

LOCATION MAP  
1" = 200'

# ROCKBURN HILL SEWER / PUMP STATION & CROSSVIEW ROAD WATER EXTENSION CAPITAL PROJECT S-6260 and W-8312 CONTRACT NO. 14-4715 HOWARD COUNTY, MARYLAND

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36	BALTIMORE COUNTY 1 1/2" AND 4" FORCE MAIN 20' RIGHT OF WAY PATAPSCO STATE PARK ACCESS ROAD 700' +/- NORTHWEST OF I-95 (SEE NOTE 1. BELOW)
37-46	ROCKBURN HILL PUMP STATION SITE DEVELOPMENT PLAN (SEE NOTE 2. BELOW)

NOTES:  
 (1) SHEET 36 IS DESIGNATED AS SHEET 36 OF 36 FOR THE OVERALL HOWARD COUNTY CONTRACT 14-14715, BUT IS SHEET 1 OF 1 FOR BALTIMORE COUNTY PROJECT 2013-0635 FOR THE FORCE MAIN CONNECTION INTO THE EXISTING BALTIMORE COUNTY PATAPSCO INTERCEPTOR MANHOLE.  
 (2) SHEETS 37-46 ARE SUPPLEMENTAL DRAWINGS TO THE CONSTRUCTION DRAWINGS (SHEETS 1-36) AS THE APPROVED SITE DEVELOPMENT PLAN (SDP) AND ARE INDEPENDENTLY LABELED AS SHEETS 1 THROUGH 10. THE SDP SHALL BE CONSIDERED PART OF THE CONTRACT DOCUMENTS. FOR ALL ISSUES RELATED TO STORMWATER MANAGEMENT (BIOSWALES AND GRAVEL TRANSITION STRIPS) AND THE PUMP STATION LANDSCAPE PLAN, THE SDP SHALL GOVERN. FOR ALL OTHER ITEMS, IF THERE IS A CONFLICT BETWEEN THE SDP AND THE CONSTRUCTION DRAWINGS (SHEETS 1-36), THE CONSTRUCTION DRAWINGS SHALL GOVERN.

TYPE OF BUILDING: RESIDENTIAL  
 NUMBER OF PARCELS: 21  
 WATER HOUSE CONNECTIONS: 6  
 SEWER HOUSE CONNECTIONS: 16  
 DRAINAGE AREA: PATAPSCO  
 PRESSURE ZONE: 550  
 WATER TEST GRADIENT: 675 (2"W TO BRUNO)  
 665 (8"W CROSSVIEW ROAD)  
 675 (6"W TO PUMP STATION)

BILL OF MATERIALS				
ITEM	QUANTITY	MATERIALS	AS-BUILT QUANTITY	MANUFACTURER
48" I.D. PRECAST CONCRETE MANHOLE < 6'	18 EACH			
48" I.D. PRECAST MANHOLE ADDITIONAL DEPTH > 6'	113 VF			
48" I.D. INTERIOR LINED PRECAST CONC. MH < 6'	8 EACH			
48" I.D. INTERIOR LINED PRECAST MH ADD. DEPTH > 6'	42 VF			
48" I.D. WT PRECAST CONCRETE MH < 6'	5 EACH			
48" I.D. WT INTERIOR LINED PRECAST CONCRETE MH < 6'	2 EACH			
8" DIA. SDR 35 PVC SANITARY SEWER	2,904 LF			
8" DIA. C-900 PVC SANITARY SEWER	568 LF			
8" DIA. DIP PVC SANITARY SEWER	116 LF			
TYPE A DROP CONNECTION	1 EACH			
TYPE B DROP CONNECTION	3 EACH			
4" SHC	340 LF			
4" PVC FORCE MAIN	825 LF			
1 1/2" HDPE FORCE MAIN	1,714 LF			
5" HDPE FORCE MAIN	889 LF			
ARV AND TRANSITION VAULT	2 EACH			
8" PVC WATER	739 LF			
6" PVC WATER	415 LF			
4" PVC WATER	177 LF			
2" HDPE WATER	1,830 LF			
6" TAPPING SLEEVE AND VALVE (WATER)	1 EACH			
8" GATE VALVE (WATER)	1 EACH			
FIRE HYDRANT	3 EACH			
1 1/2" WHC (COPPER)	140 LF			
WATER MAIN DRAIN	1 EACH			

NAME OF UTILITY CONTRACTOR:  
 SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT (SCD).  
*John R. Butler* 7/24/13  
 HOWARD SOIL CONSERVATION DISTRICT DATE

ENGINEERS/ARCHITECT DESIGN CERTIFICATION  
 "I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."  
*Will F. King* 27029 7/25/2013  
 SIGNATURE REGISTRATION NUMBER DATE

OWNERS/DEVELOPERS CERTIFICATION:  
 "I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."  
*Wes Paul* 7/26/2013  
 DATE

"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
*John N. Clark* 7/24/13  
 DIRECTOR OF PUBLIC WORKS DATE  
*Thomas J. Butler* 7/24/13  
 CHIEF, BUREAU OF ENGINEERING DATE  
*Steve Cline* 7/24/13  
 CHIEF, BUREAU OF UTILITIES DATE  
*W.D.* 7/26/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

WR&A  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450  
 STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 NO. 27029  
 7-25-13

DES:	F.B.	
DRN:	F.B.	
CHK:	W.H.	
JUNE 2013		
BY NO.	REVISION	DATE

TITLE SHEET  
 600 SCALE MAP NO. 32  
 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

G-1  
 SCALE AS SHOWN  
 SHEET 1 OF 36

**GENERAL NOTES:**

- APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS 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 FIELD SURVEYS WERE PERFORMED IN OCTOBER 2010 BY WHITMAN, REQUARDT & ASSOCIATES LLP.
- HORIZONTAL DATUM: THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE COORDINATE SYSTEM NAD '83/'91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 38BA ON ROUTE 1 AND NO. 37CA ON LANDING ROAD. SEE SURVEY INFORMATION THIS DRAWING.
- ALL VERTICAL CONTROLS ARE BASED ON NAVD '88 AND WERE DERIVED FROM SURVEY CONTROL STATION 38BA AND 37CA. SEE SURVEY INFORMATION TABLE ON THIS DRAWING.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12". CLEAR ALL POLES BY 5'-0" MINIMUM, OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. UNLESS OTHERWISE NOTED, THE OWNER HAS NOT CONTACTED UTILITY COMPANIES AND HAS NOT MADE ARRANGEMENTS FOR BRACING OF THE POLES WHICH ARE CALLED OUT ON 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 DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL AT THE LOCATION OF THE TEST PIT. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK SHALL BE LOCATED BY THE CONTRACTOR BY TEST PIT TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS.
 

AT&T	1-800-252-1133
BCE (CONSTRUCTION SERVICES)	410-637-8713
BCE (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	1-800-743-0033/410-224-9210
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR. 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 SEWER.
- 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.
- CONTRACTOR SHALL INSTALL A TREE PROTECTION FENCE ALONG THE LIMIT OF DISTURBANCE FOR THE ENTIRE PROJECT EXCEPT FOR THE LOD IN PAVED AREAS AND WHERE THE LOD IS LINED WITH SILT FENCE OR SUPER SILT FENCE (STABILIZED CONSTRUCTION ENTRANCES EXCLUDED).
- SEE EROSION AND SEDIMENT CONTROL PLANS FOR TREE PROTECTION FENCE DETAIL.
- STOCKPILE SPOILS FROM TRENCHING OPERATIONS ON THE UPHILL SIDE OF THE TRENCH, EXCEPT DO NOT STORE OR WASTE ANY SPOILS WITHIN 100-YEAR FLOOD PLAIN. ALL EXCESS MATERIALS SHALL BE REMOVED BY CONTRACTOR.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LINES, GRADES AND ELEVATIONS, AND CUT SHEETS SHALL BE PREPARED BASED ON THE LINES AND GRADES SHOWN ON THE CONTRACT DRAWINGS.
- REFER TO UTILITY PLAN SHEETS FOR SOIL BORING AND AUGER LOCATIONS, AND TO SPECIFICATIONS FOR SOIL BORING LOGS AND AUGER DATA FOR CLARITY. BORING DESIGNATIONS ARE NOT PROVIDED IN ASSOCIATION WITH MANHOLE STRUCTURES. AS SUCH, ALL BORING DESIGNATIONS CORRESPOND TO THE MANHOLE DESIGNATION (I.E. BORING MH-1 IS AT MANHOLE MH-1).
- CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING STAGING AND STOCKPILE AREAS.
- FOR THIS PROJECT THE STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) PERMIT TRACKING NUMBER IS 12-NT-0013/201260068.
- IF ROCK BLASTING IS USED IN THE RIVER, THE CONTRACTOR SHALL SUBMIT BLASTING PLANS TO MDE FOR APPROVAL AND USE.
- LOCATIONS OF OVERHEAD UTILITY POLES ARE INDICATED ON THE DRAWINGS. OVERHEAD UTILITIES EXIST FROM POLE TO POLE IN THE PROJECT AREA, BUT ARE NOT INDICATED FOR CLARITY.

**SANITARY SEWER NOTES:**

- SANITARY SEWER SHALL BE AWWA M23 PVC (SDR 35), AWWA C-900 PVC (DR 18), OR AWWA C150 DIP (CLASS 52) WHERE NOTED.
- ALL C-900 SANITARY SEWER INSTALLED ON STEEP SLOPES GREATER THAN 20% SHALL HAVE RESTRAINED JOINTS (CERTA-LOK PIPE). FOR STEEP SLOPES, WITHIN 10' OF DOWNSTREAM MANHOLE AND AT THE HALFPOINT FROM THE DOWNSTREAM MANHOLE TO THE UPSTREAM MANHOLE, A 2-FOOT THICK CLAY CUT OFF WALL SHALL BE INSTALLED ACROSS THE WIDTH OF THE TRENCH WITHIN THE STONE BEDDING.
- MANHOLES SHALL BE 4'-0" UNLESS OTHERWISE NOTED ON THE PLANS. AN INTERMEDIATE LANDING IS TO BE PROVIDED AT MANHOLE JOINT CLOSEST TO MID-DEPTH FOR ALL MANHOLES GREATER THAN 18 FEET IN DEPTH AND AT 10 FOOT INTERVALS FROM THE TOP WHEN MANHOLE DEPTH EXCEEDS 25 FEET. THE INTERMEDIATE LANDING SHALL BE PER HOWARD COUNTY STANDARD DETAIL G-5.16.
- FOR OPEN CUT FOR FORCE MAINS 4-INCHES IN DIAMETER AND GREATER, FORCE MAINS SHALL BE DR 18 C-900 PVC WITH C-900 DR-18 PVC FITTINGS. FORCE MAINS 2-INCHES IN DIAMETER AND LESS SHALL BE DR11 (IPS) HDPE. FORCE MAINS TO BE DIRECTIONALLY DRILLED SHALL BE DR-7 (IPS) HDPE. SEE POTABLE WATER NOTES THIS DRAWING FOR NOTES RELATED TO PVC MAINS.
- MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
- MANHOLES DESIGNATED "WT" IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAILS G5.52. WHERE WATERTIGHT MANHOLE FRAMES AND COVERS ARE USED, SET TOP OF FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATED THAT THE CELLAR CANNOT BE SERVED.
- ALL FITTINGS FOR PVC FORCE MAIN SHALL BE PVC MEETING THE REQUIREMENTS OF AWWA C-907, PRESSURE RATED AT 235 PSI.

**SUGGESTED PHASING OF SEWER MANHOLES/PIPE INSTALLATION:**

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

- INSTALL PUMP STATION WETWELL
- INSTALL 8-INCH SANITARY SEWER AND FORCE MAIN
- INSTALL WATER MAIN
- TEST SEWER, FORCE MAIN, AND WATER MAIN.
- CONSTRUCT PUMP STATION
- PERFORM PUMP STATION STARTUP
- RESTORE ALL DISTURBED AREAS TO EXISTING CONDITIONS OR AS SHOWN ON THE DRAWINGS.

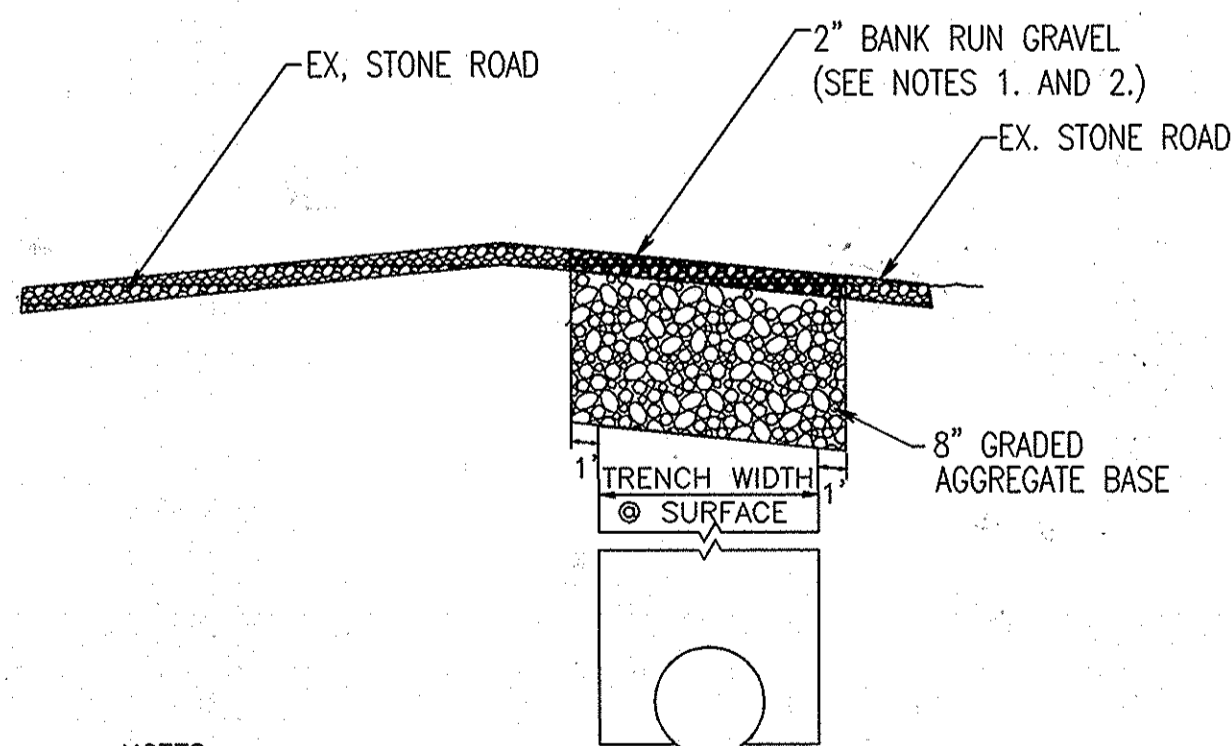
**POTABLE WATER NOTES:**

- TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 3'-6" COVER UNLESS OTHERWISE NOTED.
- ALL PIPE AND FITTINGS SHALL BE RESTRAINED WITHIN THE LIMITS INDICATED ON THE PROFILES. DUE TO HIGH PRESSURES IN THE WATER MAIN, RESTRAINT SYSTEMS WITH A PRESSURE RATING EQUAL TO OR GREATER THAN 305 PSI ARE REQUIRED.
- ALL WATER CONNECTIONS SHALL BE COPPER MEETING THE REQUIREMENTS OF AND CONSTRUCTED IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. OUTSIDE METER SETTINGS SHALL BE CONSTRUCTED PER STANDARD DETAIL W3.31. THE WATER MAIN SERVICE ALONG BOWDOIN ROAD SHALL BE DR7 HIGH DENSITY POLYETHYLENE (HDPE), MEETING THE REQUIREMENTS OF AWWA C901. ALL HDPE PIPE SUPPLIED SHALL BE MADE OF PE 4710 RESIN AS REQUIRED FOR 330 PSI PRESSURE RATING.
- 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. ALL FIRE HYDRANT LEADS INCLUDING THE TEE SHALL BE DUCTILE IRON CLASS 54 MEETING THE REQUIREMENTS OF AND CONSTRUCTED IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.
- THE FOLLOWING NOTE IS ADDED TO HOWARD COUNTY STANDARD DETAIL W2.22, BUTTRESSES AND ANCHORAGES FOR VERTICAL BENDS: WHEN ANCHORING PVC PIPE, THE STRAPPING IN CONTACT WITH THE PIPE SURFACE SHALL BE 1-INCH WIDE BY 1/4-INCH THICK STEEL. THE REMAINING PORTION OF THE STRAP SHALL BE REINFORCING BAR SIZED IN ACCORDANCE WITH THE PERTINENT CHART ON THE DETAIL.
- EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYLCHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF AWWA C900 DR14, PRESSURE CLASS 305 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.
- VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES HOWARD COUNTY 15 DAYS PRIOR TO WATER MAIN SHUT DOWNS.
- TRACER WIRES AND CONTINUITY TEST STATIONS SHALL BE INSTALLED ON ALL DIP AND PVC WATER MAINS IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL. CONTINUITY TEST STATIONS SHALL BE PLACED ADJACENT TO EACH FIRE HYDRANT AND ANCHORAGES SHALL BE INSTALLED UNDER WATER VALVES IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS AND DETAILS.
- 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.
- ALL FITTINGS FOR C-900 WATER MAIN SHALL BE CLASS 350 DIP. UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS, SEVENTEEN (17) POUND SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL VALVES AND METALLIC FITTINGS USED WITH PVC IN ACCORDANCE WITH VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. MAGNESIUM ANODES SHALL BE INSTALLED ON ALL VALVES AND DUCTILE IRON FITTINGS INCLUDING RESTRAINTS AND HARNESSSES. 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.

**ROAD RESTORATION SCHEDULE**

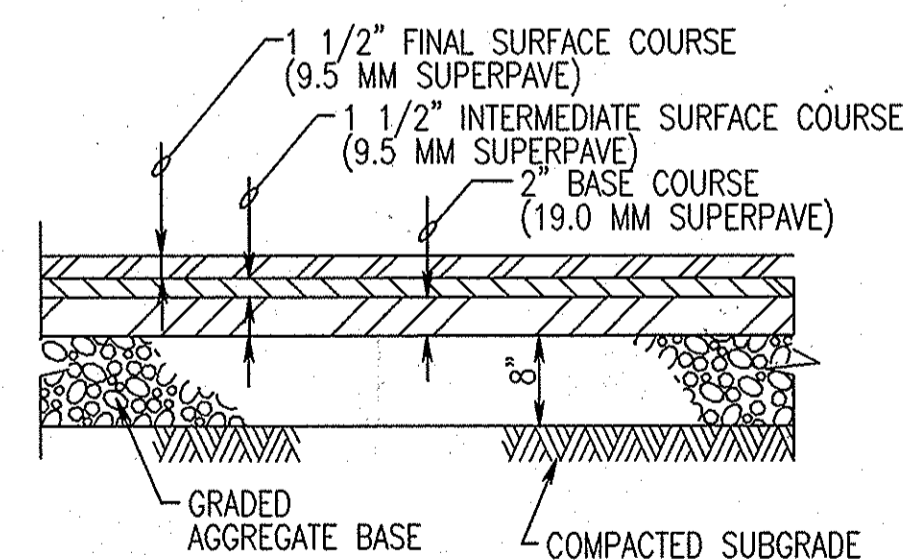
ROAD	RESTORATION DETAIL	MEASUREMENT AND PAYMENT DESCRIPTION (2.)
CROSSVIEW RD.	G-2/B (THIS DWG.)	ENTIRE ROAD RECONSTRUCTION MEASURED AND PAID FOR ON A SQUARE YARD BASIS
PUMP STATION ACCESS (3.)	G-2/B (THIS DWG.)	ENTIRE ROAD RECONSTRUCTION MEASURED AND PAID FOR ON A SQUARE YARD BASIS
ROCKBURN HILL RD.	H.C. STANDARD DETAIL G-4.01 (1.)	FINAL OVERLAY IS MEASURED AND PAID FOR ON A SQUARE YARD BASIS.
BOWDOIN ROAD	G-2/A (THIS DWG.)	RESTORATION NOT MEASURED AND PAID FOR, INCLUDED IN UTILITY INSTALLATION PRICE.

ROAD RESTORATION NOTES  
 (1.) MODIFICATION TO H.C. STANDARD DETAIL G-4.01 IS ALL REFERENCES TO NO.57 STONE SUB-BASE SHALL BE CHANGED TO GRADED AGGREGATE BASE.  
 (2.) ALL TEMPORARY RESTORATION SHALL BE INCLUDED IN THE PRICE BID FOR GIVEN UTILITY. TEMPORARY RESTORATION WILL NOT BE MEASURED AND PAID FOR. MILL AND OVERLAY OF ENTIRE ROADWAY IS REQUIRED AS NOTED ON THE DRAWINGS.  
 (3.) PUMP STATION ACCESS ROAD EXTENDS FROM RIVER ROAD TO THE PROPOSED PUMP STATION.



NOTES:  
 (1.) BANK RUN GRAVEL SUPPLIED SHALL HAVE SIMILAR CHARACTERISTICS TO THE EXISTING ROADWAY SURFACE. CONTRACTOR SHALL SUBMIT SAMPLE OF GRAVEL FOR THE ENGINEER'S APPROVAL.  
 (2.) ALL AREAS DISTURBED SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AS DETERMINED BY THE ENGINEER IN THE FIELD.

**UNPAVED ROAD DETAIL**  
 G-2 SCALE: NONE



**PAVEMENT DETAIL**  
 G-2 SCALE: NONE

**SURVEY INFORMATION TABLE**

GEODETIC CONTROL STA.	NORTHING	EASTING	ELEV.
38BA	562,553.3146	1,390,967.8616	166.1770
37CA	564,321.6624	1,382,742.8344	256.9640

**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
		CONTOUR
		CURB
		SIGN
		TREELINE
		TREE
		SANITARY SEWER & MH
		REDUCER, TEE, VALVE & FIRE HYDRANT
		WATER MAIN
		SANITARY FORCE MAIN
		WATER METER
		WATER AIR RELEASE OR VALVE MANHOLE WELL
		STORM DRAIN NLET W/ STORM DRAIN PIPE
		FENCE WIRE
		FENCE WOOD
		LIMITS OF DISTURBANCE
		LIMITS OF DISTURBANCE WITH SILT FENCE
		SILT FENCE
		SUPER SILT FENCE
		100 YEAR FLOOD PLAIN
		EDGE OF STREAM CENTER OF STREAM
		PAVED ROADWAY
		WETLAND BOUNDARY
		WETLAND BUFFER
		TRAVERSE POINT
		BORING LOCATION AND NUMBER (SEE GENERAL NOTE 16.) TEST PIT
		BENCHMARK/SURVEY CONTROL POINT
		PROPERTY LINE
		RIGHT OF WAY LINE
		PERMANENT EASEMENT
		TEMPORARY CONSTRUCTION EASEMENT
		MAILBOX
		POWER/UTILITY POLE WITH GUY WIRE
		STREET LIGHT
		ELECTRIC METER
		SIGN
		GUARDRAIL

**ABBREVIATIONS**

C.E.	CELLAR ELEVATION	LOD	LIMIT OF DISTURBANCE
C.N.S.	CELLAR NOT SERVED.	MIN.	MINIMUM
DES	DESIGN	N/A	NOT APPLICABLE
DIA.	DIAMETER	NIC	NOT IN CONTRACT
DIP	DUCTILE IRON PIPE	PROP	PROPOSED
DR	DIMENSION RATIO	PVC	POLYVINYL CHLORIDE
ELEV.	ELEVATION	R/W	RIGHT OF WAY
EX.	EXISTING	S	GRAVITY SANITARY SEWER
FM	FORCE MAIN	SAN	SANITARY
FPS	FEET PER SECOND	SF	SILT FENCE
H.B.	HORIZONTAL BEND	SSF	SUPER SILT FENCE
HDC	HIGH DEFLECTION COUPLING	TYP.	TYPICAL
HORIZ.	HORIZONTAL	VERT.	VERTICAL
HDPE	HIGH DENSITY POLYETHYLENE	V.B.	VERTICAL BEND
INV.	INVERT	WT	WATER TIGHT
LF	LINEAR FOOT		

"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
 DIRECTOR OF PUBLIC WORKS DATE	 CHIEF, BUREAU OF ENGINEERING DATE
 CHIEF, BUREAU OF UTILITIES DATE	 CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450



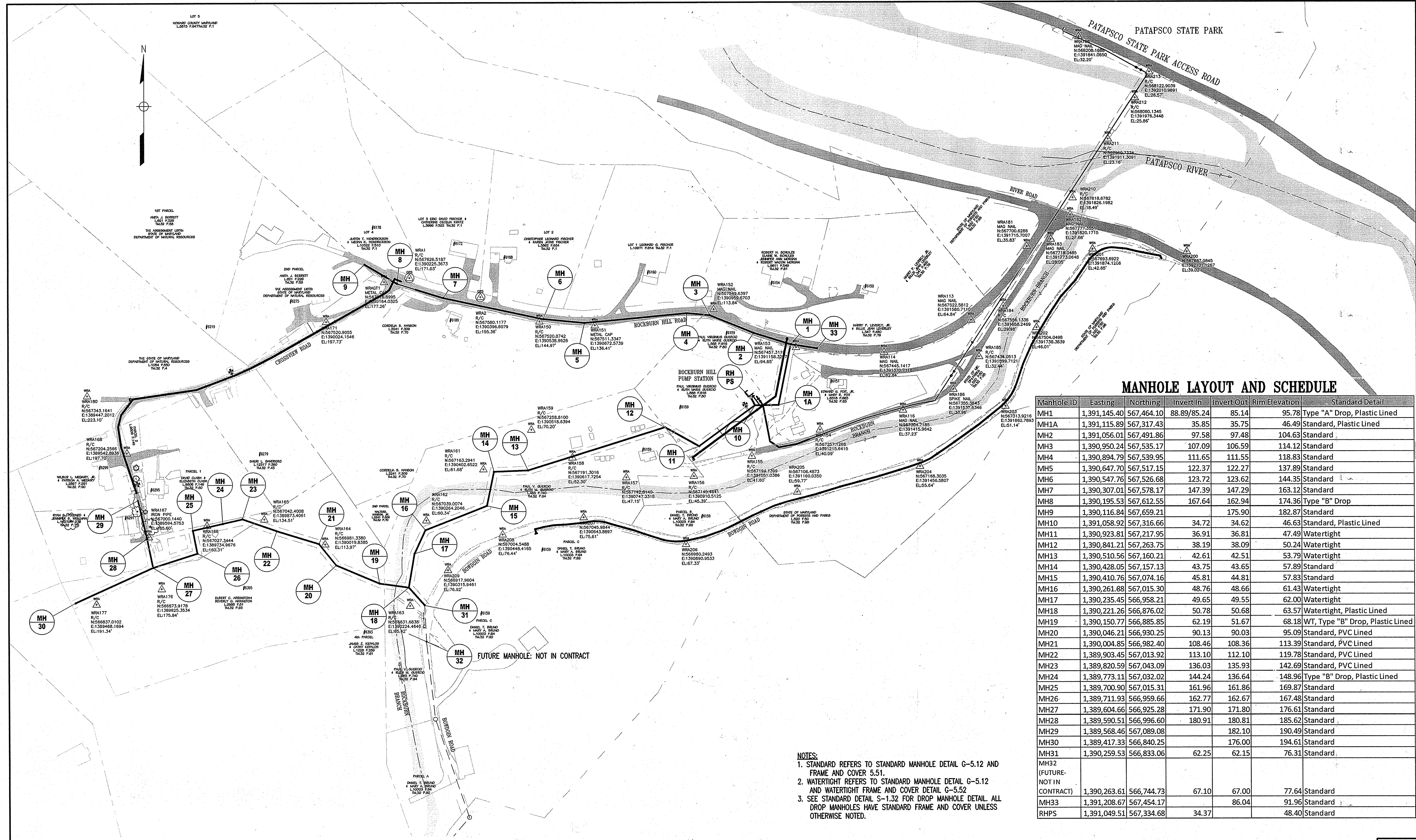
DES:	F.B.			
DRN:	F.B.			
CHK:	W.H.			
JUNE 2013				
BY	NO.	REVISION	DATE	

**GENERAL NOTES, LEGEND, ABBREVIATIONS AND ROAD RESTORATION DETAILS**

600 SCALE MAP NO. 32      BLOCK NO. 21.

**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION**  
 CAPITAL PROJECT NO. S-626C AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

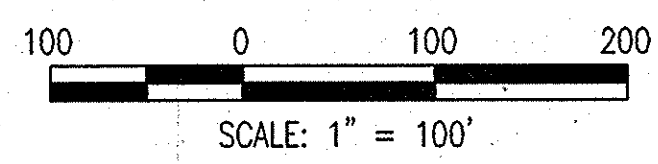
SCALE AS SHOWN  
 SHEET 2 OF 36



**MANHOLE LAYOUT AND SCHEDULE**

Manhole ID	Easting	Northing	Invert In	Invert Out	Rim Elevation	Standard Detail
MH1	1,391,145.40	567,464.10	88.89/85.24	85.14	95.78	Type "A" Drop, Plastic Lined
MH1A	1,391,115.89	567,317.43	35.85	35.75	46.49	Standard, Plastic Lined
MH2	1,391,056.01	567,491.86	97.58	97.48	104.63	Standard
MH3	1,390,950.24	567,535.17	107.09	106.59	114.12	Standard
MH4	1,390,894.79	567,539.95	111.65	111.55	118.83	Standard
MH5	1,390,647.70	567,517.15	122.37	122.27	137.89	Standard
MH6	1,390,547.76	567,526.68	123.72	123.62	144.35	Standard
MH7	1,390,307.01	567,578.17	147.39	147.29	163.12	Standard
MH8	1,390,195.53	567,612.55	167.64	162.94	174.36	Type "B" Drop
MH9	1,390,116.84	567,659.21		175.90	182.87	Standard
MH10	1,391,058.92	567,316.66	34.72	34.62	46.63	Standard, Plastic Lined
MH11	1,390,923.81	567,217.95	36.91	36.81	47.49	Watertight
MH12	1,390,841.21	567,263.75	38.19	38.09	50.24	Watertight
MH13	1,390,510.56	567,160.21	42.61	42.51	53.79	Watertight
MH14	1,390,428.05	567,157.13	43.75	43.65	57.89	Standard
MH15	1,390,410.76	567,074.16	45.81	44.81	57.83	Standard
MH16	1,390,261.88	567,015.30	48.76	48.66	61.43	Watertight
MH17	1,390,235.45	566,958.21	49.65	49.55	62.00	Watertight
MH18	1,390,221.26	566,876.02	50.78	50.68	63.57	Watertight, Plastic Lined
MH19	1,390,150.77	566,885.85	62.19	61.67	68.18	WT, Type "B" Drop, Plastic Lined
MH20	1,390,046.21	566,930.25	90.13	90.03	95.09	Standard, PVC Lined
MH21	1,390,004.85	566,982.40	108.46	108.36	113.39	Standard, PVC Lined
MH22	1,389,903.45	567,013.92	113.10	112.10	119.78	Standard, PVC Lined
MH23	1,389,820.59	567,043.09	136.03	135.93	142.69	Standard, PVC Lined
MH24	1,389,773.11	567,032.02	144.24	136.64	148.96	Type "B" Drop, Plastic Lined
MH25	1,389,700.90	567,015.31	161.96	161.86	169.87	Standard
MH26	1,389,711.93	566,959.66	162.77	162.67	167.48	Standard
MH27	1,389,604.66	566,925.28	171.90	171.80	176.61	Standard
MH28	1,389,590.51	566,996.60	180.91	180.81	185.62	Standard
MH29	1,389,568.46	567,089.08	182.10	182.00	190.49	Standard
MH30	1,389,417.33	566,840.25	176.00	176.00	194.61	Standard
MH31	1,390,259.53	566,833.06	62.25	62.15	76.31	Standard
MH32 (FUTURE-NOT IN CONTRACT)						
MH33	1,391,208.67	567,454.17	86.04	86.04	91.96	Standard
RHPS	1,391,049.51	567,334.68	34.37		48.40	Standard

**NOTES:**  
 1. STANDARD REFERS TO STANDARD MANHOLE DETAIL G-5.12 AND FRAME AND COVER 5.51.  
 2. WATERTIGHT REFERS TO STANDARD MANHOLE DETAIL G-5.12 AND WATERTIGHT FRAME AND COVER DETAIL G-5.52  
 3. SEE STANDARD DETAIL S-1.32 FOR DROP MANHOLE DETAIL. ALL DROP MANHOLES HAVE STANDARD FRAME AND COVER UNLESS OTHERWISE NOTED.



"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*[Signature]* 7/24/13  
 DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 7/24/13  
 CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 7/24/13  
 CHIEF, BUREAU OF ENGINEERING DATE

*[Signature]* 7/24/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450



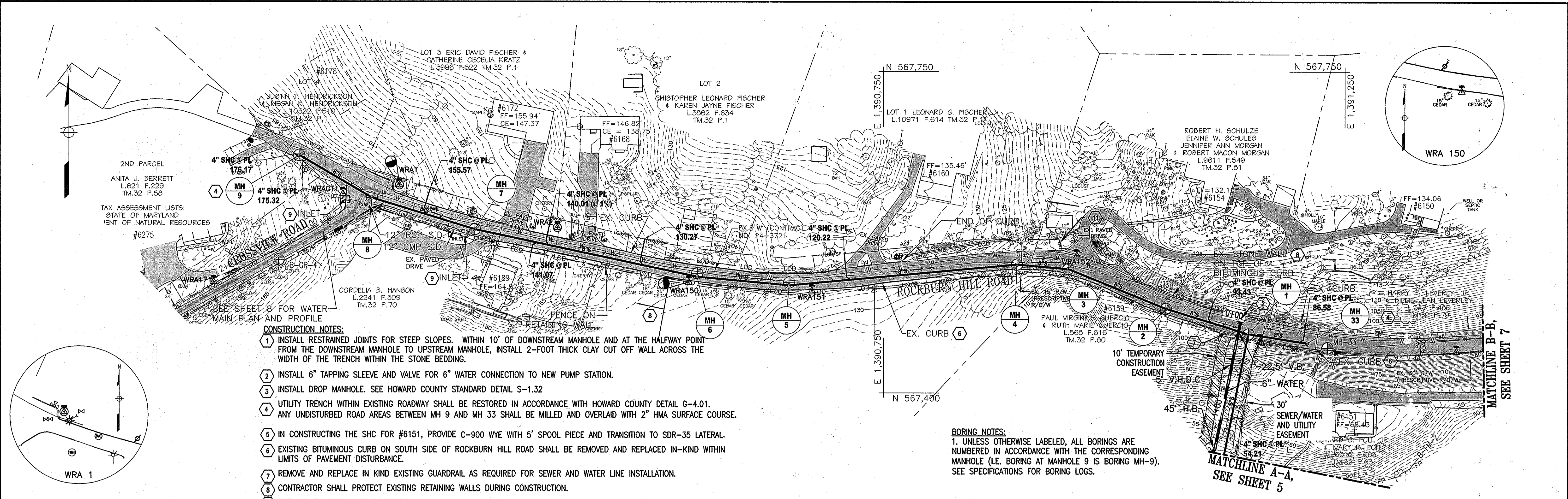
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DRN:	
CHK:	
JUNE 2013	
BY	NO.
REVISION	
DATE	

MANHOLE AND SURVEY  
 KEY SHEET

600 SCALE MAP NO. 32    BLOCK NO. 21.

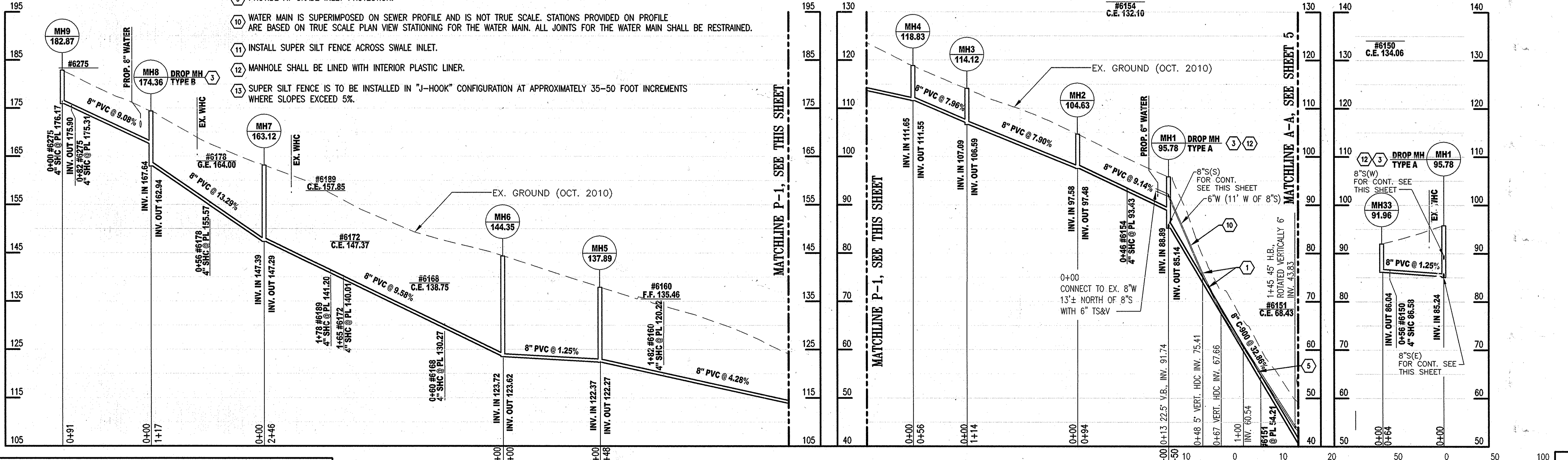
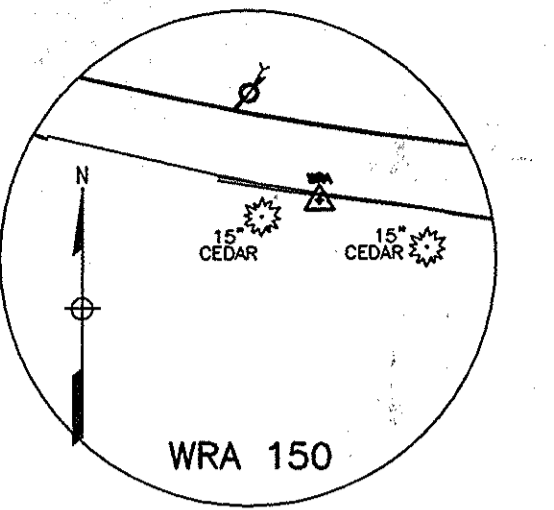
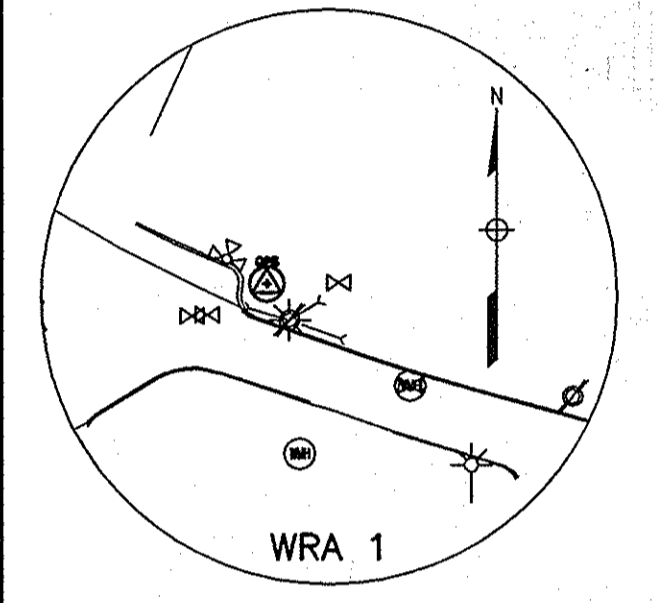
ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

G-3  
 SCALE AS SHOWN  
 SHEET 3 OF 36



- CONSTRUCTION NOTES:**
- 1 INSTALL RESTRAINED JOINTS FOR STEEP SLOPES. WITHIN 10' OF DOWNSTREAM MANHOLE AND AT THE HALFWAY POINT FROM THE DOWNSTREAM MANHOLE TO UPSTREAM MANHOLE, INSTALL 2-FOOT THICK CLAY CUT OFF WALL ACROSS THE WIDTH OF THE TRENCH WITHIN THE STONE BEDDING.
  - 2 INSTALL 6" TAPPING SLEEVE AND VALVE FOR 6" WATER CONNECTION TO NEW PUMP STATION.
  - 3 INSTALL DROP MANHOLE. SEE HOWARD COUNTY STANDARD DETAIL S-1.32
  - 4 UTILITY TRENCH WITHIN EXISTING ROADWAY SHALL BE RESTORED IN ACCORDANCE WITH HOWARD COUNTY DETAIL G-4.01. ANY UNDISTURBED ROAD AREAS BETWEEN MH 9 AND MH 33 SHALL BE MILLED AND OVERLAID WITH 2" HMA SURFACE COURSE.
  - 5 IN CONSTRUCTING THE SHC FOR #6151, PROVIDE C-900 WYE WITH 5' SPOOL PIECE AND TRANSITION TO SDR-35 LATERAL.
  - 6 EXISTING BITUMINOUS CURB ON SOUTH SIDE OF ROCKBURN HILL ROAD SHALL BE REMOVED AND REPLACED IN-KIND WITHIN LIMITS OF PAVEMENT DISTURBANCE.
  - 7 REMOVE AND REPLACE IN KIND EXISTING GUARDRAIL AS REQUIRED FOR SEWER AND WATER LINE INSTALLATION.
  - 8 CONTRACTOR SHALL PROTECT EXISTING RETAINING WALLS DURING CONSTRUCTION.
  - 9 PROVIDE AT GRADE INLET PROTECTION.
  - 10 WATER MAIN IS SUPERIMPOSED ON SEWER PROFILE AND IS NOT TRUE SCALE. STATIONS PROVIDED ON PROFILE ARE BASED ON TRUE SCALE PLAN VIEW STATIONING FOR THE WATER MAIN. ALL JOINTS FOR THE WATER MAIN SHALL BE RESTRAINED.
  - 11 INSTALL SUPER SILT FENCE ACROSS SWALE INLET.
  - 12 MANHOLE SHALL BE LINED WITH INTERIOR PLASTIC LINER.
  - 13 SUPER SILT FENCE IS TO BE INSTALLED IN "J-HOOK" CONFIGURATION AT APPROXIMATELY 35-50 FOOT INCREMENTS WHERE SLOPES EXCEED 5%.

- BORING NOTES:**
1. UNLESS OTHERWISE LABELED, ALL BORINGS ARE NUMBERED IN ACCORDANCE WITH THE CORRESPONDING MANHOLE (I.E. BORING AT MANHOLE 9 IS BORING MH-9). SEE SPECIFICATIONS FOR BORING LOGS.



"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

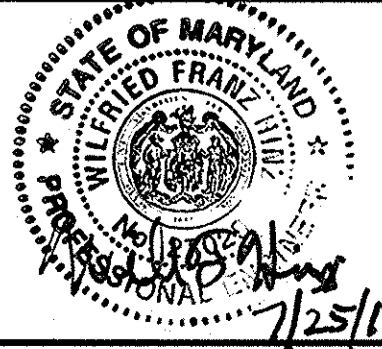
*James J. Berrett* 7/22/13  
DIRECTOR OF PUBLIC WORKS DATE

*Manor S. Butler* 7/22/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Steve Con* 7/22/13  
CHIEF, BUREAU OF UTILITIES DATE

*Debra* 7/22/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



DES:	F.B.				
DRN:	F.B.				
CHK:	W.H.				
JUNE 2013	BY NO.	REVISION	DATE		

GRAVITY SEWER PLAN AND PROFILE:  
ROCKBURN HILL ROAD

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

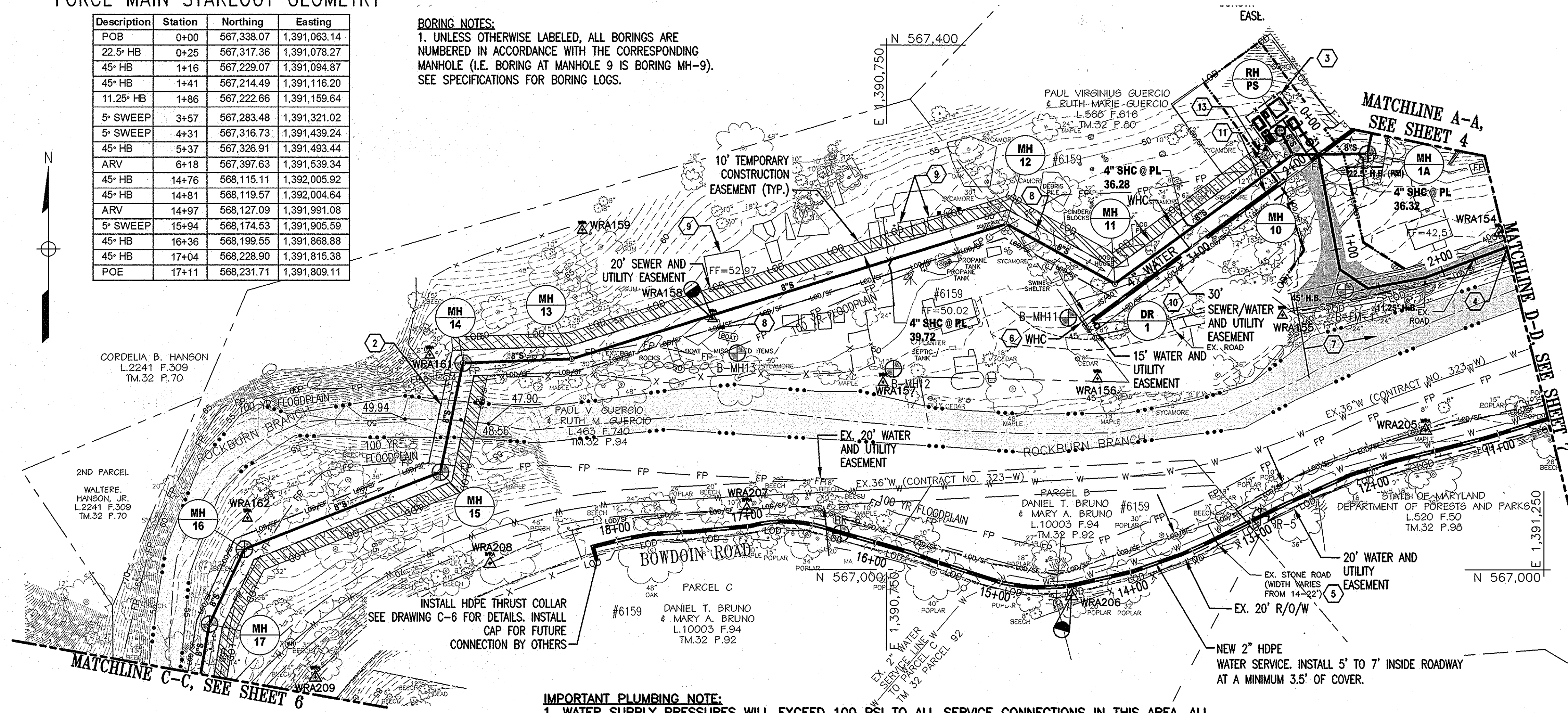
C-1  
SCALE AS SHOWN  
SHEET 4 OF 36

**FORCE MAIN STAKEOUT GEOMETRY**

Description	Station	Northing	Easting
POB	0+00	567,338.07	1,391,063.14
22.5" HB	0+25	567,317.36	1,391,078.27
45" HB	1+16	567,229.07	1,391,094.87
45" HB	1+41	567,214.49	1,391,116.20
11.25" HB	1+86	567,222.66	1,391,159.64
5" SWEEP	3+57	567,283.48	1,391,321.02
5" SWEEP	4+31	567,316.73	1,391,439.24
45" HB	5+37	567,326.91	1,391,493.44
ARV	6+18	567,397.63	1,391,539.34
45" HB	14+76	568,115.11	1,392,005.92
45" HB	14+81	568,119.57	1,392,004.64
ARV	14+97	568,127.09	1,391,991.08
5" SWEEP	15+94	568,174.53	1,391,905.59
45" HB	16+36	568,199.55	1,391,868.88
45" HB	17+04	568,228.90	1,391,815.38
POE	17+11	568,231.71	1,391,809.11

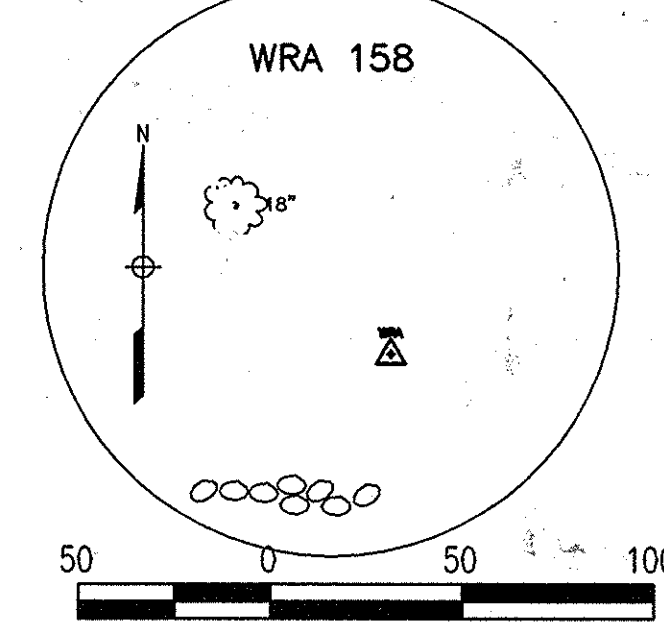
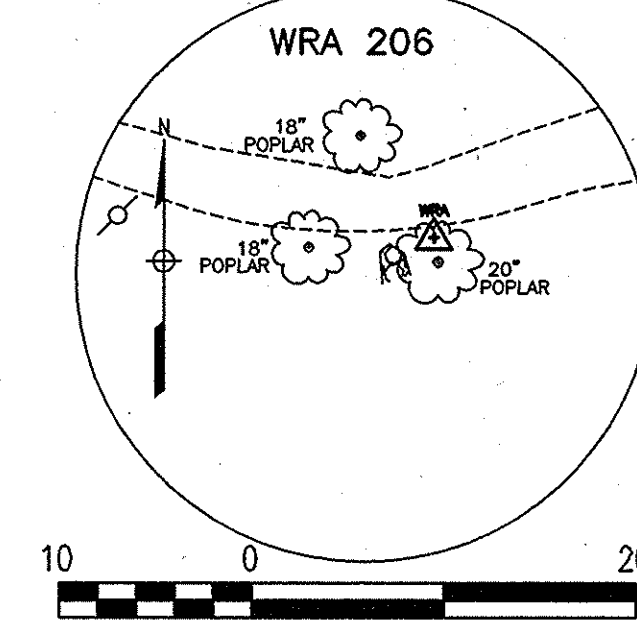
**BORING NOTES:**

1. UNLESS OTHERWISE LABELED, ALL BORINGS ARE NUMBERED IN ACCORDANCE WITH THE CORRESPONDING MANHOLE (I.E. BORING AT MANHOLE 9 IS BORING MH-9). SEE SPECIFICATIONS FOR BORING LOGS.



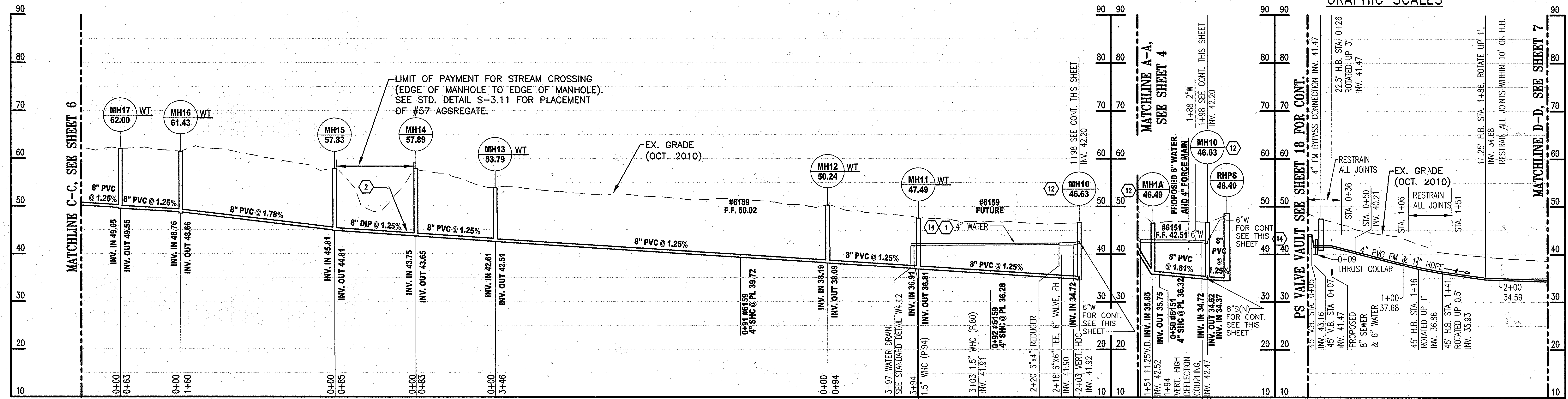
**CONSTRUCTION NOTES:**

- 1 WATER MAIN IS SUPERIMPOSED ON SEWER PROFILE AND IS NOT TRUE SCALE. STATIONS PROVIDED ON PROFILE ARE BASED ON TRUE SCALE PLAN VIEW STATIONING FOR THE WATER MAIN.
- 2 SEE HOWARD COUNTY DETAIL S-3.11 FOR STEAM CROSSING DETAIL. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES AND MDE'S GUIDELINES FOR WATERWAYS CONSTRUCTION. SEE SEDIMENT AND EROSION CONTROL NOTES AND DETAILS.
- 3 SEE SHEET 9 FOR PUMP STATION SITE PLAN.
- 4 INSTALL 1 1/2" HDPE FM IN SAME TRENCH (1.5' CENTERLINE TO CENTERLINE) AND INVERT AS 4" FM. PARALLEL 1 1/2" FM IS NOT INDICATED FOR CLARITY.
- 5 RESTORE EXISTING UNPAVED ROAD. SEE DETAIL A ON DRAWING G-2.
- 6 INSTALL WHC FOR EXISTING HOME ON PARCEL 94.
- 7 EXCAVATE EXISTING PRIVATE ENTRANCE ROAD AND RECONSTRUCT 10' WIDE PAVING SECTION PER PAVEMENT DETAIL B ON DRAWING G-2.
- 8 EXISTING SHEDS, AND MISC. SCATTERED ITEMS SHALL BE REMOVED FROM PROPOSED SEWER EASEMENT AND BE RELOCATED TO AN ON-SITE LOCATION AS REQUESTED BY THE PROPERTY OWNER.
- 9 EXISTING SHEDS WITHIN TEMPORARY CONSTRUCTION EASEMENTS SHALL BE MAINTAINED AT THEIR EXISTING LOCATION. ANY MISC. SCATTERED ITEMS WITHIN TEMPORARY CONSTRUCTION EASEMENT CAN BE RELOCATED TO AN ON-SITE LOCATION AS REQUESTED BY THE PROPERTY OWNER.
- 10 INSTALL WATER MAIN DRAIN, SEE HOWARD COUNTY STANDARD DETAIL W-4.12.
- 11 INSTALL 4" WATER 12' SOUTH OF SEWER.
- 12 MANHOLE SHALL BE LINED WITH INTERIOR PLASTIC LINER.
- 13 INSTALL FIRE HYDRANT.
- 14 ALL JOINTS FOR THE WATER MAIN SHALL BE RESTRAINED.



**IMPORTANT PLUMBING NOTE:**

1. WATER SUPPLY PRESSURES WILL EXCEED 100 PSI TO ALL SERVICE CONNECTIONS IN THIS AREA. ALL PLUMBING CONNECTIONS TO THE WATER SYSTEM SHALL BE PROVIDED WITH APPROPRIATE PRESSURE REDUCTION AND RELIEF DEVICES IN ACCORDANCE WITH THE PLUMBING CODE.



**GRAPHIC SCALES**

SCALE: 1" = 10' VERTICAL  
SCALE: 1" = 50' HORIZONTAL

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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>John G. DeLoach</i> DIRECTOR OF PUBLIC WORKS DATE		<i>Monica E. Sullivan</i> CHIEF, BUREAU OF ENGINEERING DATE	
<i>Steve Chan</i> CHIEF, BUREAU OF UTILITIES DATE		<i>Chris DeLoach</i> CHIEF, UTILITY DESIGN DIVISION DATE	

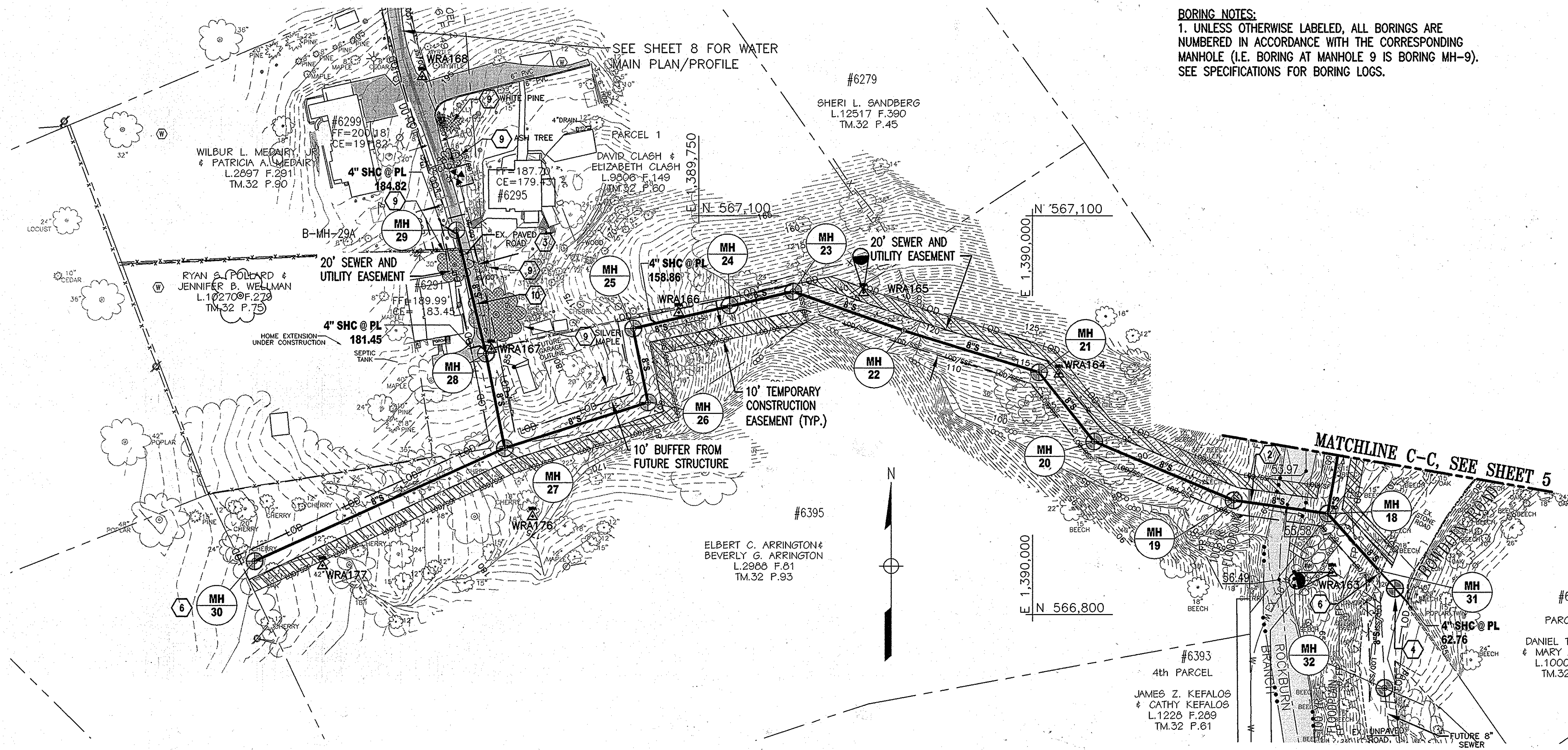
**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450

DES:	F.B.		
DRN:	F.B.		
CHK:	W.H.		
JUNE 2013	BY NO.	REVISION	DATE

GRAVITY SEWER PLAN AND PROFILE:  
 ROCKBURN BRANCH  
 600 SCALE MAP NO. 32 BLOCK NO. 21.

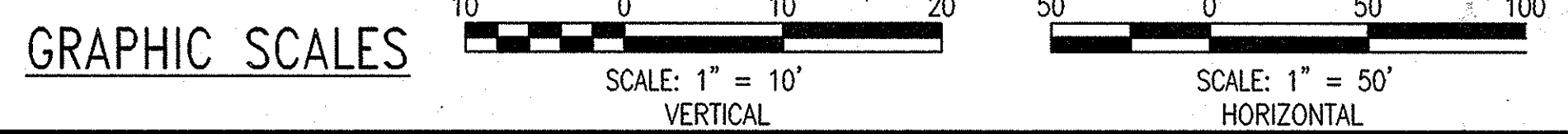
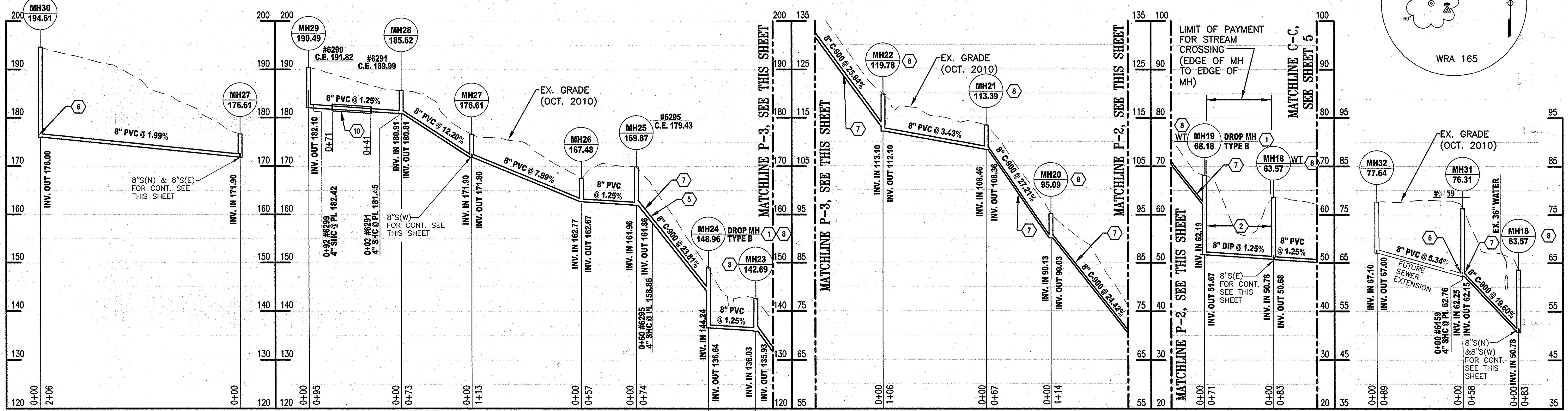
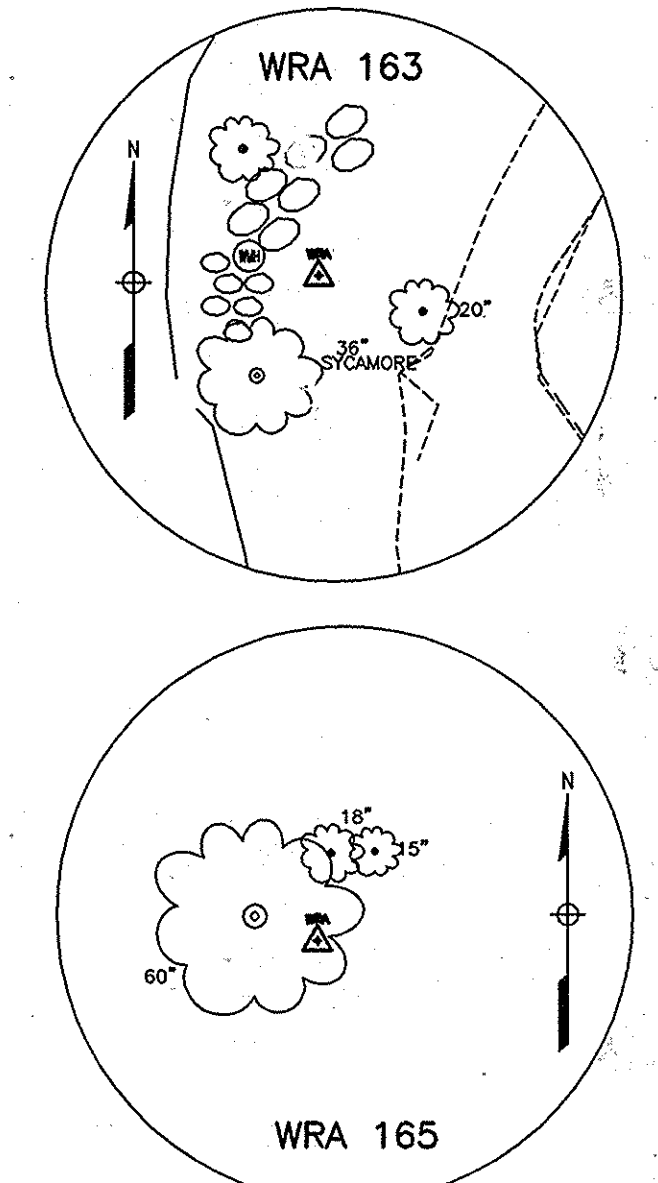
ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

C-2  
 SCALE AS SHOWN  
 SHEET 5 OF 36



**BORING NOTES:**  
 1. UNLESS OTHERWISE LABELED, ALL BORINGS ARE NUMBERED IN ACCORDANCE WITH THE CORRESPONDING MANHOLE (I.E. BORING AT MANHOLE 9 IS BORING MH-9). SEE SPECIFICATIONS FOR BORING LOGS.

