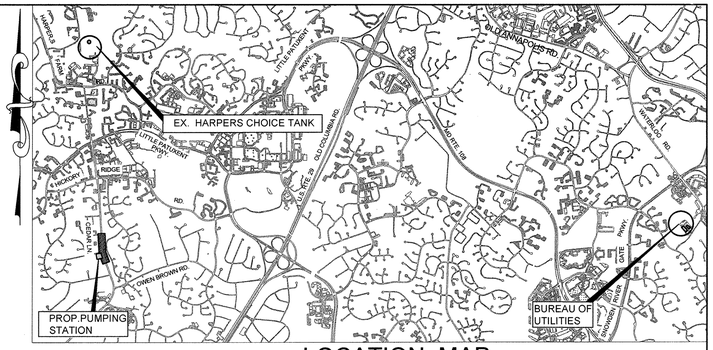
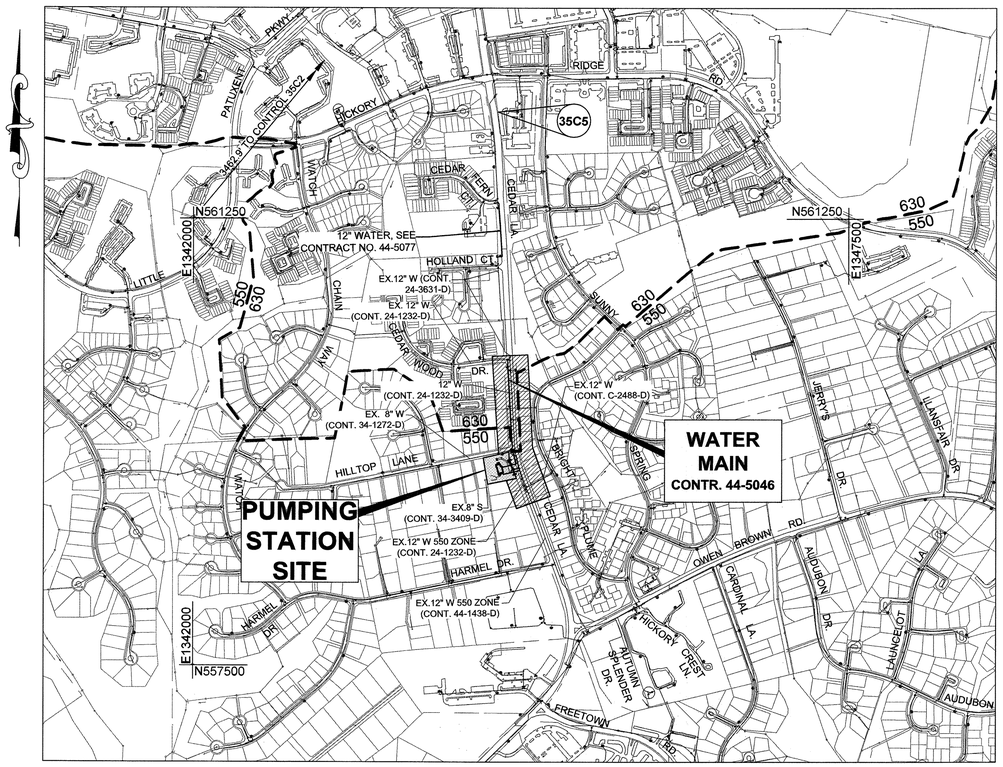
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
HOWARD COUNTY, MARYLAND



LOCATION MAP
SCALE: 1"= 3000'



VICINITY MAP
SCALE: 1"= 600'

GENERAL NOTES

1. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR EXPENSE.
2. TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON 6/02/2017 BY KCI TECHNOLOGIES, INC.
3. HORIZONTAL AND VERTICAL SURVEY CONTROLS:
   THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD 1983/2011 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 35C2, 35C5. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE REBAR & CAP AND NAILS.
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
6. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
7. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL ▩ AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:
   AT&T 1-800-252-1133
   BG&E (CONSTRUCTION SERVICES)..... 410-850-4620
   BG&E (EMERGENCY) 410-685-1400
   BUREAU OF UTILITIES (DPW)..... 410-313-4900
   COLONIAL PIPELINE CO. 410-795-1390
   MISS UTILITY 1-800-257-7777
   STATE HIGHWAY ADMINISTRATION 410-531-5533
   VERIZON. ..... 1-800-743-0033 / 410-224-9210
9. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
10. CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
11. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)313-7450 AT LEAST FIVE WORKING DAYS BEFORE ANY OPEN CUT OF ANY COUNTY ROAD OR BORING/JACKING OPERATION IN COUNTY ROADS FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(a) OF THE HOWARD COUNTY CODE.
12. A GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS PROJECT BY KCI TECHNOLOGIES, INC. THIS REPORT IS FOR INFORMATIONAL PURPOSES ONLY AND SHALL NOT BE CONSIDERED AS PART OF THE CONTRACT DOCUMENTS. THE OPINIONS AND CONCLUSIONS OF KCI REPRESENT OUR INTERPRETATION OF THE SUBSURFACE CONDITIONS AND THE PLANNED CONSTRUCTION AT THE TIME OF THE REPORT PREPARATION. THE DATA IN THIS REPORT MAY NOT BE ADEQUATE FOR CONTRACTORS ESTIMATING PURPOSES.
13. SEE DRAWING G-002 FOR INDEX OF SHEETS AND LEGEND.
14. SITE DEVELOPMENT, EROSION SEDIMENT CONTROL AND STORMWATER MANAGEMENT ARE SHOWN ON SDP-18-046.
15. SEE CONTRACT 44-5046 FOR ASSOCIATED WATER MAIN EXTENSIONS.

WATER MAIN NOTES

1. ALL WATER MAINS SHALL BE D.I.P. CLASS 54 UNLESS OTHERWISE NOTED.
2. TOPS OF WATER MAIN SHALL HAVE A MINIMUM OF 4'-0" OF COVER UNLESS OTHERWISE NOTED.
3. VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
4. ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
5. FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANT SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD DETAIL AND SPECIFICATIONS.
6. THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
7. TRACER WIRES AND CONTINUITY TEST STATIONS SHALL BE INSTALLED ON ALL DIP AND PVC WATER MAINS IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL.
8. FOR PVC WATER MAINS, ALL RECORDS FOR THE QUALITY CONTROL AND QUALIFICATION TEST REQUIREMENTS NOTED IN SECTION 5.1 OF THE AWWA STANDARD C900 FOR PVC PRESSURE PIPE SHALL BE SUBMITTED WITH THE PIPE MATERIAL CERTIFICATIONS OR SHOP DRAWINGS PRIOR TO APPROVAL OF THE MATERIAL FOR USE. THE TEST RECORDS SHALL BE FOR THE PIPE TO BE INSTALLED UNDER THIS CONTRACT. ALL PVC PIPE SHALL CONTAIN MARKINGS TO ALLOW CROSS REFERENCING OF THE PIPE SUPPLIED TO THE TEST RECORDS RECEIVED.
9. UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL VALVES AND METALLIC FITTINGS USED WITH PVC WATER MAINS IN ACCORDANCE WITH VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. SEVENTEEN (17) POUND MAGNESIUM ANODES SHALL BE INSTALLED ON ALL VALVES AND DUCTILE IRON FITTINGS INCLUDING RESTRAINTS AND HARNESSES. TWELVE (12) POUND ZINC ANODES SHALL BE INSTALLED ON ALL STAINLESS STEEL FITTINGS AND SADDLES USED WITH PVC MAINS. ALL "TEES" USED WITH PVC MAINS SHALL BE DUCTILE IRON.
10. PROPER ASSEMBLY OF GASKETED PVC PIPE JOINTS: THE MANUFACTURER'S INSERTION LINE OF GASKETED PVC PIPE JOINTS INDICATES THE MAXIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. AFTER ASSEMBLY OF THE JOINT, THE INSERTION LINE SHALL REMAIN VISIBLE. DUAL INSERTION LINES ON GASKETED PVC PIPE INDICATE THE MAXIMUM AND MINIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. THE CONTRACTOR SHALL NOT OVER INSERT OR OVER HOME THE SPIGOT INTO THE BELL OF PVC PIPE.

WATER MAIN NOTES (CONTINUED)

11. ALL CHANGES IN HORIZONTAL OR VERTICAL DIRECTION OF PVC WATER PIPE SHALL BE MADE WITH MECHANICAL JOINT DUCTILE IRON(AWWA C153) STANDARD (1/4,1/8, 1/16, 1/32, 1/64) BENDS OR MECHANICAL JOINT, FULL BODY, SOLID SLEEVES MEETING AWWA C110. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE SOLID SLEEVES ARE PERMITTED, THE CONTRACTOR SHALL PROVIDE ONE FULL PIPE LENGTH (20-FOOT LONG) ON EITHER SIDE OF THE SOLID SLEEVE. THE CONTRACTOR SHALL USE A VIBRATORY PLATE COMPACTOR OR OTHER APPROVED MEANS TO THOROUGHLY COMPACT THE #57 STONE ON BOTH SIDES OF THE SOLID SLEEVE.
12. RESTRAINING JOINTS AT MECHANICAL JOINT SOLID SLEEVES SHALL BE ACHIEVED BY USING EBBA IRON SERIES 2000PV OR APPROVED EQUAL.
13. WHEN THE WATER MAIN IS UNDER A UTILITY, THE WATER MAIN PIPE SEGMENT SHALL BE CENTERED AT THE CROSSING.
14. IN COMPLIANCE WITH COMAR 09.20.01.03 AND THE SAFE DRINKING WATER ACT (SECTION 1417(a)(4)(B)), MATERIALS THAT COME IN CONTACT WITH WATER INTENDED FOR USE IN PUBLIC WATER SUPPLY SHALL COMPLY WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT, WHICH WENT INTO EFFECT IN MARYLAND IN JANUARY 2012.
15. IN ACCORDANCE WITH CODE OF MARYLAND REGULATIONS (COMAR) 26.04.01.33, DIRECT AND INDIRECT ADDITIVES, SUPPLIERS OF WATER SHALL ONLY USE PRODUCTS (ANY MATERIALS THAT COME IN CONTACT WITH WATER INTENDED FOR USE IN PUBLIC WATER SUPPLY) THAT MEET THE APPLICABLE AMERICAN NATIONAL STANDARDS INSTITUTE / NSF INTERNATIONAL (ANSI / NSF) STANDARDS FOR DIRECT OR INDIRECT DRINKING WATER ADDITIVES. THE PRODUCTS CAN ALSO BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY THE ANSI FOR SUCH TESTING (I.E. INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS RESEARCH AND TESTING, ONTARIO CA, UNDERWRITERS LABORATORY, NORTHBROOK IL, AND WATER QUALITY ASSOCIATION, LISLE IL)
16. AFTER DISINFECTION, SAMPLES MUST BE COLLECTED BY A STATE-CERTIFIED SAMPLER AND ANALYZED AT A STATE-CERTIFIED LABORATORY. THE SAMPLE RESULTS MUST BE SUBMITTED TO MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER SUPPLY PROGRAM FOR REVIEW.
17. THE PUMPING STATION SUCTION WATER MAIN SHOWN ON DRAWING NO. C-101 SHALL BE TESTED AT THE TEST PRESSURE FOR THE 550 ZONE AS SHOWN ON THIS SHEET.
    THE PUMPING STATION DISCHARGE WATER MAIN SHOWN ON DRAWINGS C-101 SHALL BE TESTED AT THE TEST PRESSURE FOR THE 630 ZONE AS SHOWN ON THIS SHEET.

QUANTITIES

ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
16" CLASS C-900 DR14 PVC	L.F.	155		
12" CLASS C-900 DR14 PVC	L.F.	60		
8" CLASS C-900 DR14 PVC	L.F.	315		
6" CLASS C-900 DR14 PVC	L.F.	20		
4" SCHEDULE 80 PVC	L.F.	68		
FIRE HYDRANT AND 6" VALVE	EA.	2		
NAME OF UTILITY CONTRACTOR:				
		CHECKBOX		
		AS-BUILT DATE		
			SURVEY AND DRAFTING DIVISION	

TYPE OF BUILDING:	COMMERCIAL
NUMBER OF PARCELS:	N/A
NUMBER OF WATER HOUSE CONNECTIONS:	N/A
PRESSURE ZONE:	550, 630
TEST GRADIENT:	780 (550 ZONE) 860 (630 ZONE)
TEST PRESSURE:	166 psi (550 ZONE) 201 psi (630 ZONE)
DRAINAGE AREA:	MIDDLE PATUXENT

CONTROL NOTE

THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON GPS OBSERVATIONS FROM HOWARD COUNTY GEODETIC SURVEY CONTROL POINTS.

NAD 1983 / 2011 (HORIZONTAL)
NAVD 1988 (VERTICAL)

35C2	N 563920.82 E 1344204.19 ELEV. 463.41	35C5	N 562148.44 E 1344554.49 ELEV. 451.54

GRAPHIC SCALE
0 1 2
600 300 600
SCALE: 1" = 600'

OWNER'S/DEVELOPER'S CERTIFICATION

"I/WE CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO THE BEGINNING OF THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

Kerri Dinsmore 12/26/2018
OWNERS / DEVELOPERS SIGNATURE DATE

Kerri Dinsmore Project Manager
PRINTED NAME & TITLE

DESIGN CERTIFICATION

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

12/18/2018
DESIGNERS SIGNATURE DATE

LARS PETERSON
PRINTED NAME

MD REGISTRATION NO. 33984
P.E. R.L.S. OR R.L.A. (CIRCLE ONE)

PURPOSE STATEMENT:

CONTRACT NO. 44-5036 WILL PROVIDE A NEW WATER PUMPING STATION TO SERVE THE 630 WEST WATER ZONE WHICH WILL PROVIDE BACKUP WATER SUPPLY TO STRENGTHEN THE 630 WEST WATER ZONE. ALSO INCLUDED ARE ASSOCIATED COMMUNICATIONS UPGRADES AT THE HARPERS CHOICE ELEVATED WATER TANK. SEE CONTRACT 44-5046 FOR THE ASSOCIATED SUCTION AND DISCHARGE WATER MAIN EXTENSIONS.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33984, Expiration Date 01/15/2019.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-28-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

KCI TECHNOLOGIES
ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS
936 Ridgebrook Road
Sparks, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

STATE OF MARYLAND — LARS A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES: KFJ				
DRN: KFJ				
CHK: GW/LP				
DATE: DEC 2018	BY	NO.	REVISION	DATE

TITLE SHEET

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. G-001
SCALE AS SHOWN
SHEET 1 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

Date: 12/26/2018 - 8:47am User: kevin.jackson
M:\2018\13160130601\Drawings\G-001 Cover Sheet_PS.dwg

INDEX OF SHEETS

SHEET NO.	DRAWING NO.	DESCRIPTION
1	G-001	TITLE SHEET
2	G-002	INDEX OF SHEETS, SUGGESTED SEQUENCE OF CONSTRUCTION & LEGEND
3	C-101	PUMPING STATION SITE PLAN
4	CP-001	CATHODIC PROTECTION PLAN
5	A-001	PUMPING STATION LEGEND & ABBREVIATIONS
6	A-002	PUMPING STATION LIFE SAFETY PLAN
7	A1-101	PUMPING STATION LOWER LEVEL PLAN
8	A1-102	PUMPING STATION FIRST FLOOR PLAN
9	A1-103	PUMPING STATION INTERMEDIATE FLOOR PLAN
10	A1-104	PUMPING STATION ROOF PLAN
11	A1-201	PUMPING STATION NORTH & EAST ELEVATIONS
12	A1-202	PUMPING STATION SOUTH & WEST ELEVATIONS
13	A1-301	PUMPING STATION BUILDING SECTIONS
14	A1-302	PUMPING STATION BUILDING SECTIONS
15	A1-303	PUMPING STATION BUILDING SECTIONS WALL SECTIONS
16	A1-304	PUMPING STATION DETAILS
17	A1-305	PUMPING STATION WALL SECTIONS
18	A1-501	PUMPING STATION DETAILS
19	A1-601	PUMPING STATION DOOR SCHEDULE & DETAILS
20	A1-602	PUMPING STATION SCHEDULE & DETAILS
21	S1-001	GENERAL STRUCTURAL NOTES
22	S1-002	GENERAL STRUCTURAL NOTES
23	S1-101	PUMPING STATION LOWER LEVEL PLAN
24	S1-102	PUMPING STATION FIRST FLOOR PLAN
25	S1-103	PUMPING STATION CRANE PLAN
26	S1-104	PUMPING STATION CEILING PLAN
27	S1-105	PUMPING STATION ROOF PLAN
28	S1-201	MOMENT FRAME SECTION AND DETAILS
29	S1-202	ROOF TRUSS ELEVATIONS, LOADING AND NOTES
30	S1-301	SECTIONS
31	S1-302	SECTIONS
32	S1-303	SECTIONS
33	S1-304	SECTIONS
34	S1-305	SECTIONS
35	S1-306	SECTIONS
36	S1-401	PARTIAL CONTROL ROOM CEILING FAN
37	S1-402	PARTIAL FUEL TANK FOUNDATION PLAN AND SECTIONS
38	S1-501	TYPICAL DETAILS
39	S1-502	TYPICAL DETAILS
40	M-001	PROCESS GENERAL NOTES, ABBREVIATIONS AND LEGEND
41	M1-101	PUMPING STATION LOWER LEVEL
42	M1-102	PUMPING STATION FIRST FLOOR
43	M1-103	CEILING PLAN
44	M1-301	PUMPING STATION SECTIONS
45	M1-302	PUMPING STATION SECTIONS
46	M1-401	ENLARGED VIEWS
47	M1-501	PROCESS DETAILS
48	M1-502	HVAC DETAILS
49	M1-503	HVAC DETAILS
50	M1-504	PLUMBING DETAILS
51	M1-505	SUPPORT DETAILS
52	M1-506	PIPE SUPPORT DETAILS
53	M1-601	PROCESS SCHEMATICS
54	M1-602	SCHEMATICS
55	M1-701	MECHANICAL SCHEDULES
56	M1-901	PUMPING STATION 3D VIEWS

INDEX OF SHEETS (CONTINUED)

SHEET NO.	DRAWING NO.	DESCRIPTION
57	E-001	ELECTRICAL LEGEND AND GENERAL NOTES
58	E1-101	ELECTRICAL SITE PLAN
59	E1-102	POWER PLAN - LOWER LEVEL
60	E1-103	POWER PLAN - FIRST FLOOR
61	E1-104	LIGHTING PLAN - LOWER LEVEL
62	E1-105	LIGHTING PLAN - FIRST FLOOR
63	E1-501	ELECTRICAL DETAILS I
64	E1-502	ELECTRICAL DETAILS II
65	E1-503	ELECTRICAL DETAILS III
66	E1-601	SINGLE LINE DIAGRAM
67	E1-701	ELECTRICAL SCHEDULES
68	I-001	LEGEND AND CONTROL DIAGRAM SYMBOLS
69	I-002	INTEGRATOR INFORMATION
70	I-601	COMMUNICATIONS DIAGRAM
71	I1-601	PUMPING SYSTEM P&ID
72	I1-602	PUMPING SYSTEM RISER DIAGRAM
73	I1-603	GENERATOR SYSTEM P&ID AND RISER DIAGRAM
74	I1-604	METERING PUMP CONTROLS
75	I1-605	PUMP CONTROL PANEL ECD AND ELEVATION
76	I1-606	PUMP CONTROL ECD SHEET 1
77	I1-607	PUMP CONTROL ECD SHEET 2
78	I1-608	VENTILATION CONTROL ECDS
79	I1-609	VENTILATION PANEL DETAILS
80	I2-101	HARPER'S CHOICE ELEVATED TANK MODIFICATIONS
81	I2-601	HARPER'S CHOICE ELEVATED TANK P&ID AND RISER DIAGRAM

SUGGESTED SEQUENCE OF CONSTRUCTION

THE FOLLOWING SEQUENCE OF CONSTRUCTION IS NOT A COMPLETE LIST OF TASKS OR WORK REQUIRED TO COMPLETE THE CONTRACT REQUIREMENTS. THE SEQUENCE OF CONSTRUCTION MAY BE MODIFIED OR REVISED AT THE REQUEST OF THE CONTRACTOR WITH THE APPROVAL OF THE COUNTY PRIOR TO THE START OF CONSTRUCTION.

1. PREPARE THE SITE AND PERFORM CONSTRUCTION STAKE OUT.
2. INSTALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON SDP-18-046 DRAWINGS. THE CONTRACTOR SHALL FOLLOW THE SEQUENCE OF CONSTRUCTION FOR SEDIMENT CONTROLS AS SHOWN ON THE APPROVED SDP-18-046.
3. CONSTRUCT WORK SHOWN.
4. OBTAIN NECESSARY BUILDING AND TRADE PERMITS.
5. PERFORM REQUIRED SYSTEMS TESTING AND STARTUP.
6. PERFORM REQUIRED WATER PIPING SYSTEM DISINFECTION PER VOLUME IV AND LATEST AWWA REQUIREMENTS. SAMPLING AND TESTING SHALL BE IN ACCORDANCE WITH VOLUME IV.
7. COORDINATE WITH HOWARD COUNTY FOR THE OPENING OF ALL VALVES INSTALLED UNDER CONTRACT NO. 44-5046.
8. UPON COMPLETION OF WORK, REMOVE EROSION AND SEDIMENT CONTROL DEVICES.

ANNOTATION LEGEND

DRAWING NUMBER
M1-101
- SEQUENTIAL NUMBER
- DRAWING TYPE
- FACILITY NUMBER
- DISCIPLINE

DISCIPLINE	CODE
GENERAL	G
CIVIL	C
ARCHITECTURAL	A
STRUCTURAL	S
MECHANICAL	M
ELECTRICAL	E
INSTRUMENTATION	I

FACILITY

NO.	DESCRIPTION
1	CEDAR LANE PUMPING STATION
2	HARPERS CHOICE WATER TANK
3	BUREAU OF UTILITIES

DRAWING TYPE

TYPE NO.	DESCRIPTION
0	GENERAL (SYMBOLS LEGEND, NOTES, ETC.)
1	PLANS
2	ELEVATIONS
3	SECTIONS
4	LARGE SCALE VIEWS (ENLARGED PLANS, ETC.)
5	DETAILS
6	DIAGRAMS
7	SCHEDULES
8	USER DEFINED
9	3D VIEWS

LEGEND

EXISTING

- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FIRE HYDRANT
- EXISTING VALVE
- W — EXISTING WATER MAIN
- S — EXISTING SEWER MAIN
- G — EXISTING GAS MAIN
- UE — EXISTING UNDERGROUND ELECTRIC
- OE — EXISTING OVERHEAD ELECTRIC
- OH — EXISTING OVERHEAD WIRE
- FO — EXISTING FIBER OPTIC
- UT — EXISTING UNDERGROUND TELECOMMUNICATIONS
- EXISTING SEWER EASEMENT
- PROPERTY BOUNDARY/RIGHT OF WAY
- 630/550 EXISTING PRESSURE ZONE
- GUARDRAIL
- TREELINE
- TRAVERSE POINT

PROPOSED

- WATER MAIN
- FIRE HYDRANT
- VALVE
- CONTINUITY TEST STATION
- TEST PIT (COMPLETED)
- SOIL BORING (SEE GEOTECHNICAL REPORT)
- STORM DRAIN

KCI TECHNOLOGIES PROJECT No.: 131601306.01

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33984, Expiration Date 01/15/2019.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-28-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

KCI TECHNOLOGIES
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STATE OF MARYLAND — LARS A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES: KFJ
DRN: KFJ
CHK: GW/LP
DATE: DEC 2018

BY	NO.	REVISION	DATE

INDEX OF SHEETS, SUGGESTED SEQUENCE OF CONSTRUCTION & LEGEND

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

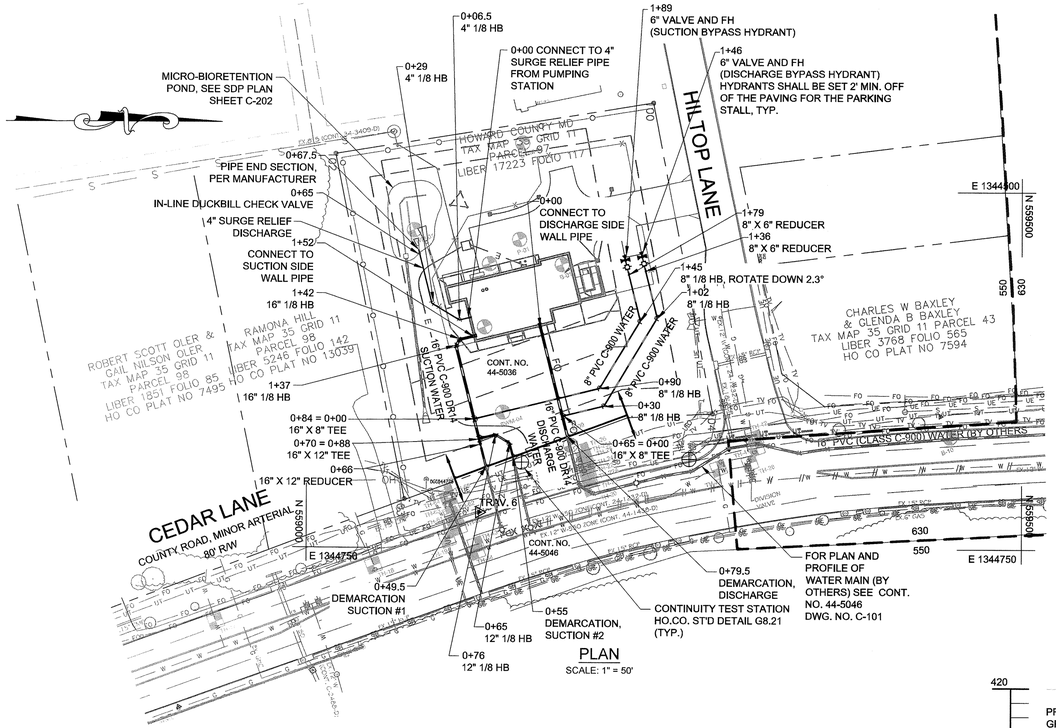
CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. G-002
SCALE AS SHOWN

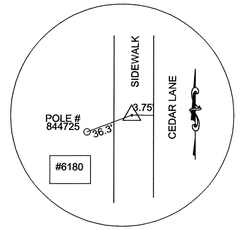
KCI TECHNOLOGIES PROJECT No.: 131601306.01



PLAN
SCALE: 1" = 50'

WATER MAIN STAKE-OUT SCHEDULE

STATION	DESCRIPTION	NORTHING	EASTING
PUMPING STATION SUCTION PIPE 1			
0+49.5	DEMARCATION, SUCTION #1	559125.33	1344692.96
0+66	16" X 12" REDUCER	559121.40	1344677.17
0+70=0+88	16" X 12" TEE	559120.43	1344673.29
0+84=0+00	16" X 8" TEE	559116.97	1344659.40
1+37	16" 1/8 HB	559104.15	1344607.98
1+42	16" 1/8 HB	559106.72	1344603.69
1+52	CONNECT TO WALL PIPE	559115.98	1344601.38
PUMPING STATION SUCTION PIPE 2			
0+55	DEMARCATION, SUCTION #2	559144.18	1344685.88
0+65	12" 1/8 HB	559141.77	1344676.21
0+76	12" 1/8 HB	559132.08	1344670.39
PUMPING STATION DISCHARGE PIPE			
0+00	CONNECT TO WALL PIPE	559163.03	1344594.59
0+65=0+00	16" X 8" TEE	559178.65	1344657.24
0+79.5	DEMARCATION, DISCHARGE	559182.25	1344671.69
SUCTION BYPASS HYDRANT PIPE			
0+90	8" 1/8 HB	559204.65	1344637.54
1+45	8" 1/8 HB	559233.03	1344590.32
1+79	8" X 6" REDUCER	559224.98	1344558.04
1+89	6" VALVE & FH	559222.45	1344547.88
DISCHARGE BYPASS HYDRANT PIPE			
0+30	8" 1/8 HB	559207.76	1344649.98
1+02	8" 1/8 HB	559244.86	1344588.22
1+36	8" X 6" REDUCER	559236.74	1344555.65
1+46	6" VALVE & FH	559234.21	1344545.48
PUMPING STATION SURGE RELIEF PIPE			
0+00	CONNECT TO PIPE AT WALL	559112.78	1344588.53
0+06.5	4" 1/8 HB	559106.48	1344590.10
0+29	4" 1/8 HB	559087.16	1344578.49
0+67.5	4" PIPE END SECTION	559077.88	1344541.24



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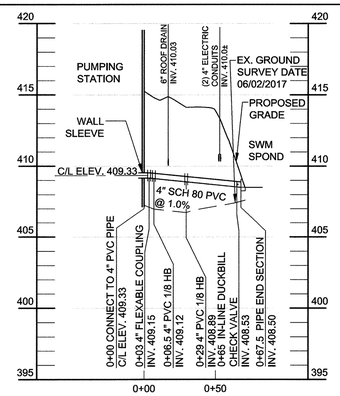
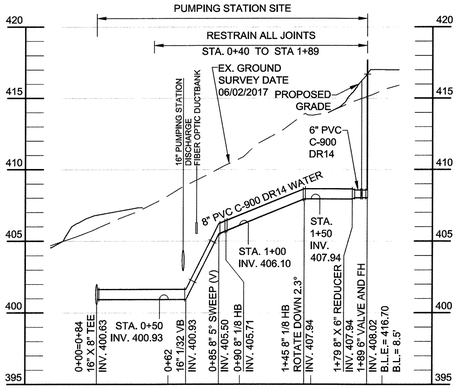
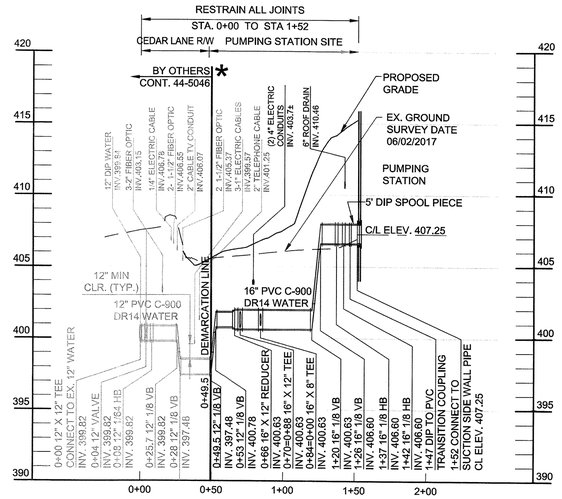


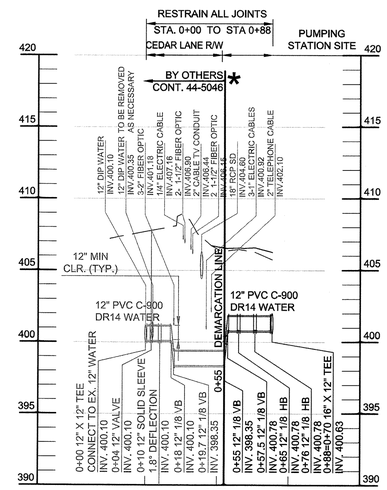
PROFILE - 4" SURGE RELIEF
SCALE: HORIZ. 1" = 50'
VERT. 1"= 5'



PROFILE - 8" SUCTION BYPASS HYDRANT LEAD
SCALE: HORIZ. 1" = 50'
VERT. 1"= 5'



PROFILE - PUMPING STATION SUCTION PIPE 1
SCALE: HORIZ. 1" = 50'
VERT. 1"= 5'



PROFILE - PUMPING STATION SUCTION PIPE 2
SCALE: HORIZ. 1" = 50'
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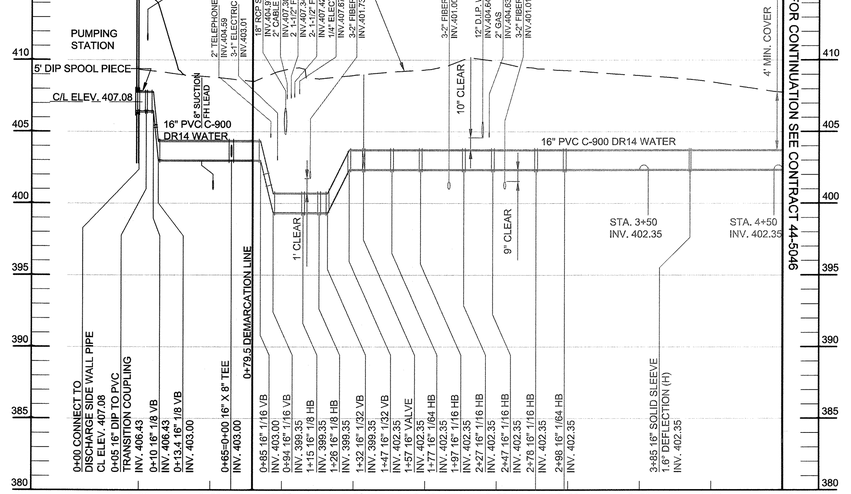
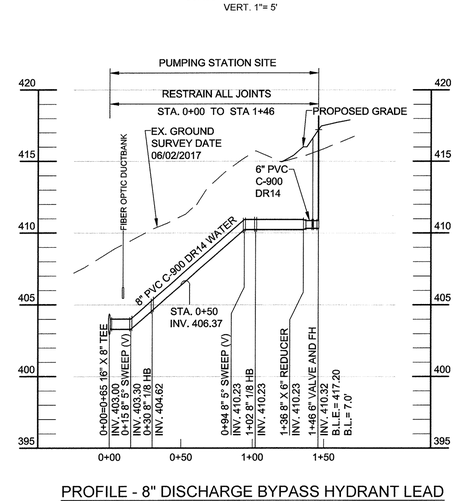


PROFILE - 16" PUMPING STATION DISCHARGE
SCALE: HORIZ. 1" = 50'
VERT. 1"= 5'



PROFILE - 8" DISCHARGE BYPASS HYDRANT LEAD
SCALE: HORIZ. 1" = 50'
VERT. 1"= 5'

* THE CONTRACTOR SHALL REMOVE THE TEMPORARY CAP AND BUTTRESS AND FLUSH THE WATER MAIN CONSTRUCTED UNDER CONTRACT NO. 44-5046 PRIOR TO MAKING THE CONNECTION.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33984 , Expiration Date 01/15/2019.

SCALE: 1" = 50'

SCALE: 1" = 5'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — LARS A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES: KFJ
DRN: KFJ
CHK: GW/LP
DATE: DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

PUMPING STATION SITE PLAN

CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. C-101
SCALE AS SHOWN
SHEET 3 OF 81

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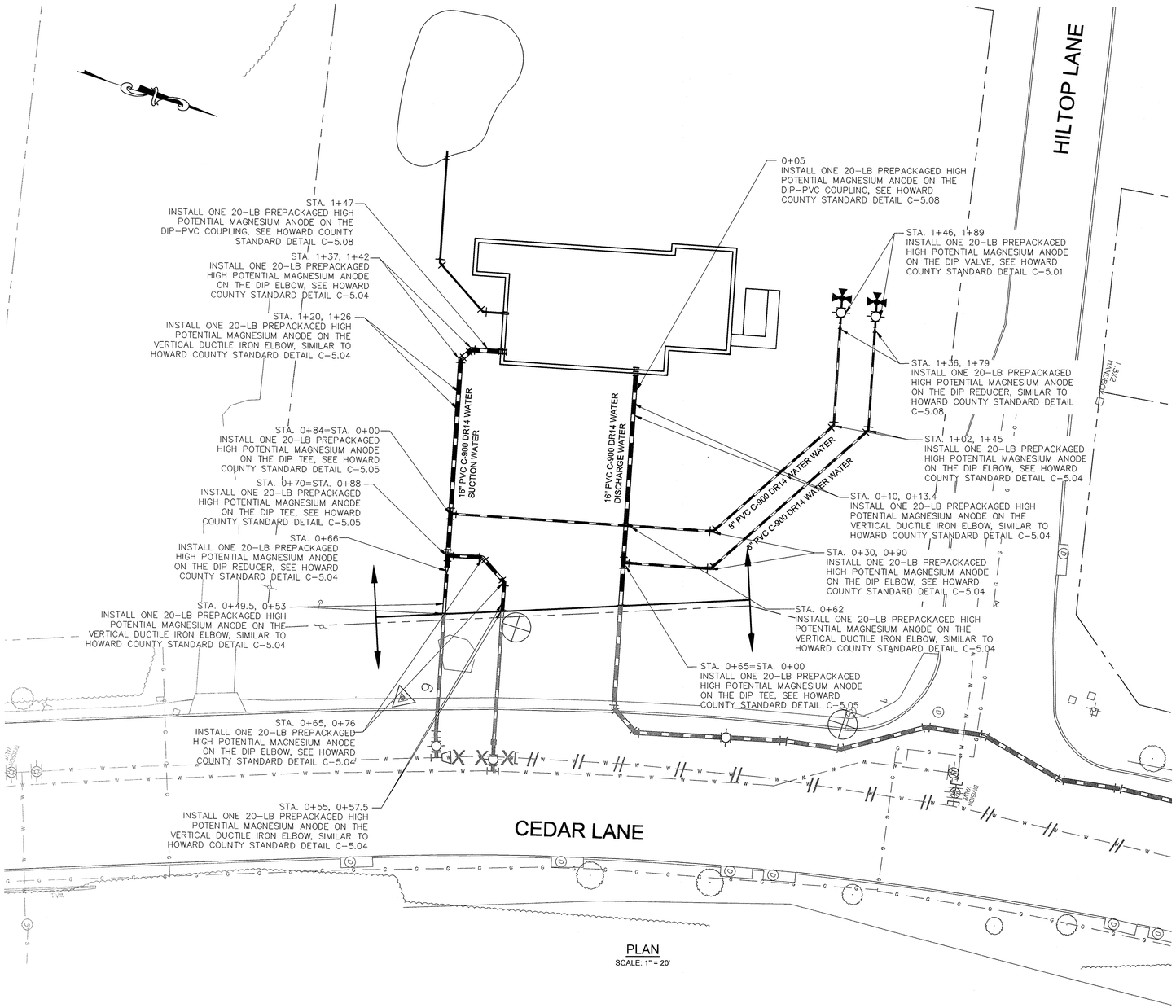

NOTES:

1. ALL NEW DUCTILE IRON AND STEEL FITTINGS, VALVES, COUPLINGS, TAPPING SLEEVES, REDUCERS, AND FIRE HYDRANT PIPE ALONG THE PVC WATER MAIN ARE TO BE PROVIDED WITH CORROSION PROTECTION, SEE HOWARD COUNTY STANDARD DETAIL C-5.01 THROUGH C-5.15.
2. FOR THERMITE WELD TO CONNECTOR PLATE, SEE HOWARD COUNTY STANDARD DETAIL C-5.13.
3. FOR HORIZONTAL THERMITE WELDS TO DUCTILE IRON PIPE, SEE HOWARD COUNTY STANDARD DETAIL C-3.04. FOR VERTICAL THERMITE WELDS TO DUCTILE IRON PIPE, SEE HOWARD COUNTY STANDARD DETAIL C-3.05.
4. FOR PLACEMENT OF ANODES, SEE HOWARD COUNTY STANDARD DETAIL C-5.14 AND C-5.15.
5. DO NOT MAKE THERMITE WELDS TO PVP PIPE.
6. POLYETHYLENE ENCASEMENT SHALL NOT BE INSTALLED ON NEW DUCTILE IRON WATER PIPING.
7. INSTALL SEPARATOR MESH ON WATER MAIN AT EXISTING UTILITY CROSSINGS OF THERE IS LESS THAN 12 INCHES OF SPACING BETWEEN THEM, SEE HOWARD COUNTY STANDARD DETAILS C-4.06.
8. INSTALL ONE 12-LB PREPACKAGED ZINC ANODE ON ALL RESTRAINING HARNESSES, SEE HOWARD COUNTY STANDARD DETAIL C-5.10.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 44991, Expiration Date 12.20.2018

SCALE: 1" = 20'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-28-18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

RUSSELL CORROSION CONSULTANTS, LLC
7130 Minstrel Way · Suite 230
Columbia, MD · 410-997-4481
www.RussellCorrosion.com

STATE OF MARYLAND — YAZID ZIARIS — No. 44991 — PROFESSIONAL ENGINEER

DES: YZ
DRN: AMT
CHK: DD
DATE: DEC. 2018

BY	NO.	REVISION	DATE

CATHODIC PROTECTION PLAN

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. CP-001
SCALE AS SHOWN
SHEET 4 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

Dec 18, 2018 - 9:15am User: kevin.jackson
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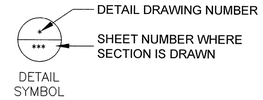
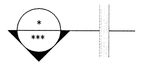
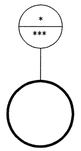
DETAIL SYMBOLS




BUILDING SECTION SYMBOL


WALL SECTION SYMBOL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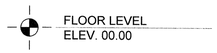
FLOOR LEVEL ELEV. 00.00

NORTH ARROW

ACTUAL NORTH


ELEVATION SYMBOL

INDICATES DIRECTION OF CUTTING PLANE

INTERIOR ELEVATION INDICATOR WITH MULTIPLE VIEWS

ROOM NAME & NUMBER

CONSTRUCTION NOTE

DOOR SYMBOL


WALL TYPE SYMBOL

WINDOW, CURTAIN WALL & LOUVER SYMBOL

EQUIPMENT SYMBOL


KEY NOTE INDICATOR


REVISION SYMBOL

COLUMN BUBBLE

ABBREVATIONS

AFF	above finish floor	MBL	marble	GWB	gypsum wall board
AT	acoustical tile	MDO	medium density overlay	GYP	gypsum
AC	air conditioning	MO	masonry opening	HDW	hardware
ALT	alternate	MTL	metal	HGT	height
ALUM	aluminum	MAX	maximum	HTG	heating
AB	anchor bolt	MECH	mechanical	HVAC	heating ventilating air conditioning
APPROX	approximate	MED	medium		
ARCH	architect (ural)	MIN	minimum	HC	hollow core
ASPH	asphalt	MISC	miscellaneous	HM	hollow metal
AUTO	automatic	NOM	nominal	HOR	horizontal
BSMT	basement	N	north	HB	hose bib
BPL	bearing plate	NIC	not in contract	HWH	hot water heater
BFF	below finish floor	NTS	not to scale	INCL	include (d) (ing)
BM	bench mark	NUM	number	ID	inside diameter
BIT	bituminous	OC	on center	INSUL	insulation
BLK	block	OPG	opening	IG	insulated glass
BD	board	OD	outside diameter	INT	interior
BS	both sides	OA	overall	PL	property line
BOT	bottom	OH	overhead	QT	quarry tile
BLDG	building	PFG	polished float glass	R	radius
BUR	built up roof	PNL	panel	REF	reference
C	cove	PER	perimeter	RA	return air
CI	cast iron	PLAS	plaster	REV	revision, revised
CB	catch basin	PL	plate	ROW	right of way
CLG	ceiling	PLK	concrete plank-painted	R	riser
CEM	cement	PWD	plywood	RM	room
CT	ceramic tile	PT	point	RO	rough opening
COL	column	PVC	pounds per	SCH	schedule
CONC	concrete	PSF	polyvinyl chloride square foot	SEC	section
CMU	concrete masonry unit			SIM	similar
CONST	construction	PSI	pounds per square inch	S	south, switch (es)
CONT	continuous, continue			SF	seamless floor
CJT	control joint	E	east, enamel paint	SPEC	specification (s)
CU	cubic	ELEC	electric (al)	SQ	square
DL	dead load	EWC	electric water cooler	ST	straight
DEM	demolish, demolition	ELEV	elevation	STL	steel
DTL	detail	EMER	emergency	STO	storage
DIA	diameter	EST	estimate	STR	structural
DIM	dimension	EW	each way	SYS	system
DR	door	EXH	exhaust	TFG	tempered float glass
DS	downspout	EXIST	existing	TH	threshold
D	drain	EXP	expansion, exposed	TIG	tempered insulated glass
DWG	drawing	EXT	exterior	THK	thick (ness)
DF	drinking fountain	FIN	finish (ed)	T&G	tongue & groove
HW	hand wash station	FE	fire extinguisher	T	tread
INV	invert	FEC	fire extinguisher cabinet	TYP	typical
JT	joint	FFL	finished floor line	VERT	vertical
KO	knock out	FLG	flashing	VCT	vinyl composition tile
LBL	label	FLR	floor (ing)	VB	vinyl base
LAV	lavatory	FD	floor drain	VCD	vinyl covered drywall
LH	left hand	FTG	footing	WC	water closet
L	length, latex	FND	foundation	WP	waterproof (ing)
LT	light	GA	gauge	WWF	welded wire fabric
LL	live load	GC	general contractor	W	west, width, wide
MH	manhole	GD	grade, grading	W/	with
MFR	manufacture (er)	GHM	galvanized hollow metal	WD	wood
MAS	masonry	GMU	glazed masonry unit	WB	wood base

MATERIALS

(ARCHITECTURAL AND STRUCTURAL DRAWINGS)

- EARTH
- CAST STONE OR PRECAST CONCRETE
- WOOD FRAMING AND FURRING
- CONCRETE
- GRAVEL OR CRUSHED STONE
- CONCRETE MASONRY UNIT
- STEEL
- PLASTER, GYPSUM BOARD OR STUCCO
- WOOD - CONTINUOUS BLOCKING AND SHIMS
- PLYWOOD (SMALL SCALE)
- INSULATION - RIGID
- INSULATION - BATT
- ALUMINUM
- GLASS
- WOOD, FINISHED
- PLYWOOD
- METAL

KCI TECHNOLOGIES PROJECT No.: 1316013O6.01

LEO MATANGUIHAN
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HOWARD COUNTY, MARYLAND

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CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — LEO MATANGUIHAN — 7269 — REGISTERED ARCHITECT — 12/20/18

DES:	LM
DRN:	LM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION
LEGEND & ABBREVIATIONS

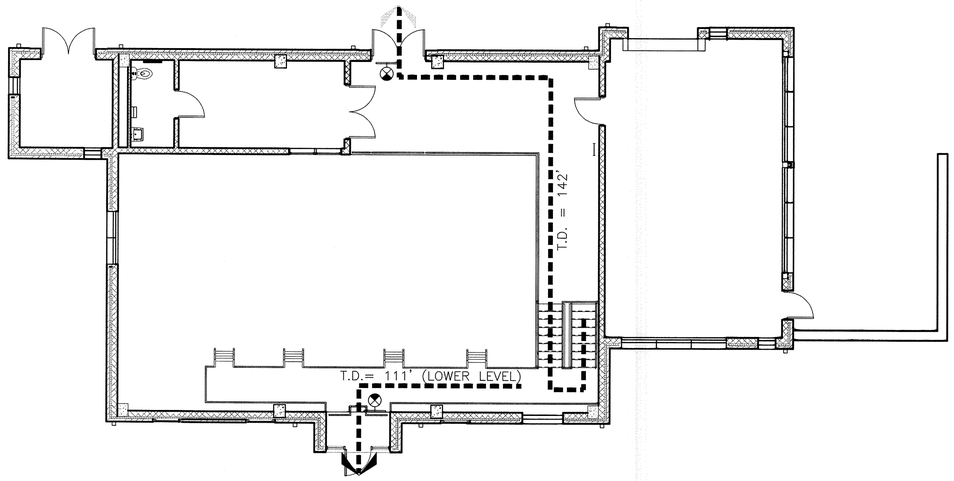
600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

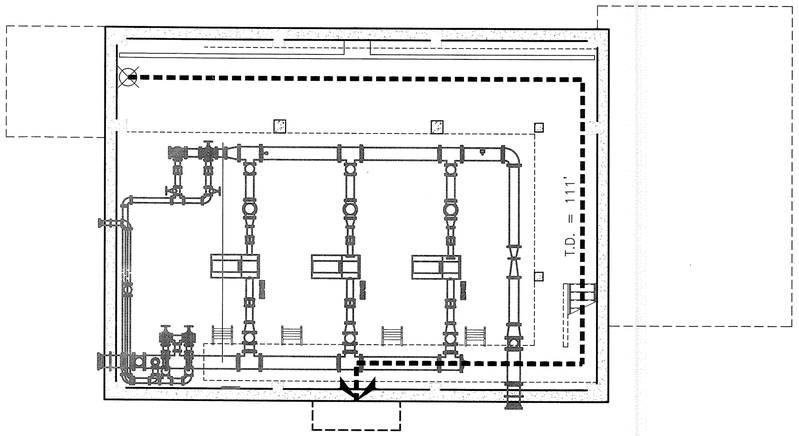
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. A-001
SCALE AS SHOWN
SHEET 5 OF 81



1 LIFE SAFETY- FIRST FLOOR
SCALE: 1/8" = 1'-0"



2 LIFE SAFETY- LOWER LEVEL
SCALE: 1/8" = 1'-0"

APPLICABLE CODE: INTERNATIONAL BUILDING CODE 2015 WITH HOWARD COUNTY AMENDMENTS			
PUMP HOUSE BUILIDNG	THE PROPOSED BUILDING IS A SINGLE STOREY STRUCTURE WITH AN OPEN FLOOR PLAN THAT HOUSES THE MECHANICAL EQUIPMENT. THE BUILDING HAS A GRADE LEVEL AND LOWER LEVEL. THE STRUCTURE IS MASONRY BEARING WALLS WITH PRECAST CONCRETE CEILING PLANKS WITH SLOPED SHINGLED ROOF AND INTERIOR CMU PARTITIONS.		
CODE DATA	PROPOSED	PERMISSIBLE	REMARKS
1. USE GROUP	F2, LOW HAZARD OCCUPANCY,	GROUP F2 AS PER IBC 306.3	IN COMPLIANCE
2. AUTOMATIC SPRINKLER SYSTEM	PROPOSED BUILDING IS NOT SPRINKLERED.		IN COMPLIANCE
3. TYPE OF CONSTRUCTION	TYPE II-B NON COMBUSTIBLE, UNPROTECTED NON-COMBUSTIBLE CONCRETE STRUCTURE WITH BEARING AND NON-LOAD BEARING CONCRETE/MASONRY PARTITIONS.	TYPE II-B, AS PER IBC CHAPTER 6, TABLE - 601	IN COMPLIANCE
4. HEIGHT AND AREA CALCULATIONS	THE BUILDING IS SINGLE STORY WITH FLOOR AREA, NUMBER OF FLOORS AND BUILDING HEIGHT: LOWER LEVEL: 2,460 SF; WALKWAY: 189 SF FIRST FLOOR: 1,642 SF NUMBER OF FLOORS = 1 PLUS LOWER LEVEL (ONE ROOM) BUILDING HEIGHT = 30'-2" TOP ROOF RIDGE (ABOVE GRADE)	THE ALLOWABLE HEIGHT, BUILDING AREA AND NUMBER OF FLOORS AS PER TABLE 5034.3, 504.4 & 506.2 ALLOWABLE GORSS AREA : 18,000 SF NUMBER OF FLOORS : 3 HEIGHT : 55'	IN COMPLIANCE

CODE DATA	PROPOSED	PERMISSIBLE	REMARKS
5. FIRE RESISTANCE RATING OF BUILDING ELEMENTS	EXTERIOR WALL= LOAD BEARING CMU BACKING WITH BRICK FASCIA NONBEARING INTERIOR WALLS = CMU, NON-COMBUSTIBLE FLOORS = NON-COMBUSTIBLE STRUCTURAL SLAB ROOF CONSTRUCTION =CONCRETE ROOF PLANKS CEILING WITH LIGHT GAUGE STEEL FRAMING ROOF FRAMING (0 HOUR RATED)	AS PER TABLE 601 AND 602 - ALL EXTERIOR/ INTERIOR WALLS, FLOOR AND ROOF CONSTRUCTIONS ARE REQUIRED TO HAVE 0 HRS FIRE RATING.	IN COMPLIANCE
6. OCCUPANCY LOAD	EXPECTED OCCUPANT LOAD: (IBC: TABLE 1004.1.2) (NFPA101: 7.3, TABLE 7.3.1.2) LOCATION FLOOR AREA/S.F. PER PERSON=OCCUPANT LOAD+OTHER LOAD = TOTAL LOAD EQUIPMENT ROOM 4,291 SF /300= 15 + 0 = 15 TOTAL OCCUPANT LOAD = 15 (NOTE: NFPA ALLOWS USE OF ACTUAL OCCUPANT LOAD FOR "SPECIAL PURPOSE INDUSTRIAL" IN CALCULATING OCCUPANT LOAD, BUT IBC IS MORE STRINGENT AT 300 SF PER PERSON AND IS USED IN DETERMINING EGRESS CAPACITIES.)		
7. EGRESS COMPONENT WIDTH - DOORS.	PROPOSED MINIMUM DOOR WIDTH = 32".	AS PER SECTION 1005.2: CALCULATED MINIMUM DOOR WIDTH USING OCCUPANCY LOAD IS LESS THAN THE REQUIRED MINIMUM WIDTH OF 32". THEREFORE, MIN DOOR WIDTHS ARE PROPOSED TO BE MORE THAN 32".	IN COMPLIANCE
8. NO. OF EXITS	SPACE NAMES / MIN. REQ'D / NO. PROV'D / IBC REFERENCE LOWER LEVEL PUMP 2 2 IBC:TABLE 1006.2.2.2 UPPER LEVEL PUMP 1 1 IBC:TABLE 1006.3.2(2)	SECTION 1006.2.2.2 LOWER LEVEL PUMP ROOM: EGRESS DISTANCE IS LESS THAN 150' AND ONE EXIT WITH A LADDER IS PERMITTED. EGRESS DISTANCE IN UPPER LEVEL PUMP ROOM IS LESS THAN 49 OCCUPANTS AND 75' EGRESS TRAVEL DISTANCE PER TABLE 1006.3.2(2), THEREFORE, ONE EXIT IS ALLOWED	IN COMPLIANCE
9. LENGTH OF EXIT ACCESS	THE MAXIMUM EXIT TRAVEL DISTANCE IS 142'-0" IN THE LOWER PUMP ROOM LEVEL.	PERMISSIBLE MAXIMUM COMMON PATH AND EXIT TRAVEL DISTANCE ARE AS PER TABLES 1006.2.1 & 1017.2 FOR OCCUPANCY GROUP F2 ARE: COMMON PATH OF TRAVEL < 75 FT (NON-SPRINKLERED) EXIT TRAVEL DISTANCE < 300 FT (NON-SPRINKLERED)	IN COMPLIANCE

LEGEND

- REMOTE POINT
- APPROXIMATE PATH OF TRAVEL
- C.P.T COMMON PATH OF TRAVEL
- T.D TRAVEL DISTANCE
- EXIT SIGN

0 1 2 3
4 8 12 16 20 24
SCALE: 1/8"= 1'-0"

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HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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DES: LM					
DRN: LM					
CHK: LP					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

PUMPING STATION
LIFE SAFETY PLAN

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

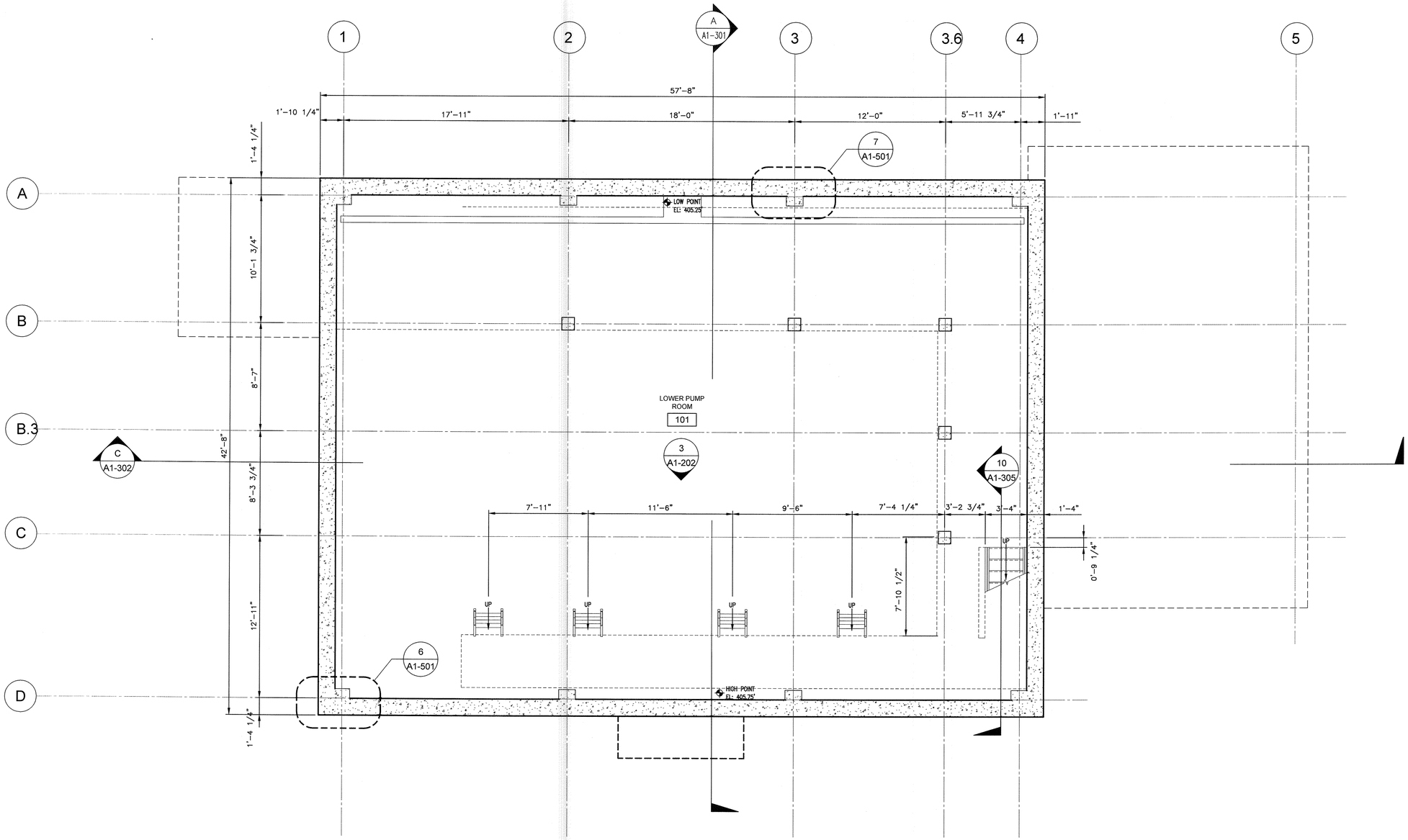
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A-002
SCALE AS SHOWN
SHEET 6 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01



1 LOWER LEVEL PLAN

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

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

KCI TECHNOLOGIES PROJECT No.: 1316013306.01

LEO MATANGUIHAN
ARCHITECT
307 Hopkins Road • Baltimore, Maryland 21212

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CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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DES:	LM
DRN:	LM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION
LOWER LEVEL PLAN

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

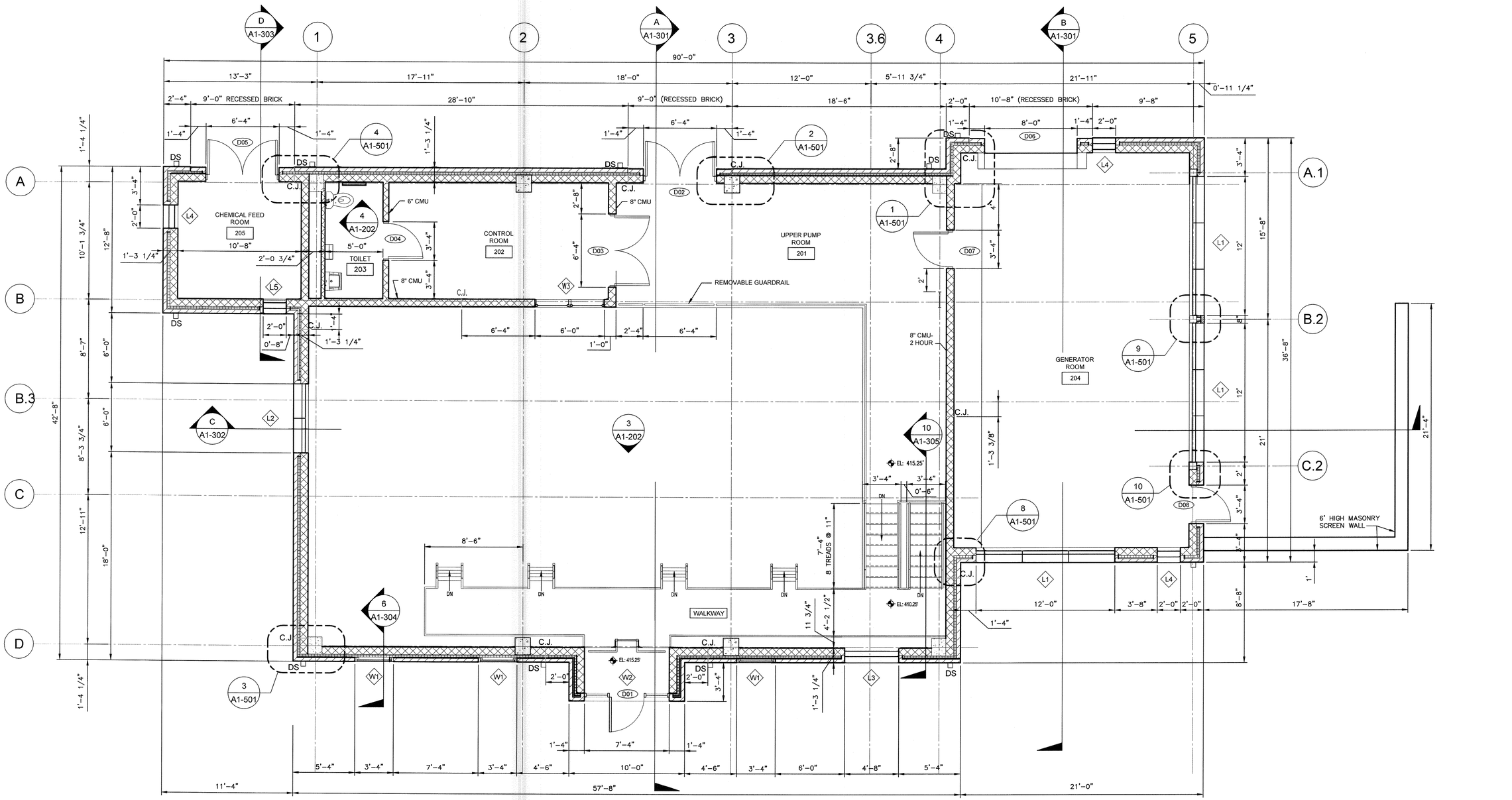
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-101
SCALE AS SHOWN
SHEET 7 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01



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

0 1 4 8 12
2 6 10
SCALE: 1/4"= 1'-0"

LEO MATANGUIHAN
ARCHITECT
307 Hopkins Road • Baltimore, Maryland 21212

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HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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DES:				
DRN:				
CHK:				
DATE: DEC 2018	BY	NO.	REVISION	DATE

PUMPING STATION
FIRST FLOOR PLAN

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

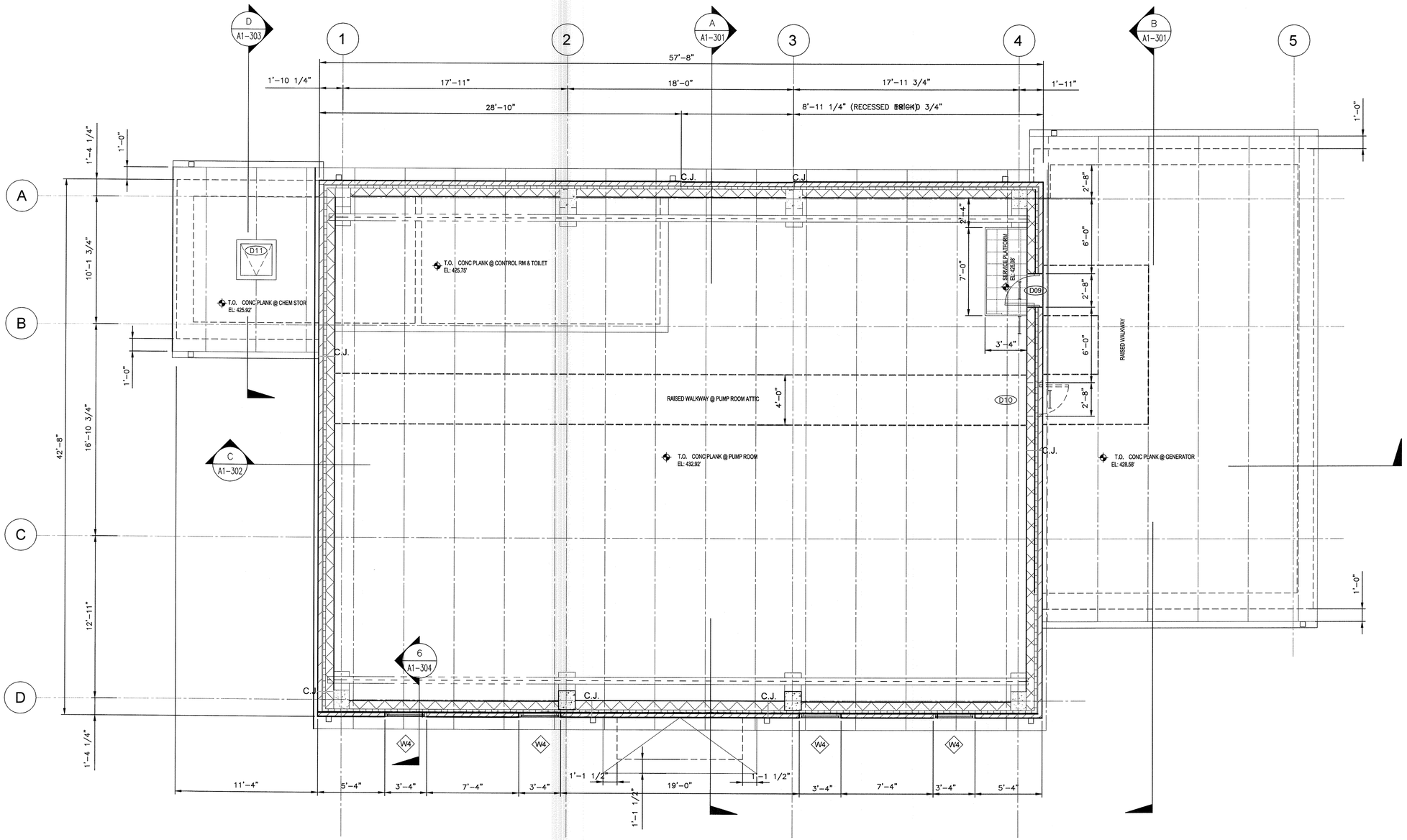
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-102
SCALE AS SHOWN
SHEET 8 OF 81

KCI TECHNOLOGIES PROJECT No.: 1316013306.01



1 INTERMEDIATE LEVEL PLAN

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

0 1 4 8 12
2 6 10
SCALE: 1/4"= 1'-0"

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DRAWING NO. A1-103

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DRN:					
CHK:					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

PUMPING STATION
INTERMEDIATE FLOOR PLAN

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

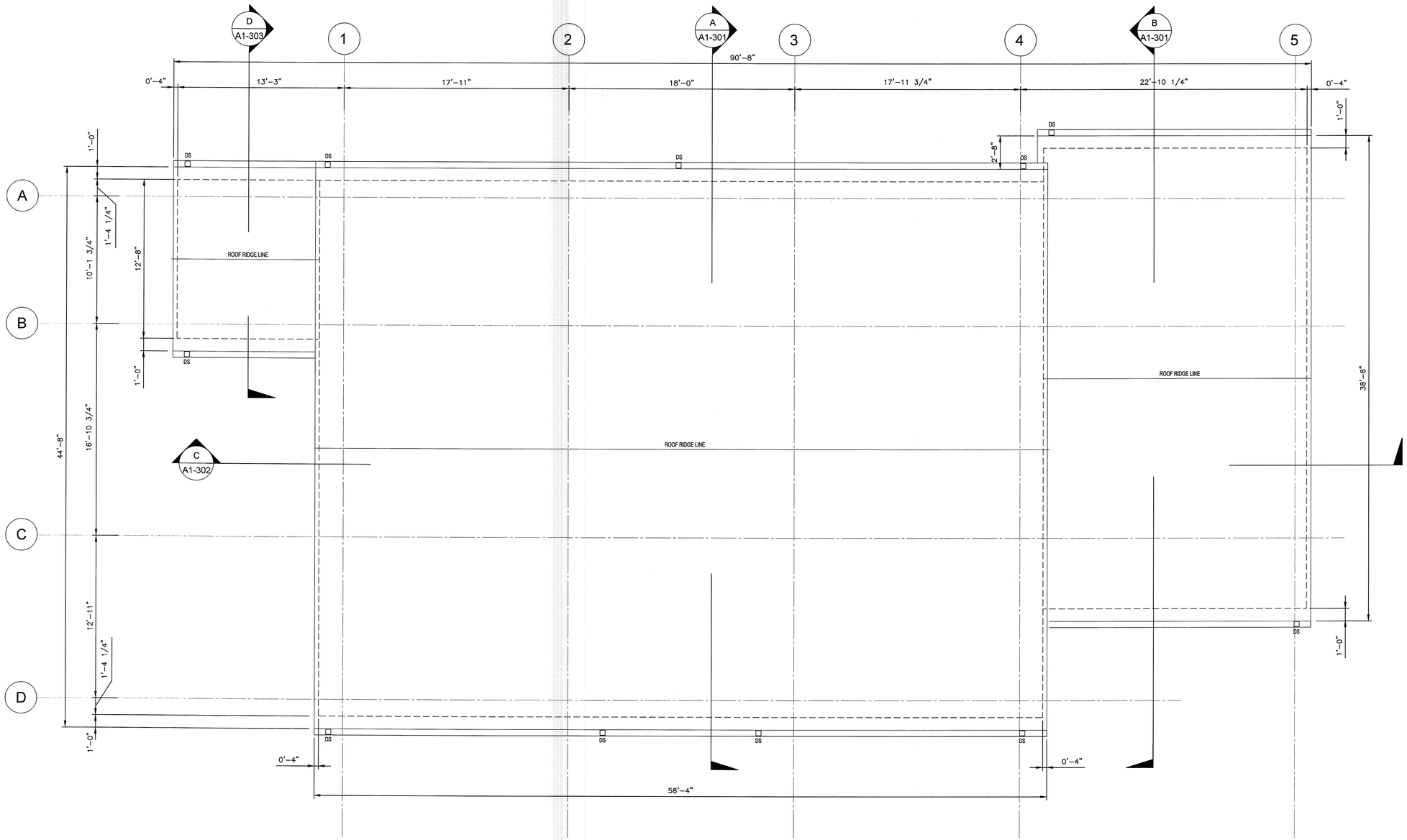
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 9 OF 81



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

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

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HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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PUMPING STATION
ROOF PLAN

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

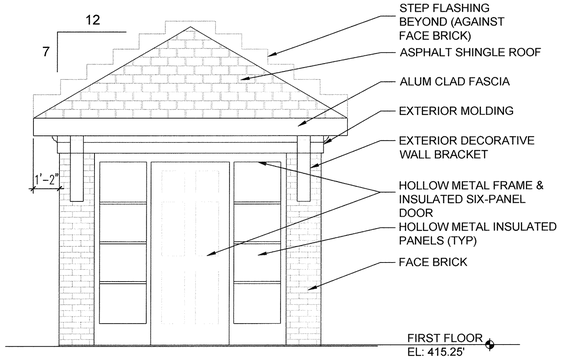
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

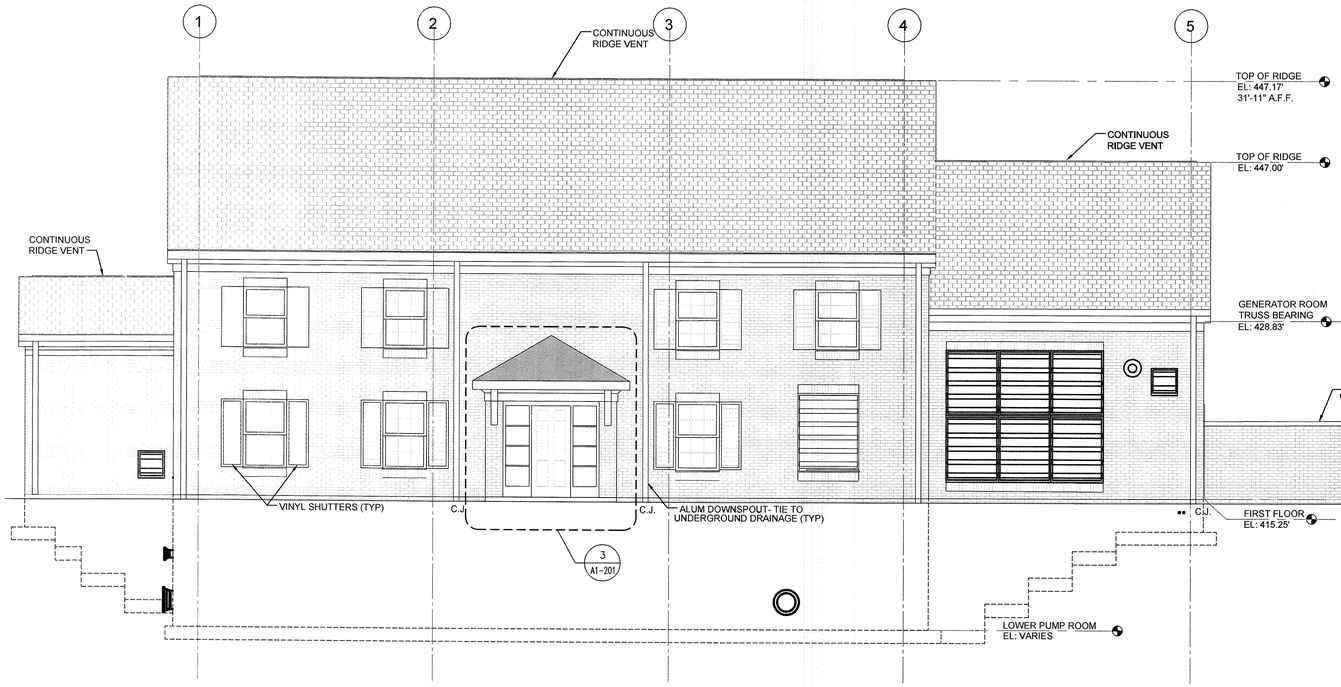
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-104
SCALE AS SHOWN
SHEET 10 OF 81

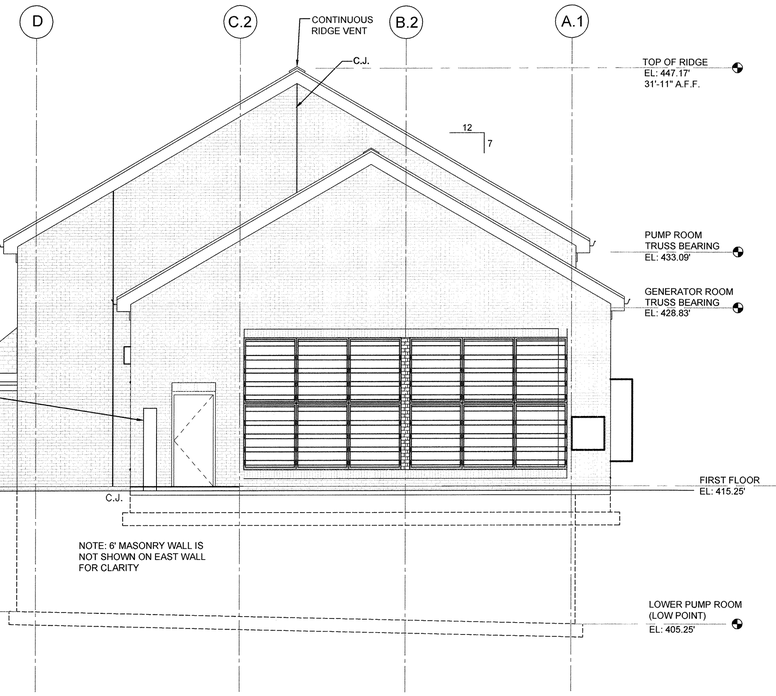
KCI TECHNOLOGIES PROJECT No.: 131601306.01



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



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



2 NORTH ELEVATION
SCALE: 3/16" = 1'-0"

0 2'-8" 5'-4" 10'-8"
SCALE: 3/16" = 1'-0"

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CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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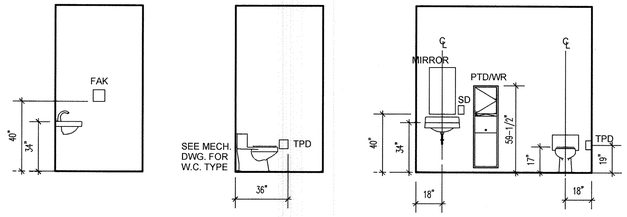
PUMPING STATION
NORTH & EAST ELEVATIONS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

