON TABLE 250-66 AND IS ALSO THE SIZE OF THE BONDING JUMPER FROM SECONDARY NEUTRAL TO THE XFMR HOUSING.
8. SECONDARY CONDUCTORS, SIZE PER FEEDER SCHEDULE ON DRAWING E-12.

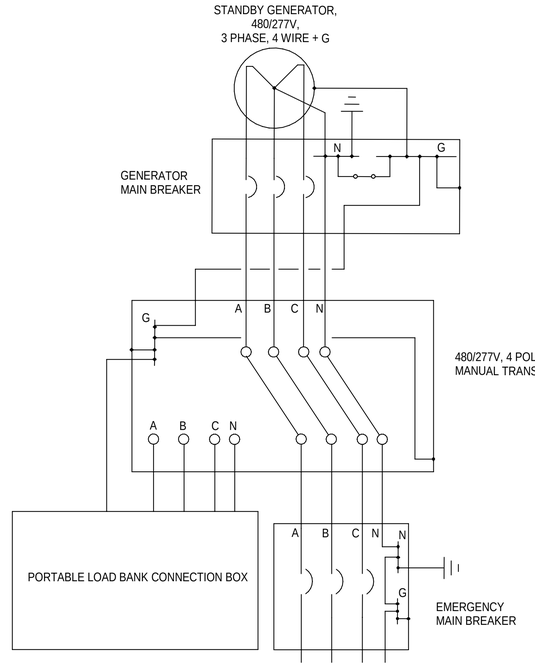
A E-14 DRY TYPE TRANSFORMER WIRING

SCALE: NOT TO SCALE
REF: E-10



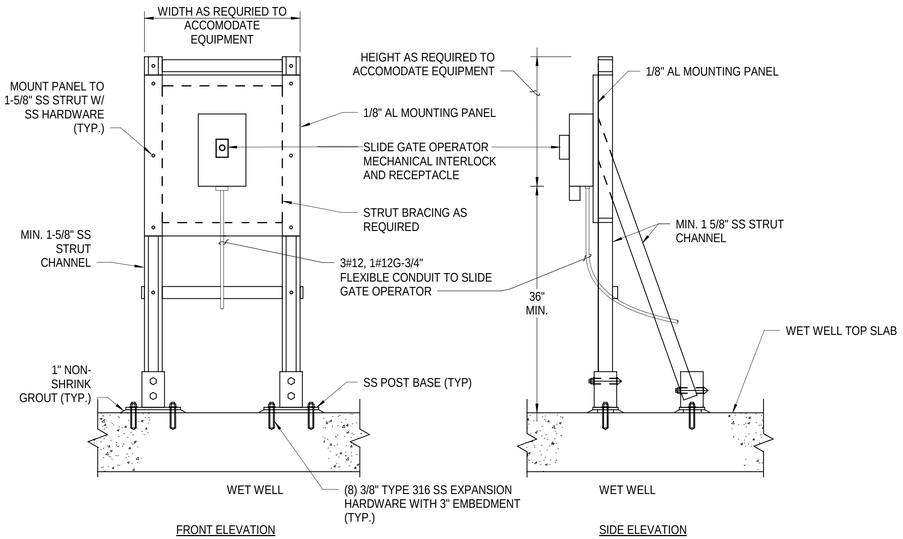
C E-14 AUTOMATIC TRANSFER SWITCH AND CIRCUIT BREAKER CONNECTION DETAIL

SCALE: NOT TO SCALE
REF:



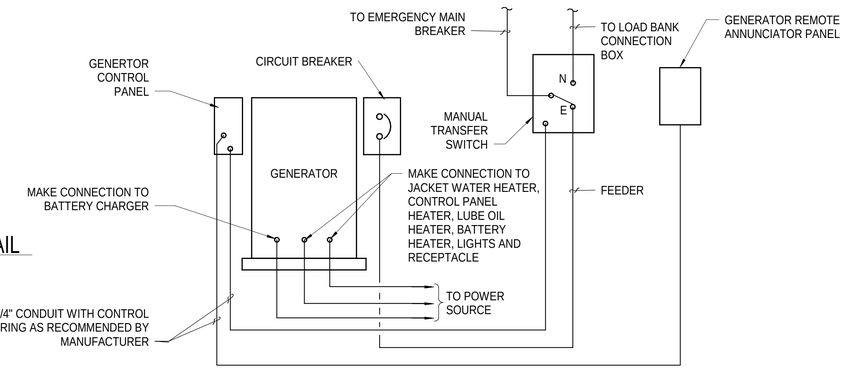
D E-14 EMERGENCY STANDBY GENERATOR, MANUAL TRANSFER SWITCH DETAIL

SCALE: NOT TO SCALE
REF:



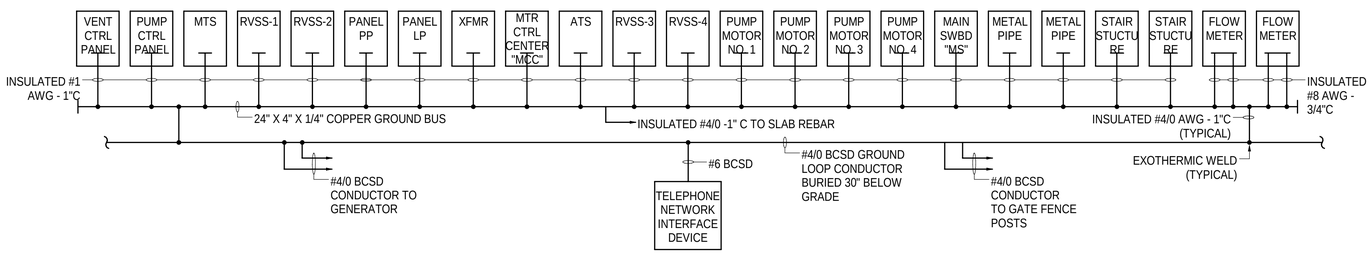
B E-14 RECEPTACLE MOUNTING DETAIL

SCALE: NOT TO SCALE
REF: E-10



E E-14 STANDBY GENERATOR - TYPICAL WIRING CONNECTION

SCALE: NOT TO SCALE
REF:



F E-14 GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE
REF:

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IL KWAN KIM
LICENSE
No. 19294
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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DATE	MAR 2025

DETAILS

NEW RICHARDSON PARK PUMPING STATION - PHASE 2

NEW CASTLE DELAWARE

REVISION
COUNTY PROJECT No. 240618
DRAWING E-14
SHEET 80 OF 92

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REVISION	COUNTY PROJECT No.	DRAWING	SHEET
0	240618	I-1	SHEET 81 OF 92

GENERAL NOTES

1. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS AND POWER REQUIREMENTS. CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS SUCH AS NOT TO CAUSE INTERFERENCE WITH NEW AND/OR EXISTING EQUIPMENT.
2. ENCLOSURE DIMENSIONS SHOWN ARE MINIMUM REQUIREMENTS. ENCLOSURES SHALL BE SIZED TO ACCOMMODATE EQUIPMENT, CONTROLS AND COMPONENTS AS SHOWN, SPECIFIED AND REQUIRED FOR AN OPERABLE SYSTEM. COORDINATE FLOOR SPACE AVAILABLE WITH PLAN DRAWINGS AND OTHER DISCIPLINES.
3. CIRCUITS SHOWN SHALL BE INSTALLED IN CONDUIT SIZES AS INDICATED IN THE GENERAL CIRCUIT/CONDUIT TAG IDENTIFICATION SCHEDULE.
4. ALL PENETRATIONS THROUGH EXISTING SOLID CONCRETE STRUCTURES WHERE SLEEVES HAVE NOT BEEN PROVIDED SHALL BE CORE DRILLED AND SIZED TO ACCEPT MECHANICAL LINK SEALS. THROUGH NON-FIRE RATED WALLS, CORE HOLES AND SEAL AROUND CONDUIT WITH NON-SHRINK GROUT. THROUGH EXTERIOR WALL, SEAL WATERTIGHT WITH SILICONE MASONRY SEALANT.
5. ALL DISCRETE OUTPUTS SHALL BE PROVIDED WITH INTERPOSING RELAYS.
6. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS ABOVE SUSPENDED CEILINGS AND FURRED WALLS SHALL BE INSTALLED PARALLEL TO THE BEAMS AND WALLS.
7. PROVIDE ALL REQUIRED PULL BOXES AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS.
8. ALL INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
9. IN CONTROL PANELS, PROVIDE PERMANENT LABEL AT EACH CIRCUIT BREAKER AND FUSE WITH CIRCUIT, AMP RATING, AND/OR EQUIPMENT BEING FED.
10. CONDUIT HOME RUNS ON PLAN DRAWINGS SHOWN INDICATE NEW CONDUIT AND CABLE TO BE INSTALLED.
11. AREAS DESIGNATED AS HAZARDOUS LOCATIONS ARE SPECIFIED AND/OR SHOWN ON THE CONTRACT DRAWINGS. WORK INSTALLED IN AREAS DESIGNATED AS CLASS I, GROUP D, DIVISION 1 OR CLASS I, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 500 OF THE NATIONAL ELECTRIC CODE. REFER TO "G" SHEETS.

ABBREVIATIONS

AFF	=	ABOVE FINISHED FLOOR
AI	=	ANALOG INPUT
AMP	=	AMPERE
AO	=	ANALOG OUTPUT
AUTO	=	AUTOMATIC
AUX	=	AUXILIARY
ATS	=	AUTOMATIC TRANSFER SWITCH
BMS	=	BUILDING MANAGEMENT SYSTEM
BOU	=	BUREAU OF UTILITIES
BP	=	BOOSTER PUMP
CIM	=	COMMUNICATION INTERFACE MODULE
COMM	=	COMMUNICATION
CP	=	CONTROL PANEL
CPT	=	CONTROL POWER TRANSFORMER
CR	=	CONTROL RELAY
DI	=	DISCRETE INPUT
DO	=	DISCRETE OUTPUT
DPDT	=	DOUBLE POLE-DOUBLE THROW
DV	=	DISCHARGE VALVE
ECD	=	ELEMENTARY CONTROL DIAGRAM
EF	=	EXHAUST FAN
E-NET	=	ETHERNET
E-STOP	=	EMERGENCY STOP
ETM	=	ELAPSED TIME METER
ETR	=	EXISTING TO REMAIN
EX	=	EXISTING
F/B	=	FEEDBACK
F/C	=	FIBER/COPPER
FM	=	FLOW METER
FO	=	FIBER OPTIC
FPP	=	FIBER OPTIC PATCH PANEL
FRP	=	FIBERGLASS REINFORCED PLASTIC
F-STAT	=	FREEZE-STAT
GFI	=	GROUND FAULT INTERRUPTER
GND	=	GROUND
HIM	=	HUMAN INTERFACE MODULE
HMI	=	HUMAN MACHINE INTERFACE
HOA	=	HAND-OFF-AUTO
I/O	=	INPUT/OUTPUT
ISB	=	INTRINSICALLY SAFE BARRIER
ISR	=	INTRINSICALLY SAFE RELAY
J-BOX	=	JUNCTION BOX
LAN	=	LOCAL AREA NETWORK
LEL	=	LOWER EXPLOSIVE
LLS	=	LEAD-LAG-STANDBY
LOR	=	LOCK OUT RELAY
L/R	=	LOCAL/REMOTE
LS	=	LIMIT SWITCH
MAX	=	MAXIMUM
MCC	=	MOTOR CONTROL CENTER
MFR	=	MANUFACTURER
MIN	=	MINIMUM
MMS	=	MANUAL MOTOR STARTER
MPR	=	MOTOR PROTECTION RELAY
MOD	=	MOTOR OPERATED DAMPER
MOV	=	MOTOR OPERATED VALVE
N	=	NEUTRAL
NC	=	NORMALLY CLOSED
NEMA	=	NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION
NO	=	NORMALLY OPEN
NTS	=	NOT TO SCALE
NTE	=	NOT TO EXCEED
OIT	=	OPERATOR INTERFACE TERMINAL
OL	=	OVERLOAD
PC	=	PERSONAL COMPUTER
PCP	=	PUMP CONTROL PANEL
PCS	=	PLANT CONTROL SYSTEM
P&ID	=	PROCESS AND INSTRUMENTATION DIAGRAM
PIO	=	POINT I/O
PLC	=	PROGRAMMABLE LOGIC CONTROLLER
PS	=	POWER SUPPLY
PSCP	=	PUMP STATION CONTROL PANEL
PSI	=	POUNDS PER SQUARE INCH
PVCC	=	PVC COATED
QTY	=	QUANTITY
RCP	=	REINFORCED CONCRETE PIPE
RCT	=	REPEAT CYCLE TIMER
RGS	=	RIGID GALVANIZED STEEL
RIO	=	REMOTE I/O
RL	=	RADAR LEVEL
RX	=	RECEIVER
RTD	=	RESISTANCE TEMPERATURE DEVICE
RTU	=	REMOTE TELEMETRY UNIT
RVSS	=	REDUCED VOLTAGE SOFT STARTER
SCADA	=	SUPERVISORY CONTROL AND DATA ACQUISITION
SF	=	SUPPLY FAN
SPD	=	SURGE PROTECTIVE DEVICE
TEMP	=	TEMPERATURE
TR	=	TIMING RELAY
TSP	=	TWISTED SHIELDED PAIR
TST	=	TWISTED SHIELDED TRIAD
T-STAT	=	THERMOSTAT
TVSS	=	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	=	TYPICAL
UON	=	UNLESS OTHERWISE NOTED
UPS	=	UNINTERRUPTIBLE POWER SUPPLY
VAC	=	VOLTS/ALTERNATING CURRENT
VCP	=	VENTILATION CONTROL PANEL
VDC	=	VOLTS/DIRECT CURRENT
VFD	=	VARIABLE FREQUENCY DRIVE
WAN	=	WIDE AREA NETWORK
WTP	=	WATER TREATMENT PLANT