- CONSTRUCTION NOTES:**
1. INSTALL DROP MANHOLE. SEE HOWARD COUNTY STANDARD DETAIL S-1.32.
  2. SEE HOWARD COUNTY DETAIL S-3.11 FOR STEAM CROSSING DETAIL. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES AND MDE'S GUIDELINES FOR WATERWAYS CONSTRUCTION. SEE SEDIMENT AND EROSION CONTROL NOTES AND DETAILS.
  3. EXCAVATE OUT EXISTING PAVED ROADWAY AND REPLACE EXISTING ROADWAY PER PAVEMENT DETAIL B ON DRAWING G-2.
  4. RESTORE EXISTING UNPAVED ROAD. SEE DETAIL A ON DRAWING G-2.
  5. PROVIDE C-900 WYE WITH 5' SPOOL PIECE AND TRANSITION TO SDR-35 LATERAL.
  6. PROVIDE PLUGGED 8" SEWER CONNECTION FOR FUTURE EXTENSION.
  7. INSTALL RESTRAINED JOINTS FOR STEEP SLOPES. WITHIN 10' OF DOWNSTREAM MANHOLE AND AT THE HALFWAY POINT FROM THE DOWNSTREAM MANHOLE TO UPSTREAM MANHOLE, INSTALL 2-FOOT THICK CLAY CUT OFF WALL ACROSS THE WIDTH OF THE TRENCH WITHIN THE STONE BEDDING.
  8. MANHOLE SHALL BE LINED WITH PLASTIC INTERIOR LINER.
  9. EX. TREE TO BE REMOVED, STUMPS TO BE GROUND MINIMUM OF 6-INCHES BELOW GRADE AND AREA STABILIZED WITH TOPSOIL AND SEED.
  10. JACK AND BORE 16" CASING PIPE, SEE PROFILE FOR LIMITS. SEE HOWARD COUNTY DETAIL G-7.31.
  11. SUPER SILT FENCE IS TO BE INSTALLED IN "J-HOOK" CONFIGURATION AT APPROXIMATELY 35-50' FOOT INCREMENTS WHERE SLOPES EXCEED 5%.



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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*John J. ...* 7/26/13  
 DIRECTOR OF PUBLIC WORKS DATE

*Thomas P. ...* 7/26/13  
 CHIEF, BUREAU OF ENGINEERING DATE

*Steve ...* 7/26/13  
 CHIEF, BUREAU OF UTILITIES DATE

*...* 7/26/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
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 BALTIMORE, MARYLAND  
 410 - 235 - 3450



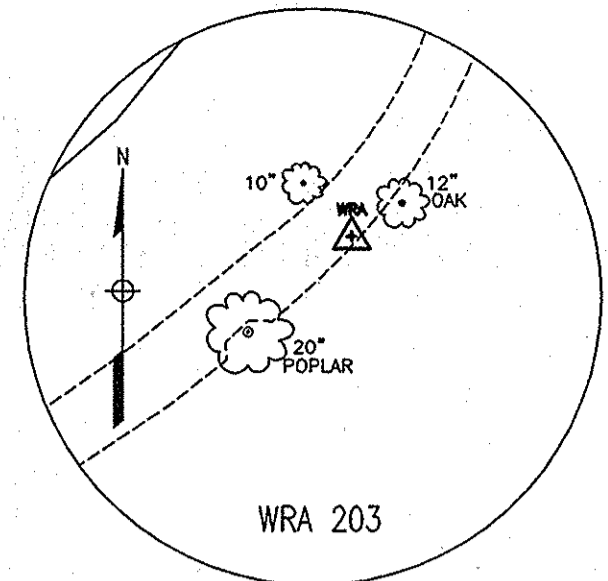
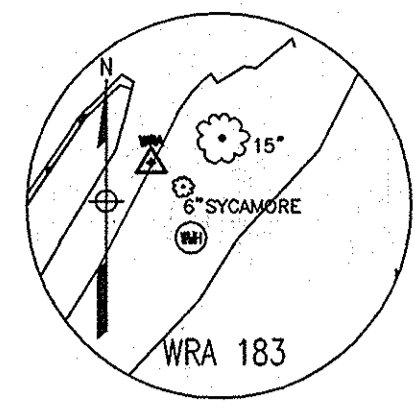
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CHK:	W.H.			
JUNE 2013	BY NO.	REVISION	DATE	

GRAVITY SEWER  
 PLAN AND PROFILE:  
 CROSSVIEW AND  
 BOWDOIN ROAD  
 CONNECTIONS

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

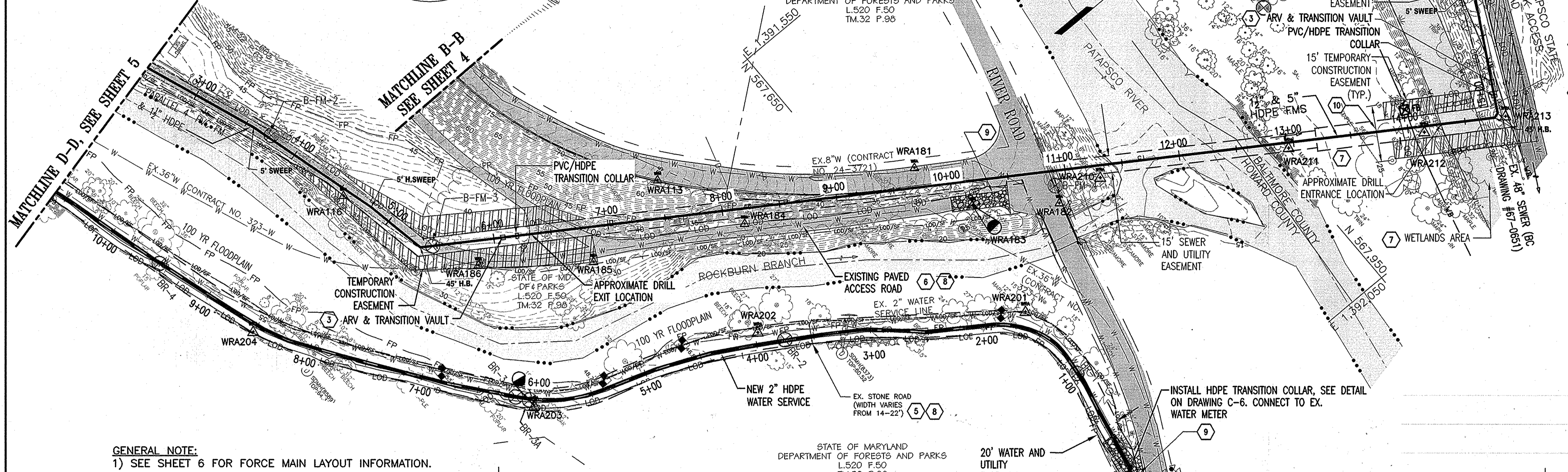
C-3  
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 SHEET 6 OF 36



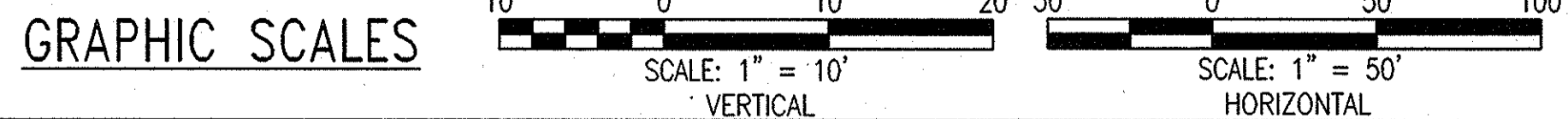
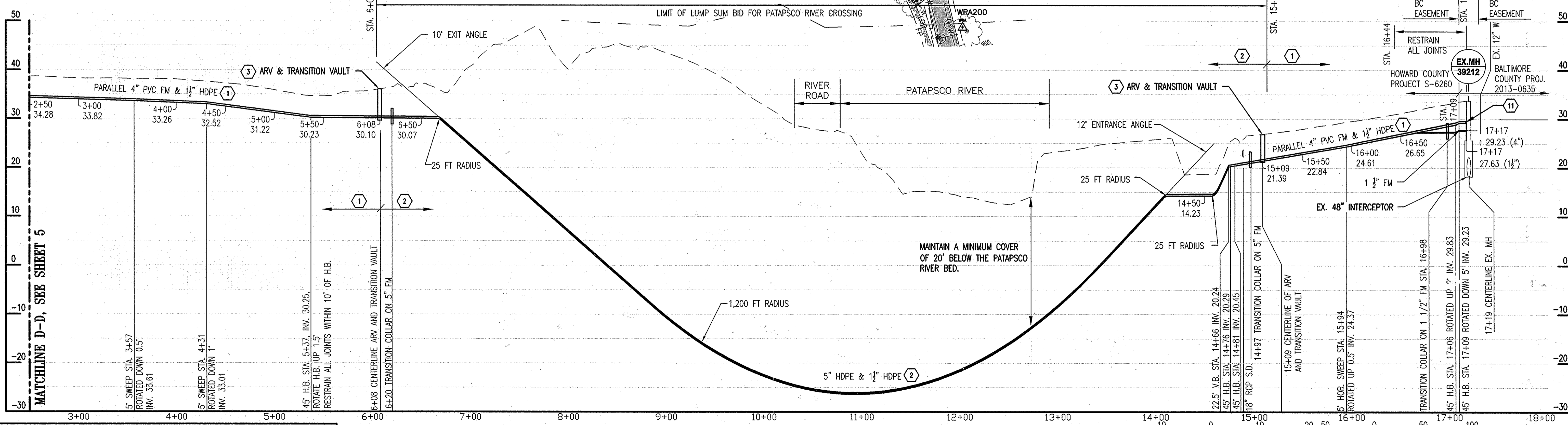
HARRY P. LEVERLY, JR.  
 & BILLIE JEAN LEVERLEY  
 L.347 F.400  
 TM.32 P.79

STATE OF MARYLAND  
 DEPARTMENT OF FORESTS AND PARKS  
 L.520 F.50  
 TM.32 P.98

- CONSTRUCTION NOTES:**
- 1) INSTALL 1 1/2" HDPE FM IN SAME TRENCH/INVERT AS 4" FM, WITH 1.5' SEPARATION CENTERLINE TO CENTERLINE. PARALLEL 1 1/2" FM IS NOT INDICATED FOR CLARITY.
  - 2) DIRECTIONAL DRILL 5" HDPE FM AND INSTALL 1 1/2" HDPE FM INSIDE 5" FM.
  - 3) SEE DETAIL 1 ON DRAWING M-4 FOR ARV AND TRANSITION VAULT DETAIL. INSTALL HDPE TO PVC TRANSITION THRUST COLLAR 10'-FEET OUTSIDE OF TRANSITION VAULT. SEE DRAWING C-6 FOR HDPE TO PVC TRANSITION DETAIL.
  - 4) MILL EXISTING ROADWAY WITHIN 10' ON EACH SIDE OF EXISTING MANHOLE AND OVERLAY WITH 2-INCHES OF HOTMIX.
  - 5) SEE STONE ROAD RESTORATION DETAIL A ON DRAWING G-2.
  - 6) EXCAVATE OUT EXISTING PRIVATE ENTRANCE ROAD AND RECONSTRUCT 10' WIDE PAVING SECTION PER PAVEMENT DETAIL ON DRAWING G-2.
  - 7) SEE DWG. BCSC-1 FOR SEDIMENT AND EROSION CONTROL FOR WORK WITHIN BALTIMORE COUNTY.
  - 8) CONTRACTOR SHALL MAINTAIN ACCESS TO ALL RESIDENCES WHO ACCESS PRIVATE ACCESS ROAD AS DESCRIBED IN THE SPECIAL PROVISIONS.
  - 9) INSTALL STABILIZED CONSTRUCTION ENTRANCE.
  - 10) SEE SHEET 10 FOR VEGETATIVE STABILIZATION OF DRILL ENTRANCE AREA.
  - 11) CONNECT BOTH NEW 4" AND 1 1/2" INTO EXISTING MANHOLE. SEE BALTIMORE COUNTY DRAWING 2013-0635 ON SHEET 35 FOR CONNECTION TO EX. MANHOLE NO. 39212.



**GENERAL NOTE:**  
 1) SEE SHEET 6 FOR FORCE MAIN LAYOUT INFORMATION.



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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*Jay D. [Signature]* 7/26/13  
 DIRECTOR OF PUBLIC WORKS DATE

*Manoel & Cynthia [Signatures]*  
 CHIEF, BUREAU OF ENGINEERING DATE

*Stefan [Signature]* 7/26/13  
 CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 7/26/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450



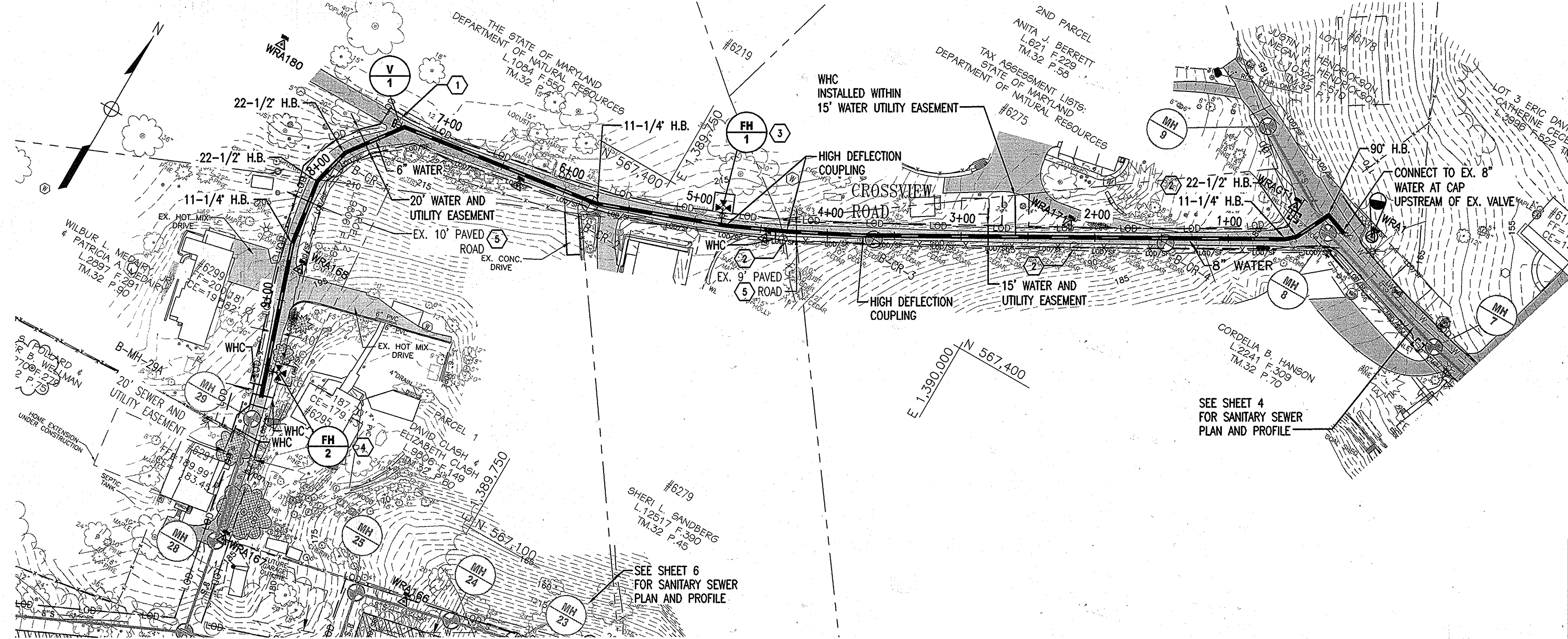
DES:	F.B.				
DRN:	F.B.				
CHK:	W.H.				
JUNE 2013	BY NO.	REVISION	DATE		

**FORCE MAIN PLAN AND PROFILE  
 AND WATER SERVICE PLAN**

600 SCALE MAP NO. 32    BLOCK NO. 21.

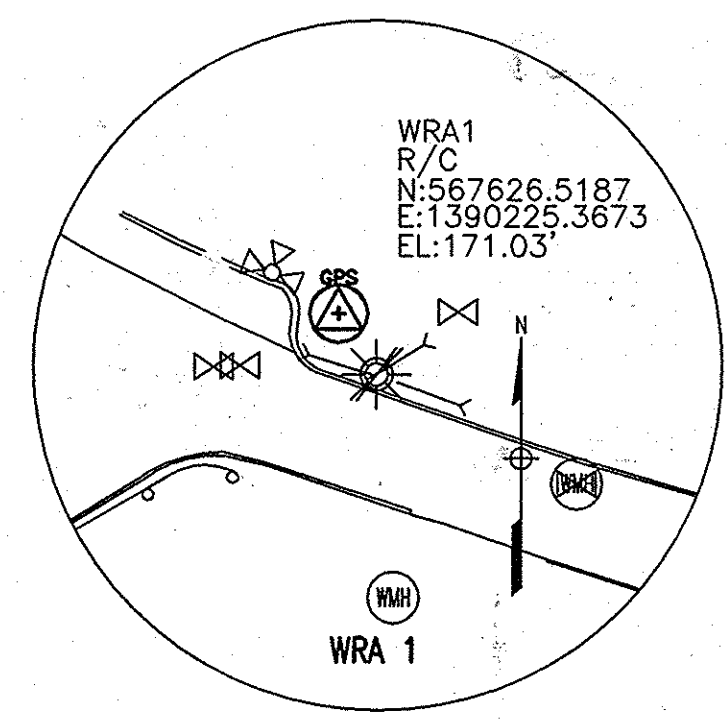
**ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION**  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

C-4  
 SCALE AS SHOWN  
 SHEET 7 OF 38



**CONSTRUCTION NOTES:**

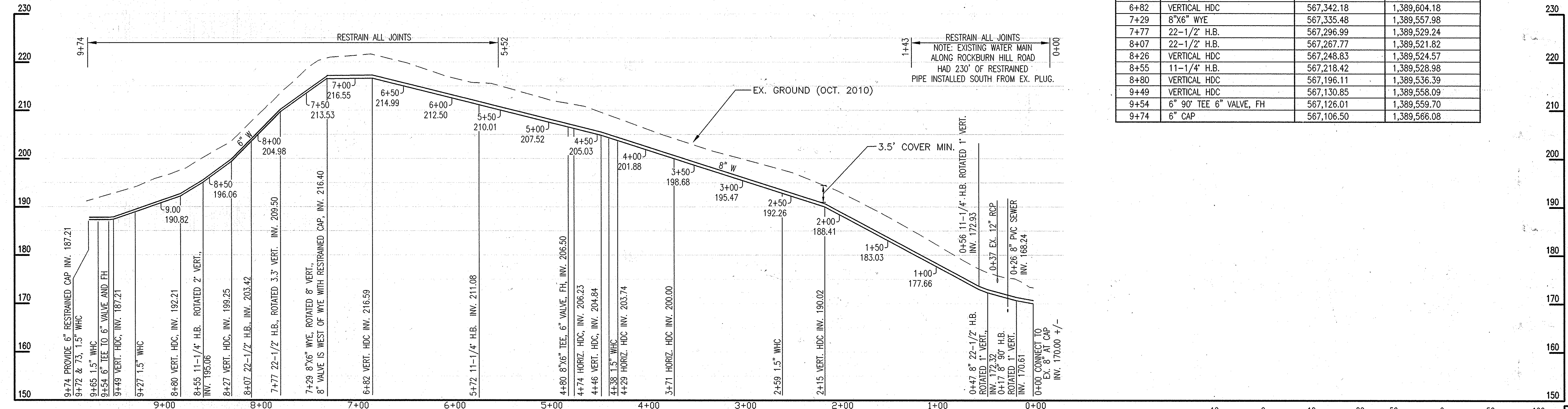
- 1 BEYOND WYE, INSTALL 2' SPOOL PIECE AND 8" WATER MAIN ISOLATION VALVE WITH RESTRAINED M.J. PLUG. SEE HOWARD COUNTY DETAIL W-5.01 FOR PVC WATER MAIN VALVE ANCHORAGE.
- 2 COUNTY WILL MAKE ARRANGEMENTS FOR BRACING OF UTILITY POLE.
- 3 INSTALL FH1 5' OFF EXISTING ROAD WITHIN 15' X 15' EASEMENT, WITH BURY DEPTH OF 6.5' AND BURY LINE ELEVATION OF 212.5'.
- 4 INSTALL FH2 4' OFF EXISTING ROAD WITHIN 10' X 15' EASEMENT, WITH BURY DEPTH OF 5.5' AND BURY LINE ELEVATION OF 192.3'.
- 5 EXCAVATE OUT EXISTING PRIVATE ENTRANCE ROAD AND RECONSTRUCT ROADWAY IN ACCORDANCE WITH PAVEMENT DETAIL ON DRAWING G-2.



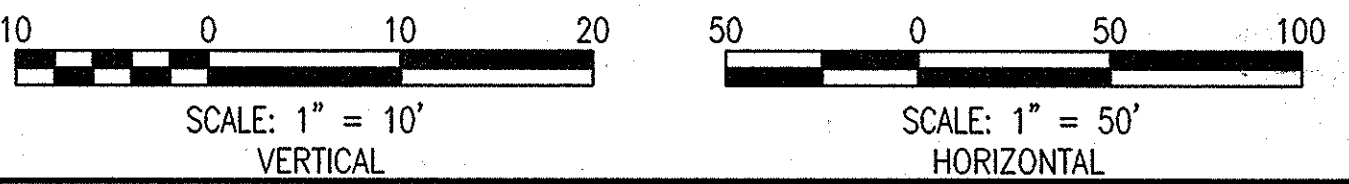
**IMPORTANT PLUMBING NOTE:**  
 1. WATER SUPPLY PRESSURES WILL EXCEED 100 PSI TO ALL SERVICE CONNECTIONS IN THIS AREA. ALL PLUMBING CONNECTIONS TO THE WATER SYSTEM SHALL BE PROVIDED WITH APPROPRIATE PRESSURE REDUCTION AND RELIEF DEVICES IN ACCORDANCE WITH THE PLUMBING CODE.

**WATER MAIN STAKEOUT GEOMETRY**

STA	NAME	NORTHING	EASTING
0+00	CONNECT TO EX. 8" AT CAP	567,618.10	1,390,206.22
0+17	8" 90° H.B.	567,624.38	1,390,189.40
0+47	22-1/2" H.B.	567,598.22	1,390,176.71
0+56	11-1/4" H.B.	567,592.26	1,390,170.01
2+15	VERTICAL HDC	567,514.82	1,390,033.13
3+71	HORIZONTAL HDC	567,436.96	1,389,895.51
4+29	HORIZONTAL HDC	567,410.96	1,389,844.50
4+46	VERTICAL HDC	567,404.47	1,389,830.26
4+74	HORIZONTAL HDC	567,392.29	1,389,803.52
4+80	8"X6" TEE, 6" VALVE, FH	567,390.70	1,389,799.48
5+72	11-1/4" H.B.	567,357.67	1,389,711.01
6+82	VERTICAL HDC	567,342.18	1,389,604.18
7+29	8"X6" WYE	567,335.48	1,389,557.98
7+77	22-1/2" H.B.	567,296.99	1,389,529.24
8+07	22-1/2" H.B.	567,267.77	1,389,521.82
8+26	VERTICAL HDC	567,248.83	1,389,524.57
8+55	11-1/4" H.B.	567,218.42	1,389,528.98
8+80	VERTICAL HDC	567,196.11	1,389,536.39
9+49	VERTICAL HDC	567,130.85	1,389,558.09
9+54	6" 90° TEE 6" VALVE, FH	567,126.01	1,389,559.70
9+74	6" CAP	567,108.50	1,389,566.08



**GRAPHIC SCALES**



"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Director of Public Works: *J. J. ...*  
 Chief, Bureau of Engineering: *Thomas J. ...*  
 Chief, Bureau of Utilities: *...*  
 Chief, Utility Design Division: *...*

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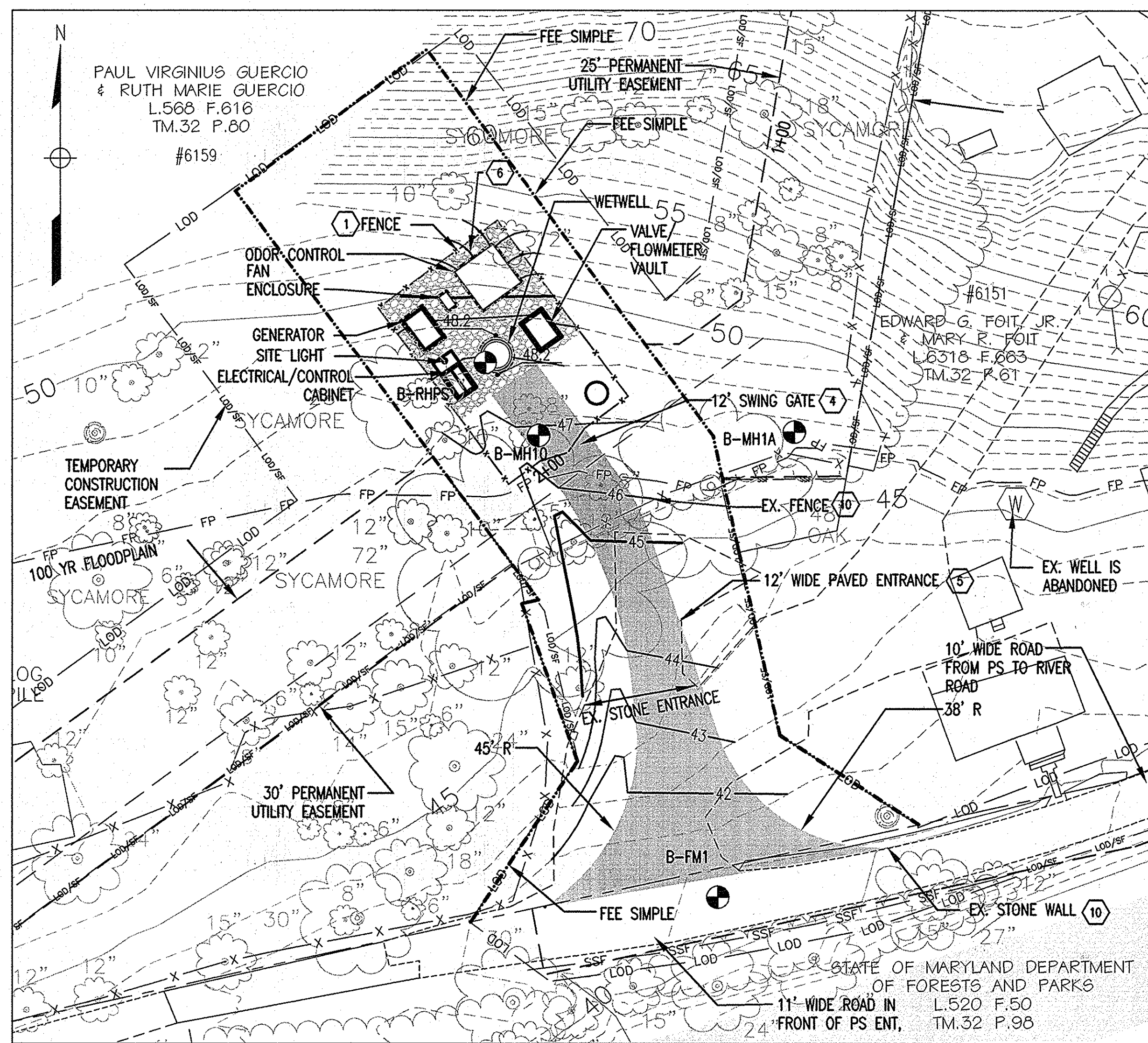
DES:	K.S.
DRN:	K.S.
CHK:	W.H.
JUNE 2013	
BY NO.	REVISION
	DATE

**WATER MAIN PLAN AND PROFILE: CROSSVIEW ROAD**  
 600 SCALE MAP NO. 32  
 BLOCK NO. 21.

**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION**  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

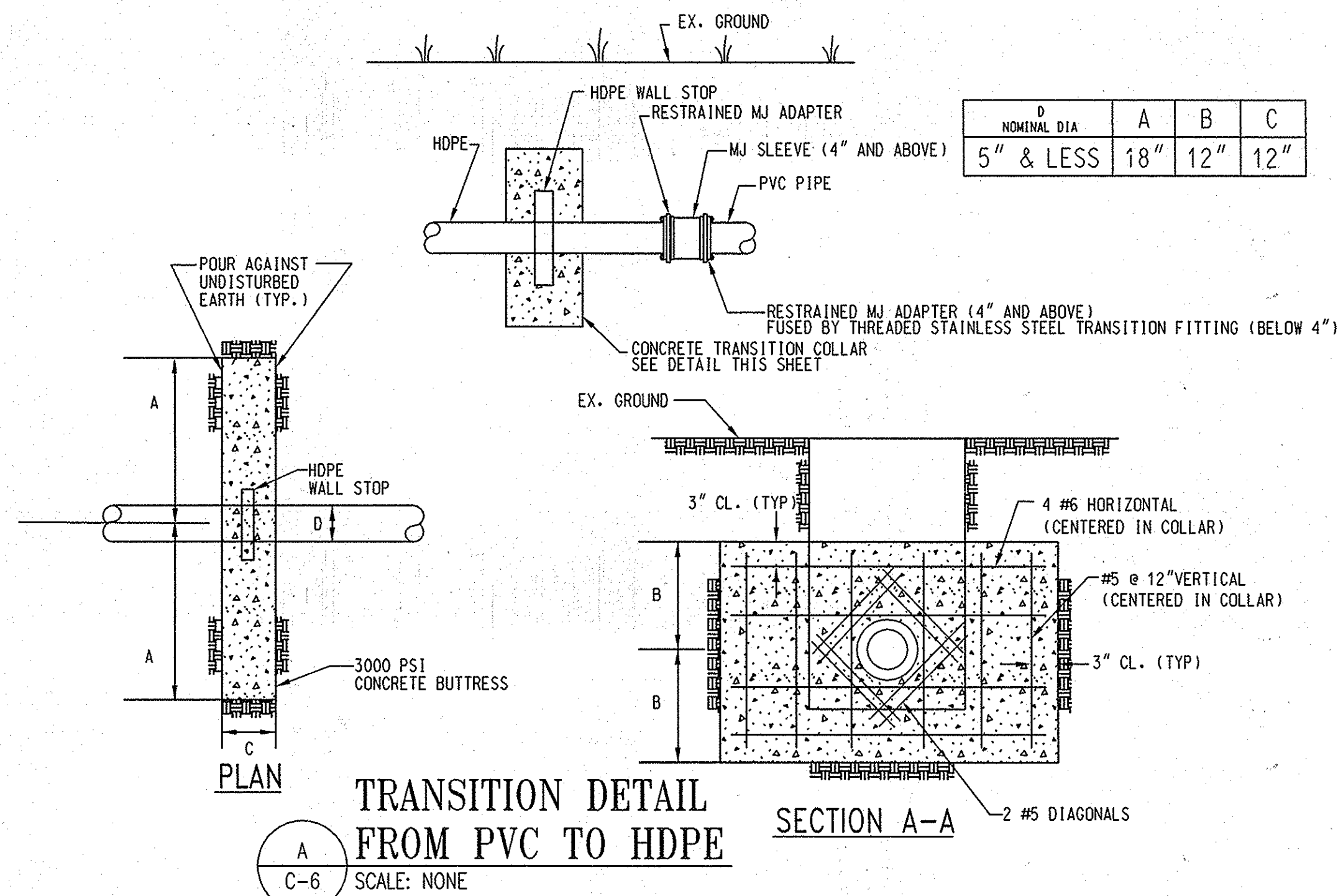
C-5  
 SCALE AS SHOWN  
 SHEET 8 OF 36





**GRADING AND EROSION & SEDIMENT CONTROL PLAN (11)(13)**

SCALE: 1"=20'

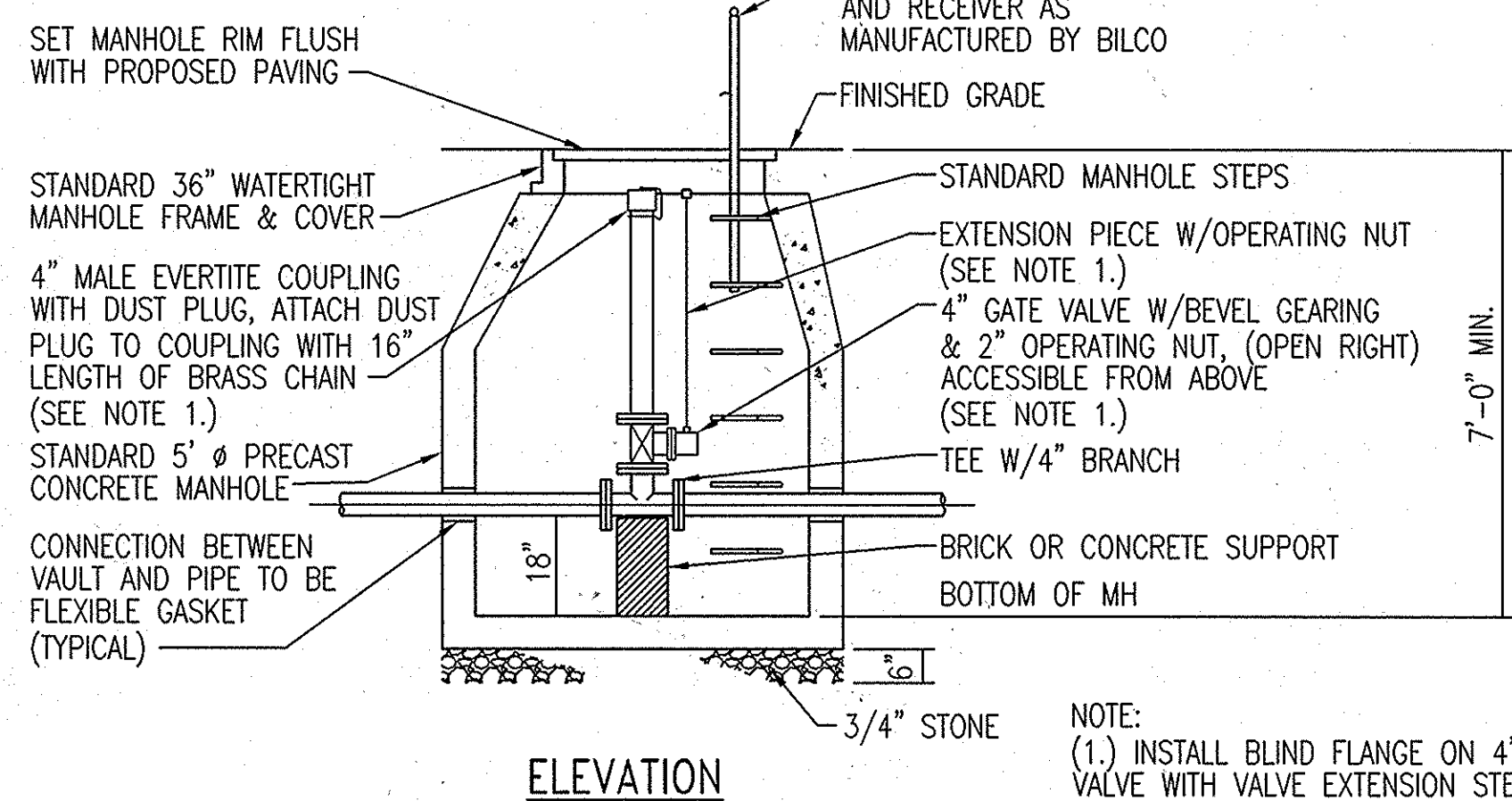
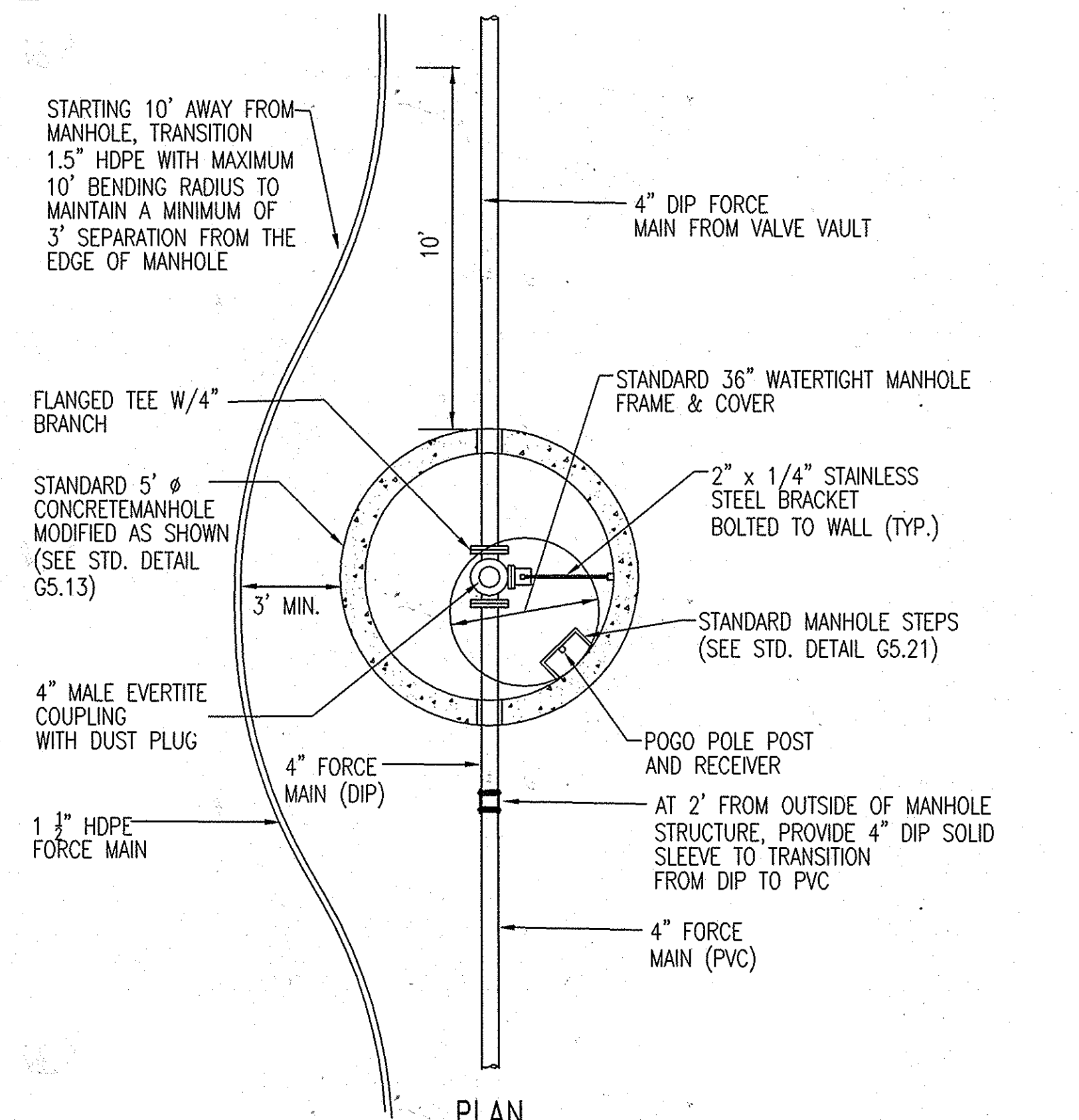


**TRANSITION DETAIL FROM PVC TO HDPE**

SCALE: NONE

**CONSTRUCTION NOTES:**

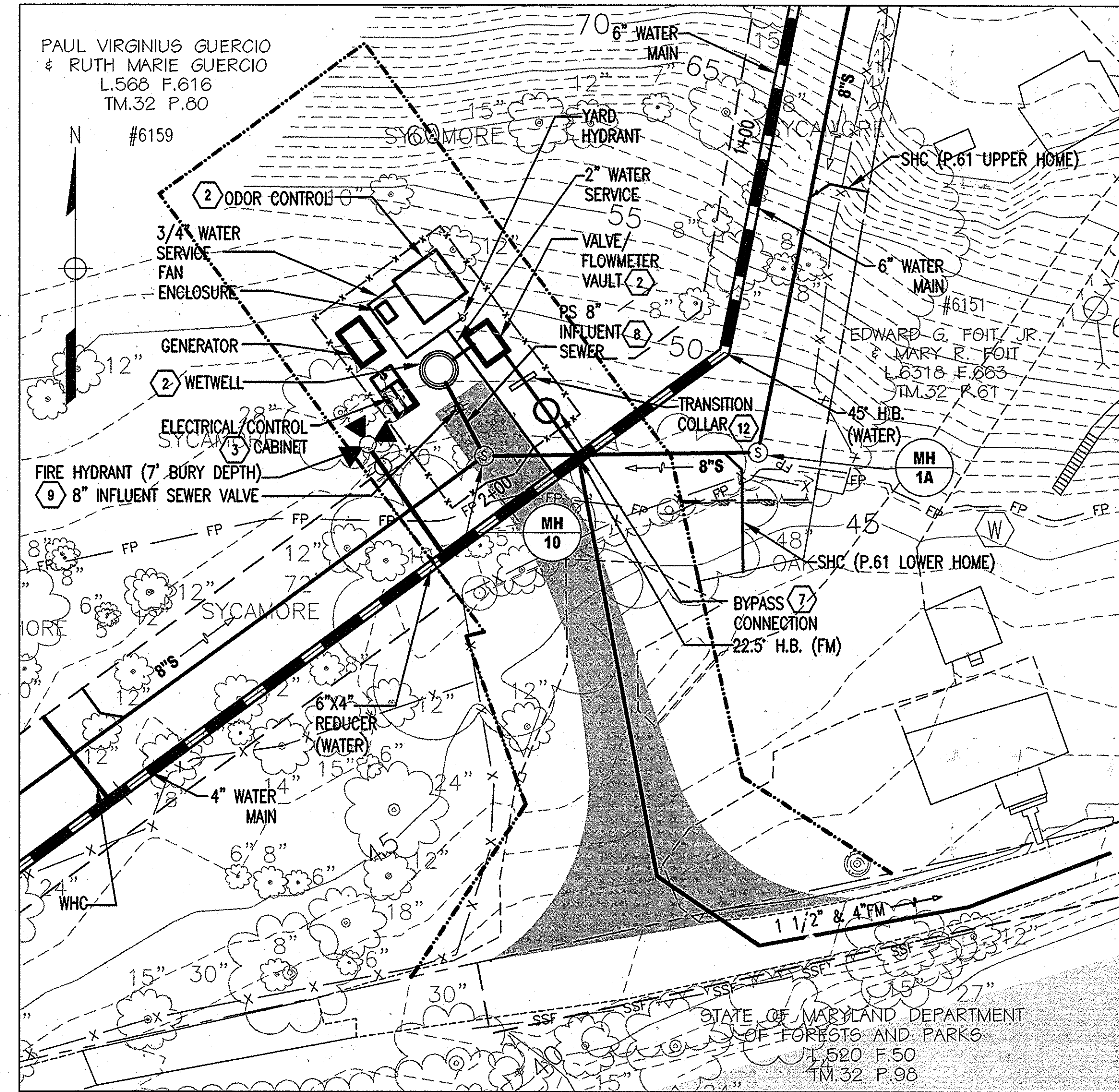
- INSTALL 6" HIGH FENCE. SEE HOWARD COUNTY DETAIL G-7.21 AND 7.22 FOR FENCE DETAILS.
- SEE MECHANICAL DRAWINGS FOR WETWELL, VALVE VAULT AND ODOR CONTROL DETAILS.
- SEE ELECTRICAL DRAWINGS FOR ELECTRICAL/CONTROL CABINET DETAILS.
- SEE HOWARD COUNTY DETAIL G-7.23 FOR CHAIN LINK FENCE GATE DETAIL.
- SEE DETAIL B ON DRAWING G-2 FOR PAVEMENT DETAILS.
- INSTALL 5-INCHES OF #7 STONE OVER LANDSCAPE CLOTH.
- SEE DETAIL B THIS DRAWING FOR BYPASS CONNECTION DETAIL.
- PS INFLUENT SEWER SHALL BE DR-18 C-900 PVC.
- INSTALL ISOLATION GATE VALVE. SEE HOWARD COUNTY DETAIL W-5.01 FOR PVC VALVE ANCHORAGE. RESTRAIN JOINTS ON BOTH SIDES OF THE VALVE.
- REMOVE EX. STONE WALL AS REQUIRED TO INSTALL PUMP STATION ENTRANCE. REINSTALL STONE WALL ALONG PERIMETER OF NEW FEE SIMPLE ENTRANCE AS INDICATED. REMOVE EX. FENCE IN FRONT OF PUMP STATION AS REQUIRED TO CONSTRUCT PUMP STATION
- LUMP SUM PAYMENT FOR PUMP STATION IS ALL REQUIRED WORK FOR THE CONSTRUCTION OF THE PUMP STATION WITH THE EXCEPTION OF THE INSTALLATION OF MANHOLES, SEWERS, HYDRANTS, PUMP STATION ENTRANCE ROAD, 4"/8" WATER MAINS, AND FORCE MAINS SOUTH OF THE 4" BYPASS CONNECTION. THESE ITEMS SHALL ALL BE MEASURED AND PAID FOR AS UNIT PRICE ITEMS.
- SEE DETAIL A THIS DRAWING FOR TRANSITION COLLAR DETAIL.
- SEE DRAWING EN-02 FOR PUMP STATION LANDSCAPE PLAN.



**ELEVATION**

**BYPASS CONNECTION DETAIL**

SCALE: NONE



**UTILITY PLAN (11)**

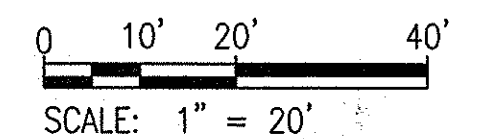
SCALE: 1"=20'

**STAKEOUT WORKING POINTS (WP)**

WORKING POINT	DESCRIPTION	NORTHING	EASTING
WP 1	CENTER OF WETWELL	1,391,049.51	567,334.68
WP 2	SE CORNER OF ELEC/CONTROL CAB. CONC. PAD	1,391,045.17	567,327.39
WP 3	SW CORNER OF ELEC/CONTROL CAB. CONC. PAD	1,391,041.07	567,324.53
WP 4	NE CORNER OF FENCE	1,391,049.52	567,365.34
WP 5	NW CORNER OF FENCE	1,391,021.14	567,345.05
WP 6	NE CORNER OF ODOR CONTROL FAC.	1,391,048.83	567,359.90
WP 7	NW CORNER OF ODOR CONTROL FAC.	1,391,039.95	567,353.40
WP 8	SE CORNER OF GENERATOR	1,391,038.32	567,338.62
WP 9	SW CORNER OF GENERATOR	1,391,033.47	567,335.08
WP 10	CENTERPOINT OF 38' RADIUS AT ENTRANCE	1,391,134.34	567,262.24
WP 11	CENTERPOINT OF 45' RADIUS AT ENTRANCE	1,391,036.86	567,248.52

**STAKEOUT NOTES:**

- SEE MECHANICAL DRAWINGS FOR ORIENTATION OF VALVE VAULT RELATIVE TO THE WETWELL.
- FENCE CORNERS ARE APPROXIMATE. THE FENCE SHALL BE INSTALLED A MINIMUM 4' CLEAR OF ANY ABOVE GROUND CONCRETE PAD AND/OR STRUCTURE.
- ELECTRICAL/CONTROL CABINET SHALL BE INSTALLED A MINIMUM OF 4' FROM THE WETWELL.



C-6

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

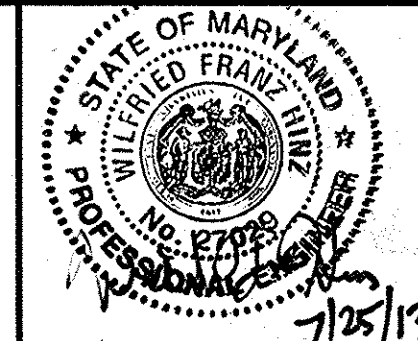
*John D. ...* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas P. ...* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Steve ...* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*...* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



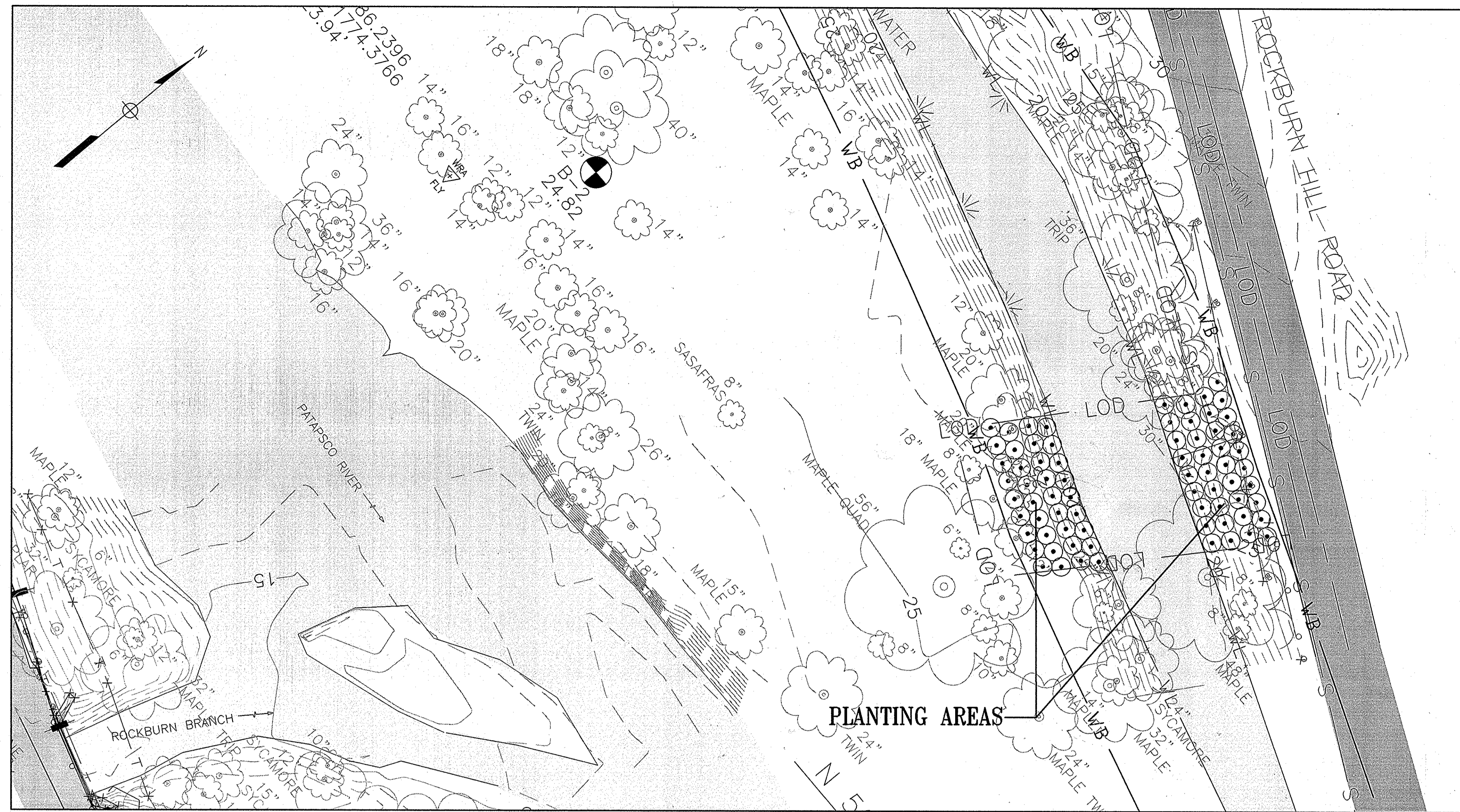
DES:	F.B.			
DRN:	F.B.			
CHK:	W.H.			
JUNE 2013	BY NO.	REVISION	DATE	

**PUMP STATION SITE AND UTILITY PLAN**

600 SCALE MAP NO. 32 BLOCK NO. 21.

**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION.**  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 9 OF 36



**NOTES**

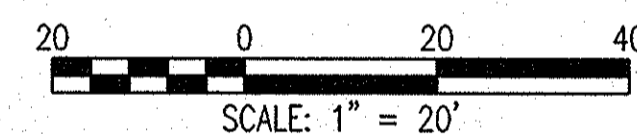
- ON-SITE NON-TIDAL WETLAND TO BE RESTORED TO PRE-EXISTING CONDITIONS. NATIVE SPECIES TO BE REPLANTED IN WETLAND BUFFER LISTED IN TABLE. PLANTING WITHIN THE EASEMENT WILL BE LIMITED TO SHRUBS AND GRASSES FOR FUTURE ACCESS TO UNDERGROUND UTILITIES.
- DURING CONSTRUCTION, BEST MANAGEMENT PRACTICES FOR WORKING IN WETLANDS ARE TO BE UTILIZED TO MINIMIZE IMPACTS TO JURISDICTIONAL WETLANDS, WATERS AND ASSOCIATED BUFFERS.
- NATIVE GRASS SEED (SPECIFIED BELOW) TO BE SPREAD IN BETWEEN SHRUB AND PLANTINGS AND STABILIZED WITH STRAW MULCH AS SPECIFIED BELOW.
- CONTAINER PLANTS OF NATIVE GRASS SPECIES MAY ALSO BE INCLUDED IN PLANTINGS IF AVAILABLE IN NURSERY STOCK.

**VEGETATIVE STABILIZATION**

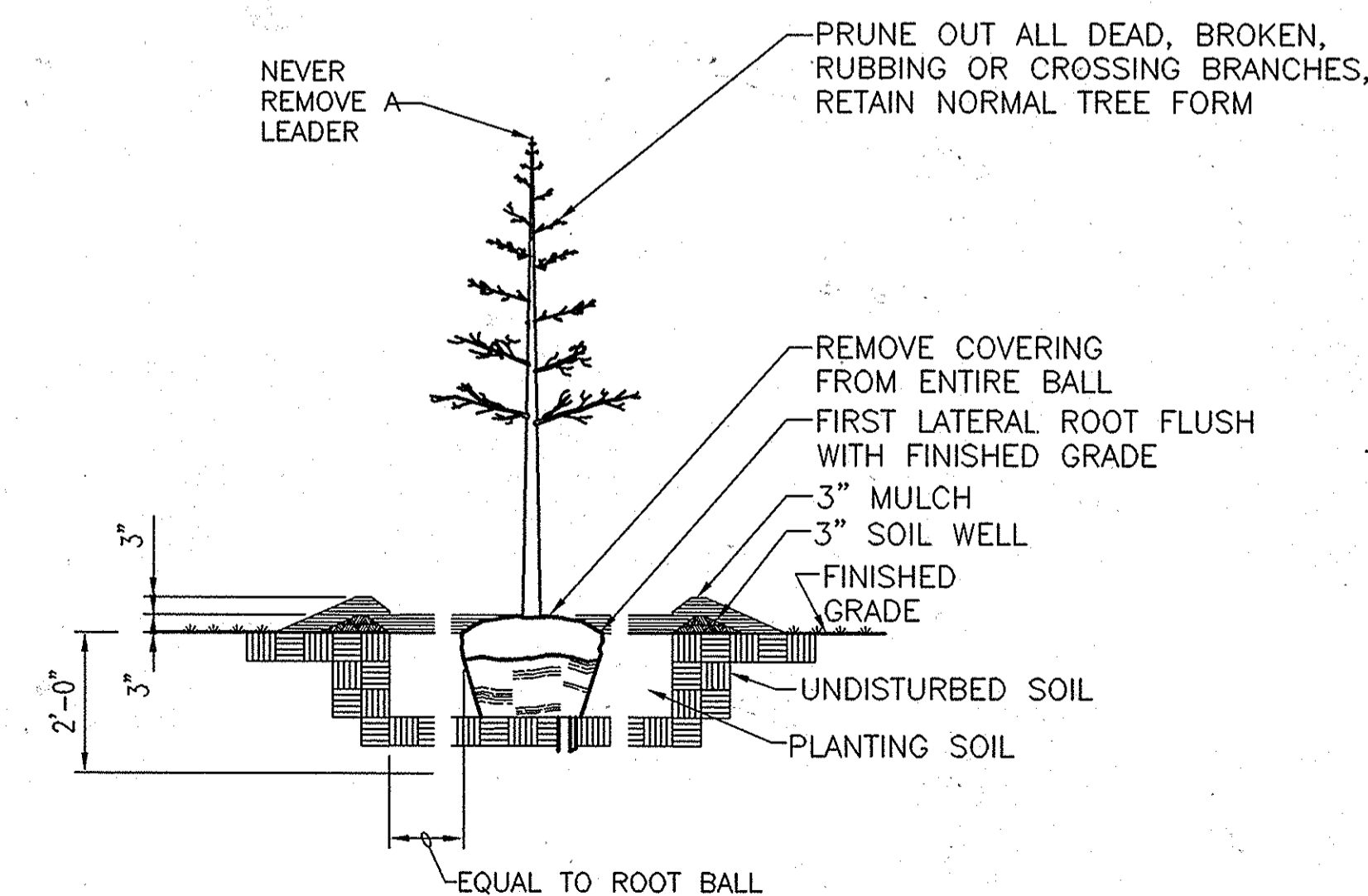
- A) SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES BY DISCING, RAKING OR OTHER ACCEPTABLE MEANS.
- B) SEEDING:  
 ALL SEEDING WITHIN STATE PARK SHALL USE NATIVE SPECIES. SEE SEDIMENT AND EROSION CONTROL DRAWINGS (BALTIMORE COUNTY) FOR SPECIFICATIONS. APPLY STRAW AS NEEDED OVER ALL SEEDED AREAS (1 TON PER ACRE).

**MARYLAND PARK SERVICE MITIGATION TABLE**

QUANTITY TO BE REMOVED	SIZE	LOCATION	MITIGATION
9	4 TO 8 INCHES	PRIVATE ACCESS ROAD ON WEST SIDE OF PATAPSCO (SEE SHEET 7 FOR LOCATION)	MINIMUM OF 5:1 MITIGATION FOR SHRUBS = 45 SHRUBS (SEE BELOW FOR PLANTING SCHEDULE)



**PLANTING DETAIL FOR SHRUBS**



**SHRUBS TO BE PLANTED: (⊙)**

QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE/CONTAINER/SPACING
18	CLETHRA ALNIFOLIA	PEPPERBUSH	3-5' TALL B&B OR CONTAINER SPACED 7'-10' O.C.
20	LINDERA BENZOIN	SPICEBUSH	3-5' TALL B&B OR CONTAINER SPACED 7'-10' O.C.
15	ILEX VERTICILLATA	WINTERBERRY	3-5' TALL B&B OR CONTAINER SPACED 7'-10' O.C.
10	ASIMINA TRILOBA	PAW PAW	3-5' TALL B&B OR CONTAINER SPACED 7'-10' O.C.
10	SAMBUCUS CANADENSIS	ELDERBERRY	3-5' TALL B&B OR CONTAINER SPACED 7'-10' O.C.

73 TOTAL

- HERBACEOUS SEED MIX:**
- MUST BE PLANTED IN BETWEEN PLANTINGS.
  - MUST CONSIST OF ONLY NATIVE SPECIES.
  - TO BE STABILIZED AS SPECIFIED ABOVE.

**LEGEND**

- WL ——— NONTIDAL WETLAND BOUNDARY
- WB ——— 25-FOOT WETLAND BUFFER
- LOD ——— LOD ——— LIMITS OF DISTURBANCE
- — — MINOR CONTOUR
- — — MAJOR CONTOUR
- ⊙ ——— SHRUB TO BE PLANTED

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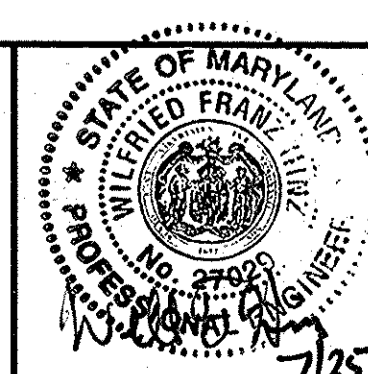
*[Signature]* 7/25/13  
 DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 7/26/13  
 CHIEF, BUREAU OF ENGINEERING DATE

*[Signature]* 7/26/13  
 CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 7/26/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

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 410 - 235 - 3450



DES:	F.B.			
DRN:	M.M.			
CHK:	W.H.			
JUNE 2013				
BY NO.	REVISION	DATE		

**RESTORATION PLAN FOR NONTIDAL WETLAND BUFFER**

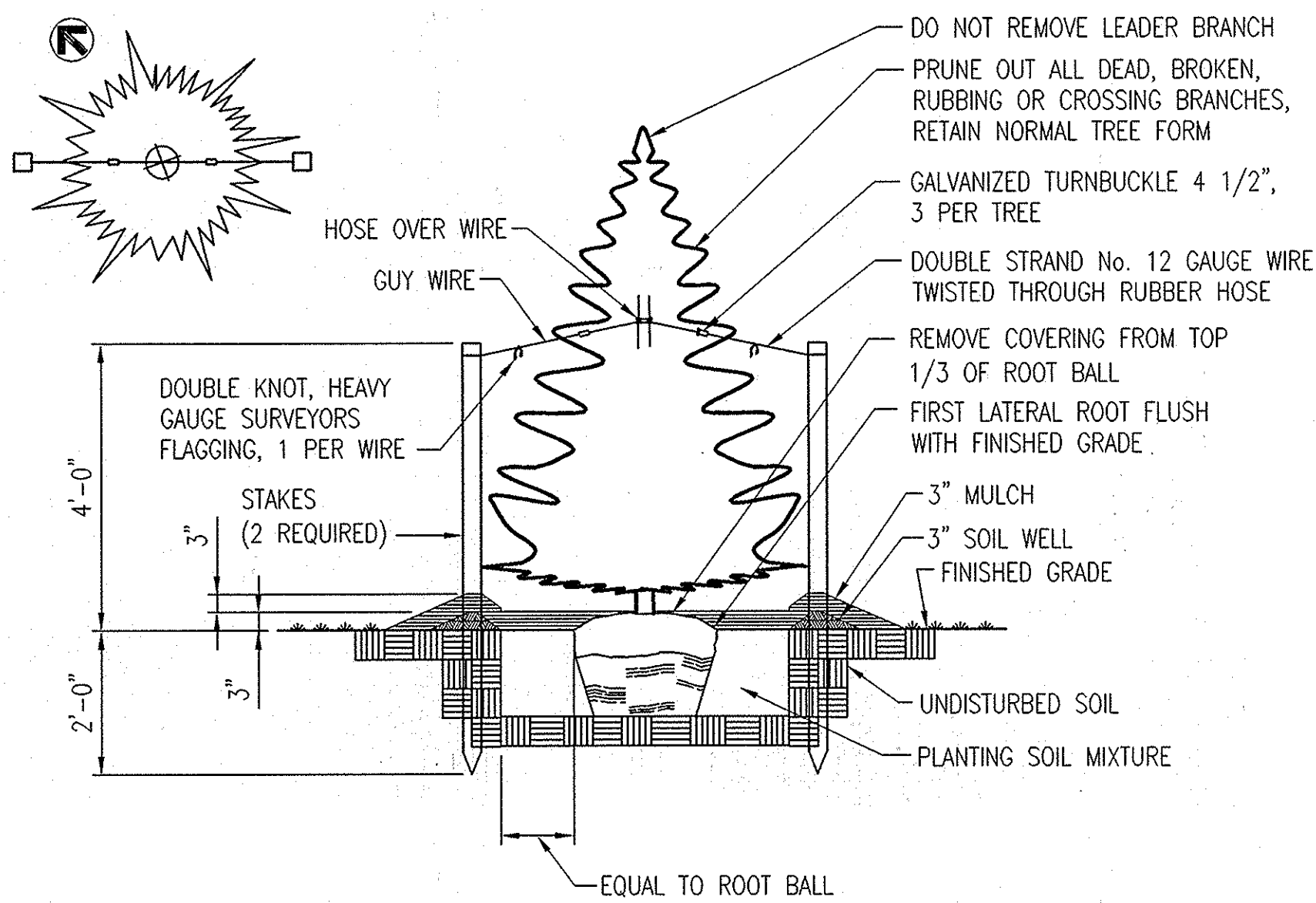
600 SCALE MAP NO. 32 BLOCK NO. 21.

