# LEGEND PROPOSED FIRE HYDRANT

PROPOSED SANITARY SEWER PROPOSED SANITARY MANHOLE

PROPOSED SANITARY TERMINAL MANHOLE

EXISTING SANITARY SEWER **EXISTING SANITARY MANHOLE** 

EXISTING WATER MAIN

PROPOSED WATER VALVE EXISTING WATER VALVE

1/16 ° BEND

1/32 ° BEND

1 1/2 WHC

8" VALVE

6" VALVE

4" VALVE

8"x8" TEE

8" x6" TEE

FIRE HYDRANTS

8"X6" REDUCER

8"X4" REDUCER

4" SCH. 40 PVC SHC

SANITARY MANHOLE

SAN DROP MANHOLE

**BLOW-OFF VALVE** 

8" SCH 35 PVC SAN, LINE

8" DIP CLASS 52 SAN. LINE

NAME OF UTILITY CONTRACTOR

8" CLASS 54 DIP

4" x 3" REDUCER

6" 44" REDUCER

90 DELARES BEND

GEODETIC SURVEY CONTROL -17FA

GEODETIC SURVEY CONTROL - 17F7

G" DIP WATER

6 CAP

ELEV. 476.721

ELEV. 469.399 N 595,829,688

E 1,363,088.330

N 594,948,426

E 1,364,626.770

4" DIP CLASS 52 SAN, LINE

BENCHMARK

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND

IMPLEMENTED IN ACCORDANCE WITH SECTION 308 OF THE

SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION

SPECIFICATIONS AND AS SHOWN ON F-14-124

6" SLEEVE, COON to DIP

1 1/2 COPPER WATERLINE

8" DR 18 C900 PVC WATER

6" DR 18 C900 PVC WATER

4" DR 18 C900 PVC WATER

PROPOSED WATER BEND PROPOSED SEWER HOUSE CONNECTION

PROPOSED WATER HOUSE CONNECTION DOMESTIC WATER METER

UTILITY TEST PIT LOCATION

SHEET INDEX	SHEET INDEX						
SHEET TITLE	SHEET NUMBER						
TITLE SHEET	1						
COMPREHENSIVE PLAN VIEW	2						
PUBLIC WATER AND SEWER PLAN	3 - 4						
PUBLIC SANITARY SEWER PROFILES	5 - 7						
PUBLIC SANITARY SEWER STRUCTURE SCHEDULES	8						
PUBLIC WATER PROFILES	9 - 11						
WATER FITTING CHARTS	12						
STREAM CROSSING DETAILS	13-14						

QUANTITIES TABLE

**ESTIMATED** 

65 EA.

2390 L.F.

1769 L.F.

650 L.F

276 L.F.

10 EA.

8 EA.

2 EA.

6 EA.

6 EA.

2 EA.

2410 L.F

2144 L.F

1533 L.F.

19 EA.

5 EA,

4 EA.

o lf

OLF

QLF.

o sa.

OEA

OEA

OEA

OEA

& EA

**J4** 16 EA

QUANTITIES

65

1970

1721

712

354

1702.5

103

65

538.5

AS-BUILT TYPE

Water

Worker

Water

Water

Water

Water

Water

Water

Sewer

Water

CHECK BOX

AS-BUILT DATE

Water

Sewer

Water

Water

Water

Water

Water

Water

SEWER NOTES

3. FORCE MAINS SHALL BE D.I.P. ONLY

OTHERWISE NOTED ON THE DRAWINGS.

OWNER

ESTATES AT PATAPSCO PARK, LLC

24012 FREDERICK ROAD

CLARKSBURG, MD 20861

CONTACT: MR. DAN SNYDER

PHONE: (301) 674-8509

SURVEY AND DRAFTING DIVISION

# PHASEIII PUBLIC WATER & SEWER FINAL CONSTRUCTION PLANS

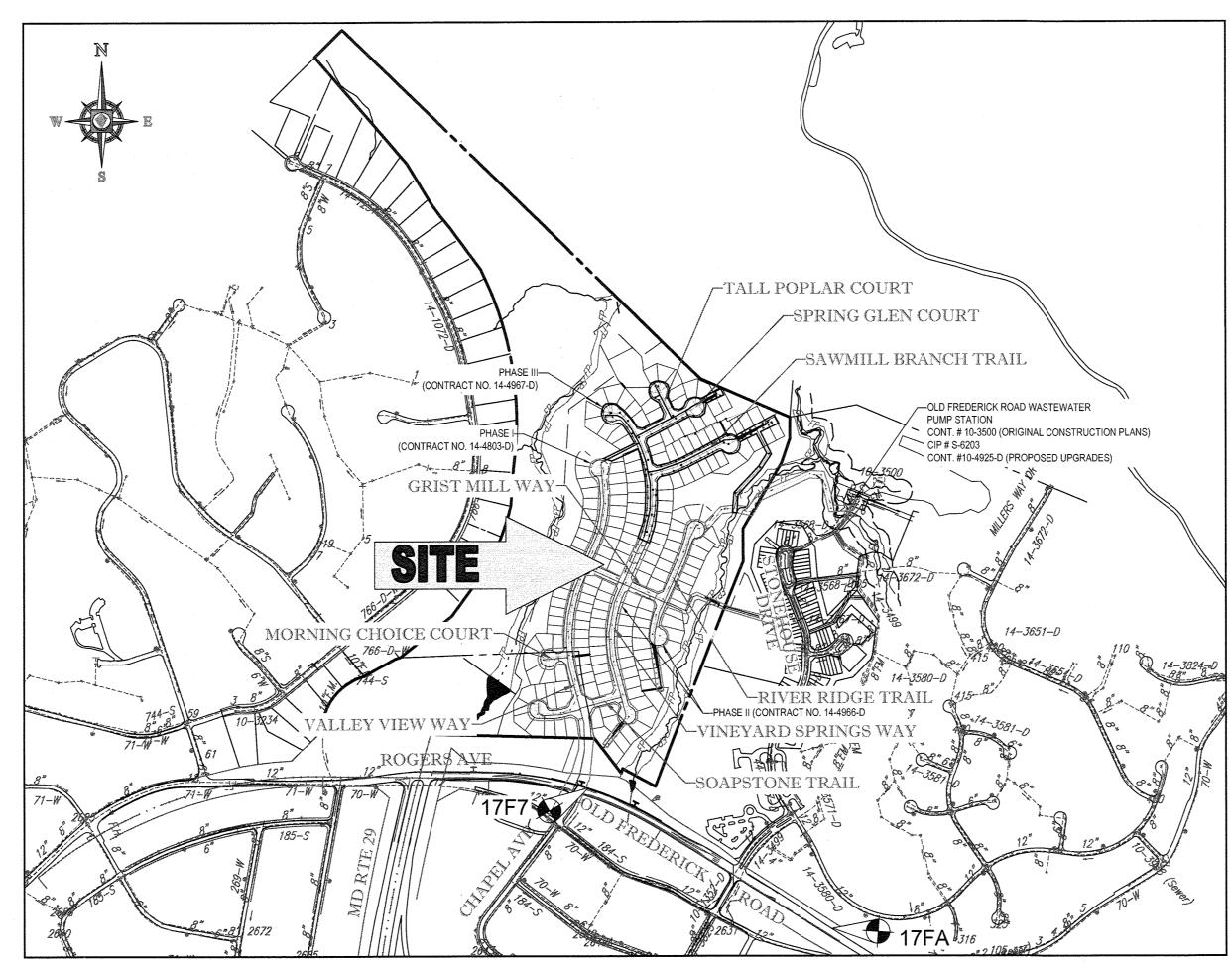
# ESTATES AT PATAPSCO PARK

**LOCATION OF SITE** 

ROGERS AVENUE TAX MAP 17, GRID 5, 6, 11 & 12

HOWARD COUNTY, MARYLAND

ZONING: R-ED AND R-20, 2ND ELECTION DISTRICT **CONTRACT NO. 14-4967-D** 



VICINITY MAP

TYPE OF BUILDING: RESIDENTIAL DRAINAGE AREA : PATAPSCO NUMBER OF LOTS/PARCELS/UNITS: 65 (PHASE III) AREA OF RESIDENTIAL LOT/PARCEL: 113.23 AC NUMBER OF W.H.C.: 65 (PHASE III) NUMBER OF S.H.C.: 65 (PHASE III) WATER ZONE: 630 W TEST GRADIENT: 780 PSI