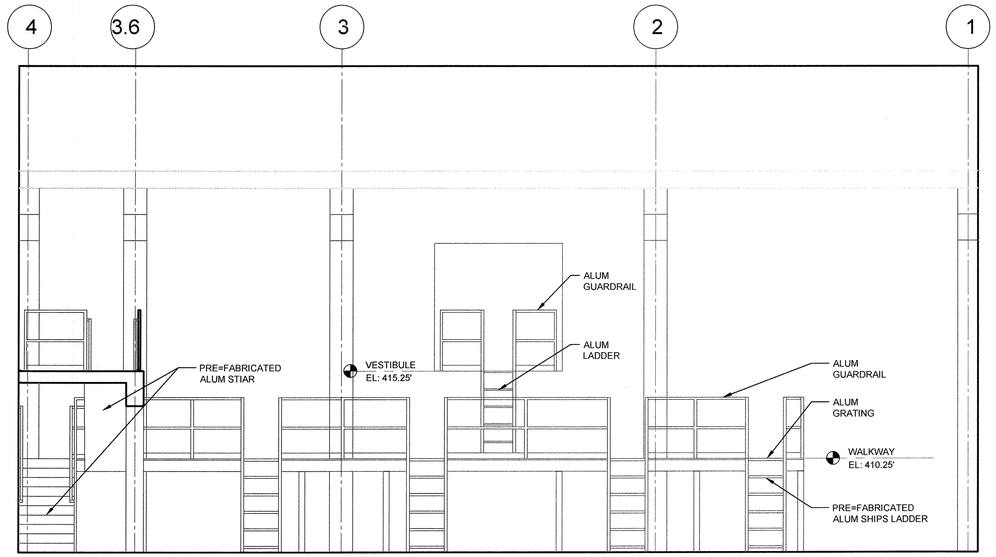
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-201
SCALE AS SHOWN
SHEET 11 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

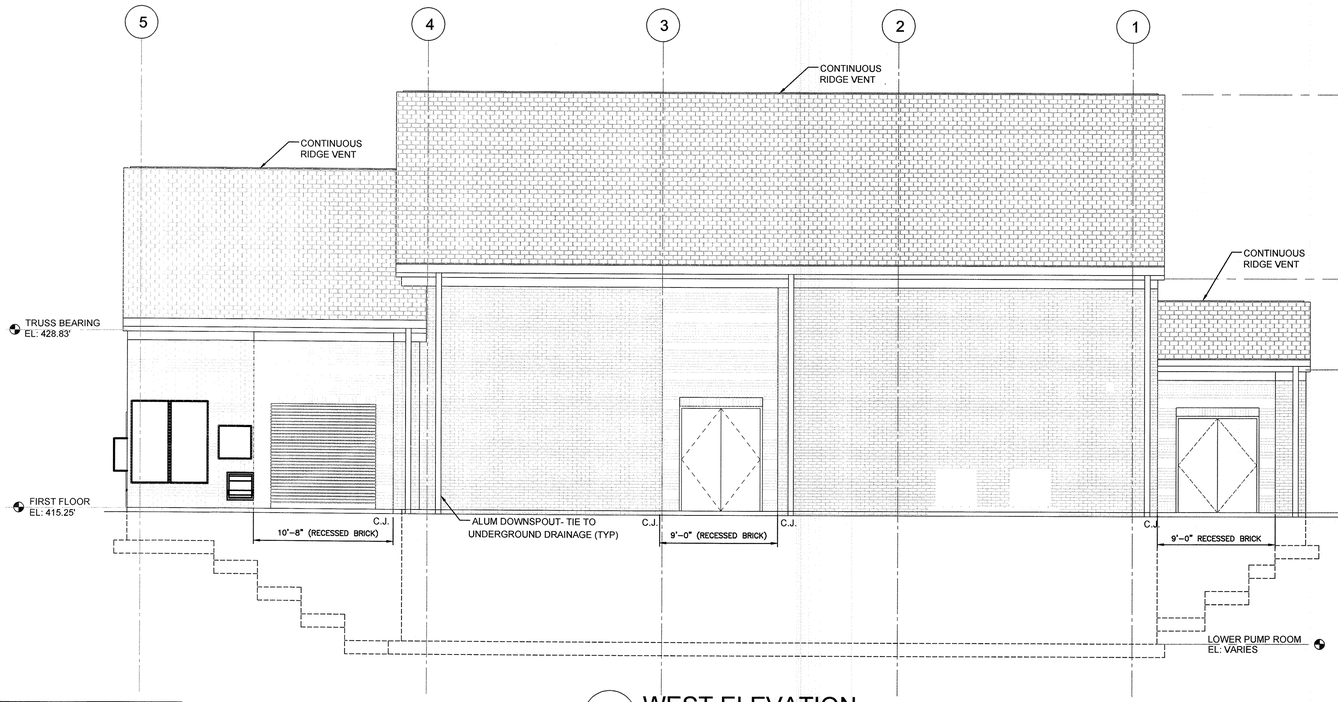


4 TOILET ROOM ELEVATIONS
SCALE: 1/4" = 1'-0"

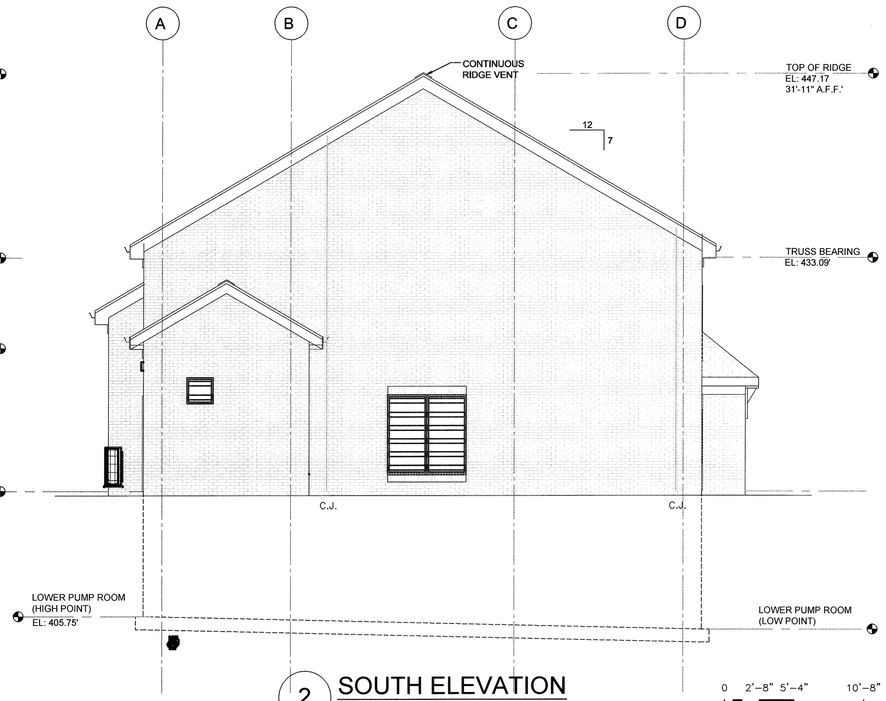


3 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

0 1 4 8 12
2 6 10
SCALE: 1/4"= 1'-0"



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



2 SOUTH ELEVATION
SCALE: 3/16" = 1'-0"

0 2'-8" 5'-4" 10'-8"
SCALE: 3/16" = 1'-0"

LEO MATANGUIHAN
ARCHITECT
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HOWARD COUNTY, MARYLAND

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CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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CHK:	
DATE: DEC 2018	

BY	NO.	REVISION	DATE

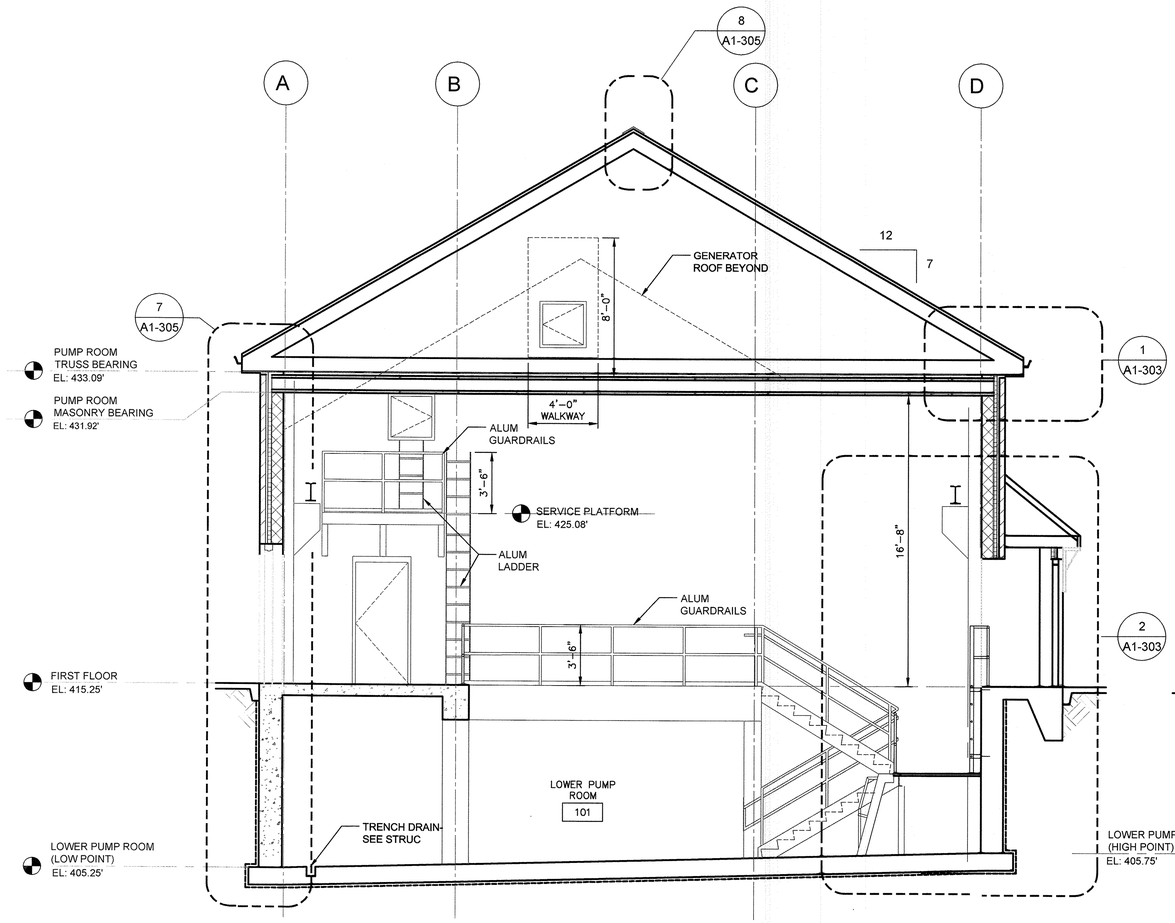
PUMPING STATION
SOUTH & WEST ELEVATIONS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

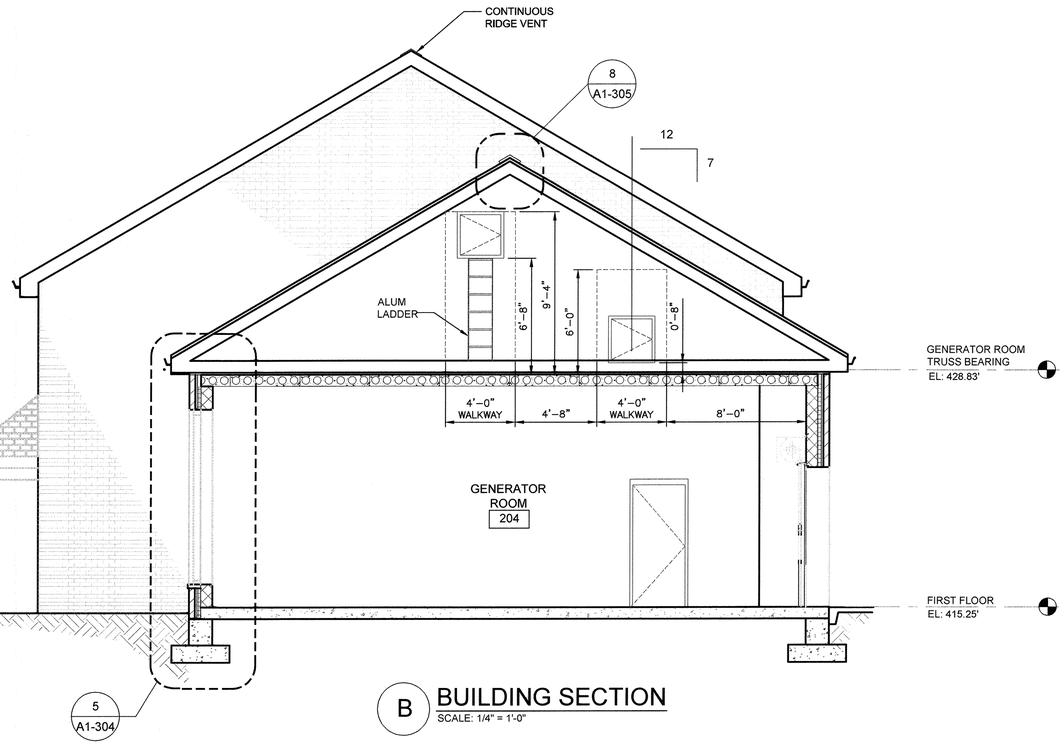
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-202
SCALE AS SHOWN
SHEET 12 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01



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



B BUILDING SECTION
SCALE: 1/4" = 1'-0"

0 1 4 8 12
2 6 10
SCALE: 1/4"= 1'-0"

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PUMPING STATION
BUILDING SECTIONS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

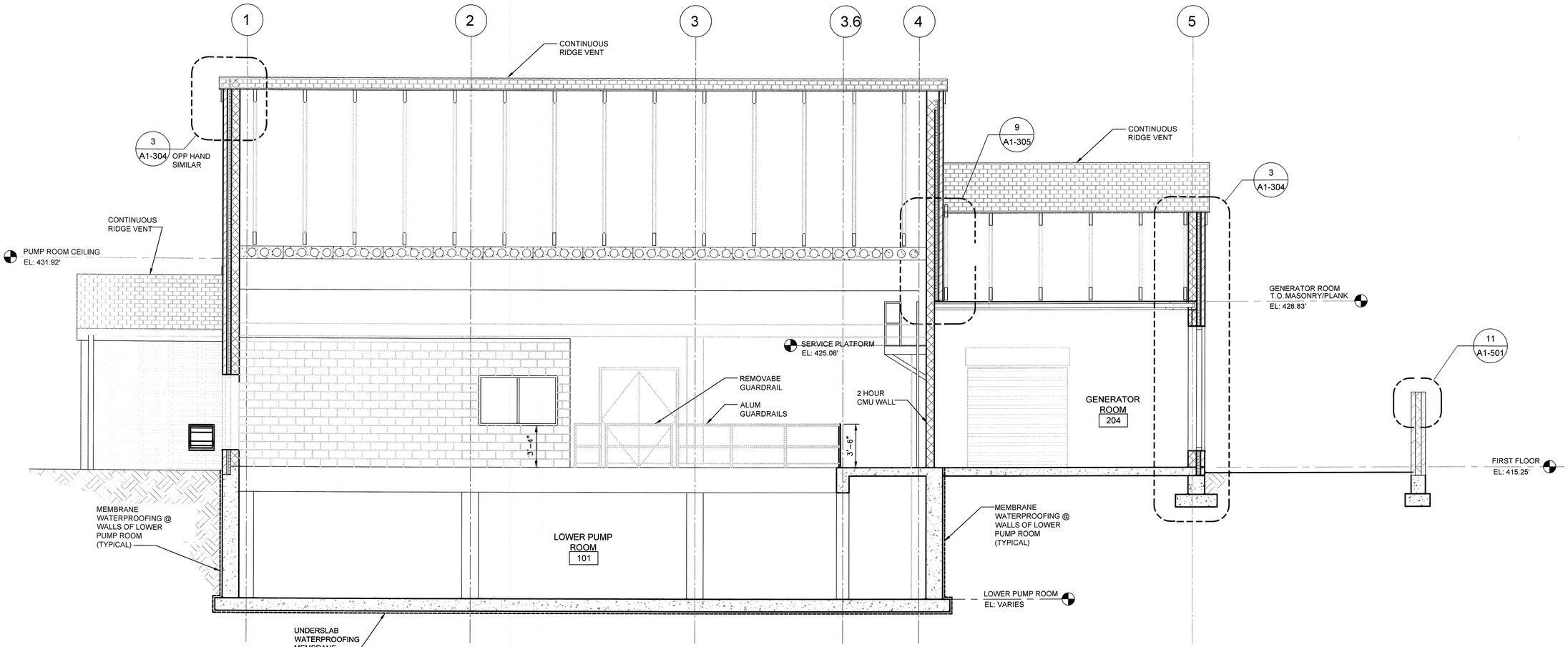
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-301
SCALE AS SHOWN
SHEET 13 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01



C BUILDING SECTION

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

0 1 4 8 12
2 6 10
SCALE: 1/4"= 1'-0"

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HOWARD COUNTY, MARYLAND

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PUMPING STATION
BUILDING SECTIONS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

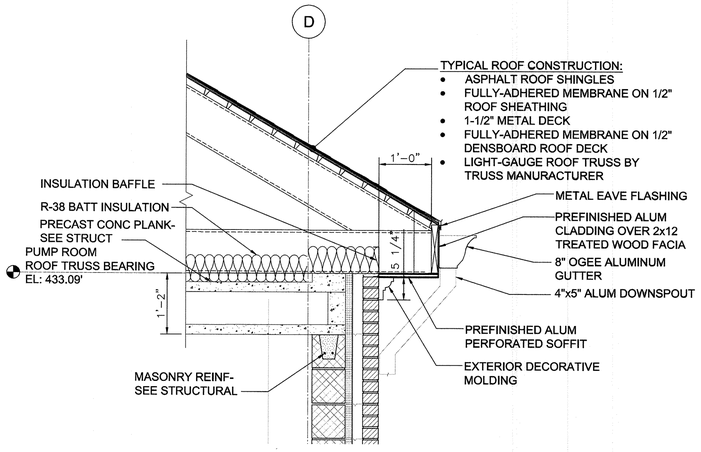
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

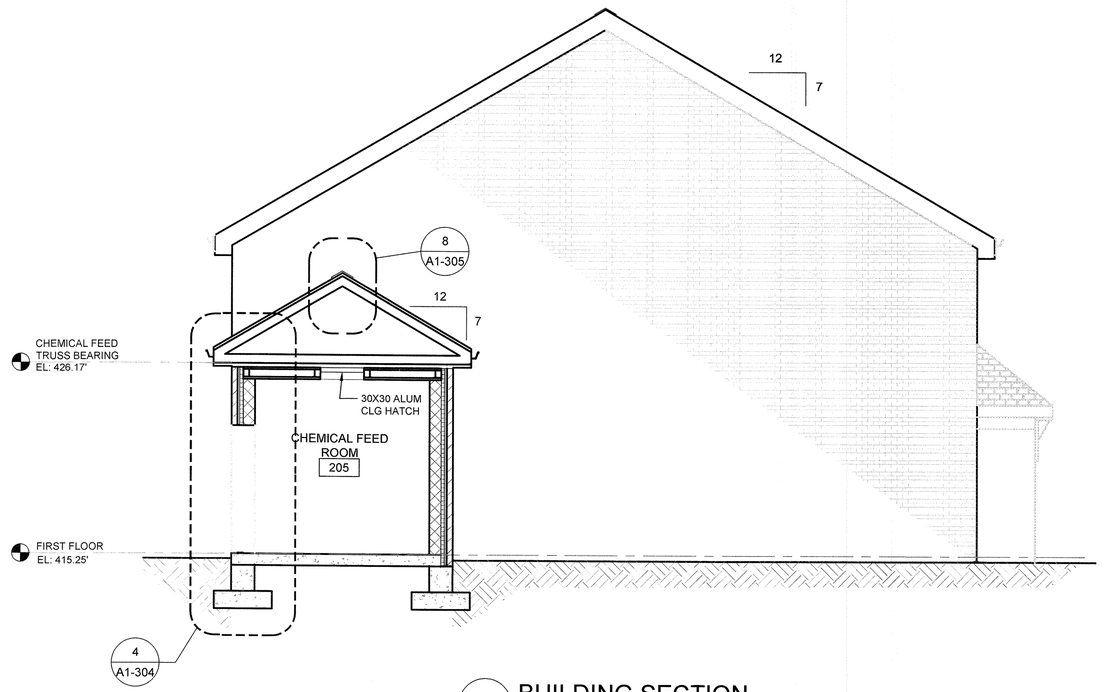
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-302
SCALE AS SHOWN
SHEET 14 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01



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



D BUILDING SECTION
SCALE: 1/4" = 1'-0"

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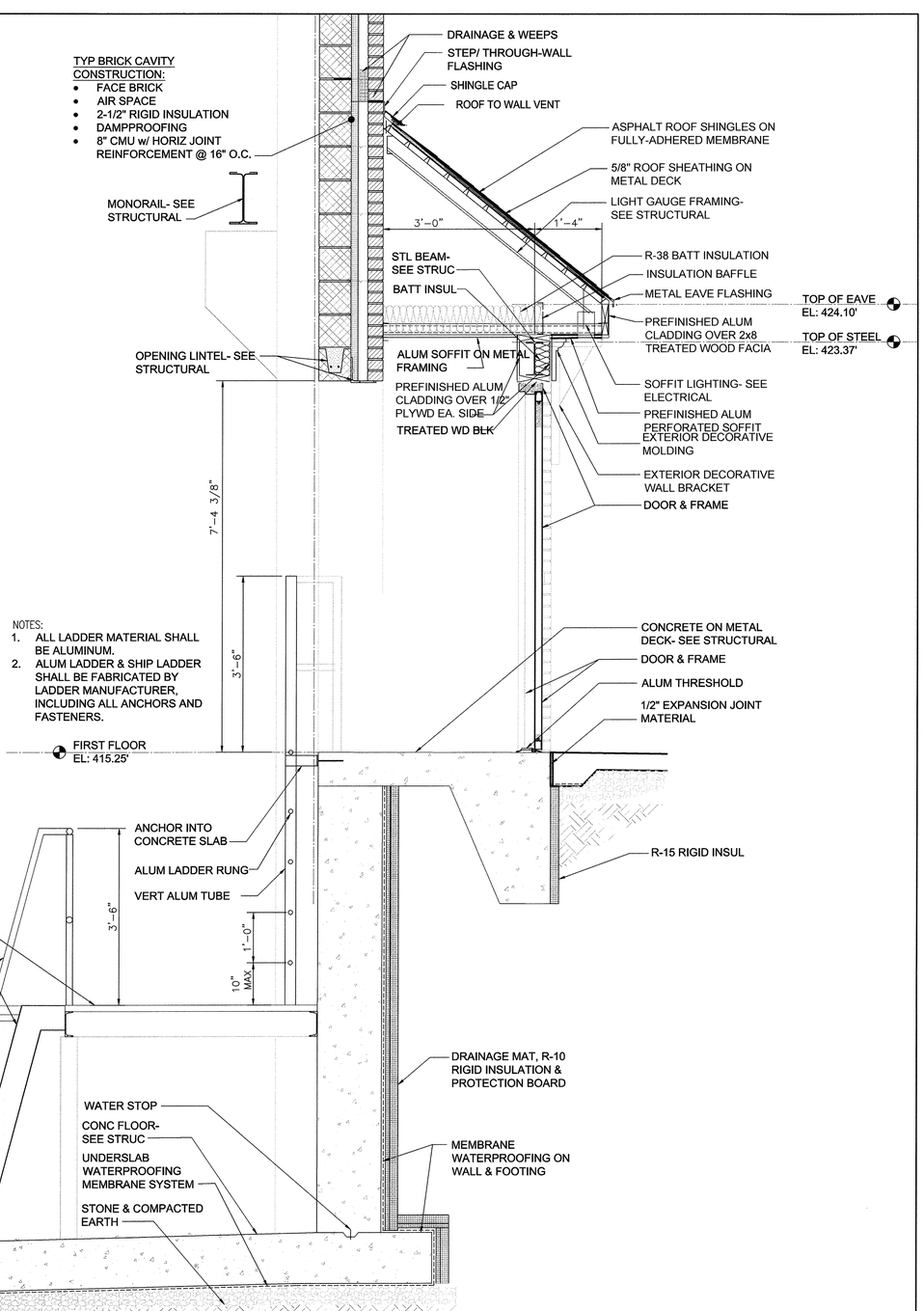
2 6 10
SCALE: 1/4"= 1'-0"



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

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

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CHIEF, BUREAU OF UTILITIES — DATE 12-26-19
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/19

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PUMPING STATION
BUILDING SECTIONS
WALL SECTIONS

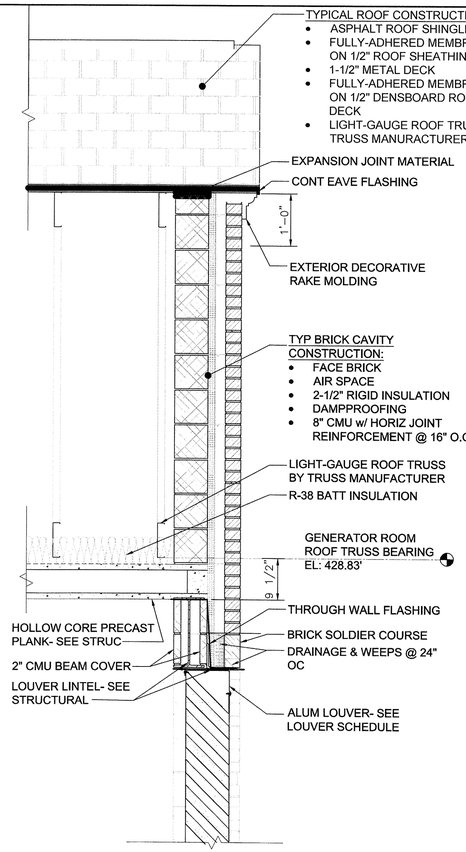
600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

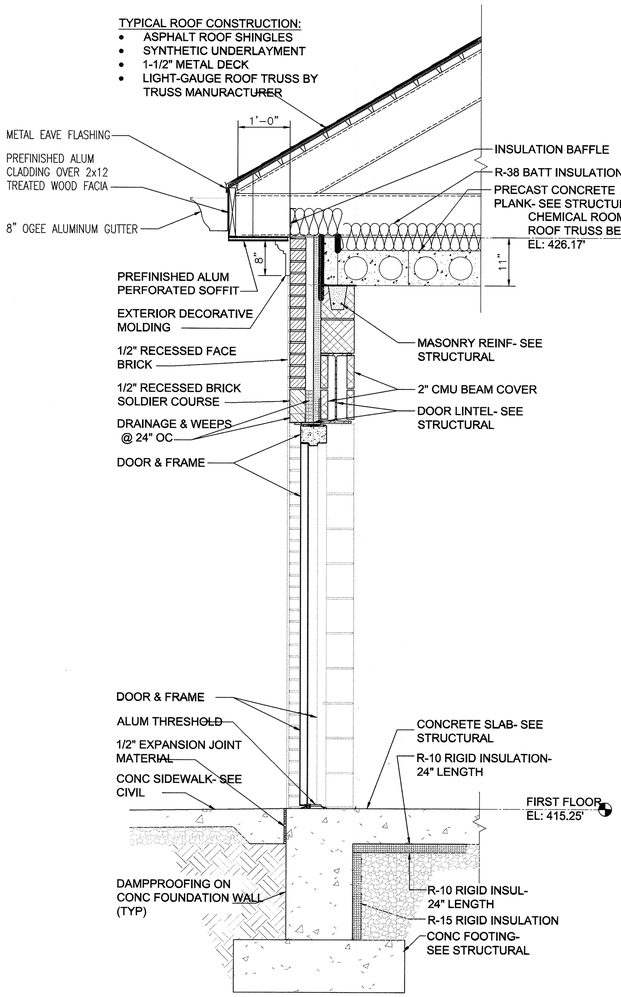
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

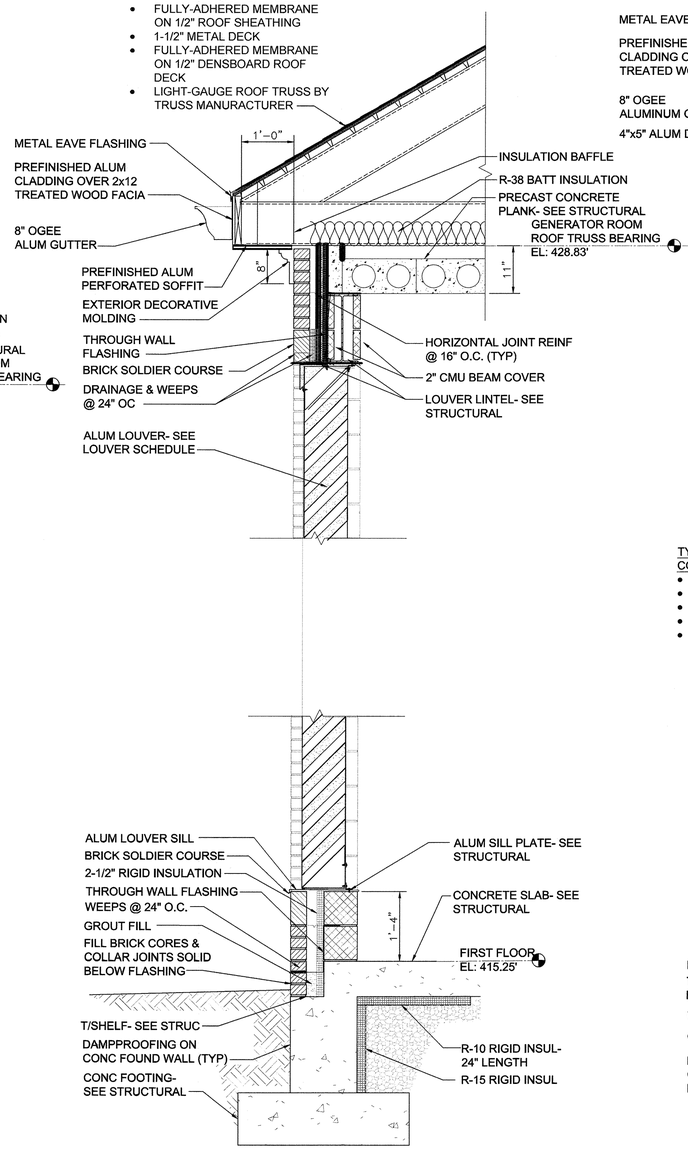
DRAWING NO. A1-303
SCALE AS SHOWN
SHEET 15 OF 81



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



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



5 WALL SECTION
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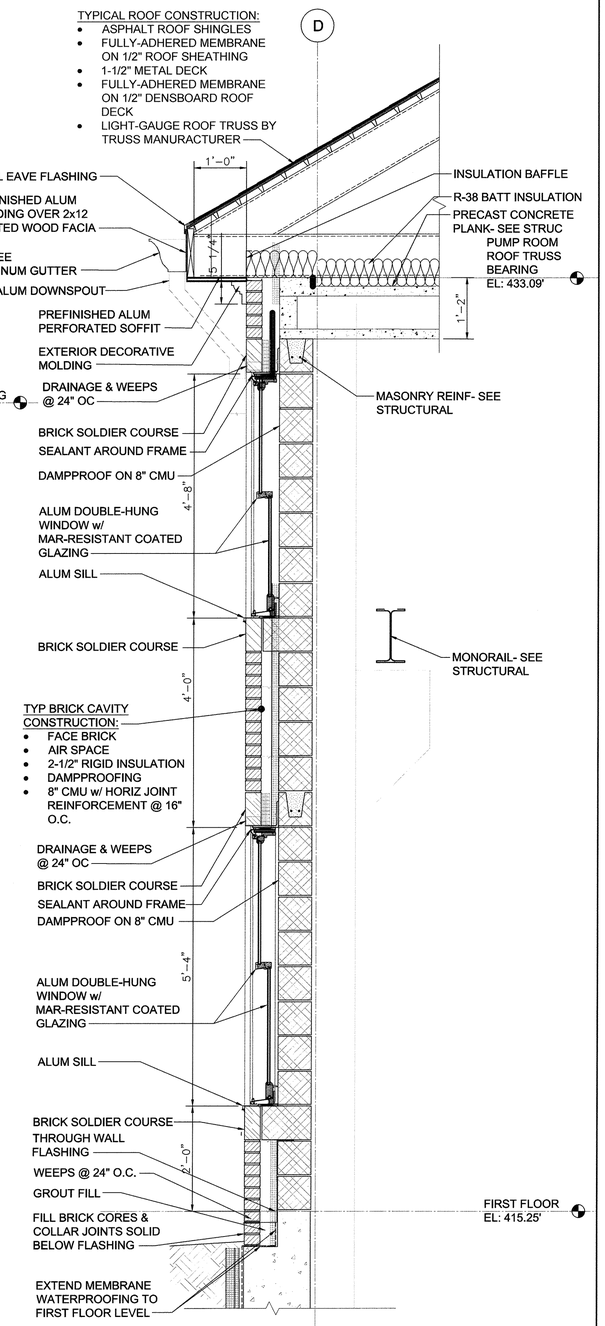

6 WALL SECTION
SCALE: 3/4" = 1'-0"

KCI TECHNOLOGIES PROJECT No.: 1316013306.01

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

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CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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CHK:				
DATE: DEC 2018				
BY	NO.	REVISION	DATE	

PUMPING STATION DETAILS

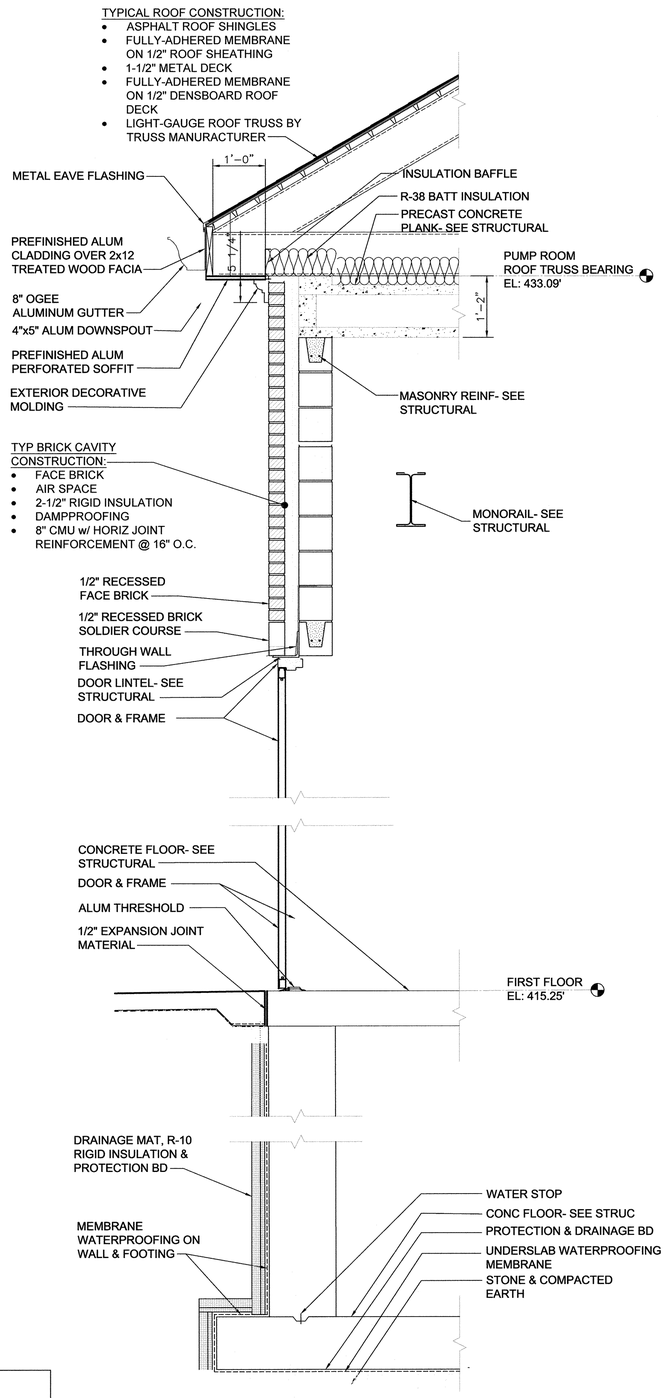
600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

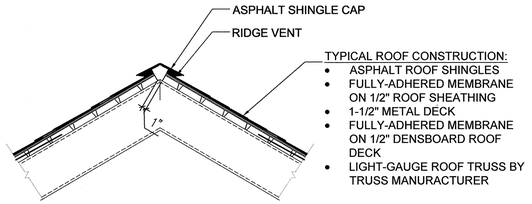
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

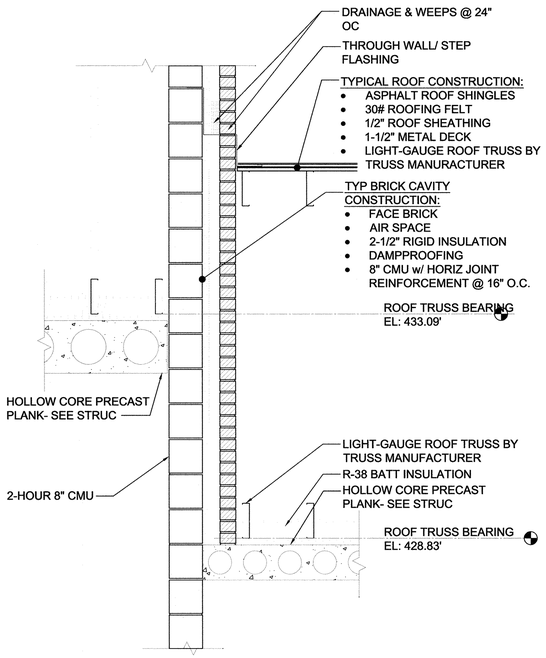
DRAWING NO. A1-304
SCALE AS SHOWN
SHEET 16 OF 81



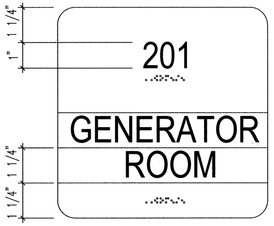
7 **WALL SECTION**
SCALE: 3/4" = 1'-0"



8 **ROOF RIDGE DETAIL**
SCALE: 3/4" = 1'-0"



9 **WALL SECTION**
SCALE: 3/4" = 1'-0"



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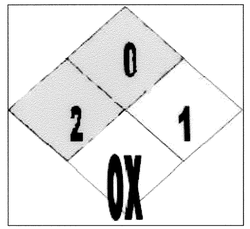
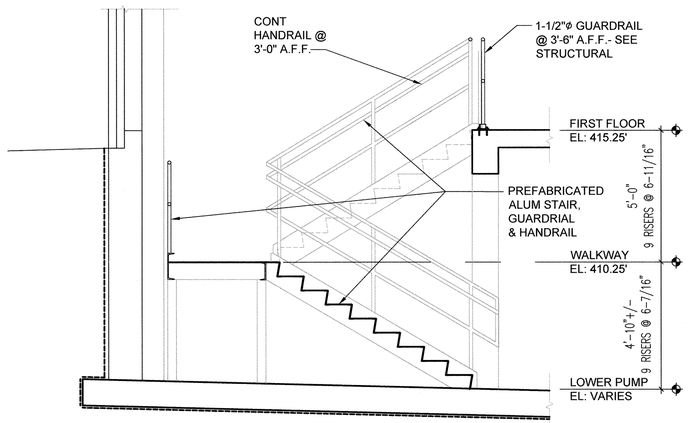
MATERIAL: ALUMINUM
(SEE ROOM SCHEDULE FOR TEXT)



SIZE: 9" DIAMOND
FONT COLOR: BLACK
BACKGROUND: GREY
COLORS: RED, WHITE, BLUE & YELLOW
MATERIAL: ALUMINUM
LOCATION: CHEMICAL STORAGE ROOM DOOR
MOUNTING HEIGHT: 6' TOP

SIZE: 14" W x 10-1/2 H
FONT COLOR: BLACK & YELLOW
BACKGROUND: YELLOW
MATERIAL: ALUMINUM
LOCATION: GENERATOR ROOM DOOR
MOUNTING HEIGHT: 6' TOP

11 **SIGNAGE**
SCALE: NTS



10 **STAIR SECTION**
SCALE: 3/8" = 1'-0"

LEO MATANGUIHAN
ARCHITECT
307 Hopkins Road • Baltimore, Maryland 21212

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 7269, Expiration Date 09/14/2020.

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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936 Ridgebrook Road
Sparks, MD 21152
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FAX: (410) 316-7817
www.kci.com

STATE OF MARYLAND — DONALD A. MATANGUIHAN — 7269-A — ARCHITECT — 12/20/18

DES:					
DRN:					
CHK:					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

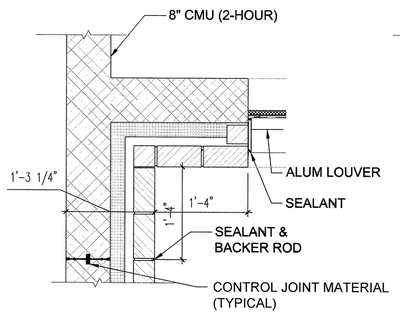
PUMPING STATION
WALL SECTIONS

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

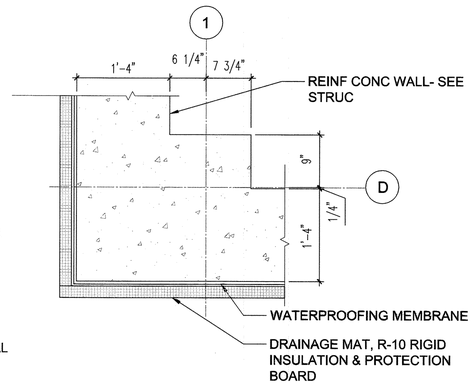
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. A1-305
SCALE AS SHOWN
SHEET 17 OF 81

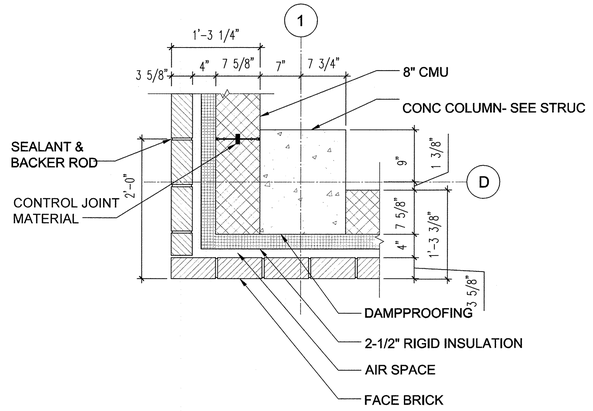
KCI TECHNOLOGIES PROJECT No.: 1316013306.01



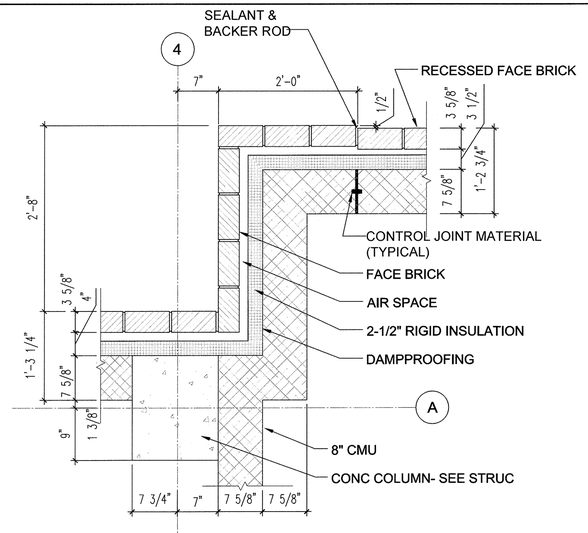
8 PLAN DETAIL
SCALE: 1" = 1'-0"



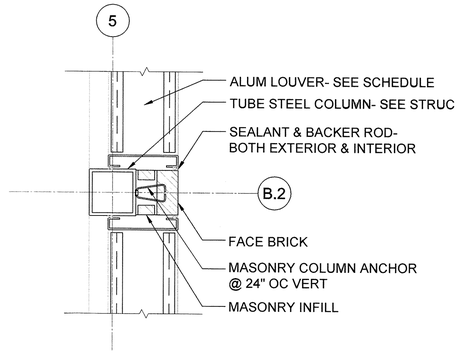
6 PLAN DETAIL
SCALE: 1" = 1'-0"



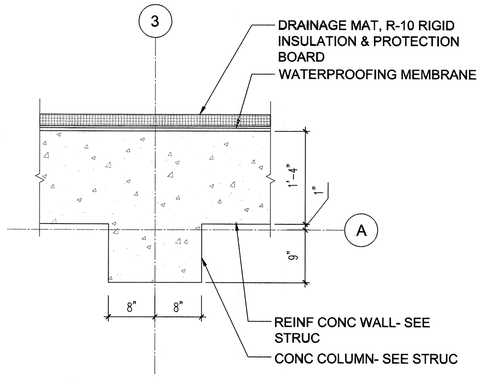
3 PLAN DETAIL
SCALE: 1" = 1'-0"



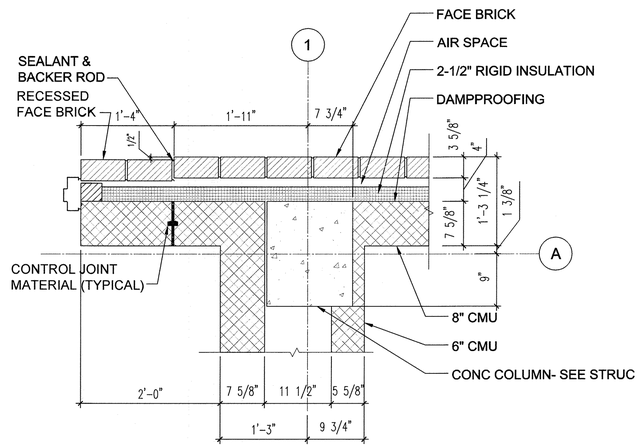
1 PLAN DETAIL
SCALE: 1" = 1'-0"



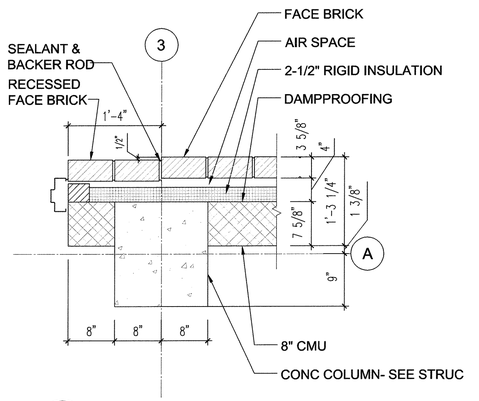
9 PLAN DETAIL
SCALE: 1" = 1'-0"



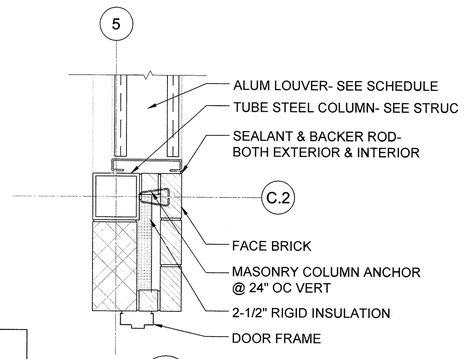
7 PLAN DETAIL
SCALE: 1" = 1'-0"



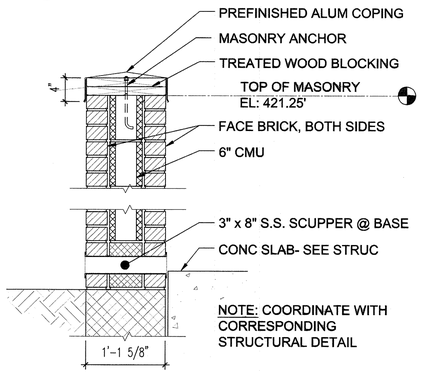
4 PLAN DETAIL
SCALE: 1" = 1'-0"



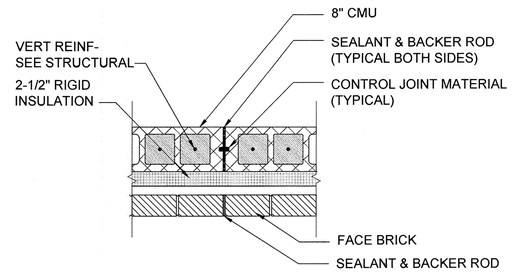
2 PLAN DETAIL
SCALE: 1" = 1'-0"



10 PLAN DETAIL
SCALE: 1" = 1'-0"



11 SECTION OF SCREEN WALL
SCALE: 1" = 1'-0"



5 TYPICAL CONTROL JOINT
SCALE: 1" = 1'-0"

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

KCI TECHNOLOGIES PROJECT No.: 1316013306.01

LEO MATANGUIHAN
ARCHITECT
307 Hopkins Road • Baltimore, Maryland 21212

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 7269, Expiration Date 09/14/2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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www.kci.com

STATE OF MARYLAND — LEO A. MATANGUIHAN — No. 7269 — REGISTERED ARCHITECT — 12/20/18

DES:					
DRN:					
CHK:					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

PUMPING STATION DETAILS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-501
SCALE AS SHOWN
SHEET 18 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

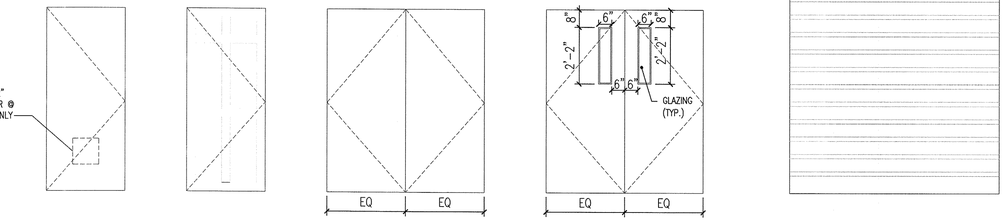
DOOR AND FRAME SCHEDULE

DOOR NO.	DOOR SIZE W	DOOR SIZE H	DOOR SIZE THK	DOOR MATL	DOOR TYPE	FRAME MATL	FRAME TYPE	FRAME DETAIL HEAD	FRAME DETAIL JAMB	FRAME DETAIL SILL	FIRE RATING LABEL	REMARKS
D01	3'-0"	7'-2"	1 3/4"	FRP	B	FRP	F3	2/A1-303	-	2/A1-303	-	SIX-PANEL DOOR
D02	6'-0"	7'-10"	1 3/4"	FRP	C	FRP	F2	H3	J3	S1	-	
D03	6'-0"	7'-2"	1 3/4"	FRP	D	FRP	F2	H1	J1	-	-	
D04	3'-0"	7'-2"	1 3/4"	FRP	A	FRP	F1	H1	J1	-	-	12"x12" LOUVER
D05	3'-0"	7'-2"	1 3/4"	FRP	C	FRP	F2	H3	J3	S1	-	
D06	8'-0"	8'-0"	-	STEEL	E	-	-	H4	J4	S2	-	INSULATED COILING DOOR
D07	3'-0"	7'-2"	1 3/4"	FRP	A	FRP	F1	H1	J1	-	90 MIN	
D08	3'-0"	7'-2"	1 3/4"	FRP	A	FRP	F1	H2	J2	S1	-	
D09	2'-4"	2'-4"	1 3/4"	FRP	A	FRP	-	-	-	-	90 MIN	ACCESS DOOR & FRAME (WALL)
D10	2'-4"	2'-4"	1 3/4"	FRP	A	FRP	-	-	-	-	90 MIN	ACCESS DOOR & FRAME (WALL)
D11	2'-6"	2'-6"	1 3/4"	FRP	A	FRP	-	-	-	-	90 MIN	ACCESS DOOR & FRAME (CEILING)

FRP = FIBERGLASS REINFORCED POLYESTER

HARDWARE SCHEDULE: SEE SHEET A1-602

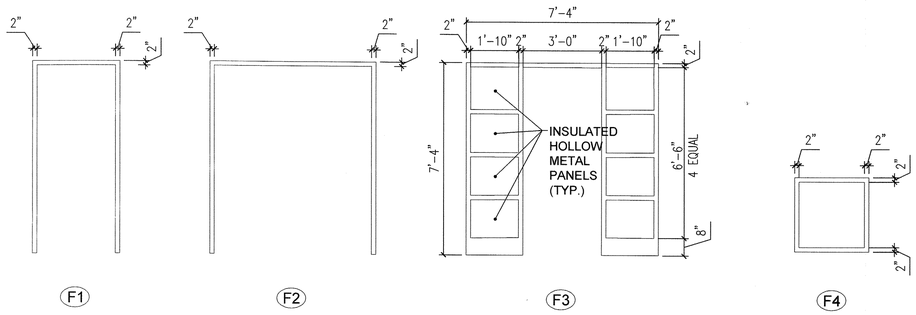
DOOR TYPE



A B C D F

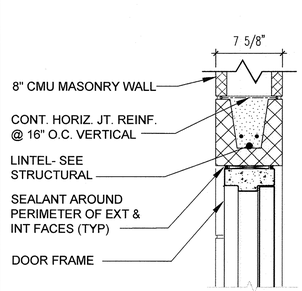
SIX-PANEL DOOR

FRAME TYPE

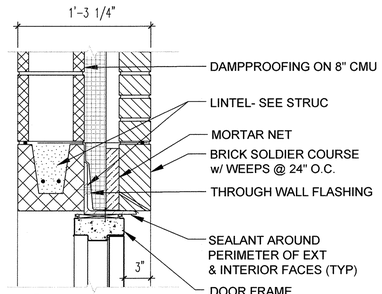


F1 F2 F3 F4

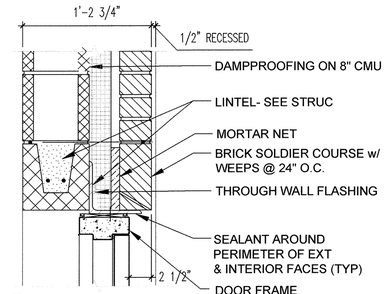
DOOR DETAILS



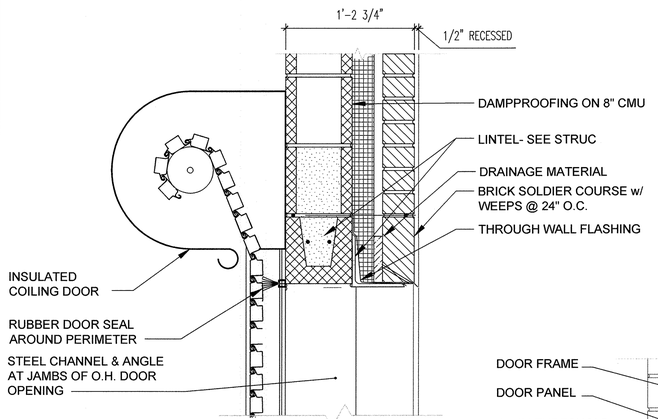
H1 HEAD DETAIL
SCALE: 1-1/2" = 1'-0"



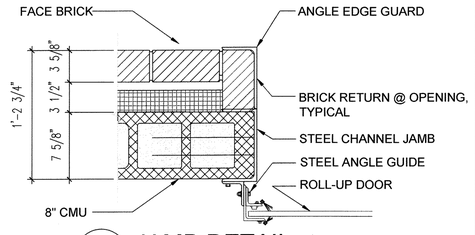
H2 HEAD DETAIL
SCALE: 1-1/2" = 1'-0"



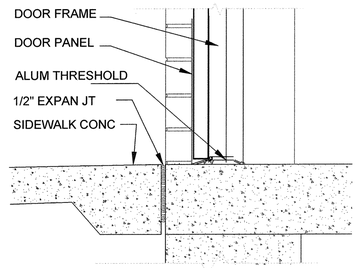
H3 HEAD DETAIL
SCALE: 1-1/2" = 1'-0"



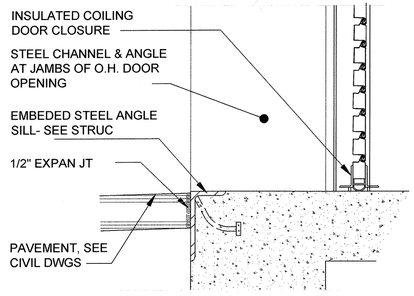
H1 HEAD DETAIL
SCALE: 1-1/2" = 1'-0"



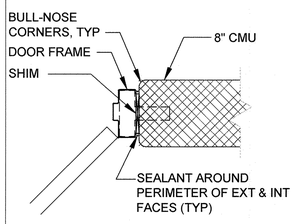
J4 JAMB DETAIL
SCALE: 1-1/2" = 1'-0"



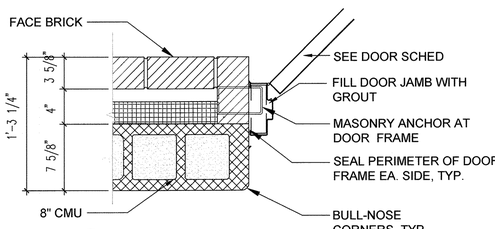
S1 SILL DETAIL
SCALE: 1-1/2" = 1'-0"



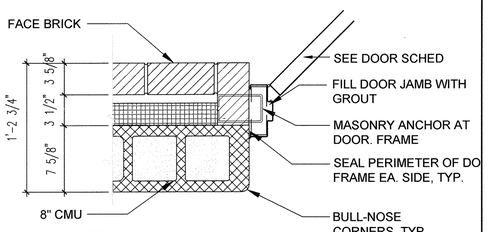
S2 SILL DETAIL
SCALE: 1-1/2" = 1'-0"



J1 JAMB DETAIL
SCALE: 1-1/2" = 1'-0"



J2 JAMB DETAIL
SCALE: 1-1/2" = 1'-0"



J3 JAMB DETAIL
SCALE: 1-1/2" = 1'-0"

0 4" 8" 1'-4"

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

LEO MATANGUIHAN
ARCHITECT
307 Hopkins Road • Baltimore, Maryland 21212

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 7269, Expiration Date 09/14/2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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PHONE: (410) 316-7800
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www.kci.com

STATE OF MARYLAND — LEO A. MATANGUIHAN — 7269 — ARCHITECT — 12/20/18

DES:	LM
DRN:	LM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION
DOOR SCHEDULE & DETAILS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-601
SCALE AS SHOWN
SHEET 19 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

WINDOW SCHEDULE

TYPE	SIZE		MATERIAL	REMARKS
	WIDTH	HEIGHT		
W1	3'-4"	5'-4"	ALUMINUM	TEMPERED GLAZING W/ MAR-RESISTANT COATING BOTH SIDES
W2	3'-4"	4'-8"	ALUMINUM	TEMPERED GLAZING W/ MAR-RESISTANT COATING BOTH SIDES
W3	6'-0"	5'-4"	ALUMINUM	--

LOUVER SCHEDULE

TYPE	SIZE		MATERIAL	REMARKS
	WIDTH	HEIGHT		
L1	12'-0"	10'-0"	ALUMINUM	HEAD & SILL DETAILS ON 3&5/A1-306
L2	6'-0"	6'-0"	ALUMINUM	HEAD & SILL DETAILS ON 3&5/A1-306
L3	14-0"	6'-0"	ALUMINUM	HEAD & SILL DETAILS ON 3&5/A1-306
L4	2'-0"	2'-0"	ALUMINUM	HEAD & SILL DETAILS ON 3&5/A1-306

ROOM FINISH SCHEDULE

ROOM NO	ROOM NAME	FLOOR	WALLS				CEILING	NOTES
			N	S	E	W		
101	LOWER PUMP ROOM	C.S.	E	E	E	E	E	
201	UPPER PUMP ROOM	C.S.	CBS	CBS	CBS	CBS	E	
202	CONTROL ROOM	C.S.	CBS	CBS	CBS	CBS	E	
203	TOILET ROOM	C.S.	CBS	CBS	CBS	CBS	E	
204	GENERATOR ROOM	C.S.	CBS	CBS	CBS	CBS	E	
205	CHEMICAL FEED ROOM	C.S.	CBS	CBS	CBS	CBS	E	

C.S. = CONCRETE SEALER
C.B.S. = CONCRETE BLOCK SEALER
E = EXPOSED

HARDWARE SCHEDULE

HARDWARE SET #1: DOORS D02 & D05
-2 CONTINUOUS HINGE
-1 EXIT DEVICE ON ACTIVE LEAF
-2 MORTISE BOLTS (TOP & BOTTOM OF IN ACTIVE LEAF)
-1 DOOR CLOSER ON ACTIVE LEAF
-WEATHERSTRIPPING
-ALUM THRESHOLD

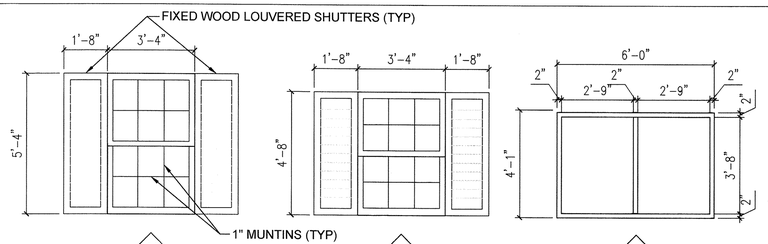
HARDWARE SET #2: DOORS D01 & D08
-1 CONTINUOUS HINGE
-1 EXIT DEVICE
-1 DOOR CLOSER
-WEATHERSTRIPPING
-ALUM THRESHOLD

HARDWARE SET #3: DOOR D03
-1 CONTINUOUS HINGE
-1 EXIT DEVICE ON ACTIVE LEAF
-2 MORTISE BOLTS (TOP & BOTTOM OF INACTIVE LEAF)
-1 DOOR CLOSER ON ACTIVE LEAF

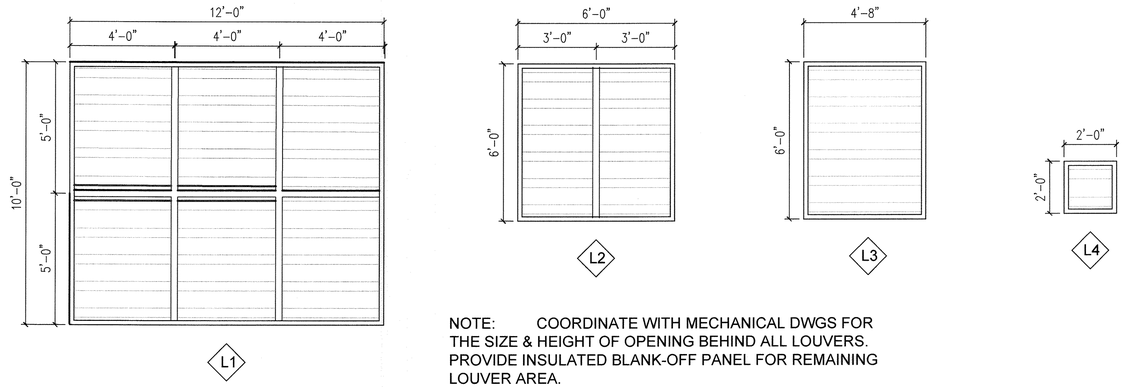
HARDWARE SET #4: DOOR D04
-1 CONTINUOUS HINGE
-1 PRIVACY LOCK SET

HARDWARE SET #5: DOOR D07, D09, D10
-1 CONTINUOUS HINGE
-1 PASSAGE SET
-1 DOOR CLOSER

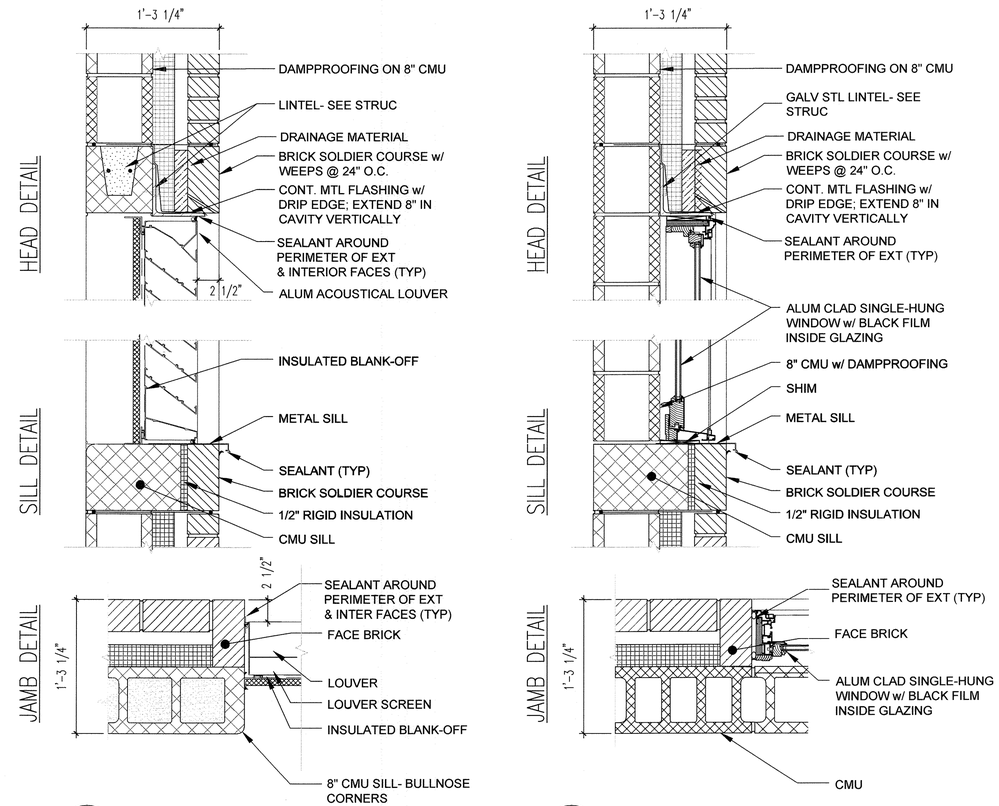
WINDOW TYPE



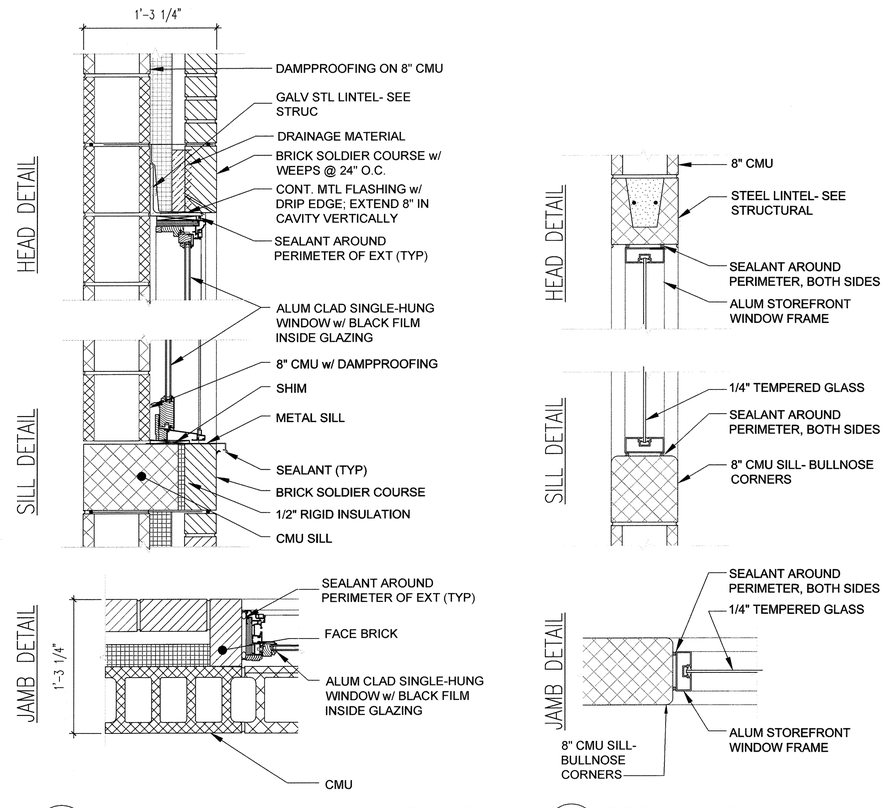
LOUVER TYPE



NOTE: COORDINATE WITH MECHANICAL DWGS FOR THE SIZE & HEIGHT OF OPENING BEHIND ALL LOUVERS. PROVIDE INSULATED BLANK-OFF PANEL FOR REMAINING LOUVER AREA.



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



2 ALUM-CLAD WINDOWS DETAILS
SCALE: 1 1/2" = 1'-0"

3 STOREFRONT DETAILS
SCALE: 1 1/2" = 1'-0"

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

LEO MATANGUIHAN
ARCHITECT
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HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
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STATE OF MARYLAND — LEO DE LA MATANGUIHAN — 7269 — ARCHITECT — 12/26/18

DES:					
DRN:					
CHK:					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

PUMPING STATION
SCHEDULE & DETAILS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. A1-602
SCALE AS SHOWN
SHEET 20 OF 81

DESIGN CRITERIA

A. STRUCTURAL DESIGN SHALL BE IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF THE FOLLOWING CODE, STANDARDS AND SPECIFICATIONS:
   1. INTERNATIONAL BUILDING CODE (IBC) 2015, INCLUDING MODIFICATIONS MADE BY LOCAL JURISIDICTION.
   2. ASCE 7-10 MIN. DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
   3. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
   4. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES.
   5. ACI 530-13 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
   6. AISC 360-10 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS
   7. AWS D1.1 STRUCTURAL WELDING CODE - STEEL (LATEST EDITION).
   8. AA ADM-2015 ALUMINUM DESIGN MANUAL - LATEST EDITION

B. SUPERIMPOSED DESIGN LOADS:
   LIVE LOADS (MIN):
   ROOFS, NON-REDUCIBLE: 30 PSF
   STAIRS: 100 PSF
   LOWER LEVEL: 250 PSF
   FIRST FLOOR MEZZANINE: 100 PSF
   ASCE 7-10: RISK CATEGORY = III
   WIND LOADS:
   ULTIMATE DESIGN SPEED: 120 MPH
   EXPOSURE: C
   INTERNAL PRESSURE COEFFICIENT, GCPi: +/-0.18
   EARTHQUAKE DESIGN DATA:
   SEISMIC IMPORTANCE FACTOR: Ie=1.25
   DESIGN SPECTRAL RESPONSE ACCELERATION: Ss=0.126 g
   DESIGN SPECTRAL RESPONSE ACCELERATION: S1=0.051 g
   DESIGN SPECTRAL RESPONSE ACCELERATION: SdS=0.134 g
   DESIGN SPECTRAL RESPONSE ACCELERATION: Sd1=0.082 g
   SOIL SITE CLASSIFICATION: TYPE D
   SEISMIC DESIGN CATEGORY: B
   BASIC SEISMIC FORCE-RESISTING SYSTEMS: ORDINARY REINFORCED
   MASONRY SHEAR WALLS & STEEL ORDINARY MOMENT FRAMES
   RESPONSE MODIFICATION COEFFICIENTS: R=2 (MASONRY SHEAR WALLS)
   =3.5 (STEEL MOMENT FRAMES)
   SEISMIC RESPONSE COEFFICIENT: Cs=0.084
   DESIGN BASE SHEAR: V= 63 KIPS
   ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE
   SNOW LOADS:
   GROUND SNOW LOAD (Pg): 25 PSF
   FLAT ROOF SNOW LOAD (Pf): 19.1 PSF
   SNOW EXPOSURE FACTOR (Ce): 0.9
   SNOW THERMAL FACTOR (Ct): 1.1
   SNOW LOAD IMPORTANCE FACTOR (Is): 1.10

FOUNDATION

A. ALLOWABLE BEARING PRESSURE = 2,000 PSF PER GEOTECHNICAL REPORT.
B. CONCRETE SHALL NOT BE POURED ON FROZEN GROUND.
C. PROVIDE SHEETING AS REQUIRED TO SUPPORT LATERAL LOADS DURING EXCAVATION. SEE GEOTECHNICAL REPORT FOR SOIL PROPERTIES.
D. FILL ALL VOIDS AND REPLACE DISTURBED SOIL WITH LEAN CONCRETE.
E. RE-USE OF ON-SITE SILT/CLAY MATERIALS FOR WALL BACKFILL IS NOT PERMITTED.
F. REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.
G. BOTTOM OF EXTERIOR FOOTINGS SHALL BE 2' - 6" MIN BELOW FINISH GRADE, UNO.

BACKFILL

DO NOT BACKFILL AGAINST WALLS UNTIL TOP OF WALL IS EITHER TEMPORARILY BRACED OR SUPPORTING SLABS ARE IN PLACE AND HAVE OBTAINED REQUIRED STRENGTH. WHERE BACKFILL IS REQUIRED ON BOTH SIDES OF WALL, BACKFILL BOTH SIDES SIMULTANEOUSLY.

CAST-IN-PLACE REINFORCED CONCRETE

A. ALL CONCRETE WORK SHALL CONFORM TO ACI-350-06 BUILDING CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES.
B. MINIMUM 28 DAY COMPRESSIVE STRENGTH, MAX WATER TO CEMENTITIOUS MATERIAL RATIOS & AGGREGATE SIZE SHALL BE 4,500 PSI NORMAL WEIGHT, W/C = 0.45 MAX, #57 AGGREGATE.
C. AIR ENTRAIN ALL CONCRETE EXPOSED TO FREEZING AND THAWING 5% ±1%.
D. SLUMP 3" MAX FOR FOUNDATIONS & 4" MAX FOR WALLS, PRIOR TO MID RANGE WATER REDUCER (MRWR).
E. CHAMFER ALL EDGES OF BEAMS, COLUMNS, HAUNCHES, WALLS EQUIPMENT PADS AND SLABS EXPOSED TO VIEW 3/4" UNLESS OTHERWISE NOTED.
F. WATERPROOF SHALL BE 9" FLAT RIBBED SWA GREENSTREAK OR APPROVED EQUAL.
G. CONCRETE COVER AS PROTECTION OF REINFORCEMENT SHALL BE 2" CLEAR UNO.
H. GROUT SHALL BE MASTER FLOW 555 NON-SHRINK GROUT WITH A COMPRESSIVE STRENGTH OF 8, 500 PSI AT 28 DAYS, BY BASF MANUFACTURER OR APPROVED EQUAL.

GENERAL

A. ALL ELEVATIONS ARE REFERENCED TO MSL. SEE CIVIL DWG FOR FINISHED FLOOR ELEV. ALL ELEVATIONS SHOWN ON PLANS ARE REFERENCED TO THIS DATUM UNLESS NOTED.
B. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OR START OF CONSTRUCTION.
C. NO STRUCTURAL MEMBER SHALL BE CUT, NOTCHED OR OTHERWISE REDUCED IN STRENGTH WITHOUT THE PRIOR NOTIFICATION OF THE STRUCTURAL ENGINEER.
D. THE GENERAL CONTRACTOR SHALL COORDINATE ALL OTHER DISCIPLINES FOR ANY ITEMS WHICH EFFECT THE STRUCTURAL DRAWINGS.
E. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING, GUY WIRES, ETC., WHERE NECESSARY TO ADEQUATELY RESIST ALL CONSTRUCTION LOADS.

REINFORCEMENT

A. ALL DEVELOPMENT AND SPLICES OF REINFORCEMENT SHALL CONFORM TO THE PROVISIONS OF ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318 - LATEST EDITION).
B. REINFORCING STEEL SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A615 GRADE 60 EXCEPT TIES MAY BE GRADE 40. ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS NOTED OTHERWISE.
C. WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185 (LATEST EDITION).
D. ALL WELDED WIRE FABRIC SHALL BE SPLICED SO THAT THE OVERLAP OF THE OUTERMOST CROSS WIRES OF EACH ADJOINING SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRES PLUS TWO INCHES, UNLESS NOTED OTHERWISE.
E. REINFORCING BAR SUPPORTS AND SPACERS SHALL CONFORM TO ACI 315 - (LATEST EDITION) DETAILING MANUAL.
F. TERMINATE ALL DISCONTINUED TOP BARS WITH 90 DEGREE STANDARD HOOK UNLESS OTHERWISE NOTED.
G. CONTINUOUS BOTTOM BARS SHALL BE SPLICED AT CENTERLINE OF SUPPORTS. CONTINUOUS TOP BARS SHALL BE SPLICED AT MIDSPAN.
H. AT CHANGES IN DIRECTION OF CONCRETE WALLS, STRIP FOOTINGS, BEAMS, TIE-BEAMS AND BOND BEAMS, PROVIDE CORNER BARS AT SAME SIZE AND SPACING AS HORIZONTAL STEEL.
I. SHOP DRAWINGS SHOWING ALL NECESSARY SECTIONS AND DETAILS FOR THE PROPER POSITIONING OF ALL REINFORCING STEEL SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW BEFORE FABRICATION OR PLACEMENT OF STEEL.
J. ALL REINFORCEMENT SHALL HAVE 3" COVER TO ALL CONCRETE CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND.