**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION**  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

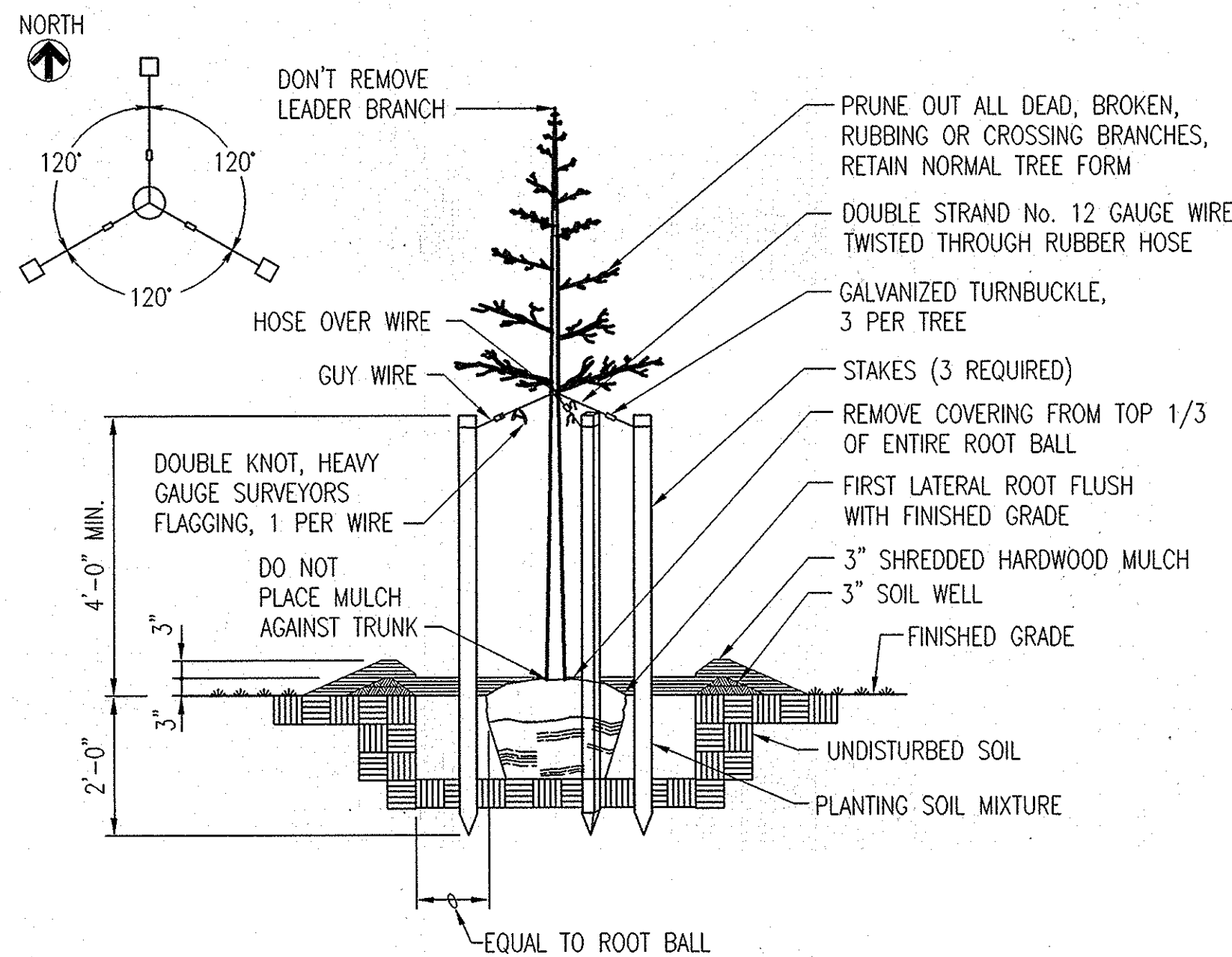
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SCALE AS SHOWN

SHEET 10 OF 36

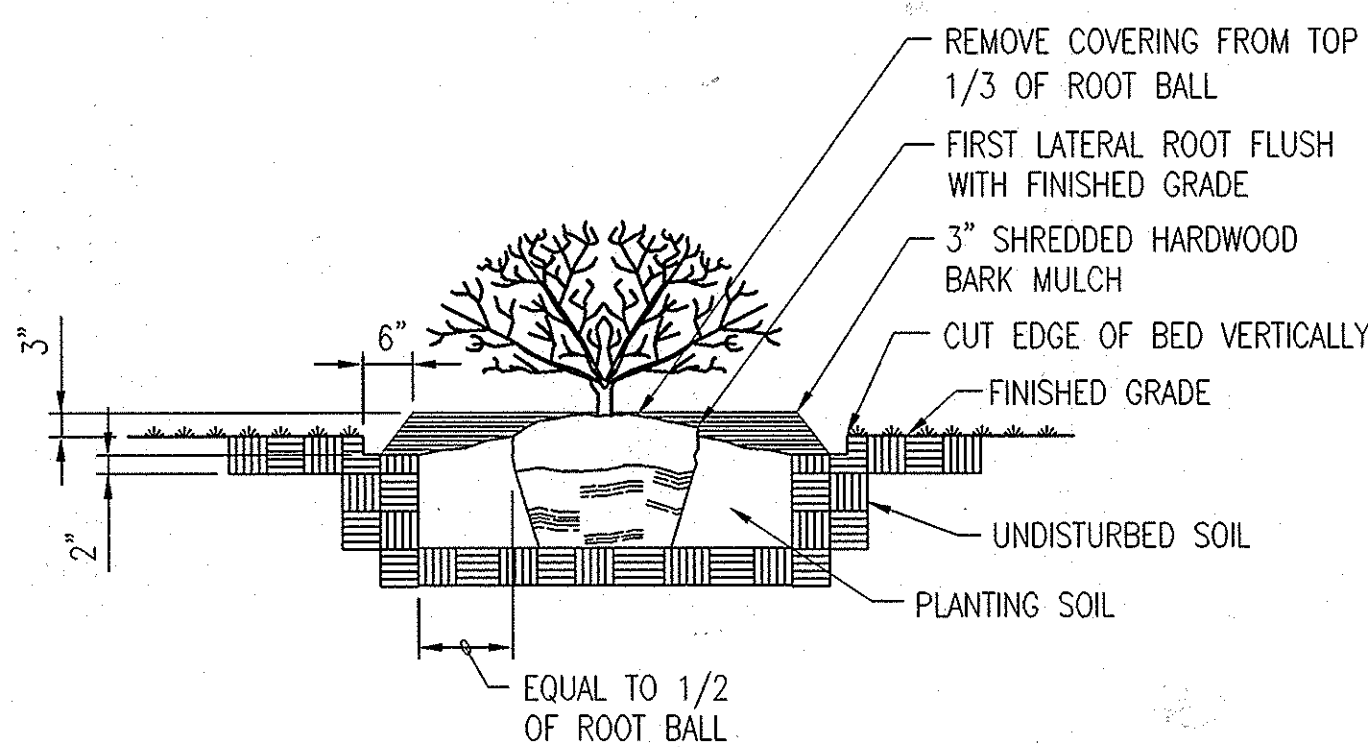


**PLANTING DETAIL - EVERGREEN TREE**  
NOT TO SCALE

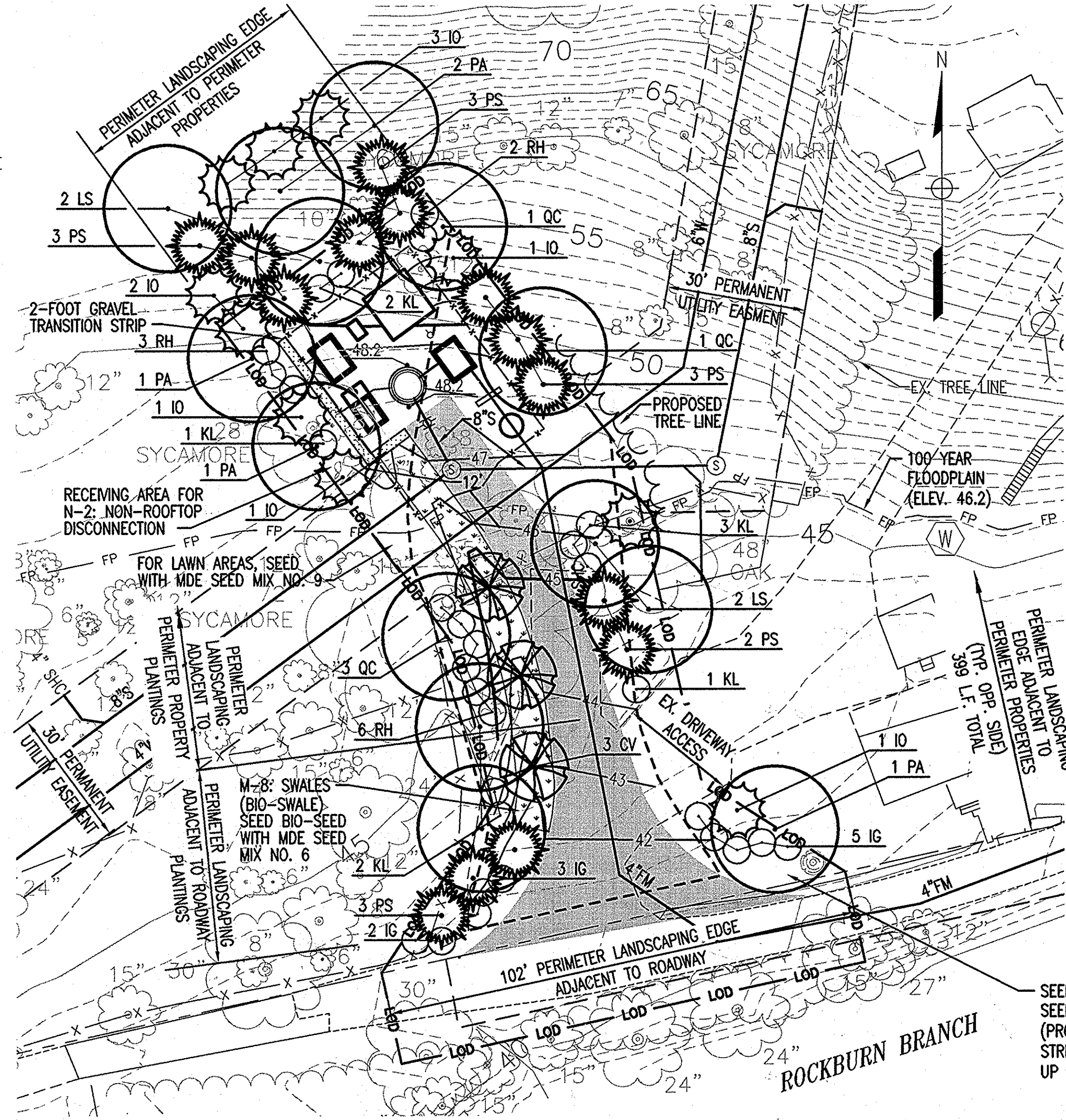


**PLANTING DETAIL - DECIDUOUS TREE**  
NOT TO SCALE

NOTE: PERIMETER LANDSCAPING IS REQUIRED IN ACCORDANCE WITH SECTION 16.124 OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE LANDSCAPE MANUAL.



**PLANTING DETAIL - SHRUB**  
NOT TO SCALE



**PLAN**  
SCALE: 1" = 20'

**SCHEDULE A**  
**PERIMETER LANDSCAPE EDGE**

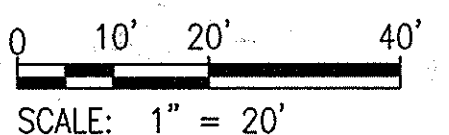
CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	C	C
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	102	459
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES (1 PER 40') EVERGREEN TREES (1 PER 20') SHRUBS	3 5 0	12 23 0
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION) (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	2 5 0 10	12 20 3 20
COMMENTS	3 TREES IN BIO-SWALE A SUBSTITUTION FOR 1 SHADE TREE	

**LANDSCAPE NOTES:**

- THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR CONTACTING MISS UTILITY PRIOR TO BEGINNING CONSTRUCTION FOR LOCATION OF ALL UTILITY LINES. THE LANDSCAPE CONTRACTOR SHALL BE COGNIZANT OF PROPOSED UTILITY LOCATIONS AS SHOWN ON THE PLANS.
- ALL PLANTS SHALL BE EQUAL TO OR BETTER THAN THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK," LATEST EDITION, AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, AND SHALL BE FIRST QUALITY, SOUND, VIGOROUS, WELL BRANCHED, AND WITH HEALTHY, WELL-FURNISHED ROOT SYSTEMS. THEY SHALL BE FREE OF DISEASE, INSECTS, PESTS AND MECHANICAL INJURIES.
- ALL PLANTS SHALL HAVE BEEN NURSERY GROWN AND SHALL HAVE BEEN GROWN UNDER THE SAME CLIMATIC CONDITIONS AS THE LOCATION OF THIS PROJECT FOR AT LEAST TWO YEARS BEFORE PLANTING. NEITHER HEELED IN PLANTS NOR PLANTS FROM COLD STORAGE WILL BE ACCEPTED.
- LANDSCAPE MAINTENANCE OBLIGATIONS SHALL IN ACCORDANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS MANUAL AND THE HOWARD COUNTY LANDSCAPE MANUAL, ADOPTED JANUARY 4, 1993 AMENDED MARCH 2, 1998.
- THE LANDSCAPE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL WATERING DURING CONSTRUCTION AND DURING THE ONE YEAR MAINTENANCE PERIOD.
- FOR SEEDING REQUIREMENTS, SEE THE EROSION AND SEDIMENT CONTROL DETAIL SHEET.
- ALL PLANT MATERIALS, TOPSOIL, MULCH, FERTILIZERS, SOIL AMENITIES, PLANTING SUPPLIES AND METHODS SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. REJECTED MATERIAL SHALL BE REMOVED FROM THE SITE WITHOUT DELAY.
- ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE FULL YEAR TO BE IN A HEALTHY GROWING CONDITION. PLANT MATERIALS WHICH DO NOT FULFILL THIS GUARANTEE SHALL BE REPLACED AT NO COST TO THE OWNER. REPLACEMENT SHALL BE GUARANTEED THROUGHOUT THE ORIGINAL GUARANTEE PERIOD. PLANTS THAT DIE WITHIN 30-60 DAYS SHALL BE REPLACED IMMEDIATELY.
- THE ONE YEAR GUARANTEE PERIOD SHALL BEGIN UPON THE OWNER'S APPROVAL OF THE PLANTING INSTALLATION. THE LANDSCAPE CONTRACTOR SHALL ALSO PROVIDE LANDSCAPE MAINTENANCE DURING THIS PERIOD.
- ALL SUBSTITUTIONS OF PLANT MATERIAL SHALL BE REQUESTED IN WRITING TO THE LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE OWNER. FAILURE TO OBTAIN SUBSTITUTIONS IN WRITING MAY RESULT IN LIABILITY TO THE CONTRACTOR.
- ONE OF THE AMERICAN HOLLY TREES SHALL BE A MALE VARIETY.
- ALL TREES OVER 6' IN HEIGHT MUST BE STAKED.
- AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPING PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL.
- THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL BY PROVIDING 15 SHADE TREES, 22 EVERGREEN TREES AND 30 SHRUBS. FINANCIAL SURETY IS NOT REQUIRED FOR THIS PROJECT BECAUSE IT IS A COUNTY CAPITAL PROJECT.

**LANDSCAPE PLANT SCHEDULE**

QUANTITY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	MATURE SIZE	MIN. SPACING
<b>DECIDUOUS TREES</b>							
3	CV	CHIONANTHUS VIRGINICUS	WHITE FRINGETREE	5'-6' HT.	B&B	HEIGHT: 10'-15' SPREAD: 10'-15'	20' O.C.
4	LS	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2.5"-3" CAL.	B&B	HEIGHT: 60'-70' SPREAD: 30'-40'	20' O.C.
5	PA	PLATANUS X ACERIFOLIA 'BLOODGOOD'	BLOODGOOD LONDON PLANETREE	2.5"-3" CAL.	B&B	HEIGHT: 80'-90' SPREAD: 60'-70'	25' O.C.
5	QC	QUERCUS COCCINEA	SCARLET OAK	2.5"-3" CAL.	B&B	HEIGHT: 40'-60' SPREAD: 40'-50'	20' O.C.
<b>EVERGREEN TREES</b>							
11	IO	ILEX OPACA	AMERICAN HOLLY	6'-7' HT.	B&B	HEIGHT: 40'-50' SPREAD: 18'-40'	10' O.C.
14	PS	PINUS STROBUS 'FASTIGIATA'	COLUMNAR EASTERN WHITE PINE	6'-7' HT.	B&B	HEIGHT: 35'-50' SPREAD: 12'-15'	10' O.C.
<b>EVERGREEN SHRUBS</b>							
10	IG	ILEX GLABRA 'COMPACTA'	COMPACT INKBERRY	2.5'-3' HT.	B&B/CONT.	HEIGHT: 4'-6' SPREAD: 6'-8'	5' O.C.
9	KL	KALMA LATIFOLIA	MOUNTAINLAUREL	2.5'-3' HT.	B&B/CONT.	HEIGHT: 4'-6' SPREAD: 4'-6'	5' O.C.
11	RH	RHODODENDRON P.J.M.	P.J.M. RHODODENDRON	2.5'-3' HT.	B&B/CONT.	HEIGHT: 4'-6' SPREAD: 4'-6'	5' O.C.



"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

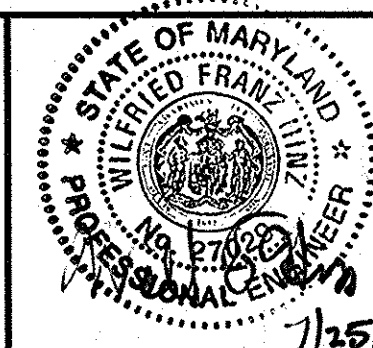
*John De* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*Morgan & Sullivan* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Steve C* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*Chris* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



DES:			
DRN:			
CHK:			
JUNE 2013	BY NO.	REVISION	DATE

PUMP STATION  
LANDSCAPE PLAN

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

EN-2

SCALE  
AS SHOWN

SHEET  
11 OF 36

## EROSION AND SEDIMENT CONTROL - GENERAL NOTES

### HOWARD COUNTY NOTIFICATION

THE CONTRACTOR MUST NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION IN WRITING AND/OR BY TELEPHONE (410) 313-1880 AT THE FOLLOWING POINTS:

- PRE-CONSTRUCTION MEETING (MINIMUM 5 DAYS PRIOR TO START OF CONSTRUCTION)
- FOLLOWING INSTALLATION OF INITIAL SEDIMENT CONTROL MEASURES
- PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL DEVICE
- PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES
- PRIOR TO FINAL ACCEPTANCE BY COUNTY.

THE HOWARD COUNTY SOIL CONSERVATION DISTRICT PROJECT REFERENCE FOR THIS PROJECT IS #EP-12-024

### STANDARDS AND SPECIFICATIONS

ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND ALL REVISIONS THERETO. THE CONTRACTOR SHALL HAVE A COPY OF THE 2011 "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" ON THE SITE.

ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE SEDIMENT AND EROSION CONTROL INSPECTOR. IN ADDITION, SILT FENCE MAY BE CHANGED TO SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

ALL SUPER SILT FENCE IS TO BE INSTALLED IN A "J" HOOK CONFIGURATION WHERE SLOPES EXCEED 5% AT APPROXIMATELY 35-50 FT INTERVALS.

### DISTURBANCE AND REDISTURBANCE

ON ALL SITES WITH DISTURBED AREAS GREATER THAN 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

FOLLOWING INITIAL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN A) 3 CALENDAR DAYS FOR ALL PERIMETER CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.

### INGRESS/EGRESS CONTROLS

THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ON PUBLIC ROADS. ALL MATERIALS DEPOSITED ON PUBLIC ROADS SHALL BE MECHANICALLY REMOVED IMMEDIATELY. THE FLUSHING OF ROAD SURFACES IS PROHIBITED.

TYPICALLY, ALL INGRESS AND EGRESS POINTS SHALL BE CONTROLLED THROUGH THE USE OF A "STABILIZED CONSTRUCTION ENTRANCE."

### INSPECTION

THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES.

### SHUTDOWNS AND OR PENALTIES

TOTAL COMPLIANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS EXPECTED AT ALL TIMES. IN CASES WHERE THE CONTRACTOR IS FOUND TO BE IN NON-COMPLIANCE THE COUNTY MAY TAKE STEPS TO IMPOSE SELECTED OR TOTAL SHUTDOWNS AND IMPOSE PER DAY PENALTIES FOR NON-COMPLIANCE.

THE COUNTY ENGINEER CAN IMPOSE A TOTAL OR PARTIAL SHUTDOWN IF THE PROJECT MAY ADVERSELY IMPACT THE WATERS OF THE STATE.

### RECORD KEEPING

THE PROJECT'S APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, APPROVED CHANGE REQUESTS, DAILY LOG BOOKS AND TEST REPORTS WILL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF HOWARD COUNTY AND MDE.

### EROSION AND SEDIMENT CONTROL EXCAVATION

SILT REMOVED FROM CONTROL DEVICES SHALL BE PLACED IN AN APPROVED WASTE SITE EITHER ON OR OFF THE PROJECT. MATERIAL STORED ON SITE MAY BE REUSED ONCE IT IS DRIED AND IF IT MEETS COUNTY REQUIREMENTS FOR EMBANKMENT OR ANY UNSPECIFIED NEED.

### 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL STANDARD REFERENCE DETAILS

DETAIL NO.	TITLE
B-1	STABILIZED CONSTRUCTION ENTRANCE
E-1	SILT FENCE
E-3	SUPER SILT FENCE
E-9-2	AT GRADE INLET PROTECTION
E-4	FILTER BAG

### OTHER PROTECTION MEASURES

-- TREE PROTECTION (SEE DWG. SC-4)

### UTILITY WORK

SEDIMENT CONTROL FOR UTILITY CONSTRUCTION SHALL FOLLOW THESE ADDITIONAL BEST MANAGEMENT PRACTICES:

- (a) CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK
- (b) EXCAVATED MATERIAL AND OR SPOIL MATERIALS FROM THE TRENCHING OPERATIONS SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
- (c) TRENCHES FOR THE CONSTRUCTION OF UTILITIES SHALL BE LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACKFILLED AND STABILIZED AT THE END OF EACH WORKING DAY, WHICHEVER IS SHORTER. SILT FENCE INSTALLATION IS NOT REQUIRED FOR UTILITY CONSTRUCTION FOR ALL AREAS THAT ARE STABILIZED AT THE END OF EACH WORKING DAY.
- (d) ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON TECH SAME DAY OF DISTURBANCE.

### SENSITIVE AREAS

NO CONSTRUCTION ACTIVITIES SHALL BE UNDERTAKEN WITHIN SPECIFIED SENSITIVE AREAS OF THE PROJECT WITHOUT PRIOR NOTIFICATION OF THE ENGINEER. ALL WORK IN THESE AREAS SHALL BE MONITORED BY A RESPONSIBLE PARTY DESIGNATED BY THE CONTRACTOR TO ASSURE THAT REASONABLE CARE IS TAKEN IN OR ADJACENT TO THESE AREAS. AREAS CONSIDERED SENSITIVE ARE DEFINED AS: FLOODPLAINS, WETLANDS (TIDAL, NONTIDAL AND ASSOCIATED BUFFERS) CRITICAL AREAS, FORESTED AREAS, ARCHEOLOGICAL SITES, HISTORIC SITES, PARKLAND AND OPEN WATER.

### SITE INFORMATION

\* (NOT FOR BIDDING PURPOSES)

TOTAL AREA OF SITE 5.00 ACRES  
 AREA DISTURBED 5.00 ACRES  
 AREA TO BE ROOFED OR PAVED 0.05 ACRES  
 TOTAL CUT 9.400 CU. YDS.  
 TOTAL FILL 9.400 CU. YDS.  
 OFFSITE WASTE/BORROW  
 AREA LOCATION (IF KNOWN) ACRES

NOT KNOWN

### CHECKLIST FOR REQUIRED INSPECTIONS

\*\* NOTICE \*\*

THIS LIST IS FOR THE SEQUENCE OF CONSTRUCTION ONLY. HOWARD COUNTY ASSUMES NO RESPONSIBILITY FOR IMPROPER INSTALLATION OF ANY ITEM ON THIS CHECKLIST. A PROFESSIONAL ENGINEER OR THEIR DESIGNEE MUST CERTIFY ALL ASPECTS OF CONSTRUCTION AND CONFORMANCE TO DESIGN REQUIREMENTS.

### TYPE OF INSPECTION

1. PRE-CONSTRUCTION MEETING
2. COMPLETION OF SEDIMENT CONTROL MEASURES
3. PRIOR TO MODIFICATION OR REMOVAL OF SEDIMENT CONTROL

### BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, WATERWAYS, AND/OR 100-YEAR FLOODPLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS IS TO BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3. DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL MATERIAL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, OR WATERWAYS OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE.
6. RECTIFY ANY NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING RECOMMENDED SPECIES: ANNUAL RYE GRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.) AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN THE WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDING AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT IMPORTANT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM AS FOLLOWS (NOTE: ROCKBURN BRANCH AND THE PATAPSCO RIVER ARE CLASS 1 WATERS):  
 CLASS 1 WATERS - IN-STREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERT(S) SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

### OVERALL PROJECT SEQUENCE OF CONSTRUCTION

1. OBTAIN A GRADING PERMIT FROM HOWARD COUNTY.
2. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS BEFORE ANY CONSTRUCTION IS TO BEGIN.
3. NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION TO ARRANGE A PRE CONSTRUCTION MEETING. NO WORK SHALL BE PERMITTED IN ANY STREAMS BETWEEN MARCH 1 AND JUNE 15.
4. PLACE STABILIZED CONSTRUCTION ENTRANCES AT ALL POINTS OF EASEMENT ACCESS FROM EXISTING ROADS.
5. INSTALL AND STABILIZE SEDIMENT CONTROL MEASURES, CONSISTING PRIMARILY OF SILT FENCE. SEE PLAN AND PROFILE SHEETS FOR ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES.
6. INSTALL SANDBAG DIVERSIONS AND DEWATERING BASINS AT ALL WATERWAY CROSSINGS AS REQUIRED TO INSTALL CROSSING IN SECTIONS. IN ACCORDANCE WITH WATERWAY CONSTRUCTION DETAIL 1.5, THE STREAM SHALL BE DIVERTED FROM ONE SIDE WHILE THE REMAINING SIDE IS CONSTRUCTED. ALL WATERWAY CROSSINGS SHALL BE PERFORMED IN AN EXPEDIENT MANNER. DEWATERING BASINS ON EACH BANK WILL RECEIVE WATER PUMPED FROM THE WATERWAY CROSSING SITE. PORTABLE SEDIMENT TANKS MAY BE USED IN PLACE OF DEWATERING BASINS SO AS TO MINIMIZE DISTURBANCE OF EXISTING TREES AND VEGETATION.
7. STOCKPILE TOPSOIL. ALL TOPSOIL FROM NON-TIDAL WETLANDS SHALL BE MAINTAINED SEPARATE FROM UPLAND MATERIALS AND REUSED WITHIN THE LIMITS OF THE ORIGINAL WETLAND AREA AFTER UTILITY INSTALLATION IS COMPLETED.
8. EXCAVATE FOR AND INSTALL SEWER MAINS, WATERMANS AND ASSOCIATED STRUCTURES. EXCAVATION FROM TRENCHING OPERATIONS SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
9. VEGETATIVELY STABILIZE BACKFILLED TRENCH AND STRUCTURE SITES AS WORK PROGRESSES.
10. NOTIFY HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (CID, 410-313-1880) AND OBTAIN APPROVAL TO REMOVE EROSION AND SEDIMENT CONTROL MEASURES
11. PERMANENTLY STABILIZE ANY AREAS DISTURBED DURING CLEANUP ACTIVITIES.

### STANDARD SYMBOLS

EARTH DIKE	
TEMPORARY SWALE	
PERIMETER DIKE/SWALE	
STONE CHECK DAM	
STONE OUTLET STRUCTURE	
SILT FENCE	
SUPER SILT FENCE	
STRAW BALES	
STANDARD INLET PROTECTION	
AT GRADE INLET PROTECTION	
CURB INLET PROTECTION	
MEDIAN INLET PROTECTION	
GABION INFLOW PROTECTION	
RIPRAP INFLOW PROTECTION	
SUMP PIT	<input checked="" type="checkbox"/> SP
REMOVABLE PUMPING STATION	<input checked="" type="checkbox"/> RPS
PORTABLE SEDIMENT TANK	<input checked="" type="checkbox"/> PST
INTERCEPTOR BERM	
TEMPORARY BERM	
PIPE SLOPE DRAIN	
STABILIZED CONSTRUCTION ENTRANCE	
SOIL STABILIZATION MATTING	
PLACED RIPRAP DITCH	
GABIONS	
CONCRETE GUTTER	
STONE OUTLET SEDIMENT TRAP	
RIPRAP OUTLET SEDIMENT TRAP	
STONE/RIPRAP OUTLET SEDIMENT TRAP	
PIPE OUTLET SEDIMENT TRAP	
LIMIT OF DISTURBANCE	LOD
EXISTING CONTOURS	100
PROPOSED CONTOURS	100

"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*John G. De...* 7/25/13  
 DIRECTOR OF PUBLIC WORKS DATE

*Marcus J. Subla* 7/26/13  
 CHIEF, BUREAU OF ENGINEERING DATE

*Shirley C. ...* 7/26/13  
 CHIEF, BUREAU OF UTILITIES DATE

*...* 7/26/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
 WHITMAN, REQUIART AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450

STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 7/25/13

DES:	
DRN:	
CHK:	
JUNE 2013	
BY:	NO.
REVISION	DATE

EROSION AND SEDIMENT CONTROL  
 GENERAL NOTES:  
 HOWARD COUNTY

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

SC-1

SCALE AS SHOWN

SHEET 12 OF 36

**H-1 STANDARDS AND SPECIFICATIONS**

**FOR MATERIALS**

Table H.1: Geotextile Fabrics

PROPERTY	TEST METHOD	WOVEN SLIT FILM GEOTEXTILE		WOVEN MONOFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MD	CD	MD	CD	MD	CD
MINIMUM AVERAGE ROLL VALUE <sup>1</sup>							
Grab Tensile Strength	ASTM D-4632	200 lb	200 lb	370 lb	250 lb	200 lb	200 lb
Grab Tensile Elongation	ASTM D-4632	15%	10%	15%	15%	50%	50%
Trapezoidal Tear Strength	ASTM D-4533	75 lb	75 lb	100 lb	60 lb	80 lb	80 lb
Puncture Strength	ASTM D-6241	450 lb		900 lb		450 lb	
Apparent Opening Size <sup>2</sup>	ASTM D-4751	U.S. Sieve 30 (0.59 mm)		U.S. Sieve 70 (0.21 mm)		U.S. Sieve 70 (0.21 mm)	
Permittivity	ASTM D-4491	0.05 sec <sup>-1</sup>		0.28 sec <sup>-1</sup>		1.1 sec <sup>-1</sup>	
Ultraviolet Resistance Retained at 500 hours	ASTM D-4355	70% strength		70% strength		70% strength	

<sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.

<sup>2</sup> Values for AOS represent the average maximum opening.

Geotextiles must be evaluated by the National Transportation Product Evaluation Program (NTPPE) and conform to the values in Table H.1.

The geotextile must be inert to commonly encountered chemicals and hydrocarbons and must be rot and mildew resistant. The geotextile must be manufactured from fibers consisting of long chain synthetic polymers and composed of a minimum of 95 percent by weight of polyolefins or polyesters, and formed into a stable network so the filaments or yarns retain their dimensional stability relative to each other, including shwags.

When more than one section of geotextile is necessary, overlap the sections by at least one foot. The geotextile must be pulled taut over the applied surface. Equipment must not run over exposed fabric. When placing riprap on geotextile, do not exceed a one foot drop height.

H.1

**B-4-3 STANDARDS AND SPECIFICATIONS**

**FOR SEEDING AND MULCHING**

**Definition**

The application of seed and mulch to establish vegetative cover.

**Purpose**

To protect disturbed soils from erosion during and at the end of construction.

**Conditions Where Practice Applies**

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

**Criteria**

- A. Seeding
- Specifications
    - All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
    - Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
    - Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
    - Soil or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phytotoxic materials.
  - Application
    - Dry Seeding: This includes use of conventional drop or broadcast spreaders.
      - Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
      - Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.

B.15

**B-4-2 STANDARDS AND SPECIFICATIONS**

**FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS**

**Definition**

The process of preparing the soils to sustain adequate vegetative stabilization.

**Purpose**

To provide a suitable soil medium for vegetative growth.

**Conditions Where Practice Applies**

Where vegetative stabilization is to be established.

**Criteria**

- A. Soil Preparation
- Temporary Stabilization
    - Seeded preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
      - Apply fertilizer and lime as prescribed on the plans.
      - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
    - Permanent Stabilization
      - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
        - Soil pH between 6.0 and 7.0.
        - Soluble salts less than 500 parts per million (ppm).
        - Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: If fescuegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
        - Soil contains 1.5 percent minimum organic matter by weight.
        - Soil contains sufficient pore space to permit adequate root penetration.
      - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
      - Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.

B.12

- B. Mulching
- Mulch Materials (in order of preference)
    - Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
    - Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
      - WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
      - WCFM, including dye, must contain no germination or growth inhibiting factors.
      - WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
      - WCFM material must not contain elements or compounds at concentration levels that will be phytotoxic.
      - WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
  - Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
    - Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
    - Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
  - Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
    - If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P<sub>2</sub>O<sub>5</sub> (phosphorous), 200 pounds per acre; K<sub>2</sub>O (potassium), 200 pounds per acre.
    - Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
    - Mix seed and fertilizer on site and seed immediately and without interruption.
    - When hydroseeding do not incorporate seed into the soil.

B.16

- Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
- Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

- Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
- Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
- Topsoiling is limited to areas having 2:1 or flatter slopes where:
  - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
  - The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
  - The original soil to be vegetated contains material toxic to plant growth.
  - The soil is so acidic that treatment with limestone is not feasible.
- Areas having slopes steeper than 2:1 require special consideration and design.
- Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
  - Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
  - Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
  - Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
- Topsoil Application
  - Erosion and sediment control practices must be maintained when applying topsoil.
  - Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
  - Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading.

B.13

2. Application

- Apply mulch to all seeded areas immediately after seeding.
  - When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
  - Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
- Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
    - A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
    - Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
    - Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petrosol, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
    - Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B.17

C. Soil Amendments (Fertilizer and Lime Specifications)

- Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analysis.
- Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
- Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
- Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
- Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B.14

**B-4-4 STANDARDS AND SPECIFICATIONS**

**FOR TEMPORARY STABILIZATION**

**Definition**

To stabilize disturbed soils with vegetation for up to 6 months.

**Purpose**

To use fast growing vegetation that provides cover on disturbed soils.

**Conditions Where Practice Applies**

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

**Criteria**

- Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
- For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

Temporary Seeding Summary

Hardiness Zone (from Figure B.3): 7a				Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)	Lime Rate
No.	Species	Application Rate (lb/acre)	Seeding Dates				
1	ANNUAL Ryegrass (perennial ryegrass)	40	FEB 15 - APR 30	0.5	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)	
	ORZ	72	FEB 15 - APR 30				
2	FODDLE MILLET (perennial)	30	MAY 1 - AUG 14	0.5	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)	
	PERN. MILLET (perennial ryegrass)	20	MAY 1 - AUG 14				

B.18

"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. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *Raymond DeLoach* DATE: *7/26/13*  
 Chief, Bureau of Engineering: *Thomas J. Sullivan* DATE: *7/26/13*  
 Chief, Bureau of Utilities: *William Chan* DATE: *7/26/13*  
 Chief, Utility Design Division: *John DeLoach* DATE: *7/26/13*

**WR&A**  
WHITMAN, REINHARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



DES:	
DRN:	
CHK:	
JUNE 2013	
BY NO.	REVISION
	DATE

EROSION AND SEDIMENT CONTROL  
GENERAL NOTES/DETAILS:  
HOWARD COUNTY

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SC-2

SCALE  
AS SHOWN

SHEET  
13 OF 38

**B-4-S STANDARDS AND SPECIFICATIONS**

**FOR**

**PERMANENT STABILIZATION**

**Definition**

To stabilize disturbed soils with permanent vegetation.

**Purpose**

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

**Conditions Where Practice Applies**

Exposed soils where ground cover is needed for 6 months or more.

**Criteria**

**A. Seed Mixtures**

**1. General Use**

- a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
- b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
- c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
- d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.

**2. Turfgrass Mixtures**

- a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
- b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
  - i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
  - ii. Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where

B.21

rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.

iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.

iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 1/2 to 3 pounds per 1000 square feet.

Notes:  
Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line

c. Ideal Times of Seeding for Turf Grass Mixtures

Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)

Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)

Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)

d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the area to prepare a proper seedbed. Remove stones and debris over 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.

e. If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2 to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

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No.	Species	Application Rate (lb/acre)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
					N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Hardiness Zone (from Figure B.3): 7A Seed Mixture: NATIVE								
	LITTLE BLUESTEM	10	FEB 15 TO APRIL 30	1/4-1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
	DEERTONGUE TOGA	5	AND	1/4-1/2 in				
	BROWNSEDEGE MO SCOTCHIE	2	AUG 15 TO NOV 30	1/4-1/2 in				
	RIVER OATS PAVA BLEND	5		1/4-1/2 in				

NOTE: NATIVE SEED MIXTURE IS REQUIRED TO BE USED WITHIN THE PATAPSCO STATE PARK.

No.	Species	Application Rate (lb/acre)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
					N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Hardiness Zone (from Figure B.3): 7A Seed Mixture: Creeping Red Fescue								
	CREeping RED FESCUE	30	FEB 15 TO APRIL 30	1/4-1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
	CHEWING FESCUE	30	AND	1/4-1/2 in				
	KENTUCKY BLUEGRASS	20	AUG 15 TO OCT 31	1/4-1/2 in				
	ROUGH BLUEGRASS	15		1/4-1/2 in				

**MAINTENANCE FERTILIZATION FOR PERMANENT SEEDINGS**

**USE SOIL TEST RESULTS OR RATES SHOWN BELOW**

SEEDING MIXTURE	TYPE	LB/AC	LB/1000 SF	TIME	MOWING
TALL FESCUE MAKES UP 70% OR MORE OF COVER	10-10-10 OR 30-10-10	500	11.5	YEARLY OR AS NEEDED, FALL	NOT CLOSER THAN 3" IF OCCASIONAL MOWING IS DESIRED
CROWNWETCH SERICEA LESPEDEZA BIRDFOOT TREFLOIL	0-20-0	400	9.2	SPRING, THE YEAR FOLLOWING ESTABLISHMENT AND EVERY 4-5 YEARS THEREAFTER	DO NOT MOW CROWNWETCH
FAIRLY UNIFORM STAND OF TALL FESCUE AND SERICEA LESPEDEZA OR BIRDFOOT TREFLOIL	5-10-10	500	11.5	FALL, THE YEAR FOLLOWING ESTABLISHMENT AND EVERY 4-5 YEARS THEREAFTER	NOT REQUIRED, NO CLOSER THAN 4" IN THE FALL AFTER SEED HAS MATURED.
WEeping LOVeGRASS & SERICEA LESPEDEZA FAIRLY UNIFORM PLANT DISTRIBUTION.	5-10-10	500	11.5	SPRING, THE YEAR FOLLOWING ESTABLISHMENT AND EVERY 4-5 YEARS THEREAFTER.	NOT REQUIRED, NO CLOSER THAN 4" IN THE FALL AFTER SEED HAS MATURED.
RED & CHEWING FESCUE, KENTUCKY BLUEGRASS, HARD FESCUE MIXTURES	20-10-10	250	5.8	SEPTEMBER, 30 DAYS LATER, DECEMBER, MAY 20, JUNE 30, IF NEEDED.	MOW NO CLOSER THAN 2" FOR RED FESCUE AND KENTUCKY BLUEGRASS, 3" FOR FESCUE.
		100	2.3		

B. Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).

**1. General Specifications**

- a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
- b. Sod must be machine cut at a uniform soil thickness of 3/4 inch, plus or minus 1/8 inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
- c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.

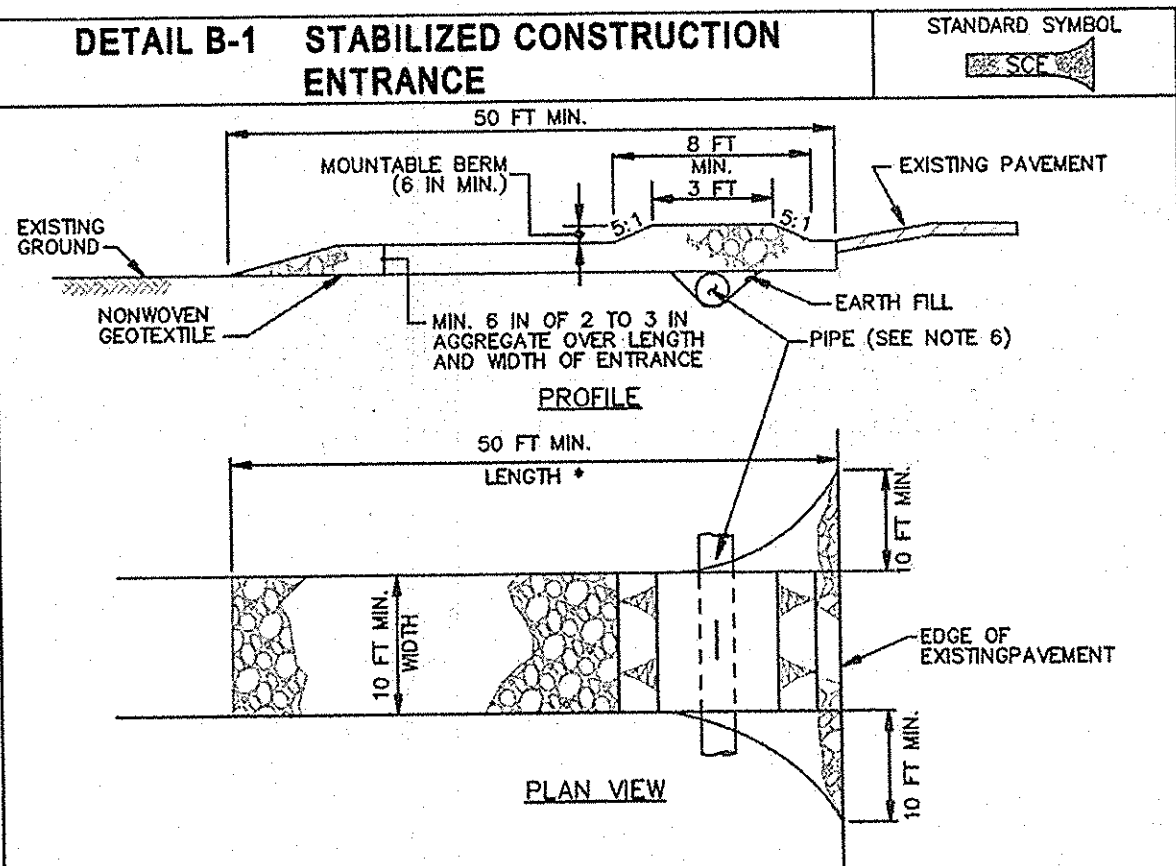
**2. Sod Installation**

- a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
- b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
- d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.

B.23

**3. Sod Maintenance**

- a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
- b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
- c. Do not mow until the sod is firmly rooted. No more than 1/2 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

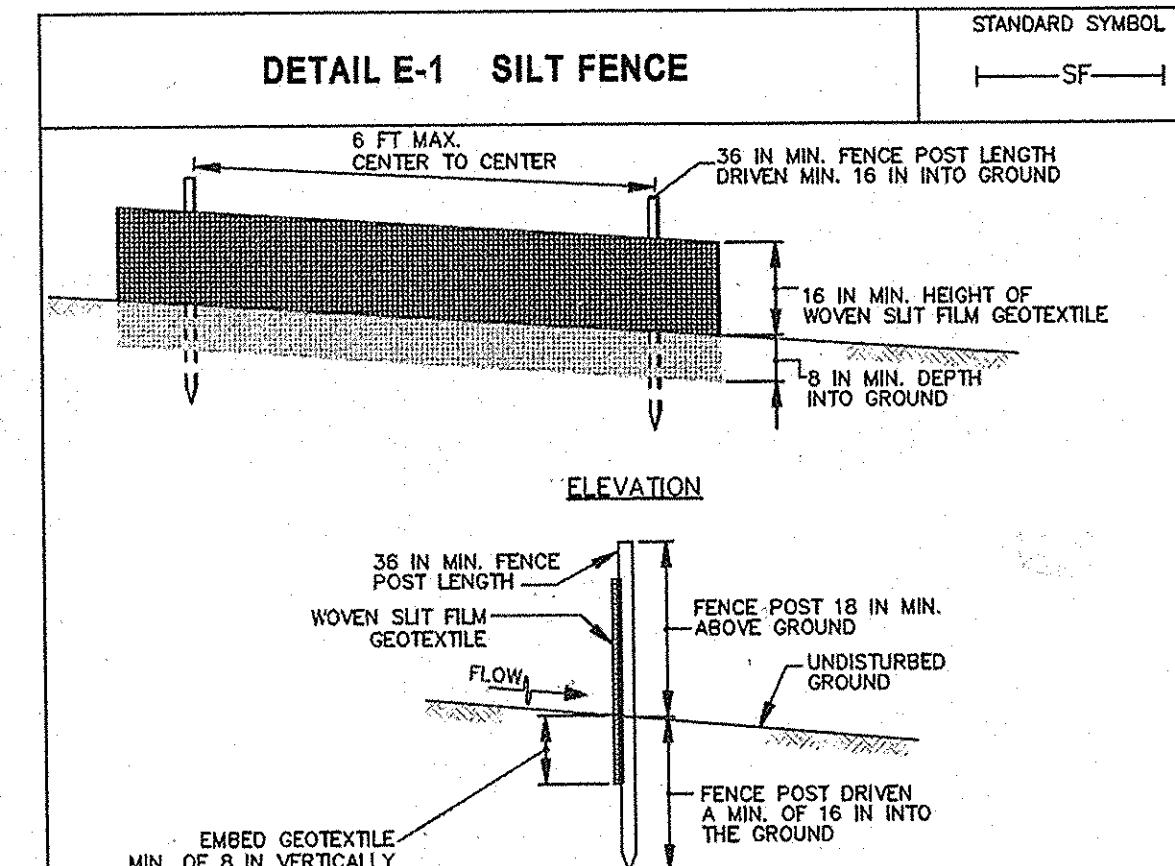


**CONSTRUCTION SPECIFICATIONS**

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (40 FEET FOR SINGLE RESIDENCE LOTS). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE TO 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 6:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE. MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
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B.2

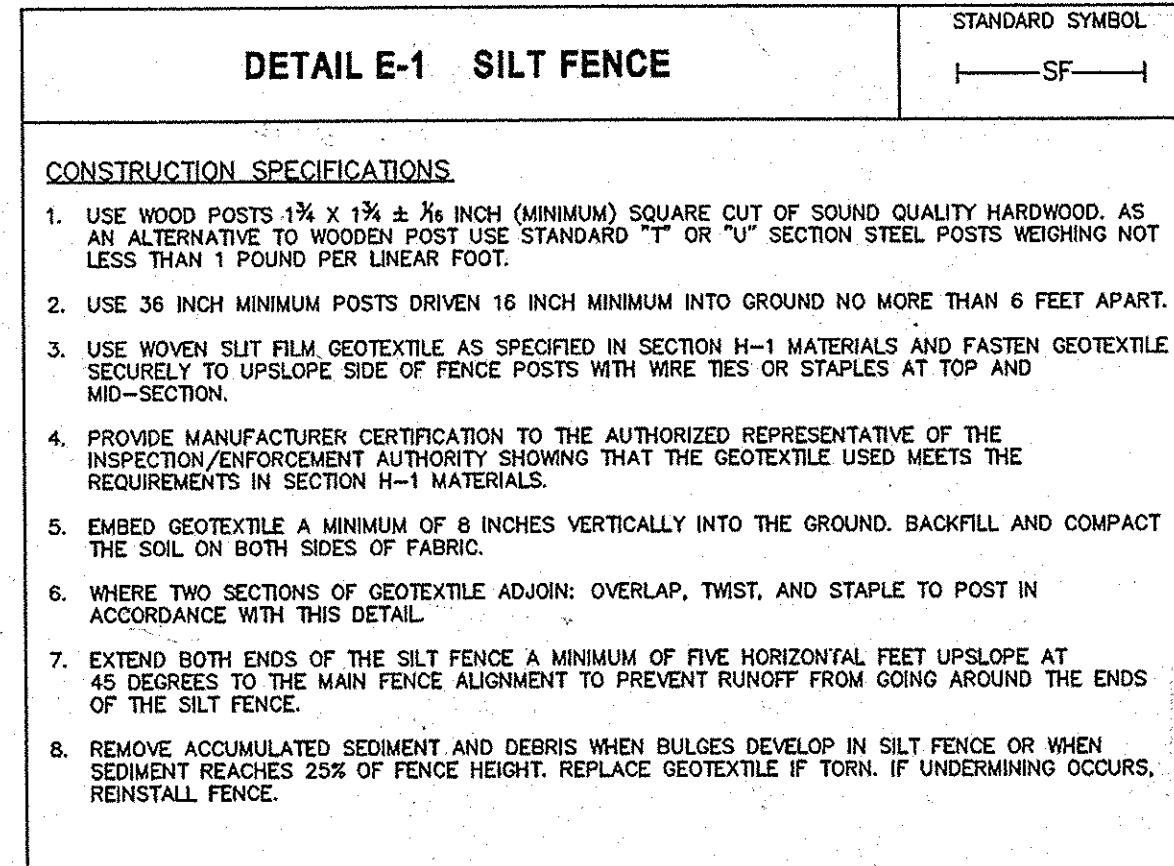


**CONSTRUCTION SPECIFICATIONS**

1. USE WOOD POSTS 1 1/2 x 1 1/2 x 3/4 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POSTS USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

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E.2

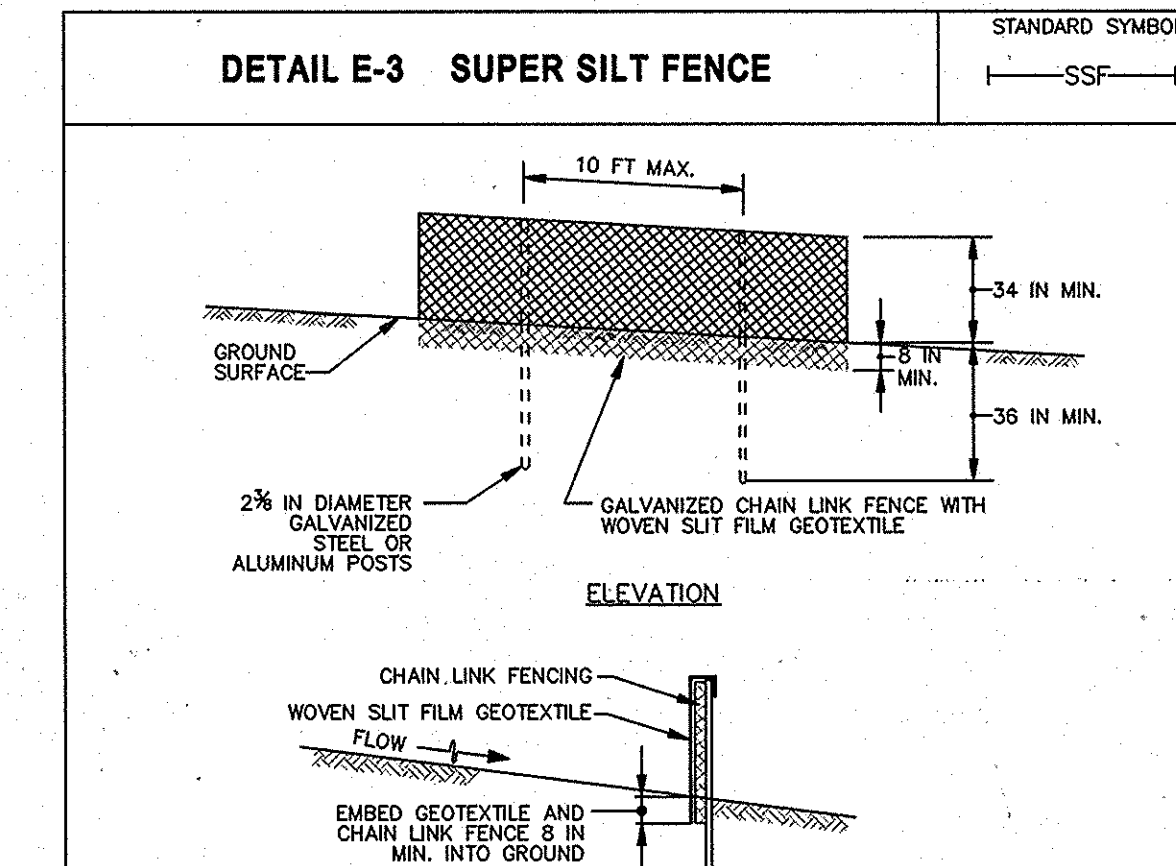


**CONSTRUCTION SPECIFICATIONS**

1. USE WOOD POSTS 1 1/2 x 1 1/2 x 3/4 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POSTS USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

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E.3



**CONSTRUCTION SPECIFICATIONS**

1. INSTALL 2 1/2 INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 1/2 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
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MARYLAND DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES ADMINISTRATION

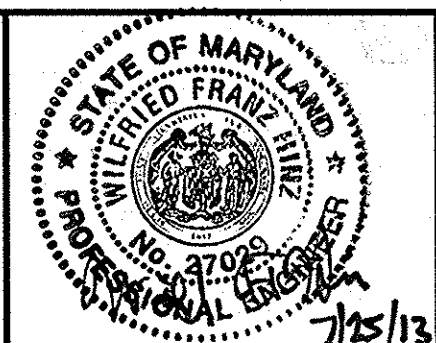
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"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 27029, EXPIRATION DATE: 01-25-2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John R. Butler* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE  
*Michael J. Butler* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE  
*John R. Butler* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE  
*John R. Butler* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



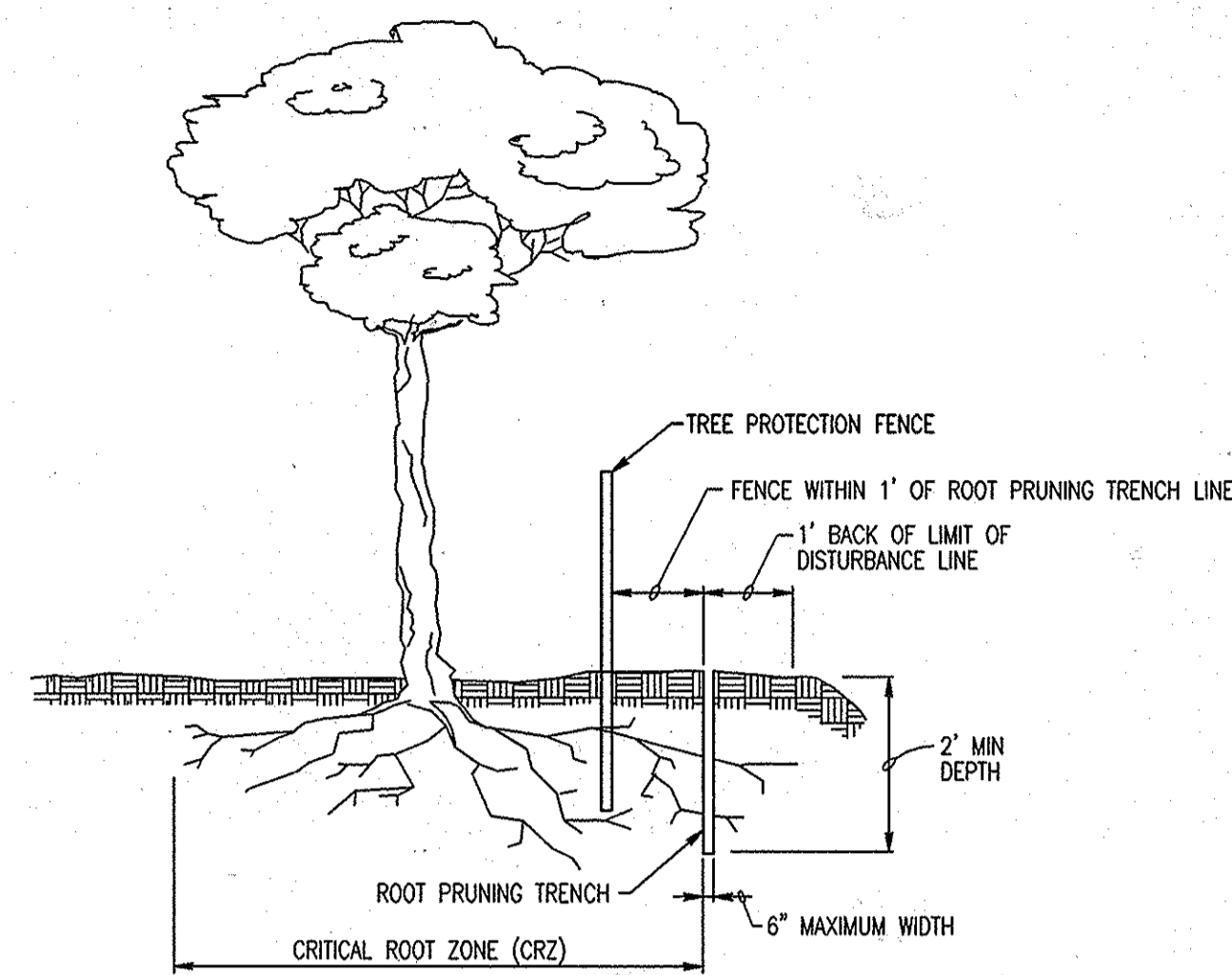
DES:	
DRN:	
CHK:	
JUNE 2013	
BY NO.	REVISION
	DATE

EROSION AND SEDIMENT CONTROL  
DETAILS:  
HOWARD COUNTY

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSWALK ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SC-3  
SCALE AS SHOWN  
SHEET 14 OF 36



THE CRITICAL ROOT ZONE (CRZ):  
 FOR TREES ALONG THE EDGES OF STANDS, THE CRZ RADIUS = 1 FOOT FOR EVERY 1 INCH OF TREE DIAMETER.  
 FOR RETENTION AREAS LESS THAN 10,000 SF AND ISOLATED SPECIMEN TREES, THE CRZ RADIUS = 1.5 FEET FOR EVERY 1 INCH OF TREE DIAMETER.

- NOTES:**
1. RETENTION AREAS TO BE ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN REVIEW PROCESS OR AS SHOWN ON THE PLAN(S).
  2. BOUNDARIES OF RETENTION AREAS TO BE STAKED AND FLAGGED PRIOR TO ROOT PRUNING TRENCHING.
  3. EXACT LOCATION OF TRENCH SHALL BE IDENTIFIED.
  4. ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.
  5. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR OTHER HIGH ORGANIC SOIL.

**DETAIL - ROOT PRUNING**  
NO SCALE

**TREE CONSERVATION NOTES**

**PRE-CONSTRUCTION ACTIVITIES**

- PRIOR TO THE START OF ANY CONSTRUCTION:
- A. THE CONTRACTOR SHALL LOCATE THE LIMITS OF DISTURBANCE (LOD) IN THE FIELD PRIOR TO ANY CONSTRUCTION ACTIVITIES. THEN INSTALL ALONG THE LOD BLAZE ORANGE FENCING. LOD SHALL BE PLACED OUTSIDE OF CRITICAL ROOT ZONES OF TREES TO BE PRESERVED WHEREVER POSSIBLE.
  - B. BLAZE ORANGE FENCING:
    1. BLAZE ORANGE FENCING SHALL BE PLACED ON ALL LIMITS OF DISTURBANCE, EXCEPT WHERE INGRESS/EGRESS IS REQUIRED.
    2. ALL FENCING SHALL BE INSTALLED PRIOR TO CONSTRUCTION ACTIVITIES.
    3. FENCING SHALL BE FIRMLY ANCHORED AT SPACING NO GREATER THAN EIGHT FEET AND CONSTRUCTED IN A MANNER WHICH PRECLUDES SAGGING.
    4. ALL FENCING SHALL BE MAINTAINED IN A GOOD CONDITION AND PROMPTLY REPAIRED OR RESTORED AS THE SITUATION WARRANTS, FOR THE PROTECTION OF THE ADJACENT TREES/WOODLANDS.
  - C. SIMULTANEOUS WITH CLEARING, THE FOLLOWING STEPS SHOULD BE UNDERTAKEN TO REDUCE STRESS TO EXISTING TREES:
    1. FERTILIZE TREES WITHIN 20 FEET OF THE CONSTRUCTION AREA AT THE RATE OF 3 POUNDS OF NITROGEN PER 1000 SQUARE FEET OF ROOT ZONE DISTURBED. APPLY FERTILIZER TO ENTIRE CRITICAL ROOT ZONE OUT TO THE BLAZE ORANGE FENCING.
    2. FERTILIZER SHOULD BE AT LEAST 50 PERCENT SLOW RELEASE NITROGEN AND CONTAIN OTHER ESSENTIAL ELEMENTS AND MICRO-NUTRIENTS.
    3. WATER CRITICAL ROOT ZONE IMMEDIATELY AFTER APPLYING FERTILIZER TO SATURATE THE TOP 6 INCHES OF SOIL.
    4. A MULCH, 1 TO 4 INCHES DEEP COMPRISED OF WOOD CHIPS OR SHREDDED BARK OR LEAVES, SHALL BE APPLIED IN THE CRITICAL ROOT ZONE ADJACENT TO THE BLAZE ORANGE FENCING.

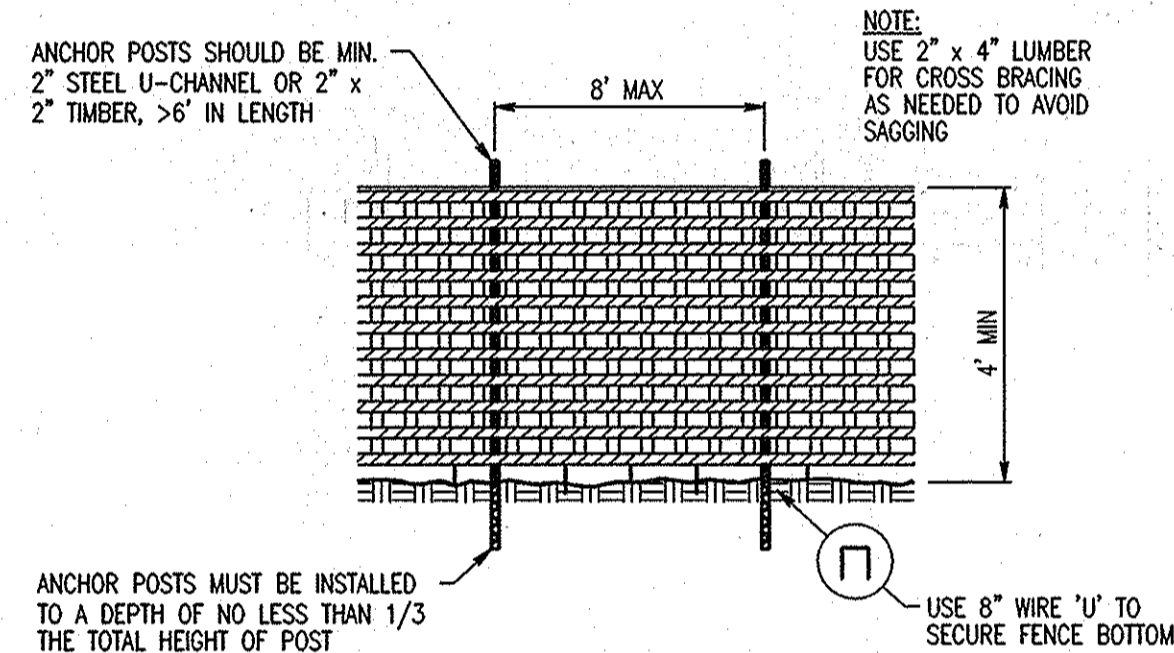
**CONSTRUCTION PHASE**

- A. EXCAVATED AND BACK FILL MATERIAL SHALL NOT BE PLACED OR SIDE CAST WITHIN THE CRITICAL ROOT ZONES OF TREES TO BE PROTECTED.
- B. CONSTRUCTION EQUIPMENT SHALL NOT BE DRIVEN INTO OR THROUGH PROTECTED TREES. NOR SHALL SWING CRANES OR BACKHOES BE ALLOWED IN THEIR CANOPIES.
- C. THERE SHALL BE NO STACKING OR STORING OF SUPPLIES WITHIN THE CRITICAL ROOT ZONES OF TREES TO BE PROTECTED.
- D. TREES TO BE REMOVED SHALL BE TAKEN OUT WITHOUT DAMAGING PROTECTED TREES.
- E. ALL GRADING SHALL TAKE PLACE OUTSIDE OF THE CRITICAL ROOT ZONE OF THE TREES TO BE PROTECTED.
- F. ALL EQUIPMENT SHALL BE KEPT INSIDE THE BLAZE ORANGE FENCING AND WITHIN THE LIMITS OF DISTURBANCE.
- G. IN THE EVENT OF DROUGHT, THE PROTECTED TREES SHALL BE MONITORED FOR SIGNS OF STRESS AND WATERED AS NEEDED.