REFERENCE DRAWINGS WP-13-048 CONT. 14-4803-D (PHASE I W&S) CONT. 14-4966-D (PHASE II W&S)

GENERAL NOTES

COPYRIGHT ADC THE MAP PEOPLE

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

2 TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON JANUARY, 2009 BY AERO-METRIC

. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLAN COORDINATE SYSTEM. HORIZONTAL AND VERTICAL CONTROL DATUM ARE BASED ON HOWARD COUNTY MONUMENT NOS. 17FA AND 17F7 WHICH WERE USED FOR THIS PROJECT HOWARD COUNTY MONUMENT NO: 17FA ELEV. = 476.72 HOWARD COUNTY MONUMENT NO: 17F7 ELEV. = 469.40

AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES. ANY COST

WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL 📆 AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IN INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR

THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS

AT & T 1-800-252-1133 BGE (CONSTRUCTION SERVICES) 410-637-8713 BGE (EMERGENCY) 410-685-0123

BUREAU OF UTILITIES 410-313-490 COLONIAL PIPELINE COMPANY 410-795-1390

MISS UTILITY 1-800-257-7777

STATE HIGHWAY ADMINISTRATION 410-531-5533

TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT BE REMOVED OR DAMAGED BY THI

1. 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

2. HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, IN A LETTER DATED JANUARY 21, 2015, APPROVED A WAIVER REQUEST OF THE REQUIREMENTS OF SECTION 4.3.B.3.B AND 4.5.E FOR LOTS 61 (NEW 263) THROUGH 66 (NEW 268), LOTS 71 (NEW 273) THROUGH 74 (NEW 276), 97 (NEW 299), AND 101 (NEW 303) (NO BASEMENT GRAVITY SERVICE). AS A RESULT OF TOPOGRAPHY CAUSING DEPTHS OF SEWER IN EXCESS OF 20 FEET, BASEMENT SEWER SERVICE CANNOT BE PROVIDED TO THESE PROPOSED LOTS. FOR THESE LOTS: GRAVITY SEWER SERVICE TO BE PROVIDED TO FIRST FLOOR ONLY; BASEMENT SERVICE TO BE PROVIDED BY PRIVATE ON-SITE PUMP. THE APPROVAL AND INSPECTION OF ON-SITE PUMPING UNITS INCLUDES THE DEPARTMENT OF INSPECTION, LICENSES AND

3. HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, IN A LETTER DATED JANUARY 21, 2015, APPROVED A WAIVER REQUEST OF THE REQUIREMENTS OF SECTION 3.3.B.5 (DEPTH OF COVER OVER WATER MAINS). THE WAIVER REQUEST TO ALLOW AN INCREASED DEPTH OF COVER OVER THE WATER MAIN CROSSING IN THE FOREST CONSERVATION EASEMENT, BETWEEN STATION 13+23 AND STATION 14+00 OF WATERLINE 'E', TO TEN (10) FEET IS APPROVED WITH THE FOLLOWING LIMITATIONS:

DR-14, C-900 PVC PIPE, WITH RESTRAINED JOINTS, SHALL BE USED BETWEEN STATION 13+06 AND STATION 14+20. THE MAXIMUM COVER WITHIN THE LIMITS DESCRIBED ABOVE SHALL NOT EXCEED TEN (10) FEET

OR APPROVED EQUAL.

. ALL WATER MAINS TO BE P.V.C. C900 UNLESS OTHERWISE NOTED.

TOPS OF ALL WATER MAINS TO HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.

. VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.

ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.

. FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE RESTRAINED AND BUTTRESSED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND 1005 OF THE STANDARD SPECIFICATIONS

THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.

TRACER WIRES AND CONTINUITY TEST STATION SHALL BE INSTALLED ON ALL DIP AND PVC WATER MAINS IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL

FOR PVC WATER MAINS, ALL RECORDS FOR THE QUALITY CONTROL AND QUALIFICATIONS TEST REQUIREMENTS NOTED IN SECTION 5.1 OF THE AWWA STANDARD C900 FOR PVC PRESSURE PIPE SHALL BE SUBMITTED WITH PIPE MATERIALS CERTIFICATIONS OR SHOP DRAWING 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.

UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS SACRIFICIAL ANODES SHALL BE ON ALL VALVES AND METALLIC FITTINGS USED WITH PVC WATER MAINS IN ACCORDANCE WITH VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. SEVENTEEN (17) POUND MAGNESIUM ANODES SHALL BE INSTALLED ON ALL VALVES AND DUCTILE IRON FITTINGS INCLUDING RESTRAINS AND HARNESSES. TWELVE (12) POUND ZINC ANODES SHALL BE INSTALLED ON ALL STAINLESS STEEL FITTINGS AND SADDLES USED WITH PVC MAINS. ALL "TEES" USED WITH PVC MAINS SHALL BE

0. PROPER ASSEMBLY OF GASKETED PVC PIPE JOINTS: THE MANUFACTURER'S INSERTION LINE OF GASKETED PVC PIPE JOINTS INDICATES THE MAXIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL AFTER ASSEMBLY OF THE JOINT, THE INSERTION LINE SHALL REMAIN VISIBLE. DUAL INSERTION LINES ON GASKETED PVC PIPE INDICATE THE MAXIMUM AND MINIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. THE CONTRACTOR SHALL NOT OVER INSERT OR OVER HOME THE SPIGOT INTO THE BELL OF PVC PIPE.

ALL CHANGES IN HORIZONTAL OR VERTICAL DIRECTION OF PVC WATER PIPE SHALL BE MADE WITH STANDARD BENDS, 5-DEGREE SWEEPS OR HIGH DEFLECTION (HD) COUPLINGS. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE HIGH DEFECTION COUPLINGS OR 5-DEGREE SWEEPS ARE PERMITTED, THE CONTRACTOR SHALL PROVIDE ONE FULL PIPE LENGTH (20-FOOT LONG) ON EITHER SIDE OF THE HIGH DEFLECTION COUPLING OR 5-DEGREE SWEEP. THE CONTRACTOR SHALL USE A VIBRATORY PLATE COMPACTOR OR OTHER APPROVED MEANS TO THOROUGHLY COMPACT THE #57 STONE ON BOTH SIDES OF THE HIGH DEFECTION COUPLING OR 5-DEGREE SWEEP, TAKING CARE NOT TO USE COMPACTION EQUIPMENT DIRECTLY OVER THE FITTING

PVC HIGH DEFLECTION COUPLINGS SHALL BE LIMITED TO A TOTAL DEFECTION OF 3-DEGREES (1 1/2-DEGREE ON EITHER END OF THE COUPLING), SHALL BE RATED FOR A MINIMUM 200 PSI MEETING THE REQUIREMENTS OF AWWA C900, SHALL HAVE A MINIMUM LAY LENGTH OF 9-INCHES AND SHALL HAVE CENTER STOPS. PVC HIGH DEFLECTION COUPLINGS SHALL BE CERTAINTEED PVC HIGH DEFLECTION