INSTRUMENTATION IDENTIFICATION SCHEDULE

	FIRST LETTER		SUCCEEDING LETTER		
	VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTOMATIC
B	BREAKER		USER'S CHOICE	CLOSE OR STOP	BYPASS
C	COMMUNICATIONS			CONTROL	CLOSE
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL
G			GAUGE		LOCAL/MANUAL/HAND
H	HAND				HIGH OR OPEN
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME	TIME RATE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR	MOMENTARY		MOTOR	MIDDLE
N	USER'S CHOICE		INPUT	FORWARD	ON OR OPERATE
O			OVERLOAD	OFF	OPEN
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUANTITY OR EVENT	TOTALIZE	EMERGENCY	EMERGENCY	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE / REPEATER	RUN
S	SPEED OR FREQUENCY	SUM	SWITCH		STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	VFD / VALVE
W	WEIGHT OR FORCE		WELL		
X	MOD, LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	INTERLOCK			RELAY OR COMPUTE	RESET
Z	POSITION			DRIVE OR ACTUATOR	

INSTRUMENT, EQUIPMENT AND CONTROL DEVICE EXAMPLES

FE	=	FLOW ELEMENT	TSH	=	TEMPERATURE SWITCH HIGH
FIT	=	FLOW INDICATING TRANSMITTER	ZSC	=	POSITION SWITCH CLOSED
PE	=	PRESSURE ELEMENT	ZSO	=	POSITION SWITCH OPEN
PIT	=	PRESSURE INDICATING TRANSMITTER	FS	=	FLOW SWITCH
PI	=	PRESSURE INDICATOR	LSL	=	LEVEL SWITCH LOW
PSH	=	PRESSURE SWITCH HIGH	LSH	=	LEVEL SWITCH HIGH

TAG IDENTIFICATION STANDARD

TAG NAME

THE COMPLETE TAG NAME WILL BE COMPRISED OF A 2 OR 3 LETTER EQUIPMENT TAG THAT IDENTIFIES THE FUNCTION OR PURPOSE OF THE POINT, THEN A 3-DIGIT LOOP IDENTIFIER WHICH WILL BE UNIQUE FOR EACH SPECIFIC DEVICE.

EQUIPMENT TAG

THE EQUIPMENT TAG, WHENEVER POSSIBLE, WILL BE DEVELOPED FROM LETTERS REPRESENTING THE DIFFERENT FUNCTIONS AS SHOWN IN THE FOLLOWING TABLE. TAGS SHOULD BE DEVELOPED SEPARATELY TO IDENTIFY BOTH THE DEVICE AND THE DEVICE FUNCTION. (SEE INSTRUMENTATION IDENTIFICATION SCHEDULE).

NOTE: LETTERS AND FUNCTIONS MAY BE ADDED TO THE TABLE FOR UNASSIGNED LETTERS IF NEEDED. HOWEVER, ASSIGNMENT OF THIS TAG FUNCTION SHOULD THEN BECOME UNIFORM THROUGHOUT.

LOOP IDENTIFIER

EACH DIGIT OF THE THREE DIGIT LOOP IDENTIFIER WILL INDICATE THE EQUIPMENT TYPE AND THE EQUIPMENT NUMBER.

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APPROVED BY:
GREGORY HORN LICENSE NO. 18622 3/21/25 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
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DATE	MAR 2025

ABBREVIATIONS, SCHEULES AND GENERAL NOTES

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION	0
COUNTY PROJECT No.	240618
DRAWING	I-1
SHEET	81 OF 92

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PROCESS AND INSTRUMENTATION DIAGRAM SYMBOLS

- FIELD MOUNTED DEVICE
- PANEL MOUNTED DEVICE
- INDICATING LAMP - X INDICATES LENS COLOR
  R = RED, A = AMBER
  G = GREEN, W = WHITE
- ABC (123) - LETTERS INDICATE FUNCTION ACCORDING TO ISA SCHEDULE: 123 DIGITS IDENTIFY ASSOCIATED EQUIPMENT (SEE SHEET I00-001)
- AE/AT (123) ABC - ANALYZER
  ABC - LETTERS INDICATE ANALYZER TYPE:
  123 DIGITS IDENTIFY ASSOCIATED EQUIPMENT (SEE SHEET I00-001)
- HS (123) XXX - SELECTOR SWITCH (MAINTAINED CONTACTS)
  XXX = H/O/A : HAND-OFF-AUTO
  L/L/S : LEAD-LAG-STANDBY
- ABC (123) - SCADA/HMI MONITOR AND CONTROL POINT. DIGITS IDENTIFY ASSOCIATED EQUIPMENT
- ABC (123) - PROGRAMMABLE LOGIC CONTROLLER (PLC) I/O POINT. DIGITS IDENTIFY ASSOCIATED EQUIPMENT.
- I - INTERLOCK-PLC LOGIC OR HARDWIRED AS SHOWN ON DRAWINGS:
- PROCESS PUMP
- FE - MAGNETIC FLOW METER
- XXX - LEVEL FLOAT SWITCH
- PNEUMATIC TUBING
- NEEDLE VALVE
- BALL VALVE
- CHECK VALVE
- SLUICE GATE
- S - SOLENOID VALVE
- PG - PRESSURE GAUGE WITH INLINE ANNULAR SEAL
- PG XXX - PRESSURE GAUGE AND SWITCH WITH INLINE ANNULAR SEAL
- PG - PRESSURE GAUGE WITH DIAPHRAGM SEAL
- PG XXX - PRESSURE GAUGE AND SWITCH WITH DIAPHRAGM SEAL
- VFD/RVSS KEYPAD
- S - ANALOG 4-20mA SIGNAL DUPLICATOR
- X - PROCESS TO/FROM "X"= NUMBER AS INDICATED ON DRAWINGS

SIGNAL LINE TYPES

- COMMUNICATION SIGNAL
- PLC I/O SIGNAL
- ELECTRICAL SIGNAL

SIGNAL INTERFACE

- ANALOG SIGNAL
- DISCRETE SIGNAL

ELEMENTARY WIRING SYMBOLS

- CRXX (CR) - CONTROL RELAY
- XXX - NORMALLY OPEN CONTACT
- XXX - NORMALLY CLOSED CONTACT
- TRXX (TR) - TIMING RELAY
- RCT - REPEAT CYCLE TIMER
- NORMALLY OPEN TIMED CLOSED CONTACT
- NORMALLY CLOSE TIMED OPEN CONTACT
- NORMALLY OPEN TIMED OPEN CONTACT
- NORMALLY CLOSE TIMED CLOSE CONTACT
- FUSE
- CIRCUIT BREAKER
- XOO - SELECTOR SWITCH
  XOO= REPRESENT THE NUMBER OF SWITCH POSITIONS
- PUSH BUTTON, NORMALLY OPEN
- PUSH BUTTON, NORMALLY CLOSED
- EMERGENCY STOP PUSH BUTTON, NORMALLY OPEN
- EMERGENCY STOP PUSH BUTTON, NORMALLY CLOSED
- W - PUSH-TO-TEST PILOT LIGHT
  R=RED, G=GREEN, A=AMBER, W=WHITE
- PLC OUTPUT VIA INTERPOSING RELAY
- M - MOTOR
- MOD - MOTOR OPERATED DAMPER
- TERMINAL BLOCK
- THERMOSTAT, CLOSE ON RISING/TEMPERATURE
- THERMOSTAT, OPEN ON RISING/TEMPERATURE
- LIMIT SWITCH, NORMALLY OPEN
- LIMIT SWITCH, NORMALLY CLOSED
- FLOAT SWITCH, NORMALLY OPEN
- FLOAT SWITCH, NORMALLY CLOSED
- PRESSURE SWITCH, NORMALLY CLOSED, PRESSURE OPEN
- PRESSURE SWITCH, NORMALLY OPEN, PRESSURE CLOSE
- FLOW SWITCH, NORMALLY OPEN
- FLOW SWITCH, NORMALLY CLOSED
- PS | CPU | COM | DI | DO | AI | AO - PLC RACK
- RADIO ANTENNA
- OVERLOAD
- G - GROUND
- RC - RESISTOR-CAPACITOR SNUBBER (RC SNUBBER)
- SOV - SOLENOID VALVE
- ETM - ELAPSED TIME METER
- CONTROL POWER TRANSFORMER
- NEW CONTROL WIRING
- NEW FIELD CONTROL WIRING
- COMMUNICATION SIGNAL
- EXISTING CONTROL WIRING
- EXISTING FIELD CONTROL WIRING
- ISR-A / ISR - INTRINSICALLY SAFE RELAY
- INTRINSICALLY SAFE BARRIER
- MMS - MANUAL MOTOR STARTER WITH OVERLOAD AND SELECTOR SWITCH

PLAN SYMBOLS

- ABC (123) - FIELD MOUNTED DEVICE/INSTRUMENT TAG
- NEW CONTROL ENCLOSURE / INSTRUMENT
- C-X C-X - NEW HOME RUN CONDUIT/CABLE (DASHED = DIRECT BURIED, SOLID = INSTALLED ABOVE GROUND)
- CONDUIT TAG. SEE CONDUCTOR/CONDUIT TAG SCHEDULE

GENERAL CONDUCTOR/CONDUIT TAG SCHEDULE

TAG	CONDUIT SIZE	CONDUCTORS	NOTES
C-X (Y)	3/4" (X=2 THRU 18) 1" (X=19 THRU 30) 2" (X=31 THRU 100)	X-#14, 1-#12G	(Y) DENOTES ADDITIONAL SPARES
P-X (Y)	3/4" (X=2 THRU 14) 1" (X=15 THRU 24) 2" (X=25 THRU 80)	X-#12, 1-#12G	(Y) DENOTES ADDITIONAL SPARES
TSP-X (Y)	3/4" (X=1,2) 1" (X=3,4) 2" (X=5 THRU 16)	X-#18 TWISTED SHIELDED PAIR	(Y) DENOTES ADDITIONAL SPARES
TST-X (Y)	3/4" (X=1,2) 1" (X=3,4) 2" (X=5 THRU 16)	X-#18 TWISTED SHIELDED TRIAD	(Y) DENOTES ADDITIONAL SPARES
RTD-X (Y)	3/4" (X=1,2) 1" (X=3,4) 2" (X=5 THRU 16)	X-#18 SHIELDED TRIAD	(Y) DENOTES ADDITIONAL SPARES
ETH-X(Y)	1" (X=1 THRU 4)	X-# OF CAT6 CABLES	(Y) DENOTES ADDITIONAL SPARES
FO-X	1" (X=2-18) 2" (X=18-48)	X-# OF MULTIMODE FIBER OPTIC STRANDS	COORDINATE CONDUIT AND INSTALLATION REQUIREMENTS WITH F.O. CABLE MANUFACTURE CABLE SIZES AND BEND RADIUS REQUIREMENTS
M-X	CONDUIT SIZE AS REQUIRED	X-MANUFACTURER SUPPLIED CABLE	CABLE AS PROVIDED OR RECOMMENDED BY EQUIPMENT MANUFACTURER. COORDINATE CONDUIT AND INSTALLATION REQUIREMENTS WITH MANUFACTURER.
AC-X (Y)	1" (X=1,2)	X-ANTENNA CABLE	(Y) DENOTES ADDITIONAL SPARES
		TOTAL CONDUCTORS REQUIRED = X + Y	