**POST-CONSTRUCTION ACTIVITIES**

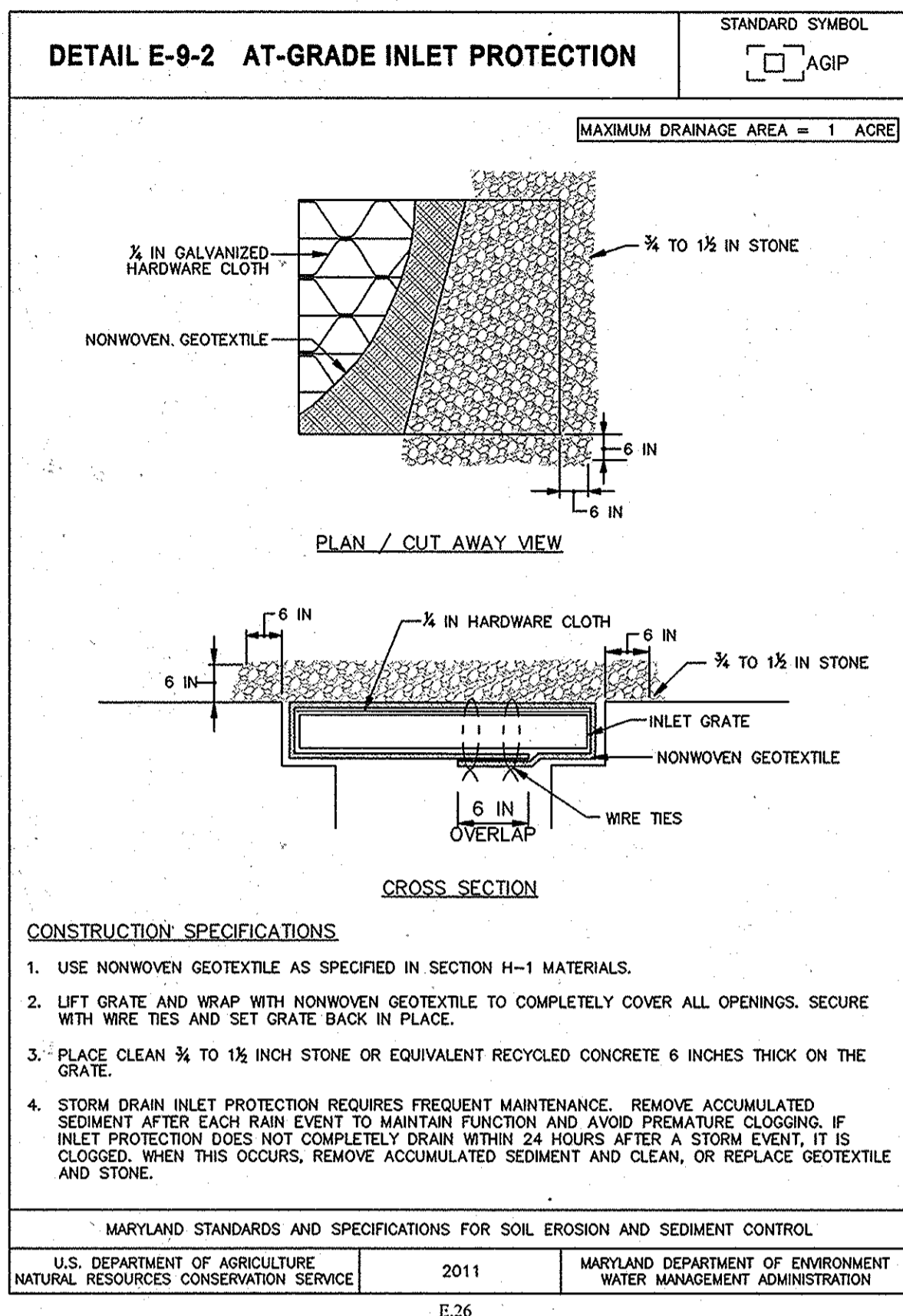
- A. THE CONTRACTOR SHALL RETAIN A CERTIFIED TREE EXPERT, LANDSCAPE ARCHITECT, FORESTER OR ARBORIST TO DEVELOP A TREE REPAIR PLAN. THE TREE REPAIR PLAN MUST BE APPROVED BY THE COUNTY.

**DETAIL - TREE PROTECTION**

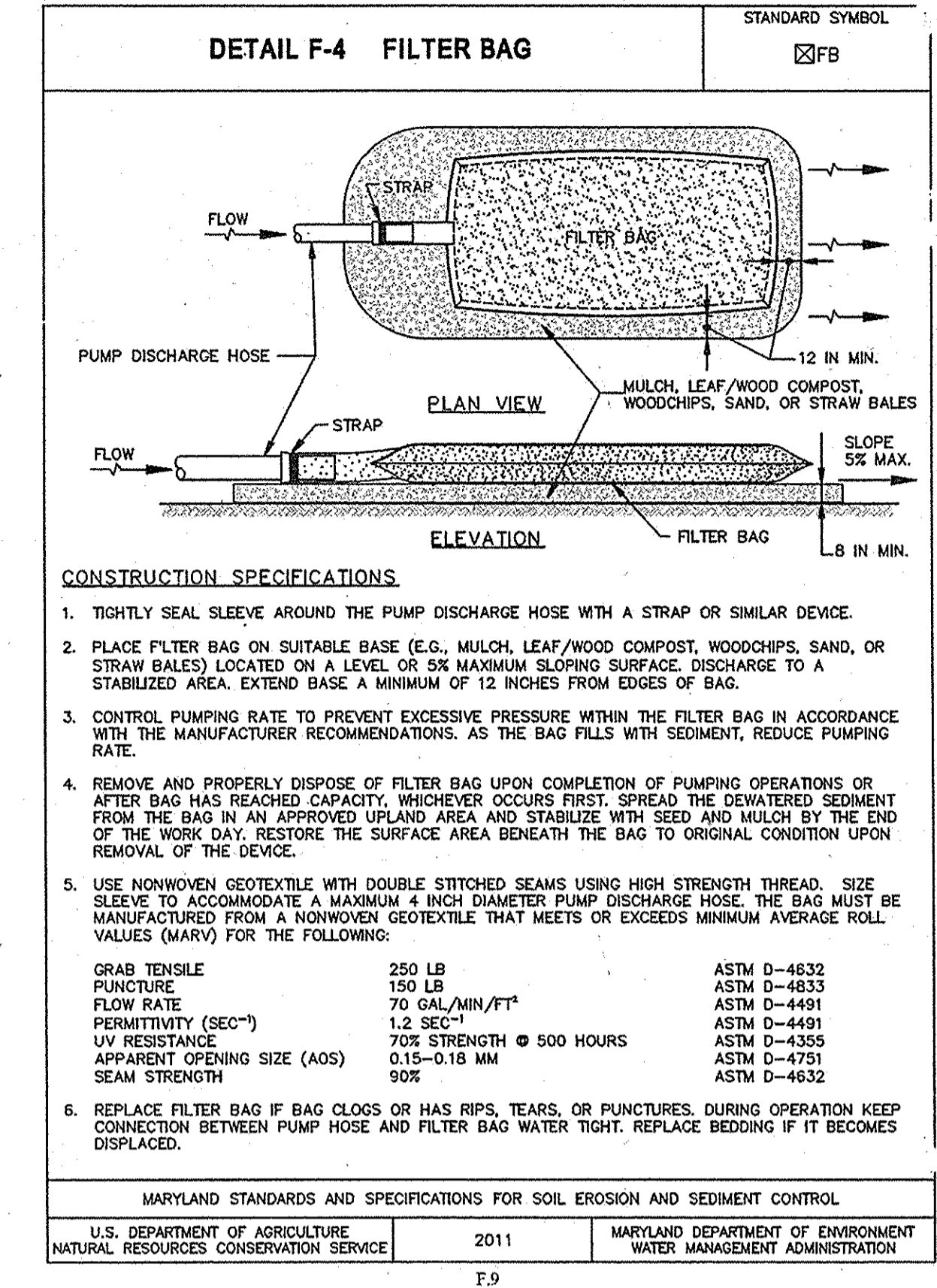


- NOTES:**
1. BLAZE ORANGE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE.
  2. BOUNDARIES OF RETENTION AREA WILL BE ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN REVIEW PROCESS OR AS SHOWN ON THE PLAN(S).
  3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
  4. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
  5. PROTECTION SIGNAGE IS TO BE PROVIDED AND PLACED IF REQUIRED BY THE COUNTY.
  6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

**PLASTIC MESH TREE PROTECTION FENCE**  
NO SCALE



- CONSTRUCTION SPECIFICATIONS:**
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
  2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
  3. PLACE CLEAN 3/4 TO 1 1/2 INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
  4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.
- MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
 U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION  
 E.26



- CONSTRUCTION SPECIFICATIONS:**
1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
  2. PLACE FILTER BAG ON SUITABLE BASE (E.G. MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
  3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
  4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY. WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
  5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:
 

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4633
FLOW RATE	70 GAL./MIN./FT <sup>2</sup>	ASTM D-4491
PERMITTIVITY (SEC <sup>-2</sup> )	1.2 SEC <sup>-2</sup>	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632
  6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.
- MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL  
 U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION  
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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Director of Public Works: *John P. De...* 7/26/13  
 Chief, Bureau of Engineering: *Thomas P. Swartz* 7/26/13  
 Chief, Bureau of Utilities: *Steve...* 7/26/13  
 Chief, Utility Design Division: *...* 7/26/13

**WR&A**  
 WHITMAN, REINHART AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
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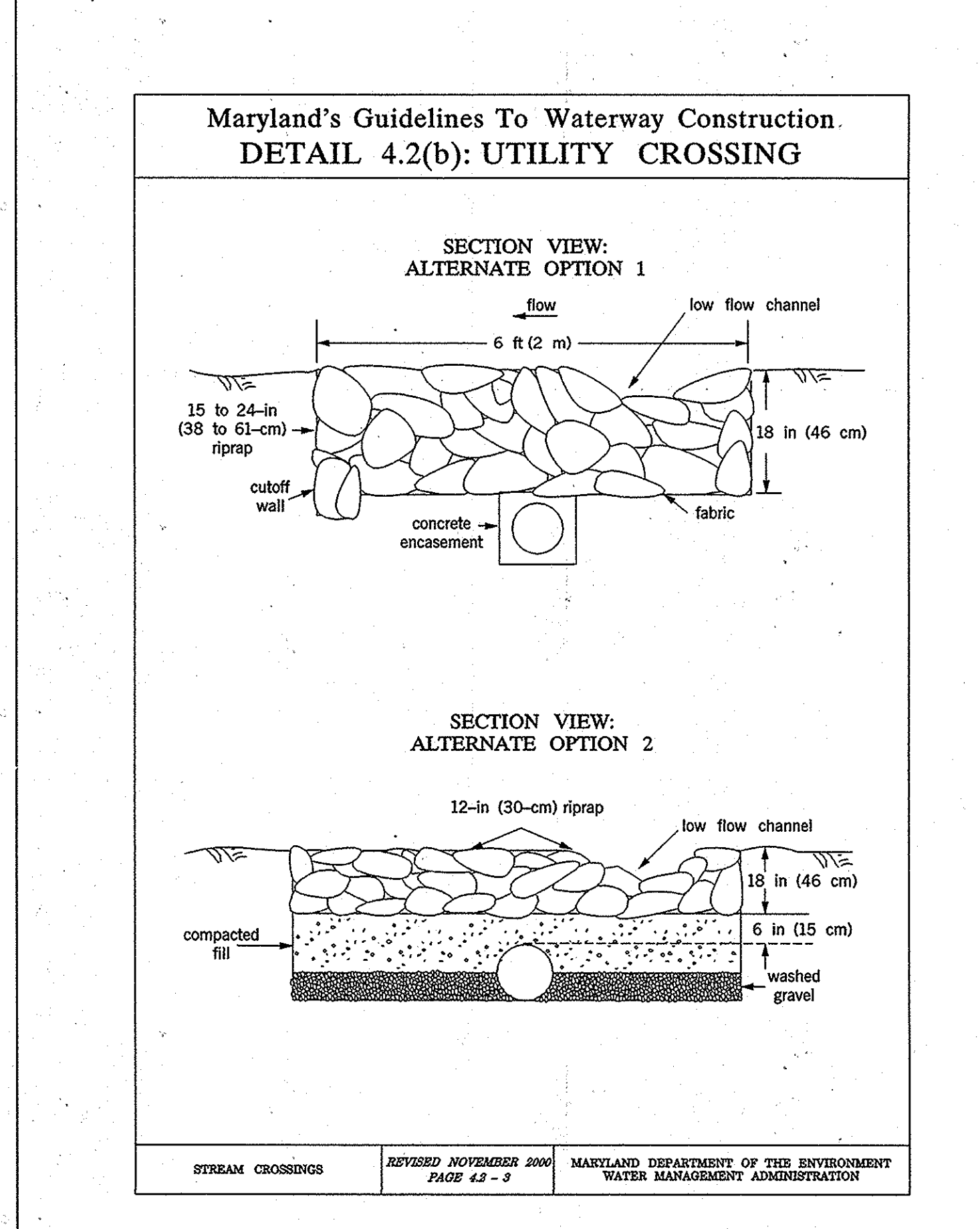
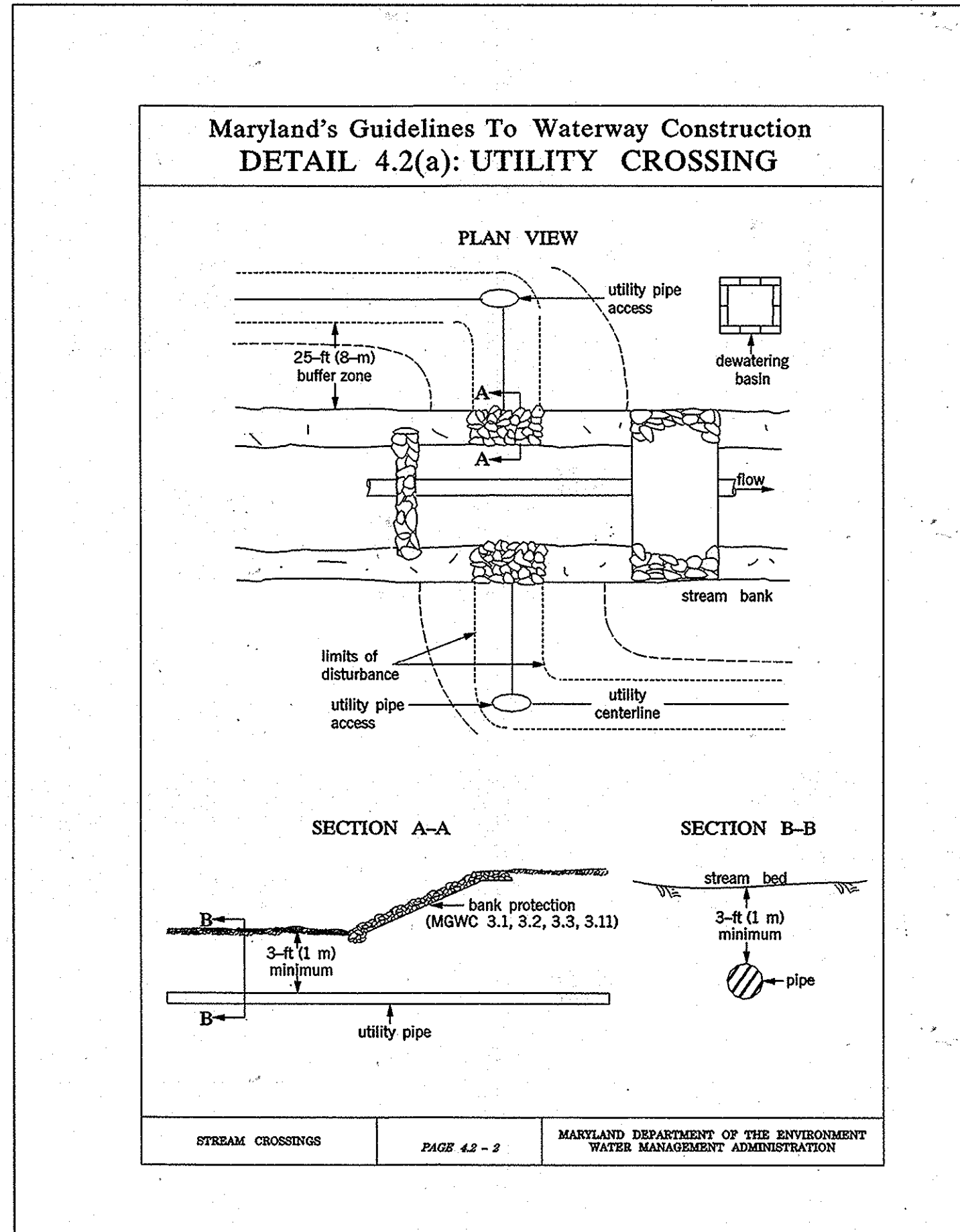
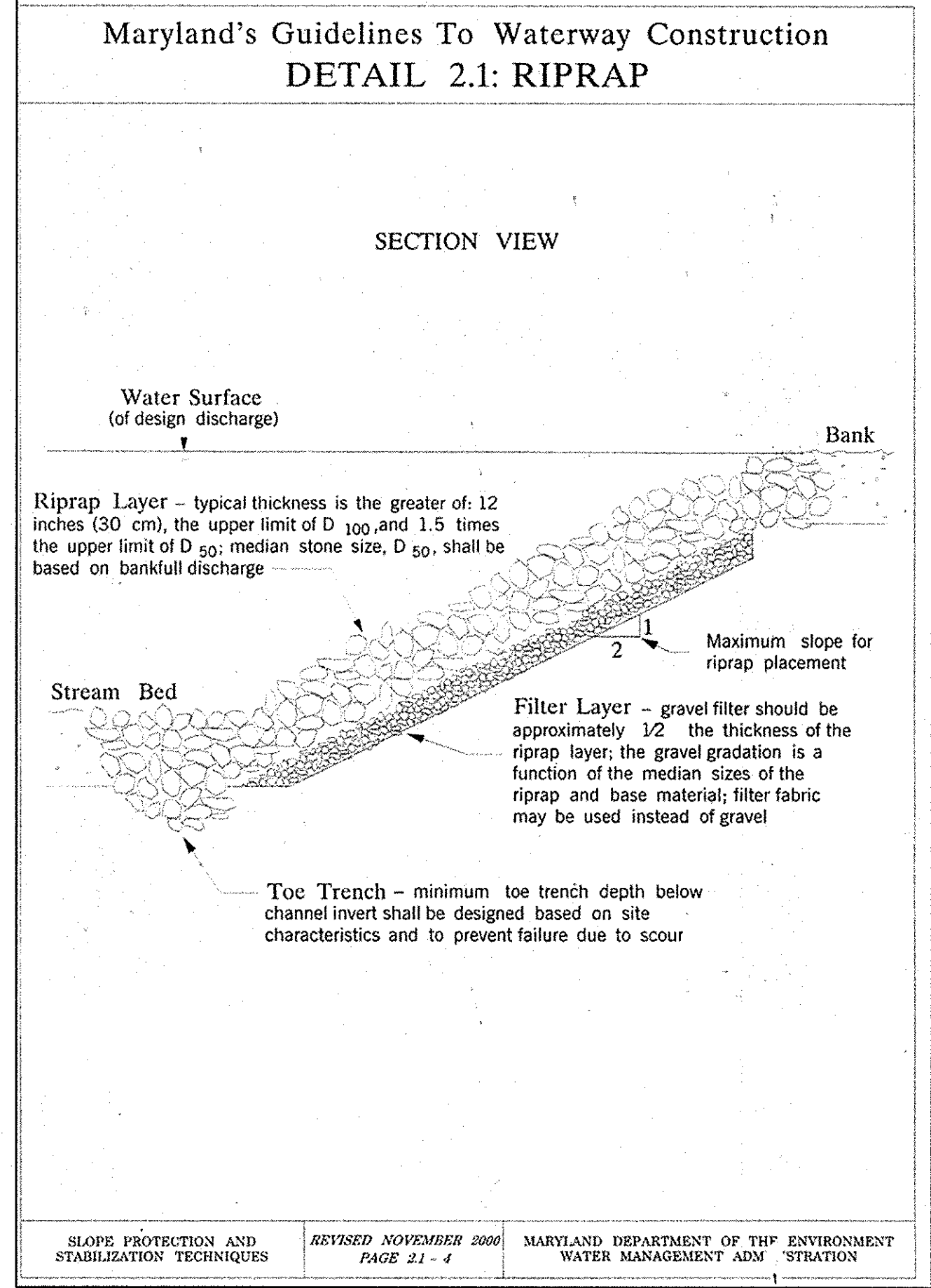
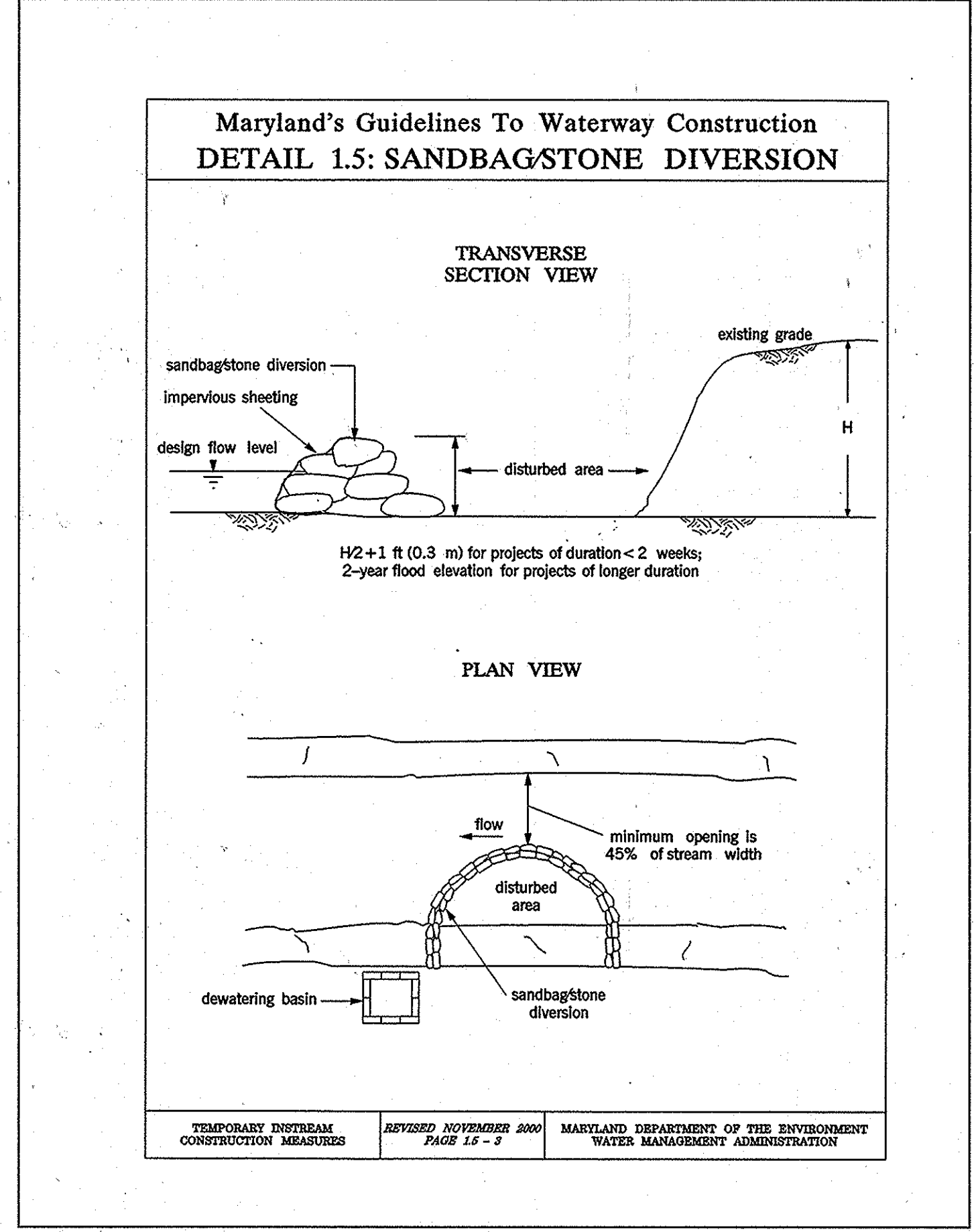
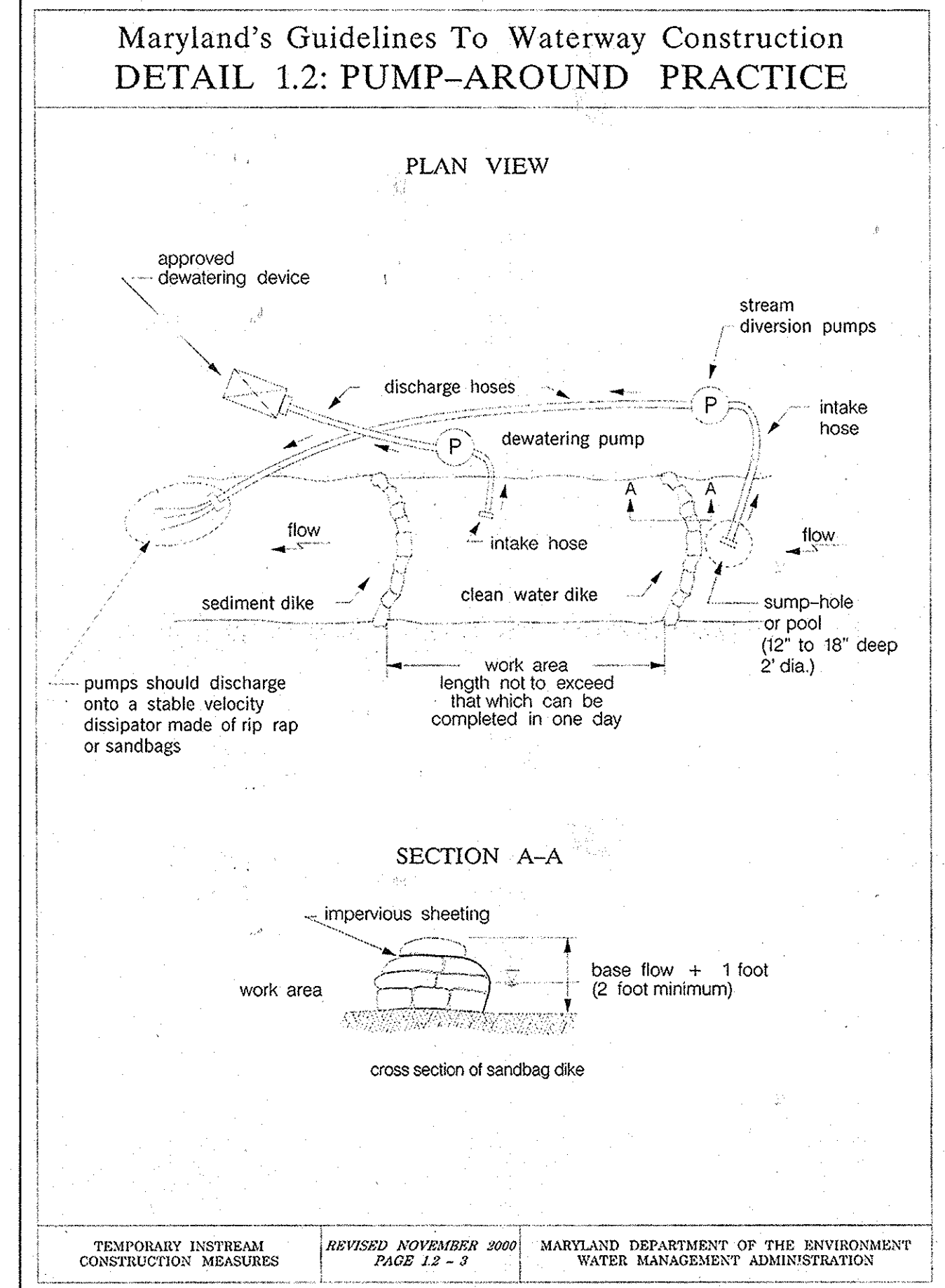
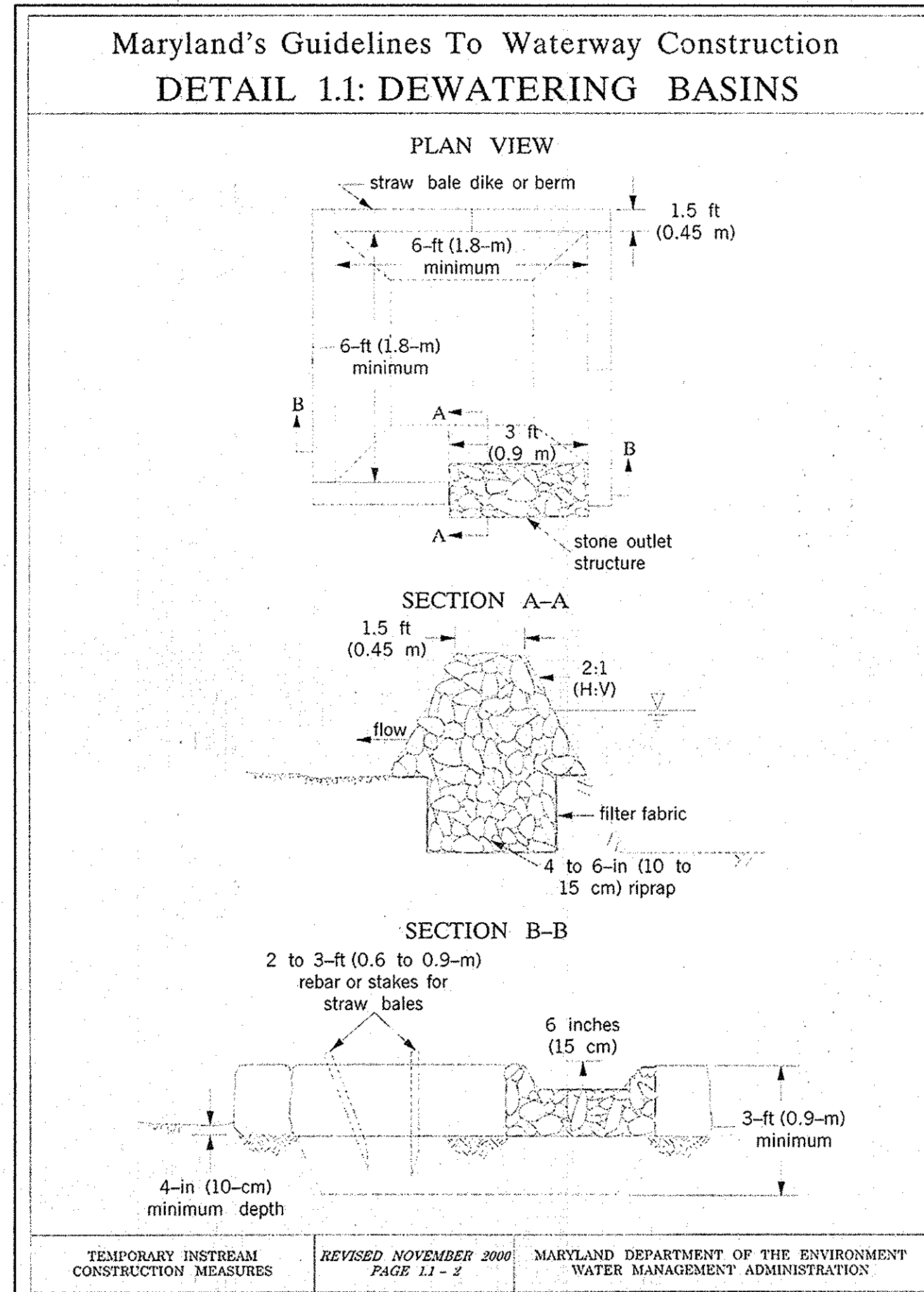
STATE OF MARYLAND  
 REGISTERED PROFESSIONAL ENGINEER  
 License No. 27029  
 7/25/13

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EROSION AND SEDIMENT CONTROL  
 DETAILS  
 600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSING ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

SC-4  
 SCALE AS SHOWN  
 SHEET 15 OF 36



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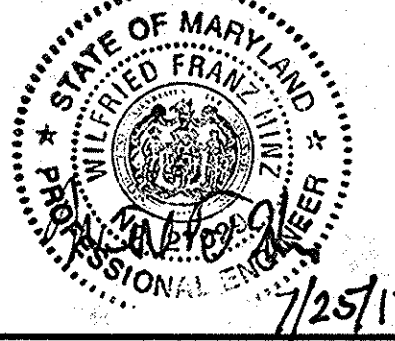
*John A. Stelzer* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas P. Buttle* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Allen Chan* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*Op. Dan* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
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1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SC-5  
SCALE AS SHOWN  
SHEET 16 OF 36

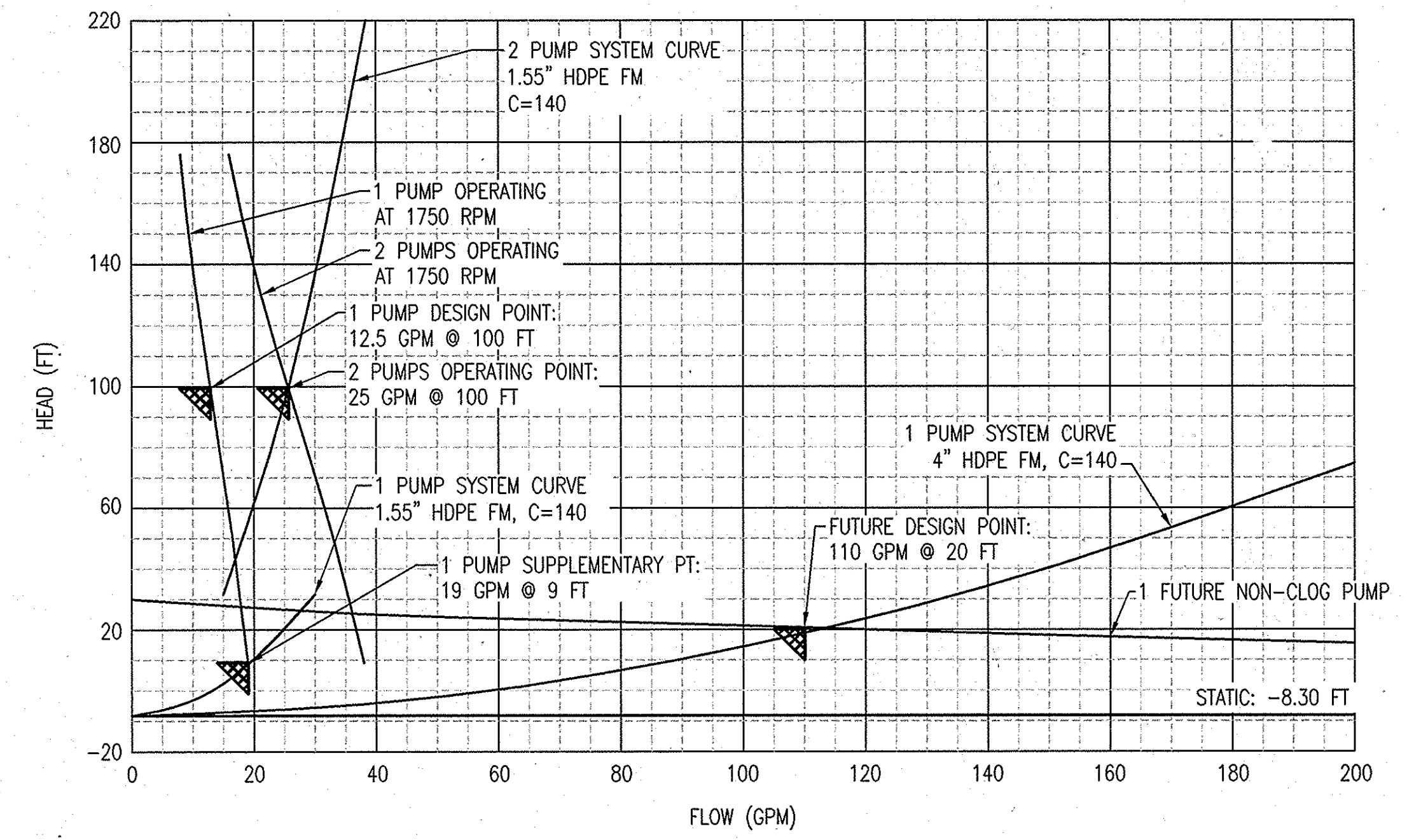


**GENERAL NOTES**

- ALL MECHANICAL WORK SHALL BE COORDINATED WITH CIVIL, ELECTRICAL AND INSTRUMENTATION DRAWINGS AND SPECIFICATIONS.
- STRUCTURAL ELEVATIONS PROVIDED FOR CLARITY. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR FF ELEVATIONS AND FLOOR SLOPE
- ALL PIPING AND DUCTWORK PASSING THRU FLOORS AND INTERIOR WALLS SHALL BE SLEEVED AND SEALED WITH A SEGMENTED RUBBER COMPRESSION SEAL ON BOTH WALL FACES TO MAKE WATER TIGHT UNLESS OTHERWISE NOTED OR SHOWN.
- ALL DUCTILE WALL CASTINGS SHALL HAVE A WATER STOP / THRUST COLLAR POSITIONED IN THE CENTER OF THE WALL, UNLESS OTHERWISE NOTED.
- PIPING CONNECTIONS 3" AND SMALLER HAVE BEEN SCHEMATICALLY SHOWN ON PLAN DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETAILED PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE SCHEMATICS. CONTRACTOR SHALL SUPPLY ALL NECESSARY FITTINGS TO MAKE CONNECTIONS.
- ALL INTERNAL STATION SEWAGE PIPING SHALL HAVE FLANGED FITTINGS, UNLESS OTHERWISE NOTED.
- COORDINATE THE LOCATION OF VALVE SUPPORTS SO THAT ACCESS TO THE VALVE BEARING(S) IS NOT RESTRICTED.
- VALVES ARE NORMALLY OPEN (N.O.) UNLESS OTHERWISE NOTED (N.C.)
- ALL PIPING BELOW SLAB SHALL BE ENCASED IN CONCRETE UNLESS OTHERWISE NOTED OR SHOWN.
- FOR FLANGED JOINTS BURIED OR SUBMERGED, BOLTS, NUTS AND OTHER HARDWARE SHALL BE OF 304 18-8 STAINLESS STEEL. ISOLATORS SHALL BE USED PER SPECIFICATION.
- ALL EXPANSION JOINTS, FLANGE ADAPTERS AND FLEXIBLE COUPLINGS SHALL BE RESTRAINED WITH TIE-RODS. SEE TIE-ROD DETAIL.
- ALL EQUIPMENT SHALL BE PROVIDED WITH A MINIMUM 4-INCH CONCRETE HOUSEKEEPING PAD SIZED TO SUIT EQUIPMENT, UNLESS OTHERWISE NOTED.
- METAL FABRICATIONS WITH BURS, SHARP EDGES OR POSE A HAZARD SHALL BE MADE DULL/BLUNT OR SHALL BE PROVIDED WITH AN APPROPRIATE COVERING THAT SHALL MITIGATE AND DRAW ATTENTION TO THE HAZARD.
- ALL BURIED PIPING BELOW THE BUILDING STRUCTURE SHALL BE OF THE RESTRAINED JOINT TYPE.
- MAINTAIN DETAILED RED LINE AS BUILT DRAWINGS ON THE JOB SITE DURING CONSTRUCTION TO DOCUMENT CONSTRUCTION CHANGES AND INFORMATION AS DELINEATED IN THE SPECIFICATIONS. RED LINE AS BUILT DRAWINGS SHALL BE MADE AVAILABLE FOR PERIODIC REVIEW DURING THE PROGRESS MEETINGS.
- COORDINATE THE PUMP DISCHARGE FITTING SIZE AND MAKE ADJUSTMENTS IN THE PIPE SIZE TO SUIT.
- PROVIDE AS BUILT SPOT ELEVATIONS AT THE CENTER OF ALL VALVES, PIPE RUNS AND OTHER MECHANICAL COMPONENTS, INCLUDING THE LEVELS IN THE WET WELL.
- PROVIDE LADDER-UP'S ON ALL LADDERS MATERIALS SHALL BE SUITABLE FOR THE LOCATION THAT THE EQUIPMENT IS INSTALLED.

**GENERAL NOMENCLATURE**

ABBREVIATION	DESCRIPTION	DESCRIPTION	ABBREVIATION
AAV	AIR ADMITTANCE VALVE	LWL	LOW WATER LEVEL
ADF	AVERAGE DAILY FLOW	MAX	MAXIMUM
ARV	AIR RELIEF VALVE	MGD	MILLION GALLONS PER DAY
ASTM	AMERICAN STANDARD FOR TESTING MATERIALS	MIN	MINIMUM
BOD	BOTTOM OF DUCT	MJ	MECHANICAL JOINT
CI	CAST IRON	N.I.C.	NOT IN CONTRACT
CL	CENTER LINE	N.C.	NORMALLY CLOSED
CO	CLEAN OUT	N.O.	NORMALLY OPEN
CP	CONTROL PANEL	NRS	NON RISING STEM
DEG	DEGREES	NTS	NOT TO SCALE
DIA	DIAMETER	OD	OUTSIDE DIAMETER
DIP	DUCTILE IRON PIPE	PE	PLAIN END
DN	DOWN	PPD	POUNDS PER DAY
DO	DISSOLVED OXYGEN	PPM	PARTS PER MILLION
EL	ELEVATION	PSI	POUNDS PER SQUARE INCH
ES	EMERGENCY SHOWER	PSIG	POUNDS PER SQUARE INCH GAUGE
EX	EXISTING	PVC	POLYVINYL CHLORIDE
FF	FINISHED FLOOR	RJ	RESTRAINED JOINT
FD	FLOOR DRAIN	RPM	REVOLUTIONS PER MINUTE
F.C.O.	FLOOR CLEAN OUT	RVSS	REDUCED VOLTAGE SOLID STATE
FC	FLUSHING CONNECTION	SCH	SCHEDULE
FLG	FLANGE	SHT	SHEET
FOB	FLAT ON BOTTOM	S.P.	STATIC PRESSURE
FOT	FLAT ON TOP	SS	STAINLESS STEEL
FPM	FEET PER MINUTE	TC	THRUST COLLAR
FPS	FEET PER SECOND	TDH	TOTAL DYNAMIC HEAD
FT	FEET	TYP	TYPICAL
GPD	GALLONS PER DAY	V	VENT
GPH	GALLONS PER HOUR	VFD	VARIABLE FREQUENCY DRIVE
GPM	GALLONS PER MINUTE	VTR	VENT THRU ROOF
HP	HORSEPOWER	W.L.	WATER LEVEL
H/P	HIGH POINT	WS	WATER STOP
H/WL	HIGH WATER LEVEL		
HZ	HERTZ		
ID	INSIDE DIAMETER		
INV	INVERT		
KW	KILOWATT		
LB/LBS	POUND/POUNDS		
LBS/HR	POUNDS PER HOUR		



**SEMI-POSITIVE DISPLACEMENT PUMP DESIGN CRITERIA**

MANUFACTURER	DELTA ENVIRONMENTAL	SUPPLEMENTARY POINT CAPACITY	19 GPM
MODEL	D1P20-21	SUPPLEMENTARY POINT HEAD	9 FT
RPM	1800 RPM		
HP (MAX)	2		
DESIGN POINT CAPACITY	12.5 GPM		
DESIGN POINT TOTAL HEAD	100 FT		

**HEATING AND VENTILATION SYMBOLS**

SYMBOL	DESCRIPTION	ABBREVIATION
	DUCT SIZE - RECTANGULAR (FIRST DIMENSION ON PLAN OR ELEVATION IS SIDE SHOWN)	
	DUCT TRANSITION - FLAT ON BOTTOM	
	DUCT TRANSITION - FLAT ON TOP	
	FLOW ARROW	
	FLEXIBLE CONNECTION AT FAN SUCTION AND DISCHARGE	
	FLEXIBLE CONNECTION	
	HEAT TRACING	HT
	INCLINED DROP IN DUCT WITH RESPECT TO AIR FLOW	DN.
	INCLINED RISE IN DUCT WITH RESPECT TO AIR FLOW	
	MOTOR OPERATED DAMPER (XXX-X DENOTES IDENTIFICATION)	M.O.D.-XX
	RETURN OR EXHAUST AIR DUCT	
	SQUARE ELBOW WITH TURNING VANES	
	SUPPLY AIR DUCT	
	THERMOSTAT (FREEZE)	
	THERMOSTAT (HIGH TEMPERATURE)	
	THERMOSTAT (VENT) (X DENOTES AUXILIARY FUNCTION)	

**GENERAL SYMBOLS**

ABBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION
BFP		BACKFLOW PREVENTER	
BV		BALL VALVE	
CW		CALIBRATION CYLINDER	
		COLD WATER	
		CLEAN OUT	
		EMERGENCY SHOWER	
FA		FLANGE ADAPTOR	
		FLEXIBLE COUPLING WITH TIE RODS	
		FLEXIBLE HOSE	
		FLOOR DRAIN	
		FLOOR CLEANOUT	
		FLOW ARROW	
		FLOW METER	
GTV		GATE VALVE	
HB		HOSE BIBB	
		HOSE RACK	
		HOSE REEL	
		HOSE VALVE	
		HUB DRAIN	
		METERING PUMP	
		NON-FREEZE WALL HYDRANT	
		PIPE BREAK	
		PIPE ELBOW-TURNED DOWN	
		PIPE ELBOW-TURNED UP	
		PIPE FACING UP	
		PIPE GUIDE/SLEEVE	
		PIPE HANGERS	
		PIPE TEE-OUTLET DOWN	
		PIPE TEE-OUTLET UP	
		PLUG VALVE	
		PRESSURE GAUGE WITH DIAPHRAGM SEAL	
		PRESSURE GAUGE WITH STOPCOCK	
		PRESSURE REDUCING VALVE	
		PROCESS PUMP	
		CONCENTRIC REDUCER OR INCREASER	
		ECCENTRIC REDUCER OR INCREASER	
		ROOF DRAIN	
		SURGE RELIEF VALVE	
		SWING CHECK VALVE	
		TRENCH DRAIN	
		UNION	
		WYE STRAINER	

**ENGINEERING UNITS/TERMS**

DESCRIPTION	ABBREVIATION
AMERICAN SOCIETY OF MECHANICAL ENGINEERS	ASME
BRITISH THERMAL UNIT PER HOUR	BTUH
HAZEN WILLIAMS COEFFICIENT	C
CUBIC FEET PER HOUR	CFH
CUBIC FEET PER MINUTE	CFM
CENTIMETER	CM
DECIBELS (CORRECTED)	dBA
DEGREE CELSIUS	DEG C
DEGREE FAHRENHEIT	DEG F
FREE AREA	F.A.
FEET PER MINUTE	FPM
FEET PER SECOND	FPS
FEET	FT
GALLONS	GAL
GALLONS PER DAY	GPD
GALLONS PER HOUR	GPH
GALLONS PER MINUTE	GPM
HORSEPOWER	HP
HERTZ	HZ
HERTZ	HZ
INCH	IN
KILOGRAM	KG
KILOWATT	KW
LITERS PER MINUTE	L/M
LITERS PER SECOND	L/S
LINEAR FOOT	LF
POUNDS	LB OR LBS
POUNDS PER HOUR	LBS/HR
1,000 BRITISH THERMAL UNITS (BTU) PER HOUR	MBH
MILLION GALLONS	MG
MILLION GALLONS PER DAY	MGD
MILLIMETER	MM
PASCAL, KILO-PASCAL	PA, KPA
POUNDS PER DAY	PPD
PARTS PER MILLION	PPM (MG/L)
POUNDS PER SQUARE INCH	PSI
POUNDS PER SQUARE INCH GAUGE	PSIG
STROKES PER MINUTE	SPM
THERMAL RESISTANCE (1/R)	U
REVOLUTIONS PER MINUTE	RPM
TOTAL DYNAMIC HEAD	TDH
WATER COLUMN	W.C.
WATER GAUGE	WG

**EQUIPMENT IDENTIFICATION LEGEND**

(-x) SUFFIX IDENTIFIER : REPRESENTS SEQUENTIAL EQUIPMENT NUMBERING

**FACILITIES EQUIPMENT (DDD-x)**

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
ACU-X	AIR CONDENSERS UNIT	PG-X	PRESSURE GAUGE
AHU-X	AIR HANDLING UNIT	RSP-X	RAW SEWAGE PUMP
BBH-X	BASE BOARD HEATER	SF-X	SUPPLY FAN
CSCP-X	CHEMICAL SYSTEM CONTROL PANEL	SP-X	SUMP PUMP
CV-X	CHECK VALVE	SRV-X	SURGE RELIEF VALVE
EF-X	EXHAUST FAN	SG-X	SLUCE GATE
EHT-X	ELECTRIC HOIST TROLLEY	VCP-X	VENTILATION CONTROL PANEL
EUH-X	ELECTRIC UNIT HEATER	WH-X	WATER HEATER
FM-X	FLOW METER		
M	MOTOR		
MG-X	MECHANICAL GRINDER		
MGCP-X	MECHANICAL GRINDER CONTROL PANEL		
MOD-X	MOTOR OPERATED DAMPER		

"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. 10009, EXPIRATION DATE: 9/14/2014"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  DIRECTOR OF PUBLIC WORKS DATE: 7/26/13	 CHIEF, BUREAU OF ENGINEERING DATE: 7/26/13
 CHIEF, BUREAU OF UTILITIES DATE: 7/26/13	 CHIEF, UTILITY DESIGN DIVISION DATE: 7/26/13

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 9450

STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 10009  
 EXPIRES 9/14/2014  
 H. W. ...

DES:	
DRN:	
CHK:	
JUNE 2013	
BY	NO.
REVISION	DATE

600 SCALE MAP NO. 32	BLOCK NO. 21.
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MECHANICAL  
 GENERAL NOTES,  
 LEGEND AND  
 ABBREVIATIONS

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

M-1

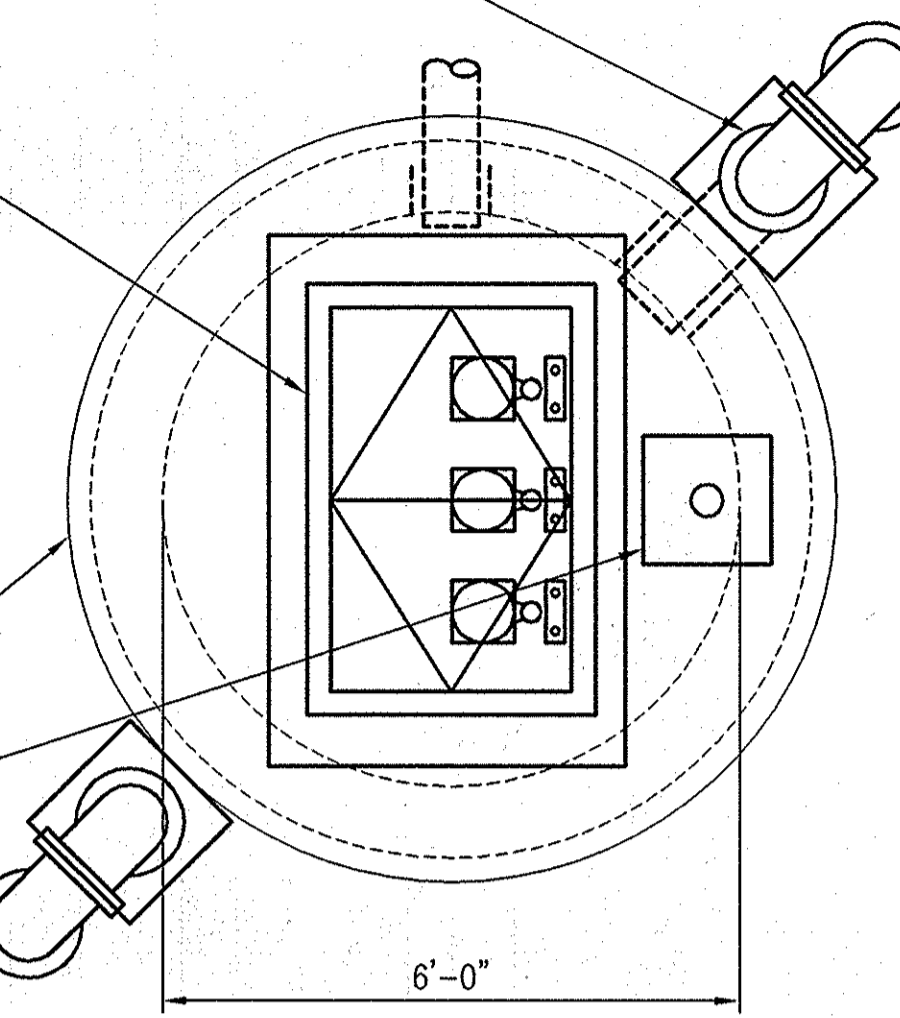
SCALE  
 AS SHOWN

SHEET  
 17 OF 36

8" PVC WET WELL EXHAUST GOOSENECK VENT #1 SEE DETAIL D/M-4

48"x30" (CLEAR OPENING) ACCESS HATCH WITH SAFETY GRATE SYSTEM

8" DIAMETER OVERSIZED CONCRETE TOPSLAB  
PORTABLE DAVIT CRANE SOCKET  
8" WET WELL SUPPLY GOOSENECK VENT #2, SEE DETAIL E/M-4

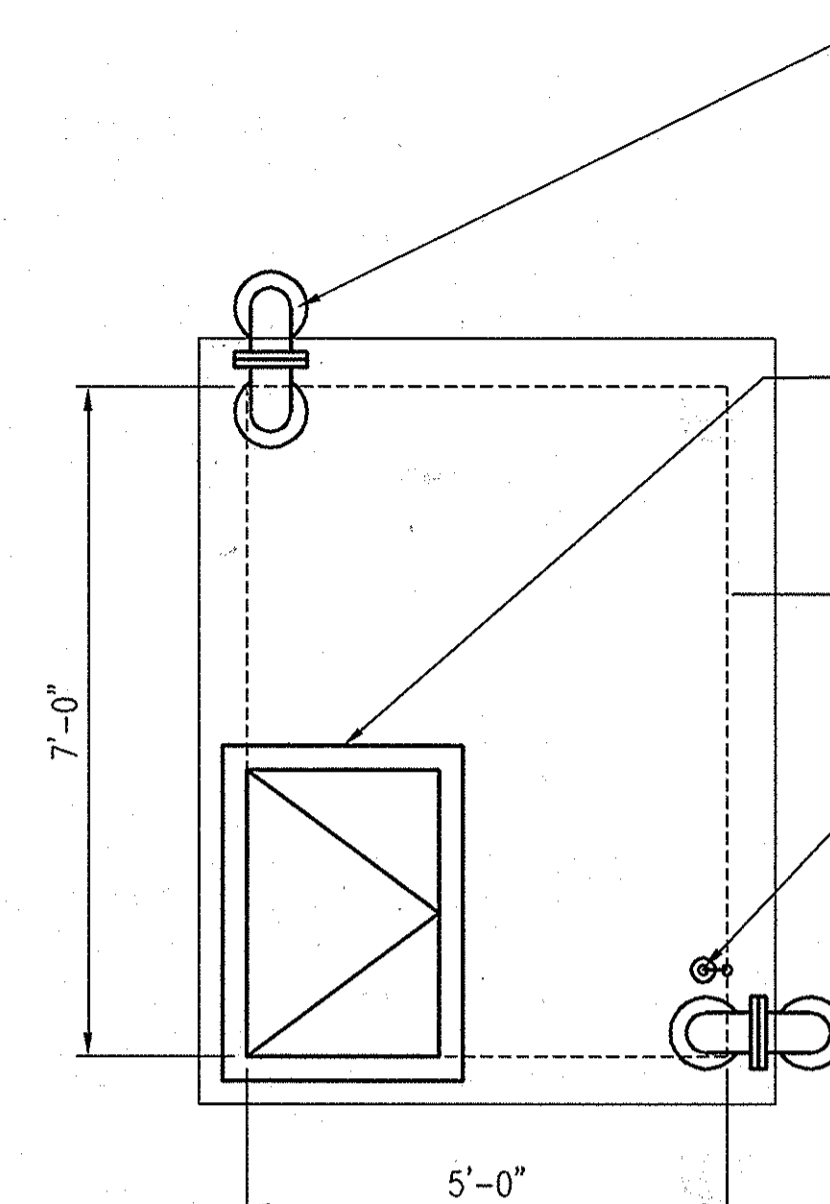


1 GRADE LEVEL PLAN  
M-2 SCALE: 1/2" = 1'-0"

4" DIP VALVE VAULT GOOSENECK (TYP.)

36"x24" (CLEAR OPENING) ACCESS HATCH

1" AIR VALVE VENT LINE SLEEVE AND SEAL PENETRATION PER DETAIL B/M-4



8" PVC WET WELL SUPPLY GOOSENECK VENT, SEE DETAIL E/M-4 (SHOWN FOR CLARITY)  
INLINE WET WELL SUPPLY FAN WITH MATING FLANGES AND NEMA 4X JUNCTION BOX

CONCRETE PAD

6" ODOR CONTROL SUPPLY DUCT

INV. EL. 45.55  
DUCT CL. EL. 44.75

DISCHARGE PIPING CL. EL. 43.33

8" WET WELL SUPPLY DUCT (SHOWN FOR CLARITY)

DUCT SUPPORT (TYP.)

BOD EL. 37.30

8" SEWER INV. EL. 34.37

FLOAT LAG 1 START EL. 33.8  
FLOAT LEAD 1/LEAD 2 START EL. 33.3  
HWL ALARM/LAG 1 START EL. 32.8

LEAD 1/LEAD 2 START EL. 31.8

PUMP STOP EL. 30.8

LWL ALARM/FLOAT PUMP STOP EL. 29.8

9" MIN., SEE GENERAL NOTE 3.

WET WELL BOTTOM EL. 27.31  
10" MIN., SEE GENERAL NOTE 3.

4" DIP VALVE VAULT GOOSENECK (TYP.)

8" DIAMETER WETWELL TOPSLAB SEE DRAWING NOTE 2.

TOP SLAB EL. 48.40  
GRADE EL. 48.00

BOD EL. 45.65

6" DIA. PRECAST CONCRETE WET WELL

1 1/2" PUMP DISCHARGE PIPING

FLOAT SWITCH (TYP.) SEE DETAIL G/M-4

PUMP GUIDE RAIL AND DISCHARGE PIPING INTERMEDIATE SUPPORT (TYP.)

PUMP GUIDE RAILS

RAW SEWAGE PUMP (TYP.)

PUMP BASE ELBOW W/ AUTO COUPLER

CONCRETE FILL

8" #57 STONE

A SECTION  
M-2 SCALE: 1/2" = 1'-0"

GENERAL NOTES:

- SEE M-1 FOR ADDITIONAL NOTES.
- UNLESS OTHERWISE NOTED, ALL OPENINGS IN PRECAST CONCRETE SHALL BE SLEEVED AND SEALED PER DETAIL B/M-4.
- DIMENSIONS GIVEN FOR WETWELLS ARE THE MINIMUM REQUIRED FOR ANTI-BUOYANCY REQUIREMENTS. CONTRACTOR SHALL SUBMIT SIGNED AND SEALED DRAWINGS FOR ALL PRE-CAST STRUCTURES IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

DRAWING NOTES:

- RUN 1 1/2" PVC THROUGH 4" DIP. SEAL ENDS WITH MECHANICAL SEAL AT EACH FLANGE FACE.
- OVERSIZED 8" DIAMETER TOPSLAB SHALL BE CAST WITH KEYS IN JOINT INTO WETWELL RISER SECTION. PROVIDE 8" OF STONE UNDERNEATH TOPSLAB OVERHANG SECTION.

8" WET WELL EXHAUST DUCT SEE DETAIL D/M-4

6" ODOR CONTROL SUPPLY DUCT SEE DETAIL D/M-4

SEE NOTE 1 (TYP.)

RAW SEWAGE PUMP (TYP.)

HOOK FOR FLOAT SWITCH ASSEMBLY

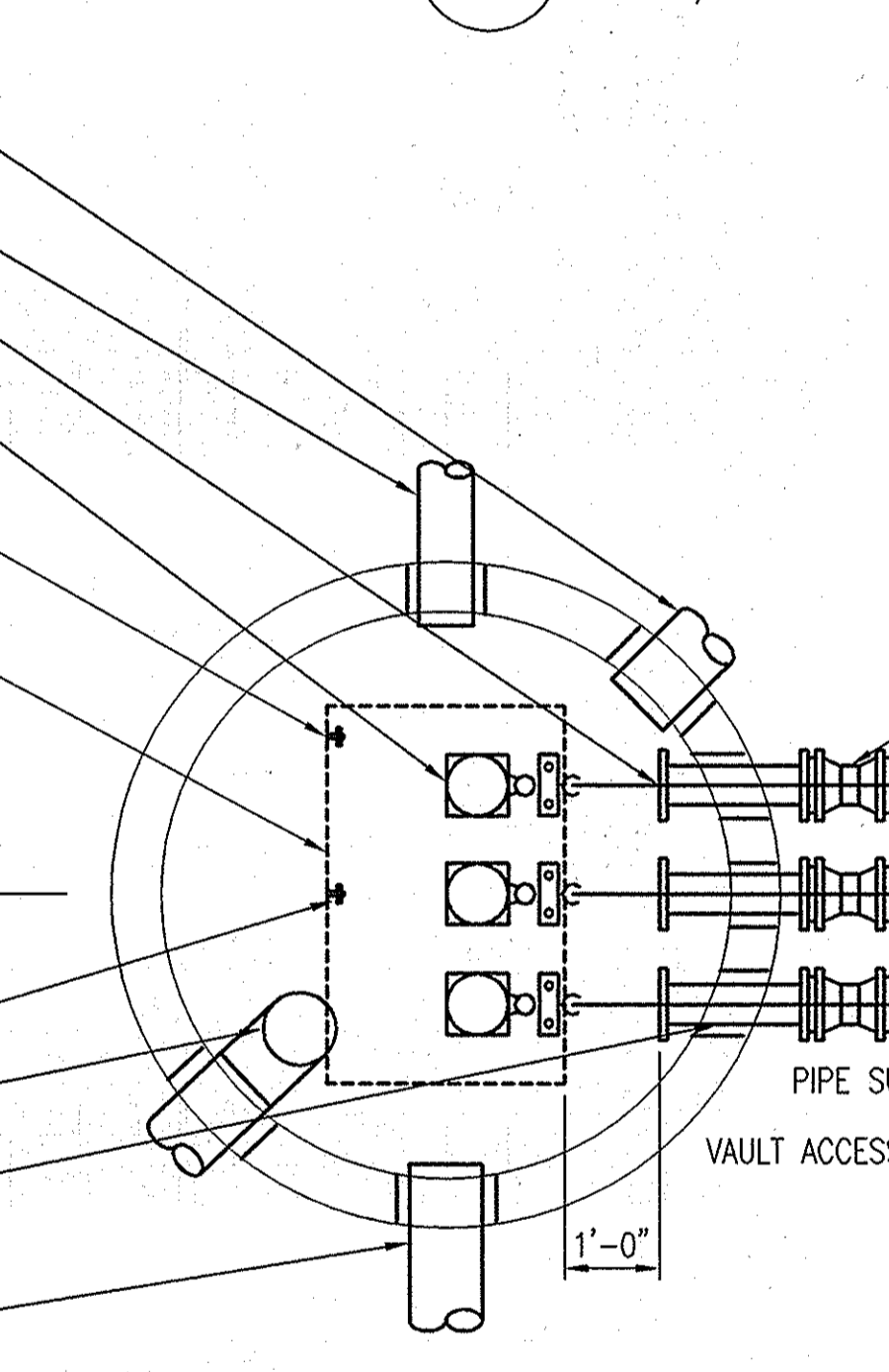
48"x30" (CLEAR OPENING) ACCESS HATCH ABOVE

HOOK FOR SUBMERSIBLE PRESSURE TRANSDUCER

8" WET WELL SUPPLY DUCT

4" FLGXPE DIP (TYP.)

8" INFLUENT SEWER W/ ALOK GASKET



2 LOWER LEVEL PLAN  
M-2 SCALE: 1/2" = 1'-0"

4" SOLID SLEEVE (TYP.)

4" DIP

4" DIP DUCT

4" FLGXPE DIP (TYP.)

1 1/2" PVC CHECK VALVE (TYP.)

1 1/2" PVC BALL VALVE (TYP.)