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

12. WHEN PVC HIGH DEFECTION COUPLINGS OR PVC 5-DEGREE SWEEPS ARE USED TO FACILITATE CHANGES IN HORIZONTAL OR VERTICAL ALIGNMENTS OF AWWA C-900 PVC PIPELINES, THE CONTRACTOR SHALL INSTALL DEVICES FOR THE PREVENTION OF OVER-INSERTION OF THE PVC PIPE SPIGOTS OR PLAIN ENDS INTO THE PUSH ON BELL JOINT ON BOTH SIDES OF THE HIGH DEFECTION COUPLINGS AND 5 DEGREE SWEEPS. BELL STOPS SHALL BE PLACED AT THE PROPER INSERTION LINE FOR THE FITTING. THE BELL STOP SHALL BE MANUFACTURED OF DUCTILE IRON AND INCORPORATE AN EXPANSION RETENTION

13. EACH DWELLING WILL BE SERVED BY A 1-1/2" DIAMETER WHC, WITH A 1" METER WHICH WILL BE LOCATED AT THE PROPERTY LINE. THE PREFERRED

SPRING TO ALLOW FOR PIPE EXPANSION AND CONTRACTION. THE BELL STOPS SHALL BE SERIES 5000 MEGA-STOP, AS MANUFACTURED BY EBAA IRON, INC.



LOCATION OF THE OUTSIDE WATER METER SETTING IS IN A GRASS AREA WITH THE ROAD RIGHT-OF-WAY AND OUTSIDE OF TRAFFIC BEARING AREAS.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

**DEPARTMENT OF PLANNING & ZONING** HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION 🙀 DAT

901 DULANEY VALLEY ROAD, SUITE 80 **TOWSON, MARYLAND 21204** Phone: (410) 821-7900 (410) 821-7987 www.BohlerEngineering.com

3-This includes 6° PVC used in Fire Hydrant Assembles

\* \*- The includes 4° Woused in Fire Hydrawi Azzemblics

AY McDonald

AY McDanale

Mueller Compa

Multi Filling:

McWane Ductile

McWane Duckile

Me Mane Duchie

Havane Duchile

Muki Fittings

Tyler Union Founds

Tuler Union Bunda

TylerUnionfoundry

Tuler Union Founds

DEVELOPER

ESTATES AT PATAPSCO PARK, LLC

24012 FREDERICK ROAD

CLARKSBURG, MD 20861

CONTACT: MR. DAN SNYDER

PHONE: (301) 674-8509

1. ALL SEWER MAINS SHALL BE SDR 35 OR SCH. 40 PVC UNLESS OTHERWISE NOTED.

2. ALL MANHOLES SHALL BE 4' - 0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.

4. MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.

5. MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT

6. HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT CELLAR CANNOT BE

FRAME AND COVERS, STANDARD DETAIL G5.52. WHERE WATERTIGHT FRAME AND COVER IS USED, SET TOP OF FRAME 1" - 6" ABOVE FINISHED GRADE JNLESS

Eclipse/Kupferle/Foundry



I BRANDON R. ROWE, HEREBY CERTIFY THAT THESE

OCCUMENTS 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. 40808, EXPIRATION DATE: 7/3/201

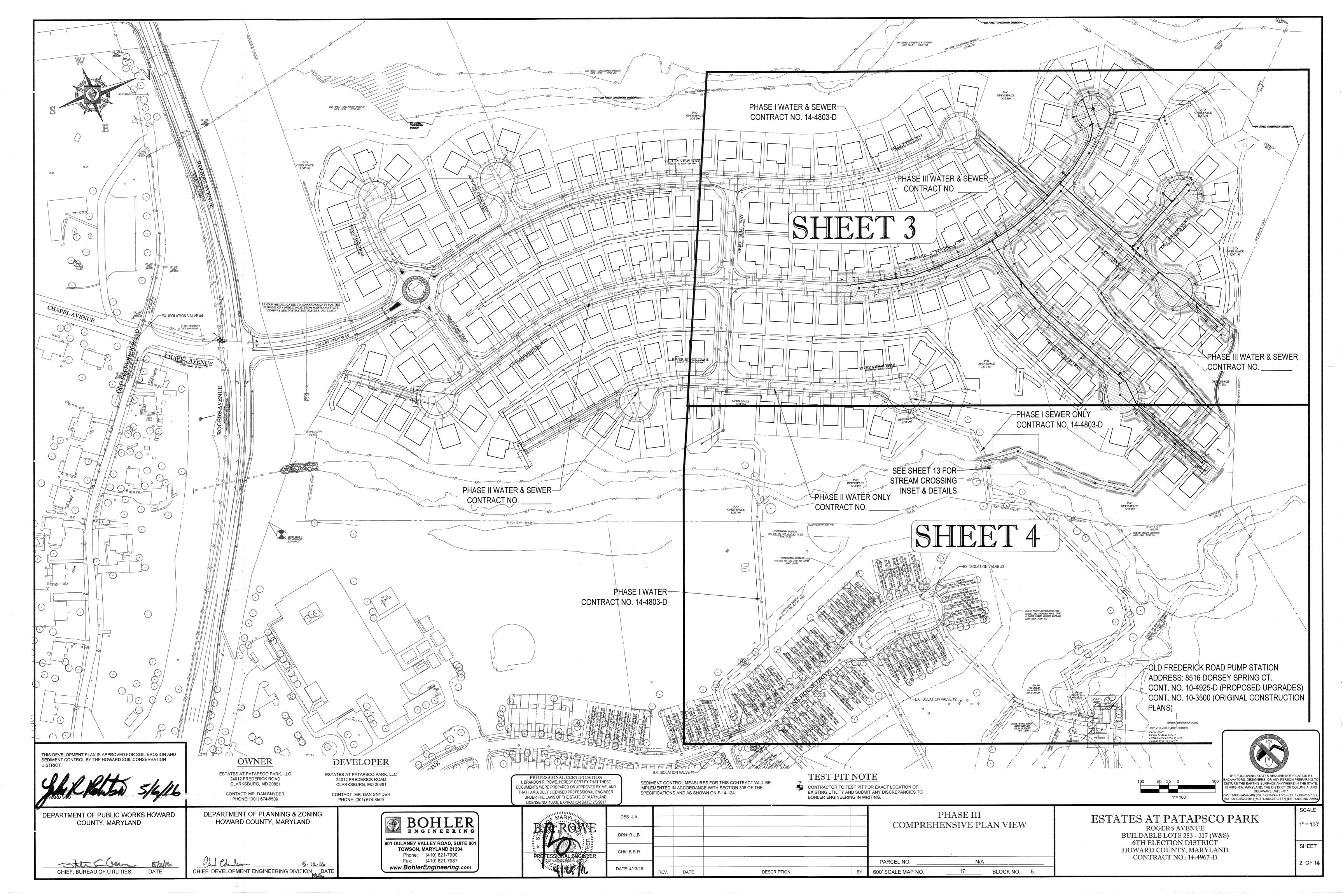
DES: J.A.					Т	PHASE III		
DRN: R.L.B.					1			
CHK: B.R.R.								
					PARCEL NO.	N/	<u>/A</u>	
DATE: 4/13/16	REV.	DATE	DESCRIPTION	BY	600' SCALE MAP NO.	17	BLOCK NO5	