CONCRETE MASONRY

A. DESIGN CRITERIA: ACI 530-13/ASCE 5-13
B. HOLLOW UNITS: MIN. 2,800 PSI @ 28 DAYS, ASTM C90, GRADE N, NORMAL WEIGHT, f'm=2,000 PSI.
C. MORTAR: ASTM C270, TYPE S, MIN. 1800 PSI @ 28 DAYS, 3/8" FULL BEDDING. REMOVE MORTAR PROTRUDING INTO CELL CAVITIES TO BE REINFORCED AND GROUTED.
D. GROUT: ASTM C476, MIN. 3,000 PSI @ 28 DAYS, 3/8" AGGREGATE MAX., 8"-10" SLUMP.
E. REINFORCEMENT:
   -HORIZONTAL JOINTS: STD. DUR-O-WALL @ 16" OC, USE PREFABRICATED CORNERS AND TEES @ WALL INTERSECTIONS, OVERLAP DISCONTINUED ENDS AND EXTEND INTO COLUMNS 6" MIN.
   -VERTICAL AND HORIZONTAL REINFORCEMENT: ASTM 615, GRADE 60, PROVIDE MIN. #4 BARS TYP @ WALL INTERSECTIONS, EACH SIDE OF OPENINGS, AND @ WALL ENDS, HOOK TOP OF ALL DISCONTINUED BARS, LAP CONT. REINF 48 BAR DIA. UNO.
   -USE BAR SPACERS IN EVERY 4TH COURSE WHERE CELLS ARE TO BE GROUTED.
F. PROVIDE CLEANOUT OPENINGS FOR EACH GROUTED CELL.
G. HIGH LIFT GROUTING SHALL BE USED WITH A MAXIMUM POUR OF 12'-0" IN 4' MAX LIFTS WITH ONE HOUR BETWEEN LIFTS. VIBRATE EACH LIFT AND RECONSOLIDATE PREVIOUS LIFT AFTER PLACING NEXT LIFT. VERTICAL CORES TO BE FILLED WITH GROUT SHALL HAVE A MINIMUM CLEAR DIMENSION OF 3"x3".
H. WHERE EXPANSION ANCHOR BOLTS ARE SET IN MASONRY WALLS, FILL BLOCK CELLS WITH GROUT FOR BOLTED COURSE AND TWO COURSES BELOW ANCHOR ELEVATION.
I. PROVIDE LINTELS OVER OPENINGS LARGER THAN 1'-0" IN ACCORDANCE WITH STRUCTURAL PLANS AND DETAILS.

ALUMINUM STRUCTURAL SHAPES

A. ALUMINUM STRUCTURAL SHAPES SHALL BE ASTM B-308, 6061-T6.
B. ALLOWABLE TOLERANCES FOR MILLED ALUMINUM STANDARD STRUCTURAL SHAPES SHALL BE IN ACCORDANCE WITH ANSI H35.2. COMPLY WITH THE ALUMINUM DESIGN MANUAL (ADM-1) LATEST EDITION.
C. ALL RECTANGULAR CUTOUTS IN GRATING SHALL BE MADE TO THE NEXT BEARING BAR BEYOND THE PENETRATION WITH A CLEARANCE NOT TO EXCEED BEARING BAR SPACING.
D. USE GRATING CLAMPS TO SECURE GRATING TO SUPPORTING MEMBERS. GRATING CLAMPS TO BE A TYPE TO ALLOW FOR EASY REMOVAL OF GRATING.
E. ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL BE GIVEN A HEAVY COAT OF ALKALI RESISTANT BITUMINOUS PAINT OR OTHER COATING PROVIDING EQUIVALENT PROTECTION BEFORE INSTALLATION.
F. CONTRACTOR IS RESPONSIBLE FOR DESIGN OF ALL ALUMINUM STRUCTURES, INCLUDING HANDRAILS, GUARDRAILS, WALKWAYS, PLATFORMS, GRATING, AND STAIRS. CONTRACTOR SHALL SUBMIT SIGNED AND SEALED PLANS. DESIGN SHALL BE IN ACCORDANCE WITH IBC.

STRUCTURAL STEEL

A. ALL STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS
B. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   -STRUCTURAL STEEL W-SHAPES: A992 HAVING A MINIMUM YIELD STRENGTH OF 50 KSI.
   -STRUCTURAL STEEL CHANNELS, ANGLES, BARS & PLATES: A36 HAVING A MINIMUM YIELD STRENGTH OF 36 KSI.
   -SQUARE AND RECTANGULAR TUBING: A500, GRADE B HAVING MINIMUM YIELD STRENGTH OF 46 KSI.
   -ROUND PIPE: A53, GRADE B HAVING A MINIMUM YIELD STRENGTH OF 35 KSI.
C. BOLTS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS: HIGH STRENGTH BOLTS: A325, ANCHOR BOLTS: F1554, GRADE 36.
D. ALL BOLTS SHALL BE 3/4" DIAMETER, OPEN HOLES 13/16" DIAMETER, UNLESS OTHERWISE SHOWN OR NOTED.
E. WELDING SHALL BE IN ACCORDANCE WITH AWS CODE FOR WELDING IN BUILDING CONSTRUCTION (AWS D1.1) AND SHALL BE PERFORMED BY CERTIFIED WELDERS. ALL WELDS SHALL BE MADE WITH AWS A5.1 E-70XX ELECTRODES.
F. ALL SHOP CONNECTIONS SHALL BE HIGH STRENGTH BOLTED OR WELDED.
G. ALL FIELD CONNECTIONS SHALL BE HIGH STRENGTH BOLTED EXCEPT WHERE DETAILS INDICATE WELDING.
H. NO PENETRATIONS ARE PERMITTED THROUGH STRUCTURAL STEEL MEMBERS UNLESS INDICATED ON STRUCTURAL DRAWINGS OR APPROVED BY ARCHITECT/ENGINEER.
I. APPROVAL OF THE ARCHITECT/ENGINEER SHALL BE MANDATORY FOR THE USE OF CUTTING TORCH IN THE FIELD.
J. ALL GROUT UNDER STEEL PLATES SHALL BE NON-SHRINK "PRE-MIX" TYPE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.
K. FOR ALL MISCELLANEOUS STEEL CONSTRUCTION NOT SHOWN ON STRUCTURAL DRAWINGS, SEE THE ARCHITECTURAL AND MECHANICAL DRAWINGS.
L. STRUCTURAL STEEL SHALL BE INSPECTED IN THE FIELD BY AN INDEPENDENT TESTING AGENCY APPROVED BY THE ARCHITECT AND PAID FOR BY THE CONTRACTOR.
M. ALL STEEL & CONNECTIONS EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED.
N. ALL STEEL DESIGNATED AS "STAINLESS STEEL" SHALL BE IN ACCORDANCE WITH ASTM A276, TYPE 304.

PRECAST HOLLOW-CORE CONCRETE SLAB

A. ALL PRECAST, PRESTRESSED, HOLLOW-CORE CONCRETE SLABS SHALL BE DESIGNED AND MANUFACTURED BY AN EXPERIENCED CONCRETE PRE-CASTING FACILITY CERTIFIED BY THE PRESTRESSED CONCRETE INSTITUTE (PCI). PRECAST CONCRETE DESIGN AND CONSTRUCTION SHALL BE IN FULL ACCORDANCE WITH THE FOLLOWING PUBLICATIONS:
   -ACI 318 -14, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
   -PCI MNL 116, "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST AND PRESTRESSED CONCRETE PRODUCTS"
B. CONCRETE FOR HOLLOW-CORE SLABS SHALL BE 5,000 PSI MIN AT 28 DAYS. THE USE OF CALCIUM CHLORIDE, CHLORIDE IONS, OR OTHER SALTS ARE NOT PERMITTED.
C. DEFORMED STEEL REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60. LAP ALL SPLICES 30 BAR DIAMETERS, MIN (UNO).
D. MANUFACTURER SHALL PREPARE SHOP DRAWINGS FOR EACH PRECAST UNIT WHICH DETAIL ALL INTENDED DIMENSIONS, REINFORCING SIZE AND LOCATIONS, OPENINGS, BLOCK-OUTS AND EMBEDDED ITEMS, INCLUDING LIFTING DEVICES. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION.
E. PROVIDE CONNECTION POINTS, LIFTING DEVICES, JOINT GASKETS, GROUT AND OTHER ITEMS AS REQUIRED FOR HANDLING, AND FOR A COMPLETE INSTALLATION.
F. PRECAST SLABS SHALL NOT BE CUT, DRILLED OR MODIFIED IN THE FIELD EXCEPT AS INDICATED ON THE CONTRACT DRAWINGS, OR AS APPROVED BY THE ENGINEER.
G. HOLLOW-CORE SLAB UNITS SHALL BE LIFTED AND SUPPORTED DURING MANUFACTURING, STOCKPILING, TRANSPORTING, AND ERECTION ONLY AT THE LIFTING OR SUPPORTING POINTS AS SHOWN ON THE SHOP DRAWINGS AND WITH APPROVED LIFTING DEVICES. STORE ALL UNITS ABOVE THE GROUND.
H. PROVIDE KOROLATH BEARING PAD AT ALL HOLLOW-CORE SLAB BEARING LOCATIONS PER OLD CASTLE MANUFACTURER OR APPROVED EQUAL.
I. GROUT INTO KEYWAY SHALL BE MINIMUM 3,000 PSI AT 28 DAYS AND 3/8" AGGREGATE MAX.

METAL DECK

A. METAL DECK SHALL CONFORM TO THE AISI (AMERICAN IRON AND STEEL INSTITUTE) SPECIFICATIONS FOR THE DESIGN OF LIGHT GAGE COLD-FORMED STRUCTURAL STEEL MEMBERS AND SDI CODE OF RECOMMENDED STANDARD PRACTICE
B. METAL DECKING SHALL BE MADE OF STEEL CONFORMING TO ASTM A653 GRADE A FOR GALVANIZED DECK AND/OR ASTM A1008, GRADE C FOR PAINTED DECK HAVING A MINIMUM YIELD STRENGTH OF 33,000 PSI.
C. ALL METAL DECK HAS BEEN DESIGNED TO BE CONTINUOUS OVER THREE SPANS MINIMUM, AND SHALL BEAR AT LEAST 2" ON STEEL SUPPORTS. FOR ONE OR TWO SPAN CONDITIONS, THE CONTRACTOR SHALL PROVIDE SHORING AS REQUIRED, OR FURNISH HIGHER GAGE DECK AS REQUIRED TO SUPPORT ALL THE APPLICABLE LOADS. CONTRACTOR SHALL SUBMIT ALTERNATE FOR APPROVAL.
D. DECK SHALL BE WELDED TO SUPPORTING STEEL AT ENDS OF UNITS AND AT ALL INTERMEDIATE SUPPORTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. SIDE LAPS SHALL BE WELDED OR SCREWED AT 3' O/C MAXIMUM FOR SPANS OVER 5'. USE WELDING WASHERS FOR ATTACHING METAL DECK OF 23 GAGE OR LIGHTER.
E. PROVIDE RIDGE AND VALLEY PLATES, STANDARD CLOSURES, CANT STRIPS, POUR STOPS AND OTHER ACCESSORIES AS SHOWN ON DRAWINGS OR AS REQUIRED.
F. METAL DECK SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES PER FOOT WIDTH:
   1 1/2", TYPE B, WIDE RIB, 22 GAUGE (0.0295 INCH)
   I = 0.169 IN^4
   SP = 0.198 IN^3
   SN = 0.213 IN^2
G. PROVIDE STEEL LEDGER ANGLE L2 1/2x2 1/2x1/4 AT STEEL COLUMNS AS REQUIRED FOR SUPPORT OF METAL DECKING.
H. DECK OPENINGS THAT ARE LARGER THAN 8" OR CUT THROUGH MORE THAN 2 WEBS SHALL BE REINFORCED PER TYPICAL DETAILS.
I. METAL DECK SHALL BE INSPECTED IN THE FIELD BY AN INDEPENDENT TESTING AGENCY APPROVED BY THE ARCHITECT AND PAID FOR BY THE CONTRACTOR.

ABBREVIATIONS

L	ANGLE
@	AT
°	DEGREE
±	PLUS / MINUS
ADD'L	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
ARCH	ARCHITECTURAL
BOT	BOTTOM
BRG	BEARING
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONT	CONTINUOUS
COORD	COORDINATE
DEG	DEGREE
DIA	DIAMETER
DIM	DIMENSION
DTL	DETAIL
DWG(S)	DRAWING(S)
EA	EACH
EE	EACH END
EF	EACH FACE
EL / ELEV	ELEVATION
EMBED	EMBEDMENT
EQ	EQUAL
EX / EXIST	EXISTING
EW	EACH WAY
EXP	EXPANSION
FF	FINISHED FLOOR
FRP	FIBER REINFORCED PLASTIC
FTG	FOOTING
FV	FIELD VERIFY
GALV	GALVANIZED
HD GALV	HOT-DIPPED GALVANIZED
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
JT	JOINT
KSI	KIPS / SQUARE INCH
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
MANUF / MFR	MANUFACTURER
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
MISC	MISCELLANEOUS
MRWR	MID RANGE WATER REDUCER
NO	NUMBER
OC	ON CENTER
PCF	POUNDS / CUBIC FOOT
PL	PLATE
PSI	POUNDS / SQUARE INCH
REINF	REINFORCEMENT
RTU	ROOF TOP UNIT
SCH / SCHED	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT
SIM	SIMILAR
SOG	SLAB ON GRADE
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TOS	TOP OF STEEL
TS	TUBE STEEL
TRANSV	TRANSVERSE
TYP	TYPICAL
T/.....	TOP OF .....
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
W/C	WATER TO CEMENT RATIO
W/ IN	WITHIN
W/ O	WITHOUT
WWF	WELDED WIRE FABRIC
DN	DOWN
CTRL	CONTROL
RM	ROOM
F/	FRONT OF
B/	BOTTOM OF

ALBRECHT ENGINEERING INC

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 23393, Expiration Date 8/25/2020

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — PROFESSIONAL ENGINEER — 12-20-18

DES:	JWG/RCC
DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

GENERAL STRUCTURAL NOTES

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-001
SCALE AS SHOWN
SHEET 21 OF 81

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SUBMISSIONS

IN ADDITION TO SUBMISSIONS AS REQUIRED IN THE SPECIFICATIONS, CONTRACTOR SHALL PROVIDE PLANS AND DETAILS, SIGNED AND SEALED BY A MARYLAND PROFESSIONAL ENGINEER, FOR THE FOLLOWING: HANDRAILS, GUARDRAILS, GRATING, METAL STAIRS, PRECAST HOLLOW CORE CONCRETE SLABS, AND ROOF TRUSSES.

SUBMITTALS

A. BEFORE SUBMISSION OF SHOP DRAWINGS, THE CONTRACTOR SHALL HAVE DETERMINED AND VERIFIED ALL QUANTITIES, DIMENSIONS, SPECIFIED PERFORMANCE CRITERIA, INSTALLATION REQUIREMENTS, MATERIALS, CATALOG NUMBERS AND SIMILAR DATA AND SHALL HAVE COORDINATED EACH SHOP DRAWING WITH OTHER SHOP DRAWINGS AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
B. PRIOR TO SUBMISSIONS, THE CONTRACTOR SHALL STAMP OR PROVIDE A SIMILAR WRITTEN INDICATION THAT THE CONTRACTOR HAS REVIEWED THE SUBMISSION AND IS SATISFIED THE CONTENTS ARE IN COMPLIANCE WITH THE CONTRACT DRAWINGS.
C. REPRINTS OF THE CONTRACT DRAWINGS WILL NOT BE ACCEPTED.
D. NO DIMENSIONAL INFORMATION MAY BE OBTAINED BY DIRECT SCALING OF THE DRAWINGS.
E. ADEQUATE SETS SHALL BE SUBMITTED SO THAT THE ARCHITECT/ENGINEER CAN MAINTAIN ONE RECORD SET AT ALL TIMES.

SPECIAL INSPECTION

A. SPECIAL INSPECTIONS, IN ACCORDANCE WITH IBC CHAPTER 17, ARE REQUIRED. THE OWNER WILL ENGAGE A SPECIAL INSPECTIONS ENGINEER OF RECORD TO PERFORM THE SERVICES INDICATED.
   1. CONTRACTOR SHALL REGULARLY PROVIDE SPECIAL INSPECTIONS ENGINEER OF RECORD WITH A CURRENT CONSTRUCTION SCHEDULE SO THAT THE REQUIRED INSPECTIONS CAN BE PROVIDED IN A TIMELY MANNER.
B. THE OWNER WILL ENGAGE AN APPROVED, QUALIFIED TESTING AGENCY TO PROVIDE TESTING AND INSPECTION SERVICES AS INDICATED BELOW. SUBMIT REPORTS TO THE STRUCTURAL ENGINEER OF RECORD AND CODE OFFICIAL (AS APPLICABLE).

TYPE OF INSPECTION	IBC SECTIONS
SPECIAL INSPECTIONS	1704.2
STEEL CONSTRUCTION	1705.2
CONCRETE CONSTRUCTION	1705.3
MASONRY CONSTRUCTION	1705.4
SOILS	1705.6

WATERPROOFING

FOR WATERPROOFING FOR EXTERIOR WALLS, SEE ARCHITECTURAL DRAWINGS. MEMBRANE WATERPROOFING SHALL BE AS SPECIFIED IN SECTION 071000.

PRE-ENGINEERED COLD-FORMED STEEL ROOF TRUSSES

A. ALL COLD-FORMED DESIGN AND FABRICATION SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING:
   - "AMERICAN IRON AND STEEL INSTITUTE STANDARD FOR COLD-FORMED STEEL FRAMING - TRUSS DESIGN"
   - "AMERICAN IRON AND STEEL INSTITUTE, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS"
   - "STRUCTURAL BUILDING COMPONENTS ASSOCIATION - COLD- FORMED STEEL BUILDING COMPONENT SAFETY INFORMATION (CFSBCSI)"
B. SHOP DRAWINGS FOR ALL COLD-FORMED STEEL TRUSSES AND CONNECTORS SHALL IDENTIFY THE SPECIFIC PROJECT, SHALL LIST ALL DESIGN CRITERIA AND SHALL SHOW ALL DETAILS NECESSARY FOR PROPER ERECTION. SHOP DRAWINGS SHALL BEAR THE SIGNATURE AND IMPRESSED SEAL OF THE PROFESSIONAL ENGINEER LICENSED IN THE STATE IF MARYLAND WHO PREPARED THEM.
C. SIGNED AND SEALED SHOP DRAWINGS SHALL INCLUDE ALL TRUSS MEMBER SIZES, CONNECTORS, FRAMING PLANS IDENTIFYING EACH TRUSS AND IT'S LOCATION, PERMANENT BRACING AND ANCHORAGE OF BRACING, TRUSS TO TRUSS CONNECTION DETAILS, TRUSS TO STRUCTURE CONNECTIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS AND ANY OTHER TEMPORARY AND PERMANENT ERECTION AND FABRICATION INFORMATION.
D. PROVIDE COMPONENTS WITH PROTECTIVE ZINC COATING COMPLYING WITH ASTM A653, MINIMUM G60 COATING.
E. STRUCTURAL MEMBERS SHALL MEET THE FOLLOWING MINIMUM YIELD STRENGTH REQUIREMENTS:
   CHORD AND WEB MEMBER: Fy=50 KSI,
   BRACING, BRIDGING AND BLOCKING MEMBERS: Fy=33 KSI
F. THE ERECTION AND BRACING OF COLD-FORMED STEEL TRUSSES SHALL BE THE RESPONSIBILITY OF THE OTHERWISE NOTED ON APPROVED SHOP DRAWINGS.
G. TRUSSES SHALL PRODUCE NO HORIZONTAL THRUST TO BEARING WALLS.

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ALBRECHT ENGINEERING INC

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 23313, Experiation Date 8-25-2020

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HOWARD COUNTY, MARYLAND

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STATE OF MARYLAND · RACHEL LYNNE ALBRECHT · No. 23313 · PROFESSIONAL ENGINEER — 12-20-18

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DRAWING S1-002

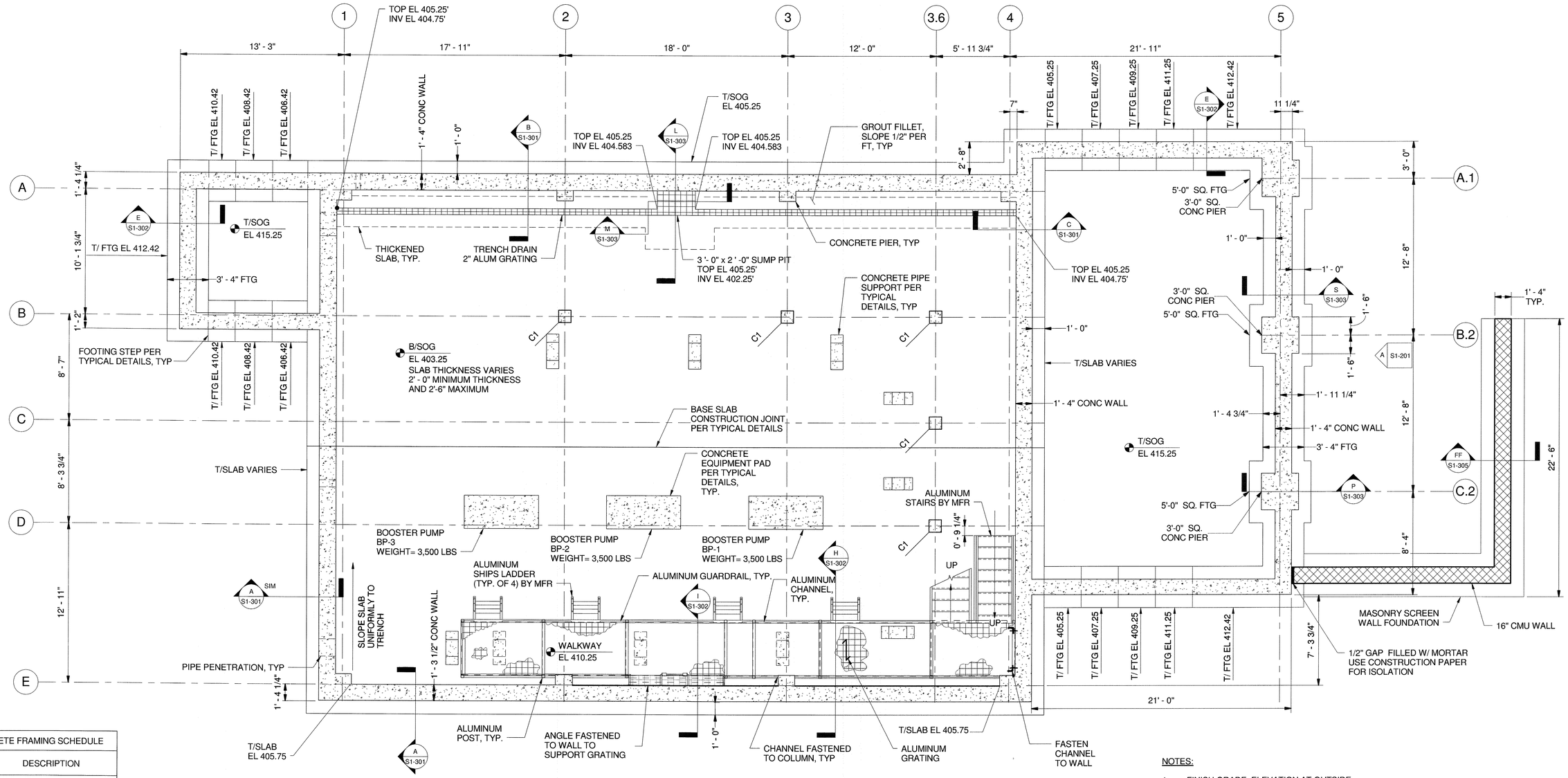
GENERAL STRUCTURAL NOTES

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 22 OF 81



CONCRETE FRAMING SCHEDULE	
I.D.	DESCRIPTION
C1	12"x12" COLUMN

NOTE:

REFER TO SECTIONS AND DETAILS FOR REINFORCEMENT

NOTES:

1. FINISH GRADE ELEVATION AT OUTSIDE PERIMETER OF BUILDING SHALL BE 414.58', UNO

1 PUMPING STATION LOWER LEVEL PLAN

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

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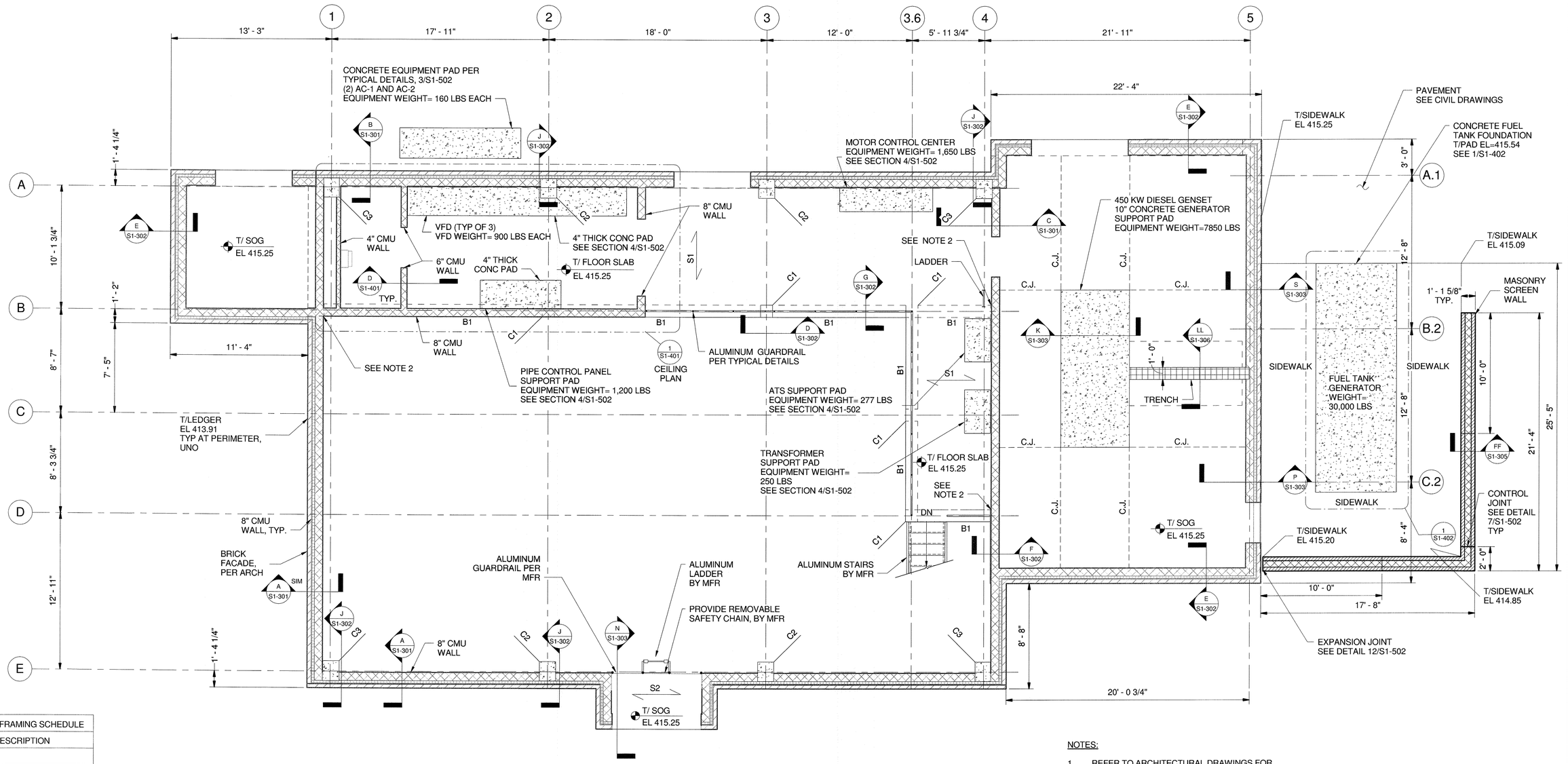
STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — No. 23393 — PROFESSIONAL ENGINEER — 12-20-18

DES:	JWG/RCC						
DRN:	ANM						
CHK:	RLA						
DATE:	DEC 2018	BY	NO.	REVISION	DATE	600' SCALE MAP NO.: 35	BLOCK NO.: 17, 11

PUMPING STATION LOWER LEVEL PLAN

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-101
SCALE AS SHOWN
SHEET 23 OF 81



CONCRETE FRAMING SCHEDULE	
I.D.	DESCRIPTION
S1	8" SLAB
S2	8" SLAB
B1	12" W x 18" D
C1	12" x 12" COLUMN
C2	14 3/4" W x 19"D COLUMN
C3	16" W x 19" D COLUMN

NOTE:

REFER TO SECTIONS AND DETAILS FOR REINFORCEMENT

NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR MASONRY WALL CONTROL JOINT LOCATIONS.
2. THE CONCRETE BEAM SHALL BE POCKETED INTO THE WALL AT THIS LOCATION.
3. FINISH GRADE ELEVATION AT OUTSIDE PERIMETER OF BUILDING SHALL BE 414.58', UNO
4. SEE CIVIL DRAWINGS FOR FUEL TANK AREA FOR FINISH FLOOR ELEVATIONS.
5. FOR EXTERIOR SIDEWALK, SEE CONTRACT SDP18-046.

1 PUMPING STATION FIRST FLOOR PLAN

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

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DRN:	ANM
CHK:	RLA
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BY	NO.	REVISION	DATE

PUMPING STATION FIRST FLOOR PLAN

600' SCALE MAP NO.: 35 — BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING S1-102
SCALE AS SHOWN
SHEET 24 OF 81

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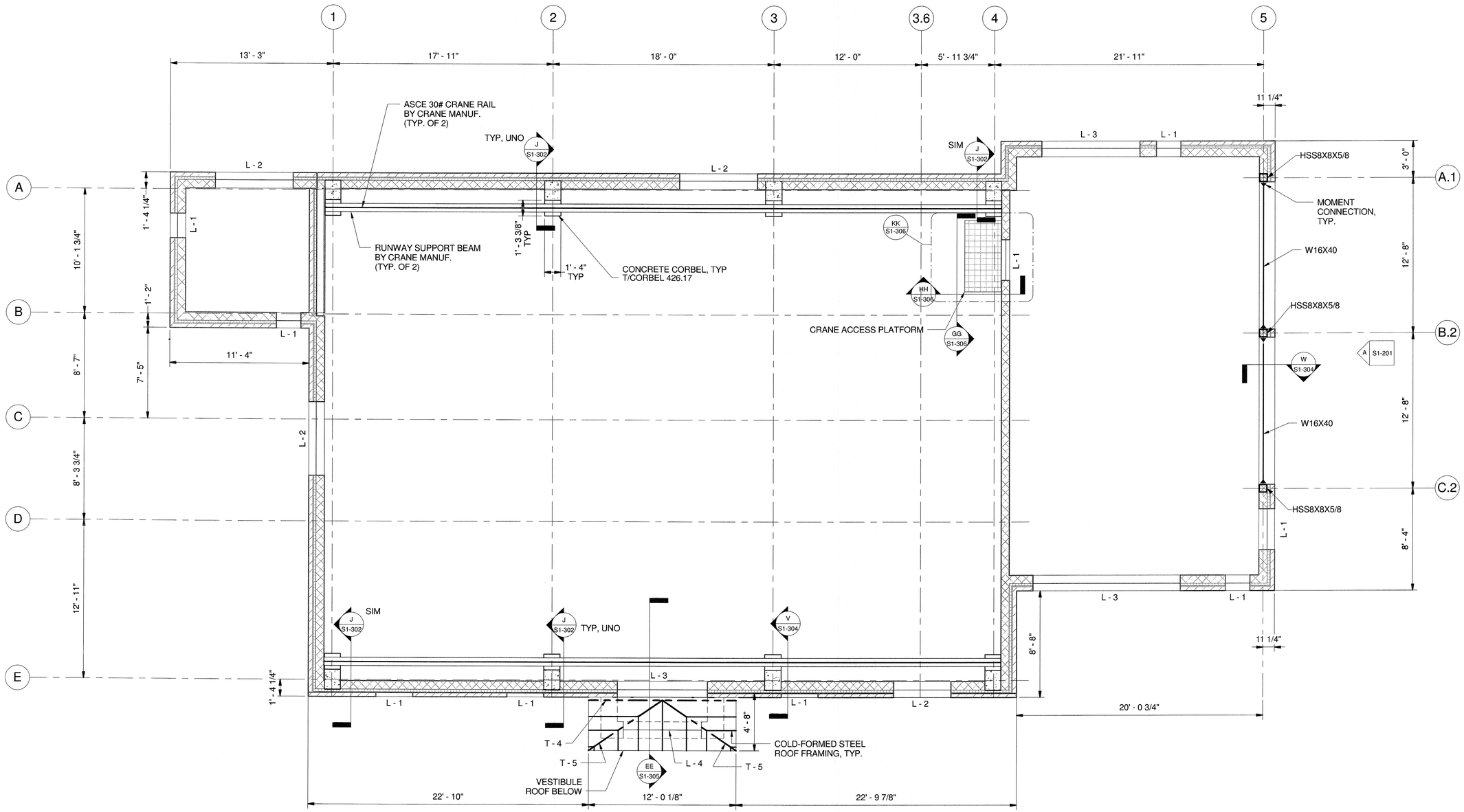

1 PUMPING STATION CRANE PLAN

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

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DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

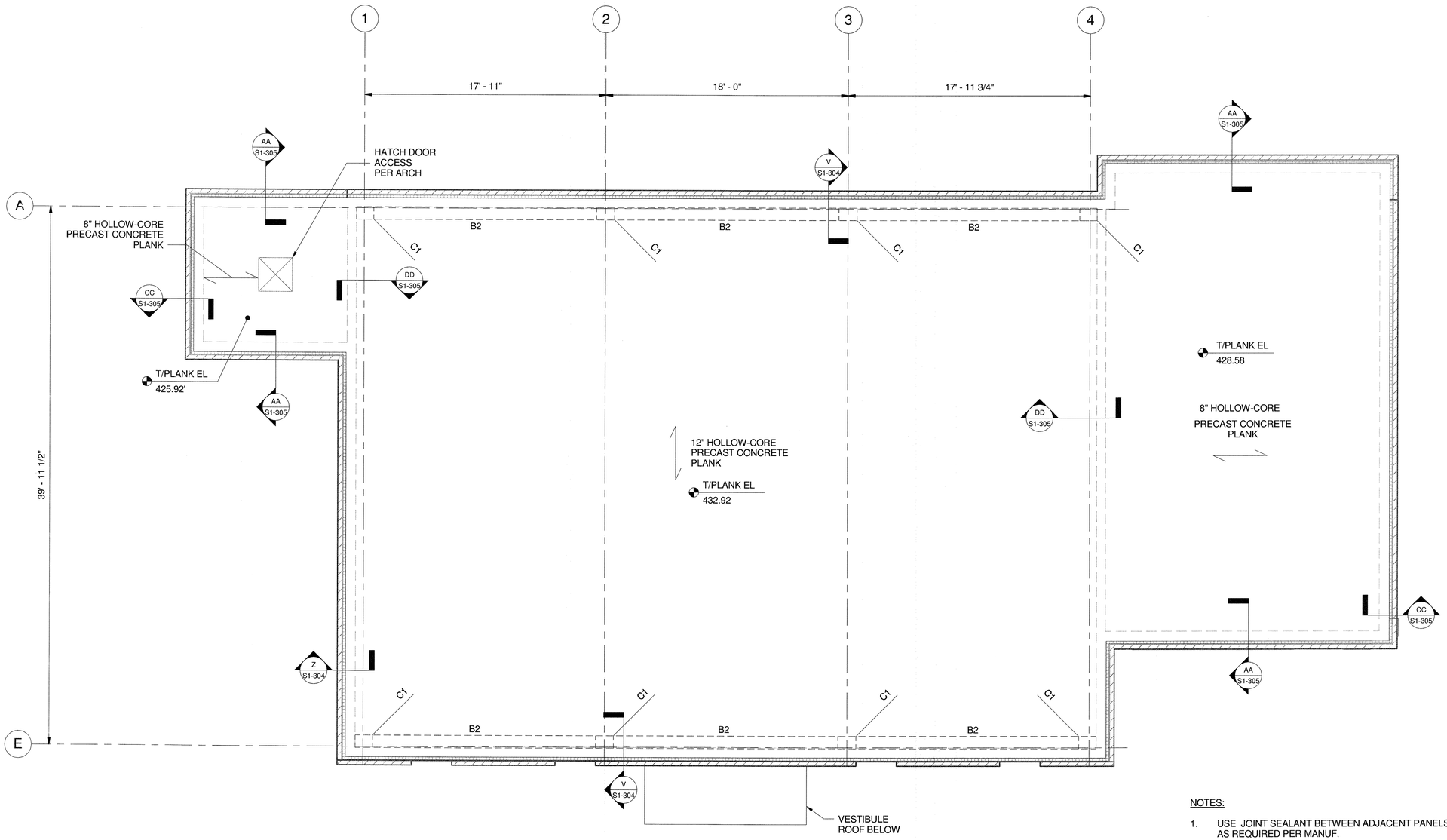
BY	NO.	REVISION	DATE

PUMPING STATION CRANE PLAN

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-103
SCALE AS SHOWN
SHEET 25 OF 81



CONCRETE FRAMING SCHEDULE	
I.D.	DESCRIPTION
C1	12" Wx12" D COLUMN
B2	10 1/2" W x 18" D BEAM

NOTE:

REFER TO SECTIONS AND DETAILS FOR REINFORCEMENT

NOTES:

1. USE JOINT SEALANT BETWEEN ADJACENT PANELS AS REQUIRED PER MANUF.

1 PUMPING STATION CEILING PLAN

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

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CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION CEILING PLAN

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-104
SCALE AS SHOWN
SHEET 26 OF 81

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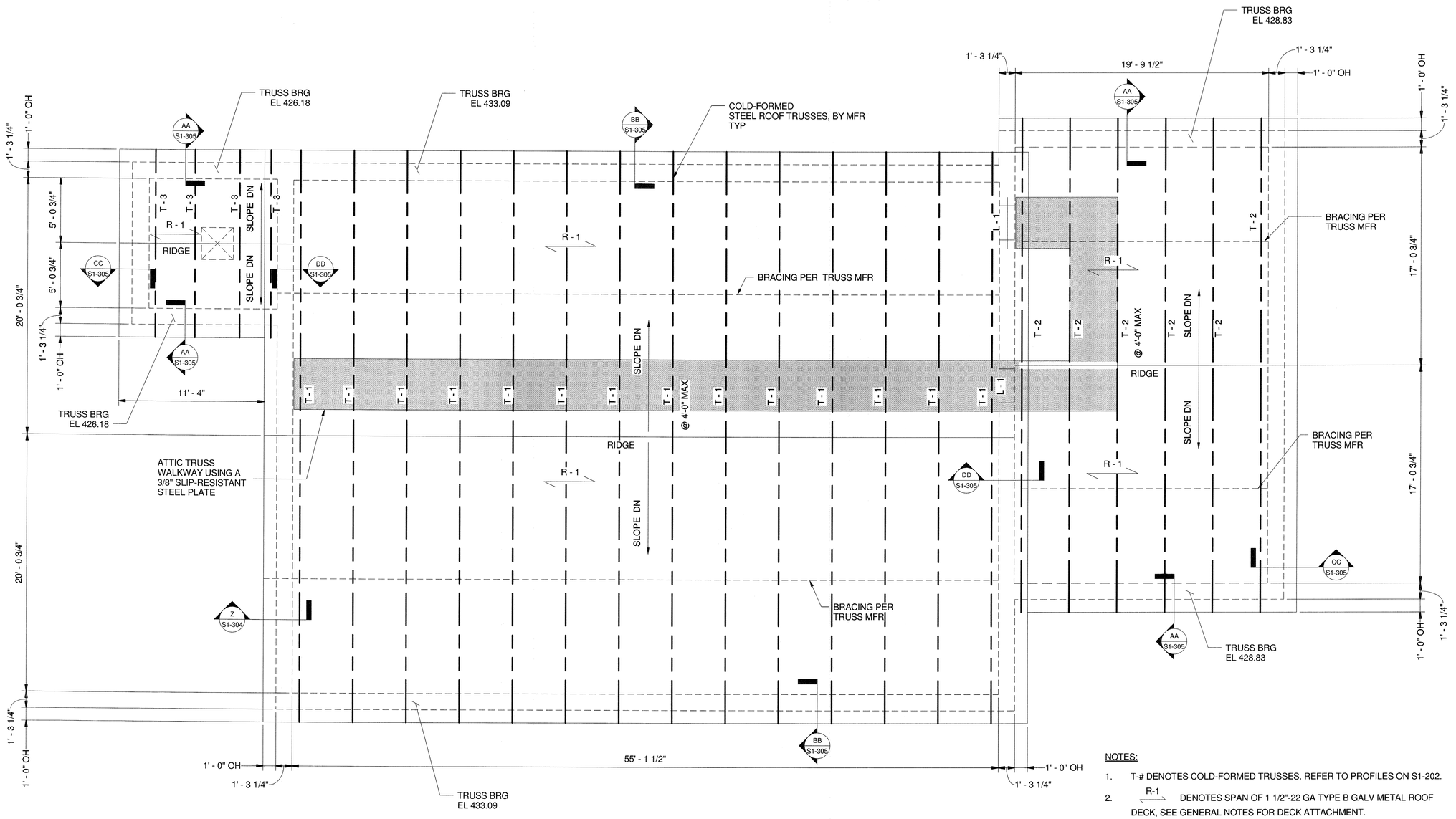

1 ROOF PLAN
SCALE: 1/4" = 1'-0"

NOTES:

1. T-# DENOTES COLD-FORMED TRUSSES. REFER TO PROFILES ON S1-202.
2. R-1 DENOTES SPAN OF 1 1/2"-22 GA TYPE B GALV METAL ROOF DECK, SEE GENERAL NOTES FOR DECK ATTACHMENT.
3. INDICATES ATTIC WALKWAY. DESIGN TRUSSES FOR A MINIMUM SUPERIMPOSED LIVE LOAD OF 20 PSF.

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STATE OF MARYLAND
RACHEL LYNNE ALBRECHT
No. 23393
PROFESSIONAL ENGINEER
12-26-18

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CHK:	RLA					
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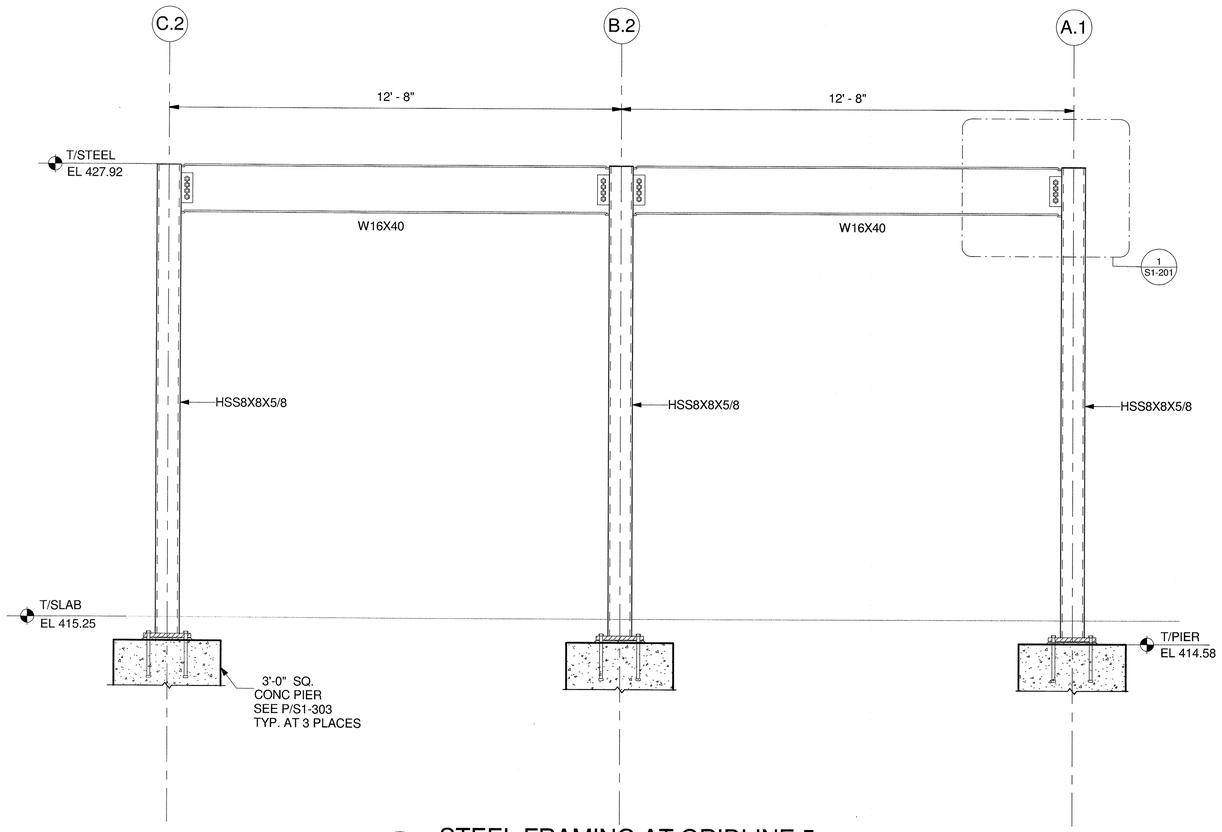
PUMPING STATION ROOF PLAN

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION

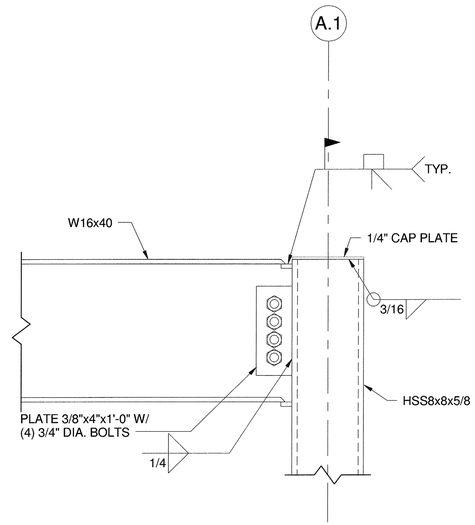
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-105
SCALE AS SHOWN
SHEET 27 OF 81



A STEEL FRAMING AT GRIDLINE 5

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



1 DETAIL

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

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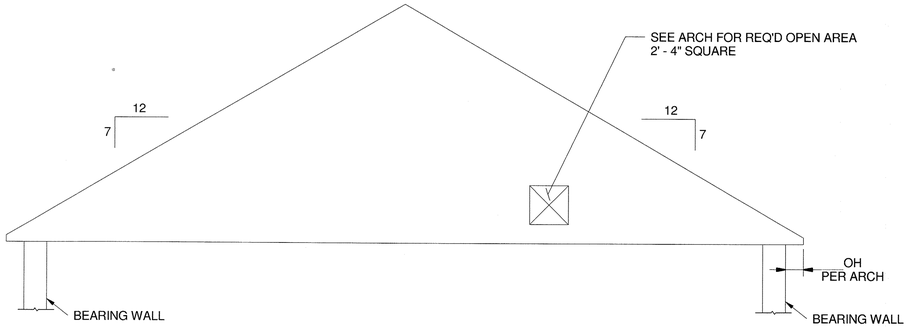
MOMENT FRAME SECTION AND DETAILS

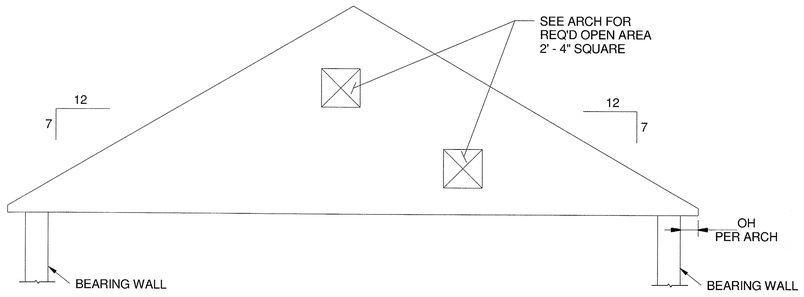
600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

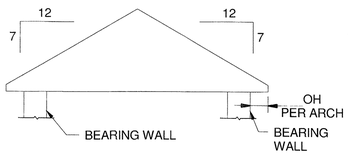
DRAWING S1-201
SCALE AS SHOWN
SHEET 28 OF 81



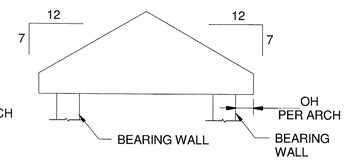
TRUSS T-1



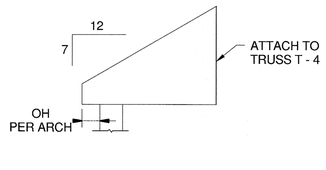
TRUSS T-2



TRUSS T-3



TRUSS T- 4



TRUSS T- 5

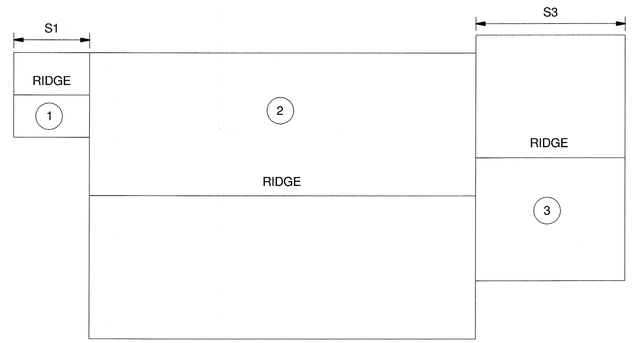
ROOF TRUSS NOTES:

1. TRUSS LAYOUT, TYPES, AND PROFILES SHOWN ON THE CONSTRUCTION DOCUMENTS SHOW DESIGN INTENT. THE TRUSS FABRICATOR SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAILING OF THE ROOF TRUSS FRAMING. SUBMIT SIGNED AND SEALED SHOP DRAWINGS INCLUDING TRUSS LAYOUT, PIECE DRAWINGS CONNECTION DETAILS, AND CALCULATIONS TO THE ENGINEER.
2. DIMENSIONED PROFILES ARE FOR DESIGN INTENT ONLY. TRUSS MANUFACTURER/DETAILER SHALL VERIFY AND COORDINATE DIMENSIONS AND SLOPES WITH ARCHITECTURAL DRAWINGS.
3. HOLD DOWNS AND ANCHORAGE ARE TO BE PROVIDED TO DEVELOP FORCES SHOWN ON APPROVED TRUSS SHOP DRAWINGS.
4. OPENINGS FOR ATTIC TRUSSES ONLY REQ'D IN AREA OF WALKWAY. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR LOCATION, DIMENSIONS AND ELEVATIONS.
5. TRUSSES SHALL BE MADE OF COLD-FORMED METAL FRAMING.

ROOF TRUSS LOADING

- TOP CHORD DEAD LOAD = 10 PSF
- BOTTOM CHORD LIVE LOAD = 30 PSF

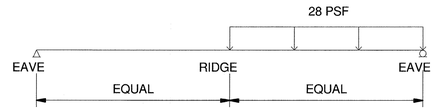
SNOW LOADS



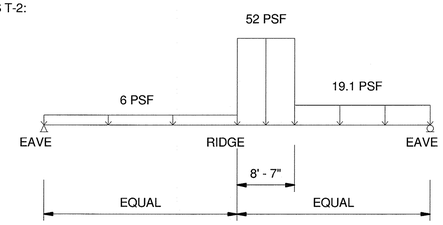
Ps = 19.2 PSF

UNBALANCED SNOW LOAD

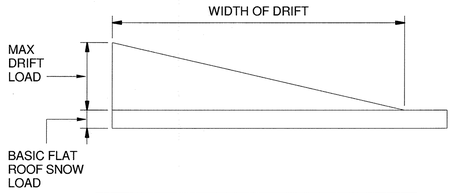
TRUSS T-1 & T-3:



TRUSS T-2:



SNOW DRIFT SCHEDULE

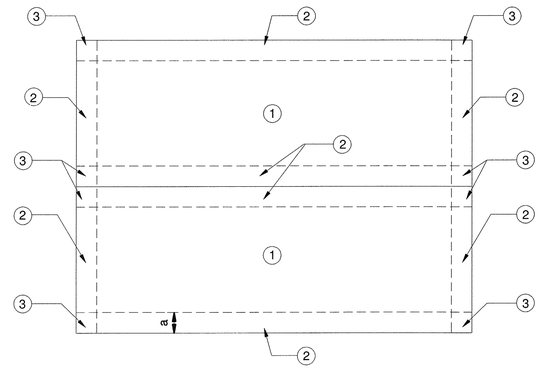


SNOW DRIFT SCHEDULE		
SNOW DRIFT MARK	MAX DRIFT LOAD	WIDTH OF DRIFT
S1	69 PSF	16'
S3	69 PSF	16'

NOTE:

IF THE DRIFT WIDTH EXCEEDS THE WIDTH OF THE LOWER ROOF, THE DRIFT SHALL BE TRUNCATED AT THE FAR EDGE OF THE ROOF.

WIND LOADS



p= -38.6 PSF (ZONE 1)
= -64.7 PSF (ZONE 2)
= -97.4 PSF (ZONE 3)

a= 10% OF LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 3 FT.

NOTES:

1. WIND LOADS HAVE BEEN COMPUTED USING ASCE 7-10 FOR COMPONENTS AND CLADDING AND ARE STRENGTH LEVEL.
2. WIND LOADS MAY BE REDUCED BASED ON EFFECTIVE WIND AREA PER TABLE 30.7-2.

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CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

ROOF TRUSS ELEVATIONS, LOADING, AND NOTES

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-202
SCALE AS SHOWN
SHEET 29 OF 81

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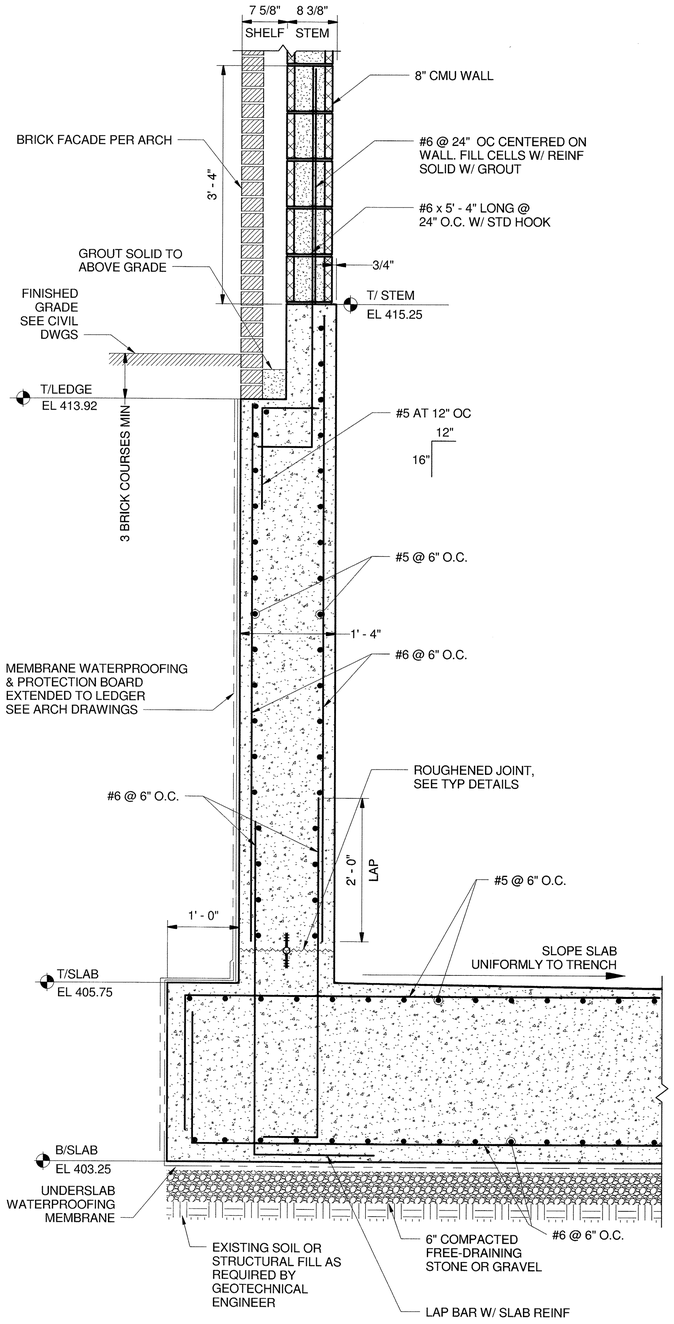
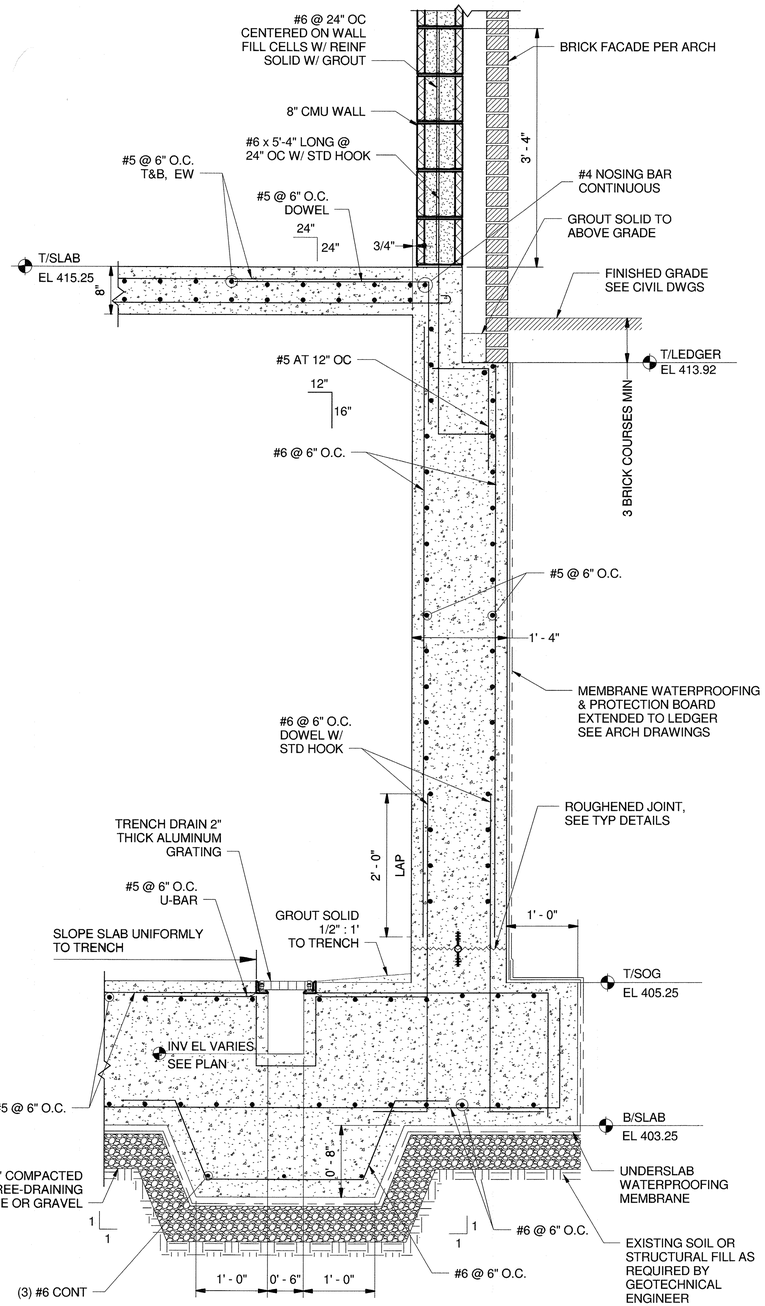


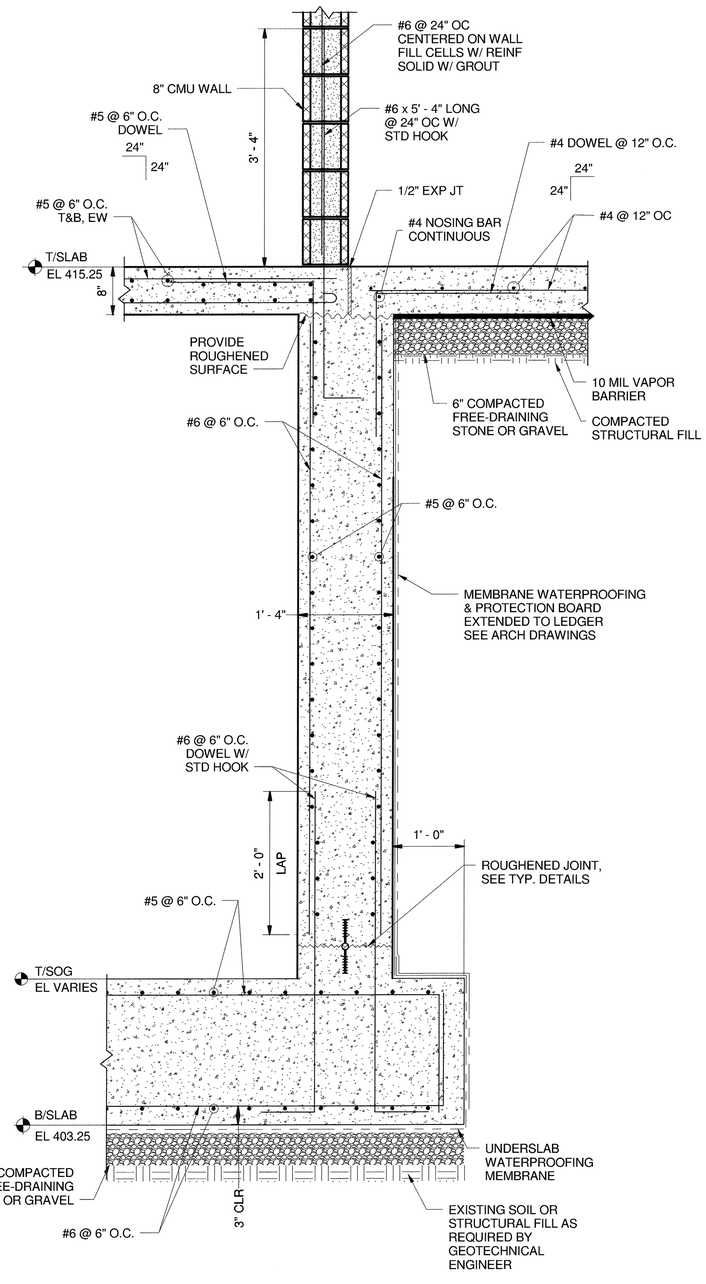
A Section A

SCALE: 1" = 1'-0"



B Section B

SCALE: 1" = 1'-0"



C Section C

SCALE: 1" = 1'-0"

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CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — No. 22396 — PROFESSIONAL ENGINEER — 12-20-18

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DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

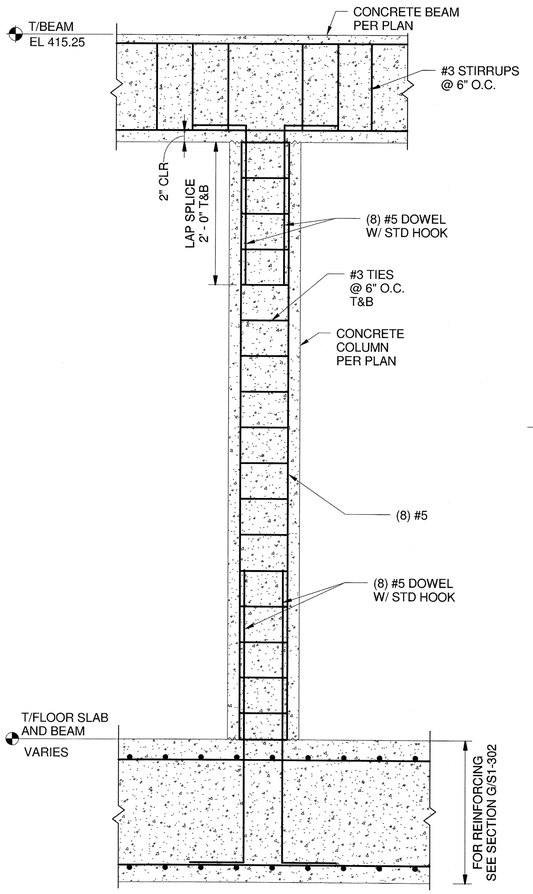
SECTIONS

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

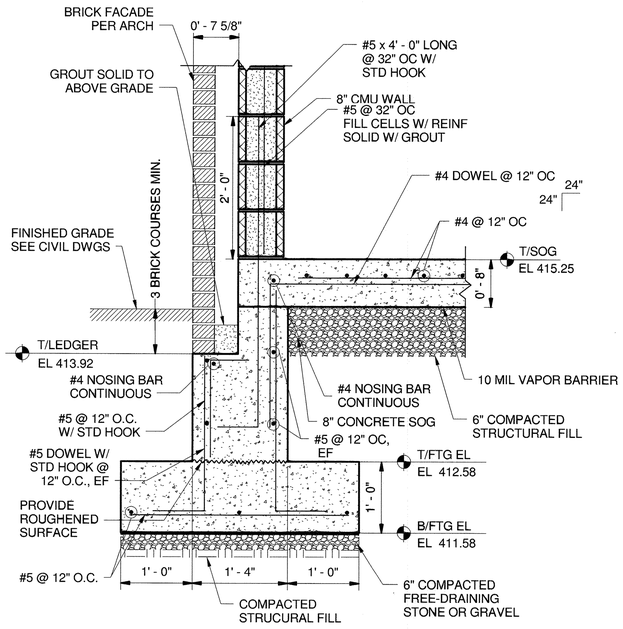
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-301
SCALE AS SHOWN
SHEET 30 OF 81



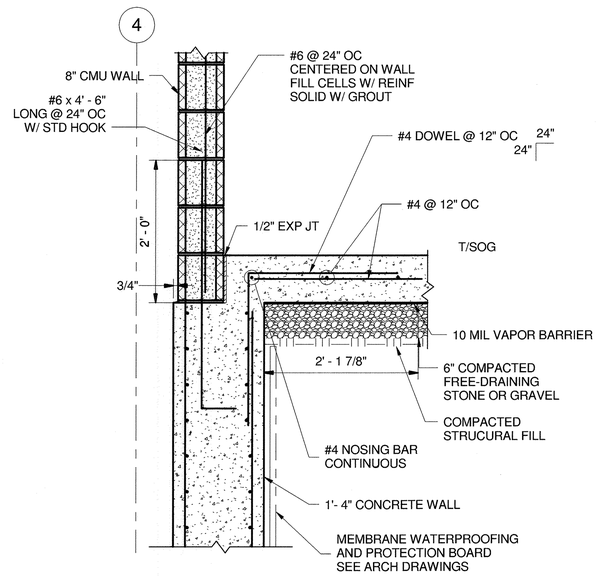
D Section D

SCALE: 1" = 1'-0"



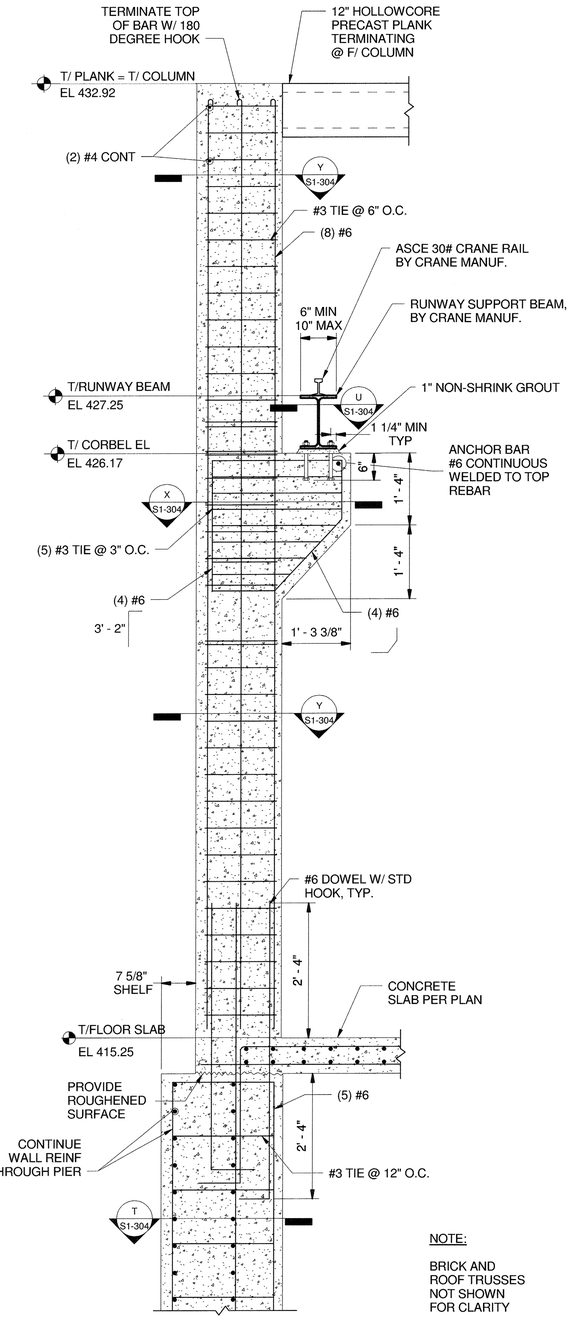
E Section E

SCALE: 1" = 1'-0"



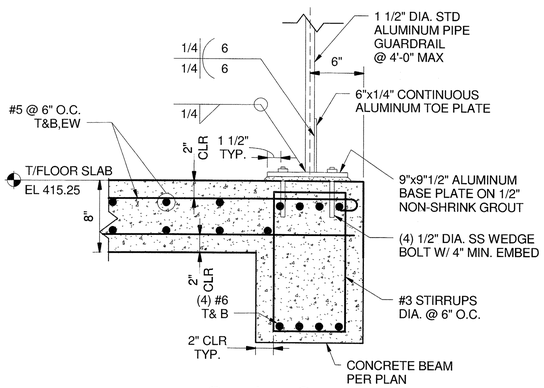
F Section F

SCALE: 1" = 1'-0"



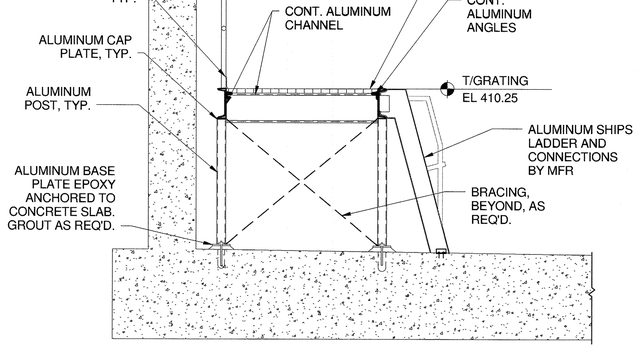
NOTE:

BRICK AND
ROOF TRUSSES
NOT SHOWN
FOR CLARITY



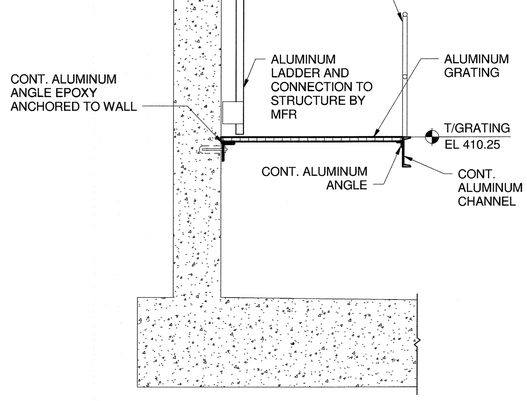
G Section G

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



H Section H

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



I Section I

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

NOTES:
1. INFORMATION SHOWN, INCLUDING: FRAMING SIZE / ORIENTATION, GRATING, CONNECTION PLATES, ANCHORS, HANDRAILS, AND GUARDRAILS ARE FOR INFORMATION ONLY. DRAWINGS AND CALCULATIONS, SIGNED AND SEALED BY A MARYLAND PROFESSIONAL ENGINEER, SHALL BE PROVIDED.
2. ALL LANDINGS, GUARDRAILS, HANDRAILS, GRATING, STAIRS, AND POSTS SHALL BE ALUMINUM, BY STAIR AND GUARDRAIL MFR.