1 1/2" MAGNETIC FLOWMETER

1" COMBINATION AIR VALVE

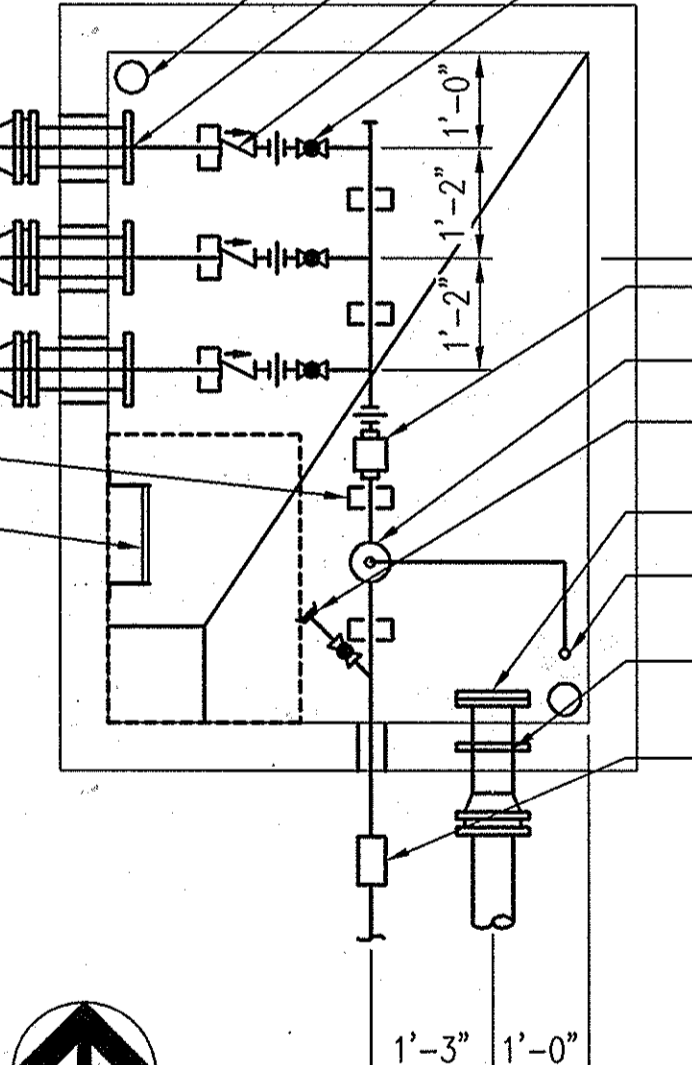
1 1/2" PVC QUICK DISCONNECT COUPLING BYPASS PUMP CONNECTION

4" BLIND FLANGE (TYP.)

1" AIR VALVE VENT LINE

4" FLGXTCXMJ WALL CASTING (TYP.)

TRANSITION COUPLING FROM PVC TO HDPE



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. 10009, EXPIRATION DATE: 9/4/2014

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John De* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*Maria E. Suttle* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*John C. Lee* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*David R. Lee* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



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WETWELL/VALVE VAULT PLAN AND SECTION

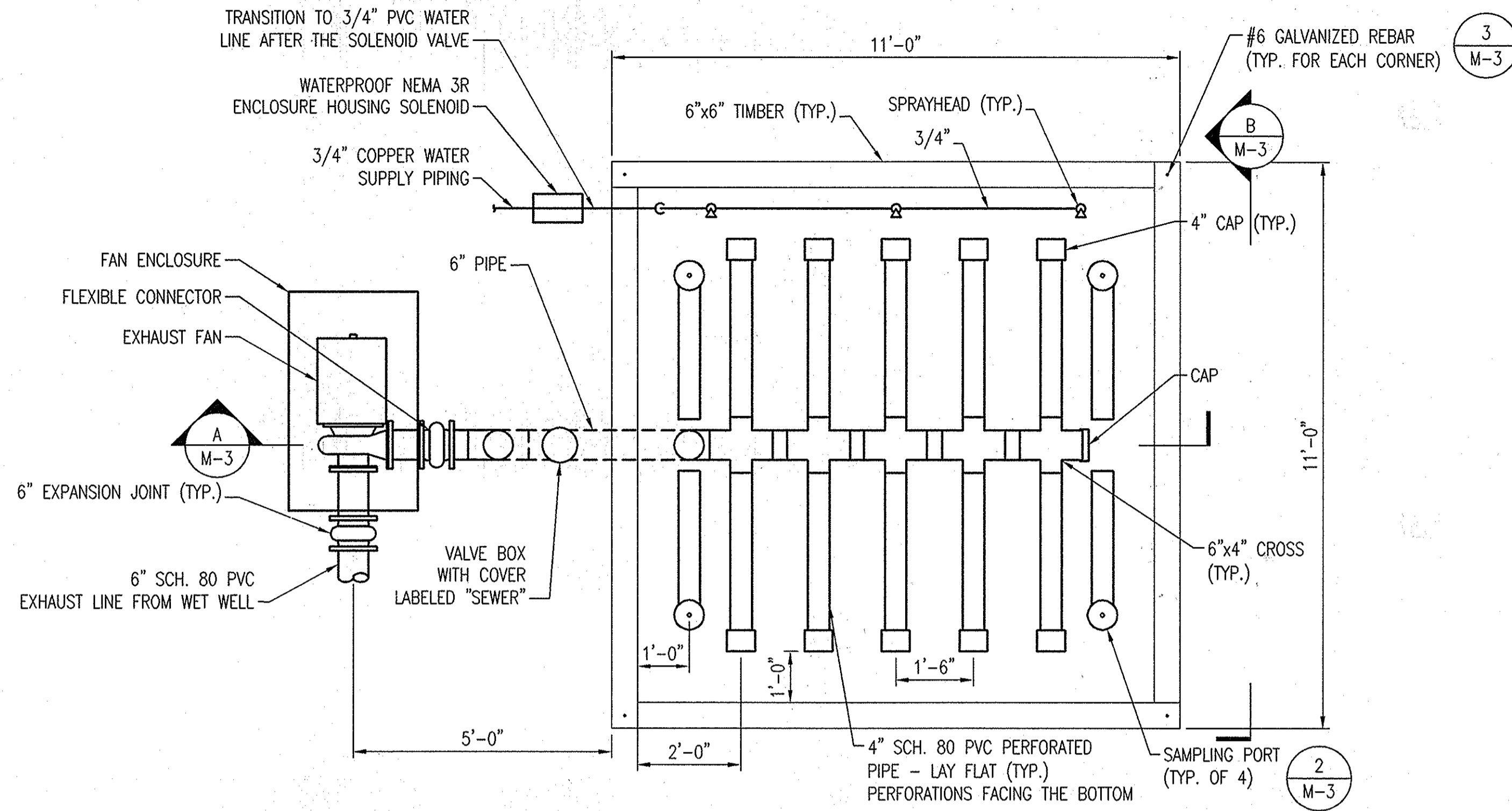
600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

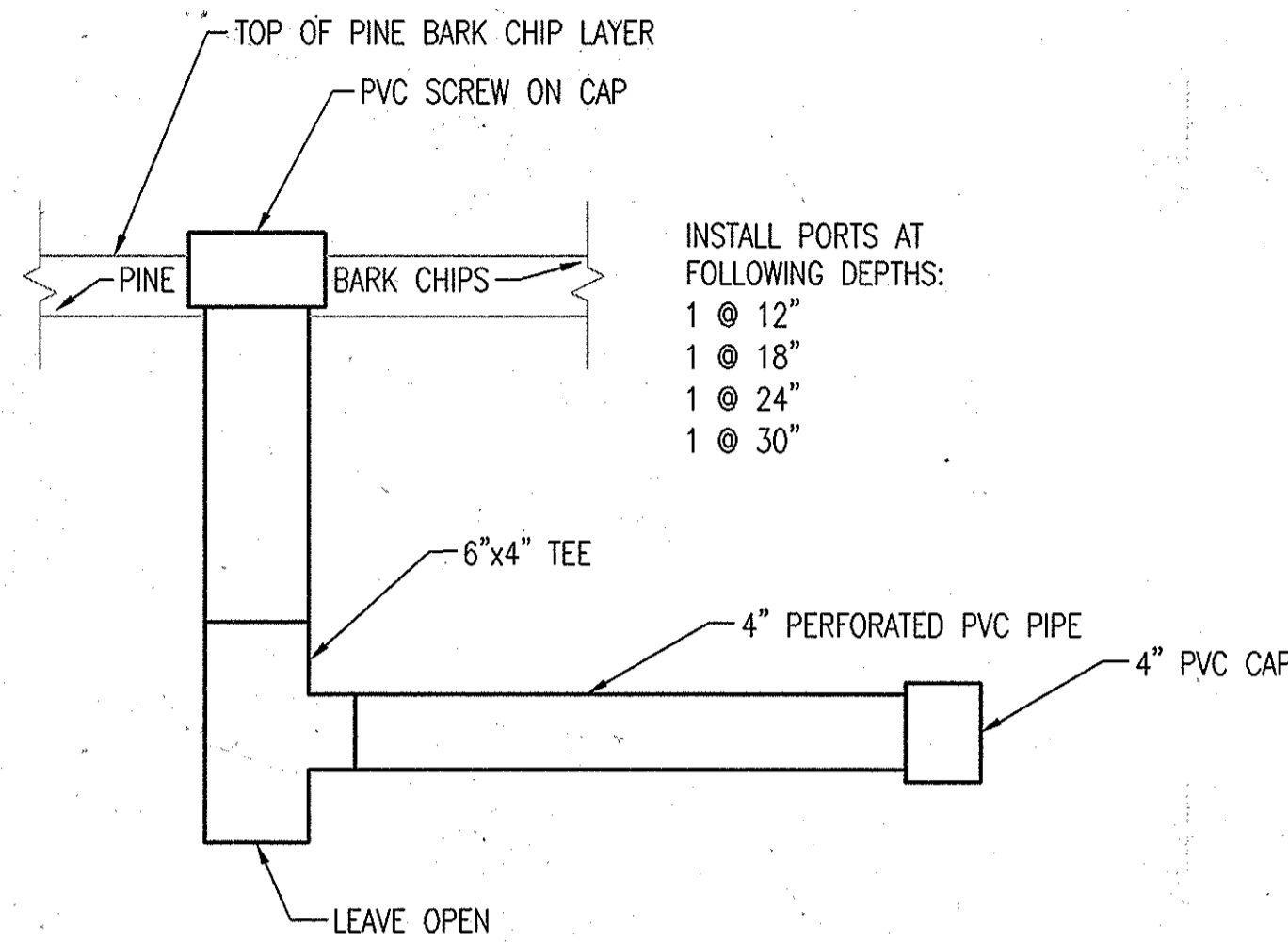
M-2  
SCALE AS SHOWN  
SHEET 18 OF 36

**DRAWING NOTES:**

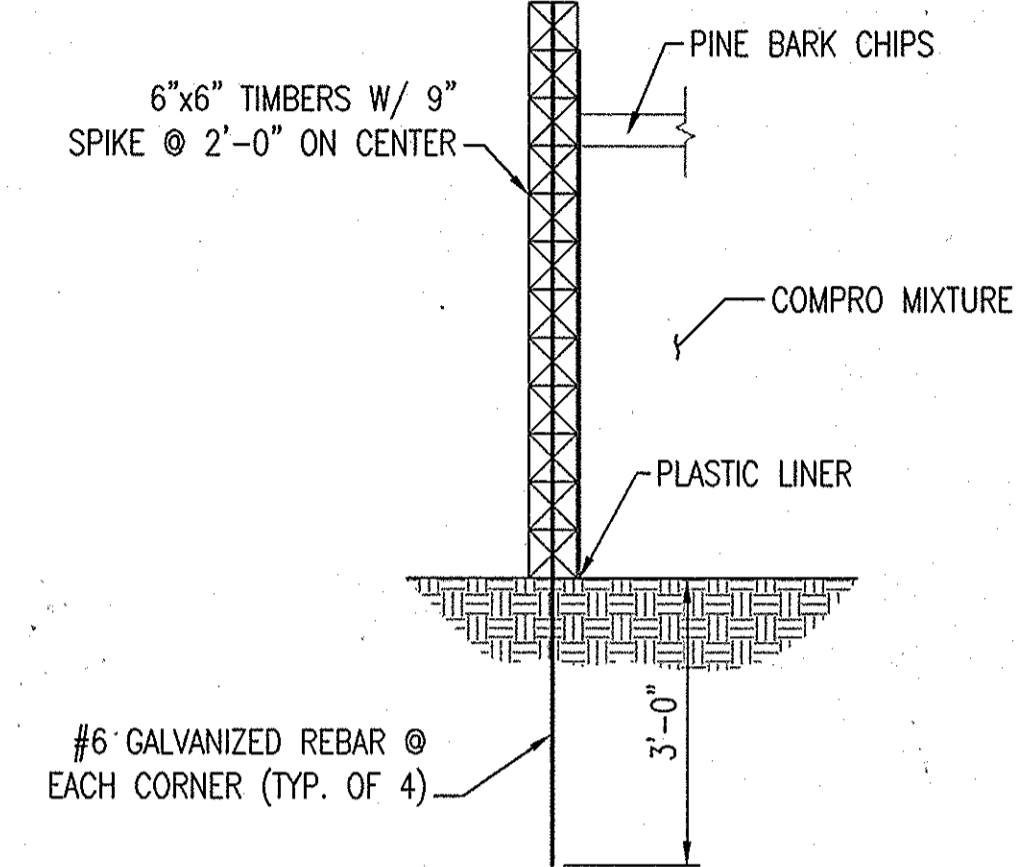
1. PROVIDE MINIMUM 18" MULCH MIXTURE BETWEEN GRAVEL AND TIMBER STRUCTURE.
2. CONTAIN GRAVEL DURING PLACEMENT WITH TEMPORARY FRAMEWORK. REMOVE TEMPORARY FRAMEWORK AFTER COMPOSITE MIXTURE IS IN PLACE AROUND GRAVEL.
3. 6"x6" TIMBERS SHALL MEET AASHTO M168 MARINE GRADE, TREATED WITH CHROMATED COPPER ARSENATE (CCA) AT A RATE OF 2.5 LBS PER CU. FT. OF WOOD AND SHALL MEET AASHTO M133.



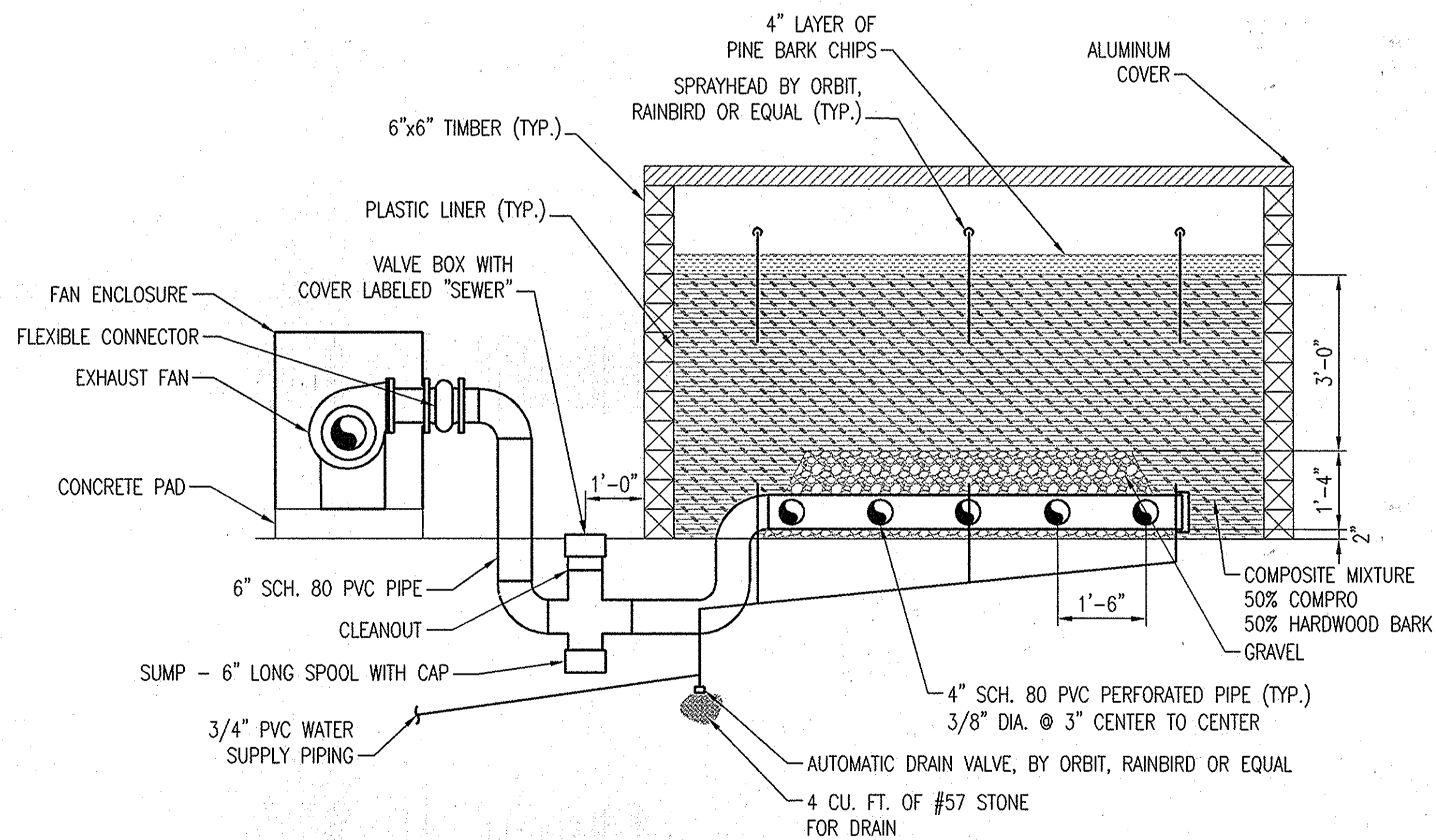
**1 ODOR CONTROL GRADE LEVEL PLAN**  
 M-3 SCALE: 1/2" = 1'-0"



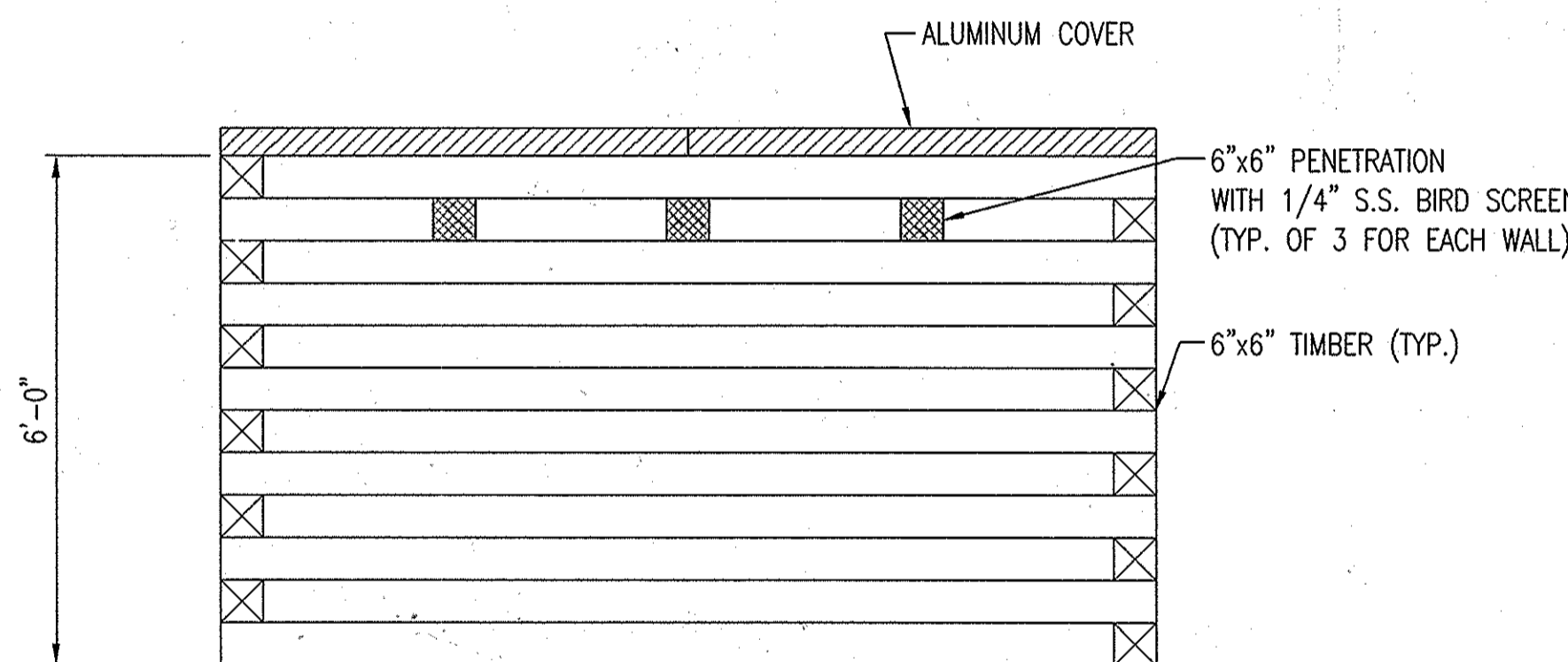
**2 SAMPLING PORT DETAIL**  
 M-3 SCALE: 1' = 1'-0"



**3 CORNER DETAIL**  
 M-3 SCALE: 1/2" = 1'-0"



**A SECTION**  
 M-3 SCALE: 1/2" = 1'-0"

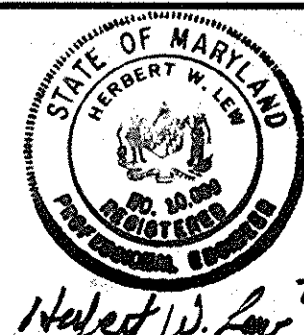


**B SECTION**  
 M-3 SCALE: 1/2" = 1'-0"

"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 10009, EXPIRATION DATE: 9/2/2014"

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Director of Public Works  
 Chief, Bureau of Engineering  
 Chief, Bureau of Utilities  
 Chief, Utility Design Division

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450

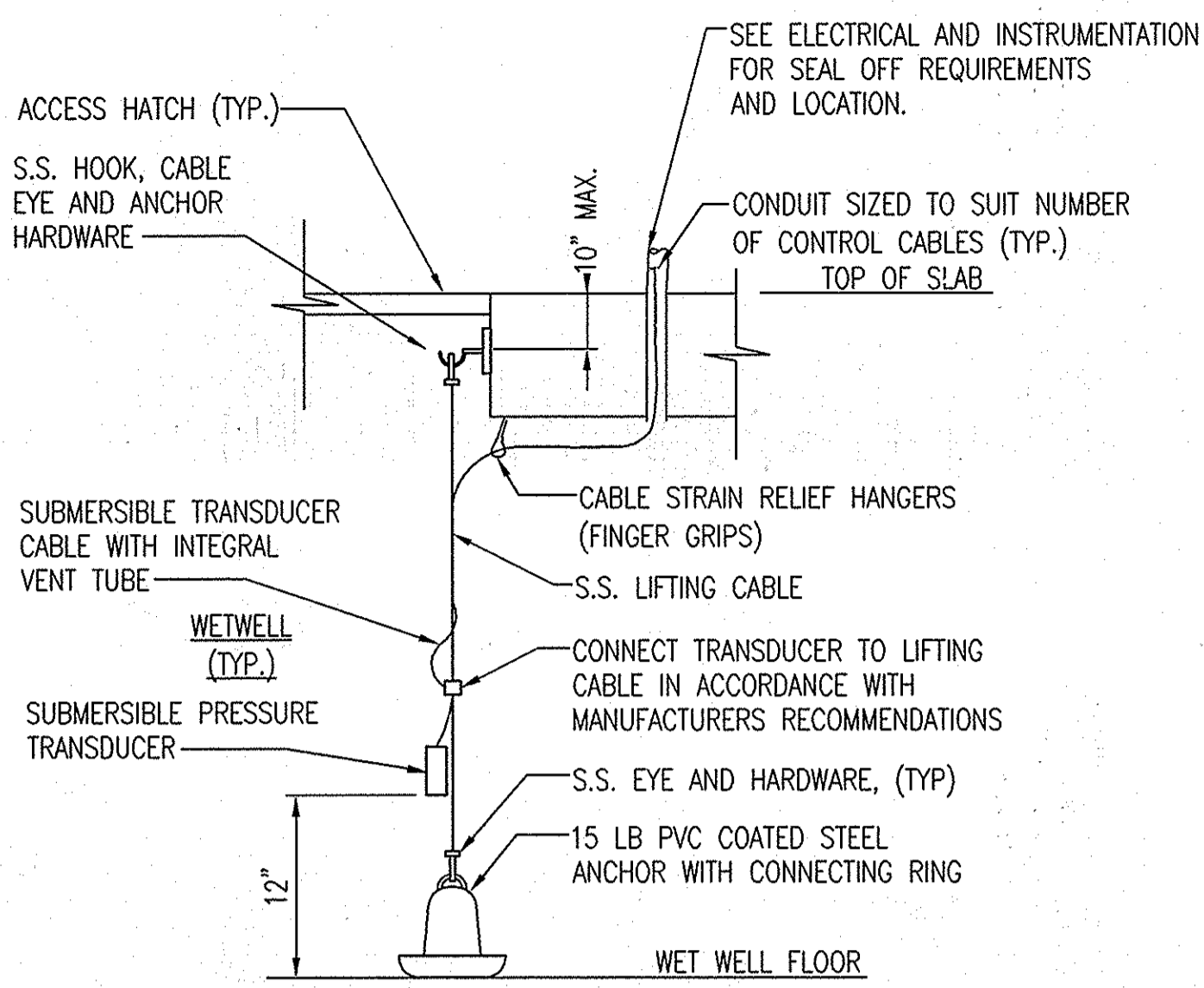


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BY NO.	REVISION
	DATE

ODOR CONTROL SYSTEM  
 PLAN, SECTIONS, AND DETAILS  
 600 SCALE MAP NO. 32  
 BLOCK NO. 21.

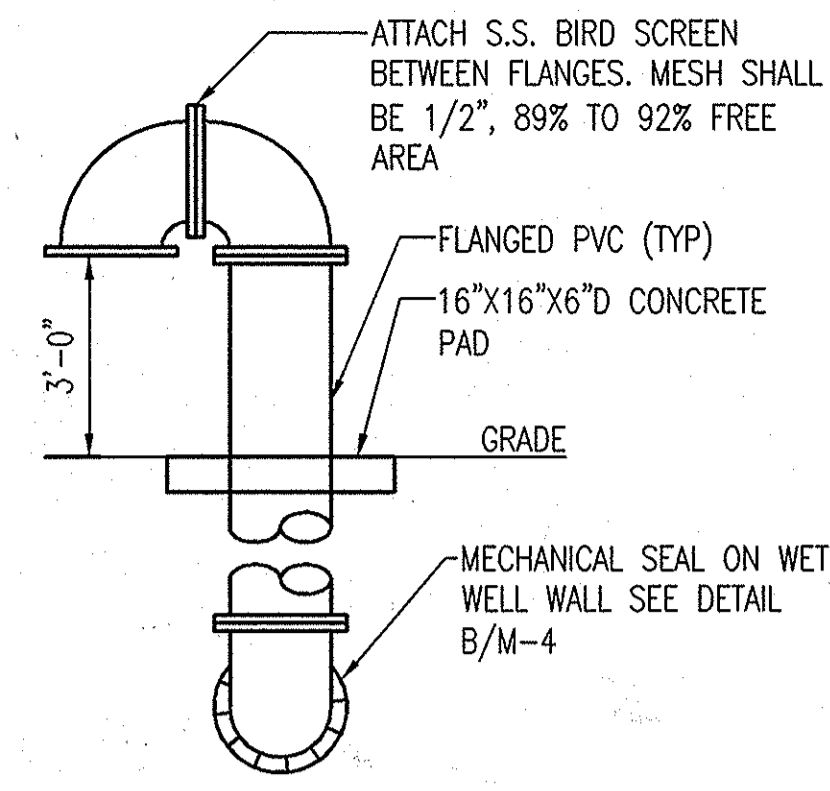
ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

M-3  
 SCALE AS SHOWN  
 SHEET 19 OF 38



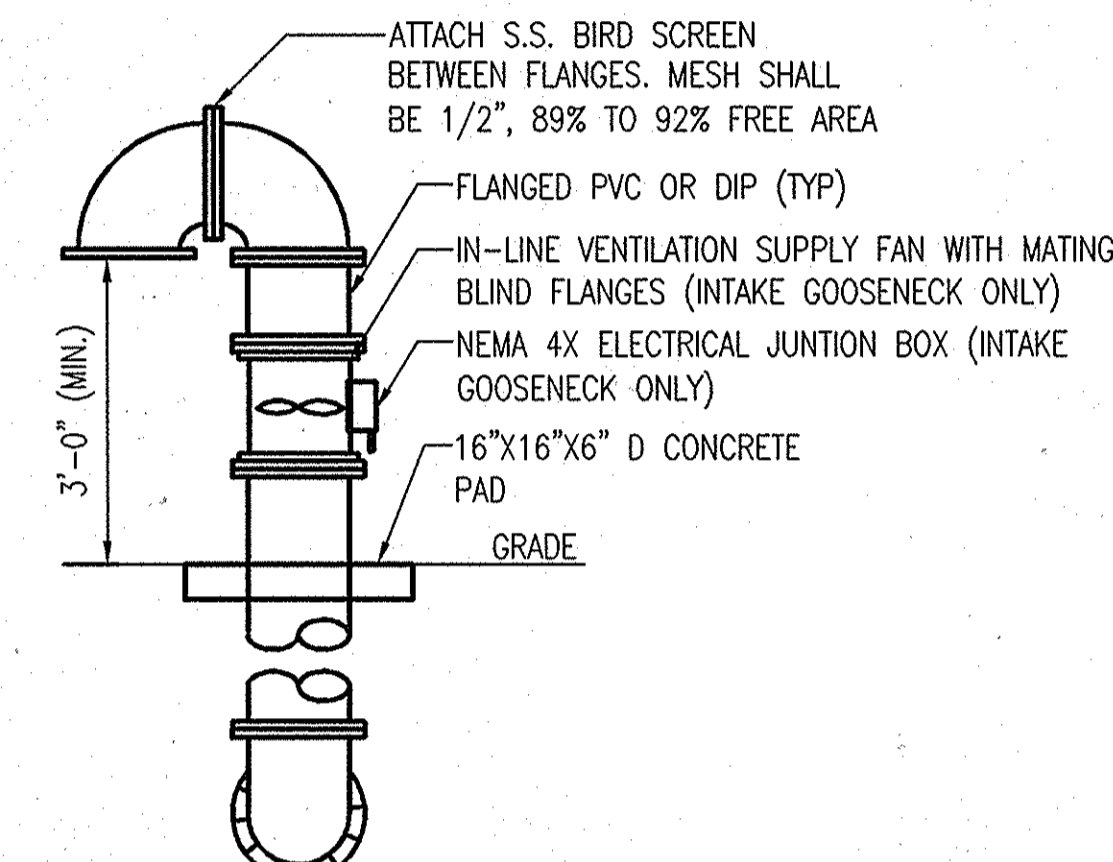
**SUBMERSIBLE LEVEL TRANSDUCER DETAIL**

A  
M-4 SCALE: NONE



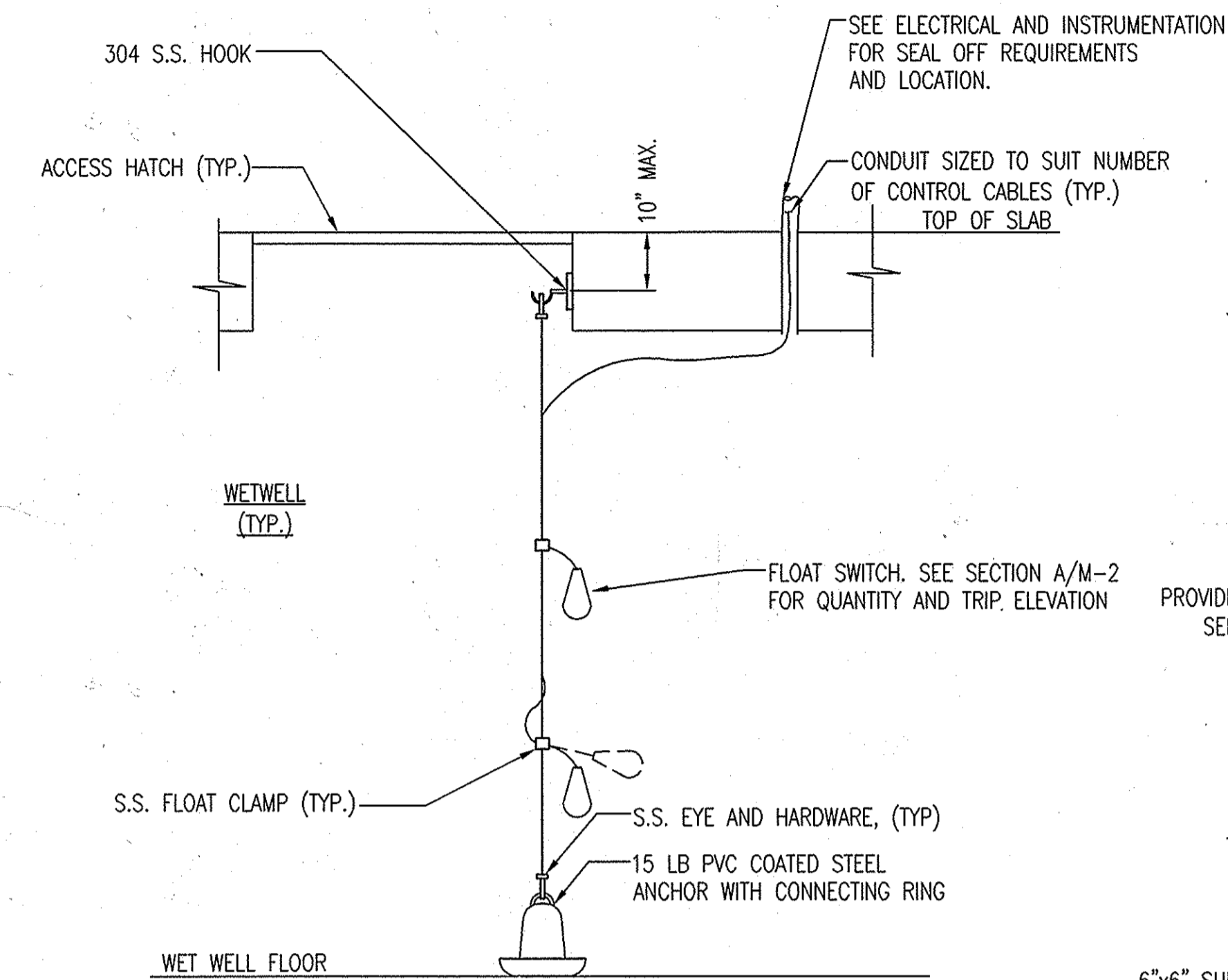
**GOOSENECK VENT #1**

D  
M-4 SCALE: NONE



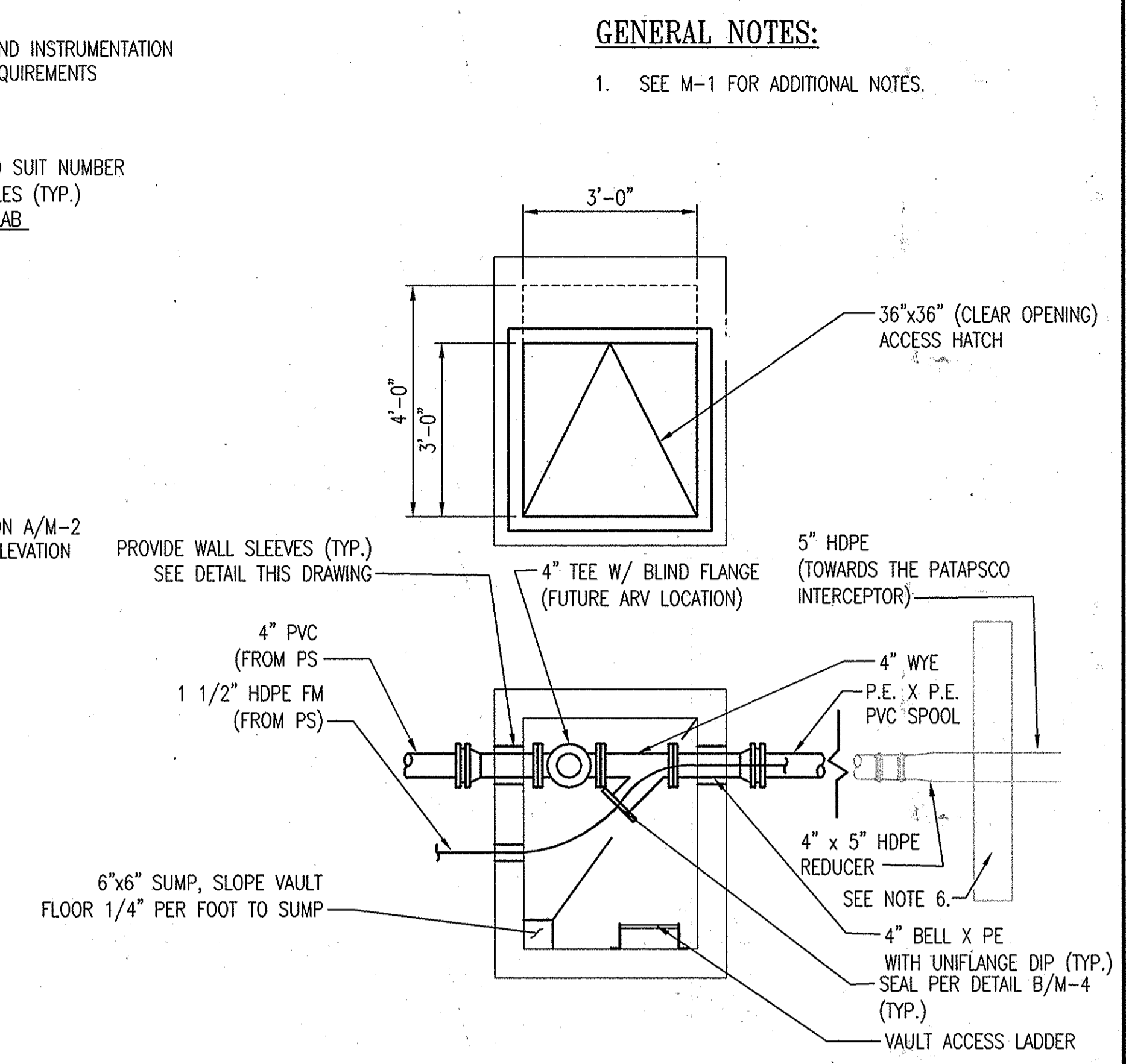
**GOOSENECK VENT #2**

E  
M-4 SCALE: NONE



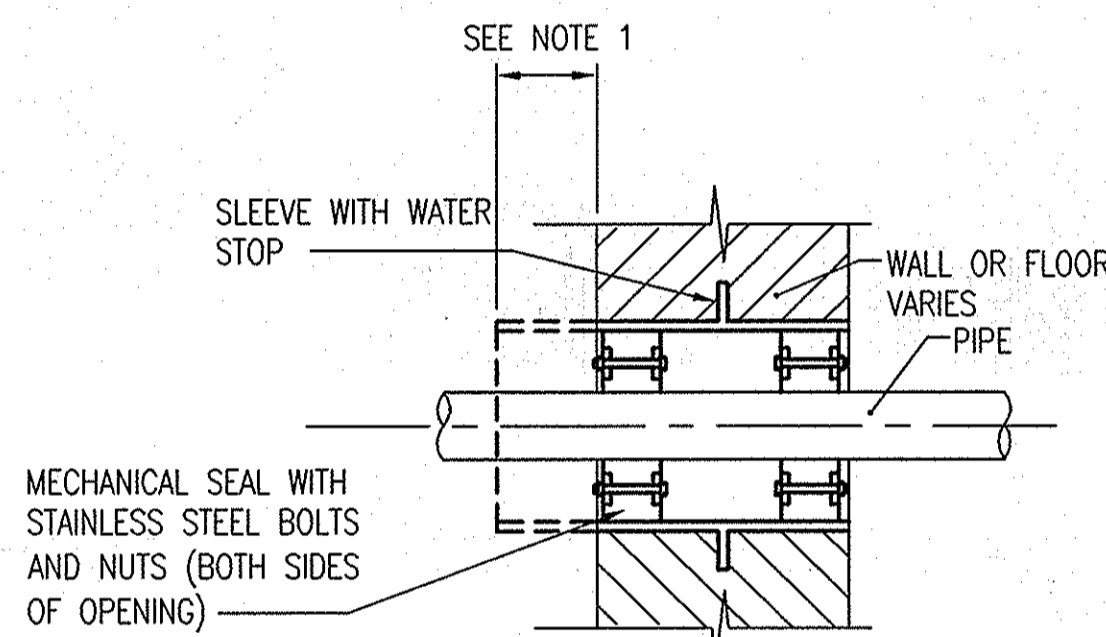
**FLOAT SWITCH DETAIL**

G  
M-4 SCALE: NONE



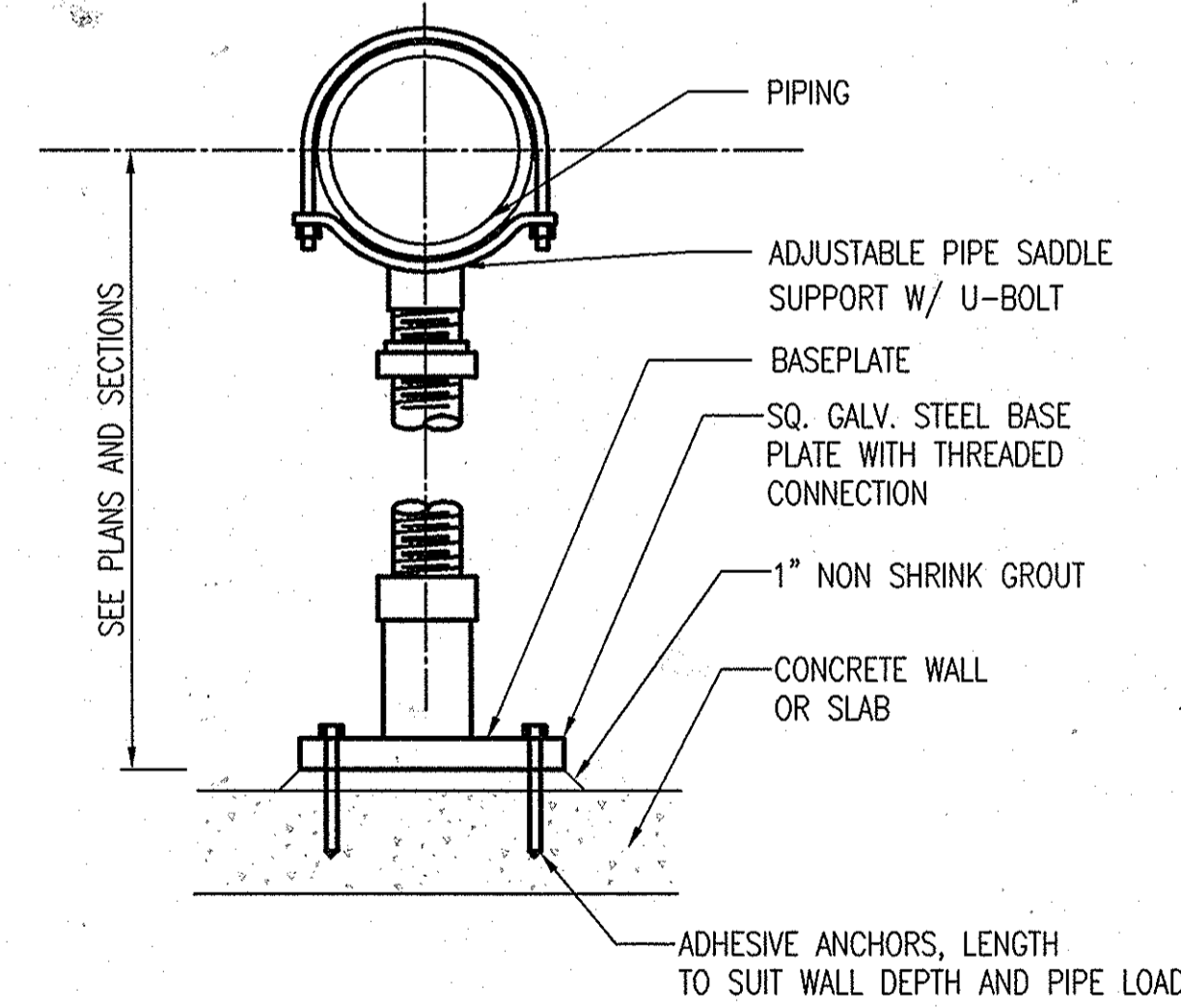
**ARV AND TRANSITION VAULT PLANS**

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



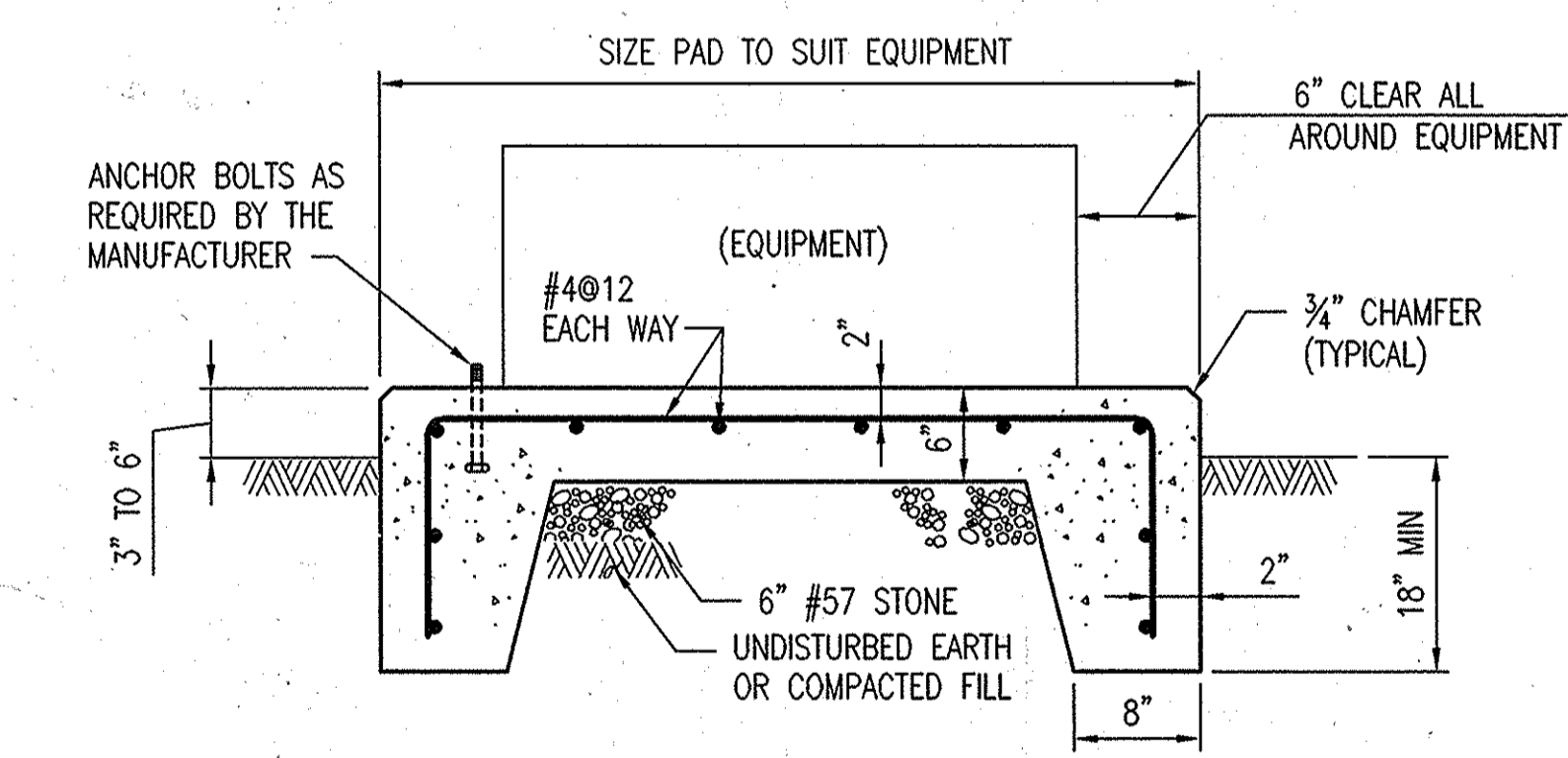
**TYPICAL FLOOR/WALL SLEEVE**

B  
M-4 SCALE: NONE



**PIPE SUPPORT SADDLE**

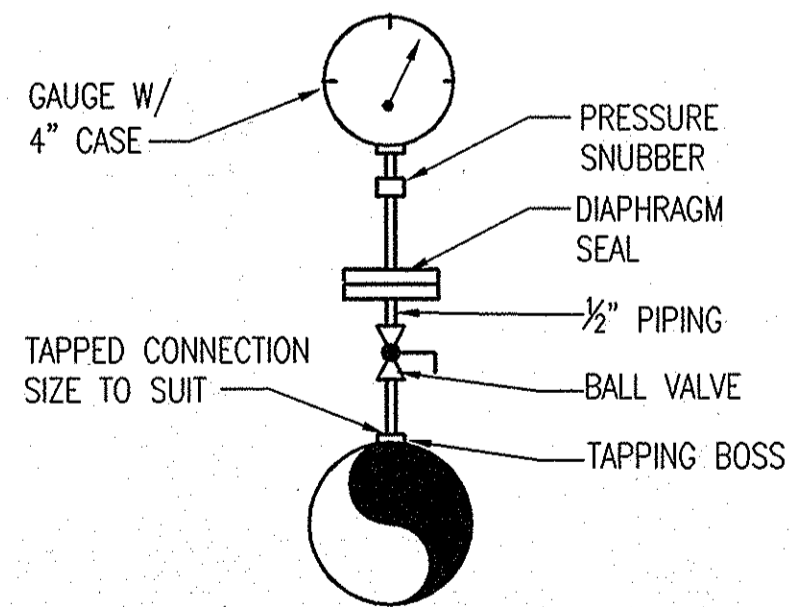
F  
M-4 SCALE: NONE



**TYPICAL EXTERIOR EQUIPMENT PAD DETAIL**

H  
M-4 SCALE: NONE

NOTES:  
1. FOR FLOOR INSTALLATION EXTEND WALKWAY SIDE OF SLEEVE 4 INCHES ABOVE FINISHED FLOOR.  
2. IF EXISTING CONCRETE WALL, CORE DRILL TO DIAMETER RECOMMENDED BY MECHANICAL SEAL MANUFACTURER. CORE DRILLED OPENINGS DO NOT REQUIRE PIPE SLEEVE BUT CONCRETE SURFACE SHALL BE SMOOTH. PREPARE AND COAT EXPOSED REBAR IN ACCORDANCE WITH DIV.9 SPECIFICATIONS. GROUT FILL AND/OR MACHINE AS NECESSARY.



**DIAPHRAGM SEAL PRESSURE GAUGE**

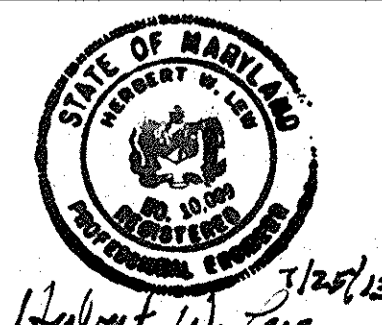
C  
M-4 SCALE: NONE

NOTES:  
1. VAULT SHALL BE PRE-CAST CONCRETE.  
2. ALL PIPE AND FITTINGS INSIDE OF VAULT SHALL BE CLASS 53 DIP.  
3. ORIENTATION FOR THE VAULT INDICATED IS FOR ARV TRANSITION VAULT STRUCTURE 1. WEST OF THE PATAPSCO. THE ARV TRANSITION VAULT STRUCTURE 2 ON THE EAST SIDE OF THE PATAPSCO IS A MIRROR IMAGE OF VAULT 1 IN REGARDS TO 4" TEE AND WYE ORIENTATION.  
4. PROVIDE CONCRETE SUPPORT UNDERNEATH 4" WYE.  
5. BOTTOM INVERT OF VAULT SHALL BE 1.5' BELOW INVERT OF PIPE. SEE CIVIL PROFILES FOR UTILITY INVERT.  
6. TRANSITION COLLAR SHALL BE INSTALLED 10' FROM VAULT. TRANSITION COLLAR FROM NON-HDPE TO HDPE IS NOT TO SCALE. SEE DRAWING C-6 FOR TRANSITION COLLAR DETAILS.

"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. 10009, EXPIRATION DATE: 9/2/2016"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works 7/26/13	Chief, Bureau of Engineering 7/26/13	Chief, Utility Design Division 7/26/13
--	---	---

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINA STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450



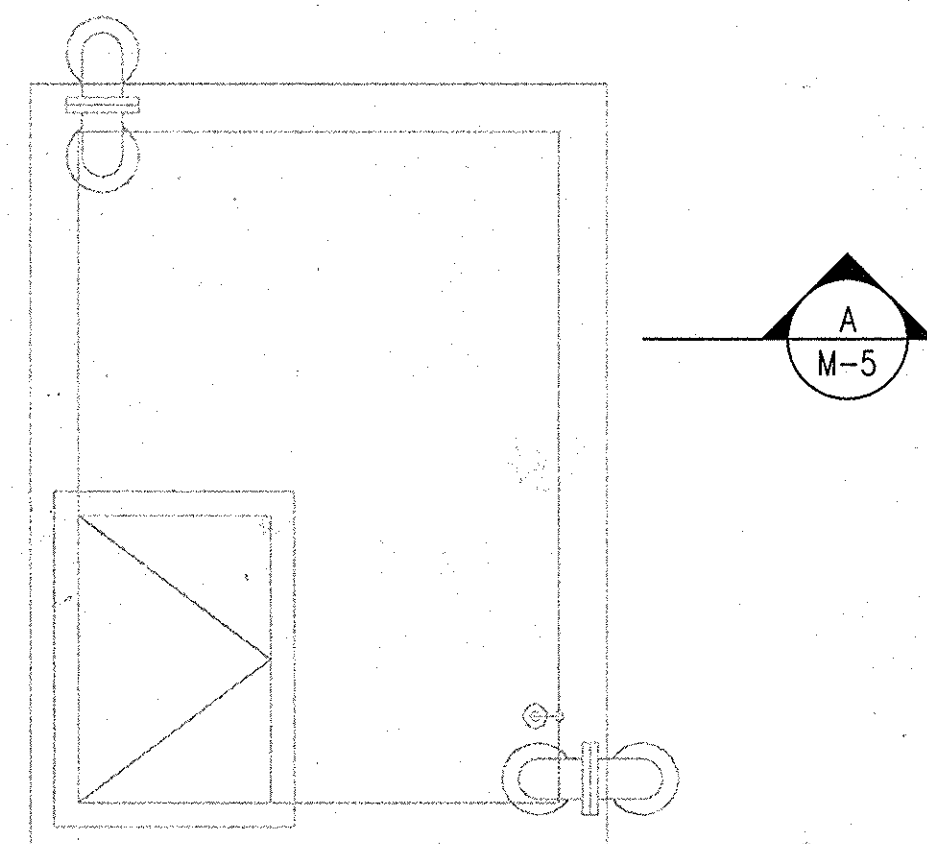
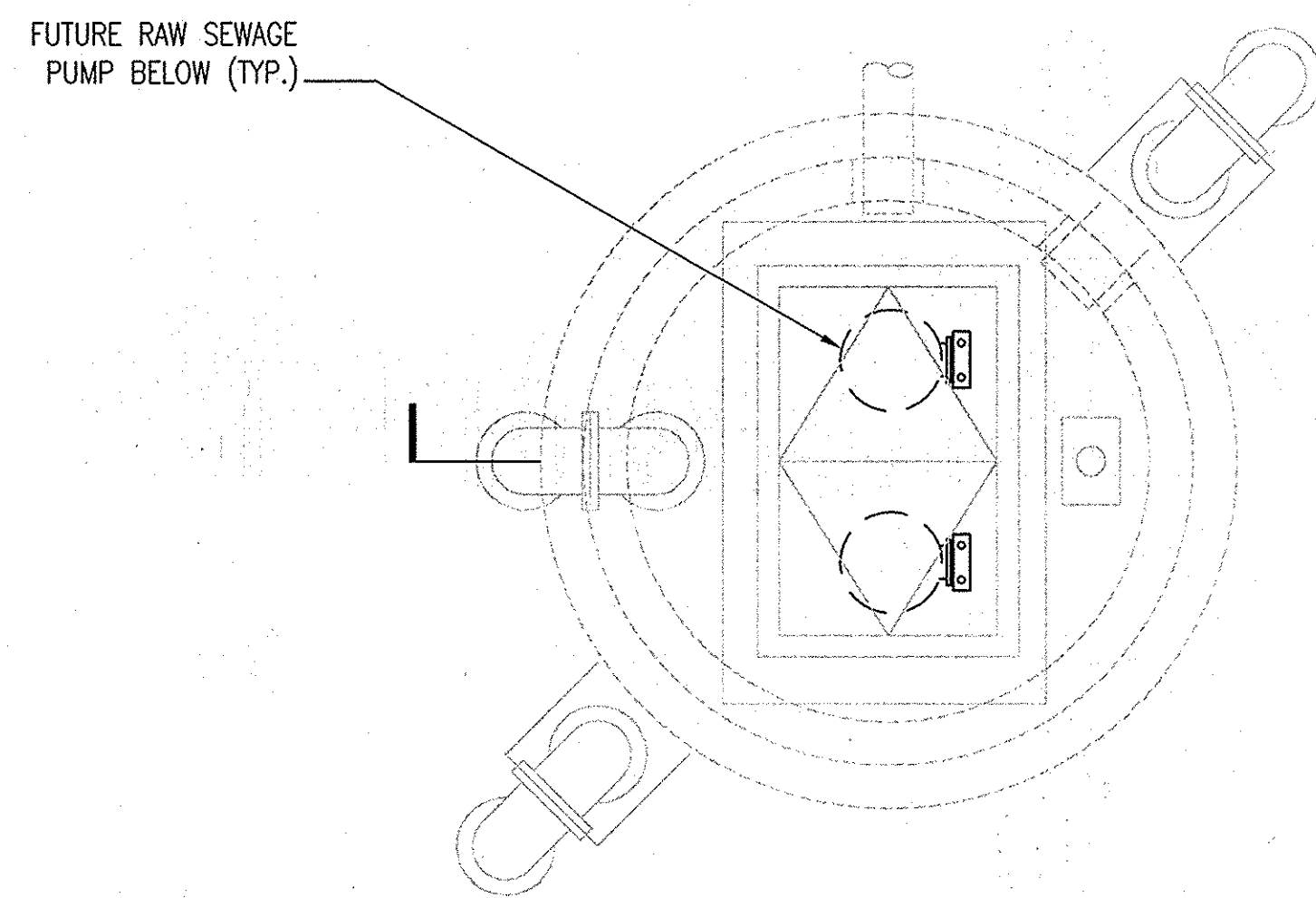
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JUNE 2013	
BY NO.	
REVISION	
DATE	

600 SCALE MAP NO. 32	BLOCK NO. 21.
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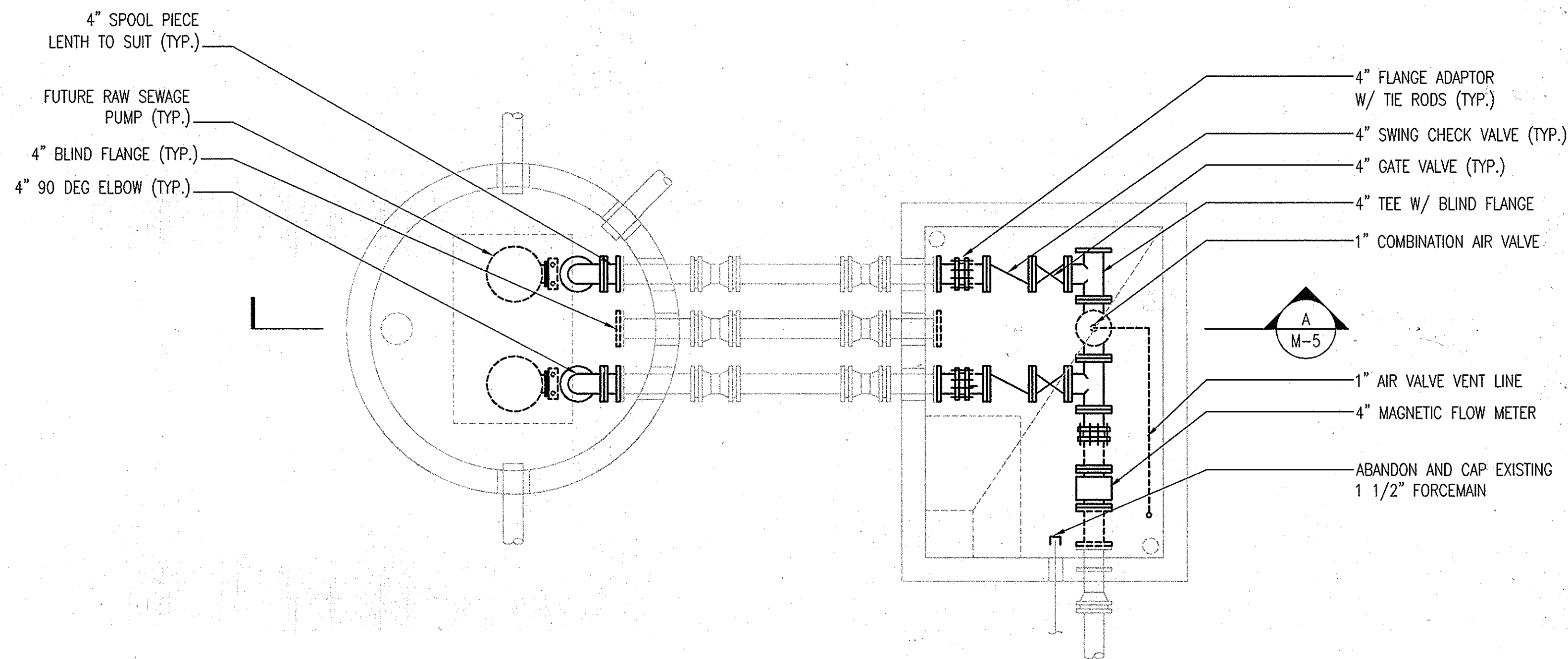
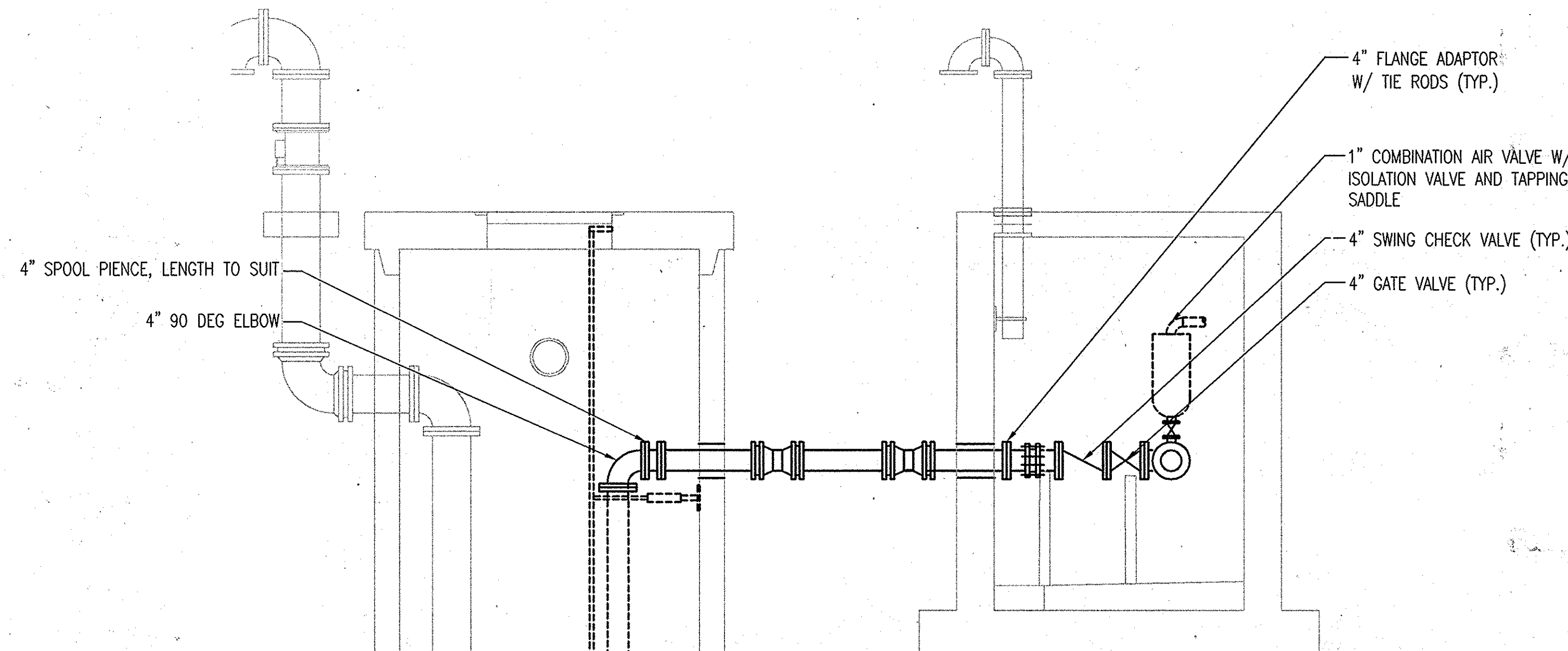
**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION**  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

M-4  
 SCALE AS SHOWN  
 SHEET 20 OF 38

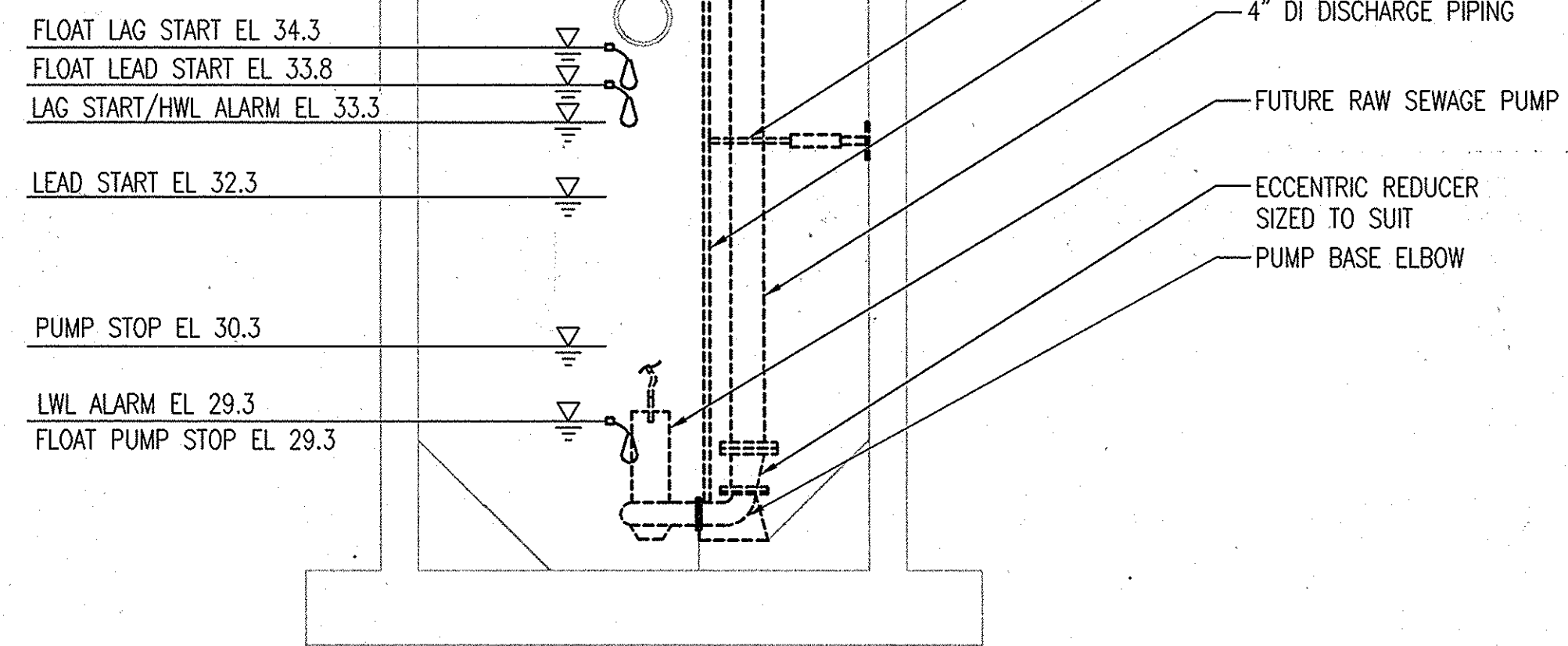
- GENERAL NOTES:**
- SEE M-1 FOR ADDITIONAL NOTES.
  - ALL BOLDED INFORMATION INDICATED ON THIS DRAWING IS FOR COUNTY REFERENCE ONLY AND IS IN REGARDS TO COORDINATION FOR THE DESIGN INTENT FOR FUTURE UPGRADES AT THE PUMP STATION. ALL BOLDED INFORMATION PROVIDED ON THIS DRAWING IS NOT IN THIS CONTRACT. SEE DRAWING M-2 FOR PIPING AND VALVING TO BE PROVIDED FOR THIS CONTRACT.