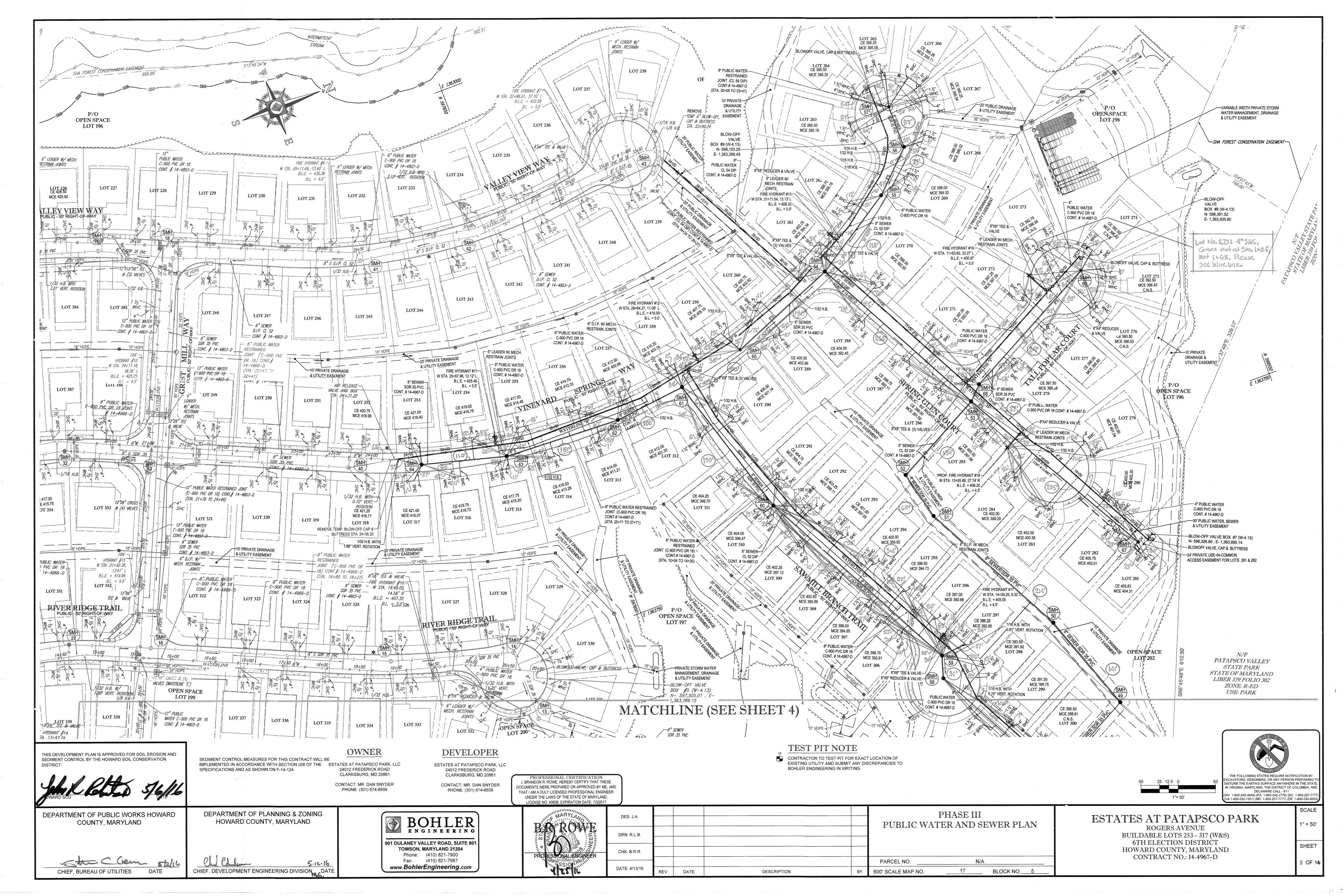


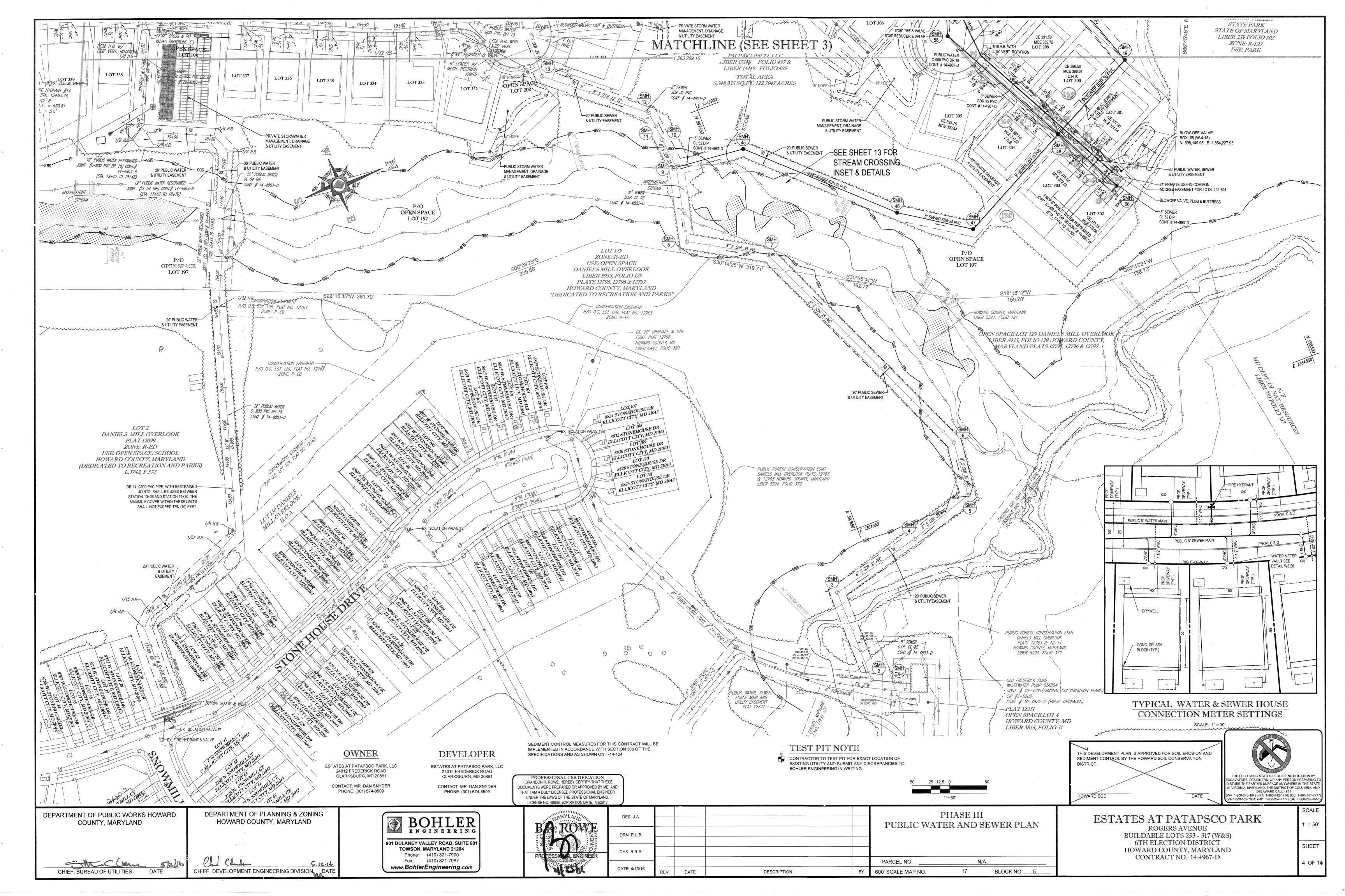
BUILDABLE LOTS 253 - 317 (W&S) 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO.: 14-4967-D