SCHEDULE OF CONDUCTOR INSULATOR COLORS

1	LINE AND LOAD CIRCUITS (AC OR DC POWER)	BLACK
2	NEUTRAL/GROUNDED CONDUCTORS	WHITE
3	AC CONTROL CIRCUITS	RED
4	DC CONTROL CIRCUITS (+)	BLUE
5	DC CONTROL CIRCUITS (-)	BLUE/BLACK
6	INTERLOCK CONTROL CIRCUITS ON THE PANEL ENERGIZED FROM EXTERNAL SOURCE	YELLOW
7	EQUIPMENT GROUNDING CONDUCTORS	GREEN

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SYMBOLS AND LEGENDS

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

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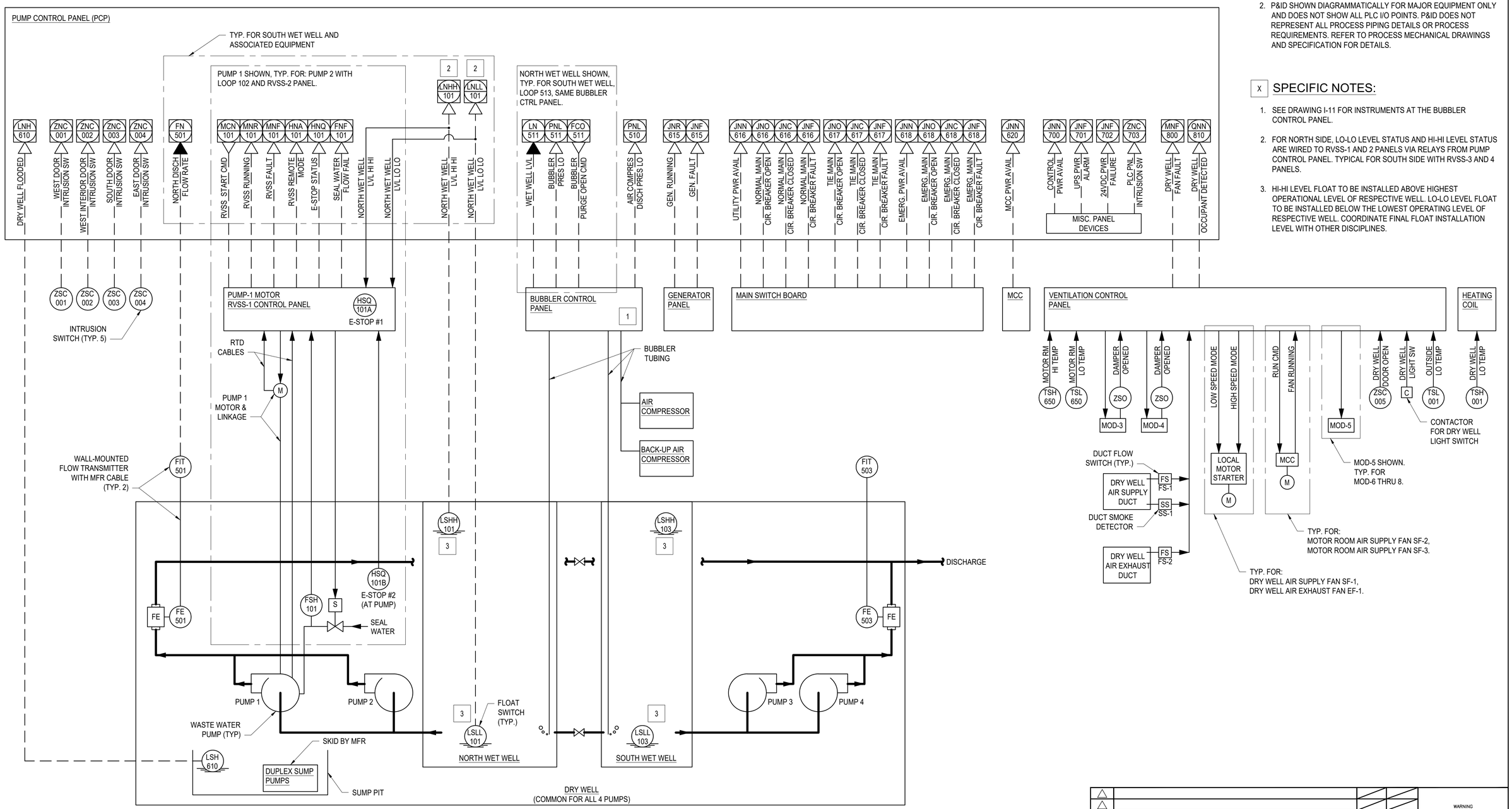
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GENERAL NOTES:

1. SEE DRAWING I-1 & I-2 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS.
2. P&ID SHOWN DIAGRAMMATICALLY FOR MAJOR EQUIPMENT ONLY AND DOES NOT SHOW ALL PLC I/O POINTS. P&ID DOES NOT REPRESENT ALL PROCESS PIPING DETAILS OR PROCESS REQUIREMENTS. REFER TO PROCESS MECHANICAL DRAWINGS AND SPECIFICATION FOR DETAILS.

X SPECIFIC NOTES:

1. SEE DRAWING I-11 FOR INSTRUMENTS AT THE BUBBLER CONTROL PANEL.
2. FOR NORTH SIDE, LO-LO LEVEL STATUS AND HI-HI LEVEL STATUS ARE WIRED TO RVSS-1 AND 2 PANELS VIA RELAYS FROM PUMP CONTROL PANEL. TYPICAL FOR SOUTH SIDE WITH RVSS-3 AND 4 PANELS.
3. HI-HI LEVEL FLOAT TO BE INSTALLED ABOVE HIGHEST OPERATIONAL LEVEL OF RESPECTIVE WELL. LO-LO LEVEL FLOAT TO BE INSTALLED BELOW THE LOWEST OPERATING LEVEL OF RESPECTIVE WELL. COORDINATE FINAL FLOAT INSTALLATION LEVEL WITH OTHER DISCIPLINES.



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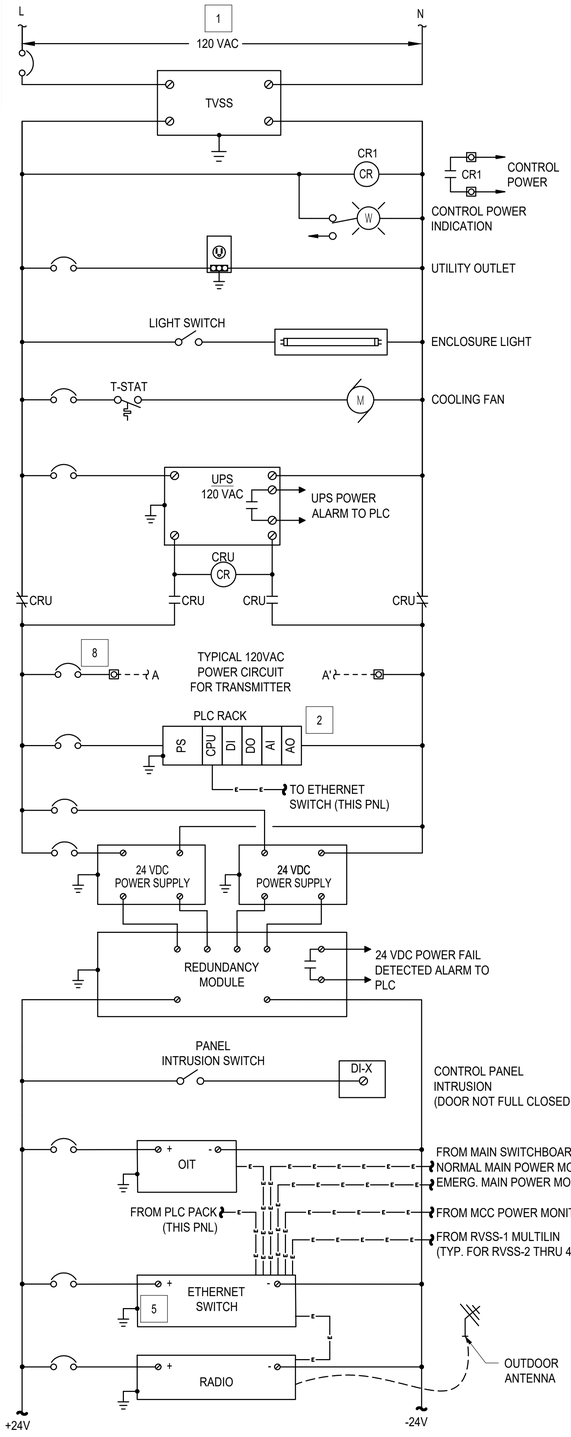
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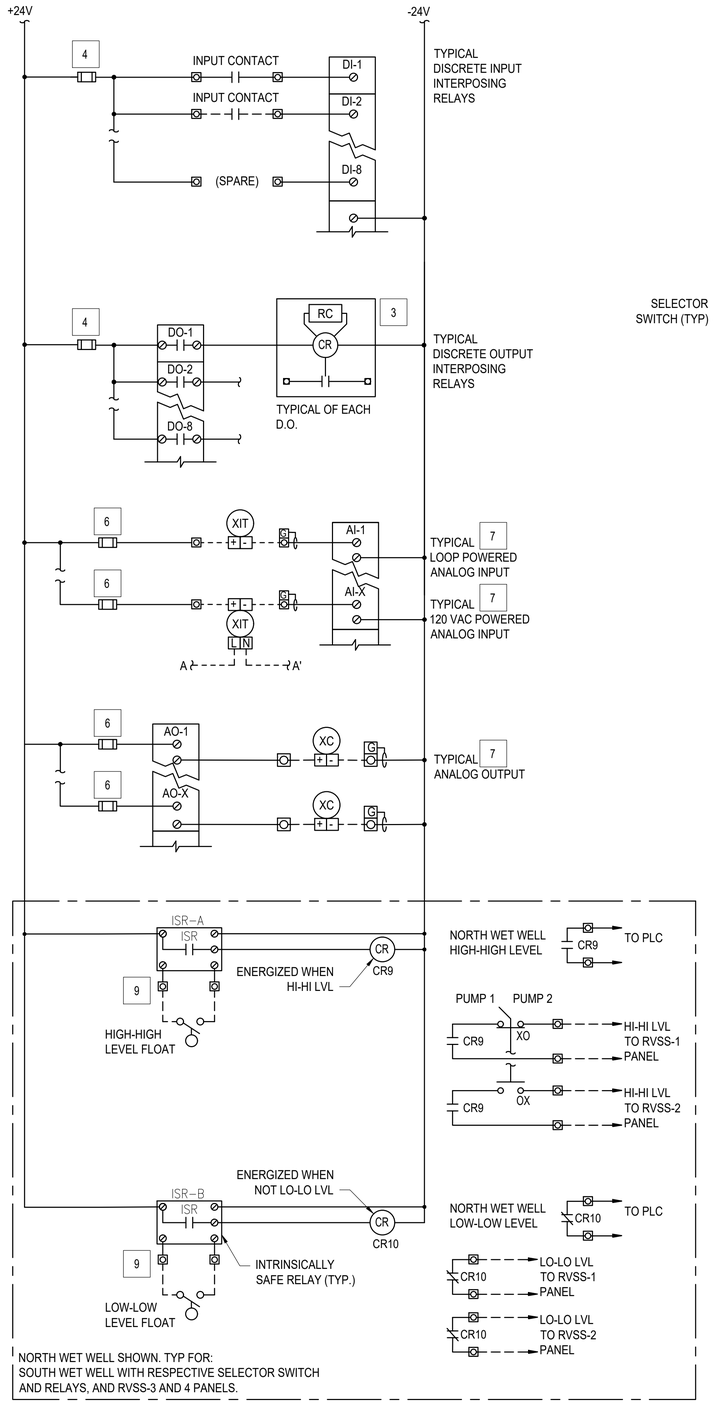
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

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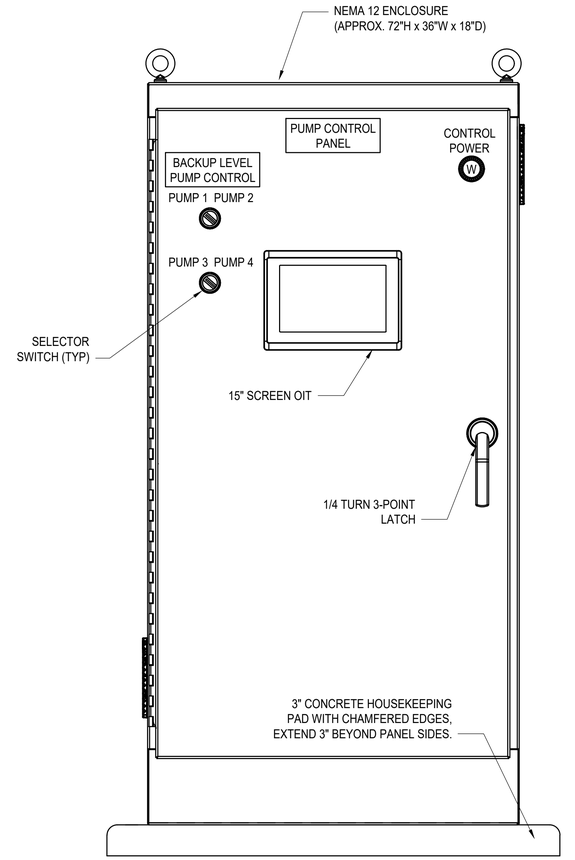
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SHEET 83 OF 92

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1 I-4 PUMP CONTROL PANEL CONTROL DIAGRAM
SCALE: NOT TO SCALE



2 I-4 PUMP CONTROL PANEL ELEVATION
SCALE: NOT TO SCALE

GENERAL NOTES:

1. SEE DRAWING I-1 & I-2 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS.
2. REFER TO ELECTRICAL & MECHANICAL DRAWINGS FOR ADDITIONAL EQUIPMENT LOCATIONS AND INFORMATION.

