


GENERAL NOTES

- APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING STRUCTURES, UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- TOPOGRAPHIC SURVEYS WERE PERFORMED IN SEPTEMBER 2015 BY DAFT MCCUNE WALKER.
- HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD '83/'91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 47GM3 AND NO. 47EM3. ALL VERTICAL CONTROLS ARE BASED ON NAVD '88.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- 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.
- FOR DETAILS NOT SHOWN ON THE DRAWING, 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.
- 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 ARE 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.
- THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

HOWARD COUNTY DPW - TRAFFIC DIVISION.....	410-313-2430
HOWARD COUNTY TRANSIT SERVICES.....	410-313-5800/240-581-5800
HOWARD COUNTY PUBLIC SCHOOLS.....	410-313-6728
HOWARD COUNTY BUREAU OF ENVIRONMENTAL SERVICES.....	410-313-6470
HOWARD COUNTY EMERGENCY COMMUNICATIONS/911 CENTER.....	410-313-2300
AT&T.....	1-800-252-1133
BGE (CONSTRUCTION SERVICES).....	410-637-8713
BGE (EMERGENCY).....	410-685-0123
BUREAU OF UTILITIES.....	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
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT.
- THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)-313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD 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.
- 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).
- 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.
- THE SITE SHALL BE GRADED AROUND THE PUMP STATION SO AS TO LEAD SURFACE DRAINAGE AWAY FROM THE PUMP STATION AS REQUIRED BY THE 10 STATES STANDARDS (6.1.1.C). SEE SDP-16-036 DRAWINGS FOR GRADING.
- FEMA FLOOD ELEVATION IS 264 FEET, FEMA PANEL #24024C0165D.

PURPOSE NOTE:

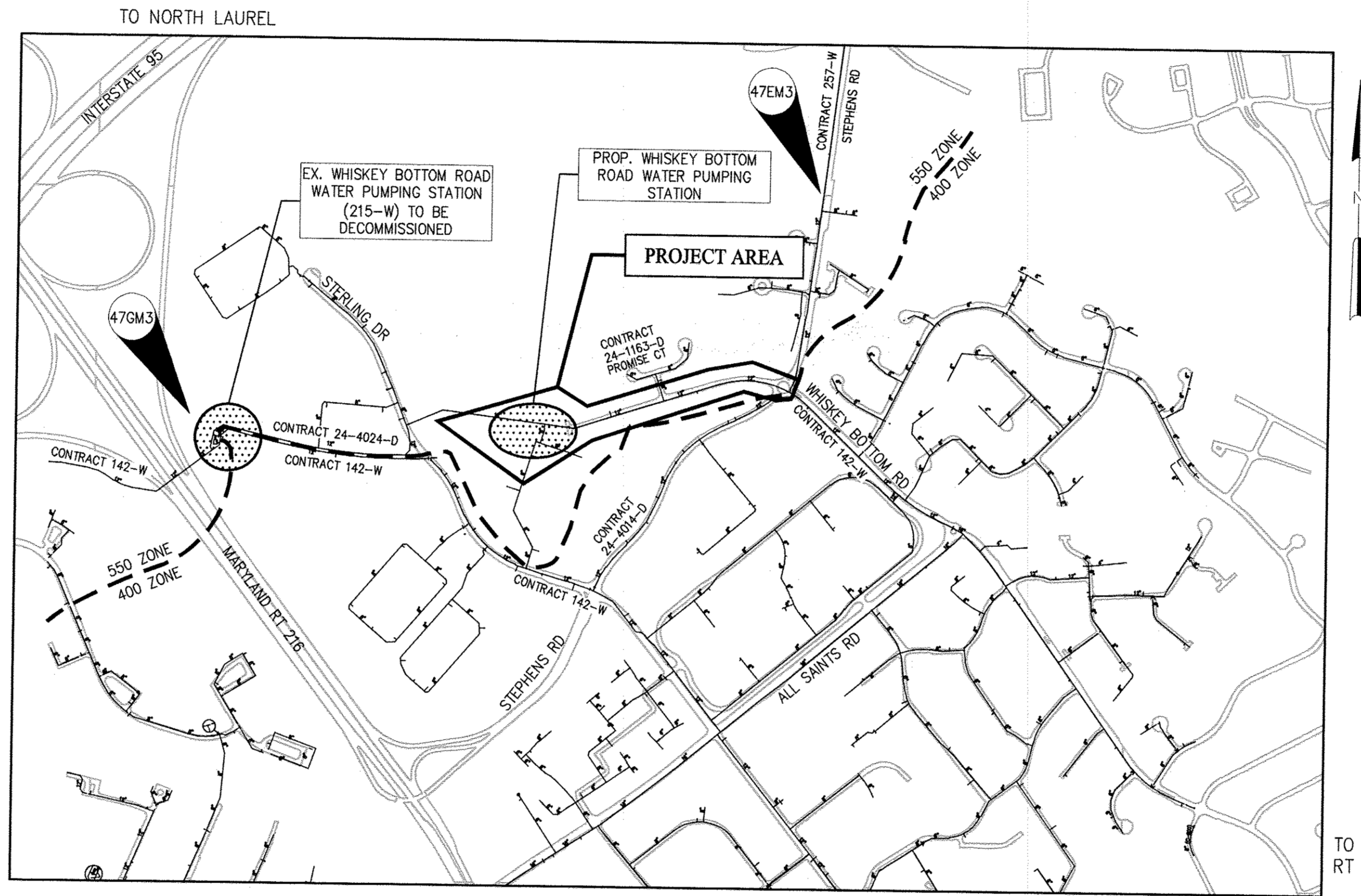
A PROJECT TO RELOCATE THE WHISKEY BOTTOM ROAD WATER PUMPING STATION AND RELATED SUCTION AND DISCHARGE PIPELINES AND TO INCREASE FUTURE PUMPING CAPACITY.

* SEE G-3 FOR HOWARD COUNTY WATER AND SEWER NOTES.

* SEE SDP-16-036 FOR LANDSCAPING, SEDIMENT AND EROSION CONTROL PLANS

WHISKEY BOTTOM ROAD WATER PUMPING STATION REPLACEMENT HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS CAPITAL PROJECT NO. W8320 CONTRACT NO. 44-4947



VICINITY MAP
1" = 600'

TYPE OF BUILDING: WATER PUMPING STATION
NUMBER OF PARCELS: N/A
PRESSURE ZONES: 400/550W
DRAINAGE AREA: LITTLE PATUXENT

NO. OF WHC: 1
NO. OF SHC: 1
ADC MAP 40, GRID NO. B-6

DIRECTIONS: TAKE ROUTE 216 EAST FROM I-95. TAKE FIRST EXIT ON RIGHT TO STEPHENS RD. CONTINUE ON STEPHENS ROAD. AT THE TRAFFIC CIRCLE, TAKE THE THIRD EXIT TO WHISKEY BOTTOM RD. SITE IS AT THE END OF THE ROAD.

HORIZONTAL & VERTICAL CONTROL

HORIZONTAL AND VERTICAL CONTROL IS BASED ON MARYLAND NAD 83/91 (HORIZONTAL) AND NAVD '88 (VERTICAL) DATUM. HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS

BENCH MARK NO. 47GM3 N 531620.07 E 1352684.71 ELEV. 91.734	BENCH MARK NO. 47EM3 N 532973.07 E 1356218.71 ELEV. 84.447
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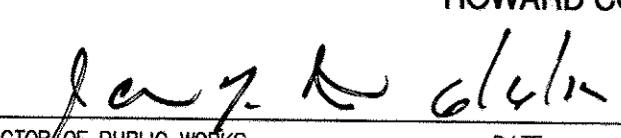

ADJACENT WATER & SEWER FACILITY CONTRACTS:

24-4014-D: 12" WATER	142-W: 12" WATER
24-4024-D: 12" WATER	215-W: PUMP STATION
24-1163-D: 8" WATER & SEWER	257-W: 12" WATER

INDEX OF DRAWINGS		
SHEET NO	DWG NO	DESCRIPTION
GENERAL		
1	G-1	COVER PAGE, GENERAL NOTES, INDEX
2	G-2	ABBREVIATIONS, LEGEND, AND CODE DATA
3	G-3	WATER AND SEWER NOTES
4	G-4	OVERALL PLAN
CIVIL		
5	C-1	WATER PUMPING STATION AND ACCESS ROAD UTILITY PLAN
6	C-2	LOW PRESSURE SEWER PLAN & PROFILE
7	C-3	DISCHARGE AND SUCTION WATER LINE PROFILES
8	C-4	SUCTION WATER LINE PROFILE CONTINUED
9	C-5	WHISKEY BOTTOM ROAD AND STEPHENS ROAD CONNECTIONS
10	C-6	TRAFFIC CONTROL PLAN - PHASE 1 ROUNDABOUT FLAGGING OPERATION
11	C-7	TRAFFIC CONTROL PLAN - PHASE 2 ROUNDABOUT FLAGGING OPERATION
12	C-8	TRAFFIC CONTROL PLAN - PHASE 3 WHISKEY BOTTOM ROAD
MECHANICAL		
13	M-1	PACKAGE PUMPING STATION SYSTEM CURVE AND DESIGN CRITERIA
14	M-2	PACKAGE PUMPING STATION DIAGRAMS AND SCHEMATICS
15	M-3	PACKAGE PUMPING STATION PLAN
16	M-4	PACKAGE PUMPING STATION SECTIONS AND DETAILS
17	M-5	SODIUM HYPOCHLORITE SCHEMATIC
STRUCTURAL		
18	S-1	STRUCTURAL NOTES
19	S-2	PACKAGE PUMPING STATION FOUNDATION PLAN
20	S-3	PACKAGE PUMPING STATION FOUNDATION SECTIONS
21	S-4	GENERATOR PLAN AND SECTIONS
22	S-5	GENERATOR DETAILS
ARCHITECTURAL		
23	A-1	PACKAGE PUMPING STATION PLANS AND CODE SUMMARY
24	A-2	PACKAGE PUMPING STATION ELEVATIONS AND SECTIONS
25	A-3	PACKAGE PUMPING STATION SCHEDULES AND DETAILS
26	A-4	PACKAGE PUMPING STATION DETAILS
HVAC		
27	H-1	SCHEDULES AND DETAILS
28	H-2	PACKAGE PUMPING STATION PLAN
PLUMBING		
29	P-1	SCHEDULES AND DETAILS
30	P-2	PACKAGE PUMPING STATION PLAN
ELECTRICAL		
31	E-1	LEGEND AND SYMBOLS
32	E-2	ONE-LINE AND ELEVATION DIAGRAMS
33	E-3	PACKAGE PUMPING STATION CONTROL SCHEMATICS
34	E-4	PACKAGE PUMPING STATION ELEMENTARY CONTROL SCHEMATICS
35	E-5	SCHEDULES
36	E-6	SCHEDULES
37	E-7	SITE PLAN
38	E-8	PACKAGE PUMPING STATION PLAN
39	E-9	PACKAGE PUMPING STATION LIGHTING & RECEPTACLE PLAN
40	E-10	GENERATOR PLAN
41	E-11	ELECTRICAL DETAILS
INSTRUMENTATION		
42	I-1	LEGEND AND SYMBOLS
43	I-2	PACKAGE PUMPING STATION PROCESS DIAGRAM
44	I-3	SODIUM HYPOCHLORITE FEED SYSTEM DIAGRAM
STANDARD DETAILS		
45	D-1	SHEET 1
46	D-2	SHEET 2

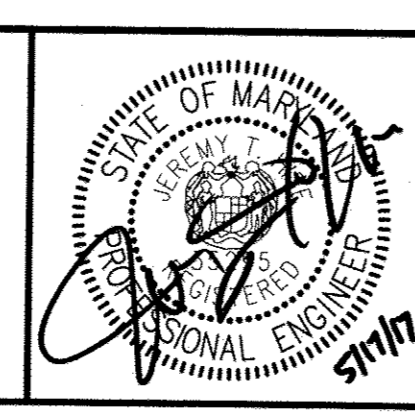
QUANTITIES				
ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
PUMP STATION	EA	1		
GENERATOR	EA	1		
GRINDER PUMP STATION	EA	1		
YARD PIPING				
1.5" SDR21 PVC (LPS)	LF	660		
20" CLASS 54 DIP	LF	50		
20" C905 PVC	LF	30		
16" CLASS 54 DIP	LF	210		
16" C905 PVC	LF	1770		
12" CLASS 54 DIP	LF	8		
FIRE HYDRANT	EA	3		
16" GATE VALVE	EA	7		
12" TAPPING VALVE	EA	3		
6" VALVE	EA	3		
ARV FOR LPS	EA	1		
ARV MANHOLE FOR LPS	EA	1		
GRINDER VALVE	EA	1		
ARV FOR WATER LINE	EA	1		
ARV MANHOLE FOR WATER LINE	EA	1		
NAME OF UTILITY CONTRACTOR:				
AS-BUILT DATE		CHECKBOX		

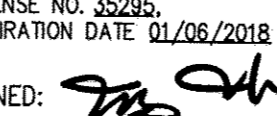
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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
DIRECTOR OF PUBLIC WORKS  DATE: 6/5/17	CHIEF BUREAU OF UTILITIES  DATE: 6/11/17
CHIEF BUREAU OF UTILITIES DATE: 6/11/17	

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 55295
EXPIRATION DATE: 01/08/2018
SIGNED: 

DESIGNED: JTH	CHECKED: JCS	PROJ. ENGR: JTH
DRAWN: MRB		
APPROVED: JTH		

COVER PAGE, GENERAL NOTES, INDEX

600' SCALE MAP: 47 BLOCK NO.: 20

**WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT**

**CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947**

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: G-1
SCALE: AS SHOWN
SHEET 1 OF 46

ABBREVIATIONS

PIPE DESIGNATIONS

LEGEND

Table of abbreviations including categories like FABRICATE, NORTH, TREAD, and various material and equipment codes.

Table of pipe designations including materials like AIR, ASPHALT PAVING, SAND, CONCRETE, BRICK, and equipment ratings like WEST/WIDTH, WATER CLOSET, WIDE FLANGE.

Legend table with columns for MATERIALS (e.g., GRADE OR EARTH, ROCK, STEEL) and SYMBOLS (e.g., GATE VALVE, SLUICE GATE, BUTTERFLY VALVE).

EQUIPMENT / RATINGS

Table of equipment and ratings including AMP, AIR RELEASE, AUTOMATIC TRANSFER SWITCH, and various electrical and mechanical symbols.

LINETYPES

Table of linetypes including PROPOSED ITEMS, EXISTING ITEMS, HIDDEN ITEMS, DEMOLITION ITEMS, CENTER LINE, MATCH LINE, and various utility lines like WATER MAIN, SEWER, STORM DRAIN.

SECTION AND DETAIL KEYING

Text explaining drawing keying methods: (A) SECTION CUT ON DRAWING A3 IS IDENTIFIED AS FOLLOWS; (B) THE SECTION SHOWN ON DRAWING A6 IS IDENTIFIED AS FOLLOWS. Includes diagrams for section letters and detail numbers.

Project information footer including Department of Public Works, Hazen logo, professional certification, project name (Whiskey Bottom Road Water Pumping Station Replacement), contract details, and drawing number (G-2).

WATER NOTES:

1. ALL WATER MAINS SHALL BE D.I.P. CLASS 54, UNLESS OTHERWISE NOTED.
2. TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 4' 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 HYDRANTS 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 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. THIS NOTE SHALL BE APPLICABLE FOR AWWA STANDARD C905 PIPE AS WELL.
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 HARNESSSES. 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.
11. ALL CHANGES IN HORIZONTAL OR VERTICAL DIRECTION OF PVC WATER PIPE SHALL BE MADE WITH STANDARD BENDS, 5-DEGREE SWEEPS OR HIGH DEFLECTION (HD) COUPLINGS. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE HIGH DEFLECTION COUPLINGS OR 5-DEGREE SWEEPS ARE PERMITTED, THE CONTRACTOR SHALL PROVIDE ONE FULL PIPE LENGTH (20-FOOT LONG) ON EITHER SIDE OF THE HIGH DEFLECTION COUPLING OR 5-DEGREE SWEEP. THE CONTRACTOR SHALL USE A VIBRATORY PLATE COMPACTOR OR OTHER APPROVED MEANS TO THOROUGHLY COMPACT THE #57 STONE ON BOTH SIDES OF THE HIGH DEFLECTION COUPLING OR 5-DEGREE SWEEP, TAKING CARE NOT TO USE COMPACTION EQUIPMENT DIRECTLY OVER THE FITTING.

PVC HIGH DEFLECTION COUPLINGS SHALL BE LIMITED TO A TOTAL DEFLECTION OF 3-DEGREES (1½-DEGREE ON EITHER END OF THE COUPLING), SHALL BE RATED FOR A MINIMUM 200 PSI MEETING THE REQUIREMENTS OF AWWA C900, SHALL HAVE A MINIMUM LAY LENGTH OF 9-INCHES AND SHALL HAVE CENTER STOPS. PVC HIGH DEFLECTION COUPLINGS SHALL BE CERTAINTIED PVC HIGH DEFLECTION (HD) STOP COUPLINGS, OR EQUAL.

FIVE DEGREE SWEEPS SHALL BE BELL BY SPIGOT, RATED FOR A MINIMUM 225 PSI, DR18 MEETING THE REQUIREMENTS OF AWWA C900 AND SHALL BE MULTI FITTINGS (IPEX) BLUE BRUTE DR18, OR EQUAL.

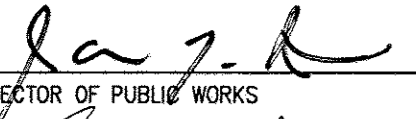
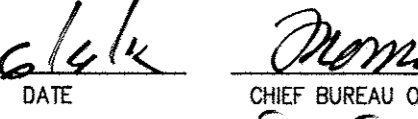


THIS NOTE SHALL BE APPLICABLE FOR AWWA STANDARD C905 PIPE AS WELL.
12. WHEN PVC HIGH DEFLECTION COUPLINGS OR PVC 5-DEGREE SWEEPS ARE USED TO FACILITATE CHANGES IN HORIZONTAL OR VERTICAL ALIGNMENTS OF AWWA C-900 PVC PIPELINES, THE CONTRACTOR SHALL INSTALL DEVICES FOR THE PREVENTION OF OVER-INSERTION OF THE PVC PIPE SPIGOTS OR PLAIN ENDS INTO THE PUSH ON BELL JOINT ON BOTH SIDES OF THE HIGH DEFLECTION COUPLINGS AND 5 DEGREE SWEEPS. BELL STOPS SHALL BE PLACED AT THE PROPER INSERTION LINE FOR THE FITTING. THE BELL STOP SHALL BE MANUFACTURED OF DUCTILE IRON AND INCORPORATE AN EXPANSION RETENTION SPRING TO ALLOW FOR PIPE EXPANSION AND CONTRACTION. THE BELL STOPS SHALL BE SERIES 5000 MEGA-STOP, AS MANUFACTURED BY EBAA IRON, INC. OR APPROVED EQUAL. THIS NOTE SHALL BE APPLICABLE FOR AWWA STANDARD C905 PIPE AS WELL.
13. IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION (AWWA) C651-14, NEW WATER MAINS SHALL BE DISINFECTED BEFORE THEY ARE PLACED IN SERVICE.

SEWER NOTES:

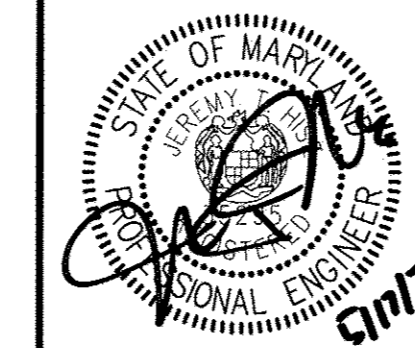
1. ALL SEWER MAINS SHALL BE D.I.P. OR P.V.C. UNLESS OTHERWISE NOTED.
2. ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
3. FORCE MAINS SHALL BE D.I.P. UNLESS OTHERWISE NOTED.
4. MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
5. MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL G5.52, WHERE WATERTIGHT MANHOLE FRAMES AND COVERS ARE USED, SET TOP OF FRAME 1'-8" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
6. HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT THE CELLAR CANNOT BE SERVED.
7. LPS PIPE SHALL BE 1.5" IN DIAMETER AND PVC SDR 21.
8. EARLY WARNING METALLIC DETECTION TAPE 8" BELOW GRADE (MIN).
9. THERE SHALL BE TRACER WIRE, TEST STATIONS AND FLUSHING CONNECTIONS EVERY 400 FEET (STANDARD DETAIL G-8.21).
10. REFER TO HOWARD COUNTY GRINDER PUMP DETAILS FOR CLEAN OUT AND SERVICE VALVE. GRINDER PUMP SHALL BE SIMPLEX.


Images: 31220-TB
XREFs: 31220-TB

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

		6/5/17
DIRECTOR OF PUBLIC WORKS	CHIEF BUREAU OF ENGINEERING	DATE
		6/11/17
CHIEF BUREAU OF UTILITIES	CHIEF UTILITY DESIGN DIVISION	DATE

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202
410-538-7681



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. 35295, EXPIRATION DATE 01/06/2018.
SIGNED: 

DESIGNED _____ JTH
DRAWN _____ MRB
CHECKED _____ JCS
PROJ. ENGR. _____ JTH
APPROVED _____
NO. _____

NO.	REVISION	DATE	BY

WATER AND SEWER NOTES

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

DATE APRIL 2017
DRAWING NUMBER G-3
SCALE NO SCALE
SHEET 3 OF 46

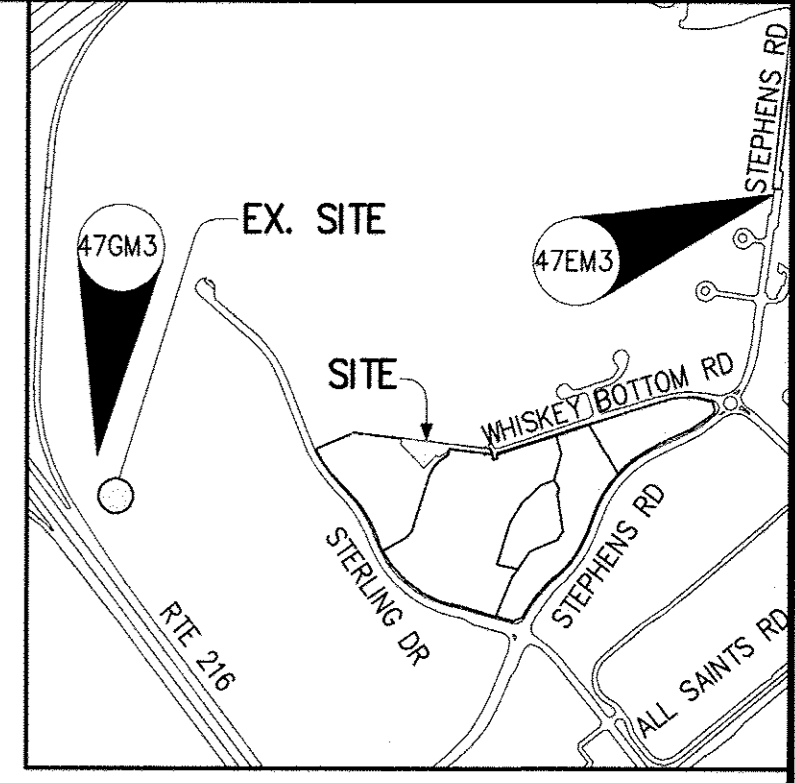
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VALVE #	SIZE	EXISTING	PROPOSED
1	8"	N.O.	ABANDONED
2 (D.V.)	12"	N.C.	ABANDONED
3	12"	N.O.	ABANDONED
4	12"	N.O.	N.O.
5	12"	N.O.	N.O.
6	12"	N.O.	N.O.
7	6"	N.C.	ABANDONED
8	12"	N.O.	N.O.
9	12"	N.C.	N.C.
10	8"	N.O.	N.O.
11	12"	N.O.	N.O.
12	12"	N.O.	N.O.
13 (D.V.)	12"	N.C.	N.C.
14	12"	N.O.	N.O.
15	12"	N.O.	N.O.

VALVE #	SIZE	EXISTING	PROPOSED
16 (D.V.)	12"	-	N.C.
17	12"	-	N.O.
18	12"	-	N.C.
19	16"	-	N.O.
20	16"	-	N.O.
21	16"	-	N.O.
22	16"	-	N.O.
23	16"	-	N.O.
24	12"	-	N.O.
25	6"	-	N.O.
26	6"	-	N.O.
27	12"	-	N.O.

NOTES:

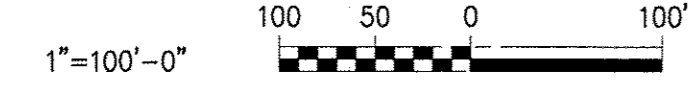
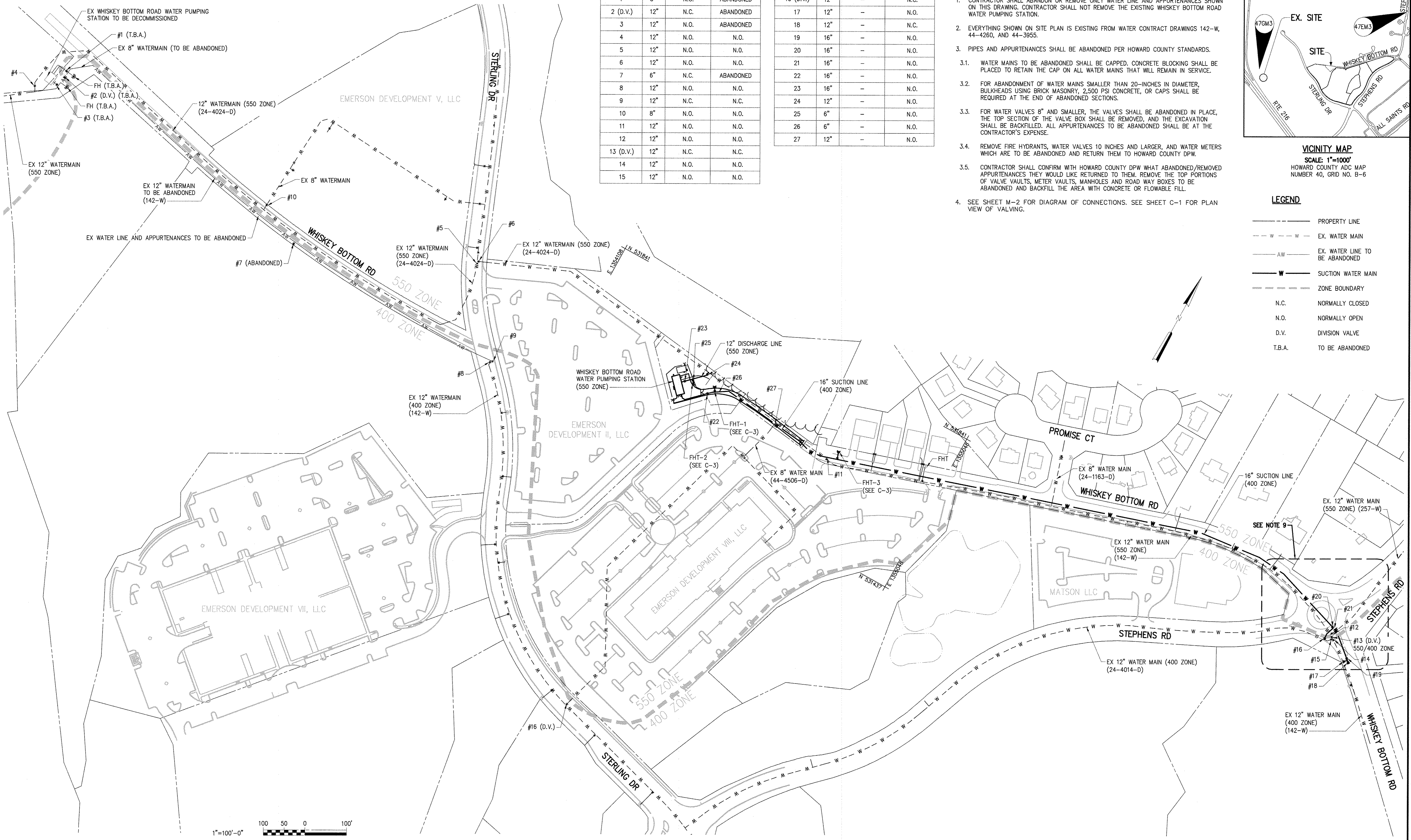
- CONTRACTOR SHALL ABANDON OR REMOVE ONLY WATER LINE AND APPURTENANCES SHOWN ON THIS DRAWING. CONTRACTOR SHALL NOT REMOVE THE EXISTING WHISKEY BOTTOM ROAD WATER PUMPING STATION.
- EVERYTHING SHOWN ON SITE PLAN IS EXISTING FROM WATER CONTRACT DRAWINGS 142-W, 44-4260, AND 44-3955.
- PIPES AND APPURTENANCES SHALL BE ABANDONED PER HOWARD COUNTY STANDARDS.
 - WATER MAINS TO BE ABANDONED SHALL BE CAPPED, CONCRETE BLOCKING SHALL BE PLACED TO RETAIN THE CAP ON ALL WATER MAINS THAT WILL REMAIN IN SERVICE.
 - FOR ABANDONMENT OF WATER MAINS SMALLER THAN 20-INCHES IN DIAMETER, BULKHEADS USING BRICK MASONRY, 2,500 PSI CONCRETE, OR CAPS SHALL BE REQUIRED AT THE END OF ABANDONED SECTIONS.
 - FOR WATER VALVES 8" AND SMALLER, THE VALVES SHALL BE ABANDONED IN PLACE, THE TOP SECTION OF THE VALVE BOX SHALL BE REMOVED, AND THE EXCAVATION SHALL BE BACKFILLED. ALL APPURTENANCES TO BE ABANDONED SHALL BE AT THE CONTRACTOR'S EXPENSE.
 - REMOVE FIRE HYDRANTS, WATER VALVES 10 INCHES AND LARGER, AND WATER METERS WHICH ARE TO BE ABANDONED AND RETURN THEM TO HOWARD COUNTY DPW.
 - CONTRACTOR SHALL CONFIRM WITH HOWARD COUNTY DPW WHAT ABANDONED/REMOVED APPURTENANCES THEY WOULD LIKE RETURNED TO THEM. REMOVE THE TOP PORTIONS OF VALVE VAULTS, METER VAULTS, MANHOLES AND ROAD WAY BOXES TO BE ABANDONED AND BACKFILL THE AREA WITH CONCRETE OR FLOWABLE FILL.
- SEE SHEET M-2 FOR DIAGRAM OF CONNECTIONS. SEE SHEET C-1 FOR PLAN VIEW OF VALVING.



VICINITY MAP
SCALE: 1"=1000'
HOWARD COUNTY ADC MAP
NUMBER 40, GRID NO. B-6

LEGEND

- PROPERTY LINE
- - - w - - - EX. WATER MAIN
- - - AW - - - EX. WATER LINE TO BE ABANDONED
- - - W - - - SUCTION WATER MAIN
- - - ZONE BOUNDARY
- N.C. NORMALLY CLOSED
- N.O. NORMALLY OPEN
- D.V. DIVISION VALVE
- T.B.A. TO BE ABANDONED



IMAGE# = 31220-TB, 31220-001, SP-PROP, 31220-001, SP-ROAD-HATCH, 31220-001, SP-SBORD, 31220-001, SP-S1, 31220-001, SP-IP, 31220-001, SP-CN, 31220-001, SP-05-ZONES

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Thomas P. Butler 6/5/17
DIRECTOR OF PUBLIC WORKS DATE

Thomas P. Butler 6/5/17
CHIEF BUREAU OF ENGINEERING DATE

Thomas P. Butler 6/5/17
CHIEF BUREAU OF UTILITIES DATE

Thomas P. Butler 6/5/17
CHIEF UTILITY DESIGN DIVISION DATE

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-538-7881

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. 35285
EXPIRATION DATE 01/08/2018
SIGNED: *[Signature]* 5/17

DESIGNED	JTH				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED	JTH				

OVERALL PLAN
PRESSURE ZONE BOUNDARY AND VALVE
LOCATION/POSITION MAP
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

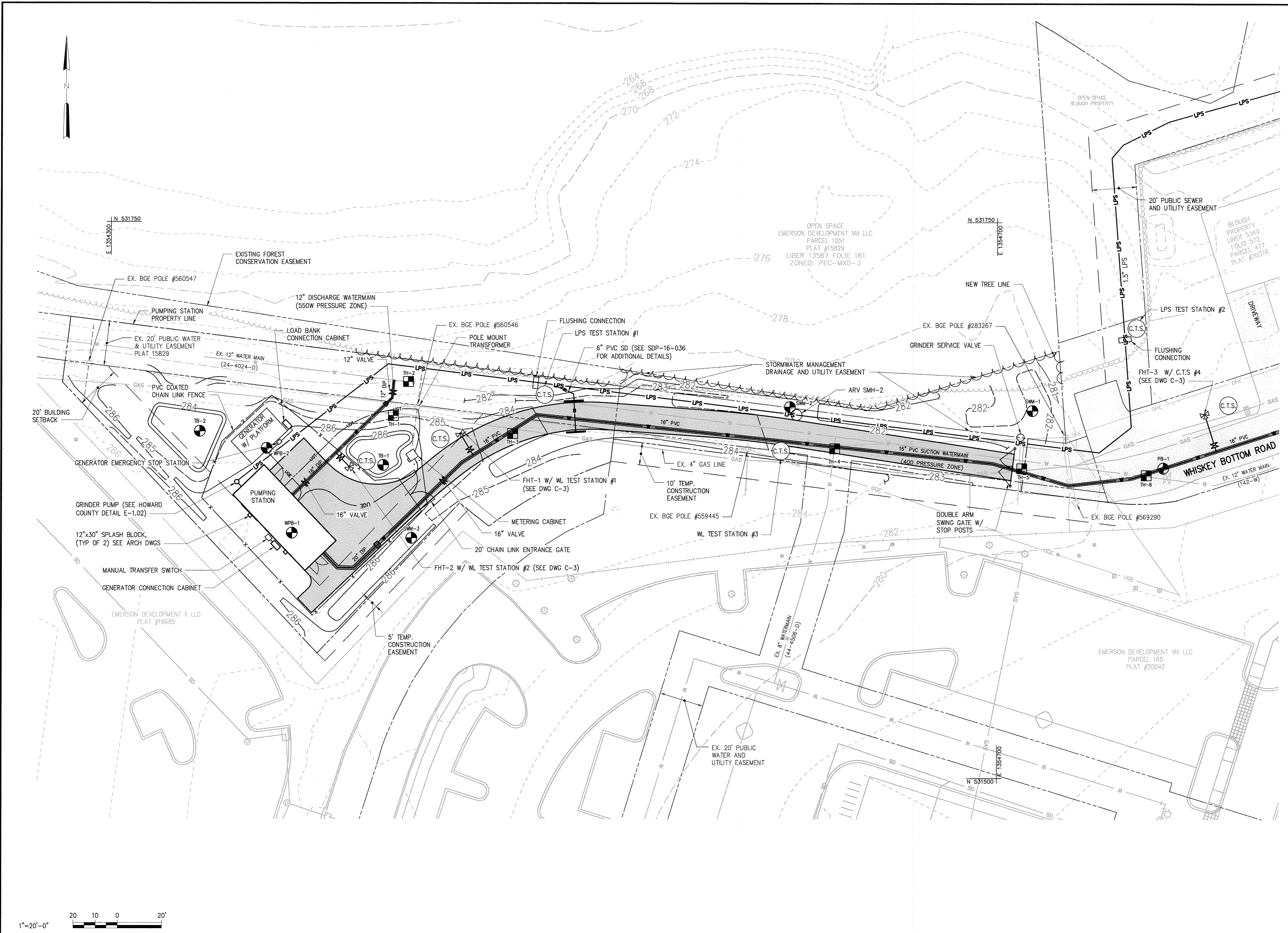
DATE: APRIL 2017
DRAWING NUMBER: G-4
SCALE: 1"=100'-0"
SHEET 4 OF 46

NOTES:

- REFER TO SDP-16-036 DRAWING SET FOR PAVING, GRADING, STORM DRAINS, STORMWATER MANAGEMENT, EROSION/SEDIMENT CONTROL, LANDSCAPING AND CIVIL DETAILS.
- STEEL PIPING INSIDE PUMP STATION TRANSITIONS TO DIP THEN PVC C905 PIPE IN THE YARD FOR THE SUCTION LINE. STEEL PIPE TRANSITIONS TO DIP FOR THE DISCHARGE LINE.
- DOUBLE ARM SWING GATE SHALL BE INSTALLED PER VOLUME II SECTION 7.8.A.14. SIGN SHALL BE PROVIDED TO THE CONTRACTOR FOR MOUNTING. SEE SDP PLANS FOR DETAILS.
- METERING CABINET AND TRANSFORMER SHALL BE MOUNTED ON PADS THAT COMPLY WITH BGE REQUIREMENTS.
- SEE SDP-16-036 FOR GRADING.

LEGEND

- EX. PROPERTY LINE
- EASEMENT/BUILDING SETBACK
- EX. EDGE OF PAVEMENT
- EX. BUILDING
- 12" WATER DISCHARGE LINE
- 16" WATER SUCTION LINE
- 6" SD PIPE
- LOW PRESSURE SEWER
- EDGE OF PAVEMENT
- BUILDING
- FENCE
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- EXISTING PAVEMENT
- PAVEMENT
- TEST STATION
- FLUSHING CONNECTION
- BOLLARDS

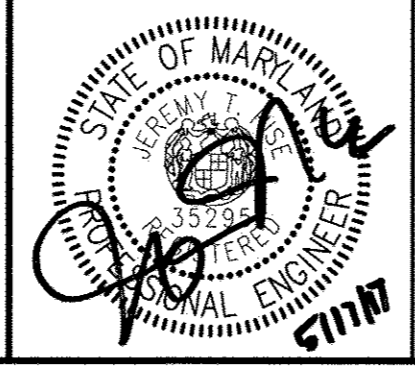


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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* DATE: 6/5/17
 Chief Bureau of Engineering: *[Signature]* DATE: 6/5/17
 Chief Bureau of Utilities: *[Signature]* DATE: 6/5/17
 Chief Utility Design Division: *[Signature]* DATE: 6/5/17

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



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. 35285, EXPIRATION DATE 01/08/2018.
SIGNED: *[Signature]*

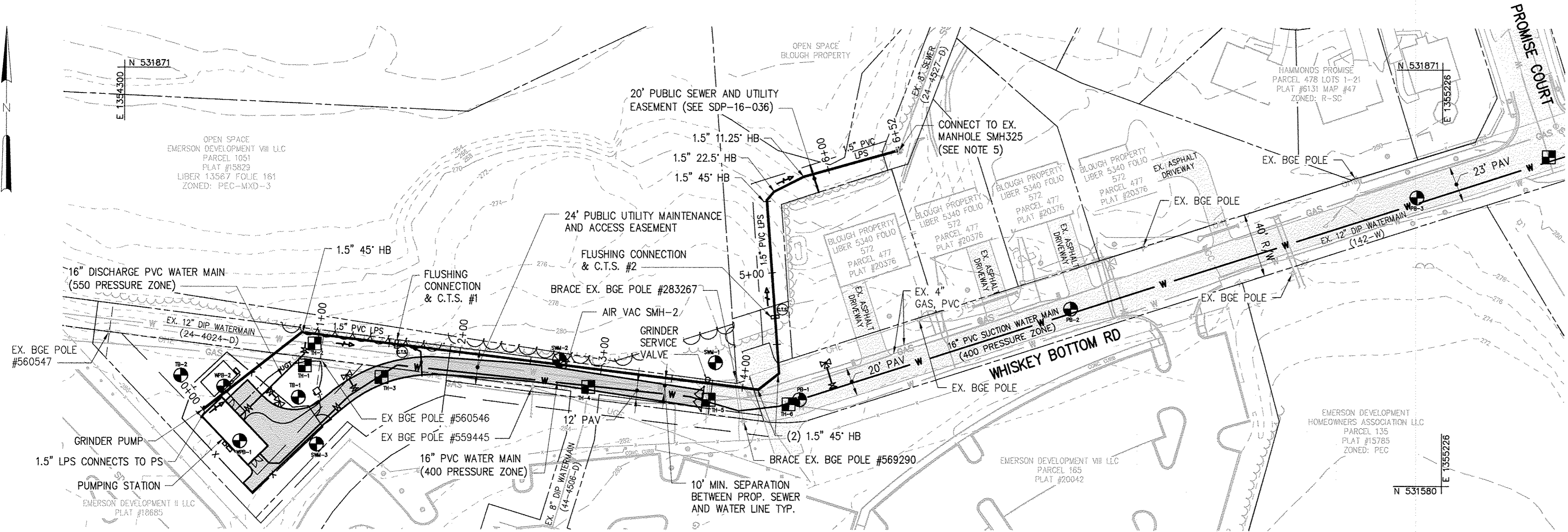
DESIGNED	DMW				
DRAWN	DMW				
CHECKED	JCS				
PROJ. ENGR.	JTH				
JTH APPROVED					

CIVIL
WATER PUMPING STATION AND ACCESS ROAD
UTILITY PLAN

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	C-1
SCALE	1"=20'-0"
SHEET	5 OF 46

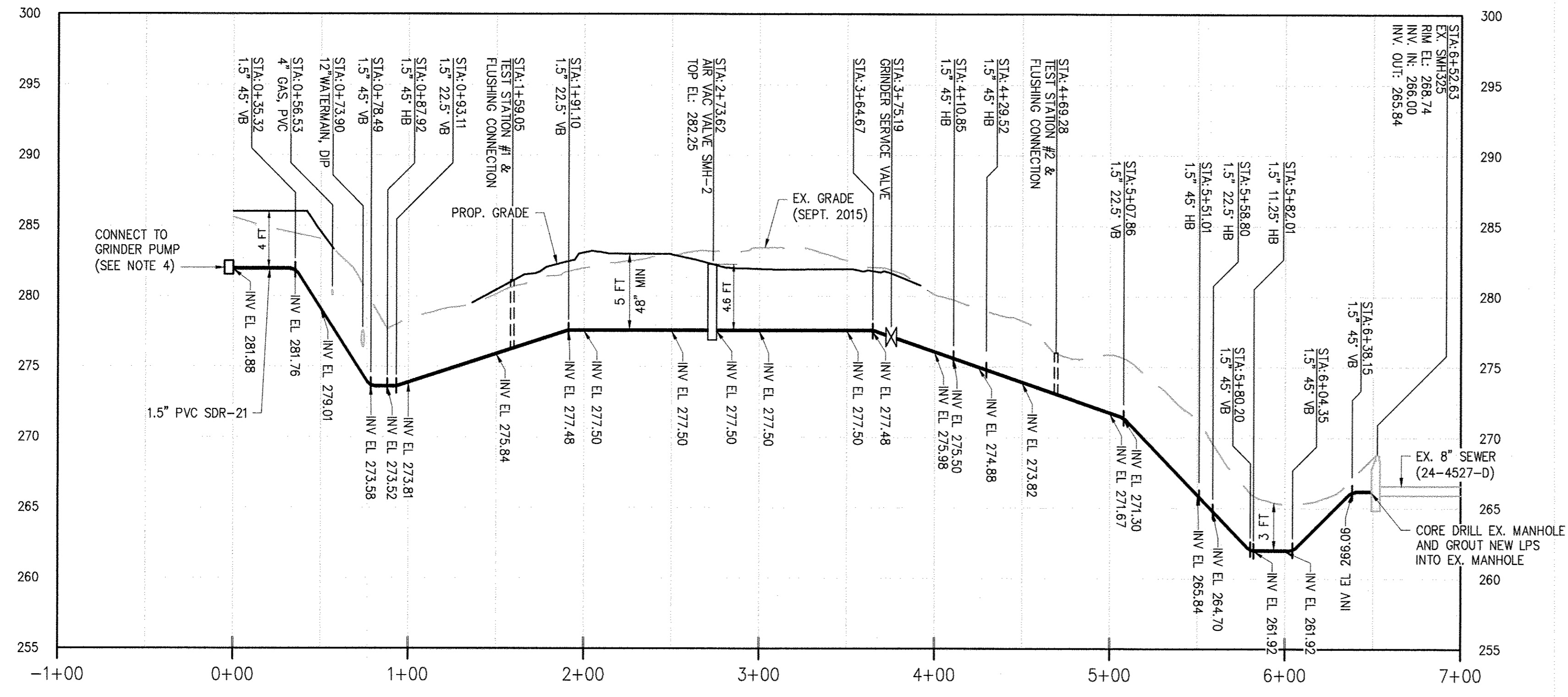
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1.5" LOW PRESSURE SEWER PLAN - STA 0+00 TO 6+60

1"=50'

LOW PRESSURE SEWER STAKE-OUT TABLE			
STATION	DESCRIPTION	NORTH	EAST
0+88	1.5" 45" H.B.	531686.25	1354425.03
1+59	TEST STATION #1/FLUSHING CONNECTION	531678.05	1354491.58
2+74	AIR VAC VALVE SMH-2	531663.52	1354609.33
3+75	GRINDER SERVICE VALVE	531651.09	1354710.12
4+11	1.5" 45" H.B.	531646.69	1354745.86
4+30	1.5" 45" H.B.	531658.03	1354760.39
4+69	TEST STATION #2/FLUSHING CONNECTION	531697.57	1354757.47
5+51	1.5" 45" H.B.	531779.19	1354751.45
5+59	1.5" 22.5" H.B.	531785.09	1354756.54
5+82	1.5" 11.25" H.B.	531795.53	1354777.28



1.5" LOW PRESSURE SEWER PROFILE - STA 0+00 TO 6+60

H: 1"=50' V: 1"=5'



- NOTES:**
- LPS PIPE SHALL BE 1.5 INCH IN DIAMETER AND PVC SDR 21.
 - EARLY WARNING METALLIC DETECTION TAPE SHALL BE PLACED 8 INCHES BELOW GRADE (MIN.) ALONG ENTIRE ALIGNMENT.
 - CONTRACTOR SHALL INSTALL TRACER WIRE, TEST STATIONS, AND FLUSHING CONNECTIONS EVERY 400 FEET (STANDARD DETAILS G-8.21 & E-1.03).
 - REFER TO HOWARD COUNTY GRINDER PUMP DETAILS E-1.01 & E-1.02 FOR CLEAN OUT AND SERVICE VALVE. GRINDER PUMP SHALL BE SIMPLEX.
 - CONTRACTOR SHALL CORE EXISTING MANHOLE AND PROVIDE GASKET IN ACCORDANCE WITH HOWARD COUNTY STANDARDS.
 - REFER TO HOWARD COUNTY STANDARD DETAILS S-4.14 AND S-4.15 FOR TRANSITION MANHOLE.
 - REFER TO HOWARD COUNTY STANDARD DETAIL S-4.07 FOR AIR RELEASE VALVE.
 - SEE SDP-16-036 FOR FINAL GRADING.
 - ➔ FLOW DIRECTION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. DeSantis
 DIRECTOR OF PUBLIC WORKS
 DATE: 6/5/17

Thomas R. Butler
 CHIEF BUREAU OF ENGINEERING
 DATE: 6/11/17

[Signature]
 CHIEF BUREAU OF UTILITIES
 DATE: 6/11/17

Hazen

HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-538-7681

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. 35296, EXPIRATION DATE 01/06/2018.

SIGNED: *[Signature]*

DESIGNED: AL

DRAWN: MRB

CHECKED: JCS

PROJ. ENGR: JTH

DATE: []

BY: []

NO. []

REVISION []

DATE []

CIVIL

LOW PRESSURE SEWER PLAN & PROFILE

600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947

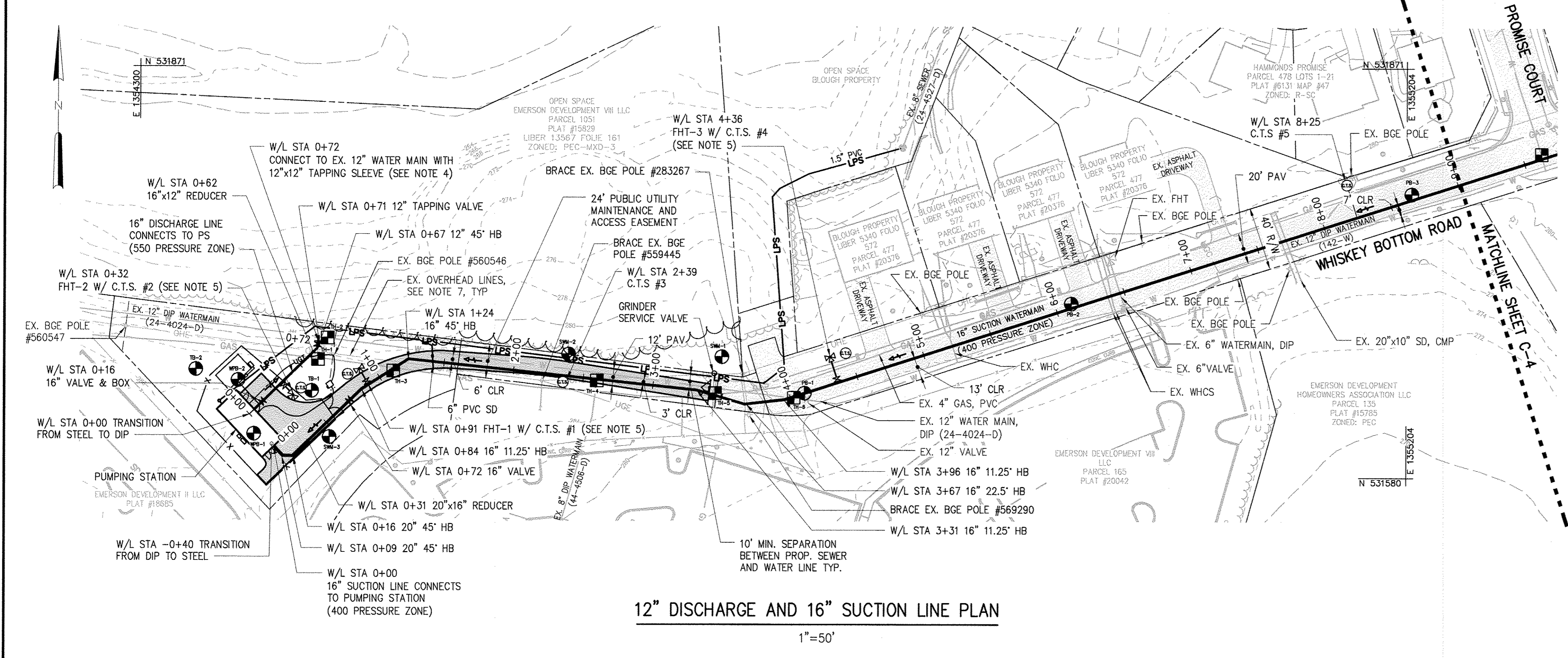
ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017

DRAWING NUMBER: C-2

SCALE: 1"=50'-0"

SHEET 6 OF 46

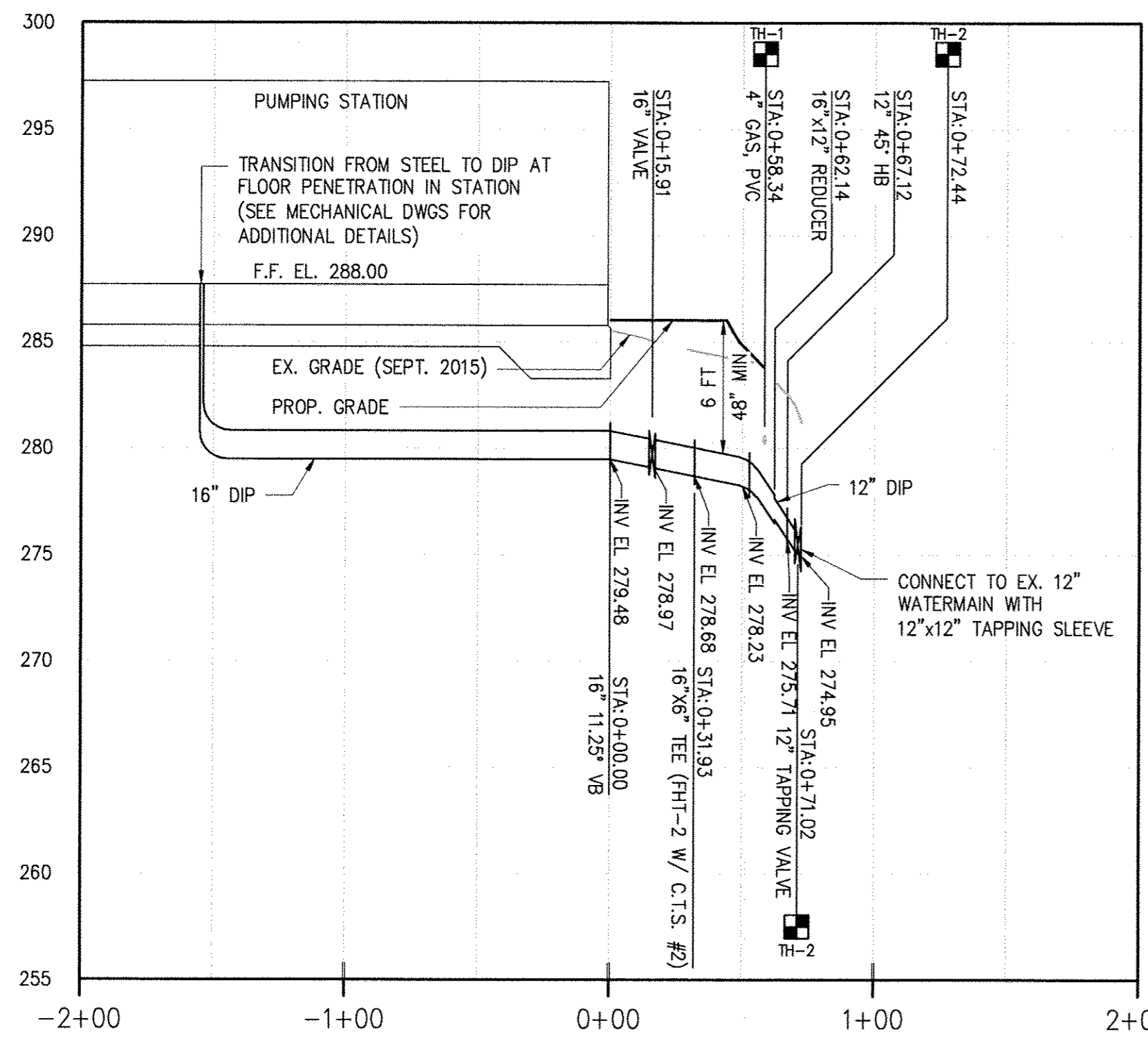


12" DISCHARGE AND 16" SUCTION LINE PLAN

1"=50'

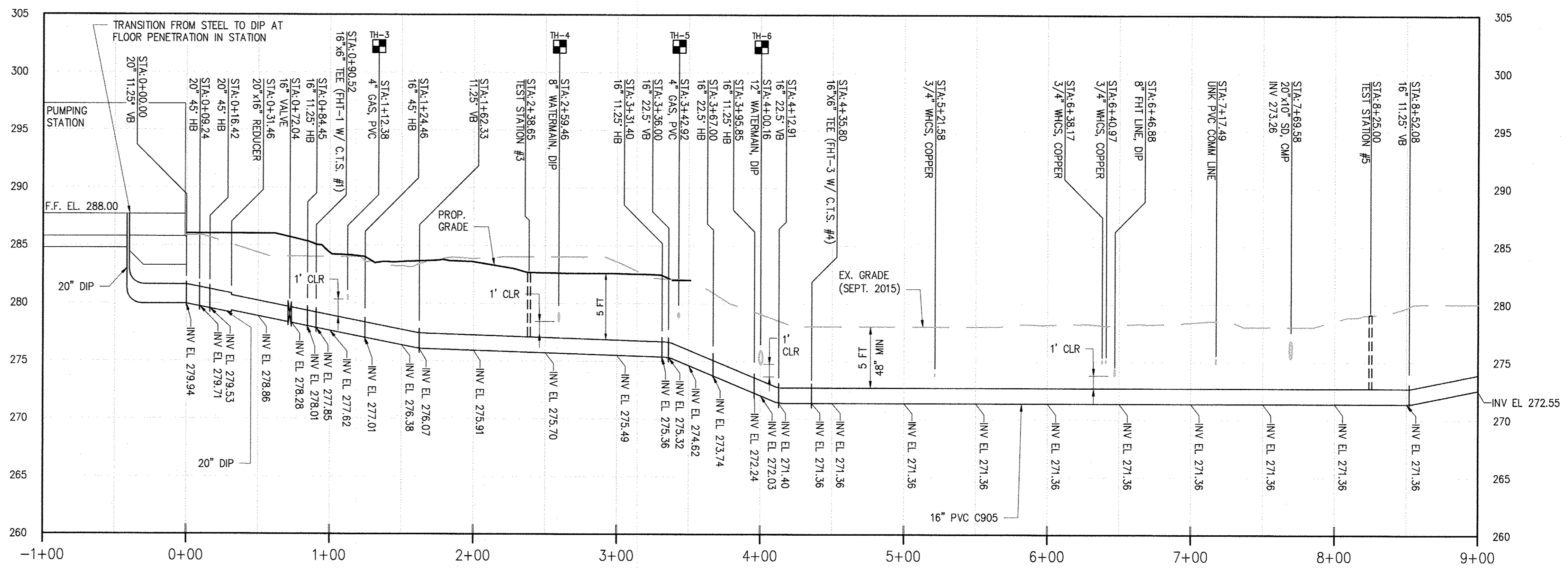
TEST HOLE DATA						
NUMBER	UTILITY	MATERIAL	DEPTH	STATION	LOCATION	
TH-1	4" GAS	PLASTIC	3.47'	25+00	N 531,662.98	E 1,354,427.36
TH-2	12" WATER MAIN	DUCTILE IRON	6.97'	62+60	N 531,678.33	E 1,354,434.17
TH-3	4" GAS	PLASTIC	4.03'	63+85	N 361,654.94	E 1,354,481.20
TH-4	8" WATER MAIN	DUCTILE IRON	5.90'	64+05	N 531,648.31	E 1,354,626.50
TH-5	4" GAS	PLASTIC	3.14'	64+18	N 531,639.49	E 1,354,710.99
TH-6	12" WATER MAIN	DUCTILE IRON	4.81'	64+61	N 531,636.39	E 1,354,767.19
TH-7	NO UTILITY FOUND	N/A	N/A	64+75	N 531,918.54	E 1,355,651.70
TH-8	3/4" WATER	COPPER	3.18'	64+91	N 531,932.99	E 1,355,837.79
TH-9	4" ELECTRIC & 12" WATER MAIN	PLASTIC & DUCTILE IRON	3.09' & 5.60'	64+98	N 531,905.59	E 1,355,924.05
TH-10	12" WATER MAIN	DUCTILE IRON	5.50'	71+10	N 531,843.28	E 1,356,062.17
TH-11	12" WATER MAIN	DUCTILE IRON	5.04'	72+19	N 531,822.60	E 1,355,941.46
TH-12	12" WATER MAIN	DUCTILE IRON	6.61'	72+85	N 531,839.69	E 1,356,029.39
TH-13	8" WATER MAIN	DUCTILE IRON	4.91'	72+85	N 531,810.46	E 1,355,300.65

- NOTES:
- EARLY WARNING METALLIC DETECTION TAPE SHALL BE INSTALLED 8 INCHES BELOW GRADE (MIN.) ALONG ENTIRE ALIGNMENT.
 - THERE SHALL BE TRACER WIRE AND TEST STATIONS EVERY 400 FEET (STANDARD DETAILS G-8.21 & E-1.03).
 - FOR TEST HOLE RESULTS, SEE CHART ON THIS SHEET.
 - CONTRACTOR SHALL PERFORM TEST PITS AT EXACT TIE-IN LOCATIONS AND SUBMIT DATA TO ENGINEER/COUNTY FOR REVIEW PRIOR TO INSTALLATION AND PROCUREMENT OF MATERIALS.
 - SEE SDP-16-036 FOR FINAL GRADING.
 - FLOW ARROW
 - CONTRACTOR SHALL BE AWARE OF OVERHEAD ELECTRIC LINES IN THE VICINITY OF THE PROPOSED WATER MAINS AND SHALL UTILIZE CONSTRUCTION EQUIPMENT THAT WILL NOT IMPACT THE OVERHEAD WIRES. EXTREME CAUTION SHALL BE USED DURING CONSTRUCTION.
 - FHT-1
W/L STA 0+91
BURY ELEV.: 284.05
BURY LENGTH: 5 FT FROM PR. GRADE
VALVE O/S 2.5' RT
FH O/S 13' RT
 - FHT-2
W/L STA 0+32
BURY ELEV.: 278.68
BURY LENGTH: 6 FT FROM PR. GRADE
VALVE O/S 2.5' RT
FH O/S 12' RT
 - FHT-3
W/L STA 4+36
BURY ELEV.: 277.40
BURY LENGTH: 5 FT FROM EX. GRADE
VALVE O/S 2.5' LT
FH O/S 19' LT



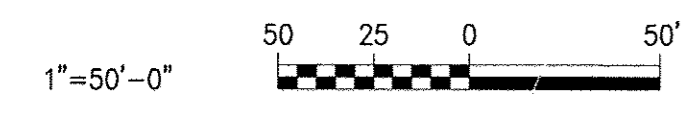
16" DISCHARGE LINE PROFILE - STA 0+00 TO 0+72

H: 1"=50' V: 1"=5'



16" SUCTION LINE PROFILE - STA 0+00 TO 9+00

H: 1"=50' V: 1"=5'



IMAGE# = 31220-TB, 31220-01 SP-30, 31220-01 SP-WATERLINE, 31220-01 SP-CH, 31220-01 SP-ESTHOLE, 31220-01 SP-CY, TORO
 REF# = 31220-TB, 31220-01 SP-30, 31220-01 SP-WATERLINE, 31220-01 SP-CH, 31220-01 SP-ESTHOLE, 31220-01 SP-CY, TORO
 NAME# = 31220-TB, 31220-01 SP-30, 31220-01 SP-WATERLINE, 31220-01 SP-CH, 31220-01 SP-ESTHOLE, 31220-01 SP-CY, TORO
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 6/5/17
DIRECTOR OF PUBLIC WORKS DATE

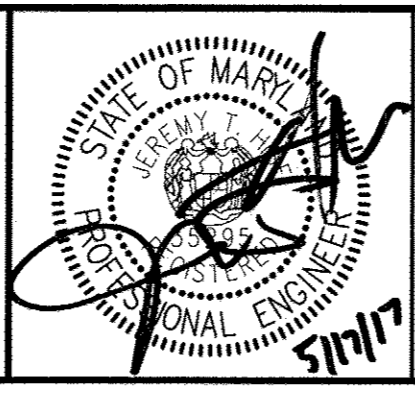
[Signature] 6/5/17
CHIEF BUREAU OF UTILITIES DATE

[Signature] 6/5/17
CHIEF OF ENGINEERING DATE

[Signature] 6/5/17
CHIEF UTILITY DESIGN DIVISION DATE

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



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. 36285, EXPIRATION DATE 01/08/2018.

SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	JTH

CIVIL

DISCHARGE AND SUCTION WATER LINE PROFILES

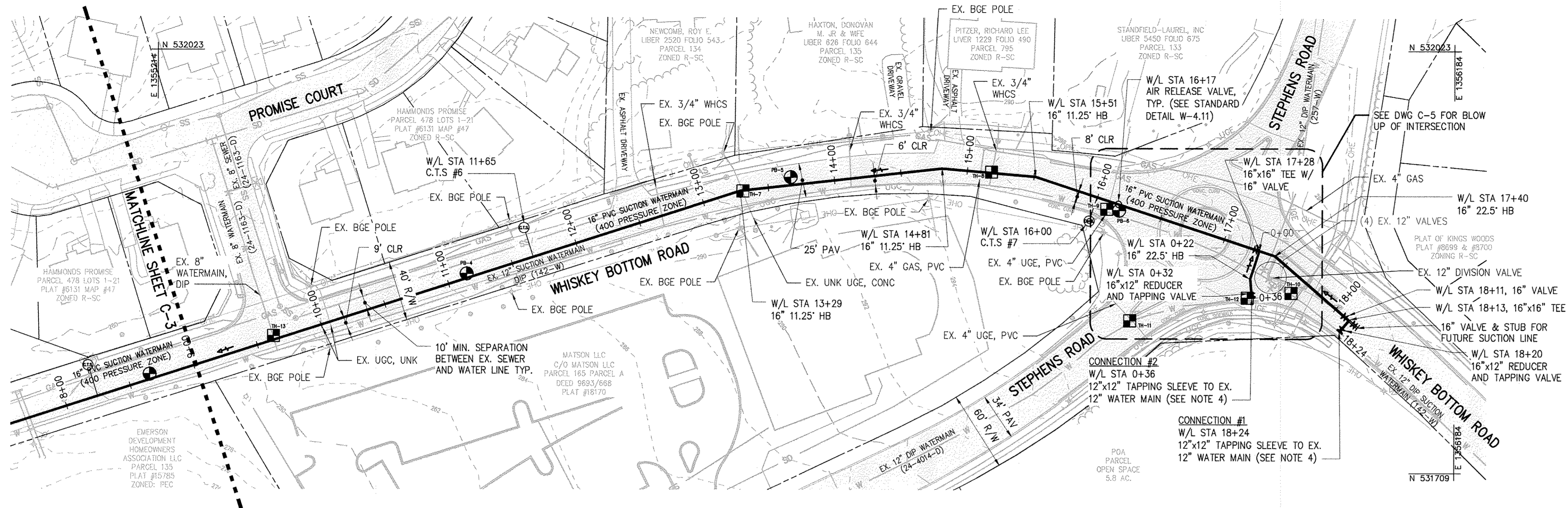
60' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: C-3
SCALE: 1"=50'-0"
SHEET 7 OF 46



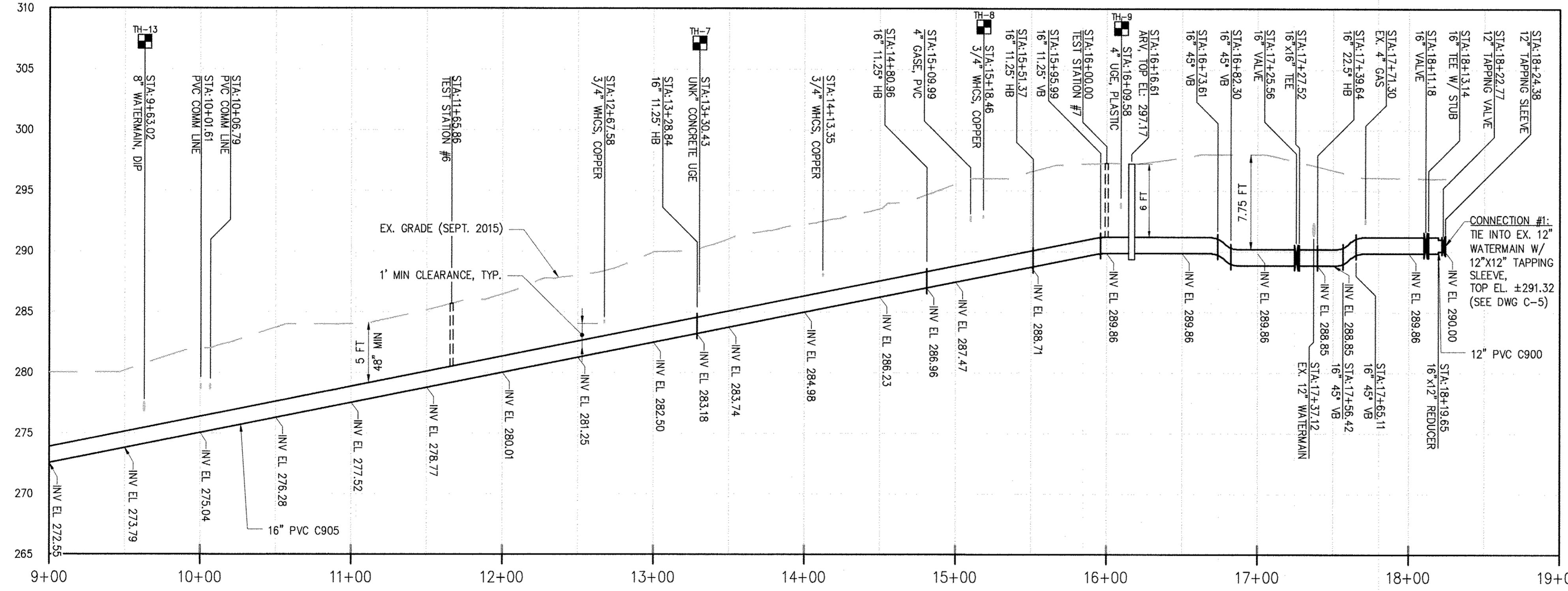
16" SUCTION LINE PLAN - STA 9+00 TO 17+92

1"=50'

NOTES:

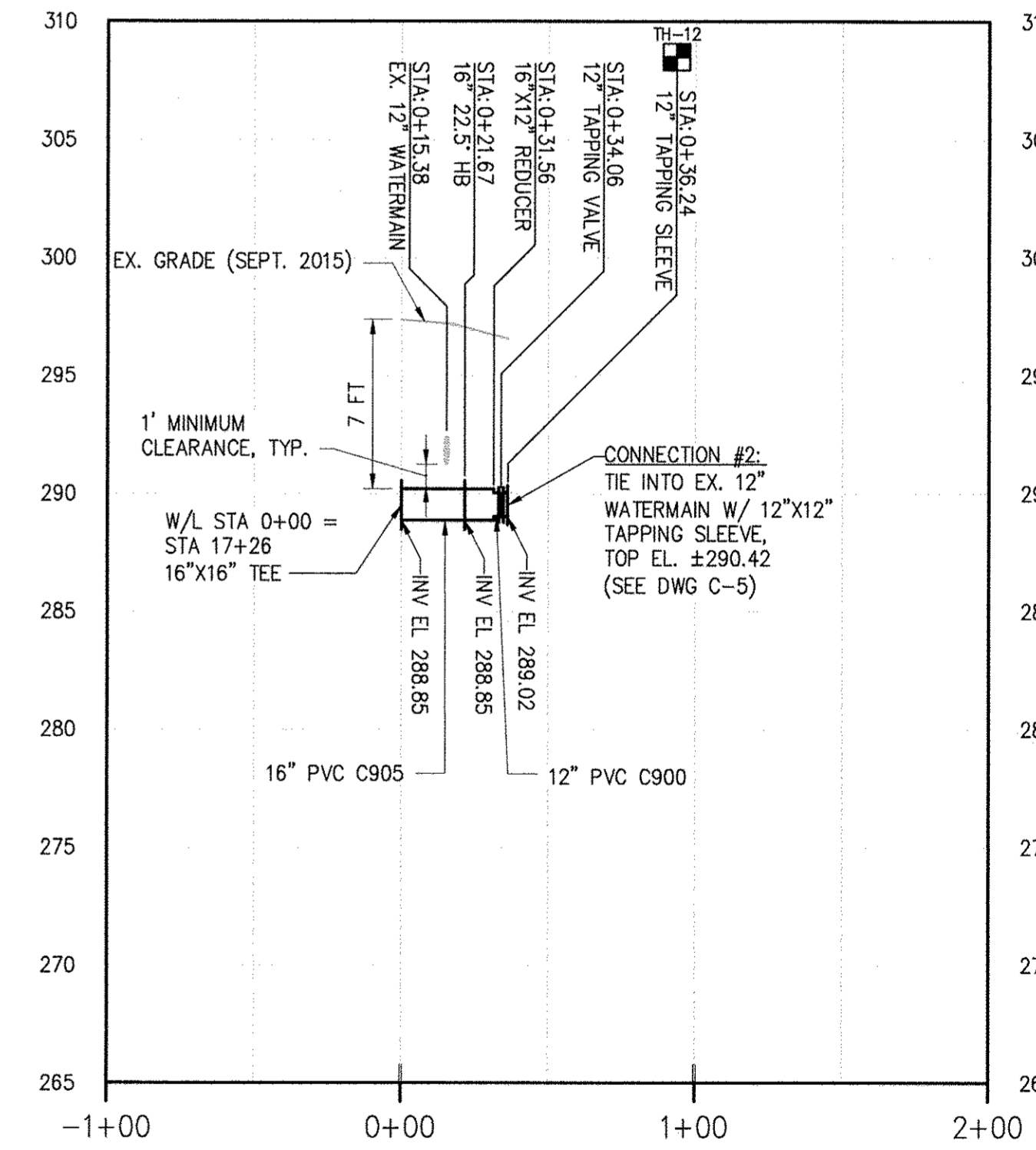
- EARLY WARNING METALLIC DETECTION TAPE SHALL BE INSTALLED 8 INCHES BELOW GRADE (MIN) ALONG ENTIRE ALIGNMENT.
- THERE SHALL BE TRACER WIRE AND TEST STATIONS EVERY 400 FEET (STANDARD DETAILS G-8.21 & E-1.03).
- FOR TEST HOLE RESULTS, SEE TABLE ON SHEET C-3.
- CONTRACTOR SHALL PERFORM TEST PITS AT EXACT TIE-IN LOCATIONS AND SUBMIT DATA TO ENGINEER/COUNTY FOR REVIEW PRIOR TO INSTALLATION AND PROCUREMENT OF MATERIALS.
- SEE SDP-16-036 FOR FINAL GRADING.
- ➔ FLOW ARROW

DISCHARGE WATER LINE STAKE-OUT TABLE			
STATION	DESCRIPTION	NORTH	EAST
0+16	16" VALVE	531633.02	1354387.70
0+32	16"x6" FHT (FHT-2)	531646.34	1354401.41
0+62	16"x12" REDUCER	531668.31	1354424.03
0+67	12" 45° H.B.	531671.05	1354426.84
0+71	12" TAPPING VALVE	531673.56	1354427.10
SUCTION WATER LINE #1 STAKE-OUT TABLE			
STA	DESCRIPTION	NORTH	EAST
0+09	20" 45° H.B.	531594.69	1354402.30
0+16	20" 45° H.B.	531594.53	1354409.49
0+31	20"x16" REDUCER	531605.04	1354420.27
0+72	16" VALVE	531633.84	1354449.97
0+84	16" 11.25" H.B.	531641.93	1354458.30
0+91	16" FHT (FHT-1)	531645.18	1354463.43
1+24	16" 45° H.B.	531663.37	1354492.07
2+39	TEST STATION #1	531651.69	1354602.99
3+31	16" 11.25" H.B.	531641.70	1354697.88
3+67	16" 22.5" H.B.	531631.85	1354732.09
3+95	16" 11.25" H.B.	531635.08	1354760.71
4+36	16" FHT (FHT-3)	531647.24	1354798.82
4+47	TEST STATION #2	531650.70	1354809.67
9+91	TEST STATION #3	531816.54	1355329.57
13+29	16" 11.25" H.B.	531918.63	1355649.63
13+67	TEST STATION #4	531922.68	1355685.70
14+81	16" 11.25" H.B.	531935.57	1355800.71
15+51	16" 11.25" H.B.	531929.61	1355870.86
16+17	AIR RELEASE VALVE	531909.29	1355932.86
17+26	16" VALVE	531875.62	1356035.58
17+28	16"x16" TEE	531874.71	1356038.34
17+40	16" 22.5" H.B.	531870.94	1356049.85
18+11	16" VALVE	531825.87	1356102.34
18+13	16"x16" TEE	531823.06	1356105.62
18+20	16"x12" REDUCER	531816.62	1356100.09
18+23	12" TAPPING VALVE	531815.64	1356099.25
SUCTION WATER LINE #2 STAKE-OUT TABLE			
STA	DESCRIPTION	NORTH	EAST
0+21	16" 22.5" H.B.	531854.12	1356031.58
0+31	16"x12" REDUCER	531842.34	1356032.48
0+34	12" TAPPING VALVE	531841.06	1356032.58



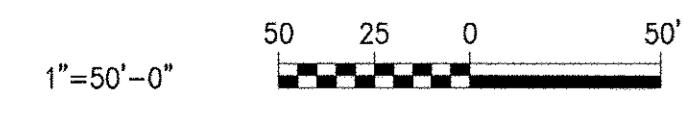
16" SUCTION LINE TO CONNECTION #1 PROFILE - STA 9+00 TO END

H: 1"=50' V: 1"=5'



16" SUCTION LINE CONNECTION #2 PROFILE - STA 0+00 TO END

H: 1"=50' V: 1"=5'



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

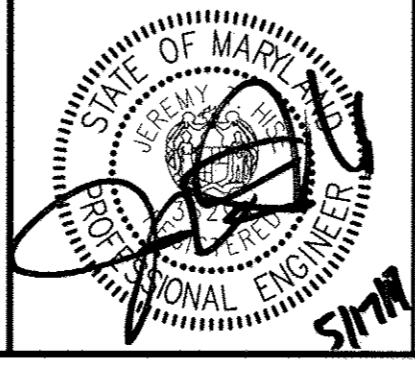
James M. Clark DATE: 6/5/17
DIRECTOR OF PUBLIC WORKS

Thomas E. Suttler DATE: 6/5/17
CHIEF BUREAU OF ENGINEERING

David S. King DATE: 6/5/17
CHIEF BUREAU OF UTILITIES

David S. King DATE: 6/5/17
CHIEF UTILITY DESIGN DIVISION

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1100, BALTIMORE, MD 21202
410-639-7681



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. 15174, EXPIRATION DATE: 01/06/2018.

DESIGNED: AL
DRAWN: MRB
CHECKED: JCS
PROJ. ENGR.: JTH
APPROVED: JTH

NO.	REVISION	DATE	BY

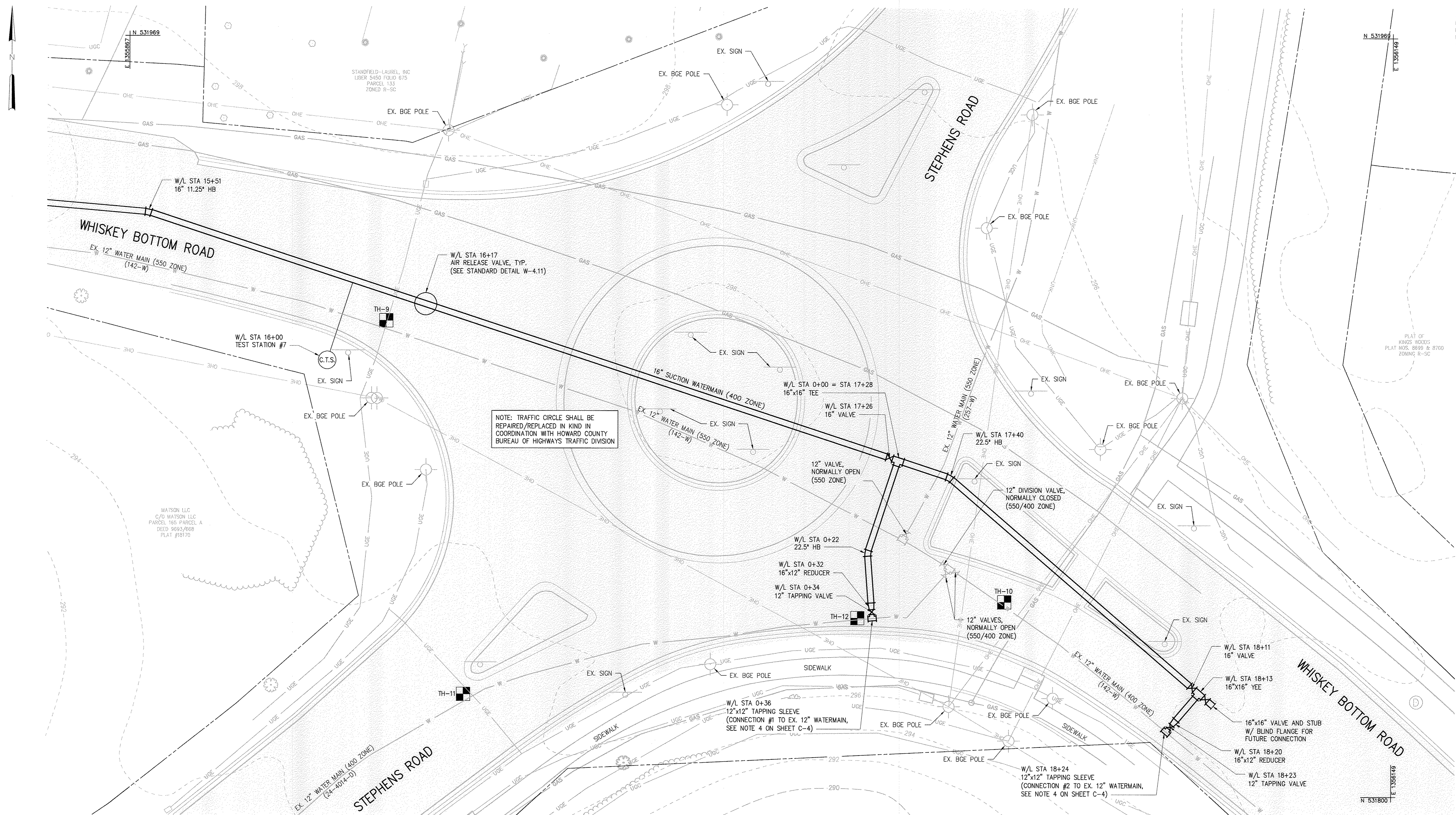
CIVIL
SUCTION WATER LINE PROFILE CONTINUED

600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: C-4
SCALE: 1"=50'-0"
SHEET 8 OF 46

31220-01 SP-CY-TOPO 31220-01 SP-WATERLINE, 31220-01 SP-TESTHOLE, 31220-01 SP-CY-TOPO 31220-01 SP-SBORE, 31220-01 SP-CN, 31220-01 SP-ROAD-HATCH, 31220-01 SP-ST, 31220-01 SP-PROP, 31220-01 SP-3D, 31220-01 SP-1150, BALTIMORE, MD 21202 410-639-7681

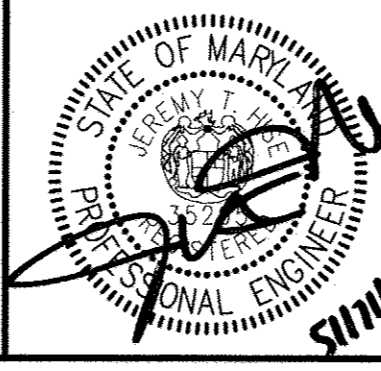


IMAGE# = 31220-TB, 31220-01 SP-PROP, 31220-01 SP-ROAD-HATCH, 31220-01 SP-SE-ORIG, 31220-01 SP-ST, 31220-01 SP-30, 31220-01 SP-CN, 31220-01 SP-MN, 31220-01 SP-TESTHOLE
 XREF# =

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS DATE 6/5/17	<i>[Signature]</i> CHIEF BUREAU OF ENGINEERING DATE 6/11/17
<i>[Signature]</i> CHIEF BUREAU OF UTILITIES DATE 6/5/17	<i>[Signature]</i> CHIEF UTILITY DESIGN DIVISION DATE 6/11/17

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-538-7881



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. 35295
EXPIRATION DATE 01/06/2018
SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	JTH

CIVIL
WHISKEY BOTTOM ROAD AND STEPHENS ROAD CONNECTIONS

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE APRIL 2017
DRAWING NUMBER C-5
SCALE 1"=10'-0"
SHEET 9 OF 46

TRAFFIC CONTROL NOTES:

1. PROTECTIVE VEHICLE RECOMMENDED - MAY BE A WORK VEHICLE.
2. TYPICAL APPLICATION SHOWN, ADJUST FOR SITE CONDITIONS.
3. TRAVEL PATHS ARE SHOWN FOR ONE PATH ONLY - FROM WEST OF THE TRAFFIC CIRCLE ALONG STEPHENS ROAD. IT IS INTENDED THAT ONLY ONE DIRECTION WILL BE PERMITTED TO GO AT A TIME. TRAVEL PATHS WILL CHANGE DEPENDENT UPON WHICH ROAD IS PERMITTED TO MOVE.
4. THE CONTRACTOR SHALL CONTACT HOWARD COUNTY BUREAU OF HIGHWAYS, TRAFFIC ENGINEERING DIVISION AT (410) 313-2430 AT LEAST 3 DAYS PRIOR TO BEGINNING ANY WORK IN ORDER TO SCHEDULE A FIELD INSPECTION OF TRAFFIC CONTROL DEVICES AND ONE (1) WEEK PRIOR TO ANY PROPOSED CHANGE TO THE MAINTENANCE OF TRAFFIC.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SUPPLY, INSTALL, AND MAINTAIN ALL TEMPORARY TRAFFIC CONTROL EQUIPMENT FOR THE DURATION OF THE CONTRACT.
6. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH CURRENT EDITIONS AND REVISIONS OF THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.), MARYLAND S.H.A. WORK ZONE TRAFFIC CONTROL STANDARDS, AND THE HOWARD COUNTY DESIGN MANUAL VOLUME III.
7. THE CONTRACTOR IS REQUIRED TO PROTECT AND MAINTAIN EXISTING SIGNALS, ALL LIGHTING, AND CONDUIT FACILITIES DURING CONSTRUCTION.
8. TRAVEL LANES SHALL BE A MINIMUM OF TEN FEET (10') IN WIDTH. WHEN ONLY ONE LANE IS OPEN, FLAGGERS AND THE APPROPRIATE SIGNAGE SHALL BE PROVIDED. THE ROADWAY SHALL BE REOPENED TO TWO-WAY TRAFFIC AT THE END OF EACH WORK SHIFT.
9. THE CONTRACTOR SHALL MAINTAIN INGRESS AND EGRESS TO ALL LOCAL BUSINESSES AND RESIDENTS.
10. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL EXISTING DRIVEWAYS.
11. THE CONTRACTOR SHALL BACKFILL THE TRENCH IMMEDIATELY AFTER THE INSTALLATION OF A SECTION OF PIPE. IF STEEL PLATES ARE TO BE USED, APPROPRIATE SIGNING WILL BE REQUIRED. STEEL PLATES MUST BE RECESSED AND PINNED PER HOWARD COUNTY STANDARD DETAIL G-4.02. STEEL PLATES ON ALL COUNTY ROADWAYS MUST BE RECESSED. THE CONTRACTOR SHALL NOT LEAVE AN OPEN TRENCH UNATTENDED. ALL ROADWAYS SHALL BE FULLY REOPENED AT THE END OF EACH WORK SHIFT.
12. CONTRACTOR SHALL NOT LEAVE OR STORE ANY EQUIPMENT OR MATERIALS WITHIN THE PUBLIC RIGHT-OF-WAY.
13. AT THE END OF EACH WORK DAY, THE CONTRACTOR SHALL COVER OR REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES NOT APPLICABLE TO THE CURRENT OPERATIONS.
14. THE CONTRACTOR IS RESPONSIBLE FOR ANY SIGNING AND PAVEMENT MARKINGS DAMAGED OR DESTROYED DURING CONSTRUCTION, INCLUDING THOSE OUTSIDE PROJECT LIMITS.
15. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY TEMPORARY "NO STOPPING" PROHIBITION SIGNING THAT WILL BE NECESSARY TO COMPLETE THIS PROJECT.
16. THE CONTRACTOR SHALL HAVE AN SHA TRAFFIC MANAGER WITH ORANGE CARD ON SITE DURING ALL WORK IN PUBLIC ROADWAYS.
17. FLAGGERS SHALL BE CERTIFIED AND SHALL HAVE THEIR CERTIFIED FLAGGER CARD WITH THEM AT ALL TIMES DURING FLAGGING OPERATIONS. ROAD CLOSURES IN THE TRAFFIC CIRCLE (PHASE 1 AND 2) ARE RESTRICTED TO 9AM-3PM M-F. ROAD CLOSURES ON WHISKEY BOTTOM ROAD (PHASE 3) ARE RESTRICTED TO 8AM-5PM.
18. ANY MODIFICATIONS TO THE TRAFFIC CONTROL PLANS AS REQUESTED BY THE CONTRACTOR SHALL FOLLOW MARYLAND SHA STANDARDS AND SHALL BE APPROVED BY THE HOWARD COUNTY TRAFFIC ENGINEER.
19. IF A DROP-OFF MEASURES GREATER THAN 2-1/2" BUT NOT EQUAL TO OR LESS THAN 5", A BARRIER OR 2:1 SLOPE OF COMPACTED CRUSHER RUN GRAVEL WILL BE REQUIRED.
20. PAVEMENT DISRUPTIONS OF ONE INCH (1") OR GREATER SHALL BE RAMPED WITH A BEVELED EDGE OF FOUR HORIZONTAL TO ONE VERTICAL (4:1).
21. THE HOWARD COUNTY PUBLIC SCHOOL SYSTEM, 410-313-6278, SHALL BE ADVISED OF WORK ACTIVITIES WHICH MAY AFFECT BUS ROUTE TIMING AS EARLY AS PRACTICAL.

CHANNELIZATION DEVICE SPACING (FEET)		
MPH	TAPER	TANGENT
50/55	40	80
35/45	30	60
23/30	20	40

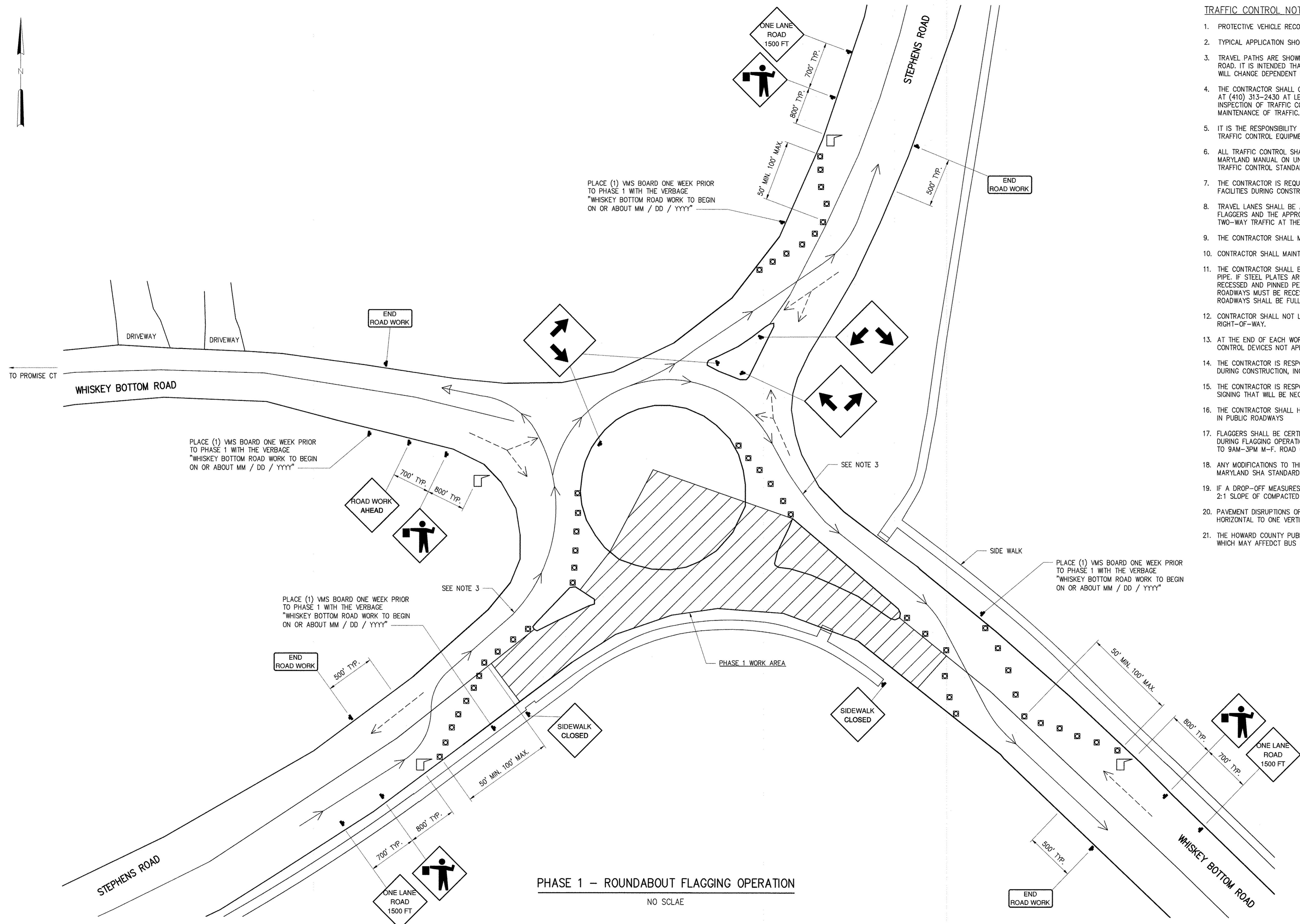
SYMBOL LEGEND

- ← DIRECTION OF TRAFFIC
- SIGN
- ▨ WORK AREA
- PAVEMENT STRIPE (PERMANENT)
- SOLID YELLOW MARKINGS (PERMANENT)
- ⊠ CHANNELIZING DEVICES
- FLAGGER

NOTE: DASHED ARROWS REPRESENT FLOW DIRECTIONS WHEN TRAFFIC IS PERMITTED TO LEAVE EACH ARTERY OF THE TRAFFIC CIRCLE.

ABBREVIATIONS

- VMS VARIABLE MESSAGE SIGN
- NOTE: HOWARD COUNTY ROADS ALLOW A 3 MESSAGE ROTATION FOR VARIABLE MESSAGE SIGNS.



PHASE 1 - ROUNDABOUT FLAGGING OPERATION
NO SCLAE

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS: *[Signature]* DATE: 4/5/17
 CHIEF BUREAU OF ENGINEERING: *[Signature]* DATE: 6/11/17
 CHIEF BUREAU OF UTILITIES: *[Signature]* DATE: 6/15/17
 CHIEF UTILITY DESIGN DIVISION: *[Signature]* DATE: 6/11/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681

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. 35286, EXPIRATION DATE 01/06/2018.

SIGNED: *[Signature]*

DESIGNED	AL								
DRAWN	MRB								
CHECKED	JCS								
PROJ. ENGR.	JTH								
JTH									
APPROVED									

CIVIL

TRAFFIC CONTROL PLAN - PHASE 1
ROUNDABOUT FLAGGING OPERATION

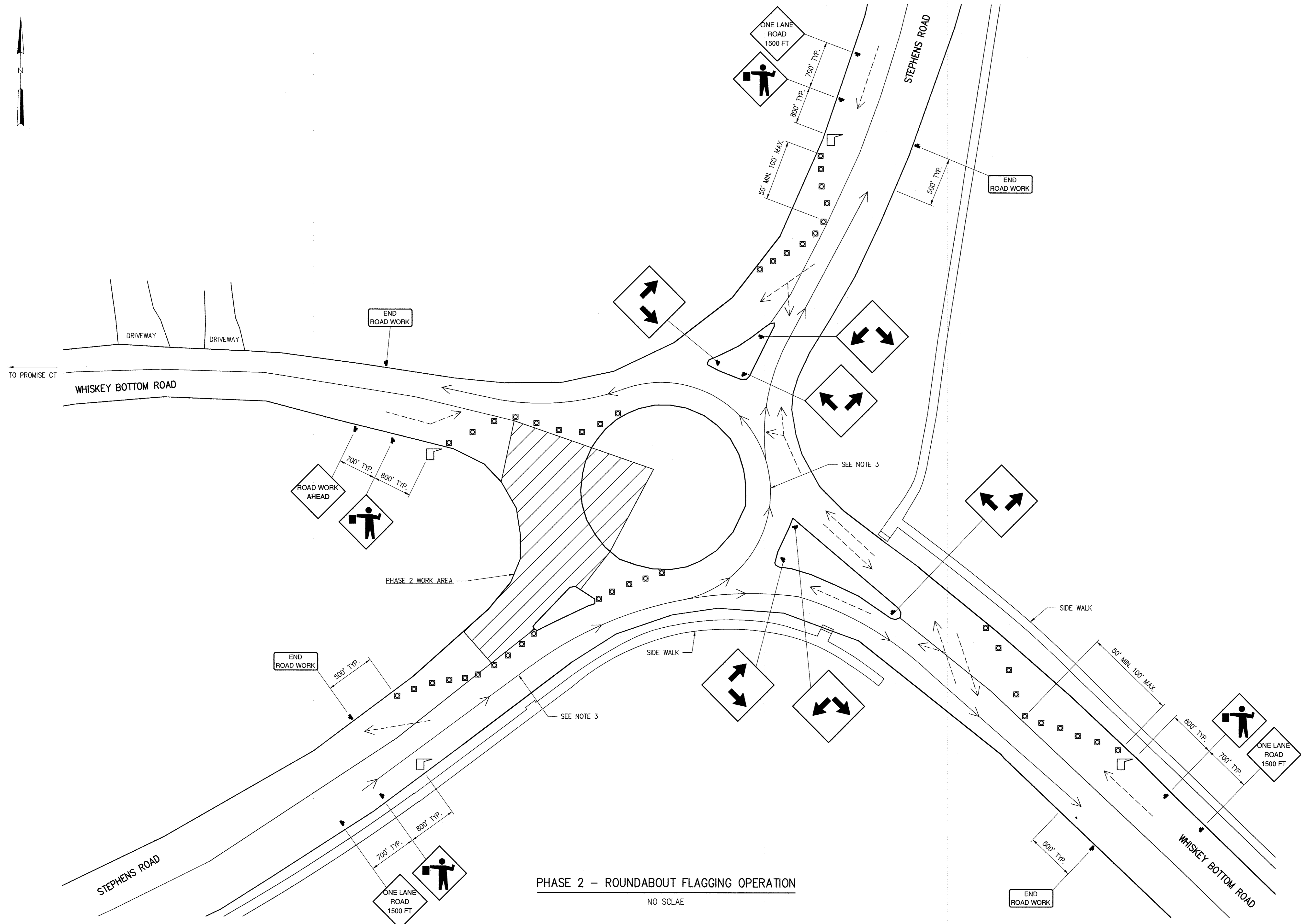
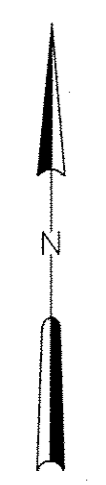
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: C-6
SCALE: 1"=100'-0"
SHEET 10 OF 46



- TRAFFIC CONTROL NOTES:**
1. PROTECTIVE VEHICLE RECOMMENDED - MAY BE A WORK VEHICLE.
 2. TYPICAL APPLICATION SHOWN, ADJUST FOR SITE CONDITIONS.
 3. TRAVEL PATHS ARE SHOWN FOR ONE PATH ONLY - FROM WEST OF THE TRAFFIC CIRCLE ALONG STEPHENS ROAD. IT IS INTENDED THAT ONLY ONE DIRECTION WILL BE PERMITTED TO GO AT A TIME. TRAVEL PATHS WILL CHANGE DEPENDENT UPON WHICH ROAD IS PERMITTED TO MOVE.

CHANNELIZATION DEVICE SPACING (FEET)		
MPH	TAPER	TANGENT
50/55	40	80
35/45	30	60
23/30	20	40

- SYMBOL LEGEND**
- ← DIRECTION OF TRAFFIC
 - SIGN
 - ▨ WORK AREA
 - PAVEMENT STRIPE (PERMANENT)
 - SOLID YELLOW MARKINGS (PERMANENT)
 - ⊠ CHANNELIZING DEVICES
 - ⌞ FLAGGER

NOTE: DASHED ARROWS REPRESENT FLOW DIRECTIONS WHEN TRAFFIC IS PERMITTED TO LEAVE EACH ARTERY OF THE TRAFFIC CIRCLE.

- ABBREVIATIONS**
- VMS VARIABLE MESSAGE SIGN
- NOTE: HOWARD COUNTY ROADS ALLOW A 3 MESSAGE ROTATION FOR VARIABLE MESSAGE SIGNS.

PHASE 2 - ROUNDABOUT FLAGGING OPERATION
NO SCLAE

IMAGE# 31220-TB-31220-001-SP-ST, 31220-001-SP-CN
 XREF# 31220-TB-31220-001-SP-ST, 31220-001-SP-CN
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS: *[Signature]* DATE: 6/5/17
 CHIEF BUREAU OF UTILITIES: *[Signature]* DATE:
 CHIEF BUREAU OF ENGINEERING: *[Signature]* DATE: 4/5/17
 CHIEF UTILITY DESIGN DIVISION: *[Signature]* DATE: 4/11/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681

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. 35295, EXPIRATION DATE: 01/06/2018

SIGNED: *[Signature]*

DESIGNED	JTH				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED					

CIVIL

TRAFFIC CONTROL PLAN - PHASE 2
ROUNDABOUT FLAGGING OPERATION

600' SCALE MAP: 47 BLOCK NO.: 20

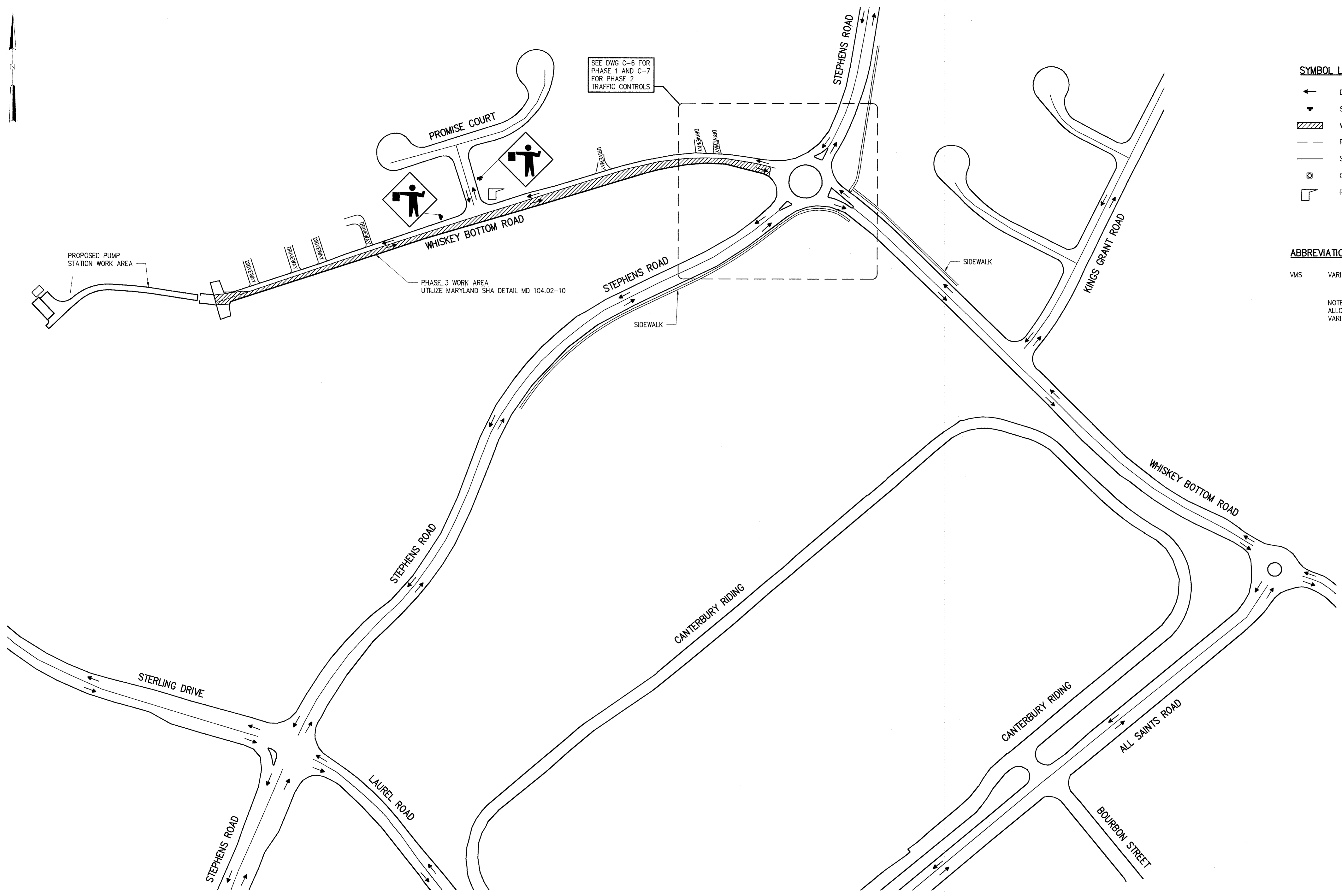
WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	C-7
SCALE	1"=20'-0"
SHEET	11 OF 46

BID SET



- SYMBOL LEGEND**
- ← DIRECTION OF TRAFFIC
 - SIGN
 - ▨ WORK AREA
 - PAVEMENT STRIPE (PERMANENT)
 - SOLID YELLOW MARKINGS (PERMANENT)
 - ⊠ CHANNELIZING DEVICES
 - ⏏ FLAGGER

ABBREVIATIONS

VMS VARIABLE MESSAGE SIGN

NOTE: HOWARD COUNTY ROADS ALLOW A 3 MESSAGE ROTATION FOR VARIABLE MESSAGE SIGNS.

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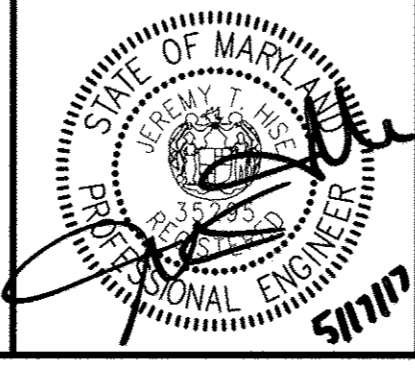
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS DATE: 6/15/17	<i>[Signature]</i> CHIEF BUREAU OF ENGINEERING DATE: 6/15/17
<i>[Signature]</i> CHIEF BUREAU OF UTILITIES DATE: 6/15/17	<i>[Signature]</i> CHIEF UTILITY DESIGN DIVISION DATE: 6/15/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202
410-539-7681



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SIGNED: *[Signature]*

DESIGNED	JTH
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	JTH

CIVIL

TRAFFIC CONTROL PLAN - PHASE 3 WHISKEY BOTTOM ROAD

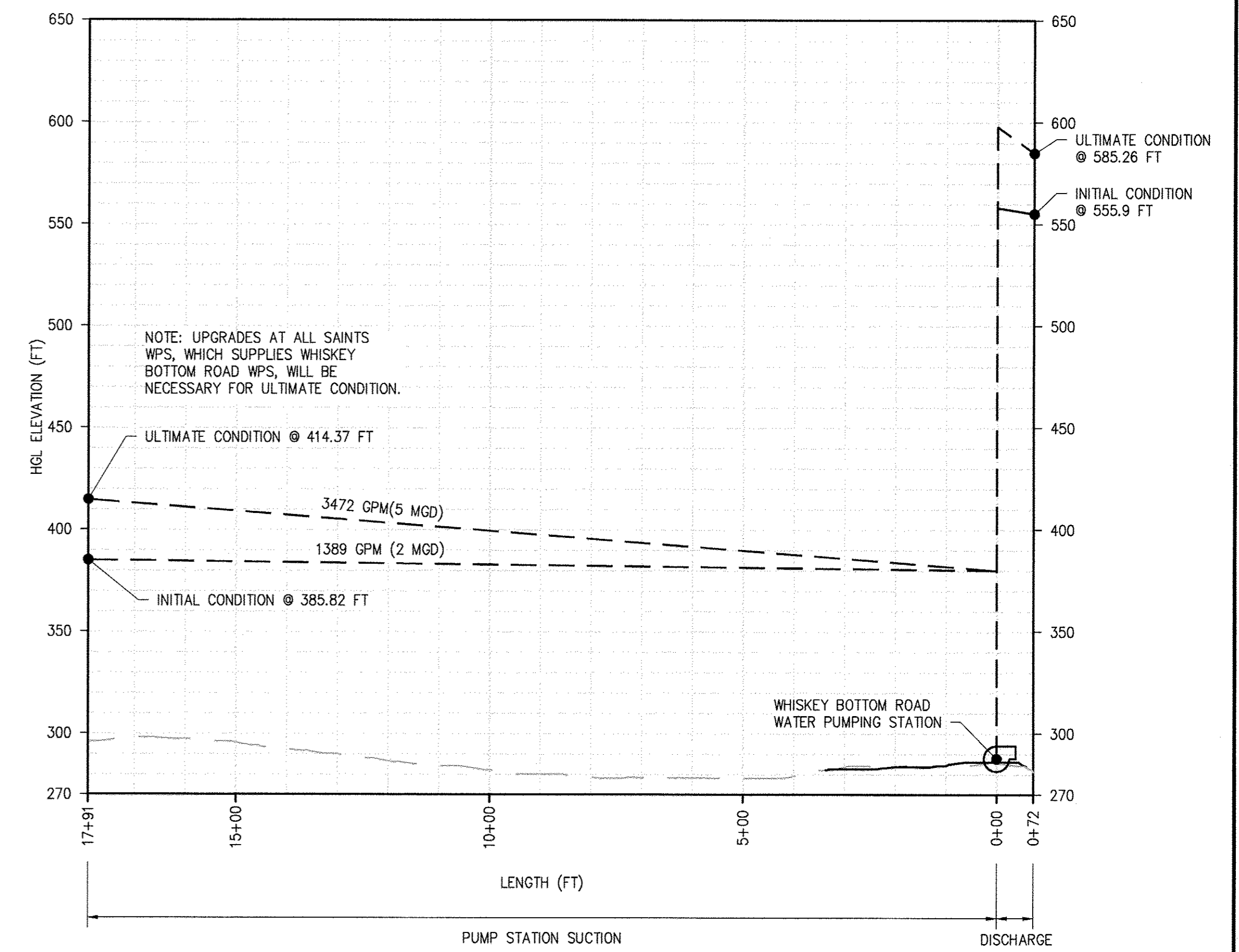
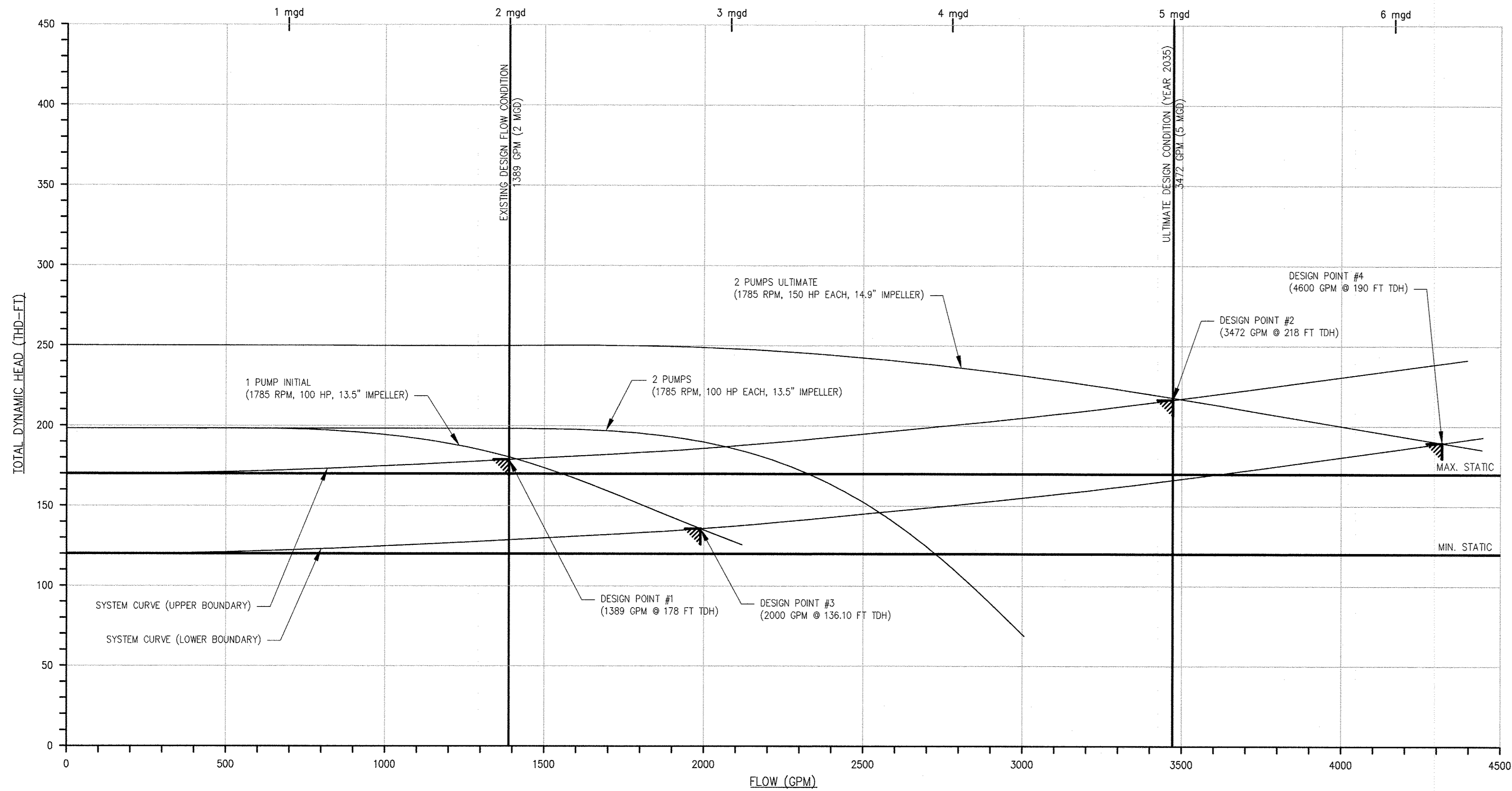
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	C-8
SCALE	AS SHOWN
SHEET	12 OF 46



SYSTEM AND PUMP CURVES

OPERATION NOTES

HYDRAULIC CONDITIONS

SNOWDEN ELEVATED TANK

FULL LEVEL 550 FEET
LOW LEVEL 520 FEET

WHISKEY BOTTOM SUCTION GRADIENT*

MAX LEVEL 400 FEET
MIN LEVEL 380 FEET

* ALL SAINTS WPS ON

STATIC CONDITIONS

MINIMUM 120 FEET
MAXIMUM 170 FEET

INITIAL CONDITIONS/DESIGN POINT #1 (2 MGD)

DESIGN FLOW: 1389 GPM
DESIGN TDH: 178 FEET

NO. OF PUMPS: 2 (DUTY/STANDBY)

PUMP TYPE: CENTRIFUGAL, HES
BASIS OF DESIGN: CORNELL HORIZONTAL END SUCTION 5HH

MOTOR: 100 HP
IMPELLER: 13.5 INCH
DRIVE: VFD
SPEED: 1785 RPM
SUCTION: 8 INCH
DISCHARGE: 5 INCH
NPSHR: 11.1 FEET

ULTIMATE CONDITIONS/DESIGN POINT #2 (5 MGD)

DESIGN FLOW: 3472 GPM
DESIGN TDH: 218 FEET

NO. OF PUMPS: 3 (LEAD/LAG/STANDBY)

PUMP TYPE: CENTRIFUGAL, HES
BASIS OF DESIGN: CORNELL HES 5HH

MOTOR: 150 HP
IMPELLER: 14.9 INCH
DRIVE: VFD
SPEED: 1785 RPM
SUCTION: 8 INCH
DISCHARGE: 5 INCH

PRV EQUIPMENT

SIZE: 10"
SETTING: 50 PSI
FLOW: 1042 GPM(1.5 MGD)
CONTROL: FOOD MARKET TANK

PRESSURE RELIEF

TYPE: SURGE RELIEF
CONTROL: HYDRAULIC PILOT (SPRING OPERATED)
SETTING: 135 PSI

- WHISKEY BOTTOM ROAD WPS PUMPS DIRECTLY INTO THE 550W ZONE DISTRIBUTION SYSTEM.
- ALL SAINTS WPS MUST BE IN OPERATION FOR THE WHISKEY BOTTOM ROAD WPS TO OPERATE.
- THIS STATION DOES NOT PUMP ALL THE WAY TO THE SNOWDEN TANK, WHICH RESULTS IN LOWER STATIC HEAD CONDITIONS.

- OPERATING CONDITIONS ARE BASED ON DESKTOP ANALYSIS HYDRAULIC MODELING, AND INFORMATION AVAILABLE THROUGH THE LATEST HOWARD COUNTY MASTER PLAN (DATED 2016).
- HYDRAULIC CONDITIONS ASSUME THE PROPOSED 16" SUCTION LINE AND 16" DISCHARGE LINE ARE INSTALLED AS SHOWN ON THESE PLANS.

IMAGES: XREFs: 31220-1B_WhiskeyBottom Pump and System Curves_31220-001.SP-30
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 6/15/17
 Chief Bureau of Engineering: *[Signature]* 6/15/17
 Chief Bureau of Utilities: *[Signature]* 6/15/17
 Chief Utility Design Division: *[Signature]* 6/15/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-639-7681



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SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
JTH	
APPROVED	

MECHANICAL

PACKAGE PUMPING STATION SYSTEM
CURVE AND DESIGN CRITERIA

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

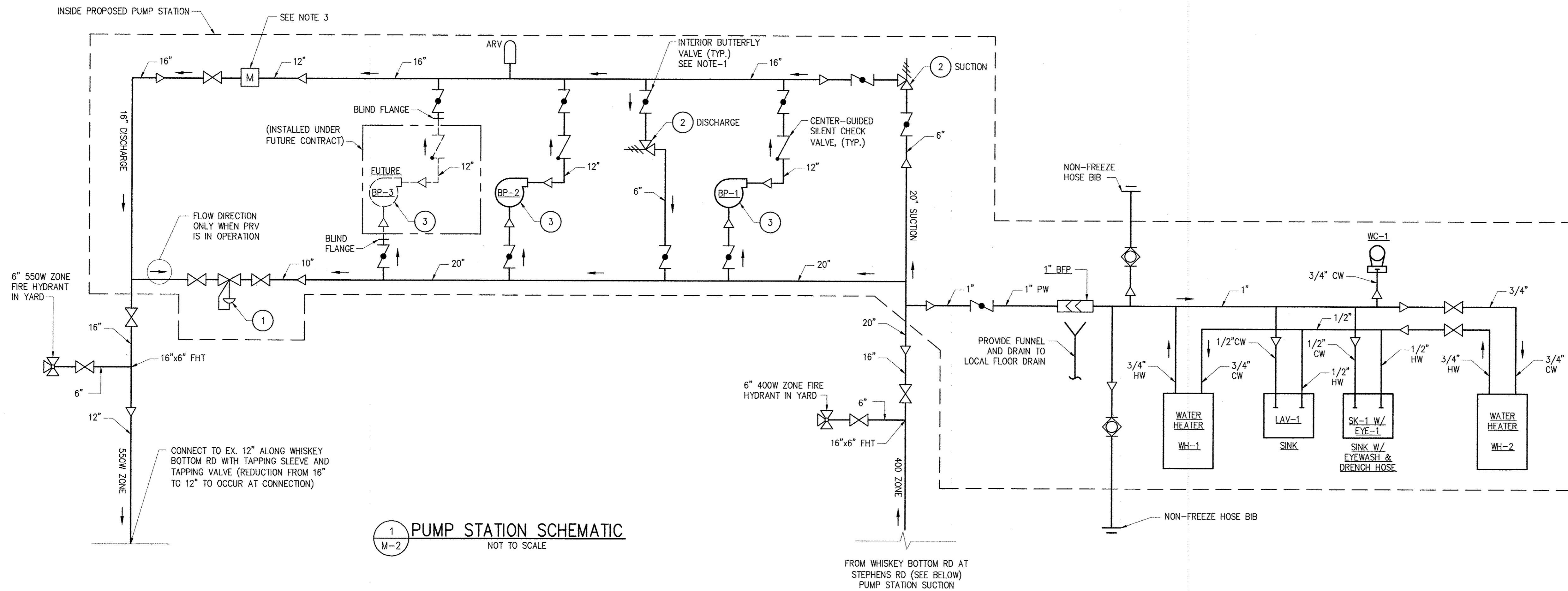
DATE APRIL 2017

DRAWING NUMBER

M-1

SCALE AS SHOWN

SHEET 13 OF 46



1 PUMP STATION SCHEMATIC
M-2 NOT TO SCALE

NOTES:

1. THE PACKAGED STATION SHALL UTILIZE BUTTERFLY VALVES FOR SERVICE ISOLATION.
2. CONTRACTOR SHALL COORDINATE PACKAGE STATION DIMENSIONS AND MOUNTING DETAILS WITH STATION MANUFACTURER.
3. CONTRACTOR SHALL PROVIDE SPARE SPOOL PIECE FOR MAG METER.

CODED NOTES:

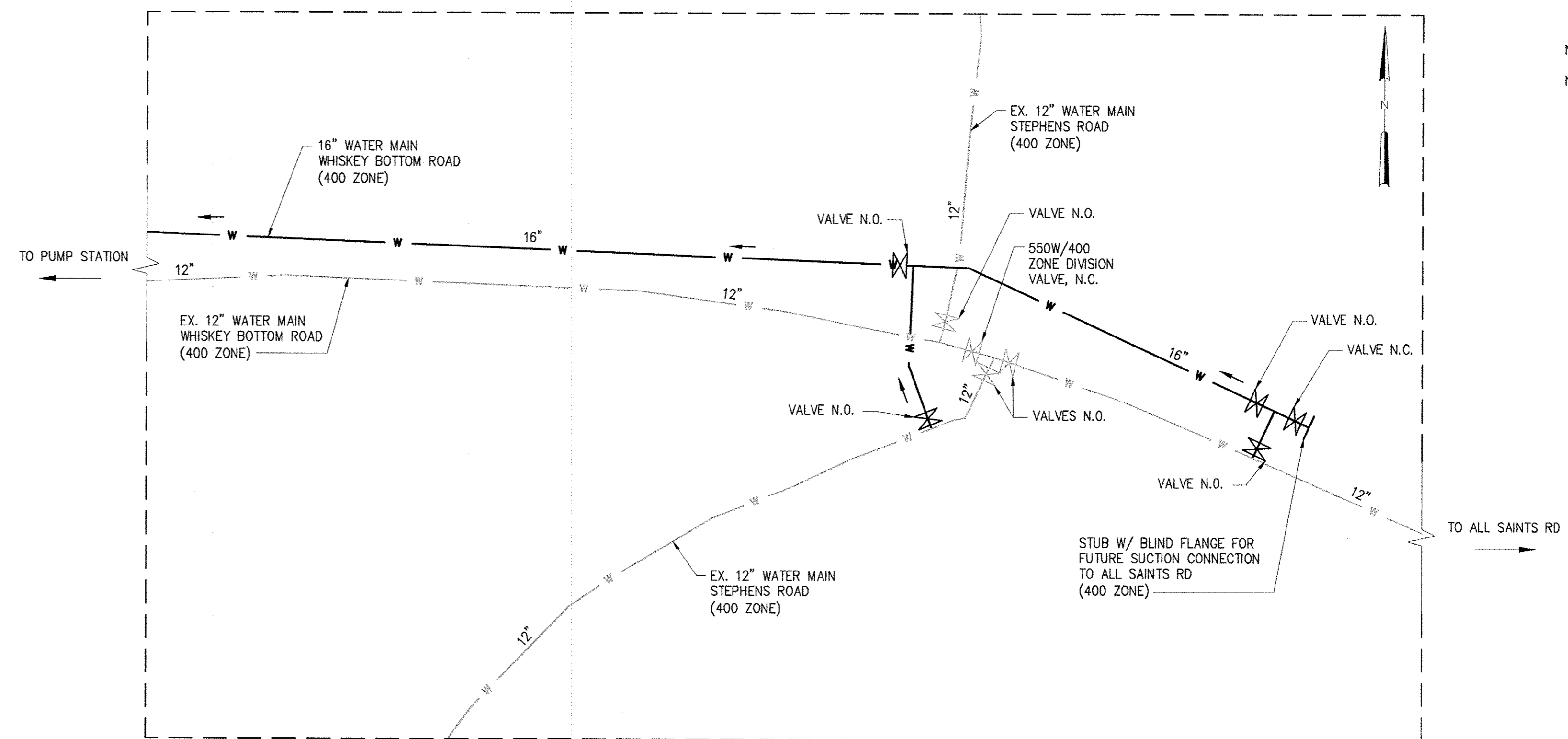
- 1 10" PRESSURE REDUCING VALVE W/ FLOW METERING CAPABILITY
- 2 6" SURGE RELIEF VALVE (TWO)
- 3 100HP, 1,785 RPM PUMP (TWO), SEE M-1 FOR ADDITIONAL PUMP INFORMATION

OPERATIONS:

- INITIAL**
- SUPPLY ----- 400 ZONE (ALL SAINTS WPS ON)
 - 550W PUMPED SUPPLY ----- 2 MGD @ 178FT OF TDH
 - PUMPING ----- ONE (1) PUMP DUTY WITH ONE (1) STANDBY @ 100 HP EACH
 - CONTROL ----- VFD
- ULTIMATE**
- SUPPLY ----- 400 ZONE (ALL SAINTS WPS ON)
 - 550W PUMPED SUPPLY ----- 5 MGD @ 218FT OF TDH
 - PUMPING ----- TWO (2) PUMPS DUTY WITH ONE (1) STANDBY @ 150 HP EACH
 - CONTROL ----- VFD

LEGEND:

- ← FLOW DIRECTION
- ◁ REDUCER/INCREASER
- N.C. NORMALLY CLOSED
- N.O. NORMALLY OPEN



EAST OF PS AT WHISKEY BOTTOM RD & STEPHENS RD

NTS
(SEE SHEET C-5 FOR DETAILS)

IMAGE# 31220-TB, 31220-001 SP-DN, 31220-001 SP-ST, 31220-001 SP-65-ZONES

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS: *[Signature]* DATE: 6/5/17
 CHIEF BUREAU OF ENGINEERING: *[Signature]* DATE: 6/5/17
 CHIEF BUREAU OF UTILITIES: *[Signature]* DATE: 6/5/17
 CHIEF UTILITY DESIGN DIVISION: *[Signature]* DATE: 6/5/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-639-7881



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SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	MRR
CHECKED	JCS
PROJ. ENGR.	JTH
JTH	
APPROVED	

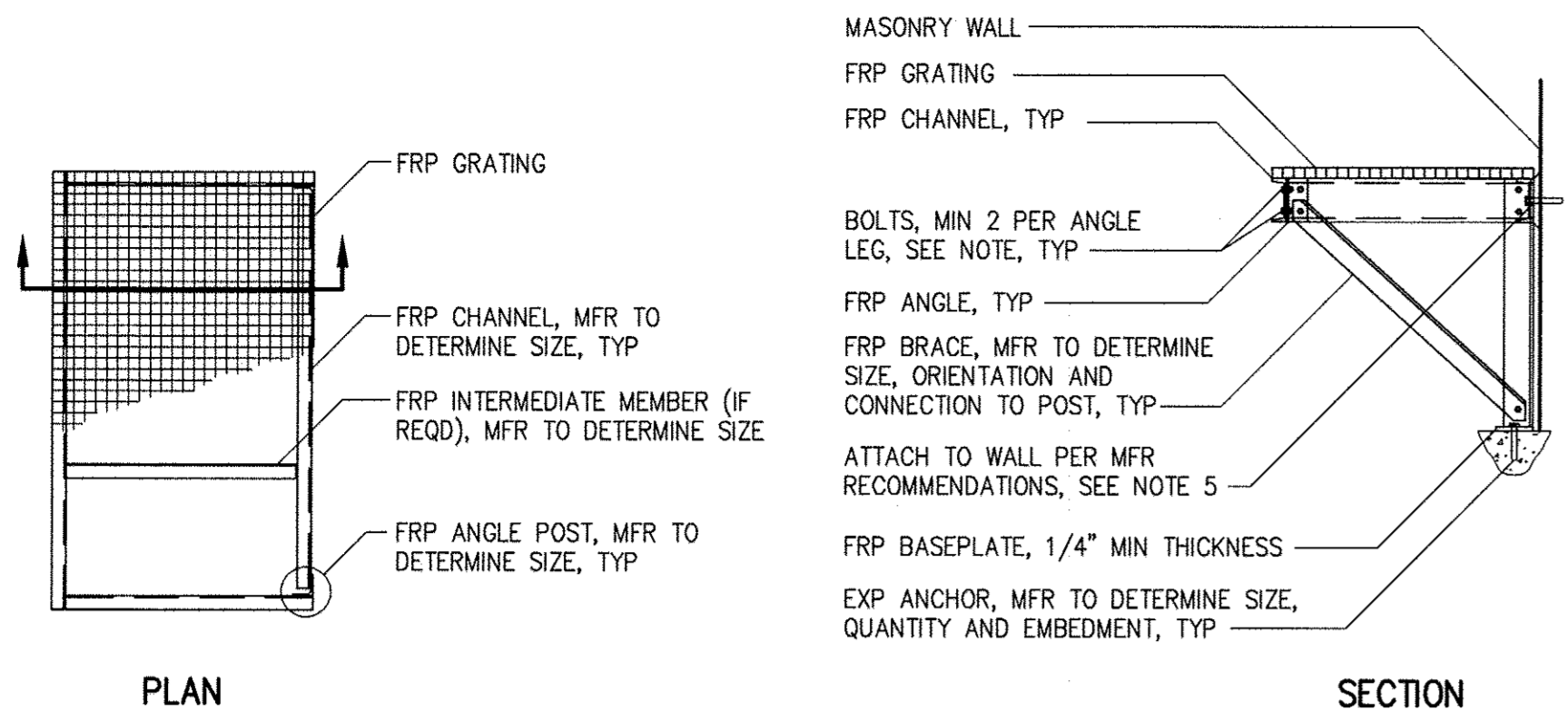
MECHANICAL	
PACKAGE PUMPING STATION DIAGRAMS AND SCHEMATICS	
NO.	REVISION
DATE	BY
600' SCALE MAP:	47
BLOCK NO.:	20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

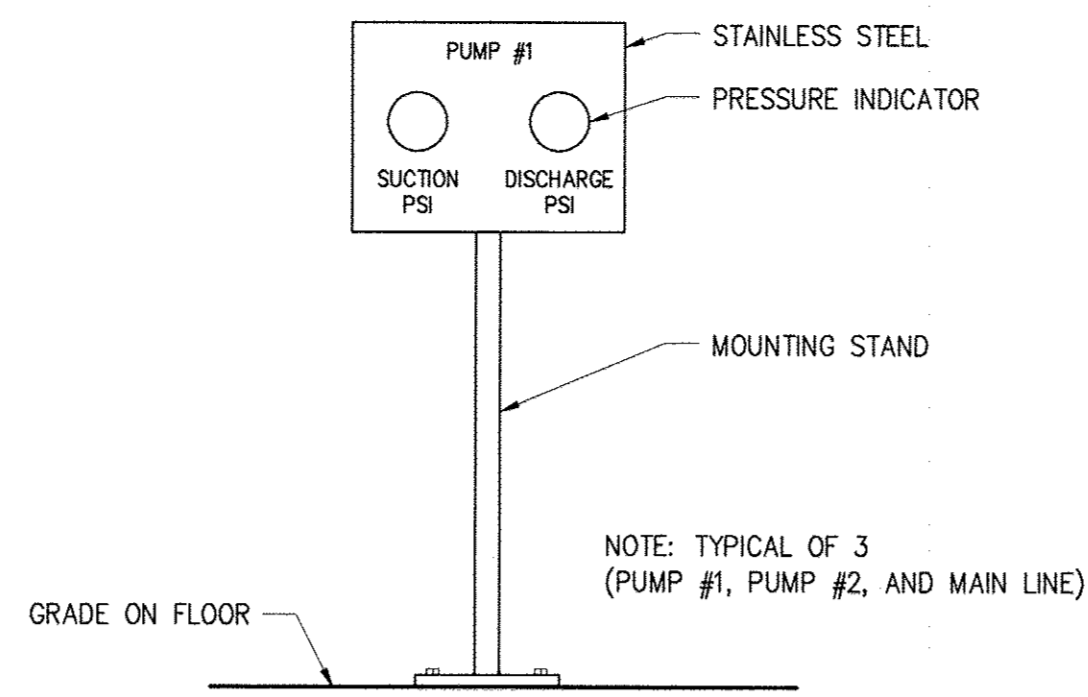
DATE	APRIL 2017
DRAWING NUMBER	M-2
SCALE	AS SHOWN
SHEET	14 OF 46



FRP EQUIPMENT BENCH FOR CHEMICAL PUMPS

NOTE: SEE SPECIFICATION SECTION 06610, GLASS FIBER AND RESIN APPLICATIONS, FOR REQUIREMENTS OF FRP GRATING, STRUCTURAL SHAPES AND BOLTED CONNECTIONS.

DETAIL 1	1
1/2" = 1'-0"	M-3



PRESSURE PANEL MOUNTED ON STAND

DESIGN CRITERIA

POWER SERVICE: 480 VOLTS, 3 PHASE, 60 CYCLE

PUMP DATA

TYPE: HORIZ. CLOSE CPLD. END SUCTION
 PUMP 1 & 2
 CAPACITY: 1389 GPM AT 178 FEET TDH (1 PUMP RUNNING)
 SIZE: 5" x 8" x 16"
 MOTOR: 100 HP, 1785 RPM

PUMP 1, 2 & 3 (FUTURE)
 CAPACITY: 3472 GPM AT 218 FEET TDH (2 PUMPS RUNNING)
 SIZE: 5" x 8" x 16"
 MOTOR: 150 HP, 1785 RPM

NOTES

- THIS REPRESENTS A PACKAGE PUMP STATION UNLESS OTHERWISE NOTED. ALL COMPONENTS ON THIS DRAWING SHALL BE PART OF THE PACKAGE STATION.
- EXCEPT FOR PIPE END SUPPORTS, WHICH ARE SHOWN, VERTICAL AND ANGLE PIPE BRACES ARE NOT SHOWN FOR CLARITY.
- SEE SPECIFICATIONS FOR INSTRUMENT REQUIREMENTS.
- ALL TAPS TO PIPING SHALL UTILIZE TAPERED THREADED CORPORATION STOPS.
- ACTUAL DIMENSIONS MAY VARY DEPENDING ON THE MANUFACTURER OF THE PACKAGE STATION.
- PRESSURE GAUGES SHALL BE INSTALLED ON THE SUCTION AND DISCHARGE SIDES OF ALL PUMPS. INSTALLATION OF GAUGES SHALL UTILIZE TAPS PROVIDED BY PUMP MANUFACTURER.
- ALL PIPING INSTALLED UNDER THE FOUNDATION SHALL BE CL 54 DIP.
- CONTRACTOR SHALL PROVIDE SPARE SPOOL PIECE FOR (1) 12" MAG METER REMOVAL.
- INTERIOR PIPING SHALL BE WELDED STEEL. EXTERIOR PIPING SHALL BE PVC TRANSITION INTO DIP.
- FLOORS ARE SLOPED TO DRAIN TO FLOOR DRAINS. ALL FLOOR DRAINS DISCHARGE INTO THE SEWER SYSTEM.
- ALL SAMPLE TAPS SHALL BE SMOOTH NOSED SAMPLE TAPS.