J Section J

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

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — No. 23393 — PROFESSIONAL ENGINEER — 12-20-18

DES:	JWG/RCC
DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

SECTIONS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-302
SCALE AS SHOWN
SHEET 31 OF 81

12/18/2018 12:42:00 PM
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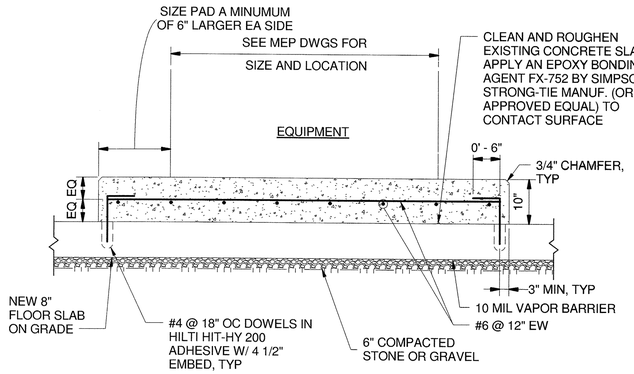
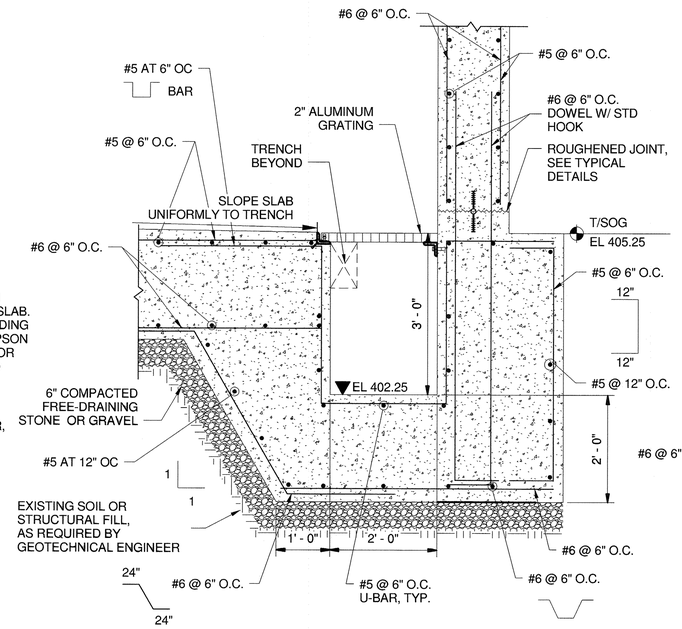


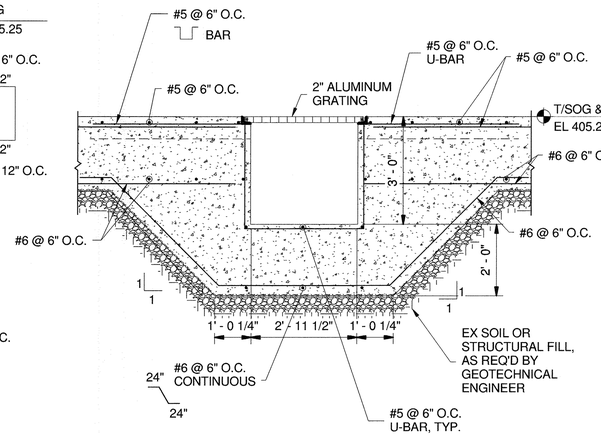
K Section K

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



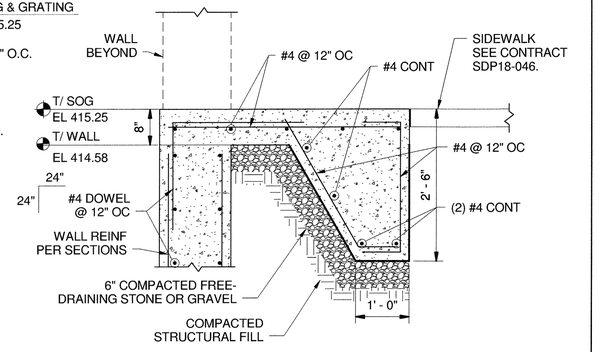
L Section L

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



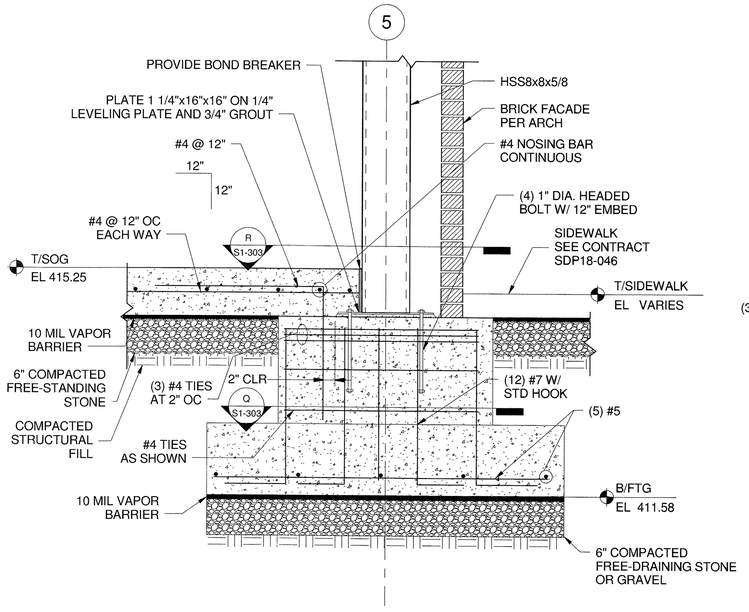
M Section M

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



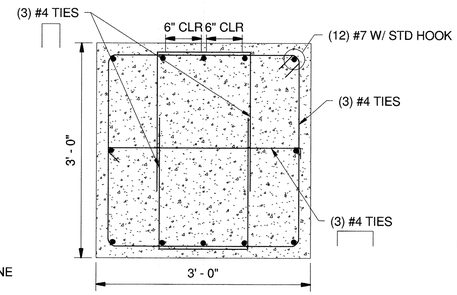
N Section N

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



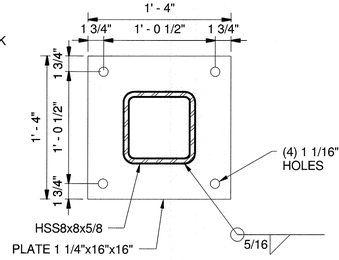
P Section P

SCALE: 1" = 1'-0"



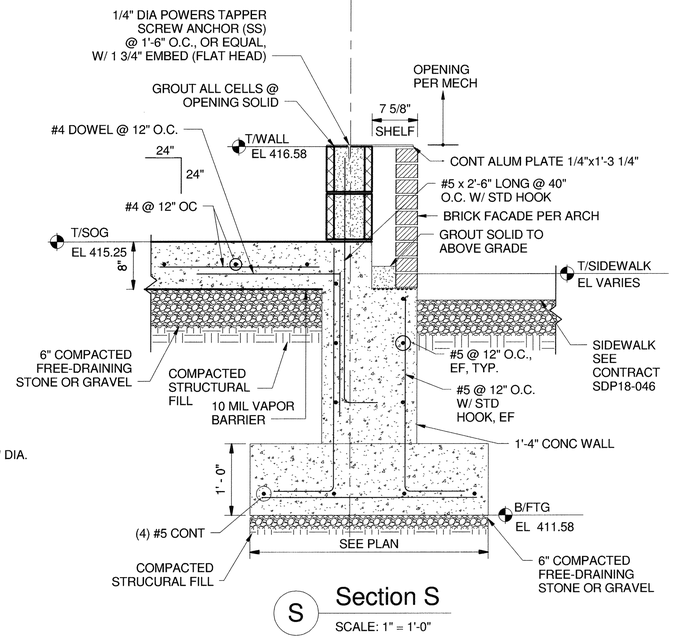
Q Section Q

SCALE: 1" = 1'-0"



R Section R

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



S Section S

SCALE: 1" = 1'-0"

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CHIEF, BUREAU OF UTILITIES — DATE 12-28-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — No. 23393 — PROFESSIONAL ENGINEER — 12/20/18

DES:	JWG/RCC
DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

SECTIONS

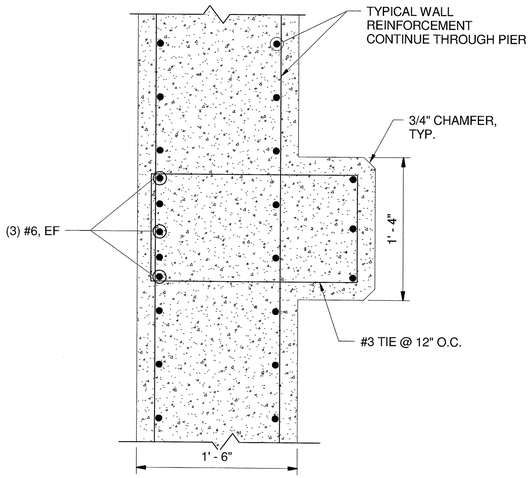
600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

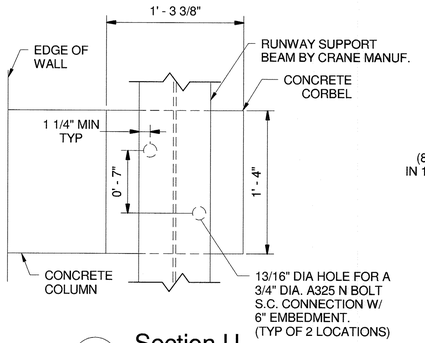
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-303
SCALE AS SHOWN
SHEET 32 OF 81



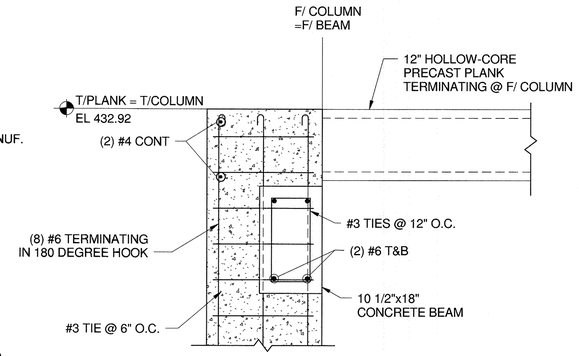
T Section T

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



U Section U

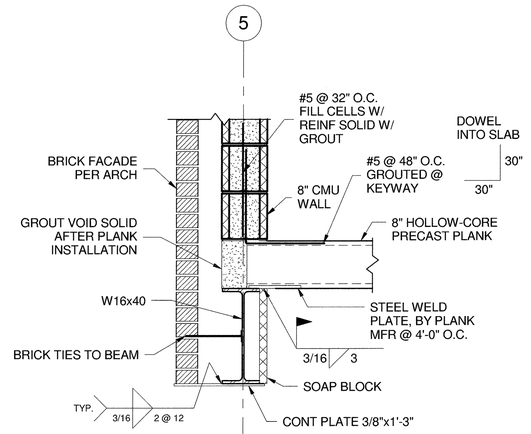
SCALE: 1 1/2" = 1'-0"



NOTE:
1. CONTINUE BEAM REINFORCEMENT THROUGH COLUMN

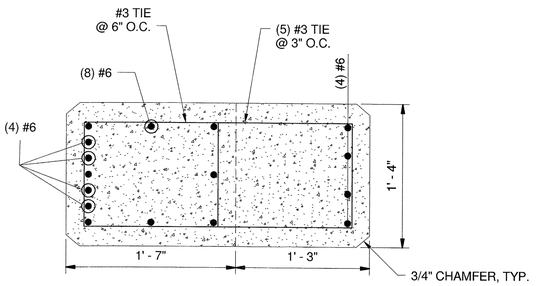
V Section V

SCALE: 1" = 1'-0"



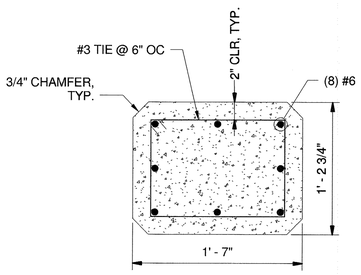
W Section W

SCALE: 1" = 1'-0"



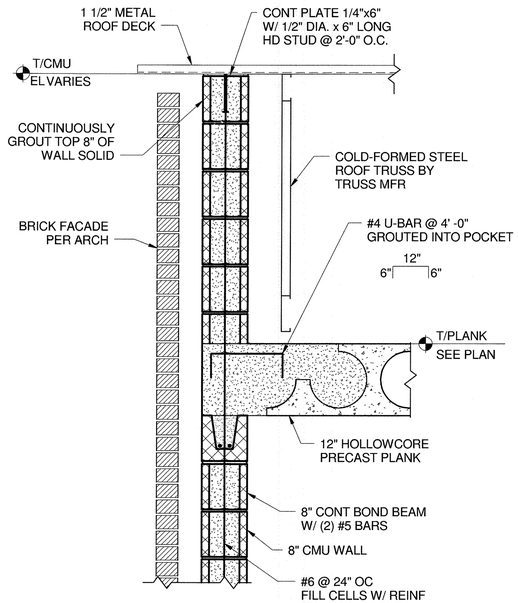
X Section X

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



Y Section Y

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



Z Section Z

SCALE: 1" = 1'-0"

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DES:	JWG/RCC
DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

SECTIONS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-304
SCALE AS SHOWN
SHEET 33 OF 81

12/18/2018 12:42:03 PM
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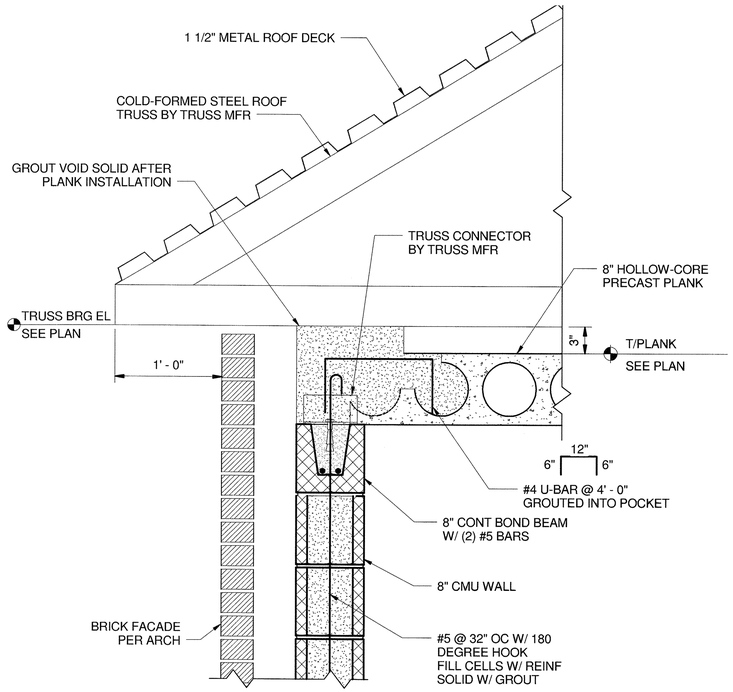
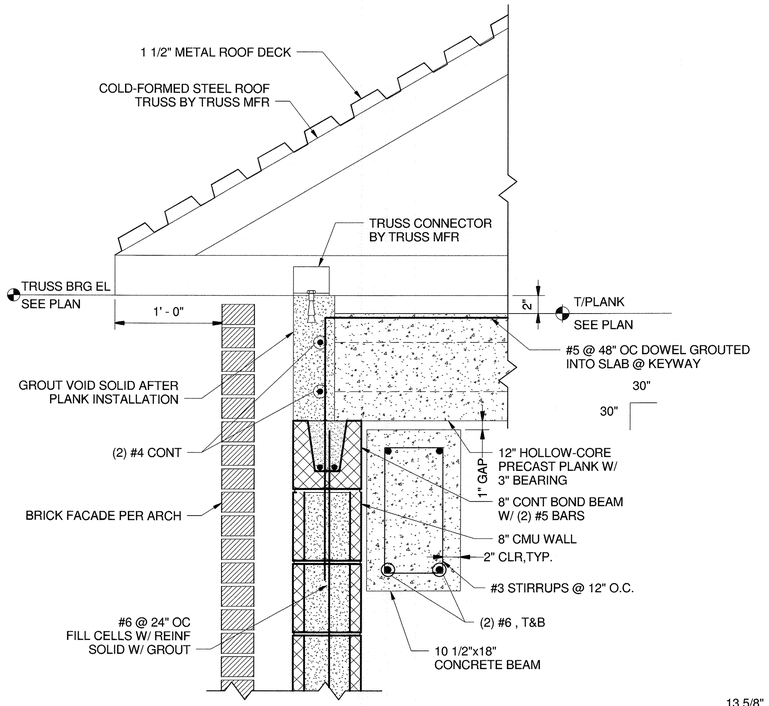


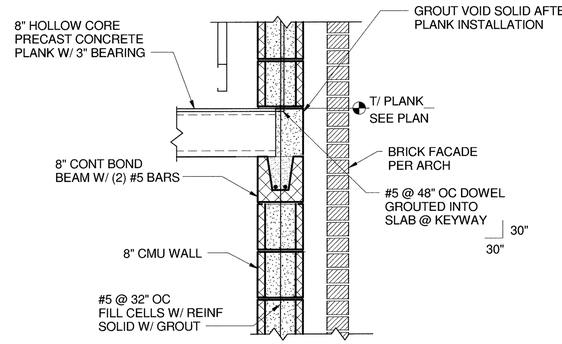
AA Section AA

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



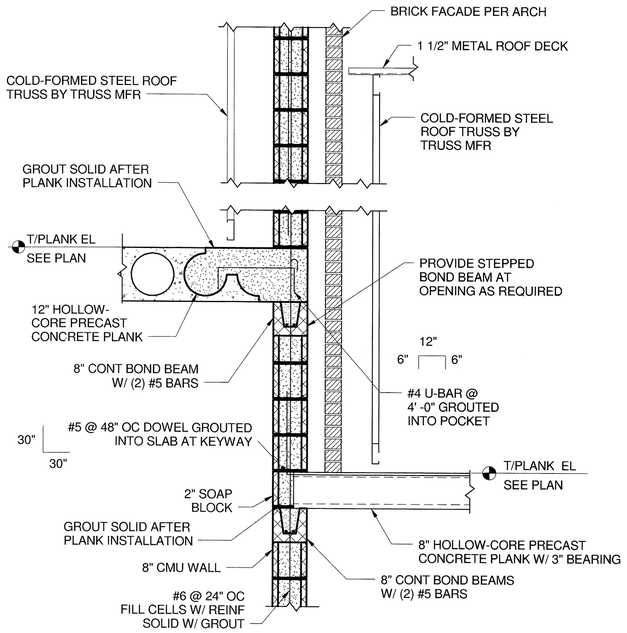
BB Section BB

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



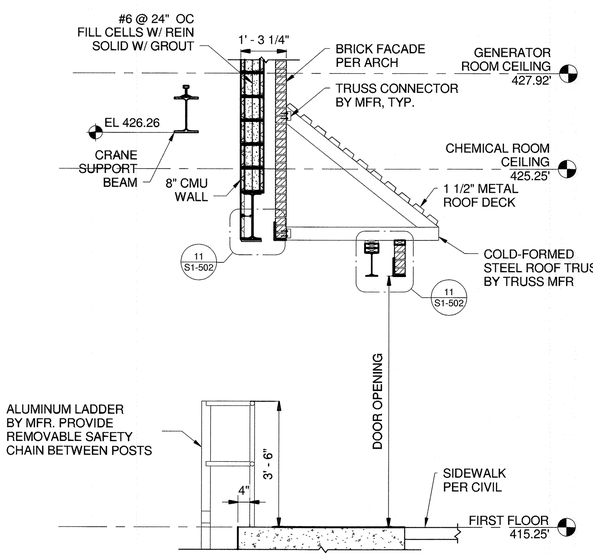
CC Section CC

SCALE: 1" = 1'-0"



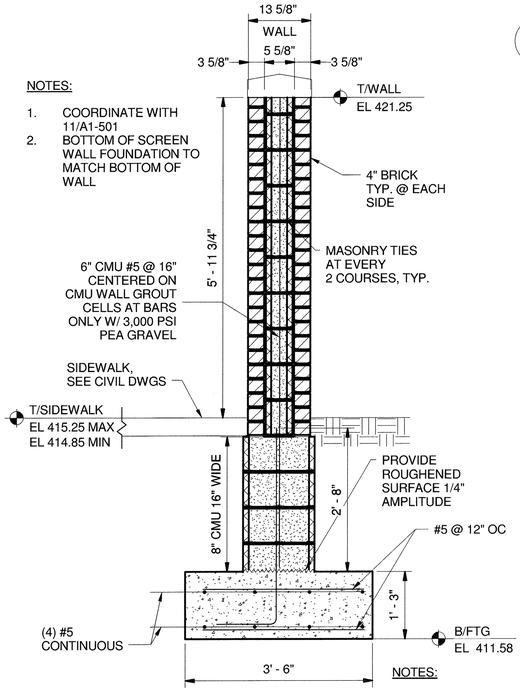
DD Section DD

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



EE Section EE

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



NOTES:

1. COORDINATE WITH 11/A1-501
2. BOTTOM OF SCREEN WALL FOUNDATION TO MATCH BOTTOM OF WALL

FF Section FF

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

NOTES:

1. SEE ARCH DRAWINGS FOR FINISHES.
2. SEE CIVIL DRAWINGS FOR GRADE ELEVATIONS.
3. FILL CELLS BELOW GRADE W/ PEA GRAVEL (F'C=3,000 PSI) CONTINUOUSLY.

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — PROFESSIONAL ENGINEER — 23593 — 12/26/18

DES:	JWG/RCC				
DRN:	ANM				
CHK:	RLA				
DATE:	DEC 2018	BY	NO.	REVISION	DATE

SECTIONS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-305
SCALE AS SHOWN
SHEET 34 OF 81

12/18/2018 12:42:05 PM
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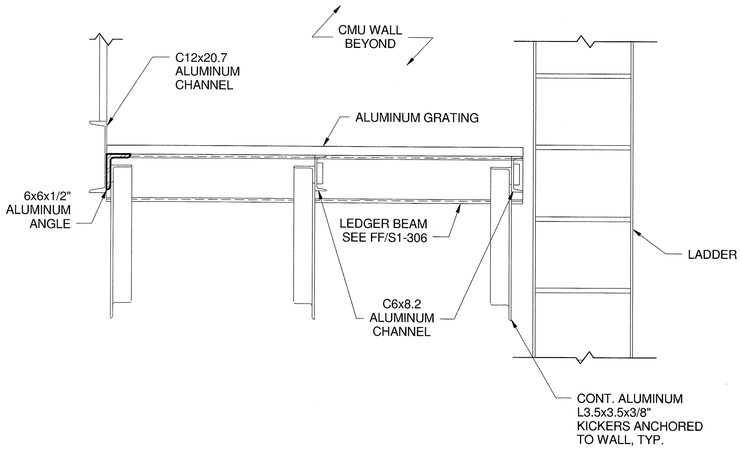
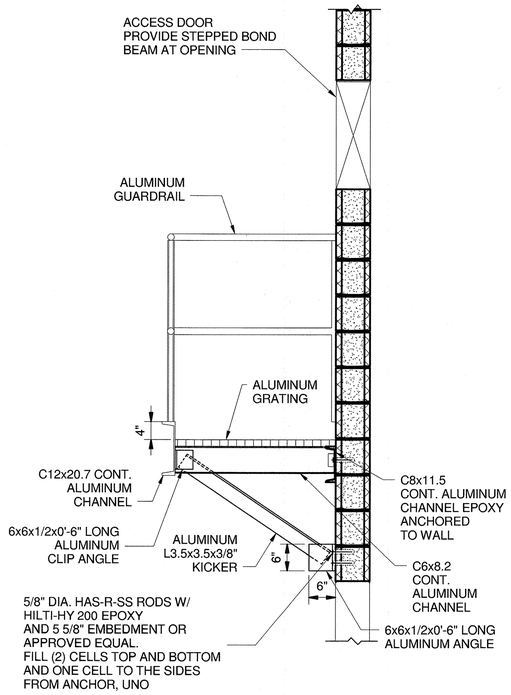
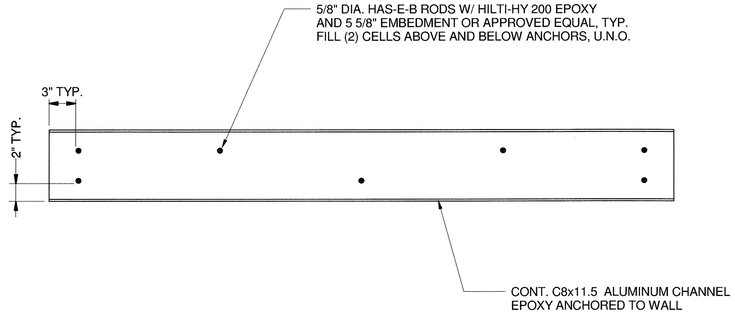




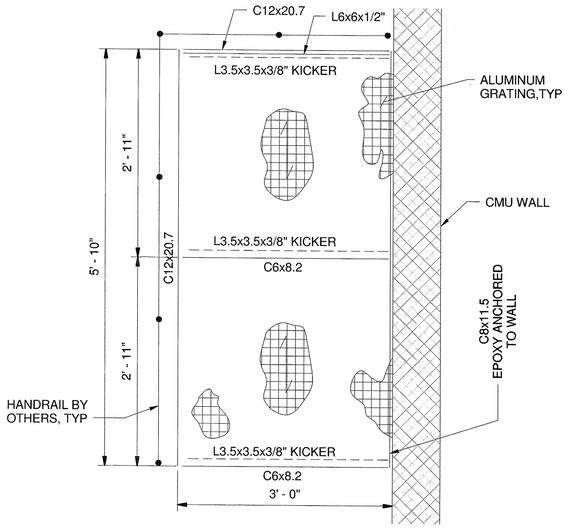


NOTES:

1. ISOLATE BOLTS AND NUTS FROM ALUMINUM AND STAINLESS STEEL USING PLASTIC WASHERS BETWEEN THE BOLT HEAD AND THE SIDE OF THE JOIN AND ALSO BETWEEN THE NUT AND THE OTHER SIDE OF THE JOIN. ALSO, USE A NON-CONDUCTIVE SLEEVE TO FIT ON THE SHAFT OF THE BOLT TO KEEP IT FROM MAKING CONTACT WITH THE STEEL AND/OR ALUMINUM.

GG Section GG

SCALE: 1" = 1'-0"

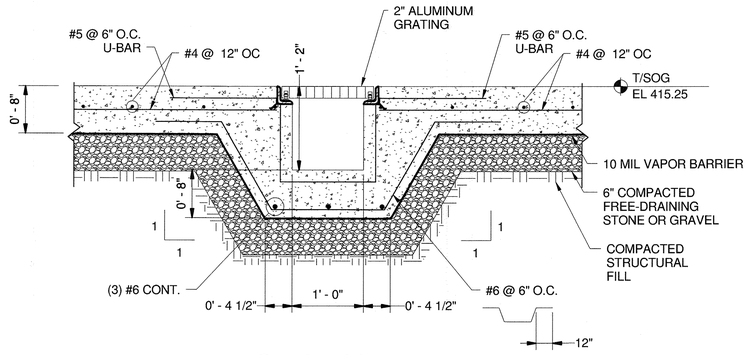


KK CRANE PLAN

SCALE: 1" = 1'-0"

HH Section HH

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



LL Section LL

SCALE: 1" = 1'-0"

JJ LEDGER BEAM AT CRANE

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

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CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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DES:	JWG/RCC
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DATE:	DEC 2018

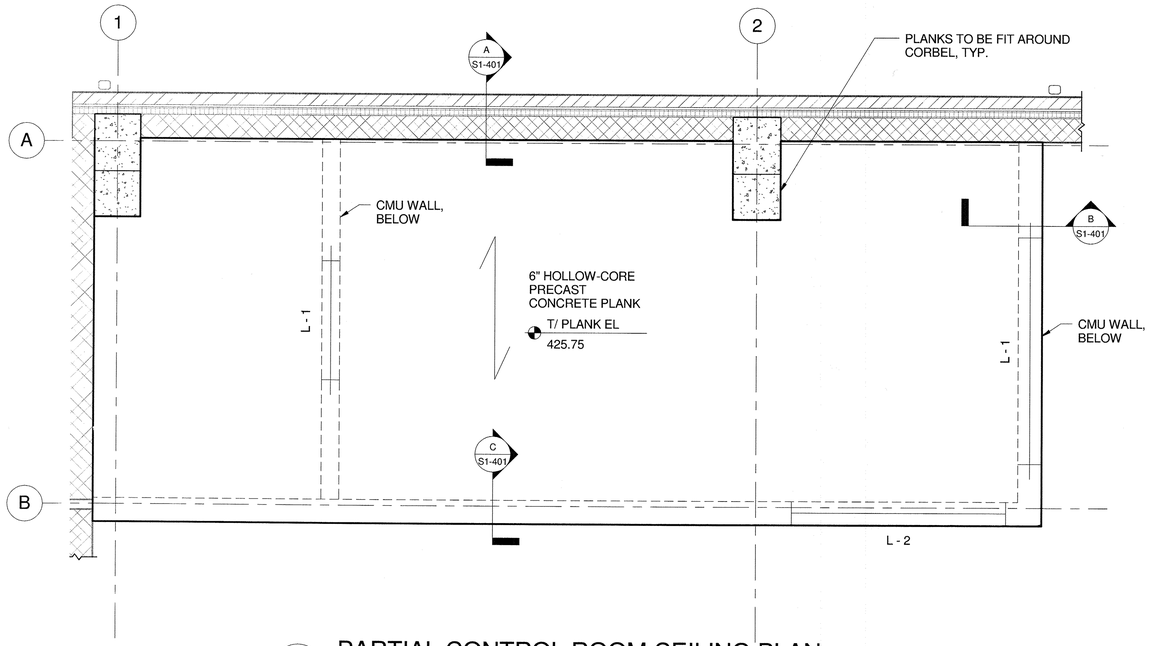
BY	NO.	REVISION	DATE

SECTIONS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

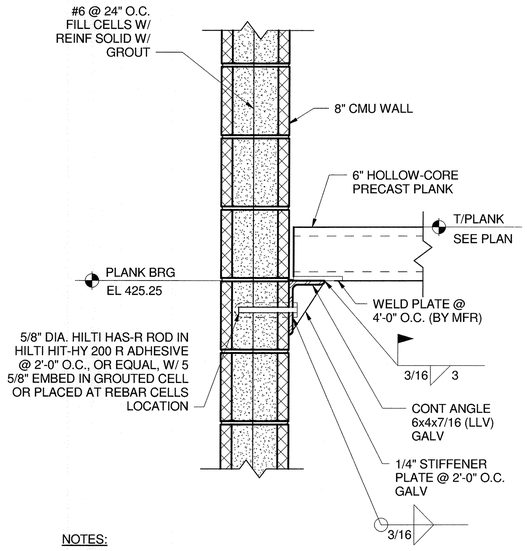
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-306
SCALE AS SHOWN
SHEET 35 OF 81



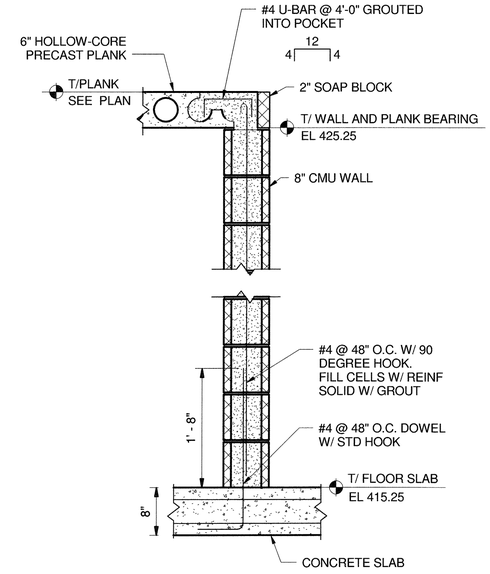
1 PARTIAL CONTROL ROOM CEILING PLAN

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



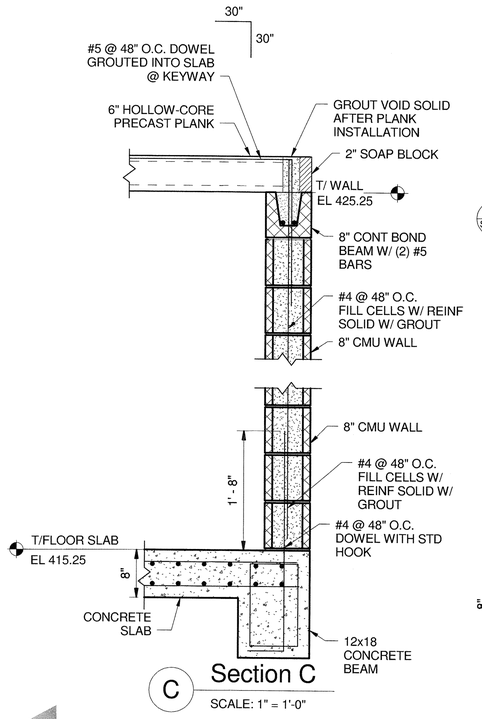
NOTES:

1. ISOLATE BOLT AND WASHER OR NUT FROM GALVANIZED MATERIAL USING A NON-CONDUCTIVE MATERIAL SUCH AS PLASTIC WASHER, RUBBER, PAINT SLEEVE, ETC. TO AVOID GALVANIC CORROSION.



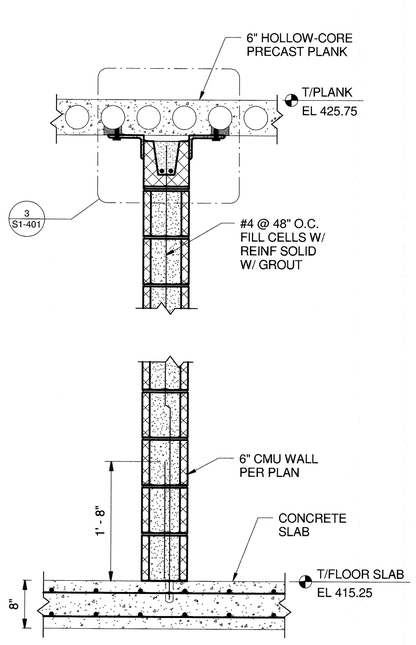
B Section B

SCALE: 1" = 1'-0"



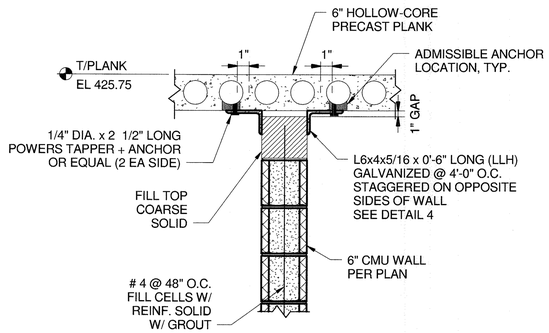
C Section C

SCALE: 1" = 1'-0"



D Section D

SCALE: 1" = 1'-0"

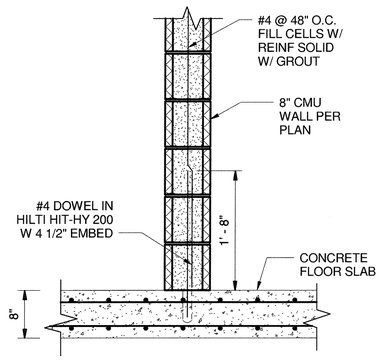


NOTES:

1. ISOLATE BOLT AND WASHER OR NUT FROM GALVANIZED MATERIAL USING A NON-CONDUCTIVE MATERIAL SUCH AS PLASTIC WASHER, RUBBER, PAINT SLEEVE, ETC. TO AVOID GALVANIC CORROSION.

3 DETAIL 3

SCALE: 1" = 1'-0"



4 DETAIL 4

SCALE: 1" = 1'-0"

ALBRECHT ENGINEERING INC

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 25393, Expiration Date 8-25-2020

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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SPARKS, MD 21152
PHONE: (410)316-7800
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STATE OF MARYLAND — RACHEL LYNNE ALBRIGHT — No. 25393 — PROFESSIONAL ENGINEER — 12-20-18

DES:	JWG/RCC					
DRN:	ANM					
CHK:	RLA					
DATE:	DEC 2018	BY	NO.	REVISION	DATE	

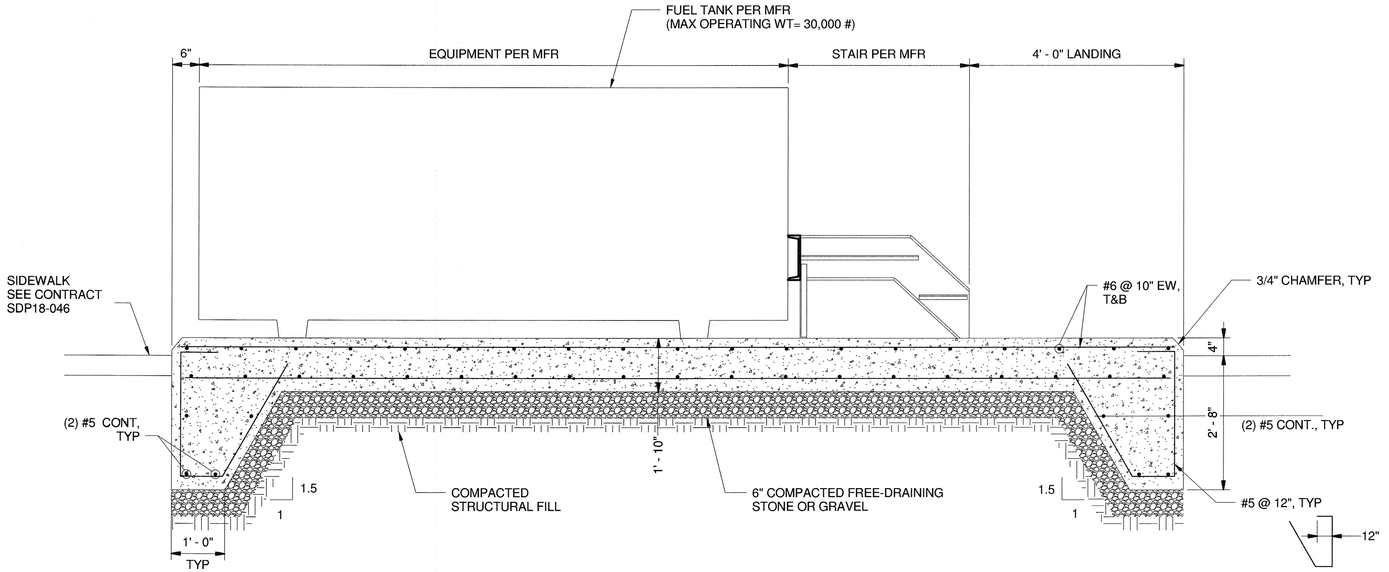
PARTIAL CONTROL ROOM CEILING PLAN

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

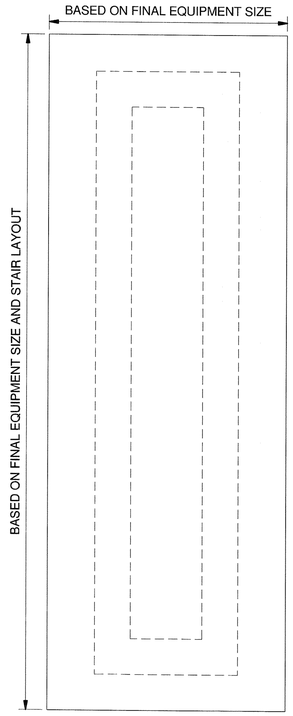
DRAWING S1-401
SCALE AS SHOWN
SHEET 36 OF 81

12/19/2018 12:42:06 PM
\\AES\AEInc\Albrecht Engineering Inc\Projects\2016\2016-009 KCI HoCo 630W\04 CADD\03 STRUCT\13160130601-STRUCT-1.rvt



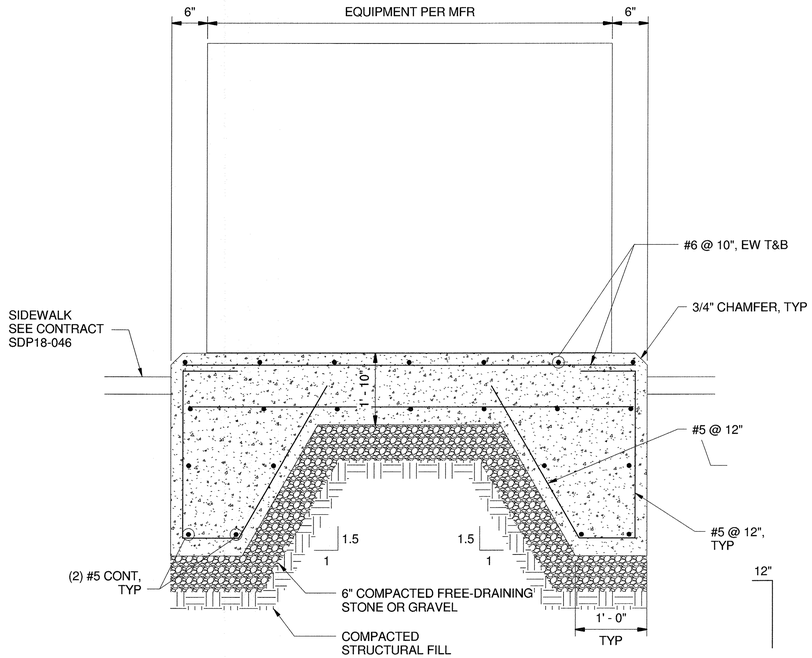
A Section A

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



1 PARTIAL FUEL TANK FOUNDATION PLAN

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



B Section B

SCALE: 1" = 1'-0"

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HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — 23293 — PROFESSIONAL ENGINEER — 12-20-18

DES:	JWG/RCC				
DRN:	ANM				
CHK:	RLA				
DATE:	DEC 2018	BY	NO.	REVISION	DATE

PARTIAL FUEL TANK FOUNDATION PLAN AND SECTIONS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-402
SCALE AS SHOWN
SHEET 37 OF 81

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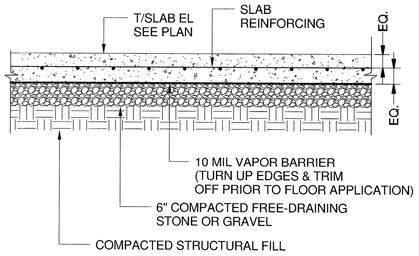
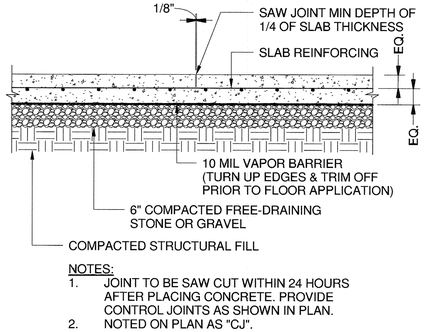


1 SLAB-ON-GRADE

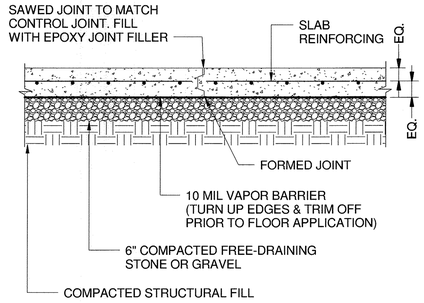
SCALE: 1" = 1'-0"



NOTES:
1. JOINT TO BE SAW CUT WITHIN 24 HOURS AFTER PLACING CONCRETE. PROVIDE CONTROL JOINTS AS SHOWN IN PLAN.
2. NOTED ON PLAN AS "CJ".

2 SLAB-ON-GRADE CONTROL JOINT

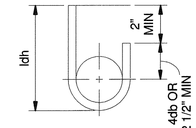
SCALE: 1" = 1'-0"



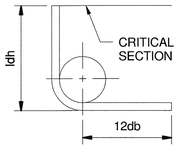
3 SLAB-ON-GRADE CONSTRUCTION JOINT

SCALE: 1" = 1'-0"

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"	13"	12"	13"	6"	5"	6"	3"
#4	14"	18"	17"	22"	6"	6"	6"	3"
#5	17"	22"	25"	32"	8"	8"	8"	3"
#6	20"	26"	34"	44"	9"	9"	9"	3"
#7	33"	43"	49"	63"	11"	11"	11"	4"
#8	42"	54"	56"	72"	12"	12"	12"	4"
#9	53"	69"	63"	81"	14"	14"	14"	5"
#10	67"	87"	71"	92"	16"	16"	16"	6"
#11	78"	102"	78"	102"	17"	17"	17"	6"



STANDARD 180° END HOOK

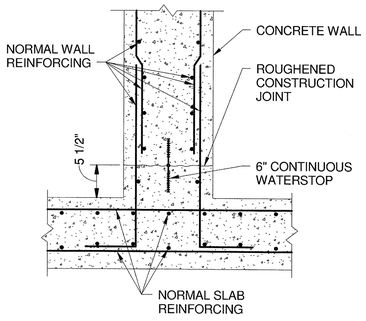


STANDARD 90° END HOOK

STANDARD HOOK ASSUMPTIONS:
SIDE COVER SHALL NOT BE LESS THAN 2 1/2".
END COVER ON 90 DEGREE HOOK SHALL NOT BE LESS THAN 2".

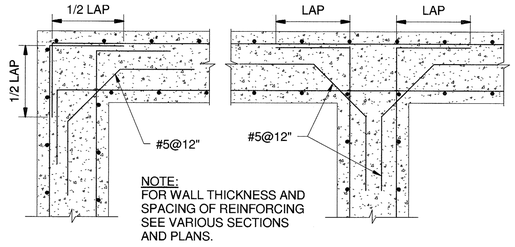
LAP SPLICE ASSUMPTIONS:

CONCRETE: 5,000 PSI COMPRESSIVE STRENGTH (NORMAL WEIGHT CONCRETE).
SLAB & WALL: 4" MINIMUM REBAR SPACING WITH CONCRETE COVER = 2" CLEAR.
BEAM: MINIMUM CLEAR SPACING BETWEEN BARS = 1 1/2".
MINIMUM CONCRETE COVER = 3".
MINIMUM STIRRUP #4@12" OC 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.



4 WALL TO SLAB CONSTRUCTION JOINT

SCALE: 1" = 1'-0"

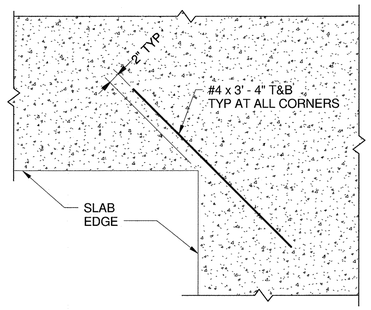


NOTE:
FOR WALL THICKNESS AND SPACING OF REINFORCING SEE VARIOUS SECTIONS AND PLANS.

PLAN VIEW

5 REINFORCING AT INTERSECTIONS

SCALE: 1" = 1'-0"



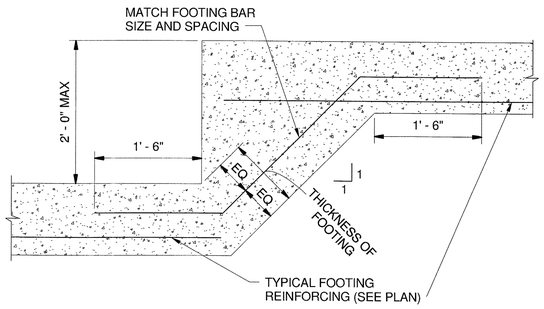
PLAN VIEW

6 ADDITIONAL REINFORCEMENT AT CORNERS

SCALE: 1" = 1'-0"

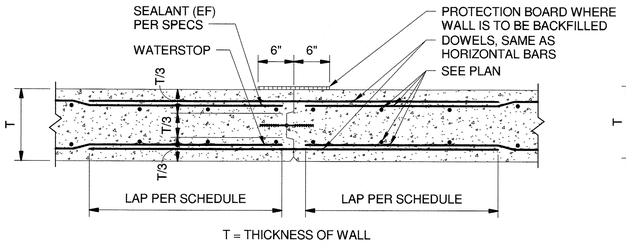
7 REINFORCEMENT LAP SPLICE AND STANDARD HOOK LENGTHS

SCALE: 1" = 1'-0"



8 STEP FOOTING

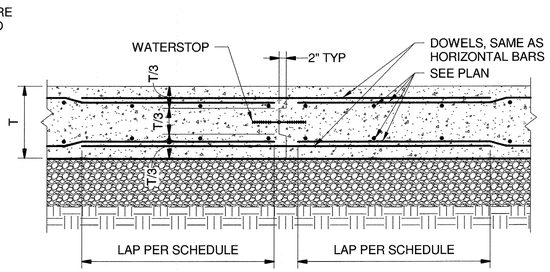
SCALE: 1" = 1'-0"



T = THICKNESS OF WALL

9 WALL CONSTRUCTION JOINT

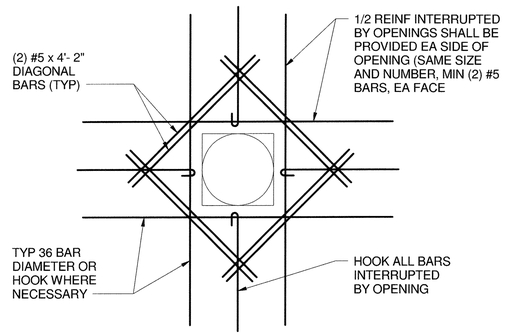
SCALE: 1" = 1'-0"



T = THICKNESS OF WALL

10 BASE SLAB CONSTRUCTION JOINT

SCALE: 1" = 1'-0"



11 SLAB AND WALL OPENING REINFORCEMENT

SCALE: 1" = 1'-0"

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HOWARD COUNTY, MARYLAND

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CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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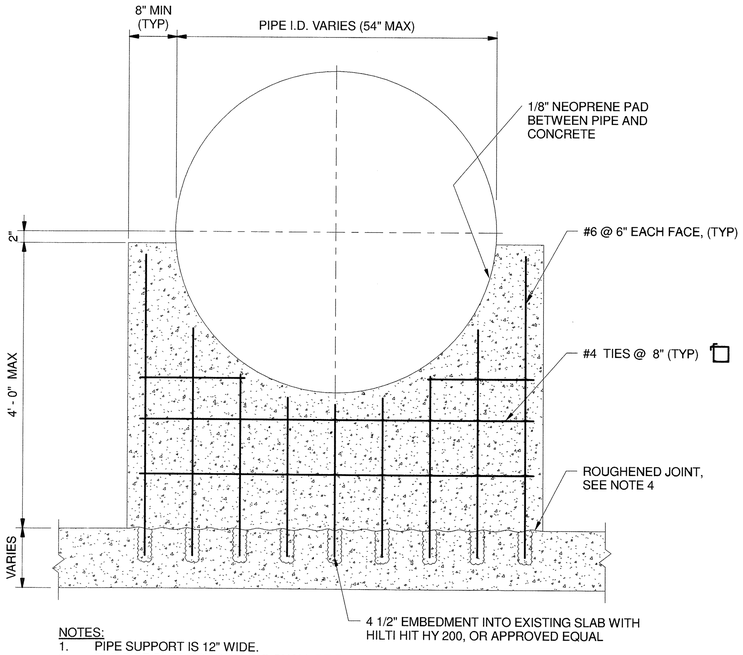
STATE OF MARYLAND · RACHEL LYNNE ALBRECHT · No. 23393 · PROFESSIONAL ENGINEER — 10-30-18

DES:	JWG/RCC						
DRN:	ANM						
CHK:	RLA						
DATE:	DEC 2018	BY	NO.	REVISION	DATE	600' SCALE MAP NO.: 35	BLOCK NO.: 17, 11

TYPICAL DETAILS

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

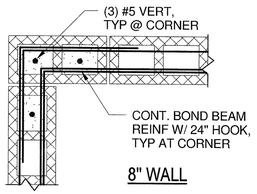
DRAWING S1-501
SCALE AS SHOWN
SHEET 38 OF 81

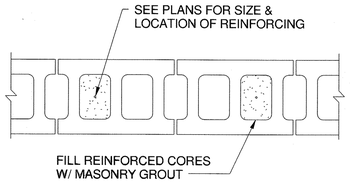


NOTES:
1. PIPE SUPPORT IS 12" WIDE.
2. THE PIPE SUPPORT SPACING SHALL BE PER CONTRACTOR'S PIPE SUPPORT DESIGN.
3. PIPE STRAP SHALL NOT INTERFERE WITH VALVE OPERATION.
4. SURFACE OF EXISTING CONCRETE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO EXISTING CONCRETE. APPLY BONDING COMPOUND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING AGENT SHALL BE "SIKADUR 32, HI MOD" OR APPROVED EQUAL.

1 CONCRETE PIPE SADDLE SUPPORT

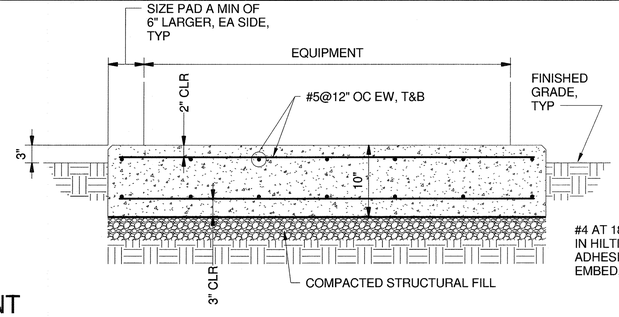
SCALE: 1" = 1'-0"





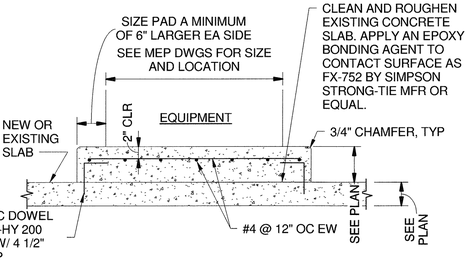
2 MASONRY WALL REINFORCEMENT

SCALE: 1" = 1'-0"



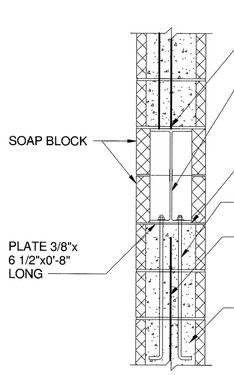
3 EXTERIOR EQUIPMENT PAD SUPPORT

SCALE: 1" = 1'-0"



4 TYP EQUIPMENT PAD SUPPORT

SCALE: 1" = 1'-0"

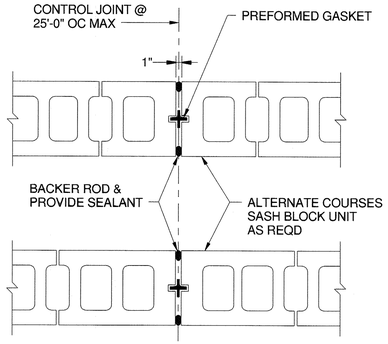


8 REINFORCING AT CORNER

SCALE: 1" = 1'-0"

9 REINFORCING AT JAMBS AND WALL ENDS

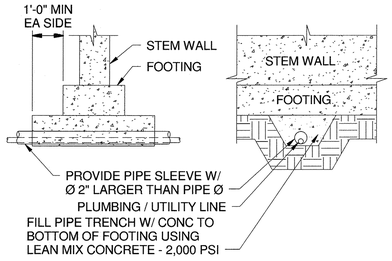
SCALE: 1" = 1'-0"



NOTE: REFER TO ARCH DRAWINGS FOR CONTROL JOINT LOCATIONS

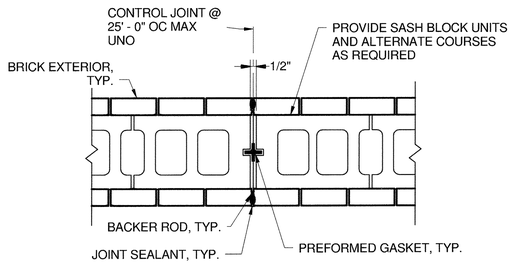
5 CONTROL JOINTS IN CMU MASONRY WALLS

SCALE: 1" = 1'-0"



6 UTILITY PIPE UNDER FOOTING

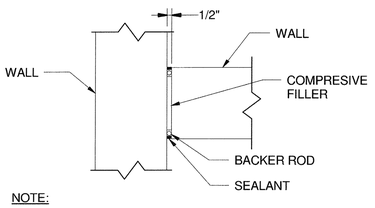
SCALE: 1" = 1'-0"



NOTE:
STOP CONTINUITY OF HORIZONTAL MASONRY TIES AT JOINT LOCATIONS.

7 CONTROL JOINTS IN SCREEN WALLS - PLAN VIEW

SCALE: 1" = 1'-0"



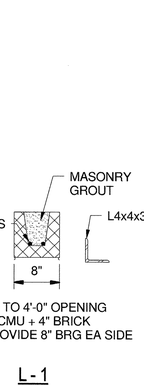
NOTE:
PROVIDE INTERSECT ANCHOR WALLS AT 48" MAX VERTICALLY.

12 ISOLATION JOINT - PLAN VIEW

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

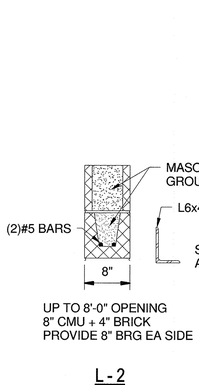
10 W16 BEARING ON CMU WALL

SCALE: 1" = 1'-0"



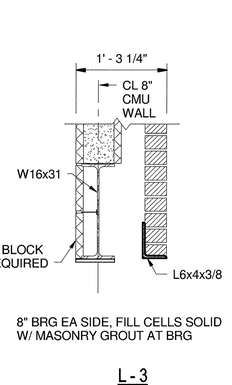
UP TO 4'-0" OPENING
8" CMU + 4" BRICK
PROVIDE 8" BRG EA SIDE

L - 1



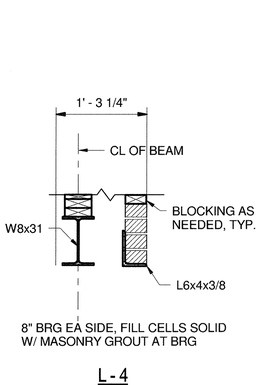
UP TO 8'-0" OPENING
8" CMU + 4" BRICK
PROVIDE 8" BRG EA SIDE

L - 2



8" BRG EA SIDE, FILL CELLS SOLID
W/ MASONRY GROUT AT BRG

L - 3



8" BRG EA SIDE, FILL CELLS SOLID
W/ MASONRY GROUT AT BRG

L - 4

11 LINTELS

SCALE: 1" = 1'-0"

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CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — RACHEL LYNNE ALBRECHT — No. 22393 — PROFESSIONAL ENGINEER — 12-2018

DES:	JWG/RCC
DRN:	ANM
CHK:	RLA
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

TYPICAL DETAILS

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING S1-502
SCALE AS SHOWN
SHEET 39 OF 81

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GENERAL ABBREVIATIONS

ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ARV	AIR RELEASE VALVE
BF	BLIND FLANGE
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BV	BALL VALVE
CI	CAST IRON
CL	CENTERLINE
CLR	CLEAR/CLEARANCE
CONC	CONCRETE
CONT	CONTINUOUS
D	DEEP/DEPTH
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWING
ECC	ECCENTRIC
EFF	EFFLUENT
EJ	EXPANSION JOINT
EL OR ELEV	ELEVATION
ELL	ELBOW
EQ	EQUALIZATION
EW	EACH WAY
EX	EXISTING
FCA	FLANGE COUPLING ADAPTOR
FCV	FLOW CONTROL VALVE
FF	FINISHED FLOOR
FLG	FLANGE
FLR	FLOOR
FM	FORCE MAIN
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
GWRV	GROUNDWATER RELIEF VALVE
H	HIGH/HEIGHT
HORIZ	HORIZONTAL
HP	HIGH POINT OR HORSEPOWER
HWL	HIGH WATER LEVEL
ID	INSIDE DIAMETER
IMC	INTERNATIONAL MECHANICAL CODE
INV	INVERT
JB	JUNCTION BOX
JC	JUNCTION CHAMBER
L	LONG/LENGTH
LF	LINEAR FEET
LP	LOW POINT
LWL	LOW WATER LEVEL
MAX	MAXIMUM
MFR	MANUFACTURER
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
MIN	MINIMUM
MJ	MECHANICAL JOINT
NAVD88	NORTH AMERICAN VERTICAL DATUM 1988
NC	NORMALLY CLOSED
NGVD29	NATIONAL GEODETIC VERTICAL DATUM 1929
NPT	NATIONAL PIPE THREAD
OC	ON CENTER
PE	PLAIN END
PPD	POUNDS PER DAY
PRV	PRESSURE REDUCING VALVE
PS	PUMPING STATION
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PV	PLUG VALVE
R	RADIUS
RCP	REINFORCED CONC. PIPE
REINF	REINFORCEMENT
REQ	REQUIRED
RGC	RIGID GROOVED COUPLING
RGP	RIGID GROOVED PIPE
RPM	REVOLUTIONS PER MINUTE
SCH	SCHEDULE
SIM	SIMILAR
SSMH	SANITARY SEWER MANHOLE
SS	STAINLESS STEEL
STL	STEEL
SYM	SYMMETRICAL
TDH	TOTAL DYNAMIC HEAD
TSS	TOTAL SUSPENDED SOLIDS
TYP	TYPICAL
VERT	VERTICAL
W	WIDE/WIDTH/WATER
W/	WITH
WFP	WATER FILTRATION PLANT
WL	WATER LEVEL
WS	WATERSTOP

PROCESS EQUIPMENT ABBREVIATIONS

BP-x	BOOSTER PUMP
DMSC	DRUM SCALE
MP-x	METERING PUMP

FLOWSTREAM ABBREVIATIONS

D	DRAIN
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
NAOCL	SODIUM HYPOCHLORITE
PW	POTABLE WATER
S	SANITARY DRAIN OR SEWER

HVAC ABBREVIATIONS

AHU	AIR HANDLING UNIT
B	BELT DRIVE
BDD	BACKDRAFT DAMPER
BTUH	BRITISH THERMAL UNITS PER HOUR
C	CELSIUS
CB	CENTRIFUGAL BLOWER
CE	CEILING EXHAUST
CFM	CUBIC FEET PER MINUTE
CWE	CENTRIFUGAL WALL EXHAUST
D	DIRECT DRIVE
EA	EXHAUST AIR
EAG	EXHAUST AIR GRILLE
EDB	ENTERING DRY BULB TEMPERATURE
EF	EXHAUST FAN
EWB	ENTERING WET BULB TEMPERATURE
F	FAHRENHEIT
FPM	FEET PER MINUTE
FRG	FILTERED RETURN GRILLE
GD	GRAVITY DAMPER
I	INLINE
IA	INLINE AXIAL
IC	INLINE CENTRIFUGAL
KW	KILOWATT
LDB	LEAVING DRY BULB TEMPERATURE
LWB	LEAVING WET BULB TEMPERATURE
MBH	THOUSANDS OF BRITISH THERMAL UNITS PER HOUR
MOD	MOTOR OPERATED DAMPER
P	PROPELLER
RA	RETURN AIR
RAD	RETURN AIR DIFFUSER
RE	ROOF EXHAUST
RAG	RETURN AIR GRILLE
SA	SUPPLY AIR
SAD	SUPPLY AIR DIFFUSER
SAG	SUPPLY AIR GRILLE
SF	SUPPLY FAN

PLUMBING ABBREVIATIONS

BFP	BACKFLOW PREVENTER
CO	CLEAN OUT
CW	COLD WATER
D	DRAIN
ES	EMERGENCY SHOWER
EW	EMERGENCY EYEWASH
EW/ES	EMERGENCY EYEWASH & SHOWER
FD	FLOOR DRAIN
FCO	FLOOR CLEAN OUT
GW	GRAY WATER
HB	HOSE BIBB
HD	HUB DRAIN
HR	HOSE RACK
HRL	HOSE REEL
HV	HOSE VALVE
HW	HOT WATER
NFWH	NON FREEZE WALL HYDRANT
RD	ROOF DRAIN
S	SANITARY DRAIN
SP	SUMP PUMP
SPD	SUMP PUMP DISCHARGE
TD	TRENCH DRAIN
TW	TEMPERED WATER
V	VENT
VTR	VENT THROUGH ROOF

GENERAL MECHANICAL NOTES

1. THE FOLLOWING NOTES APPLY TO ALL MECHANICAL DRAWINGS.
2. COORDINATE ALL SHUTDOWNS AND SEQUENCING WITH THE OWNER.
3. OWNER WILL MAINTAIN AND OPERATE EXISTING EQUIPMENT. CONTRACTOR SHALL NOT OPERATE EXISTING VALVES OR EQUIPMENT.
4. UNLESS OTHERWISE NOTED, ITEMS ARE NEW UNLESS CALLED OUT AS EXISTING.
5. COORDINATE ALL WORK TO AVOID EQUIPMENT CLEARANCE ISSUES.
6. CHECK ALL DIMENSIONS OF EXISTING CONSTRUCTION WHICH AFFECT NEW WORK.
7. STRUCTURE ELEVATIONS PROVIDED FOR CLARITY. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR FF ELEVATIONS AND FLOOR SLOPE.
8. COORDINATE HATCH LOCATIONS, GRATING AND CLEAR OPENINGS TO SUIT EQUIPMENT REMOVAL.
9. COORDINATE ALL PENETRATIONS WITH OTHER DISCIPLINES. ALL PENETRATIONS SHALL BE WATERTIGHT.
10. UNLESS OTHERWISE NOTED, WALL PIPE AND SLEEVES SHALL HAVE A WATERSTOP COLLAR POSITIONED IN THE CENTER OF THE WALL OR FLOOR. SEE TYPICAL DETAILS FOR CONFIGURATION. WALL PIPES AND SLEEVES SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE PLACEMENT.
11. PIPING 3 INCH AND SMALLER HAS 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. UNIONS, BUSHINGS AND/OR REDUCING INSERTS, ETC NOT SHOWN ON DRAWING BUT REQUIRED FOR INSTALLATIONS SHALL BE PROVIDED.
12. SCHEMATIC DRAWINGS SHOW PROCESS CONNECTIONS AND NOT SPATIAL ORIENTATION.
13. THE SIZES OF THE PIPE CONNECTIONS AT EQUIPMENT ARE SHOWN TO DEMONSTRATE INTENT. SIZES MAY VARY FROM WHAT IS SHOWN. COORDINATE THE SIZE OF CONNECTIONS TO ALL APPROVED EQUIPMENT.
14. SIZE OF FITTINGS SHOWN SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED.
15. PROVIDE PROCESS PIPING DRAINS WHERE INDICATED AND AT THE FOLLOWING: LOW POINTS; FLOW METERS AND AT PUMPS. PUMP DRAINS SHALL BE BETWEEN THE SUCTION AND DISCHARGE ISOLATION VALVES. CENTRIFUGAL PUMPS SHALL DRAIN ON SUCTION SIDE.
16. UNLESS OTHERWISE NOTED, ECCENTRIC REDUCERS SHALL BE INSTALLED FLAT SIDE ON TOP.
17. FLEXIBLE COUPLINGS AND FLANGE ADAPTORS SHALL HAVE TIE RODS AS SHOWN IN COUNTY DETAIL G8.41.
18. VERIFY VALVE OPERATOR ORIENTATION WITH ENGINEER.
19. VALVES ARE NORMALLY OPEN (N.O.) UNLESS OTHERWISE NOTED AS NORMALLY CLOSED (N.C.).
20. COORDINATE THE LOCATION OF VALVE SUPPORTS SO THAT ACCESS TO VALVE BEARINGS IS NOT RESTRICTED.
21. VALVES WITH CENTERLINES HIGHER THAN 5 FEET ABOVE FLOOR OR WALKWAY SHALL HAVE CHAINWHEEL OPERATORS.
22. UNLESS OTHERWISE NOTED, ALL EQUIPMENT SHALL BE PROVIDED WITH A MINIMUM 4 INCH HIGH CONCRETE HOUSEKEEPING PAD SIZED TO SUIT EQUIPMENT.
23. SUPPORTS AND HANGERS ARE ONLY SHOWN WHERE SPECIFIC TYPES OR LOCATIONS ARE REQUIRED. ADDITIONAL SUPPORTS AND HANGERS SHALL BE REQUIRED AS SPECIFIED.
24. METAL FABRICATIONS WITH BURRS, 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 HAZARD.
25. ALL DUCTS, AIR HANDLERS, FANS AND FILTER BOXES SHALL BE SEALED IN ACCORDANCE WITH SECTION 603.9 OF THE IMC.
26. DUCTWORK SHALL BE FABRICATED IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS.
27. PROVIDE FLEXIBLE CONNECTIONS BETWEEN EQUIPMENT AND DUCTWORK.
28. DUCTWORK SIZES SHOWN ARE MINIMUM INSIDE FREE OPENING SIZES.
29. UNLESS OTHERWISE NOTED, ALL PLUMBING WORK SHALL CONFORM TO THE IPC, LATEST EDITION.
30. UNLESS OTHERWISE NOTED, MINIMUM SLOPE FOR DRAINS SHALL BE 1/4 INCH PER LINEAR FOOT.
31. COORDINATE THE LOCATION OF VALVES, WATER HAMMER ARRESTORS AND TRAP PRIMERS SO THEY ARE ACCESSIBLE.
32. TRAP PRIMERS SHALL BE REQUIRED FOR ALL FLOOR AND TRENCH DRAIN TRAPS. TRAP PRIMER VALVES AND PIPING LOCATIONS ARE NOT SHOWN. FIELD ROUTE PIPING DURING INSTALLATION OF DRAINS AND PRIOR TO CONCRETE PLACEMENT. LOCATE TRAP PRIMER VALVES IN ACCESSIBLE LOCATIONS.
33. COMPLY WITH CODE OF MARYLAND (COMAR) LEAD FREE REQUIREMENTS SHOWN ON DRAWING G-001.
34. CLEAR PVC CONTAINMENT PIPING SHALL NOT BE PAINTED.

PROCESS PIPING SYMBOLS

	DOUBLE LINE	SINGLE LINE
WELDED PIPING		
FLANGED PIPING (4"& LARGER		
MECHANICAL JOINT PIPING (4" & LARGER)		
RIGID GROOVED PIPING (4" & LARGER)		
THREADED PIPING		
ELBOW UP		
ELBOW DOWN		
TEE UP		
TEE DOWN		
LATERAL UP		
LATERAL DOWN		
CONCENTRIC REDUCER		
ECCENTRIC REDUCER		
UNION		
FLANGED COUPLING ADAPTOR		
FLEXIBLE COUPLING		
METAL BELLOWS EXP JOINT		
ELASTOMER BELLOWS EXP JOINT		
PIPE CAP OR BLIND FLANGE	OR	

VALVE SYMBOLS

	SIDE VIEW	TOP VIEW	SINGLE LINE
BALL VALVE			
BUTTERFLY VALVE			
CHECK VALVE			
GATE VALVE			
GLOBE VALVE			

HVAC SYMBOLS

	PLAN / SECTION
DUCT SIZE- RECTANGULAR (FIRST DIMENSION IS SIDE SHOWN)	24X12 / 12X24
DUCT TRANSITION- FLAT ON BOTTOM	FOB
DUCT TRANSITION- FLAT ON TOP	FOT
DUCT TRANSITION-CIRCULAR TO RECTANGULAR	
FLEXIBLE CONNECTION AT FAN-INLET AND OUTLET	
RETURN AIR DUCT (SIMILAR FOR ROUND)	
EXHAUST AIR DUCT (SIMILAR FOR ROUND)	
SUPPLY AIR DUCT (SIMILAR FOR ROUND)	
SQUARE ELBOW WITH TURNING VANES	
EXHAUST FLOW ARROW	
SUPPLY FLOW ARROW	
MOTOR OPERATED DAMPER	
VOLUME DAMPER	VD
FIRE DAMPER	FD
UNIT HEATER	
HEAT TRACE	
THERMOSTAT- AIR CONDITIONING	TAC
FREEZESTAT	Tf
THERMOSTAT- VENTILATION	TV
THERMOSTAT - HIGH HEAT	TH

PLUMBING SYMBOLS

	TOP VIEW	SINGLE LINE
BACKFLOW PREVENTER		
CLEAN OUT		
EMERGENCY EYEWASH & SHOWER		
FLOOR DRAIN		
FLOOR CLEAN OUT		
HOSE BIBB		
HOSE RACK		
HOSE REEL		
HOSE VALVE		
NON FREEZE WALL HYDRANT		NFWH / WALL

ANNOTATION SYMBOLS

WATER SURFACE ELEVATION	
ONE WAY FLOW DIRECTION	
BOTH WAYS FLOW DIRECTION	
NEW WORK	
EXISTING	
DEMOLITION	
EQUIPMENT TAG	ABC-1
FLOWSTREAM TAG	X" ABC
PLUMBING FIXTURE TAG	P-X

NOTE:
THIS IS A STANDARD LEGEND SHEET. NOT ALL INFORMATION SHOWN IS USED ON THIS PROJECT

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33984, Expiration Date 11/5/19.

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HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18 KD

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STATE OF MARYLAND — LARS M. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

		BY	NO.	REVISION	DATE
DES:	MM				
DRN:	Author				
CHK:	LAP				
DATE:	DEC 2018				

PROCESS GENERAL NOTES, ABBREVIATIONS AND LEGEND

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M-001
SCALE AS SHOWN
SHEET 40 OF 81

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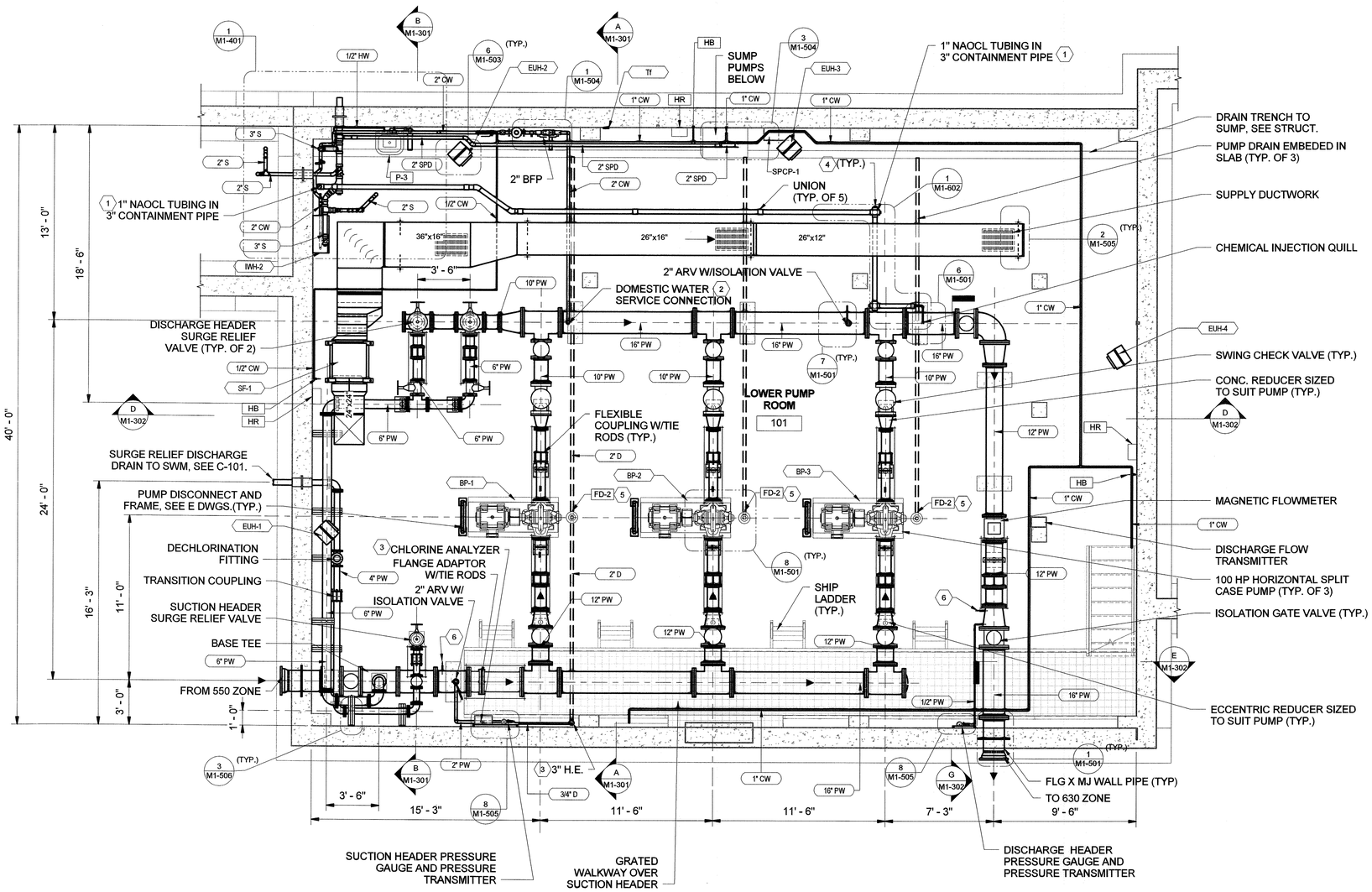
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.
2. SEE DWG. M1-601 FOR PROCESS PRESSURE RANGES AND SETTINGS.

ⓧ SHEET KEY NOTES

1. PVC CONTAINMENT PIPE SHALL BE SCHEDULE 40 CLEAR PVC AND SHALL BE COMPATIBLE WITH NaOCL.
2. SEE DOMESTIC WATER SCHEMATIC ON DWG. M1-602.
3. ROUTE ANALYZER DRAIN TO 3" H.E. PROVIDE SUITABLE CONNECTORS TO MAKE PIPE CONNECTIONS TO ANALYZER.
4. PROVIDE TEE FITTINGS WITH THREADED PLUGS TO FACILITATE CHEMICAL TUBING MAINTENANCE.
5. PROVIDE PVC PIPING TO CONNECT PUMP SEAL WATER FROM PUMP SEALS TO FLOOR DRAIN FOR PROPER SEAL WATER DRAINAGE.
6. MDE SAMPLE TAP



1 LOWER LEVEL PLAN

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

GRAPHIC SCALE

0 2' 4' 8'

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

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DRN:	JW
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION LOWER LEVEL

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

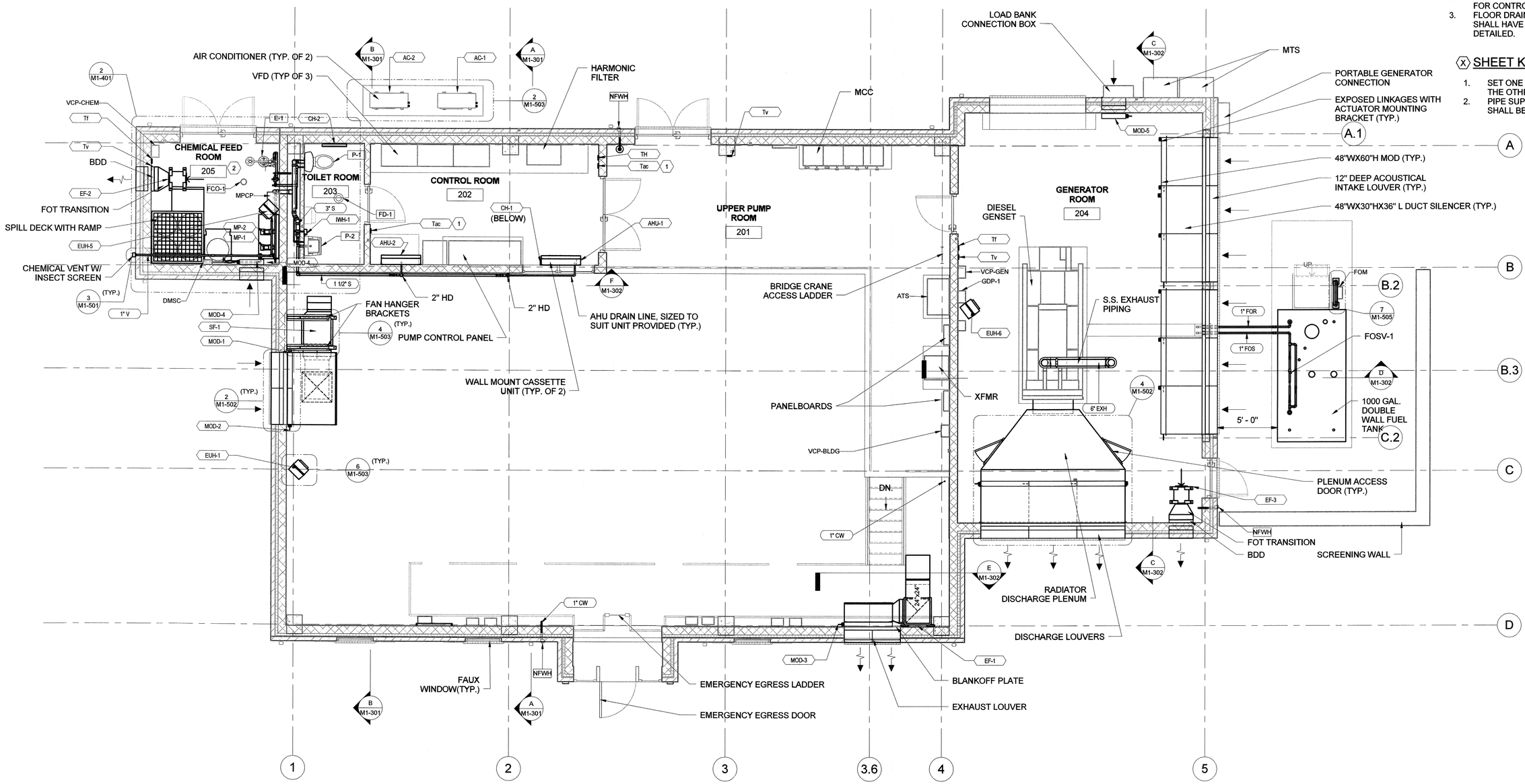
DRAWING M1-101
SCALE AS SHOWN
SHEET 41 OF 81

GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.
2. SEE INSTRUMENTATION DRAWINGS FOR CONTROL PANEL DETAILS.
3. FLOOR DRAINS ON THIS LEVEL SHALL HAVE TRAP PRIMERS AS DETAILED.