X SPECIFIC NOTES:

1. SEE ELECTRICAL DRAWINGS FOR POWER SOURCE.
2. THE PLC RACK SHOWN IS A GENERIC PLATFORM. REFER TO SPECIFICATIONS AND I/O LIST FOR PLC, COMMUNICATIONS AND INDIVIDUAL MODULE REQUIRED QUANTITY AND OTHER REQUIREMENTS. PROVIDE WIRING FOR ALL I/O INCLUDING SPARES TO FIELD TERMINAL STRIPS AND TERMINATE AT FIELD TERMINAL BLOCKS.
3. PROVIDE INTERPOSING RELAYS WITH RC OR DIODE SNUBBER CIRCUITS FOR DISCRETE OUTPUTS, BOTH ACTIVE AND SPARES.
4. PROVIDE FUSED POWER TO DISCRETE IO POINTS IN GROUPS OF 8 FOR BOTH ACTIVE AND SPARE.
5. NOT ALL ETHERNET AND FIBER OPTIC PORTS SHOWN. PROVIDE PORTS FOR ALL REQUIRED CONNECTIONS PLUS 20% SPARE.
6. PROVIDE INDIVIDUAL 0.1A FUSED FOR EACH ANALOG SIGNAL, BOTH ACTIVE & SPARES.
7. ANALOG LOOP DIAGRAMS SHOWN SIMPLIFIED FOR CLARITY. USE TWISTED SHIELDED CONDUCTORS WITH DRAIN WIRES GROUNDED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS FOR ALL ANALOG POINTS.
8. PROVIDE CIRCUIT BREAKER QTY AS REQUIRED FOR ALL 120VAC POWERED INSTRUMENTS SHOWN ON PLAN DRAWINGS.
9. INTRINSICALLY SAFE WIRING CIRCUITS SHALL ENTER PCS CABINET AT AN ISOLATED LOCATION, SHALL BE PHYSICALLY SEPARATED FROM ALL OTHER PANEL WIRING BY A MINIMUM OF 2 INCHES, AND SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE NEC AND UL-698A REQUIREMENTS.

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PUMP CONTROL PANEL CONTROL DIAGRAM & ELEVATION

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

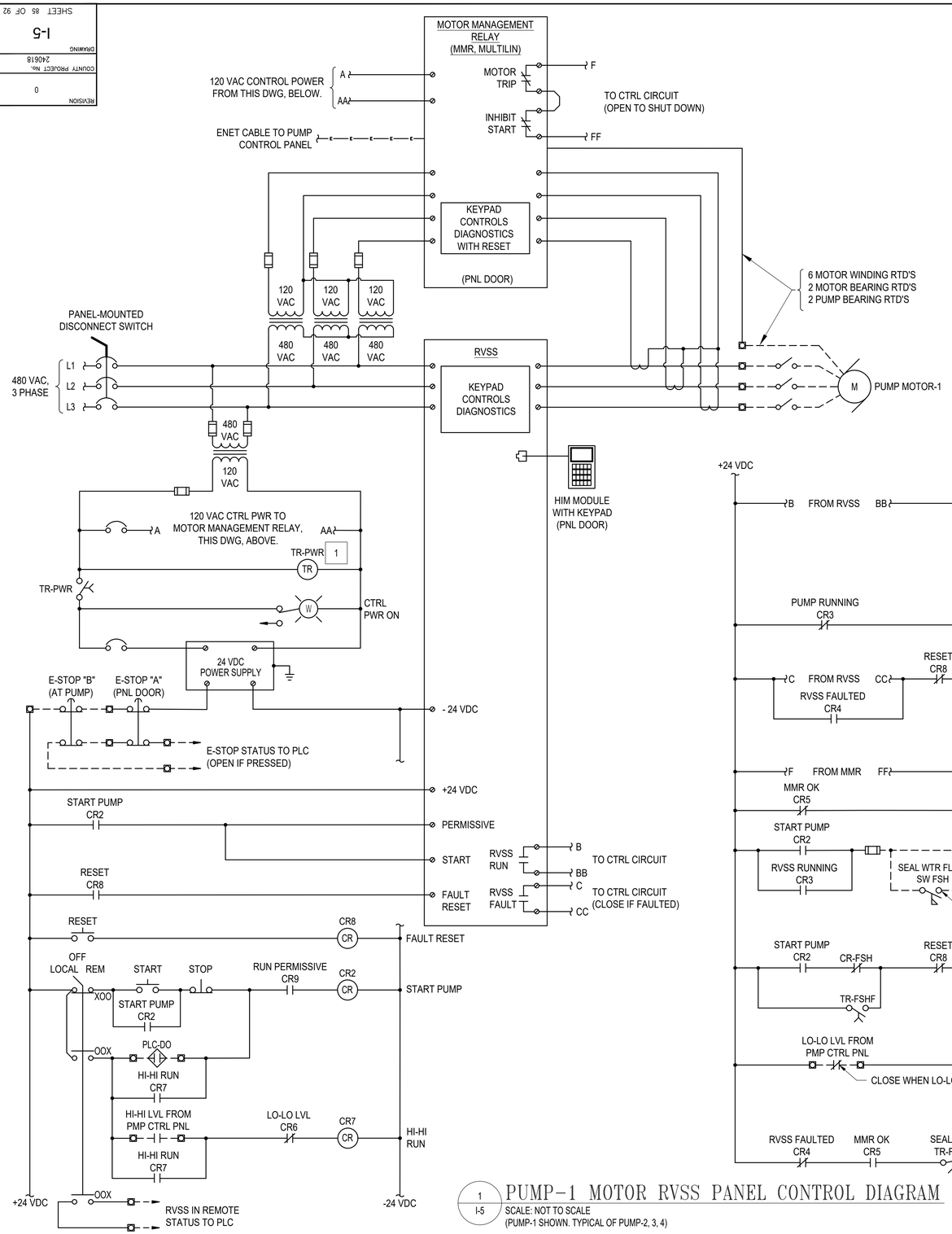
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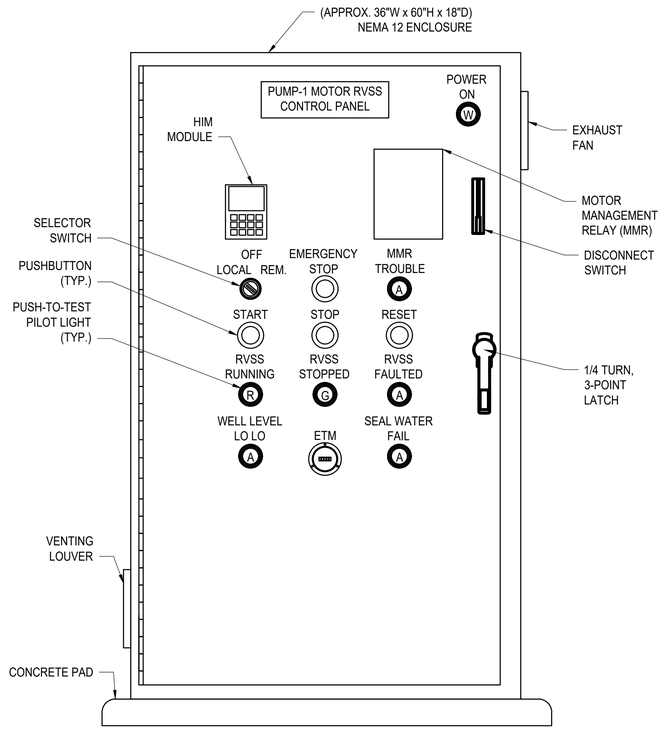
1 I-5
PUMP-1 MOTOR RVSS PANEL CONTROL DIAGRAM
SCALE: NOT TO SCALE
(PUMP-1 SHOWN. TYPICAL OF PUMP-2, 3, 4)

GENERAL NOTES:

1. SEE DRAWING I-1 & I-2 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS.
2. REFER TO ELECTRICAL & MECHANICAL DRAWINGS FOR ADDITIONAL EQUIPMENT LOCATIONS AND INFORMATION.
3. SEE SPECIFICATIONS FOR MOTOR MONITORING REQUIREMENTS.
4. UNLESS OTHERWISE NOTED, ALL TIMER RELAYS SHALL HAVE 0 TO 120 SECONDS. COORDINATE FINAL SETTING DURING START-UP.

X SPECIFIC NOTES:

1. ON DELAY TIMER, 0 TO 120 SECONDS. INITIALLY SET AT 10, 20, 30 AND 40 SECONDS FOR RVSS-1 THRU 4 RESPECTIVELY. COORDINATE WITH OWNER FOR FINAL SET POINTS.



2 I-5
PUMP-1 MOTOR RVSS PANEL ELEVATION
SCALE: NOT TO SCALE
(PUMP-1 SHOWN. TYPICAL OF PUMP-2, 3, 4)

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RVSS PUMP CONTROL DIAGRAM AND ELEVATION