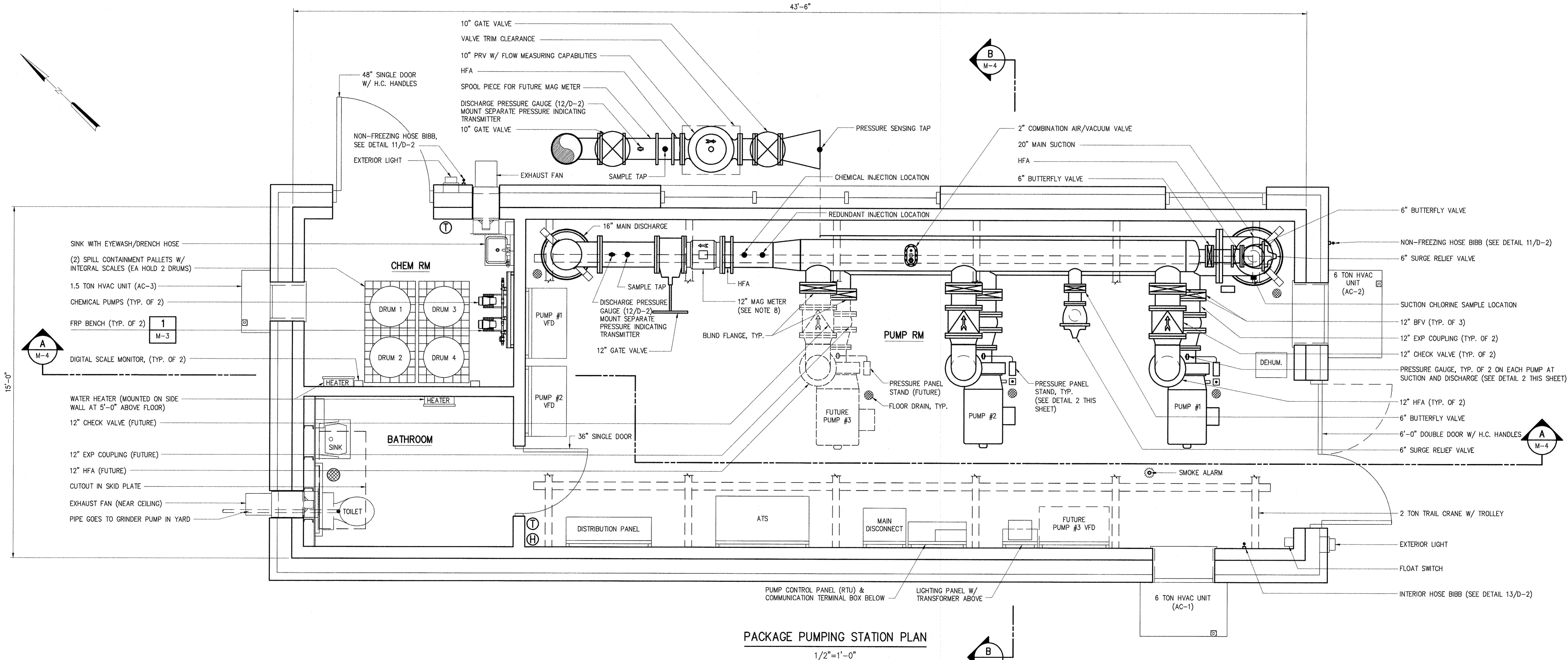


IMAGE: 31220-1B_PS-P1_PS-DA_PS-P1-H_PS-P1-E XREF: 31220-bal\31220-001\Drawings\Mechanical\M-3.dwg

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* DATE: 6/5/17
 Chief Bureau of Engineering: *[Signature]* DATE: 6/5/17
 Chief Utility Design Division: *[Signature]* DATE: 6/5/17

Hazen
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 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
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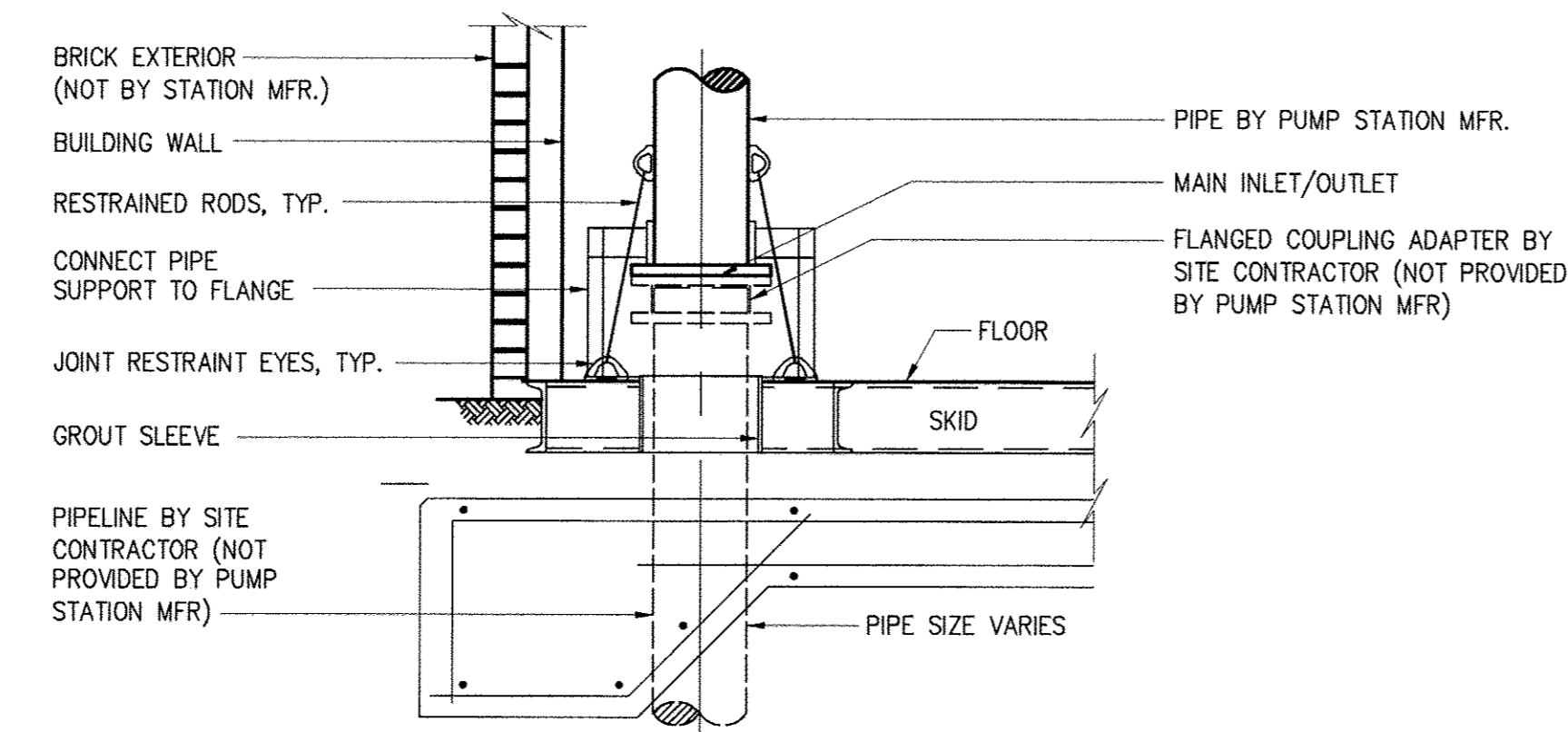
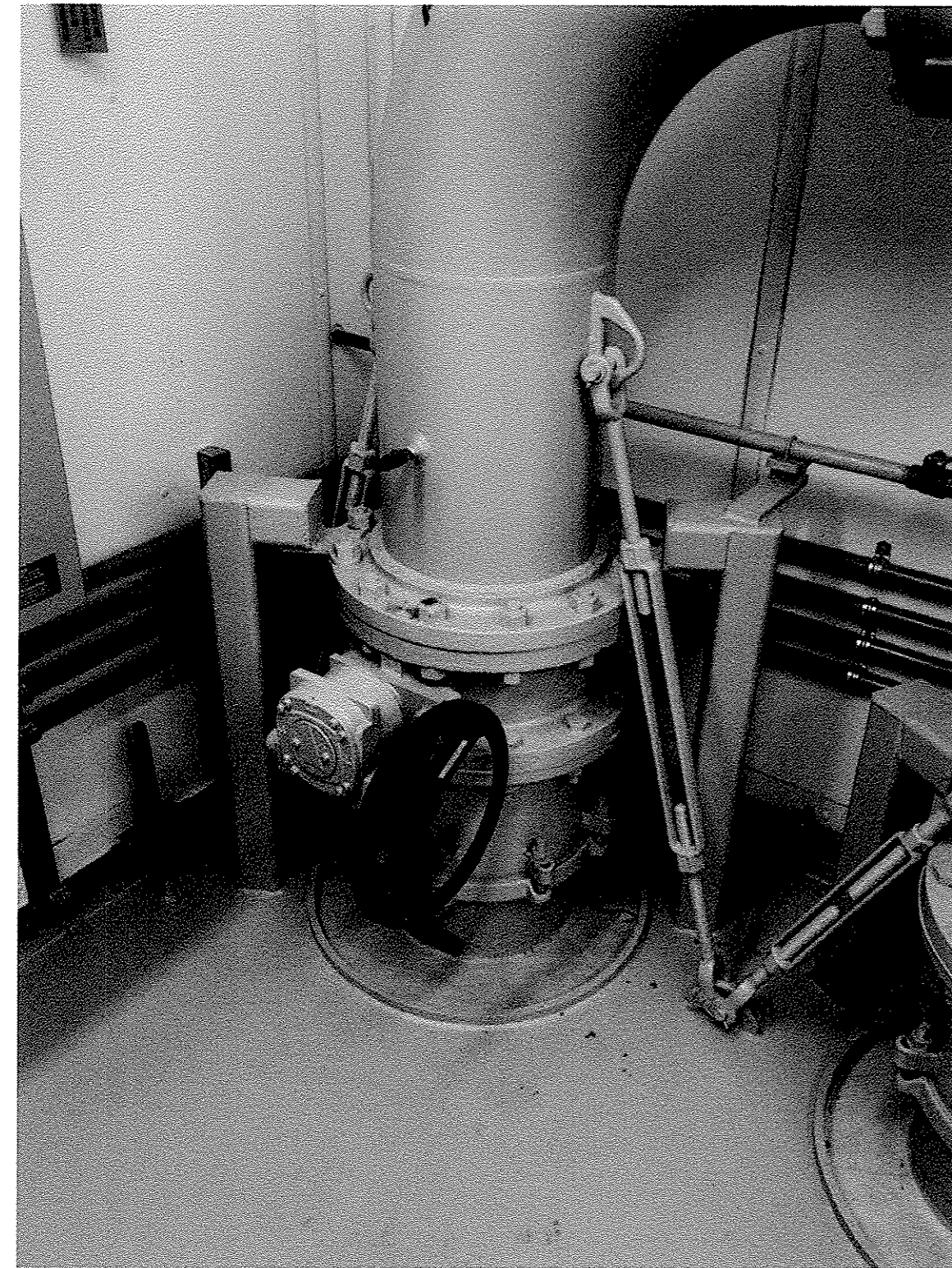
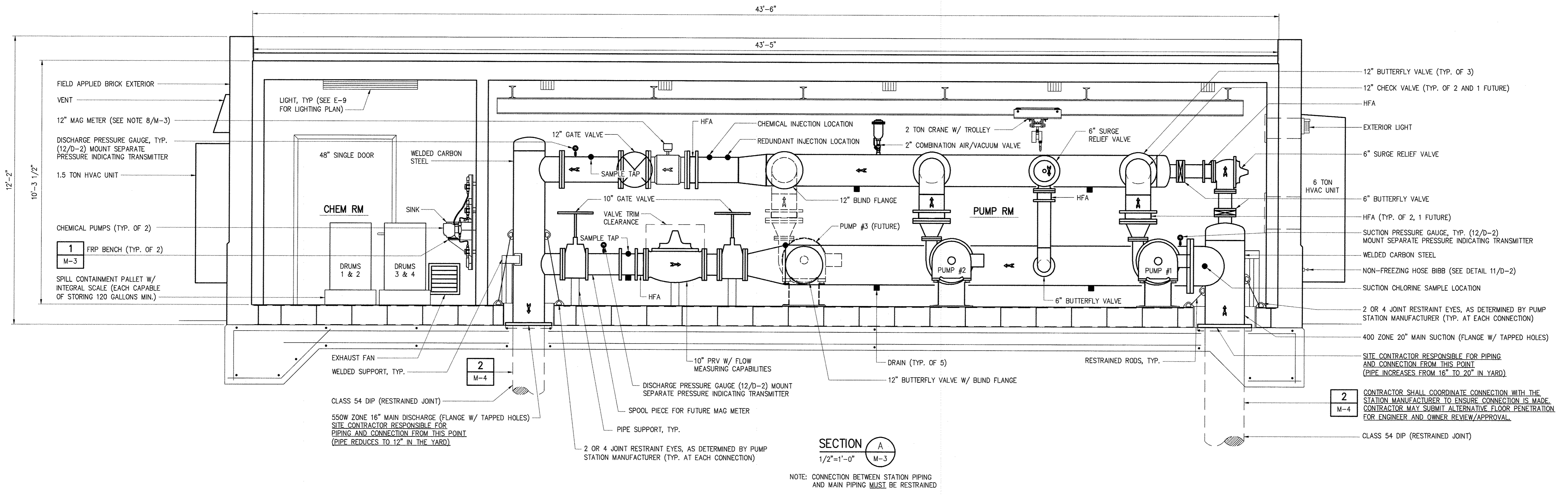
PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36295, EXPIRATION DATE 01/06/2018
 SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	JTH

MECHANICAL	
PACKAGE PUMPING STATION PLAN	
60' SCALE MAP:	47
BLOCK NO.:	20

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

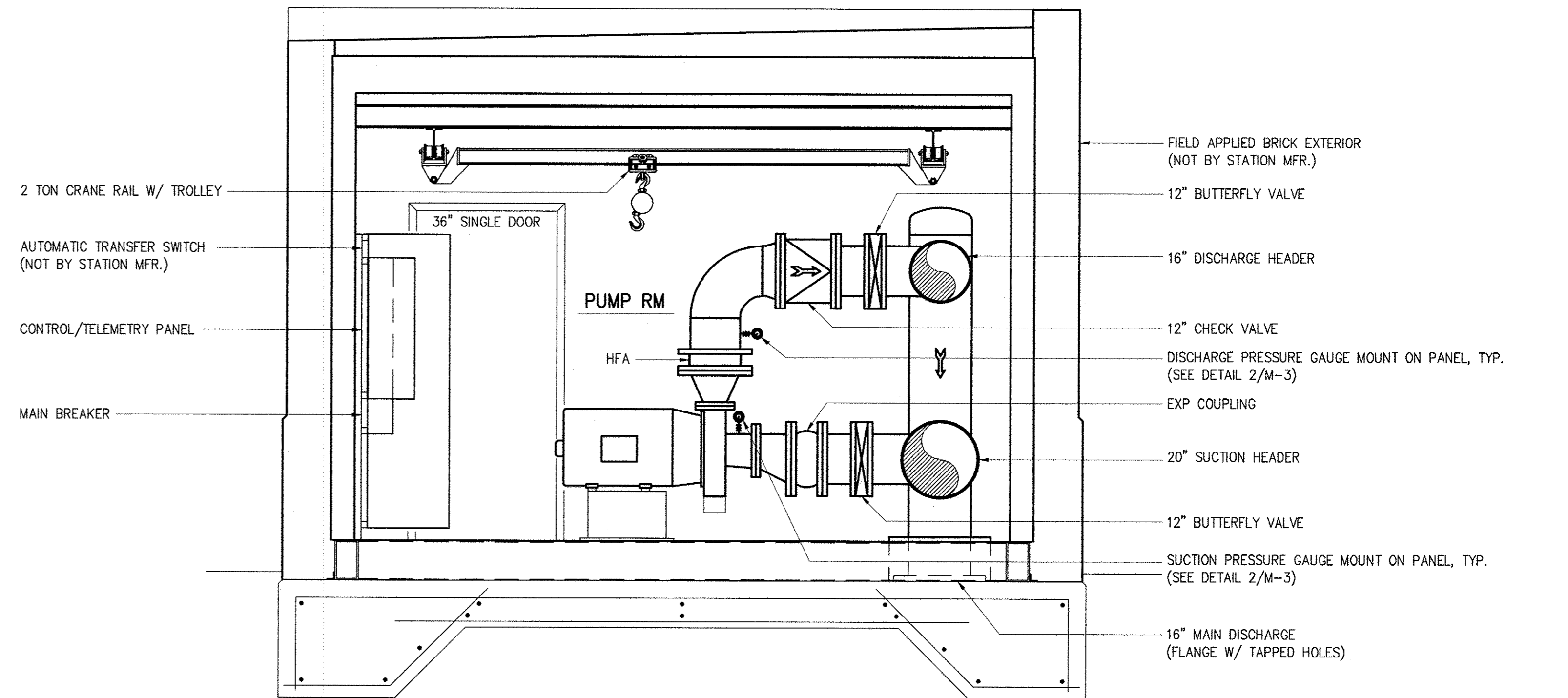
DATE	APRIL 2017
DRAWING NUMBER	M-3
SCALE	AS SHOWN
SHEET	15 OF 46



ALTERNATIVE PIPE CONNECTION
 DETAIL 2
 1/2"=1'-0" M-4

* CONTRACTOR TO COORDINATE WITH STATION MANUFACTURER ACCORDINGLY
 * SEE PHOTO FOR SIMILAR INSTALLATION (THIS SHEET)

SECTION A
 1/2"=1'-0" M-3
 NOTE: CONNECTION BETWEEN STATION PIPING AND MAIN PIPING MUST BE RESTRAINED



SECTION B
 1/2"=1'-0" M-3

PHOTO - PIPE CONNECTION
 NTS

MACE# PIPE CONNECTION M-4, XREF# 31220-TB, P5-DB, P5-SD1, P5-302, P5-302-S, P5-501-S

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND			
Director of Public Works <i>John J. Kelly</i> DATE: 6/5/17	Chief Bureau of Engineering <i>Thomas R. Butler</i> DATE: 6/5/17	Chief Bureau of Utilities <i>Chris R. King</i> DATE: 6/5/17	Chief Utility Design Division <i>John Kelly</i> DATE: 6/5/17

Hazen
 HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-538-7881

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. 35235
 EXPIRATION DATE 01/06/2018
 SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	MRR
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	JTH

MECHANICAL			
PACKAGE PUMPING STATION SECTIONS AND DETAILS			
60' SCALE MAP:	47	BLOCK NO.:	20

WHISKEY BOTTOM ROAD WATER PUMPING STATION REPLACEMENT CAPITAL PROJECT No. W8320 CONTRACT No. 44-4947	
ELECTION DISTRICT NO. 5	HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	M-4
SCALE	AS SHOWN
SHEET	16 OF 46

NOTES:

1. FIELD ROUTE VENT PIPING.
2. CONTRACTOR SHALL SUBMIT DETAILED PROPOSED LAYOUT OF CHEMICAL PIPING FOR ENGINEER'S REVIEW PRIOR TO INSTALLATION.
3. FLEXIBLE TUBING CONNECTIONS AT PUMPS SHALL BE INSTALLED WITH A CONTINUOUS UPWARD SLOPE (WITHOUT LOOPS) TO PREVENT AIR BINDING.
4. PROVIDE SPARE FLEXIBLE TUBING WITHIN CASING PIPE WITH QUICK CONNECT FITTINGS INSTALLED ON BOTH ENDS. TUBING SHALL BE CONTINUOUS WHERE RUN THROUGH CASING PIPE WITHOUT SPLICES. LENGTH OF THIS SPARE TUBE SHALL BE RUN FOR THE FULL LENGTH OF THE CASING PIPE PLUS TUBE LENGTH NECESSARY TO REACH CONNECTION POINT ON BOTH ENDS OF THE TUBE RUN.
5. CONTRACTOR SHALL FURNISH AND INSTALL SPARE INJECTOR ASSEMBLY AT EACH INJECTION POINT.
6. CALIBRATION COLUMN SHALL BE INSTALLED AT SUITABLE ELEVATION TO FILL FROM TOTE BY GRAVITY.

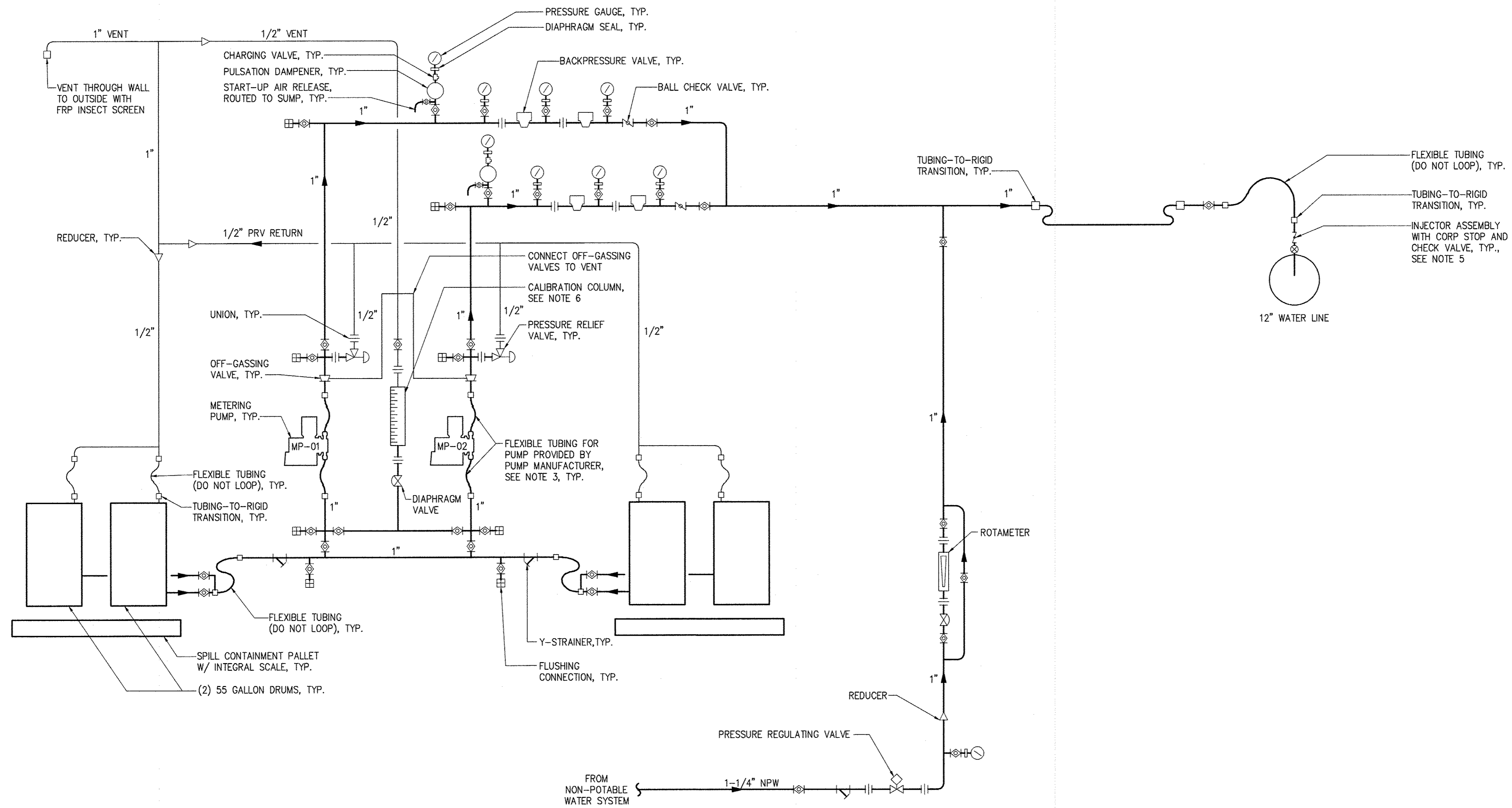


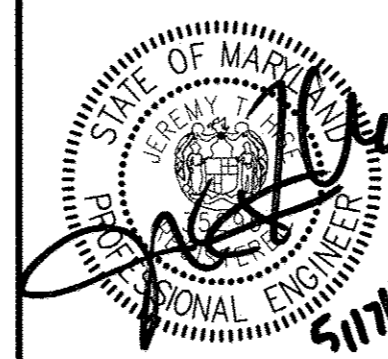
IMAGE: 31220-1B, PS-5C-A1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	<i>[Signature]</i> DATE 6/5/17	<i>[Signature]</i> CHIEF BUREAU OF ENGINEERING	<i>[Signature]</i> DATE 6/5/17
<i>[Signature]</i> CHIEF BUREAU OF UTILITIES	<i>[Signature]</i> DATE 6/5/17	<i>[Signature]</i> CHIEF UTILITY DESIGN DIVISION	<i>[Signature]</i> DATE 6/5/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-639-7881



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. 35295
EXPIRATION DATE 01/06/2018
SIGNED: *[Signature]*

DESIGNED	AL								
DRAWN	MRB								
CHECKED	JCS								
PROJ. ENGR.	JTH								
APPROVED	JTH								
NO.		REVISION		DATE	BY				

MECHANICAL
SODIUM HYPOCHLORITE SCHEMATIC

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	M-5
SCALE	AS SHOWN
SHEET	17 OF 46

GENERAL STRUCTURAL NOTES

- G-1 THESE NOTES ARE GENERAL AND SUPPLEMENT THE SPECIFICATIONS. THESE NOTES APPLY TO THE ENTIRE PROJECT UNLESS MODIFIED OR NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
- G-2 STANDARD DETAILS SHALL BE USED WHEN REFERRED TO OR WHEN NO MORE RESTRICTIVE OR DIFFERENT DETAILS ARE SHOWN ON THE DRAWINGS.
- G-3 DESIGN IS IN ACCORDANCE WITH AND CONSTRUCTION SHALL COMPLY WITH THE PROVISIONS OF THE MARYLAND BUILDING PERFORMANCE STANDARD. THE DESIGN LOADS AND OTHER DESIGN VALUES GIVEN IN NOTES G-4 THROUGH G-7 WERE USED FOR DESIGN UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- G-4 LIVE LOADS:

STRUCTURE	LEVEL	ROOF	BASEMAT/ PAD
PUMP STATION		PER MANUFACTURERS RECOMMENDATIONS	1000 PSF*
GENERATOR		N/A	500 PSF*

*LOADS INDICATED ASSUMED FOR DESIGN. CONTRACTOR SHALL SUBMIT WEIGHTS OF ITEMS BEARING ON CONCRETE FOUNDATIONS FOR ENGINEER'S REVIEW PRIOR TO CONSTRUCTION OF FOUNDATION ELEMENTS.

**ALL STAIRWAYS, LANDINGS AND PLATFORMS ARE DESIGNED FOR A LIVE LOAD = 100 PSF UNLESS NOTED OTHERWISE.

G-5 SNOW LOAD:

GROUND SNOW LOAD (Pg) = 25 PSF
 FLAT-ROOF SNOW LOAD (P_f) = PER MANUFACTURER'S RECOMMENDATIONS
 SNOW EXPOSURE FACTOR (Ce) = PER MANUFACTURER'S RECOMMENDATIONS
 SNOW LOAD IMPORTANCE FACTOR (Is) = 1.20 (RISK CATEGORY IV)
 THERMAL FACTOR (Ci) = PER MANUFACTURER'S RECOMMENDATIONS

G-6 WIND DESIGN CRITERIA:

BASIC WIND SPEED = 120 MPH
 WIND IMPORTANCE FACTOR (Iw) = NOT APPLICABLE
 WIND EXPOSURE = PER MANUFACTURER'S RECOMMENDATION

G-7 SEISMIC LOAD:

RISK CATEGORY = IV
 SEISMIC IMPORTANCE FACTOR (Ie) = 1.50
 SITE CLASS = D
 MAPPED SPECTRAL RESPONSE ACCELERATIONS (S_s/S₁) = 0.122/0.051
 SPECTRAL RESPONSE ACCELERATIONS (S_M/S_{M1}) = 0.195/0.122
 SPECTRAL RESPONSE COEFFICIENTS (SDS/SD1) = 0.051/0.081
 SEISMIC DESIGN CATEGORY = C

- G-8 ALL DIMENSIONS INDICATED (*) SHALL BE VERIFIED EITHER BY FIELD MEASUREMENTS FOR EXISTING STRUCTURES OR BY SHOP DRAWINGS FOR EQUIPMENT FURNISHED. STRUCTURAL DIMENSIONS NOT SHOWN BUT CONTROLLED BY OR RELATED TO EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR WITH THE MANUFACTURER PRIOR TO CONSTRUCTION.
- G-9 THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING INFORMATION IN THE FIELD AS REQUIRED FOR NEW WORK.
- G-10 IF A CONFLICT IS FOUND BETWEEN DIFFERENT PORTIONS OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. CONTINUED CONSTRUCTION OF THE AREA IN CONFLICT SHALL BE AT THE CONTRACTOR'S OWN RISK UNTIL THE CONFLICT IS RESOLVED.
- G-11 EQUIPMENT ANCHOR BOLT SIZES, TYPES, EMBEDMENT AND PATTERNS SHALL BE VERIFIED WITH THE MANUFACTURER. ALL BOLT PATTERNS SHALL BE TEMPLATED TO INSURE ACCURACY OF PLACEMENT.
- G-12 STRUCTURAL DRAWINGS SHALL BE USED IN COORDINATION WITH THE DRAWINGS OF ALL OTHER DISCIPLINES AND MANUFACTURER'S SHOP DRAWINGS.
- G-13 STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURE. DURING CONSTRUCTION, THE STRUCTURES SHALL BE PROTECTED BY BRACING AND TEMPORARY SUPPORTS WHEREVER EXCESSIVE CONSTRUCTION LOADS MAY OCCUR. OVERSTRESSING OF ANY STRUCTURAL ELEMENT IS PROHIBITED.
- G-14 IF CONTRACTOR DESIRES TO TEMPORARILY PLACE OR MOVE LOADS ON OR ADJACENT TO EXISTING STRUCTURES OR UTILITIES DURING CONSTRUCTION PROCESS. CONTRACTOR IS EXCLUSIVELY RESPONSIBLE FOR MAINTAINING STRUCTURAL INTEGRITY AND AVOIDING OVERSTRESSING AND DAMAGING EXISTING STRUCTURES AND UTILITIES. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS AND DRAWINGS VERIFYING PROPOSED CONSTRUCTION INCLUDING APPLICATION OF TEMPORARY CONSTRUCTION LOADS WILL NOT OVERSTRESS OR DAMAGE EXISTING STRUCTURES AND UTILITIES. DRAWINGS AND CALCULATIONS SHALL BE SEALED BY A PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF MARYLAND.

NONSTRUCTURAL COMPONENT ANCHORAGE

- A-1 ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS SHALL BE DESIGNED AND INSTALLED TO RESIST THE CONTROLLING CONDITION OF OPERATIONAL FORCES OR SEISMIC FORCES IN ACCORDANCE WITH THE GOVERNING BUILDING CODE. SEISMIC FORCES SHALL ALSO BE AS PER ASCE 7. COMPONENT SEISMIC ATTACHMENTS SHALL BE BOLTED, WELDED, OR OTHERWISE POSITIVELY FASTENED WITHOUT CONSIDERATION OF FRICTIONAL RESISTANCE PRODUCED BY THE EFFECTS OF GRAVITY. A CONTINUOUS LOAD PATH OF SUFFICIENT STRENGTH AND STIFFNESS BETWEEN THE COMPONENT AND THE SUPPORTING STRUCTURE SHALL BE PROVIDED. CONNECTIONS FOR BOTH ORTHOGONAL DIRECTIONS (TRANSVERSE AND LONGITUDINAL) SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER CURRENTLY REGISTERED IN THE STATE OF MARYLAND.
- A-2 IF ATTACHED TO THE CONCRETE FOUNDATION ELEMENTS, COMPONENT REACTION FORCES AT THE POINT OF ATTACHMENT SHALL BE SUBMITTED TO AND COORDINATED WITH THE ENGINEER FOR CONFIRMATION FOUNDATION ELEMENTS CAN WITHSTAND REACTION FORCES.
- A-3 CONTRACTOR SHALL PROVIDE SPECIAL SEISMIC CERTIFICATION (SSC) FROM MANUFACTURER OF EQUIPMENT FOR ALL SYSTEMS DEEMED NECESSARY BY SPECIFICATIONS. SPECIAL SEISMIC CERTIFICATION SHALL BE IN COMPLIANCE WITH ASCE 7.

FOUNDATIONS

- F-1 CONCRETE (CAST-IN-PLACE) NOTES APPLY TO FOUNDATIONS.
- F-2 ALLOWABLE SOIL BEARING PRESSURE = 3000 PSF
- F-3 MINIMUM DEPTH FROM ADJACENT FINISHED GRADE TO BOTTOM OF FOUNDATION = 30 INCHES.

PRECAST CONCRETE

- PC-1 PRECAST VAULTS AND MANHOLES SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MARYLAND. STRUCTURAL DRAWINGS SHALL INDICATE DESIGN IS IN COMPLIANCE WITH THE MARYLAND BUILDING PERFORMANCE STANDARD.

STRUCTURAL METALS

- M-1 DETAIL, FABRICATE, AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN, LATEST EDITION.
- M-2 STEEL MATERIAL:
 - A. STRUCTURAL HSS: ASTM A500, GRADE C (46/50 KSI) OR A1085 (50 KSI)
 - B. STRUCTURAL PIPE: ASTM A53, GRADE B (35 KSI)
 - C. PLATES, BARS AND ANGLES: ASTM A36 UNO (36 KSI)
 - D. STRUCTURAL W SHAPES: ASTM A992 (50 KSI)
 - E. STRUCTURAL S, M, C & MC SHAPES: ASTM A36 (36 KSI)
 - F. STRUCTURAL HP: ASTM A572 GRADE 50 (50 KSI)
 - G. RODS: ASTM F1554 GRADE 36 (36 KSI)
- M-3 PROVIDE MINIMUM 3/4" DIAMETER ASTM A325 HIGH STRENGTH BOLTS WITH SNUG TIGHTENED TYPE N CONNECTIONS FOR STRUCTURAL STEEL UNLESS NOTED OTHERWISE. HOLES FOR BOLTS SHALL BE STANDARD SIZE UNLESS NOTED OTHERWISE.
- M-4 PROVIDE TYPICAL STEEL BEAM CONNECTIONS FOR A CAPACITY OF NOT LESS THAN THE TOTAL UNIFORM LOAD CAPACITY TABULATED IN THE AISC TABLES FOR ALLOWABLE LOADS OF BEAMS UNLESS NOTED OTHERWISE.
- M-5 DO NOT PAINT STEEL SURFACES WHICH ARE TO BE WELDED OR ARE TO BE ENCASED IN CONCRETE.
- M-6 ALL STAINLESS STEEL FABRICATIONS EXPOSED TO UNDERWATER SERVICE SHALL BE TYPE 316. ALL OTHER STAINLESS STEEL FABRICATIONS SHALL BE TYPE 304 UNLESS NOTED OTHERWISE.
- M-7 ALUMINUM SHALL BE ALLOY 6061-T6 UNLESS NOTED OTHERWISE.
- M-8 ALL BOLTS, ANCHOR BOLTS, AND CONCRETE ANCHORS CONNECTING ALUMINUM SHALL BE STAINLESS STEEL TYPE 316 FOR UNDERWATER APPLICATIONS AND TYPE 304 FOR ALL OTHER APPLICATIONS.
- M-9 DETAIL, FABRICATE, AND ERECT ALUMINUM IN ACCORDANCE WITH THE LATEST EDITION OF THE ALUMINUM ASSOCIATION ALUMINUM DESIGN MANUAL.
- M-10 ALUMINUM SHALL BE ISOLATED FROM CONTACT WITH CONCRETE AND DISSIMILAR METALS.
- M-11 ALL GROOVE AND BUTT WELDS SHALL BE FULL PENETRATION.
- M-12 FILLET WELD SIZES SHALL NOT BE LESS THAN THE MINIMUM SIZE REQUIRED BY AISC CODE FOR PLATE SIZES TO BE CONNECTED AND SHALL BE APPLIED TO THE ENTIRE JOINT CONTACT LENGTH, AND NOT LESS THAN 3/16".
- M-13 BOTTOM SURFACES OF BASE PLATES SHALL BE GROUTED TO ENSURE FULL BEARING CONTACT WITH CONCRETE SLAB.
- M-14 WHENEVER ONE MEMBER IS FASTENED TO ANOTHER WITH FASTENINGS (BOLTS, WELDS, ETC.) SET AT A UNIFORM SPACING, THERE SHALL BE A MINIMUM OF TWO FASTENINGS PER PIECE CONNECTED AND THE FIRST AND LAST FASTENINGS SHALL BE LOCATED NOT TO EXCEED 0.25 OF FASTENER SPACING FROM EACH END.
- M-15 BOLTED CONNECTIONS FOR STRUCTURAL STEEL SHALL BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RCSC (SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS).
- M-16 STRUCTURAL WELDED JOINTS SHALL CONFORM TO THE PROVISIONS OF AWS D1.1, STRUCTURAL WELDING CODE OR AWS D1.2, STRUCTURAL WELDING CODE - ALUMINUM BY AMERICAN WELDING SOCIETY. PROOF OF WELDER CERTIFICATION SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION.

PACKAGED BOOSTER PUMP STATION

- PS-1 PACKAGED BOOSTER PUMP STATION SHALL BE DESIGNED PER THE MARYLAND BUILDING PERFORMANCE STANDARDS (MBPS).
- PS-2 APPLIED LOADINGS, BOTH GRAVITY AND LATERAL, SHALL BE PER THE REQUIREMENTS OF THE MBPS. ROOF LOADING SHALL BE THE DESIGN SNOW LOAD OR THE MINIMUM LIVE LOAD AS REQUIRED BY THE MBPS, WHICHEVER IS GREATER.
- PS-3 BUILDING FRAMING MATERIALS SHALL COMPLY WITH AISI SPECIFICATIONS FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS AND STANDARDS ASTM C-955, ASTM C-1007, ASTM C-845, ASTM C-754 AND ICBO 4782P AND 4784P.
- PS-4 BUILDING WALL FRAMING MEMBERS SHALL BE FABRICATED FROM MINIMUM 2"x3 5/8"x16 GA C-STUDS. BUILDING ROOF JOIST MEMBERS SHALL BE FABRICATED FROM MINIMUM 1 5/8"x8"x16 GA METAL C-JOISTS.
- PS-5 SHEATHING SHALL MEET THE FOLLOWING MINIMUMS:
 - A. EXTERIOR WALL SHEATHING SHALL BE 1/2", EXTERIOR, CDX GRADE PLYWOOD
 - B. EXTERIOR ROOF SHEATHING SHALL BE 5/8", EXTERIOR, CDX GRADE PLYWOOD
 - C. INTERIOR WALL AND CEILING SHEATHING SHALL BE 3/4", EXTERIOR, CDX GRADE PLYWOOD
- PS-6 BUILDING SHALL BE ATTACHED TO A STEEL BASE FRAME WHICH IS ATTACHED TO THE BASE/ FLOOR SYSTEM SUBSTRUCTURE. BASE FRAME SHALL FABRICATED FROM MINIMUM 2"x6" TUBING AND SHALL BE WELDED TO FORM A RIGID FRAME.
- PS-7 BASE/ FLOOR SYSTEM SUBSTRUCTURE SHALL BE MADE UP OF STEEL PLATE AND STANDARD STRUCTURAL SHAPES. ALL PLATES AND SHAPES SHALL BE ASTM A36, MINIMUM.

CONCRETE (CAST-IN-PLACE)

- C-1 DESIGN OF CONCRETE ELEMENTS IS IN ACCORDANCE WITH ACI 318 (CODE REQUIREMENTS FOR STRUCTURAL CONCRETE).
- C-2 FOR CONCRETE MIX DESIGN SEE SPECIFICATIONS.
- C-3 CONCRETE STRENGTH CLASSES (28-DAY COMPRESSIVE STRENGTH):
 - A. CLASS A CONCRETE (4,500 PSI); NORMAL WEIGHT STRUCTURAL CONCRETE USED IN ALL STRUCTURES AND FOR ALL SIDEWALKS AND PAVEMENT.
 - B. CLASS B CONCRETE (3,000 PSI); NORMAL WEIGHT STRUCTURAL CONCRETE USED FOR DUCT BANK ENCASUREMENTS, CATCH BASINS, FENCE AND GUARD POST EMBEDMENT, CONCRETE FILL, AND OTHER AREAS WHERE SPECIFICALLY NOTED ON CONTRACT DRAWINGS.
- C-4 ALL BAR REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60. WHERE REINFORCEMENT IS TO BE WELDED IN ACCORDANCE WITH AWS D1.4, ASTM A706 GRADE 60 SHALL BE USED. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- C-5 CONCRETE COVER FOR REINFORCING (UNLESS NOTED OTHERWISE ON THE DRAWINGS):
 - A. CONCRETE DEPOSITED DIRECTLY AGAINST SOIL: 3"
 - B. CONCRETE EXPOSED TO WEATHER (#5 OR SMALLER): 1 1/2"
 - C. CONCRETE EXPOSED TO WEATHER (#6 OR LARGER): 2"
 - D. SLABS: 1 1/2"
 - E. AT SURFACES CONTACTING FLUID: 2"
 - F. BEAMS AND COLUMNS (TO MAIN REINFORCEMENT): 2"
 - G. BEAMS AND COLUMNS (TO COLUMN TIES OR STIRRUPS): 1 1/2"
 - H. WALLS 12" OR MORE: 2"
 - I. WALLS LESS THAN 12" (#5 OR SMALLER): 1 1/2"
 - J. WALLS LESS THAN 12" (#6 OR LARGER): 2"
 - K. FOR SURFACES EXPOSED TO FLUID IN BEAMS, COLUMNS AND WALLS: ADD 1/2" TO ABOVE VALUES
- C-6 SPLICES SHALL BE CLASS "B" CONFORMING TO THE PROVISIONS OF ACI 318 UNLESS NOTED OTHERWISE. SPLICE LENGTH FOR TWO DIFFERENT SIZED BARS TO BE LAP SPLICED TOGETHER SHALL BE THE LENGTH OF THE LARGER BAR UNLESS NOTED OTHERWISE.
- C-7 CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. CONSTRUCTION JOINTS NOT SHOWN SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE APPROVAL OF THE ENGINEER PRIOR TO SUBMITTING REBAR SHOP DRAWINGS. VERTICAL CONSTRUCTION JOINTS IN WALLS AND HORIZONTAL JOINTS IN SLABS SHALL BE PROVIDED AT A SPACING NOT GREATER THAN 45 FEET ON CENTER. FOR EXPOSED WALLS WITH FLUID OR EARTH ON THE OPPOSITE SIDE, THE SPACING BETWEEN VERTICAL AND HORIZONTAL JOINTS SHALL BE A MAXIMUM OF 25 FEET.
- C-8 WHERE HORIZONTAL CONSTRUCTION JOINTS, LOCATED ABOVE THE FOUNDATION SLAB, EXTEND BEYOND WHERE NEEDED, THEY SHALL BE TERMINATED AT A VERTICAL CONSTRUCTION JOINT APPROVED BY THE ENGINEER.
- C-9 ALL JOINTS WHICH ARE IN MEMBERS IN CONTACT WITH LIQUID OR BELOW GRADE SHALL HAVE A WATERSTOP. CONSTRUCTION JOINTS SHALL HAVE A 6" PVC RIBBED WATERSTOP. EXPANSION JOINTS SHALL HAVE A 9" PVC CENTER BULB RIBBED WATERSTOP. IN VERTICAL JOINTS, WATERSTOPS SHALL TERMINATE NO LESS THAN 18" ABOVE THE MAXIMUM WATER SURFACE OR 18" ABOVE GRADE, WHICHEVER IS HIGHER.
- C-10 SLABS WITH SLOPING SURFACES SHALL HAVE THE INDICATED SLAB THICKNESS MAINTAINED AS THE MINIMUM. SLAB BOTTOMS CAN EITHER SLOPE WITH THE TOP SURFACE OR BE LEVEL. REINFORCEMENT IN SLABS WITH SLOPING SURFACES SHALL BE PLACED AT THE REQUIRED CLEARANCE FROM THE SLAB SURFACE.
- C-11 ALL EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER OR A 1/2" RADIUS TOOLED CORNER.
- C-12 EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DOCUMENTS, SHALL BE PROVIDED FOR PRIOR TO PLACING CONCRETE.
- C-13 REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY METAL PIPE, PIPE FLANGE, METAL CONDUIT, OR OTHER METAL PARTS EMBEDDED IN CONCRETE. A MINIMUM CLEARANCE OF 2" SHALL BE PROVIDED.
- C-14 DOWELS, ANCHOR BOLTS, PIPES, WATERSTOPS AND OTHER EMBEDDED ITEMS SHALL BE HELD SECURELY IN POSITION WHILE CONCRETE IS BEING PLACED.
- C-15 CONDUITS AND OTHER SIMILAR ITEMS EMBEDDED IN OR PENETRATING THROUGH CONCRETE SHALL BE SPACED ON CENTER NOT LESS THAN 3 TIMES THEIR OUTSIDE DIMENSION, BUT NOT LESS THAN 2 1/2" CLEAR. WHEN SUCH ITEMS ARE EMBEDDED IN WALLS OR SLABS, THEY SHALL NOT OCCUPY MORE THAN 1/3 OF THE MEMBER THICKNESS.
- C-16 AT ALL TYPICAL CURBS, EQUIPMENT PADS, AND PIPE SUPPORT PIERS, REINFORCING DOWELS SHOWN MAY BE REPLACED WITH MATCHING DOWELS SET IN EPOXY IN DRILLED HOLES AS SPECIFIED. DOWELS LOCATED CLOSER THAN 3" FROM ANY EDGE OF CONCRETE SHALL NOT BE REPLACED WITH DRILLED DOWELS.
- C-17 DRILLED ADHESIVE DOWELS (WHERE DOWELS ARE SHOWN TO BE PLACED INTO HARDENED CONCRETE):
 - A. THE HOLE DIAMETER SHALL BE NO LARGER THAN 1/8" GREATER THAN THE DIAMETER OF THE REINFORCING BAR AT THE DEFORMATIONS.
 - B. THE DEPTH OF EMBEDMENT SHALL BE 12 BAR DIAMETERS, UNLESS NOTED OTHERWISE.
 - C. ADJUST THE DOWEL LOCATIONS AS NEEDED TO AVOID DRILLING THROUGH ANY REINFORCING BARS. IF THE LOCATION NEEDS TO BE MODIFIED, CONTACT THE ENGINEER. CONTRACTOR SHALL USE NON-DESTRUCTIVE MEANS TO FIELD LOCATE REINFORCEMENT PRIOR TO DRILLING HOLES FOR DOWELS.
- C-18 CLEAR DISTANCE FROM ANCHOR BOLTS TO ANY CONCRETE EDGE SHALL BE 4" MINIMUM UNLESS NOTED OTHERWISE.
- C-19 CONCRETE COMPRESSIVE STRENGTH TESTS SHALL BE AVAILABLE ON THE JOB SITE FOR REVIEW BY THE ENGINEER.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John A. Clebs DATE *6/15/17*
 DIRECTOR OF PUBLIC WORKS
Thomas R. Butler DATE *6/15/17*
 CHIEF BUREAU OF ENGINEERING
Chris King DATE *6/15/17*
 CHIEF BUREAU OF UTILITIES
David DATE *6/15/17*
 CHIEF UTILITY DESIGN DIVISION

Hazen
 HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-539-7681



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. 43355
 EXPIRATION DATE 03/27/2019
 SIGNED: *Quinn*

DESIGNED	AGM						
DRAWN	MRB						
CHECKED	JCS						
PROJ. ENGR.	JTH						
CIP							
APPROVED		NO.	REVISION	DATE	BY		

STRUCTURAL	
NOTES	
600' SCALE MAP:	47
BLOCK NO.:	20

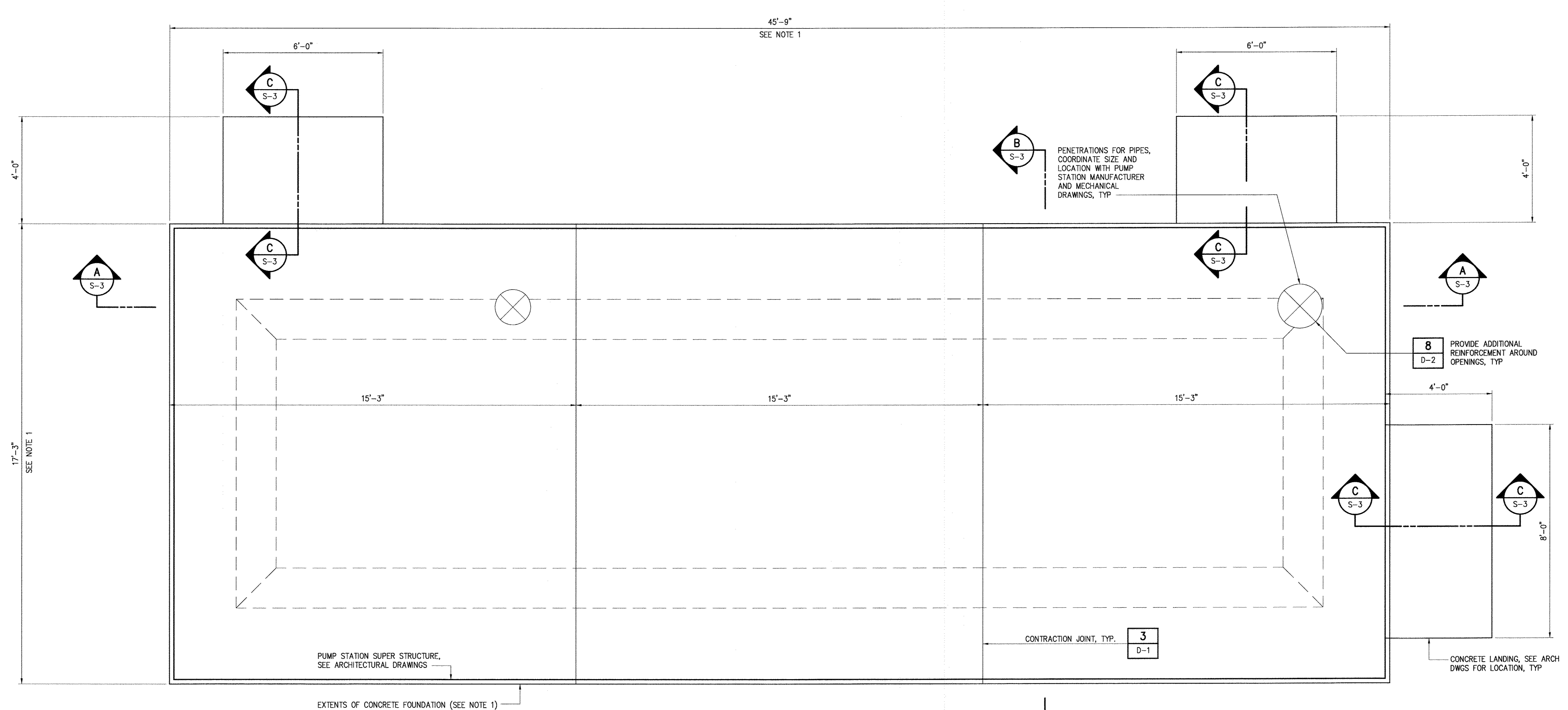
WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE APRIL 2017
 DRAWING NUMBER S-1
 SCALE AS SHOWN
 SHEET 18 OF 46

NOTES

1. OUT TO OUT DIMENSIONS OF BASE MAT SHALL BE COORDINATED WITH PUMP STATION SUPER STRUCTURE MANUFACTURER AND ARCHITECTURAL DRAWINGS.



PACKAGE PUMPING STATION FOUNDATION PLAN

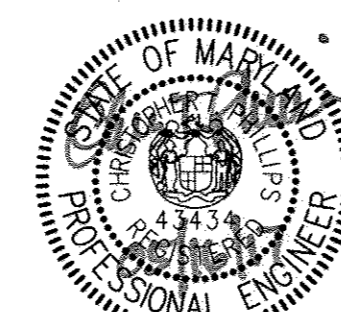
1/2"=1'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 6/6/17
 DIRECTOR OF PUBLIC WORKS
[Signature] 6/5/17
 CHIEF BUREAU OF UTILITIES
[Signature] 6/5/17
 CHIEF BUREAU OF ENGINEERING
[Signature] 6/11/17
 CHIEF UTILITY DESIGN DIVISION

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



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. 53635
EXPIRATION DATE 03/27/2019
SIGNED: *[Signature]*

DESIGNED	AGM
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
CIP APPROVED	

NO.	REVISION	DATE	BY

STRUCTURAL

PACKAGE PUMPING STATION FOUNDATION PLAN

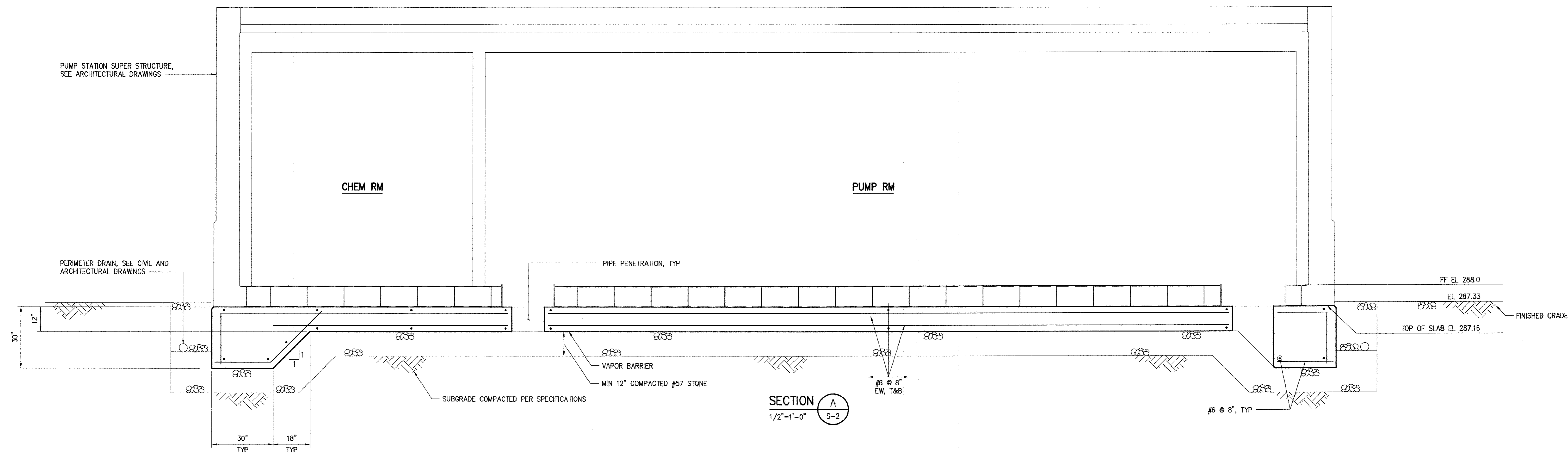
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

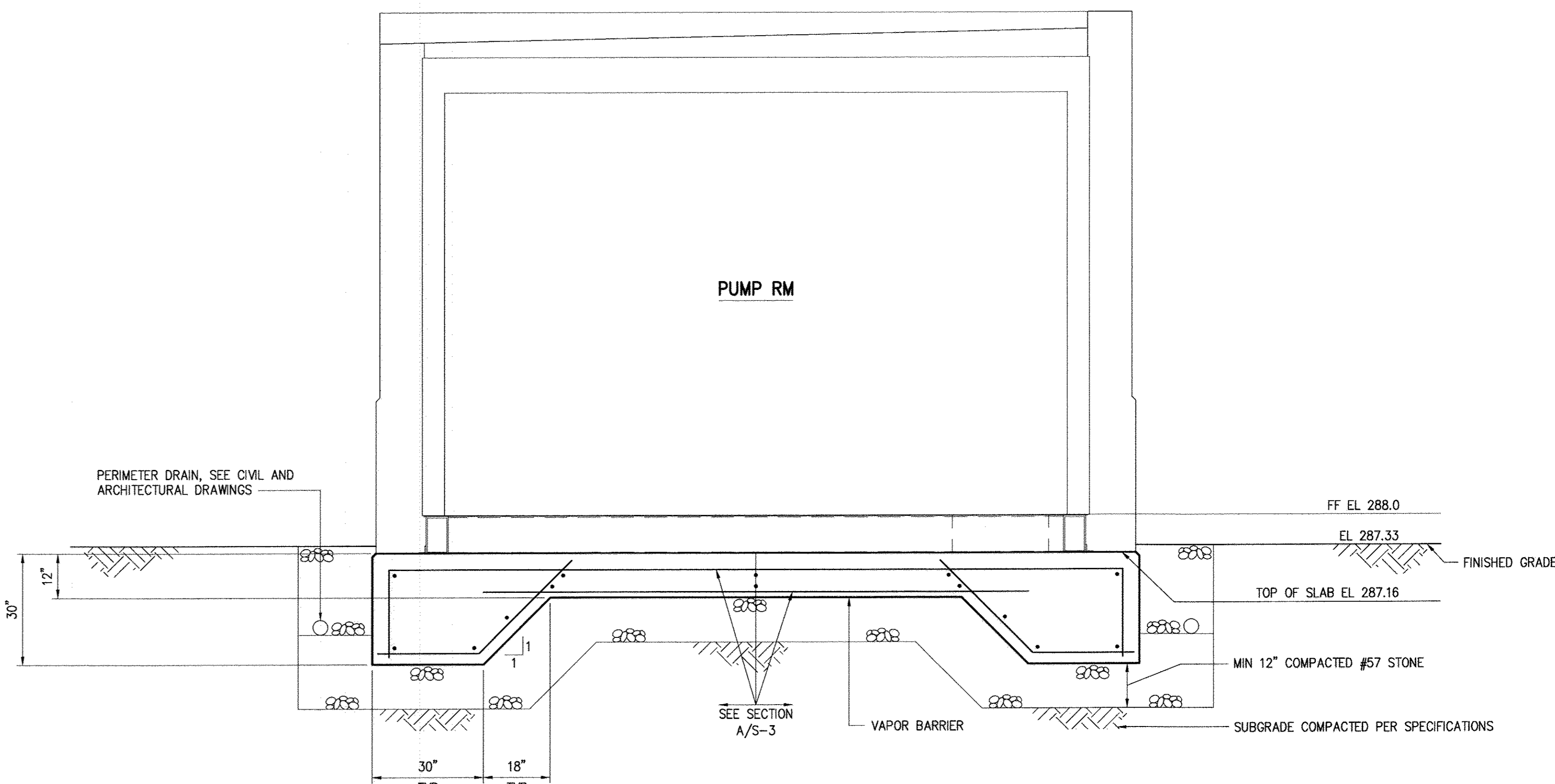
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	S-2
SCALE	AS SHOWN
SHEET	19 OF 46

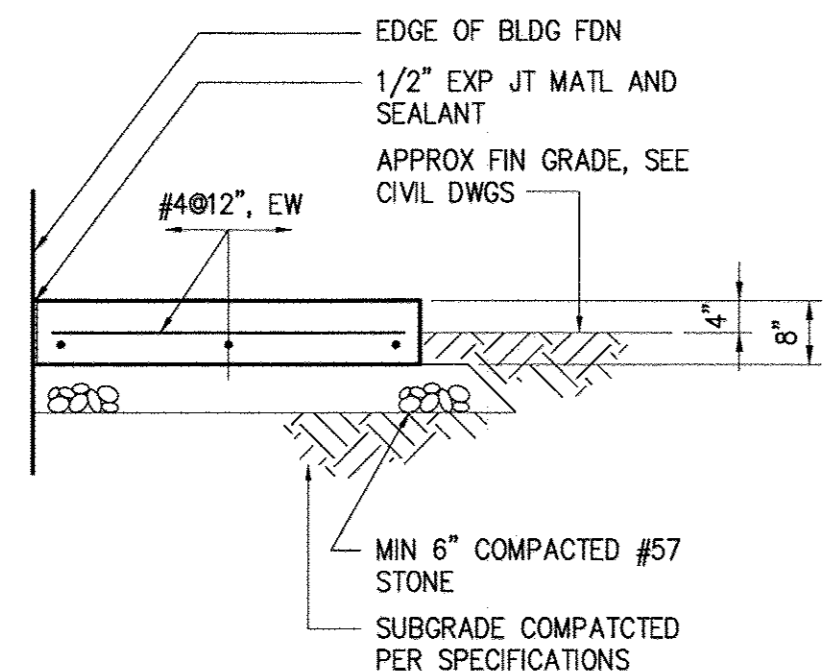
NOTES
 1. SEE SHEET S-1 FOR STRUCTURAL NOTES.



SECTION A
 1/2"=1'-0" S-2



SECTION B
 1/2"=1'-0" S-2



SECTION C
 1/2"=1'-0" S-2

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

[Signature] 6/5/17
 DIRECTOR OF PUBLIC WORKS DATE

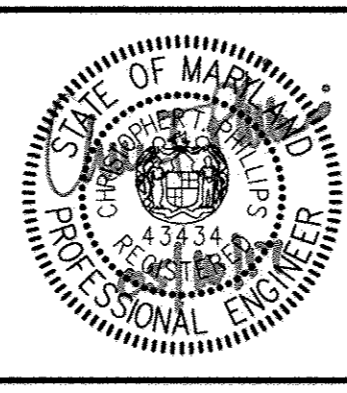
[Signature] 6/11/17
 CHIEF BUREAU OF ENGINEERING DATE

[Signature] 6/5/17
 CHIEF BUREAU OF UTILITIES DATE

[Signature] 6/11/17
 CHIEF UTILITY DESIGN DIVISION DATE

Hazen

HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-539-7681



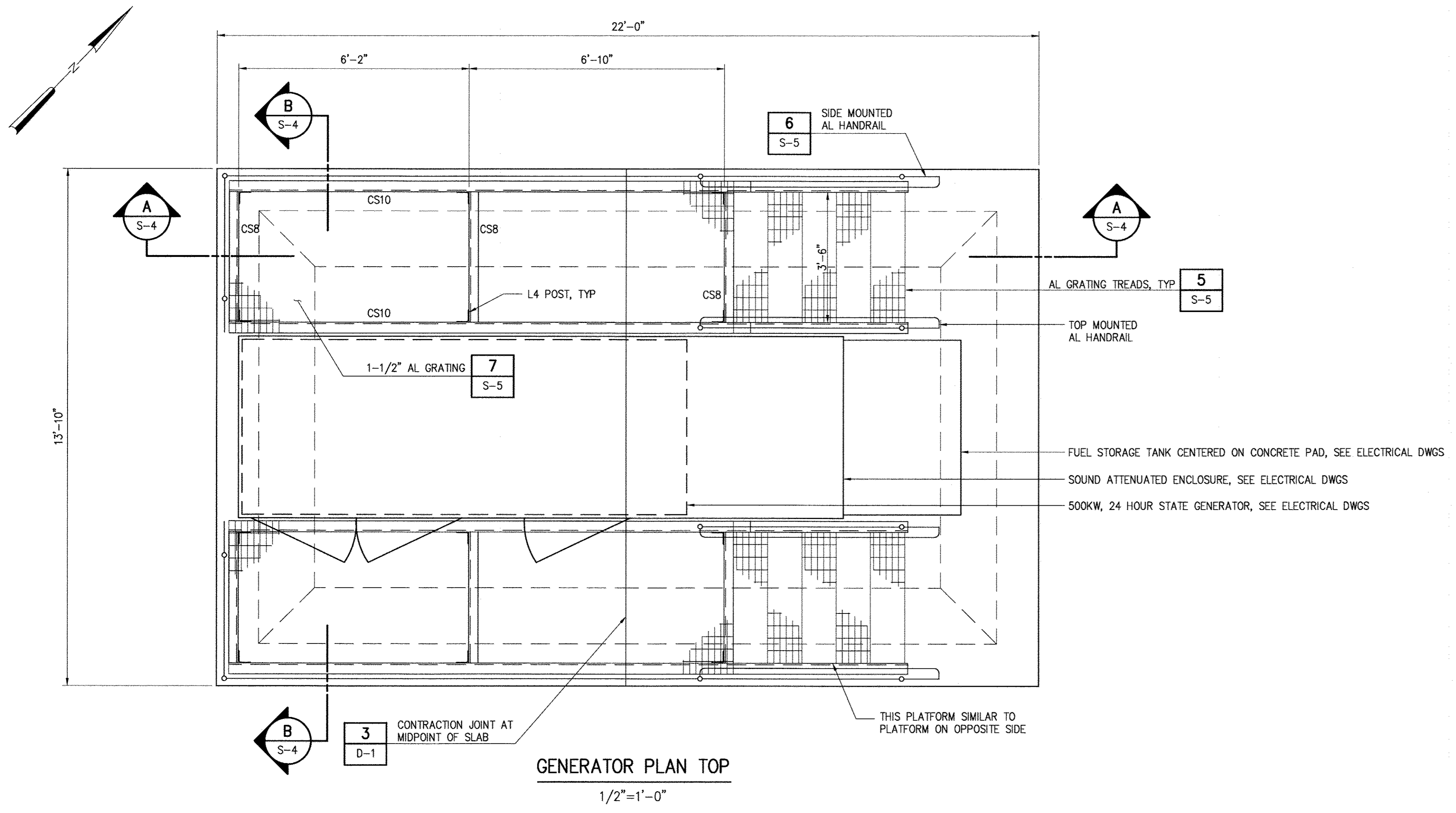
PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
 LICENSE NO. 43754
 EXPIRATION DATE 03/27/2019
 SIGNED: *[Signature]*

DESIGNED	AGM				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
CIP APPROVED					
NO.	REVISION	DATE	BY	600' SCALE MAP:	47
				BLOCK NO.:	20

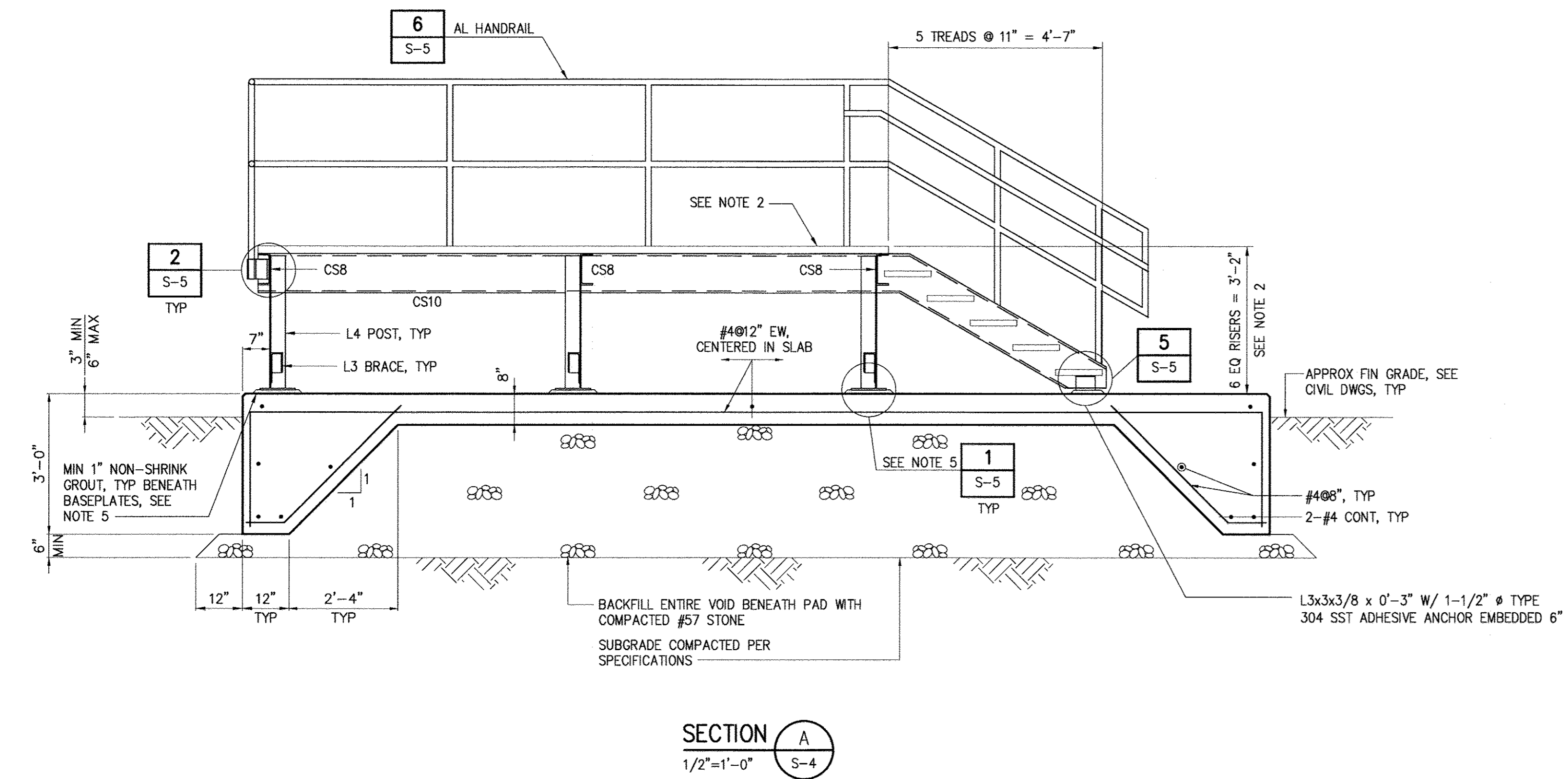
STRUCTURAL
 PACKAGE PUMPING STATION FOUNDATION SECTIONS

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

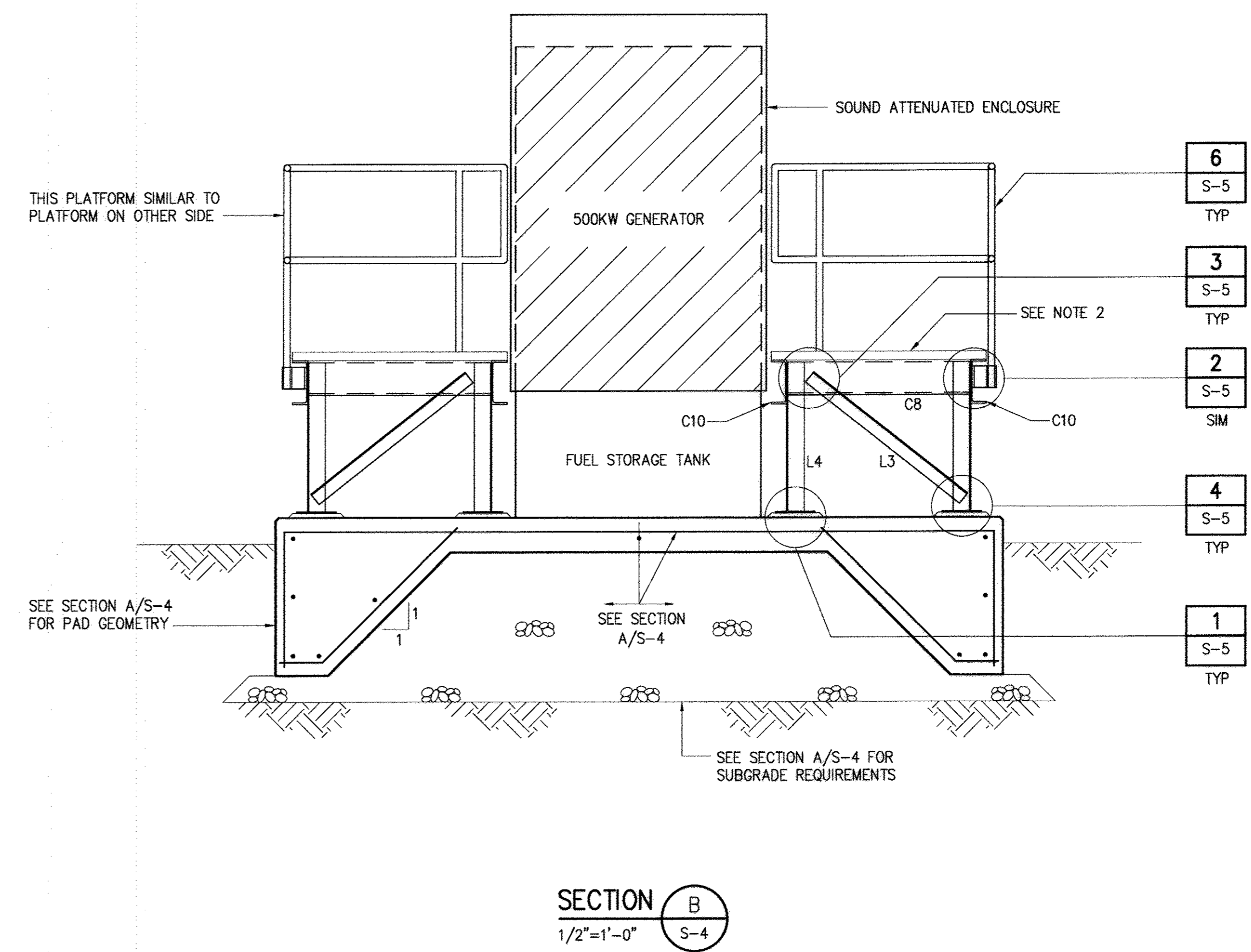
DATE APRIL 2017
 DRAWING NUMBER S-3
 SCALE AS SHOWN
 SHEET 20 OF 46



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



SECTION A
1/2"=1'-0" S-4



SECTION B
1/2"=1'-0" S-4

- NOTES**
- FOR SHAPES INDICATED:
 - CS10 DENOTES AL CS 10X6.14 CRIPPLED STRINGER
 - CS8 DENOTES AL CS 8X4.15
 - L4 DENOTES AL L4X4X1/4
 - L3 DENOTES AL L3X3X1/4
 - HEIGHT OF GENERATOR ACCESS PLATFORM IS BASED ON RECOMMENDATIONS FROM KOHLER POWER SYSTEMS FOR A 2'-5" HIGH FUEL TANK AND 10" GENERATOR SKID WITH AN 1" ALLOWANCE FOR OPENING OF ENCLOSURE DOORS. CONTRACTOR SHALL VERIFY THIS HEIGHT WITH ACTUAL EQUIPMENT INSTALLED. IF REQUIRED HEIGHT IS DIFFERENT THAN SHOWN CONTRACTOR SHALL COORDINATE REVISED HEIGHT WITH ENGINEER PRIOR TO SUBMITTAL OF FABRICATION DRAWINGS.
 - SEE SHEET S-1 FOR STRUCTURAL NOTES.
 - CONTRACTOR SHALL PLACE CAPS/PLUGS IN BOTTOM OF RAILING POSTS TO KEEP INSECTS AND BEES FROM NESTING.
 - CONTRACTOR SHALL INSTALL A NEOPRENE GASKET BETWEEN THE ALUMINUM BASE PLATE AND CONCRETE GROUT FOR CORROSION PROTECTION.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

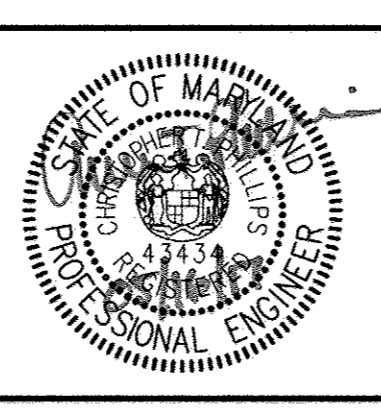
DIRECTOR OF PUBLIC WORKS: *Thomas R. Butler* 6/5/17
DATE: 6/5/17

CHIEF BUREAU OF ENGINEERING: *[Signature]* 6/11/17
DATE: 6/11/17

CHIEF BUREAU OF UTILITIES: *[Signature]* 6/11/17
DATE: 6/11/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



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. 43434, EXPIRATION DATE 03/27/2019.