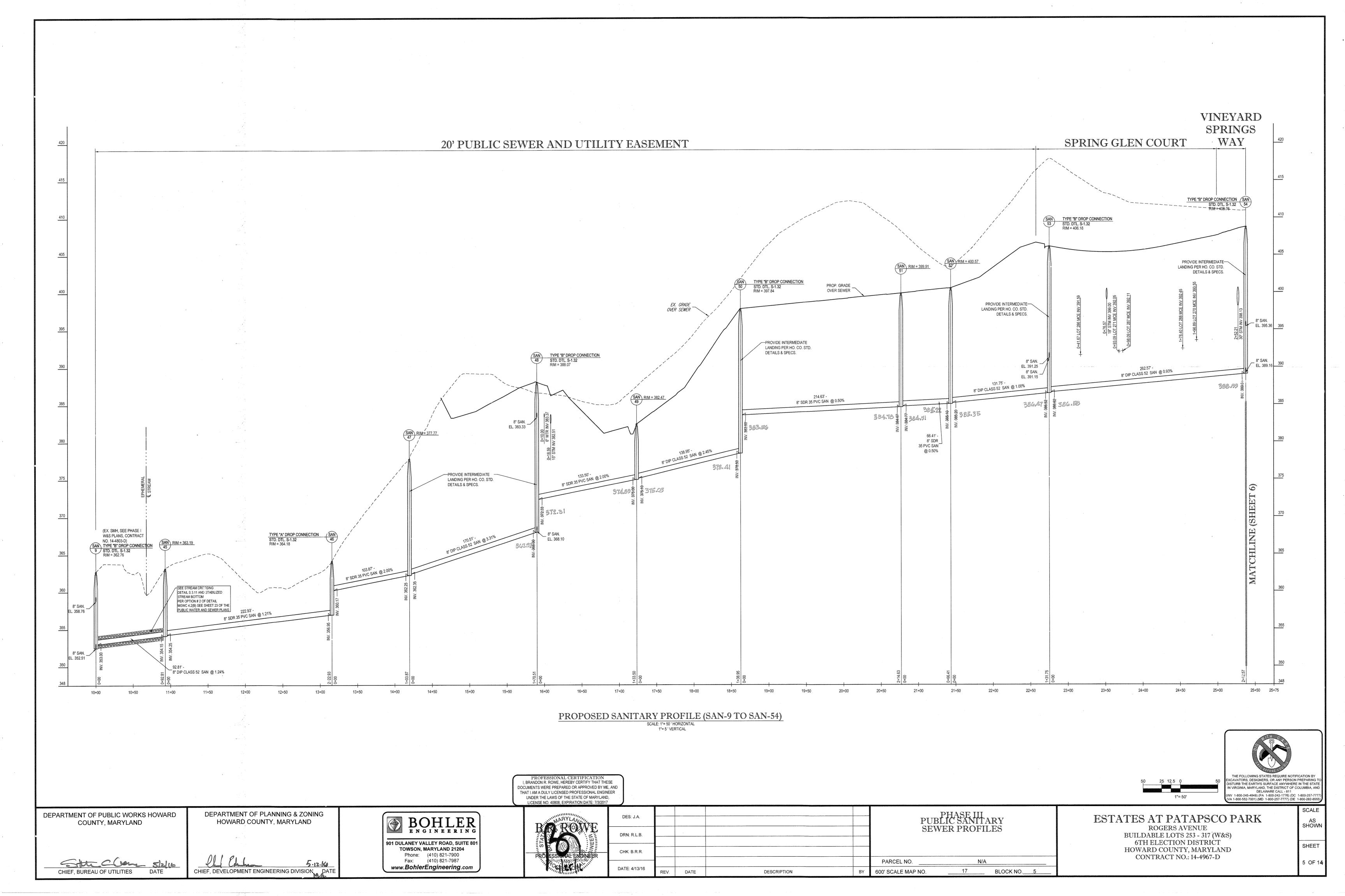
SHOWN SHEET 1 OF 14

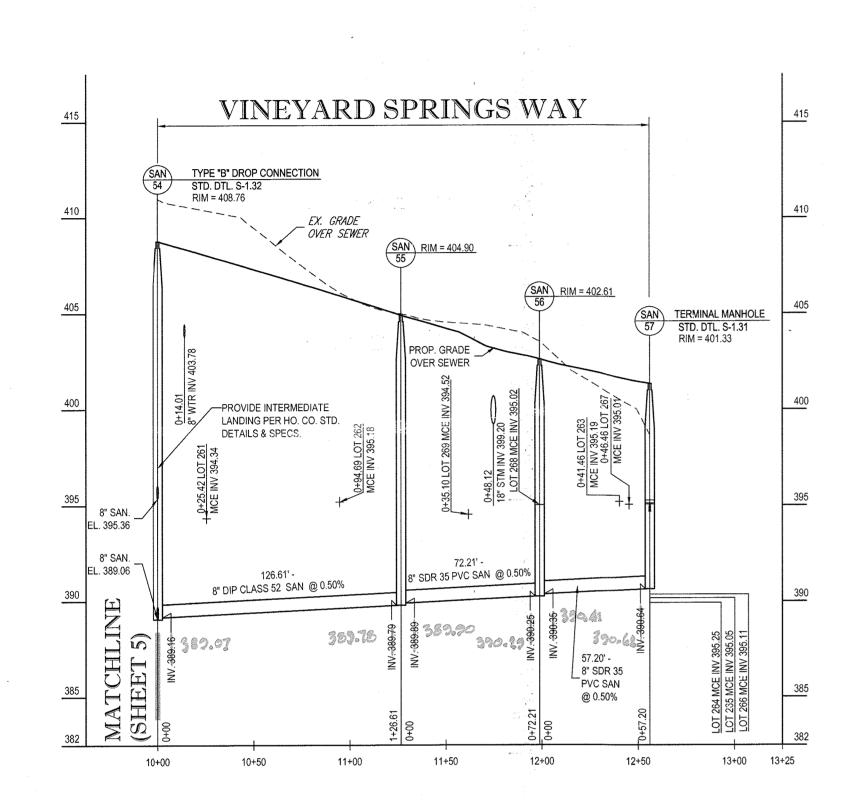
SCALE



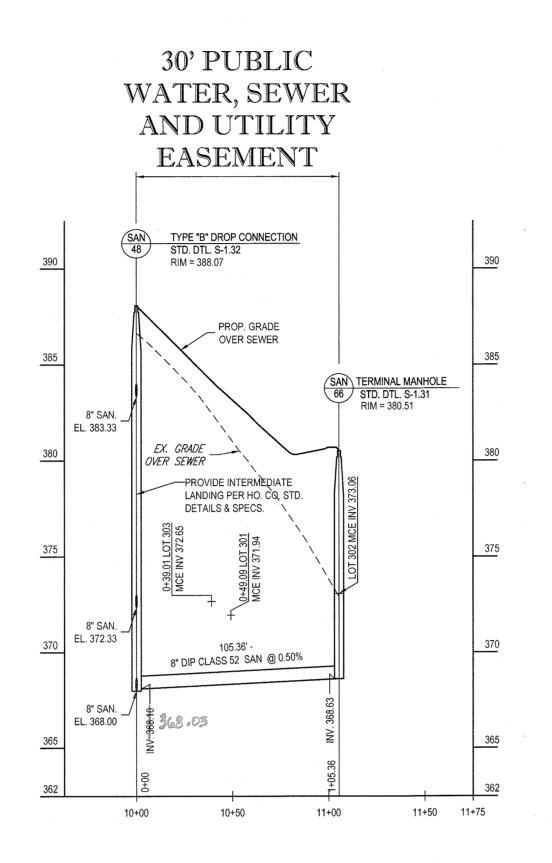




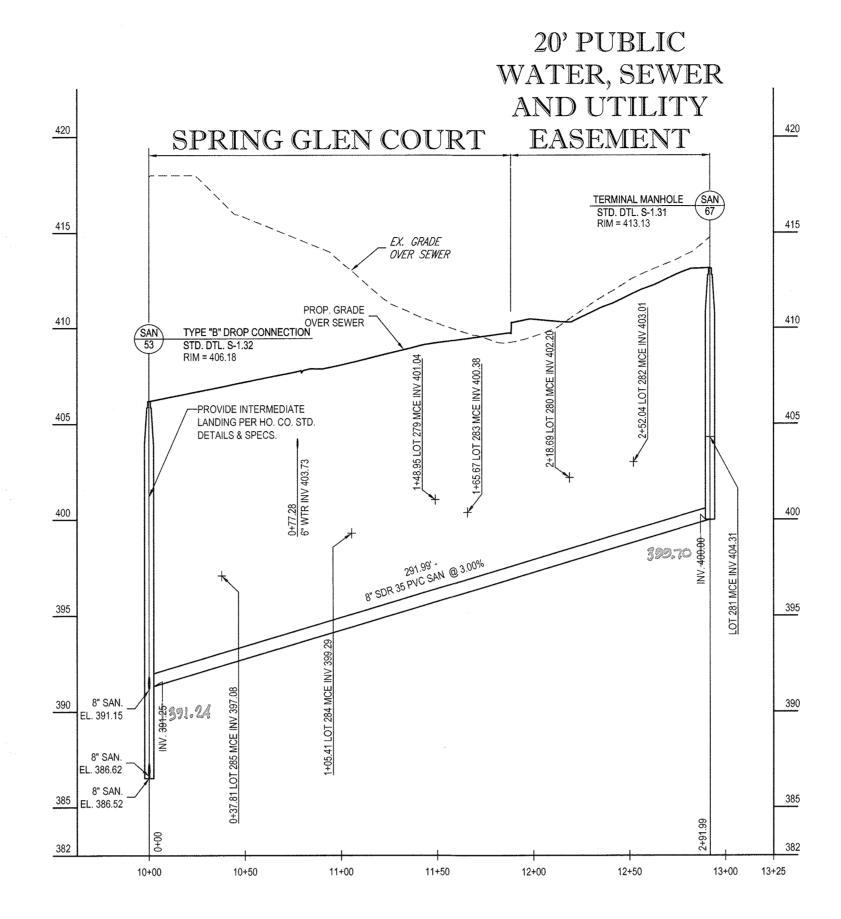




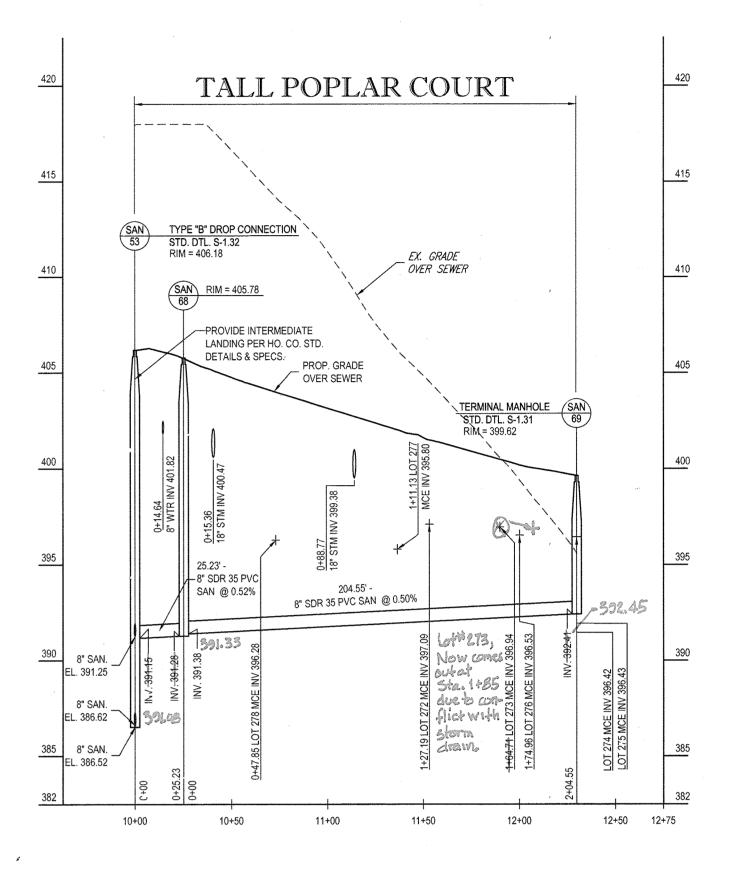
PROPOSED SANITARY PROFILE (SAN-54 TO SAN-57) SCALE: 1"= 50 ' HORIZONTAL 1"= 5 ' VERTICAL



PROPOSED SANITARY PROFILE (SAN-48 TO SAN-66) SCALE: 1"= 50" HORIZONTAL 1"= 5 ' VERTICAL



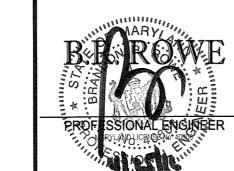
PROPOSED SANITARY PROFILE (SAN-53 TO SAN-67) SCALE: 1"= 50 ' HORIZONTAL 1"= 5 ' VERTICAL



PROPOSED SANITARY PROFILE (SAN-53 TO SAN-69) SCALE: 1"= 50 ' HORIZONTAL 1"= 5 ' VERTICAL

I, BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017



				alang and a second					_			
DES: J.A.					PUBI	PHASE II ICSANI	LARY					
DRN: R.L.B.					SEW	ER PROF	ILES		Manage of the Actual of the Ac			
CHK: B.R.R.	AND SECURITY OF THE SECURITY O	-							AND DESCRIPTION OF THE PROPERTY OF THE PROPERT			
	New York				PARCEL NO.	N	I/A		A CONTRACTOR			
ATE: 4/13/16	REV.	DATE	DESCRIPTION	BY	600' SCALE MAP NO.	17	BLOCK NO	5				

EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE. IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AND DELAWARE CALL - 811 WV 1-800-245-4848) (PA 1-800-242-1776) (DC 1-800-257-7777 VA 1-800-552-7001) (MD 1-800-257-7777) (DE 1-800-282-8555) SCALE

ESTATES AT PATAPSCO PARK

ROGERS AVENUE BUILDABLE LOTS 253 - 317 (W&S) 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO.: 14-4967-D