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

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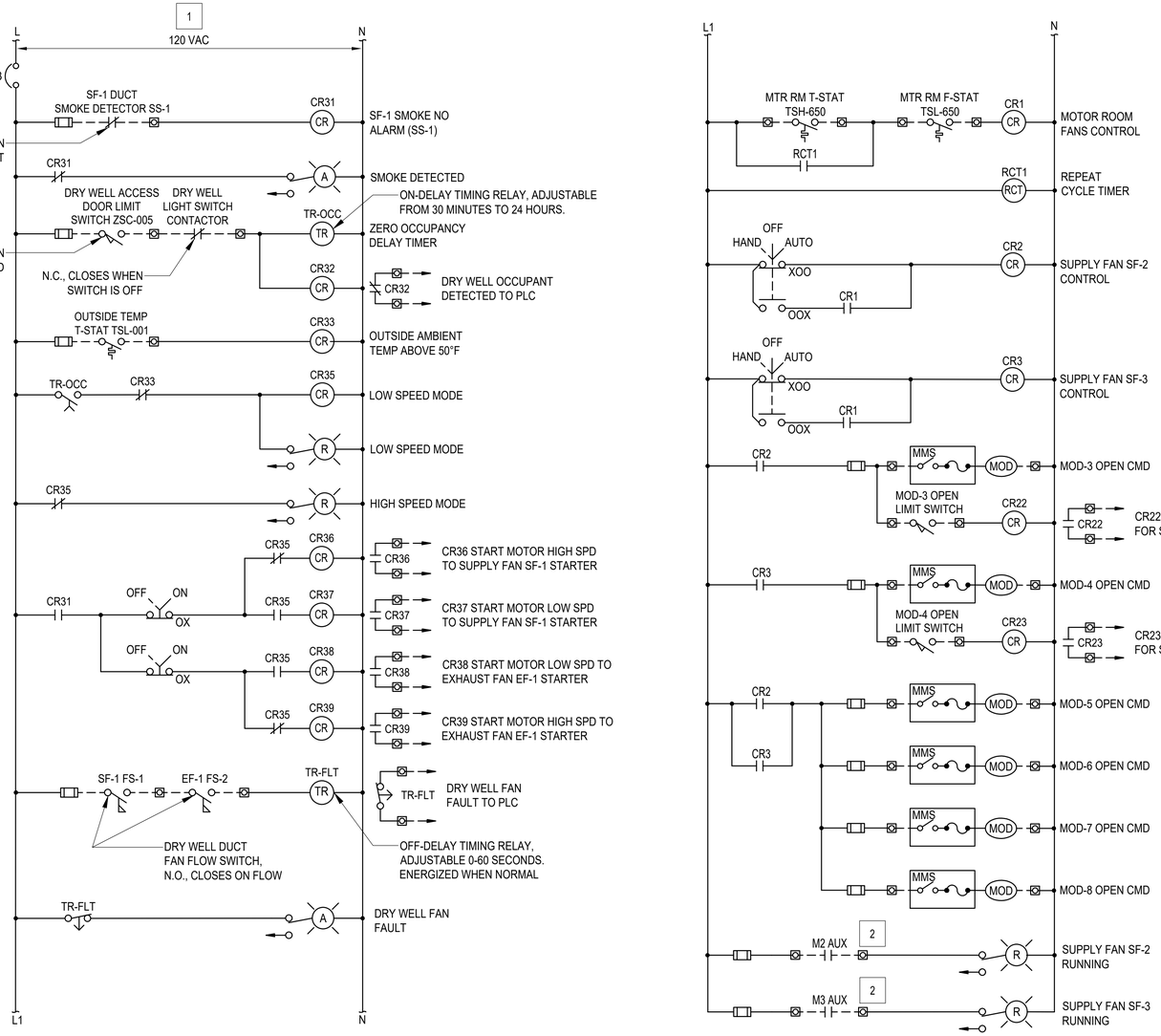
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERETO AND APPURTENANT INCLUDING THE LATEST REVISIONS.

GENERAL NOTES:

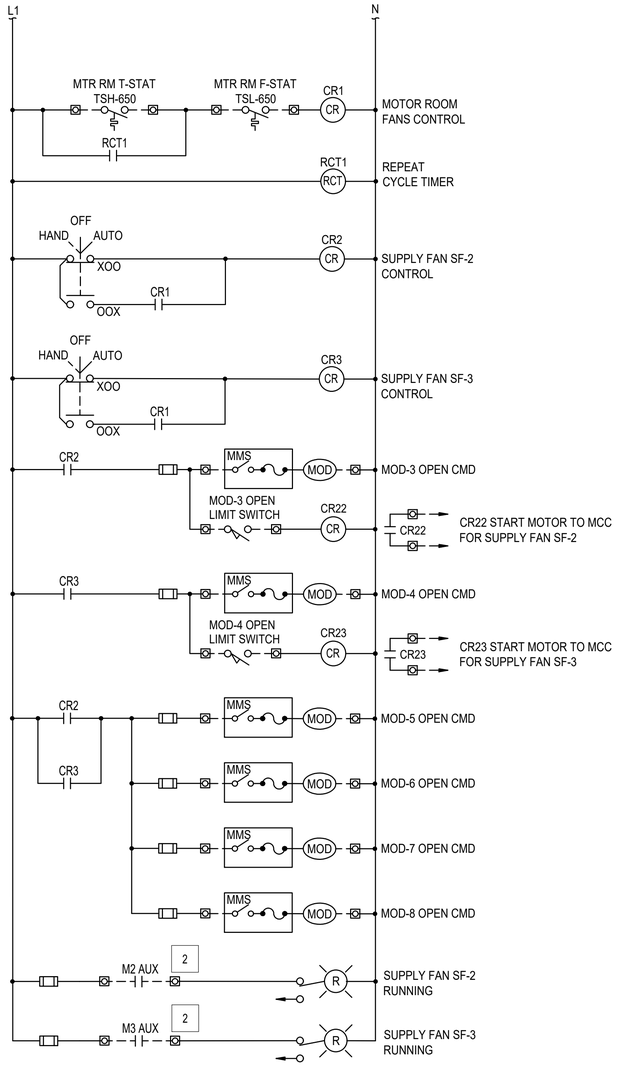
1. SEE DRAWING I-1 & I-2 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS.
2. SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL MCC REQUIREMENTS.
3. COORDINATE ALL TIMING SET POINTS DURING START I[/

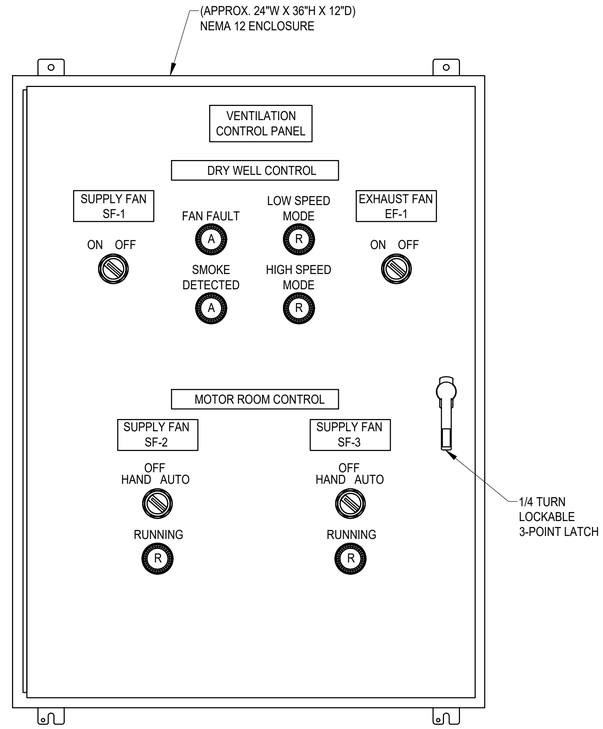
X SPECIFIC NOTES:

1. SEE ELECTRICAL DRAWINGS FOR POWER SOURCE.
2. LOCATED IN RESPECTIVE MCC.



1 I-6 VENTILATION PANEL CONTROL DIAGRAM
SCALE: NOT TO SCALE





2 I-6 VENTILATION CONTROL PANEL ELEVATION
SCALE: NOT TO SCALE

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WO: 70852-002

APPROVED BY: GREGORY HOBBS LICENSE No. 18622 3/21/25 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NONE
DESIGNED	HDL
DRAWN	MRW
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DATE	MAR 2025

VENTILATION PANEL DIAGRAM AND ELEVATION (1 OF 2)

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

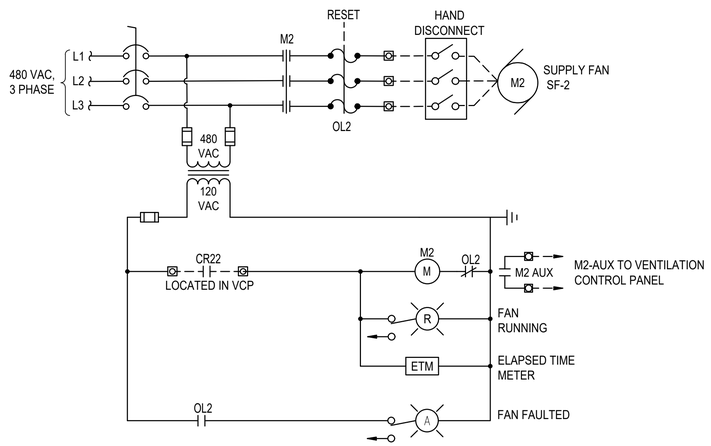
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COUNTY PROJECT No. 240618
DRAWING I-6
SHEET 86 OF 92

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Mar 25, 2025 - 8:47pm

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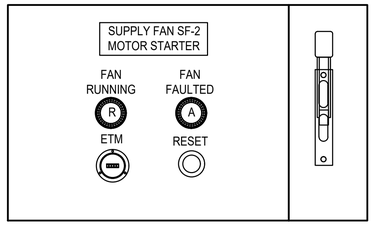
GENERAL NOTES

1. SEE DRAWING I-1 & I-2 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS AND LEGENDS.
2. SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL MCC REQUIREMENTS.



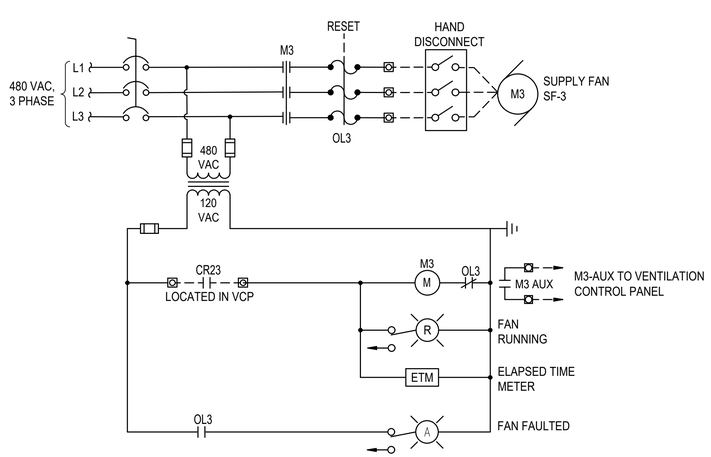
MOTOR ROOM SUPPLY FAN SF-2
MCC ELEMENTARY DIAGRAM

1 / I-7 SCALE: NOT TO SCALE



TYPICAL SUPPLY FAN
PARTIAL MCC ELEVATION

3 / I-7 SCALE: NOT TO SCALE
SUPPLY FAN SF-2 SHOWN, TYP. FOR SF-3.



MOTOR ROOM SUPPLY FAN SF-3
MCC ELEMENTARY DIAGRAM

2 / I-7 SCALE: NOT TO SCALE

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APPROVED BY:
GREGORY HORN LICENSE No. 20320 STATE OF DELAWARE PROFESSIONAL ENGINEER
3/21/25

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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PROFESSIONAL ENGINEER – DESIGN

SCALE	NONE
DESIGNED	HDL
DRAWN	MRW
CHECKED	GAH
DATE	MAR 2025

VENTILATION PANEL DIAGRAM AND ELEVATION (2 OF 2)

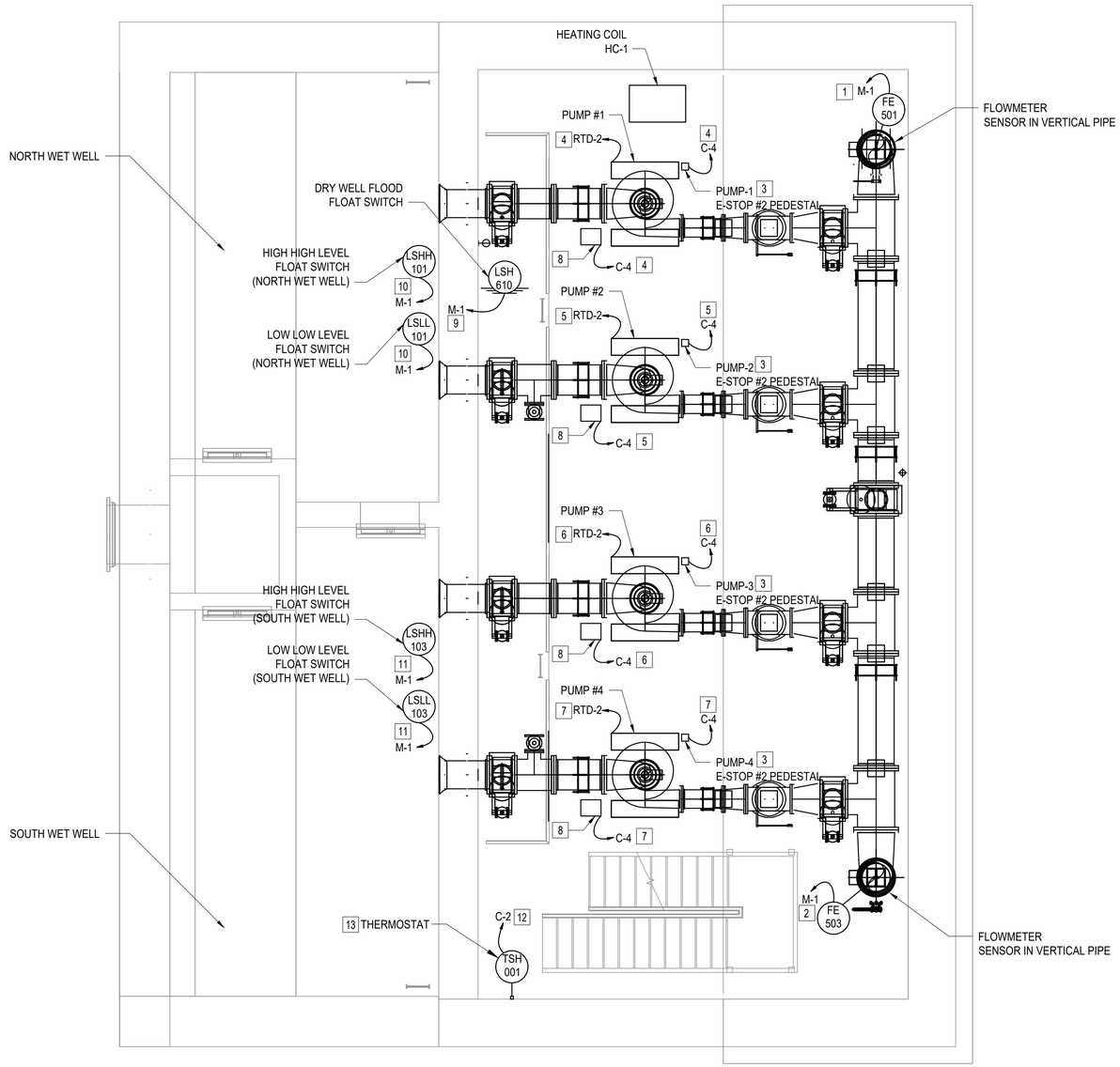
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-7
SHEET 87 OF 92