SIGNED: *Chert-Pain*

DESIGNED	AGM
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
CIP	
APPROVED	

STRUCTURAL
GENERATOR PLAN AND SECTIONS

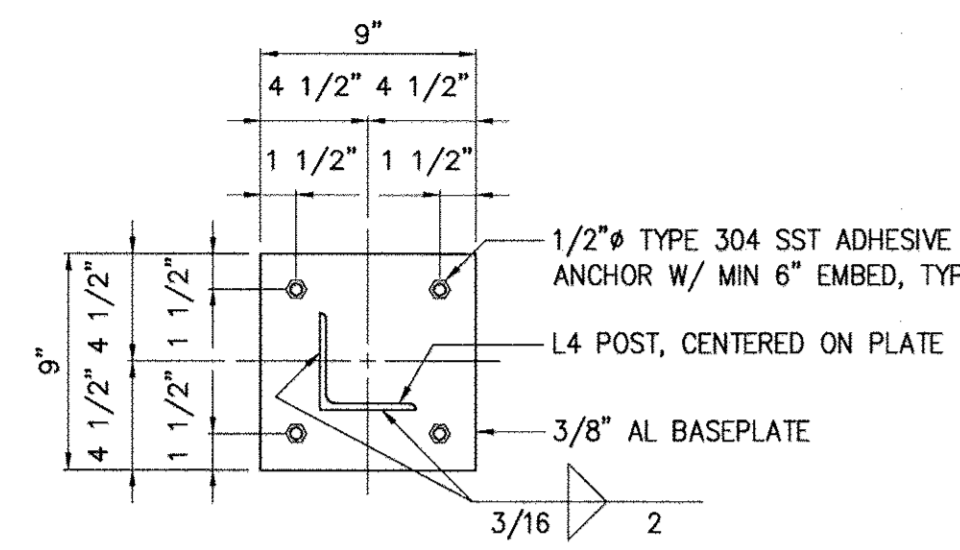
60' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

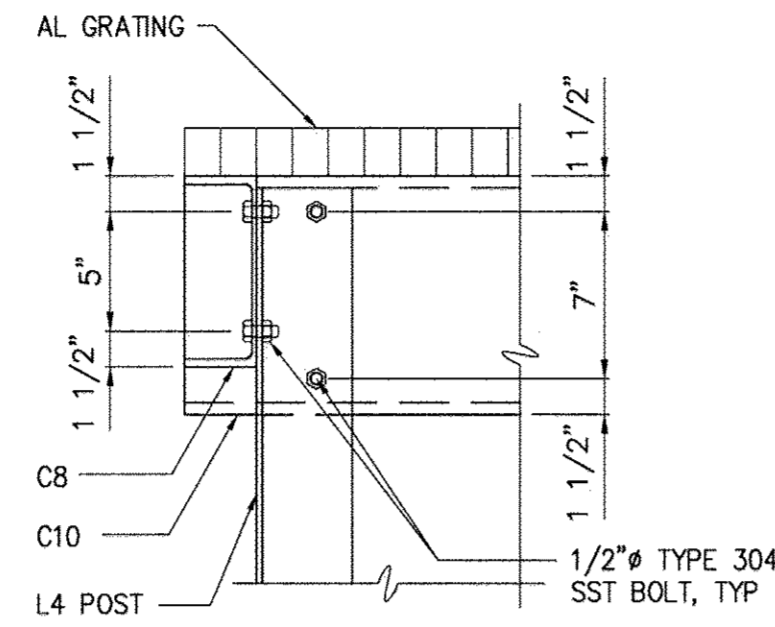
DATE: APRIL 2017
DRAWING NUMBER: S-4
SCALE: AS SHOWN
SHEET 21 OF 46

NOTES

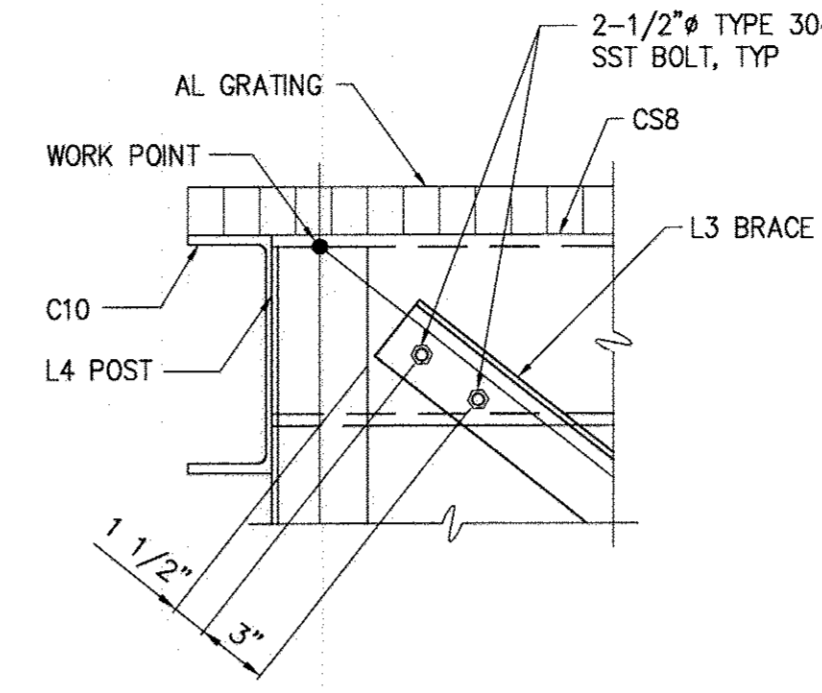
- CONTRACTOR SHALL PLACE CAPS/PLUGS IN BOTTOM OF RAILING POSTS TO KEEP INSECTS AND BEES FROM NESTING.
- CONTRACTOR SHALL INSTALL A NEOPRENE GASKET BETWEEN THE ALUMINUM BASE PLATE AND CONCRETE GROUT FOR CORROSION PROTECTION.



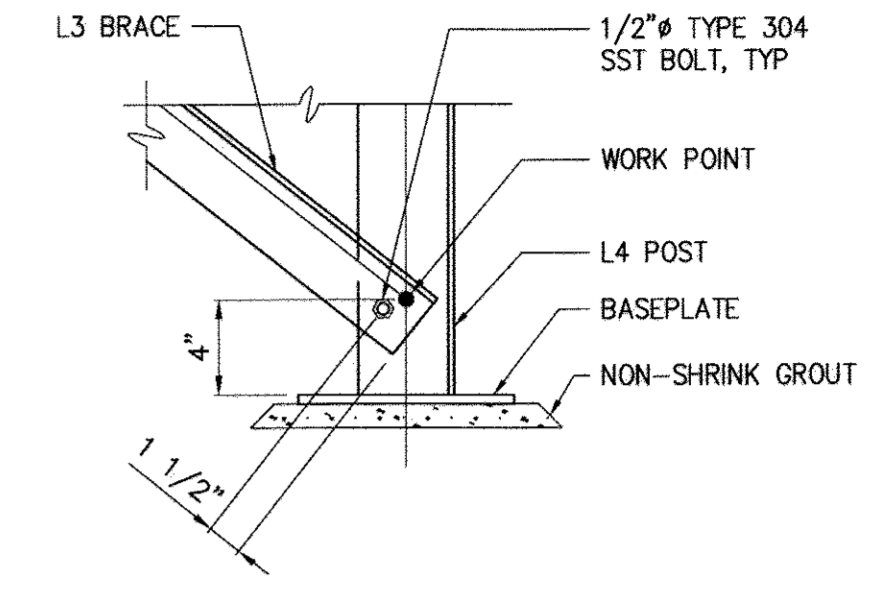
BASEPLATE
DETAIL 1
NTS S-4



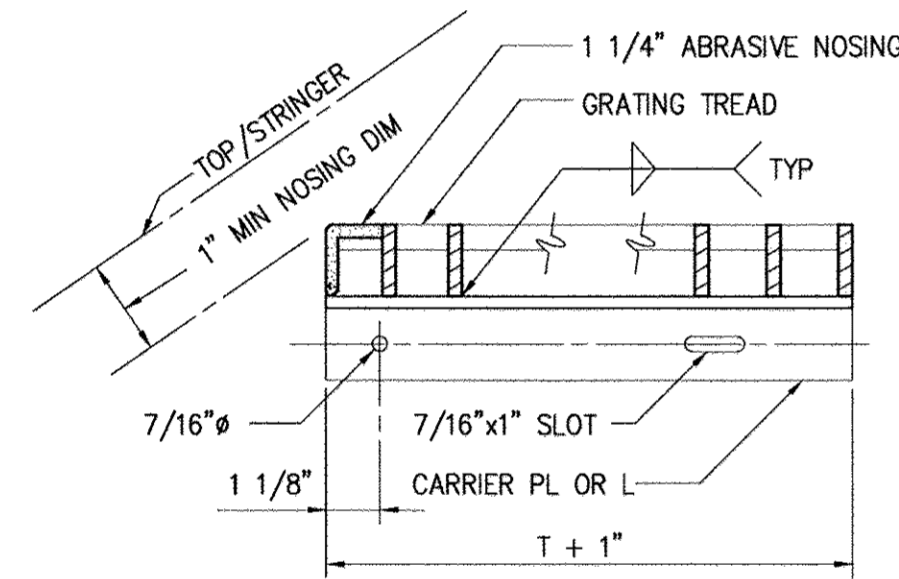
BEAM TO POST CONNECTION
DETAIL 2
NTS S-4



BRACE TOP CONNECTION
DETAIL 3
NTS S-4



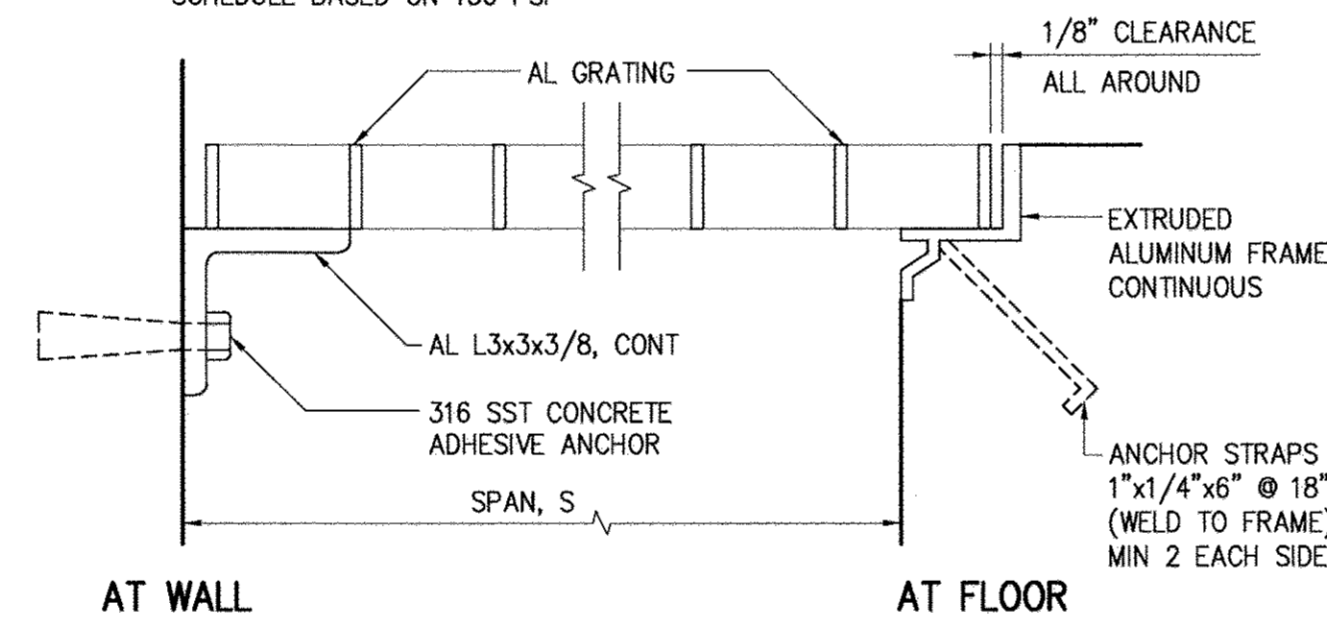
BRACE BOTTOM CONNECTION
DETAIL 4
NTS S-4



TYP TREAD DETAIL
DETAIL 5
NTS S-4

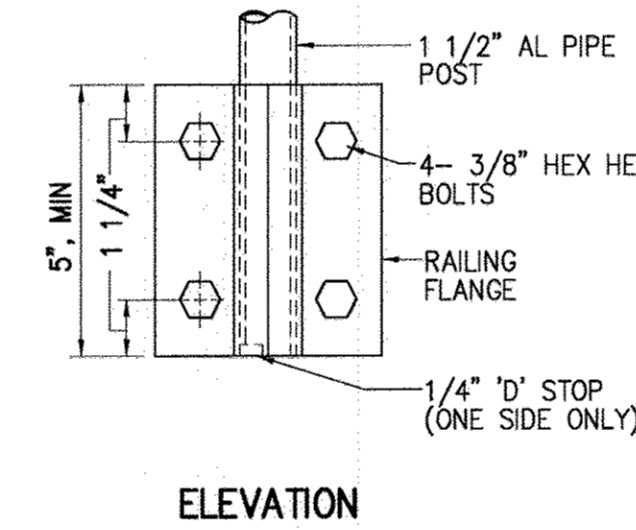
SPAN, S	DEPTH (MIN)	CONCRETE ANCHOR (SIZE AND SPACING)
0'-0" < S ≤ 4'-0"	1 1/2"	1/2" x 5 1/2" @ 18"
4'-0" < S ≤ 5'-0"	1 3/4"	
5'-0" < S ≤ 5'-6"	2"	
5'-6" < S ≤ 6'-0"	2 1/4"	5/8" x 6" @ 18"
6'-0" < S ≤ 6'-6"	2 1/2"	

SCHEDULE BASED ON 150 PSF

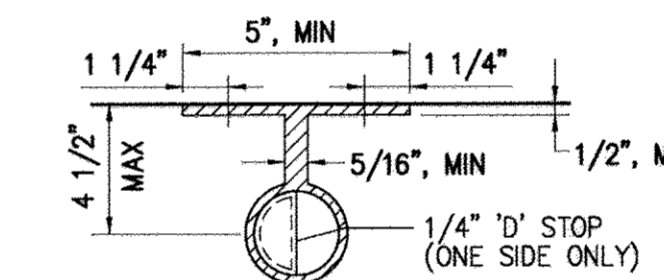


* WHERE ALUMINUM IS TO BE IN CONTACT WITH CONCRETE, IT SHALL BE COATED WITH A BITUMINOUS COATING.

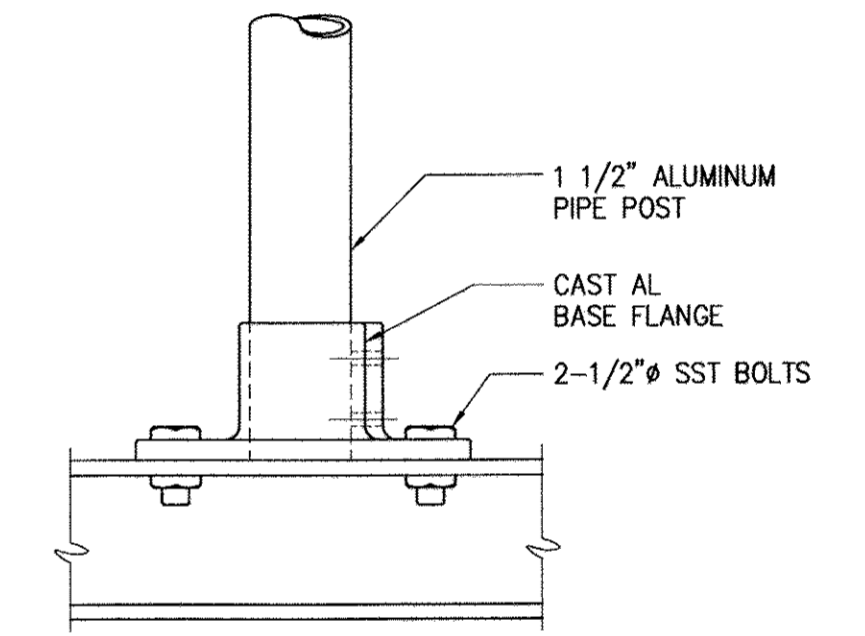
ALUMINUM GRATING
DETAIL 7
NTS S-4



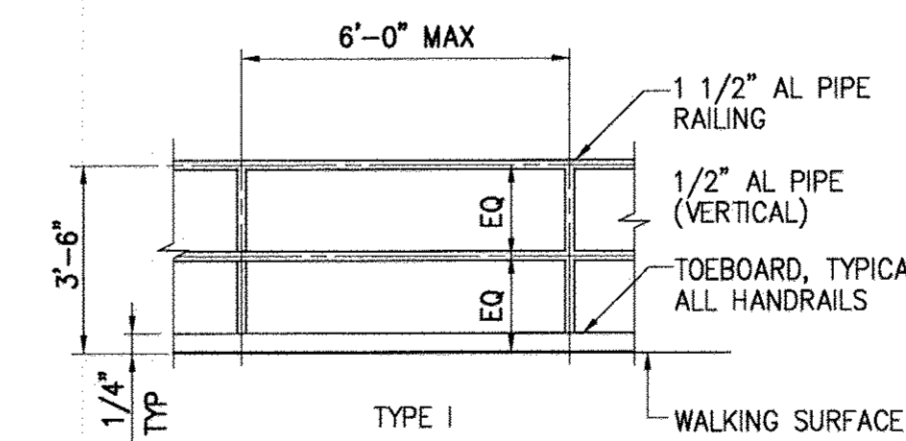
ELEVATION



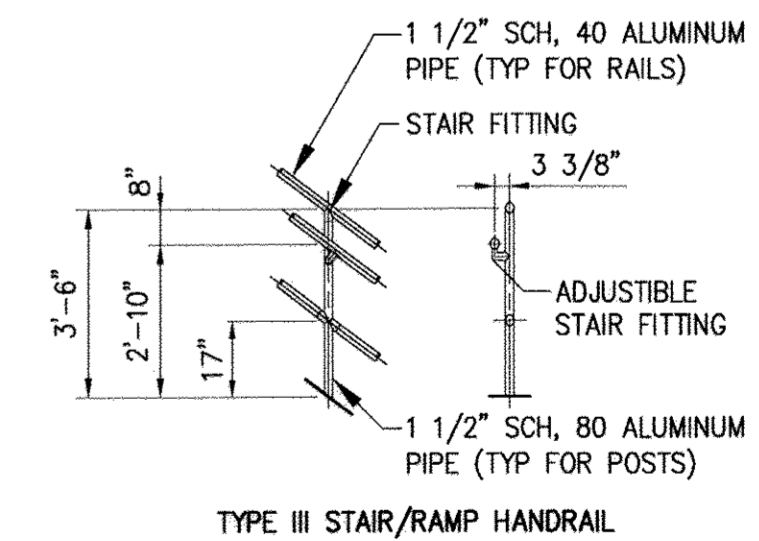
SIDE MOUNT TO METAL



SURFACE MOUNTED TO METAL



ELEVATION



TYPE III STAIR/RAMP HANDRAIL

ALUMINUM HANDRAILS
DETAIL 6
NTS S-4

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *J. G. Ho* 6/5/17
 Chief Bureau of Engineering: *Thomas R. Butler* 6/5/17
 Chief Bureau of Utilities: *Chris Long* 6/5/17
 Chief Utility Design Division: *[Signature]* 6/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



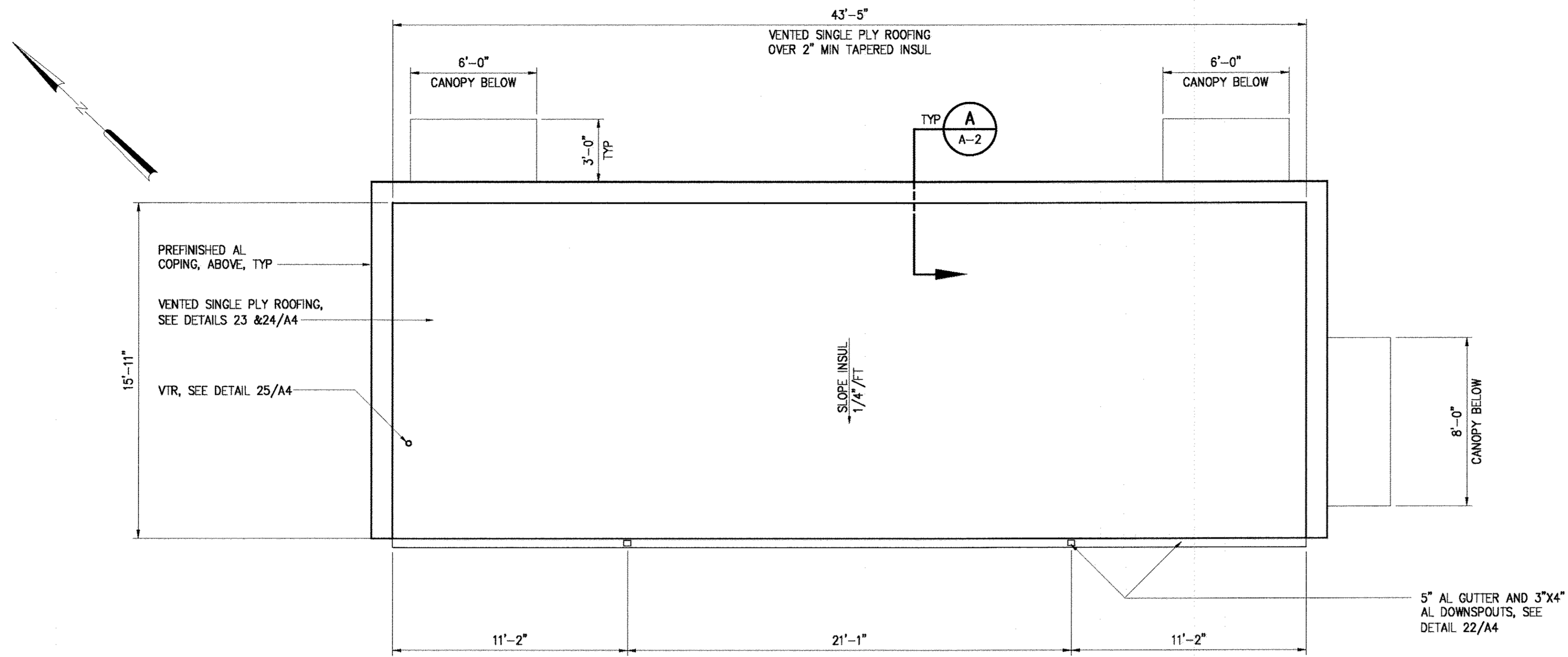
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 43434, EXPIRATION DATE 02/27/2019.
SIGNED: *Chris J. P...*

DESIGNED	AGM				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
CIP APPROVED					

STRUCTURAL
GENERATOR DETAILS
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: S-5
SCALE: AS SHOWN
PAGE: 22 OF 46



ROOF PLAN

1/4"=1'-0"
45'-5"

MANUFACTURED BUILDING ENCLOSURE NOTES:

- WALL FINISH MATERIALS SHALL BE EXTENDED INTO DOOR OPENINGS TO MATCH BRICK OPENINGS SHOWN ON DRAWINGS. PACKAGE PUMP STATION ENCLOSURE SHOP DRAWINGS SHALL INCLUDE COLD FORMED METAL FRAMING REACTION LOADS.
- INTERIOR RESTROOM DOOR SHALL BE BUILDING MANUFACTURER'S STANDARD METAL DOOR.

NOTES:

- DIMENSIONS ARE NOMINAL AND TO THE FACE OF WALL. COORDINATE MANUFACTURED BUILDING OPENINGS TO MATCH BRICK OPENINGS SHOWN ON DRAWINGS. PACKAGE PUMP STATION ENCLOSURE SHOP DRAWINGS SHALL INCLUDE COLD FORMED METAL FRAMING REACTION LOADS.
- EXTERIOR FINISHES SHALL MATCH THE ADJACENT EMERSON VIII BUILDING AS FOLLOWS:
 - BASE
 - 2.1.1. CAST STONE
 - WALL
 - 2.2.1. BRICK RUNNING BOND
 - 2.2.2. SOLDIER COURSE OVER OPENINGS
 - 2.2.3. RECESSED COURSE ACCENT BAND
 - STOREFRONT
 - 2.6.1. LIGHT GRAY FLUOROPOLYMER COATED ALUMINUM
 - 2.6.2. DARK OPAQUE GLASS
 - DOORS
 - 2.6.1. LIGHT GRAY FLUOROPOLYMER COATED STEEL
 - WALL COPING CAP
 - 2.6.1. LIGHT GRAY FLUOROPOLYMER COATED ALUMINUM
 - GUTTER AND DOWNSPOUTS
 - 2.7.1. LIGHT GRAY FLUOROPOLYMER COATED ALUMINUM
 - THRU WALL HVAC UNITS
 - 2.8.1. LIGHT GRAY FLUOROPOLYMER COATED METAL
 - WALL MOUNTED LIGHTING
 - 2.9.1. LIGHT GRAY

BUILDING CODE SUMMARY:

2015 INTERNATIONAL BUILDING CODE WITH LOCAL AMENDMENTS, HOWARD COUNTY, MD

OCCUPANCY: F2, FACTORY INDUSTRIAL
 CONSTRUCTION TYPE: VB
 BUILDING AREA: 753 SF GROSS
 BUILDING HEIGHT: 11.33 FEET
 BUILDING STORIES: 1 STORY
 OCCUPANCY NUMBER: 3 OCCUPANTS
 NUMBER AND ARRANGEMENT OF EXITS: 1 PROVIDED PER SPACE

EMERGENCY LIGHTING AND EXIT SIGNS PROVIDED

ADA COMPLIANCE IS NOT REQUIRED, PER 1103.2.9 EQUIPMENT SPACES.

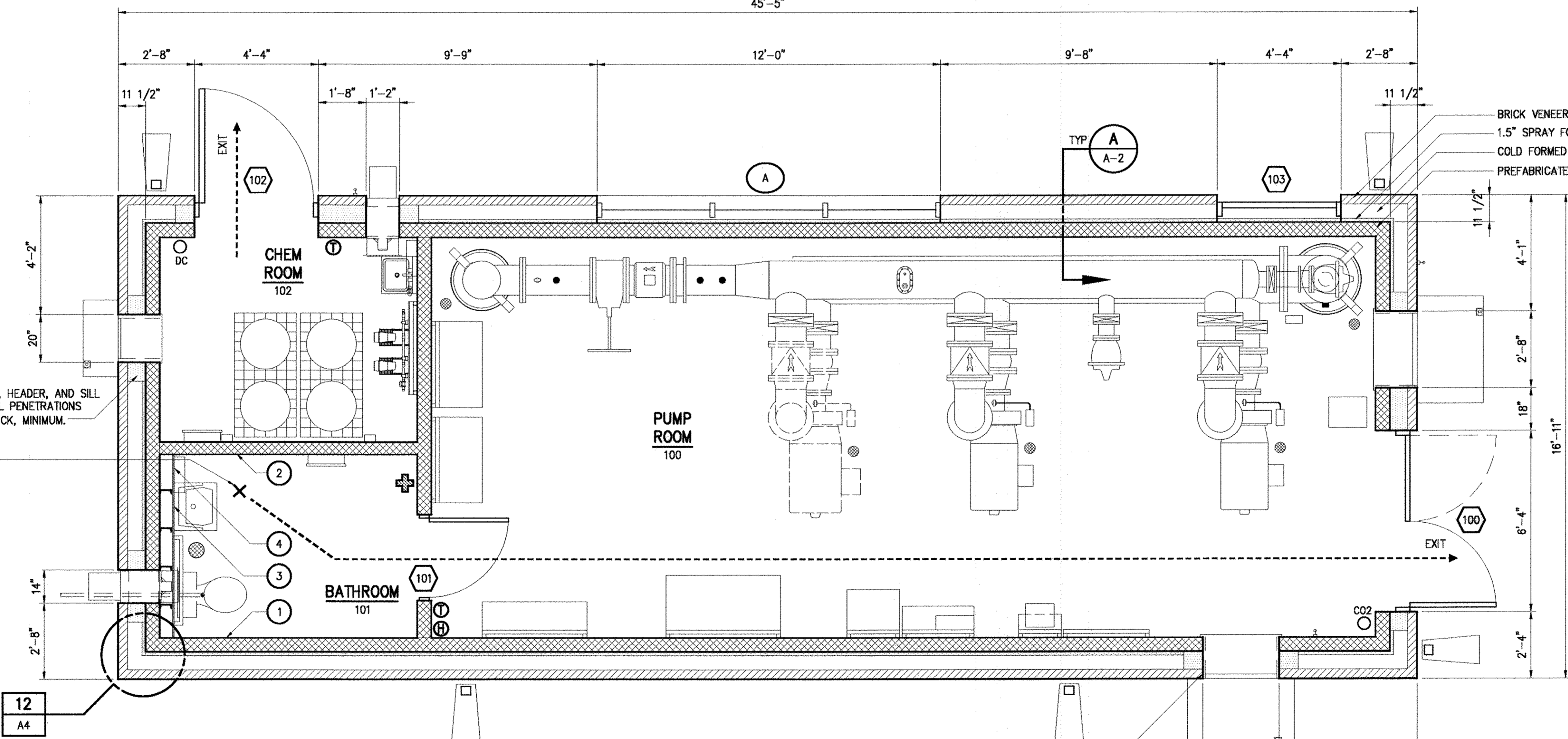
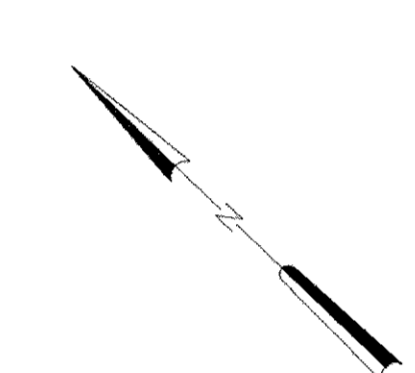
INSULATION PROVIDED TO MEET IECC BUILDING THERMAL ENVELOPE REQUIREMENTS. R-21 INSULATION PROVIDED WITH PACKAGED PUMP STATION ENCLOSURE. INSULATION WILL BE ADDED IN FIELD TO PROVIDE R-26 AT WALLS AND R-30 AT ROOF.

ROOF DRAINAGE SUMMARY:

100 YEAR 1 HOUR RAINFALL: 3.5"
 HORIZONTAL ROOF AREA: 692 SF
 TOTAL ROOF GPM (100 YR): 32 GPM
 HORIZONTAL GUTTER CAPACITY: ONE 3"x5" 157 GPM
 RECTANGULAR DOWNSPOUT CAPACITY: TWO 3"x4" 192 GPM EACH

LEGEND:

- BRICK
- MANUFACTURED ENCLOSURE
- DOOR, SEE A-3 FOR SCHEDULE
- WINDOW, SEE A-3 FOR SCHEDULE
- LOUVER, SEE HVAC
- DC FIRE EXTINGUISHER - DRY CHEMICAL
- CO2 FIRE EXTINGUISHER - CARBON DIOXIDE
- FIRST AID KIT



FLOOR PLAN

3/8"=1'-0"

BATHROOM ACCESSORY SCHEDULE		
(NO.)	ITEM	MOUNTING HEIGHT
1	TOILET TISSUE DISPENSER	19"
2	SURFACE MOUNTED PAPER TOWEL DISPENSER/DISP.	TOP @ 5'-0"
3	MIRROR 24"x36"	BOTTOM @ 40"
4	SOAP DISPENSER	40"

FILL COLD FORMED METAL FRAMING JAMB, HEADER, AND SILL WITH SPRAY POLYURETHANE FOAM AT ALL PENETRATIONS THRU MANUFACTURED ENCLOSURE, 5" THICK, MINIMUM.
 MOST REMOTE POINT, 41' TO EXIT

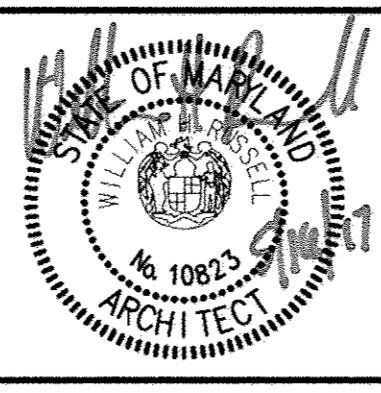
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

James E. Buttle 4/5/17
 CHIEF BUREAU OF ENGINEERING DATE

Chris King 5/5/17
 CHIEF BUREAU OF UTILITIES DATE

Hazen
 HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-539-7881



PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
 LICENSE NO. 10823
 EXPIRATION DATE 11/18/2017
 SIGNED: *James E. Buttle*

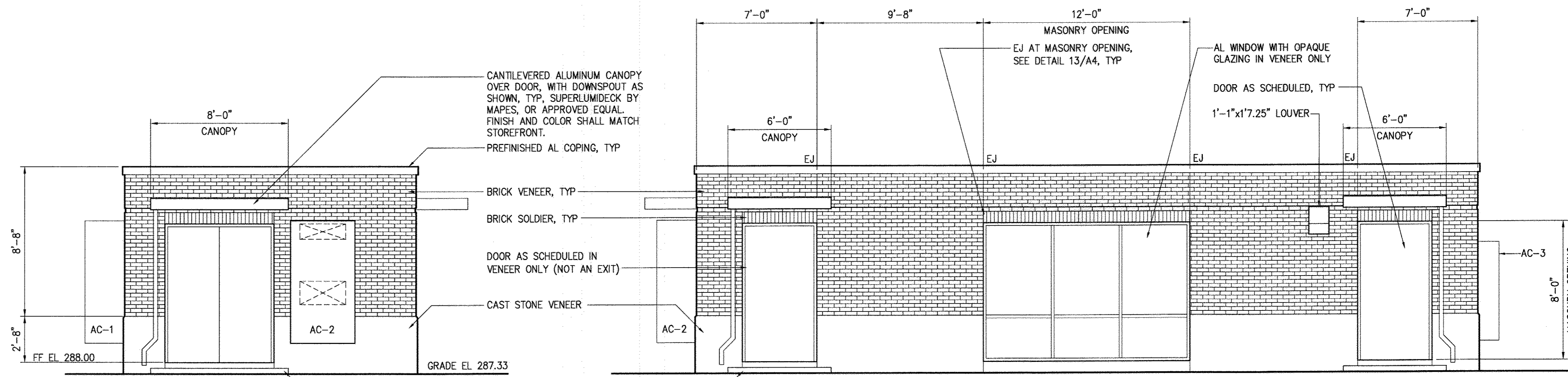
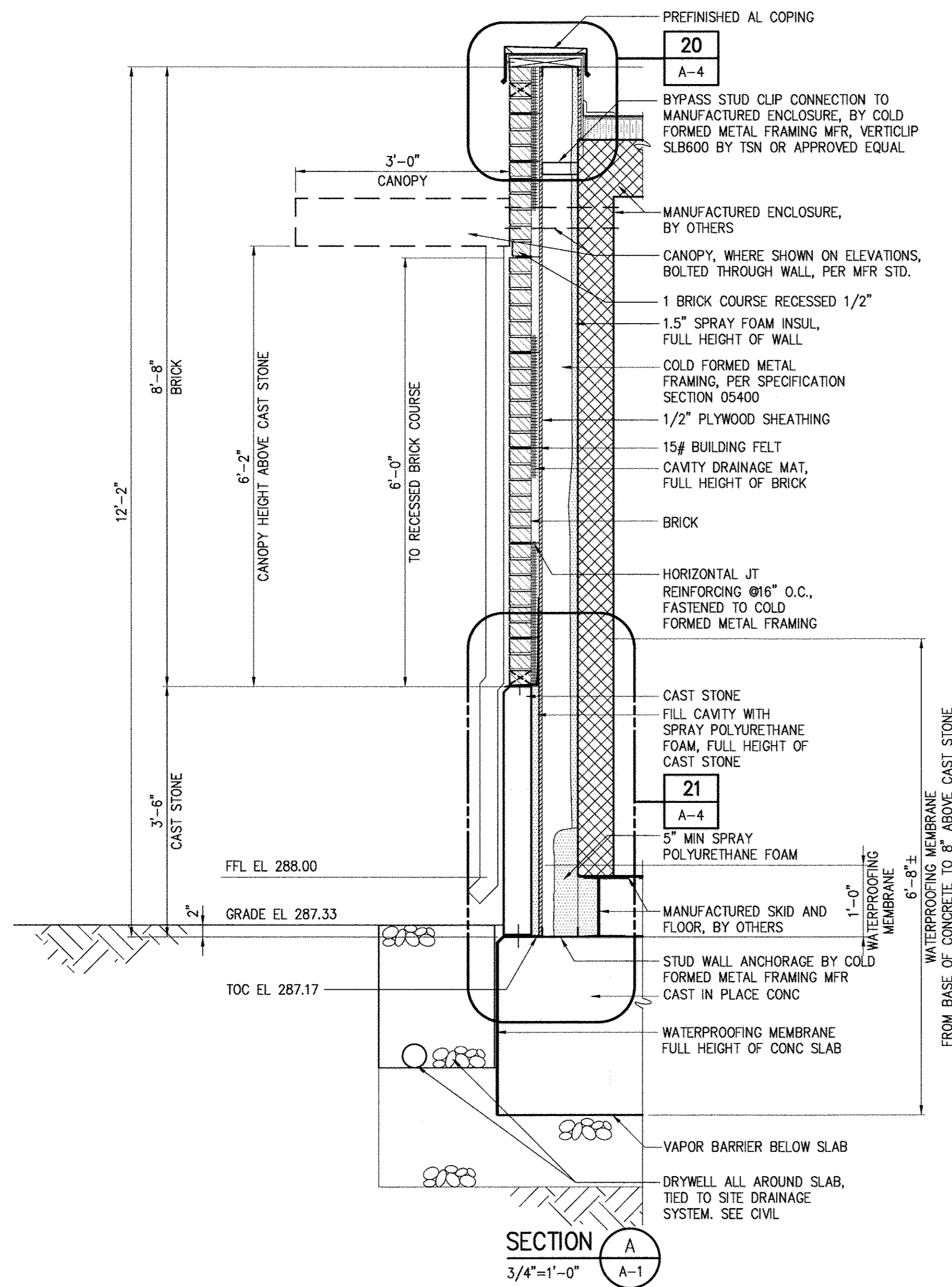
DESIGNED	WHR
DRAWN	MMM
CHECKED	WHR
PROJ. ENGR.	JTH
APPROVED	WHR

ARCHITECTURAL
 PACKAGE PUMPING STATION
 PLANS AND CODE SUMMARY

600' SCALE MAP: 47 BLOCK NO.: 20

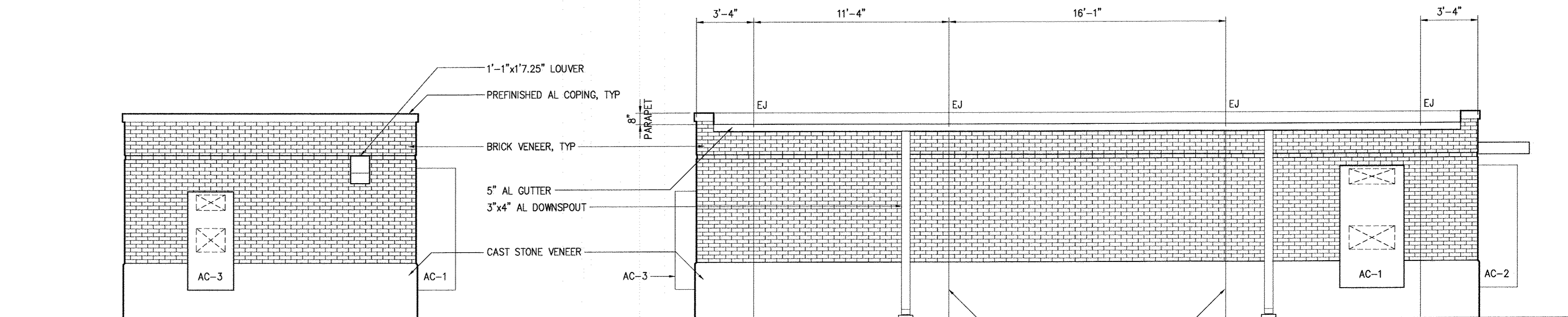
WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	A-1
SCALE	AS SHOWN
TOTAL SHEETS	23 OF 46



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

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



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

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

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 6/6/17
 Chief Bureau of Engineering: *[Signature]* 6/5/17
 Chief Bureau of Utilities: *[Signature]* 6/5/17
 Chief Utility Design Division: *[Signature]* 6/11/17

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202
410-539-7681



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SIGNED: *[Signature]*

DESIGNED	WHR						
DRAWN	MMM						
CHECKED	WHR						
PROJ. ENGR.	JTH						
WHR APPROVED							
NO.		REVISION		DATE	BY		

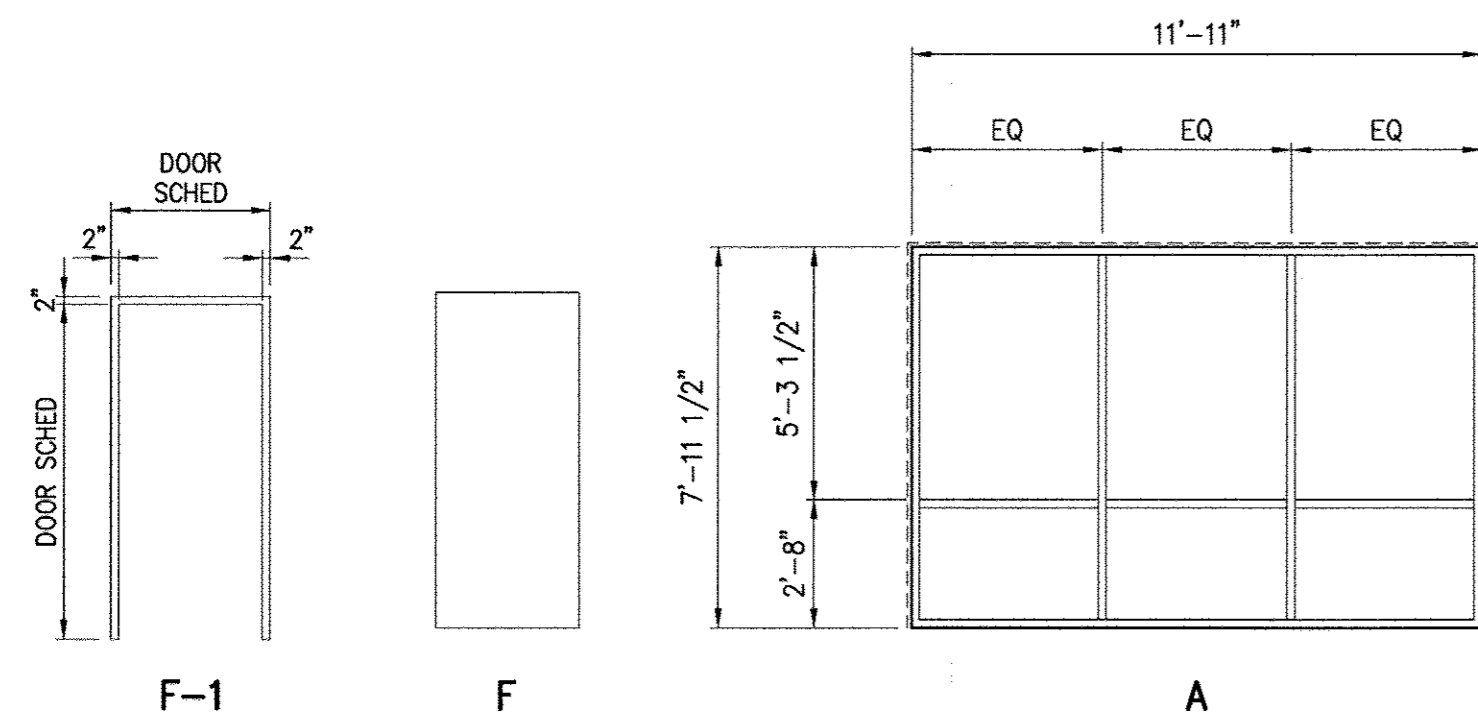
ARCHITECTURAL
PACKAGE PUMPING STATION
ELEVATIONS AND SECTIONS

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
 DRAWING NUMBER: A-2
 SCALE: AS SHOWN
 SHEET 24 OF 46

DOOR & FRAME TYPES AND WINDOW TYPES

1/4" = 1'-0"



SV-3 SIDING VENT, BY CORAVENT, OR APPROVED EQUAL, INSTALLED FULL LENGTH OF JAMB AND HEAD, BETWEEN STOREFRONT AND WALL OPENING.

DOOR SCHEDULE

NO.	FRAME		DOOR			DETAILS			GLAZING	LOUVER	FIRE LABEL	FINISH	HDWR NO	THRSHLD	REMARKS		
	TYPE	MATL	TYPE	MATL	WIDTH	HEIGHT	THICKNESS	HEAD								JAMB	SILL
WATER PUMPING STATION																	
100	F-1	HM	F	HM	(2) 3'-0"	7'-10"	1 3/4"	1/A3	2/A3	3/A3	---	---	---	MFR	2	AL	NOTE 5
101	F-1	HM	F	HM	3'-0"	7'-10"	1 3/4"	1/A3	2/A3	3/A3	---	---	---	MFR	1	AL	NOTE 2,5
103	F-1	HM	F	HM	3'-0"	7'-10"	1 3/4"	1/A3 SIM	2/A3 SIM	3/A3 SIM	---	---	---	MFR	3	AL	NOTE 3,5

WINDOW SCHEDULE

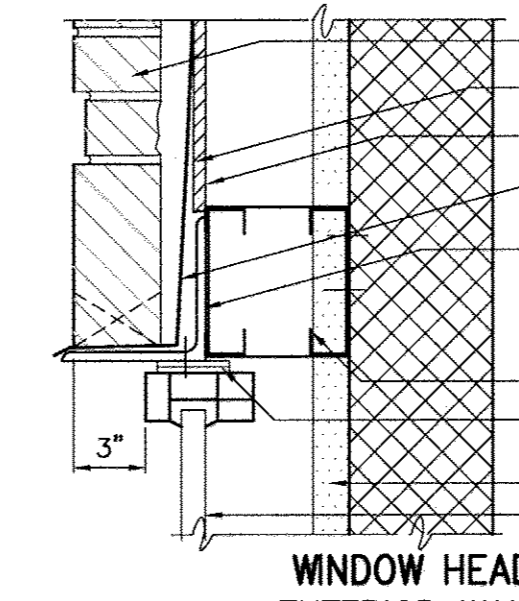
NO.	TYPE	MATERIAL	WIDTH	HEIGHT	DETAILS			GLAZING	WINDOW TREATMENT	REMARKS
					HEAD	JAMB	SILL			
WATER PUMPING STATION										
A	W-1	AL	12'-0"	8'-0"	4/A3	5/A3	6/A3	OG		NOTE 4,5

ABBREVIATIONS:

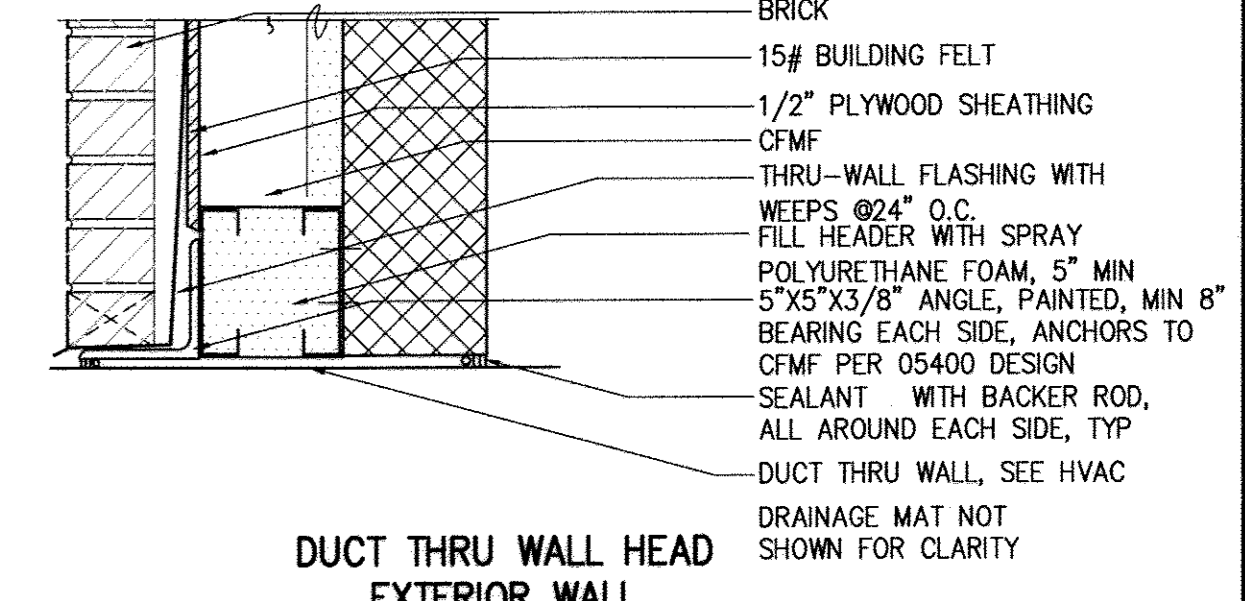
AL	ALUMINUM	IG	INSULATED GLASS
BRK	BRICK	LIG	LAMINATED INSULATED GLASS
CFMF	COLD FORMED METAL FRAMING	MFR	MANUFACTURER'S STANDARD
CONC	CONCRETE	MO	MASONRY OPENING
EJ	EXHAUST FAN	OG	OPAQUE GLASS
EXP	EXPANSION JOINT	PT	PAINT
F	FLUSH	SST	STAINLESS STEEL
FD	FLOOR DRAIN	STFR	STOREFRONT SYSTEM
FRP	FIBERGLASS REINFORCED POLYMER	STL	STEEL
HM	HOLLOW METAL	TIC	TINTED INSULATED GLASS
INSUL	INSULATED	TIG	TINTED TEMPERED GLASS
		TG	1/4" TEMPERED GLASS
		UNO	UNLESS NOTED OTHERWISE

NOTES:

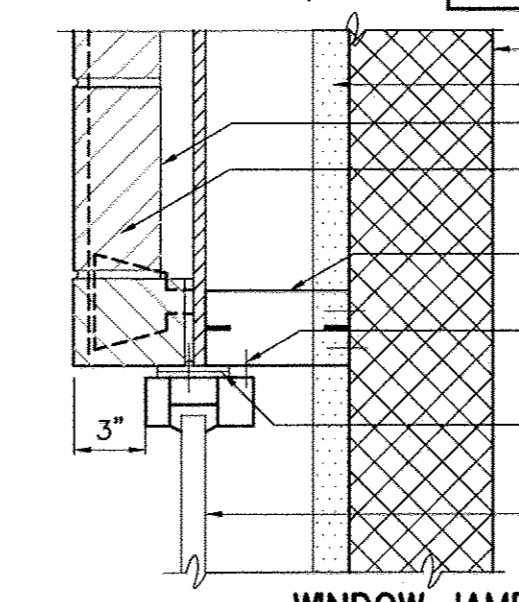
- INTERIOR FINISHES BY ENCLOSURE MANUFACTURER.
- INTERIOR RESTROOM DOOR BY ENCLOSURE MANUFACTURER. EXTERIOR DOORS PER SPECIFICATION SECTION 0810.
- DOOR 103 TO BE INSTALLED IN VENEER OPENING IN FRONT OF MANUFACTURED ENCLOSURE WALL, AND TO REMAIN LOCKED.
- WINDOW A TO BE INSTALLED IN VENEER OPENING IN FRONT OF MANUFACTURED ENCLOSURE WALL. FIELD VERIFY OPENING DIMENSIONS BEFORE FABRICATION OF WINDOW. SIZE WINDOW TO ACCOMMODATE VENTS. SEE WINDOW TYPE ELEVATION AND HEAD AND JAMB DETAILS THIS SHEET.
- COLD FORMED METAL FRAMING, INCLUDING OPENING HEADERS, JAMBS, SILLS, AND SUPPORT OF BRICK VENEER, SHALL BE ENGINEERED IN ACCORDANCE WITH SPECIFICATION SECTION 05400



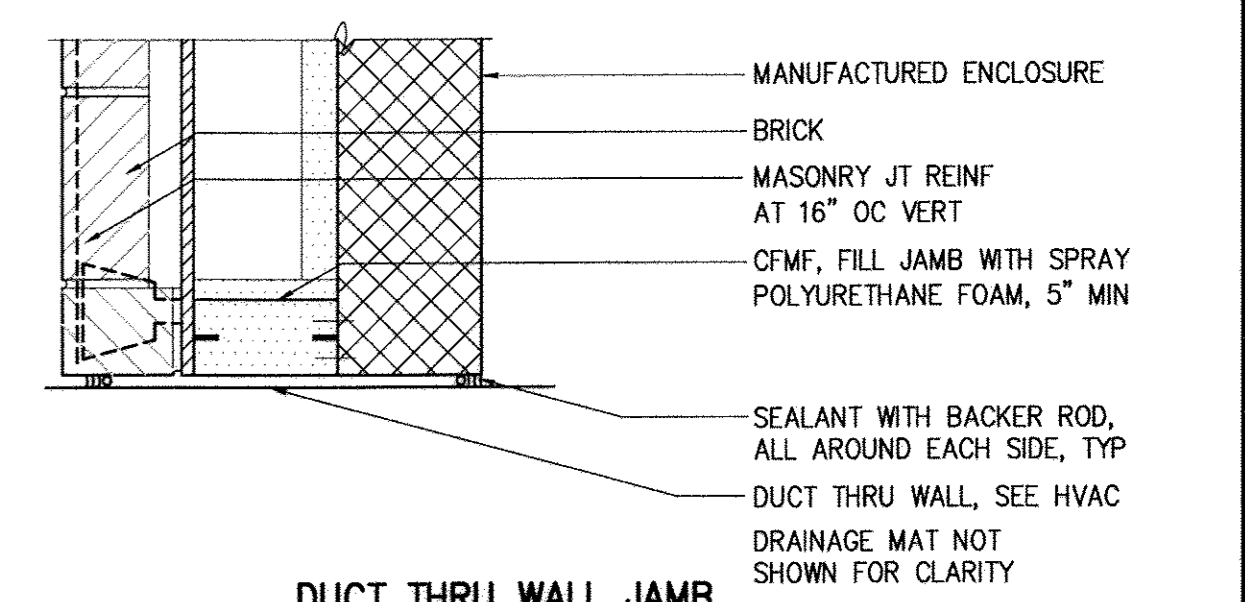
WINDOW HEAD EXTERIOR WALL
DETAIL 4
1 1/2"=1'-0" A-3



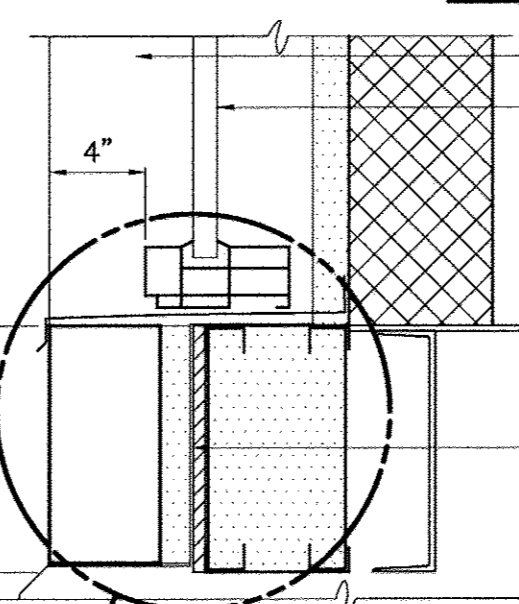
DUCT THRU WALL HEAD EXTERIOR WALL
DETAIL 7
1 1/2"=1'-0" A-3



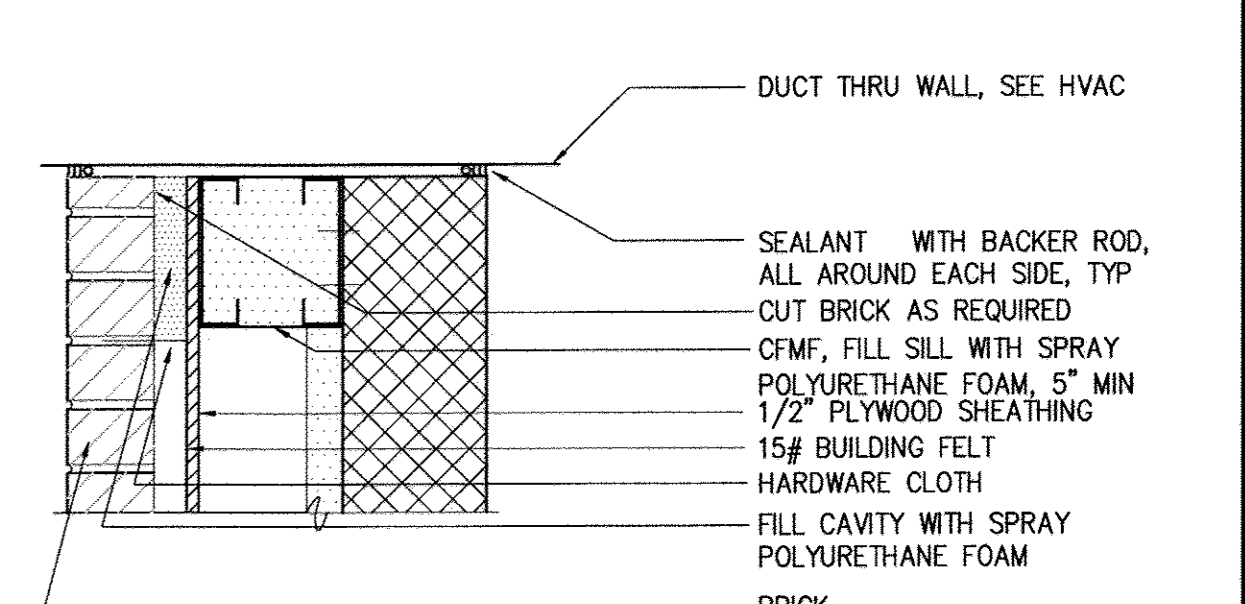
WINDOW JAMB EXTERIOR WALL
DETAIL 5
1 1/2"=1'-0" A-3



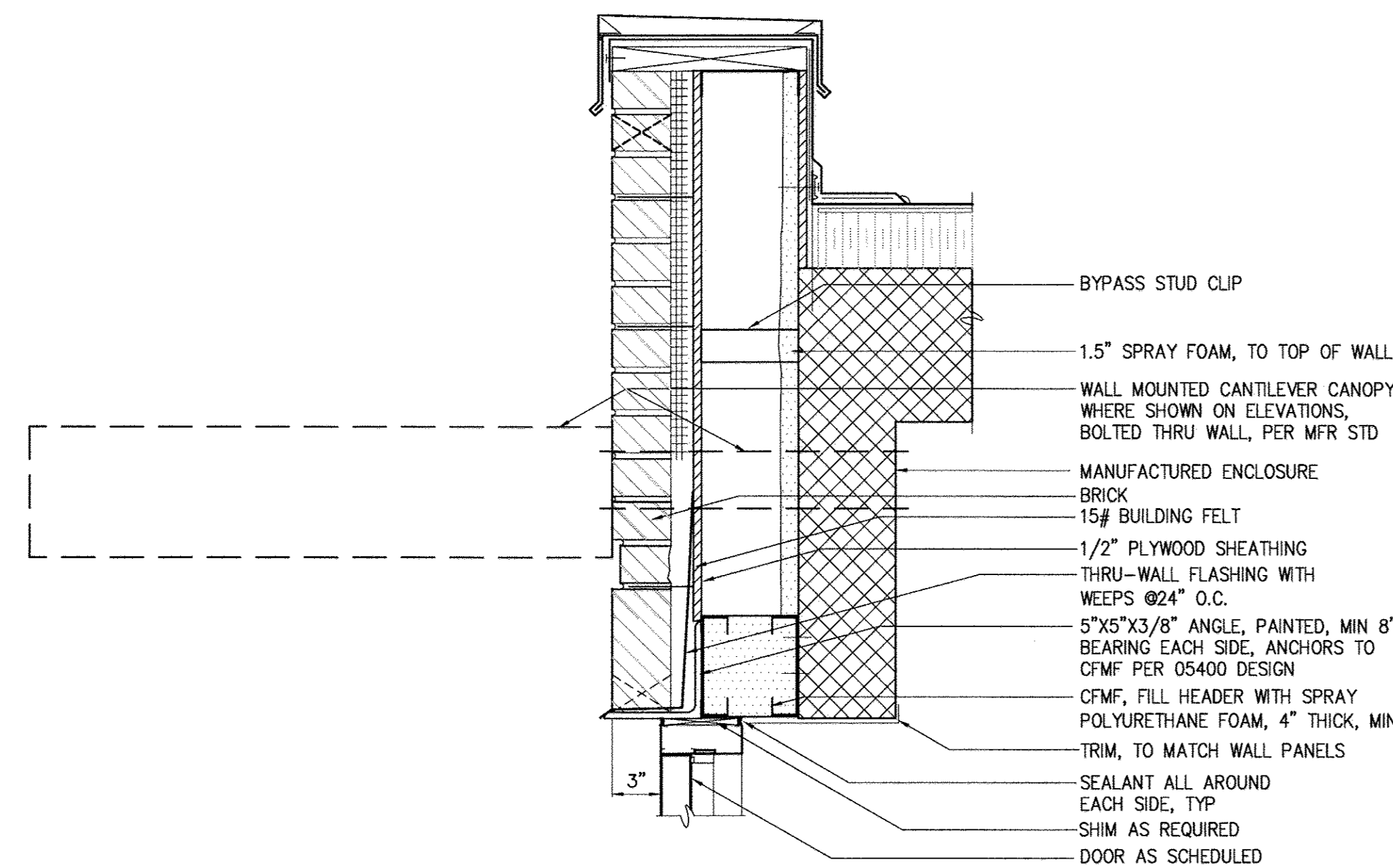
DUCT THRU WALL JAMB EXTERIOR WALL
DETAIL 8
1 1/2"=1'-0" A-3



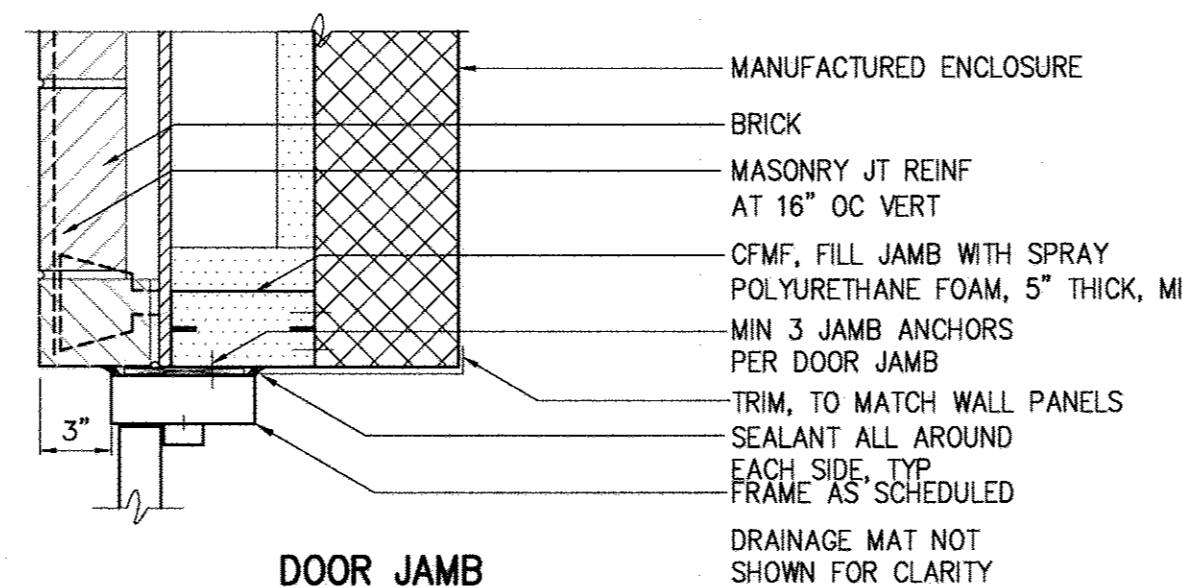
WINDOW SILL EXTERIOR WALL
DETAIL 6
1 1/2"=1'-0" A-3



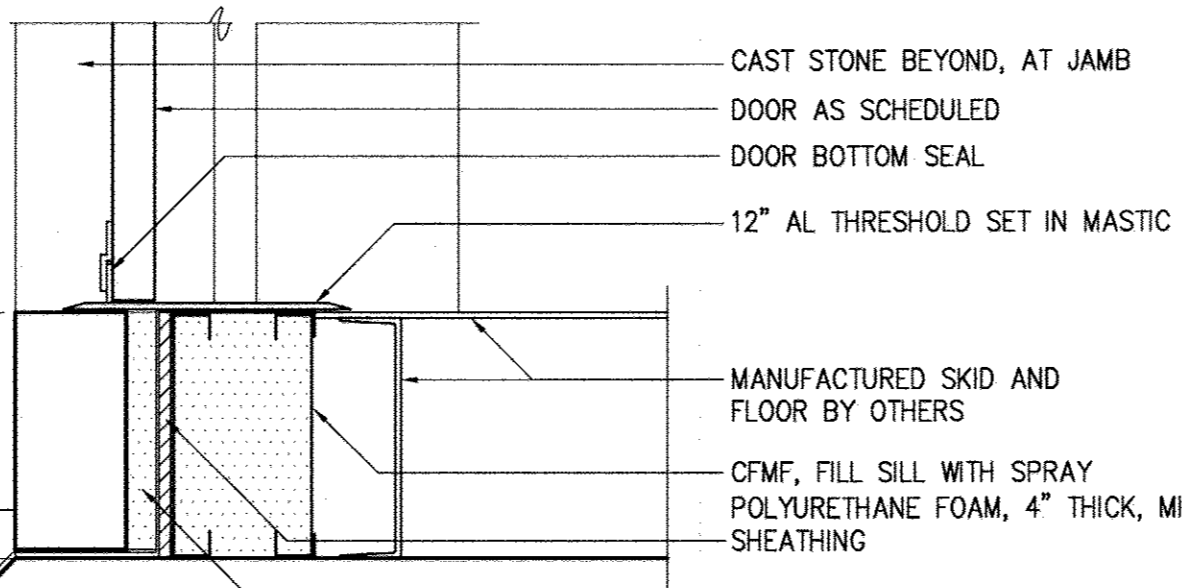
DUCT THROUGH WALL SILL EXTERIOR WALL
DETAIL 9
1 1/2"=1'-0" A-3



DOOR HEAD EXTERIOR WALL
DETAIL 1
1 1/2"=1'-0" A-3



DOOR JAMB EXTERIOR WALL
DETAIL 2
1 1/2"=1'-0" A-3

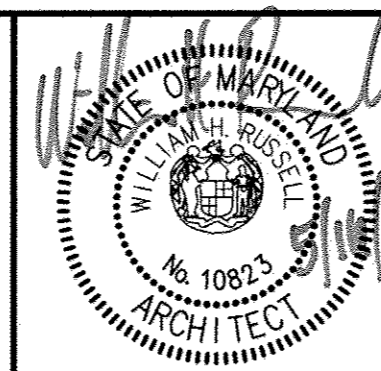


DOOR SILL EXTERIOR WALL
DETAIL 3
1 1/2"=1'-0" A-3

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 10823
EXPIRATION DATE 11/18/2017
SIGNED: [Signature]

DESIGNED: WHR
DRAWN: MMM
CHECKED: WHR
PROJ. ENGR: JTH
APPROVED: [Signature]