(X) SHEET KEY NOTES

1. SET ONE TSTAT TO 75 DEG AND THE OTHER TO 85 DEG.
2. PIPE SUPPORTS IN THIS ROOM SHALL BE FRP.



2 FIRST FLOOR PLAN

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

GRAPHIC SCALE

0 2' 4' 8'

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

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DRN:	Author
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION FIRST FLOOR

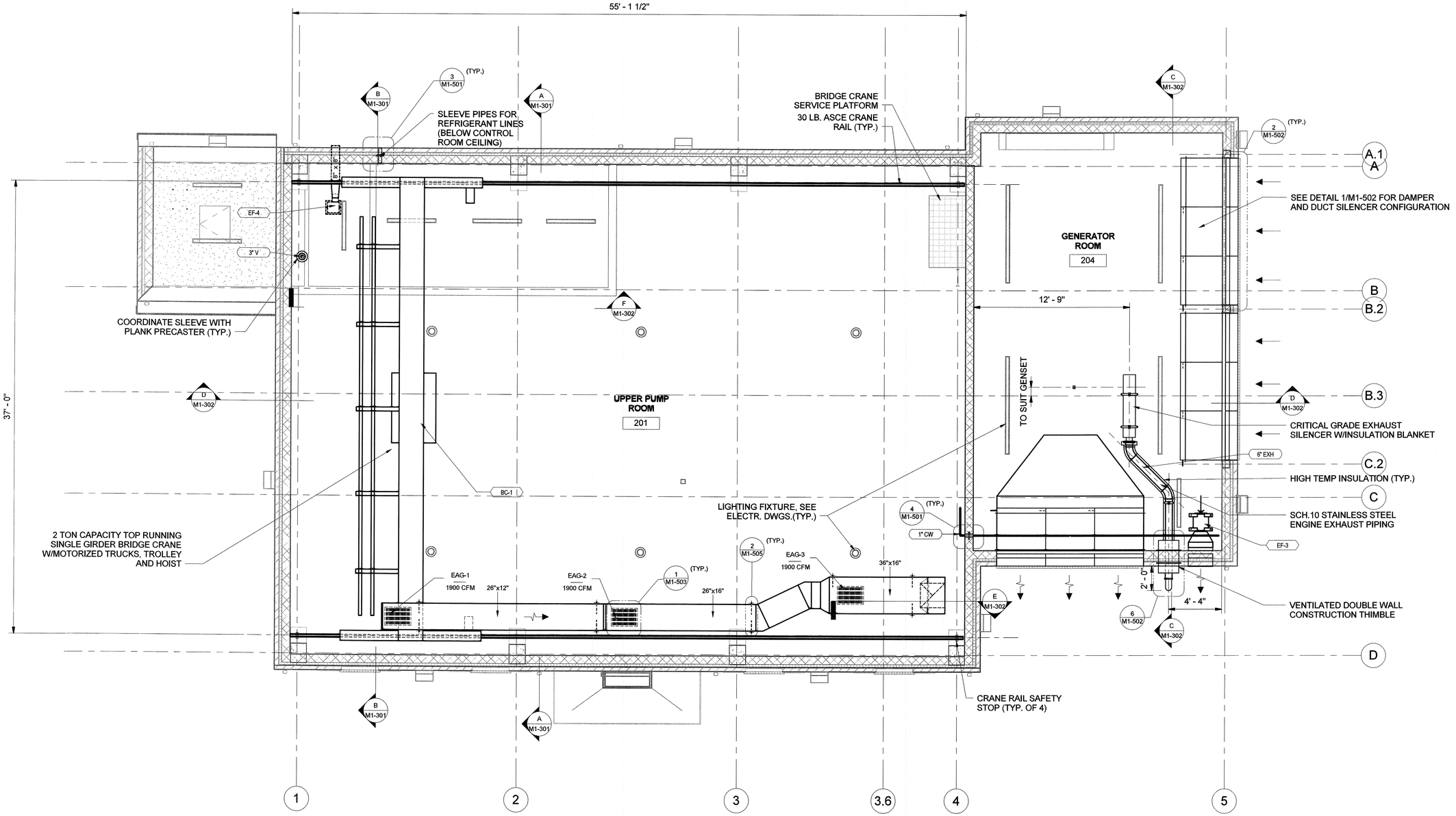
600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-102
SCALE AS SHOWN
SHEET 42 OF 81

GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



1 UPPER LEVEL PLAN

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

GRAPHIC SCALE

0 2' 4' 8'

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

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CEILING PLAN

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-103
SCALE AS SHOWN
SHEET 43 OF 81

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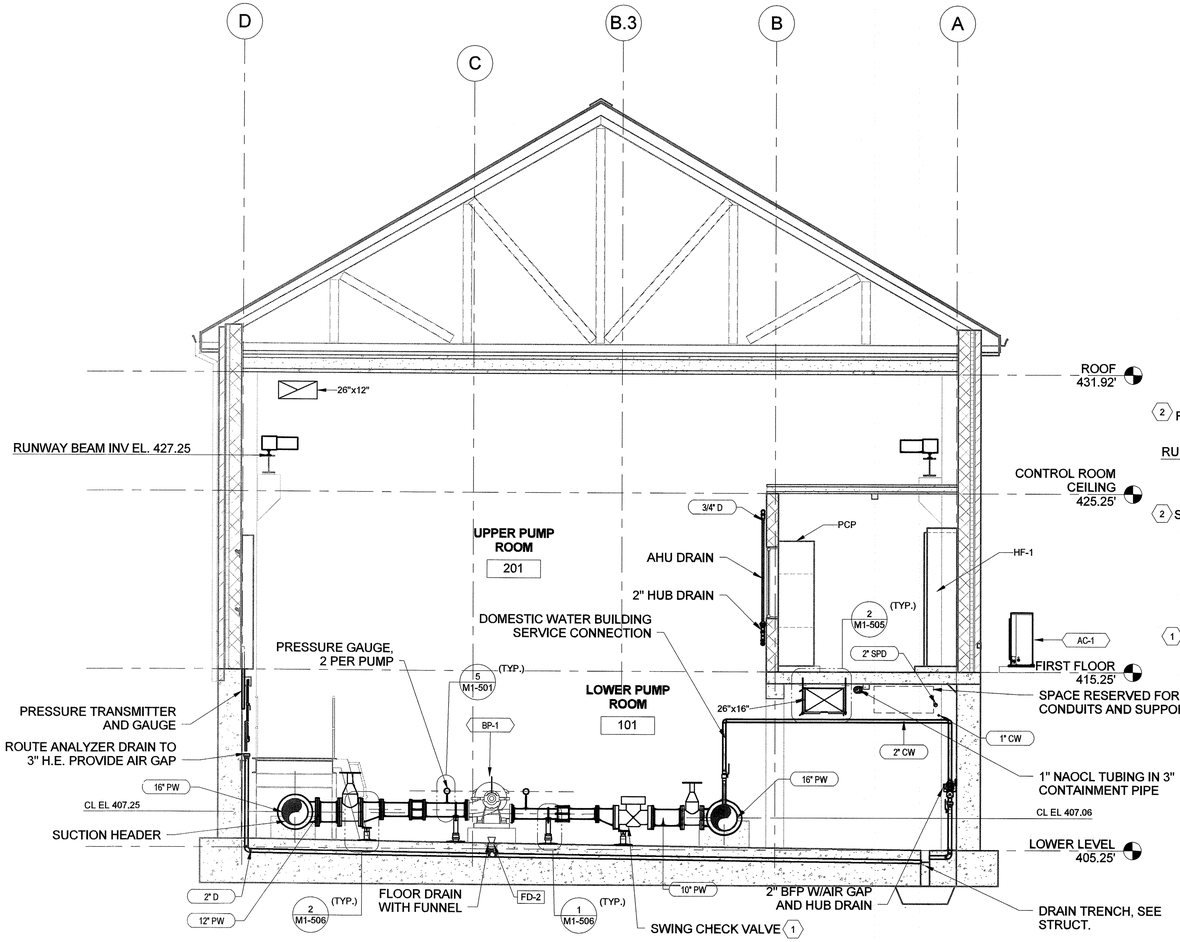
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.

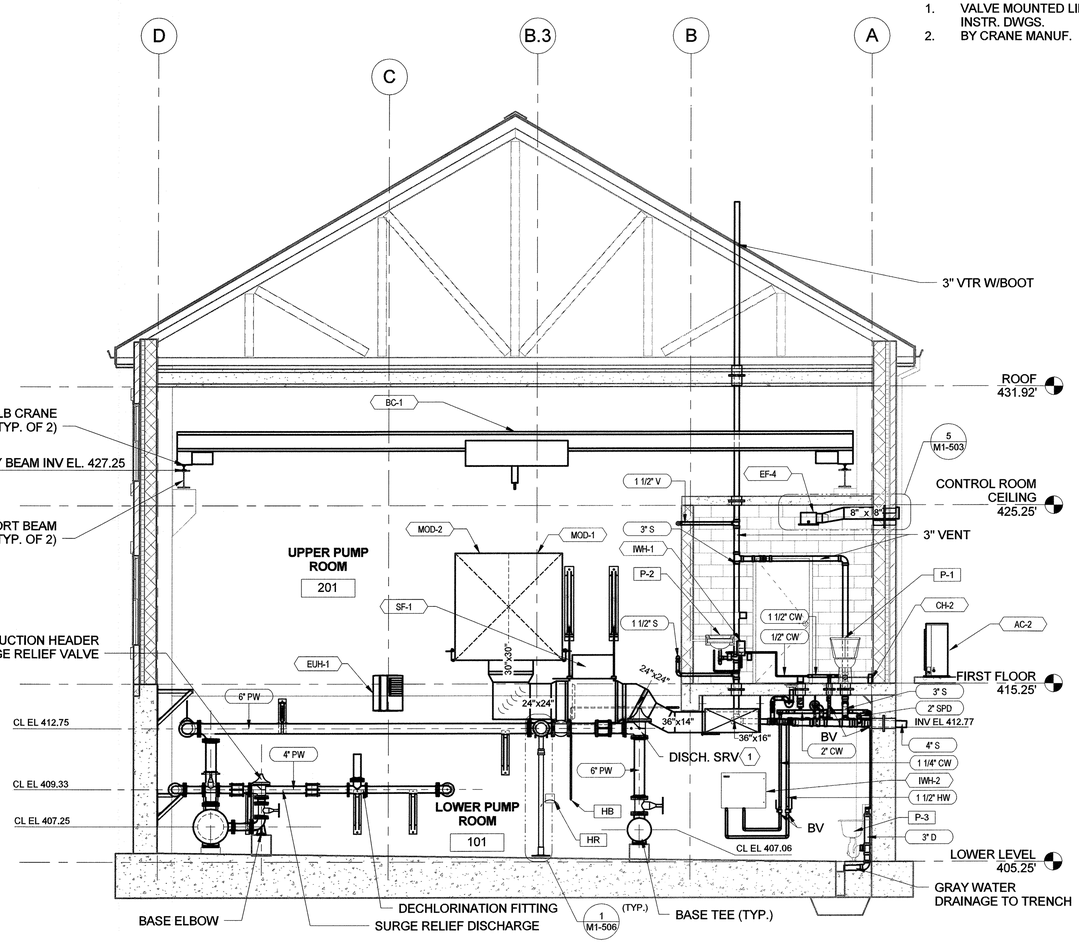
⓪ SHEET KEY NOTES

1. VALVE MOUNTED LIMIT SWITCH. SEE INSTR. DWGS.
2. BY CRANE MANUF.



A SECTION

SCALE: 1/4" = 1'-0"
REF:M1-101



B SECTION

SCALE: 1/4" = 1'-0"
REF:M1-101

GRAPHIC SCALE

0 2' 4' 8'

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

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CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PUMPING STATION SECTIONS

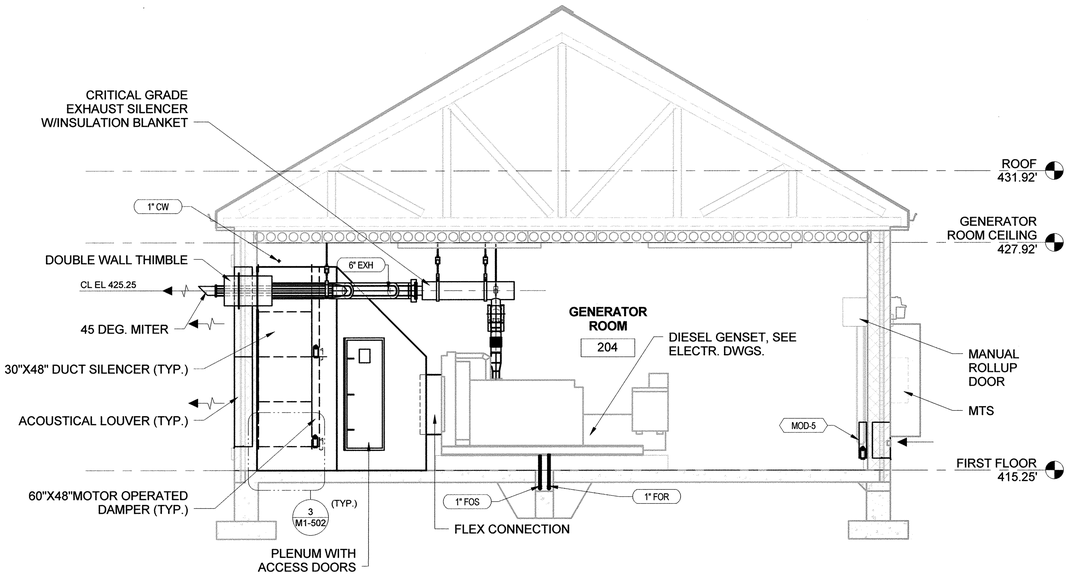
600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-301
SCALE AS SHOWN
SHEET 44 OF 81

GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



C SECTION

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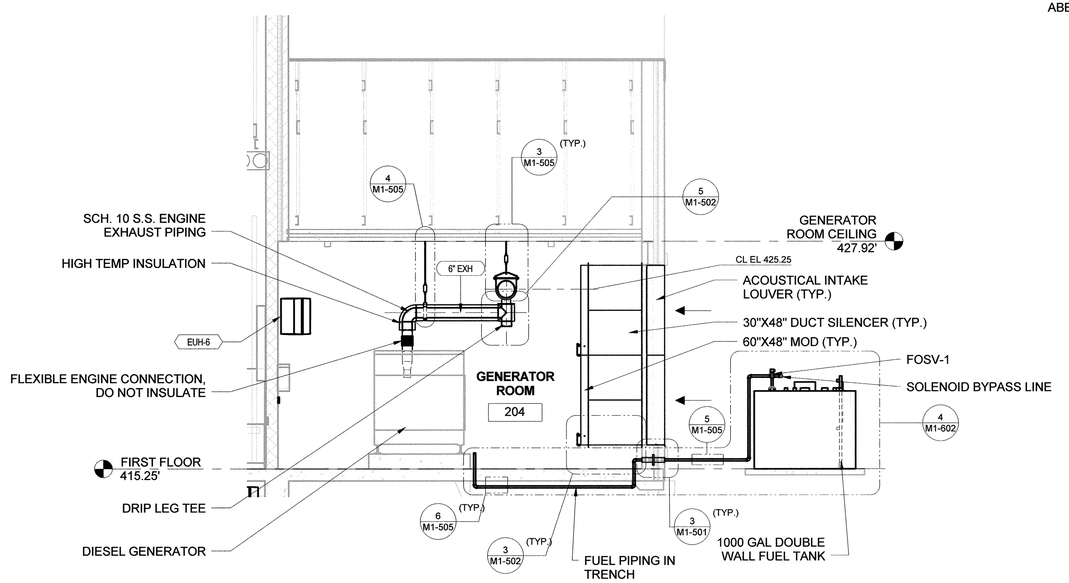

D SECTION

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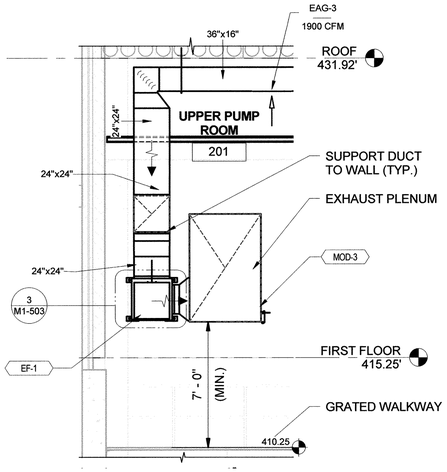

E SECTION

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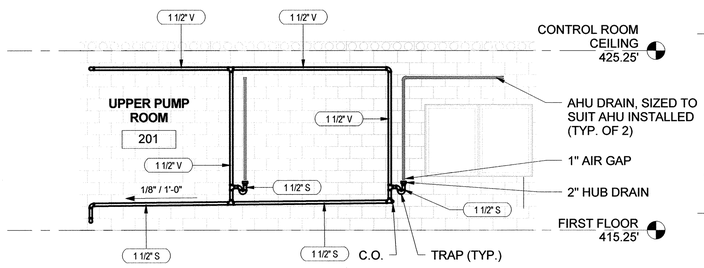
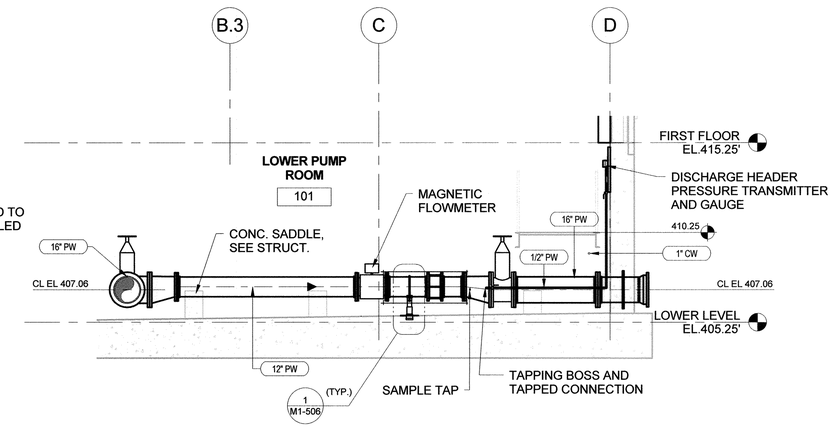


F SECTION

SCALE: 1/4" = 1'-0"
REF:M1-102



G SECTION

SCALE: 1/4" = 1'-0"
REF:M1-101

GRAPHIC SCALE

0 2' 4' 8'

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

12/20/2018 9:06:32 AM
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HOWARD COUNTY, MARYLAND

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CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — LARS J. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	MM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

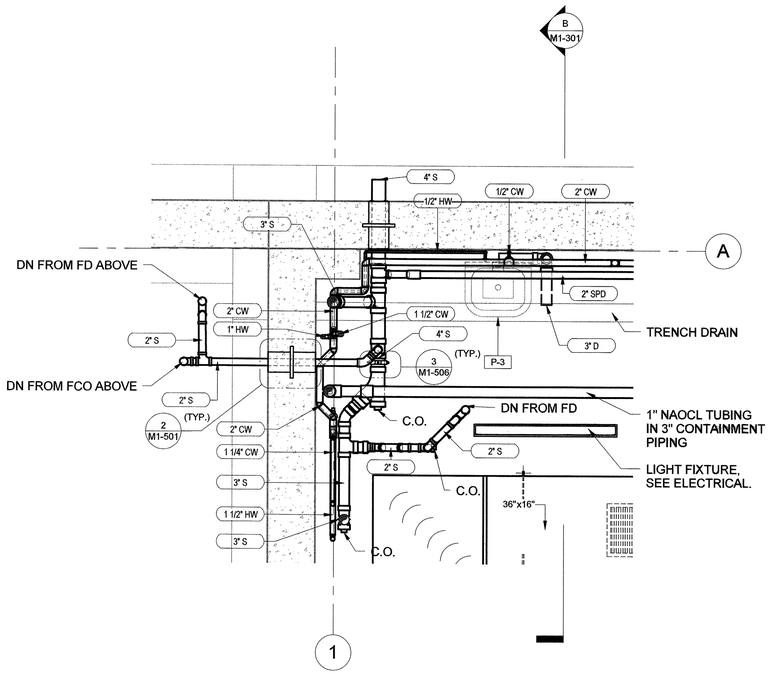
PUMPING STATION SECTIONS

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

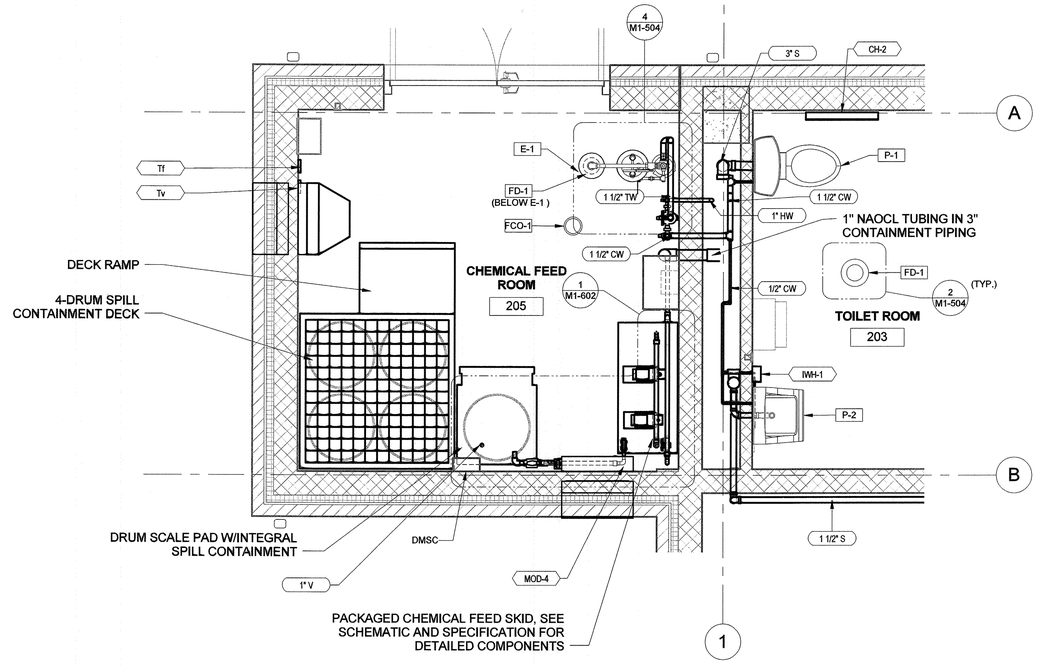
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-302
SCALE AS SHOWN
SHEET 45 OF 81



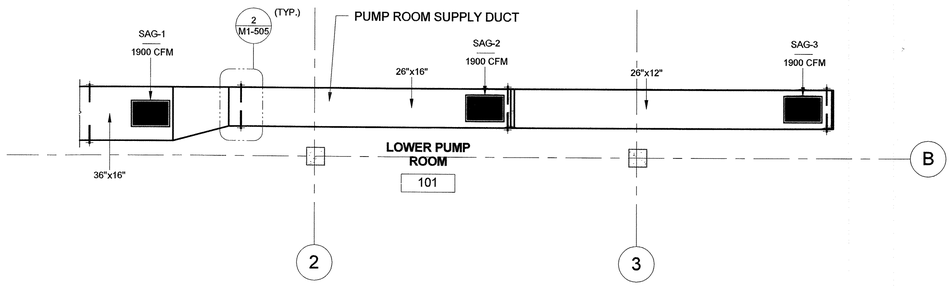
1 LOWER LEVEL PARTIAL PLAN

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



2 FIRST FLOOR PARTIAL PLAN

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



3 PUMP ROOM SUPPLY DUCT PLAN

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

GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.
2. PROVIDE TRAP PRIMING SYSTEM FOR FLOOR DRAINS ON FIRST FLOOR. MOUNT PRIMING VALVE NEAR TOILET FIXTURE SUPPLY LINE.
3. PROVIDE FRP HANGERS AND SUPPORTS IN CHEMICAL FEED ROOM.

GRAPHIC SCALE

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

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

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STATE OF MARYLAND — LAURA A. PETERSON — NO. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	MM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

ENLARGED VIEWS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-401
SCALE AS SHOWN
SHEET 46 OF 81

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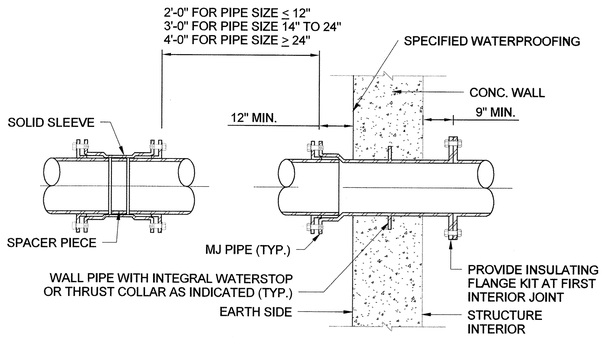
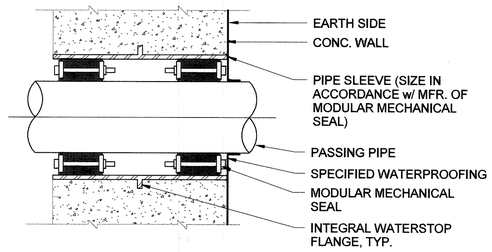


NOTES:
1. UNLESS OTHERWISE NOTED, WATERSTOP COLLARS SHALL BE CENTERED IN WALL.

1 MJ BY FLANGE WALL PIPE DETAIL

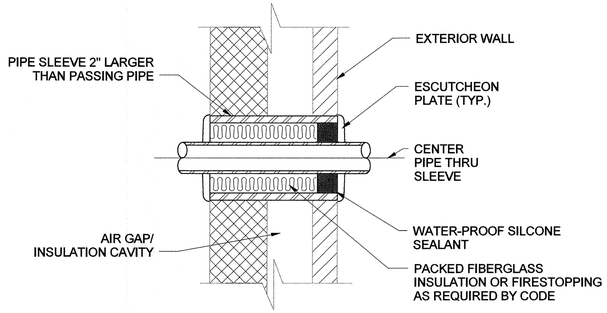
SCALE: NONE



NOTES:
1. EXTEND PIPE SLEEVE BEYOND THE FACE OF THE WALL IF NECESSARY TO ACCOMODATE SECOND MODULAR MECHANICAL SEAL
2. FOR FLOOR APPLICATIONS, EXTEND WALKWAY SIDE OF SLEEVE 4 INCHES ABOVE FINISHED SURFACE OF WALKWAY.
3. FOR EXISTING WALLS, CORE DRILL WALL TO SUIT INSTALLATION REQUIREMENTS OF MECHANICAL SEAL. CONCRETE SURFACE SHALL BE MADE SMOOTH WITH NON-SHRINK GROUT. MACHINE AND COAT EXPOSED REBAR.

2 PIPE SLEEVE DUAL SEAL DETAIL

SCALE: NONE



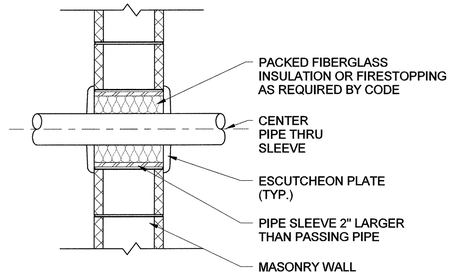
NOTES:
1. SET SLEEVE IN WALL AS WORK PROGRESSES.
2. SLEEVE LENGTH TO SUIT WALL CONSTRUCTION.

3 PIPE SLEEVE EXTERIOR MASONRY DETAIL

SCALE: NONE

GENERAL SHEET NOTES

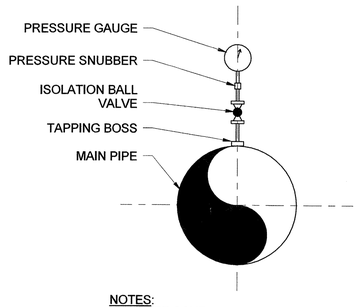
1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



NOTES:
1. SET SLEEVE IN WALL AS WORK PROGRESSES.
2. SLEEVE LENGTH TO SUIT WALL CONSTRUCTION.
3. NOT FOR USE WITH HIGH TEMPERATURE PIPING.

4 PIPE SLEEVE INTERIOR MASONRY DETAIL

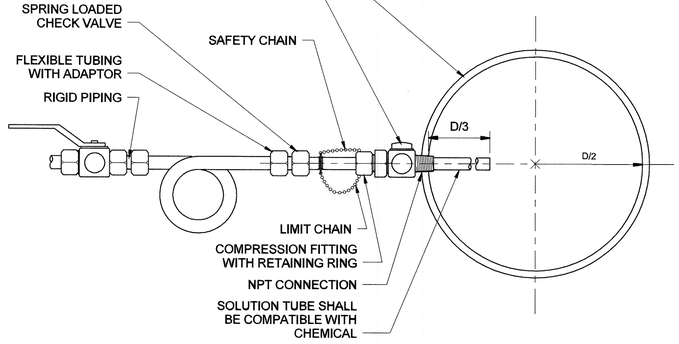
NOT TO SCALE



NOTES:
1. SEE SCHEMATICS FOR GAUGE RANGE.
2. SERVICE SADDLE MAY BE USED IN LIEU OF TAPPING BOSS

5 PRESSURE GAUGE DETAIL

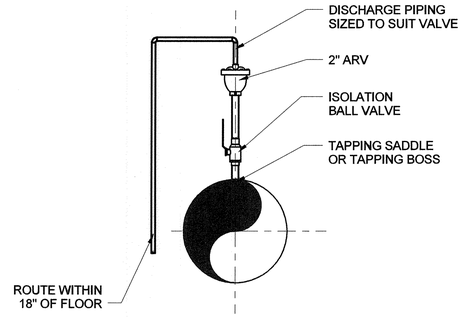
SCALE: NONE



NOTES:
1. WHERE DIRECT TAP CAN NOT BE USED, A SERVICE SADDLE SHALL BE USED FOR CONNECTION.

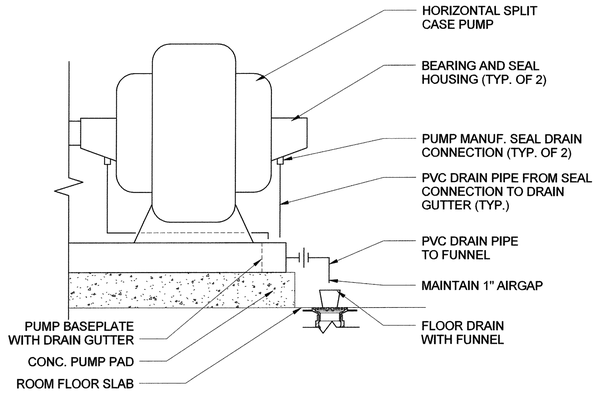
6 CHEMICAL INJECTION QUILL DETAIL

SCALE: NONE



7 ARV DETAIL

SCALE: NONE



8 MECHANICAL SEAL DRAIN DETAIL

SCALE: NONE

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STATE OF MARYLAND — LARS A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	Author
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PROCESS DETAILS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-501
SCALE AS SHOWN
SHEET 47 OF 81

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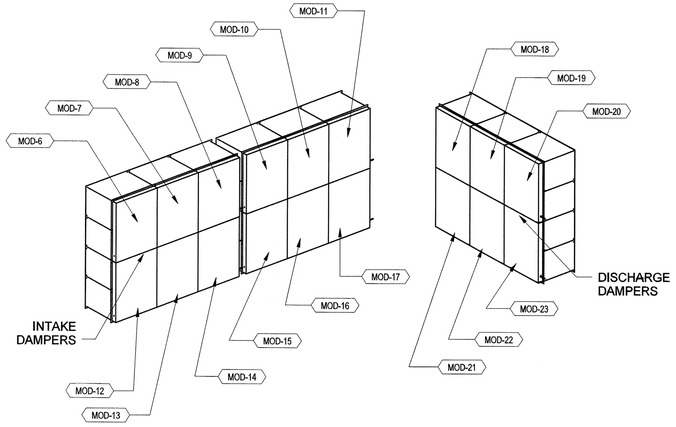
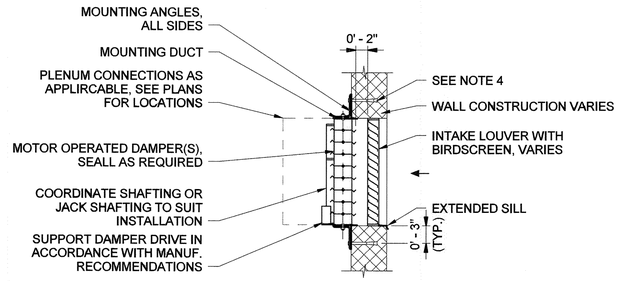
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



1 GENERATOR MOD ARRANGEMENT DETAIL

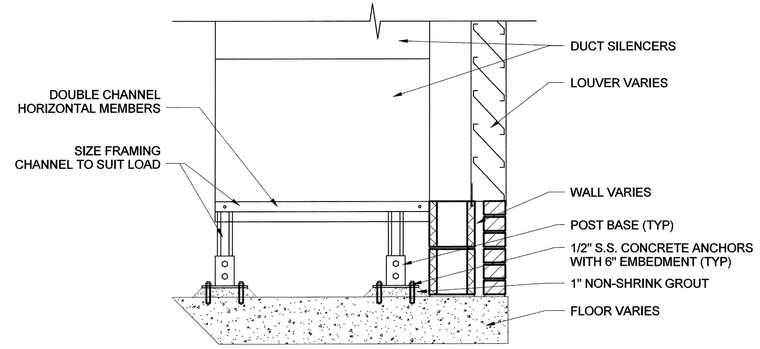
SCALE: NONE



NOTES:
1. MOUNTING DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION FOR 4" STATIC PRESSURE CLASS, REGARDLESS OF OPERATING PRESSURE.
2. DAMPER, DUCT AND MOUNTING ANGLE SHALL BE CONSTRUCTED OF THE SAME MATERIAL.
3. DAMPER DRIVE LOCATION SHOWN IS GENERAL ARRANGEMENT. DRIVE LOCATION SHALL BE ADJUSTED AS NECESSARY TO AVOID INTERFERENCE WITH OTHER EQUIPMENT AND WALKWAYS.
4. USE 1/2" S.S. ADHESIVE ANCHORS, WITH 6-INCH EMBEDMENT SPACED AT 12-INCHES ON CENTER. ANCHOR TYPE TO SUIT WALL CONSTRUCTION.
5. ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS, UNLESS OTHERWISE NOTED. WHERE MULTIPLE DAMPERS SHARE A LOUVER, THE DAMPERS SHALL BE PARTITIONED FOR EACH RESPECTIVE SERVICE. SEAL AS REQUIRED.

2 MASONRY INTAKE MOD DETAIL

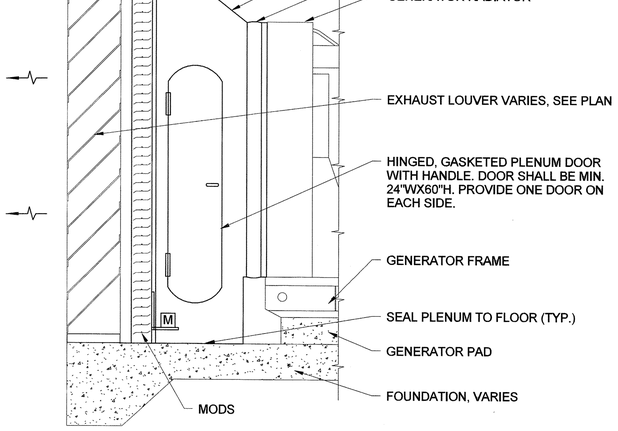
SCALE: NONE



NOTES:
1. NOT ALL DUCT ACCESSORIES SHOWN.
2. SIZE POST BASES TO DISTRIBUTE LOAD TO FLOOR
3. SUPPORTS MATERIALS TO BE SIMILAR WITH DUCT CONSTRUCTION

3 DUCT SILENCER SUPPORT DETAIL

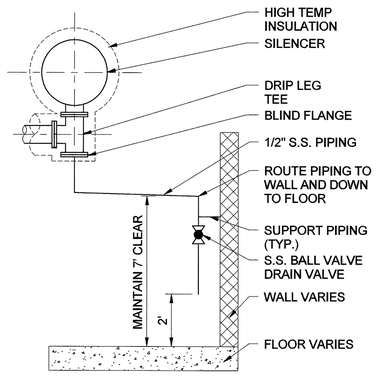
SCALE: NONE



NOTES:
1. GENERAL ARRANGEMENT SHOWN. ADJUST PLENUM TO BUILDING SPECIFIC REQUIREMENTS.
2. NOT ALL DUCT ACCESSORIES SHOWN.

4 GENERATOR DISCHARGE PLENUM DETAIL

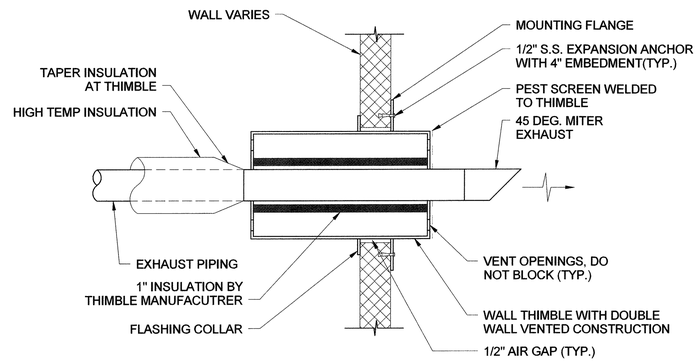
SCALE: NONE



NOTES:
1. SUPPORT PIPING AS REQUIRED.

5 GENERATOR EXHAUST DRIPLEG DETAIL

SCALE: NONE



6 WALL THIMBLE DETAIL

SCALE: NONE

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STATE OF MARYLAND — VIRGINIA PETERSON — NO. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	Author
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

HVAC DETAILS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-502
SCALE AS SHOWN
SHEET 48 OF 81

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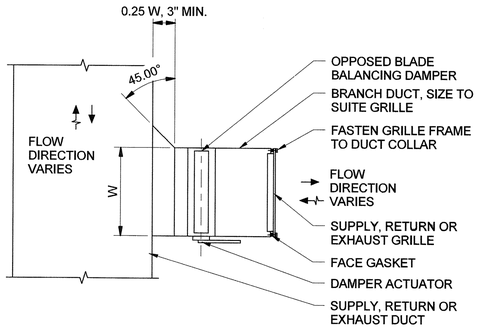
GENERAL SHEET NOTES

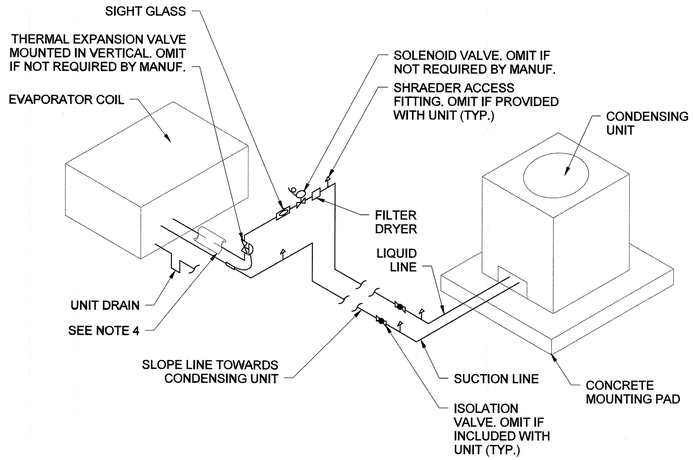
1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



NOTES:
1. IN LIEU OF SEPERATE DAMPER, GRILLES MAY BE SUPPLIED WITH INTEGRAL DAMPER.

1 DUCT MOUNTED GRILLE DETAIL

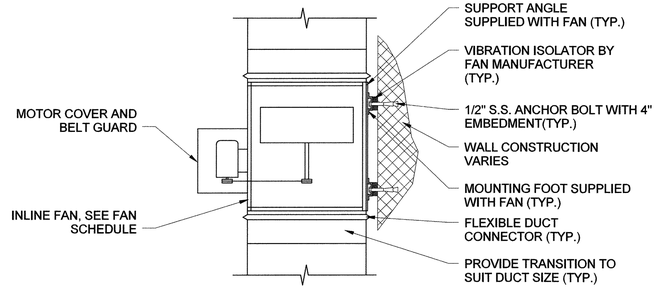
SCALE: NONE



NOTES:
1. OMIT ANY VALVES OR MATERIALS THAT ARE FURNISHED WITH THE UNIT.
2. REFRIGERANT PIPING SHALL BE SIZED BY SYSTEM MANUFACTURER.
3. PROVIDE RISER TRAPS WHEN CONDENSOR IS ABOVE EVAPORATOR.
4. INSULATE LIQUID LINE.

2 REFRIGERANT PIPING

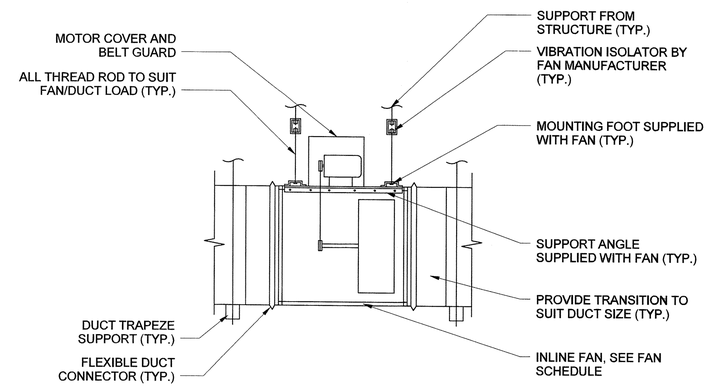
SCALE: NONE



NOTES:
1. FOR MASONRY WALL ANCHORING USE 1/2" DIA S.S. EXPANSION ANCHORS SUITABLE FOR HOLLOW CORE WITH MIN. 4" EMBEDMENT SPACED AT 8" ON CENTER.
2. FOR CONCRETE WALL ANCHORING USE 1/2" DIA. S.S. ADHESIVE ANCHORS WITH MIN 6" EMBEDMENT SPACED AT 12" ON CENTER.
3. PROVIDE SPACER FRAMING CHANNEL BETWEEN MOUNTING FEET AND VIBRATION ISOLATORS AS REQUIRED TO ACHEIVE SPACING FROM WALL.

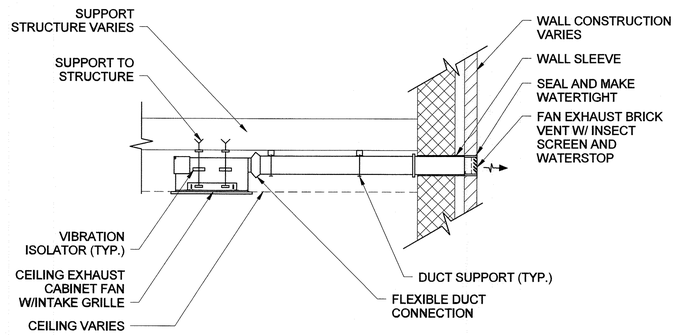
3 VERTICAL INLINE FAN

SCALE: NONE



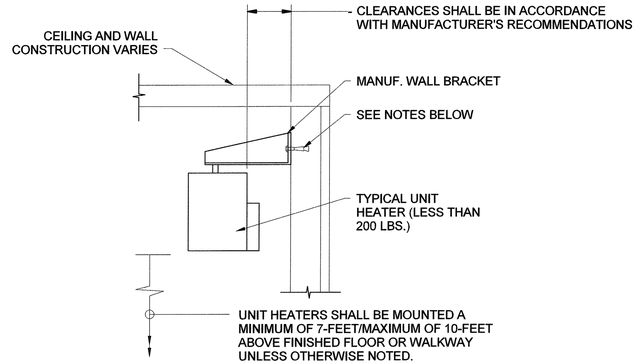
4 HORIZONTAL INLINE FAN

SCALE: NONE



5 CABINET FAN DETAIL

SCALE: NONE



NOTES:
1. FOR MASONRY WALL ANCHORING USE 1/2" DIA S.S. EXPANSION ANCHORS SUITABLE FOR HOLLOW CORE WITH MIN. 4" EMBEDMENT SPACED AT 8" ON CENTER.
2. FOR CONCRETE WALL ANCHORING USE 1/2" DIA. S.S. ADHESIVE ANCHORS WITH MIN 6" EMBEDMENT SPACED AT 12" ON CENTER.

6 WALL MOUNTED UNIT HEATER DETAIL

SCALE: NONE

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STATE OF MARYLAND — LARS A. PETERSON — NO. 33984 — PROFESSIONAL ENGINEER — 12/26/18

DES:	MM
DRN:	Author
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

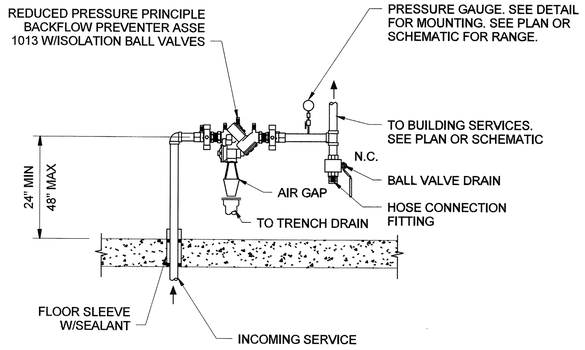
HVAC DETAILS

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-503
SCALE AS SHOWN
SHEET 49 OF 81

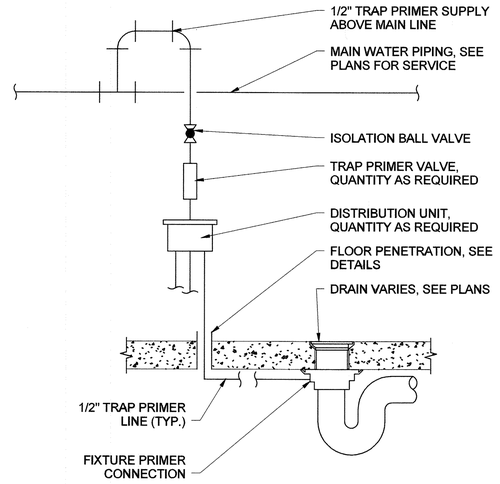
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



1 BACKFLOW PREVENTER DETAIL

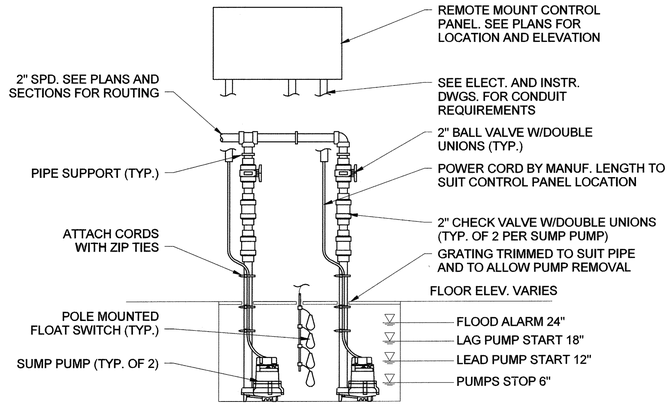
SCALE: NONE



NOTES:
1. INACCESSIBLE PIPING SHALL BE SOFT COPPER WITH MECHANICAL CONNECTIONS.
2. LOCATE VALVE AND DISTRIBUTION UNIT IN ACCESIBLE LOCATION.

2 TRAP PRIMER DETAIL

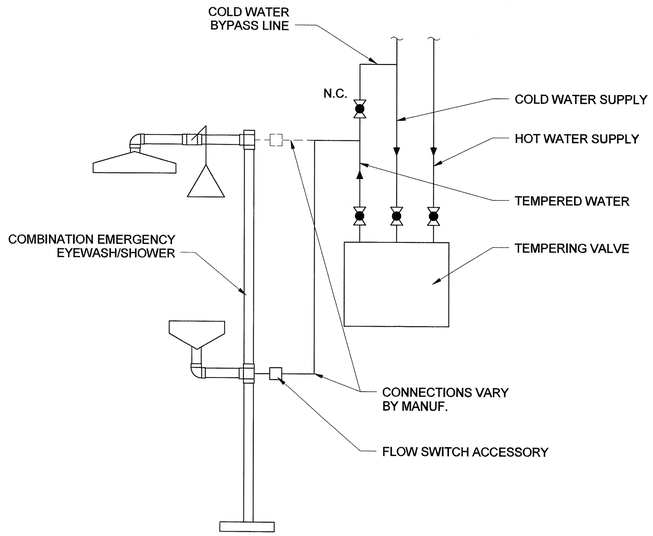
SCALE: NONE



NOTES:
1. PIPE SUPPORTS SHALL NOT BE USED BETWEEN BALL VALVE AND PUMP TO ALLOW FOR COMPONENT REMOVAL.
2. PROVIDE BUSHINGS AS NECESSARY TO CONNECT PUMPS TO 2" PIPING.
3. PUMP AND FLOAT CABLE LENGTHS TO SUIT REMOTE CONTROL PANEL LOCATION.
4. LIQUID LEVELS SHOWN ARE INCHES ABOVE SUMP FLOOR.

3 DUPLEX SUMP PUMP DETAIL

SCALE: NONE



NOTES:
1. VALVES SHALL BE LOCATED WITHIN 6 FEET OF FINISHED FLOOR.

4 EMERGENCY EYEWASH/SHOWER DETAIL

SCALE: NONE

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STATE OF MARYLAND — LANE A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER

DES:	MM
DRN:	MM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

PLUMBING DETAILS

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-504
SCALE AS SHOWN
SHEET 50 OF 81

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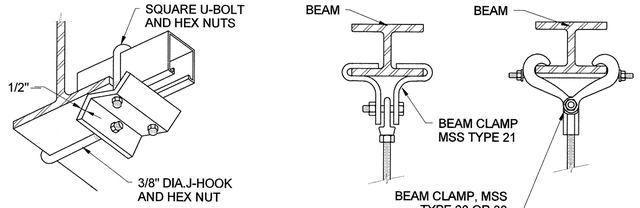
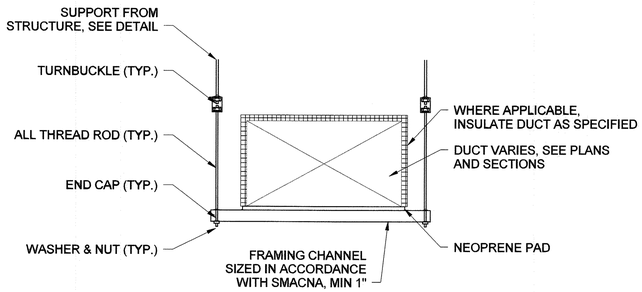


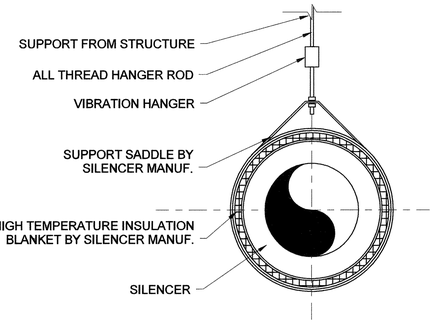
1 STRUCTURE ATTACHMENTS DETAIL

SCALE: NONE



2 DUCT SUPPORT DETAIL

SCALE: NONE

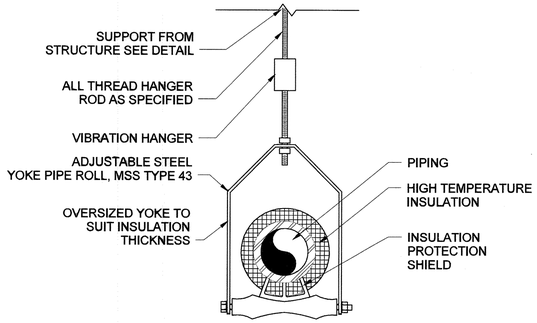


3 EXHAUST SILENCER SUPPORT DETAIL

SCALE: NONE

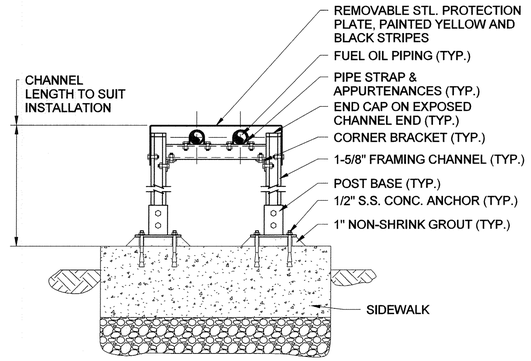
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.
2. HOLLOW SET MECH ANCHORS SHALL BE POWERS HOLLOW-SET DROPIN ANCHOR OR EQUAL. QUANTITY TO SUIT LOAD.



4 EXHAUST PIPE SUPPORT DETAIL

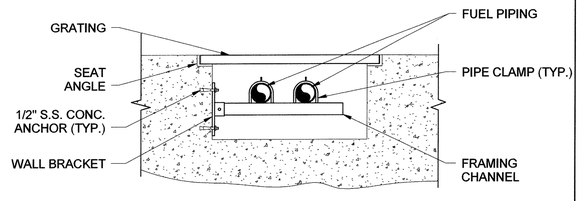
SCALE: NONE



NOTES:
1. MATERIALS OF CONSTRUCTION: 316 STAINLESS STEEL.

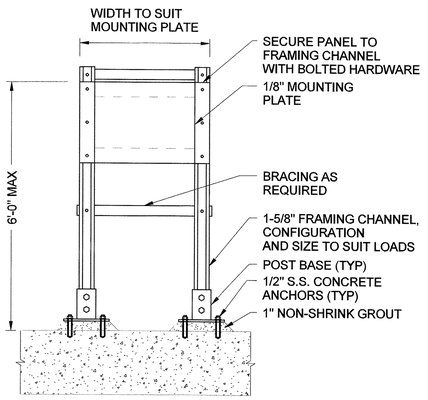
5 EXTERIOR FUEL PIPE SUPPORT DETAIL

SCALE: NONE



6 FUEL PIPE SUPPORT DETAIL

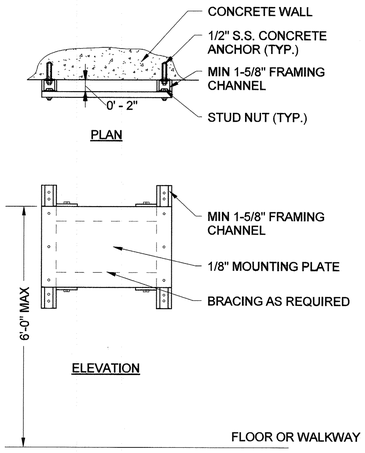
SCALE: NONE



NOTES:
1. MOUNTING PLATE, FRAMING CHANNEL AND HARDWARE SHALL BE CONSTRUCTED OF THE SAME MATERIALS.
2. MATERIALS: 304 S.S.

7 FREESTANDING MOUNTING PANEL

SCALE: NONE



NOTES:
1. MOUNTING PLATE, FRAMING CHANNEL AND HARDWARE SHALL BE CONSTRUCTED OF THE SAME MATERIALS.
2. MATERIALS: 304 S.S.

8 WALL MOUNT PANEL DETAIL

SCALE: NONE

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HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
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CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — LARS A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/26/18

DES:	MM					
DRN:	Author					
CHK:	LP					
DATE:	DEC 2018	BY	NO.	REVISION	DATE	

SUPPORT DETAILS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-505
SCALE AS SHOWN
SHEET 51 OF 81

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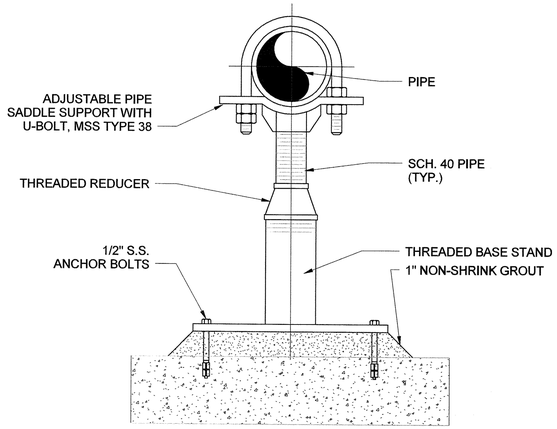
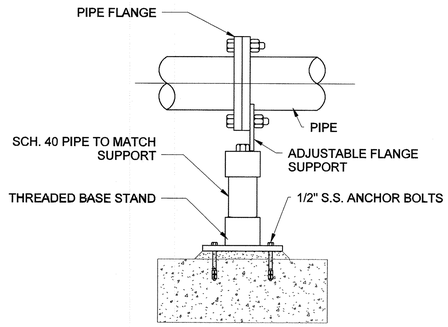
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



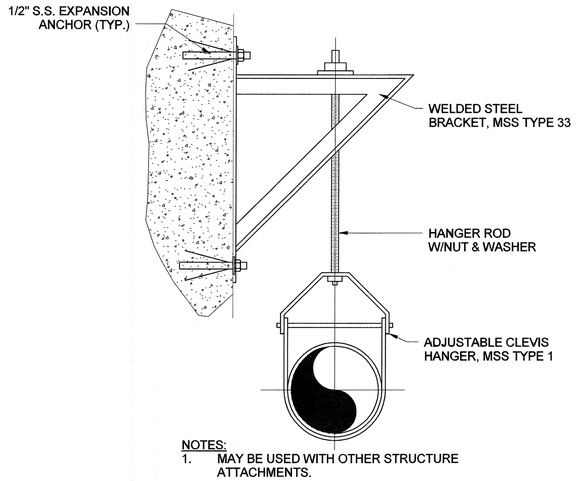
1 ADJUSTABLE SADDLE SUPPORT DETAIL

SCALE: NONE



2 FLANGE SUPPORT DETAIL

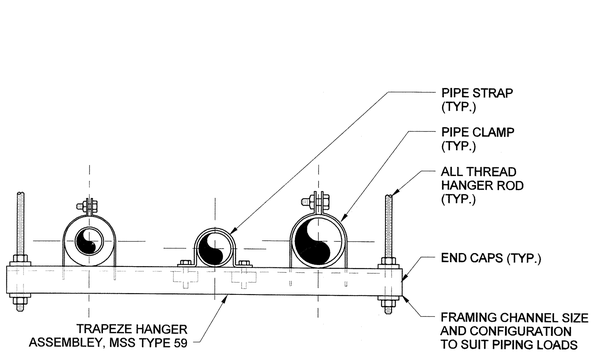
SCALE: NONE



NOTES:
1. MAY BE USED WITH OTHER STRUCTURE ATTACHMENTS.

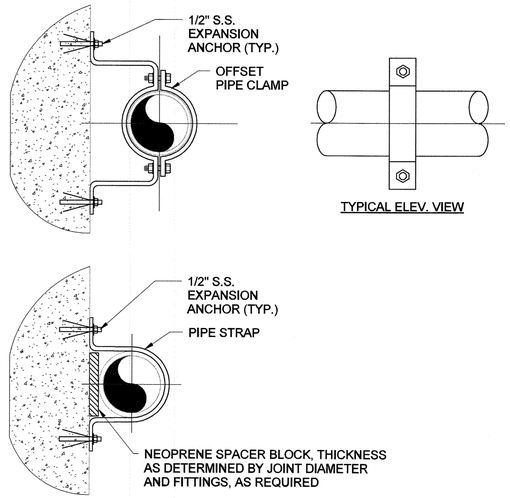
3 CLEVIS HANGER DETAIL

SCALE: NONE



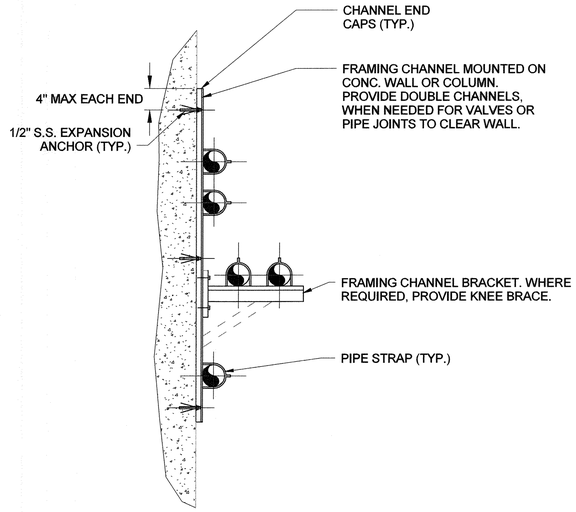
4 PIPE TRAPEZE DETAIL

SCALE: NONE



5 OFFSET PIPE CLAMP DETAIL

SCALE: NONE



NOTES:
1. CONFIGURATION SHOWN IS SUITABLE FOR PIPING 4 INCHES AND SMALLER.
2. CUT EDGES OF CHANNEL SHALL BE MACHINED SMOOTH.

6 PIPE RACK SUPPORT DETAIL

SCALE: NONE

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CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — LARS A. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/26/18

DES:	Designer
DRN:	Author
CHK:	Checker
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PIPE SUPPORT DETAILS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-506
SCALE AS SHOWN
SHEET 52 OF 81

DESIGN CRITERIA

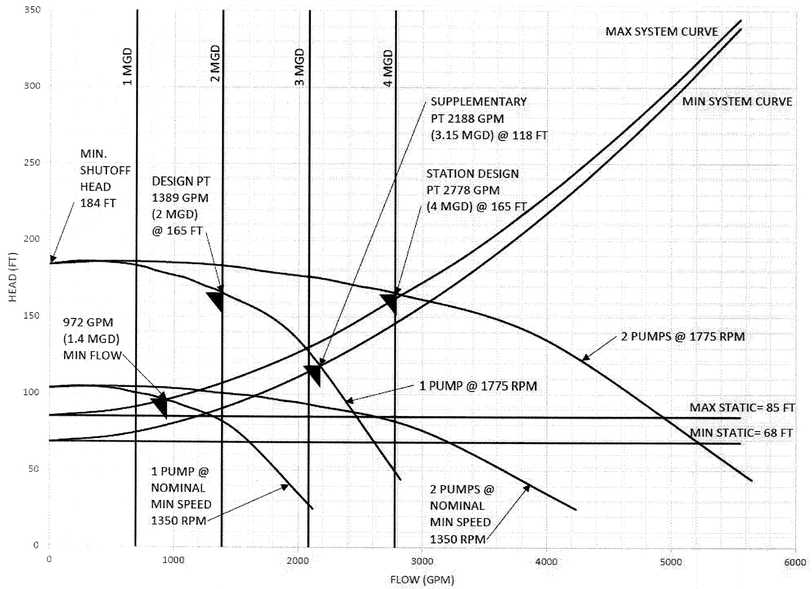
STATION SAFE PUMPING CAPACITY	4 MGD
NUMBER OF INSTALLED PUMPS	3
NUMBER OF OPERATING PUMPS	2

PUMP DATA

DESIGN CAPACITY	1,388 GPM (2 MGD)
DESIGN TDH	165 FT
DESIGN EFFICIENCY (MIN)	77%
DESIGN NPSHR (MAX)	16 FT
PUMP/MOTOR OPERATION	VARIABLE SPEED
MOTOR HP (MAX)	100 HP
MOTOR NOMINAL SPEED	1800 RPM
MOTOR NOMINAL MINIMUM SPEED	1350 RPM

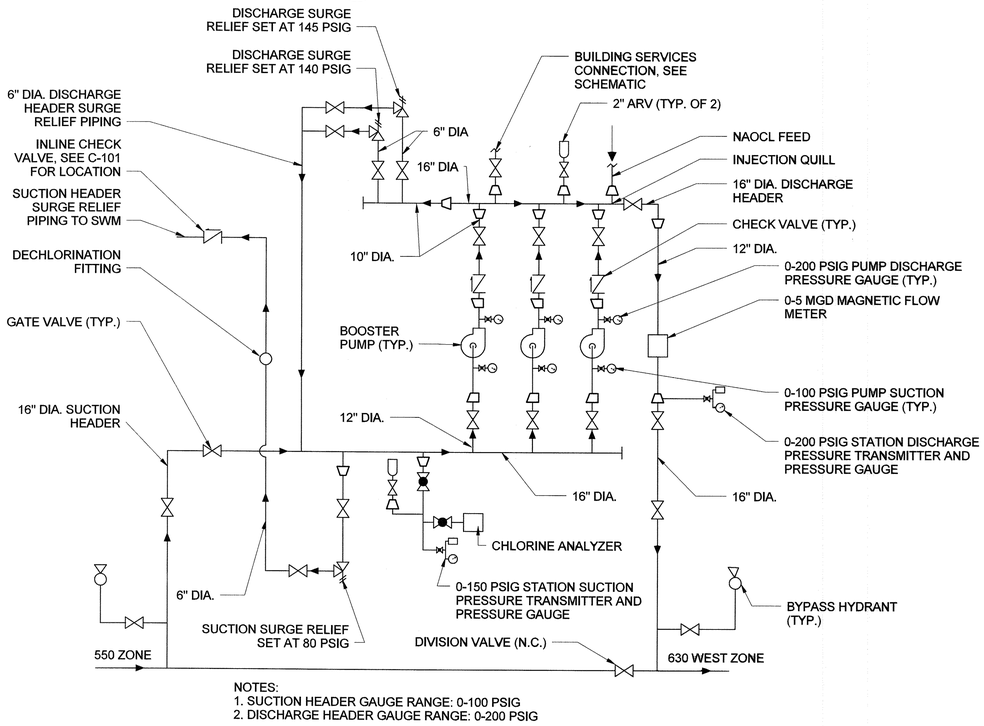
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.



1 PUMP & SYSTEM CURVES

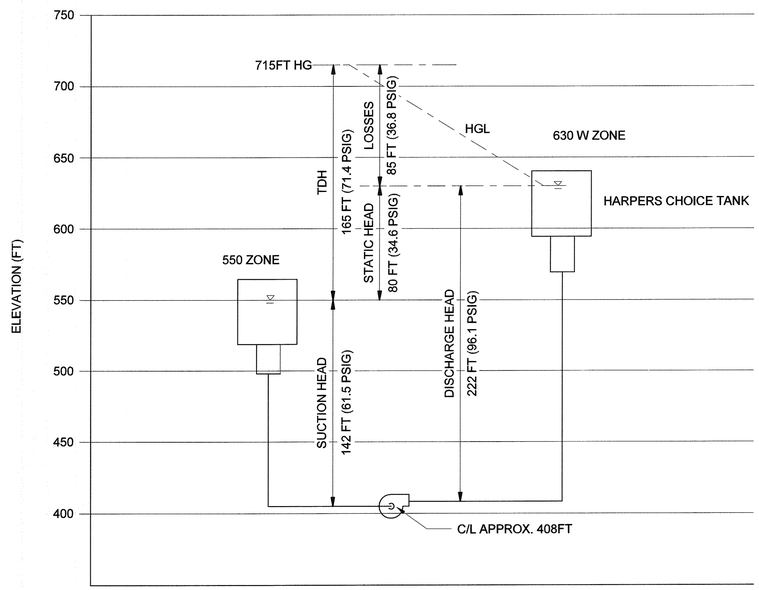
SCALE: NONE



NOTES:
1. SUCTION HEADER GAUGE RANGE: 0-100 PSIG
2. DISCHARGE HEADER GAUGE RANGE: 0-200 PSIG

2 PIPING SCHEMATIC

SCALE: NONE



3 HYDRAULIC DIAGRAM

SCALE: NONE

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CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — LANCE M. PETERSON — No. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	MM
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

PROCESS SCHEMATICS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-601
SCALE AS SHOWN
SHEET 53 OF 81

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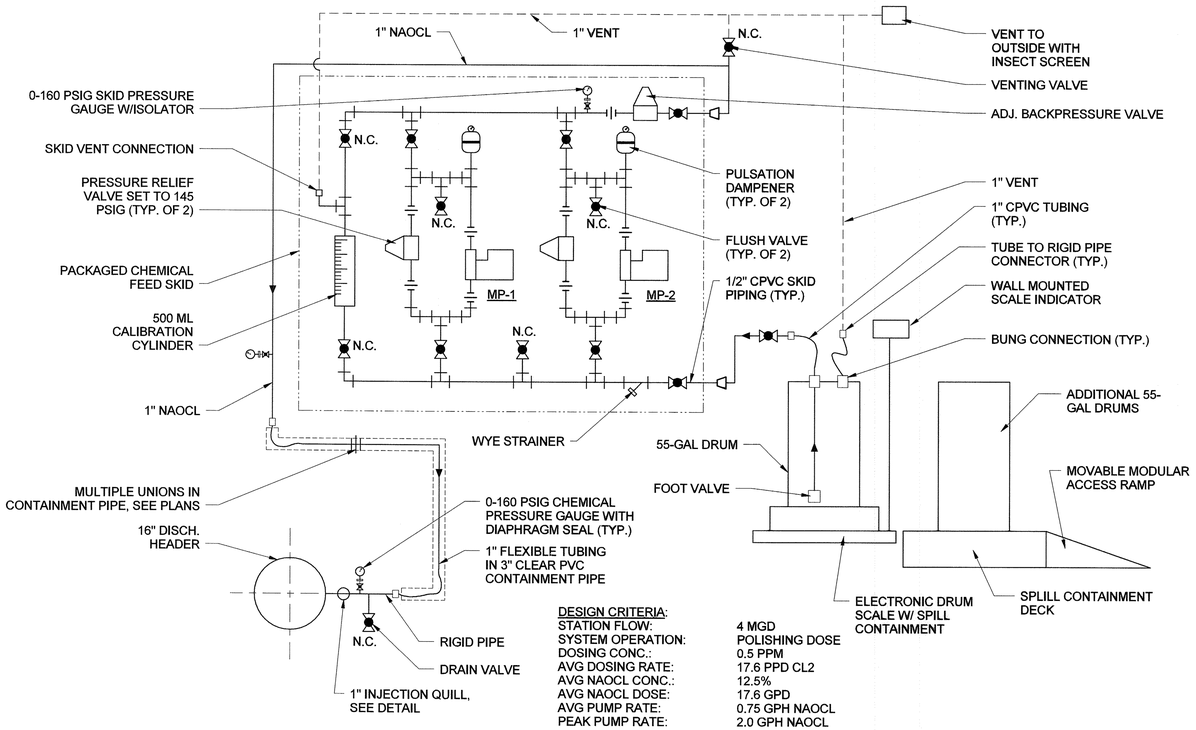
GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.
2. HOSE BIBBS AND WALL HYDRANTS SHALL HAVE VACUUM BREAKERS

⓪ SHEET KEY NOTES

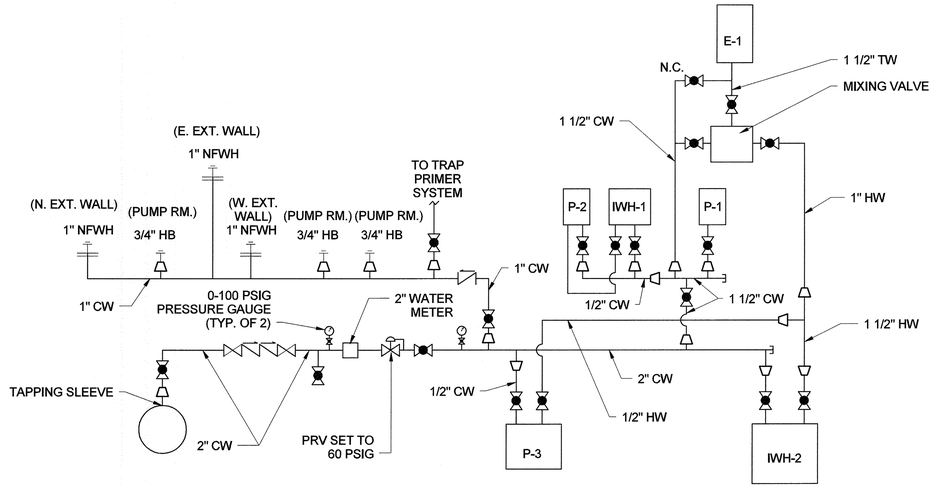
1. PROVIDE TRAP PRIMING AS DETAILED.