**1 GRADE LEVEL PLAN**  
M-5 SCALE: 1/2" = 1'-0"



**2 LOWER LEVEL PLAN**  
M-5 SCALE: 1/2" = 1'-0"



**A SECTION**  
M-5 SCALE: 1/2" = 1'-0"

N I C

"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. 10009, EXPIRATION DATE: 9/2/2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Dan De 7/29/13*  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas J. Subla 7/26/13*  
CHIEF, BUREAU OF ENGINEERING DATE

*Shawn C. ... 7/29/13*  
CHIEF, BUREAU OF UTILITIES DATE

*... 7/26/13*  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
*Hubert W. ... 7/27/13*

DES:	
DRN:	
CHK:	
JUNE 2013	
BY NO.	REVISION
	DATE

FUTURE WETWELL/VALVE  
VAULT PLANS AND  
SECTIONS (SEE NOTE 2.)

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

M-5  
SCALE  
AS SHOWN  
SHEET  
21 OF 36

# ELECTRICAL LEGEND (SCHEMATICS AND WIRING DIAGRAMS)

# GENERAL NOTES

# ABBREVIATIONS

## PLANS SYMBOLS

## SCHEMATIC SYMBOLS

- INSTALLATION OF ALL WIRING AND CONDUITS SHALL CONFORM WITH LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70 AND LOCAL CODES).
- CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO THE BEAMS AND WALLS.
- PROVIDE ALL REQUIRED PULL BOXES AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS.
- THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS ARE BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS APPROVED BY THE COUNTY MAY BE MADE BY THE CONTRACTOR AT HIS EXPENSE TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY COMPONENTS REQUIRED FOR MAKING FINAL CONNECTION OF ALL EQUIPMENT INSTALLED OR MODIFIED AS PART OF THIS CONTRACT.
- ALL ALARM INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
- COORDINATE WITH UTILITY COMPANY FOR LOCATION OF POLE MOUNTED TRANSFORMER, SECONDARY CONDUIT ROUTING AND REQUIREMENTS PRIOR TO START OF CONSTRUCTION.
- ELECTRICAL ENCLOSURES LOCATED OUTDOORS SHALL BE WEATHERPROOF NEMA 4X, UNLESS OTHERWISE NOTED.
- DRAWINGS ARE DIAGRAMMATIC. ACTUAL LOCATION OF EQUIPMENT TO BE DETERMINED IN THE FIELD. NEW EQUIPMENT SHALL FIT INTO AVAILABLE SPACE. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE EQUIPMENT WHICH MEETS THE SPACE REQUIREMENT.
- COORDINATE WORK SCHEDULE WITH THE COUNTY.
- THE CONTRACTOR SHALL SUBMIT A LIST OF ALL MAJOR EQUIPMENT AND FIXTURES TO THE ENGINEER FOR REVIEW AND APPROVAL. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT THE PERMISSION OF THE ENGINEER IN WRITING. ALL EQUIPMENT SHALL BE NEW AND BEAR THE MANUFACTURER'S NAME AND TRADE NAME. ALL EQUIPMENT SHALL BE UL LISTED.
- ALL DRAWINGS ARE PREPARED IN ENGLISH UNITS. WIRE SIZE IS INDICATED IN THE AMERICAN WIRE GAUGE. ALL CONDUIT SIZES ARE INDUSTRY STANDARD.
- THE CIRCUIT NUMBERS ARE FOR IDENTIFICATION PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS AND CORRECTLY PHASING THE CIRCUITS IN PANELBOARD.
- ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT ARE BASED ON EQUIPMENT SPECIFIED. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL SHOP DRAWINGS PRIOR TO ORDERING AND INSTALLING EQUIPMENT.
- WHERE ELECTRICAL INSTALLATIONS DEPEND UPON WORK OF OTHER TRADES, THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT NECESSARY INSTRUCTIONS, TEMPLATES, MATERIALS, ETC. ARE PROVIDED AND SUPERVISE THE WORK OF THE OTHER TRADES FOR QUALITY AND CODE COMPLIANCE.
- ALL JUNCTION AND PULL BOXES SHALL BE LABELED WITH THEIR VOLTAGE AND USAGE.
- CUT AND PATCH SLABS, FLOOR, WALL, ROADWAY AND OTHER SURFACES AS NECESSARY TO ACCOMPLISH CONSTRUCTION WORK UNDER THIS CONTRACT.
- CONTRACTOR SHALL COORDINATE AND OBTAIN APPROVAL OF ALL WORK RELATED TO ELECTRICAL SERVICE FROM POWER COMPANY.
- ALL CONDUITS TO WET WELL SHALL BE PVC COATED RGS.
- CONTRACTOR SHALL TEST PIT TO DETERMINE LOCATION OF EXISTING UTILITIES BEFORE CONSTRUCTION OF NEW UNDERGROUND CONDUITS.
- SERIES RATING OF CIRCUIT BREAKERS SHALL NOT BE ALLOWED.
- MINIMUM WIRE SIZE SHALL BE #12 UON.
- MINIMUM CONDUIT SIZE SHALL BE 3/4" UON.
- CONTRACTOR SHALL PROVIDE SEAL OFF FITTINGS FOR ALL CONDUITS ENTERING HAZARDOUS LOCATION, IN COMPLIANCE WITH THE NEC. WET WELL IS CLASSIFIED AS CLASS 1, DIV. 1 AREA.

A	AMPERE
AIC	AMPS INTERRUPTING CAPACITY
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AMP	AMPERES
ATS	AUTOMATIC TRANSFER SWITCH
BCSD	BARE COPPER SOFT DRAWN
BFG	BELOW FINISHED GRADE
CB	CIRCUIT BREAKER
CBP	CITY BOOSTER PUMP
CKT	CIRCUIT
COMM	COMMUNICATIONS
CO	CONDUIT ONLY
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
DISC SW	DISCONNECT SWITCH
DWG	DRAWING
E	EMERGENCY
EC	EMPTY CONDUIT
EF	EXHAUST FAN
ELEC	ELECTRIC, ELECTRICAL
EUH	ELECTRIC UNIT HEATER
FDTs	FUEL DAY TANK SYSTEM
FLSCP	FUEL LEVEL SYSTEM CONTROL PANEL
FVNR	FULL VOLTAGE, NON REVERSING
GFI	GROUND FAULT INTERRUPTER
G, GND	GROUND
GRS	GALVANIZED RIGID STEEL CONDUIT
HID	HIGH INTENSITY DISCHARGE LTG
HOA	HAND OFF AUTO SELECTOR SWITCH
HP	HORSE POWER
HPS	HIGH PRESSURE SODIUM
IC	INSULATED CASE
JB	JUNCTION BOX
kA	KILO AMPERES
kCML	THOUSAND CIRCULAR MILS
kV	KILOVOLT
kVA	KILOVOLT AMPERES
kWH	KILOWATT HOUR
L	LOAD
LO	LOCKOUT
LTG	LIGHTING
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDS	MAIN DISTRIBUTION SWITCHBOARD
MH	MOUNTING HEIGHT
M.H.	METAL HALIDE
MIN	MINIMUM
N	NEUTRAL
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN, NUMBERS
NTS	NOT TO SCALE
P	POLE
PB STA	PUSHBUTTON STATION
PNL	PANEL
PSI	POUNDS PER SQUARE INCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RGS	RIGID GALVANIZED STEEL
RMS	ROOT MEAN SQUARE
RVSS	REDUCED VOLTAGE SOLID STATE STARTER
SC	SHORTING CONTACTOR
SYMM.	SYMMETRICAL
SW	SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLTS AMPERES
VFD	VARIABLE FREQUENCY DRIVE
W	WATT
WCR	WITHSTAND CURRENT RATING
W	WIRE
WP	WEATHERPROOF CONSTRUCTION
XFMR	TRANSFORMER
∅	PHASE

**SWITCHES**

S SINGLE POLE SWITCH

**SM** MANUAL MOTOR STARTER SWITCH WITH OVERLOAD, PROVIDE HOA

**RECEPTACLES**

**PS** DUPLEX RECEPTACLE (120V, 20A), GFCI TYPE AND LIGHT SWITCH.

**EQUIPMENT CONNECTIONS**

**⊙** JUNCTION BOX

**⊞** DRY TYPE TRANSFORMER, SIZE AS INDICATED.

**GROUNDING**

**⊙B** 3/4" DIA x10' LONG GROUND ROD

**⊙A** GROUND ROD WITH TEST WELL

**UNDERGROUND SITE WORK**

**▨** UNDERGROUND DUCTBANK

**---** RACEWAY BELOW SLAB OR IN SLAB OR CONCEALED

**---** RACEWAY EXPOSED

**---** RACEWAY TURNED UP OR TOWARDS VIEWER

**---** RACEWAY TURNED DOWN OR AWAY FROM VIEWER

**DB** DIRECT BURIED

**PANELBOARD**

**▨** ELECTRICAL PANELBOARD (240/120V, 1∅, 3W+G)

**MISCELLANEOUS**

**X1** **X2** X1 - DESIGNATION OF PLAN (1, 2, 3,...)  
X2 - DRAWING WHERE PLAN IS LOCATED

**1** KEYED CONSTRUCTION NOTE

**225**  
**200** MOLDED CASE CIRCUIT BREAKER, TRIP VALUE INDICATED BELOW LINE AND FRAME SIZE ABOVE. 3 POLES UNLESS OTHERWISE NOTED.

**60**  
**3** DISCONNECT SWITCH, NON-FUSED, SUBSCRIPT INDICATES AMPACITY AND NO. OF POLES, 3P-30A UON

**15**  
**3** DISCONNECT SWITCH, FUSED, SUBSCRIPT INDICATES FUSE SIZE AND NO. OF POLES

**TRANSFORMER**

**50A** FUSE WITH RATING

**Δ** 3 PHASE, 3 WIRE, DELTA

**⏚** 3 PHASE, 4 WIRE, GROUNDED WYE

**⏚** GROUND CONNECTION

**SPD** SURGE PROTECTIVE DEVICES

**⊙** MOTOR

**⊙** GENERATOR

**ATS** - AUTOMATIC TRANSFER SWITCH

**ENCLOS** ENCLOSED CIRCUIT BREAKER, MOLDED CASE TYPE, SIZE AS INDICATED

**3** FUSE, ADJACENT NUMBER INDICATES NO. OF FUSES.

**CB** CONNECTION BOX

**POWER** POWER DISTRIBUTION BLOCKS, SQUARE D CLASS 9080, SUITABLE FOR COPPER AND ALUMINUM CONDUCTORS.

**MC** MINI CAS CONTROLLER

**NEMA** NEMA SIZE STARTER

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jan 7 de 7/26/13*  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas E. Butler 7/26/13*  
CHIEF, BUREAU OF ENGINEERING DATE

*William C. Carr 7/26/13*  
CHIEF, BUREAU OF UTILITIES DATE

*D. J. Dem... 7/26/13*  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
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BALTIMORE, MARYLAND  
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DES:	J.V.				
DRN:	J.V.				
CHK:	A.P.				
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BY	NO.	REVISION	DATE		

ELECTRICAL LEGEND,  
ABBREVIATIONS &  
GENERAL NOTES

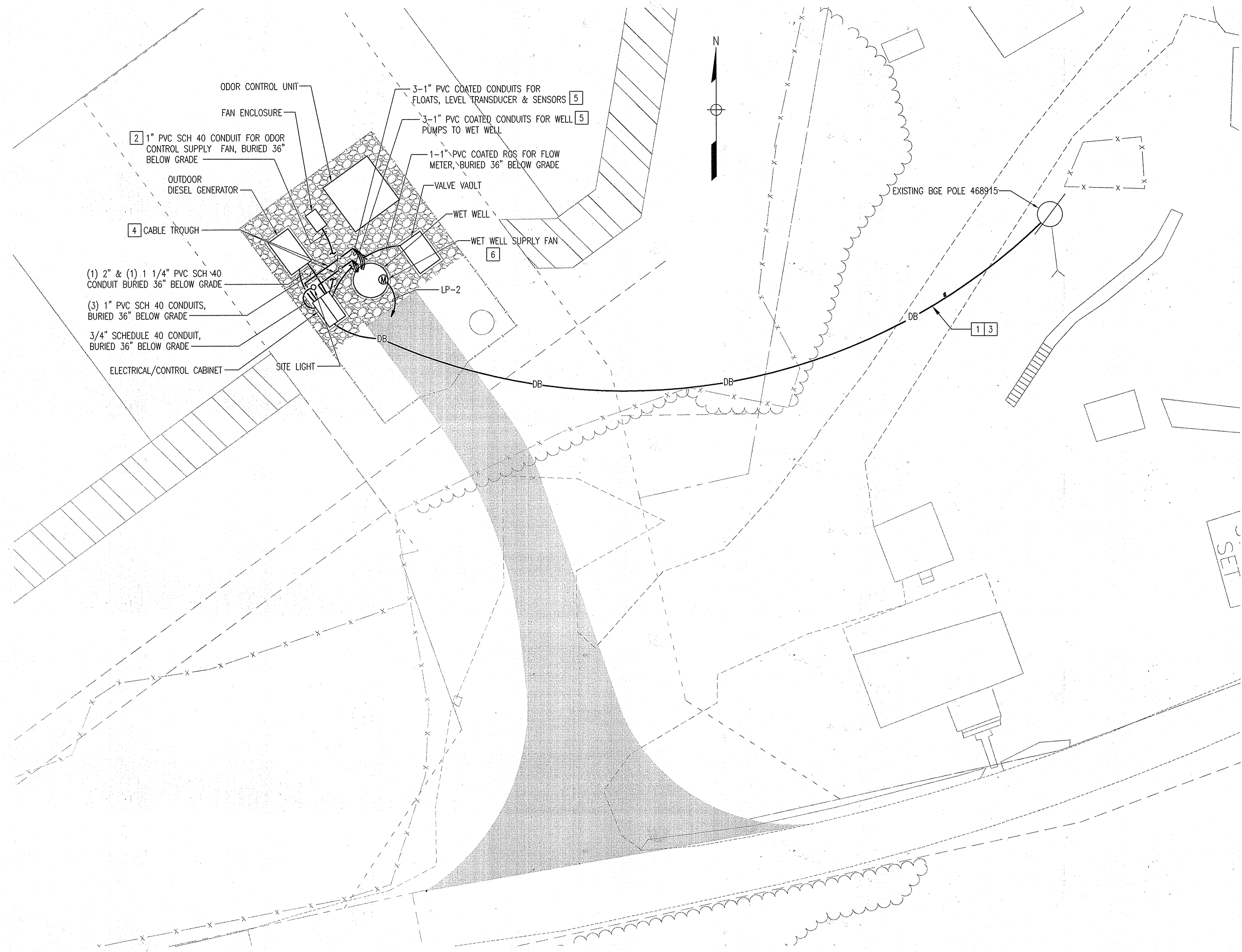
600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

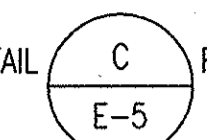
E-1

SCALE AS SHOWN

SHEET 22 OF 36



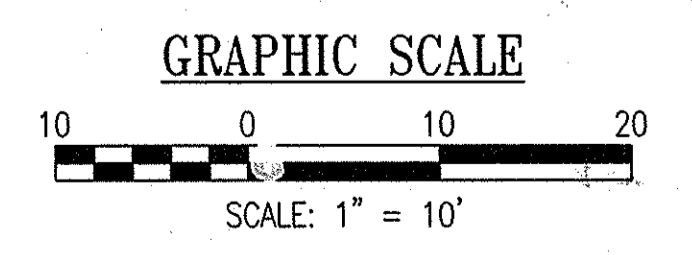
**GENERAL NOTES**

- REFER TO DRAWING E-3 FOR WIRE AND CONDUIT SHOWN ON ONE LINE DIAGRAM.
- COORDINATE WITH UTILITY COMPANY FOR SECONDARY CONDUIT REQUIREMENT AND ROUTING.
- REFER TO DETAIL  FOR ALL DIRECT BURIED CONDUITS.
- COORDINATE AND ARRANGE INSPECTION OF TRENCH FOR CONDUIT INSTALLATION WITH BGE. TRENCH SHALL BE BACKFILLED AFTER APPROVAL OF BGE INSPECTOR.
- COORDINATE WITH BGE FOR EXACT TERMINATION OF CONDUITS AT THE POLE BASE AND TERMINATION OF CONDUIT FOR MAKING CONNECTION TO CABLES.
- BGE TO PROVIDE METER. BGE TO PROVIDE FEEDERS BETWEEN METER AND BGE POLE.

**SPECIFIC NOTES**

- PROVIDE 2-4" DIRECT BURIED PVC SCHEDULE 40 CONDUITS, BURIED 36" BELOW GRADE FOR SERVICE, TO WITHIN 2' OF EXISTING BGE POLE. COORDINATE WITH UTILITY COMPANY DURING TRENCHING AND INSTALLATION OF CONDUITS AND FOR SPECIFIC CONDUIT INSTALLATION REQUIREMENTS. CONDUIT SHALL BE INSTALLED WITH A 5' MINIMUM RADIUS.
- PROVIDE 2#12, 1#12G IN PVC CONDUIT.
- PROVIDE 2" CONDUIT FROM ELECTRICAL ENCLOSURE FOR TELEPHONE CONNECTION, AS REQUIRED BY UTILITY COMPANY, FROM BGE POLE TO TELEPHONE CABINET INSIDE THE ENCLOSURE. PROVIDE NUMBER OF CONDUCTORS AS REQUIRED BY BGE POWER. TOP OF ALL DIRECT BURIED CONDUITS SHALL BE MINIMUM 36" BELOW GRADE. COORDINATE WITH BGE PRIOR TO TERMINATION.
- PROVIDE 2-CABLE TROUGHS (POWER, CONTROL) WITH 4" THROAT (6 1/4" OVERALL WIDTH) x 8"D WITH OPEN GRATE TYPE REMOVABLE COVER IN 20' LONG SECTIONS, WITH HEAVY DUTY H-20 LOAD RATING. (TROUGH COMPONENTS BY ZURN INDUSTRIES, TYPE Z886 "PERMA TRENCH").
- ROUTE POWER AND CONTROL WIRING THROUGH TROUGH AND VIA CONDUITS AS INDICATED ON DRAWING E-4. CONTROL WIRING SHALL BE RUN IN CONTROL TROUGH/CONDUIT AND POWER WIRING SHALL BE RUN IN POWER TROUGH/CONDUITS.
- WET WELL SUPPLY FAN SHALL BE INSTALLED A MINIMUM OF 5' AWAY FROM THE CABLE TROUGH THROAT. APPROXIMATE LOCATION OF FAN SHOWN. COORDINATE ACTUAL LOCATION IN FIELD.

1 SITE PLAN  
E-2 SCALE: 1" = 10'



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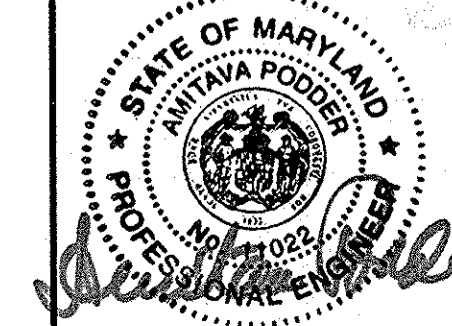
*J. G. De...* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*Marissa S. Butler* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*...* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*...* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

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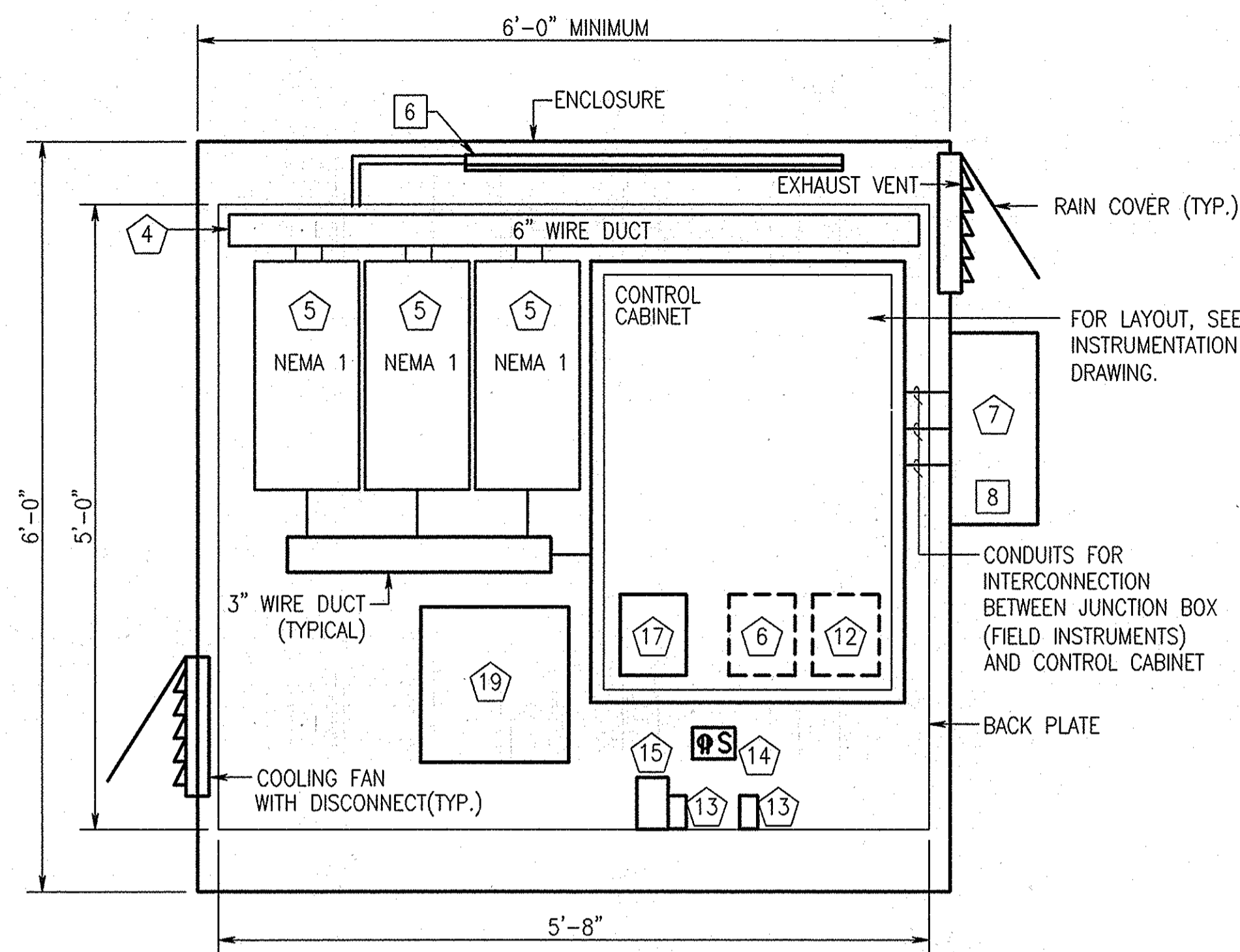
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**ELECTRICAL SITE PLAN**

600 SCALE MAP NO. 32    BLOCK NO. 21.

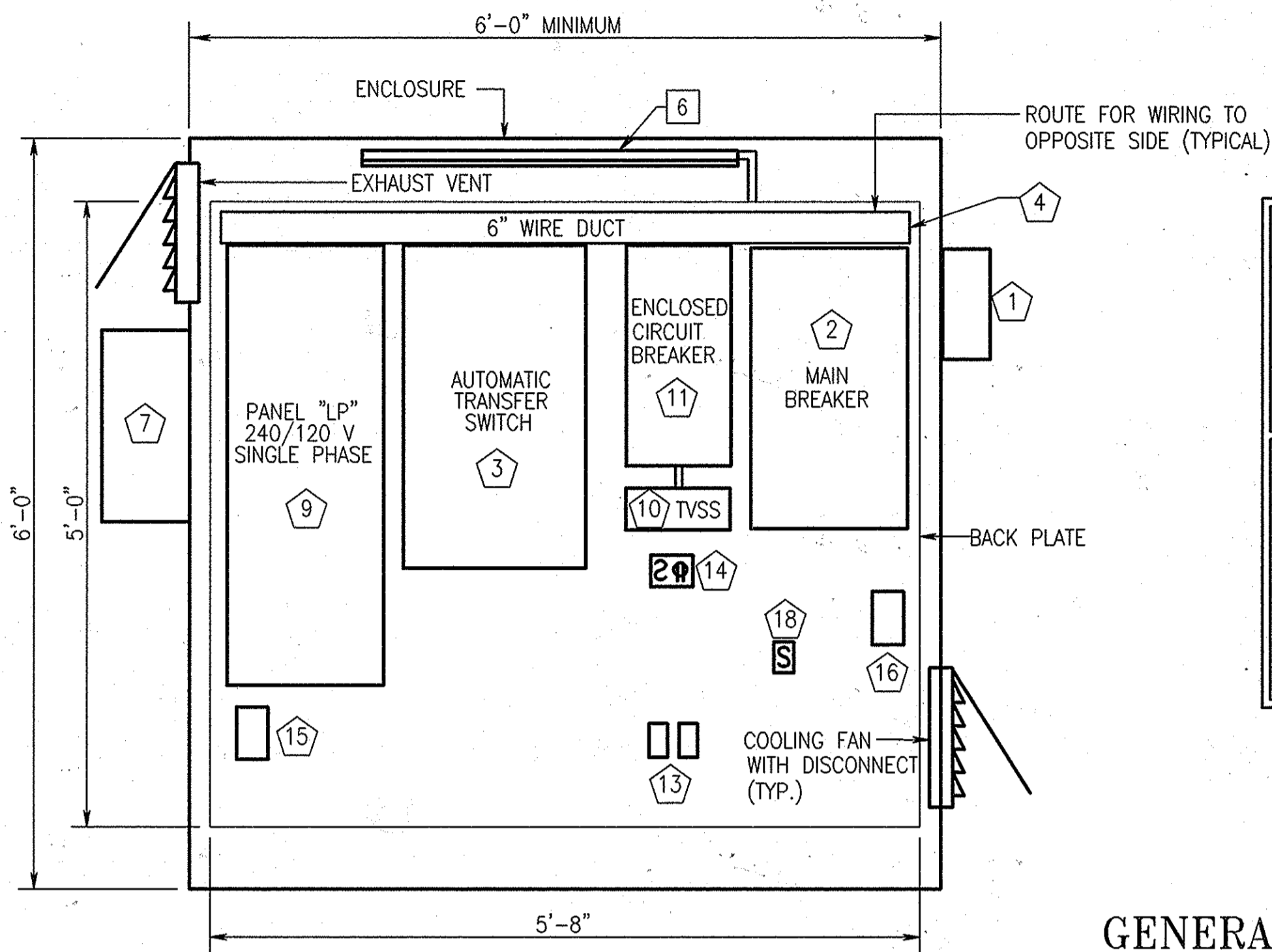
**ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION**  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4/15  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

E-2  
SCALE AS SHOWN  
SHEET 23 OF 36



**ELECTRICAL CABINET-CONTROLS SIDE** 4

SCALE: NONE



**ELECTRICAL CABINET-POWER SIDE**

SCALE: NONE

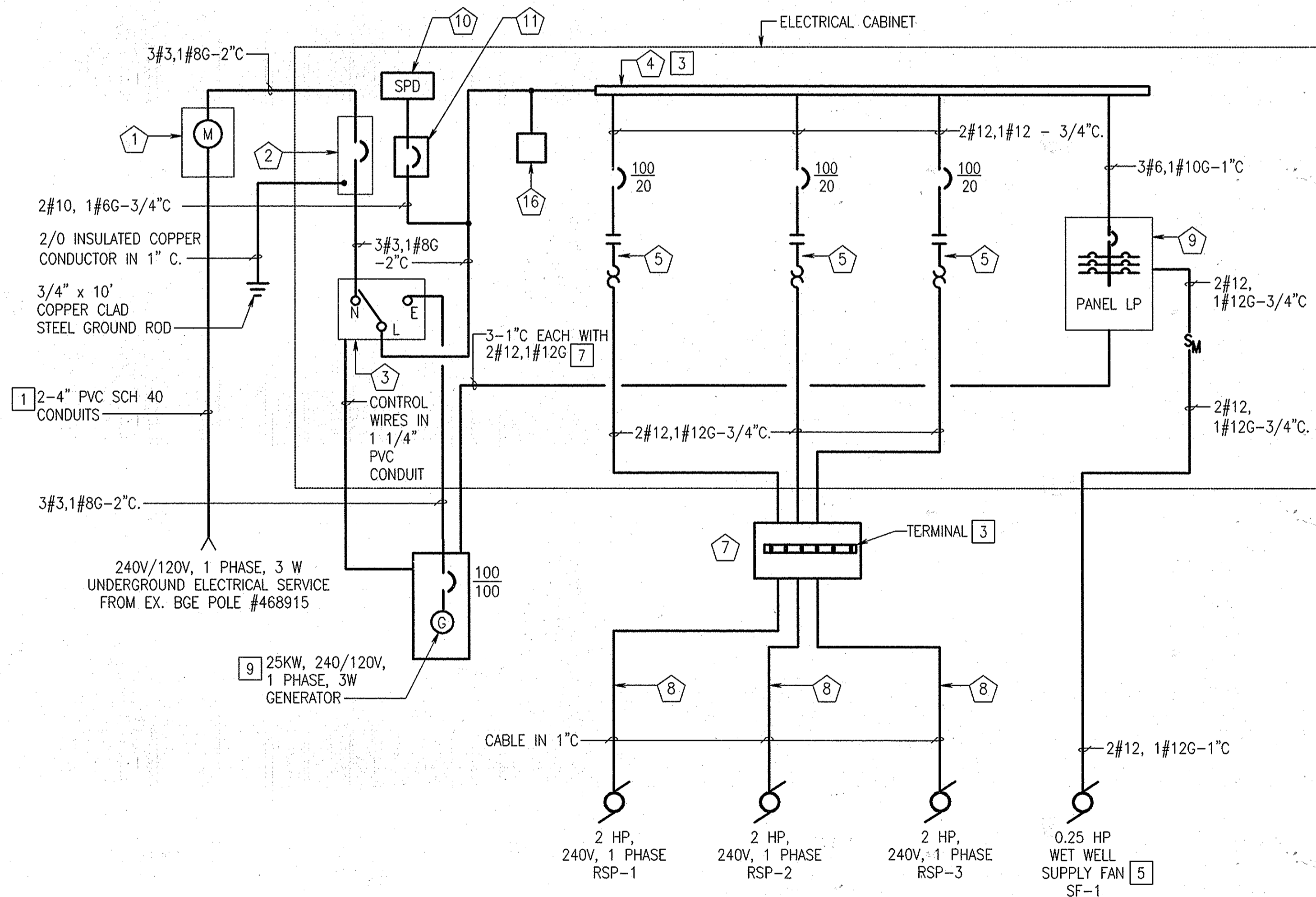
PANELBOARD LP									
18,000 RMS AIC MIN. NEMA 12 ENCLOSURE		100 AMP BUS 240/120 VOLTS SURFACE MOUNTED				50 AMP MCB 1 PHASE, 3 WIRE + GROUND PANEL LOCATION: CABINET			
LOAD SERVED	CIRCUIT BREAKER FRAME	TRIP	P	CKT. NO.	CKT. NO.	CIRCUIT BREAKER P	TRIP	FRAME	LOAD SERVED
CABINET FANS	100	15	1	1	2	1	20	100	WET WELL SUPPLY FAN
CABINET HEATERS	100	20	1	3	4	1	20	100	CABINET LIGHTING
SITE LIGHTING	100	20	1	5	6	1	20	100	ODOR CONTROL SUPPLY FAN-S 2
CONTROL PANEL	100	20	1	7	8	1	20	100	GEN. CONTROL PANEL, LUBE HTR
GENERATOR JACKET HEATER	100	20	1	9	10	1	20	100	SPARE
BATTERY CHARGER	100	20	1	11	12	1	20	100	SPARE
SPARE	100	20	1	13	14	1	20	100	SPARE
SPARE	100	20	1	15	16	1	20	100	SPARE

**GENERAL NOTES**

- METER BY UTILITY COMPANY, CONDUIT AND METER BASE BY CONTRACTOR, COORDINATE WITH UTILITY COMPANY.
- CONNECT CONTROL WIRES, BATTERY CHARGER, JACKET WATER HEATER, LUBE OIL HEATER, CONTROL PANEL HEATER AND ANY OTHER REQUIRED WIRING TO GENERATOR AS INSTRUCTED BY MANUFACTURER.
- ALL CONDUITS TO WET WELL SHALL BE PVC COATED RGS.
- REFER TO INSTRUMENTATION DRAWINGS FOR INSTRUMENTATION AND CONTROL WIRING DETAILS.
- GROUND ALL CABINETS, ENCLOSURES, CONDUITS, GEN-SET ENCLOSURE, ACCORDING TO NEC.
- ALL PROTECTIVE DEVICES SHALL BE RATED FOR 18,000 AIC UON.

**SPECIFIC NOTES**

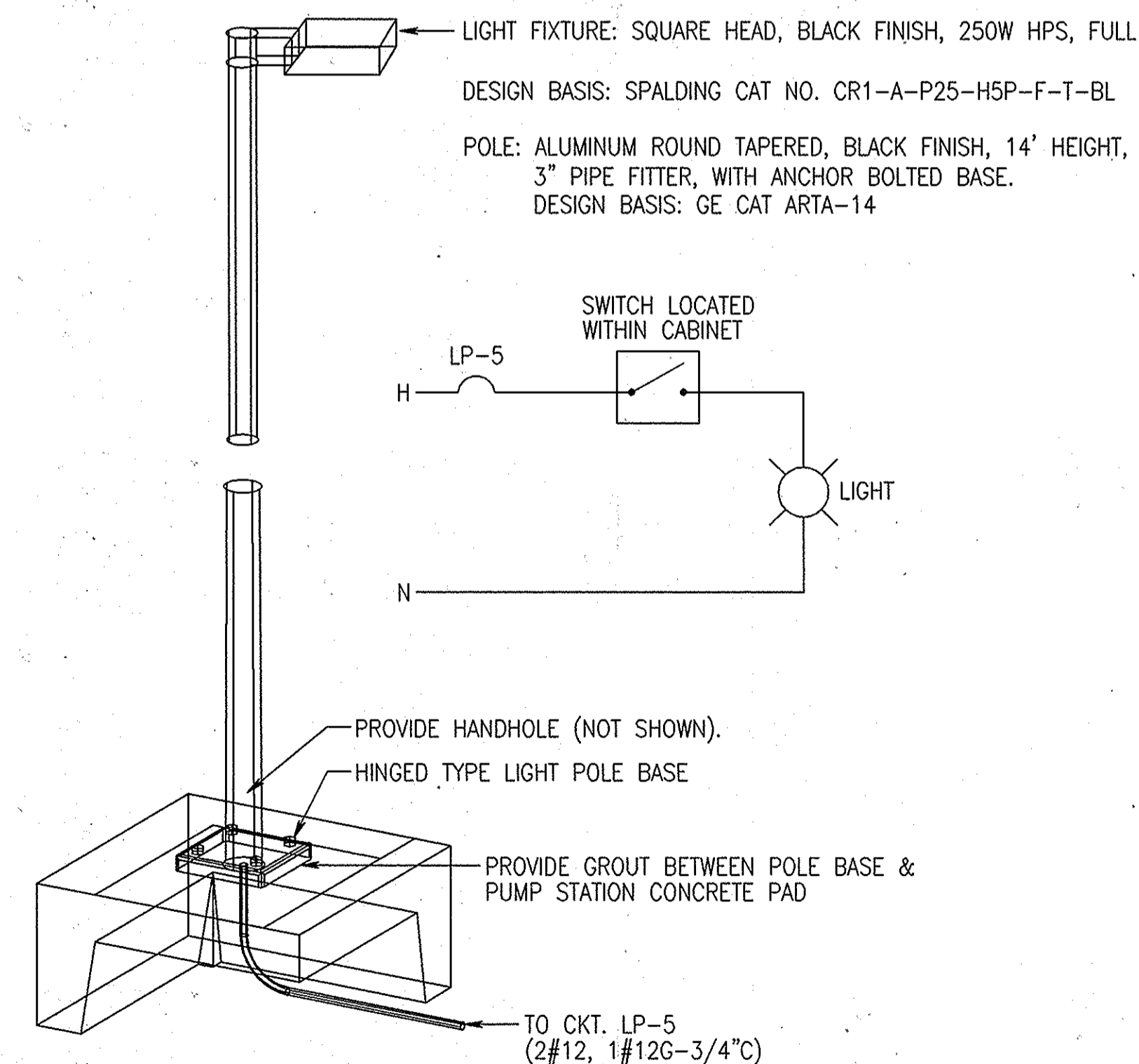
- STUB UP AND CAP THE EMPTY CONDUIT WATER TIGHT, NEAR METER LOCATION. PROVIDE 2 1/2" REDUCER FOR INCOMING CONDUIT FROM BELOW GRADE TO CHANGE CONDUIT FROM 4" TO 2 1/2" UP TO METER.
- CONNECT CIRCUITS AS SHOWN ON PANEL SCHEDULE. MINIMUM BRANCH CIRCUIT SIZE SHALL BE 2# 12, 1#12G-3/4"C.
- PROVIDE POWER DISTRIBUTION BLOCKS WITH COVER, SQUARE D, CLASS 9080, SUITABLE FOR COPPER CONDUCTORS.
- CONTROL SIDE CABINET TO FACE WET WELL.
- REFER TO DWG. I-1 FOR SUPPLY FAN CONTROL DETAILS.
- LIGHT FIXTURE, TWO LAMPS, T8, F032, WITH PRISMATIC LENS, 120 VOLTS 4' LONG (ONE FOR EACH SIDE), ELECTRONIC BALLAST WITH EMERGENCY BATTERY PACK.
- PROVIDE (1) ADDITIONAL EMPTY 1" CONDUIT FOR CONTROLS.
- PROVIDE TERMINAL STRIP IN JUNCTION BOX FOR TERMINATION OF ALL FIELD INSTRUMENTATION. ISOLATE LEVEL TRANSDUCER WIPING FROM ALL 120 VAC CIRCUITS.
- PROVIDE EXTENDED STACK ALTERNATOR FOR FUTURE 3 PHASE USE OF EMERGENCY GENERATOR.



**ELECTRICAL ONE LINE DIAGRAM** 2

**LIGHT FIXTURE DETAIL**

NOT TO SCALE



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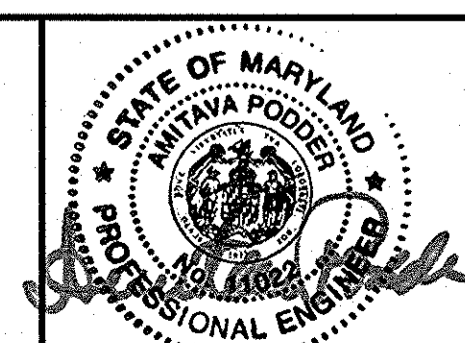
*John De* 7/24/13  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas E. Kulla* 7/24/13  
CHIEF, BUREAU OF ENGINEERING DATE

*John De* 7/24/13  
CHIEF, BUREAU OF UTILITIES DATE

*John De* 7/24/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
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DRN:	J.V.			
CHK:	A.P.			
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ONE-LINE DIAGRAM,  
SCHEDULES AND  
DETAILS

600 SCALE MAP NO. 32 BLOCK NO. 21.

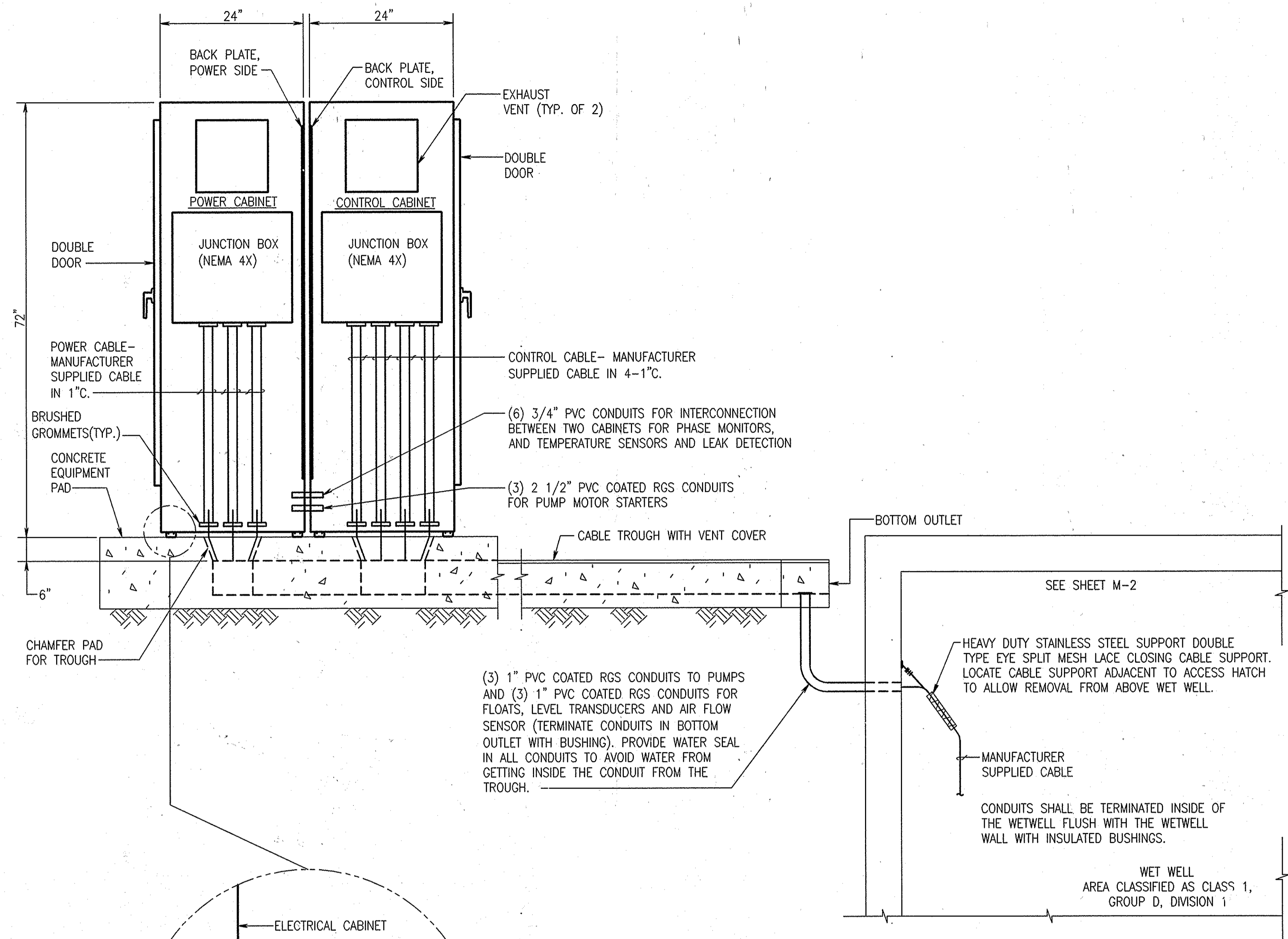
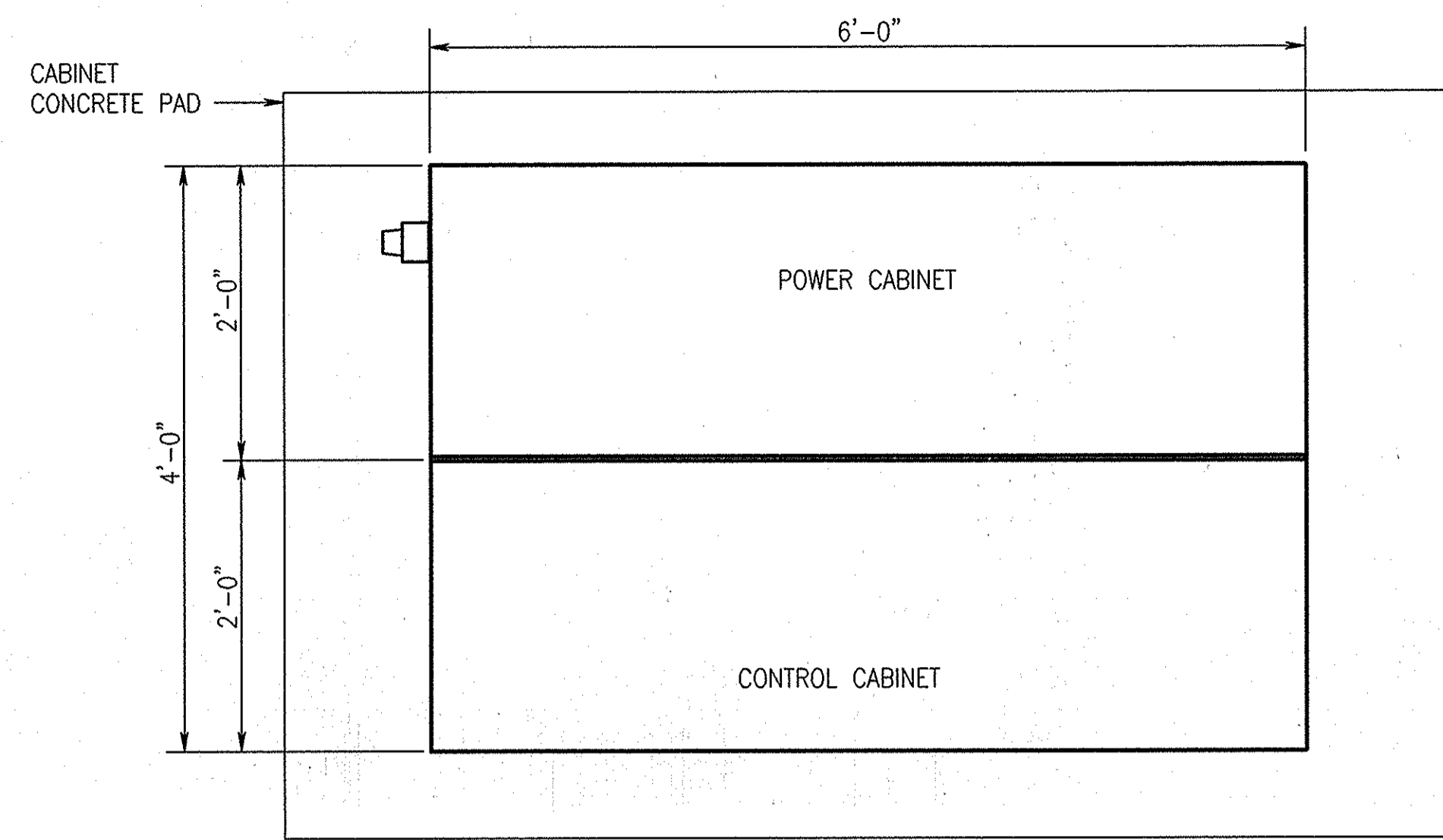
ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

E-3

SCALE  
AS SHOWN

SHEET  
24 OF 38





**ELECTRICAL TERMINATIONS & CONDUITS TO WET WELL-DETAIL**

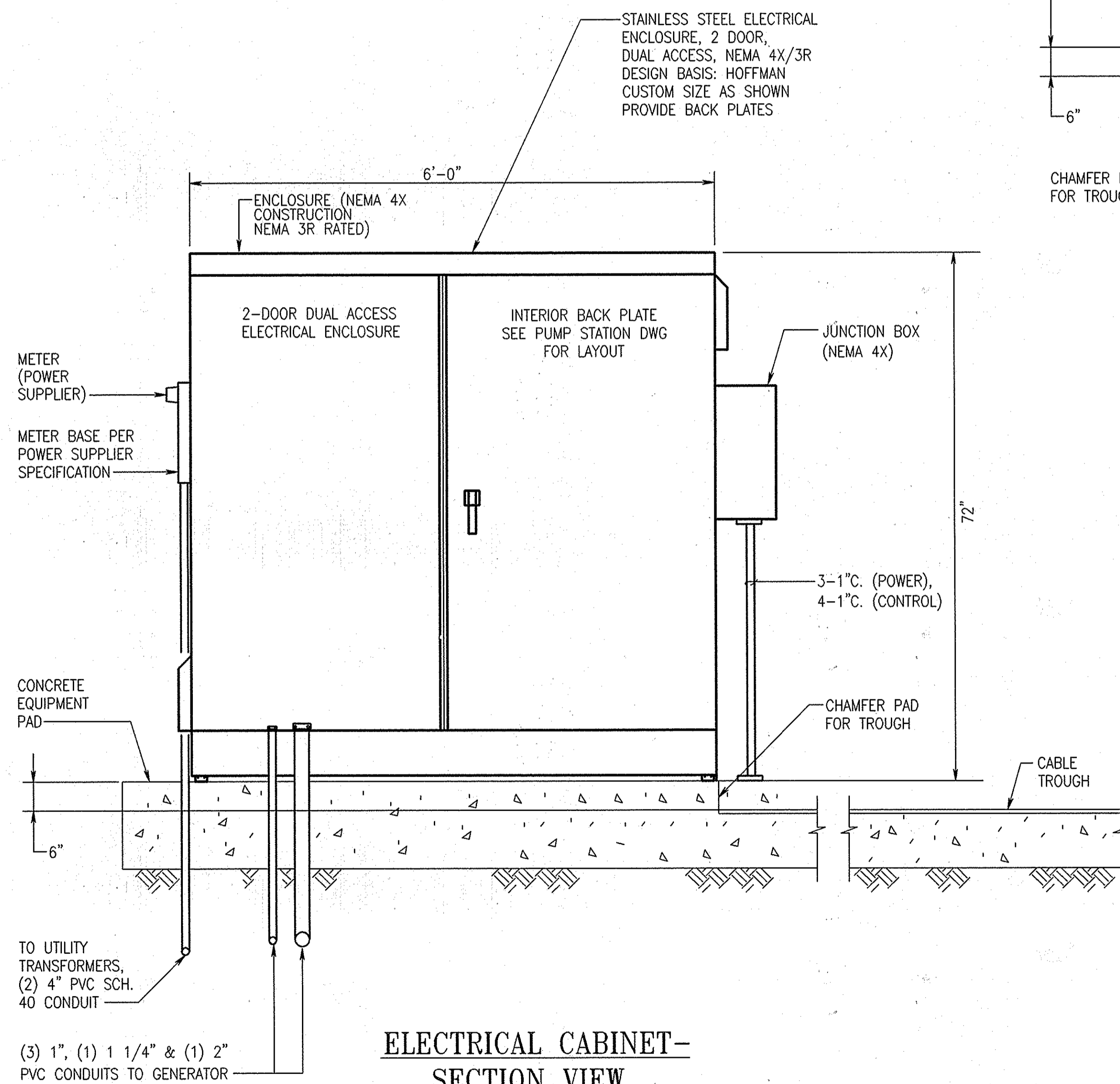
NOT TO SCALE  
NOTE: TO ALLOW SUBMERSIBLE PUMP REMOVAL & MAINTAIN MANUFACTURER SUPPLIED CABLE INTEGRITY

**CABINET BASE DETAIL NOTES**

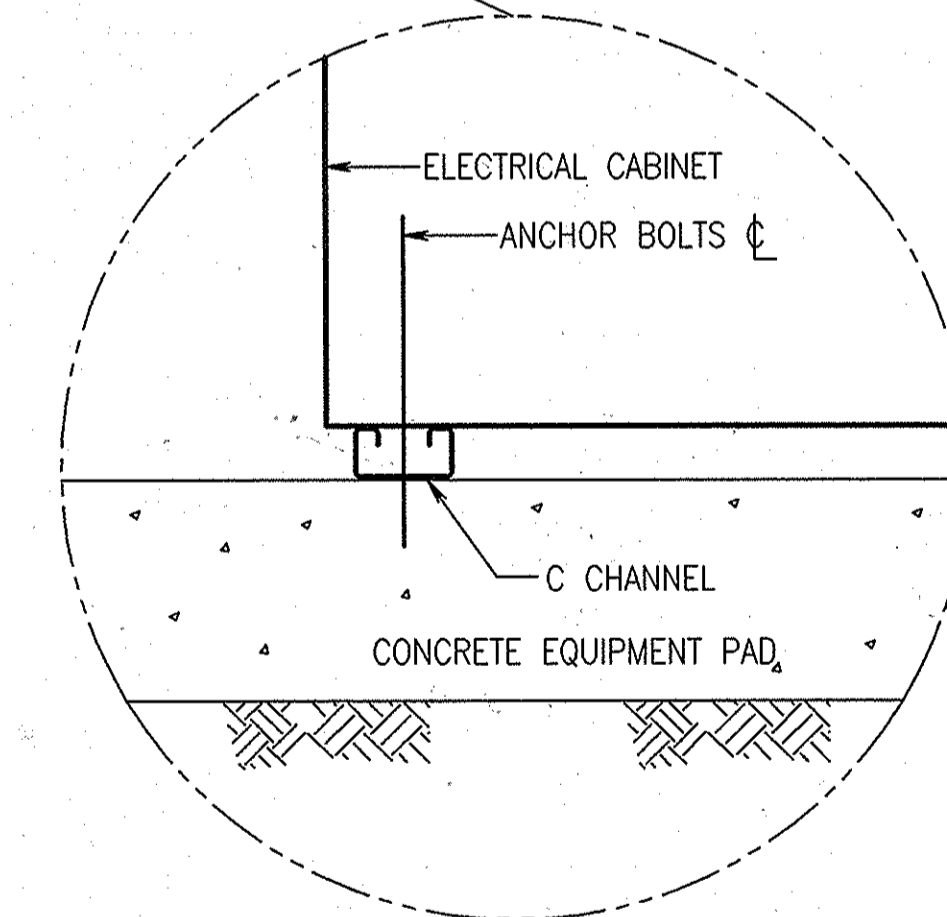
1. PROVIDE C CHANNEL ON ALL 4 SIDES. ALL CORNERS SHALL BE 45° MITERED CUT.
2. C CHANNEL SHALL BE 13/16" X 1 5/8" 14 GAUGE TYPE 316 STAINLESS STEEL. DESIGN BASIS B LINE TYPE B54.
3. CABINET SHALL BE ANCHORED TO EQUIPMENT PAD WITH A MINIMUM OF 14 ANCHOR BOLTS 3/8" IN DIAMETER. DESIGN BASIS: HILTI KWIK BOLT II 316 STAINLESS STEEL.
4. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) & REQUIREMENTS OF STATE OF MARYLAND.

**GENERAL NOTES**

1. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) & REQUIREMENTS OF STATE OF MARYLAND.
2. PROVIDE INSULATED BUSHINGS TO ALL CONDUIT ENDS.
3. LABEL CONDUITS INSIDE CABINET AS INTRINSICALLY SAFE CIRCUITS. MAINTAIN CLEARANCE BETWEEN INTRINSICALLY SAFE CIRCUITS AND OTHER WIRING PER NEC REQUIREMENTS.