ARCHITECTURAL

PACKAGE PUMPING STATION
SCHEDULES AND DETAILS

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

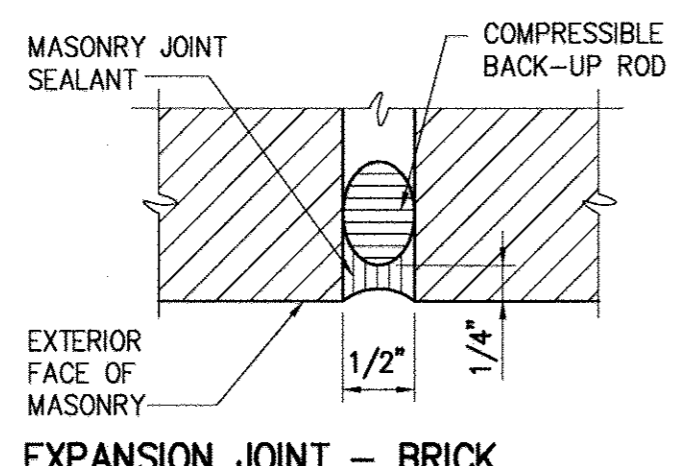
DATE: APRIL 2017

DRAWING NUMBER

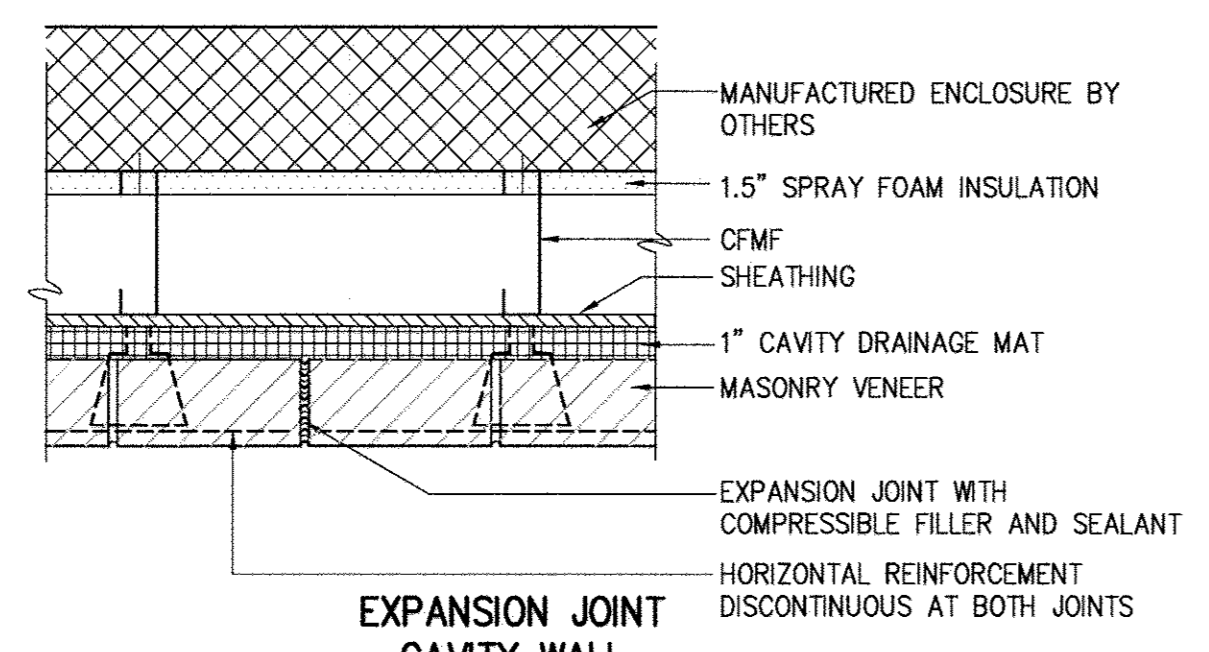
A-3

SCALE: AS SHOWN

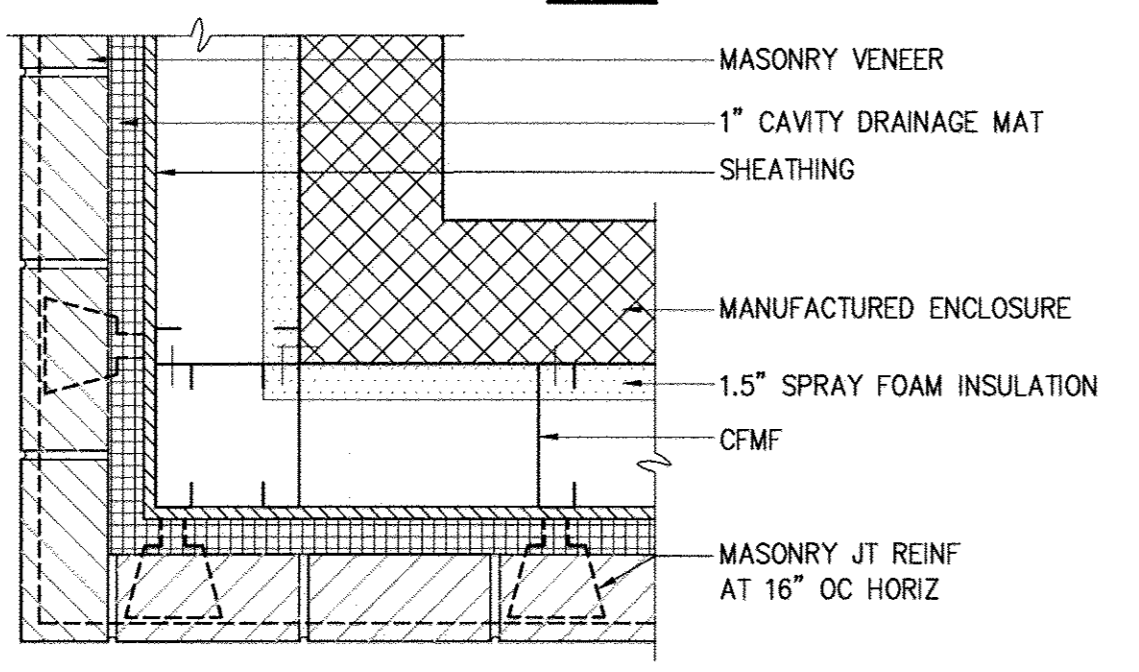
SHEET 25 OF 46



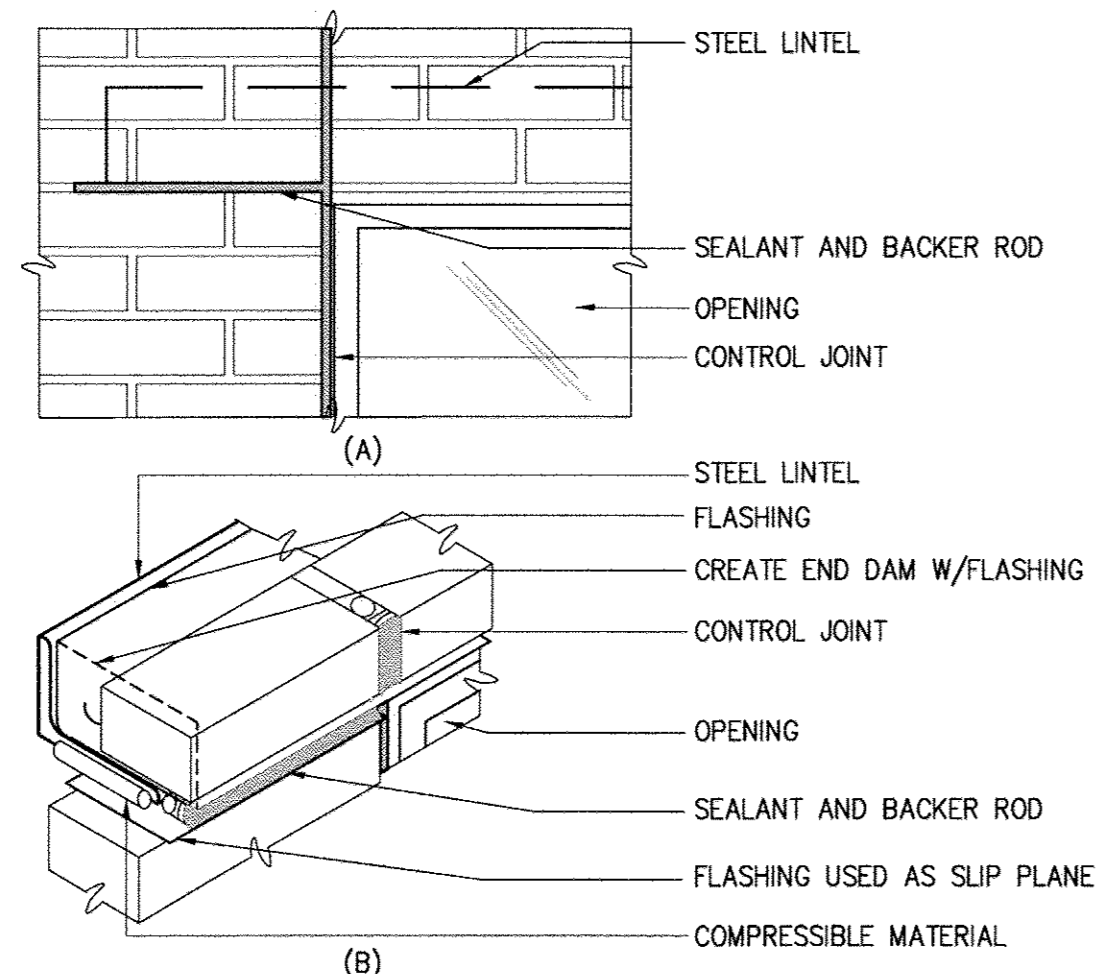
EXPANSION JOINT - BRICK
DETAIL 10
 NOT TO SCALE A-2



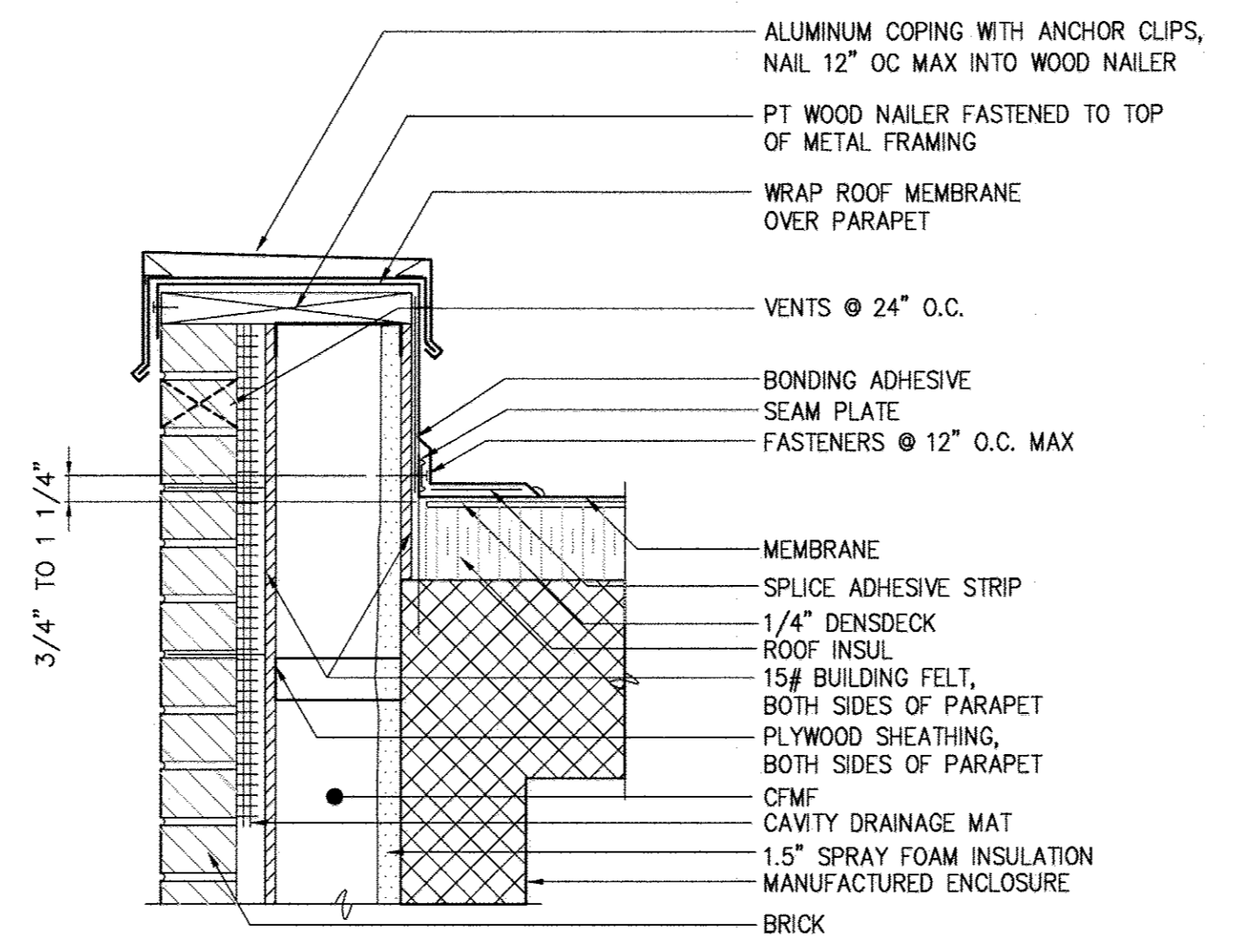
EXPANSION JOINT CAVITY WALL
DETAIL 11
 1 1/2"=1'-0" A-2



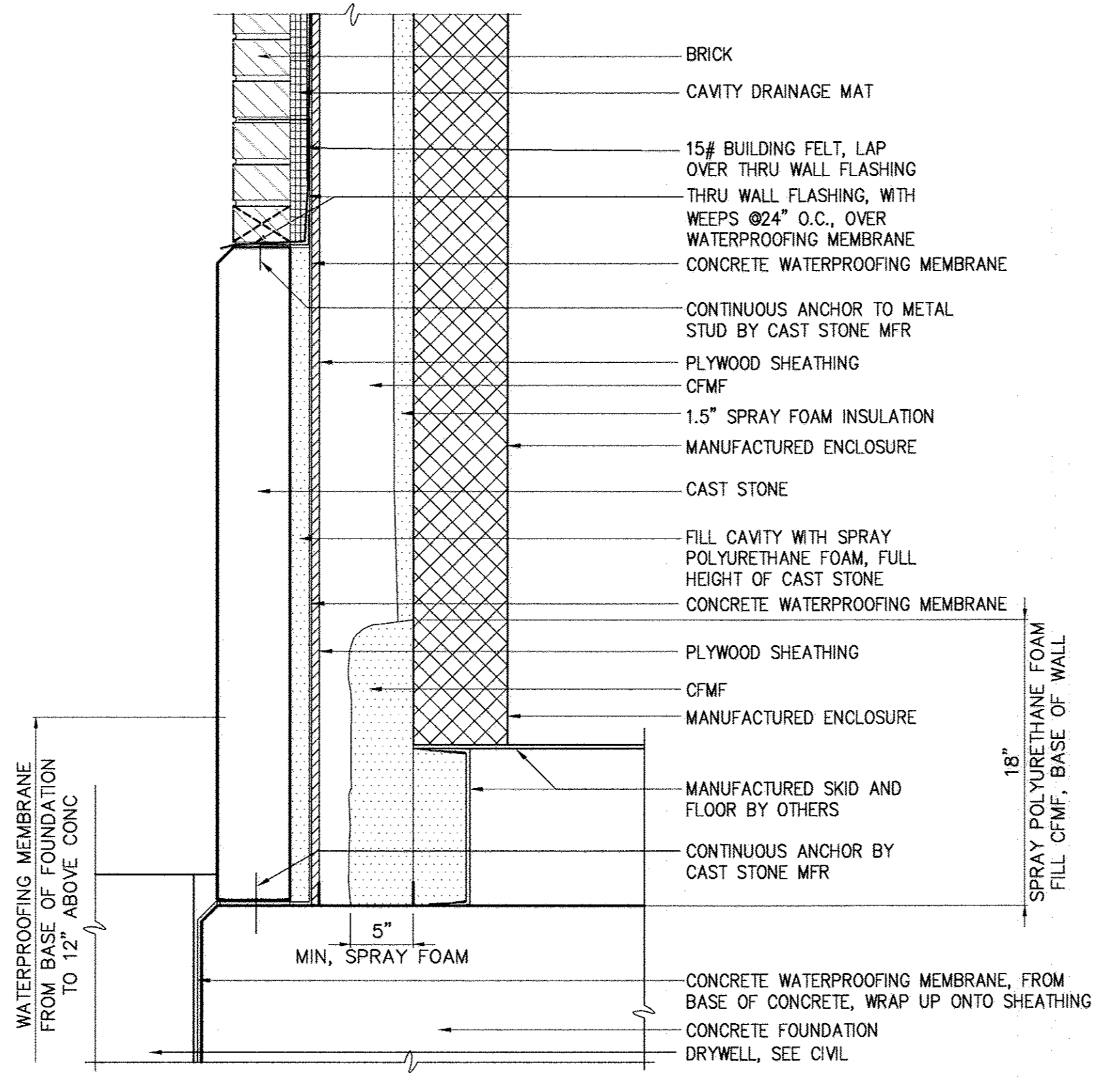
BRICK AT CORNER CAVITY WALL
DETAIL 12
 1 1/2"=1'-0" A-1



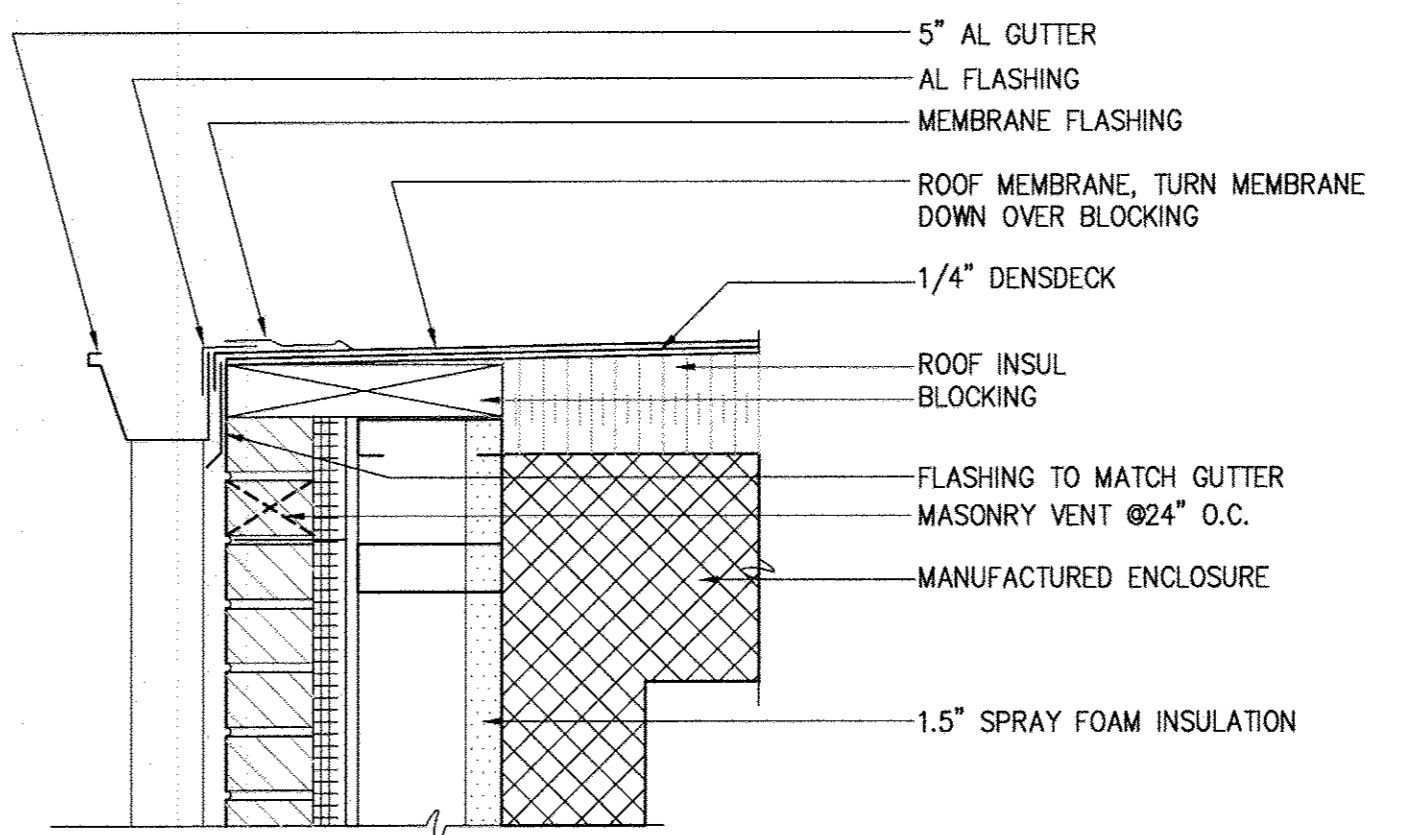
EXPANSION JOINT AT LOOSE LINTEL
DETAIL 13
 1 1/2"=1'-0" A-2



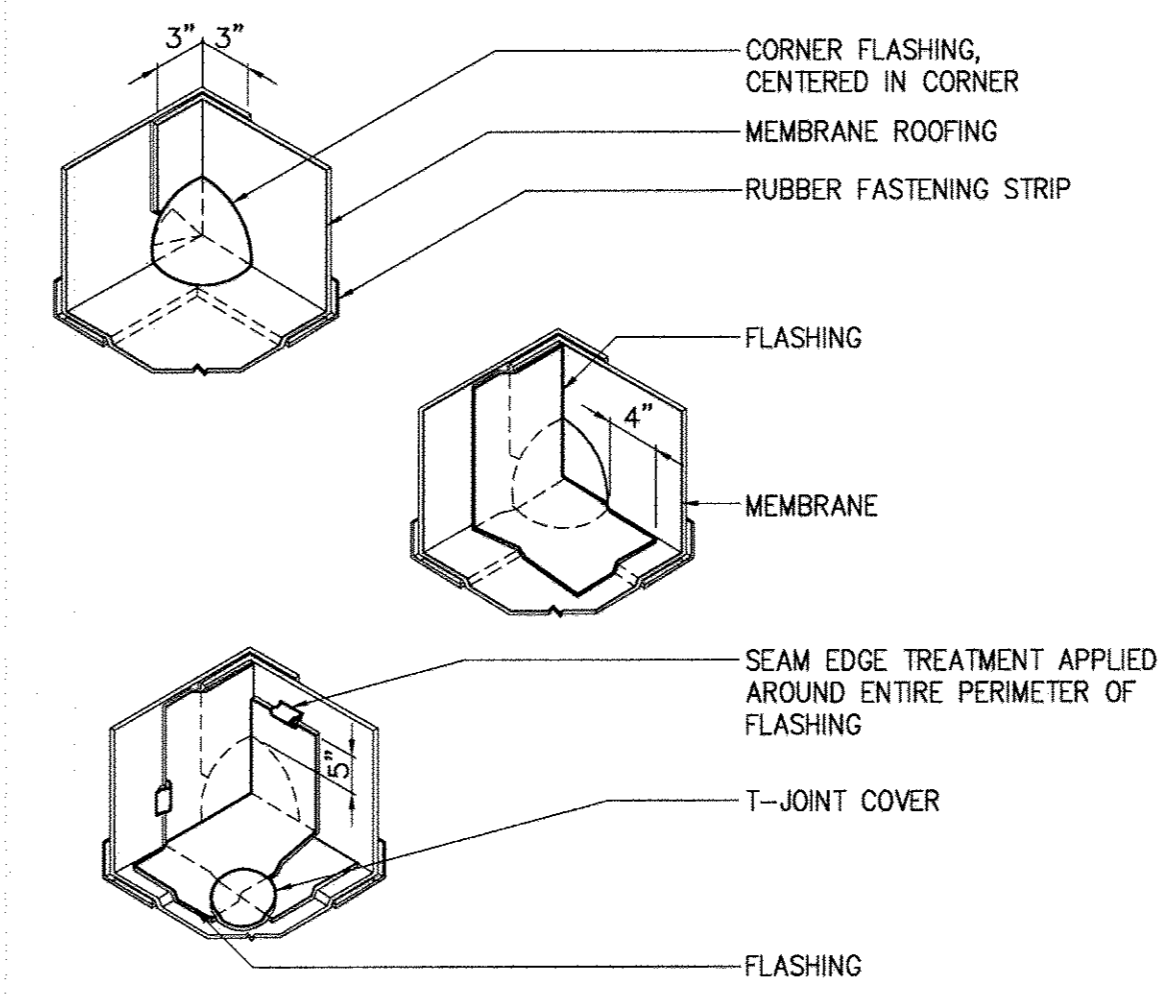
PARAPET FLASHING CAVITY WALL
DETAIL 20
 1 1/2"=1'-0" A-2



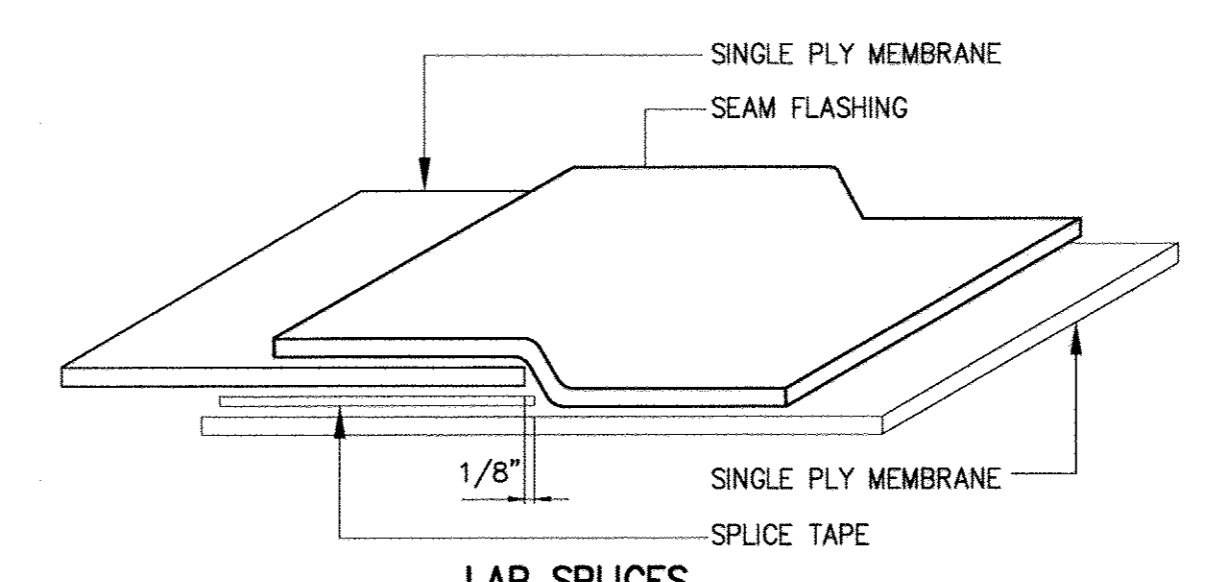
BASE FLASHING CAVITY WALL
DETAIL 21
 1 1/2"=1'-0" A-2



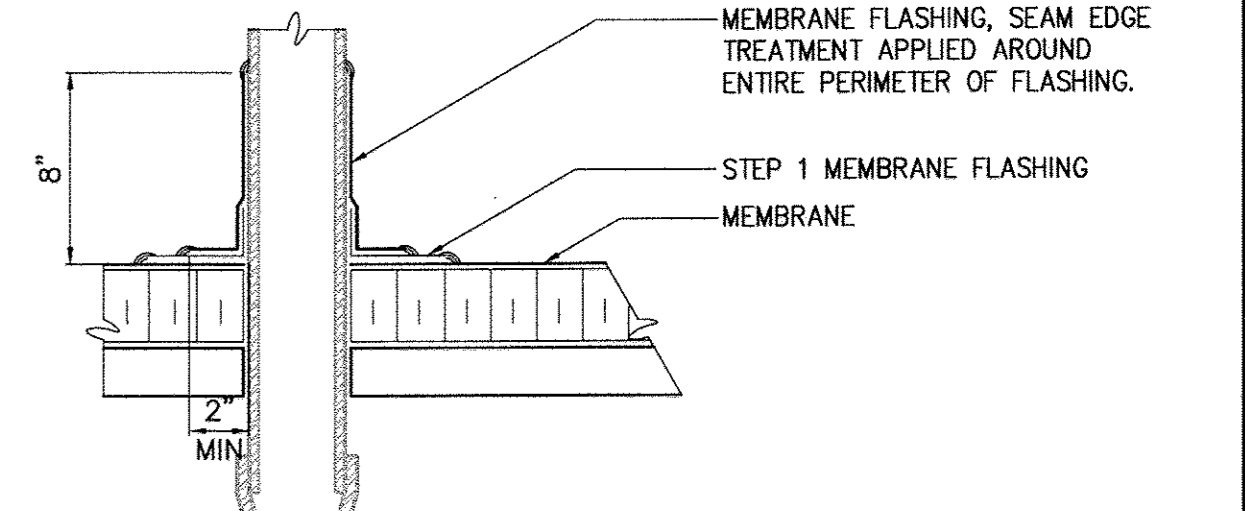
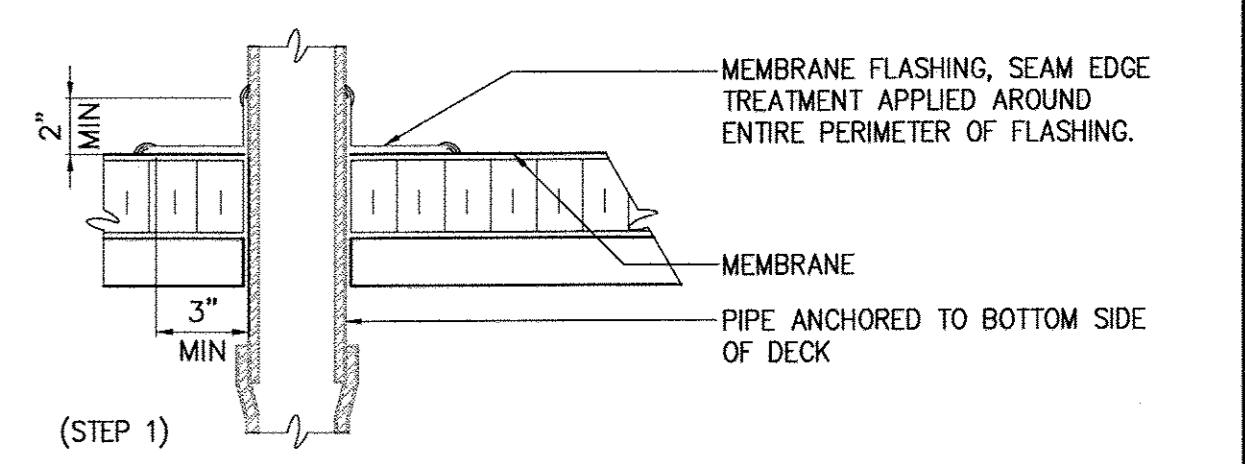
GUTTER SINGLE PLY MEMBRANE ROOFING
DETAIL 22
 1 1/2"=1'-0" A-1



INSIDE CORNER SINGLE PLY MEMBRANE ROOFING
DETAIL 23
 1 1/2"=1'-0" A-1



LAP SPLICES SINGLE PLY MEMBRANE ROOFING
DETAIL 24
 1 1/2"=1'-0" A-1

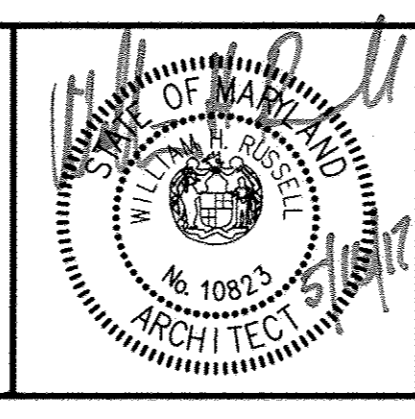


PLUMBING VENT SINGLE PLY MEMBRANE ROOFING
DETAIL 25
 1 1/2"=1'-0" A-1

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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Hazen
 HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-539-7681



PROFESSIONAL CERTIFICATION.
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 SIGNED: *Thomas R. Butler*

DESIGNED	WHR						
DRAWN	MMM						
CHECKED	WHR						
PROJ. ENGR.	JTH						
APPROVED	WHR						
		NO.	REVISION	DATE	BY		

ARCHITECTURAL
 PACKAGE PUMPING STATION
 DETAILS
 600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
 DRAWING NUMBER: A-4
 SCALE: AS SHOWN
 SHEET 26 OF 46

PRECISION CONTROL AIR CONDITIONING UNIT SCHEDULE

UNIT No.	LOCATION	AREA SERVED	MANUFACTURER & MODEL No.	TYPE	CAPACITY BTU/HR		WEIGHT POUNDS	FAN DATA				COMPRESSOR			ELECTRIC HEAT		ELECTRICAL			NOTES
					TOTAL	SENSIBLE		CFM	H.P.	E.S.P.	OUTSIDE AIR	TYPE	QTY.	REFRIG.	STAGES	K.W.	FLA	HACR CB	V/P/HZ	
AC-1	PUMPING STATION	PUMP ROOM	MARVAIR AVPA72ACD	WALL MOUNTED	70,000	46,800	705	1,925	3/4	0.25	250	SCROLL	1	410A	2	6.0	17.3	25	480/3/60	1, 2, 3
AC-2	PUMPING STATION	PUMP ROOM	MARVAIR AVPA72ACD	WALL MOUNTED	70,000	46,800	705	1,925	3/4	0.25	250	SCROLL	1	410A	2	6.0	17.3	25	480/3/60	1, 2, 3
AC-3	PUMPING STATION	CHEMICAL ROOM	MARVAIR AVPA12ACA	WALL MOUNTED	10,800	8,000	185	400	3/4	0.25	60	ROTARY	1	410A	1	2.2	12.4	15	208/1/60	1, 2

NOTES:
 1. ROOM TEMPERATURE SETPOINT SHALL BE 78 DEGREES FAHRENHEIT ALL UNITS
 2. CAPACITY RATINGS BASED ON 62.5° ENT WB., 95° OUTDOOR AMBIENT.
 3. DEHUMIDIFICATION IN UNIT.

FAN SCHEDULE

UNIT No.	LOCATION	AREA SERVED	MANUFACTURER & MODEL No.	TYPE	CFM	SP (IN WG)	SONES	FAN RPM	MOTOR				FAN INTERLOCK SCHEDULE		NOTES	
									HP	MAX. BHP	RPM	ELEC.	DRIVE	CONTROL		WITH
EF-1	PUMPING STATION	CHEMICAL ROOM	GREENHECK SE1-8-440-VG	SIDEWALL PROPELLER	200	0.125	6.3	1,546	1/6	0.03	1,725	120/1	DIRECT	HOA	-	1,2,3,4,5,6
EF-2	PUMPING STATION	BATHROOM	GREENHECK SE1-8-440-VG	SIDEWALL PROPELLER	200	0.125	6.3	1,546	1/6	0.03	1,725	120/1	DIRECT	ON/OFF	LIGHT SWITCH	1,2,3,4,5,6

NOTES:
 1. WITH WALL MOUNTING KIT.
 2. VARI-GREEN EC MOTOR WITH MOUNTED POTENTIOMETER DIAL.
 3. PROVIDE BACK DRAFT DAMPER.
 4. PROVIDE HI-PRO POLYESTER COATING.
 5. PROVIDE LONG WALL HOUSING FLUSH WITH EXTERIOR.
 6. PROVIDE WEATHER HOOD WITH BIRD SCREEN.

ELECTRIC UNIT HEATER SCHEDULE

UNIT No.	LOCATION	AREA SERVED	MANUFACTURER & MODEL No.	MOUNTING HEIGHT (FT)	AIR DELIVERY		ELECTRICAL			NOTES
					CFM	TEMP RISE (F)	KW	AMPS	VOLTS/PH	
EUH-1	PUMPING STATION	CHEMICAL ROOM	INDEECO WCI	3	160	60	3	6.7	480/3	1, 2
EUH-2	PUMPING STATION	BATHROOM	INDEECO WCI	3	160	60	3	6.7	480/3	1, 2

NOTES:
 1. SURFACE MOUNTING BOX.
 2. FAN ON/AUTO SWITCH.

DEHUMIDIFIER SCHEDULE

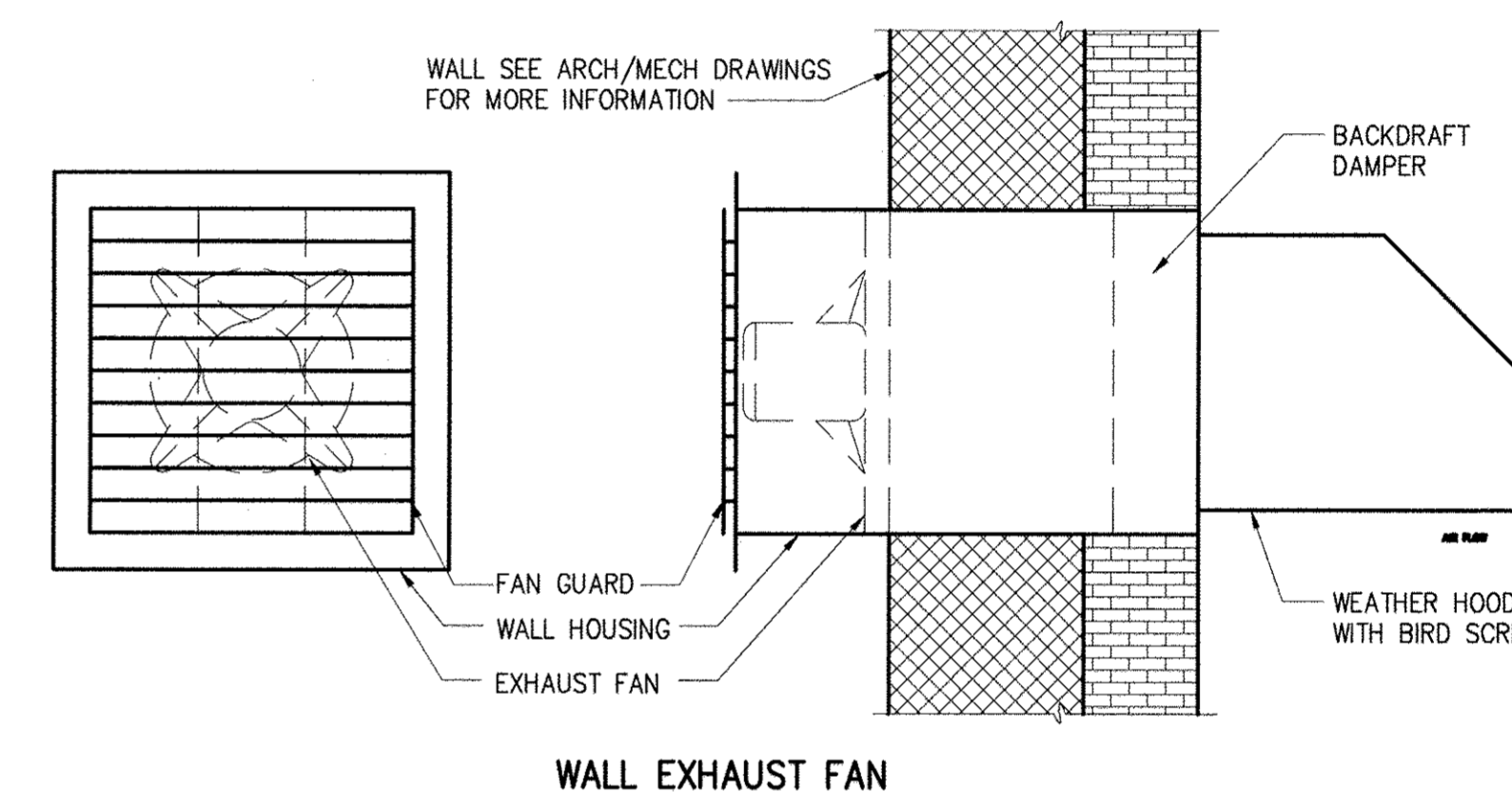
UNIT No.	AREA SERVED	MANUFACTURER & MODEL No.	CAPACITY			ELECTRICAL		
			CFM	AC	MOISTURE REMOVAL (LBS/H)	KW	FLA	VOLTS/PH
DH-1	PUMPING STATION	DESERT AIRE MODEL HPR-1201NPGNH	400	1.6	3.9	2.0	15.5	115 / 1

NOTES:
 1. PROVIDE LOW AMBIENT COMPENSATION VALVE AND HOT GAS BYPASS VALVE FOR COIL FROST PREVENTION.
 2. MOISTURE REMOVAL EFFICIENCY (MRE) BASED ON ARI STANDARD 910 @ 82° F / 60% RH.

DESIGN TEMPERATURE CONDITIONS

OUTSIDE	PROCESS ROOMS
WINTER: 18.4° F DB	WINTER: 60° F
SUMMER: 90.2° F DB / 73.4° F WB	SUMMER: 78° F DB
NON-PROCESS AREAS	
WINTER: 60° F	
SUMMER: 92° F DB	

OUTSIDE DESIGN TEMPERATURES BASED ON ASHRAE 2013 FUNDAMENTALS CHAPTER 14 CLIMATIC DESIGN DATA FOR THE 99 PERCENTILE HEATING DRYBULB INCIDENCE AND 1 PERCENTILE COOLING DRYBULB AND WETBULB INCIDENCES: ANDREWS AIR FORCE BASE, MD

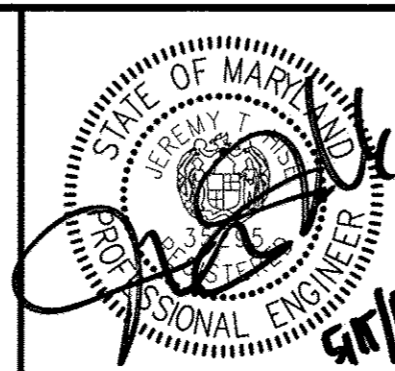


DETAIL	1
NTS	H-2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 6/5/17
 Chief Bureau of Engineering: *[Signature]* 6/5/17
 Chief Bureau of Utilities: *[Signature]* 6/5/17
 Chief Utility Design Division: *[Signature]* 6/5/17

Hazen
 HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-538-7881



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. 35295
 EXPIRATION DATE 07/06/2018
 SIGNED: *[Signature]*

DESIGNED: AL
 DRAWN: TD
 CHECKED: JCS
 PROJ. ENGR: JTH
 APPROVED: JTH

NO.	REVISION	DATE	BY

HVAC
SCHEDULES AND DETAILS

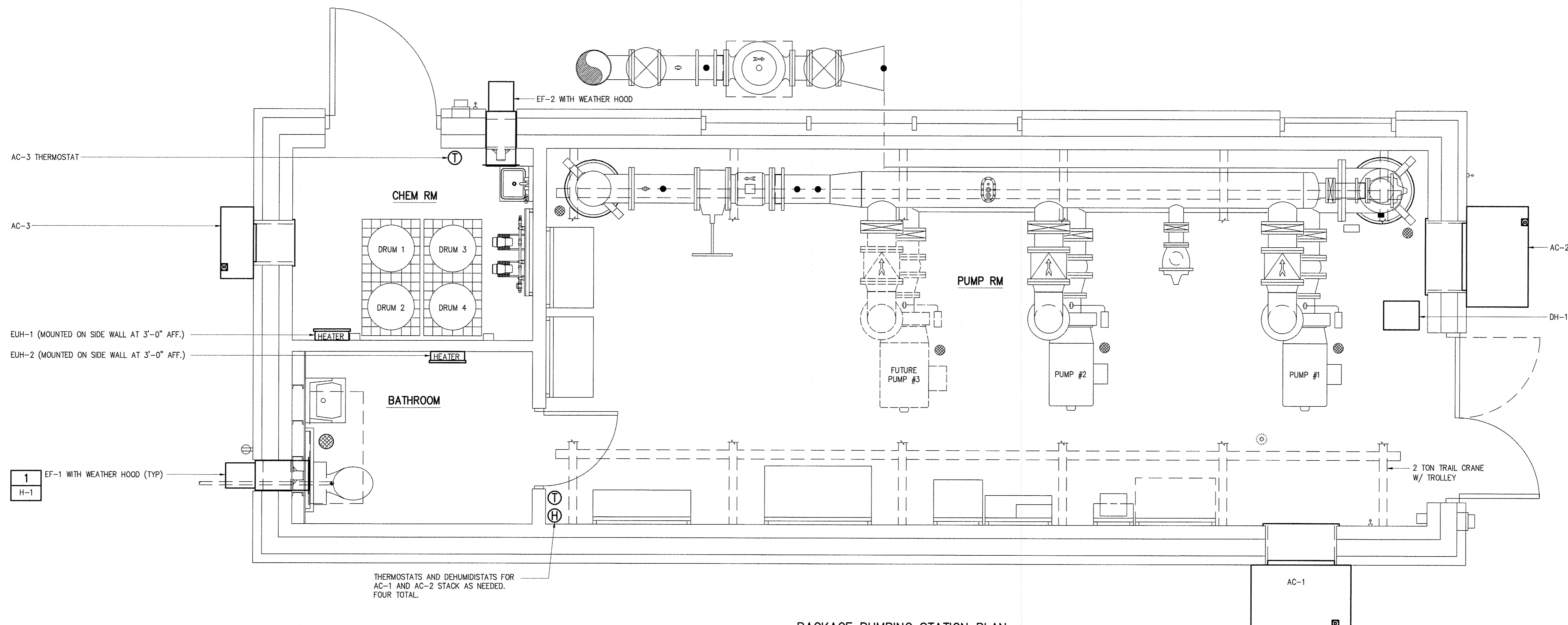
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
 DRAWING NUMBER: H-1
 SCALE: AS SHOWN
 SHEET 27 OF 46

IMAGE# XREF# 31220-1B



PACKAGE PUMPING STATION PLAN

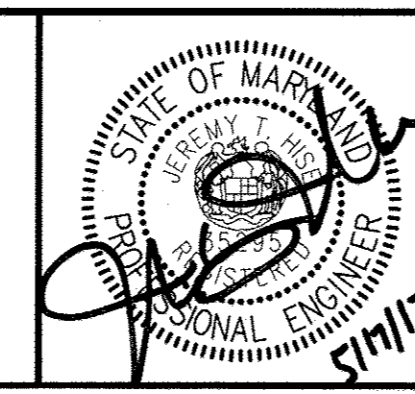
1/2"=1'-0"

THERMOSTATS AND DEHUMIDISTATS FOR AC-1 AND AC-2 STACK AS NEEDED. FOUR TOTAL.

IMAGE= XREFS= 31220-TB, PS-DA, PS-PT, PS-PT-H, PS-PT-E
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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
Director of Public Works <i>[Signature]</i> DATE: 6/5/17	Chief Bureau of Engineering <i>[Signature]</i> DATE: 6/11/17
Chief Bureau of Utilities <i>[Signature]</i> DATE: 6/5/17	Chief Utility Design Division <i>[Signature]</i> DATE: 6/11/17

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 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
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 LICENSE NO. 35295
 EXPIRATION DATE 01/06/2018
 SIGNED: *[Signature]*

DESIGNED	AL		
DRAWN	TD		
CHECKED	JCS		
PROJ. ENGR.	JTH		
APPROVED	JTH		
NO.	REVISION	DATE	BY

HVAC PACKAGE PUMPING STATION PLAN	
600' SCALE MAP:	47
BLOCK NO.:	20

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

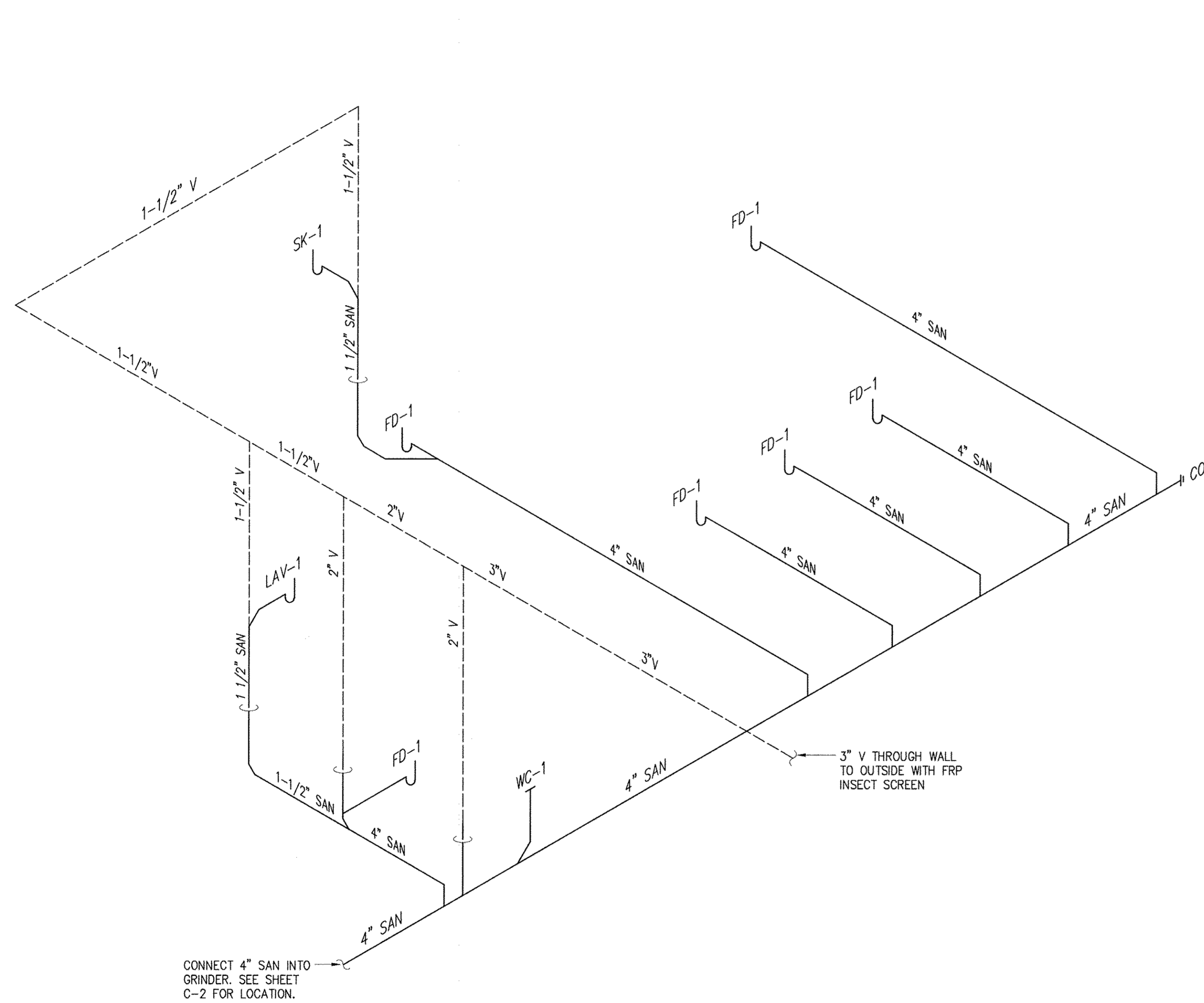
DATE	APRIL 2017
DRAWING NUMBER	H-2
SCALE	AS SHOWN
SHEET	28 OF 46

PLUMBING WATER HEATER SCHEDULE										
MARK	MANUFACTURER	MODEL	TYPE	CW (PIPE SIZE)	HW (PIPE SIZE)	INPUT KW	DESIGN FLOWRATE (GPM)	TYPE	ELECTRICAL VOLTS/PHASE/AMPS	REMARKS
WH-1	EEMAX	PA01822712T	ELECTRIC	3/4"	3/4"	18	1.5	INSTANTANEOUS	480/3/22	-
WH-2	EEMAX	PA01822712T	ELECTRIC	3/4"	3/4"	18	1.5	INSTANTANEOUS	480/3/22	-

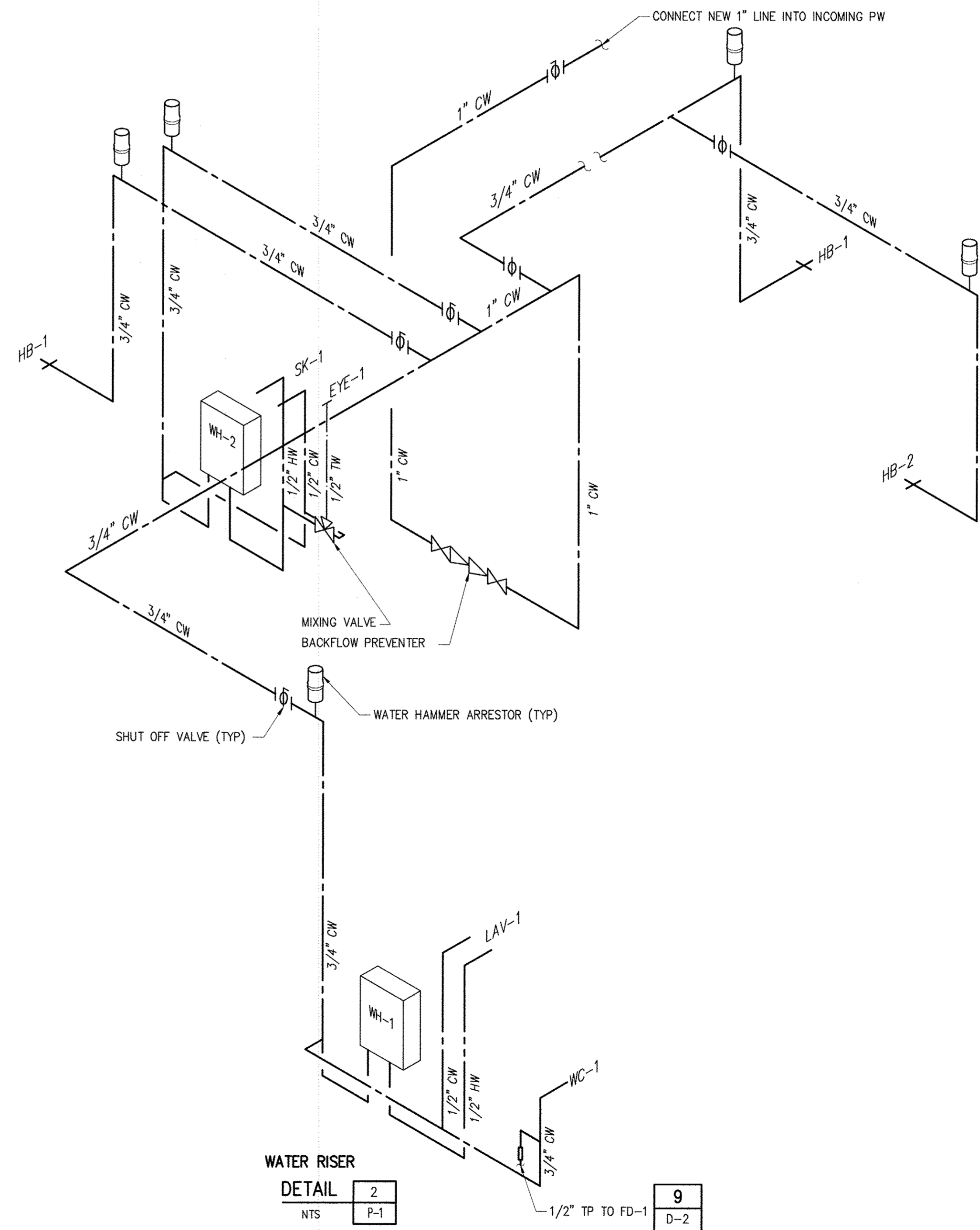
- REMARKS
- ALL WATER HEATERS SHALL MEET OR EXCEED STANDBY LOSS REQUIREMENTS PER US DEPARTMENT OF ENERGY AND ASHRAE 90.1-2007.
 - RATED FOR 150 PSIG WORKING PRESSURE.
 - PROVIDE 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE AND 3/4" COPPER DRAIN LINE PIPED TO WITHIN 1'-0" OF NEAREST FLOOR DRAIN.
 - INSTALL DIELECTRIC UNIONS AND SHUT-OFF ISOLATION VALVES AT EACH WATER CONNECTION.
 - REFER TO SPEC SECTION 15400 FOR ADDITIONAL REQUIRED OPTIONS AND ACCESSORIES.
 - PROVIDE 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE AND 3/4" COPPER DRAIN LINE PIPED TO EXTERIOR.

PLUMBING FIXTURE ROUGH-IN SCHEDULE												
FIXTURE TAG	FIXTURE TYPE	TW (PIPE SIZE)	HW (PIPE SIZE)	CW (PIPE SIZE)	WASTE (PIPE SIZE)	VENT (PIPE SIZE)	MANUFACTURER	MODEL	GALLONS PER FLUSH/MIN	FAUCET/FLUSH VALVE MANUFACTURER	FAUCET/VALVE MODEL	REMARKS
EYE-1	SINK MOUNTED EYEWASH/DRENCH	1/2"	-	-	-	-	GUARDIAN	G5022	1.8	-	-	2
FD-1	FLOOR DRAIN ADJUSTABLE TOP	-	-	-	4"	2"	ZURN	FD2210-NT-VP	-	-	-	3
WC-1	WATER CLOSET FLOOR MOUNTED	-	-	1"	4"	2"	KOHLER	K-3658-RA	1.28	-	-	4
LAV-1	LAVATORY WALL MOUNTED	-	1/2"	1/2"	1-1/2"	1-1/2"	KOHLER	K-2032	1.5	KOHLER	K-7404-5A	1
SK-1	SAMPLE SINK WALL MOUNTED	-	1/2"	1/2"	1-1/2"	1-1/2"	JUST	A-544-912-TA	1.5	JUST	JS-45-TGA	5
HB-1	HOSE BIBB	-	-	3/4"	-	-	ZURN	Z1321	5	-	-	NON-FREEZE
HB-2	HOSE BIBB	-	-	3/4"	-	-	ZURN	Z1341	5	-	-	-
TP	TRAP PRIMER	-	-	1/2"	-	-	PRECISION PLUMBING	PR-500	-	-	-	-

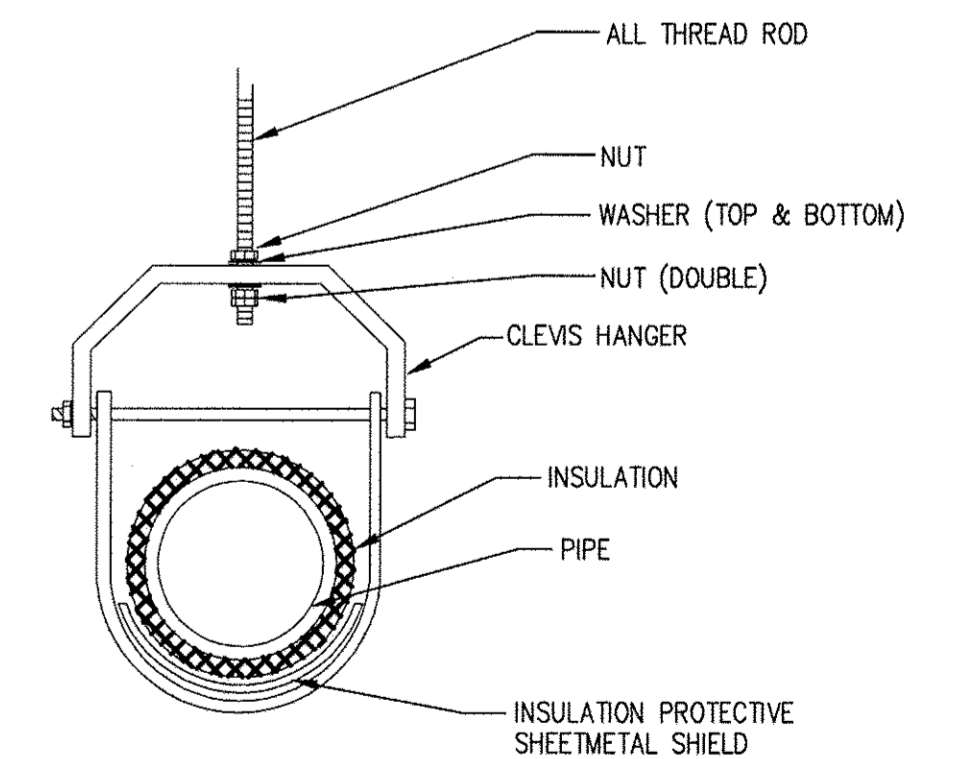
- REMARKS
- PROVIDE GRID DRAIN WITH OVERFLOW KOHLER K-7129-A.
 - PROVIDE WITH THERMOSTATIC MIXING VALVE G3600LF AND HOSE GUIDE BRACKET.
 - NICKEL BRONZE ROUND TOP AND VANDAL RESISTANT SCREWS.
 - PROVIDE ADA COMPLIANT ELONGATED OPEN FRONT TOILET SEAT KOHLER K-4731.
 - PROVIDE CHROME PLATED BRASS DRAIN WITH FLAT GRID STRAINER JUST J15-FS AND SOLID NON-ADJUSTABLE P-TRAP JUST JT-150.