AS SHOWN SHEET 6 OF 14

CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PUBLIC WORKS HOWARD

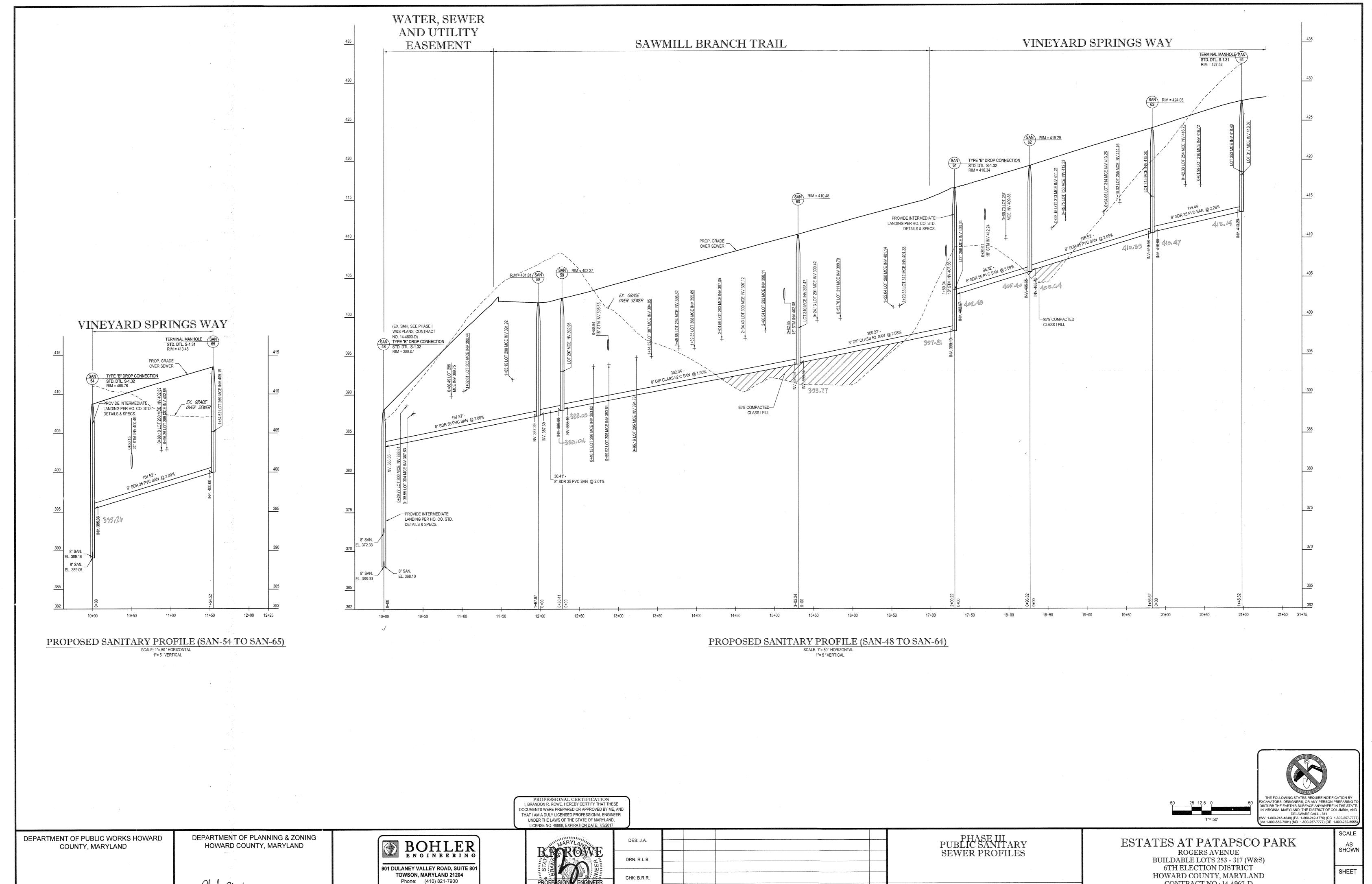
COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

DEPARTMENT OF PLANNING & ZONING

HOWARD COUNTY, MARYLAND

BOHLER ENGINEERING BOHLER 901 DULANEY VALLEY ROAD, SUITE 801 TOWSON, MARYLAND 21204 Phone: (410) 821-7900 Fax: (410) 821-7987 www.BohlerEngineering.com



DATE: 4/13/16

DATE

Fax: (410) 821-7987

www.BohlerEngineering.com

CHIEF, BUREAU OF UTILITIES DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

7 OF 14

CONTRACT NO.: 14-4967-D

PARCEL NO.

600' SCALE MAP NO.

17

BLOCK NO. 5

NAME	TYPE	NORTHING EASTING	RIM ELEV. (FT.)	INVERTS
45	STANDARD 48" MANHOLE	N 597688.57	363.19	INV IN = 354.25
	(HO. CO. STD. G-5.12)  48" MANHOLE DROP CONN. TYPE A	E 1364020.33 N 597850.56		INV OUT = 354.15
46	(HO. CO. STD. G-1.32)	E 1364173.49	364.18	INV OUT = 356.95
47	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12) PROVIDE INTERMEDIATE LANDING PER HO. CO. STD. DETAILS & SPECS.	N 597937.55 E 1364230.25	377.77	INV IN = 362.35 INV OUT = 362.25
48	48" MANHOLE DROP CONN. TYPE 'B' (HO. CO. STD S-1.32) PROVIDE INTERMEDIATE LANDING PER HO. CO. STD. DETAILS & SPECS.	N 598088.83 E 1364151.57	388.07	INV IN = 372.33 INV IN = 383.33 INV IN = 368.10 INV OUT = 368.00
49	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598207.27 E 1364089.97	382.47	INV IN = 375.10 INV OUT = 375.00
50	48" MANHOLE DROP CONN. TYPE 'B' (HO. CO. STD S-1.32) PROVIDE INTERMEDIATE LANDING PER HO. CO. STD. DETAILS & SPECS.	N 598161.56 E 1363958.76	397.84	INV IN = 383.60 INV OUT = 378.50
51	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598062.53 E 1363768.34	399.91	INV IN = 384 77 INV OUT = 384.67
52	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598047.23 E 1363703.71	400.57	INV IN = 385.20 INV OUT = 385.10
53	48" MANHOLE DROP CONN. TYPE 'B' (HO. CO. STD S-1.32) PROVIDE INTERMEDIATE LANDING PER HO. CO. STD. DETAILS & SPECS.	N 598164.12 E 1363642.92	406.18	INV IN = 386.62 INV IN = 391.25 INV IN = 391.15 INV OUT = 386.52
54	48" MANHOLE DROP CONN. TYPE 'B' (HO. CO. STD S-1.32) PROVIDE INTERMEDIATE LANDING PER HO. CO. STD. DETAILS & SPECS.	N 598043.01 E 1363409.96	408.76	INV IN = 389.16 INV IN = 395.36 INV OUT = 389.06
55	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598149.56 E 1363341.56	404.90	INV IN = 389.89 INV OUT = 389.79
56	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598201.56 E 1363291.46	402.61	INV IN = 390.35 INV OUT = 390.25
57	TERMINAL MANHOLE (HO. CO. STD S-1.31)	N 598201.26 E 1363234.26	401.33	INV OUT = 390.64
58	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 597997.53 E 1363976.03	401.81	INV IN = 387.39 INV OUT = 387.29
59	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598006.68 E 1363947.03	402.37	INV IN = 388.10 INV OUT = 388.00
60	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 597867.18 E 1363678 81	410.32	INV IN = 393.94 INV OUT = 393.84
61	48" MANHOLE DROP CONN. TYPE 'B' (HO. CO. STD S-1.32) PROVIDE INTERMEDIATE LANDING PER HO. CO. STD. DETAILS & SPECS.	N 597809.20 E 1363487.16	416.34	INV IN = 402.67 INV OUT = 398.10
62	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 597713.42 E 1363497.36	419.29	INV IN = 405.75 INV OUT = 405.65
63	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 597557.10 E 1363489.45	424.08	INV IN = 410.68 INV OUT = 410.58
64	TERMINAL MANHOLE (HO. CO. STD S-1.31)	N 597446.67 E 1363459.40	427.48	INV OUT = 413.29
65	TERMINAL MANHOLE (HO. CO. STD S-1.31)	N 597899.76 E 1363467.89	413.48	INV OUT = 400.00
66	TERMINAL MANHOLE (HO. CO. STD S-1.31)	N 598137.44 E 1364245.05	, 380.51	INV OUT = 368.63
67	TERMINAL MANHOLE (HO. CO. STD S-1.31)	N 598305.84 E 1363898.21	413.13	INV OUT = 400.00
68	STANDARD 48" MANHOLE (HO. CO. STD. G-5.12)	N 598182.11 E 1363625.22	405.78	INV IN = 391.38 INV OUT = 391.28
69	TERMINAL MANHOLE (HO. CO. STD S-1.31)	N 598363.58 E 1363530.84	399.62	INV OUT = 392.41