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Mar 26, 2025 - 4:16pm

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1 / I-8 PUMP ROOM PLAN
SCALE: 1/4" = 1'

N

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

GENERAL NOTES:

1. REFER TO DRAWING I-1 AND I-2 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL CONDUIT AND CONDUCTORS TO TERMINATE AT THE PUMP CONTROL PANEL UNLESS OTHERWISE NOTED.
3. REFER TO ELECTRICAL DRAWINGS FOR POWER REQUIREMENTS AND CONDUIT ROUTING.

[X] SPECIFIC NOTES:

1. TO FLOW TRANSMITTER FIT-501 IN MOTOR ROOM ABOVE.
2. TO FLOW TRANSMITTER FIT-503 IN MOTOR ROOM ABOVE.
3. SEE E-STOP PEDESTAL DETAIL ON INSTALLATION DETAILS.
4. ROUTE CONDUCTORS AND CABLES THROUGH E-STOP #1 ENCLOSURE ON PEDESTAL TO JB-11 ON INTERMEDIATE LEVEL.
5. ROUTE CONDUCTORS AND CABLES THROUGH E-STOP #2 ENCLOSURE ON PEDESTAL TO JB-12 ON INTERMEDIATE LEVEL.
6. ROUTE CONDUCTORS AND CABLES THROUGH E-STOP #3 ENCLOSURE ON PEDESTAL TO JB-13 ON INTERMEDIATE LEVEL.
7. ROUTE CONDUCTORS AND CABLES THROUGH E-STOP #4 ENCLOSURE ON PEDESTAL TO JB-14 ON INTERMEDIATE LEVEL.
8. SEAL WATER SOLENOID WITH FLOW SWITCH ASSEMBLY FOR EACH RESPECTIVE PUMP. REFER TO MECHANICAL DWGS FOR ASSEMBLY DETAILS.
9. TO BUBBLER PANEL ON INTERMEDIATE LEVEL.
10. ROUTE CABLES TO JB-1 ON MOTOR ROOM LEVEL.
11. ROUTE CABLES TO JB-3 ON MOTOR ROOM LEVEL.
12. TO HEATING COIL HC-1 LOCAL CONTROL PANEL ON THIS LEVEL, APPROX. 10 FEET FROM FLOOR FINISH. REFER TO MECHANICAL DWG FOR HC-1 DETAILS.
13. T-STAT INSTRUMENT TO BE WALL-MOUNTED. CONTRACTOR TO COORDINATE FINAL LOCATION WITH SYSTEM INTEGRATOR AND PROVIDE ALL MOUNTING HARDWARE AS REQUIRED.

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APPROVED BY:
GREGORY HORN
LICENSE
No. 19620
3/21/25
DELAWARE
PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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SCALE	AS SHOWN
DESIGNED	HDL
DRAWN	MRW
CHECKED	GAH
DATE	MAR 2025

LOWER LEVEL WELL I&C PLAN

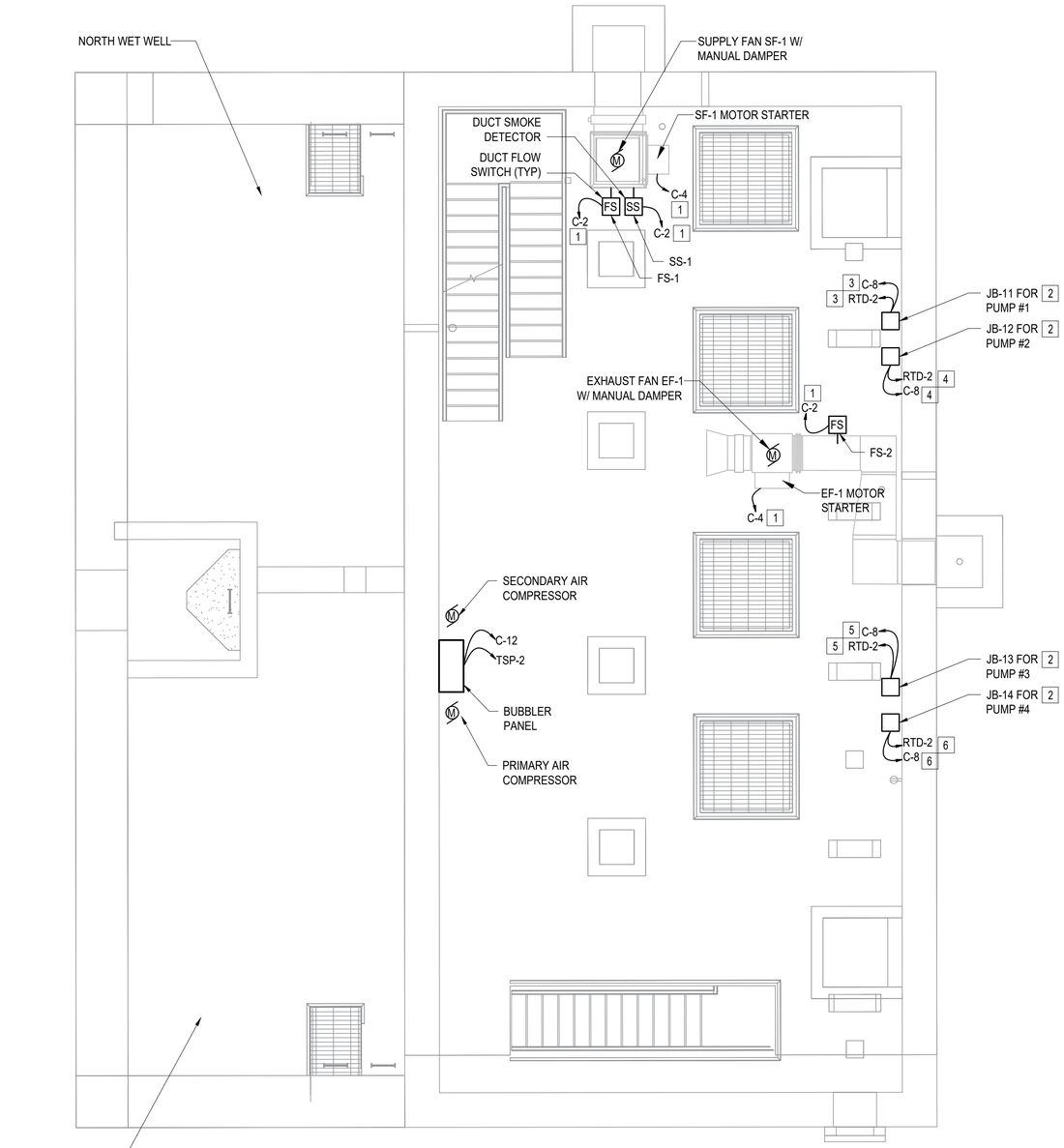
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-8
SHEET 88 OF 92

N:\70852-000\CADD\70852PPS-008 - Plan Pump Rm.dwg
Mar 26, 2025 - 4:36pm

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1 / I-9 INTERMEDIATE LEVEL PLAN
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. REFER TO DRAWING I-1 AND I-2 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. INSTRUMENTATION WORK AND EQUIPMENT SHOWN IN BOLD.
3. ALL CONDUIT AND CONDUCTORS TO TERMINATE AT THE PUMP CONTROL PANEL ON THE GRADE LEVEL UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO COORDINATE UTILITIES AND ROUTING FOR ALL CONDUIT.
5. REFER TO ELECTRICAL DRAWINGS FOR POWER REQUIREMENTS AND CONDUIT ROUTING.

X SPECIFIC NOTES:

1. TO VENTILATION CONTROL PANEL IN MOTOR ROOM ABOVE.
2. JB IS NEMA 4X, WALL-MOUNTED WITH BOTTOM OF BOX AT 4 FEET ABOVE INTERMEDIATE LEVEL'S FLOOR.
3. TO RVSS-1 PANEL IN MOTOR ROOM ABOVE.
4. TO RVSS-2 PANEL IN MOTOR ROOM ABOVE.
5. TO RVSS-3 PANEL IN MOTOR ROOM ABOVE.
6. TO RVSS-4 PANEL IN MOTOR ROOM ABOVE.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

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WO: 70852-002

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187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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PROFESSIONAL ENGINEER – DESIGN

SCALE	AS SHOWN
DESIGNED	HDL
DRAWN	MRW
CHECKED	GAH
DATE	MAR 2025

INTERMEDIATE LEVEL I&C PLAN

NEW RICHARDSON PARK PUMPING STATION – PHASE 2
NEW CASTLE DELAWARE

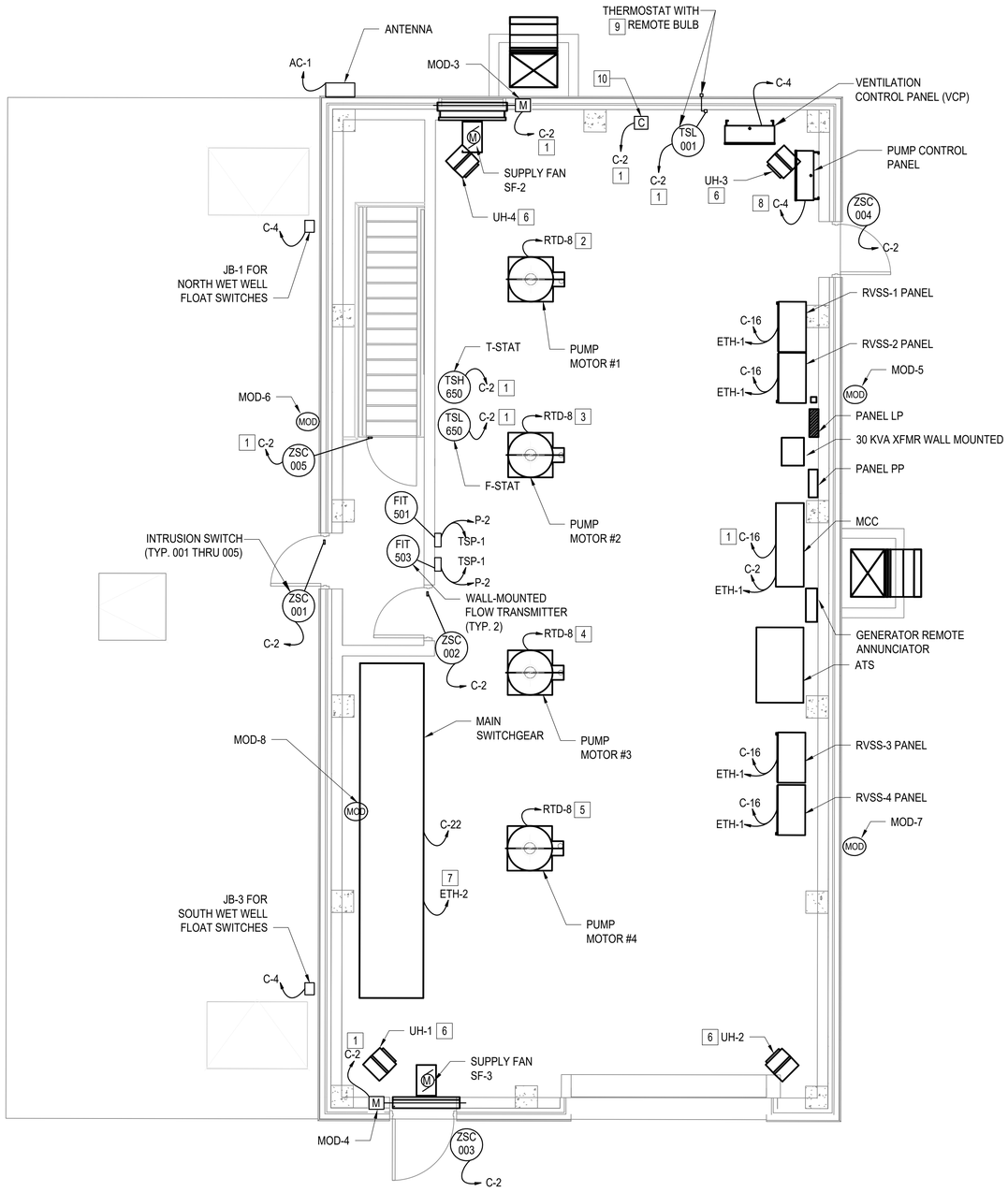
REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-9
SHEET 89 OF 92