DESIGN CRITERIA:	
STATION FLOW:	4 MGD
SYSTEM OPERATION:	POLISHING DOSE
DOSING CONC.:	0.5 PPM
AVG DOSING RATE:	17.6 PPD CL2
AVG NAOCL CONC.:	12.5%
AVG NAOCL DOSE:	17.6 GPD
AVG PUMP RATE:	0.75 GPH NAOCL
PEAK PUMP RATE:	2.0 GPH NAOCL

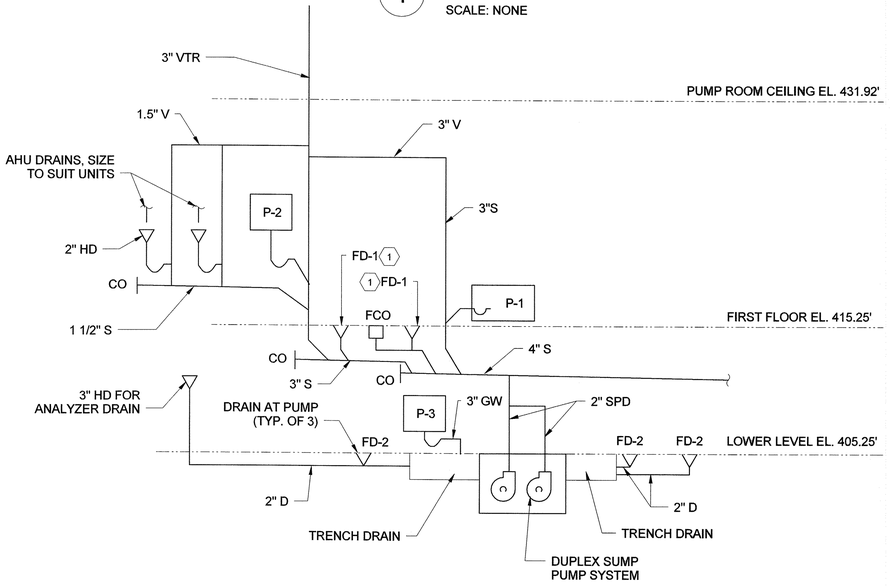
1 NAOCL SYSTEM SCHEMATIC

SCALE: NONE



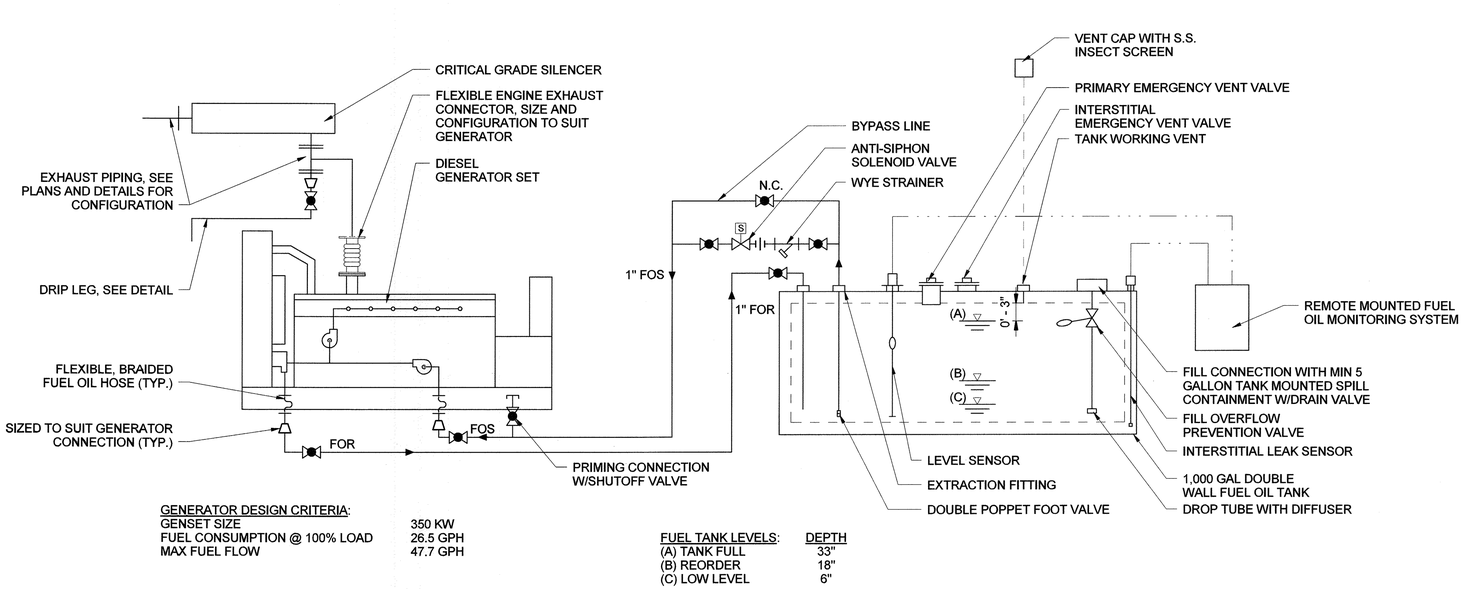
2 DOMESTIC WATER SCHEMATIC

SCALE: NONE



3 SANITARY DRAIN RISER SCHEMATIC

SCALE: NONE



GENERATOR DESIGN CRITERIA:	
GENSET SIZE	350 KW
FUEL CONSUMPTION @ 100% LOAD	26.5 GPH
MAX FUEL FLOW	47.7 GPH

FUEL TANK LEVELS:	DEPTH
(A) TANK FULL	33"
(B) REORDER	18"
(C) LOW LEVEL	6"

4 FUEL OIL SYSTSEM SCHEMATIC

SCALE: NONE

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STATE OF MARYLAND — LANCE A. PETERSON — No. 39984 — PROFESSIONAL ENGINEER — 12/20/18

DES: Designer					
DRN: Author					
CHK: Checker					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

SCHEMATICS

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-602
SCALE AS SHOWN
SHEET 54 OF 81

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GENERAL SHEET NOTES

1. SEE SHEET M-001 FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND.

FAN SCHEDULE

MARK	FAN TYPE	AIRFLOW	ESP	FAN RPM	FAN DRIVE TYPE	MOTOR HP	VOLTAGE	PHASE	HERTZ	MOTOR ENCLOSURE	DAMPER TYPE	BASIS OF DESIGN	COMMENTS
EF-1	IC	5700 CFM	0.70 in-wg	1176	B	3.00 hp	480 V	3	60 Hz	TEFC	N/A	GREENHECK BSQ-200	SIDE OUTLET
EF-2	IC	240 CFM	0.25 in-wg	1196	D	0.10 hp	120 V	1	60 Hz	TEFC	BDD	GREENHECK SQ-85-VG	
EF-3	IC	565 CFM	0.25 in-wg	1355	D	0.25 hp	120 V	1	60 Hz	ODP	BDD	GREENHECK SQ-95-VG	
EF-4	CE	75 CFM	0.41 in-wg	935	D	0.01 hp	120 V	1	60 Hz	ODP	BDD	GREENHECK SP-80-VG	
SF-1	IC	5700 CFM	0.70 in-wg	1176	B	3.00 hp	480 V	3	60 Hz	TEFC	N/A	GREENHECK BSQ-200	

UNIT HEATER SCHEDULE

MARK	HEATER POWER	HEATING CAPACITY	HEATER TYPE	AIRFLOW	AIR THROW	VOLTAGE	PHASE	HERTZ	NEMA RATING	BASIS OF DESIGN	COMMENTS
CH-1	1.7 kW	0.0 Btu/h	ELECTRIC	0 CFM	0' - 0"	208 V	1	60 Hz	12	CHROMALOX CCAS-12	INTEGRAL T-STAT & DISCONNECT
CH-2	0.5 kW	0.0 Btu/h	ELECTRIC	0 CFM	0' - 0"	208 V	1	60 Hz	12	CHROMALOX CAF-6	INTEGRAL T-STAT & DISCONNECT
EUH-1	5.0 kW	0.0 Btu/h	ELECTRIC	405 CFM	12' - 0"	480 V	3	60 Hz	4X	CHROMALOX HD3D	INTEGRAL T-STAT & DISCONNECT
EUH-2	5.0 kW	0.0 Btu/h	ELECTRIC	405 CFM	12' - 0"	480 V	3	60 Hz	4X	CHROMALOX HD3D	INTEGRAL T-STAT & DISCONNECT
EUH-3	5.0 kW	0.0 Btu/h	ELECTRIC	405 CFM	12' - 0"	480 V	3	60 Hz	4X	CHROMALOX HD3D	INTEGRAL T-STAT & DISCONNECT
EUH-4	5.0 kW	0.0 Btu/h	ELECTRIC	405 CFM	12' - 0"	480 V	3	60 Hz	4X	CHROMALOX HD3D	INTEGRAL T-STAT & DISCONNECT
EUH-5	2.0 kW	0.0 Btu/h	ELECTRIC	405 CFM	12' - 0"	208 V	1	60 Hz	4X	CHROMALOX HD3D	INTEGRAL T-STAT & DISCONNECT
EUH-6	5.0 kW	0.0 Btu/h	ELECTRIC	380 CFM	12' - 0"	480 V	3	60 Hz	12	CHROMALOX LUH	INTEGRAL T-STAT & DISCONNECT

DUCTLESS SPLIT SYSTEM SCHEDULE

MARK	MATCHING INDOOR UNIT ID	INDOOR UNIT TYPE	TOTAL COOLING CAPACITY	HEATING CAPACITY	VOLTAGE	PHASE	HERTZ	MIN SEER	REFRIGERANT	COMMENTS
AC-1	AHU-1	WALL MOUNT	24000.0 Btu/h	0.0 Btu/h	208 V	1	60 Hz	20	410A	REMOTE TSTAT/ CONTROLLER
AC-2	AHU-2	WALL MOUNT	24000.0 Btu/h	0.0 Btu/h	208 V	1	60 Hz	20	410A	REMOTE TSTAT/ CONTROLLER

NOTES:
1. INTERIOR DESIGN: 75 DEG F, 40% RH
2. COOLING AMBIENT: 95 DEG F

Air Terminal Schedule

MARK	FLOW	SIZE
EAG-1	1900 CFM	24"x16""
EAG-2	1900 CFM	24"x16""
EAG-3	1900 CFM	24"x16""
SAG-1	1900 CFM	24"x16""
SAG-2	1900 CFM	24"x16""
SAG-3	1900 CFM	24"x16""

PLUMBING FIXTURE SCHEDULE

TYPE MARK	DESCRIPTION	CW	HW	TW	SAN	VENT	COMMENTS
E-1	EMERGENCY EYEWASH/SHOWER COMBINATION			1 1/2"	1 1/2"		
P-1	TOILET	3/8"			2 1/2"	3"	BACK OUTLET
P-2	LAVATORY	3/8"	3/8"		1 1/4"	1 1/2"	
P-3	SERVICE SINK	1/2"	1/2"		3"	0"	

WATER HEATER SCHEDULE

Mark	WH TYPE	RECOVERY RATE	GALLONS	NUMBER OF HEATERS	VOLTAGE	PHASE	HERTZ	HEATER POWER	FLA	COMMENTS
IWH-1	INST.	0.5 GPM AT 41 DEG F	0	1	208 V	1	60 Hz	3 kW	15 A	
IWH-2	INST.	13 GPM AT 28 DEG F	0	1	480 V	3	60 Hz	39 kW	47 A	NEMA 4X

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HOWARD COUNTY, MARYLAND

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STATE OF MARYLAND — LARS A. PETERSON — NO. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	Author
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

MECHANICAL SCHEDULES

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-701
SCALE AS SHOWN
SHEET 55 OF 81

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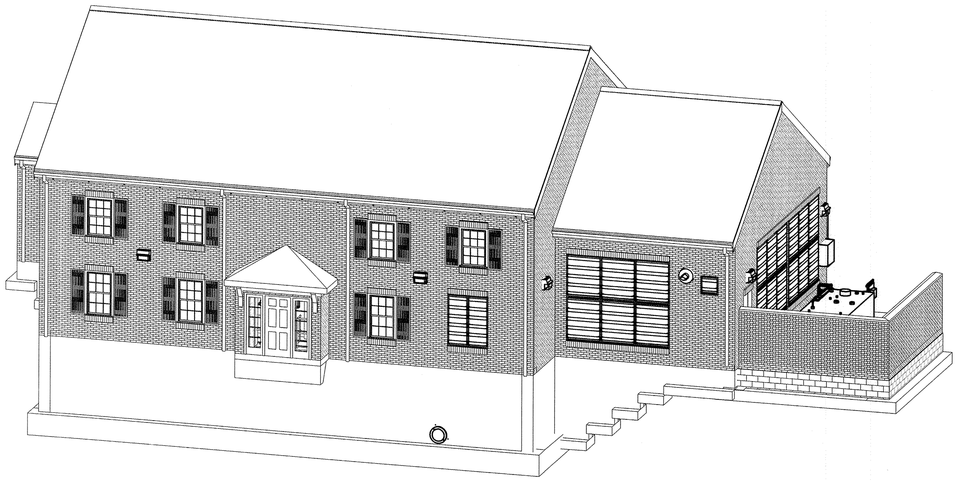
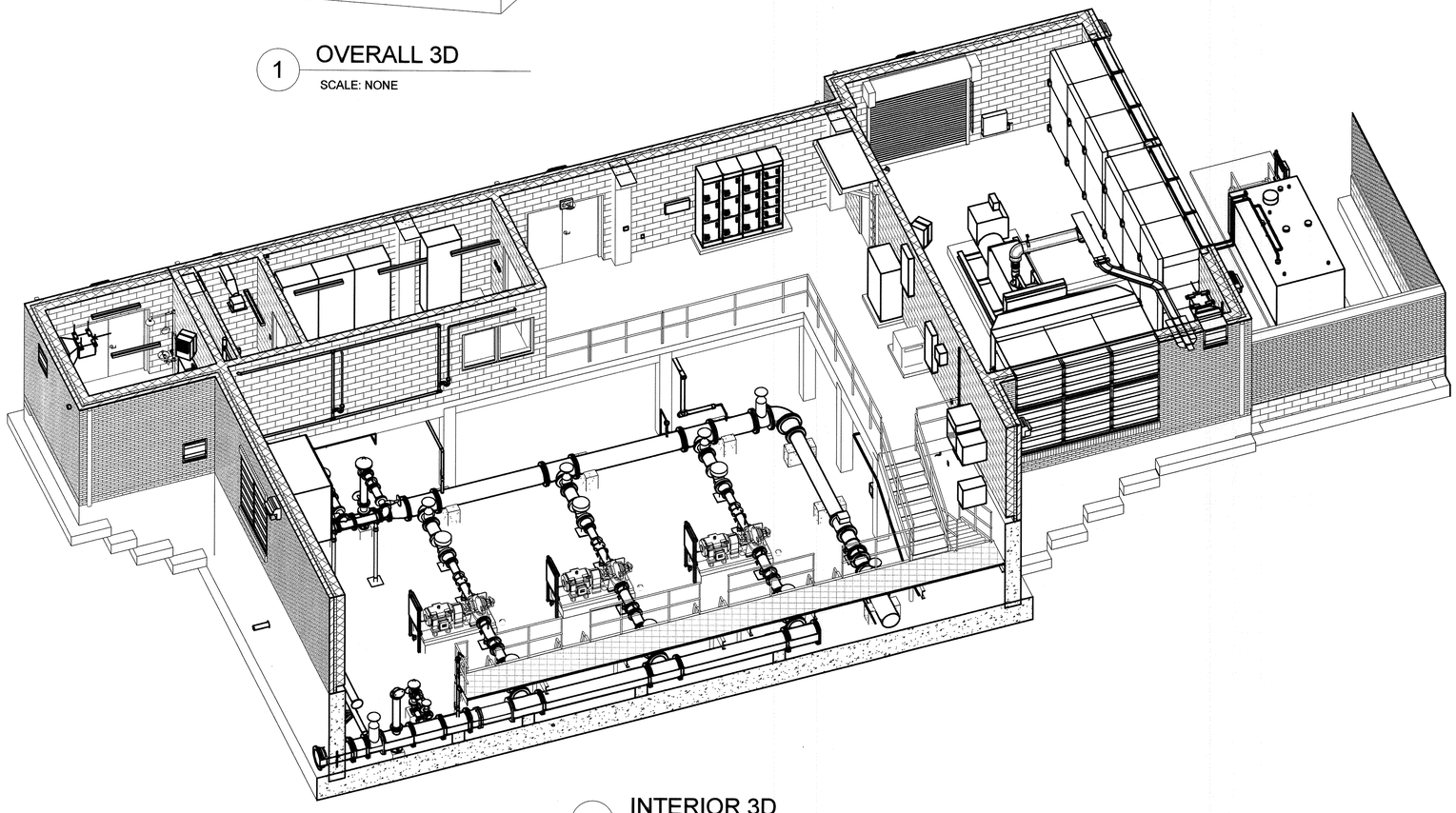


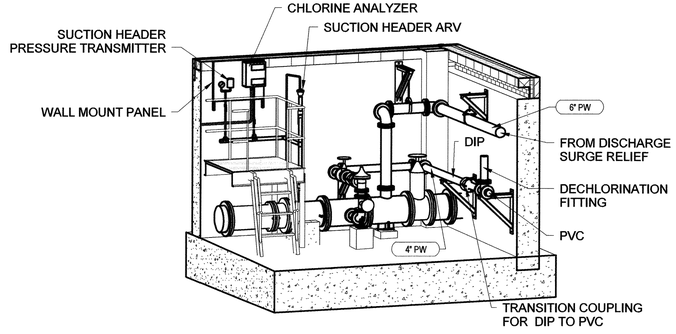
1 OVERALL 3D

SCALE: NONE



2 INTERIOR 3D

SCALE: NONE



3 SUCTION SURGE RELIEF 3D

SCALE: NONE

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PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33984, Expiration Date 1/15/19.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — LARS A. PETERSON — NO. 33984 — PROFESSIONAL ENGINEER — 12/20/18

DES:	MM
DRN:	MM/LP
CHK:	LP
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

PUMPING STATION 3D VIEWS

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING M1-901
SCALE AS SHOWN
SHEET 56 OF 81

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
S_m	20A, 1 POLE, 120V MANUAL MOTOR STARTER (TOGGLE SWITCH TYPE) WITH THERMAL OVERLOAD PROTECTION		MOTORIZED EQUIPMENT
S_{m2}	20A, 2 POLE, 240V MANUAL MOTOR STARTER (TOGGLE SWITCH TYPE) WITH THERMAL OVERLOAD PROTECTION	MOD	MOTOR OPERATED DAMPER
S_{m3}	20A, 3 POLE, 600V MANUAL MOTOR STARTER (TOGGLE SWITCH TYPE) WITH THERMAL OVERLOAD PROTECTION		CIRCUIT BREAKER
	EQUIPMENT (SURFACE MOUNTED AND RECESSED)	3 FV	FULL VOLTAGE MAGNETIC, NON-REVERSING, 3 PHASE MOTOR STARTER
	CONDUIT ROUTING	SPD	SURGE PROTECTION DEVICE
E	CONDUIT ROUTING: UNDERGROUND		GROUNDING CONNECTION
MDP-1,3,5	HOMERUN TO PANELBOARD, NOTATION INDICATES PANEL AND CIRCUIT	CT'S	CURRENT TRANSFORMER CONNECTIONS AT PHASE CONDUCTORS
	RACEWAY-CONDUIT TURNED DOWN		DELTA-WYE POWER TRANSFORMER
	RACEWAY-CONDUIT TURNED UP	N L E	TRANSFER SWITCH
ABOVE GRADE BELOW GRADE	RACEWAY-CHANGE IN ELEVATION		
	PLUG AND CORD CONNECTION	CB	ENCLOSED CIRCUIT BREAKER
GFI WP	DUPLEX RECEPTACLE, 20A, NEMA 5-20R GFI: GROUND FAULT CIRCUIT INTERRUPTER WP: WEATHER PROOF COVER	G	GENERATOR
	EXIT SIGN, SEE LIGHT FIXTURE SCHEDULE		UTILITY POLE
A B	LIGHT FIXTURES, SEE LIGHT FIXTURE SCHEDULE	$	SINGLE POLE LIGHTING CONTROL TOGGLE SWITCH, 20A, 2P, 3W
J	JUNCTION BOX	$_3$	THREE-WAY LIGHTING CONTROL TOGGLE SWITCH, 20A, 2P, 3W
OS	DUAL TECHNOLOGY CEILING MOUNTED OCCUPANCY SENSOR, COVERAGE SHALL BE IN ACCORDANCE WITH ROOM SQUARE FOOTAGE	$_{OS}$	DUAL TECHNOLOGY WALL MOUNTED OCCUPANCY SENSOR WITH SWITCH, COVERAGE SHALL BE IN ACCORDANCE WITH ROOM SQUARE FOOTAGE
LS	LIMIT SWITCH (INTRUSION DETECTION)		DISCONNECT SWITCH AND COMBINATION MOTOR STARTER/DISCONNECT SWITCH
AK	ALARM KEY SWITCH		

ELECTRICAL ABBREVIATIONS

ABBR.	DESCRIPTION	ABBR.	DESCRIPTION
A	AMPERE	KCMIL	THOUSAND CIRCULAR MILS
ACT	ABOVE COUNTER TOP	KV	KILOVOLT
AF	AMPERE FRAME	KVA	KILOVOLT AMPERE
AFF	ABOVE FINISHED FLOOR	KW	KILOWATT
AFG	ABOVE FINISHED GRADE	LRA	LOCKED ROTOR AMPS
AIC	AMPERE INTERRUPTING CAPACITY	LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND FAULT
ATS	AUTOMATIC TRANSFER SWITCH	MDP	MAIN DISTRIBUTION PANEL
AWG	AMERICAN WIRE GAUGE	MCA	MINIMUM CIRCUIT AMPACITY
C	CONDUIT	MCB	MAIN CIRCUIT BREAKER
CB	CIRCUIT BREAKER	MOPD	MAXIMUM OVERCURRENT PROTECTIVE DEVICE
CT	CURRENT TRANSFORMER	NEC	NATIONAL ELECTRICAL CODE
DP	DISTRIBUTION PANEL	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
DWG	DRAWINGS	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
EX	EXISTING TO REMAIN	P	POLE
ELEC	ELECTRICAL	PH OR Ø	PHASE
ELEV	ELEVATION	PRI	PRIMARY
FLA	FULL LOAD AMPS	SEC	SECONDARY
FVNR	FULL VOLTAGE NON-REVERSING	S/N	SOLID NEUTRAL
G, GND, GRD	GROUND	U.L.	UNDERWRITER'S LABORATORIES
GFI	GROUND FAULT INTERRUPTING	V	VOLTS
XFMR	TRANSFORMER	VA	VOLTAMPERES
HP	HORSEPOWER	W	WIRE

OVERCURRENT PROTECTION STUDIES

1. CONTRACTOR SHALL UTILIZE THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER (P.E.) TO GENERATE THE FOLLOWING OVERCURRENT PROTECTION DEVICE REPORTS:
   - SHORT CIRCUIT STUDY
   - COORDINATION STUDY
   - ARC FLASH STUDY
2. THE STUDIES SHALL ORIGINATE AT THE PROPOSED UTILITY COMPANY ELECTRICAL SERVICE CONNECTION POINT AND INCLUDE ALL DOWNSTREAM ELECTRICAL DISTRIBUTION EQUIPMENT, LARGE MOTORS AND FEEDERS AS REFLECTED IN THE SINGLE LINE POWER DISTRIBUTION DIAGRAM. THE STUDIES SHALL ALSO INCLUDE THE GENERATOR AND ASSOCIATED EQUIPMENT. DETERMINE OPTIMAL SETTINGS FOR ALL BREAKERS AT MOTOR CONTROL CENTER AND ASSOCIATED FEEDER SIZES. SEE ELECTRICAL SPECIFICATION SECTIONS 260572, 260573 AND 260574 FOR ADDITIONAL INFORMATION. PROVIDE ALL REQUIRED WARNING AND HAZARD LABELS AT PROPOSED MOTOR CONTROL CENTER AND PANELS, IN ACCORDANCE WITH ARC FLASH STUDY TO BE PERFORMED.
3. PRIOR TO ANY POTENTIAL FIELD ADJUSTMENTS AS A RESULT OF THE STUDIES, GENERATE A REPORT OF SUGGESTED FIELD ADJUSTMENTS FOR OWNER AND ENGINEER REVIEW AND APPROVAL.

LIGHTNING PROTECTION SYSTEM

1. CONTRACTOR SHALL PROVIDE LIGHTNING PROTECTION SYSTEM FOR BUILDING STRUCTURE IN ACCORDANCE WITH NFPA 780 AND LOCAL CODES. SEE LIGHTNING PROTECTION SPECIFICATION SECTION 264113 FOR ADDITIONAL INFORMATION.
2. CONTRACTOR SHALL INCLUDE ABOVE GRADE GENERATOR FUEL TANK IN LIGHTNING PROTECTION SYSTEM CALCULATIONS (ZONE OF PROTECTION) TO DETERMINE THE EXTENT OF LIGHTNING PROTECTION REQUIRED.
3. CONTRACTOR SHALL ENGAGE AN EXPERIENCED LIGHTNING PROTECTION DESIGNER AND INSTALLER. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL LIGHTNING PROTECTION SYSTEM COMPONENTS AND CONNECTIONS FOR ENGINEER'S REVIEW. SHOP DRAWINGS SHALL INCLUDE AIR TERMINAL LOCATIONS, CONDUCTOR ROUTINGS, CONNECTION DETAILS, BONDING AND GROUNDING PROVISIONS. COORDINATE INSTALLATION OF SYSTEM WITH OTHER BUILDING SYSTEMS, INCLUDING ELECTRICAL WIRING, SUPPORTING STRUCTURES AND BUILDING MATERIALS, METAL BODIES REQUIRING BONDING TO LIGHTNING PROTECTION COMPONENTS AND FINISHES. PROVIDE UL MASTER LABEL AND LP1 CERTIFICATIONS OF SYSTEM. PROVIDE ETL MASTER LABEL.

MOUNTING HEIGHT SCHEDULE

INTERIOR RECEPTACLES	18" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE
EXTERIOR RECEPTACLES	24" ABOVE FINISHED GRADE
LIGHT SWITCHES	48" ABOVE FINISHED FLOOR
PANELBOARDS	TOP OF PANEL TO BE 72" ABOVE FINISHED FLOOR
LIGHT FIXTURES AND EXIT SIGNS	SEE LIGHT FIXTURE SCHEDULE

NOTES (FOR MOUNTING HEIGHT SCHEDULE):

1. UNLESS INDICATED OTHERWISE, DEVICE MOUNTING HEIGHTS ARE TO CENTER LINE OF DEVICE.
2. REFER TO FLOOR PLANS FOR DEVICES MOUNTED AT HEIGHTS DIFFERING FROM HEIGHTS SCHEDULED.
3. MOUNTING HEIGHTS OF ALL DEVICES SHALL COMPLY WITH ICC/ANSI A117.1-2003.

REQUIREMENTS FOR BRANCH CIRCUIT CONDUCTORS AND CONDUITS FOR VOLTAGE DROP

PROVIDE 120V-1PH AND 208V-1PH BRANCH CIRCUIT CONDUCTORS AND CONDUIT AS FOLLOWS FOR ALL 20A BRANCH CIRCUIT LENGTHS AS INDICATED:

1. 120V-1PH BRANCH CIRCUITS:
   a. 56' AND LESS: (2)#12,(1)#12G-3/4"C.
   b. 57' TO 92': (2)#10,(1)#10G-3/4"C.
   c. 93' TO 146': (2)#8,(1)#8G-3/4"C.
   d. 147' TO 232': (2)#6,(1)#6G-1"C.
   e. 233' TO 370': (2)#4,(1)#4G-1"C.

WHERE #8 AWG OR LARGER IS REQUIRED FOR A 20A-120V BRANCH CIRCUIT, PROVIDE #8 AWG (OR LARGER SIZE AS INDICATED) IN HORIZONTAL CONDUIT RUN AND #10 IN VERTICAL DROP TO DEVICES.

2. 208V-1PH BRANCH CIRCUITS (WITHOUT NEUTRAL):
   a. 100' AND LESS: (2)#12,(1)#12G-3/4"C.
   b. 101' TO 159': (2)#10,(1)#10G-3/4"C.
   c. 160' TO 253': (2)#8,(1)#8G-3/4"C.
   d. 254' TO 403': (2)#6,(1)#6G-1"C.

GENERAL ELECTRICAL NOTES:

1. PROVIDE MATERIALS THAT ARE NEW AND WITHOUT IMPERFECTIONS OR BLEMISHES, AND PROTECTED FROM THE ELEMENTS PRIOR TO CONSTRUCTION.
2. COMPLY WITH OWNER'S USE OF PREMISES AND SAFETY REGULATIONS.
3. COORDINATE LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND ROUTINGS OF ALL ELECTRICAL FEEDERS (AND ASSOCIATED PULLBOXES) AND BRANCH CIRCUITS WITH ALL OTHER UTILITIES (EXISTING AND NEW), WITH STRUCTURE, AND WITH BUILDING ELEMENTS.
4. UNLESS NOTED OTHERWISE, EVERY CONDUIT CONTAINING 120V RATED WIRING AND GREATER, SHALL CONTAIN A SEPARATE INSULATED GROUND WIRE RATED FOR 600V.
5. PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL BRANCH CIRCUITS UTILIZING A NEUTRAL (I.E. 120V, 277V, ETC). PROVIDE SEPARATE UNSHARED NEUTRAL CONDUCTOR(S) FOR ALL FEEDERS REQUIRING A NEUTRAL (I.E. 1 PHASE-3 WIRE, 3 PHASE-4 WIRE FEEDERS). SHARING OF NEUTRAL CONDUCTORS BETWEEN ANY CIRCUIT (BRANCH OR FEEDER) IS NOT PERMITTED. MULTI-WIRE BRANCH CIRCUITS ARE NOT PERMITTED.
6. PROVIDE STRUCTURAL FRAME SUPPORTS AS REQUIRED FOR DISCONNECT SWITCHES, PANELBOARDS, TRANSFORMERS, CONTACTORS, ETC. (IF DISCONNECT SWITCHES OR STARTERS ARE LOCATED ON EQUIPMENT HOUSINGS, COORDINATE LOCATIONS WITH EQUIPMENT SUPPLIER TO ENSURE SWITCHES ARE NOT INSTALLED ON EQUIPMENT ACCESS PANELS). MAINTAIN PROPER NATIONAL ELECTRICAL CODE CLEARANCES. IN ADDITION, MAINTAIN PROPER MECHANICAL WORKING CLEARANCES FOR SERVICING OF EQUIPMENT.
7. PROVIDE ALL CUTTING, PATCHING, AND ACCESS PANELS REQUIRED FOR ELECTRICAL WORK. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES.
8. ALL WORK AND EQUIPMENT SHALL COMPLY WITH ALL AUTHORITIES HAVING JURISDICTION, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL MECHANICAL CODE, THE LOCAL FIRE MARSHALL, UNDERWRITERS LABORATORY (UL), IRI, FM, OSHA, AND THE NATIONAL ELECTRICAL CODE (NEC). MODIFICATIONS REQUIRED BY THE ABOVE SAID AUTHORITIES TO BRING THE SPACE UNDER CONTRACT UP TO CODE SHALL BE MADE WITHOUT ADDITIONAL CHARGE WHERE CONTRACT DOCUMENT REQUIREMENTS ARE IN EXCESS OF CODE REQUIREMENTS, THE CONTRACT DOCUMENTS SHALL GOVERN. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
9. CONTRACTOR SHALL VERIFY ALL POINTS OF CONNECTION BEFORE COMMENCING WORK. CONTRACTOR SHALL REMOVE ALL WASTE MATERIALS, DEBRIS, AND RUBBISH FROM THE SITE AND LEGALLY DISPOSE OF IT.
10. A SET OF ELECTRICAL RECORD/COORDINATION DRAWINGS SHALL BE MAINTAINED AT THE JOB SITE. ACTUAL LOCATIONS OF ALL EQUIPMENT, CONDUIT, ETC., AND ALL DEVIATIONS OF THE WORK FROM THAT SHOWN ON THE CONTRACT DOCUMENTS SHALL BE MARKED ON THE RECORD/COORDINATION DRAWINGS. EACH TRADE SHALL REVIEW THE COORDINATION DRAWINGS AND RESOLVE ANY POTENTIAL CONFLICTS WITH OTHER TRADES PRIOR TO INSTALLING ANY PORTION OF THERE WORK.
11. WORK SHALL BE EXECUTED IN A GOOD WORKMANLIKE MANNER USING MECHANICS SKILLED IN THEIR RESPECTIVE TRADES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES FOR ALL COORDINATION OF WORK UNDER THIS CONTRACT. MAINTAIN THE CONSTRUCTION PREMISES IN A NEAT AND ORDERLY CONDITION AT THE END OF EACH WORKING DAY.
12. CONTRACTOR SHALL MAKE ALL FINAL EQUIPMENT CONNECTIONS AND PROVIDE THE NECESSARY DEVICES, ETC. FOR A COMPLETE AND OPERABLE SYSTEM.
13. ARRANGE CONDUIT, WIRING, EQUIPMENT AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCE AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND COORDINATE THE WORK WITH ALL TRADES. WHERE DEPARTURES ARE PROPOSED BECAUSE OF FIELD CONDITIONS OR OTHER CAUSES, PREPARE AND SUBMIT DETAILED DRAWINGS FOR ACCEPTANCE.
14. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC. ALL OFFSETS, BENDS, FITTINGS AND ACCESSORIES ARE NOT NECESSARILY SHOWN. PROVIDE ALL SUCH ITEMS AS REQUIRED FOR COMPLETE OPERATIONAL SYSTEM.
15. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, PLAN REVIEWS AND CERTIFICATES OF INSPECTION REQUIRED BY THE AUTHORITIES HAVING JURISDICTION OVER THIS WORK.
16. COST INCURRED FROM DAMAGES AS A RESULT OF THE CONTRACTOR'S WORK WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. DAMAGES WILL NOT WARRANT COST OR DELAY CLAIMS.
17. CONTRACTOR SHALL COMPLY WITH LOCAL AND APPLICABLE CODES. IN THE EVENT OF A CONFLICT, THE MOST STRINGENT SHALL GOVERN. SHOULD A CONFLICT ARISE BETWEEN CONSTRUCTION DOCUMENTS AND APPLICABLE CODES, WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE ENFORCING CODE AUTHORITIES.
18. WHERE EVER POSSIBLE, THE CONTRACTOR SHALL OBTAIN ACTUAL ROUGH-IN DRAWINGS FOR THE ACTUAL ITEM OF EQUIPMENT TO BE INSTALLED PRIOR TO ROUGH-IN. THIS SHALL APPLY TO ALL EQUIPMENT, WHETHER IT IS TO BE INSTALLED BY THE CONTRACTOR OR BY OTHERS.
19. ANY EXISTING ELECTRICAL WORK SHOWN ON THESE DRAWINGS IS INDICATED FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE OWNER AND ENGINEER IN NO WAY WARRANT OR GUARANTEE EITHER THE ACCURACY OR COMPLETENESS OF THIS INFORMATION. FINAL LOCATIONS AND QUANTITIES SHALL BE FIELD VERIFIED BY THE CONTRACTOR TO THEIR OWN SATISFACTION.
20. THE CONTRACTOR SHALL VISIT THE SITE AND FIELD VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING WORK. ROUTINGS SHOWN ON DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL VERIFY THAT INTERFERENCES WILL NOT BE ENCOUNTERED. IF ANY DISCREPANCY IS DETECTED, THE CONTRACTOR SHALL BRING IT TO THE OWNER'S ATTENTION WITH RECOMMENDATIONS FOR OWNER'S APPROVAL.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788, Expiration Date 08-15-2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE
CHIEF, BUREAU OF ENGINEERING — DATE 12/20/18
CHIEF, BUREAU OF UTILITIES — DATE 12/20/18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/20/18

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STATE OF MARYLAND — 49788 — PROFESSIONAL ENGINEER — 12/20/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

ELECTRICAL LEGEND AND GENERAL NOTES

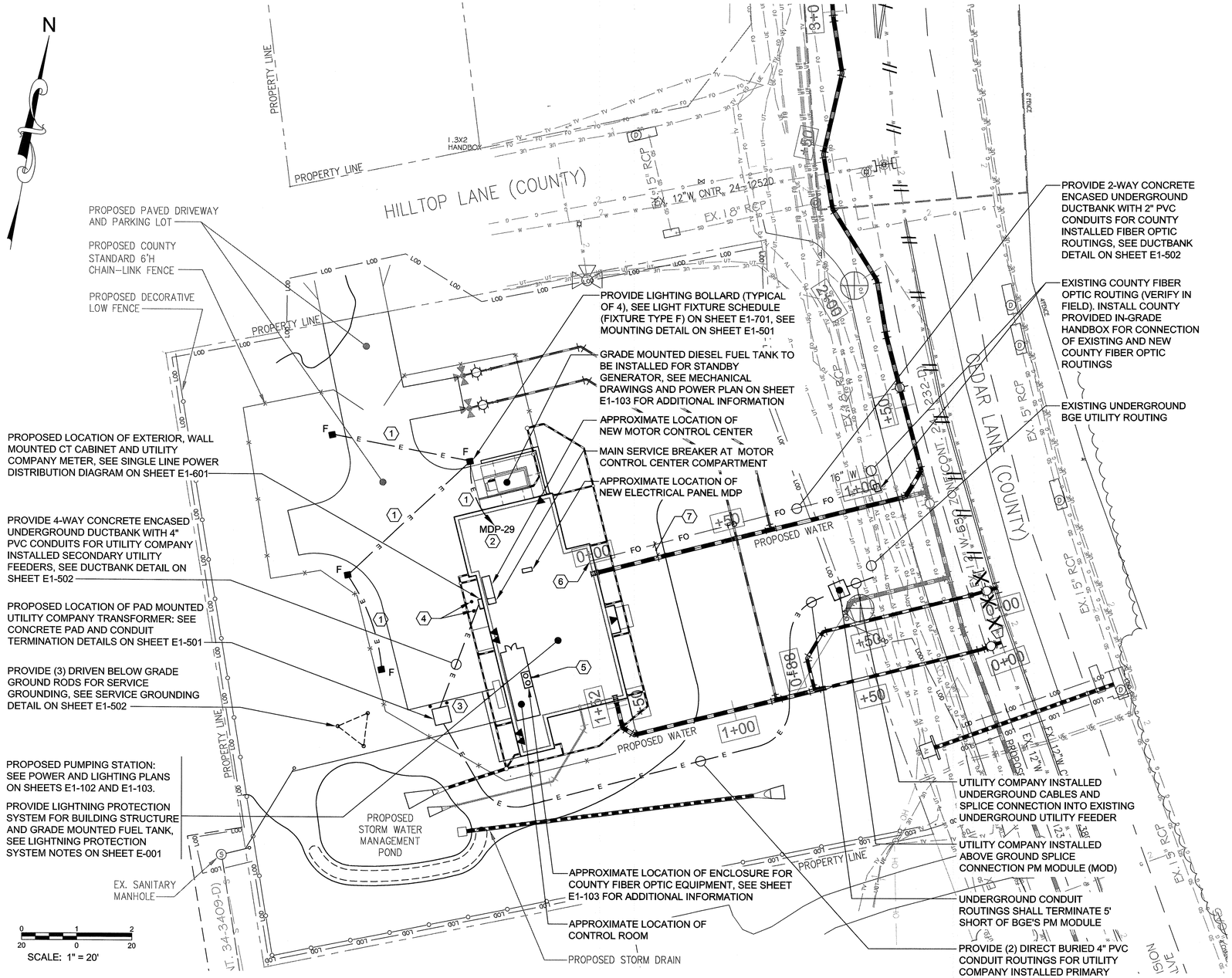
600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. E-001
SCALE AS SHOWN
SHEET 57 OF 81



1 ELECTRICAL SITE PLAN

SCALE: 1" = 20'-0"

SITE LEGEND

LOD	LIMIT OF DISTURBANCE		PROP. WATER MAIN
S	EX. SEWER	S	PROP. SEWER
	EX. WATER		PROP. WATER
SD	EX. STORM DRAIN		PROP. STORM DRAIN
UE	EX. UNDERGROUND ELECTRIC	E	PROP. UNDERGROUND ELECTRIC
	EX. UTILITY POLE		PROP. UTILITY POLE
OE	EX. OVERHEAD ELECTRIC	OE	PROP. OVERHEAD ELECTRIC
FO	EX. UNDERGROUND FIBER OPTIC	FO	PROP. UNDERGROUND FIBER OPTIC
UT	EX. UNDERGROUND TELEPHONE	F	PROP. LIGHTING BOLLARD
X	PROP. CHAIN LINK FENCE		PROP. PROTECTION BOLLARD

ELECTRICAL UTILITY NOTES:

1. CONDUIT SWEEP BENDS SHALL HAVE A MINIMUM RADIUS OF 36 INCHES.
2. NYLON PULL CABLES SHALL BE INSTALLED IN CONDUITS AND DUCTBANK FOR EXTENSION OF UTILITY COMPANY INSTALLED FEEDERS.
3. DIRECT BURIED CONDUITS AND UNDERGROUND DUCTBANK FOR PRIMARY AND SECONDARY UTILITY FEEDERS SHALL BE PROVIDED WITH A MINIMUM COVER OF 48 INCHES.
4. UTILITY COMPANY (BGE) SHALL INSTALL PRIMARY AND SECONDARY FEEDERS AND MAKE ALL FINAL CONNECTIONS TO UTILITY TRANSFORMER, CT CABINET AND SERVICE METERING.
5. CONTRACTOR SHALL FIELD COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLING TRANSFORMER PAD, METERING, CT CABINET AND PROTECTION BOLLARDS FOR CT/METERING EQUIPMENT AND SERVICE TRANSFORMER.
6. PRIOR TO UTILITY COMPANY INSTALLATIONS, CONTRACTOR SHALL LOCATE AND CLEARLY MARK PROPOSED PROPERTY/CURB LINES ON THE JOB SITE.
7. PRIOR TO UTILITY COMPANY INSTALLATIONS, SITE MUST BE WITHIN 6 INCHES OF FINAL GRADE.
8. CONTRACTOR SHALL PROVIDE MARKINGS IN 3 FEET INTERVALS FOR EXISTING AND/OR PROPOSED WATER, SEWER, STORM DRAIN AND ALL OTHER NON-BGE UNDERGROUND UTILITIES.
9. INSTEAD OF PROVIDING POURED CONCRETE PAD FOR UTILITY COMPANY TRANSFORMER MOUNTING, CONTRACTOR HAS OPTION OF PURCHASING AND HAVING DELIVERED A PRECAST CONCRETE PAD FROM CHOCTAW-KAUL DISTRIBUTION COMPANY (302-292-2660).
10. ALL WORK AND MATERIALS RELATED TO INCOMING ELECTRICAL SERVICE SHALL BE COMPLIANT WITH BALTIMORE GAS AND ELECTRICAL (BGE) STANDARDS AND SPECIFICATIONS.
11. PRIOR TO ANY CONSTRUCTION FOR THE UNDERGROUND ELECTRICAL SERVICE, CONTRACTOR SHALL CONTACT JOE BOSSE (410-470-6974) FOR ELECTRIC METERING.

GENERAL ELECTRICAL SITE NOTES:

1. MAINTAIN A MINIMUM VERTICAL CLEARANCE OF 12 INCHES BETWEEN UNDERGROUND ROUTINGS THAT CROSS EACH OTHER.
2. OTHER PROPOSED UNDERGROUND UTILITY ROUTINGS (GAS, WATER, SEWER, STORM DRAIN, ETC.) ARE SHOWN ON ELECTRICAL SITE PLAN FOR COORDINATION PURPOSES.
3. UNLESS NOTED OTHERWISE, ALL EXTERIOR UNDERGROUND CONDUIT ROUTINGS SHALL BE SCHEDULE 40 PVC CONDUIT.
4. UNLESS NOTED OTHERWISE, ALL EXTERIOR ABOVE GRADE EXPOSED CONDUIT ROUTINGS SHALL BE RIGID GALVANIZED STEEL.
5. CONDUITS INSTALLED THROUGH A BUILDING WALL SHALL HAVE INTERNAL AND EXTERNAL SEALANT APPLIED. SEALANT SHALL MATCH FIRE RATING (2 HOUR MINIMUM) OF WALL TO BE PENETRATED. SEE WALL PENETRATION DETAIL ON SHEET E1-503 FOR ADDITIONAL INFORMATION.

ELECTRICAL KEYED NOTES:

1. PROVIDE BRANCH CIRCUIT ROUTING FOR EXTERIOR LIGHTING BOLLARDS: 2#10, 1#10 GROUND IN DIRECT BURIED 1" PVC CONDUIT ROUTING, SEE DIRECT BURIED CONDUIT DETAIL ON SHEET E1-502.
2. PROVIDE HOMERUN BACK TO PANEL AND CIRCUIT INDICATED.
3. PROVIDE PROTECTION BOLLARDS FOR UTILITY COMPANY TRANSFORMER, IN ACCORDANCE WITH BGE REQUIREMENTS. SEE PROTECTION BOLLARD DETAIL ON SHEET E1-501.
4. PROVIDE PROTECTION BOLLARDS FOR CT CABINET AND UTILITY METERING INSTALLATIONS, IN ACCORDANCE WITH BGE REQUIREMENTS. SEE PROTECTION BOLLARD DETAIL ON SHEET E1-501.
5. TERMINATE (2) 2" CONDUIT STUB-UPS WITH PULL CABLE AT PROPOSED COUNTY FIBER OPTIC ENCLOSURE. SEE FIRST FLOOR POWER PLAN ON SHEET E1-103 FOR ADDITIONAL INFORMATION.
6. EXTEND CONDUIT ROUTINGS THROUGH BUILDING INTERIOR (TRANSITION TO ALUMINUM CONDUIT) TO ENCLOSURE AT CONTROL ROOM FOR COUNTY FIBER OPTIC EQUIPMENT. SEE LOWER LEVEL POWER PLAN ON SHEET E1-102 FOR ADDITIONAL INFORMATION.
7. PROVIDE A MINIMUM HORIZONTAL CLEARANCE OF 5'-0" BETWEEN NEAREST EDGE OF PROPOSED UNDERGROUND FIBER OPTIC DUCTBANK AND NEAREST EDGE OF PROPOSED UNDERGROUND WATER PIPE.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788, Expiration Date 08-15-2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — RICHARD E. WILLIAMS — 49788 — PROFESSIONAL ENGINEER — 12/21/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

ELECTRICAL SITE PLAN

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. E1-101
SCALE AS SHOWN
SHEET 58 OF 81

KCI TECHNOLOGIES PROJECT No.: 13160130601
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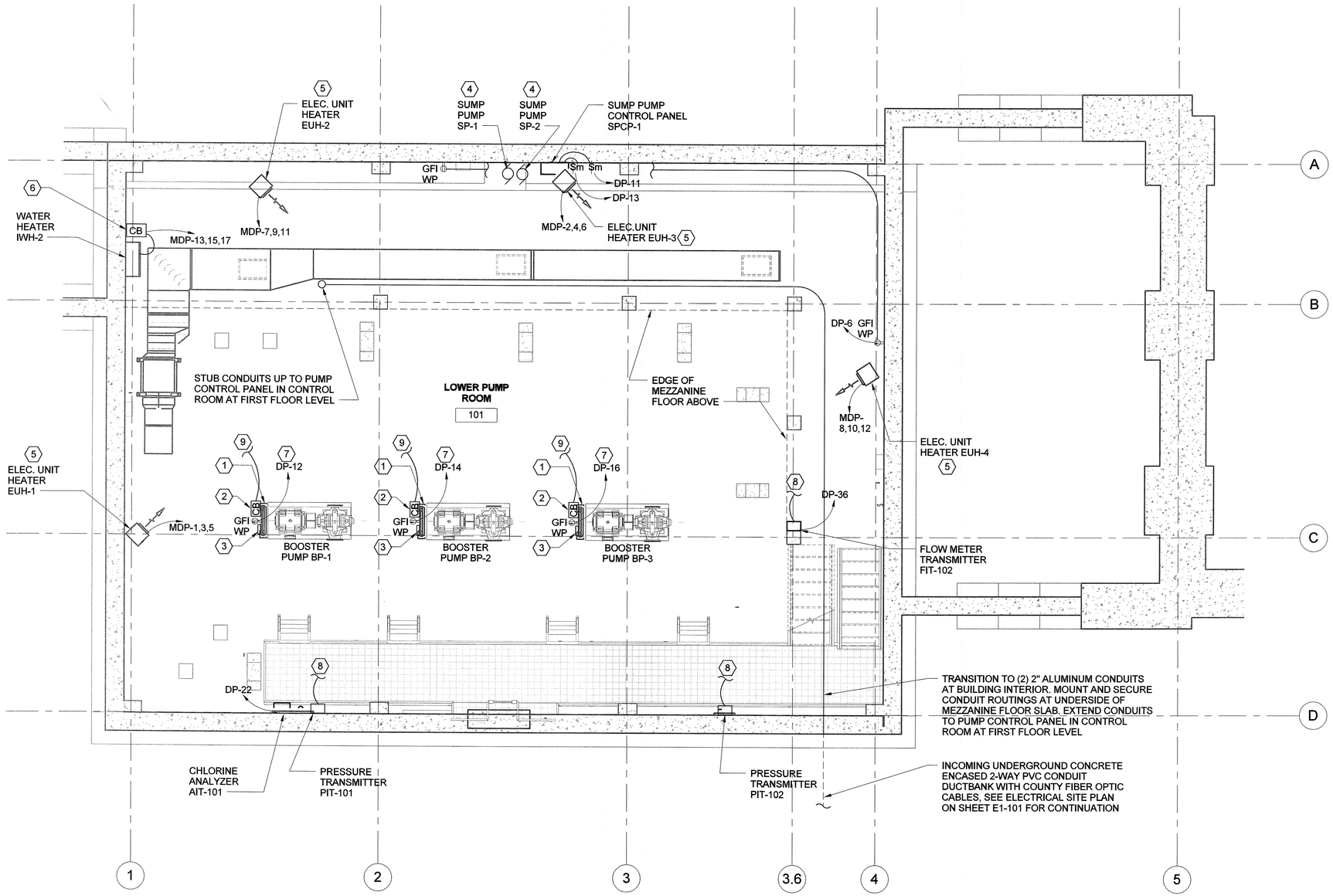

1 LOWER LEVEL POWER PLAN

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

GENERAL ELECTRICAL NOTES

1. SEE SHEET E-001 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE ALL ELECTRICAL INSTALLATIONS WITH ALL DISCIPLINES.
3. SEE PANEL AND MCC SCHEDULES ON SHEET E1-701 FOR BRANCH CIRCUIT CONDUIT AND WIRING SIZES.
4. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601 FOR ADDITIONAL INFORMATION.
5. AT EACH ENCLOSED BREAKER, DISCONNECT SWITCH AND CONTROL ENCLOSURE INDICATED, PROVIDE NAME PLATE DATA REFLECTING PANEL SOURCE AND CIRCUIT NUMBER.
6. SEE SHEET E1-601 FOR NEMA RATING OF ENCLOSURES FOR SPECIFIC AREAS.
7. UNLESS NOTED OTHERWISE, ALL CONDUIT ROUTINGS AT BUILDING INTERIOR SHALL BE ALUMINUM (RIGID AND FLEXIBLE WHERE APPLICABLE).
8. ALL CONDUIT ROUTINGS IN LOWER LEVEL FLOOR SLAB SHALL BE SCHEDULE 40 PVC CONDUIT AND TRANSITION TO ALUMINUM CONDUIT WHEN EXTENDED ABOVE SLAB FOR EQUIPMENT CONNECTION.
9. PROVIDE ADDITIONAL CONTROL DEVICES (CONTACTORS, RELAYS, CONTROL TRANSFORMERS, ETC. IN ACCORDANCE WITH INSTRUMENTATION DRAWINGS AT ENCLOSED BREAKERS AND SWITCHES THAT REFLECT A CONTROL CONNECTION.

ELECTRICAL KEYED NOTES

1. PROVIDE UNISTRUT CHANNEL SUPPORT STRUCTURE FOR MOUNTING OF INDICATED EQUIPMENT. SEE EQUIPMENT MOUNTING AT PUMP DETAIL ON SHEET E1-503.
2. PROVIDE 600V, 250A, 3P ENCLOSED CIRCUIT BREAKER FOR BOOSTER PUMP. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-701. ROUTE ASSOCIATED CONDUITS IN LOWER LEVEL FLOOR SLAB.
3. EMERGENCY STOP STATION TO BE INSTALLED. SEE INSTRUMENTATION DRAWINGS. PROVIDE 3/4" CONDUIT ROUTING (IN LOWER LEVEL FLOOR SLAB) AND CONTROL WIRING FROM LOCAL CONTROL STATION TO VFD AT CONTROL ROOM. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.
4. EQUIPMENT POWERED AND CONTROLLED FROM SUMP PUMP CONTROL PANEL SPCP-1. EQUIPMENT PROVIDED WITH VENDOR SUPPLIED PRE-WIRED CABLE SYSTEMS FOR FLOAT SWITCHES AND PUMPS. MAKE ALL FINAL CONNECTIONS TO SPCP-1.
5. EQUIPMENT TO BE PROVIDED WITH MANUFACTURER SUPPLIED DISCONNECT SWITCH.
6. PROVIDE 600V, 60A, 3P ENCLOSED CIRCUIT BREAKER.
7. ROUTE CONDUIT IN LOWER LEVEL FLOOR SLAB.
8. EQUIPMENT CONTROLLED FROM PUMP CONTROL PANEL PCP AT CONTROL ROOM. PROVIDE 3/4" CONDUIT ROUTING AND CONTROL WIRING. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.
9. PROVIDE 3/4" CONDUIT ROUTING WITH CONTROL WIRING FROM ENCLOSED BREAKER TO CORRESPONDING VFD. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS. ROUTE CONDUIT IN LOWER LEVEL FLOOR SLAB.

0 2' 4' 8'

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

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 49788 , Expiration Date 08-15-2020

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, UTILITY DESIGN DIVISION KD — DATE 12/26/18

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STATE OF MARYLAND — WAYNE D. WILLIAMS — 49788 — PROFESSIONAL ENGINEER — 12/20/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

POWER PLAN - LOWER LEVEL

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING E1-102
SCALE AS SHOWN
SHEET 59 OF 81

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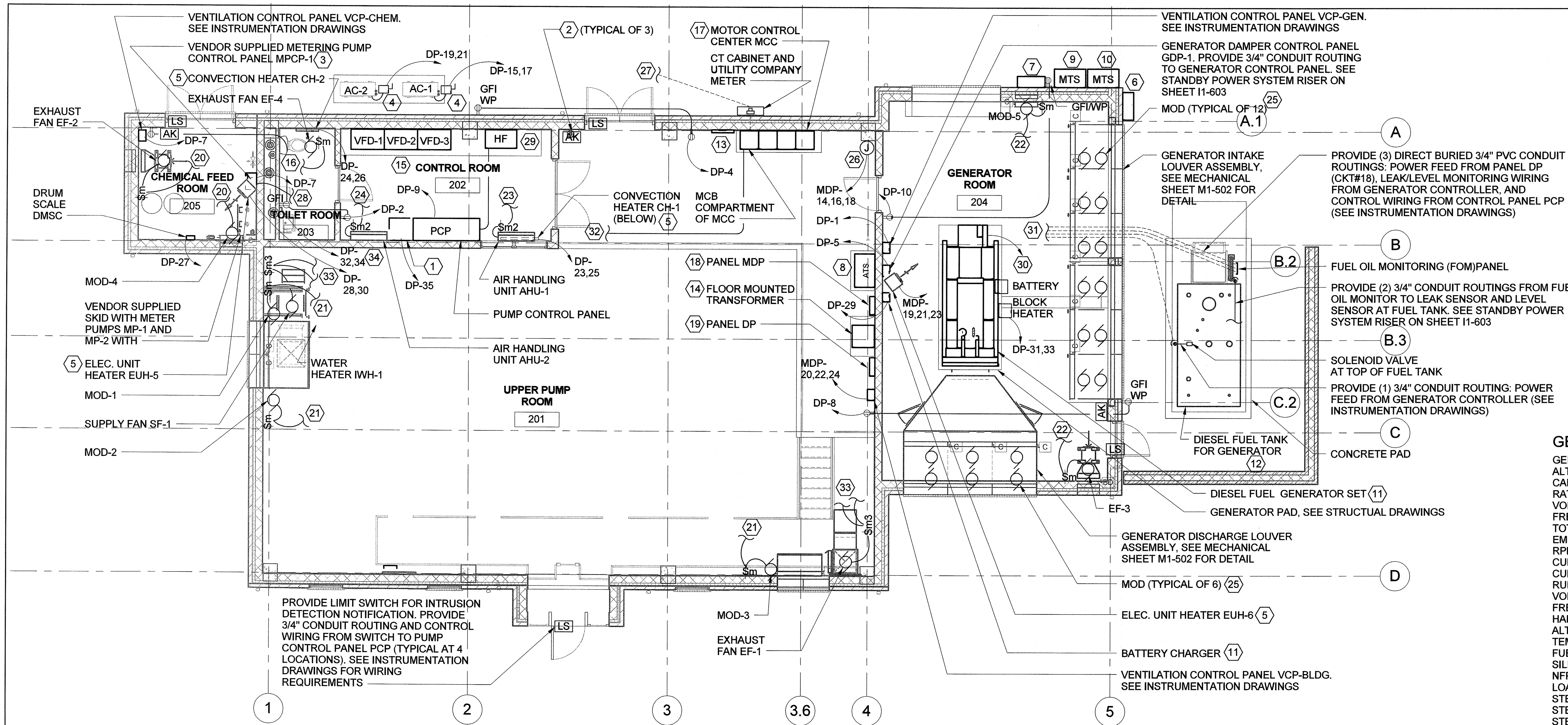

1 FIRST FLOOR POWER PLAN

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

GENERAL ELECTRICAL NOTES

1. SEE SHEET E-001 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE ALL ELECTRICAL INSTALLATIONS WITH ALL DISCIPLINES.
3. SEE PANEL AND MCC SCHEDULES ON SHEET E1-701 FOR BRANCH CIRCUIT CONDUIT AND WIRING SIZES.
4. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601 FOR ADDITIONAL INFORMATION.
5. AT EACH ENCLOSED BREAKER, DISCONNECT SWITCH AND CONTROL ENCLOSURE INDICATED, PROVIDE NAME PLATE DATA REFLECTING PANEL SOURCE AND CIRCUIT NUMBER.
6. SEE SHEET E1-601 FOR NEMA RATING OF ENCLOSURES FOR SPECIFIC AREAS.
7. UNLESS NOTED OTHERWISE, ALL CONDUIT ROUTINGS AT BUILDING INTERIOR SHALL BE ALUMINUM (RIGID AND FLEXIBLE WHERE APPLICABLE).
8. ALL CONDUIT ROUTINGS BELOW LOWER LEVEL FLOOR SLAB (IN GRADE) SHALL BE SCHEDULE 40 PVC CONDUIT.
9. MAINTAIN A MINIMUM CLEARANCE OF 48" BETWEEN GENERATOR FRAME AND OTHER EQUIPMENT AND WALLS.
10. IN ACCORDACNE WITH NEC 358.26, THERE SHALL BE NO MORE THAN A TOTAL OF 360 DEGREES OF BENDS IN A CONDUIT ROUTING BETWEEN PULL POINTS (BOXES).
11. PROVIDE ADDITIONAL CONTROL DEVICES (CONTACTORS, RELAYS, CONTROL TRANSFORMERS, ETC. IN ACCORDANCE WITH INSTRUMENTATION DRAWINGS AT ENCLOSED BREAKERS AND SWITCHES THAT REFLECT A CONTROL CONNECTION.

GENERATOR DESIGN CRITERIA

GENERATOR:	KOHLER MODEL 350REOZJB
ALTERNATOR:	KOHLER MODEL 4M4021
CAPACITY:	350KW.
RATING:	STANDBY
VOLTAGE:	277/480 VAC, 3PH, 4W
FREQUENCY:	60HZ
TOTAL AMP OUTPUT	526
EMISSIONS:	EPA STATIONARY EPA TIER 3
RPM:	1800
CUMILATIVE STEP KVA:	302.39
CUMILATIVE STEP KW:	274.02
RUNNING KW:	274.02
VOLTAGE DIP LIMIT:	20%(PEAK)
FREQUENCY DIP LIMIT:	10% (PEAK)
HARMONICS:	5% (PEAK)
ALTERNATOR TEMPERATURE RISE:	130°C STANDBY
FUEL TANK:	STAND ALONE
SILENCER:	CRITICAL GRADE
NFPA COMPLIANT:	NFPA 110 WITH UL 220 CERTIFIED
LOAD SEQUENCE:	
STEP 1:	LINEAR AND SMALL MOTOR LOADS (146 KW)
STEP 2:	LEAD BOOSTER PUMP (100 HP)
STEP 3:	LAG BOOSTER PUMP (100 HP)

NOTE: IF ALTERNATE GENERATER MANUFACTURER IS SUBMITTED FOR REVIEW, CONTRACTOR SHALL RUN GENERATOR MODEL IN ACCORDANCE WITH CRITERIA LISTED ABOVE AND INSTALLATIONS REFLECTED ON SINGLE LINE POWER DISTRIBUTION DIAGRAM. PROVIDE (2) SEPERATE MODELS: ONE REFLECTING VFD INSTALLATION AND OTHER REFLECTING SOFT START REDUCED VOLTAGE STARTER.

ELECTRICAL KEYED NOTES

(1) PROVIDE ENCLOSURE FOR MOUNTING OF COUNTY FIBER OPTIC EQUIPMENT. SEE ELECTRICAL SITE PLAN ON SHEET E1-101 FOR INCOMING FIBER OPTIC ROUTING. PROVIDE CONDUIT FROM ENCLOSURE TO ADJACENT PUMP CONTROL PANEL PCP, SEE INSTRUMENTATION DRAWINGS.

(2) PROVIDE ALARM KEY MOUNTED ADJACENT TO LIGHT SWITCH CONTROL. PROVIDE 3/4" CONDUIT ROUTING AND CONTROL WIRING FROM ALARM KEY TO PUMP CONTROL PANEL PCP. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(3) PROVIDE 2#12, 1#12 GROUND IN 3/4" CONDUIT FROM CONTROL PANEL MPCP-1 TO VENDOR SUPPLIED TERMINATION BOX WITH DUPLEX RECEPTACLE FOR PLUG-IN CONNECTION OF METER PUMPS MP-1 & MP-2 MOUNTED ON SKID. SEE INSTRUMENTATION DRAWINGS FOR CONTROL WIRING REQUIREMENTS.

(4) PROVIDE 240V, 30A, 2P NON-FUSED DISCONNECT SWITCH. PROVIDE STAINLESS STEEL UNISTRUT CHANNEL SUPPORT STRUCTURE AS REQUIRED FOR MOUNTING OF DISCONNECT.

(5) EQUIPMENT TO BE PROVIDED WITH MANUFACTURER SUPPLIED DISCONNECT SWITCH.

(6) PROVIDE CONNECTION BOX FOR EXTERIOR PORTABLE GENERATOR. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601.

(7) PROVIDE CONNECTION BOX FOR EXTERIOR LOAD BANK. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601.

(8) PROVIDE AUTOMATIC TRANSFER SWITCH FOR TRANSFER TO STANDBY GENERATOR UPON LOSS OF NORMAL POWER. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601. PROVIDE 3/4" CONDUIT ROUTING FROM ATS TO GENERATOR CONTROL PANEL. PROVIDE 3/4" CONDUIT ROUTING FROM ATS TO CONTROL PANEL PCP. SEE STANDBY POWER SYSTEM RISER ON SHEET I1-603

(9) PROVIDE MANUAL TRANSFER SWITCH FOR EXTERIOR LOAD BANK CONNECTION. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601.

(10) PROVIDE MANUAL TRANSFER SWITCH FOR EXTERIOR PORTABLE GENERATOR CONNECTION. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601.

(11) PROVIDE DIESEL FUEL GENERATOR SET. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601. PROVIDE 3/4" CONDUIT ROUTING FROM BATTERY CHARGER TO CONTROL PANEL PCP. SEE STANDBY POWER SYSTEM RISER ON SHEET I1-603

(12) EXTERIOR, GRADE MOUNTED DIESEL FUEL TANK TO BE INSTALLED, SEE KEY NOTE #10 ON SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601 AND MECHANICAL DRAWINGS.

(13) PROVIDE WALL MOUNTED GROUNDING BAR. SEE SERVICE GROUNDING DETAIL AND GROUND BAR DETAIL ON SHEET E1-502.

(14) PROVIDE FLOOR MOUNTED 30KVA, 3PH TRANSFORMER. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601. SEE INTERIOR TRANSFORMER DETAILS ON SHEET E1-502.

(15) (3) VARIABLE FREQUENCY DRIVES TO BE INSTALLED FOR BOOSTER PUMPS. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601. PROVIDE 3/4" CONDUIT ROUTING AND CONTROL WIRING FROM EACH VFD TO CONTROL PUMP CONTROL PANEL PCP, SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(16) CONNECT EXHAUST FAN EF-4 TO 120V LIGHTING CIRCUIT AND ASSOCIATED LIGHTING CONTROL SERVING TOILET ROOM 203. PROVIDE 2#12, 1#12 GROUND IN 3/4" CONDUIT.

(17) PROVIDE MOTOR CONTROL CENTER MCC. SEE MCC SCHEDULE ON SHEET E1-701. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601. SEE MCC ELEVATION ON SHEET E1-502. SEE SERVICE GROUNDING DETAIL ON SHEET E1-502.

(18) PROVIDE PANEL MDP. SEE PANEL SCHEDULE ON SHEET E1-701. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601.

(19) PROVIDE PANEL DP. SEE PANEL SCHEDULE ON SHEET E1-701. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601.

(20) EQUIPMENT CONTROLLED FROM VENTILATION CONTROL PANEL VCP-CHEM. PROVIDE 3/4" CONDUIT ROUTING AND WIRING. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(21) EQUIPMENT CONTROLLED FROM VENTILATION CONTROL PANEL VCP-BLDG. PROVIDE 3/4" CONDUIT ROUTING AND WIRING. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(22) EQUIPMENT CONTROLLED FROM VENTILATION CONTROL PANEL VCP-GEN. PROVIDE 3/4" CONDUIT ROUTING AND WIRING. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(23) EQUIPMENT POWERED FROM EXTERIOR MOUNTED AIR CONDITIONING UNIT AC-1, PROVIDE 2#10, 1#10 GROUND IN 3/4" CONDUIT.

(24) EQUIPMENT POWERED FROM EXTERIOR MOUNTED AIR CONDITIONING UNIT AC-2, PROVIDE 2#10, 1#10 GROUND IN 3/4" CONDUIT.

(25) EACH RESPECTIVE MOD POWERED AND CONTROLLED FROM GENERATOR DAMPER CONTROL PANEL GDP-1. PROVIDE CONTROL WIRING AND 3/4" CONDUIT ROUTINGS. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS. PROVIDE (3) DAMPER CIRCUITS IN 3/4" CONDUIT ROUTING. CONTRACTOR SHALL DERATE CONDUIT/WIRING IF (4) OR MORE DAMPER CIRCUITS ARE PLACED IN A CONDUIT ROUTING.

(26) PROVIDE JUNCTION BOX CONNECTION FOR MOTORIZED BRIDGE CRANE/TROLLEY/HOIST SYSTEM. MOUNT JUNCTION BOX ABOVE BRIDGE CRANE SERVICE PLATFORM AT UPPER LEVEL. CONDUIT AND WIRING INSTALLATIONS FROM JUNCTION BOX TO BRIDGE CRANE PROVIDED BY VENDOR.

(27) INCOMING ELECTRICAL SERVICE (4-WAY CONCRETE ENCASED UNDERGROUND DUCTBANK). SEE ELECTRICAL SITE PLAN ON SHEET E1-101 FOR CONTINUATION.

(28) EQUIPMENT CONTROLLED FROM PUMP CONTROL PANEL PCP. PROVIDE 3/4" CONDUIT ROUTING AND WIRING. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(29) HARMONIC FILTER TO BE INSTALLED. SEE SINGLE LINE POWER DISTRIBUTION DIAGRAM ON SHEET E1-601. PROVIDE 3/4" CONDUIT ROUTING TO PUMP CONTROL PANEL, SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(30) PROVIDE (2) BRANCH CIRCUIT ROUTINGS FROM PANEL DP FOR GENERATOR BLOCK HEATER AND BATTERY CHARGER. SEE PANEL SCHEDULE DP ON SHEET E1-701.

(31) EXTEND CONDUIT AND WIRING (UNDER FLOOR SLAB) TO NOTED EQUIPMENT AND STUB-UP. PROVIDE ALL FINAL CONNECTIONS.

(32) PROVIDE 1" CONDUIT ROUTING FROM POWER MONITORING COMPARTMENT OF MCC TO PUMP CONTROL PANEL PCP FOR COMMUNICATION AND ALARM INTERFACE.

(33) EQUIPMENT POWERED AND CONTROLLED FROM VENTILATION CONTROL PANEL VCP-BLDG. PROVIDE (2) 3/4" CONDUIT ROUTINGS FOR RESPECTIVE POWER AND CONTROL WIRING INSTALLATIONS. SEE INSTRUMENTATION DRAWINGS FOR WIRING REQUIREMENTS.

(34) PROVIDE BRANCH CIRCUIT ROUTING FOR INSTANT HOT WATER HEATER IWH-1 AT TOILET ROOM. PROVIDE WATER HEATER WITH 20A,2P,240V MANUAL MOTOR STARTER (TOGGLE SWITCH TYPE) WITH THERMAL OVERLOAD PROTECTION FOR DISCONNECTING MEANS.

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

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 49788 . Expiration Date 08-15-2020

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HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING DATE 12/26/18
CHIEF, BUREAU OF UTILITIES DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION DATE 12/26/18

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
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STATE OF MARYLAND — PROFESSIONAL ENGINEER

DES:	REW	BY	NO.	REVISION
DRN:	REW			
CHK:	WDM			
DATE:	DEC 2018			

DATE

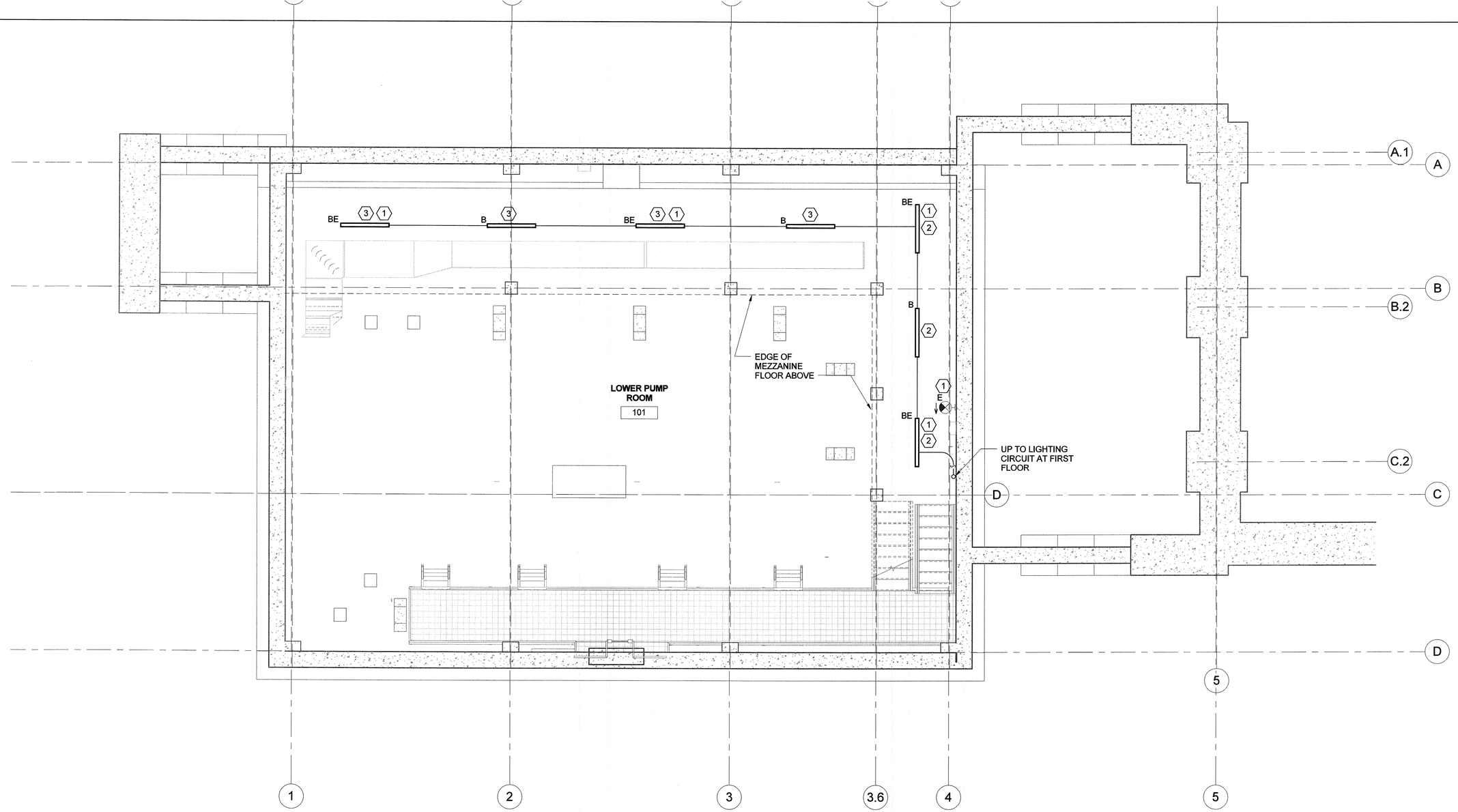
POWER PLAN - FIRST FLOOR

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING E1-103
SCALE AS SHOWN
SHEET



1 LOWER LEVEL LIGHTING PLAN

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

GENERAL ELECTRICAL NOTES

1. SEE SHEET E-001 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. SEE OCCUPANCY SENSOR DETAILS ON SHEET E1-503.
3. ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE ALL ELECTRICAL INSTALLATIONS WITH ALL DISCIPLINES.
4. SEE PANEL SCHEDULE MDP ON SHEET E1-701 FOR LIGHTING BRANCH CIRCUIT CONDUIT AND WIRING SIZES.
5. SEE LIGHT FIXTURE SCHEDULE ON SHEETE1-701 FOR ADDITIONAL INFORMATION.
6. UNLESS NOTED OTHERWISE, ALL CONDUIT ROUTINGS AT BUILDING INTERIOR SHALL BE ALUMINUM (RIGID AND FLEXIBLE WHERE APPLICABLE)

ELECTRICAL KEYED NOTES

1. EXIT SIGNS AND BATTERY PACKS AT EMERGENCY FIXTURES SHALL BE CONNECTED TO 277V, SINGLE PHASE LIGHTING CIRCUIT SERVING AREA AHEAD OF ANY LIGHTING CONTROL.
2. MOUNT AND SECURE LIGHT FIXTURE AT UNDERSIDE OF MEZZANINE FLOOR SLAB.
3. STEM SUSPEND LIGHT FIXTURE FROM BOTTOM OF MEZZANINE FLOOR SLAB, SUCH THAT BOTTOM OF LIGHT FIXTURE IS AT SAME LEVEL OF BOTTOM OF ADJACENT DUCT INDICATED.

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

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STATE OF MARYLAND — 49788 — PROFESSIONAL ENGINEER — 12/26/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

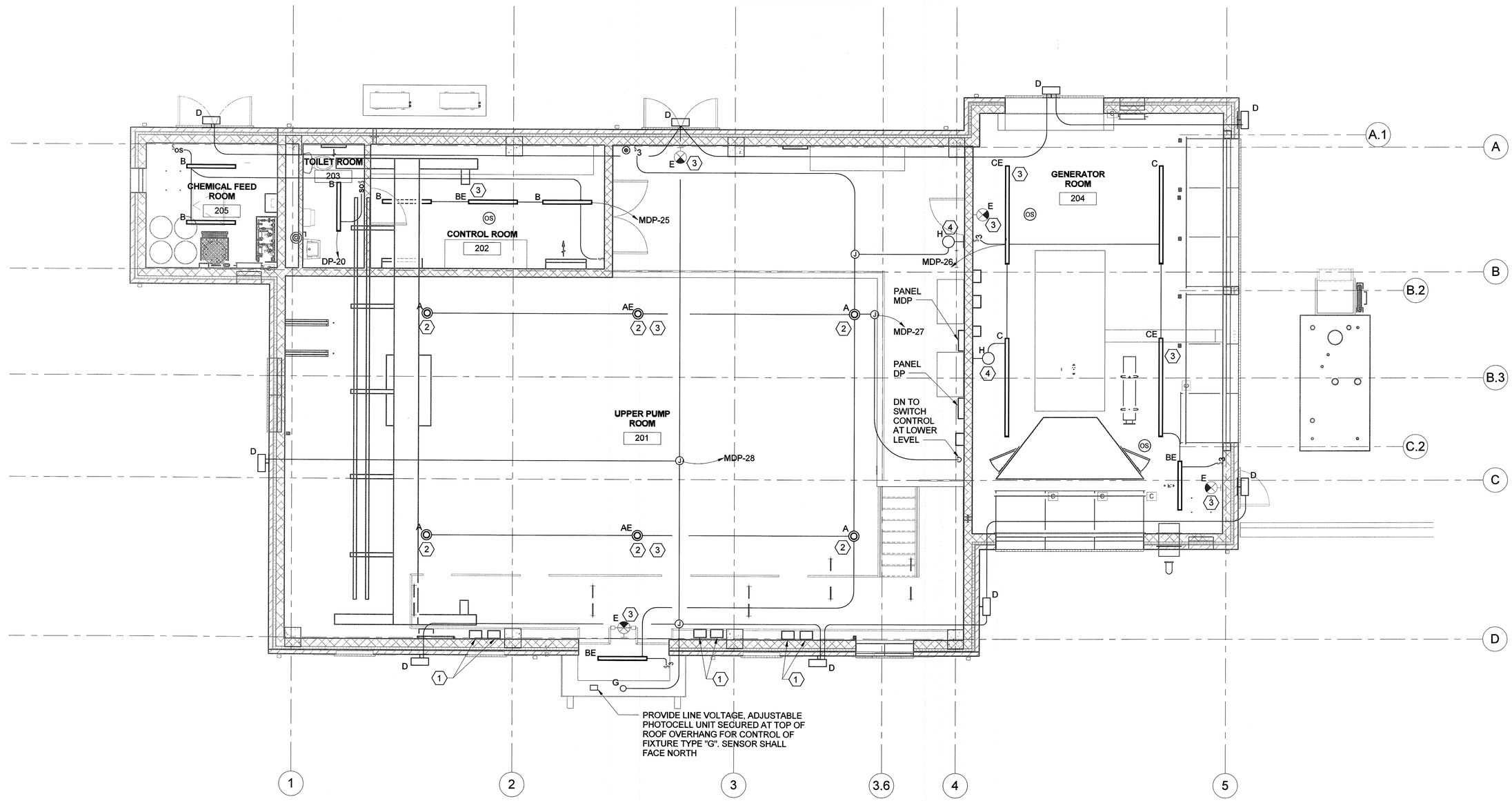
BY	NO.	REVISION	DATE

LIGHTING PLAN - LOWER LEVEL

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING E1-104
SCALE AS SHOWN
SHEET 61 OF 81



1 FIRST FLOOR LIGHTING PLAN

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

GENERAL ELECTRICAL NOTES

1. SEE SHEET E-001 FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. SEE OCCUPANCY SENSOR DETAILS ON SHEET E1-503.
3. ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE ALL ELECTRICAL INSTALLATIONS WITH ALL DISCIPLINES.
4. SEE PANEL SCHEDULE MDP ON SHEET E1-701 FOR LIGHTING BRANCH CIRCUIT CONDUIT AND WIRING SIZES.
5. SEE LIGHT FIXTURE SCHEDULE ON SHEET E1-701 FOR ADDITIONAL INFORMATION.
6. UNLESS NOTED OTHERWISE, ALL CONDUIT ROUTINGS AT BUILDING INTERIOR SHALL BE ALUMINUM (RIGID AND FLEXIBLE WHERE APPLICABLE)

ELECTRICAL KEYED NOTES

(1) PROVIDE PERMANENT WINCHING MECHANISM FOR MANUAL LOWERING OF FIXTURE TYPES "A" & "AE" VIA CABLE SYSTEM. SEE LIGHT FIXTURE MANUAL LOWERING DETAIL ON SHEET E1-503.

(2) CONNECT LIGHT FIXTURE TO CABLE LOWERING SYSTEM FOR ACCESSIBLE MAINTENANCE PURPOSES. SEE LIGHT FIXTURE MANUAL LOWERING DETAIL ON SHEET E1-503.

(3) EXIT SIGNS AND BATTERY PACKS AT EMERGENCY FIXTURES SHALL BE CONNECTED TO 277V, SINGLE PHASE LIGHTING CIRCUIT SERVING AREA AHEAD OF ANY LIGHTING CONTROL.

(4) WALL MOUNT LIGHT FIXTURE ADJACENT TO ATTIC ACCESS DOOR, SEE ARCHITECTURAL DRAWINGS A1-103 AND A1-301 FOR DOOR LOCATION.