SANITARY STACK
DETAIL 1
NTS P-1



WATER RISER
DETAIL 2
NTS P-1



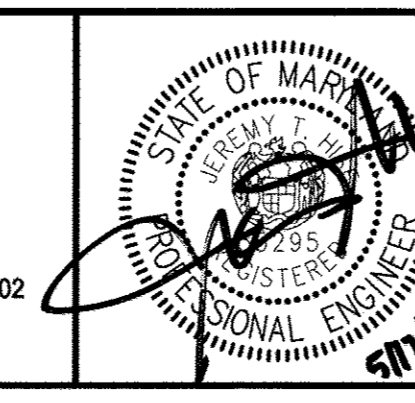
PIPE SUPPORT
DETAIL 3
NTS P-1

IMAGE# XREF# 31220-1B

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* Date: 6/15/17
 Chief Bureau of Engineering: *[Signature]* Date: 6/15/17
 Chief Bureau of Utilities: *[Signature]* Date: 6/15/17
 Chief Utility Design Division: *[Signature]* Date: 6/15/17

Hazen
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LICENSE NO. 35285
EXPIRATION DATE 01/06/2018
SIGNED: *[Signature]*

DESIGNED	AL
DRAWN	TD
CHECKED	JCS
PROJ. ENGR.	JTH
JTH	
APPROVED	

NO.	REVISION	DATE	BY

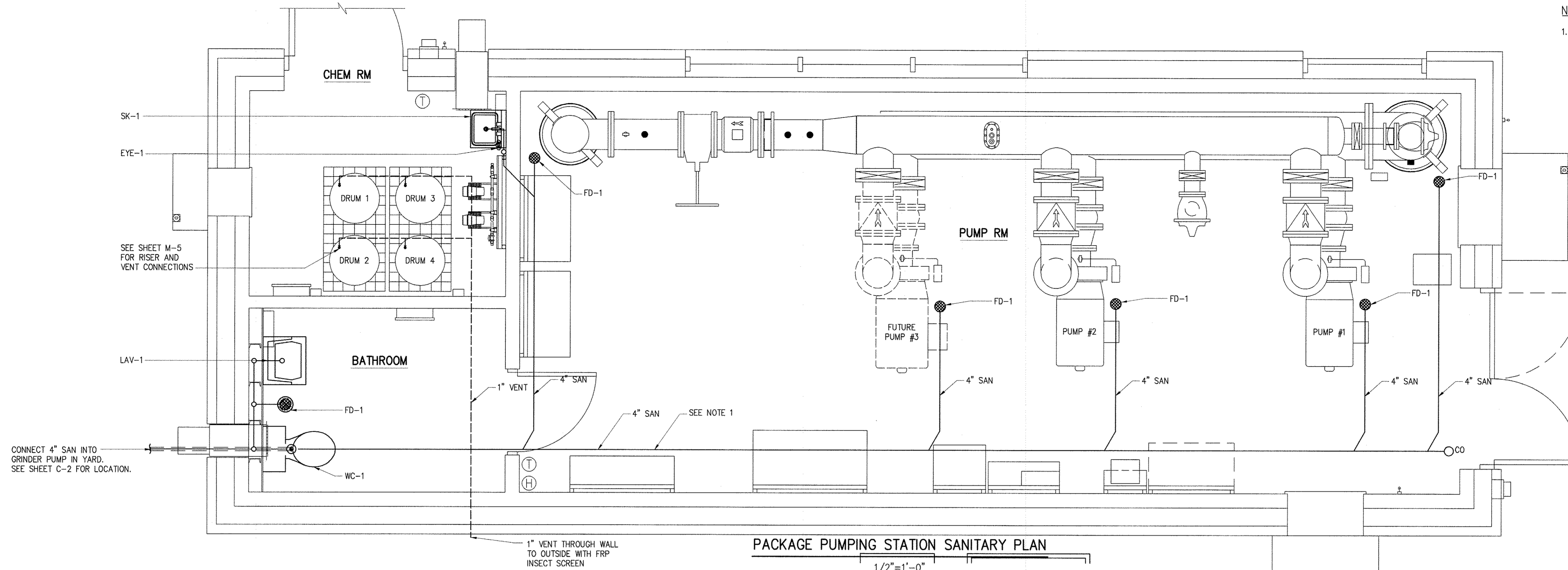
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	P-1
SCALE	AS SHOWN
SHEET	29 OF 46

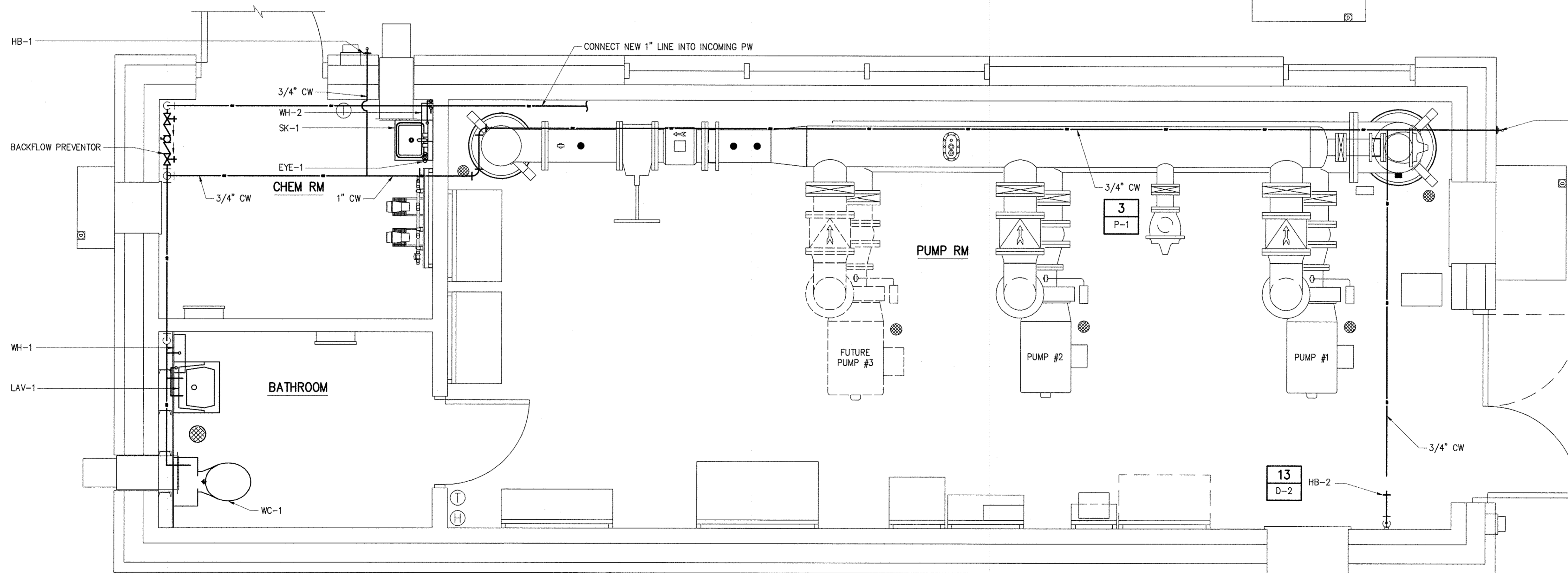
NOTES

1. VENT PIPING FOR SANITARY PIPING NOT SHOWN FOR CLARITY. SEE SCHEMATIC ON DWG P-1



PACKAGE PUMPING STATION SANITARY PLAN

1/2"=1'-0"



PACKAGE PUMPING STATION POTABLE WATER PLAN

1/2"=1'-0"

11
D-2

13
D-2

MAKE: 3/22/2017 11:14A 0:\31220-ba\31220-001\Drawings\Plumbing\P-2.dwg LostSaveBy:MBROCATO

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *James De...* 6/6/17
 Chief Bureau of Engineering: *Thomas E. Butler* 6/5/17
 Chief Bureau of Utilities: *[Signature]* 5/5/17
 Chief Utility Design Division: *[Signature]* 6/1/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-538-7881



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SIGNED: *[Signature]*

DESIGNED	AL				
DRAWN	TD				
CHECKED	JCS				
PROJ. ENGR.	JTH				
JTH					
APPROVED					
NO.	REVISION	DATE	BY		

PLUMBING
PACKAGE PUMPING STATION PLAN
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: P-2
SCALE: AS SHOWN
SHEET 30 OF 46

LIGHTING:

- X DENOTES FIXTURE TYPE (TYP.)
SEE SPECIFICATION 16500 FOR FIXTURE SCHEDULE
DENOTES CIRCUIT NUMBER (TYP.)
- RECTANGULAR FIXTURE
- CEILING-MOUNTED FIXTURE
- WALL-MOUNTED FIXTURE
- EMERGENCY WALL-MOUNTED FIXTURE:
LEFT: STANDARD/RIGHT: REMOTE-HEAD
- CEILING-MOUNTED EXIT SIGN:
SHADED PORTION DENOTES SIGN FACE
- WALL-MOUNTED EXIT SIGN:
SHADED PORTION DENOTES SIGN FACE
- POLE-MOUNTED FIXTURE
- PHOTOCELL
- CEILING MOUNTED OCCUPANCY SENSOR:
NUMBER DENOTES TYPE
- WALL MOUNTED OCCUPANCY SENSOR:
NUMBER DENOTES TYPE

RECEPTACLES:

- X DENOTES RECEPTACLE TYPE (TYP.);
GFCI DENOTES GROUND FAULT CIRCUIT INTERRUPT
UPS DENOTES UNINTERRUPTIBLE POWER SUPPLY
WPCR DENOTES WEATHERPROOF CORROSION RESISTANT
DENOTES CIRCUIT NUMBER (TYP.)
- DUPLEX RECEPTACLE
- SIMPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE
- MULTI-OUTLET RECEPTACLE SIMPLEX
- MULTI-OUTLET RECEPTACLE DUPLEX
- 240 VOLT RECEPTACLE
- SPECIAL PURPOSE OUTLET

PANELS AND BOXES

- JUNCTION BOX
- PULL BOX
- CONTROL PANEL

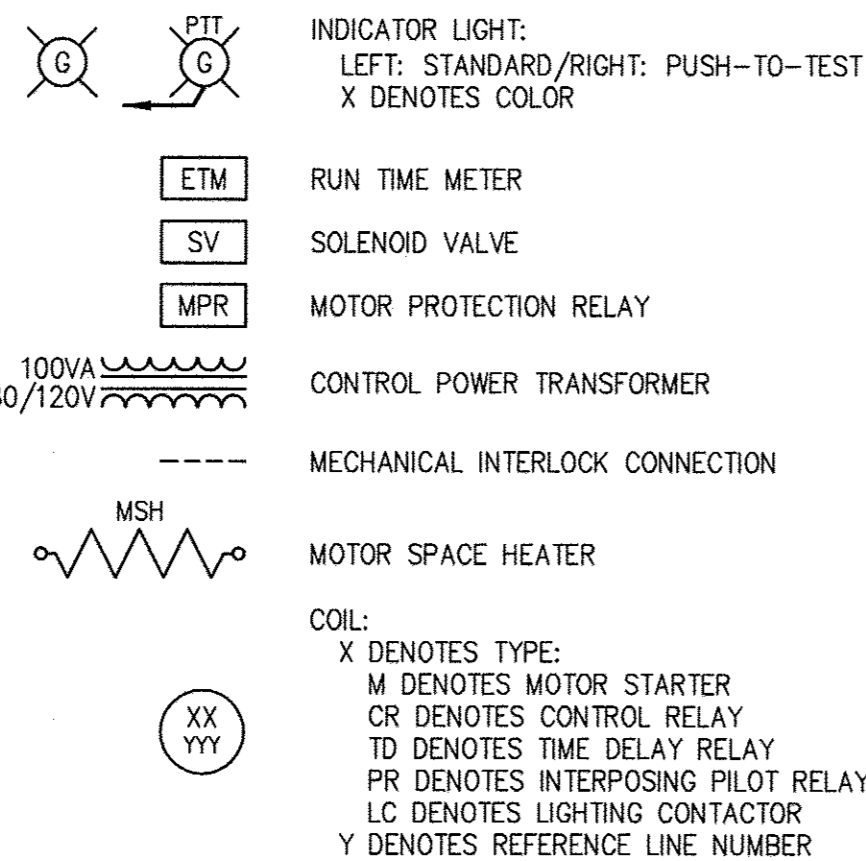
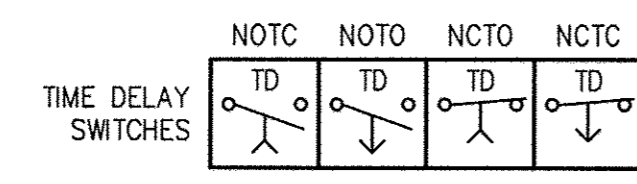
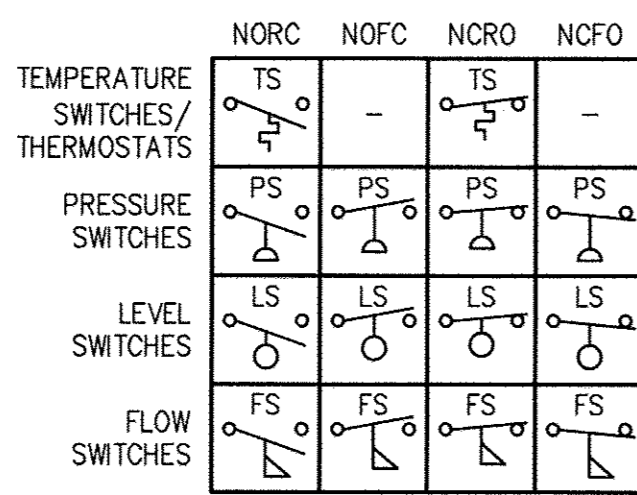
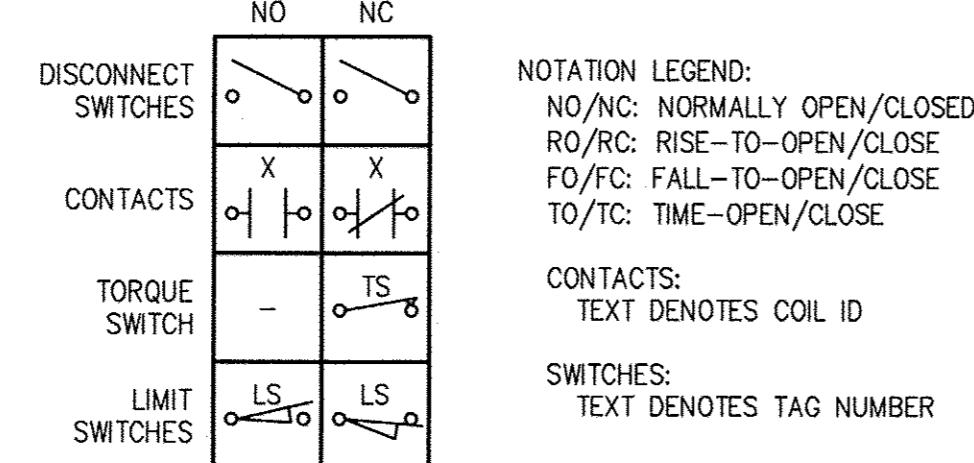
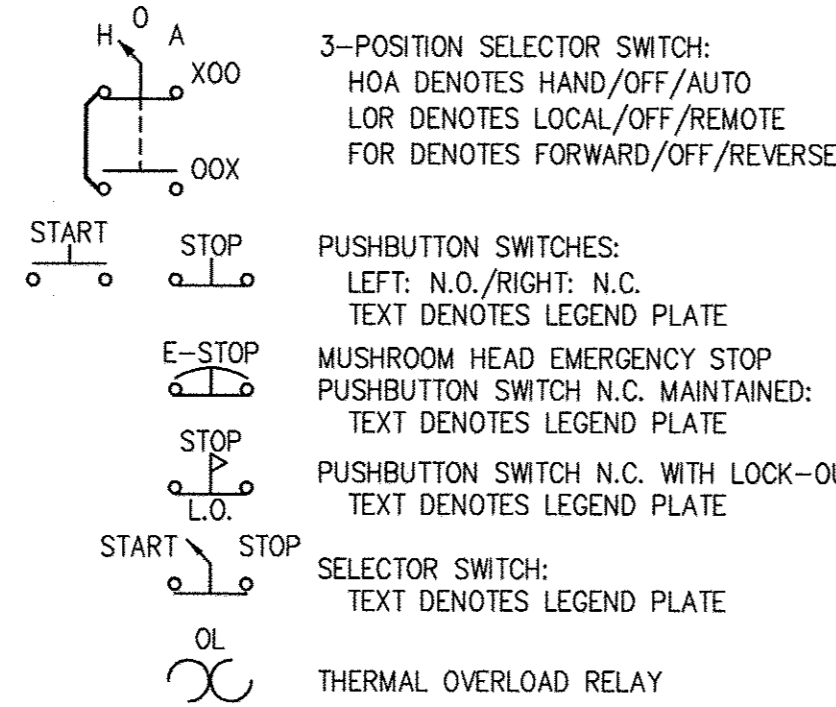
HVAC AND FIRE ALARM

- FIRE ALARM CONTROL PANEL
- FIRE ALARM ANNUNCIATOR PANEL
- FIRE ALARM PULL STATION
- FIRE ALARM INDICATOR:
X DENOTES ALERT TYPE (TYP.):
A DENOTES AUDIBLE
V DENOTES VISIBLE (# DENOTES STROBE INTENSITY)
- FIRE ALARM INDICATOR MOUNTED
ABOVE A FIRE ALARM PULL STATION
- DUCT DETECTOR
- SMOKE DETECTOR:
X DENOTES TYPE:
Z DENOTES IONIZATION
P DENOTES PHOTOELECTRIC
T DENOTES THERMAL
- HEAT DETECTOR
- THERMOSTAT
- AMBIENT TEMPERATURE TRANSMITTER

EQUIPMENT/DEVICE LOCATION SYMBOLS

- LOCATED IN MCC
- LOCATED IN STAND-ALONE MOTOR STARTER/CONTROLLER
- LOCATED IN FIELD
- LOCATED AT PANEL:
X DENOTES PANEL ID:
L DENOTES LOCAL CONTROL STATION

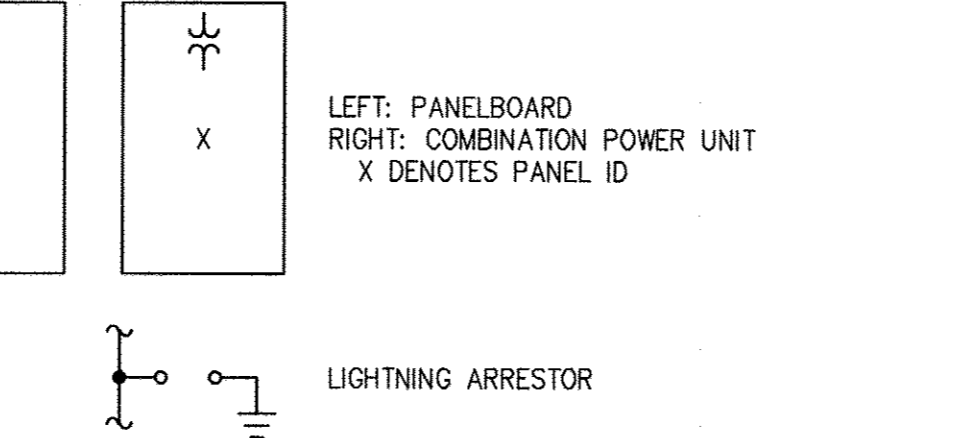
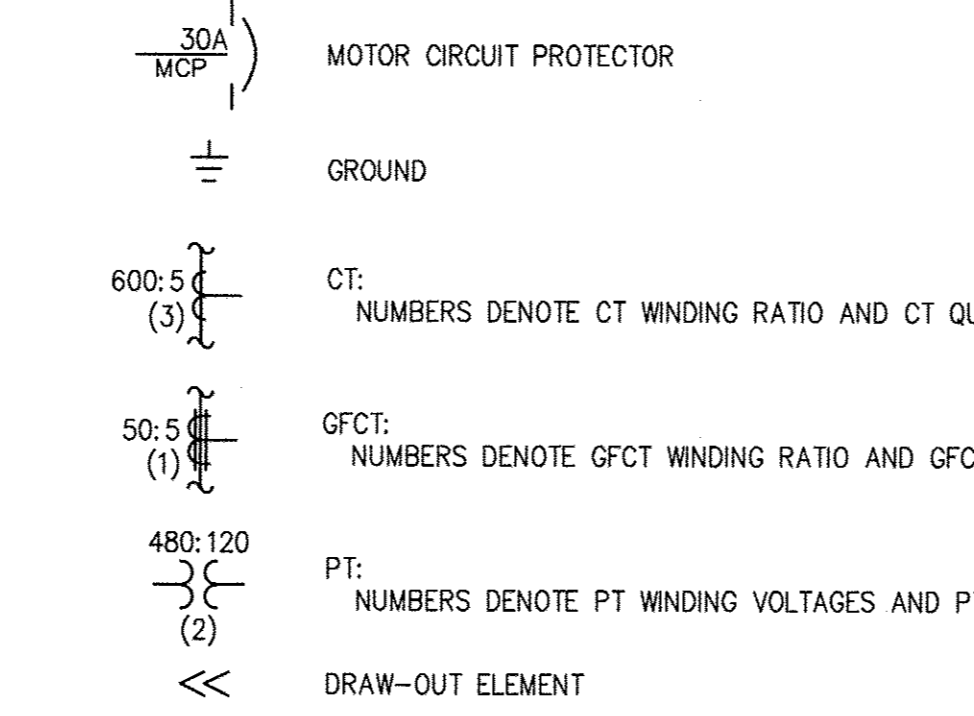
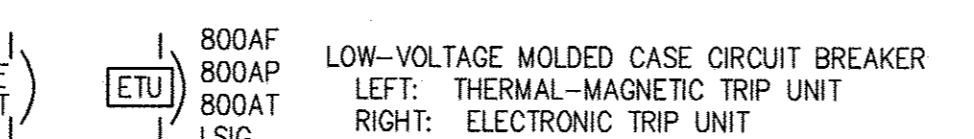
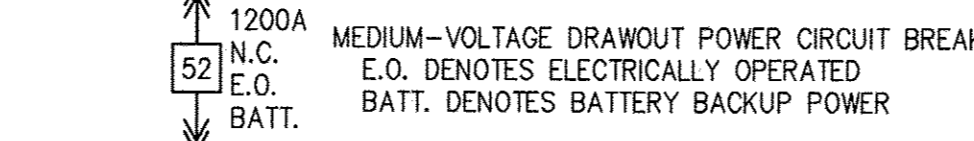
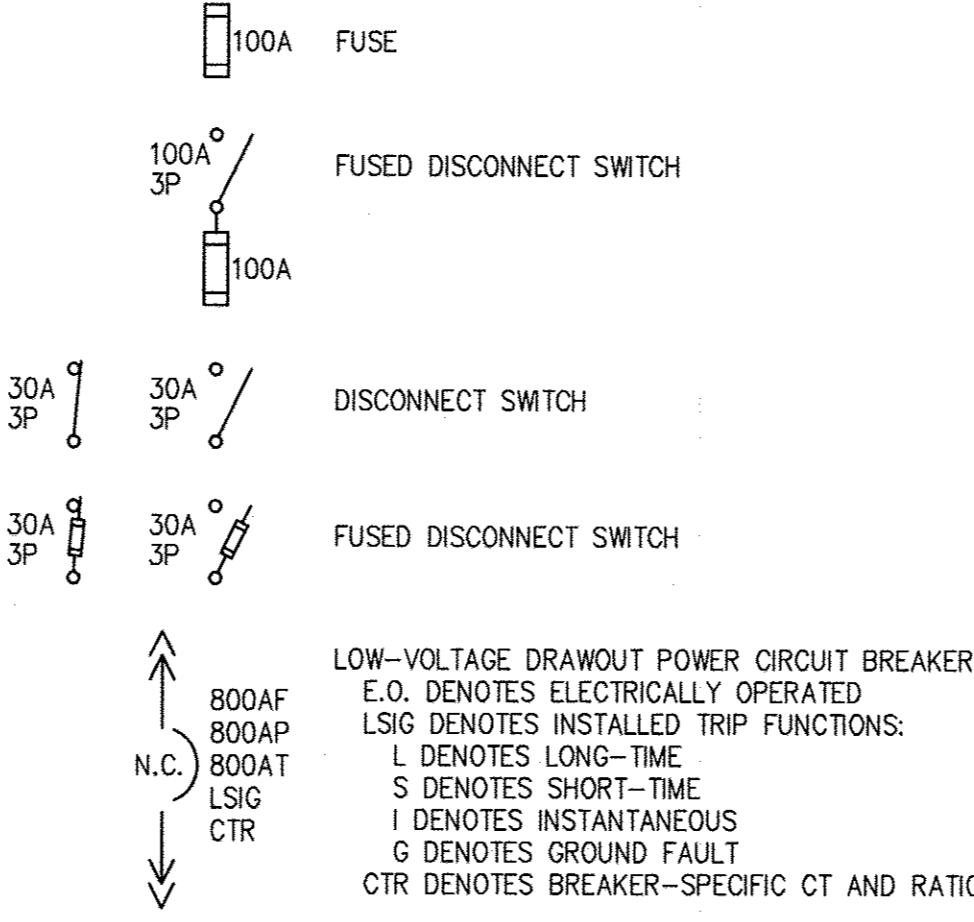
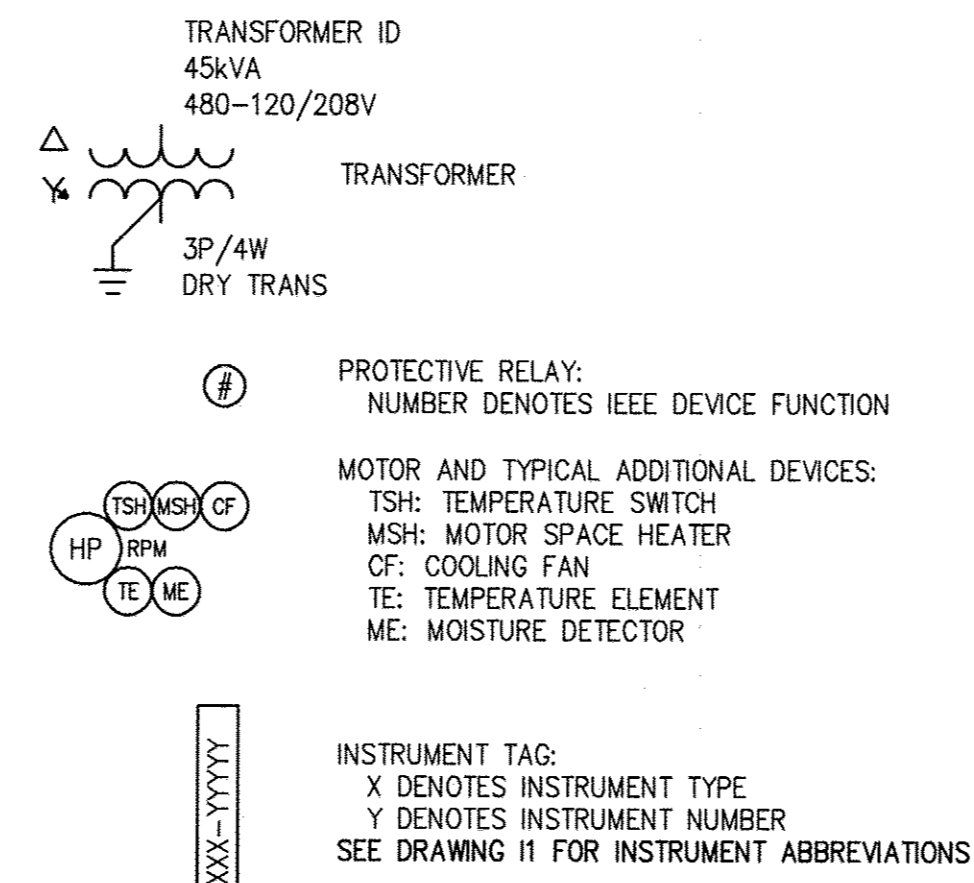
ELEMENTARY CONTROL SCHEMATICS



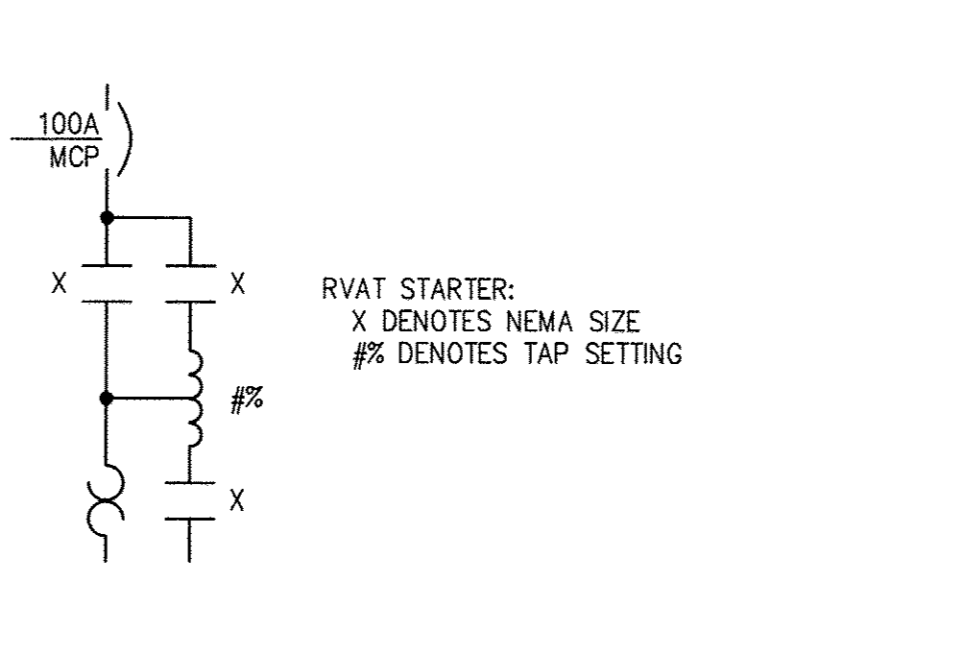
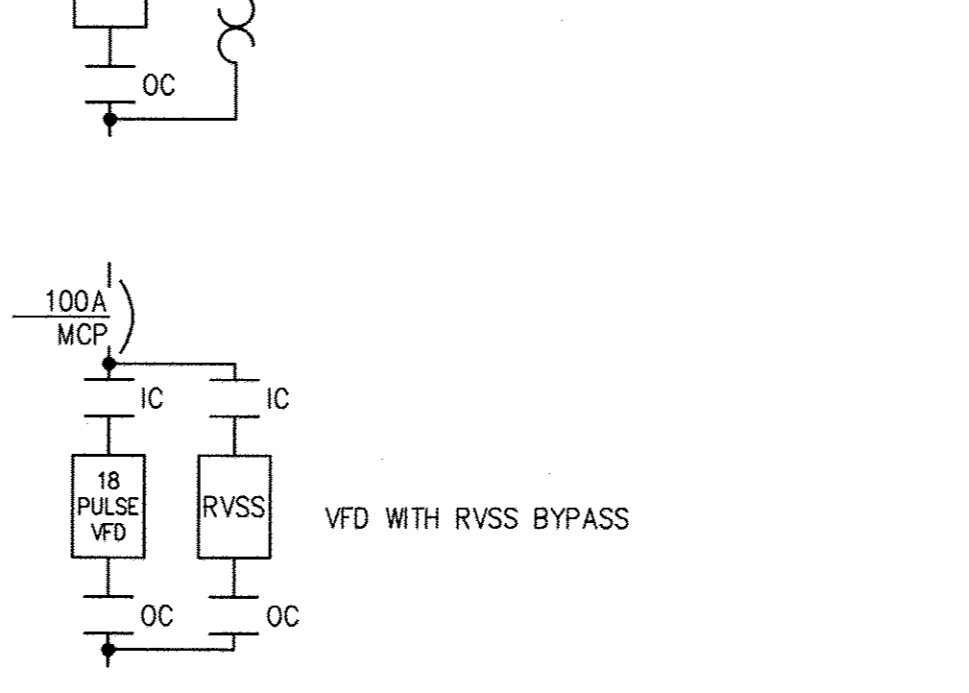
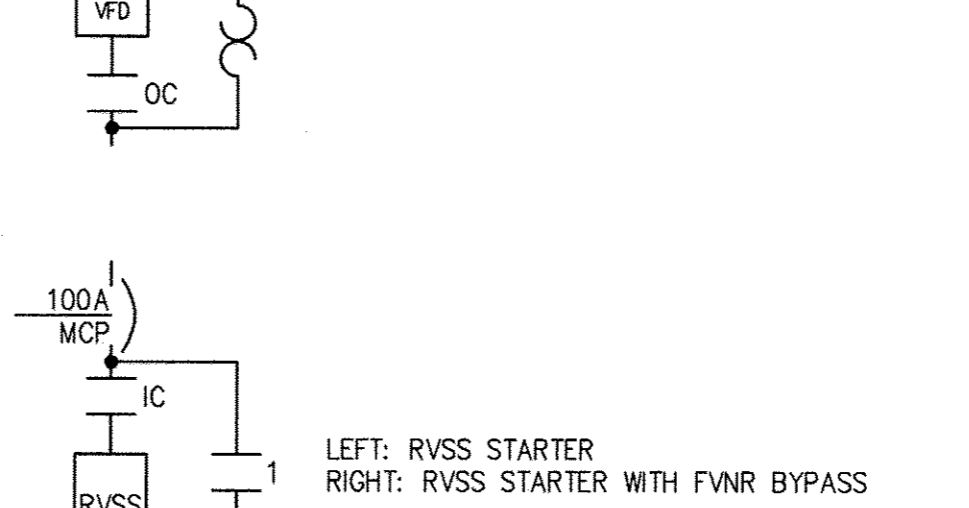
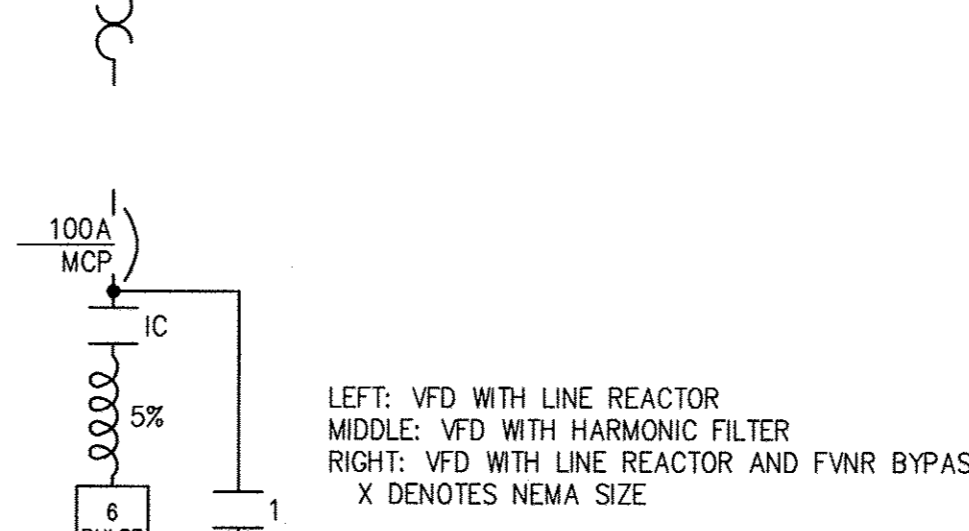
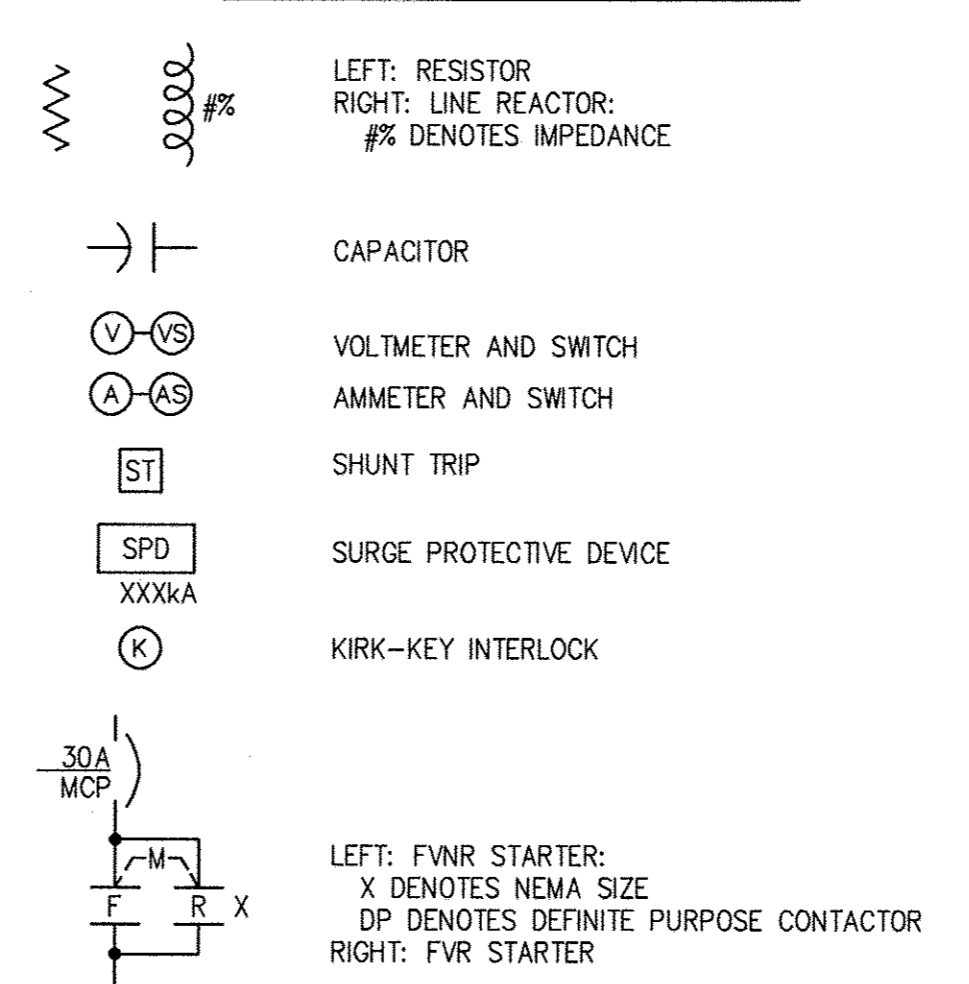
SWITCHES

- WALL SWITCH:
X DENOTES TYPE:
NO SUBSCRIPT DENOTES SINGLE-POLE SWITCH
3 DENOTES 3-WAY SWITCH
4 DENOTES 4-WAY SWITCH
M DENOTES MANUAL MOTOR STARTER
DENOTES CIRCUIT NUMBER
WPCR DENOTES WEATHERPROOF AND CORROSION RESISTANT
- COMBINATION MOTOR STARTER
- DISCONNECT SWITCH
- LOCAL CONTROL STATION

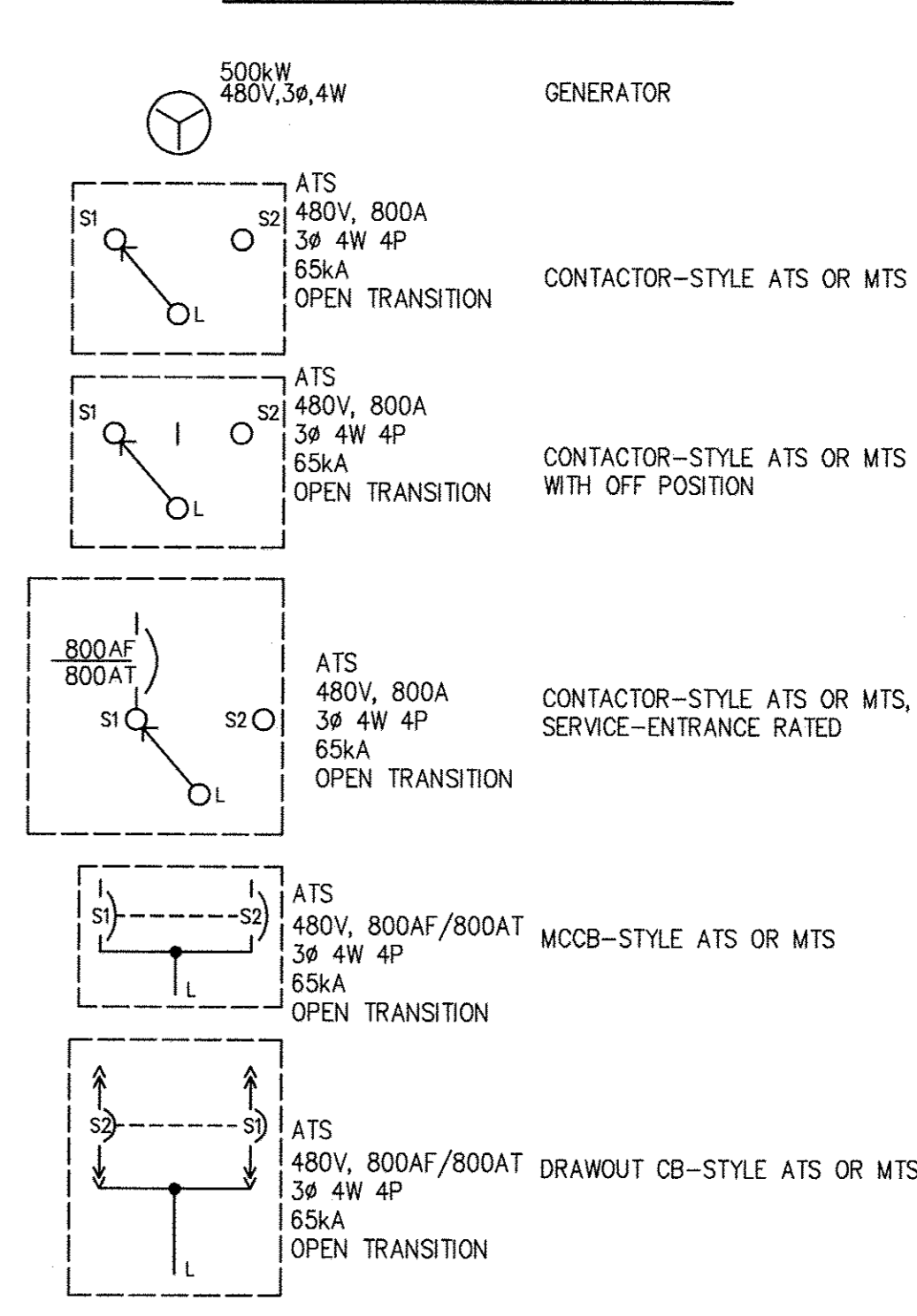
SINGLE-LINE DIAGRAMS



SINGLE-LINE DIAGRAMS, CONT'D.



SINGLE-LINE DIAGRAMS, CONT'D.



MISC PLAN VIEW SYMBOLS

- EQUIPMENT CONNECTION
- GROUND RODS:
LEFT: BURIED
RIGHT: IN TESTWELL
- DUCTBANK SECTION CUT IDENTIFIER:
DBXX DENOTES DUCTBANK ID
EXX DENOTES DRAWING NUMBER
WHERE SECTION CUT IS LOCATED
- DUCTBANK TAG:
X DENOTES DUCTBANK ID
- CABLE TRAY TAG:
X DENOTES CABLE TRAY ID
Y DENOTES SCHEDULE REFERENCE
- INSTRUMENT TAG:
X DENOTES INSTRUMENT TYPE
DENOTES INSTRUMENT NUMBER
SEE DRAWING 11 FOR INSTRUMENT ABBREVIATIONS
- CONDUIT TAGS:
P DENOTES POWER
C DENOTES CONTROL
I DENOTES INSTRUMENTATION
XXX DENOTES CONDUIT ID
XXX-XXX DENOTES CONDUIT ID

COMMUNICATIONS

- TELEPHONE OR NETWORK DROP
- PAGER RECEPTACLE
- HORN/LIGHT DEVICE
- PA UNIT

WIRING

- CONDUIT HOME RUN
- CONDUIT EXPOSED
- CONCRETE ENCASED CONDUIT
- CONDUIT CONCEALED
- FLEXIBLE CONDUIT
- CONCRETE ENCASED DUCTBANK
LEFT: CONDUIT RISE (TURN UP)
RIGHT: CONDUIT DROP (TURN DOWN)
- GROUND WIRE

IMAGE# 31720-1B
XREFS# 31720-1B

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 6/5/17
Chief Bureau of Engineering: *[Signature]* 6/5/17
Chief Bureau of Utilities: *[Signature]* 6/5/17
Chief Utility Design Division: *[Signature]* 6/11/17

Hazen
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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. 40176, EXPIRATION DATE 03/20/2019

DESIGNED: DPW
DRAWN: MRR
CHECKED: JCS
PROJ. ENGR.: JTH

APPROVED: *[Signature]*

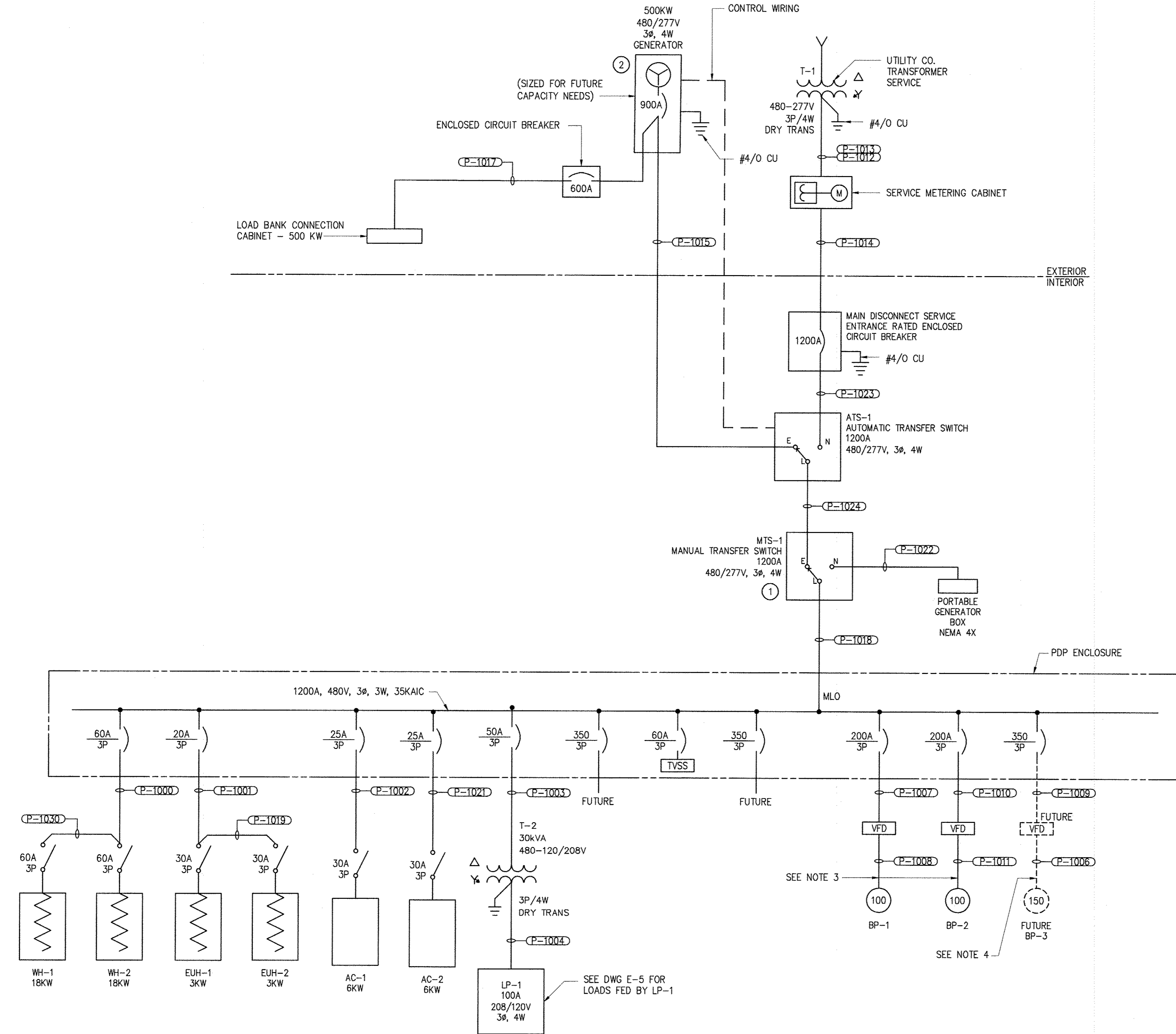
NO.	REVISION	DATE	BY

ELECTRICAL
LEGEND AND SYMBOLS

600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: E-1
SCALE: AS SHOWN
SHEET 31 OF 46



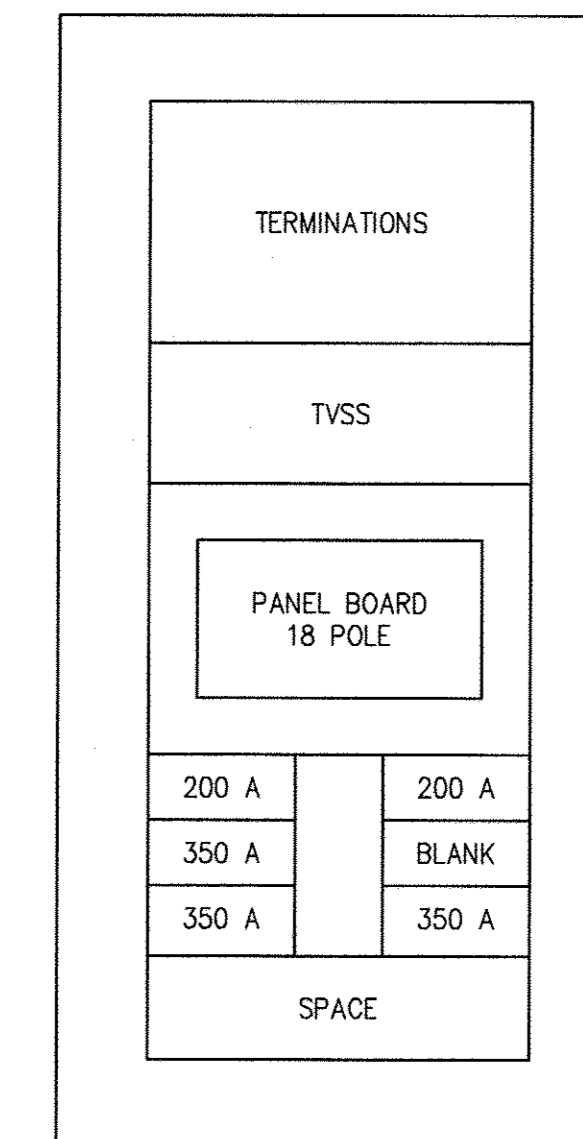
ELECTRICAL ONE-LINE DIAGRAM
NOT TO SCALE

NOTES:

- SEE E-1 FOR ELECTRICAL LEGEND AND SYMBOLS
- ALL INDOOR PANEL BOARDS, VFD, ATS, MTS, DISCONNECT SWITCHES, AND MAIN CIRCUIT BREAKER SHALL HAVE NEMA 12 ENCLOSURES.
- CONDUITS FOR PUMPS SHALL BE LARGE ENOUGH FOR FUTURE 150 HP MOTOR WIRING.
- CONDUITS FOR PUMPS ARE SIZED FOR FUTURE UPSIZING TO 150 HP PUMPS.
- PROVIDE EMPTY CONDUIT TO VFD NO. 3 LOCATION. SIZE FOR 150 HP MOTOR.
- SEE SHEET E-5 FOR LIGHTING PANEL LP-1 LOADS.

KEYED NOTES:

- MANUAL TRANSFER SWITCH (MTS)
- PROVIDE A 500KW (SIZED FOR 5MGD), 480/277V, 3PH STANDBY GENERATOR WITH SUB-BASE FUEL-OIL STORAGE AND ACOUSTICAL GRADE ENCLOSURE, 55 dBA SOUND ATTENUATION LIMIT.



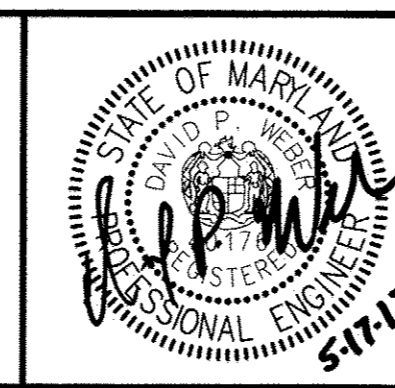
PANEL BOARD ELEVATION
NOT TO SCALE

IMAGE# 31220-TB
XREFS#

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* DATE: 6/5/17
 Chief Bureau of Engineering: *[Signature]* DATE: 6/1/17
 Chief Bureau of Utilities: *[Signature]* DATE: 6/5/17
 Chief Utility Design Division: *[Signature]* DATE: 6/1/17

Hazen
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LICENSE NO. 40176
EXPIRATION DATE 03/20/2019
SIGNED: *[Signature]*

DESIGNED	DPW
DRAWN	MRR
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	

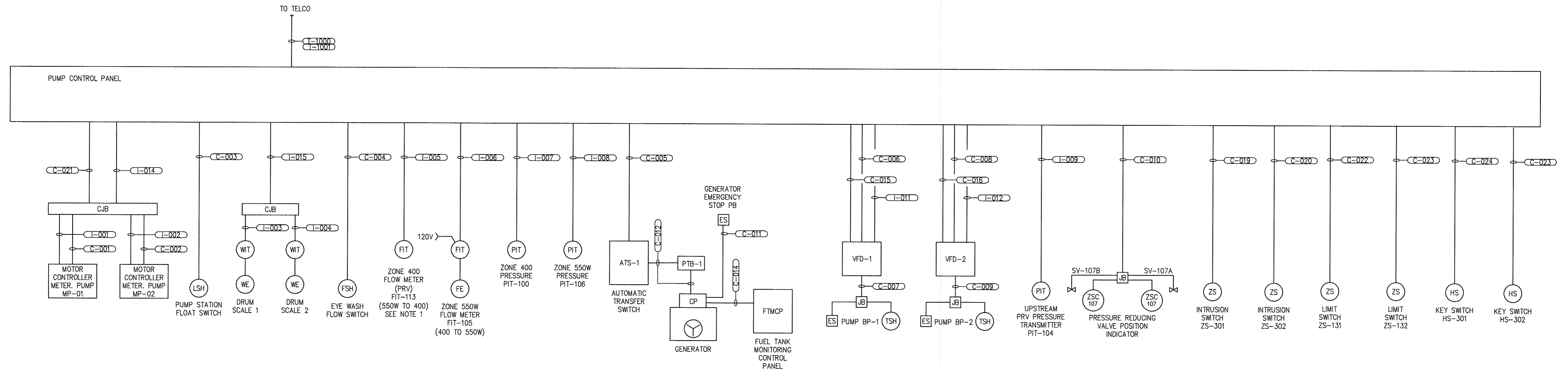
ELECTRICAL
ONE-LINE AND ELEVATION DIAGRAMS

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	E-2
SCALE	AS SHOWN
SHEET	32 OF 46

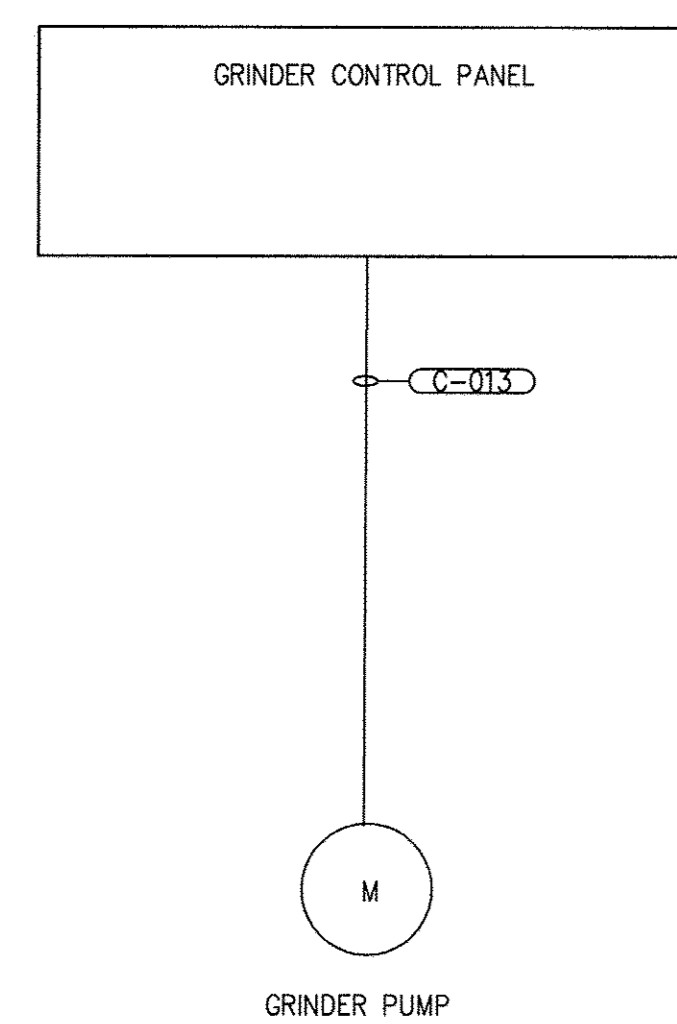
NOTES

1. FLOW TRANSMITTER SHALL BE INTEGRAL TO 10" PRESSURE REGULATING VALVE.



CONTROL SYSTEM RISER DIAGRAM

NOT TO SCALE



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND



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LICENSE NO. 40176
EXPIRATION DATE: 03/20/2019
SIGNED: *[Signature]*

DESIGNED: DPW
DRAWN: MRB
CHECKED: JCS
PROJ. ENGR: JTH
APPROVED: JTH

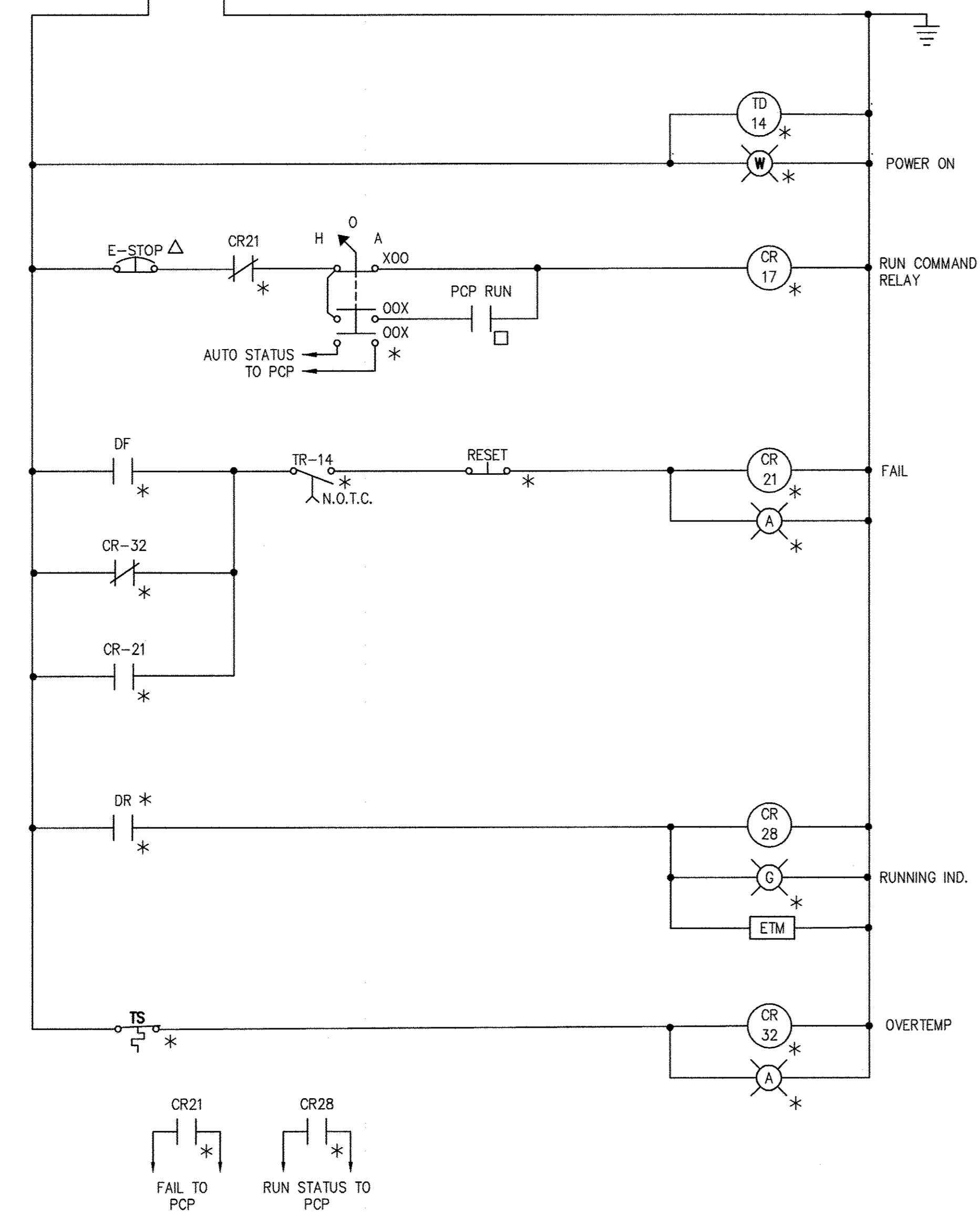
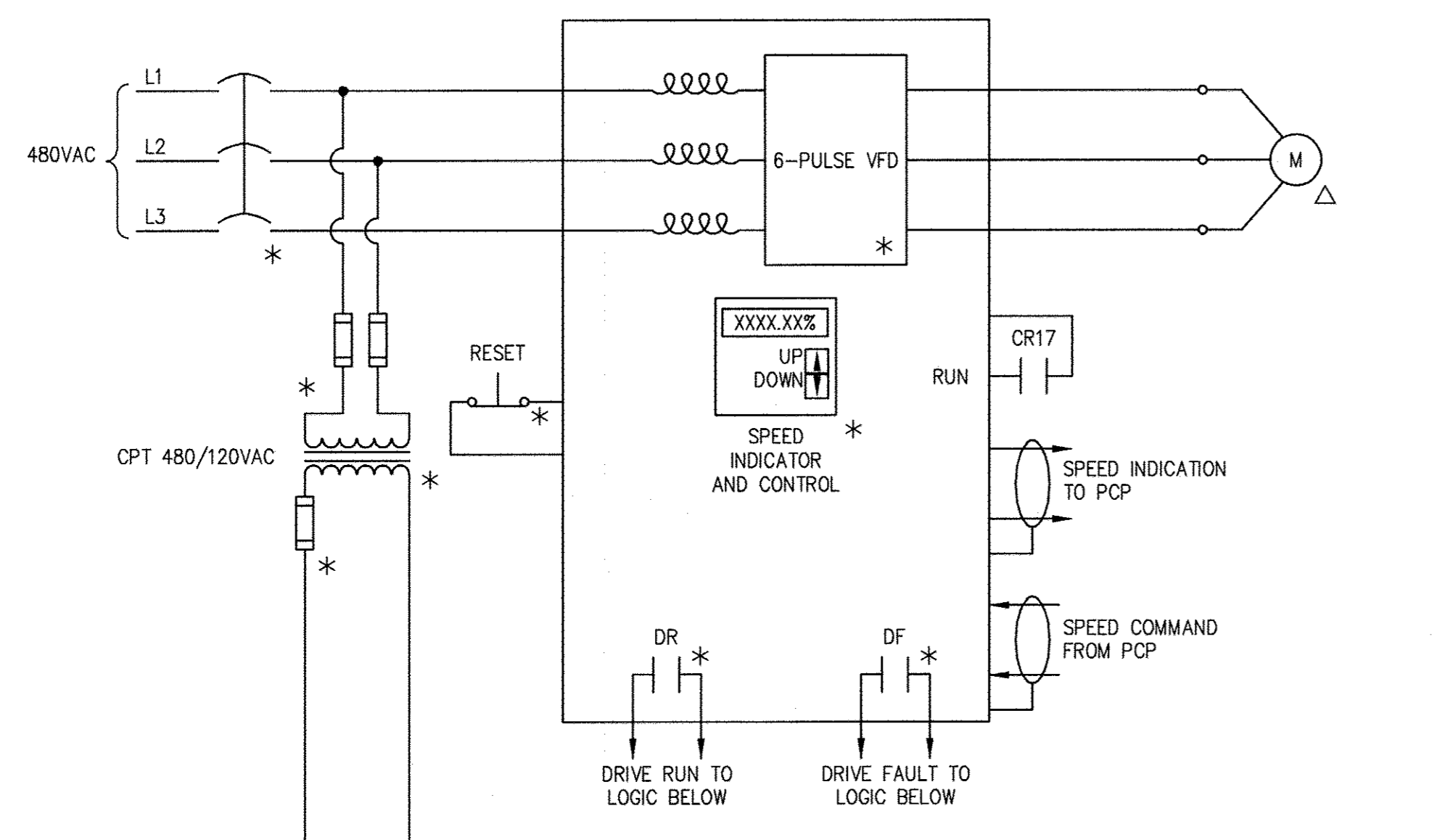
NO.	REVISION	DATE	BY

ELECTRICAL
PACKAGE PUMPING STATION CONTROL SCHEMATICS

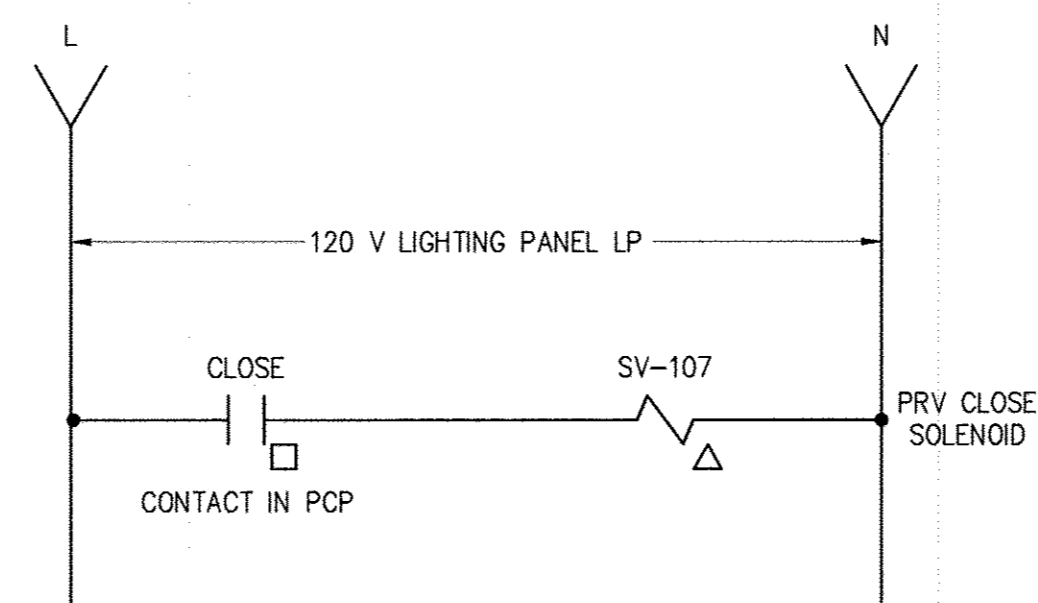
WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: E-3
SCALE: AS SHOWN
SHEET 33 OF 46

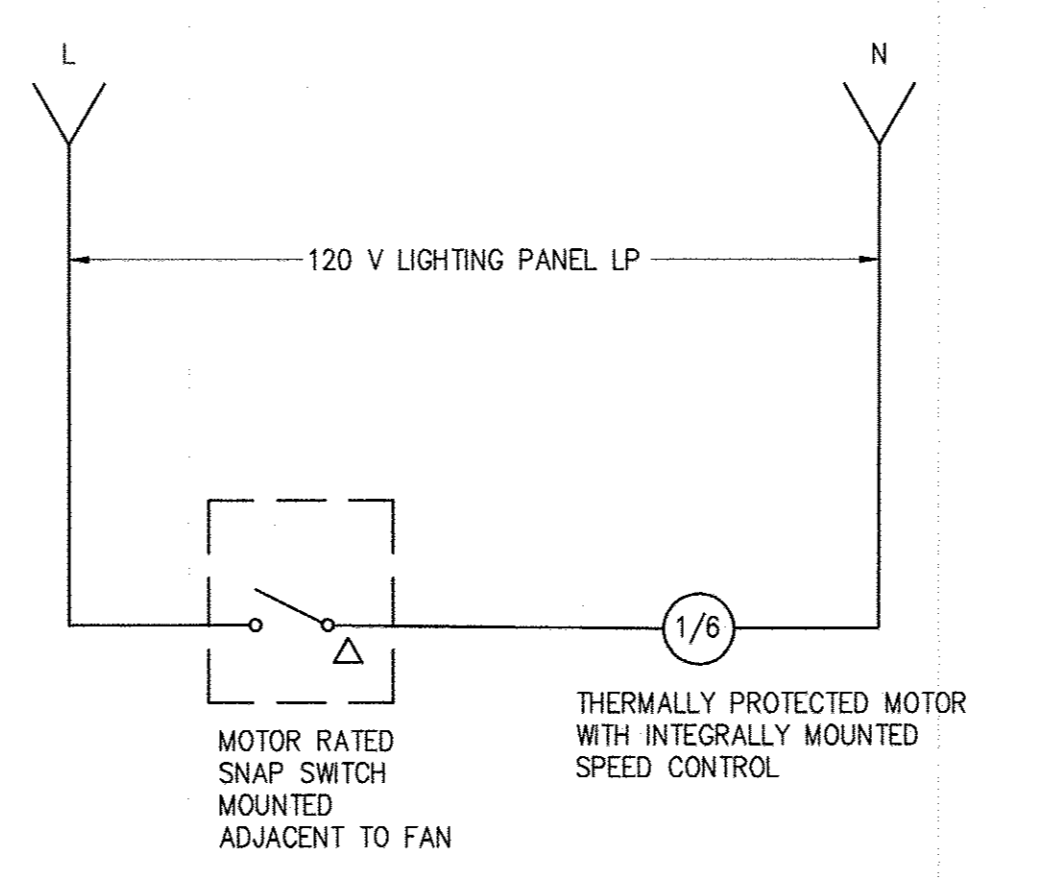
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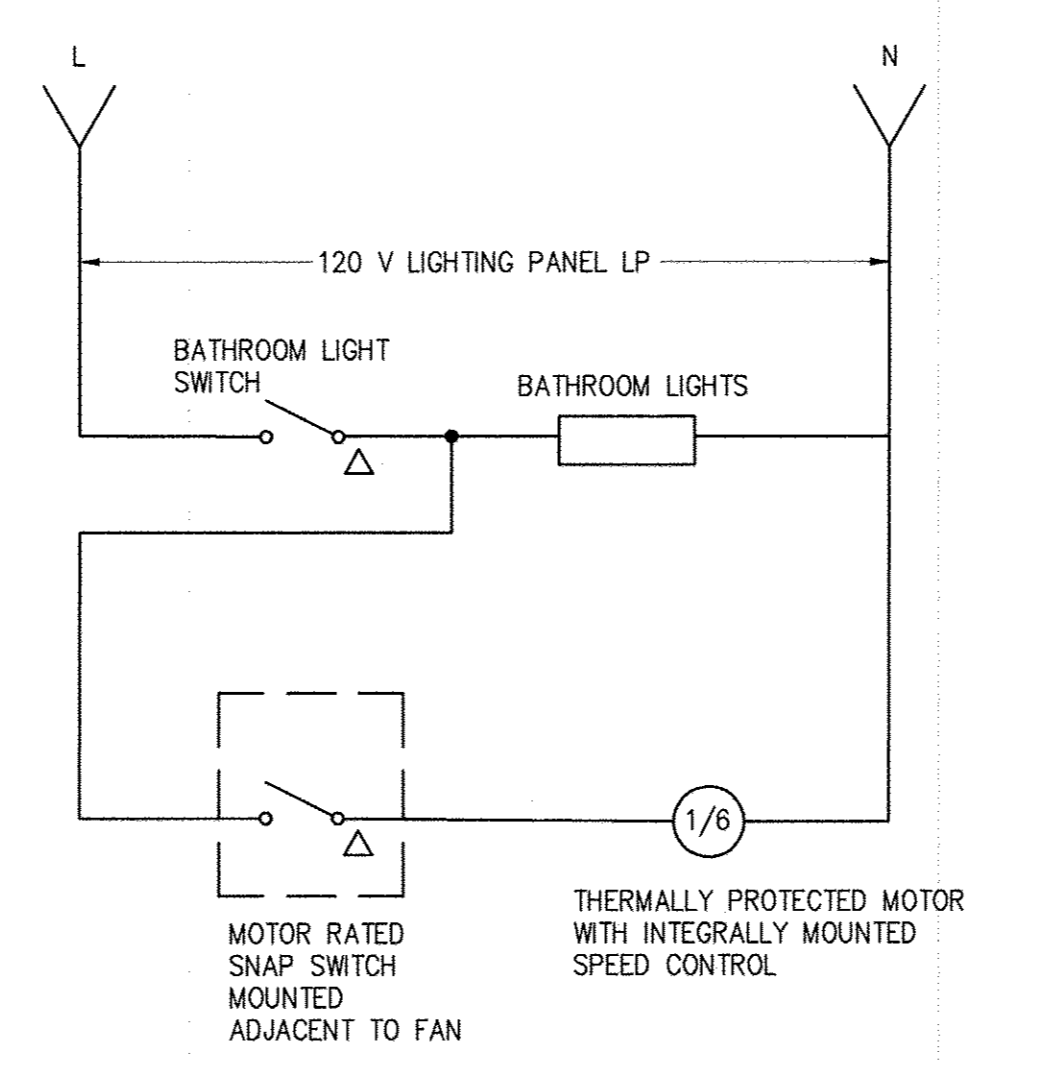
TYPICAL PUMP
NOT TO SCALE



PRV CONTROL & FLOW MEASUREMENT
NOT TO SCALE



CHEMICAL ROOM EXHAUST FAN EF-1
NOT TO SCALE



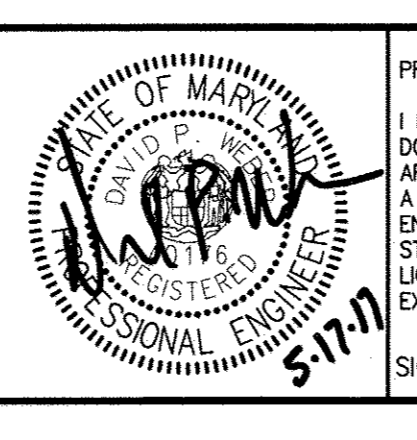
BATHROOM EXHAUST FAN EF-2
NOT TO SCALE

MAKE: 20170517 11:15A
 XREF: 31220-1B

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 6/5/17
 Chief Bureau of Engineering: *[Signature]* 6/5/17
 Chief Utility Design Division: *[Signature]* 6/5/17

Hazen
HAZEN AND SAWYER
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 LICENSE NO. 40176
 EXPIRATION DATE 03/20/2019
 SIGNED: *[Signature]*

DESIGNED	DPW	NO.	REVISION	DATE	BY
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED					

ELECTRICAL	
PACKAGE PUMPING STATION ELEMENTARY CONTROL SCHEMATICS	
600' SCALE MAP:	47
BLOCK NO.:	20

WHISKEY BOTTOM ROAD WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	E-4
SCALE	AS SHOWN
SHEET	34 OF 46

NOTES

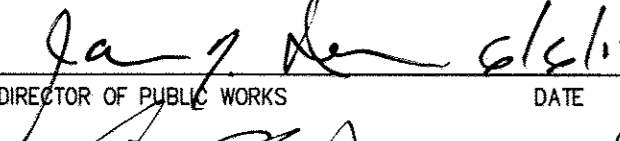
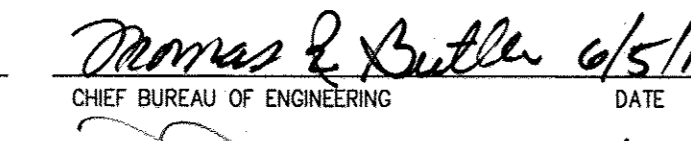
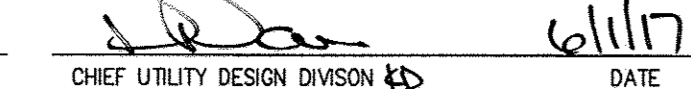
1. LIGHTING PANEL CIRCUITS SHALL BE 2#12 AWG CONDUCTORS WITH A #12 GROUND IN A 3/4" CONDUIT UNLESS OTHERWISE INDICATED.

FIXTURE SCHEDULE			
FIXTURE TYPE	LAMP/ FIXTURE WATTAGE	DESCRIPTION	MFR AND MODEL
CM1	2-17W	Wall mounted florescent, commercial vanity fixture, square acrylic lens with aluminum end caps, 120 VAC, 2' T8 linear fluorescent luminaires.	Lithonia Contemporary Vanity, or equal.
EW1	10 W	Wall mounted, emergency fixture, 120-277 VAC with 6 or 12 VDC nickel cadmium battery, gray corrosion and impact resistant molded fiberglass housing, time delay shutoff, surge and brown-out protection, and low voltage battery cut-off. Battery shall be suitable for 90 minutes. Two 5W LED heads, wet location Listed.	Holophane Desoto M90X, Philips Rhyno Series, or Lithonia INDX Series.
FC1	2-F32T8	Ceiling mounted, 4 ft. fluorescent light fixture, 120 VAC, spread beam, dust and moisture tight, corrosion and high impact resistant fiberglass enclosure with neoprene gasket, polycarbonate latches, high impact acrylic lens, and specular aluminum reflector, Wet Location Listed, and IP67 rated.	Holophane EMS Series, Day-Brite Vaporlume V2 Series, or Lithonia DMW Series.
LW1	72	Wall-mounted, 120 VAC, LED light fixture, color temperature of 5000 K, prismatic borosilicate glass lens, 20 LEDs, IESNA Type III medium distribution, bronze die-cast aluminum housing, 1000mA driver, 7000 lumen minimum, integral photocell, and wet location Listed.	Holophane W4G LED, Hubbell LED PGM3 Series, or GE EWS1 Series.
XW1	1.5W	Wall-mounted, red LED exit sign, 120-277VAC, black faceplate, die cast aluminum housing, single/double face as indicated on the drawings, nickel cadmium battery, brownout and surge protected, damp location Listed.	Holophane Magellan MEX Series, Lithonia LE Series, or Dualite Sempra Series.