REVISION	COUNTY PROJECT No.	DRAWING
0	240618	I-9

SHEET 89 OF 92

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Mar 26, 2025 - 9:40am

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1 I-10 MOTOR ROOM LEVEL PLAN

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

N

0 2' 4' 8'

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

GENERAL NOTES:

1. REFER TO DRAWING I-1 AND I-2 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. INSTRUMENTATION WORK AND EQUIPMENT SHOWN IN BOLD.
3. ALL CONDUIT AND CONDUCTORS TO TERMINATE AT THE PUMP CONTROL PANEL UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO COORDINATE UTILITIES AND ROUTING FOR ALL CONDUIT.
5. REFER TO ELECTRICAL DRAWINGS FOR POWER REQUIREMENTS AND CONDUIT ROUTING.

X SPECIFIC NOTES:

1. TO VENTILATION CONTROL PANEL. SEE ELECTRICAL DRAWINGS FOR POWER WIRING REQUIREMENT.
2. (6) MOTOR WINDING RTD AND (2) MOTOR BEARING RTD CABLES AND CONDUIT TO RVSS PANEL-1.
3. (6) MOTOR WINDING RTD AND (2) MOTOR BEARING RTD CABLES AND CONDUIT TO RVSS PANEL-2.
4. (6) MOTOR WINDING RTD AND (2) MOTOR BEARING RTD CABLES AND CONDUIT TO RVSS PANEL-3.
5. (6) MOTOR WINDING RTD AND (2) MOTOR BEARING RTD CABLES AND CONDUIT TO RVSS PANEL-4.
6. INSTALL THERMOSTAT FOR UNIT HEATERS ON WALL AT A MINIMUM OF 5 FT ABOVE FINISH FLOOR. COORDINATE PRECISE LOCATION WITH OTHER DISCIPLINES. SEE DETAILS SHEET FOR ADDITIONAL INSTALLATION REQUIREMENTS.
7. ONE (1) ETHERNET CABLE FROM POWER MONITOR UNIT ON NORMAL MAIN. ONE (1) ETHERNET CABLE FROM POWER MONITOR UNIT ON EMERGENCY MAIN.
8. TO GENERATOR CONTROL PANEL AT GENERATOR. SEE ELECTRICAL DRAWINGS.
9. MOUNT THERMOSTAT ENCLOSURE TO INTERIOR WALL AND BULB TO EXTERIOR WALL W/ S-ST HARDWARE. PROVIDE WALL PENETRATION AND CAPILLARY WITH LENGTH TO-SUIT, AND PREVENTION OF WATER INGRESS.
10. DRY WELL LIGHT SWITCH CONTACTOR WITH MINIMUM OF ONE (1) N.O. AND ONE (1) N.C. CONTACTS INDICATING DRY WELL LIGHT ON/OFF. LOCATION SHOWN IS APPROX. REFER TO ELECTRICAL DWGS FOR MORE DETAILS.

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APPROVED BY: GREGORY HORN LICENSE No. 18622 3/21/25 DELAWARE PROFESSIONAL ENGINEER

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DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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PROFESSIONAL ENGINEER – DESIGN

SCALE	AS SHOWN
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DRAWN	MRW
CHECKED	GAH
DATE	MAR 2025

GRADE LEVEL I&C PLAN

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

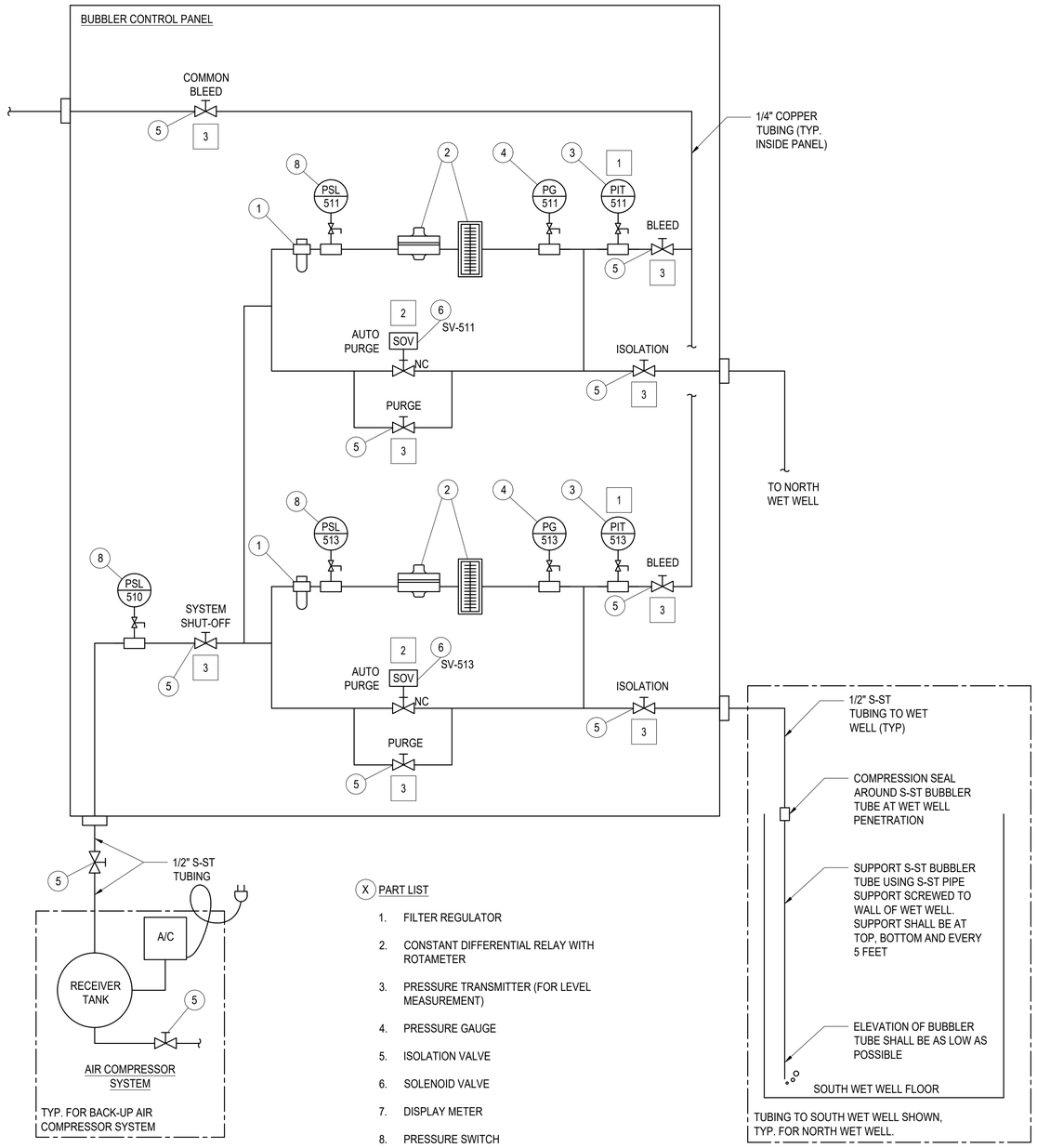
NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-10
SHEET 90 OF 92

REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-10
SHEET 90 OF 92

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Mar 26, 2025 - 7:41pm

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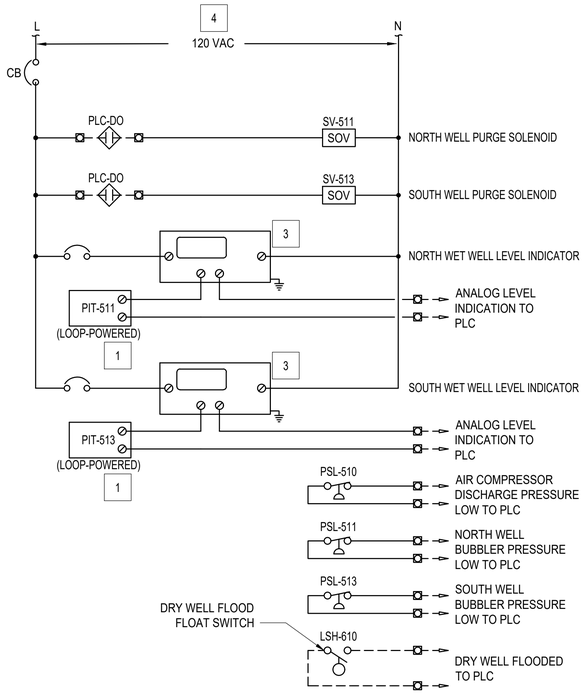


(X) PART LIST

1. FILTER REGULATOR
2. CONSTANT DIFFERENTIAL RELAY WITH ROTAMETER
3. PRESSURE TRANSMITTER (FOR LEVEL MEASUREMENT)
4. PRESSURE GAUGE
5. ISOLATION VALVE
6. SOLENOID VALVE
7. DISPLAY METER
8. PRESSURE SWITCH

BUBBLER LEVEL MEASUREMENT SYSTEM INSTALLATION PROCESS SCHEMATIC

1 / I-11 SCALE: NOT TO SCALE



BUBBLER LEVEL MEASUREMENT SYSTEM CONTROL DIAGRAM

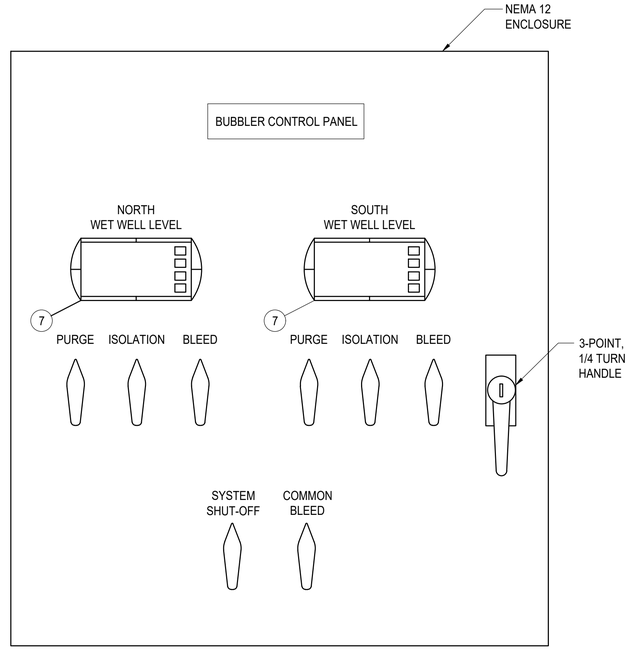
2 / I-11 SCALE: NOT TO SCALE

GENERAL NOTES:

1. REFER TO SHEET I-1 & I-2 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. SEE INSTRUMENTATION SPECIFICATIONS FOR ADDITIONAL INSTRUMENT REQUIREMENTS.
3. CONTRACTOR SHALL INSTALL ALL INSTRUMENTS AND DEVICES IN ACCORDANCE WITH MANUFACTURERS INSTALLATION RECOMMENDATIONS.
4. DIGITAL AND ANALOG SIGNALS SHALL BE ROUTED IN SEPARATE CONDUIT RUNS. ALL CONNECTIONS.
5. COORDINATE CONDUIT SIZES AND QUANTITIES WITH THE PLAN DRAWINGS.