**ELECTRICAL CABINET-SECTION VIEW**  
SCALE: 1"=1'-0"

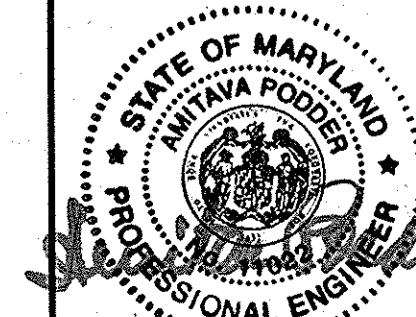


**ELECTRICAL CABINET BASE-DETAIL**  
NOT TO SCALE

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*Jan P. De...* 7/22/13  
 DIRECTOR OF PUBLIC WORKS DATE  
*Morgan P. Sudler* 7/22/13  
 CHIEF, BUREAU OF ENGINEERING DATE  
*John P. ...* 7/22/13  
 CHIEF, BUREAU OF UTILITIES DATE  
 CHIEF, UTILITY DESIGN DIVISION DATE

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**ELECTRICAL CABINET DETAILS**

600 SCALE MAP NO. 32 BLOCK NO. 21.

**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION**  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

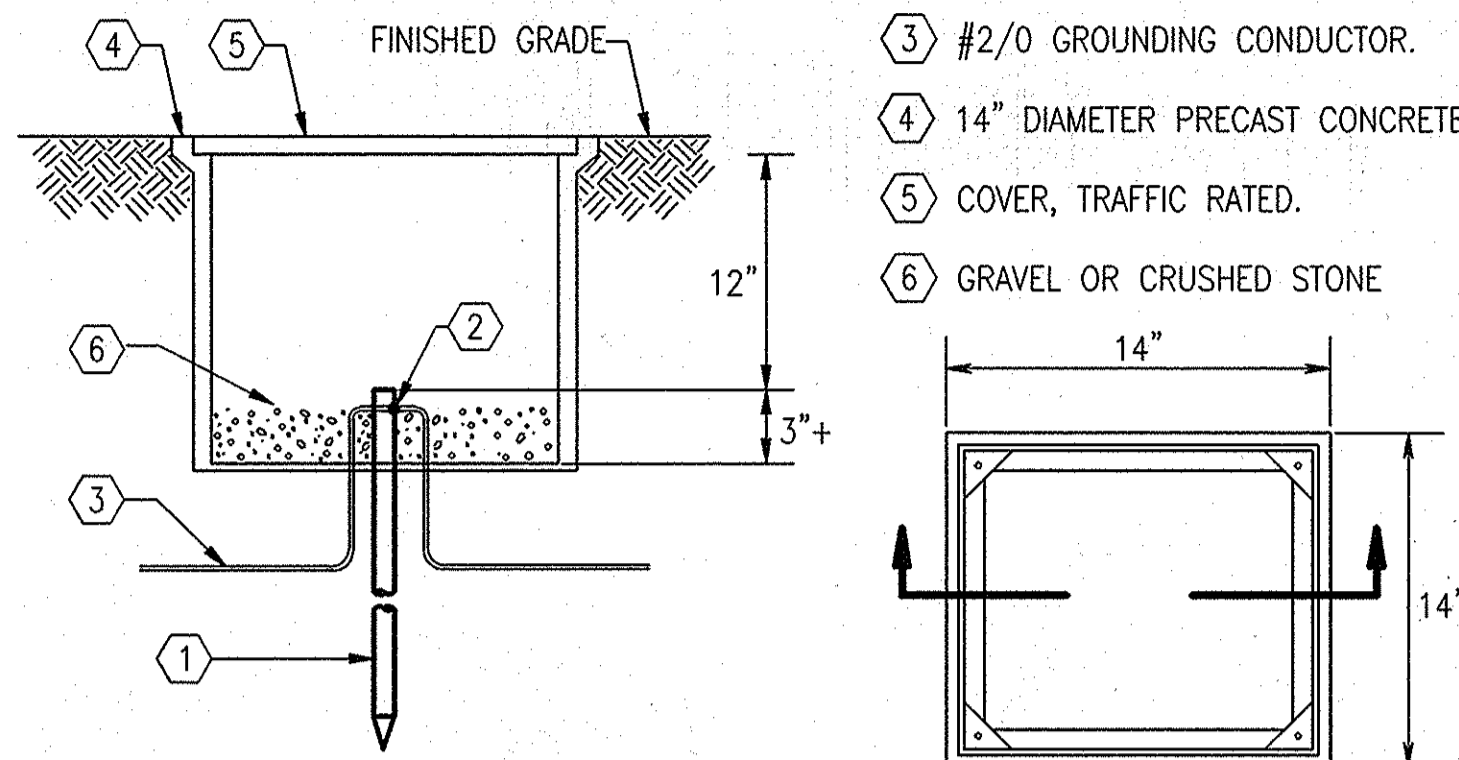
E-4

SCALE AS SHOWN

SHEET 25 OF 36

**NOTES**

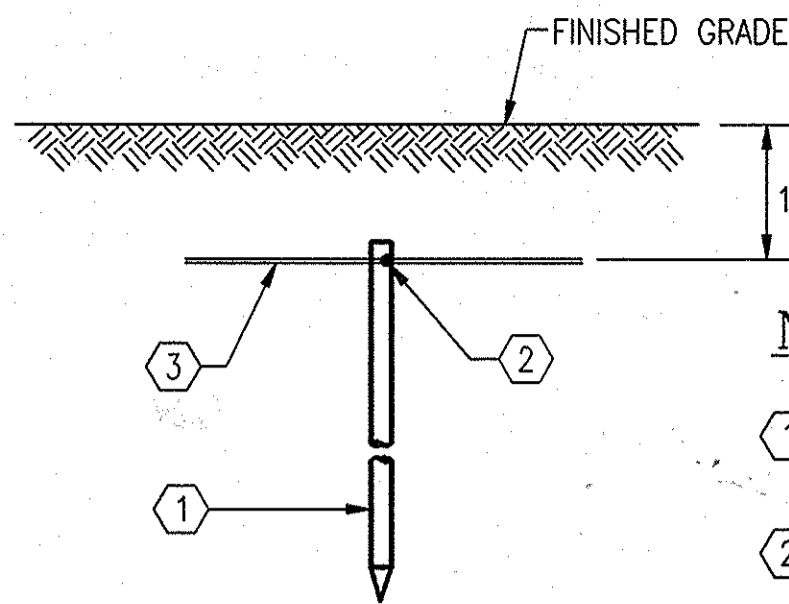
- ① 3/4" DIAMETER COPPER COATED STEEL GROUND ROD 10'-0" LONG.
- ② EXOTHERMIC WELD.
- ③ #2/0 GROUNDING CONDUCTOR.
- ④ 14" DIAMETER PRECAST CONCRETE BOX.
- ⑤ COVER, TRAFFIC RATED.
- ⑥ GRAVEL OR CRUSHED STONE



**SECTION**

**PLAN - COVER REMOVED**

**A GROUND ROD TYPE "A" DETAIL**  
E-5 SCALE: NONE

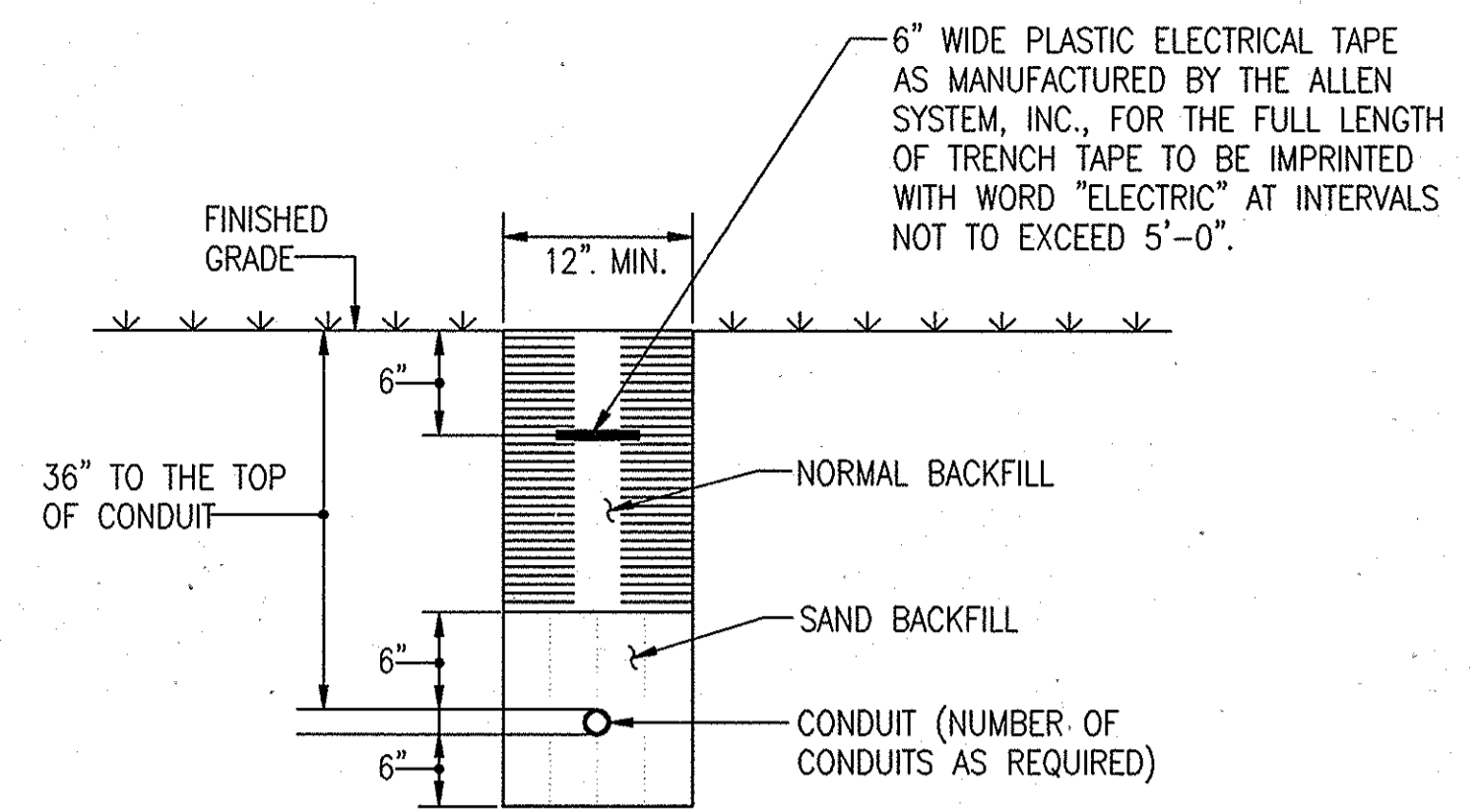


**SECTION**

**NOTES**

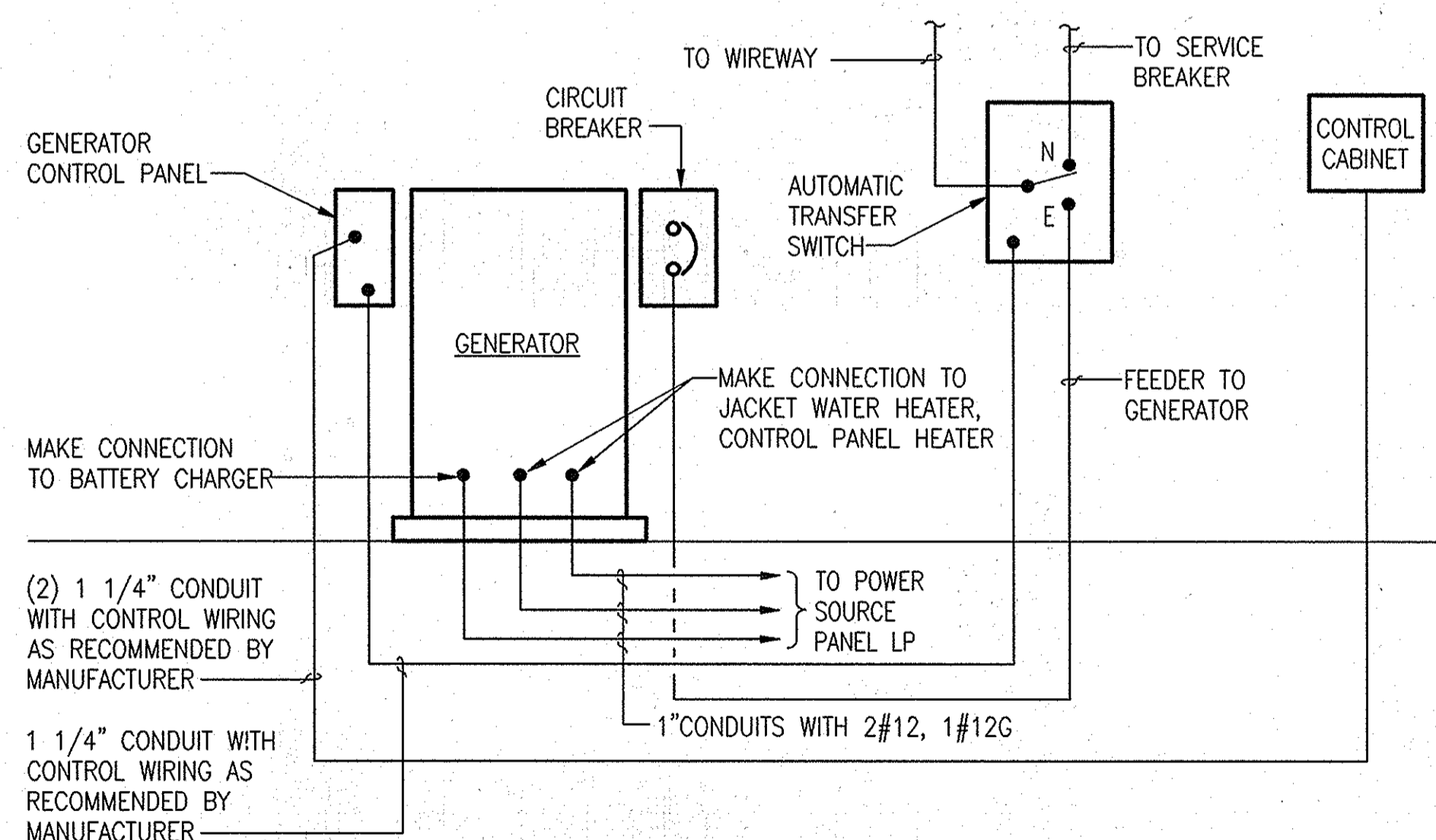
- ① 3/4" DIAMETER COPPER COATED STEEL GROUND ROD 10'-0" LONG.
- ② EXOTHERMIC WELD.
- ③ #2/0 GROUNDING CONDUCTOR

**B GROUND ROD TYPE "B" DETAIL**  
E-5 SCALE: NONE

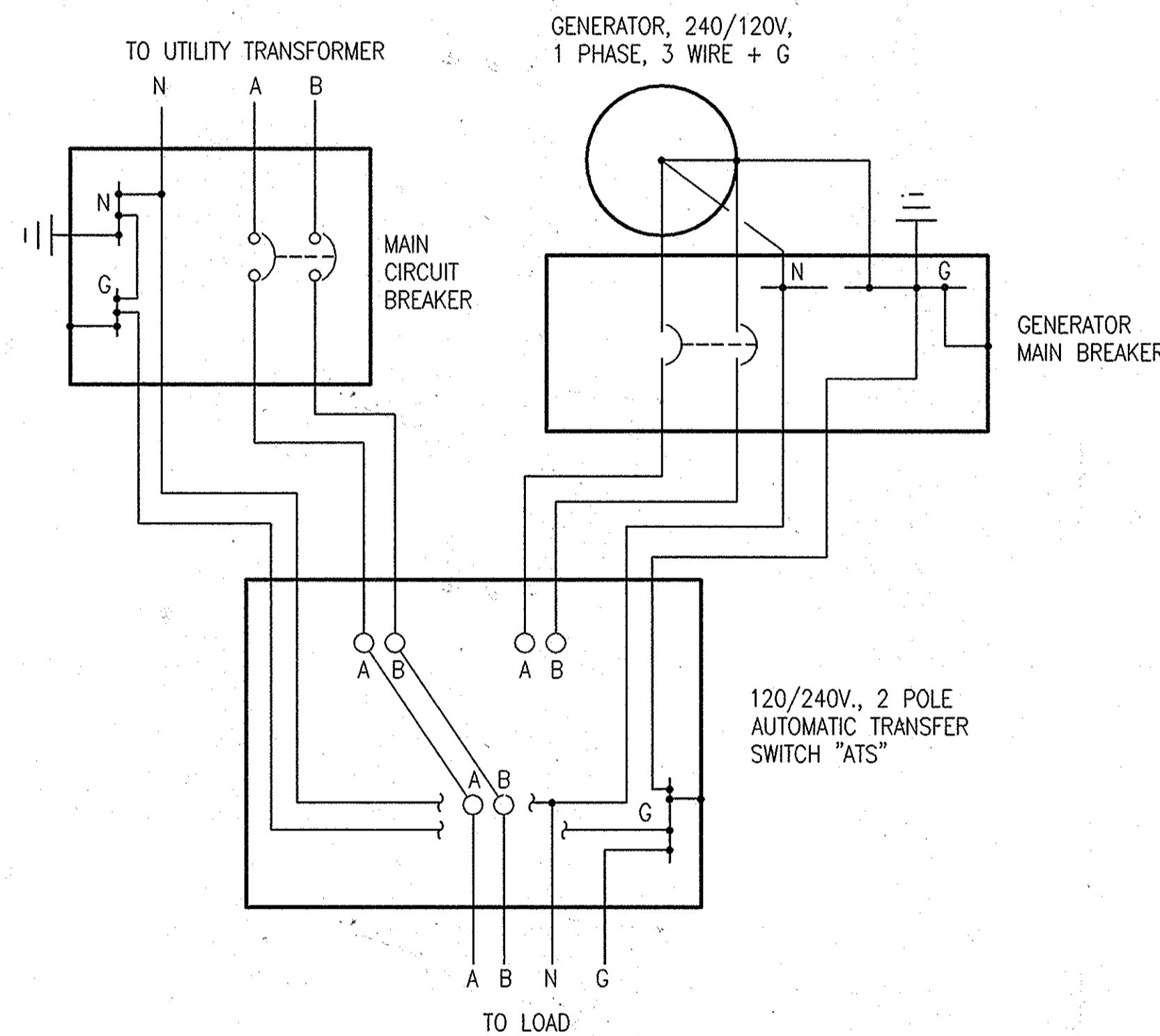


**UNDERGROUND CONDUIT INSTALLATION DETAIL TYPICAL**

**C**  
E-5 SCALE: NONE

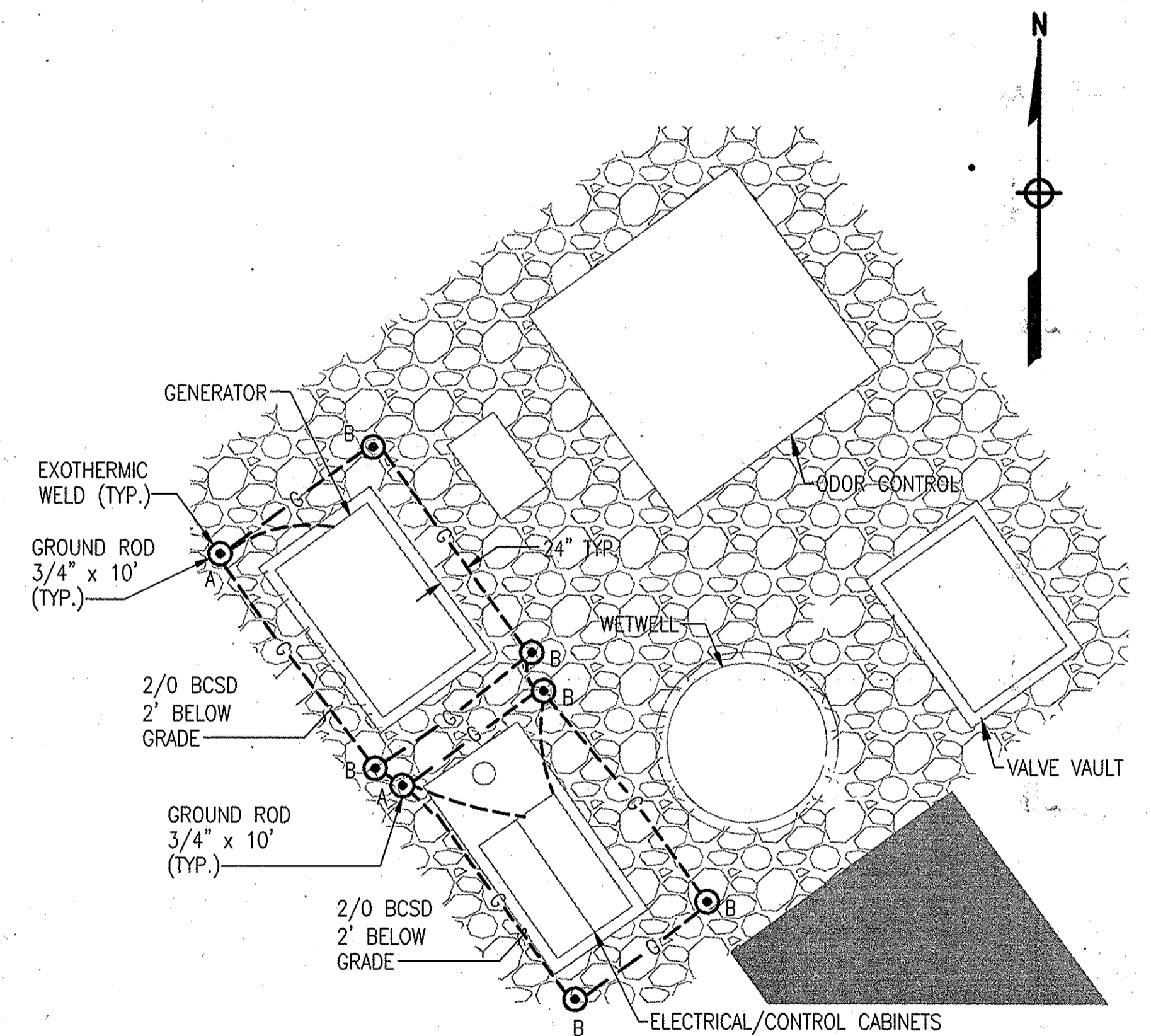


**D EMERGENCY GENERATOR WIRING CONNECTION**  
E-5 SCALE: NONE



**EMERGENCY GENERATOR, ATS, AND MAIN CIRCUIT BREAKER GROUNDING CONNECTION DETAIL**

**E**  
E-5 SCALE: NONE



**F GROUNDING PLAN**  
E-5 SCALE: NONE

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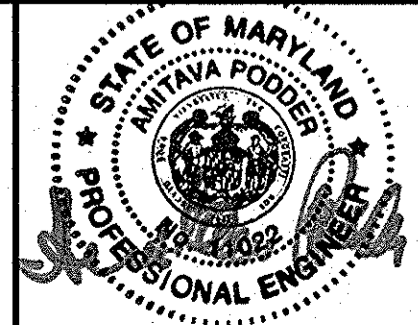
*John De* 7/24/13  
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*Thomas & Butcher* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Steve Chen* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*Chris* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

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CHK:	A.P.			
JUNE 2013	BY	NO.	REVISION	DATE

**GROUNDING PLAN AND DETAILS**

600 SCALE MAP NO. 32 BLOCK NO. 21.

**ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION**  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

E-5  
SCALE AS SHOWN  
SHEET 26 OF 36

**PROCESS AND INSTRUMENTATION**

**SYMBOLS**

- FIELD MOUNTED DEVICE
- PANEL MOUNTED DEVICE
- INDICATING LAMP - X INDICATES LENS COLOR  
R = RED, A = AMBER  
G = GREEN, W = WHITE
- ABC - LETTERS INDICATE FUNCTION ACCORDING TO ISA SCHEDULE. 123 DIGITS IDENTIFY ASSOCIATED EQUIPMENT
- PROCESS FLOW
- ELECTRICAL SIGNAL
- INTERLOCK-PLC LOGIC OR HARDWIRED AS SHOWN ON DRAWINGS: (X) DENOTES CONDITIONS REFERENCE MODIFIERS
- EQUIPMENT GROUPED AS A TYPICAL ARRANGEMENT GROUPING TYPICAL OF MULTIPLES OF THE SAME PROCESS

**EQUIPMENT SYMBOLS**

- PUMP
- CHECK VALVE
- GATE VALVE
- REDUCER
- CHART RECORDER
- NEW PIPING
- EXISTING PIPING

**ABBREVIATIONS**

- AI = ANALOG INPUT
- AO = ANALOG OUTPUT
- AUTO = AUTOMATIC
- ATS = AUTOMATIC TRANSFER SWITCH
- B.O.U. = BUREAU OF UTILITIES
- BP = BOOSTER PUMP
- CBP = COUNTY BOOSTER PUMP
- CIM = COMMUNICATION INTERFACE MODULE
- CPT = CONTROL POWER TRANSFORMER
- DI = DISCRETE INPUT
- DO = DISCRETE OUTPUT
- DPDT = DOUBLE POLE-DOUBLE THROW
- ETM = ELAPSE TIME METER
- HMI = HUMAN MACHINE INTERFACE
- I/O = INPUT/OUTPUT
- MPD = MOTOR PROTECTIVE DEVICE
- MOD = MOTOR OPERATED DAMPER
- OIT = OPERATOR INTERFACE TERMINAL
- PCP = PUMP CONTROL PANEL
- PLC = PROGRAMMABLE LOGIC CONTROLLER
- PVCC = PVC COATED
- RTU = REMOTE TELEMETRY UNIT
- SSRV = SOLID STATE REDUCED VOLTAGE
- TEMP = TEMPERATURE
- TSP = TWISTED SHIELDED PAIR
- TYP = TYPICAL
- VAC = VOLTS/ALTERNATING CURRENT
- VDC = VOLTS/DIRECT CURRENT

**INSTRUMENTATION IDENTIFICATION SCHEDULE**

FIRST LETTER	SUCCEEDING LETTER	
	VARIABLE	MODIFIER
A	ANALYSIS	
B	BREAKER	
C	COMMUNICATIONS	
D	DENSITY	DIFFERENTIAL
E	VOLTAGE (EMF)	
F	FLOW RATE	RATIO
G	GAUGING	
H	HAND	
I	CURRENT	
J	POWER	SCAN
K	TIME	TIME RATE
L	LEVEL	
M	MOTOR	MOMENTARY
N	USER'S CHOICE	
O		
P	PRESSURE	PNEUMATIC
Q	QUANTITY OR EVENT	TOTALIZE
R	RADIOACTIVITY	
S	SPEED OR FREQUENCY	SUM
T	TEMPERATURE	
U	MULTIVARIABLE	
V	VARIABLE OR VISCOSITY	
W	WEIGHT OR FORCE	
X	MOD, LIGHT OR VALVE	
Y	INTERLOCK	
Z	POSITION	

PASSIVE FUNCTION	OUTPUT FUNCTION	
	FUNCTION	MODIFIER
ALARM		AUTOMATIC
USER'S CHOICE	CLOSE OR STOP	BYPASS
	CONTROL	
	OPEN OR START	
PRIMARY ELEMENT	SENSOR	
FAIL	FAIL	FAIL
GLASS		LOCAL/MANUAL/HAND
		HIGH OR OPEN
INDICATE		INTERMEDIATE
	CONTROL STATION	
LIGHT		LOW OR CLOSE
	MOTOR	MIDDLE
INPUT	FORWARD	ON OR OPERATE
	OFF	OVERLOAD
POINT (TEST)	POSITION	
	EMERGENCY/ABNORMAL	
RECORD OR PRINT	REMOTE	RUN
SWITCH	SWITCH	STOP
	TRANSMIT	
MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
	VALVE OR DAMPER	VFD / VALVE
WELL		
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
	RELAY OR COMPUTE	RESET
	DRIVE OR ACTUATOR	

**GENERAL NOTES**

- ALL WORK SHOWN SHALL BE NEW UNLESS OTHERWISE NOTED AS EXISTING.
- SEE ELECTRICAL DRAWINGS FOR POWER DISTRIBUTION, DISCONNECT REQUIREMENTS, EQUIPMENT LOCATIONS AND FEEDER REQUIREMENTS.
- MOTOR STARTER ELEMENTARIES SHOWN ARE INTENDED TO DEPICT THE GENERAL CONTROLS REQUIREMENT FOR THAT PARTICULAR PIECE OF EQUIPMENT AND DO NOT NECESSARILY INDICATE ALL THE REQUIREMENTS OF THE MOTOR STARTER. SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SPECIFIC MOTOR STARTER REQUIREMENTS.
- SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS AND POWER REQUIREMENTS. CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS SUCH AS NOT TO CAUSE INTERFERENCE WITH NEW AND/OR EXISTING EQUIPMENT.
- ENCLOSURE DIMENSIONS SHOWN ARE MINIMUM REQUIREMENTS. ENCLOSURES SHALL BE SIZED TO ACCOMMODATE EQUIPMENT, CONTROLS AND COMPONENTS AS SHOWN, SPECIFIED AND REQUIRED FOR AN OPERABLE SYSTEM.
- CIRCUITS SHOWN SHALL BE INSTALLED 3/4" CONDUITS UNLESS INDICATED OTHERWISE.
- ALL PENETRATIONS THROUGH EXISTING SOLID CONCRETE STRUCTURES WHERE SLEEVES HAVE NOT BEEN PROVIDED SHALL BE CORE DRILLED AND SIZED TO ACCEPT MECHANICAL LINK SEALS. THROUGH NON-FIRE RATED WALLS, CORE HOLES AND SEAL AROUND CONDUIT WITH NON-SHRINK GROUT. THROUGH EXTERIOR WALL, SEAL WATERTIGHT WITH SILICONE MASONRY SEALANT.
- ALL DISCRETE OUTPUTS FROM THE PUMP CONTROLLERS SHALL BE PROVIDED WITH INTERPOSING RELAYS.

**ELEMENTARY WIRING SYMBOLS**

- CONTROL RELAY
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- FUSE
- CIRCUIT BREAKER
- SELECTOR SWITCH  
XOO= REPRESENT THE NUMBER OF SWITCH POSITIONS
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- EMERGENCY STOP PUSH BUTTON
- PUSH-TO-TEST PILOT LIGHT  
R=RED, G=GREEN, A=AMBER, W=WHITE
- PLC OUTPUT VIA INTERPOSING RELAY
- MOTOR
- TERMINAL BLOCK
- THERMOSTAT CLOSE ON RISING/TEMPERATURE
- NORMALLY OPEN LIMIT SWITCH
- NORMALLY OPEN TIMED CLOSED CONTACT
- NORMALLY CLOSE CONTACT TIMED OPEN
- FLOAT SWITCH
- MANUAL MOTOR STARTER WITH OVERLOAD AND SELECTOR SWITCH
- GROUND

**HAND SWITCHES**

- SELECTOR SWITCH (MAINTAINED CONTACTS)
- XXX = H/O/A : HAND-OFF-AUTO  
L/L/S : LEAD-LAG-STANDBY

**INSTRUMENT, EQUIPMENT AND CONTROL DEVICE EXAMPLES**

- FE = FLOW ELEMENT
- FI = FLOW INDICATING TRANSMITTER
- PE = PRESSURE ELEMENT
- PIT = PRESSURE INDICATING TRANSMITTER
- TSH = TEMPERATURE SWITCH HIGHT
- TSL = TEMPERATURE SWITCH LOW
- ZSC = POSITION SWITCH CLOSED
- ZSO = POSITION SWITCH OPEN
- FS = FLOW SWITCH
- LSL = LEVEL SWITCH LOW
- LSH = LEVEL SWITCH HIGH

**MISCELLANEOUS**

- # - DESIGNATION OF PLAN/SHEET NUMBER (1, 2, ETC.)
- X - DESIGNATION OF SECTION LETTER (A, B, ETC.)

**SIGNAL INTERFACE**

- ANALOG INPUT
- ANALOG OUTPUT
- DISCRETE INPUT
- DISCRETE OUTPUT

**SIGNAL LINE TYPES**

- ETHERNET SIGNAL
- ANALOG SIGNAL
- DISCRETE SIGNAL

**GENERAL CIRCUIT/CONDUIT TAG IDENTIFICATION**

TAG	CONDUIT SIZE	CONDUCTORS	NOTES
C-X (Y)	3/4" (X=2 THRU 18) 1" (X=19 THRU 30) 2" (X=31 THRU 100)	X-#14, 1-#12G	(Y) DENOTES ADDITIONAL SPARES
TSP-X (Y)	3/4" (X=1,2) 1" (X=3,4) 2" (X=5 THRU 16)	X-#18 TWISTED SHIELDED PAIR	(Y) DENOTES ADDITIONAL SPARES
MAN-X	CONDUIT SIZE AS REQUIRED	CABLE AS PROVIDED OR RECOMMENDED BY EQUIPMENT MANUFACTURER. COORDINATE CONDUIT AND INSTALLATION REQUIREMENTS WITH MANUFACTURER.	
TEL-X	CONDUIT SIZE AS REQUIRED	TELEPHONE LINE IN ACCORDANCE WITH EXISTING COUNTY BRIDGE CONNECTIONS. COORDINATE TELEPHONE LINE WITH VERIZON AND COUNTY B.O.U.	

TOTAL CONDUCTORS REQUIRED = X + Y

"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. 25318, EXPIRATION DATE: 7/14/2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jay C. ...* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*... ..* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*... ..* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*... ..* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
7/25/2013

DES: G.H.			
DRN: G.H.			
CHK: P.G.			
JUNE 2013	BY NO.	REVISION	DATE

**INSTRUMENTATION LEGEND, SCHEDULES, AND ABBREVIATIONS**

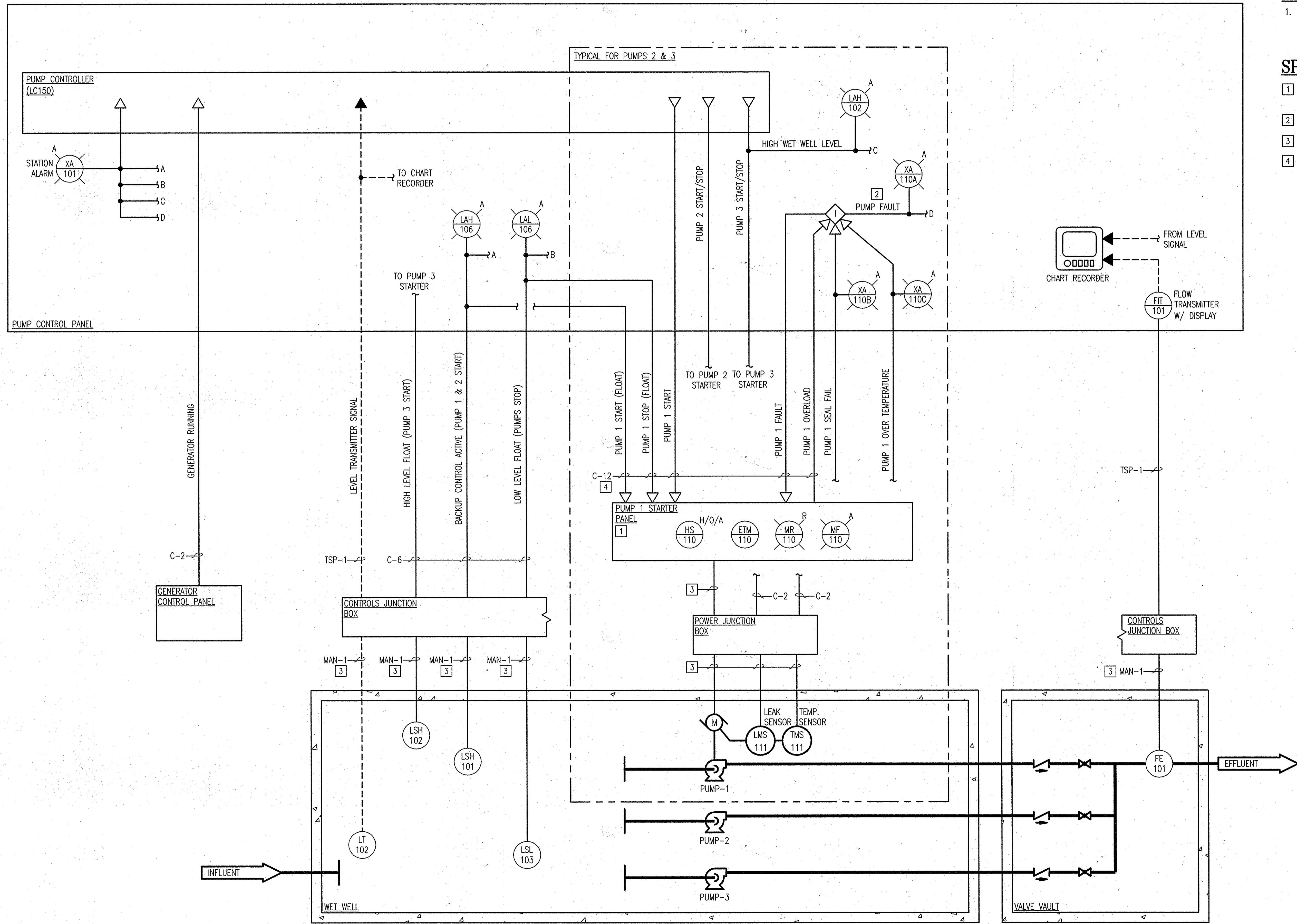
600 SCALE MAP NO. 32 | BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

I-1

SCALE AS SHOWN

SHEET 27 OF 38



**GENERAL NOTES:**

1. UNLESS OTHERWISE INDICATED, EACH OF THE I/O SIGNALS BROUGHT FROM THE FIELD TO THE PUMP CONTROL PANEL SHALL BE PROVIDED WITH AN INTERPOSING RELAY IN THE PUMP CONTROL PANEL TO ISOLATE THE DEVICE POWER FROM THE PUMP CONTROLLER CONTROL POWER.

**SPECIFIC NOTES:**

- 1 EQUIPMENT LOCATED IN THE ELECTRICAL CONTROL CABINET. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL CONTROL CABINET LAYOUT.
- 2 PUMP FAULT INTERLOCK TO PUMP CONTROL AND STATION ALARM.
- 3 SEE ELECTRICAL DRAWINGS FOR CONDUIT AND CABLE DETAILS.
- 4 CONDUIT AND CABLE REQUIREMENTS TYPICAL FOR PUMP 2 & 3 MOTOR STARTER.

1 PROCESS & INSTRUMENTATION DIAGRAM  
I-2 NOT TO SCALE

"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. 25318, EXPIRATION DATE: 7/14/2014."

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
Director of Public Works <i>John P. Lee</i> 7/26/13	Chief, Bureau of Engineering <i>Thomas E. Butler</i> 7/26/13
Chief, Bureau of Utilities <i>Steve Oden</i> 7/26/13	Chief, Utility Design Division <i>Chris Lee</i> 7/26/13

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
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 410 - 235 - 3450



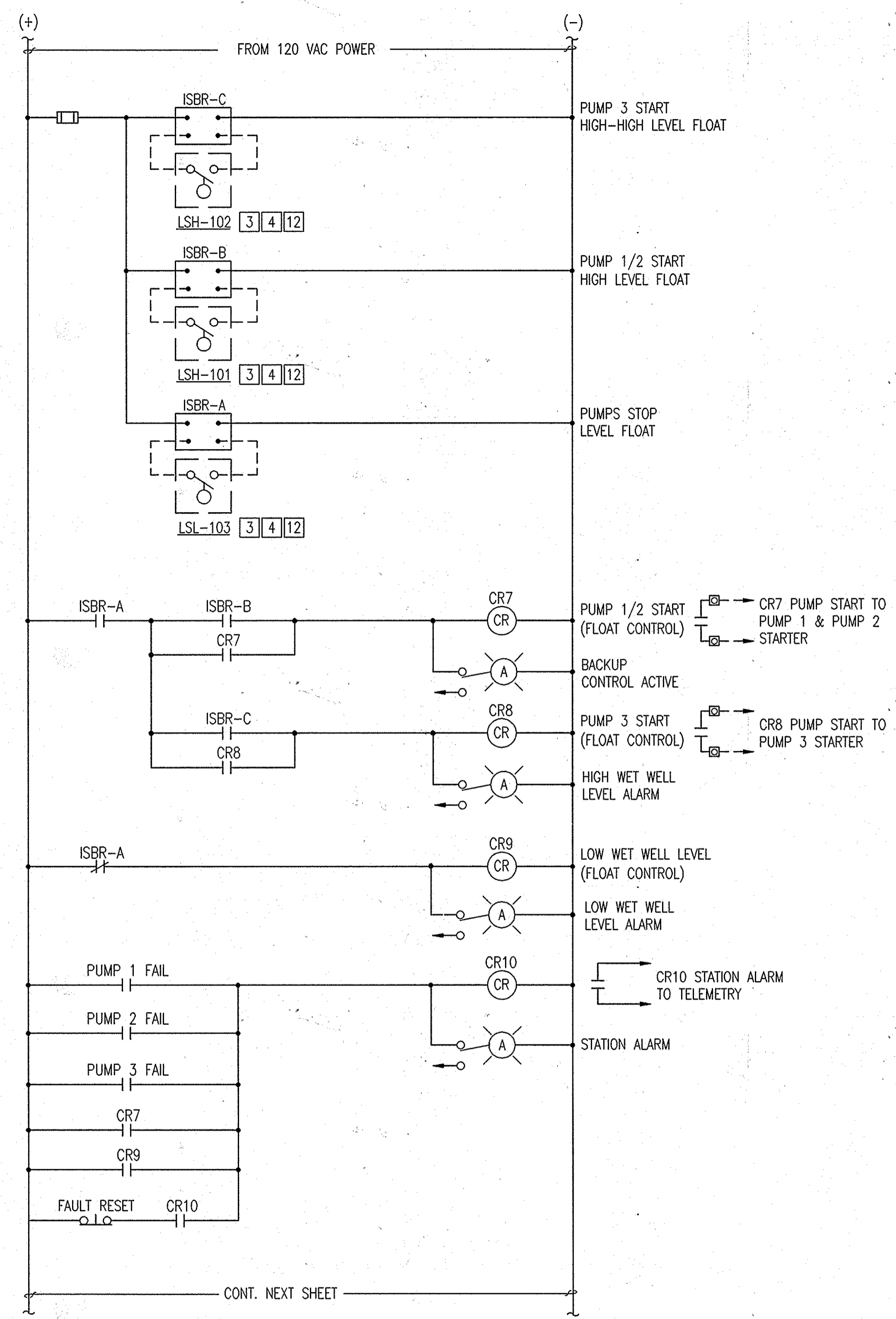
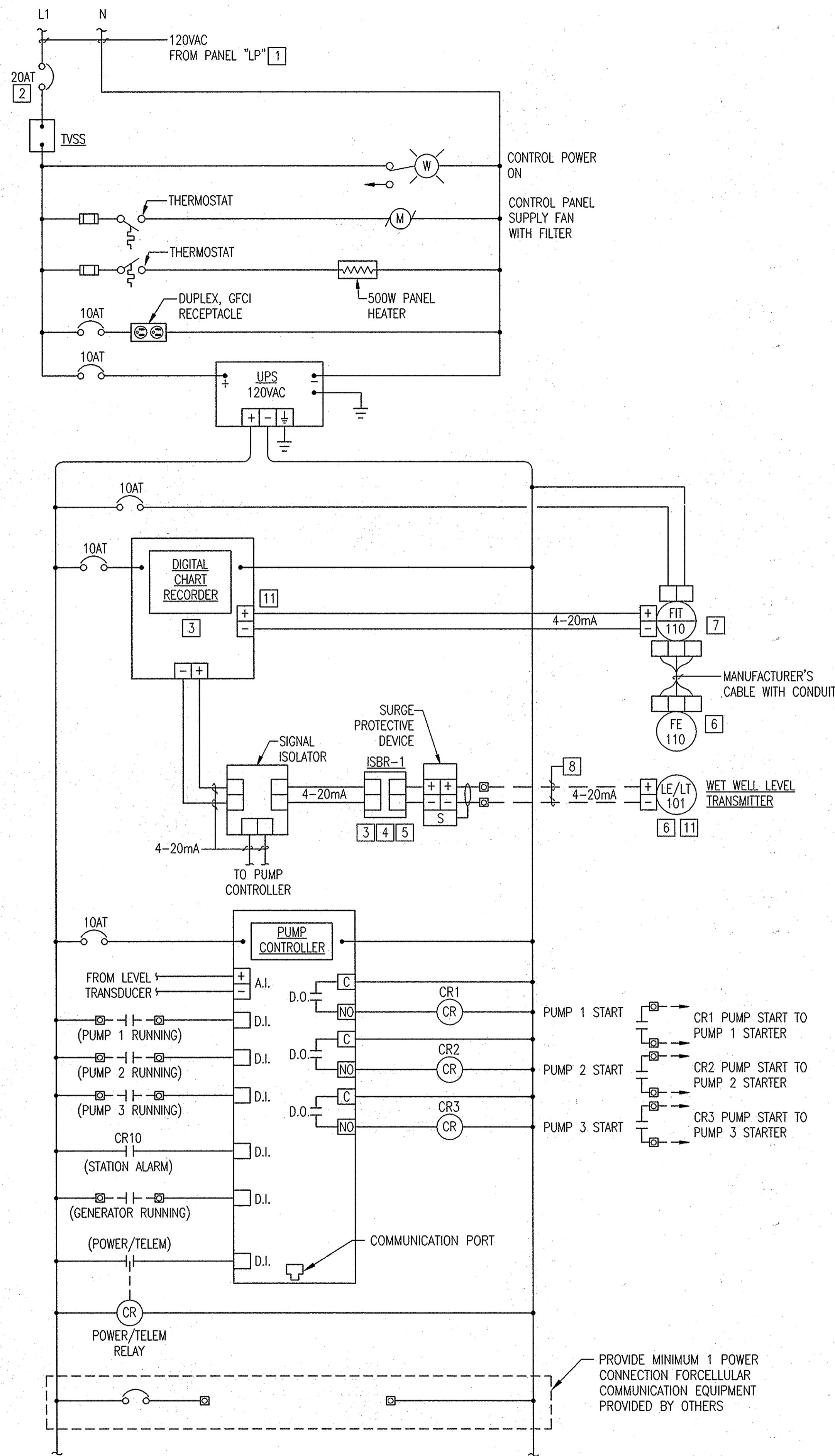
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DRN:	G.H.			
CHK:	P.G.			
JUNE 2013				
BY	NO.	REVISION	DATE	

PROCESS, INSTRUMENTATION,  
AND RISER DIAGRAM (P&ID)

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

I-2  
 SCALE AS SHOWN  
 SHEET 28 OF 36



1 PUMP CONTROL PANEL ELEMENTARY  
I-3 NOT TO SCALE

**SPECIFIC NOTES:**

- 1 REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC PANELBOARD CIRCUITS.
- 2 MOUNT CIRCUIT BREAKER INSIDE PCP. LABEL WITH CIRCUIT NUMBER.
- 3 ALL INTRINSICALLY SAFE BARRIER RELAYS SHALL BE MOUNTED IN SAME LOCATION WITHIN PUMP STATION CONTROL PANEL, AND SHALL BE PHYSICALLY SEPARATED BY METAL BARRIER FROM CONTROL PANEL COMPONENTS. PROVIDE PERMANENT NAMEPLATE IN ACCORDANCE WITH UL-698A AT LOCATION INDICATING:  
"INTRINSICALLY SAFE RELAYS AND CIRCUITRY".
- 4 INTRINSICALLY SAFE WIRING CIRCUITS SHALL ENTER CONTRL. PANEL AT SAME LOCATION, SHALL BE PHYSICALLY SEPARATED FROM ALL OTHER PANEL WIRING BY A MINIMUM OF 2 INCHES, AND SHALL BE INSTALLED ACCORDANCE WITH APPLICABLE NEC AND UL-698A REQUIREMENTS.
- 5 INTRINSICALLY SAFE BARRIER RELAYS FOR LEVEL TRANSDUCER CIRCUITS SHALL BE BY SAME MANUFACTURER AS TRANSDUCERS AND COMPATIBLE WITH THE TRANSDUCERS. ISBR SHALL PROVIDE UL LISTED INTRINSICALLY SAFE CIRCUIT AND BARRIER FOR WIRING FROM TRANSMITTER LOCATED IN CLASS I, DIVISION 1 GROUP D, HAZARDOUS LOCATION. PROVIDE GROUNDING OF ISBRS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 6 EQUIPMENT LOCATED REMOTE FROM PCP.
- 7 FIT-110 ANALOG FLOW SIGNAL DOES NOT REQUIRE LOOP POWER FROM DIGITAL RECORDER.
- 8 MANUFACTURER'S CABLE. PROVIDE VAPOR TIGHT CABLE SEALS AT POINT WHERE INDIVIDUAL CONDUCTORS ARE SEPARATED FROM CABLE SHEATH.
- 9 LOOP POWER FOR WET WELL LEVEL TRANSMITTER SHALL BE OBTAINED FROM THE 24VDC POWER BUS.
- 10 PROVIDE LIGHTNING/SURGE PROTECTION INTEGRAL WITH TRANSDUCER.
- 11 LEVEL TRANSDUCER LOCATED IN WET WELL. WET WELL CLASSIFIED AS CLASS I, DIVISION 1 GROUP D, HAZARDOUS LOCATION.
- 12 FLOAT SWITCHES ARE LOCATED IN THE WET WELL. WET WELLS ARE CLASSIFIED AS CLASS 1, DIVISION 1, GROUP D, HAZARDOUS LOCATIONS.

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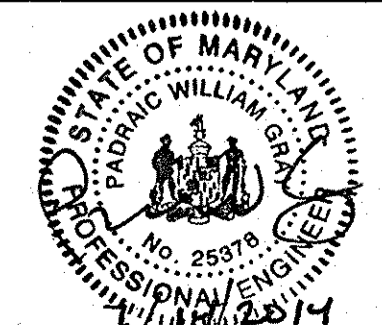
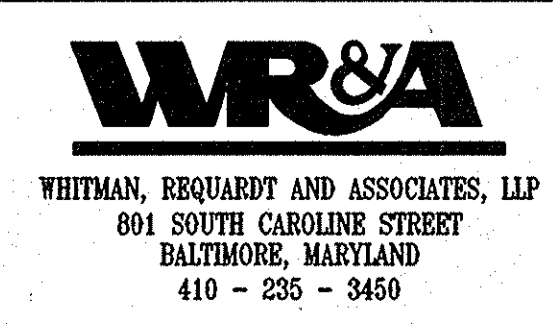
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John P. De...* 7/24/13  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas P. Butler* 7/24/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Steve Chan* 7/24/13  
CHIEF, BUREAU OF UTILITIES DATE

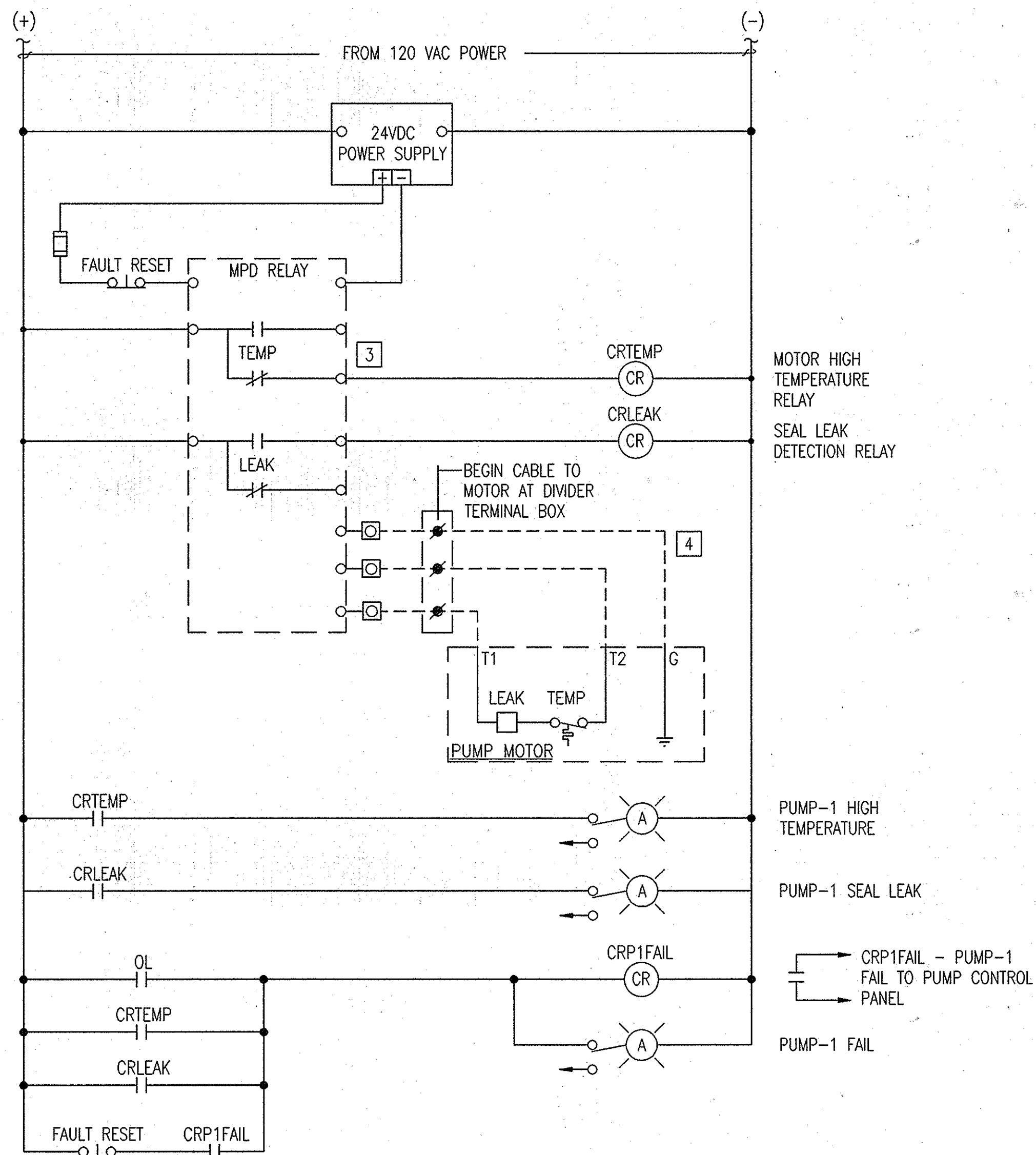
*Clayton...* 7/24/13  
CHIEF, UTILITY DESIGN DIVISION DATE



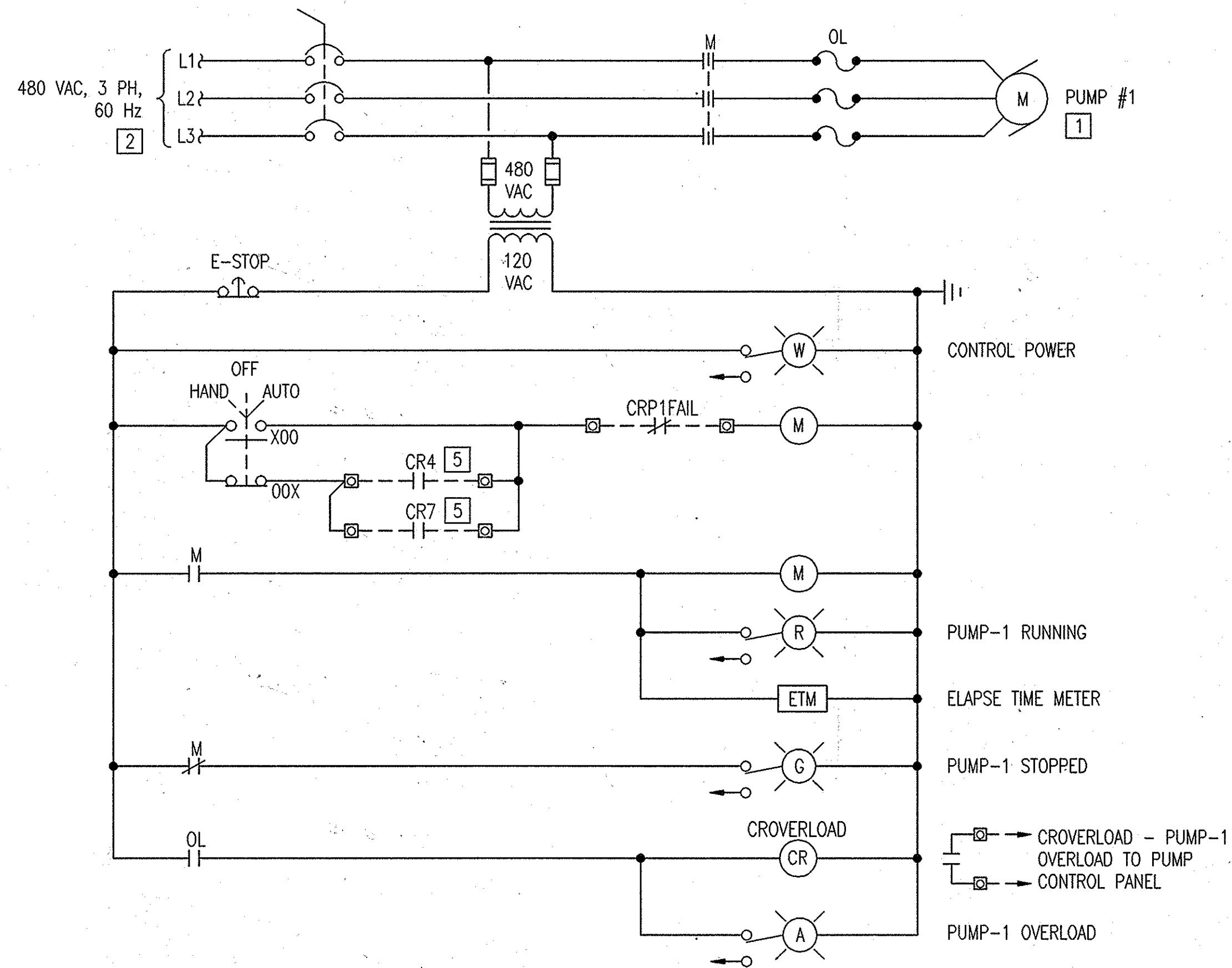
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JUNE 2013	BY NO.	REVISION	DATE	

PUMP CONTROL PANEL ELEMENTARY	
600 SCALE MAP NO. 32	BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND



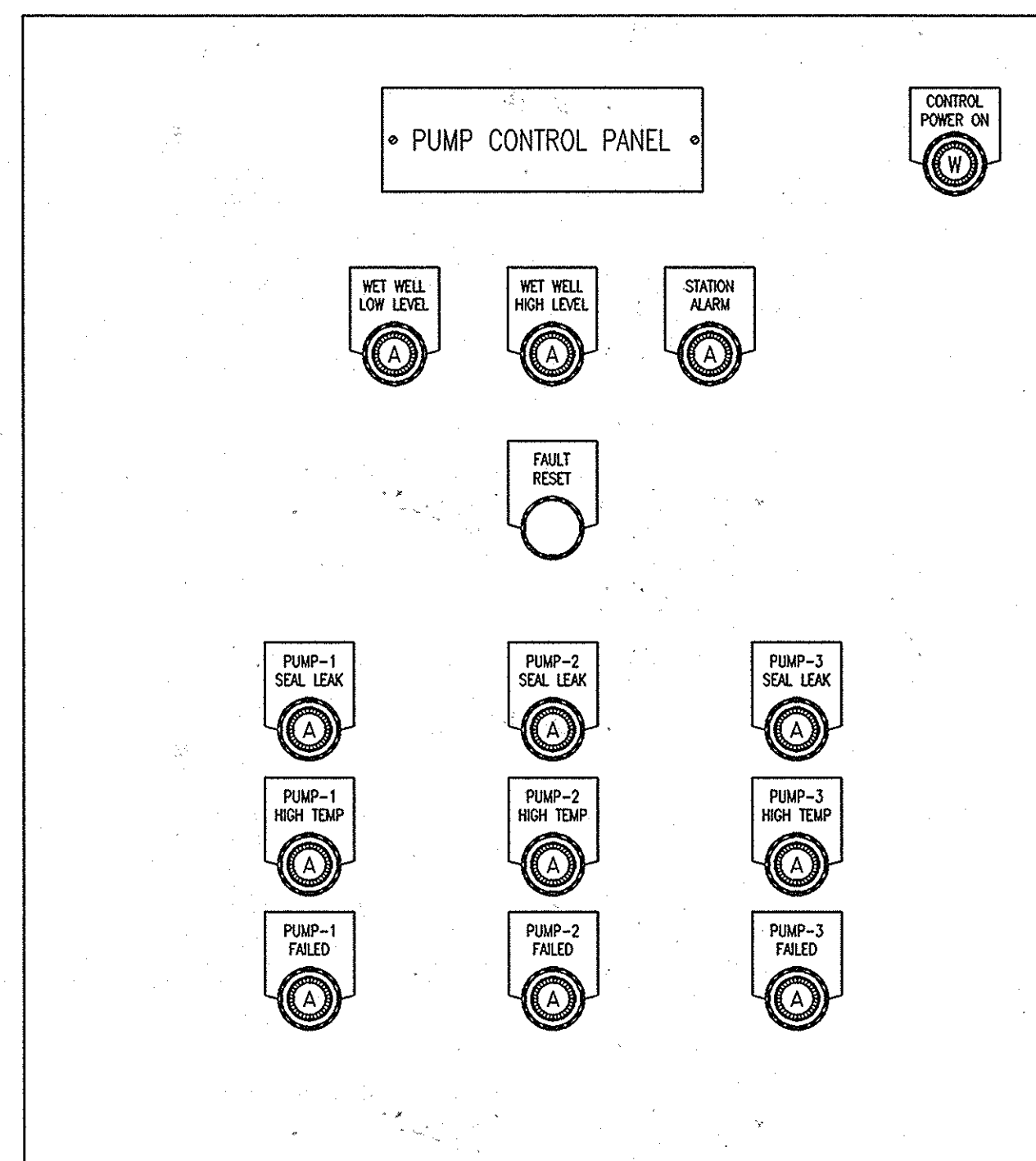
**1 PUMP CONTROL PANEL ELEMENTARY CONT.**  
 I-4 NOT TO SCALE  
 (TYP. PUMPS 2 & 3)



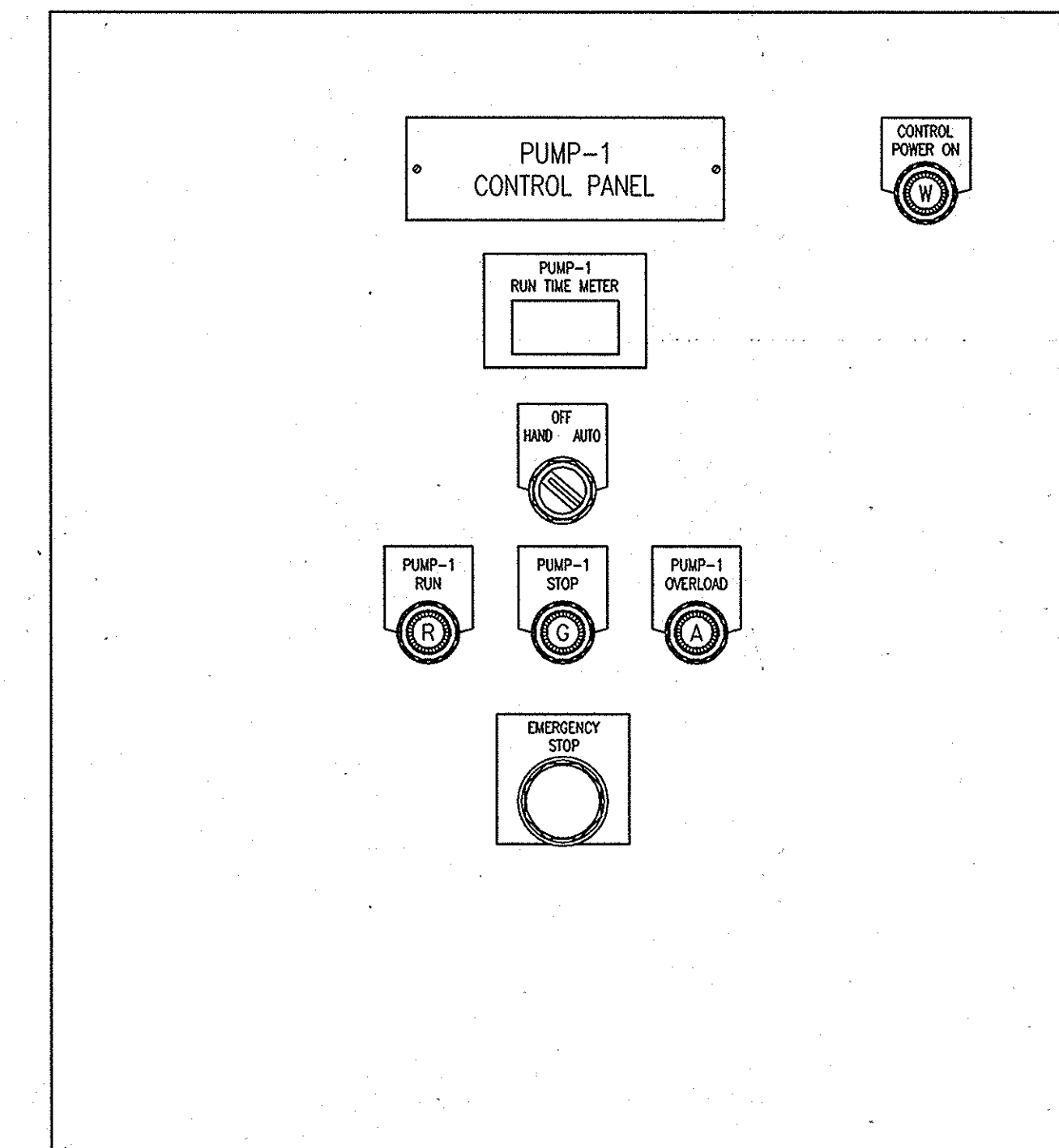
**2 PUMP 1 MOTOR STARTER PANEL ELEMENTARY**  
 I-4 NOT TO SCALE  
 (TYP. PUMP 2 & 3)

**SPECIFIC NOTES**

- 1 EQUIPMENT LOCATED REMOTE FROM STARTER.
- 2 REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC PANELBOARD CIRCUITS.
- 3 NORMAL CONDITION - TEMPERATURE RELAY IS PICKED UP (CONTACT 1 & 3 ARE CLOSED) TEMPERATURE CAN BE RESET IF: 1) TEMP SWITCH IS COOLED DOWN & 2) POWER IS REMOVED FROM THE MOTOR PROTECTION RELAY VIA (REMOVE 24 VOLT DC VIA PLC)
- 4 PROVIDE EXPLOSION PROOF CABLE SEAL INSIDE CONTROL PANEL AT POINT WHERE CONDUCTORS ARE SEPARATED FROM CABLE COVERING.
- 5 CONTACT FROM PUMP CONTROL PANEL.
- 6 DETAIL TYPICAL FOR PUMPS 2 AND 3.