0 2' 4' 8'

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

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 49788, Expiration Date 08-15-2020

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STATE OF MARYLAND — 49788 — PROFESSIONAL ENGINEER — 12/10/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO.: 35 BLOCK NO.: 17, 11

LIGHTING PLAN - FIRST FLOOR

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT NO. W-8328
CONTRACT NO. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING E1-105
SCALE AS SHOWN
SHEET 62 OF 81

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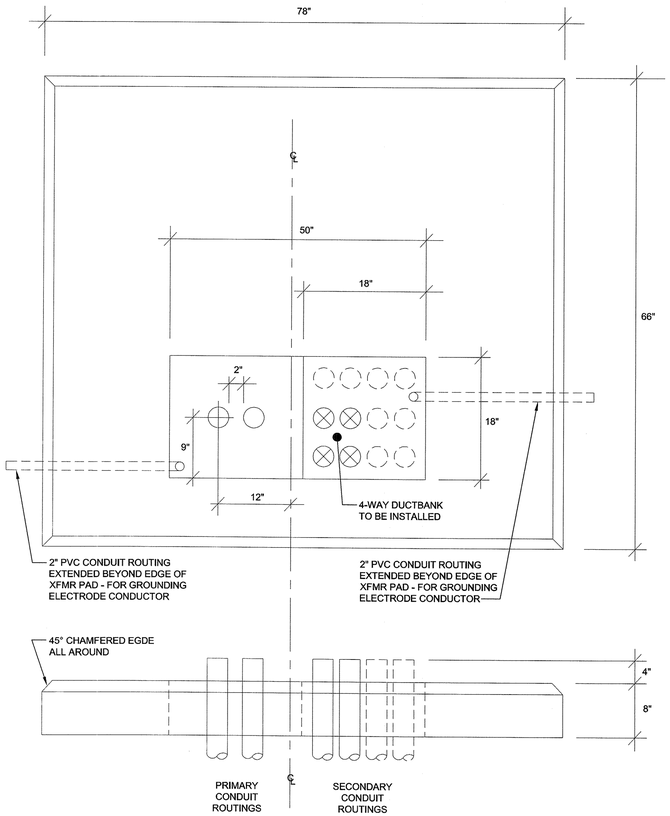
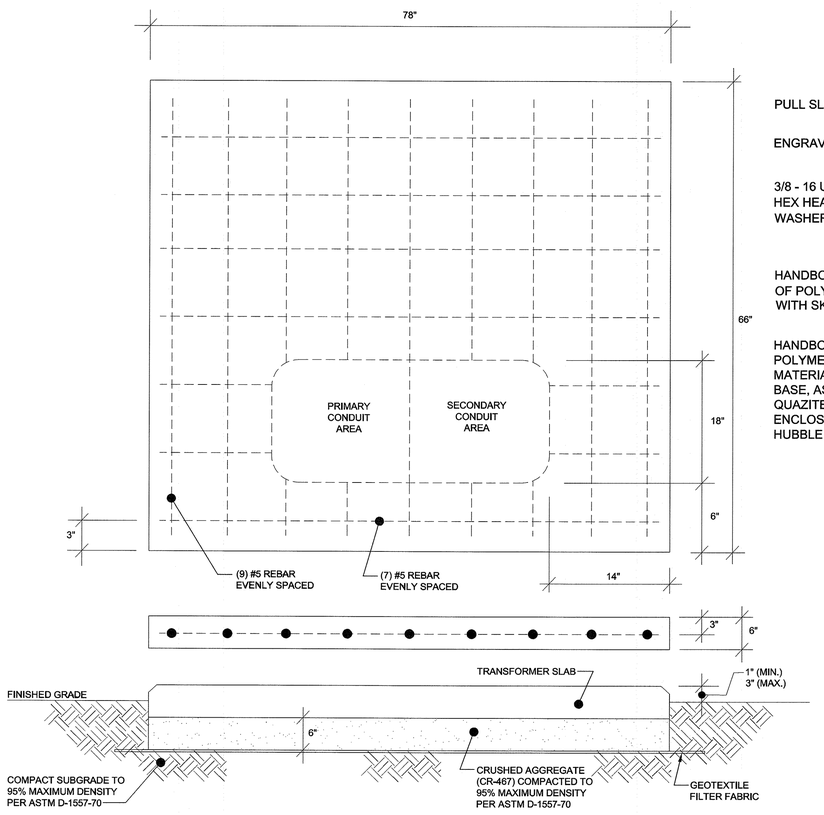


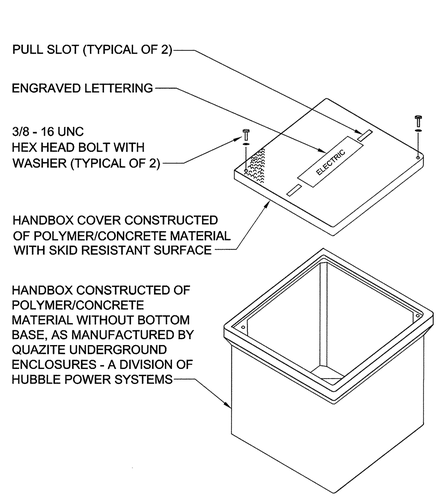
1 PRECAST CONCRETE PAD DETAIL

SCALE: NONE

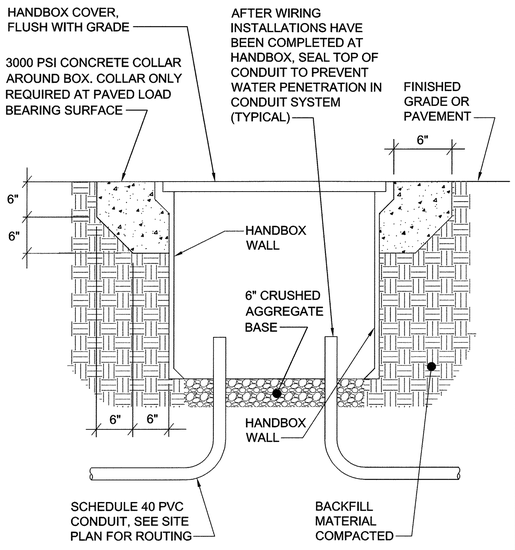


2 POURED-IN-PLACE CONCRETE PAD DETAIL

SCALE: NONE



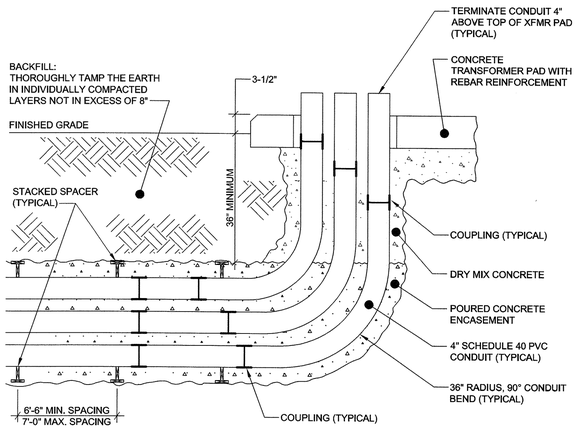
ISOMETRIC VIEW



CROSS-SECTION VIEW

4 HANDBOX INSTALLATION DETAILS

SCALE: NONE



4 CONDUIT TERMINATION AT UTILITY XFMR PAD DETAIL

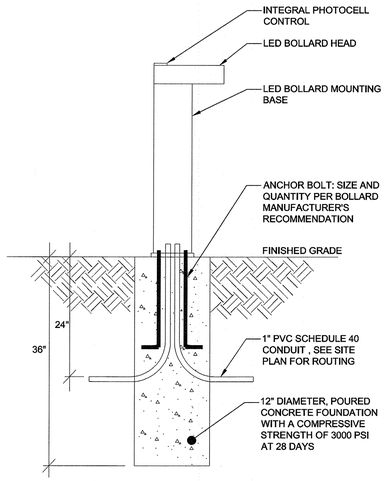
SCALE: NONE

CONCRETE PAD NOTES:

1. APPROXIMATE WEIGHT OF PRECAST PAD IS 2200 POUNDS FOR 500 KVA AND SMALLER TRANSFORMERS OR 3900 POUNDS FOR 750 KVA AND LARGER TRANSFORMERS.
2. THE NUMBER OF SECONDARY CONDUIT ROUTINGS SHALL NOT EXCEED 12 TOTAL.
3. SECONDARY CONDUITS SHALL BE CENTERED SYMMETRICALLY WITHIN 18" X 18" AREA.
4. CONTRACTOR SHALL INSTALL GROUNDING ELECTRODE CONNECTIONS FROM TRANSFORMER'S GROUNDING TERMINAL TO GROUND RODS IN SUCH A MANNER THAT AVOIDS INCOMING CONDUITS.
5. PAD DETAILS SHOWN ARE REFERENCED FROM BGE DESIGN GUIDE. CONTRACTOR SHALL COORDINATE WITH BGE ON LATEST PAD DETAILS AVAILABLE.

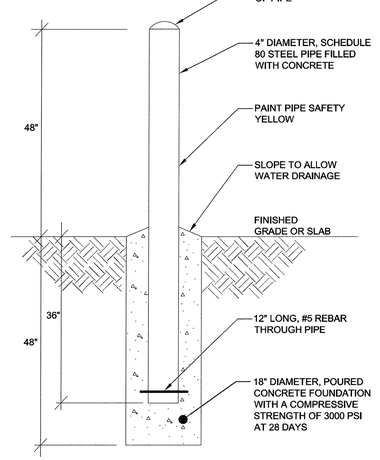
GENERAL ELECTRICAL NOTES:

1. SEE ELECTRICAL SITE PLAN ON SHEET E1-101 FOR PROPOSED LOCATIONS OF PROTECTION BOLLARDS, LIGHTING BOLLARDS AND PAD MOUNTED UTILITY TRANSFORMER.

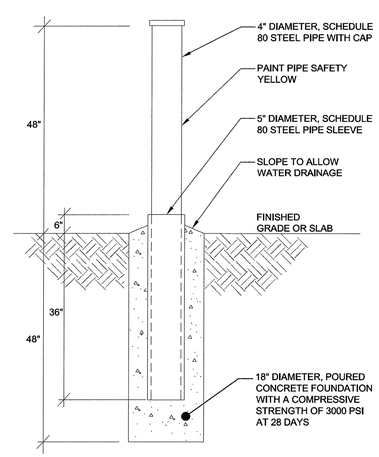


5 LIGHTING BOLLARD MOUNTING DETAIL

SCALE: NONE



STATIONARY GUARD PIPE WHERE REQUIRED (COORDINATE WITH UTLITY COMPANY)



REMOVABLE GUARD PIPE WHERE REQUIRED (COORDINATE WITH UTLITY COMPANY)

6 UTILITY COMPANY PROTECTION BOLLARD DETAILS

SCALE: NONE

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788, Expiration Date 08-15-2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — STEVEN D. MARTIN — 40798 — PROFESSIONAL ENGINEER — 12/20/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

ELECTRICAL DETAILS I

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. E1-501
SCALE AS SHOWN
SHEET 63 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

Dec 18, 2018 - 11:00am
User: Robert Williams
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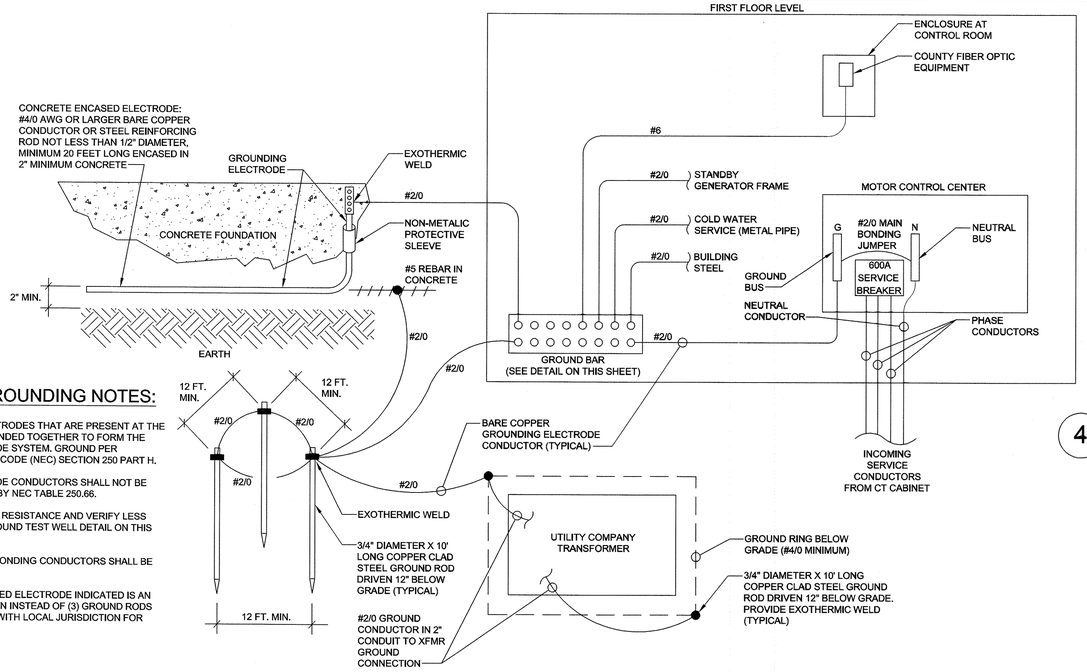
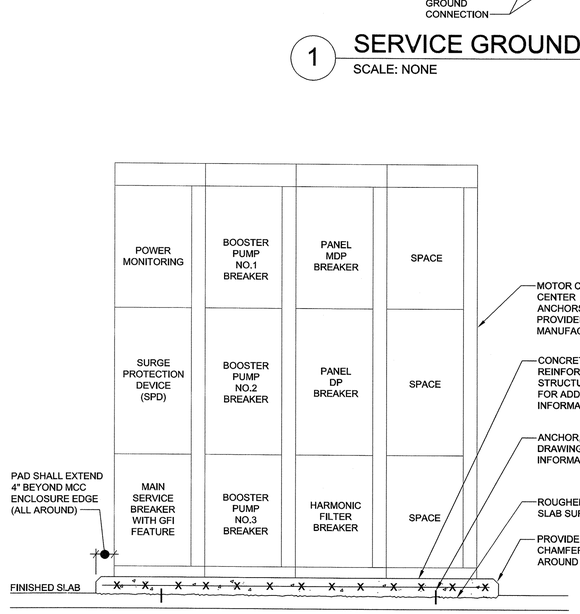


GENERAL GROUNDING NOTES:

1. ALL GROUNDING ELECTRODES THAT ARE PRESENT AT THE BUILDING SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM. GROUND PER NATIONAL ELECTRICAL CODE (NEC) SECTION 250 PART H.
2. GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE LESS THAN REQUIRED BY NEC TABLE 250.66.
3. TEST GROUND SYSTEM RESISTANCE AND VERIFY LESS THAN 5 OHMS. SEE GROUND TEST WELL DETAIL ON THIS SHEET.
4. ALL GROUNDING AND BONDING CONDUCTORS SHALL BE COPPER.
5. THE CONCRETE ENCASED ELECTRODE INDICATED IS AN OPTIONAL INSTALLATION INSTEAD OF (3) GROUND RODS SHOWN. COORDINATE WITH LOCAL JURISDICTION FOR PREFERENCE.

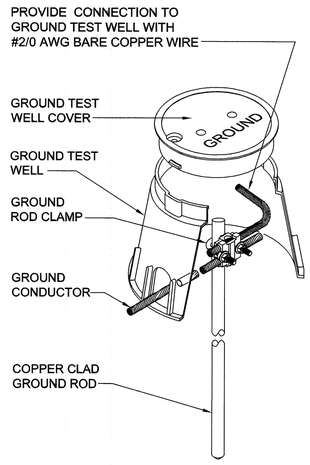
1 SERVICE GROUNDING DETAIL

SCALE: NONE



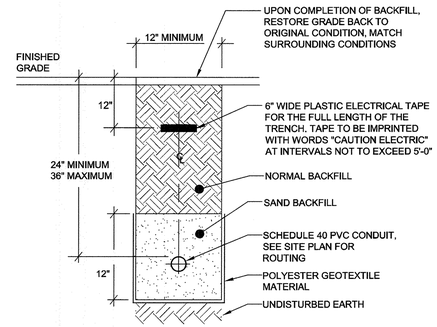
2 MOTOR CONTROL CENTER ELEVATION

SCALE: NONE



3 GROUND TEST WELL DETAIL

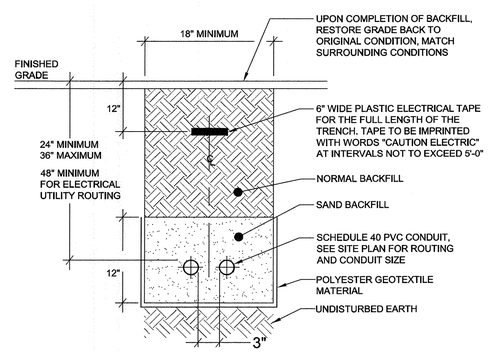
SCALE: NONE



4 (1) DIRECT BURIED CONDUIT DETAIL

SCALE: NONE

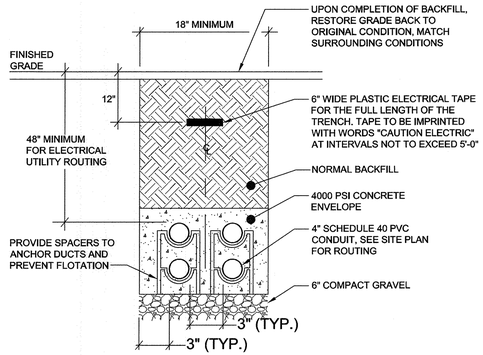
PLEASE NOTE: TRANSITION TO PVC COATED RGS CONDUIT WHERE CONDUIT IS ROUTED UNDER VEHICLE LOAD BEARING AREA



5 (2) DIRECT BURIED CONDUITS DETAIL

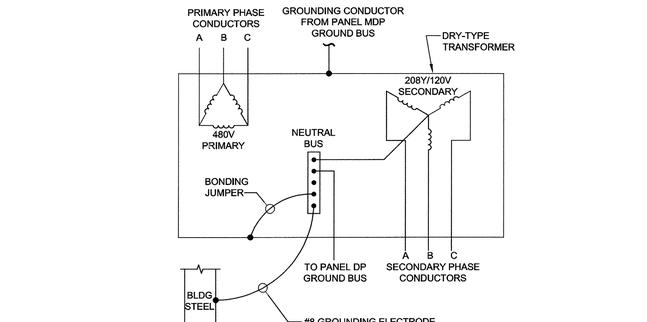
SCALE: NONE

PLEASE NOTE: TRANSITION TO PVC COATED RGS CONDUIT WHERE CONDUIT IS ROUTED UNDER VEHICLE LOAD BEARING AREA



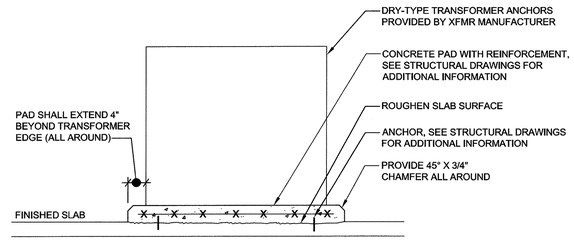
6 4-WAY CONCRETE ENCASED DUCTBANK DETAIL

SCALE: NONE



7 INTERIOR FLR. MTD. XFMR GROUNDING DETAIL

SCALE: NONE

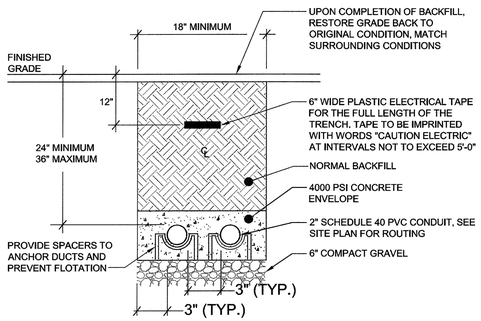


8 INTERIOR FLR. MTD. XFMR PAD DETAIL

SCALE: NONE

9 GROUND BAR DETAIL

SCALE: NONE



10 2-WAY CONCRETE ENCASED DUCTBANK DETAIL

SCALE: NONE

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788, Expiration Date 08-15-2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — REW — 49788 — PROFESSIONAL ENGINEER — 12/20/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

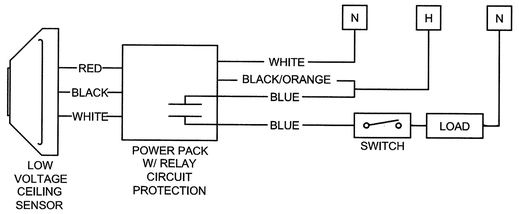
BY	NO.	REVISION	DATE

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

ELECTRICAL DETAILS II

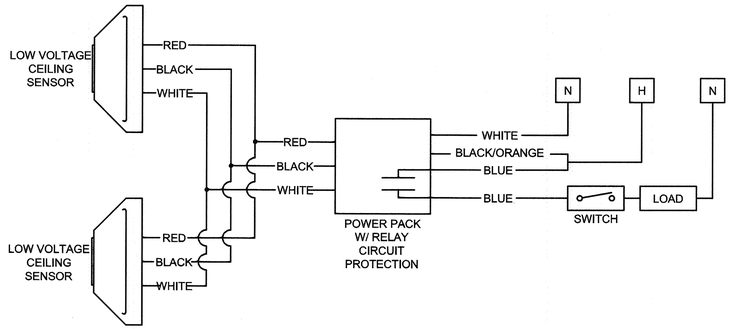
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. E1-502
SCALE AS SHOWN
SHEET 64 OF 81



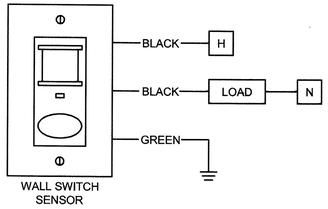
1 LOW VOLTAGE CEILING SENSOR

SCALE: NONE



2 MULTIPLE LOW VOLTAGE CEILING SENSORS

SCALE: NONE

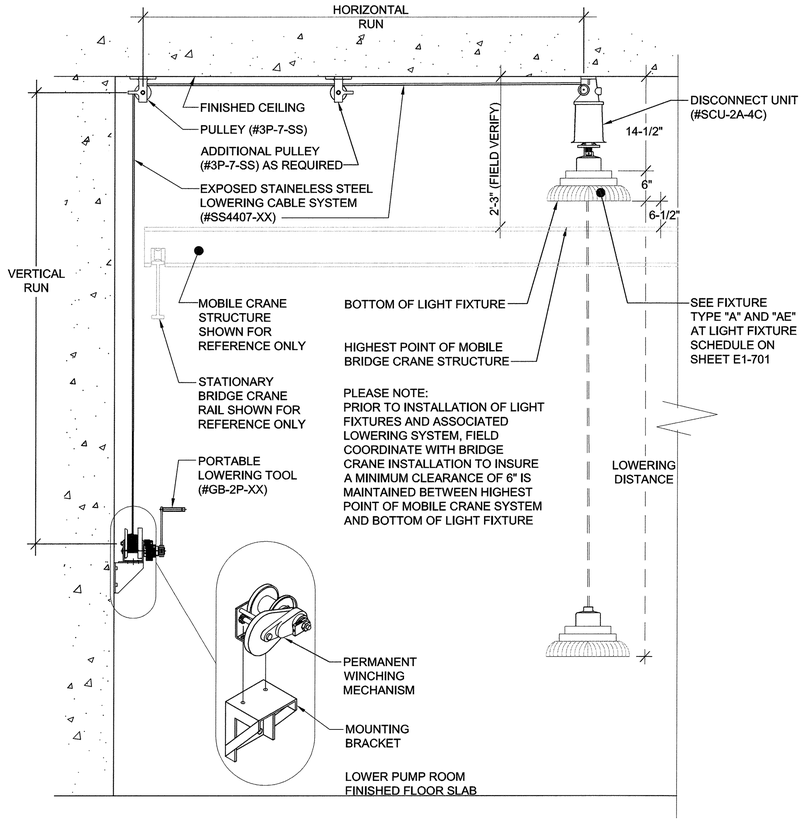


3 WALL MOUNTED SWITCH SENSOR

SCALE: NONE

GENERAL LIGHTING CONTROL SENSOR NOTES:

1. THESE DETAILS ARE FOR DIAGRAMMATIC PURPOSES ONLY AND SHALL NOT BE USED AS A BILL OF MATERIAL. THE CONTRACTOR SHALL COORDINATE EXACT EQUIPMENT QUANTITIES AND REQUIREMENTS WITH LIGHTING CONTROL SYSTEMS MANUFACTURER.
2. PROVIDE ALL OCCUPANCY SENSORS, POWER PACKS, MOUNTING HARDWARE, WIRING, ETC. REQUIRED FOR A COMPLETE AND OPERATIONAL LIGHTING CONTROL SYSTEM. INSTALLATION AND WIRING SHALL BE PER MANUFACTURER'S REQUIREMENTS.
3. COMMISSION THE SETTINGS OF THE SENSORS: DUAL TECHNOLOGY SHALL BE SET TO "TURN ON" WHEN BOTH TECHNOLOGIES SENSE MOTION AND MAINTAIN "ON" WITH EITHER TECHNOLOGY. SET SENSOR TO MID-RANGE SENSITIVITY WITH A 15 MINUTE DELAY TO "TIME OFF".
4. MANUFACTURER'S REPRESENTATIVE SHALL RE-VISIT THE SITE AS REQUESTED TO PERFORM ADJUSTMENTS TO SATISFY THE OWNER AND ENGINEERING SERVICES.



6 MANUAL LIGHT FIXTURE LOWERING SYSTEM DETAIL

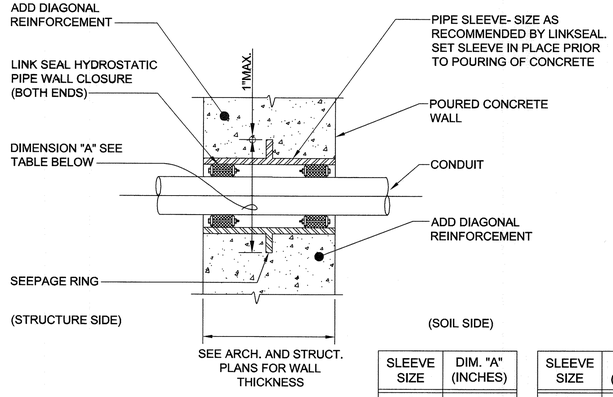
SCALE: NONE

LIGHT FIXTURE LOWERING SYSTEM NOTES:

1. DETAIL SHOWN IS INTENDED AS AN APPLICATION EXAMPLE FOR A MANUAL LOWERING SYSTEM FOR EACH LIGHT FIXTURE TYPE "A" AND "AE" REFLECTED ON FIRST FLOOR LIGHTING PLAN. AN ALTERNATE LOWERING SYSTEM MAY BE SUBMITTED FOR REVIEW AND APPROVAL. DETAIL SHOWN IS REFERENCED FROM THE FOLLOWING MANUFACTURER: "LIGHTING AND LOWERING SYSTEM'S" (MODEL #PWE-400) WITH EXPOSED WINCH CABLE SYSTEM AND PORTABLE LOWERING TOOL.
2. PRINCIPAL COMPONENTS OF THE PWE-400 LOWERING SYSTEM CONSISTS OF:
   -ELECTRICAL DISCONNECT UNIT ASSEMBLY (MODEL #SCU-2A-4C)
   -STAINLESS STEEL RAISING AND LOWER CABLE (MODEL #SS4407-XX)
   -STAINLESS STEEL PULLEY (MODEL #3P-7-SS)
   -PORTABLE LOWER TOOL (MODEL #GB-2P-XX)
3. PROVIDE ALL REQUIRED HARDWARE (CORROSION RESISTANT STAINLESS STEEL) FOR A COMPLETE AND OPERABLE SYSTEM.
4. CONTACT MANUFACTURER'S REPRESENTATIVE OR FACTORY FOR SPECIFIC DETAILS ABOUT SPECIAL INSTALLATION APPLICATION AND OTHER INFORMATION.
5. THE PWE-400 SYSTEM HAS A MAXIMUM LIFTING CAPACITY OF 400 POUNDS FOR EACH RESPECTIVE LIGHT FIXTURE. UPON LOWERING, THE LIGHT FIXTURE IS DISCONNECTED FROM THE POWER SOURCE FOR MAINTENANCE PURPOSES.
6. THE DISCONNECT UNIT (#SCU-2A-4C) AND PULLEYS (#3P-6) MUST BE MOUNTED TO A STRUCTURE CAPABLE OF SUPPORTING 5X THE LOAD OF THE FIXTURE IN THE VERTICAL AND HORIZONTAL DIRECTION. DISCONNECT UNIT MUST BE MOUNTED TO A SUPPORT STRUCTURE HORIZONTALLY LEVEL ON TWO 90 DEGREE PLANES.
7. THE SYSTEM CAN BE USED WITH AN INCLINED CEILING STRUCTURE PROVIDED THE HORIZONTAL SUPPORT FOR THE DISCONNECT UNIT FULFILLS ALL THE REQUIREMENTS NOTED ABOVE. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING LEVEL SUPPORT STRUCTURE AS REQUIRED.

4 EQUIPMENT MOUNTING AT PUMP DETAIL

SCALE: NONE
(TYPICAL OF 3 INSTALLATIONS)



NOTES:

1. PRIOR TO POURING OF CONCRETE WALLS, ELECTRICAL CONTRACTOR SHALL SET IN PLACE ALL REQUIRED CONDUIT SLEEVES AND DIAGONAL REINFORCEMENT, FIELD COORDINATE AS REQUIRED.
2. DETAIL APPLICABLE FOR FLOOR PENETRATIONS AS WELL.

SLEEVE SIZE	DIM. "A" (INCHES)
2	6
2½	7
3	7½
3½	8½
4	9
6	11
8	13½
10	16
12	19

SLEEVE SIZE	DIM. "A" (INCHES)
14	21
16	23½
18	25
20	27½
24	32
30	38¾
36	46
42	53
48	59½

5 WALL PENETRATION DETAIL

SCALE: NONE

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788, Expiration Date 08-15-2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR, OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

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STATE OF MARYLAND — ROBERT REW — 49788 — PROFESSIONAL ENGINEER — 12/20/18

DES: REW
DRN: REW
CHK: WDM
DATE: DEC 2018

BY	NO.	REVISION	DATE

ELECTRICAL DETAILS III

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. E1-503
SCALE AS SHOWN
SHEET 65 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

Dec 18, 2018 — 11:02am User: Robert Williams
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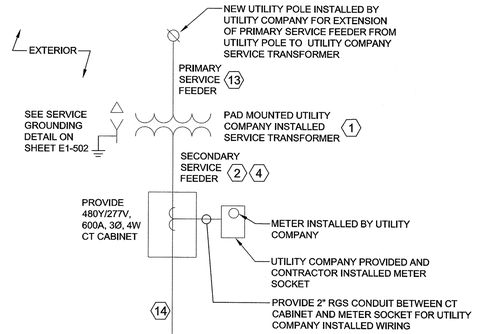


GENERAL ELECTRICAL NOTES:

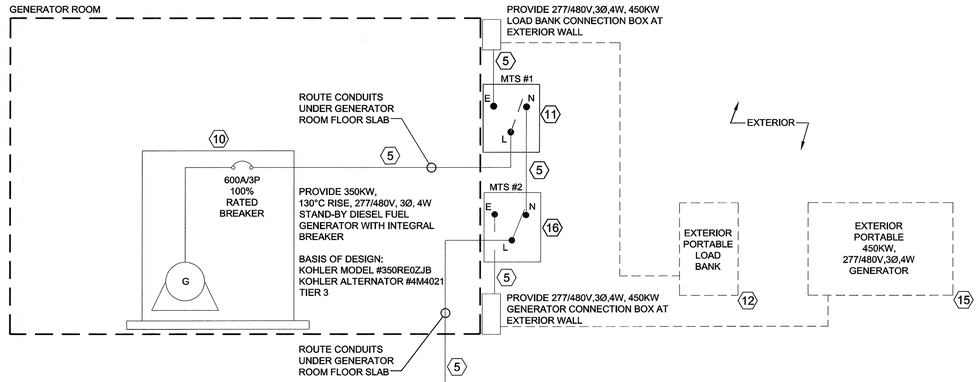
1. ALL ELECTRICAL PANELBOARDS, ENCLOSED BREAKERS, VFD'S, BOXES, ETC. SHALL BE PROVIDED WITH PERMANENT LABELS INDICATING THEIR RESPECTIVE POWER SOURCE.
2. ALL CONDUCTORS SHALL BE COPPER, UNLESS NOTED OTHERWISE.
3. THE TRANSFER SWITCHES DO NOT SWITCH THE NEUTRAL, THE SYSTEM IS NOT SEPARATELY DERIVED.
4. ALL CONDUIT ROUTINGS AT BUILDING INTERIOR SHALL BE ALUMINUM.
5. SEE MCC AND PANEL SCHEDULES ON SHEET E1-701 FOR ADDITIONAL INFORMATION ON BRANCH CIRCUIT CONDUIT AND WIRING REQUIREMENTS FOR EQUIPMENT.
6. IN ACCORDANCE WITH NEC ARTICLE 701.12, STANDBY GENERATOR POWER SHALL BE AVAILABLE WITHIN 60 SECONDS UPON LOSS OF NORMAL POWER SUPPLY.
7. FINAL PRIMARY AND SECONDARY CONNECTIONS TO INTERIOR FLOOR MOUNTED TRANSFORMER SHALL BE IN FLEXIBLE ALUMINUM CONDUIT.

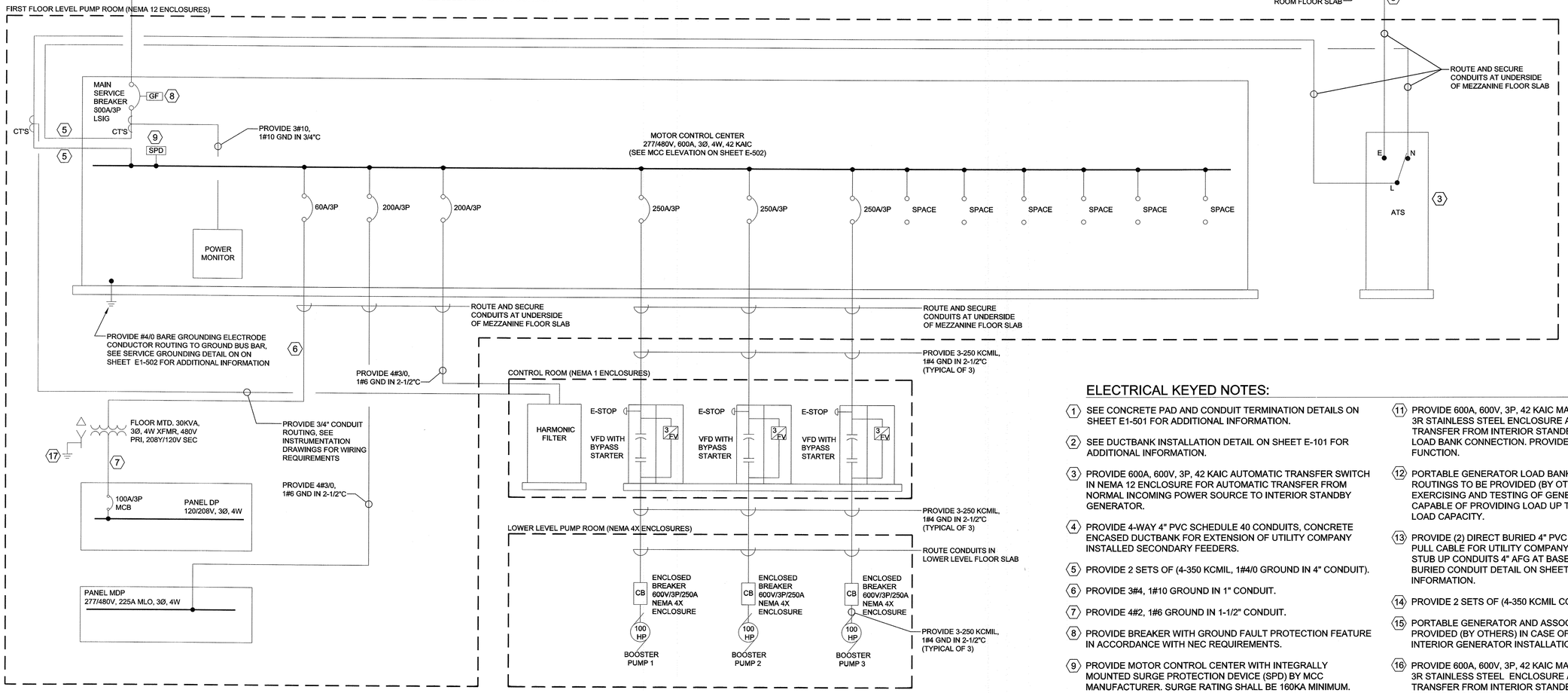
NEMA RATING OF ENCLOSURES:

NEMA ENCLOSURE TYPES FOR MISCELLANEOUS BOXES, PANELS, TRANSFORMERS, GENERATOR, MCC, ATS, MTS, ENCLOSED BREAKERS AND ALL OTHER ELECTRICAL EQUIPMENT ENCLOSURES NOT SPECIFICALLY INDICATED SHALL BE RATED IN ACCORDANCE WITH THE FOLLOWING:

- EXTERIOR: NEMA 4X (STAINLESS STEEL), NEMA 3R (STAINLESS STEEL) WHERE NOTED
- GENERATOR ROOM: NEMA 12
- FIRST FLOOR LEVEL PUMP ROOM: NEMA 12
- LOWER LEVEL PUMP ROOM: NEMA 4X (STAINLESS STEEL)
- CONTROL ROOM: NEMA 1

THE ENCLOSURE TYPE REFLECTED FOR EXTERIOR APPLICATIONS IS NOT APPLICABLE TO UTILITY COMPANY PROVIDED SERVICE EQUIPMENT.





ELECTRICAL KEYED NOTES:

1. SEE CONCRETE PAD AND CONDUIT TERMINATION DETAILS ON SHEET E1-501 FOR ADDITIONAL INFORMATION.
2. SEE DUCTBANK INSTALLATION DETAIL ON SHEET E-101 FOR ADDITIONAL INFORMATION.
3. PROVIDE 600A, 600V, 3P, 42 KAIC AUTOMATIC TRANSFER SWITCH IN NEMA 12 ENCLOSURE FOR AUTOMATIC TRANSFER FROM NORMAL INCOMING POWER SOURCE TO INTERIOR STANDBY GENERATOR.
4. PROVIDE 4-WAY 4" PVC SCHEDULE 40 CONDUITS, CONCRETE ENCASED DUCTBANK FOR EXTENSION OF UTILITY COMPANY INSTALLED SECONDARY FEEDERS.
5. PROVIDE 2 SETS OF (4-350 KCMIL, 1#4/0 GROUND IN 4" CONDUIT).
6. PROVIDE 3#4, 1#10 GROUND IN 1" CONDUIT.
7. PROVIDE 4#2, 1#6 GROUND IN 1-1/2" CONDUIT.
8. PROVIDE BREAKER WITH GROUND FAULT PROTECTION FEATURE IN ACCORDANCE WITH NEC REQUIREMENTS.
9. PROVIDE MOTOR CONTROL CENTER WITH INTEGRALLY MOUNTED SURGE PROTECTION DEVICE (SPD) BY MCC MANUFACTURER. SURGE RATING SHALL BE 160KA MINIMUM.
10. IN ACCORDANCE WTH OWNER'S REQUIREMENTS, THE GENERATOR DIESEL FUEL TANK HAS BEEN SIZED TO OPERATE THE GENERATOR AT FULL CAPACITY FOR A MINIMUM OF 24 HOURS AT FULL LOAD. THE GENERATOR HAS BEEN SIZED TO OPERATE ONLY (2) BOOSTER PUMPS AT FULL LOAD CAPACITY AND ALL OTHER MISCELLANEOUS LOADS.
11. PROVIDE 600A, 600V, 3P, 42 KAIC MANUAL TRANSFER SWITCH IN NEMA 3R STAINLESS STEEL ENCLOSURE AT EXTERIOR WALL, FOR MANUAL TRANSFER FROM INTERIOR STANDBY GENERATOR TO EXTERIOR LOAD BANK CONNECTION. PROVIDE PERMANENT LABEL INDICATING FUNCTION.
12. PORTABLE GENERATOR LOAD BANK AND ASSOCIATED CABLE ROUTINGS TO BE PROVIDED (BY OTHERS) ON A PERIODIC BASIS FOR EXERCISING AND TESTING OF GENERATOR. LOAD BANK SHALL BE CAPABLE OF PROVIDING LOAD UP TO 75% OF GENERATOR'S TOTAL LOAD CAPACITY.
13. PROVIDE (2) DIRECT BURIED 4" PVC SCHEDULE 40 CONDUITS WITH PULL CABLE FOR UTILITY COMPANY INSTALLED PRIMARY FEEDER. STUB UP CONDUITS 4" AFG AT BASE OF UTILITY POLE. SEE DIRECT BURIED CONDUIT DETAIL ON SHEET E1-101 FOR ADDITIONAL INFORMATION.
14. PROVIDE 2 SETS OF (4-350 KCMIL CONDUCTORS IN 4" RGS CONDUIT).
15. PORTABLE GENERATOR AND ASSOCIATED CABLE ROUTINGS TO BE PROVIDED (BY OTHERS) IN CASE OF FAILURE OF PERMANENT INTERIOR GENERATOR INSTALLATION.
16. PROVIDE 600A, 600V, 3P, 42 KAIC MANUAL TRANSFER SWITCH IN NEMA 3R STAINLESS STEEL ENCLOSURE AT EXTERIOR WALL, FOR MANUAL TRANSFER FROM INTERIOR STANDBY GENERATOR TO EXTERIOR PORTABLE GENERATOR CONNECTION. PROVIDE PERMANENT LABEL INDICATING FUNCTION.
17. PROVIDE #8 GROUNDING ELECTRODE CONDUCTOR IN 3/4" CONDUIT CONNECTED TO BUILDING STEEL, SEE INTERIOR MOUNTED TRANSFORMER GROUNDING DETAIL ON SHEET E1-502 FOR ADDITIONAL INFORMATION.

1 SINGLE LINE POWER DISTRIBUTION DIAGRAM

SCALE: NONE

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788, Expiration Date 08-15-2020.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
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STATE OF MARYLAND — 49788 — PROFESSIONAL ENGINEER — 12/26/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

SINGLE LINE DIAGRAM

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. E1-601
SCALE AS SHOWN
SHEET 66 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01
Dec 18, 2018 – 11:02am User: Robert.Williams
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LIGHT FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	MOUNTING	LAMPS	BALLAST	VOLTAGE	MANUFACTURER & CATALOG NUMBER	REMARKS
A	18" DIAMETER HIGH BAY FIXTURE WITH PROTECTIVE GLASS LENS, SEVERE LOCATION RATING, WIDE DISTRIBUTION OPTICS AND WHITE FINISH	CEILING MOUNT VIA CABLE LOWERING SYSTEM	5000K CCT LED 20,208 LUMENS	DRIVER	UNIVERSAL VOLTAGE	HUBBLE INDUSTRIAL LIGHTING HIGHBAY HBLHO SERIES #HBLHO-72L-U-A-2-5K-W-092-ND-WH-ENCA	CONNECT FIXTURE TO MANUAL CABLE LOWERING SYSTEM FOR ACCESSIBLE MAINTENANCE , SEE LIGHT FIXTURE LOWERING DETAIL ON SHEET E-503
AE	SAME AS FIXTURE TYPE "A" EXCEPT WITH CONTRACTOR PROVIDED REMOTE EMERGENCY BATTERY PACK COMPLIANT WITH LIFE SAFETY 101 REQUIREMENTS (90 MINUTES OF OPERATION AND 10 SECOND AVAILABILITY UPON NORMAL POWER LOSS)	CEILING MOUNT VIA CABLE LOWERING SYSTEM	5000K CCT LED 20,208 LUMENS	DRIVER	UNIVERSAL VOLTAGE	HUBBLE INDUSTRIAL LIGHTING HIGHBAY HBLHO SERIES #HBLHO-72L-U-A-2-5K-W-092-ND-WH-ENCA	CONNECT FIXTURE TO MANUAL CABLE LOWERING SYSTEM FOR ACCESSIBLE MAINTENANCE , SEE LIGHT FIXTURE LOWERING DETAIL ON SHEET E-503
B	1X4 NARROW BODY FIXTURE WITH STEEL HOUSING, RUST INHIBITING FINISH, DAMP LOCATION RATING, WRAP AROUND FROSTED LENS AND WIDE THROW OPTICS	SURFACE MOUNT AT CEILING	5000K CCT LED 5,478 LUMENS	DRIVER	UNIVERSAL VOLTAGE	EATON (COOPER LIGHTING) METALUX SRL SERIES #4-SRL-LED-54SL-LW-UNV-L850-CD-1-U	NONE
BE	SAME AS FIXTURE TYPE "B", EXCEPT WITH INTEGRAL EMERGENCY BATTERY PACK	SURFACE MOUNT AT CEILING	5000K CCT LED 5,478 LUMENS	DRIVER	UNIVERSAL VOLTAGE	EATON (COOPER LIGHTING) METALUX SRL SERIES #4-SRL-LED-54SL-LW-UNV-EL14W-L850-CD-1-U	NONE
C	1X8 NARROW BODY FIXTURE WITH STEEL HOUSING, RUST INHIBITING FINISH, DAMP LOCATION RATING, WRAP AROUND FROSTED LENS AND WIDE THROW OPTICS	SURFACE MOUNT AT CEILING	5000K CCT LED 6,744 LUMENS	DRIVER	UNIVERSAL VOLTAGE	EATON (COOPER LIGHTING) METALUX SRL SERIES #8-SRL-LED-67SL-LW-UNV-L850-CD-1-U	NONE
CE	SAME AS FIXTURE TYPE "C", EXCEPT WITH INTEGRAL EMERGENCY BATTERY PACK	SURFACE MOUNT AT CEILING	5000K CCT LED 6,744 LUMENS	DRIVER	UNIVERSAL VOLTAGE	EATON (COOPER LIGHTING) METALUX SRL SERIES #8-SRL-LED-67SL-LW-UNV-EL14W-L850-CD-1-U	NONE
D	OUTDOOR RATED WALL PACK WITH IMPACT RESISTANT LENS, INTEGRAL EMERGENCY BATTERY PACK, INTEGRAL PHOTOCELL CONTROL, FULL CUTOFF OPTICS AND BRONZE FINISH	EXTERIOR WALL MOUNT 9'-0" A.F.G. TO FIXTURE CENTER	5000K CCT LED 3,137 LUMENS	DRIVER	277V	EATON (COOPER LIGHTING) LUMARK SERIES # LD-WP-FC-6B-277V-PE-EMLED-CD	NONE
E	EXIT SIGN WITH HIGH IMPACT THERMOPLASTIC HOUSING, UNIVERSAL MOUNTING, DAMP LOCATION RATING, MAINTENANCE FREE BATTERY AND WHITE FINISH	WALL MOUNT 7'-6" A.F.F.	LED	DRIVER	DUAL VOLTAGE	EATON (COOPER LIGHTING) SURE-LITES SERIES # APXH7	PROVIDE LETTER COLOR PER LOCAL JURISDICTION REQUIREMENTS
F	42" HIGH LIGHTING BOLLARD WITH INTEGRAL PHOTOCELL CONTROL, TYPE II LATERAL THROW OPTICS, CORROSION RESISTANT ALUMINUM ALLOY BODY AND BRONZE FINISH	GRADE MOUNTED AT EXTERIOR	4000K CCT LED 661 LUMENS	DRIVER	277V	EATON (COOPER LIGHTING) LUMIERE SERIES #303B1LEDB1-4000-277-T2-BZ-42-PC2	SEE LIGHTING BOLLARD MOUNTING DETAIL ON SHEET E-501
G	6" DIAMETER DOWN LIGHT WITH WET LOCATION RATING, IMPACT RESISTANT LENS,AND INTEGRAL EMERGENCY BATTERY PACK/REMOTE TEST SWITCH	RECESSED AT UNDERSIDE OF EXTERIOR ROOF SOFFIT	5000K CCT	DRIVER	UNIVERSAL VOLTAGE	GOTHAM LIGHTING EVO SERIES #EVO-50/30-6-DFR-MVOLT-EZ10-ELR	NONE
H	VAPOR TIGHT FLOOD LIGHT WITH FROSTED GLASS LENS AND WET LOCATION RATING	WALL MOUNT AT ATTIC DOOR	3500K CCT	DRIVER	UNIVERSAL VOLTAGE	EATON (COOPER LIGHTING) ALL-PRO SERIES #VT-17-30	NONE

MOTOR CONTROL CENTER MCC SCHEDULE

277/480V - 3 PH - 4 W
MAIN BREAKER WITH GFI FEATURE **600A/3P**
MINIMUM AIC RATING **42,000**

SERVICE ENTRANCE RATED

MAIN BREAKER: 100% RATED
OPTIONS: INTEGRAL SURGE SUPPRESSION
BUS RATING: 600A HORIZONTAL, 600A VERTICAL, 100% NEUTRAL
ENCLOSURE TYPE: NEMA 12

CKT #	SERVING	POLE	FRAME (A)	TRIP (A)	PHASE KVA A	PHASE KVA B	PHASE KVA C	REMARKS
1	PANEL MDP	3	400	200	27.50	28.50	27.10	
2	PANEL DP	3	100	60	9.10	8.80	6.10	
3	HARMONIC FILTER	3	400	200	2.40	2.40	2.40	
4	BOOSTER PUMP BP-1	3	400	250	34.30	34.30	34.30	
5	BOOSTER PUMP BP-2	3	400	250	34.30	34.30	34.30	
6	BOOSTER PUMP BP-3	3	400	250	34.30	34.30	34.30	
7	SURGE PROTECTION DEVICE	3	100	45	0.00	0.00	0.00	
8	MAIN BREAKER WITH GFI FEATURE COMPARTMENT	_	_	_	0.00	0.00	0.00	
9	POWER MONITORING COMPARTMENT	_	_	_	0.00	0.00	0.00	
10	SPARE COMPARTMENT	_	_	_	0.00	0.00	0.00	
11	SPARE COMPARTMENT	_	_	_	0.00	0.00	0.00	
10	SPARE COMPARTMENT	_	_	_	0.00	0.00	0.00	
					141.90	142.60	138.50	

TOTAL CONNECTED KVA: 423.00
TOTAL AMPACITY: 508.8

PANEL DESIGNATION: MDP
VOLTAGE: 277/480 VOLT, 3 PHASE, 4 WIRE
MIN. AIC: 42,000
MOUNTING: SURFACE
BUS AMP: 225A
TOTAL POLES: 42
LOCATION: 1ST FLR PUMP ROOM
MAIN BREAKER: MLO
NOTES: NEMA 12 ENCLOSURE

CKT NO.	DESCRIPTION	BREAKER A	BREAKER P	BREAKER GFI	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	WIRE NO.	WIRE SIZE	GND. SIZE	COND. SIZE	COND. SIZE	GND. SIZE	WIRE SIZE	WIRE NO.	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	BREAKER GFI	BREAKER P	BREAKER A	DESCRIPTION	CKT NO.
1	HEATER EUH-1 AT LOWER PUMP ROOM	20	3	N	1.7			4	12	12	3/4	3/4	12	12	4	1.7			N	3	20	HEATER EUH-3 AT LOWER PUMP ROOM	2
3	_					1.7											1.7					_	4
5	_						1.7											1.7				_	6
7	HEATER EUH-2 AT LOWER PUMP ROOM	20	3	N	1.7			4	12	12	3/4	3/4	12	12	4	1.7			N	3	20	HEATER EUH-4 AT LOWER PUMP ROOM	8
9	_					1.7											1.7					_	10
11	_						1.7											1.7				_	12
13	WATER HEATER IWH-2 AT LOWER PUMP RM.	60	3	N	13.0			4	4	10	1 1/4	3/4	12	12	4	3.0			N	3	20	BRIDGE CRANE BC-1	14
15	_					13.0											3.0					_	16
17	_						13.0											3.0				_	18
19	HEATER EUH-6 AT GENERATOR ROOM	20	3	N	1.7			4	12	12	3/4	3/4	10	10	4	2.7			N	3	20	VENTILATION CONTROL PANEL VCP-BLDG	20
21	_					1.7											2.7					_	22
23	_						1.7											2.7				_	24
25	LIGHTING - CHEM. RM. AND CONTROL RM.	20	1	N	0.3			2	12	12	3/4	3/4	12	12	2	0.2			N	1	20	LIGHTING - GENERATOR ROOM	26
27	LIGHTING - UPPER & LOWER PUMP ROOMS	20	1	N		1.2		2	12	12	3/4	3/4	10	10	2		0.2		N	1	20	LIGHTING - BUILDING EXTERIOR	28
29	LIGHTING - EXTERIOR SITE	20	1	N			0.1	2	10	10	3/4											SPACE	30
31	SPACE																					SPACE	32
33	SPACE																					SPACE	34
35	SPACE																					SPACE	36
37	SPACE																					SPACE	38
39	SPACE																					SPACE	40
41	SPACE																					SPACE	42
	SIDE TOTAL CONNECTED KVA				18.3	19.2	18.1									9.21	9.24	9.01				SIDE TOTAL CONNECTED KVA	

LOAD: A: 27.5 KVA
B: 28.5 KVA
C: 27.1 KVA
TOTAL LOAD: 83.1 KVA 100 AMPS

PANEL DESIGNATION: DP
VOLTAGE: 120/208 VOLT, 3 PHASE, 4 WIRE
MIN. AIC: 42,000
MOUNTING: SURFACE
BUS AMP: 125A
TOTAL POLES: 54
LOCATION: 1ST FLR. PUMP ROOM
MAIN BREAKER: 100 MCB
NOTES: NEMA 12 ENCLOSURE

CKT NO.	DESCRIPTION	BREAKER A	BREAKER P	BREAKER GFI	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	WIRE NO.	WIRE SIZE	GND. SIZE	COND. SIZE	COND. SIZE	GND. SIZE	WIRE SIZE	WIRE NO.	LOAD (KVA) A	LOAD (KVA) B	LOAD (KVA) C	BREAKER GFI	BREAKER P	BREAKER A	DESCRIPTION	CKT NO.
1	CONTROL PANEL VCP-GEN	20	1	N	0.7			2	12	12	3/4	3/4	12	12	2	0.6			N	1	20	RECEPT - CHEM. RM., CONTROL RM. & TOILET	2
3	CONTROL PANEL VCP-CHEM	20	1	N		0.4		2	12	12	3/4	3/4	12	12	2		0.6		N	1	20	RECEPT - UPPER PUMP RM & EXTERIOR	4
5	CONTROL PANEL GDP-1	20	1	N			0.6	2	12	12	3/4	3/4	12	12	2			0.2	N	1	20	RECEPT - LOWER PUMP ROOM	6
7	CONTROL PANEL MPCP-1	20	1	N	1.4			2	12	12	3/4	3/4	12	12	2	0.2			N	1	20	RECEPT - UPPER PUMP RM & EXTERIOR	8
9	CONTROL PANEL PCP	20	1	N		0.5		2	12	12	3/4	3/4	12	12	2		0.2		N	1	20	RECEPT - GENERATOR RM & EXTERIOR	10
11	CONTROL PANEL SPCP-1	20	1	N			1.2	2	12	12	3/4	3/4	12	12	2			0.2	N	1	20	RECEPT - AT BOOSTER PUMP BP-1	12
13	CONTROL PANEL SPCP-1	20	1	N	1.2			2	12	12	3/4	3/4	12	12	2	0.2			N	1	20	RECEPT - AT BOOSTER PUMP BP-2	14
15	EXTERIOR AC-1	25	2	N		1.0		3	10	10	3/4	3/4	12	12	2		0.2		N	1	20	RECEPT - AT BOOSTER PUMP BP-3	16
17	_						1.0					3/4	12	12	2			0.2	N	1	20	FUEL OIL MONITOR AT DIESEL FUEL TANK	18
19	EXTERIOR AC-2	25	2	N	1.0			3	10	10	3/4	3/4	12	12	2	0.2			N	1	20	LIGHT FIXTURE AND EF-4 AT TOILET ROOM	20
21	_					1.0						3/4	12	12	2		0.3		N	1	20	CHLORINE ANALYZER (AIT-101) - LOWER PUMP RM	22
23	HEATER (CH-1) AT CONTROL ROOM	20	2	N	0.9			3	12	12	3/4	3/4	12	12	3			0.3	N	2	20	HEATER (CH-2) AT TOILET RM.	24
25	_					0.9												0.3				_	26
27	DRUM SCALE DMSC	20	1	N	0.0		0.2	2	12	12	3/4	3/4	12	12	3		1.0		N	2	20	HEATER (EUH-5) AT CHEMICAL ROOM	28
29	GENERATOR BATTERY CHARGER	20	1	N	0.5			2	12	12	3/4							1.0				_	30
31	GENERATOR BLOCK HEATER	20	2	N		1.3		3	12	12	3/4	3/4	12	12	3	1.5			N	2	20	WATER HEATER IWH-1 AT TOILET RM.	32
33	_						1.3										1.5					_	34
35	COUNTY FIBER ENCLOSURE	20	1	N	0.5			2	12	12	3/4	3/4	12	12	2			0.3	N	1	20	DISCHARGE MAGNETIC FLOWMETER	36
37	SPACE																					SPACE	38
39	SPACE																					SPACE	40
41	SPACE																					SPACE	42
	SIDE TOTAL CONNECTED KVA				6.19	5	4.28									2.95	3.8	2.1				SIDE TOTAL CONNECTED KVA	

LOAD: A: 9.1 KVA
B: 8.8 KVA
C: 6.4 KVA
TOTAL LOAD: 24.3 KVA 67.5 AMPS

GENERAL NOTES:

1. PROVIDE TYPED WRITTEN SCHEDULES FOR PANELBOARD CIRCUITS.
2. PANELBOARD SCHEDULES SHALL REFLECT POWER SOURCE FOR PANEL.
3. AIC RATING OF BREAKER INSTALLATIONS SHALL MATCH AIC RATING OF DISTRIBUTION EQUIPMENT IN WHICH BREAKERS ARE TO BE INSTALLED.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 49788 , Expiration Date 08-15-2020 ,

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 12/26/18
CHIEF, BUREAU OF ENGINEERING — DATE 12/26/18
CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
CHIEF, UTILITY DESIGN DIVISION — DATE 12/26/18

KCI TECHNOLOGIES
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STATE OF MARYLAND — ROBERT E. WILLIAMS — 19788 — PROFESSIONAL ENGINEER — 12/20/18

DES:	REW
DRN:	REW
CHK:	WDM
DATE:	DEC 2018

BY	NO.	REVISION	DATE

ELECTRICAL SCHEDULES

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. E1-701
SCALE AS SHOWN
SHEET 67 OF 81

P & I LEGEND

ABC-X
SEQUENTIAL NUMBER
IDENTIFICATION
ABC-X

EQUIPMENT LEGEND

ABC-X
SEQUENTIAL NUMBER
IDENTIFICATION

PANEL LEGEND

- ATS = AUTOMATIC TRANSFER SWITCH
- BC = BATTERY CHARGER
- FOM = FUEL-OIL MONITOR
- G = GENERATOR (EMERGENCY STANDBY)
- GCP = GENERATOR CONTROL PANEL
- GDP = GENERATOR DAMPER PANEL
- HF = HARMONIC FILTER
- HMI = HUMAN MACHINE INTERFACE
- JH = JACKET HEATER
- LC = LOCAL PANEL
- MTS = MANUAL TRANSFER SWITCH
- OIT = OPERATOR INTERFACE
- PCP = PUMP CONTROL PANEL
- PDP = POWER DISTRIBUTION PANEL
- SCADA = SUPERVISORY CONTROL AND DATA ACQUISITION
- SSRVS SOLID STATE REDUCED VOLTAGE STARTER
- VCP-X = VENTILATION CONTROL PANEL
- VFD = VARIABLE FREQUENCY DRIVE

GENERAL ABBREVIATIONS

- ARV = AIR RELEASE VALVE
- CB = CIRCUIT BREAKER
- ECD = ELECTRICAL CONTROL DIAGRAM
- EST = ELEVATED STORAGE TANK
- ETM = ELAPSED TIME METER
- GND = GROUND
- I/O = INPUT/OUTPUT
- MFR = MANUFACTURER
- P&ID = PROCESS AND INSTRUMENTATION DIAGRAM
- PM = PHASE MONITOR
- SPD = SURGE PROTECTION DEVICE
- TB = TERMINAL BLOCK
- VAC = VOLTS / ALTERNATING CURRENT
- VDC = VOLTS / DIRECT CURRENT
- XFMR = TRANSFORMER
- XMTR = TRANSMITTER

HAND SWITCHES

- HS 123 (XXX) SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)
- HK 123 (XXX) HAND CONTROL STATION
- HMS 123 (XXX) MOMENTARY SELECTOR SWITCH

PROCESS AND INSTRUMENTATION SYMBOLS

- DIGITAL SIGNALS
- EQUIPMENT PANELS
- POWER CONNECTION
- ELECTRICAL SIGNAL
- REMOTE I/O
- SOFTWARE OR COMMUNICATIONS DATA SIGNAL
- ANALOG SIGNALS
- TEL — TELEPHONE LINE
- PROCESS FLOW
- ANALOG INPUT
- ANALOG OUTPUT
- DIGITAL INPUT
- DIGITAL OUTPUT
- (X) X = A DESIGNATED CONTINUATION OF A SPECIFIC SIGNAL
- TS 112 FIELD-MOUNTED DEVICE
- AIT 110 PANEL-MOUNTED DEVICE
- ABC 123 X INDICATING LAMP - X INDICATES LENS COLOR:
  - R = RED G = GREEN
  - W = WHITE A = AMBER
  - B = BLUE Y = YELLOW
- AH 110 PLC OR REMOTE INPUT/OUTPUT
- AH 123 SCADA INPUT/OUTPUT
- AH 123 PANEL INPUT/OUTPUT TERMINATION
- LE 106 ULTRASONIC LEVEL INDICATOR

HAND SWITCH-NOTES (XXX)

- ACK = ACKNOWLEDGE PUSHBUTTON
- ES = EMERGENCY STOP (PUSHBUTTON)
- HOA = HAND/OFF/AUTOMATIC (SELECTOR SWITCH)
- LO = LOCKOUT STOP (PUSHBUTTON)
- LR = LOCAL/REMOTE (SELECTOR SWITCH)
- MA = MANUAL/AUTOMATIC (SELECTOR SWITCH)
- POT = POTENTIOMETER (HAND CONTROL)
- RES = RESET (PUSHBUTTON)
- SEL = SELECTOR
- SP = STOP (PUSHBUTTON)
- ST = START (PUSHBUTTON)
- VS = VFD/SOLID STATE REDUCED VOLTAGE STARTER

ELECTRICAL CONTROL DIAGRAM (ECD) SYMBOLS

- INCOMING LINE
- OUTGOING LINE
- CIRCUIT BREAKER
- CONTACTS - NORMALLY CLOSED
- CONTACTS - NORMALLY OPEN
- CONTROL POWER TRANSFORMER
- (XXX) CONTROL RELAY (SEQUENTIAL)
- DISCONNECT SWITCH
- ETM ELAPSED TIME METER
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL DROP
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL RISE
- FUSE
- GROUND (GND)
- H O A (XOO, OOX) HAND-OFF-AUTOMATIC SWITCH
- LOCAL REMOTE (OX) LOCAL-REMOTE SWITCH
- OPEN CLOSE (OX) OPEN-CLOSE SWITCH
- LIMIT SWITCH - NORMALLY OPEN
- MANUAL MOTOR STARTER, SINGLE-POLE
- OVERCURRENT ELEMENT THERMOSTAT
- PM PHASE MONITOR
- PLC OUTPUT (RTU OUTPUT)
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE DROP
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE RISE
- PUSH-BUTTON - MOMENTARY CONTACT
- PUSH-PULL BUTTON - MAINTAINED CONTACT
- PUSH-BUTTON - MOMENTARY CONTACT START/STOP
- PUSH TO TEST (TRANSFORMER TYPE) INDICATING LAMP - X INDICATES LENS COLOR:
  - R = RED (RUN) B = BLUE (POSITION)
  - G = GREEN (STOP) Y = YELLOW (POSITION)
  - W = WHITE (POWER) A = AMBER (ALARM)
- RCT REPEAT CYCLE TIMER
- SOLENOID

ELECTRICAL CONTROL DIAGRAM (ECD) SYMBOLS

- M STARTER OR CONTACT COIL - DESIGNATION AS INDICATED
- START-STOP PUSHBUTTON - MAINTAINED CONTACT
- N.C. THERMOSTAT, NORMALLY CLOSED
- T1 TIMER
- TIMER - NORMALLY OPEN - TIMED TO CLOSE
- TIMER - NORMALLY CLOSED - TIMED TO OPEN

EQUIPMENT SYMBOLS

- V AIR RELEASE VALVE (ARV)
- BALL VALVE
- BUTTERFLY VALVE
- CENTRIFUGAL PUMP
- CHECK VALVE
- DOUBLE DOOR CHECK VALVE
- ELECTRICAL DISCONNECT
- EXPLOSION PROOF SEAL-OFF
- FLOAT
- FM FLOW METER
- GATE VALVE
- JB JUNCTION BOX
- M MOTOR
- M MOTOR ACTUATOR
- M MOTORIZED BUTTERFLY VALVE
- M MOTORIZED GATE VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- RECEPTACLE
- REDUCER OR INCREASER

CONDUIT LEGEND:

A#14-B (C)

- A - QUANTITY OF CONDUCTORS
- B - SIZE OF CONDUIT (LARGER THAN 3/4-INCH
- C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM-A)

(ISA) INSTRUMENT 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/REVERSE
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL/INCOMPLETE
G	GAUGING		GLASS		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	STATUS		INPUT	FORWARD	ON OR OPERATE
O				OFF	OVERLOAD
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUANITY OR EVENT	TOTALIZE		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE	RUN/FORWARD
S	SPEED OR FREQUENCY	SUM	SWITCH	SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	VFD/VALVE
W	WEIGHT OR FORCE	TORQUE	WELL		UNCLASSIFIED
X	MOD. LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	RESET
Y	INTERLOCK			RELAY OR COMPUTE	
Z	POSITION			DRIVE OR ACTUATOR	

INSTRUMENT, EXAMPLES

- FIT = FLOW INDICATING TRANSMITTER
- PIT = PRESSURE INDICATING TRANSMITTER
- ZS = POSITION SWITCH

P & I D NUMBERING SEQUENCE

- 100 SERIES = PUMP STATION
- 200 SERIES = WATER TANK
- 300 SERIES = GENERATOR
- 400 SERIES = COMMUNICATIONS

ELECTRICAL CONTROL DIAGRAM (ECD) LEGEND

- REMOTE
- AT PLC CABINET
- AT LOCAL PANEL
- AT MOTOR CONTROL PANEL
- PANEL BOARD
- AT SYSTEM CONTROL PANEL
- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- PANEL CONNECTIONS
- REMOTE CONNECTIONS
- POWER SUPPLY CONNECTION

RISER DIAGRAM LEGEND

- NEW WORK
- EXISTING INSTRUMENTATION
- NEMA BOUNDARY
- DISCRETE SIGNAL CONDUIT
- ANALOG SIGNAL CONDUIT
- POWER CONNECTION
- ETHERNET

GENERAL SHEET NOTES

1. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS.
2. FOR POWER DISTRIBUTION AND DISCONNECT REQUIREMENTS, SEE ELECTRICAL DRAWINGS.
3. ALL STATION EQUIPMENT AND CONTROLS SHALL BE DESIGNED AND FURNISHED BY THE SYSTEM MANUFACTURER SPECIFIED.
4. ALL INSTRUMENTATION ASSEMBLIES, CIRCUITS AND CONTROLS SHALL BE IN ACCORDANCE WITH ISA STANDARDS AND SHALL BE LABELED AND TESTED IN ACCORDANCE WITH UL508.
5. PROVIDE 60-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
6. THE PROJECT SYSTEMS INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE PROJECT SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE SPARES AS SHOWN HERE IN AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
7. THE PROJECT SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SIGNAL CONDUIT QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS

(X) CONSTRUCTION NOTES

PROGRAMMING NOTES

1. SEE SPECIFICATIONS FOR WRITTEN CONTROL DESCRIPTIONS, SCADA PROGRAMMING SHALL BE FURNISHED BY THE SCADA SYSTEM SUPPLIER. PACKAGED EQUIPMENT, CONTROLS, AND INSTRUMENTS SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER AND PROJECT SYSTEMS INTEGRATOR. SEE INTEGRATION PLAN AND SCOPE DESCRIBED ON DRAWING I-002.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33925 , Expiration Date 01/15/19 .

INTEGRATION SCOPE

NOTE: THE FOLLOWING "SCOPE SUMMARY" IS A GENERALIZED LIST OF CONTRACTORS INTEGRATION SCOPE, AND IS NOT ALL INCLUSIVE TO THE ITEMS LISTED BELOW. SEE RESPECTIVE SPECIFICATIONS FOR COMPLETE SCOPE DESCRIPTIONS AND RESPONSIBILITIES.

(1) SCADA SYSTEM SUPPLIER
- LC3000 INTEGRATION WPS
- LC2000 INTEGRATION EWT
- PRE-STARTUP TERMINATION VERIFICATIONS
- COORDINATE WITH PROJECT SYSTEM INTEGRATOR
- COUNTY FIBER ENCLOSURE
- COUNTY FIBER COORDINATION
- STARTUP AND TESTING
- TRAINING
- AS-BUILTS

(2) PROJECT SYSTEMS INTEGRATOR
- COORDINATE WITH ALL SUPPLIERS
- BOOSTER PUMP SYSTEM VFD/SSRVS AND LOCAL CONTROLS
- DISCHARGE FLOW METER TRANSMITTER
- SUCTION AND DISCHARGE PRESSURE TRANSMITTERS
- CHLORINE ANALYZER
- VENTILATION SYSTEM AND CONTROLS (BUILDING, GENERATOR ROOM, CHEMICAL ROOM)
- PRE-STARTUP TERMINATION VERIFICATIONS
- STARTUP AND TESTING
- TRAINING
- COMPLETE PROJECT WIRING TERMINATION DRAWINGS
- COORDINATE AND FURNISH PROJECT AS-BUILTS

(3) MECHANICAL CONTRACTOR
- PACKAGED SUMP PUMP SYSTEM
- FANS
- BOOSTER PUMPS
- ALL CHEMICAL SYSTEM PUMPS, TANKS, CONTAINMENTS, RAMPS, AND SYSTEM COMPONENTS
- GENERATOR FUEL-OIL TANK AND COMPONENTS
- CHECK VALVE WITH POSITION LIMIT SWITCH
- SODIUM HYPOCHLORITE SYSTEM
- AS-BUILTS

(4) ELECTRICAL CONTRACTOR
- POWER
- LIGHTING
- STANDBY POWER GENERATOR
- ALL POWER AND SIGNAL CONDUIT AND CONDUCTORS
- AS-BUILTS

LEGEND
- — — — POWER
- – – – – – DIGITAL SIGNALS
- ——— NEW FEATURES
- — · · — ANALOG SIGNALS
- —o—o—o— COMM-LINK

(1) DETAIL: INTEGRATOR PLAN
SCALE: NONE

NOTE: THE PROJECT SYSTEMS INTEGRATOR SHALL BE RESPONSIBLE FOR COORDINATING ALL SYSTEMS AND SUPPLIERS TO FURNISH A COMPLETE INTEGRATED CONTROL SYSTEM.

KCI TECHNOLOGIES PROJECT No.: 131601306.01

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CHIEF, BUREAU OF UTILITIES — DATE 12-26-18
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12/20/18

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DRN: SDR				
CHK: SEA				
DATE: DEC 2018	BY	NO.	REVISION	DATE

INTEGRATOR INFORMATION

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

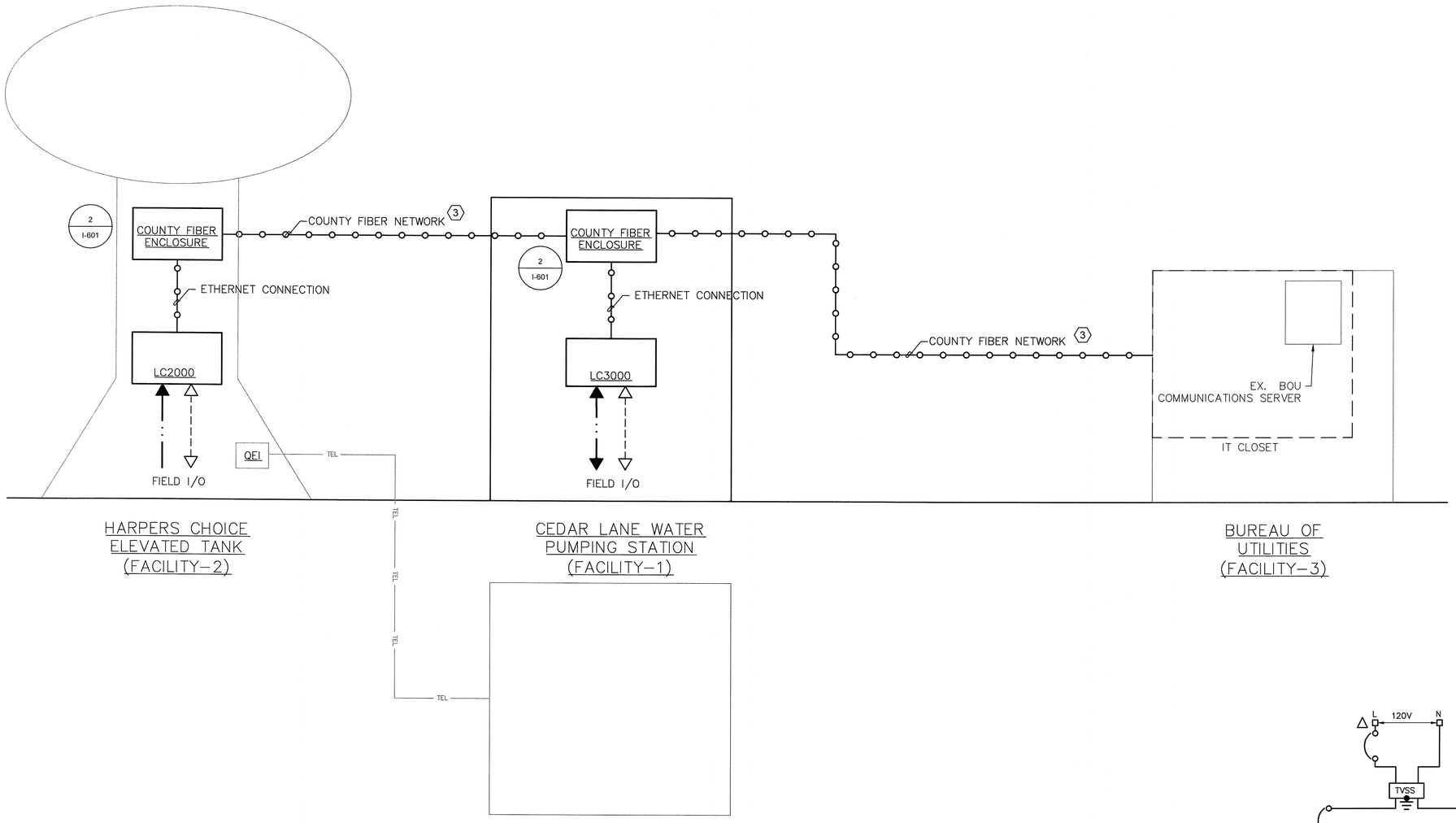
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I-002
SCALE: AS SHOWN
SHEET 69 OF 81

Dec 18, 2018 – 9:03am User: Seth.Rong
M:\2016\131601306.01\Drawings\I-002 INTEGRATOR INFORMATION.dwg

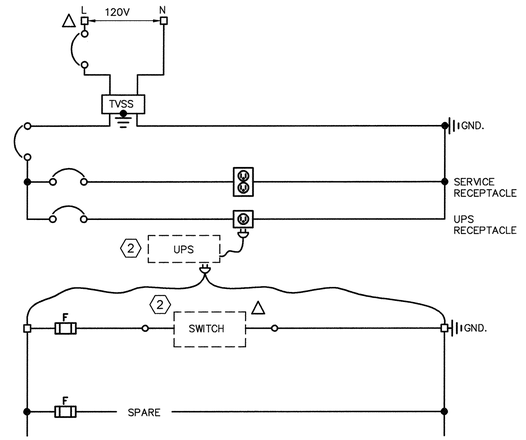
(X) SHEET KEY NOTES

1. PHYSICAL WIRED COMMUNICATION BETWEEN SITES TO BE COORDINATED WITH COUNTY.
2. COMMUNICATIONS FIBER PATCH / CONNECTION HARDWARE AND NETWORK SWITCH AND FIBER UPS SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE COUNTY. THE SCADA SYSTEM SUPPLIER SHALL COORDINATE AND FURNISH THE COUNTY FIBER ENCLOSURE TO SUIT COUNTY FIBER HARDWARE AND NETWORK CONNECTIONS SHOWN ON THE I&C DRAWINGS AND TO SUIT FIBER UPS SYSTEM.
3. COUNTY WILL FURNISH AND INSTALL ALL FIBER OPTIC CABLE.