(X) SPECIFIC NOTES:

1. LEVEL SHALL BE INDICATED ON DISPLAY METER AT BUBBLER CONTROL PANEL AND OIT SCREEN AT PUMP CONTROL PANEL.
2. NORMALLY CLOSED SOLENOID VALVE FOR SYSTEM PURGE. VALVE OPENS WHEN ENERGIZED TO BYPASS REGULATING PORTION OF BUBBLER SYSTEM. SOLENOID SHALL BE ACTIVATED VIA THE PLC.
3. DEVICE MOUNTED ON BUBBLER PANEL DOOR.
4. SEE ELECTRICAL DRAWINGS FOR POWER SOURCE.



BUBBLER LEVEL MEASUREMENT SYSTEM PANEL ELEVATION

3 / I-11 SCALE: NOT TO SCALE

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NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

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PROFESSIONAL ENGINEER – DESIGN

SCALE	NOT TO SCALE
DESIGNED	HDL
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CHECKED	GAH
DATE	MAR 2025

INSTALLATION DETAILS (1 OF 2)

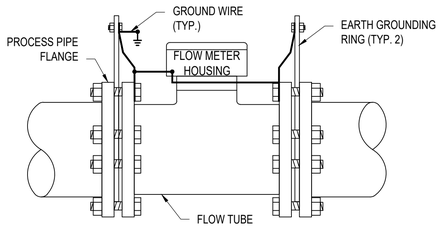
NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-11
SHEET 91 OF 92

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Mar 06, 2025 - 2:45pm

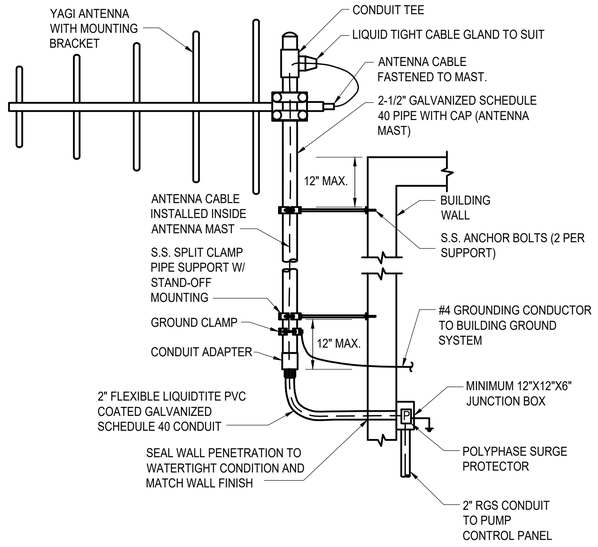
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1. SIZE GROUND WIRE CONDUCTORS PER FLOW METER MFR REQUIREMENTS.

1 I-12 FLOW METER RING GROUNDING DETAIL

SCALE: NOT TO SCALE
FE-501 AND FE-503

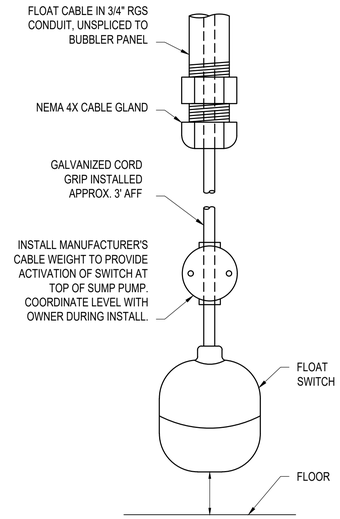


DETAIL NOTES:

1. CONTRACTOR SHALL CONFIRM AND COORDINATE WITH OWNER PRIOR TO INSTALLATION OF ANTENNA MOUNTING SUPPORT AS REQUIRED.
2. CONTRACTOR SHALL COORDINATE ANTENNA CABLE LENGTH AS REQUIRED FOR ONE CONTINUOUS RUN.
3. PROVIDE PIPE SUPPORT EVERY 12" IN BETWEEN TOP AND BOTTOM SUPPORTS. PROVIDE A MINIMUM OF 4 SUPPORTS.
4. CONTRACTOR SHALL COORDINATE ANTENNA MOUNTING HEIGHT AND DIRECTION AS REQUIRED TO COMMUNICATE WITH EX. SCADA SYSTEM.
5. CONTRACTOR SHALL PROVIDE ANTENNA INSTALLATION SUCH THAT IT CAN WITHSTANDING THE WIND VELOCITY FOR THE LOCATION AS INDICATED BY APPLICABLE CODES.
6. INSTALL POLYPHASE SURGE PROTECTOR DEVICE IN JUNCTION BOX AND GROUND IN ACCORDANCE WITH MFR'S RECOMMENDATIONS. JUNCTION BOX SHALL BE MOUNTED APPROX. 5'-0" AFF.
7. BEND CONDUIT AND SIZE JUNCTION BOX TO-SUIT THE BEND RADIUS FOR ANTENNA CABLE PER MFR'S RECOMMENDATIONS.
8. SUBMIT SHOP DRAWINGS FOR ANTENNA SUPPORT FOR APPROVAL PRIOR TO FABRICATION.

2 I-12 ANTENNA MOUNTING DETAIL

SCALE: NONE



3 I-12 FLOAT INSTALLATION DETAIL

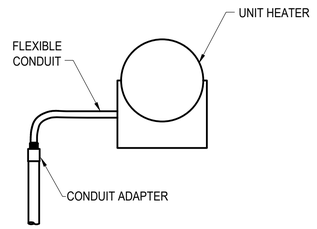
SCALE: NONE
LSH-610 AT DRY WELL SUMP PIT.

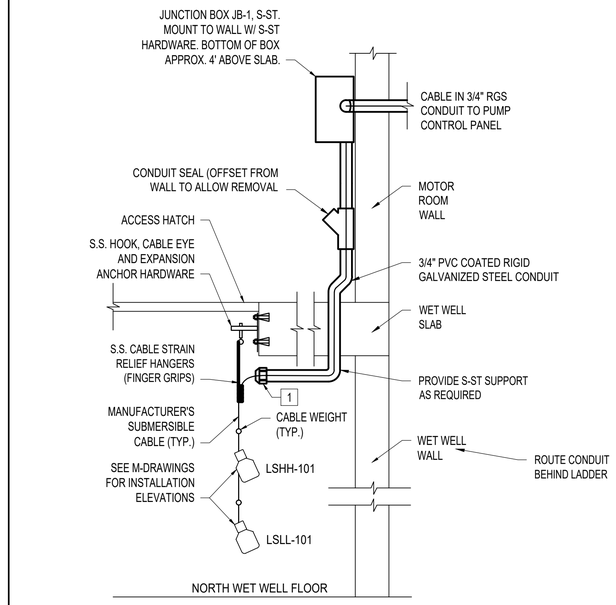
GENERAL NOTES:

1. REFER TO SHEET I-1 & I-2 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. SEE INSTRUMENTATION SPECIFICATIONS FOR ADDITIONAL INSTRUMENT REQUIREMENTS.
3. CONTRACTOR SHALL INSTALL ALL INSTRUMENTS AND DEVICES IN ACCORDANCE WITH MANUFACTURERS INSTALLATION RECOMMENDATIONS.
4. DIGITAL AND ANALOG SIGNALS SHALL BE ROUTED IN SEPARATE CONDUIT RUNS.
5. COORDINATE CONDUIT SIZES AND QUANTITIES WITH THE PLAN DRAWINGS.
6. REFER TO ELECTRICAL DRAWINGS FOR EQUIPMENT STAND DETAIL.

X SPECIFIC NOTES:

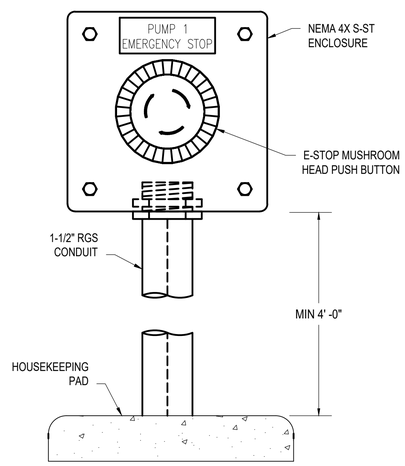
1. CONDUIT SEALING BUSHING WITH GLAND LOCKING COLLAR. PRODUCT AND MFR SHALL BE TYPE CSBG BY OZ GEDNEY OR APPROVED EQUAL.





4 I-12 LEVEL FLOAT INSTALLATION DETAIL

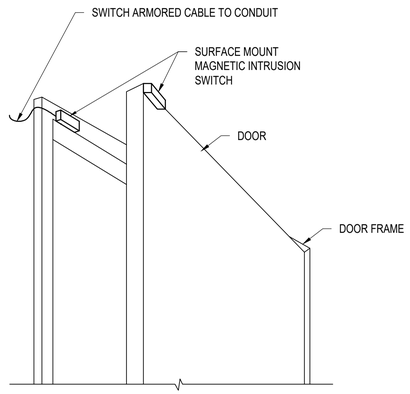
SCALE: NONE
TYPICAL FOR J-BOX JB-3, LSLL-103, AND LSHH-103 AT SOUTH WET WELL.



1. SIZE ENCLOSURE TO-SUIT ALL CONDUCTORS AND CABLES FOR EACH PUMP. SEE PLAN DRAWING FOR TYPES AND QTY.

5 I-12 E-STOP PEDASTAL DETAIL

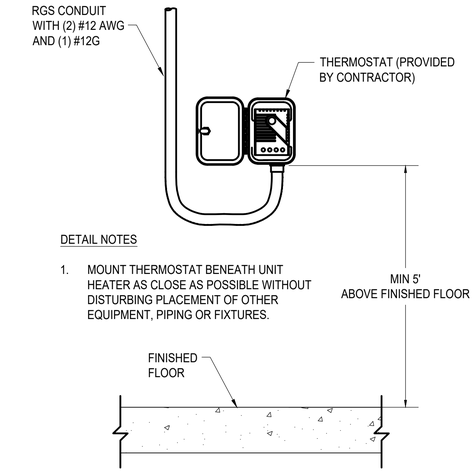
SCALE: NOT TO SCALE
TYP. FOR PUMP-2, 3, & 4



1. FOR DOUBLE DOORS, INSTALL SWITCH ON ACTIVE LEAF.
2. INTRUSION SWITCH SHALL BE MOUNTED FACING THE INTERIOR OF THE SECURED SPACE WHEN DOOR IS CLOSED.

6 I-12 INTRUSION SWITCH INSTALLATION DETAIL

SCALE: NONE



DETAIL NOTES

1. MOUNT THERMOSTAT BENEATH UNIT HEATER AS CLOSE AS POSSIBLE WITHOUT DISTURBING PLACEMENT OF OTHER EQUIPMENT, PIPING OR FIXTURES.

7 I-12 UNIT HEATER INSTALLATION DETAIL

SCALE: NONE

REV	DESCRIPTION OF REVISION	REVISED BY/DATE	CHECKED BY/DATE
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WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MISS UTILITY of DELMARVA
BEFORE YOU DIG CALL 1-800-282-8555 (In Del.) 1-800-441-8355 (Md., NJ.) PROTECT YOURSELF, GIVE TWO WORKING DAYS NOTICE

Whitman, Requardt & Associates, LLP
1013 Centre Road, Suite 302, Wilmington, Delaware 19805
WO: 70852-002

APPROVED BY: GREGORY HORN LICENSE No. 19632 3/21/25 DELAWARE PROFESSIONAL ENGINEER

NEW CASTLE COUNTY
DEPARTMENT OF PUBLIC WORKS
187-A OLD CHURCHMANS ROAD
NEW CASTLE, DELAWARE 19720

NEW CASTLE COUNTY
DELAWARE
DEPARTMENT OF PUBLIC WORKS
APPROVED BY: _____
PROFESSIONAL ENGINEER – DESIGN

SCALE	NOT TO SCALE
DESIGNED	HDL
DRAWN	MRW
CHECKED	GAH
DATE	MAR 2025

INSTALLATION DETAILS (2 OF 2)

NEW RICHARDSON PARK PUMPING STATION – PHASE 2

NEW CASTLE DELAWARE

REVISION 0
COUNTY PROJECT No. 240618
DRAWING I-12
SHEET 92 OF 92

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Mar 26, 2025 - 4:16pm