**3 PUMP CONTROL PANEL PARTIAL ELEVATION**  
 I-4 NOT TO SCALE



**4 STARTER PANEL PARTIAL ELEVATION**  
 I-4 NOT TO SCALE

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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

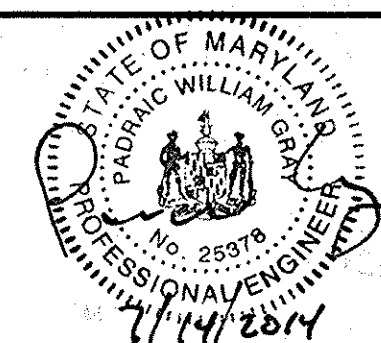
*John P. ...* 7/29/12  
 DIRECTOR OF PUBLIC WORKS DATE

*Michael ...* 7/26/13  
 CHIEF, BUREAU OF ENGINEERING DATE

*Steven ...* 7/29/13  
 CHIEF, BUREAU OF UTILITIES DATE

*...* 7/26/13  
 CHIEF, UTILITY DESIGN DIVISION DATE

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BY	NO.	REVISION	DATE	

PUMP STARTER ELEMENTARY AND  
 PANEL ELEVATIONS

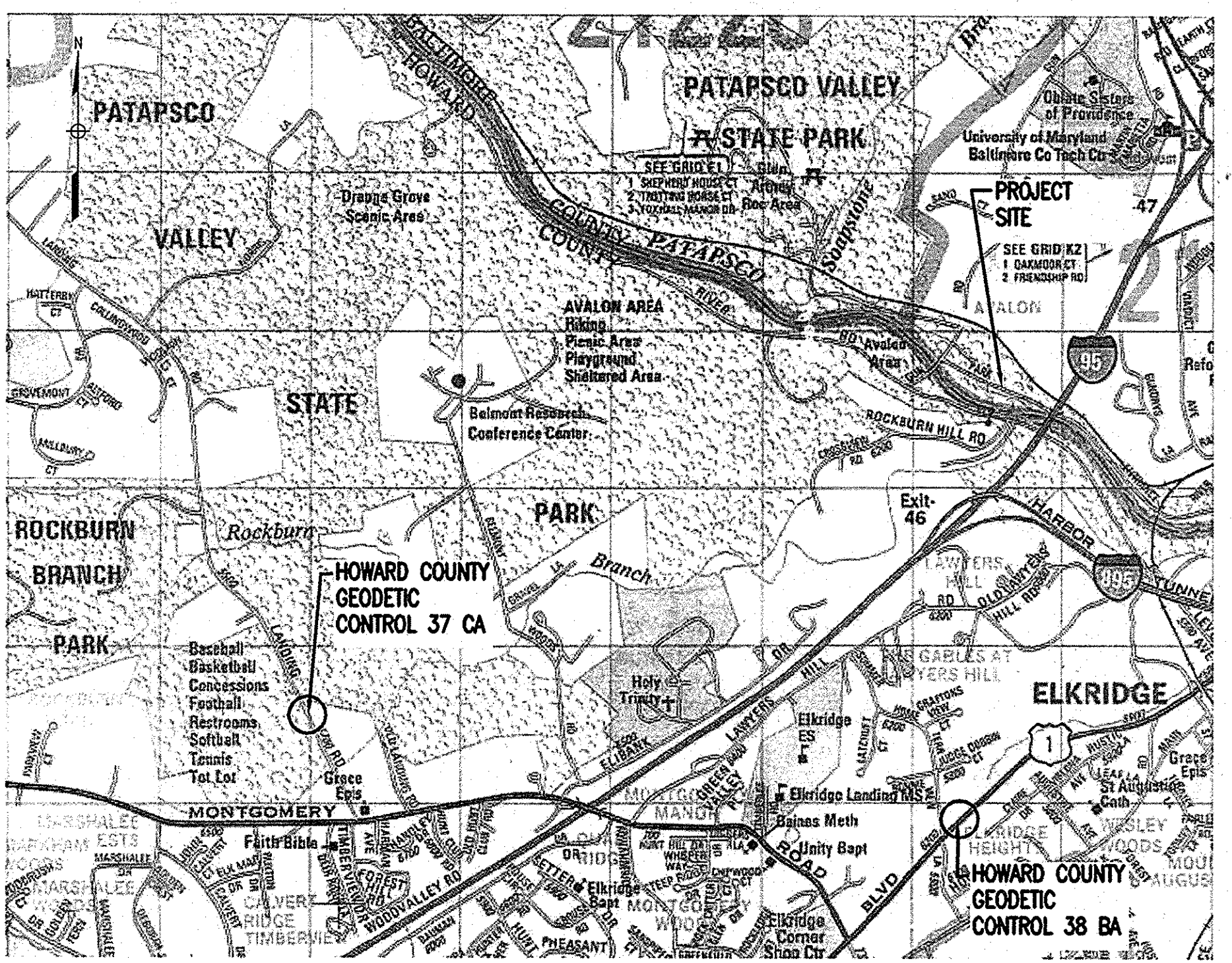
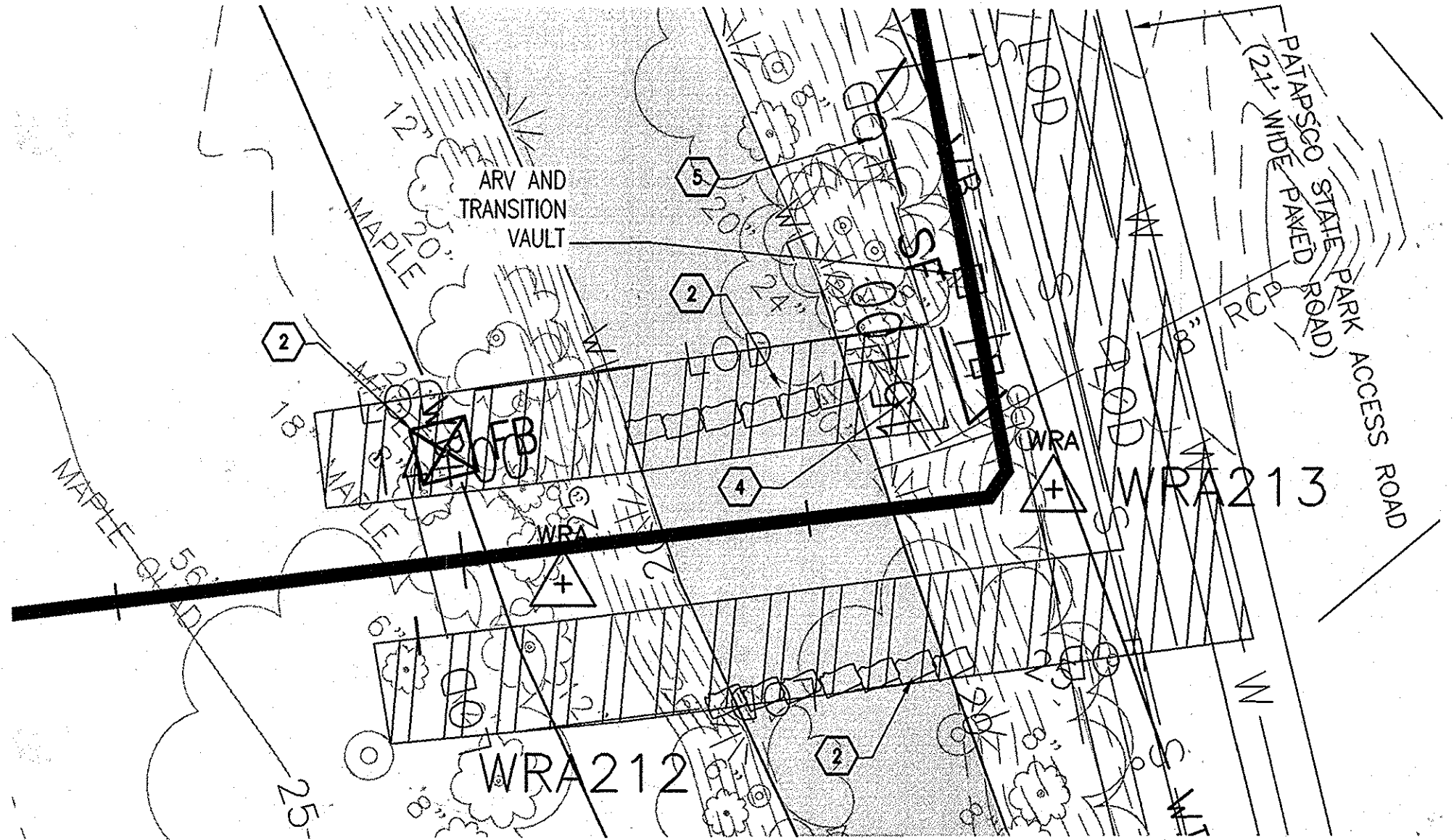
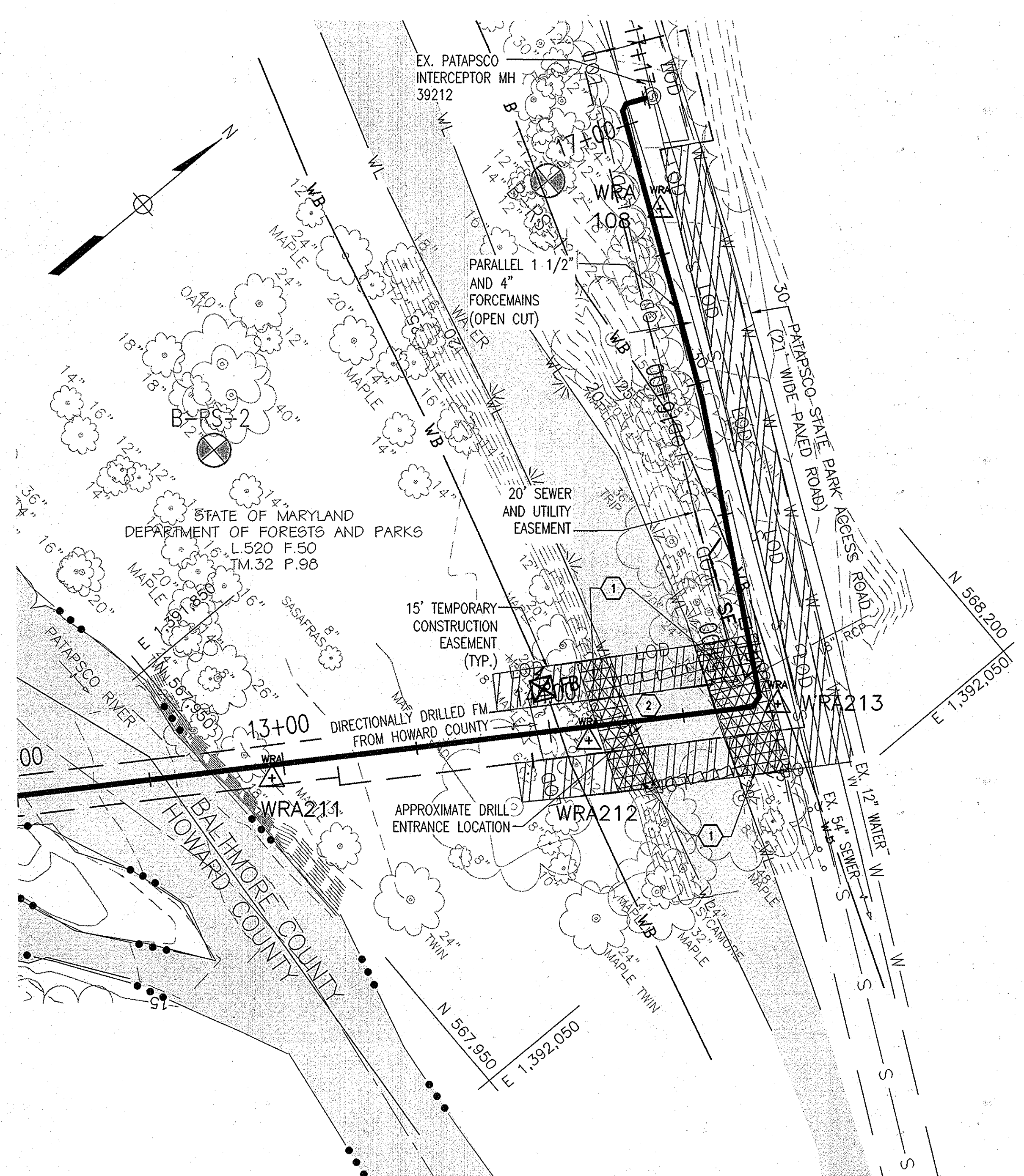
600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

I-4

SCALE  
 AS SHOWN

SHEET  
 30 OF 36



**CONSTRUCTION NOTES**

- 1) PROVIDE TEMPORARY STABILIZATION MATTING (MIN. TSSMS- 2 LB/FT<sup>2</sup>). SEE DRAWING EN-01 FOR PERMANENT RESTORATION PLANTING PLAN.
- 2) ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES. SEE SEDIMENT AND EROSION CONTROL NOTES AND DETAILS SHEETS. CONTRACTOR SHALL INSTALL SANDBAGS OR STONE DIVERSION AND MAINTAIN WORK AREA IN DEWATERED CONDITIONS FOR DURATION OF IMPACT. ALL WATER REMOVED FROM THE WORK AREA SHALL BE FILTERED THROUGH A FILTER BAG PRIOR TO DISCHARGE BACK INTO CHANNEL OUTSIDE OF WITHIN LOD BUT OUTSIDE OF SANDBAGGED AREA.
- 3) A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED AT THE DISCRETION OF THE S&E CONTROL INSPECTOR. ANY SEDIMENT TRACKED ONTO THE EXISTING PAVED 21' ACCESS ROAD SHALL BE IMMEDIATELY REMOVED BY VACUUMING, SCRAPING, AND/OR SWEEPING.
- 4) PROVIDE TEMPORARY FLEXIBLE PIPING EXTENSION FROM EXISTING STORM DRAIN TO AREA WITHIN LOD BUT OUTSIDE OF SANDBAGGED AREA. TEMPORARY STABILIZATION MATTING SHALL BE INSTALLED TO PROVIDE STABLE OUTLET FOR TEMPORARY DRAIN EXTENSION.
- 5) ALL WORK WITHIN THE PROJECT AREA SHALL BE CONSTRUCTED IN ACCORDANCE WITH UTILITY NOTE 1. PROVIDE SILT FENCE IN AREA AROUND PROPOSED ARV AND TRANSITION VAULT CONSTRUCTION.

**GENERAL NOTES**

- 1.) THE SITE IS NOT INDICATED AS IN THE 100 YEAR FLOODPLAIN PER FIRM MAP 2400100505F BUT IS INDICATED OUT OF THE FLOODPLAIN STUDY AREA. HOWEVER, BASED ON THE 100 YEAR FLOODPLAIN ELEVATION (NGVD 88 ELEVATION OF 48.4) GIVEN ON FIRM MAP 2400440030B, THE ENTIRE SITE IS WITHIN THE 100 YEAR FLOODPLAIN.
- 2.) A PERMIT HAS BEEN OBTAINED FROM MDE (REF. PERMIT 12-NI-0013/201260068) FOR TEMPORARY DISTURBANCE OF WETLANDS AND WETLANDS BUFFER ASSOCIATED WITH THIS PLAN.

**UTILITY NOTE**

- 1.) CONTRACTOR SHALL OPEN ONLY THAT SECTION OF TRENCH THAT CAN BE BACKFILLED AND STABILIZED EACH DAY, IF THE TRENCH MUST REMAIN OPEN LONGER THAN ONE DAY, SILT FENCE SHALL BE PLACED BELOW (DOWN SLOPE OF) THE TRENCH.
- 2.) PLACE ALL EXCAVATED MATERIAL ON THE UPHILL SIDE OF THE TRENCH.
- 3.) ANY SEDIMENT CONTROLS DISTURBED BY UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

**TEMPORARY STOCKPILE NOTE**

- TEMPORARY STOCKPILES SHALL BE:
- 1.) LOCATED WITHIN THE LIMIT OF DISTURBANCE (LOD).
  - 2.) DRAIN TO A FUNCTIONING SEDIMENT CONTROL DEVICE.
  - 3.) POSITIONED TO NOT IMPEDE UPON, OR IMPAIR THE FUNCTION OF SAID DEVICE. POSITIONED TO NOT ALTER DRAINAGE DIVIDE.

**MAINTENANCE NOTE**

CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SEDIMENT AND EROSION CONTROL MEASURES AND DEVICES AFTER EVERY STORM EVENT. MAINTENANCE SHALL INCLUDE, BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT. GEOTEXTILE FABRIC SHALL BE REPLACED AS NEEDED TO ENSURE PROPER FUNCTION.

**DAILY STABILIZATION NOTE**

CONTRACTOR SHALL DISTURB ONLY THAT AREA WHICH CAN BE COMPLETED AND STABILIZED BY THE END OF EACH WORKING DAY. STABILIZATION SHALL BE AS FOLLOWS:

- 1.) FOR AREAS TO BE PAVED, THE APPLICATION OF STONE BASE.
- 2.) FOR AREAS TO BE VEGETATIVELY STABILIZED:
  - A.) PERMANENT SEED AND SOIL STABILIZATION MATTING OR SOD FOR ALL STEEP SLOPES, CHANNELS, OR SWALES.
  - B.) PERMANENT SEED AND MULCH FOR ALL OTHER AREAS.

ANY SLOPE WHICH CAN NOT BE STABILIZED BY THE END OF THE WORKING DAY MUST HAVE SILT FENCE INSTALLED ON THE DOWNSLOPE SIDE

**LOCATION MAP AND SURVEY CONTROL POINTS: SCALE 1" = 800'**


**SURVEY INFORMATION TABLE**

GEODETIC CONTROL STA.	NORTHING	EASTING	ELEV.
38BA	562,553.3146	1,390,967.8616	166.1770
37CA	564,321.6624	1,382,742.8344	256.9640

ALL HORIZONTAL CONTROLS ARE BASED ON MARYLAND STATE COORDINATE SYSTEM NAD '83/'91. VERTICAL CONTROLS ARE BASED ON NAVD '88. SURVEY CONTROLS ARE AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 38BA ON ROUTE 1 AND NO. 37CA ON LANDING ROAD.

**OWNERS/DEVELOPER'S CERTIFICATION- GRADING**

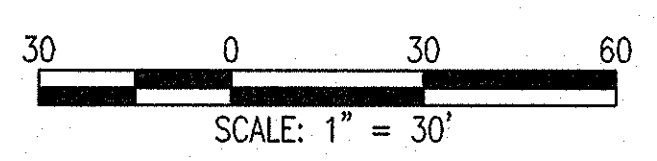
I/WE CERTIFY THAT ALL GRADING ON THIS SITE WILL BE DONE IN ACCORDANCE WITH THE CURRENT GRADING REQUIREMENTS AS SET FORTH BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND WITH THE REQUIREMENTS SPECIFIED IN ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE.

  
 SIGNATURE OF OWNER/DEVELOPER  
 Was DAUB  
 PRINT NAME

Howard Co. DPW  
 Project MANAGER  
 TITLE

6/5/2013  
 DATE

PLAN: SCALE 1" = 30'




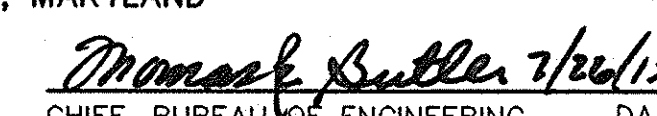
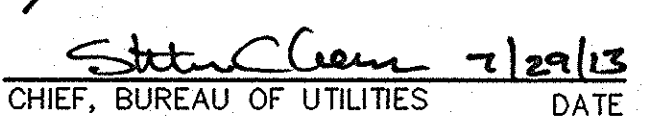

**LEGEND**

- WL NONTIDAL WETLAND BOUNDARY
- WB 25-FOOT WETLAND BUFFER
- LOD LOD LIMITS OF DISTURBANCE
- 20 MINOR CONTOUR (EX.)
- MAJOR CONTOUR (EX.)
- TEMPORARY STABILIZATION MATTING
- S-S-S-S-S EXISTING SEWER
- W-W-W-W-W EXISTING WATER
- NEW FORCE MAIN

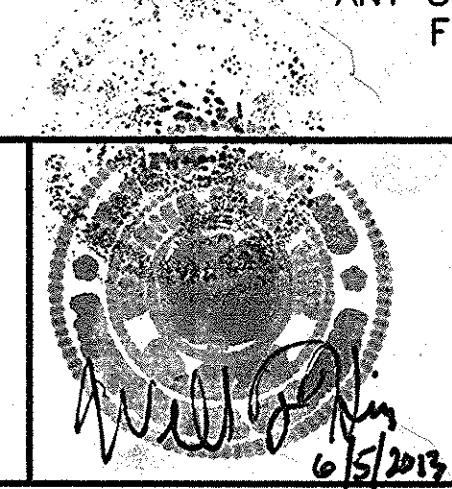
**LEGEND**

- FB FILTER BAG
- SF SILT FENCE
- SANDBAG

"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. 27029, EXPIRATION DATE: 1-25-2014."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
  
 DIRECTOR OF PUBLIC WORKS DATE 7/26/13  
  
 CHIEF, BUREAU OF ENGINEERING DATE 7/26/13  
  
 CHIEF, BUREAU OF UTILITIES DATE 7/26/13  
  
 CHIEF, UTILITY DESIGN DIVISION DATE 7/26/13

**WR&A**  
 WHITMAN, REINHARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450



DES: F.B.				
DRN: F.B.				
CHK: W.H.				
JUNE 2013	BY	NO.	REVISION	DATE

EROSION AND SEDIMENT CONTROL PLAN:  
 BALTIMORE COUNTY  
 600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-6260 AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

BCSC-1  
 SCALE AS SHOWN  
 SHEET 31 OF 36

SEQUENCE OF CONSTRUCTION

- (1 DAY) DAY 1 1.) OBTAIN A GRADING PERMIT... NOTIFICATION MDE INSPECTION AND COMPLIANCE PROGRAM AT 410-537-3510 A MINIMUM OF 5 DAYS PRIOR TO BEGINNING WORK. (2 DAYS) DAY 2-3 2.) IF APPLICABLE, ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED... (1 DAY) DAY 4 3.) CLEAR AND GRUB AREA FOR SEDIMENT AND EROSION CONTROL MEASURES OR DEVICES ONLY. (1 DAY) DAY 5 4.) INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES AND DEVICES... (2 DAYS) DAYS 6-7 5.) NOTIFY BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS... (3 DAYS) DAYS 8-10 6.) WITH THE APPROVAL OF BALTIMORE COUNTY DEPARTMENT OF PERMITS... (3 DAYS) DAYS 11-13 7.) INSTALL TEMPORARY FLEXIBLE PIPING EXTENSION... (15 DAYS) DAYS 14-28 8.) DIRECTIONAL DRILL UNDERNEATH PATAPSCO RIVER... (1 DAY) DAY 29 9.) INSTALL FORCEMAINS FROM DIRECTIONAL DRILL AREA... (1 DAY) DAY 30 10.) INSTALL TEMPORARY SOIL STABILIZATION MATTING... (3 DAYS) DAYS 31-33 11.) INSTALL NECESSARY SILT FENCE DOWNSTREAM... (2 DAYS) DAYS 34-35 12.) INSTALL FORCEMAINS BY OPEN TRENCH...

SEQUENCE OF CONSTRUCTION (CONTINUED)

- (1 DAY) DAY 36 13.) MAKE TIE INTO EXISTING MANHOLE 39212. (2 DAYS) DAYS 37-38 14.) REPLACE/REPAIR ALL EXISTING PAVING. (2 DAYS) DAYS 39-40 15.) UPON STABILIZATION OF SITE WITH ESTABLISHED VEGETATION AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS. NOTIFY MDE INSPECTION AND COMPLIANCE PROGRAM AT 410-537-3510 A MAXIMUM OF 5 DAYS AFTER COMPLETING ACTIVITIES.

GENERAL NOTES

- 1) REFER TO "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN. 2) WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, MINOR FIELD ADJUSTMENTS CAN AND WILL BE MADE TO INSURE THE CONTROL OF ANY SEDIMENT. 3) AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION. 4) FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN: A) THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1), AND B) SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING. 5) ANY CHANGE TO THE GRADING PROPOSED ON THIS PLAN REQUIRES RE-SUBMISSION TO BALTIMORE COUNTY SOIL CONSERVATION DISTRICT FOR APPROVAL. 6) DUST CONTROL WILL BE PROVIDED FOR ALL DISTURBED AREAS. 7) ANY VARIATIONS FROM THE SEQUENCE OF OPERATIONS STATED ON THIS PLAN REQUIRES THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT PRIOR TO THE INITIATION OF THE CHANGE.

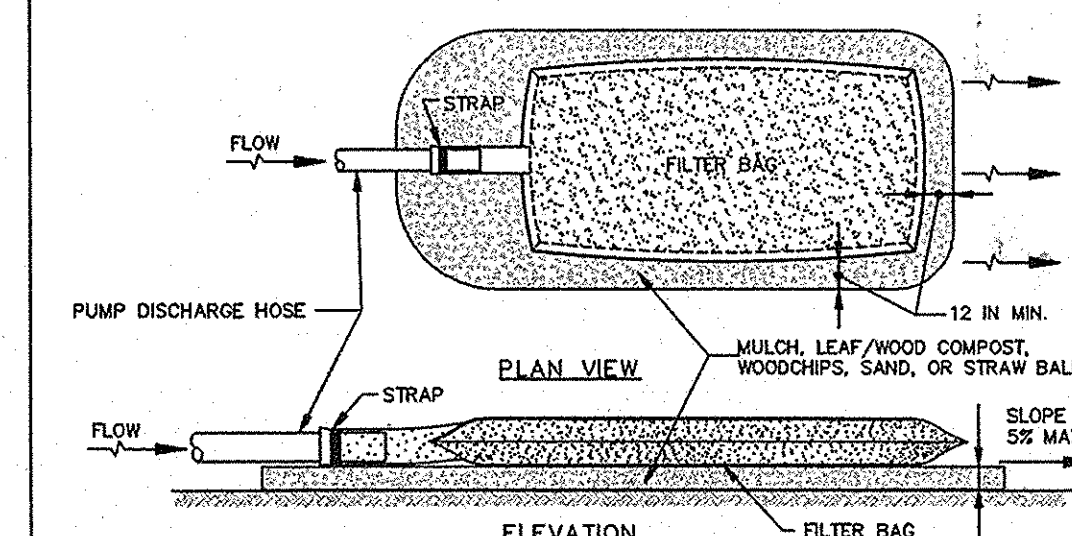
8) EXCESS CUT OR BORROW MATERIAL SHALL GO TO, OR COME FROM, RESPECTIVELY, A SITE WITH AN OPEN GRADING PERMIT AND APPROVED SEDIMENT AND EROSION CONTROL PLAN.

9) THE FOLLOWING ITEM MAY BE USED AS APPLICABLE: REFER TO "MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION" BY THE WATER MANAGEMENT ADMINISTRATION OF THE MD. DEPT. OF THE ENVIRONMENT REVISED NOVEMBER, 2000 FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN FOR WATERWAY CONSTRUCTION.

10) PUMPING SEDIMENT-LADEN WATER INTO WATERS OF THE STATE IS STRICTLY PROHIBITED. ANY PORTABLE DEWATERING DEVICE MUST BE LOCATED WITHIN THE LIMIT OF DISTURBANCE.

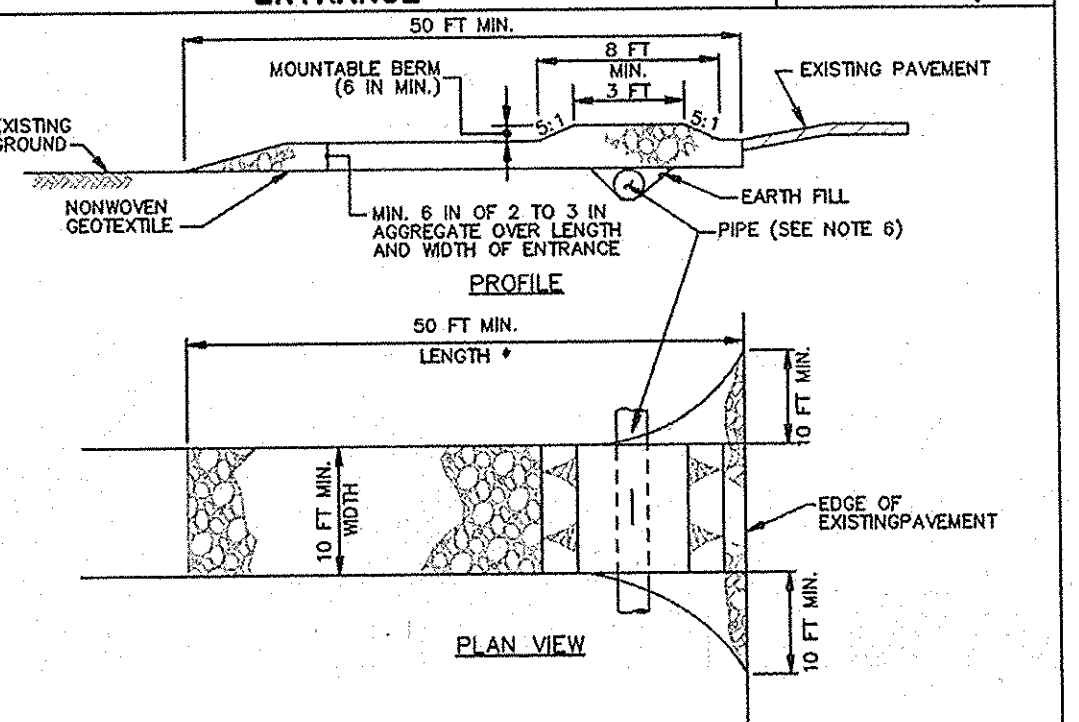
SITE DATA table with columns: AREA OF SITE, LIMIT OF DISTURBANCE, FILL, CUT, AREA VEGETATIVELY STABILIZED, IMPERVIOUS AREA. Values include 0.23 AC, 10,200 SF, 210 CY, 6,500 SF, 0.15 AC, 0 SF.

DETAIL F-4 FILTER BAG STANDARD SYMBOL



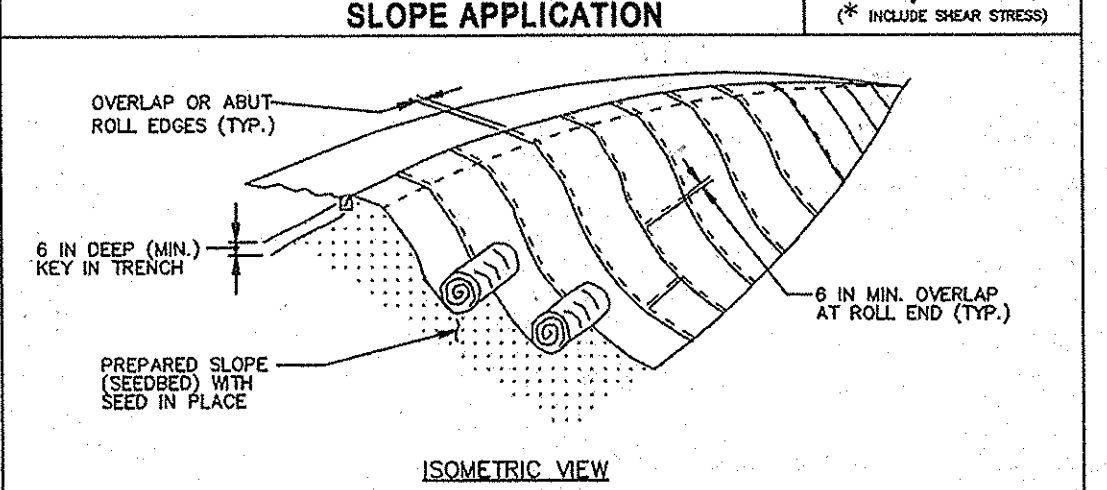
- CONSTRUCTION SPECIFICATIONS 1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP... 2. PLACE FILTER BAG ON SUITABLE BASE... 3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE... 4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION... 5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS... 6. REPLACE FILTER BAG IF BAG CLOSURE OR HAS RIPS, TEARS, OR PUNCTURES...

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE STANDARD SYMBOL



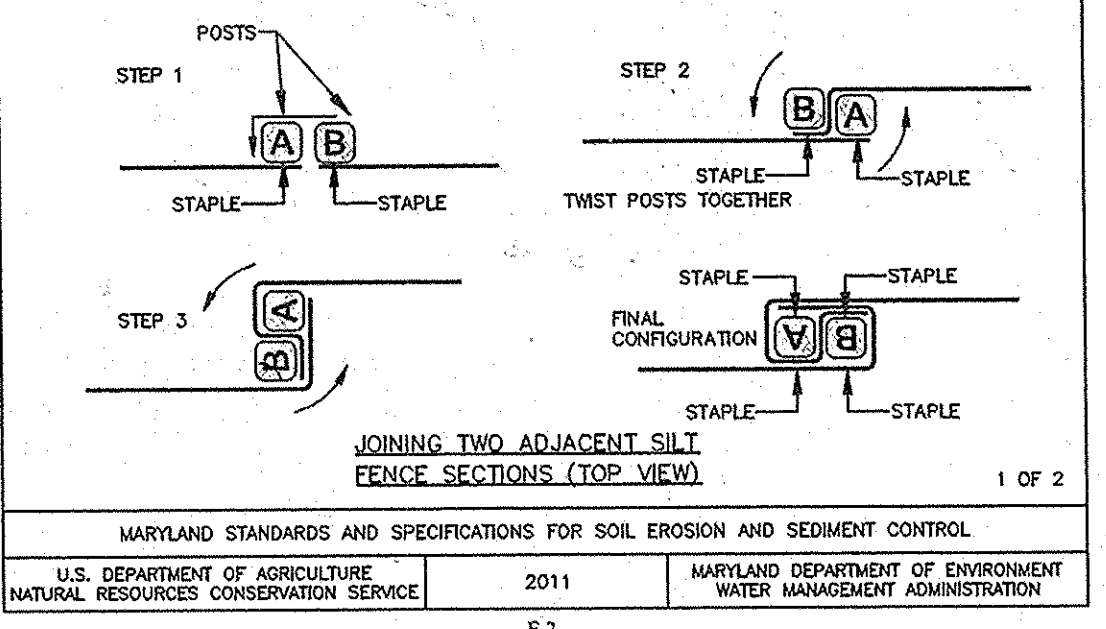
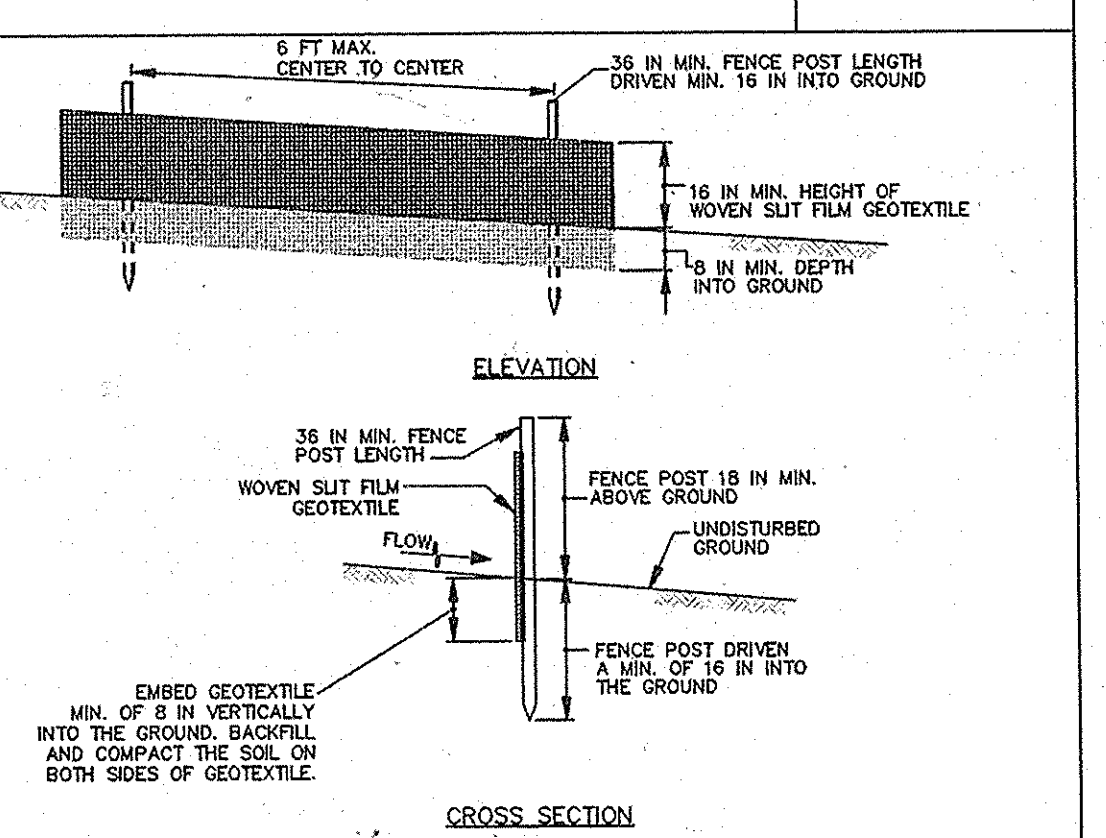
- CONSTRUCTION SPECIFICATIONS 1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN... 2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE... 3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE... 4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE... 5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT...

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION STANDARD SYMBOL



- CONSTRUCTION SPECIFICATIONS 1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS. 2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS... 3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT... 4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDED PREPARATION, AND PERMANENT SEEDING... 5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE... 6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS... 7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH... 8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS... 9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET...

DETAIL E-1 SILT FENCE STANDARD SYMBOL



DETAIL E-1 SILT FENCE STANDARD SYMBOL

- CONSTRUCTION SPECIFICATIONS 1. USE WOOD POSTS 1 1/2 x 1 1/2 x 3/4 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD... 2. USE 36 INCH MINIMUM POSTS DRIVEN 18 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART... 3. USE WOVEN SILT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS... 4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE... 5. EMBED GEOTEXTILE A MINIMUM OF 6 INCHES VERTICALLY INTO THE GROUND... 6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL... 7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE... 8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE...

CONSULTANTS CERTIFICATION I CERTIFY THAT THIS PLAN OF EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THIS SITE... Signature: Will Hinz, Date: 6/5/2013, License No. 27029

OWNER/DEVELOPER CERTIFICATION I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THIS CONSTRUCTION PROJECT WILL HAVE A CERTIFICABLE ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM... Signature: Wes Daub, Date: 6/5/2013, License No. 27029

"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. 27029, EXPIRATION DATE: 1-25-2014." DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Director of Public Works: Janice A. ... Date: 7/26/13. Chief, Bureau of Engineering: ... Date: 7/26/13. Chief, Bureau of Utilities: ... Date: 7/26/13. Chief, Utility Design Division: ... Date: 7/26/13.

WR&A logo and contact information: WHITMAN, REQUARDT AND ASSOCIATES, LLP, 801 SOUTH CAROLINE STREET, BALTIMORE, MARYLAND, 410 - 235 - 3450.

Revision table with columns: NO., REVISION, DATE. Entries include: DRN: F.B., CHK: W.H., JUNE 2013.

EROSION AND SEDIMENT CONTROL GENERAL NOTES AND DETAILS: BALTIMORE COUNTY 600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION CAPITAL PROJECT NO. S-6260 AND W-8312 CONTRACT NO. 14-4715 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND SCALE AS SHOWN SHEET 32 OF 36



**H-1 STANDARDS AND SPECIFICATIONS**

**FOR MATERIALS**

Table H.1: Geotextile Fabrics

PROPERTY	TEST METHOD	MINIMUM AVERAGE ROLL VALUE <sup>1</sup>					
		WOVEN SPLIT FILM GEOTEXTILE		WOVEN MONOFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MD	CD	MD	CD	MD	CD
Grab Tensile Strength	ASTM D-4632	200 lb	200 lb	370 lb	250 lb	200 lb	200 lb
Grab Tensile Elongation	ASTM D-4632	15%	10%	15%	15%	50%	50%
Trapezoidal Tear Strength	ASTM D-4533	75 lb	75 lb	100 lb	60 lb	80 lb	80 lb
Puncture Strength	ASTM D-6241	450 lb		900 lb		450 lb	
Apparent Opening Size <sup>2</sup>	ASTM D-4751	U.S. Sieve 30 (0.59 mm)		U.S. Sieve 70 (0.21 mm)		U.S. Sieve 70 (0.21 mm)	
Permittivity	ASTM D-4491	0.05 sec <sup>2</sup>		0.28 sec <sup>2</sup>		1.1 sec <sup>2</sup>	
Ultraviolet Resistance Retained at 500 hours	ASTM D-4355	70% strength		70% strength		70% strength	

<sup>1</sup> All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.

<sup>2</sup> Values for AOS represent the average maximum opening.

Geotextiles must be evaluated by the National Transportation Product Evaluation Program (NTPPEP) and conform to the values in Table H.1.

The geotextile must be inert to commonly encountered chemicals and hydrocarbons and must be rot and mildew resistant. The geotextile must be manufactured from fibers consisting of long chain synthetic polymers and composed of a minimum of 95 percent by weight of polyethylene or polyesters, and formed into a stable network so the filaments or yarns retain their dimensional stability relative to each other, including selvages.

When more than one section of geotextile is necessary, overlap the sections by at least one foot. The geotextile must be pulled taut over the applied surface. Equipment must not run over exposed fabric. When placing riprap on geotextile, do not exceed a one foot drop height.

H.1

**B-4.2 STANDARDS AND SPECIFICATIONS**

**FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS**

**Definition**

The process of preparing the soils to sustain adequate vegetative stabilization.

**Purpose**

To provide a suitable soil medium for vegetative growth.

**Conditions Where Practice Applies**

Where vegetative stabilization is to be established.

**Criteria**

- A. Soil Preparation
- Temporary Stabilization
    - Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
    - Apply fertilizer and lime as prescribed on the plans.
    - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
  - Permanent Stabilization
    - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
      - Soil pH between 6.0 and 7.0.
      - Soluble salts less than 500 parts per million (ppm).
      - Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
      - Soil contains 1.5 percent minimum organic matter by weight.
      - Soil contains sufficient pore space to permit adequate root penetration.
    - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
    - Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.

B.12

- Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
- Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

- Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
- Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
- Topsoiling is limited to areas having 2:1 or flatter slopes where:
  - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
  - The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
  - The original soil to be vegetated contains material toxic to plant growth.
  - The soil is so acidic that treatment with limestone is not feasible.
- Areas having slopes steeper than 2:1 require special consideration and design.
- Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
  - Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
  - Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
  - Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
- Topsoil Application
  - Erosion and sediment control practices must be maintained when applying topsoil.
  - Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be done in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
  - Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading

B.13

and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

- Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
- Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
- Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
- Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B.14

**B-4.3 STANDARDS AND SPECIFICATIONS**

**FOR SEEDING AND MULCHING**

**Definition**

The application of seed and mulch to establish vegetative cover.

**Purpose**

To protect disturbed soils from erosion during and at the end of construction.

**Conditions Where Practice Applies**

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

**Criteria**

- A. Seeding
- Specifications
    - All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
    - Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
    - Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
    - Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phytotoxic materials.
  - Application
    - Dry Seeding: This includes use of conventional drop or broadcast spreaders.
      - Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
      - Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.

B.15

**B-4.4 STANDARDS AND SPECIFICATIONS**

**FOR TEMPORARY STABILIZATION**

**Definition**

To stabilize disturbed soils with vegetation for up to 6 months.

**Purpose**

To use fast growing vegetation that provides cover on disturbed soils.

**Conditions Where Practice Applies**

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

**Criteria**

- Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
- For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4.3.A.1.b and maintain until the next seeding season.

**Temporary Seeding Summary**

No.	Species	Application Rate (lb/ao)	Seeding Dates		Seeding Depths	Fertilizer Rate (10-20-20)	Lime Rate
			Start	End			
1	ANNUAL RYEGRASS ( <i>Lolium perenne</i> var. <i>multiflorum</i> )	40	FEB 15 - APR 30	AUG 15 - NOV 30	0.5	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
2	COCKLE (OATS) ( <i>Avena sativa</i> )	72	FEB 15 - APR 30	AUG 15 - NOV 30	1.0		
3	FOXTAIL MILLET ( <i>Setaria fabryi</i> )	30	MAY 1 - AUG 14		0.5		
4	PARIA MULLET ( <i>Pennisetum glaucum</i> )	20	MAY 1 - AUG 14		0.5		

B.18

Baltimore County Soil Conservation District  
APPROVED FOR SEDIMENT CONTROL

*Scott J. A. Bull* 6-7-13  
Date

BCSC-3

"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. 27029, EXPIRATION DATE: 1-25-2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jan 7 de* 7/26/13  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas J. Butler* 7/26/13  
CHIEF, BUREAU OF ENGINEERING DATE

*Steve C. Cram* 7/26/13  
CHIEF, BUREAU OF UTILITIES DATE

*Clayton D. ...* 7/26/13  
CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
WHITMAN, REQUART AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3460



DES: F.B.  
DRN: F.B.  
CHK: W.H.  
JUNE 2013

BY NO. REVISION DATE

EROSION AND SEDIMENT CONTROL DETAILS: BALTIMORE COUNTY

600 SCALE MAP NO. 32 BLOCK NO. 21.

ROCKBURN HILL SEWER/PUMP STATION AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 33 OF 36

**B-4-5 STANDARDS AND SPECIFICATIONS**

**FOR**

**PERMANENT STABILIZATION**

**Definition**

To stabilize disturbed soils with permanent vegetation.

**Purpose**

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

**Conditions Where Practice Applies**

Exposed soils where ground cover is needed for 6 months or more.

**Criteria**

**A. Seed Mixtures**

**1. General Use**

- Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
- Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
- For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
- For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.

**2. Turfgrass Mixtures**

- Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
- Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
  - Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
  - Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where

B.21

rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.

- Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.

- Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 1/2 to 3 pounds per 1000 square feet.

**Notes:**

Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line

**c. Ideal Times of Seeding for Turf Grass Mixtures**

**Western MD:** March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)

**Central MD:** March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)

**Southern MD, Eastern Shore:** March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)

- Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2 to 1 inch every 2 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

B.22

No.	Species	Application Rate (lb/oc)	Hardness Zone (from Figure B.3):		Fertilizer Rate (10-20-20)			Lime Rate
			7A	NATIVE	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
	LITTLE BLUESTEM	10	FEB 15 TO APRIL 30	1/4-1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/oc (2 lb/1000 sf)	90 lb/oc (2 lb/1000 sf)	2 tons/oc (90 lb/1000 sf)
	DEERTONGUE	5	AND	1/4-1/2 in				
	HOVA	2	MAY 1 TO MAY 31	1/4-1/2 in				
	BROOMSEDGE	5		1/4-1/2 in				
	MO ECOTYPE							
	RIVER OATS							
	PAVA BLEND							

**B. Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).**

**1. General Specifications**

- Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
- Sod must be machine cut at a uniform soil thickness of 3/4 inch, plus or minus 1/8 inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
- Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.

**2. Sod Installation**

- During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
- Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
- Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.

B.23

**3. Sod Maintenance**

- In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
- After the first week, sod watering is required as necessary to maintain adequate moisture content.
- Do not mow until the sod is firmly rooted. No more than 1/2 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

B.24

**MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION**



**DESCRIPTION**

The work should consist of installing sandbag or stone flow diversions for the purpose of erosion control when construction activities occur within the stream channel.

**EFFECTIVE USES & LIMITATIONS**

Diversions are used to isolate work areas from flow during the construction of in-stream projects. Diversions which have an insufficient flow capacity can fail and severely erode the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low rainfall. This temporary measure may not be practical in large channels.

**MATERIAL SPECIFICATIONS**

Materials for sandbag and stone stream diversions should meet the following requirements:

- Riprap:** Riprap should be washed and have a minimum diameter of 6 inches (0.15 meters).
- Sandbags:** Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of the fill material (i.e., sand, fine gravel, etc.).
- Sheeting:** Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

**INSTALLATION GUIDELINES**

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Sandbag/stone diversions can be used independently or as components of other stream diversion techniques.

Installation of this measure should proceed as follows (refer to Detail 1.5):

- The diversion structure should be installed from upstream to downstream.
- The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration less than 2 weeks, the height of the diversion should be one half the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.
- All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
- Sediment-laden water from the construction area should be pumped to a dewatering basin.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATERWAY CONSTRUCTION GUIDELINES  
REVISED NOVEMBER 2000

PAGE 1.5 - 1

**MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION**

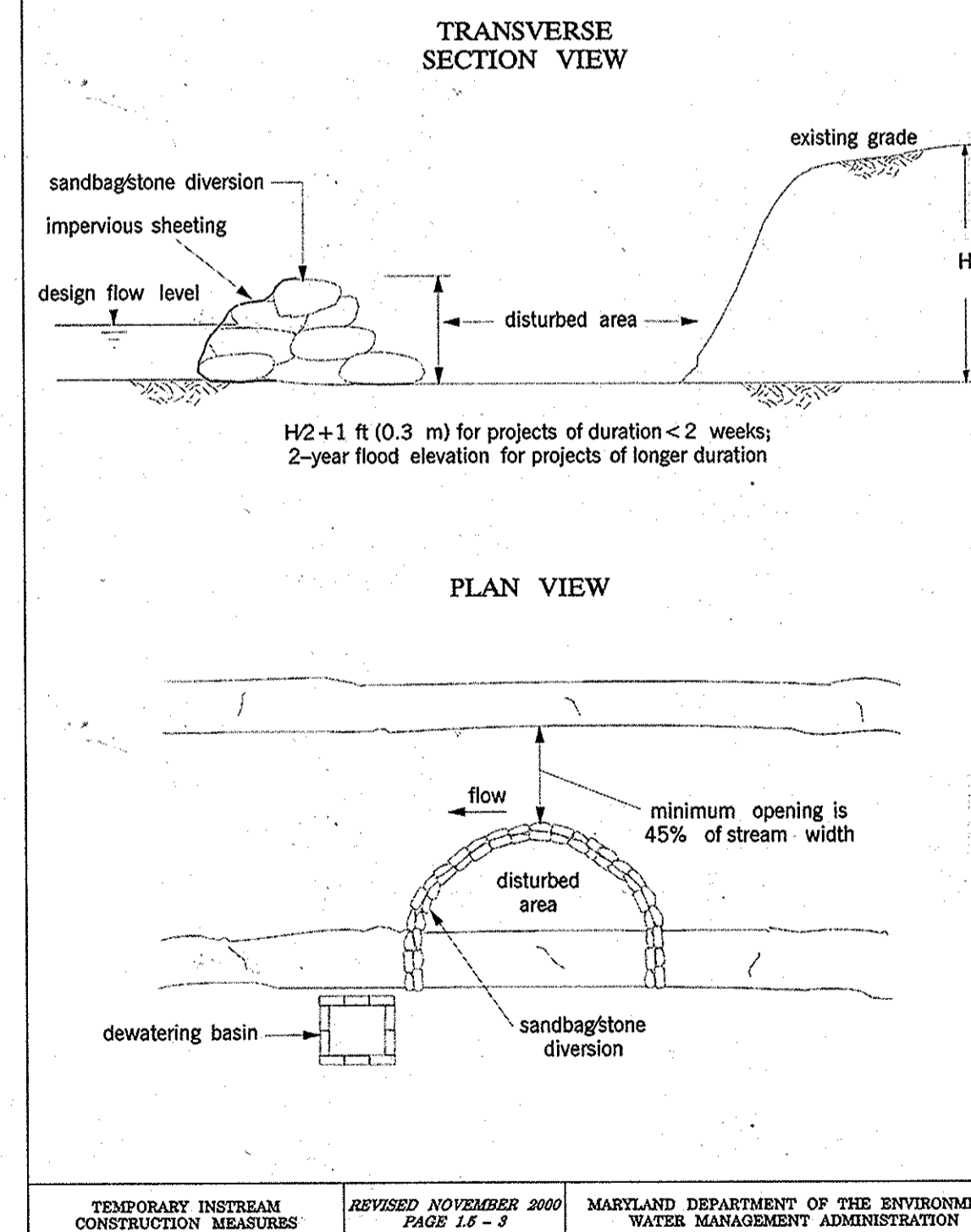
- Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.
- Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project time is expected to last more than 2 weeks.
- Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
- Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATERWAY CONSTRUCTION GUIDELINES  
REVISED NOVEMBER 2000

PAGE 1.5 - 2

**Maryland's Guidelines To Waterway Construction  
DETAIL 1.5: SANDBAG/STONE DIVERSION**

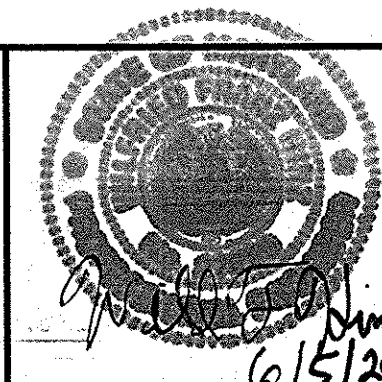


"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 27029, EXPIRATION DATE: 1-25-2014."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *Janet De...* 7/26/13  
 Chief, Bureau of Engineering: *Mona...* 7/26/13  
 Chief, Bureau of Utilities: *Steve...* 7/26/13  
 Chief, Utility Design Division: *Cy...* 7/26/13

**WR&A**  
WHITMAN, REQUARDT AND ASSOCIATES, LLP  
801 SOUTH CAROLINE STREET  
BALTIMORE, MARYLAND  
410 - 235 - 3450



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EROSION AND SEDIMENT CONTROL DETAILS:  
BALTIMORE COUNTY

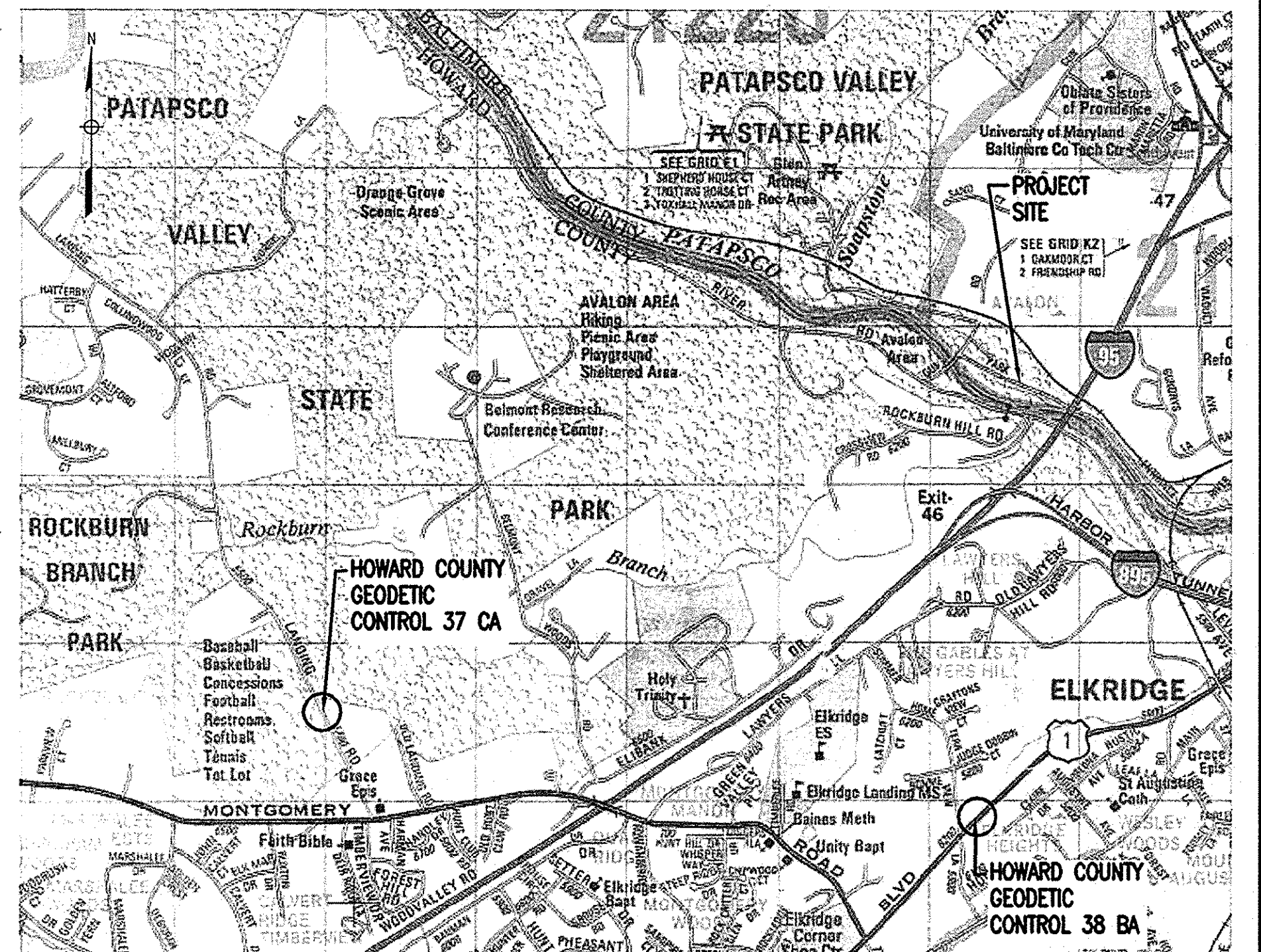
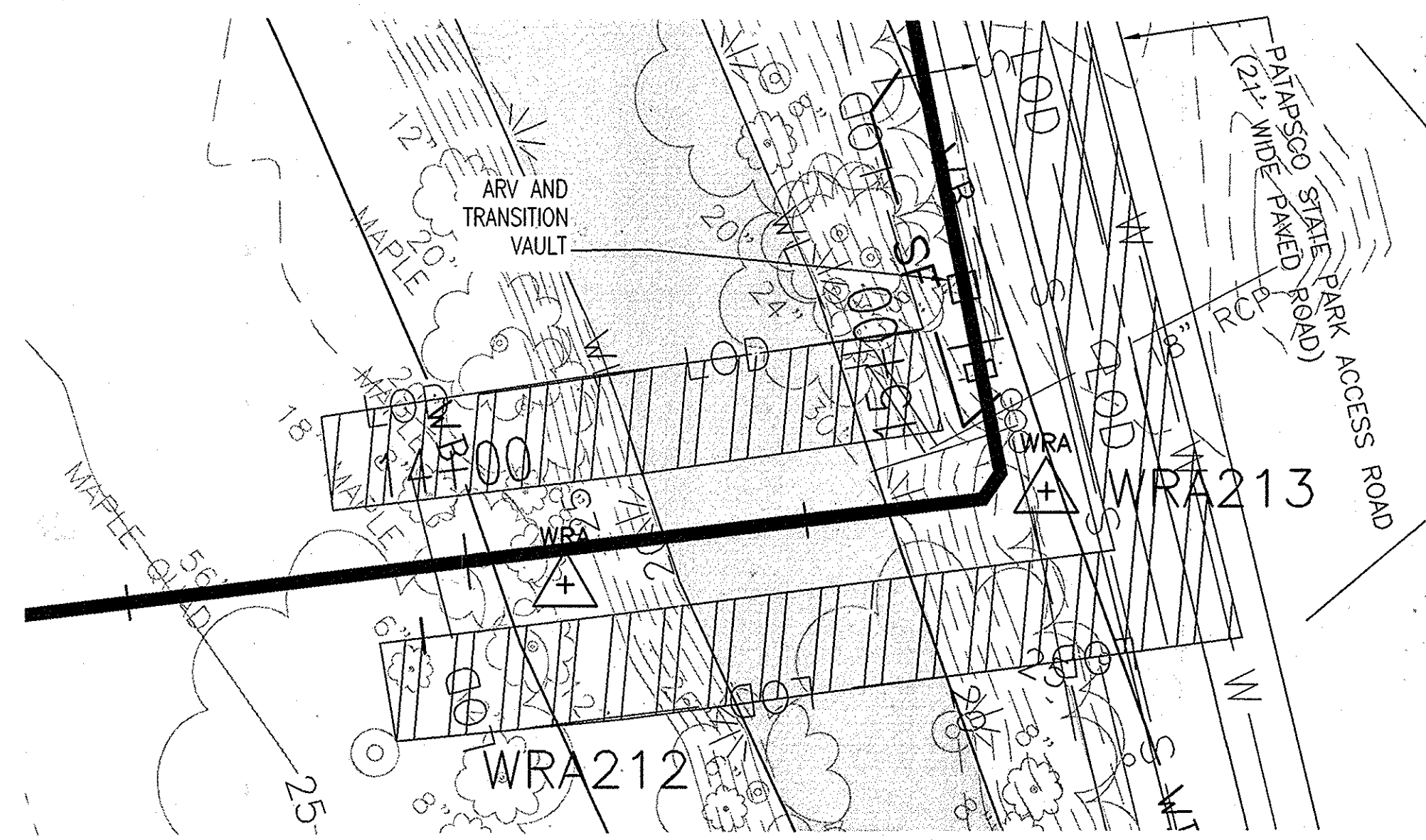
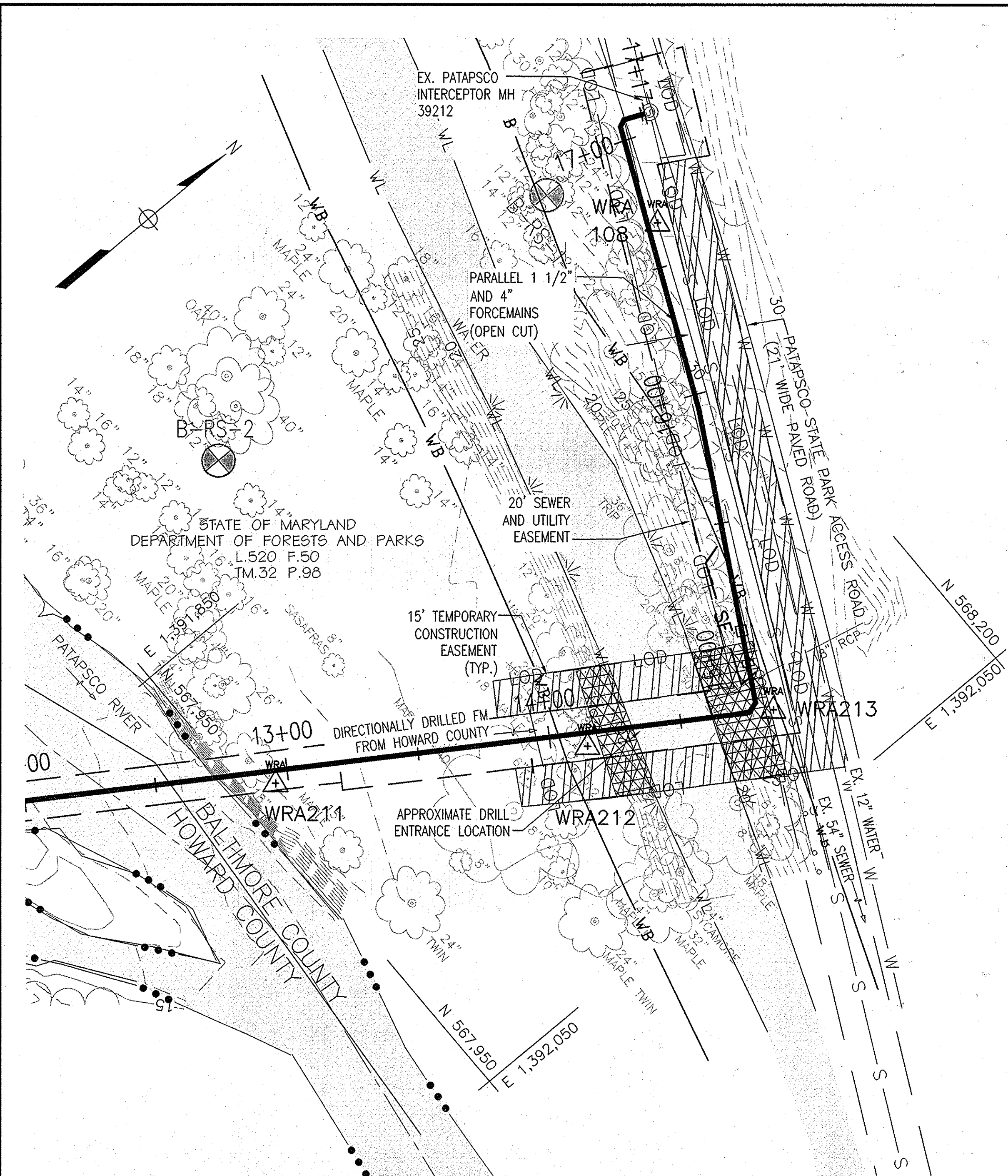
600 SCALE MAP NO. 32 BLOCK NO. 21.

Baltimore County Soil Conservation District  
APPROVED FOR SEDIMENT CONTROL

*[Signature]* 6-7-13  
Date

ROCKBURN HILL SEWER/PUMP STATION  
AND CROSSVIEW ROAD WATER EXTENSION  
CAPITAL PROJECT NO. S-6260 AND W-8312  
CONTRACT NO. 14-4715  
1ST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

BCSC-4  
SCALE AS SHOWN  
SHEET 34 OF 36



LOCATION MAP AND SURVEY CONTROL POINTS: SCALE 1" = 800'

**SURVEY INFORMATION TABLE**

GEODETIC CONTROL STA.	NORTHING	EASTING	ELEV.
38BA	562,553.3146	1,390,967.8616	166.1770
37CA	564,321.6624	1,382,742.8344	256.9640

ALL HORIZONTAL CONTROLS ARE BASED ON MARYLAND STATE COORDINATE SYSTEM NAD '83/'91. VERTICAL CONTROLS ARE BASED ON NAVD '88. SURVEY CONTROLS ARE AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 38BA ON ROUTE 1 AND NO. 37CA ON LANDING ROAD.

**OWNERS/DEVELOPER'S CERTIFICATION- GRADING**

I/WE CERTIFY THAT ALL GRADING ON THIS SITE WILL BE DONE IN ACCORDANCE WITH THE CURRENT GRADING REQUIREMENTS AS SET FORTH BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND WITH THE REQUIREMENTS SPECIFIED IN / TICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE.

*Wes Daub* Project Manager 6/10/2013  
 SIGNATURE OF OWNER/DEVELOPER TITLE DATE  
**WES DAUB**  
 PRINT NAME

BALTIMORE COUNTY  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 AND SUSTAINABILITY  
**APPROVED FOR GRADING**  
*R.A. With* 6-17-13  
 Date

STORMWATER MANAGEMENT PERMIT NOT REQUIRED

**GENERAL NOTES**

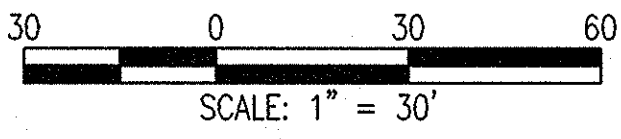
- 1.) THE SITE IS NOT INDICATED AS IN THE 100 YEAR FLOODPLAIN PER FIRM MAP 2400100505F BUT IS INDICATED OUT OF THE FLOODPLAIN STUDY AREA. HOWEVER, BASED ON THE 100 YEAR FLOODPLAIN ELEVATION (NGVD 88 ELEVATION OF 48.4) GIVEN ON FIRM MAP 2400440030B, THE ENTIRE SITE IS WITHIN THE 100 YEAR FLOODPLAIN.
- 2.) A PERMIT HAS BEEN OBTAINED FROM MDE (REF. PERMIT 12-NT-0013/201260068) FOR TEMPORARY DISTURBANCE OF WETLANDS AND WETLANDS BUFFER ASSOCIATED WITH THIS PLAN.

**BALTIMORE COUNTY GRADING NOTES**

- 1.) THE PROPOSED GRADING ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
- 2.) ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO THE BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
- 3.) THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT OR OTHER FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
- 4.) STORMWATER MANAGEMENT HAS BEEN ADDRESSED THROUGH A STORMWATER MANAGEMENT VARIANCE, LETTER DATED APRIL 25, 2013.

SITE DATA  
LIMIT OF DISTURBANCE . . . . . 10,200 SF/ 0.23 AC

PLAN: SCALE 1" = 30'



**LEGEND**

- WL ——— NONTIDAL WETLAND BOUNDARY
- WB ——— 25-FOOT WETLAND BUFFER
- LOD ——— LOD ——— LIMITS OF DISTURBANCE
- MINOR CONTOUR (EX.)
- 20 ——— MAJOR CONTOUR (EX.)
- TEMPORARY STABILIZATION MATTING
- - - - - EXISTING SEWER
- - - - - EXISTING WATER
- NEW FORCE MAIN

**LEGEND**

- SF ——— SILT FENCE

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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
*Jan 11 2013* DIRECTOR OF PUBLIC WORKS DATE  
*Monica E. Suttler 7/26/13* CHIEF, BUREAU OF ENGINEERING DATE  
*Stan Chan 7/22/13* CHIEF, BUREAU OF UTILITIES DATE  
*Op. Dan 7/26/13* CHIEF, UTILITY DESIGN DIVISION DATE

**WR&A**  
 WHITMAN, REQUARDT AND ASSOCIATES, LLP  
 801 SOUTH CAROLINE STREET  
 BALTIMORE, MARYLAND  
 410 - 235 - 3450



DES:	F.B.			
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CHK:	W.H.			
JUNE 2013	BY	NO.	REVISION	DATE

GRADING PLAN:  
BALTIMORE COUNTY

ROCKBURN HILL SEWER/PUMP STATION  
 AND CROSSVIEW ROAD WATER EXTENSION  
 CAPITAL PROJECT NO. S-262G AND W-8312  
 CONTRACT NO. 14-4715  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

BCGP-1  
 SCALE AS SHOWN  
 SHEET 35 OF 36

MARYLAND COORDINATE SYSTEM INDICATED IS THE MARYLAND STATE COORDINATE SYSTEM NAD '83/'91.