POWER CIRCUIT SCHEDULE				
CONDUIT NO.	SIZE	FROM	TO	REMARKS
P-1000	1" C	POWER PANEL PDP	ELECTRIC WATER HEATER WH-1/WH-2	VIA SAFETY SWITCH
P-1001	3/4" C	POWER PANEL PDP	ELECTRIC UNIT HEATER EUH-1	VIA SAFETY SWITCH
P-1002	3/4" C	POWER PANEL PDP	AC-1	VIA SAFETY SWITCH
P-1003	1" C	POWER PANEL PDP	TRANSFORMER T-2	
P-1004	1 1/4"	TRANSFORMER T-2	LIGHTING PANEL LP-1	
P-1005	2"	LIGHTING PANEL LP-1	GENERATOR POWER DIST. BLOCK	
P-1006	2"	PUMP BP-3 VFD LOCATION	PUMP BP-3 LOCATION	
P-1007	2"	POWER PANEL PDP	PUMP BP-1 VFD	
P-1008	2"	PUMP BP-1 VFD	PUMP BP-1	
P-1009	2"	POWER PANEL PDP	PUMP BP-3 VFD LOCATION	
P-1010	2"	POWER PANEL PDP	PUMP BP-2 VFD	
P-1011	2"	PUMP BP-2 VFD	PUMP BP-2	
P-1012	4"	UTILITY TRANSFORMER	UTILITY METERING CABINET	FOR USE BY BGE
P-1013	4"	UTILITY TRANSFORMER	UTILITY METERING CABINET	FOR USE BY BGE
P-1014	4"	UTILITY METERING CABINET	MAIN SERVICE DISCONNECT	
P-1015	4"	GENERATOR MAIN CIRCUIT BREAKER	AUTOMATIC TRANSFER SWITCH(ATS-1)	
P-1016	3/4"	LIGHTING PANEL LP-1	GRINDER CONTROL PANEL	
P-1017	4"	GENERATOR MOUNTED LOAD BANK CB	LOAD BANK CONNECTION CABINET	
P-1018	4"	MANUAL TRANSFER SWITCH(MTS-1)	POWER PANEL PDP	
P-1019	3/4" C	ELECTRIC UNIT HEATER EUH-1	ELECTRIC UNIT HEATER EUH-2	VIA SAFETY SWITCH
P-1020	3/4" C		NOT USED	
P-1021	3/4" C	POWER PANEL PDP	AC-2	VIA SAFETY SWITCH
P-1022	4"	MANUAL TRANSFER SWITCH(MTS-1)	PORTABLE GENERATOR CONNECTION BOX	
P-1023	4"	AUTOMATIC TRANSFER SWITCH(ATS-1)	MAIN SERVICE DISCONNECT	
P-1024	4"	MANUAL TRANSFER SWITCH(MTS-1)	AUTOMATIC TRANSFER SWITCH(ATS-1)	
P-1025	3/4"	LIGHTING PANEL LP-1	EXHAUST FAN EF-1	VIA SAFETY SWITCH
P-1026	3/4"	LIGHTING PANEL LP-1	CHEMICAL PUMP MP-1	
P-1027	3/4"	LIGHTING PANEL LP-1	CHEMICAL PUMP MP-1	
P-1028	3/4"	LIGHTING PANEL LP-1	PUMP CONTROL PANEL	
P-1029	3/4"	LIGHTING PANEL LP-1	AC-3	VIA SAFETY SWITCH
P-1030	1" C	ELECTRIC WATER HEATER WH-1	ELECTRIC WATER HEATER WH-2	VIA SAFETY SWITCH
P-1031	3/4"	LIGHTING PANEL LP-1	FLOWMETER TRANSMITTER FIT-105	
P-1032	3/4"	LIGHTING PANEL LP-1	CHLORINE ANALYZER AIT-128	
T-1000	4"	UTILITY POLE	JUNCTION BOX TJB-1	EMPTY (TELEPHONE)
T-1001	4"	UTILITY POLE	JUNCTION BOX TJB-1	EMPTY (TELEPHONE)
T-1002	2"	JUNCTION BOX TJB-1	TERMINAL BOX AT PUMP CONTROL PANEL	EMPTY (TELEPHONE)
T-1003	2"	JUNCTION BOX TJB-1	JUNCTION BOX TJB-1	EMPTY (TELEPHONE)

CONTROL CIRCUIT SCHEDULE					
CONDUIT NO.	SIZE	FROM	TO	CONDUCTORS	REMARKS
C-001	3/4"	METER PUMP MP01 - MOTOR CONTROLLER	JB NEAR CHEMICAL PUMPS	2-#14, 1#14 GND	CIRCUIT TO PUMP CONTROL PANEL - PCP
C-002	3/4"	METER PUMP MP02 - MOTOR CONTROLLER	JB NEAR CHEMICAL PUMPS	2-#14, 1#14 GND	CIRCUIT TO PUMP CONTROL PANEL - PCP
C-003	3/4"	LEVEL SWITCH LSH-107	PUMP CONTROL PANEL - PCP	2-#14, 1#14 GND	
C-004	3/4"	EYEWASH STATION FLOW SWITCH	PUMP CONTROL PANEL - PCP	2-#14, 1#14 GND	
C-005	3/4"	AUTOMATIC TRANSFER SWITCH	PUMP CONTROL PANEL - PCP	20#14, 1 #12 GND	
C-006	3/4"	VFD - 1	PUMP CONTROL PANEL - PCP	8#14, 1#12 GND	INCLUDES 4 SPARE
C-007	3/4"	PUMP BP-1 CONTROLS	VFD - 1	8#14, 1#12 GND	INCLUDES 2 SPARE
C-008	3/4"	VFD - 2	PUMP CONTROL PANEL - PCP	8#14, 1#12 GND	INCLUDES 4 SPARE
C-009	3/4"	PUMP BP-2 CONTROLS	VFD - 2	8#14, 1#12 GND	INCLUDES 2 SPARE
C-010	3/4"	PRESSURE RELIEF VALVE - POSITION SWITCHES	PUMP CONTROL PANEL - PCP	8#14, 1#14 GND	
C-011	3/4"	GENERATOR CONTROL PANEL	GENERATOR STOP PUSHBUTTON	2-#12, 1#12 GND	USE 2" CONDUIT UNDERGROUND
C-012	2"	GENERATOR CONTROL PANEL	TRANSFER SWITCH ATS-1	20#14, 1 #12 GND	
C-013	1"	GRINDER PANEL	GRINDER WELL	MFG SUPPLIED	POWER AND CONTROL
C-014	1"	FUEL MONITORING CONTROL PANEL	GENERATOR CONTROL PANEL	12#14, 1 #12 GND	
C-015	3/4"	VFD - 1	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-016	3/4"	VFD - 2	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-017	3/4"	VFD - 3	PUMP CONTROL PANEL - PCP	FUTURE	
C-018	3/4"	VFD - 3	PUMP CONTROL PANEL - PCP	FUTURE	
C-019	3/4"	INTRUSION SWITCH ZS-301	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-020	3/4"	INTRUSION SWITCH ZS-302	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-021	3/4"	JB NEAR CHEMICAL PUMPS	PUMP CONTROL PANEL - PCP	4#14, 1#12 GND	CONTENTS OF C-001 AND C-002
C-022	3/4"	CHECK VALVE LIMIT SWITCH - PUMP NO. 1	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-023	3/4"	CHECK VALVE LIMIT SWITCH - PUMP NO. 2	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-024	3/4"	INTRUSION KEY SWITCH	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
C-025	3/4"	INTRUSION KEY SWITCH	PUMP CONTROL PANEL - PCP	2#14, 1#12 GND	
I-001	3/4"	METER PUMP MP01 - MOTOR CONTROLLER	JB NEAR CHEMICAL PUMPS	1-2/C#16 TSH, 1#14 GND	CIRCUIT TO PUMP CONTROL PANEL - PCP
I-002	3/4"	METER PUMP MP02 - MOTOR CONTROLLER	JB NEAR CHEMICAL PUMPS	1-2/C#16 TSH, 1#14 GND	CIRCUIT TO PUMP CONTROL PANEL - PCP
I-003	3/4"	DRUM SCALE NO. 1 - WEIGHT TRANSMITTER	JB NEAR DRUM SCALE	1-2/C#16 TSH, 1#14 GND	CIRCUIT TO PUMP CONTROL PANEL - PCP
I-004	3/4"	DRUM SCALE NO. 2 - WEIGHT TRANSMITTER	JB NEAR DRUM SCALE	1-2/C#16 TSH, 1#14 GND	CIRCUIT TO PUMP CONTROL PANEL - PCP
I-005	3/4"	ZONE 400 FLOWMETER (PRV) TRANSMITTER FIT-113	PUMP CONTROL PANEL - PCP	1-2/C#16 TSH, 1#14 GND	
I-006	3/4"	ZONE 550W FLOWMETER TRANSMITTER FIT-105	PUMP CONTROL PANEL - PCP	1-2/C#16 TSH, 1#14 GND	
I-007	3/4"	ZONE 400 PRESSURE TRANSMITTER PIT-100	PUMP CONTROL PANEL - PCP	1-2/C#16 TSH, 1#14 GND	
I-008	3/4"	ZONE 550W PRESSURE TRANSMITTER PIT-106	PUMP CONTROL PANEL - PCP	1-2/C#16 TSH, 1#14 GND	
I-009	3/4"	UPSTREAM PRV LINE PRESSURE TRANSMITTER-104	PUMP CONTROL PANEL - PCP	1-2/C#16 TSH, 1#14 GND	
I-010	1-1/2"	CHART RECORDER	PUMP CONTROL PANEL - PCP	3-2/C#16 TSH, 1#14 GND	
I-011	3/4"	VFD - 1	PUMP CONTROL PANEL - PCP	2-2/C#16 TSH, 1#14 GND	
I-012	3/4"	VFD - 2	PUMP CONTROL PANEL - PCP	2-2/C#16 TSH, 1#14 GND	
I-013	3/4"	VFD-3	PUMP CONTROL PANEL - PCP	FUTURE	
I-014	3/4"	JB NEAR CHEMICAL PUMPS	PUMP CONTROL PANEL - PCP	2-2/C#16 TSH, 1#14 GND	CONTENTS OF I-001 AND I-002
I-015	3/4"	JB NEAR DRUM SCALES	PUMP CONTROL PANEL - PCP	2-2/C#16 TSH, 1#14 GND	CONTENTS OF I-003 AND I-004

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND


 DIRECTOR OF PUBLIC WORKS
 DATE: 6/5/17

 CHIEF BUREAU OF ENGINEERING
 DATE: 6/11/17

 CHIEF UTILITY DESIGN DIVISION
 DATE: 6/11/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-538-7881



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. 40176
EXPIRATION DATE 03/20/2019
SIGNED: [Signature]

DESIGNED: DPW
 DRAWN: MRB
 CHECKED: JCS
 PROJ. ENGR: JTH
 APPROVED: [Signature]

NO.	REVISION	DATE	BY	600' SCALE MAP:	47	BLOCK NO.:	20

ELECTRICAL
SCHEDULES

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER:

E-5

SHEET 35 OF 46

NOTES

1. LIGHTING PANEL CIRCUITS SHALL BE 2#12 AWG CONDUCTORS WITH A #12 GROUND IN A 3/4" CONDUIT UNLESS OTHERWISE INDICATED.
2. CIRCUIT FOR BATHROOM LIGHTS SHALL POWER EXHAUST FAN EF-2. SEE SCHEMATIC DIAGRAM ON SHEET E-4.
3. CHEMICAL ROOM INSTRUMENTS REQUIRING POWER INCLUDE WEIGHT TRANSMITTERS WIT-127 AND WIT-127; AND FLOW SWITCH FSH-125.

LIGHTING SCHEDULE																
208/120 VOLTS 3 PHASE, 4 WIRE					LP-1 MAIN BREAKER 100A 3P					TYPE: NEMA 12 MOUNT: SURFACE						
MODS	DESCRIPTION	WIRE	TRIP	POLE	No.	VOLT-AMPERES			No.	POLE	TRIP	WIRE	DESCRIPTION	MODS		
						A	B	C								
-	PUMP ROOM LIGHTING	SEE NOTE 1.	20	1	1	384			2	1	20	SEE NOTE 1.	PUMP ROOM LIGHTING	-		
-	BATHROOM LIGHTING/EF-2	SEE NOTE 2.	20	1	3		650		4	1	20	SEE NOTE 1.	BATHROOM RECEPTACLES	GFCI		
-	EXTERIOR LIGHTING	SEE NOTE 1.	20	1	5				6	1	20	SEE NOTE 1.	CHEMICAL ROOM LIGHTING	-		
-	PUMP CONTROL PANEL	P-1028	20	1	7	250			8	1	20	P-1028	PUMP CONTROL PANEL	-		
GFCI	PUMP ROOM RECEPTACLES	SEE NOTE 1.	20	1	9		1,260		10	1	20	P-1025	EXHAUST FAN EF-1	-		
-	CHLORINE ANALYZER AIT-128	P-1032	20	1	11				12	1	20		DEHUMIDIFIER	-		
-	AC-3	P-1029	20	2	13	570			14	1	20			-		
-					15		570		16	1	20	P-1005	GENERATOR CHARGER	-		
-	FLOWMETER - 10"	P-1031	20	1	17				18	1	20		SPARE	-		
-	CHEMICAL PUMP	P-1026	20	1	19	450			20	1	20	P-1027	CHEMICAL PUMP	-		
-					21	1,000			22	1	20	SEE NOTE 3.	CHEM ROOM INSTRUMENTS	-		
-	GENERATOR JACKET HEATER	P-1005	20	3	23		1,000		24	1	20	SEE NOTE 1.	CHEM ROOM RECEPTACLES	-		
-					25				26	1	30	P-1016	SEWAGE GRINDER PUMP	-		
-	EMERGENCY LIGHTS	SEE NOTE 1.	20	1	27		15		28	1	20		SPARE	-		
-	GENERATOR CONTROL PANEL	P-1005	20	1	29				30	1	20		SPARE	-		
-	SPARE		20	1	31				32	1	20		SPARE	-		
-	SPARE		20	1	33				34	1	20		SPARE	-		
-	SPARE		20	1	35				36	1	20		SPARE	-		
-	SPARE		20	1	37				38	1	20		SPARE	-		
-	SPARE		20	1	39				40	1	20		SPARE	-		
-	SPARE		20	1	41				42	1	20		SPARE	-		

TOTAL	2,654	3,495	1,720
PHASE TOTAL	4,188	5,095	4,312

1,534	1,600	2,592	TOTAL
TOTAL LOAD (VA)			
13,595			
TOTAL LOAD (A)			
38			

37.7%

MODIFICATION (MODS) LEGEND:
 GFCI - GROUND FAULT CIRCUIT INTERRUPTER
 LOD - LOCK-ON DEVICE
 LFD - LOCK-OFF DEVICE

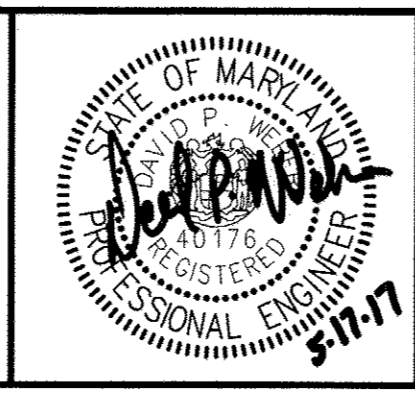
NOTES:
 22K AIC
 100kA SPD

IMAGE PLOT XREFS 31220-TB

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
DIRECTOR OF PUBLIC WORKS <i>[Signature]</i> 6/16/17 DATE	CHIEF BUREAU OF ENGINEERING <i>[Signature]</i> 6/15/17 DATE
CHIEF BUREAU OF UTILITIES <i>[Signature]</i> 6/15/17 DATE	CHIEF UTILITY DESIGN DIVISION <i>[Signature]</i> 6/17 DATE

Hazen

HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-539-7881



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. 40176
 EXPIRATION DATE 03/20/2019
 SIGNED: *[Signature]*

DESIGNED	DPW				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED					

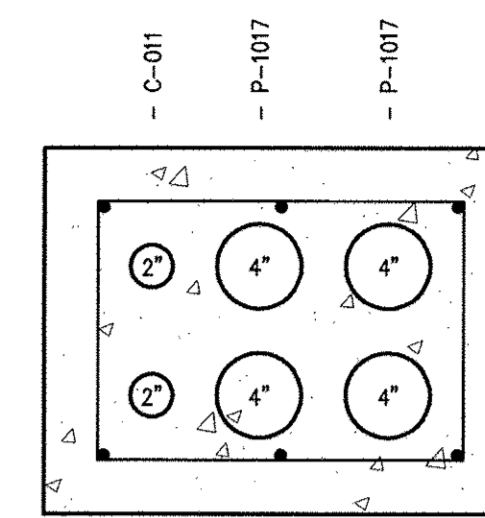
ELECTRICAL SCHEDULES
NO. REVISION DATE BY
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

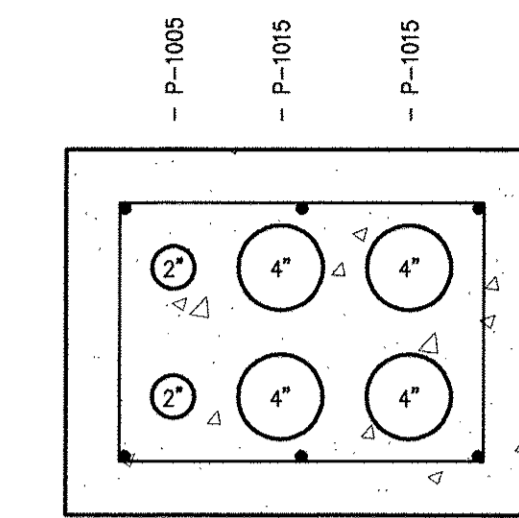
DATE	APRIL 2017
DRAWING NUMBER	E-6
SCALE	AS SHOWN
SHEET	36 OF 46

NOTES:

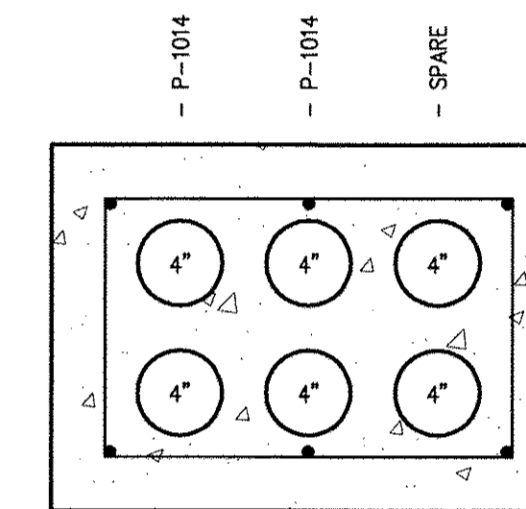
- COORDINATE PAD DIMENSIONS WITH THE GENERATOR EQUIPMENT SUPPLIER. SEE STRUCTURAL DRAWINGS FOR GENERATOR PAD DETAILS.
- COORDINATE LOCATION OF UTILITY CONNECTIONS WITH UTILITY COMPANIES.
- TELECOMMUNICATION CABLES SHALL BE INSTALLED BY OTHERS.
- INSTALLATION SHALL MEET BGE SERVICE REQUIREMENTS.



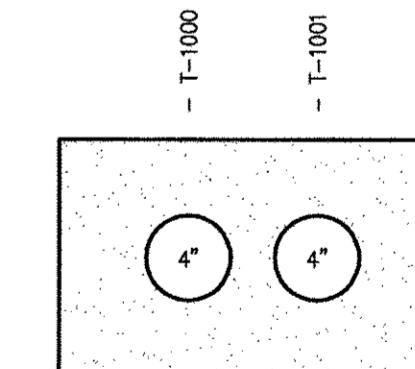
SECTION DBA
NTS E-6



SECTION DBB
NTS E-6

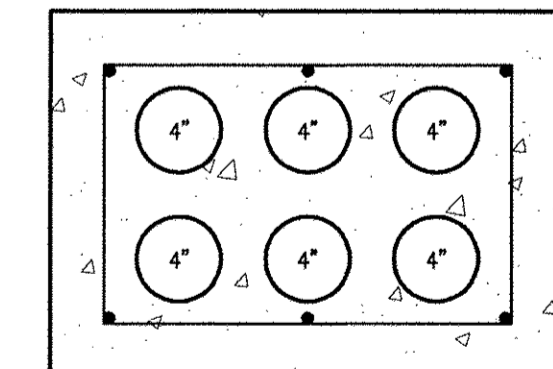


SECTION DBD
NTS E-6



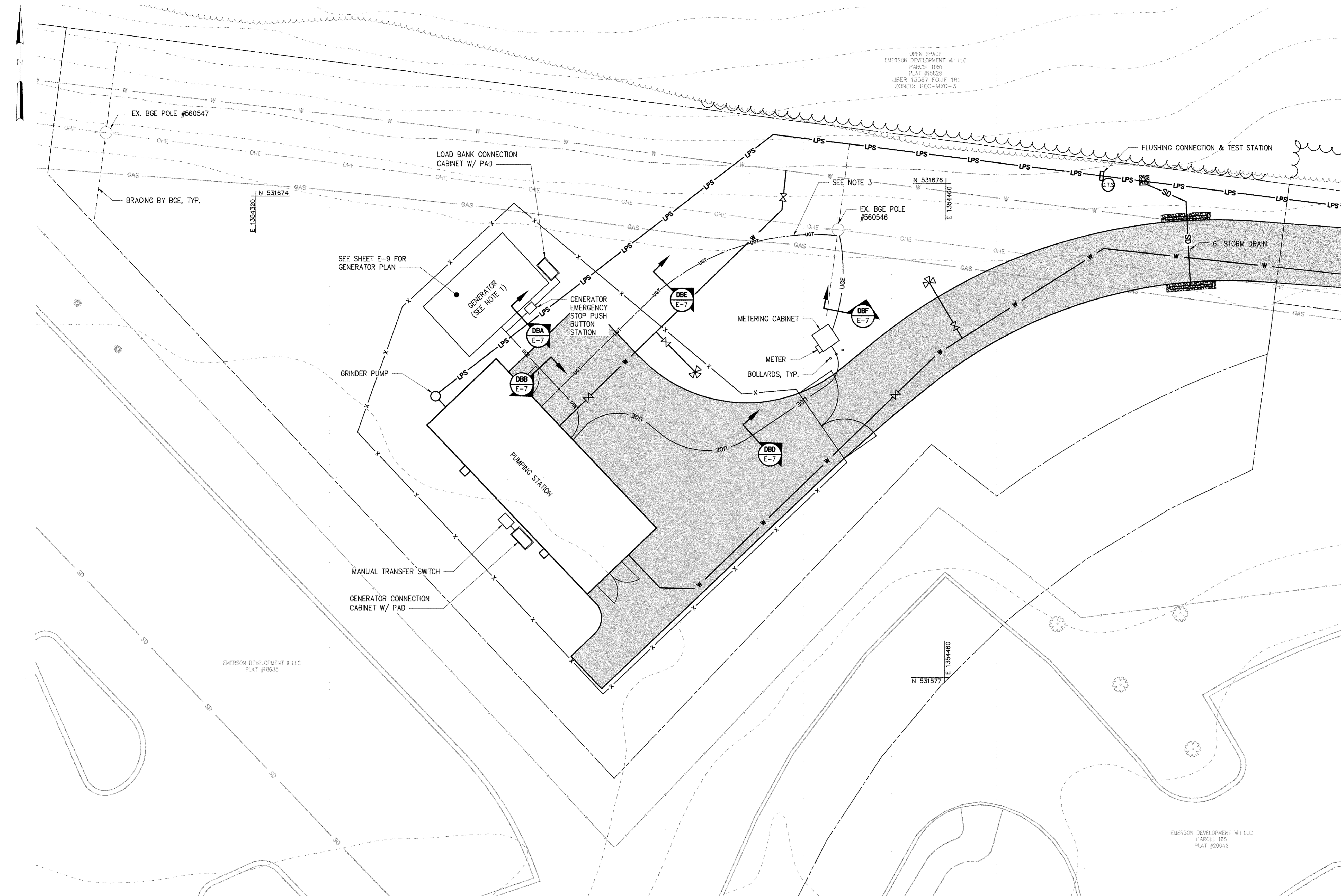
SECTION DBE
NTS E-6

(TELEPHONE)



SECTION DBF
NTS E-6

NOTE: CONTRACTOR SHALL COORDINATE DIRECTLY WITH BGE ON PRIMARY CONDUIT TRENCH BACKFILL NEEDS.

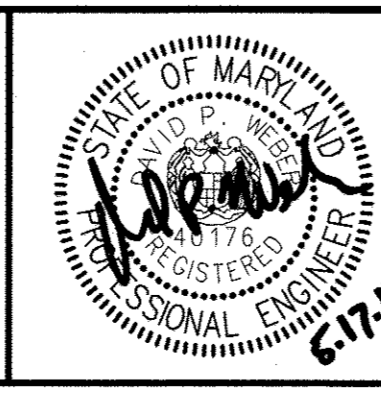


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 20170517 11:16A O:\31220-ba\31220-001\Drawings\Electrical\E-7.dwg LastSaveBy: MBROCATO

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *James De...* 6/5/17
 Chief Bureau of Engineering: *Thomas & Butler* 6/5/17
 Chief Bureau of Utilities: *...* 6/5/17
 Chief Utility Design Division: *...* 6/11/17

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-538-7681



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. 40176
EXPIRATION DATE 03/20/2019
SIGNED: *[Signature]*

DESIGNED	DPW				
DRAWN	MRR				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED					

ELECTRICAL
SITE PLAN

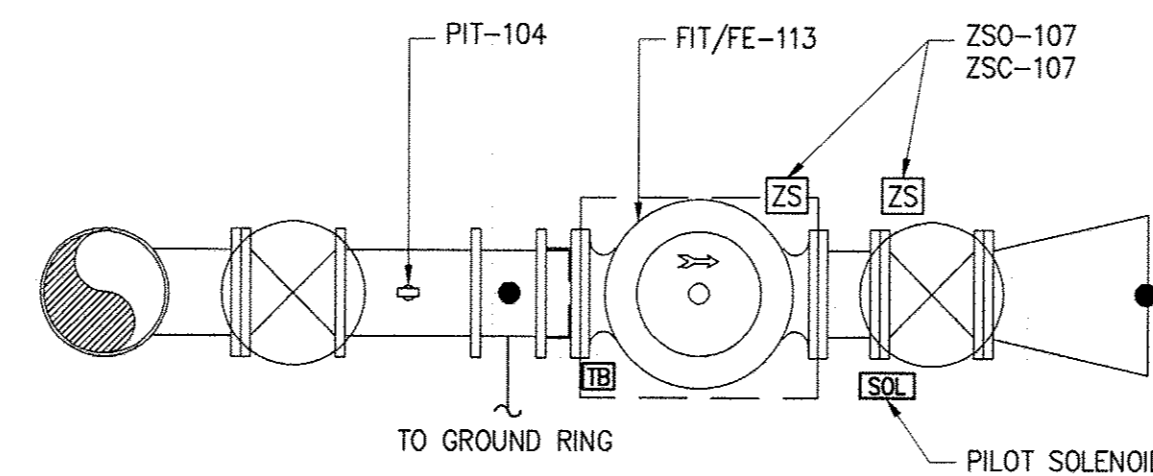
600' SCALE MAP: 47 BLOCK NO.: 20

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

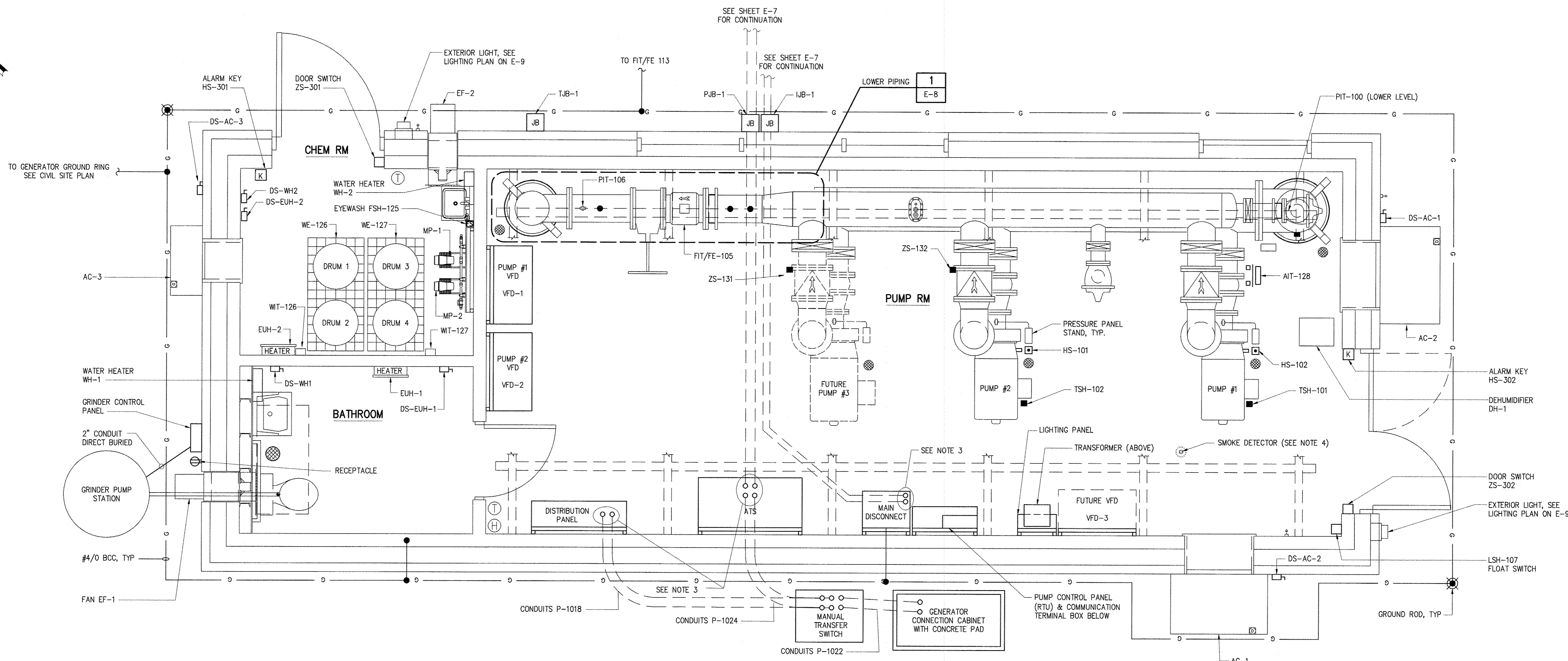
DATE: APRIL 2017
DRAWING NUMBER: E-7
SCALE: AS SHOWN
SHEET 37 OF 46

NOTES

1. BOND SERVICE ENTRANCE DISCONNECT, STRUCTURE STEEL AND PROCESS PIPING TO PUMP STATION GROUNDING RING.
2. INSTALL CONDUITS A MINIMUM OF 18" BELOW FOUNDATION SLAB.
3. COORDINATE FLOOR CUT-OUTS WITH STRUCTURE SUPPLIER.
4. BATTERY OPERATED SMOKE DETECTOR. LOCAL ANNUNCIATION ONLY.
5. TERMINATE AND CAP ELECTRICAL CONDUITS FOR FUTURE PUMP NO. 3 POWER AND CONTROL CONNECTIONS AT THE END OF THE MECHANICAL PIPING TO AVOID A TRIPPING HAZARD.
6. SEE SHEET E-9 FOR LIGHTING AND RECEPTACLE PLAN.



LOWER PIPING
 DETAIL 1
 1/2"=1'-0" E-8



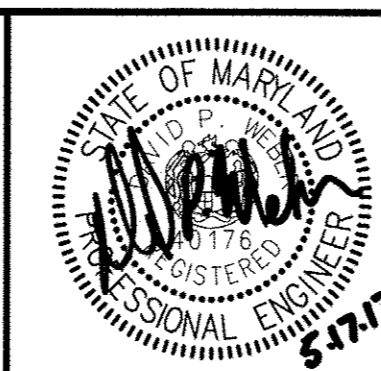
PACKAGE PUMPING STATION PLAN
 1/2"=1'-0"

IMAGE# 31220-1B, PS-P1, PS-P1-H, PS-P1-E
 XREF# 31220-1B, PS-P1, PS-P1-H, PS-P1-E

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	DATE 6/1/17	<i>[Signature]</i> CHIEF BUREAU OF ENGINEERING	DATE 6/15/17
<i>[Signature]</i> CHIEF BUREAU OF UTILITIES	DATE 6/1/17	<i>[Signature]</i> CHIEF UTILITY DESIGN DIVISION	DATE 6/11/17

Hazen
 HAZEN AND SAWYER
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
 410-539-7881



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. 40176
 EXPIRATION DATE 10/20/2018
 SIGNED: *[Signature]*

DESIGNED	DPW
DRAWN	MRR
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	DPW

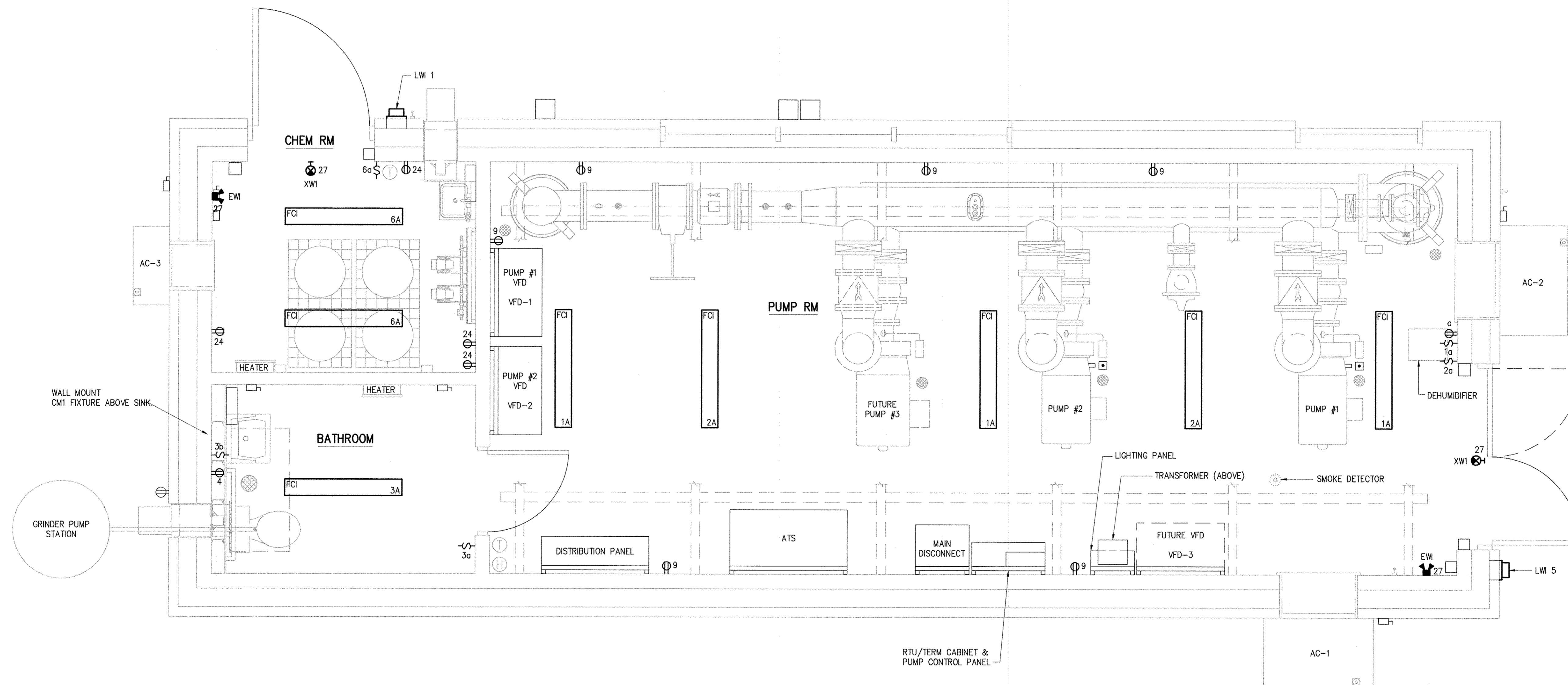
NO.	REVISION	DATE	BY

ELECTRICAL
 PACKAGE PUMPING STATION PLAN
 WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE APRIL 2017
 DRAWING NUMBER E-8
 SCALE AS SHOWN
 SHEET 38 OF 46

NOTES

1. FLUORESCENT FIXTURES SHALL BE CEILING MOUNTED.
2. WALL MOUNTED FIXTURES SHALL BE MOUNTED APPROXIMATELY 8 INCHES ABOVE THE TOP OF THE ADJACENT DOOR FRAME.
3. ALL RECEPTACLES SHALL BE GFCI PROTECTED.

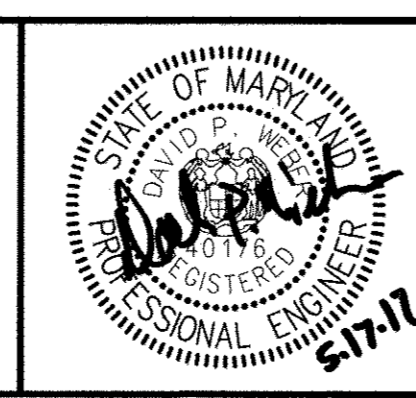


PACKAGE PUMPING STATION PLAN
1/2"=1'-0"

IMAGE= XREFS= 31220-1B_PS-PT-1_PS-PT-1_H_PS-PT-E

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND			
 DIRECTOR OF PUBLIC WORKS DATE: 6/5/17	 CHIEF BUREAU OF ENGINEERING DATE: 6/11/17	 CHIEF UTILITY DESIGN DIVISION DATE: 6/11/17	

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7881



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. 40176
EXPIRATION DATE 8/20/2019
SIGNED:

DESIGNED: DPW					
DRAWN: MRB					
CHECKED: JCS					
PROJ. ENGR: JTH					
APPROVED: DPW					

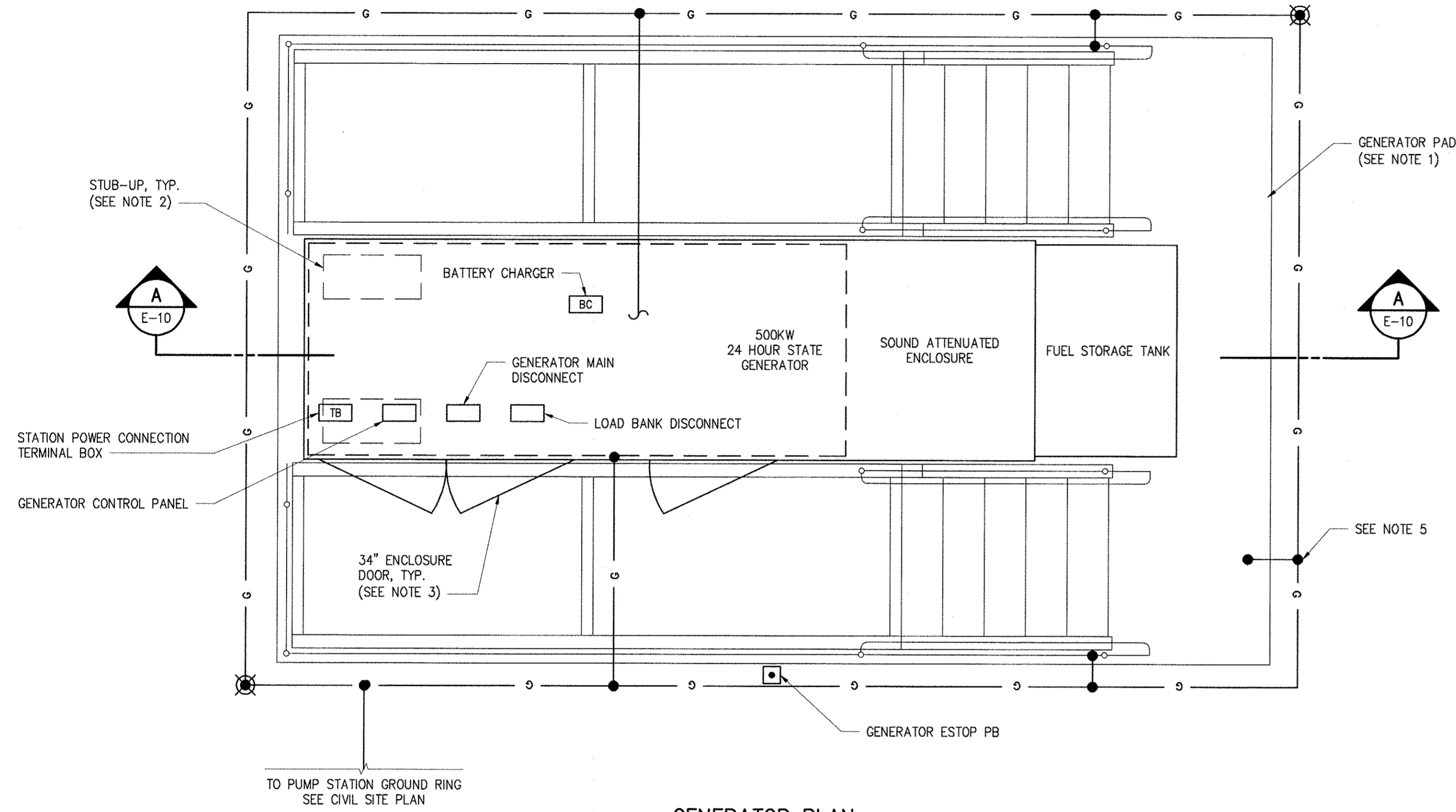
ELECTRICAL
PACKAGE PUMPING STATION LIGHTING & RECEPTACLE PLAN

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

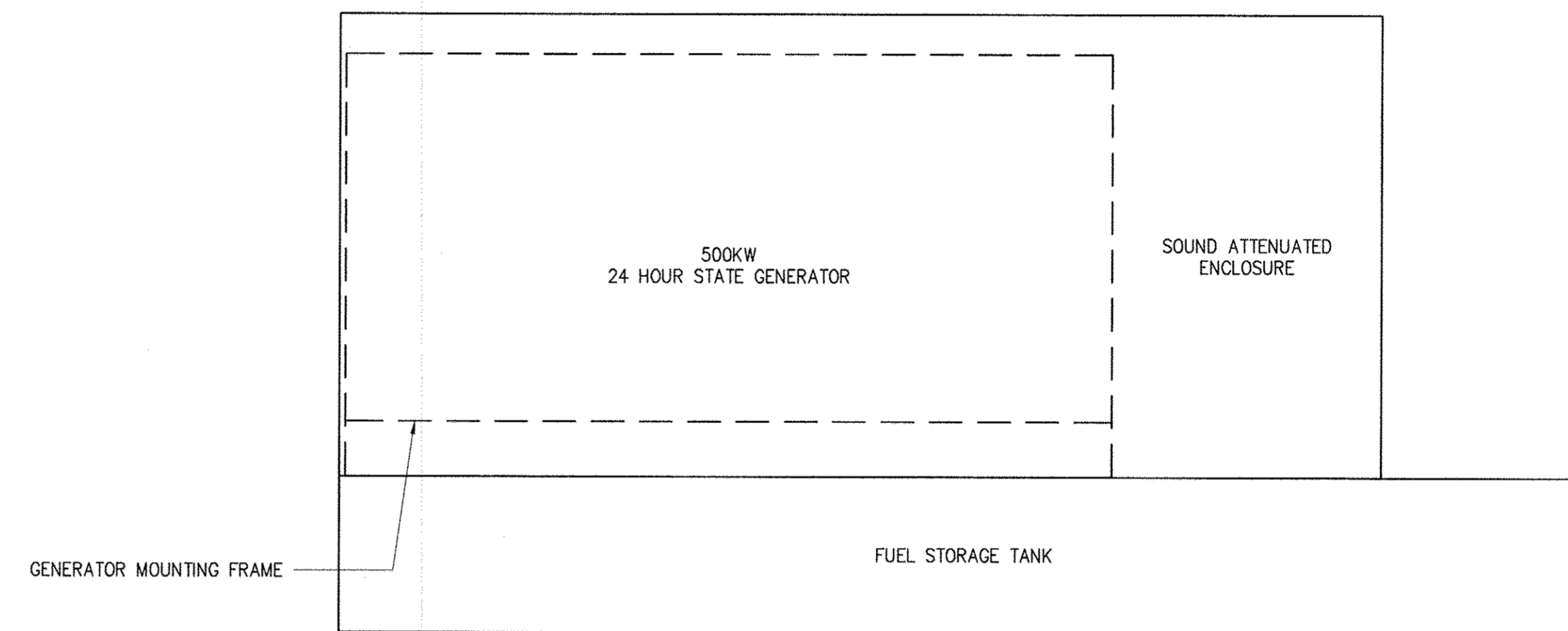
DATE: APRIL 2017
DRAWING NUMBER: E-9
SCALE: AS SHOWN
SHEET 39 OF 46

NOTES

1. COORDINATE PAD DIMENSIONS WITH GENERATOR EQUIPMENT SUPPLIER.
2. COORDINATE CONDUIT STUB-UPS WITH GENERATOR EQUIPMENT SUPPLIER.
3. LOCATE ELECTRICAL DISCONNECTS AND CONTROL PANELS IN FRONT OF ENCLOSURE DOORS TO MAINTAIN ADEQUATE WORKING CLEARANCE.
4. COORDINATE ELEVATION OF ALUMINUM ACCESS PLATFORM WITH GENERATOR SUPPLIER TO ENSURE ACCESS TO EQUIPMENT AND CLEARANCE FROM THE ENCLOSURE DOORS. SEE STRUCTURAL DRAWINGS FOR ALUMINUM PLATFORM REQUIREMENTS.
5. GROUND ALUMINUM PLATFORMS, EQUIPMENT PAD, REINFORCING, GENERATOR FRAME, AND MAIN BREAKER GROUND BAR TO THE GROUND GRID.



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



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

IMAGE# 31220-TB-PS-PT-H, PS-PT-H, PS-PT-E, GEN-PT-E, GEN-PT-E, GEN-PT-E

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS DATE 5/5/17	<i>[Signature]</i> CHIEF BUREAU OF ENGINEERING DATE 6/5/17
<i>[Signature]</i> CHIEF BUREAU OF UTILITIES DATE 5/5/17	<i>[Signature]</i> CHIEF UTILITY DESIGN DIVISION DATE 6/10/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



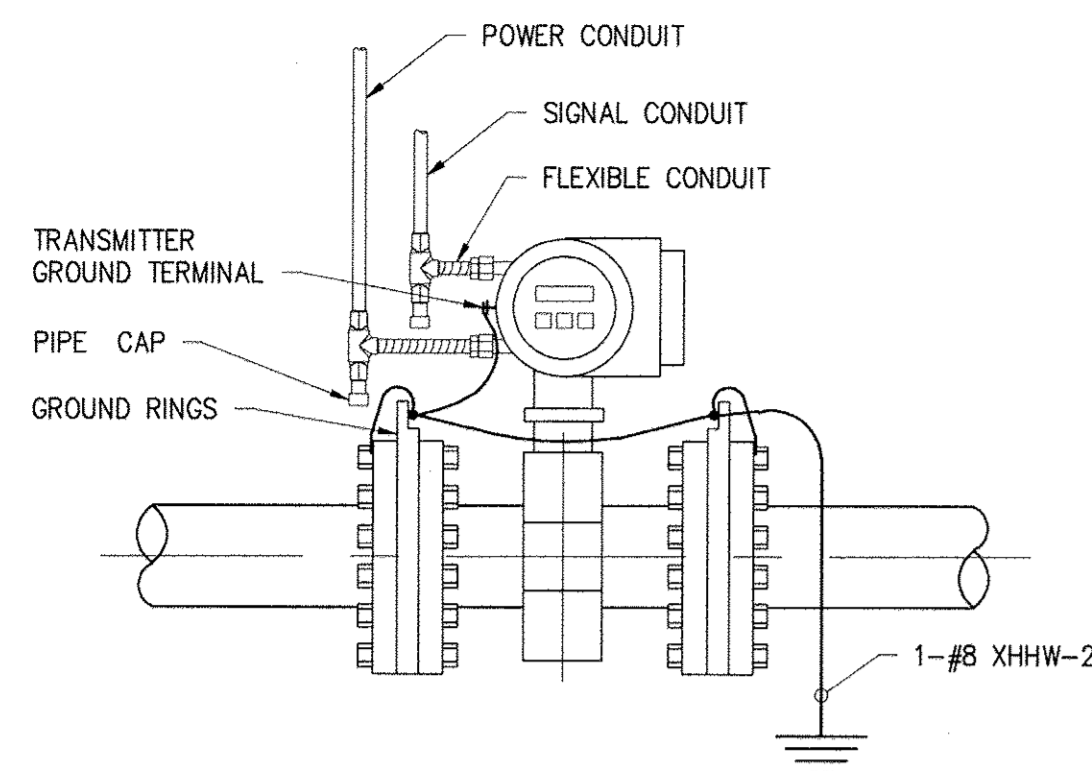
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 40178
EXPIRATION DATE 02/20/2019
SIGNED: *[Signature]*

DESIGNED	DPW				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED					

ELECTRICAL	
GENERATOR PLAN	
NO.	REVISION
DATE	BY

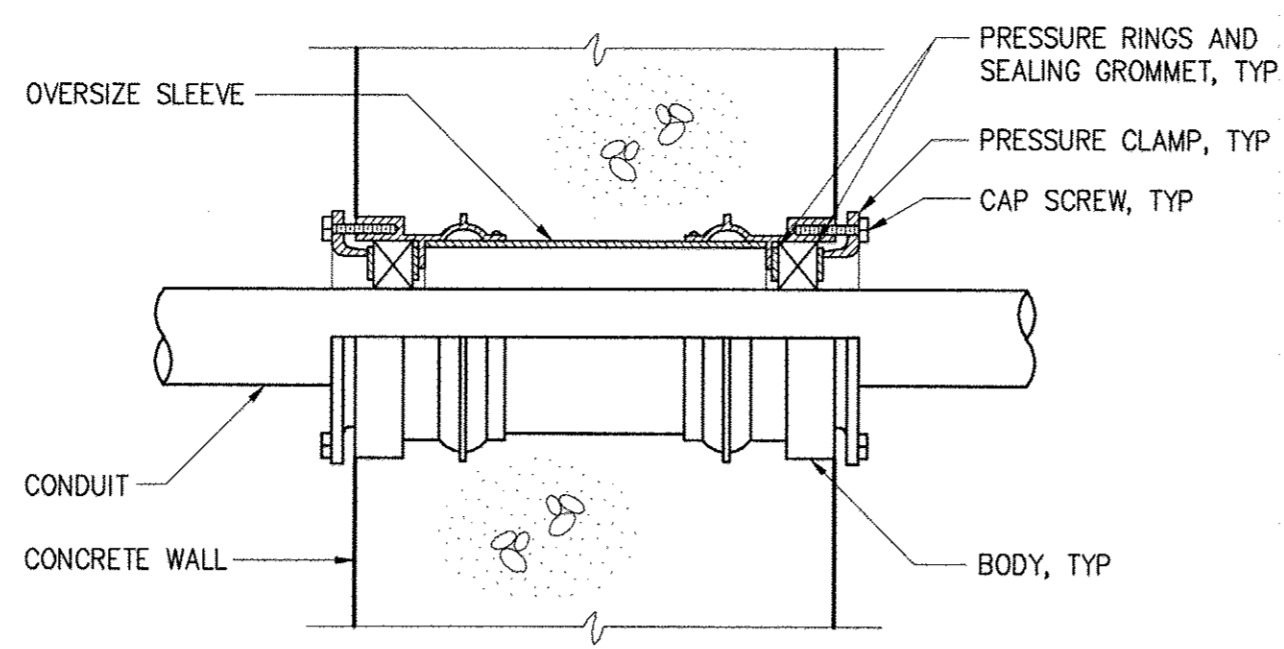
WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE APRIL 2017
DRAWING NUMBER
E-10
SCALE AS SHOWN
SHEET 40 OF 46



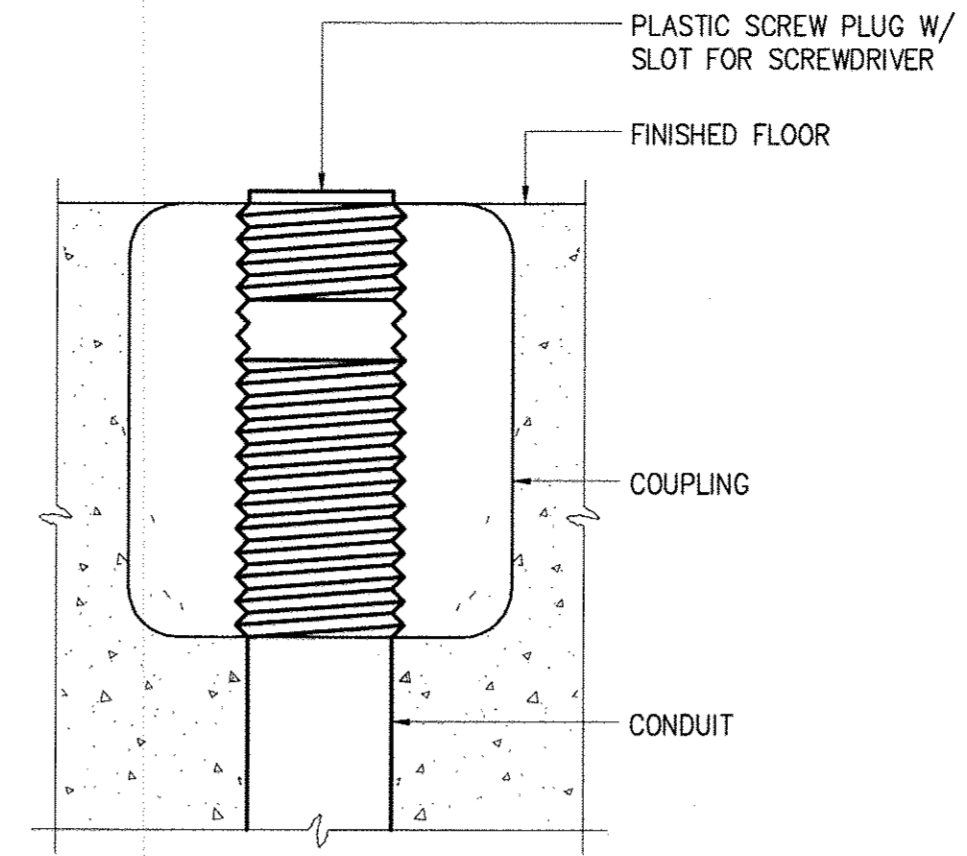
INTEGRAL MAGNETIC FLOW METER INSTALLATION

DETAIL	1
NO SCALE	E-11



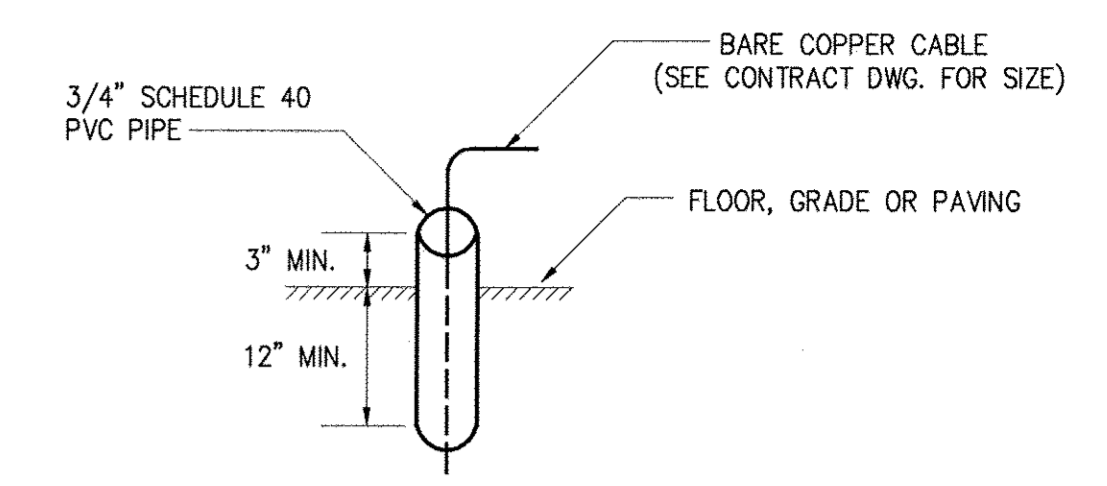
CONDUIT THROUGH WALL SEAL

DETAIL	2
NO SCALE	E-11



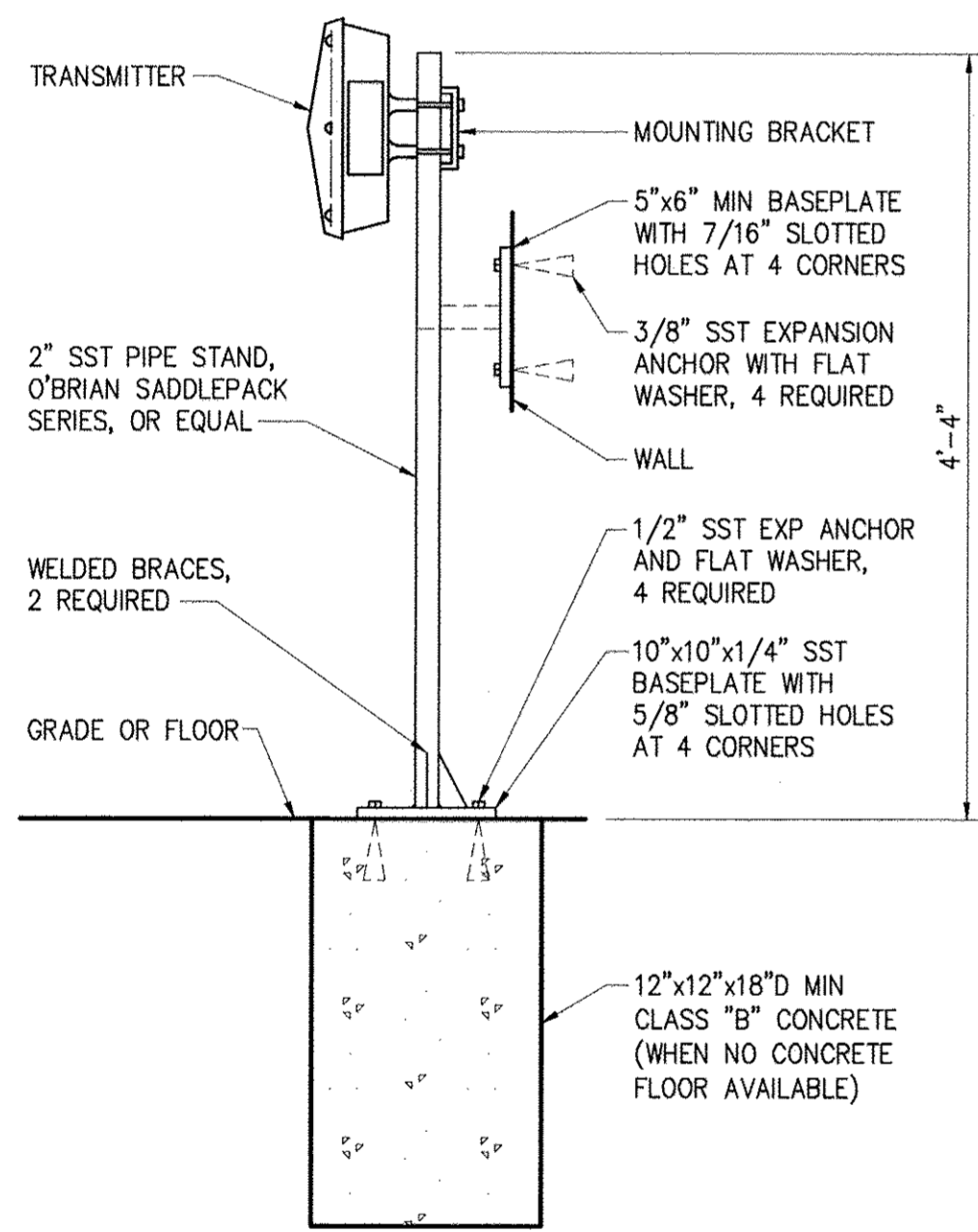
CONDUIT, FLOOR STUB UP

DETAIL	3
NO SCALE	E-11



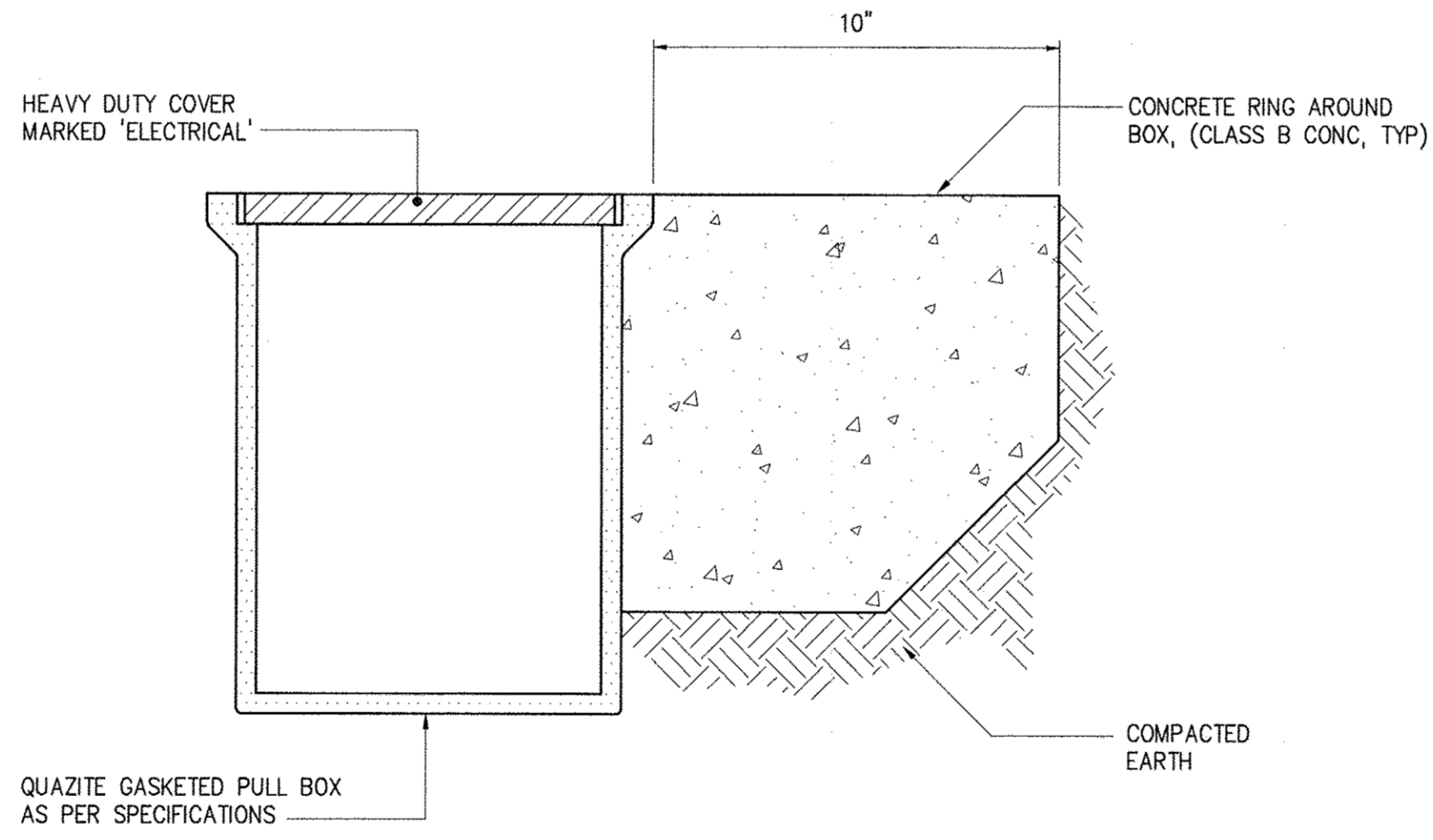
GROUND CABLE SLEEVE INSTALLATION

DETAIL	4
NO SCALE	E-11



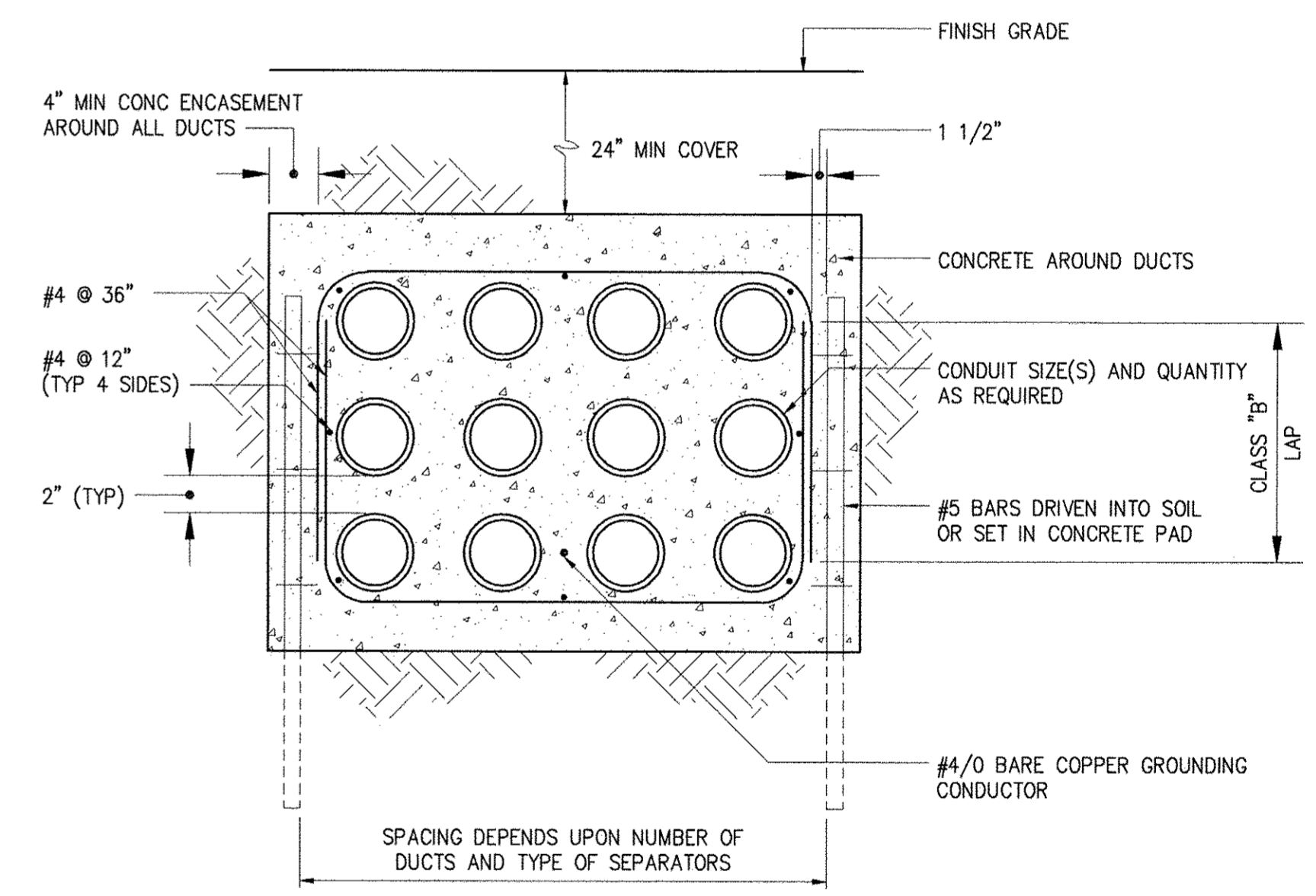
TYPICAL PIPE STAND TRANSMITTER MOUNT (FLOOR OR WALL)

DETAIL	5
NO SCALE	E-11



PULL BOX AND HAND HOLE (HH) INSTALLATION

DETAIL	6
NO SCALE	E-11



TYPICAL DUCT BANK

DETAIL	7
NO SCALE	E-11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7881



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. 40176
EXPIRATION DATE: 03/20/2019
SIGNED: [Signature]

DESIGNED: DPW
DRAWN: MRB
CHECKED: JCS
PROJ. ENGR.: JTH
APPROVED: [Signature]

ELECTRICAL DETAILS

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT

CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: E-11
SCALE: AS SHOWN
SHEET 41 OF 46

IMAGE PLOT XREFS 31220-TB

INSTRUMENT AND FUNCTION SYMBOLS

	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	NORMALLY INACCESSIBLE OR BEHIND THE PANEL DEVICES OR FUNCTIONS
FIELD/PANEL EQUIPMENT				
SHARED DISPLAY, SHARED CONTROL (OIT)				
PROGRAMMABLE LOGIC CONTROLLER				
SUPERVISORY COMPUTER FUNCTION (HMI/SERVER)				

SINGLE INSTRUMENT OR OTHER DEVICE HAVING MULTIPLE FUNCTIONS OR SHARING A COMMON HOUSING

SOFTWARE LOGIC OR CONTROL MODULE XXXX AND SUB-MODULE YYY RESIDENT IN DISTRIBUTED CONTROL SYSTEM (DCS) OR PROGRAMMABLE LOGIC CONTROLLER (PLC) REFER TO CONTRACT DOCUMENTS FOR CONTROL AND MODULE DESCRIPTIONS.

DESIGNATIONS OF CONTROL FUNCTIONS (ZZZ) ASSOCIATED WITH INSTRUMENT OR OTHER DEVICES.