1 DETAIL: COMMUNICATIONS (1)

SCALE: NONE



2 ECD: COUNTY FIBER ENCLOSURE

SCALE: NONE

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COMMUNICATIONS DIAGRAM

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

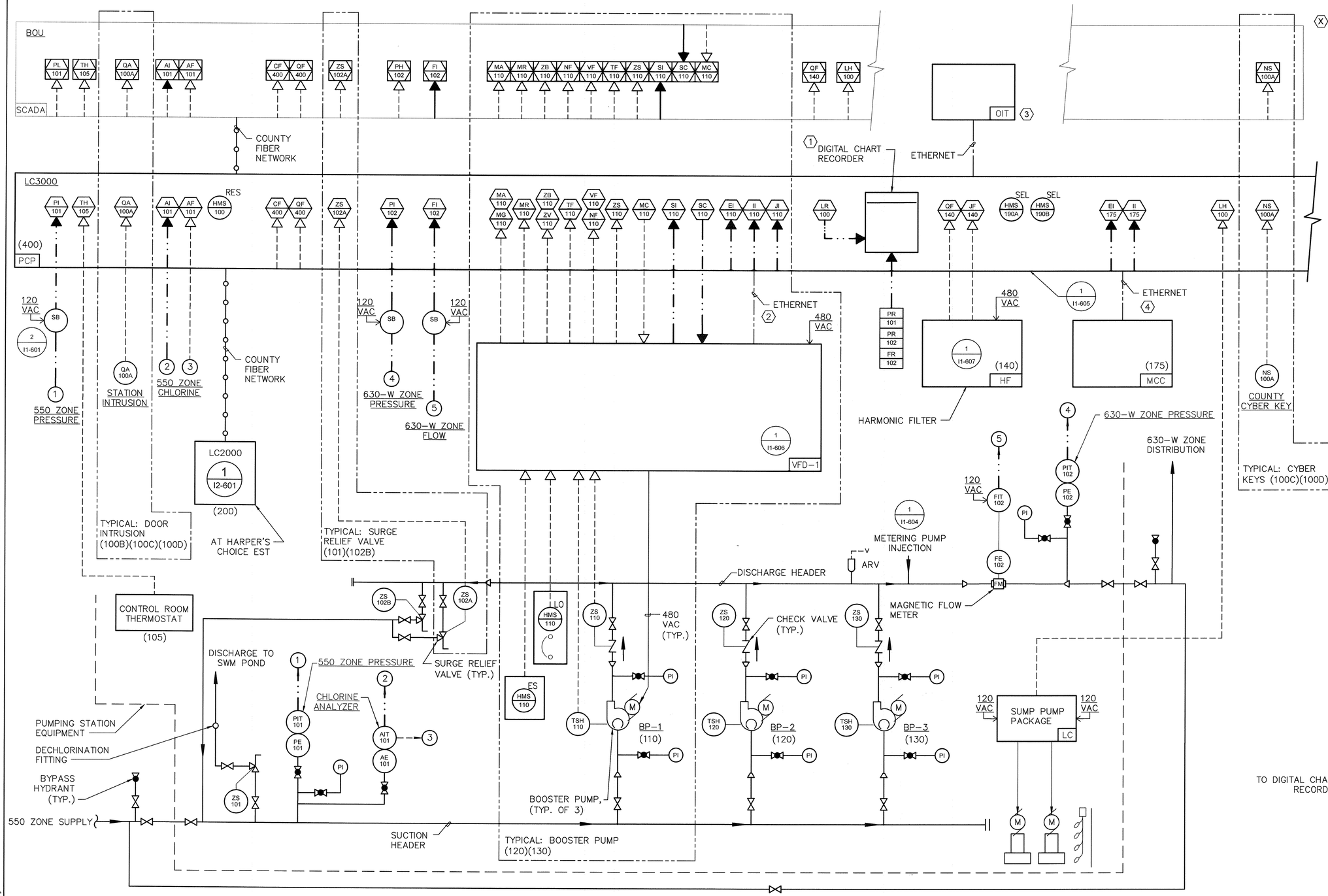
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I-601
SCALE AS SHOWN
SHEET 70 OF 81

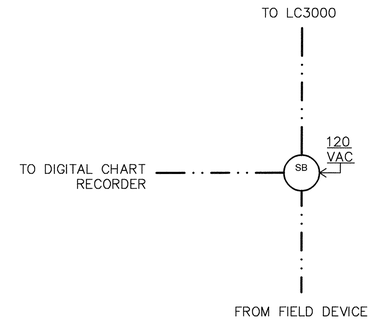
SHEET KEY NOTES

1. ALL DIGITAL CHART RECORDER SIGNALS, EXCEPT WATER TANK LEVEL, SHALL BE ISOLATED AND DUPLICATED WTHIN THE PCP.
2. ALL VFD AND RVSS POWER QUALITY I/O IS TO BE OVER ETHERNET TO THE PCP. REFER TO I/O LIST.
3. PANEL OIT SHALL DISPLAY ALL I/O FROM THE LC3000.
4. SCADA SYSTEM SUPPLIER SHALL COORDINATE WITH THE COUNTY AND ADD ADDITIONAL POWER MONITOR SOFT I/O POINTS IF NEEDED.



1 P&ID: PUMPING SYSTEM

SCALE: NONE



2 DETAIL: SIGNAL ISOLATION / DUPLICATION

SCALE: NONE

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PUMPING SYSTEM P&ID

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

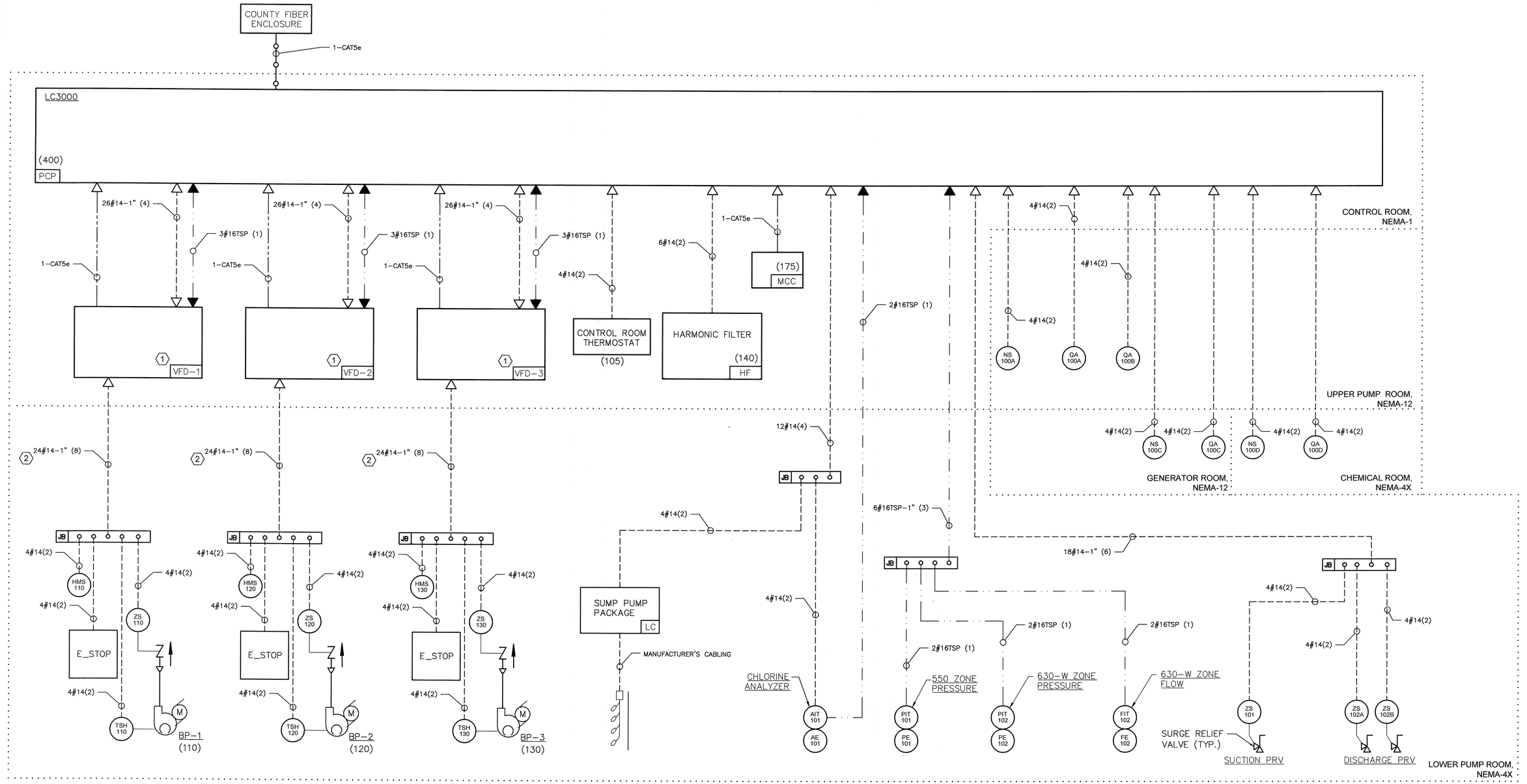
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I1-601
SCALE AS SHOWN
SHEET 71 OF 81

(X) SHEET KEY NOTES

1. ALL VFD AND RVSS POWER QUALITY I/O IS TO BE OVER ETHERNET TO THE PCP. REFER TO I/O LIST.
2. CONDUIT TO BE INSTALLED IN FLOOR SLAB OR BELOW GRADE.



1 RISER DIAGRAM: PUMPING SYSTEM

SCALE: NONE

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PUMPING SYSTEM RISER DIAGRAM

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

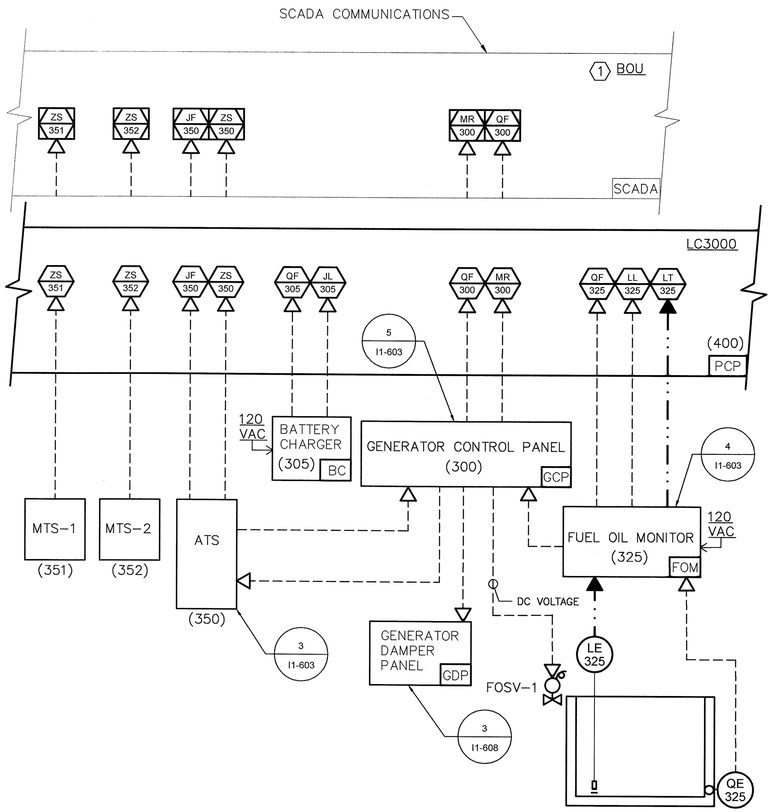
CEDAR LANE
WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

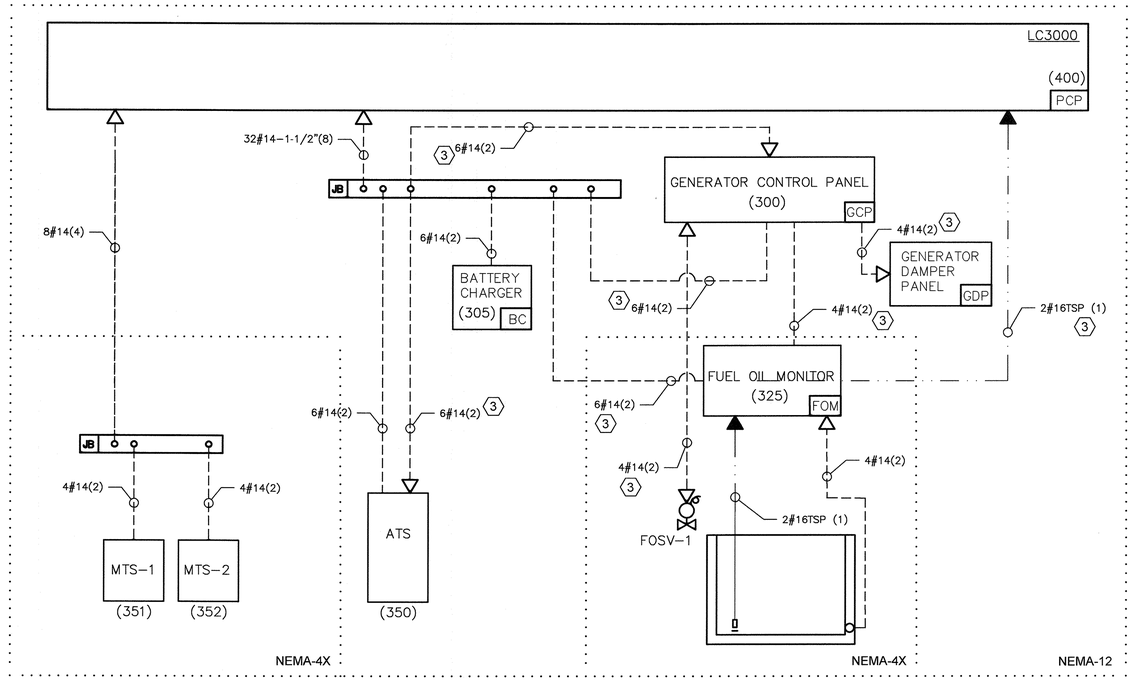
DRAWING NO. I1-602
SCALE AS SHOWN
SHEET 72 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01
Dec 18, 2018 – 9:04am User: Seth.Rang
M:\2018\131601306.01\Drawings\I1-602 PUMPING SYSTEM RISER DIAGRAM.dwg



1 P&ID: STANDBY POWER SYSTEM

SCALE: NONE

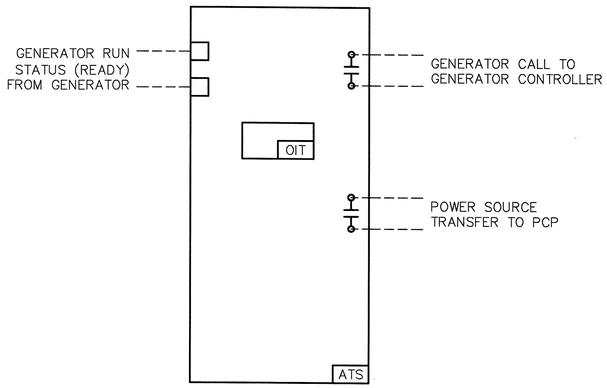


2 RISER: STANDBY POWER SYSTEM

SCALE: NONE

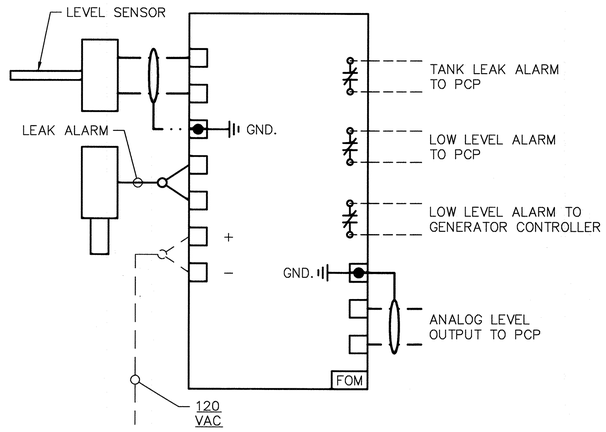
⟨X⟩ SHEET KEY NOTES

1. SIGNALS SHOWN AT BOU ARE TRANSMITTED FROM THE LC3000 IN THE PUMP STATION. REFER TO DRAWING I1-601.
2. VALVE SHALL BE ENERGIZED TO OPEN. VALVE OPEN SIGNAL TO BE GENERATED WHEN ATS CALLS FOR GENERATOR TO START.
3. CONDUIT TO BE INSTALLED IN FLOOR SLAB OR BELOW GRADE.



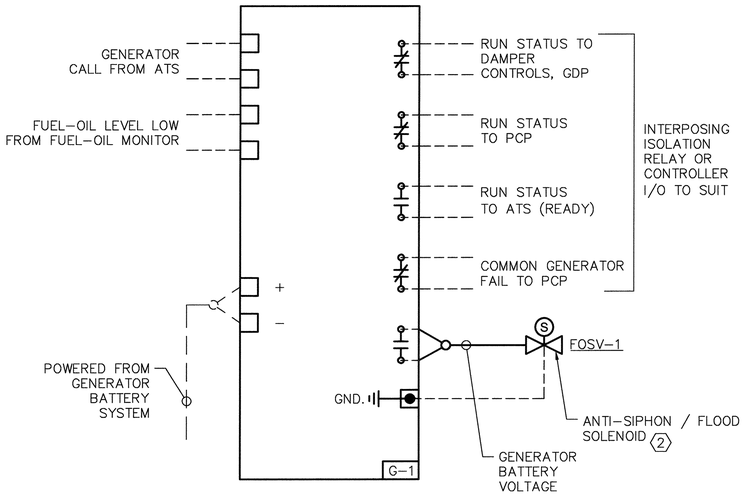
3 RISER DETAIL: ATS CONTROLLER

SCALE: NONE



4 RISER DETAIL: FUEL-OIL MONITOR

SCALE: NONE



5 RISER DETAIL: GENERATOR CONTROL PANEL

SCALE: NONE

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GENERATOR SYSTEM P&ID AND RISER DIAGRAM

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

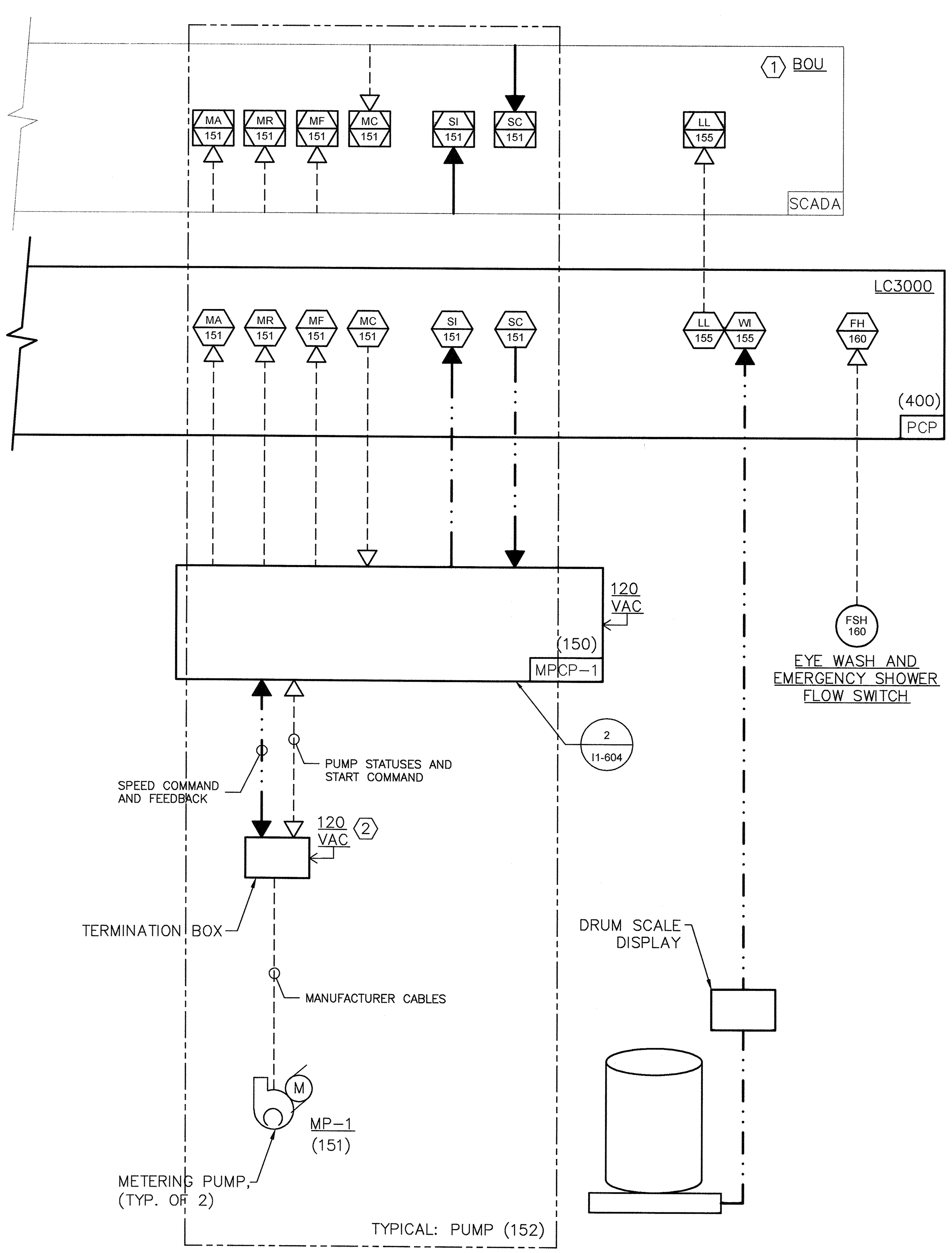
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I1-603
SCALE AS SHOWN
SHEET 73 OF 81

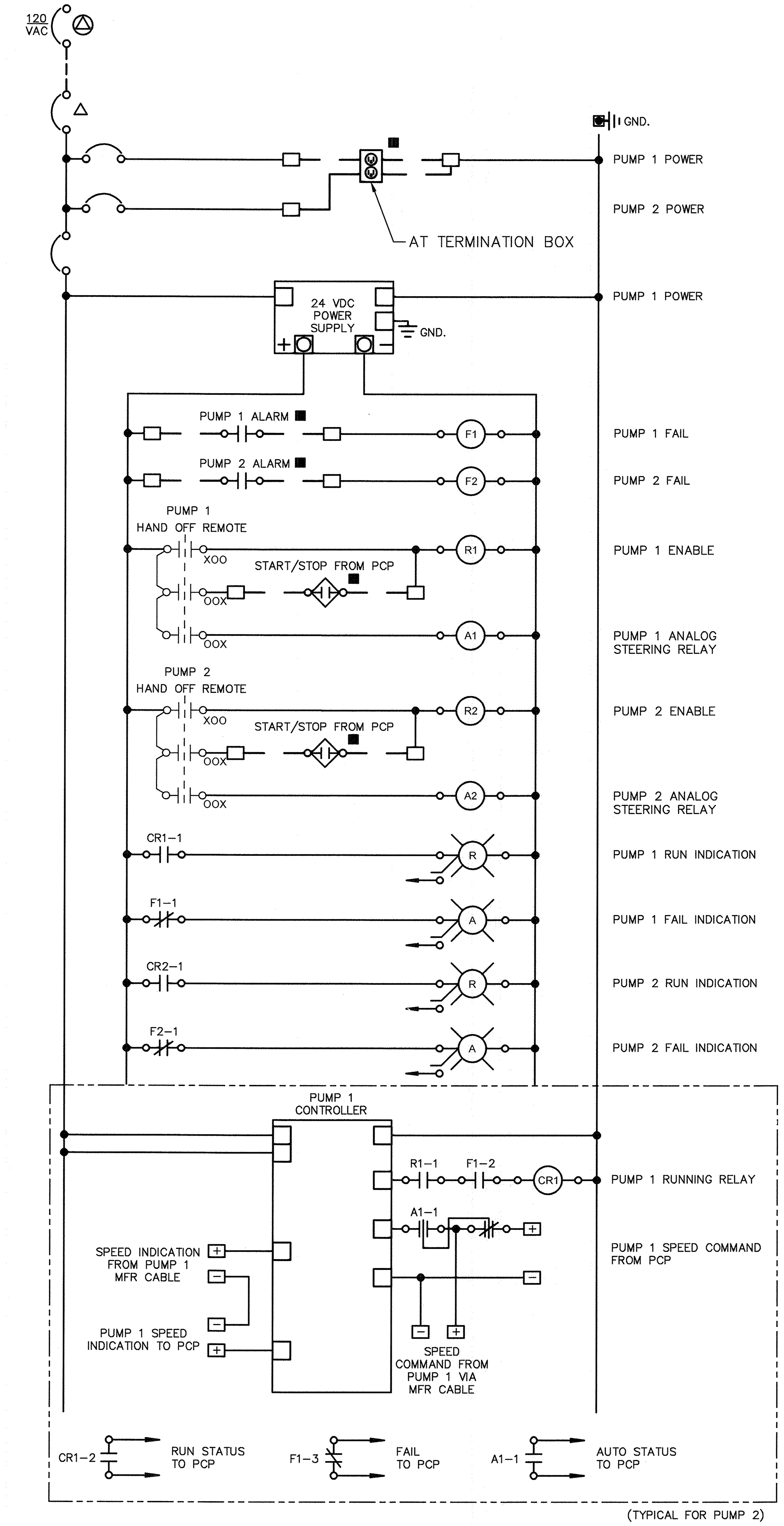
KCI TECHNOLOGIES PROJECT No.: 131601306.01
User: Seth.Rang
Dec 18, 2018 – 9:04am
M:\2016\13\1601306.01\Drawings\I1-603 GENERATOR SYSTEM PID AND RISER DIAGRAM.dwg

(X) SHEET KEY NOTES

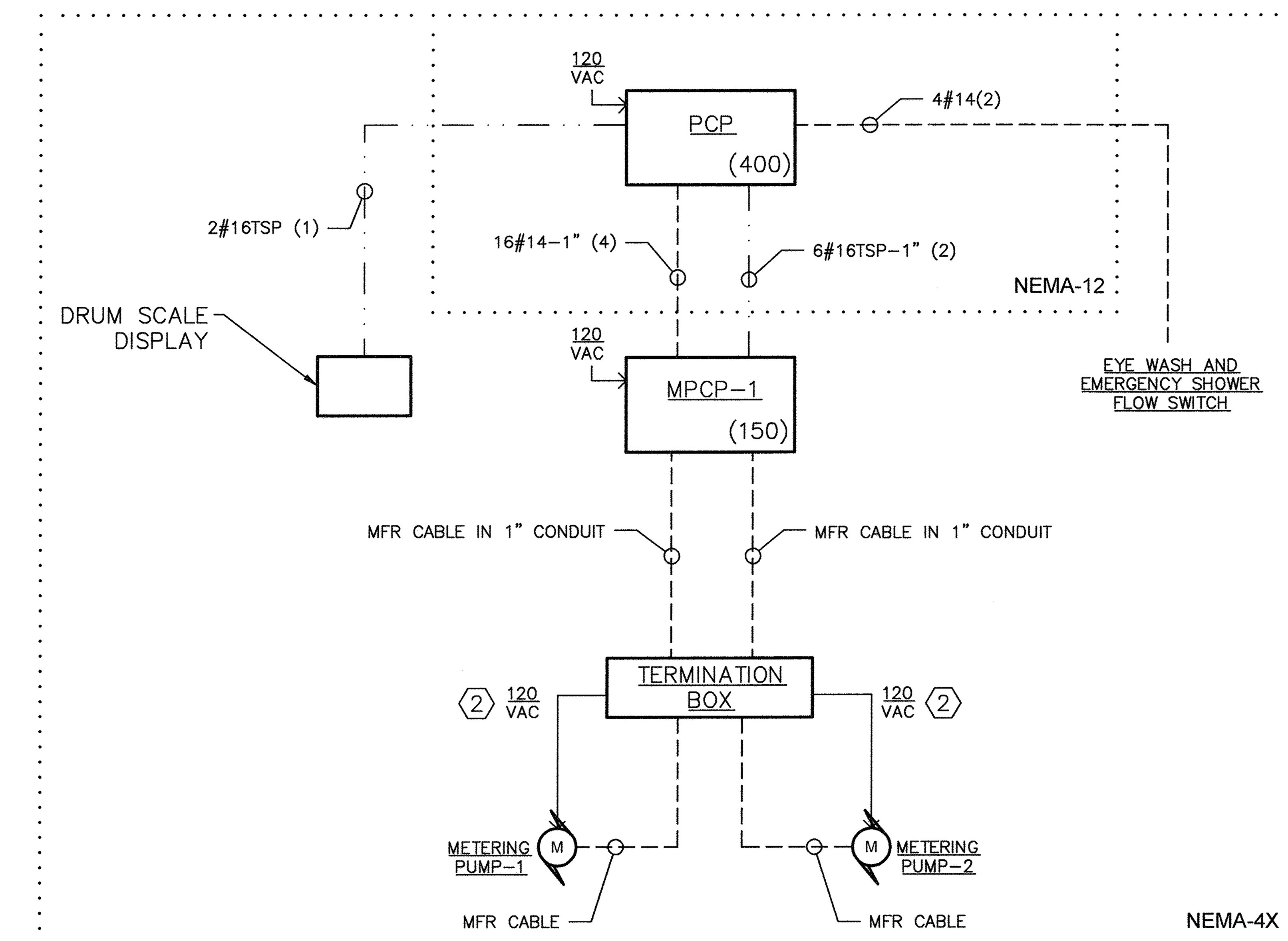
1. SIGNALS SHOWN AT BOU ARE TRANSMITTED FROM THE LC3000 IN THE PUMP STATION. REFER TO DRAWING I1-601.
2. METERING PUMPS TO BE POWERED VIA NEMA 4X RECEPTACLE ON TERMINATION BOX. TERMINATION BOX TO BE POWERED FROM MPCP-1. REFER TO ELECTRICAL DRAWINGS FOR WIRING REQUIREMENTS AND MECHANICAL DRAWINGS FOR LOCATION.



1 P&ID: SODIUM HYPO CHLORITE METERING PUMP SYSTEM
SCALE: NONE



2 ECD: METERING PUMPS (MPCP-1)
SCALE: NONE



3 RISER DIAGRAM: METERING PUMP SYSTEM
SCALE: NONE

KCI TECHNOLOGIES PROJECT No.: 131601306.01

Dec 18, 2018 – 9:04am User: Seth.Rang M:\2016\131601306.01\Drawings\I1-604 METERING PUMP CONTROLS.dwg

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HOWARD COUNTY, MARYLAND

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CHIEF, BUREAU OF UTILITIES 12-28-18 DATE	CHIEF, UTILITY DESIGN DIVISION 12/26/18 DATE

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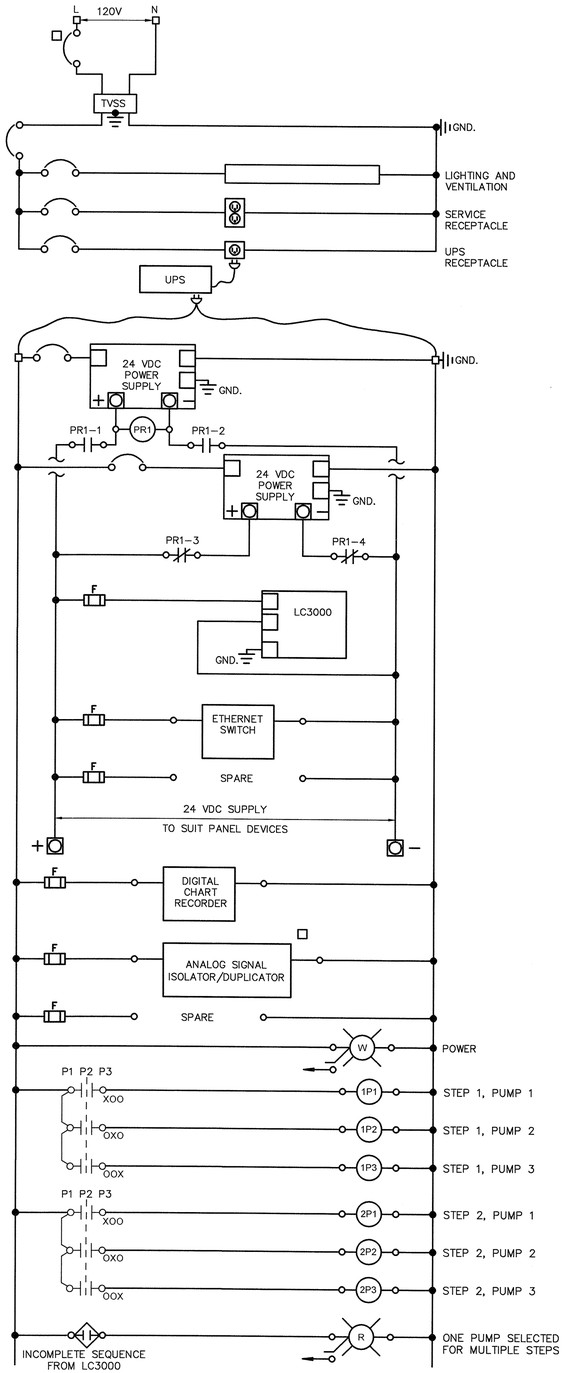
METERING PUMP CONTROLS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. I1-604
SCALE AS SHOWN
SHEET 74 OF 81



1 ECD: PCP POWER

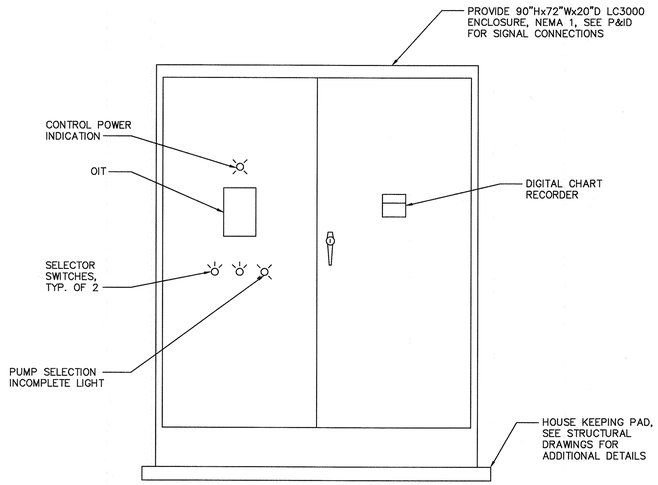
SCALE: NONE

GENERAL SHEET NOTES

1. SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
2. ALL RELAYS SHALL HAVE L.E.D. INDICATION.
3. ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.

⟨X⟩ SHEET KEY NOTES

1. SCADA SYSTEM SUPPLIER SHALL COORDINATE PLC I/O MODULE POWER SUPPLY AND I/O TERMINATIONS.



2 ELEVATION: PUMP CONTROL PANEL

SCALE: NONE

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PUMP CONTROL PANEL ECD AND ELEVATION

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I1-605
SCALE AS SHOWN
SHEET 75 OF 81

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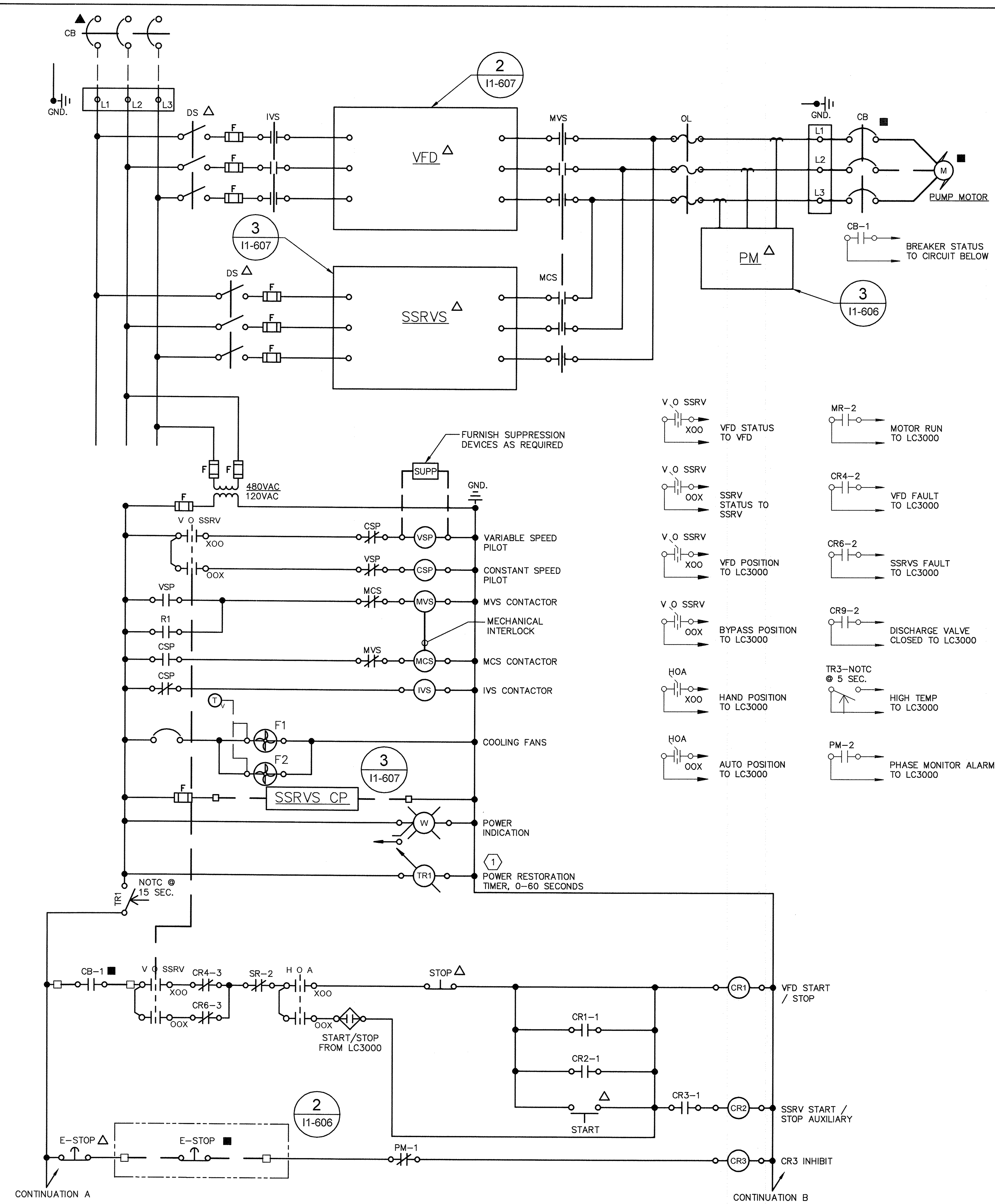
M:\2018\131601306.01\Drawings\I1-605 PUMP CONTROL PANEL ECD AND ELEVATION.dwg

GENERAL SHEET NOTES

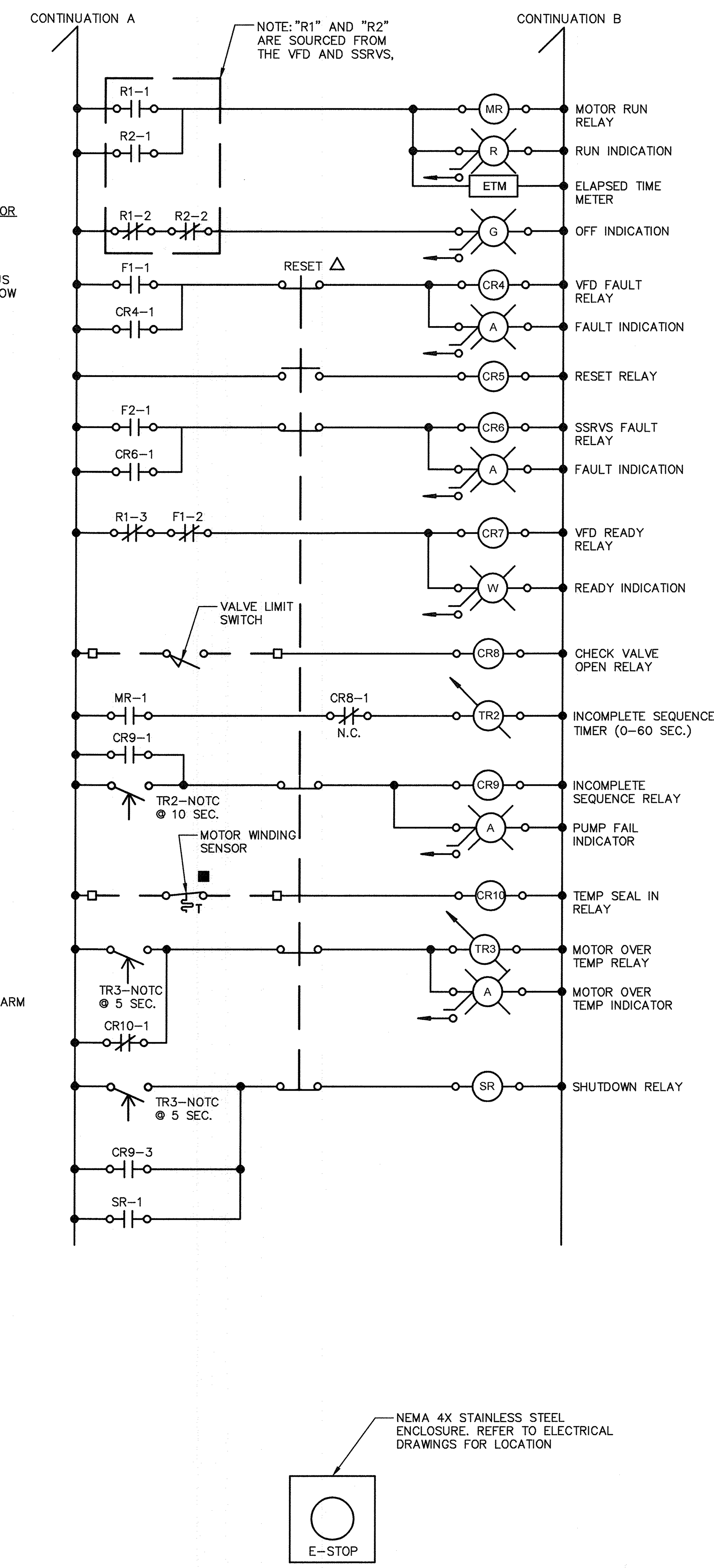
1. SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
2. ALL RELAYS SHALL HAVE L.E.D. INDICATION.
3. ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
4. ALL VFD AND RVSS POWER QUALITY I/O IS TO BE OVER ETHERNET TO THE PCP. REFER TO I/O LIST.

(X) SHEET KEY NOTES

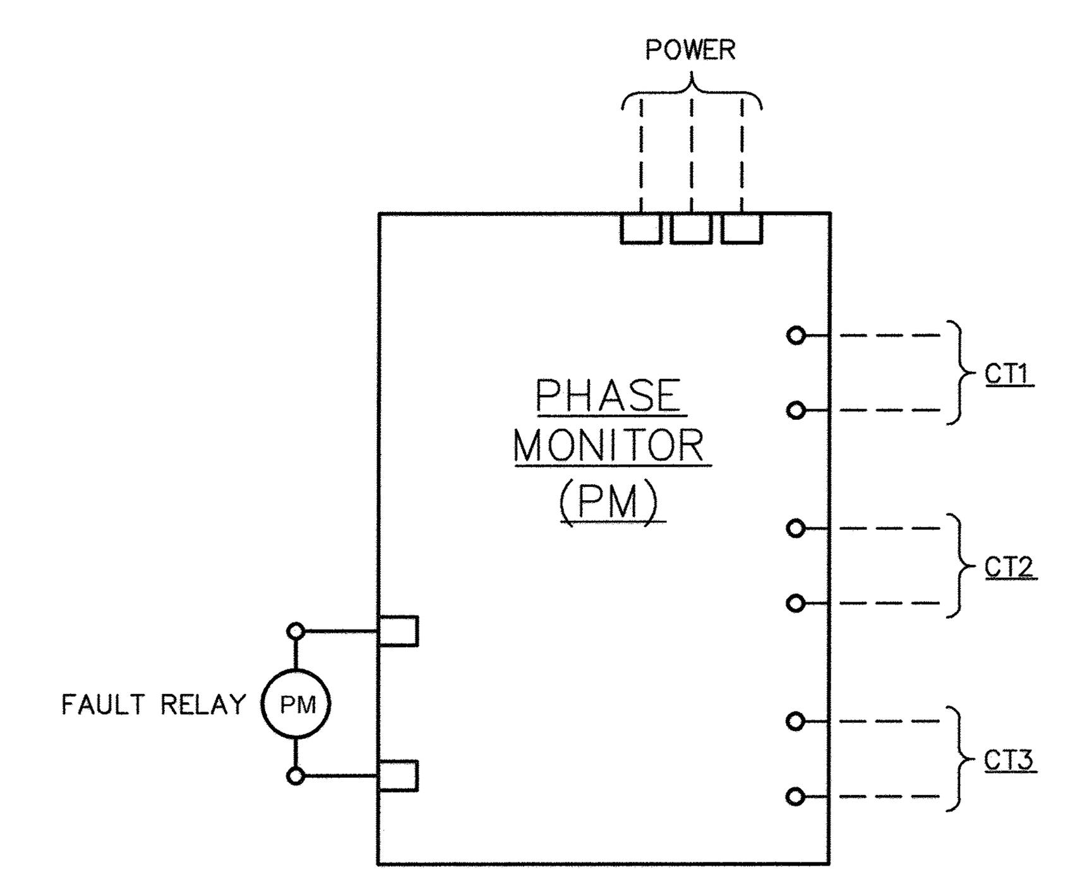
1. POWER START-UP TIMERS SHALL BE:
   - PUMP-1 - 15 SECONDS
   - PUMP-2 - 30 SECONDS
   - PUMP-3 - 45 SECONDS



1 ECD: PUMP CONTROLS VFD/SSRVS
SCALE: NONE



2 DETAIL: LOCAL E-STOP
SCALE: NONE



3 ECD: PHASE MONITOR
SCALE: NONE

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PUMP CONTROL ECD SHEET 1

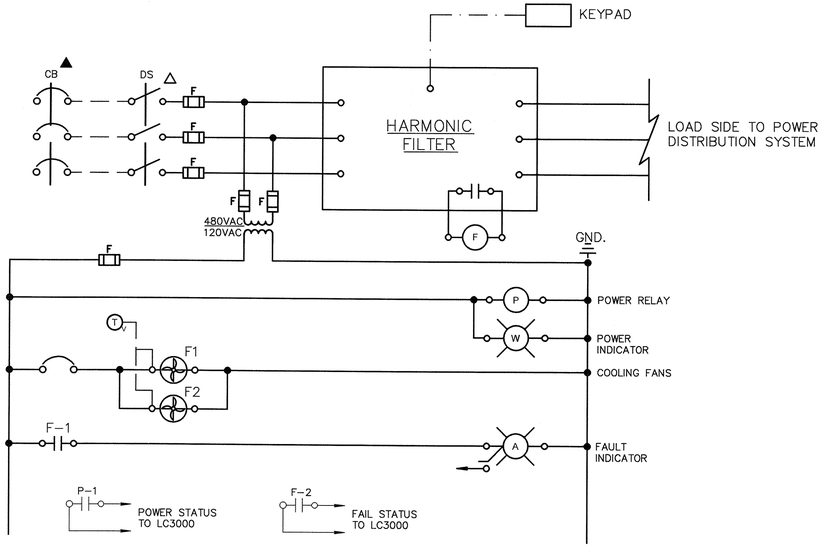
600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

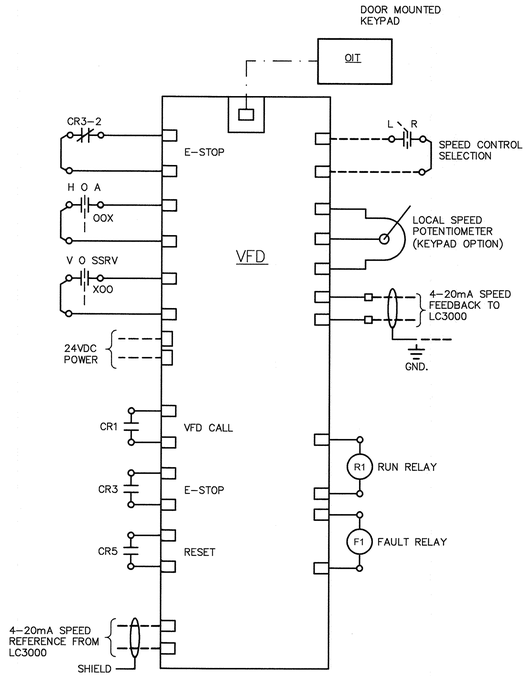
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I1-606
SCALE: AS SHOWN
SHEET 76 OF 81

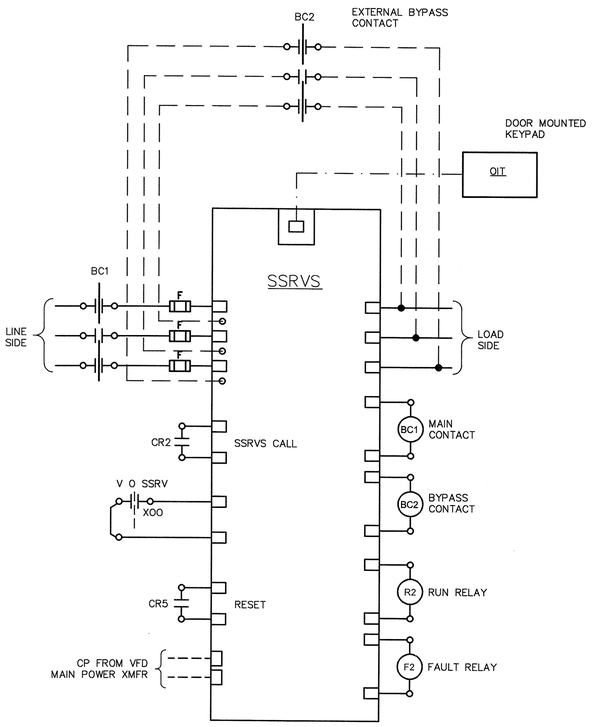
KCI TECHNOLOGIES PROJECT No.: 131601306.01



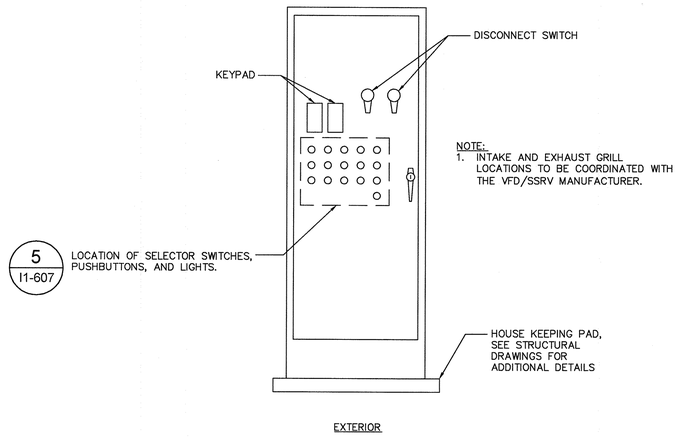
1 ECD: HARMONIC FILTER (HF)
SCALE: NONE



2 ECD: VFD TERMINATIONS
SCALE: NONE



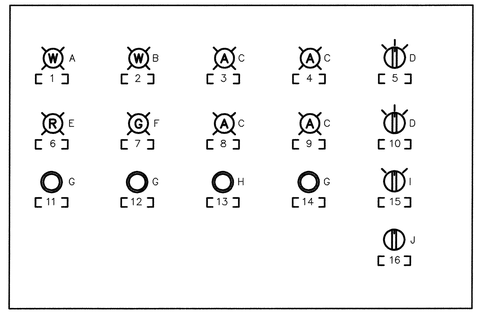
3 ECD: SSRVS TERMINATIONS
SCALE: NONE



4 ELEVATION: VFD/SSRV STARTER PANEL
SCALE: NONE

GENERAL SHEET NOTES

1. SEE SYSTEM P&I DIAGRAMS FOR PROCESS CONTROL IDENTIFICATIONS.
2. ALL RELAYS SHALL HAVE L.E.D. INDICATION.
3. ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
4. ALL VFD AND RVSS POWER QUALITY I/O IS TO BE OVER ETHERNET TO THE PCP. REFER TO I/O LIST.



NAMEPLATE LEGEND:

1	POWER "ON"
2	VFD READY
3	PUMP FAIL
4	MOTOR OVERTEMP
5	VFD-OFF-SSRVS
6	RUNNING
7	STOPPED
8	VFD FAULT
9	SSRVS FAULT
10	HAND-OFF-AUTO
11	START
12	STOP
13	E-STOP
14	RESET
15	LOCAL-REMOTE
16	LOCAL SPEED CONTROL

DEVICE LEGEND:

A	INDICATOR (WHITE)
B	PUSH-TO-TEST INDICATOR (WHITE)
C	PUSH-TO-TEST INDICATOR (AMBER)
D	3-POSTION SELECTOR SWITCH
E	PUSH-TO-TEST INDICATOR (RED)
F	PUSH-TO-TEST INDICATOR (GREEN)
G	PUSHBUTTON (MOMENTARY)
H	PUSHBUTTON (MAINTAINED)
I	2-POSTION SELECTOR SWITCH
J	POTENTIOMETER

5 DETAIL: VFD / SSRVS CONTROL PANEL
SCALE: NONE

KCI TECHNOLOGIES PROJECT No.: 131601306.01

Dec 18, 2018 - 9:04am User: Seth.Rong
W:\2013\131601306.01\Drawings\I1-607 PUMP CONTROL ECD SHEET 2.dwg

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DRN: SDR					
CHK: SEA					
DATE: DEC 2018	BY	NO.	REVISION	DATE	

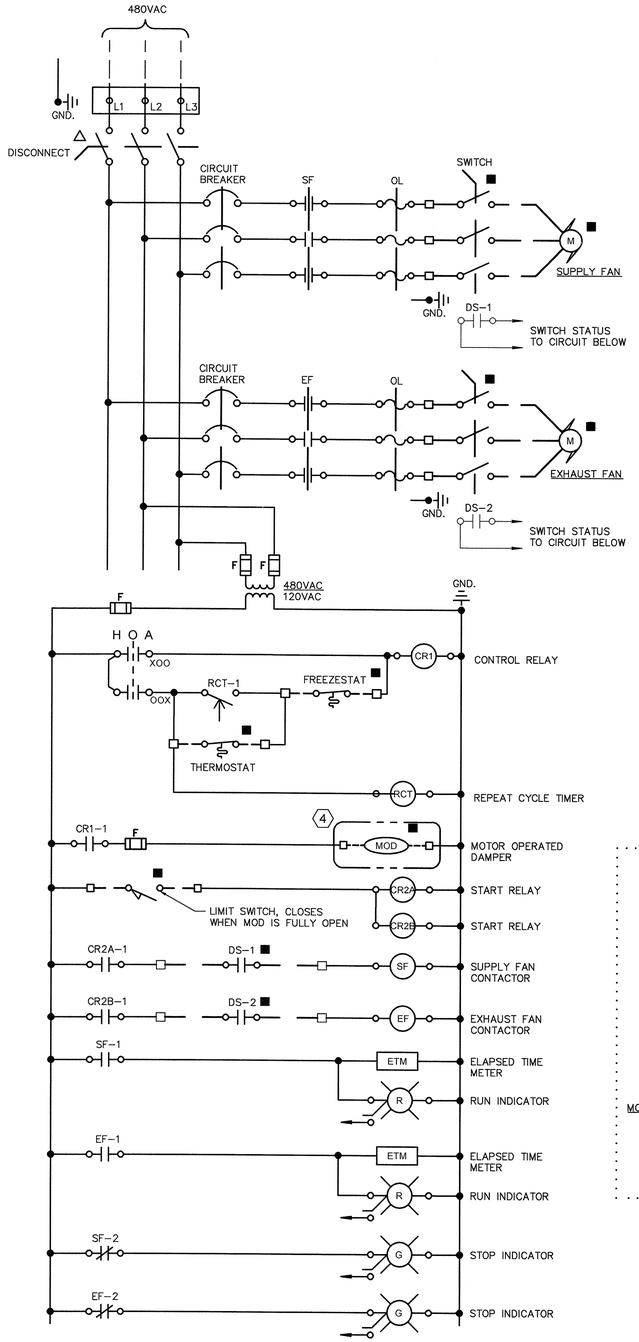
PUMP CONTROL ECD SHEET 2

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

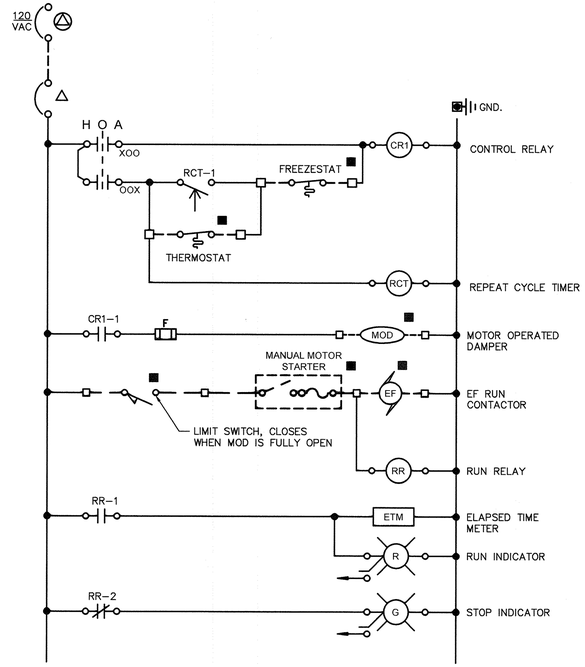
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

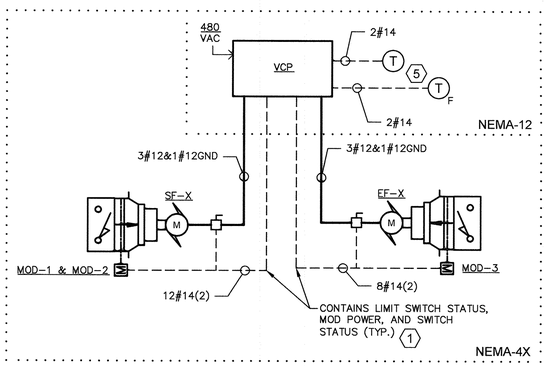
DRAWING NO. I1-607
SCALE AS SHOWN
SHEET 77 OF 81



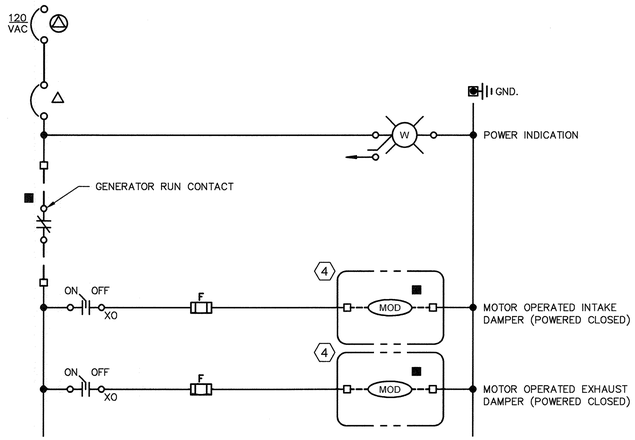
1 ECD: VCP-BLDG
SCALE: NONE



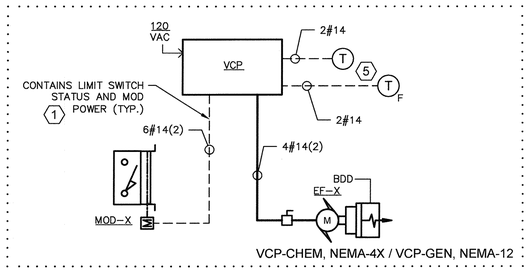
2 ECD: VCP-CHEM, VCP-GEN
SCALE: NONE



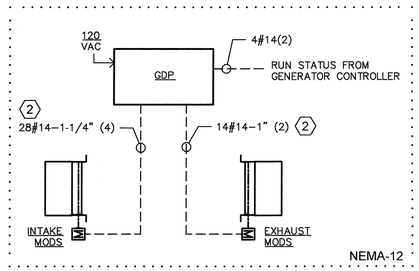
4 RISER DIAGRAM: VCP-BLDG
SCALE: NONE



3 ECD: GENERATOR DAMPER PANEL (GDP)
SCALE: NONE



5 RISER DIAGRAM: VCP-CHEM, VCP-GEN
SCALE: NONE



6 RISER DIAGRAM: GDP
SCALE: NONE

GENERAL SHEET NOTES

1. ALL RELAYS SHALL HAVE L.E.D. INDICATION OF STATUS.
2. ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AT NEC STANDARDS.
3. PROVIDE 60-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
4. ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
5. CONTRACTOR TO COORDINATE APPROVED LOCATION WITH COUNTY FIRE MARSHAL.

(X) SHEET KEY NOTES

1. LIMIT SWITCH POSITION STATUS SIGNALS CAN BE COMBINED WITH THE MOD CONTROL POWER CONDUCTORS.
2. INSTALL CONDUIT IN FLOOR SLAB
3. LOCATION WITH COUNTY FIRE MARSHAL.
4. MOD QUANTITY TO SUIT. REFER TO MOD SCHEDULE, THIS SHEET.
5. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.

EQUIPMENT LEGEND:

BDD	BACK DRAFT DAMPER
EF-X	EXHAUST FAN
MOD-X	MOTORIZED OPERATED DAMPER
SF-X	SUPPLY FAN
VCP-X	VENTILATION CONTROL PANEL
(T)	HIGH TEMP - 90°F
(T)F	FREEZESTAT - 45°F

MOTOR OPERATED DAMPER (MOD) SCHEDULE

CONTROL PANEL	INTAKE	EXHAUST
VCP-BLDG	MOD-1, MOD-2	MOD-3
VCP-CHEM	MOD-4	-
VCP-GEN	MOD-5	-
GDP	MOD-6, MOD-7, MOD-8, MOD-9, MOD-10, MOD-11, MOD-12, MOD-13, MOD-14, MOD-15, MOD-16, MOD-17	MOD-18, MOD-19, MOD-20, MOD-21, MOD-22, MOD-23

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DRN: SDR					
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DATE: DEC 2018	BY	NO.	REVISION	DATE	

VENTILATION CONTROL ECDS

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I1-608
SCALE AS SHOWN
SHEET 78 OF 81

KCI TECHNOLOGIES PROJECT No.: 131601306.01

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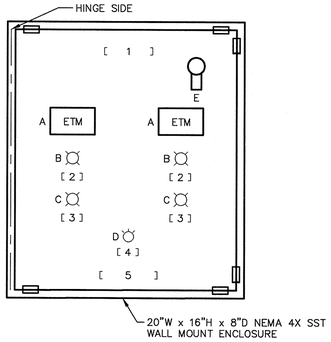
User: Seth.Rong



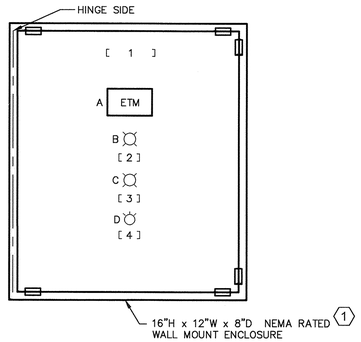
DEVICE LEGEND:

A	ELAPSED TIME METER	
B	INDICATION LAMP (RED)	
C	INDICATION LAMP (GREEN)	
D	3-POSITION SELECTOR SWITCH	
E	DISCONNECT SWITCH	

NAMEPLATE LEGEND:

1	VCP-BLDG
2	RUNNING
3	STOPPED
4	HAND / OFF / AUTO
5	FANS: SF-1 / EF-1

1 ELEVATION: VCP-BLDG
SCALE: NONE



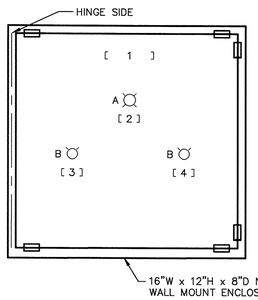
DEVICE LEGEND:

A	ELAPSED TIME METER
B	INDICATION LAMP (RED)
C	INDICATION LAMP (GREEN).
D	3-POSITION SELECTOR SWITCH

NAMEPLATE LEGEND:

1	VCP-CHEM OR VCP-GEN
2	RUNNING
3	STOPPED
4	HAND / OFF / AUTO

2 ELEVATION: VCP-CHEM, VCP-GEN
SCALE: NONE



DEVICE LEGEND:

A	INDICATION LAMP (WHITE)
B	2-POSITION SELECTOR SWITCH

NAMEPLATE LEGEND:

1	GENERATOR DAMPER PANEL
2	POWER
3	INTAKE MODS CLOSE / OPEN
4	EXHAUST MODS CLOSE / OPEN

3 ELEVATION: GENERATOR DAMPER PANEL (GDP)
SCALE: NONE

GENERAL SHEET NOTES

1. CONTRACTOR TO COORDINATE APPROVED LOCATION WITH COUNTY FIRE MARSHAL.

(X) SHEET KEY NOTES

1. VCP-CHEM SHALL BE NEMA 4X SST. VCP-GEN SHALL BE NEMA 12

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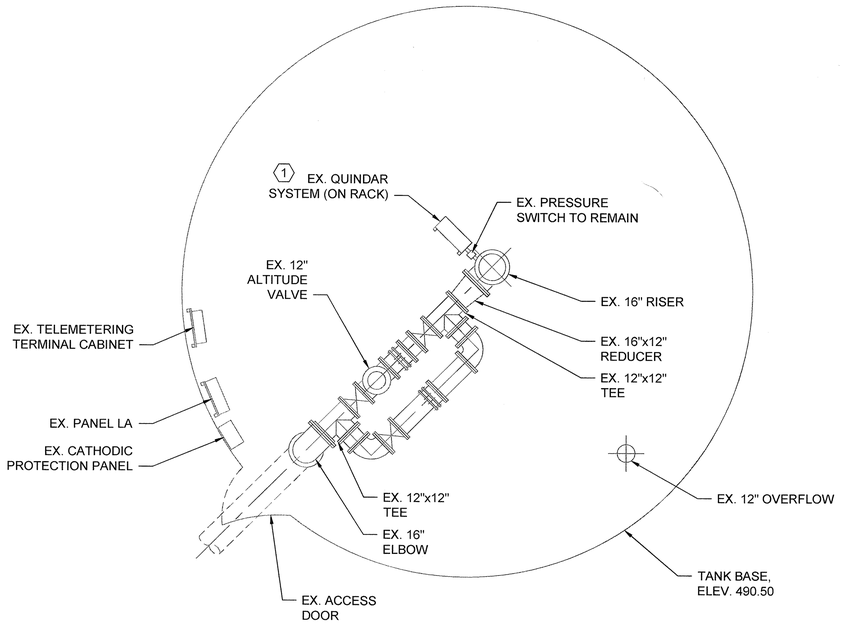
600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

VENTILATION PANEL DETAILS

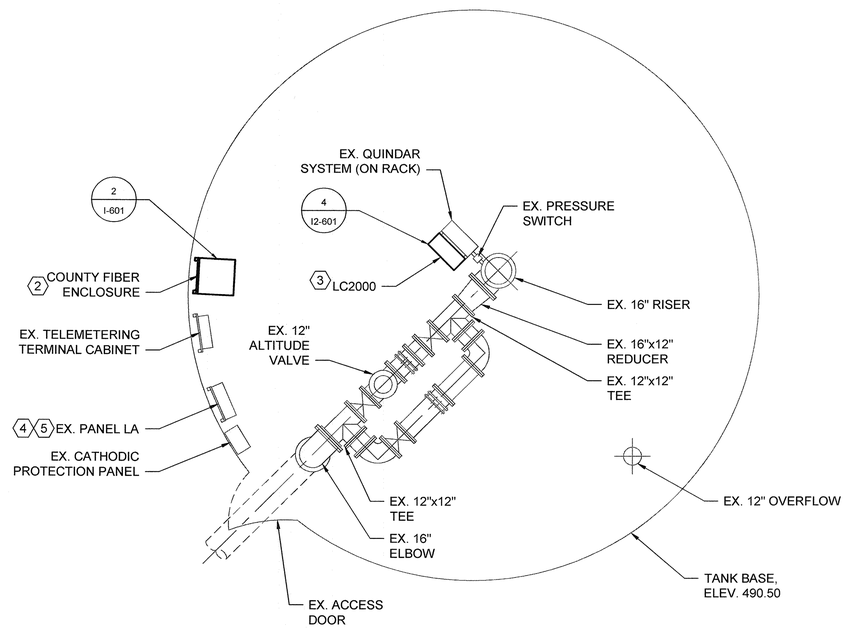
CEDAR LANE
WATER PUMPING STATION
CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036
ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I1-609
SCALE AS SHOWN
SHEET 79 OF 81



1 EXISTING PLAN: TANK AT GRADE

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



2 NEW WORK PLAN: TANK AT GRADE

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

GENERAL SHEET NOTES

1. ALL SIGNALS ARE TO BE DUPLICATED TO BOTH THE EXISTING QUINDAR SYSTEM AND THE PROPOSED LC2000. SEE WATER TANK P&ID DRAWING FOR INFORMATION.

(X) SHEET KEY NOTES

1. EXISTING QUINDAR SYSTEM IS TO REMAIN FUNCTIONAL TO MAINTAIN EXISTING COMMUNICATIONS TO COLUMBIA BPS.
2. CONTRACTOR TO COORDINATE WITH COUNTY FOR INSTALLATION. COUNTY TO PROVIDE FIBER CONDUIT ROUTING. SCADA SYSTEM SUPPLIER TO PROVIDE MOUNTING AND ENCLOSURE.
3. MOUNT LC2000 ENCLOSURE TO EXISTING RACK.
4. PROVIDE A 20A/1P BREAKER FOR PROPOSED COUNTY FIBER ENCLOSURE. FURNISH 2#12 AND #12 GND FROM PANEL LA TO COUNTY FIBER ENCLOSURE.
5. PROVIDE A 20A/1P BREAKER FOR PROPOSED LC2000 ENCLOSURE. FURNISH 2#12 AND #12 GND FROM PANEL LA TO LC2000 ENCLOSURE.

0 1 3 8 12
2 4 6 10
SCALE: 1/4"= 1'-0"

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HARPERS CHOICE ELEVATED TANK MODIFICATIONS

600' SCALE MAP NO. 35 BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DRAWING NO. I2-101
SCALE AS SHOWN
SHEET 80 OF 81

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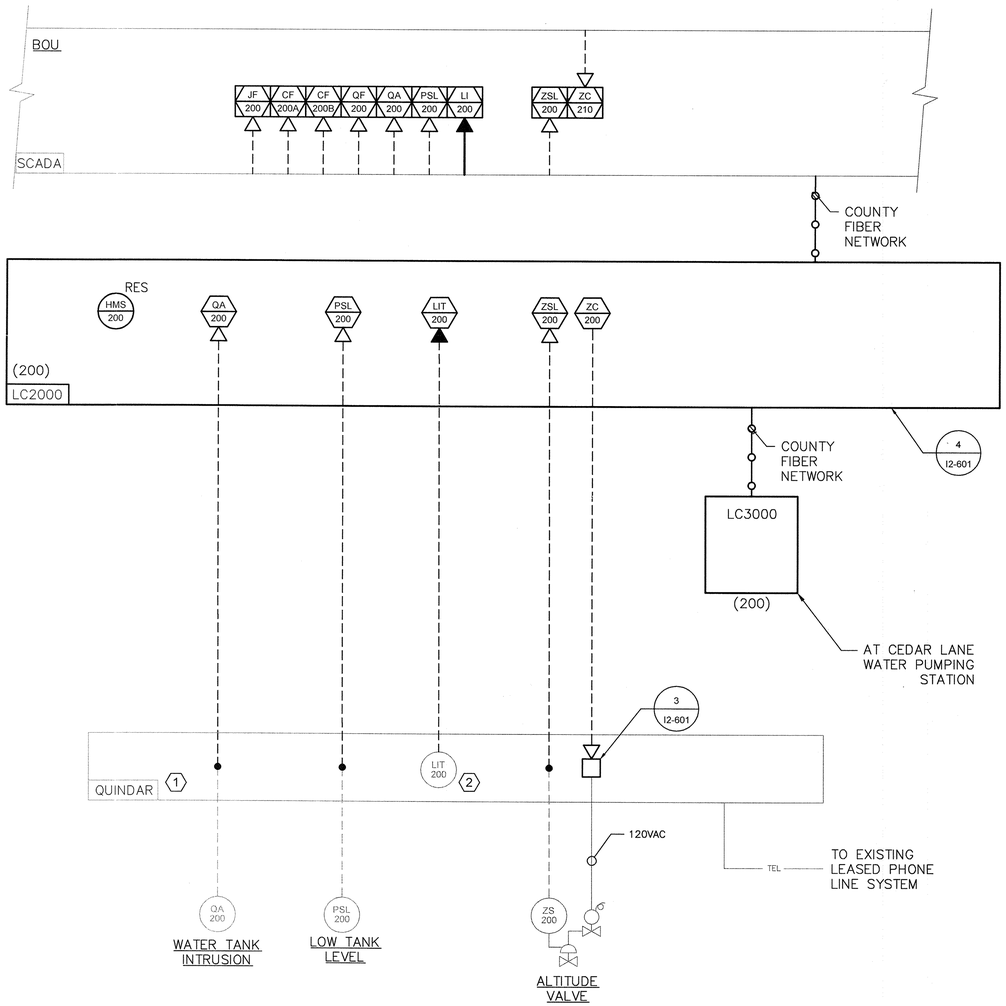
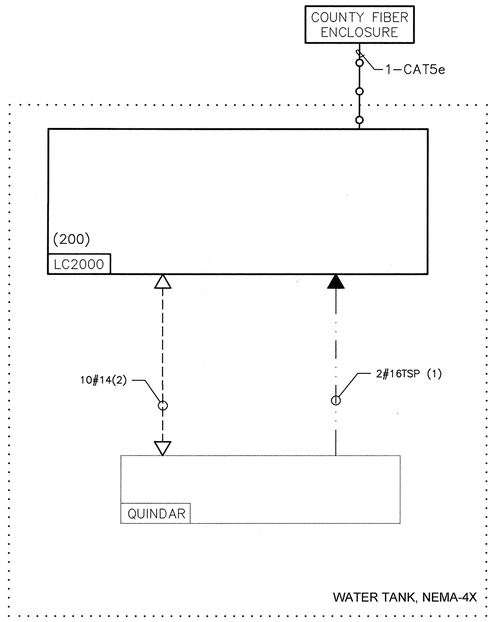
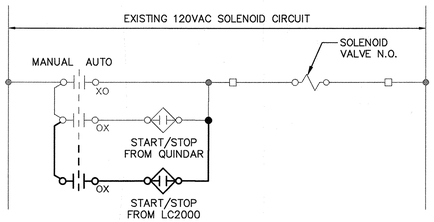
Dec 18, 2018 - 9:05am User: Seth.Rong
M:\2016\131601306.01\Drawings\I2-101 WATER TANK FLOOR PLAN AND SECTION.dwg



1 P&ID: WATER TANK
SCALE: NONE



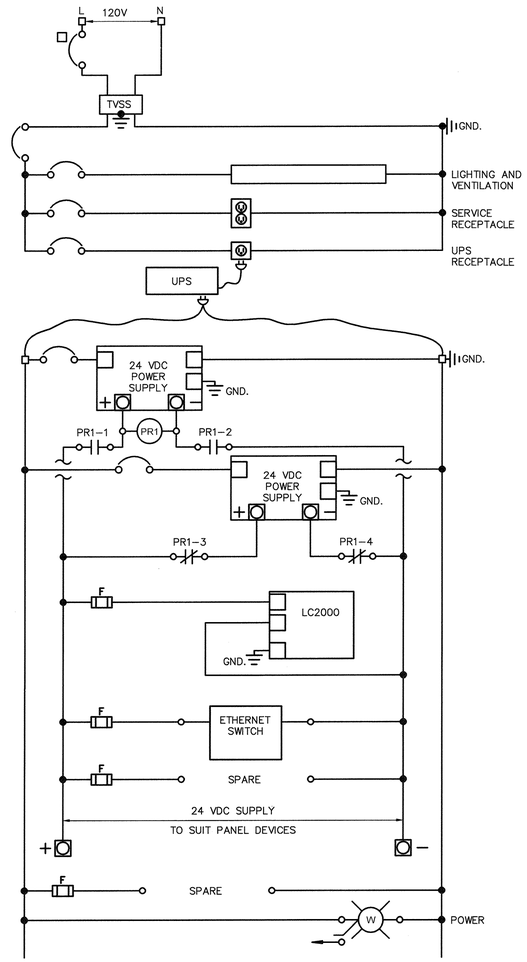
2 RISER DIAGRAM: WATER TANK
SCALE: NONE



3 ECD: ALTITUDE VALVE SOLENOID
SCALE: NONE

⟨X⟩ SHEET KEY NOTES

1. EXISTING QUINDAR CABINET TO BE MODIFIED TO HOUSE DOUBLE POLE RELAYS, POWERED FROM QUINDAR POWER CIRCUIT, FOR EACH SIGNAL. ONE SET OF CONTACTS CONTINUES TO THE QUINDAR SYSTEM WHILE THE OTHER SET OF CONTACTS IS FOR THE NEW LC2000.
2. EXISTING PIT TO BE REWIRED IN ORDER TO BE DAISY-CHAINED BETWEEN THE LC2000 AND THE EXISTING QUINDAR SYSTEM.



4 ECD: LC2000 POWER
SCALE: NONE

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BY	NO.	REVISION	DATE

HARPERS CHOICE ELEVATED TANK P&ID AND RISER DIAGRAM

600' SCALE MAP NO. 35 — BLOCK NO. 17, 11

CEDAR LANE WATER PUMPING STATION

CAPITAL PROJECT No. W-8328
CONTRACT No. 44-5036

ELECTION DISTRICT NO. 5 — HOWARD COUNTY, MARYLAND

DRAWING NO. I2-601
SCALE AS SHOWN
SHEET 81 OF 81