AHC - AUTO/HOLD/CLOSE	OC - OPEN/CLOSE
AM - AUTO/MANUAL	OSC - OPEN/STOP/CLOSED
DEV - DEVIATION	POT - POTENTIOMETER
HOA - HAND/OFF/AUTO	RL - RAISE/LOWER
MOA - MANUAL/OFF/AUTO	RSL - RAISE/STOP/LOWER
HOR - HAND/OFF/REMOTE	SD - SHUTDOWN
LOS - LOCKOUT STOP	SEL - SELECT
LR - LOCAL/REMOTE	SP - SET POINT
LOR - LOCAL/OFF/REMOTE	SR - START/RESET
OO - ON/OFF	SS - START/STOP

INSTRUMENT PANEL MOUNTED WITH COMPUTING OR CONVERTING FUNCTION

CONVERT E - VOLTAGE H - HYDRAULIC
I - CURRENT O - ELECTROMAGNETIC, SONIC
P - PNEUMATIC R - RESISTANCE (ELECT.)
A - ANALOG D - DIGITAL
B - BINARY

COMPUTE SUMMING EXPONENTIAL
 SUBTRACTOR AVERAGING
 MULTIPLYING RATIO
 DIVIDING HIGH SELECTING
 ROOT LOW SELECTING
 PROPORTIONAL INTEGRAL
 DERIVATIVE PID

PANEL MOUNTED PILOT LIGHT

ANALYZER, XXXX = TYPE

XXXX ALK - ALKALINITY	O ₃ - OZONE
CL ₂ - CHLORINE CONCENTRATION	ORP - OXIDATION/REDUCTION POTENTIAL
COMB - COMBUSTIBLE GAS	pH - HYDROGEN ION CONCENTRATION
COND - CONDUCTIVITY	TH - TOTAL HARDNESS
DO - DISSOLVED OXYGEN	UV - ULTRAVIOLET
H ₂ S - HYDROGEN SULFIDE	
LEL - LOWER EXPLOSIVE LIMIT	
O ₂ - OXYGEN CONCENTRATION	

(*) ASTERISK IDENTIFIES FIELD INSTRUMENTS FURNISHED BY EQUIPMENT SUPPLIER

⊗ ASTERISK IDENTIFIES LOCAL CONTROL PANELS FURNISHED BY EQUIPMENT SUPPLIER

OPERATIONAL INTERLOCK

COMPLEX INTERLOCK	AND LOGIC
# = 1, 2, 3, etc. INTERLOCK NUMBER DESCRIPTION ON SAME SHEET	OR LOGIC

VALVE AND ACTUATOR SYMBOLS

GENERIC VALVE	PLUG VALVE	GLOBE VALVE	BALL VALVE
BALL VALVE (3-WAY)	3-WAY VALVE (GENERAL)	PINCH VALVE	COMBINATION VACUUM AND PRESSURE RELIEF VALVE
BUTTERFLY VALVE	SWING CHECK VALVE	BALL CHECK VALVE	DIAPHRAGM VALVE
NEEDLE VALVE	ANGLE VALVE	ROTARY VALVE	THROUGH PLUG VALVE
PRESSURE RELIEF OR SAFETY VALVE	VACUUM RELIEF VALVE	PRESSURE-REDUCING REGULATOR	BACKPRESSURE REGULATOR
BACKFLOW PREVENTER	SLUICE GATE	STOP/SLIDE GATE	STRAINER
BACKFLOW PREVENTER	ELECTRIC ACTUATOR	SOLENOID ACTUATOR	PNEUMATIC ACTUATOR
ELECTROPNEUMATIC ACTUATOR	ELECTROHYDRAULIC ACTUATOR	HAND WHEEL	HYDRANT
CENTRIFUGAL PUMP			

INSTRUMENT SYMBOLS

MAGNETIC FLOW METER	VENTURI FLOW TUBE	TURBINE FLOW METER	ROTAMETER	ULTRASONIC FLOW METER	PADDLE WHEEL FLOW METER	VORTEX FLOW METER	POSITIVE DISPLACEMENT FLOW METER
PITOT TUBE	PARSHALL FLUME	WEIR	ORIFICE PLATE	STRAIGHTENING VANES	ULTRASONIC LEVEL SENSOR	SUBMERSIBLE LEVEL SENSOR	FLOAT TYPE LEVEL SWITCH
TAPPED RING SEAL	DIAPHRAGM SEAL	FULL LINE RING SEAL	VALVED TAP	RTD AND THERMOWELL	RADAR LEVEL SENSOR (UNGUIDED)	RADAR LEVEL SENSOR (GUIDED)	CAPACITANCE LEVEL SENSOR
SIGNAL BOOSTER	SEQUENTIAL EQUIPMENT	ANALOG INPUT	ANALOG OUTPUT	DIGITAL INPUT	DIGITAL OUTPUT		

INSTRUMENT/DEVICE IDENTIFICATION LETTERS

FIRST-LETTER		SUCCEEDING-LETTERS		
MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A ANALYSIS		ALARM		
B BURNER, COMBUSTION				
C			CONTROL	CLOSE, CLOSED
D	DIFFERENTIAL			
E VOLTAGE		PRIMARY ELEMENT SENSOR		
F FLOW RATE	FRACTION RATIO			
G GAUGE		GLASS, VIEWING DEVICE		
H HAND				HIGH
I ELECTRICAL CURRENT		INDICATE		
J POWER	SCANE			
K TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L LEVEL		LIGHT		LOW
M	MOMENTARY			MIDDLE, INTERMEDIATE
N TORQUE				
O		ORIFICE, RESTRICTION		OPEN, OPENED
P PRESSURE, VACUUM		TEXT POINT CONNECTION		
Q QUANTITY	INTEGRATE, TOTALIZE			
R RUN		RECORD & STORE	REPORT	
S SPEED, FREQUENCY	SAFETY		SWITCH	
T TEMPERATURE			TRANSMIT	
U MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V VIBRATION, VOLUME MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W WEIGHT, FORCE		WELL		
X FAILURE OR TROUBLE	X AXIS			
Y EVENT, STATE/PRESENCE	Y AXIS		COMPUTE, REVERT, RELAY	
Z POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

LINETYPE LEGEND

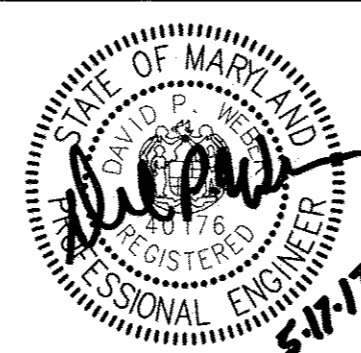
	MAJOR PROCESS PIPES OR CHANNELS
	SECONDARY PROCESS OR MECHANICAL CONNECTIONS
	CAPILLARY OR IMPULSE TUBING
	AIR SUPPLY OR SIGNAL
	HYDRAULIC SUPPLY OR SIGNAL
	ELECTRICAL SIGNAL
	DATA LINK OR INTERNAL SOFTWARE LINK
	PROCESS FLOW
	TYPICAL PUMP
	PUMPING STATION EQUIPMENT

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* DATE: 5/5/17
Chief Bureau of Engineering: *[Signature]* DATE: 5/5/17
Chief Bureau of Utilities: *[Signature]* DATE: 5/5/17
Chief Utility Design Division: *[Signature]* DATE: 5/5/17

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



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LICENSE NO. 40176
EXPIRATION DATE 03/20/2019
SIGNED: *[Signature]*

DESIGNED: DPW
DRAWN: MRB
CHECKED: JCS
PROJ. ENGR.: JTH
APPROVED: DPW

NO.	REVISION	DATE	BY

INSTRUMENTATION
LEGEND AND SYMBOLS

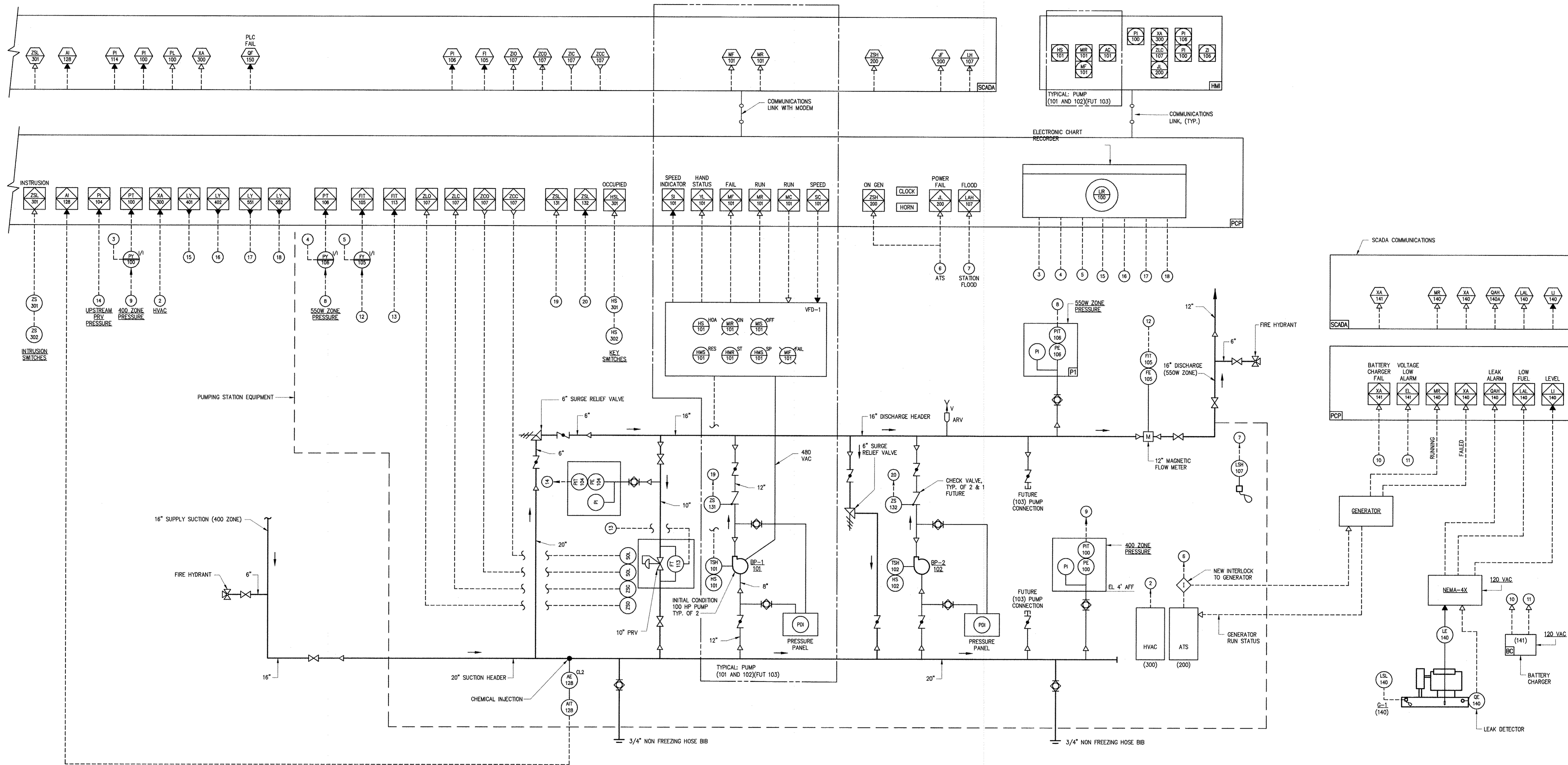
WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

DATE: APRIL 2017
DRAWING NUMBER: 1-1
SCALE: AS SHOWN
SHEET 42 OF 46

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

NOTES:
SEE I-1 FOR INSTRUMENT LEGEND AND SYMBOLS

→ FLOW DIRECTION
◁ REDUCER/INCREASER



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signatures]
DIRECTOR OF PUBLIC WORKS DATE
CHIEF BUREAU OF ENGINEERING DATE
CHIEF BUREAU OF UTILITIES DATE
CHIEF UTILITY DESIGN DIVISION DATE

Hazen
HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
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SIGNED: *[Signature]*

DESIGNED	DPW
DRAWN	MRB
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	
NO.	REVISION
DATE	BY

INSTRUMENTATION
PACKAGE PUMPING STATION PROCESS DIAGRAM

600' SCALE MAP: 47 BLOCK NO.: 20

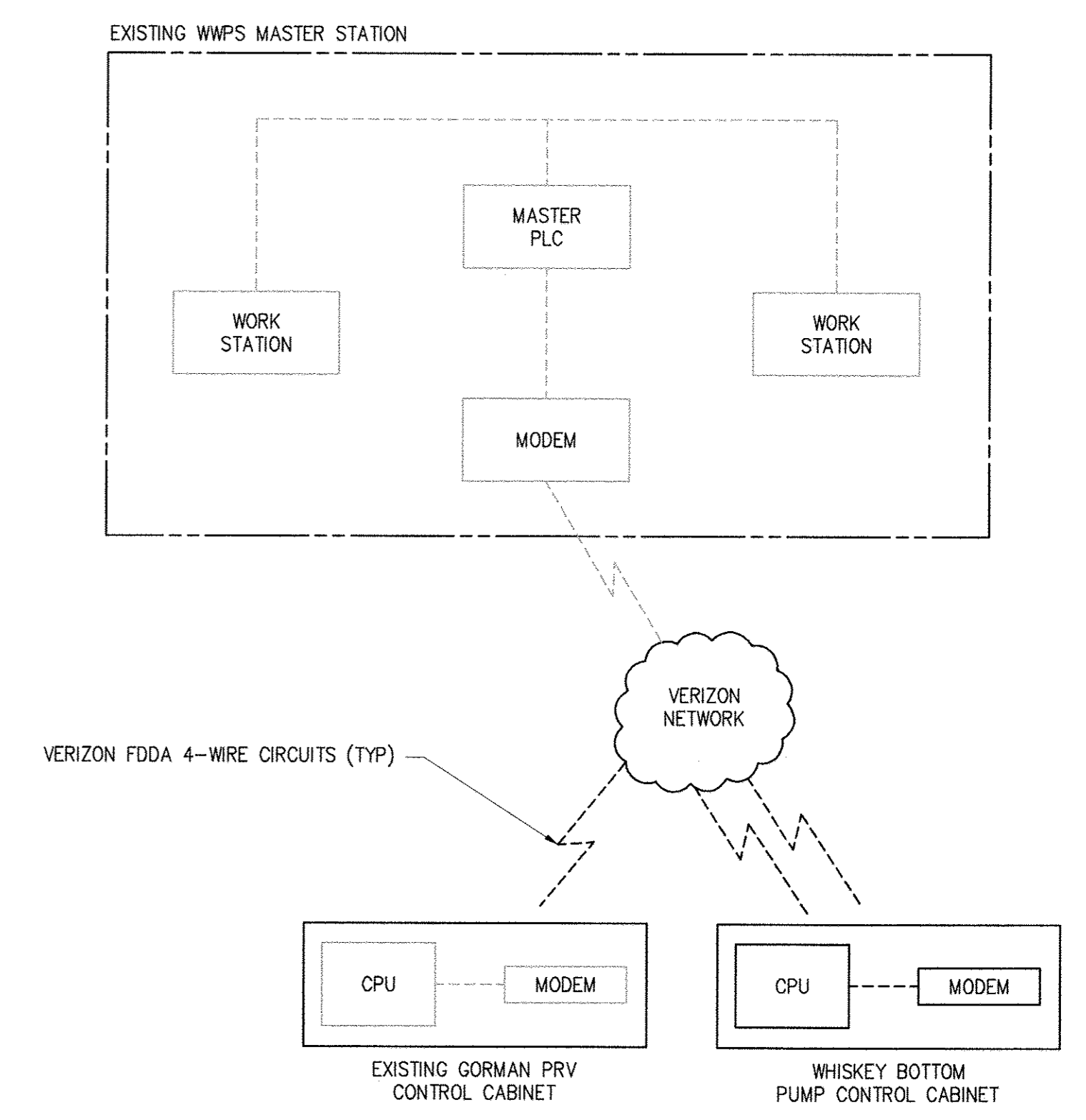
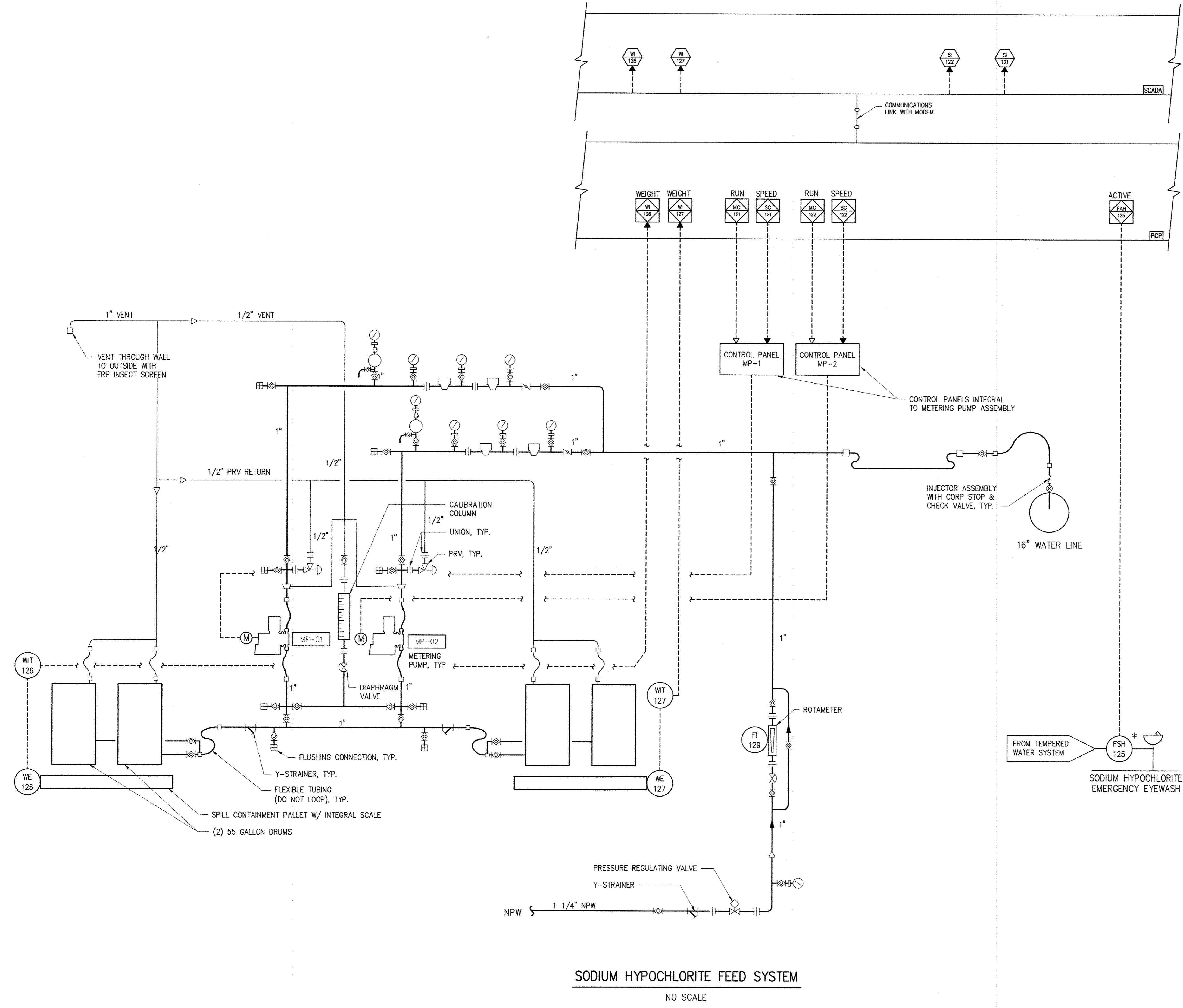
WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

DATE APRIL 2017
DRAWING NUMBER 1-2
SCALE AS SHOWN
SHEET 43 OF 46

IMAGE# 31220-1B

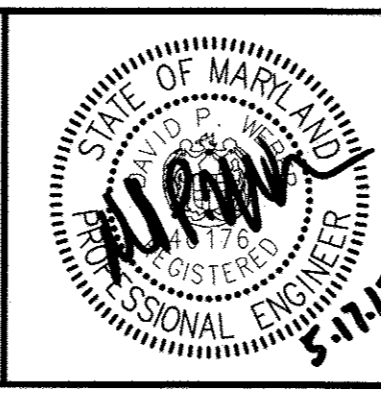
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* Date: 6/5/12
 Chief Bureau of Engineering: *[Signature]* Date: 6/5/12
 Chief Bureau of Utilities: *[Signature]* Date: 6/5/12
 Chief Utility Design Division: *[Signature]* Date: 6/5/12

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EXPIRATION DATE 03/20/2019
SIGNED: *[Signature]*

DESIGNED	DPW
DRAWN	MRR
CHECKED	JCS
PROJ. ENGR.	JTH
APPROVED	

INSTRUMENTATION
SODIUM HYPOCHLORITE FEED SYSTEM
DIAGRAM

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947
ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

DATE: APRIL 2017
DRAWING NUMBER: 1-3
SCALE: AS SHOWN
SHEET 44 OF 46

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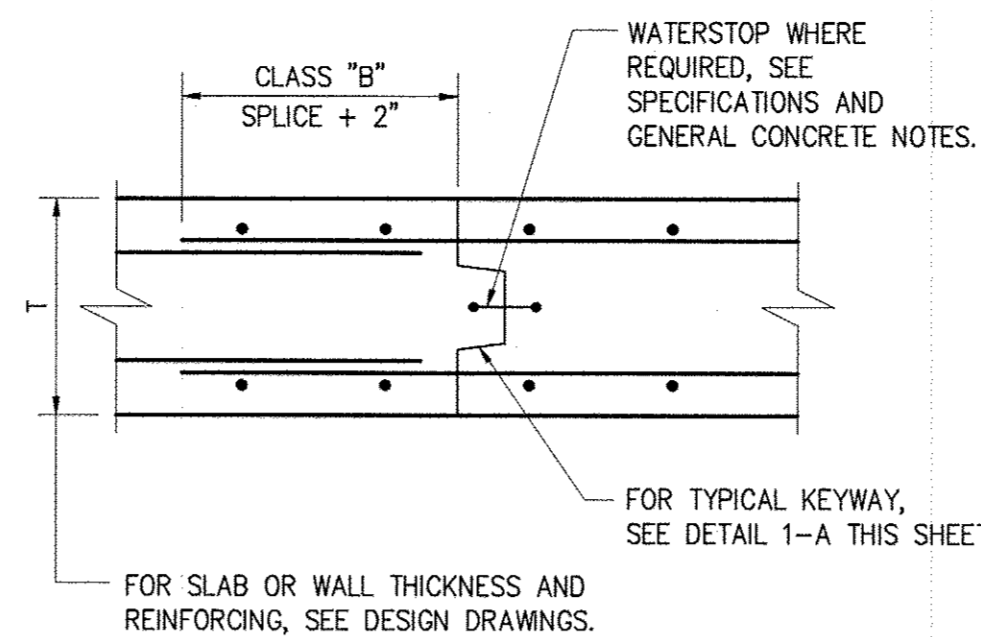
GENERAL CONCRETE NOTES:

- CONCRETE PROTECTION FOR REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED ON THE DRAWINGS:
 - A - CONCRETE DEPOSITED DIRECTLY AGAINST SOIL _____ 3"
 - B - CONCRETE EXPOSED TO WEATHER (#5 OR SMALLER) _____ 1 1/2"
 - _____ (#6 OR LARGER) _____ 2"
 - C - SLABS _____ 1 1/2"
 - AT SURFACES CONTACTING WATER OR SEWAGE _____ 2"
 - D - BEAMS AND COLUMNS (TO MAIN REINFORCEMENT) _____ 2"
 - _____ (TO COLUMN TIES OR STIRRUPS) _____ 1 1/2"
 - _____ SURFACES EXPOSED TO SEAWATER _____ 4"
 - E - WALLS 12" OR MORE _____ 2"
 - _____ WALLS LESS THAN 12" (#5 OR SMALLER) _____ 1 1/2"
 - _____ (#6 OR LARGER) _____ 2"
 - _____ SURFACES EXPOSED TO SEAWATER _____ 3"
 - F - FOR SURFACES EXPOSED TO WATER OR SEWAGE IN BEAMS, COLUMNS AND WALLS ADD 1/2" TO ABOVE.
- SPLICES SHALL BE CLASS "B" CONFORMING TO THE PROVISIONS OF ACI 318-89 UNLESS NOTED OTHERWISE.
- ALL EMBEDDED ITEMS SHALL BE INSTALLED AND SECURED IN PLACE BEFORE CONCRETE PLACEMENT. CONSULT ELECTRICAL, MECHANICAL AND HVAC DRAWINGS FOR PIPING, EMBEDDED ITEMS AND OPENINGS.
- ALL JOINTS IN WATER BEARING STRUCTURES SHALL HAVE A WATERSTOP. ALL JOINTS BELOW GRADE IN WALLS OR SLABS WHICH ENCLOSE AN ACCESSIBLE AREA SHALL HAVE WATERSTOPS.
- CONSTRUCTION JOINTS NOT SHOWN SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE APPROVAL OF THE ENGINEER PRIOR TO SUBMITTING REBAR SHOP DRAWINGS.
- PROVIDE VERTICAL CONSTRUCTION JOINTS IN WALLS AND HORIZONTAL JOINTS IN SLABS NOT GREATER THAN 45'-0" ON CENTER.
- NO BACKFILL SHALL BE PLACED AGAINST ANY SUBSTRUCTURE WALLS UNLESS ADJACENT FLOOR SLABS HAVE TAKEN THEIR FINAL SET, OR WALLS HAVE BEEN PROPERLY BRACED, AND IN ANY CASE NOT SOONER THAN 28 DAYS AFTER THE PLACING OF CONCRETE UNLESS APPROVED BY THE ENGINEER.
- CONTRACTOR SHALL ROUGHEN NOSING AREA ACROSS FULL WIDTH OF STAIR TREAD TO PROVIDE NON-SLIP SURFACE.

HOWARD COUNTY STANDARD DETAILS

CONTRACTOR SHALL REFER TO HOWARD COUNTY STANDARD DETAILS INCLUDING, BUT NOT LIMITED TO:

DETAIL#	DETAIL TITLE
E-1.01	ELECTRIC SERVICE GRINDER PUMP
E-1.02	COUNTY OWNED GRINDER PUMP LAYOUT
E-1.03	TERMINAL FLUSHING CONNECTION
E-2.01	ANTI FLOAT COLLAR
E-2.02	BACKFILL
E-2.05	PUMP CONTROL AND ALARM
G-8.21	CONTINUITY TEST STATION
W-1.15	FIRE HYDRANT CONTINUITY TEST STATION
W-3.65	VALVE KEY EXTENSION
W-4.11	AIR RELEASE VALVE MANHOLE
W-4.13	6"-12" BLOW OFF
W-5.01	VALVE ANCHORAGE
S-2.22	SEWER HOUSE CONNECTION CLEANOUT
S-4.14	TRANSITION MANHOLE
S-4.15	TRANSITION MANHOLE
S-4.18	TRACER WIRE, CONDUCTING ROD, AND VAULT

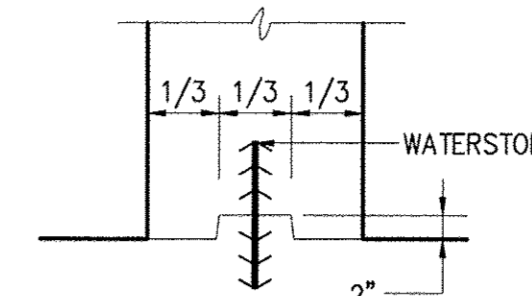


TYPICAL CONSTRUCTION JOINT

DETAIL	1
NO SCALE	D-1

NOTES:

- CONTRACTOR TO DETERMINE IF CONSTRUCTION JOINTS ARE NECESSARY. ANTICIPATE MONOLITHIC CONCRETE POUR WHICH WOULD NOT REQUIRE CONSTRUCTION JOINTS.
- CONTRACTOR SHALL COORDINATE ACCORDINGLY IF CONSTRUCTION JOINTS ARE NECESSARY.



TYPICAL KEYWAY

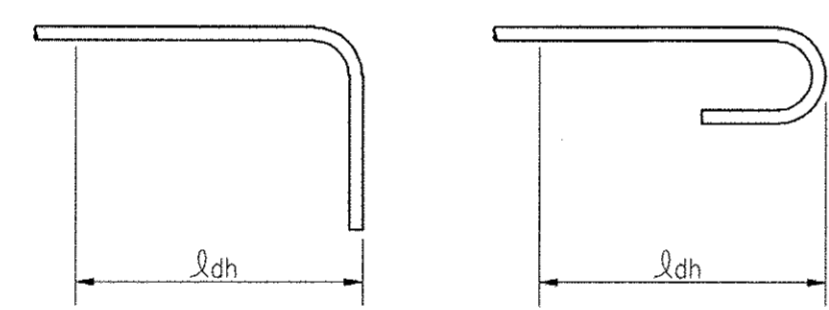
DETAIL	1-A
NO SCALE	D-1

DEVELOPMENT LENGTH OF STANDARD HOOKS FOR BARS IN TENSION

$f_y = 60,000 \text{ psi}$ $f_c' = 4000 \text{ psi OR GREATER}$

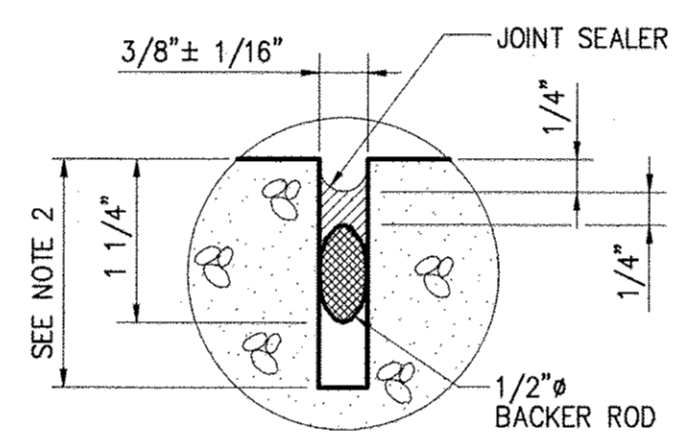
BAR SIZE	DEVELOPMENT LENGTH, l_d	
	BASIC	W/ CONC COVER *
#3	8"	6"
#4	10"	7"
#5	1'-0"	9"
#6	1'-3"	11"
#7	1'-5"	1'-0"
#8	1'-7"	1'-2"
#9	1'-10"	1'-4"
#10	2'-1"	1'-6"
#11	2'-3"	1'-7"

* SIDE COVER NORMAL TO PLANE OF HOOK AT LEAST 2 1/2"; AND FOR 90° HOOK END COVER BEYOND OUTSIDE END OF HOOK AT LEAST 2".



NOTES:

- JOINTS SHALL BE FORMED BY AN APPROVED JOINT INSERT. SAWCUTTING OF JOINTS WILL NOT BE ALLOWED.
- DEPTH SHALL BE 1 1/2" IN REINF CONC DEPTH SHALL BE 1/3 OF CONCRETE THICKNESS IN UNREINFORCED CONCRETE PAVEMENT.



TYPICAL CONTRACTION JOINT

DETAIL	3
NO SCALE	D-1

BASIC DEVELOPMENT LENGTH AND SPLICE LENGTH FOR BARS IN COMPRESSION

$f_y = 60,000 \text{ psi}$ $f_c' = 4000 \text{ psi OR GREATER}$

BASIC DEVELOPMENT LENGTH	CONFINEMENT *	BAR SIZE	SPLICE LENGTH	
			BASIC	CONFINEMENT *
8"	8"	# 3	12"	12"
10"	8"	# 4	1'-3"	12"
1'-0"	9"	# 5	1'-7"	1'-3"
1'-3"	1'-0"	# 6	1'-11"	1'-6"
1'-5"	1'-1"	# 7	2'-3"	1'-9"
1'-7"	1'-3"	# 8	2'-6"	1'-11"
1'-10"	1'-4"	# 9	2'-10"	2'-2"
2'-1"	1'-7"	# 10	3'-3"	2'-6"
2'-3"	1'-8"	# 11	3'-7"	2'-9"

* BAR ENCLOSED WITHIN SPIRALS OF NOT LESS THAN 1/4 INCH DIAMETER AND NOT MORE THAN 4 INCH PITCH OR WITHIN #4 TIES IN CONFORMANCE WITH ACI 318-95, SECTION 7.10.5 AT NOT MORE THAN 4 INCHES ON CENTER, FACTOR 0.75 USED.

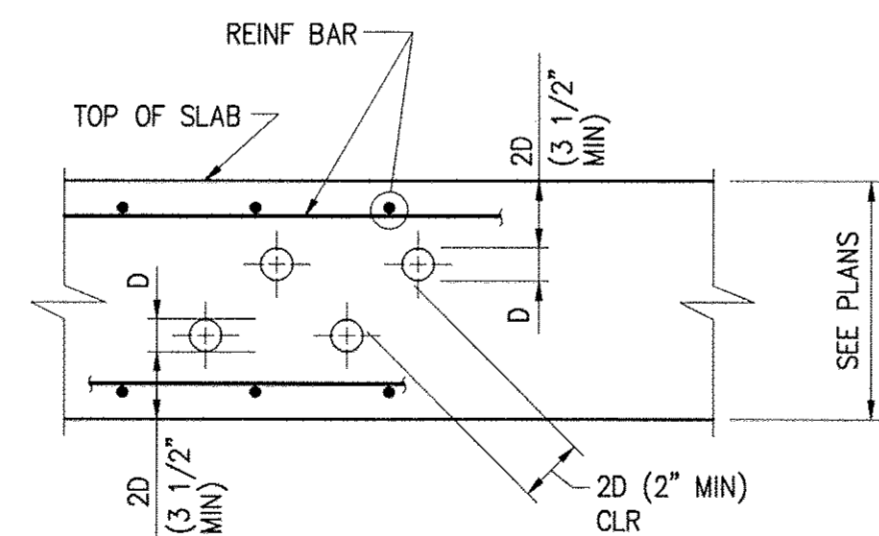
BASIC DEVELOPMENT LENGTH AND SPLICE LENGTH FOR BARS IN TENSION

$f_y = 60,000 \text{ psi}$ $f_c' = 4000 \text{ psi OR GREATER, NORMAL WEIGHT CONCRETE}$

BASIC DEVELOPMENT LENGTH **				BAR SIZE	CLASS B SPLICE LENGTH **			
l_d		$1.3 \times l_d$			CLEAR SPACING $\geq 3"$		CLEAR SPACING $< 3"$	
CLEAR SPACING $\geq 3"$	CLEAR SPACING $< 3"$	BASIC	TOP *	BASIC	TOP *	BASIC	TOP *	
1'-0"	1'-0"	1'-0"	1'-4"	# 3	1'-0"	1'-3"	1'-4"	1'-8"
1'-0"	1'-3"	1'-7"	2'-1"	# 4	1'-3"	1'-8"	2'-1"	2'-8"
1'-3"	1'-7"	2'-4"	3'-0"	# 5	1'-7"	2'-0"	3'-0"	3'-11"
1'-5"	1'-11"	3'-1"	4'-0"	# 6	1'-11"	2'-5"	4'-0"	5'-2"
2'-5"	3'-1"	4'-11"	6'-4"	# 7	3'-1"	4'-0"	6'-4"	8'-3"
3'-0"	3'-11"	6'-0"	7'-9"	# 8	3'-11"	5'-1"	7'-9"	10'-1"
3'-8"	4'-9"	6'-8"	8'-8"	# 9	4'-9"	6'-2"	8'-8"	11'-4"
4'-5"	5'-8"	7'-5"	9'-8"	# 10	5'-8"	7'-5"	9'-8"	12'-7"
5'-2"	6'-8"	8'-2"	10'-8"	# 11	6'-8"	8'-8"	10'-8"	13'-10"

* TOP REINFORCEMENT IS HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.

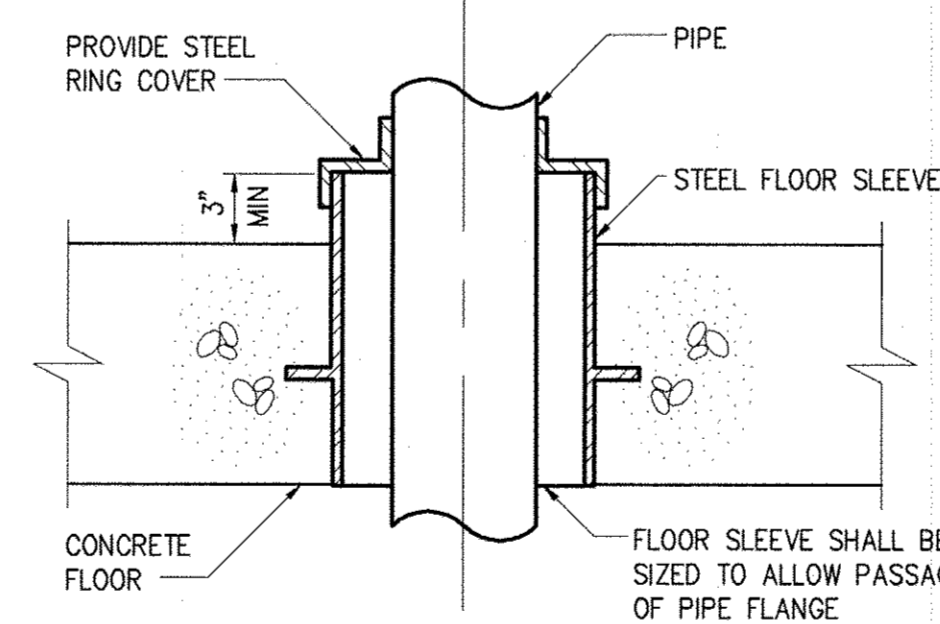
** LENGTHS SHOWN IN CHART SHALL BE MODIFIED WHERE REQUIRED TO CONFORM TO THE PROVISIONS OF ACI 318, SECTION 12.2.



NOTE: D DENOTES PIPE OR CONDUIT OD

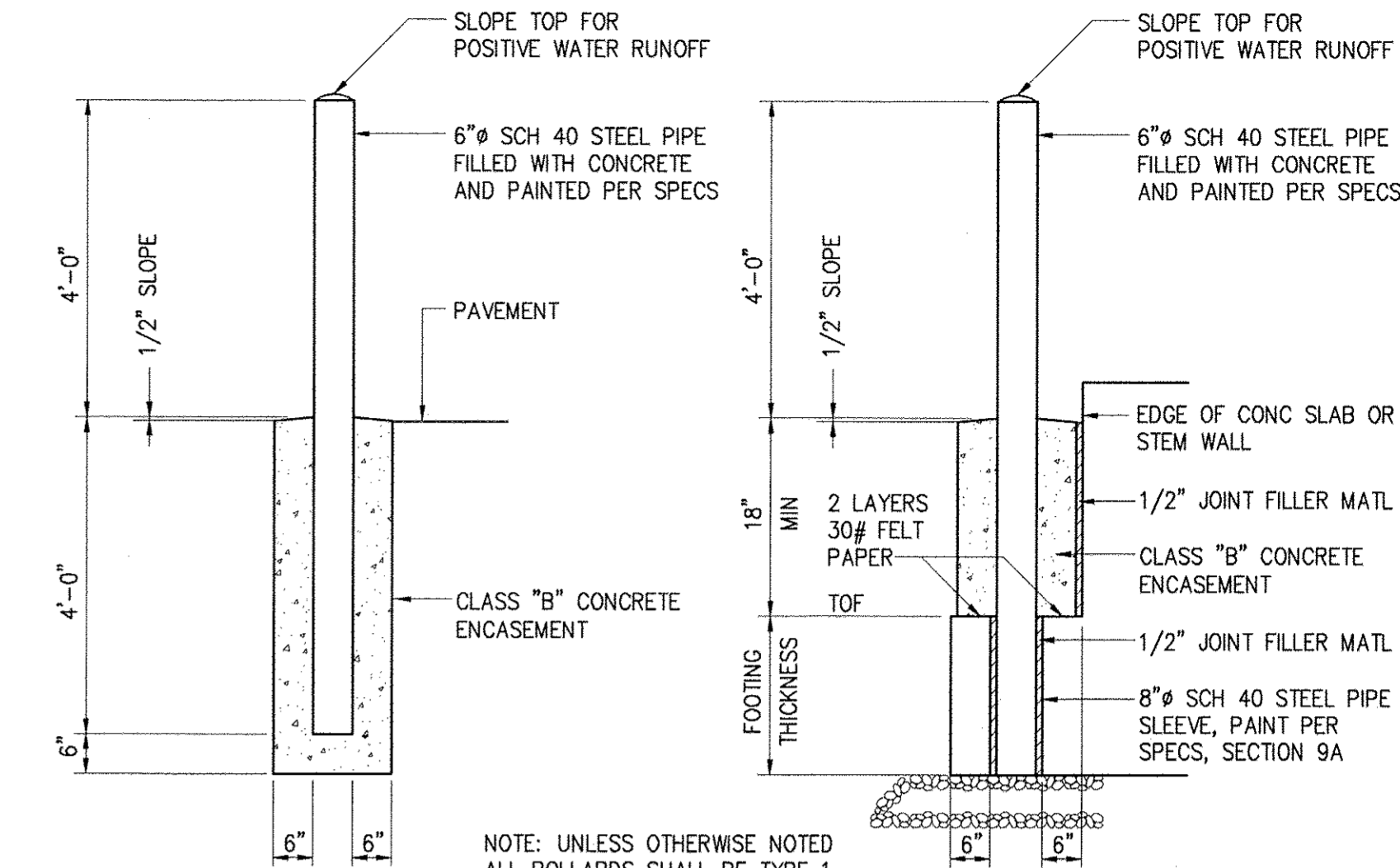
PIPE OR CONDUIT EMBEDDED IN SLAB

DETAIL	6
NO SCALE	D-1



FLOOR PENETRATION

DETAIL	4
NO SCALE	D-1



BOLLARD TYPE 1

BOLLARD TYPE 2

BOLLARDS

DETAIL	2
NO SCALE	D-1

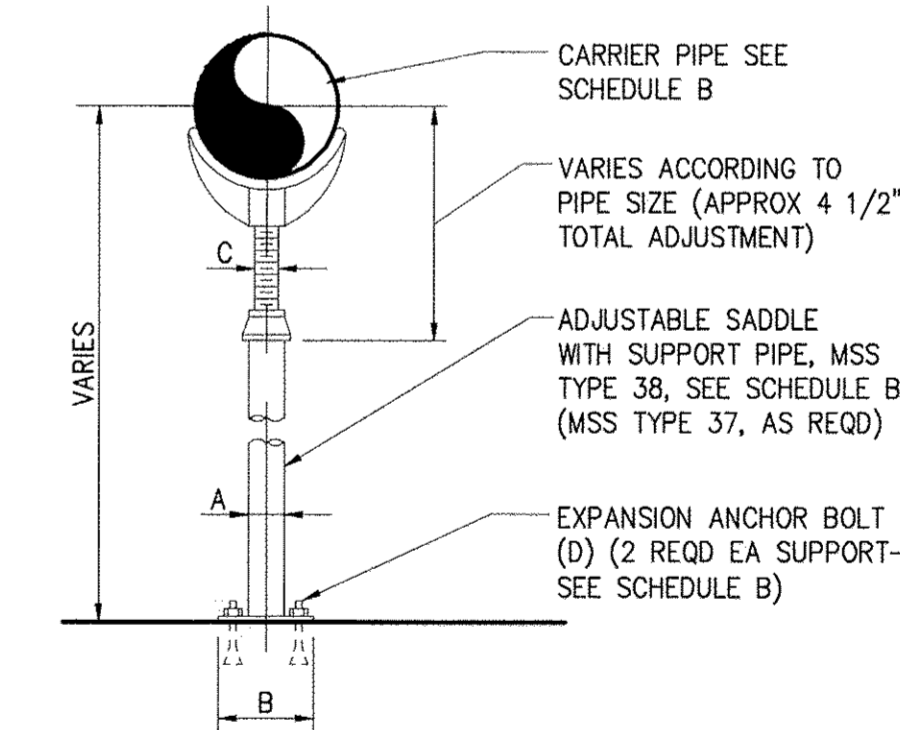
NOTES:

- TO PROTECT ELECTRICAL EQUIPMENT, SEE SHEET E-7

BASE ELBOW AND ADJUSTABLE SADDLE SCHEDULES

SCHEDULE A				
BASE ELBOW (TEE) (DIM IN INCHES)				
PIPE SIZE	A	B	C	D DIA x LG
3	1 1/2	5	4 7/8	1/2 x 5
4	2	6	5 1/2	5/8 x 5
5-6	2 1/2	7	VARIES	5/8 x 5
8-10	4	9	VARIES	5/8 x 5
12-16	6	11	VARIES	3/4 x 6
18-24	8	13 1/2	VARIES	3/4 x 6
30	10	16	23	7/8 x 7
36	12	19	26	7/8 x 7

SCHEDULE B				
ADJUSTABLE SADDLE (DIM IN INCHES)				
PIPE SIZE	A	B	C	D DIA x LG
3	2 1/2	7	1 1/2	5/8 x 5
4-12	3	7 1/2	2 1/2	5/8 x 5
14-16	4	9	3	5/8 x 5
18-20	6	11	3 1/2	3/4 x 6
24-36	6	11	4	3/4 x 6



ADJUSTABLE SADDLE

DETAIL	5
NO SCALE	D-1

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

J. A. ... DIRECTOR OF PUBLIC WORKS
Thomas R. Butler CHIEF BUREAU OF ENGINEERING
... CHIEF BUREAU OF UTILITIES
... CHIEF UTILITY DESIGN DIVISION

Hazen

HAZEN AND SAWYER
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202
410-539-7681



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. 35295, EXPIRATION DATE 07/06/2018.
SIGNED: *J. A. ...*

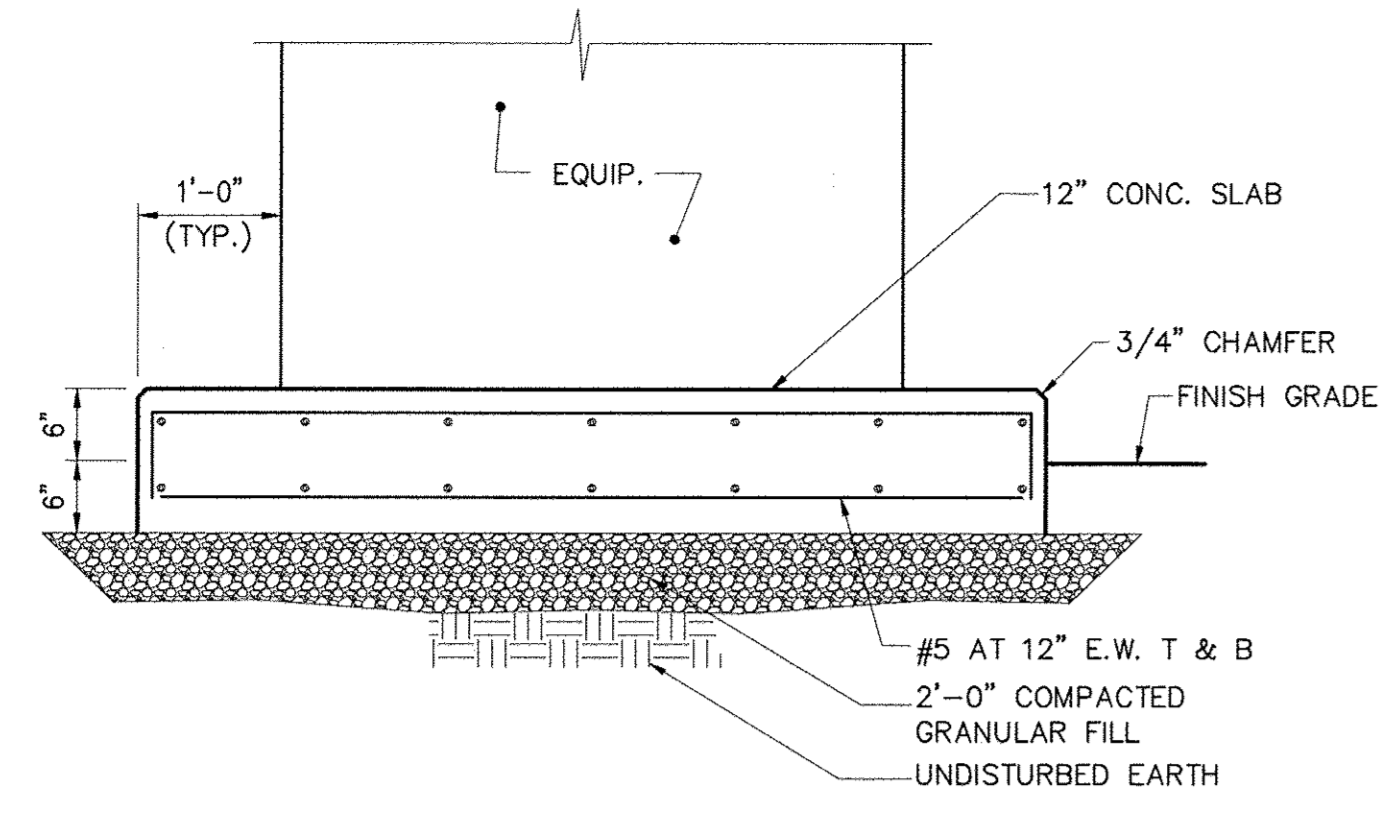
DESIGNED	AL				
DRAWN	MRB				
CHECKED	JCS				
PROJ. ENGR.	JTH				
APPROVED	JTH				
NO.	REVISION	DATE	BY	600' SCALE MAP:	47
				BLOCK NO.:	20

STANDARD DETAILS
SHEET 1

WHISKEY BOTTOM ROAD
WATER PUMPING STATION REPLACEMENT
CAPITAL PROJECT No. W8320
CONTRACT No. 44-4947

DATE: APRIL 2017
DRAWING NUMBER: D-1
SCALE: AS SHOWN
SHEET 45 OF 46

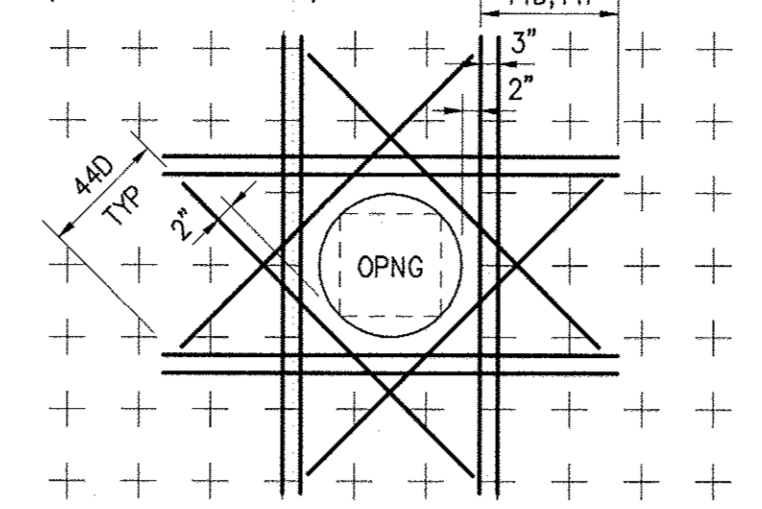
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND



NOTE: COORDINATE ANCHOR BOLT LOCATIONS WITH EQUIPMENT MANUFACTURER

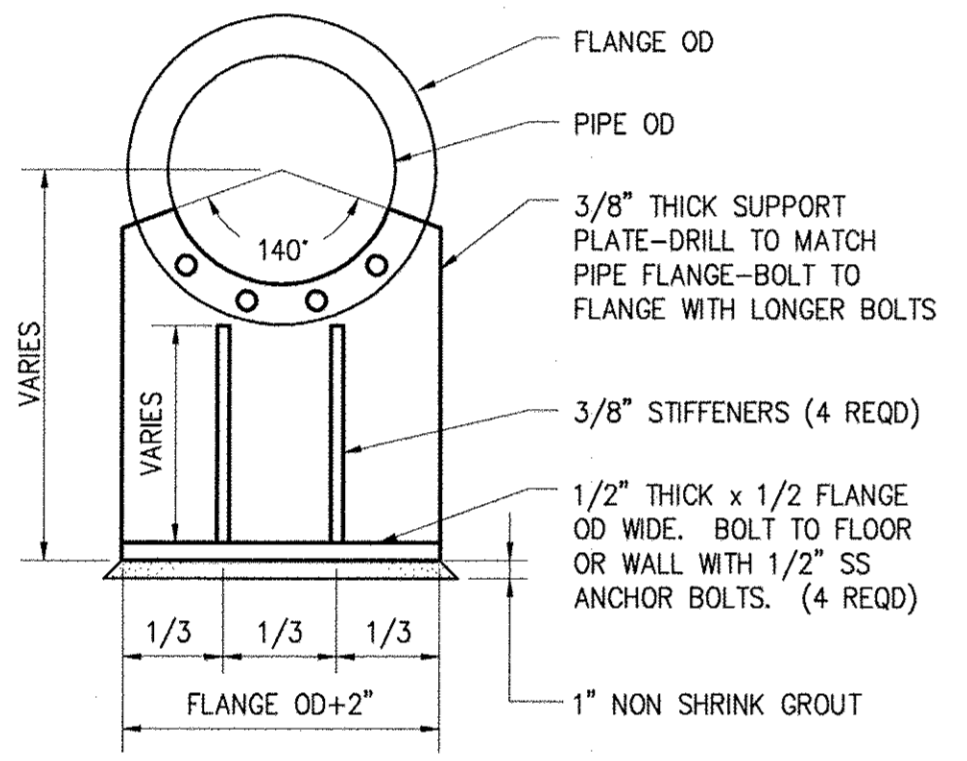
TYPICAL EXTERIOR EQUIPMENT PAD
DETAIL 7
 NO SCALE D-2

PLACE EXTRA BARS OF THE SAME SIZE AS THE INTERRUPTED BARS AT EACH SIDE OF OPENINGS. QUANTITY OF EXTRA BARS AT EACH SIDE SHALL EQUAL HALF THE QUANTITY OF INTERRUPTED BARS, EXCEPT WHERE NOTED OTHERWISE. PROVIDE ONE DIAGONAL BAR EACH SIDE OF OPENING, SIZE TO BE EQUAL TO MAIN REINFORCING. (TYPICAL EACH FACE)

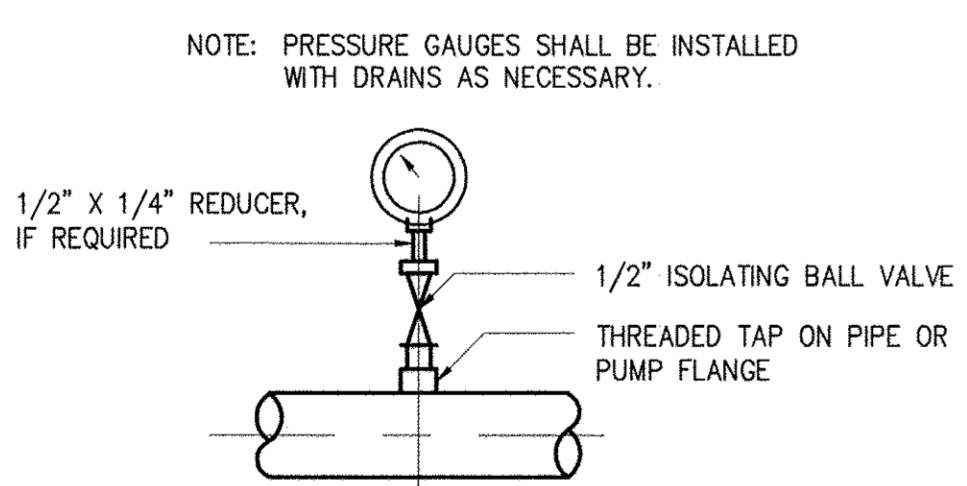


NOTE: THIS DETAIL IS FOR OPENINGS 8" OR LARGER, FOR SMALLER OPENINGS, BEND BARS.

TYPICAL REINFORCEMENT AT OPENINGS
DETAIL 8
 NO SCALE D-2

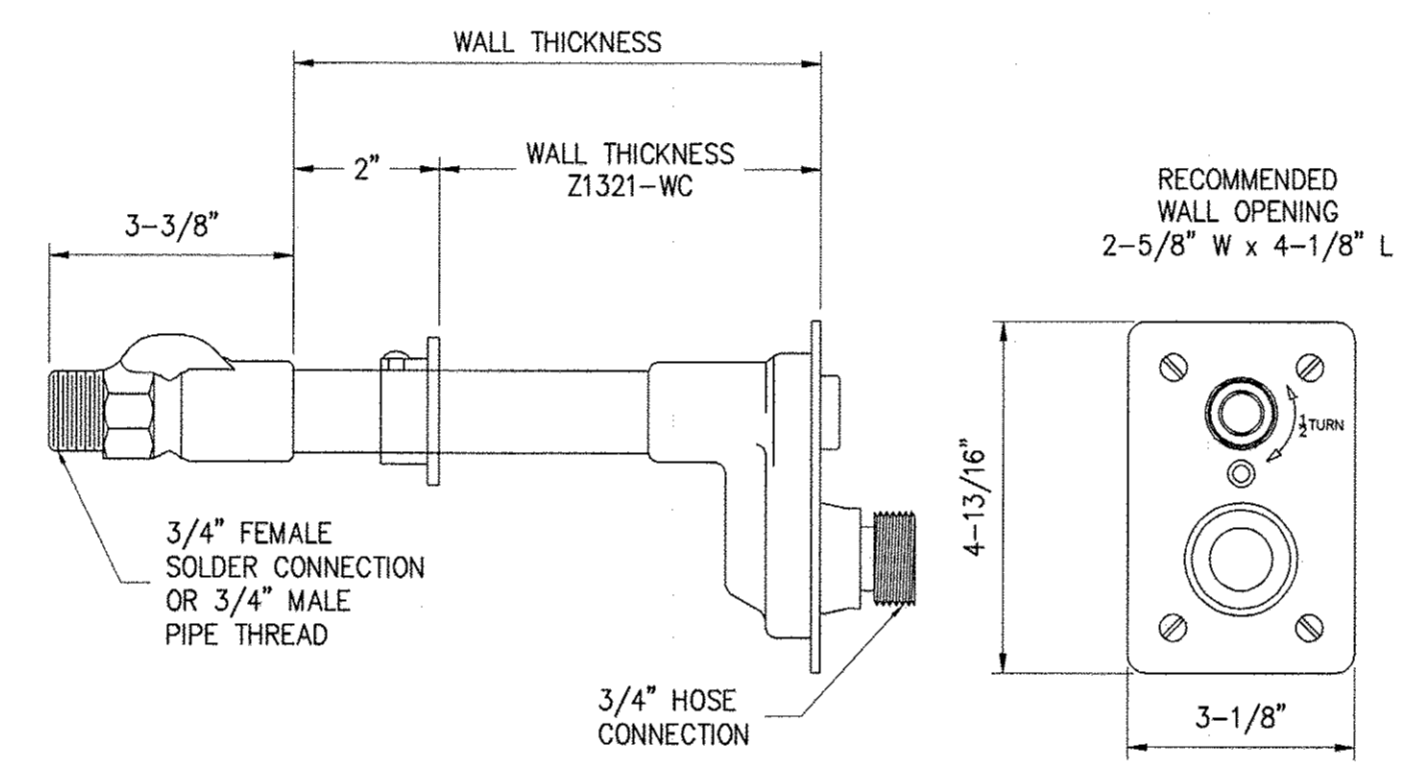


FABRICATED PIPE SUPPORT (AT FLANGE)
DETAIL 10
 NO SCALE D-2

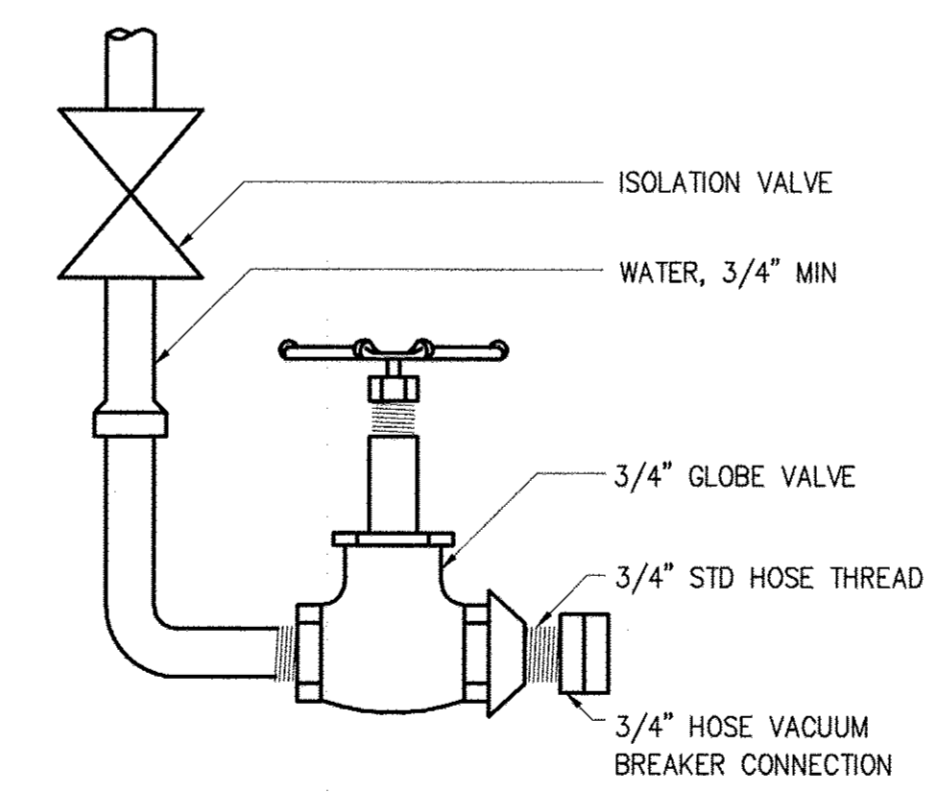


* FOR MAIN DISCHARGE AND SUCTION HEADERS ONLY. PUMP GAUGES SHALL BE PANEL MOUNTED 4' AFF

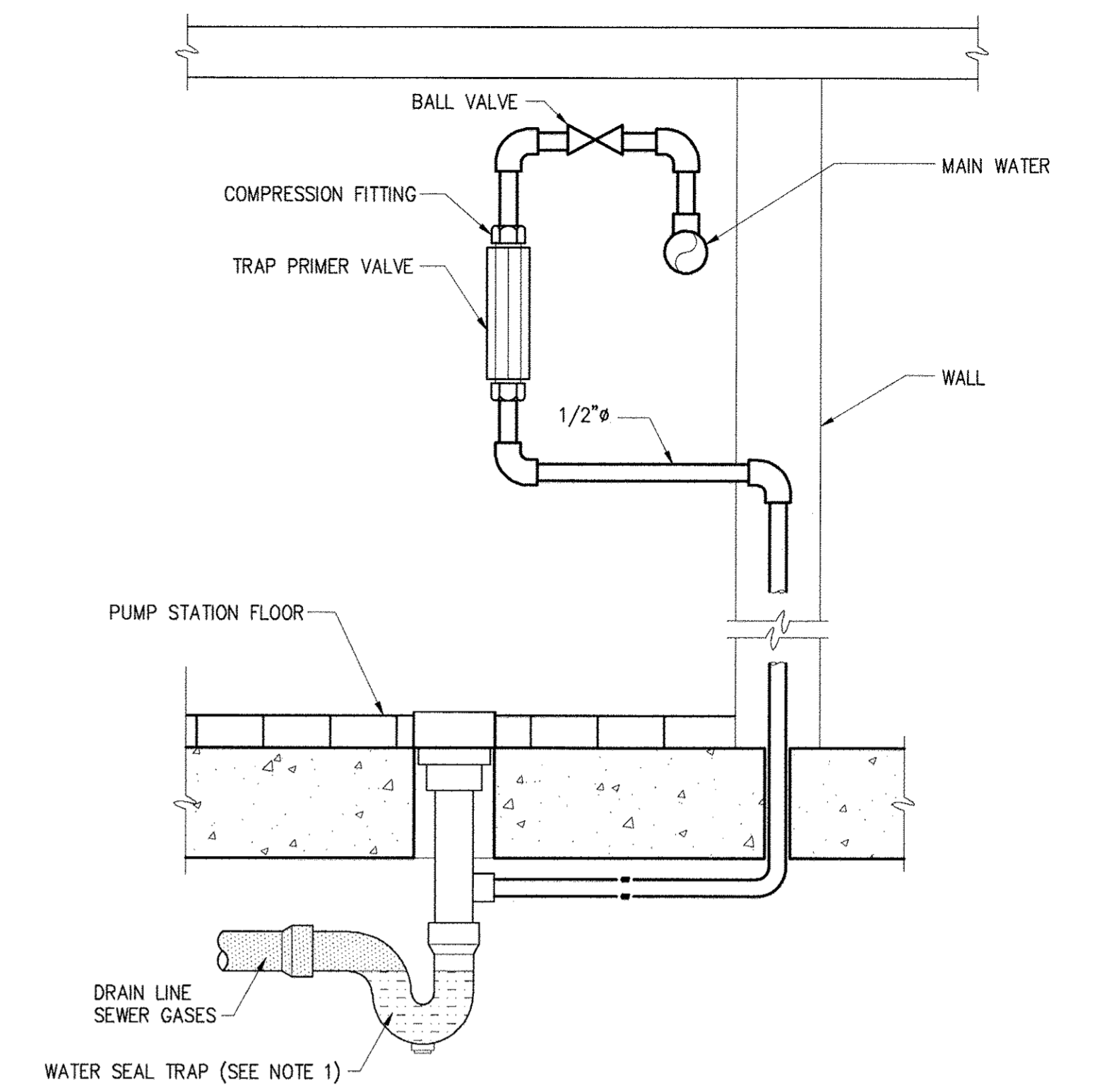
PRESSURE GAUGE INSTALLATION
DETAIL 12
 NO SCALE D-2



FREEZE PROOF HOSE BIBB
DETAIL 11
 NO SCALE D-2

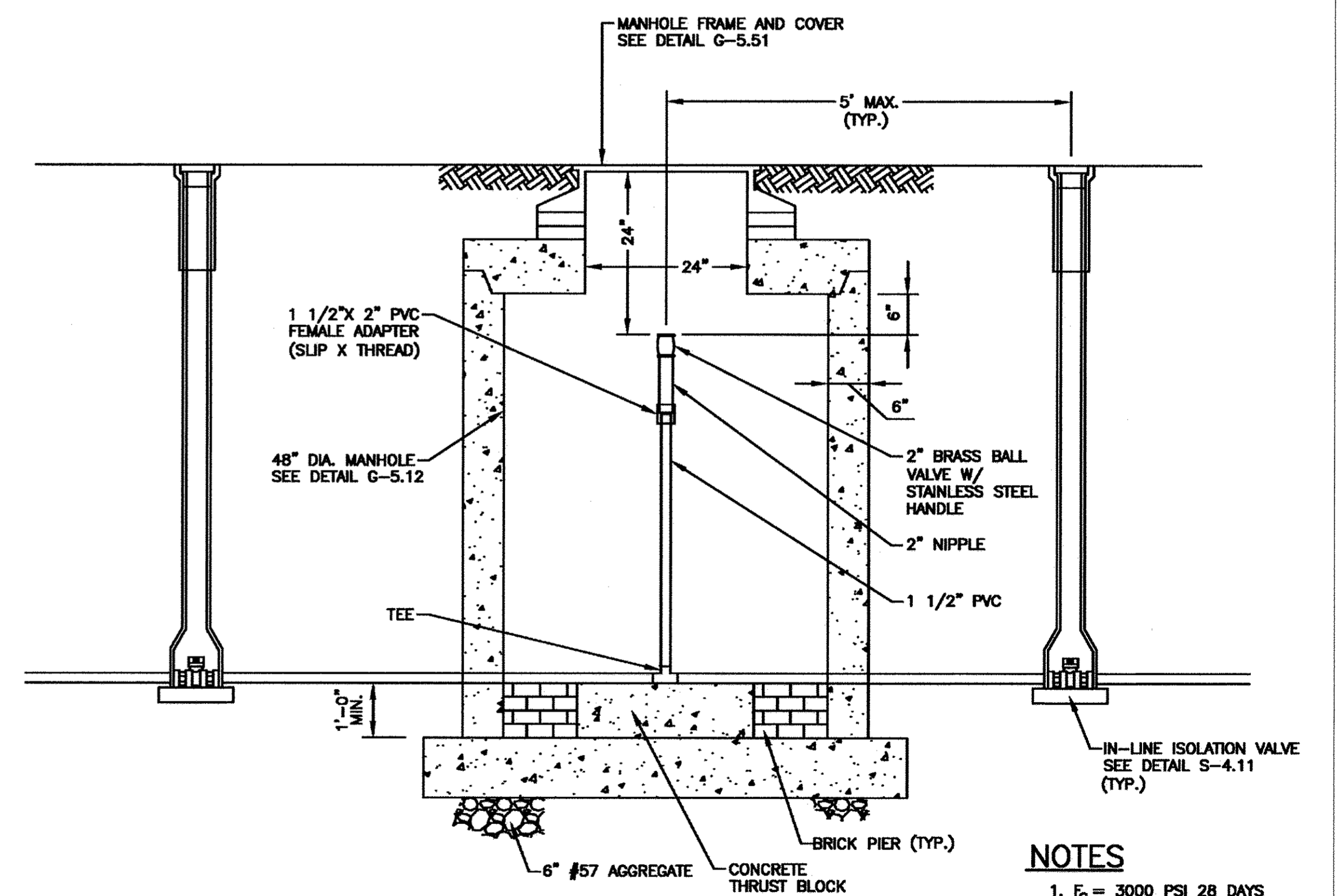


INTERIOR HOSE BIBB
DETAIL 13
 NO SCALE D-2



NOTES:
 1. CONTRACTOR MAY SUBMIT A TRAP GUARD CHECK VALVE AS A SUBSTITUTE FOR A TRAP PRIMER.

TRAP PRIMER
DETAIL 9
 NO SCALE D-2



NOTES
 1. F_c = 3000 PSI 28 DAYS
 2. DO NOT ENCASE JOINTS.

IN-LINE FLUSHING CONNECTION
DETAIL 14
 NO SCALE D-2

IMAGES: DET - In-line Flushing Connection, 3/22/20-1B

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

John J. ... DIRECTOR OF PUBLIC WORKS
Thomas R. Butler CHIEF-BUREAU OF ENGINEERING
... CHIEF BUREAU OF UTILITIES
... CHIEF UTILITY DESIGN DIVISION

DATE: 6/5/17

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 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. 35285, EXPIRATION DATE 01/06/2018

SIGNED: *...*

DESIGNED	AL
DRAWN	MBR
CHECKED	JGS
PROJ. ENGR.	JTH
APPROVED	JTH

NO.	REVISION	DATE	BY

STANDARD DETAILS
 SHEET 2

WHISKEY BOTTOM ROAD
 WATER PUMPING STATION REPLACEMENT
 CAPITAL PROJECT No. W8320
 CONTRACT No. 44-4947
 ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

DATE	APRIL 2017
DRAWING NUMBER	D-2
SCALE	AS SHOWN
SHEET	46 OF 46