									25255				Α	IND / OF	SHC	BU/EDT	0511.45	
LOT	FF ELEV.	CELLAR ELEV.	NV.@ MAIN	SHC LENGTH TO ROW (FT)		NVERT@ ROW	SHC SLOPE WITHIN LOT	MAX. SHC LENGTH (FT)	2.50 FT BELOW CELLAR	MN. CELLAR ELEV. (MCE)	CONNECTION TYPE	LOT	BETWEEN CE & MCE	INV. OF DHC @ MAIN	SLOPE WITHIN ROW	INVERT @ ROW	GRAVITY SERVICE	FLOOR FLOO
253	431.00	421.00	413.39	28.70	3.0%	414.25	3.0%	96.60	2.50	419.65	STD SHC	253	1.35	_			YES	10-F
254	429.00	419.00	411.65	30.60	3.0%	412.57	3.0%	99.40	2.50	418.05	STD SHC	254	0.95				YES	10-F
255	427.00	417.00	409.30	31.30	3.0%	410.24	3.0%	101.50	2.50	415.78	STD SHC	255	1.22				YES	10-F
256	424.75	414.75	407.16	30.80	3.0%	408.08	3.0%	102.70	2.50	413.67	STD SHC	256	1.08				YES	10-F
257	422.50	412.50	404.70	32.40	3.0%	405.67	3.0%	101.80	2.50	411.23	STD SHC	257	1.27				YES	10-F
258	420.25	410.25	398.20	33.20	5.0%	399.86	5.0%	99.00	2.50	407.31	DROP TYPE A	258	2.94	401.14	2.0%	401.80	YES	10-F
259	417.75	407.75	400.10	34.30	3.0%	401.13	3.0%	95.00	2.50	406.48	STD SHC	259	1.27				YES	10-F
260	415.75	405.75	398.01	30.00	4.0%	399.21	4.0%	85.30	2.50	405.12	STD SHC	260	0.63				YES	10-F
261	412.25	402.25	389.29	30.60	5.0%	390.82	5.0%	97.00	2.50	398.17	DROP TYPE A	261	4.08	393.37	2.0%	393.98	YES	10-F
262	409.75	399.75	389.63	29.40	4.5%	390.95	4.5%	123.00	2.50	398.99	STD SHC	262	0.76				YES	10-F
263	405.75	395.50	390.56	57.36	2.0%	391.71	1.0%	97.80	2.50	395.19	STD SHC	263	0.31		ļ		YES	10-F7
264	405.50	395.50	390.74	52.40	2.0%	391.79	1.0%	96.50	2.50	395.25	STD SHC	264	0.25				YES	10-F1
				47.20	2.0%	391.68	1.0%	86.50	2.50	395.05	STD SHC	265	0.20		<b></b>		YES	10-F
265	405.25	395.25	390.74						2.50	395,11	STD SHC	266	0.15	-			YES	10-F
266	405.26	395.26	390.74	48.30	2.0%	391.71	1.0%	90.00			STD SHC		0.13				YES	10-F1
267	405.25	395.25	390.58	53.10	2.0%	391.64	1.0%	89.40	2.50	395.04		267					YES	10-F1
268	406.00	396.00	390.35	25.60	2.0%	390.86	2.0%	82.70	2.50	395.02	STD SHC	268	0.98		<u> </u>			-
269	408.00	398.00	390.07	21.80	4.5%	391.05	4.5%	75.60	2.50	396.95	STD SHC	269	1.05				YES	10-FT
270	409.00	399.00	388.45	32.80	5.0%	390.09	5.0%	97.00	2.50	397.44	STD SHC	270	1.56		-		YES	10-F7
271	407.00	397.00	387.49	32.80	5.0%	389.13	5.0%	70.00	2.50	395.13	STD SHC	271	1.87			-	YES	10-F7
272	407.25	397.25	392.02	36.10	2.0%	392.74	2.0%	92.30	2.50	397.09	STD SHC	272	0.16				YES	10-F7
273	402.75	392.75	392.21	66.70	2.0%	393.54	1.0%	90.00	2.50	396.94	STD SHC	273	-4.19			-	NO	10-F
274	402.50	392.50	392.51	31.10	2.0%	393.13	1.0%	79.10	2.50	396.42	STD SHC	274	-3.92				NO	10-F
275	402.50	392.50	392.51	31.10	2.0%	393.13	1.0%	80.00	2.50	396.43	STD SHC	275	-3.93				NO	10-F
276	403.50	393.50	392.26	48.80	2.0%	393.24	1.0%	79.00	2.50	396.53	STD SHC	276	-3.03				МО	10-F7
277	406.00	396.00	391.94	18.80	2.0%	392.32	1.0%	97.90	2.50	395.80	STD SHC	277	0.21			ļ	YES	10-F7
278	407.50	397.50	391.62	18.80	2.0%	392.00	2.0%	89.00	2.50	396.28	STD SHC	278	1.22				YES	10-F1
279	412.00	402.00	395.71	58.40	2.0%	396.88	2.0%	83.00	2.50	401.04	STD SHC	279	0.96				YES	10-F7
280	413.00	403.00	397.80	23.80	2.0%	398.28	2.0%	71.00	2.50	402.20	STD SHC	280	0.80	,			YES	10-F7
281	415.83	405.83	400.10	9.40	2.5%	400.34	2.5%	76.20	2.50	404.74	STD SHC	281	1.09				YES	10-F7
282	415.75	405.75	398.80	9.20	4.0%	399.17	4.0%	76.50	2.50	404.73	STD SHC	282	1.02				YES	10-F7
283	412.00	402.00	396.21	47.10	2.0%	397.15	2.0%	73.00	2.50	401.11	STD SHC	283	0.89				YES	10-F7
284	412.00	402.00	394.41	39.30	3.5%	395.79	3.5%	79.50	2.50	401.07	STD SHC	284	0.93				YES	10-F7
285	410.50	400.50	392.38	19.90	4.0%	393.18	4.0%	90.00	2.50	399.28	STD SHC	285	1.22				YES	10-F1
286	409.00	399.00	387.01	18.80	5.0%	387.95	5.0%	85.00	2.50	394.70	DROP TYPE A	286	4.30	391.31	2.0%	391.69	YES	10-F7
287	408.75	398.75	387.53	18.90	5.0%	388.48	5.0%	85.00	2.50	395.23	DROP TYPE A	287	3.53	391.06	2.0%	391.43	YES	10-F
288	414.00	404.00	388.28	18.90	5.0%	389.23	5.0%	64.50	2.50	394.95	DROP TYPE A	288	9.05	397.33	2.0%	397.71	YES	10-F7
289	415.50	405.50	398.22	21.40	3.5%	398.97	3.5%	85.50	2.50	404.46	STD SHC	289	1.04			<del> </del>	YES	10-F7
290	416.50	406.50	396.48	29.40	5.0%	397.95	5.0%	78.60	2.50	404.38	STD SHC	290	2.12				YES	10-F7
291	414.75	404.75	394.44	31.40	5.0%	396.01	5.0%	92.40	2.50	403.13	STD SHC	291	1.62			-	YES	10-FT
292	413.25	403.25	393.05	32.80	5.0%	394.69	5.0%	95.00	2.50	401.94	STD SHC	292	1.31				YES	10-FT
			391.99	32.80	5.0%	393.63	5.0%	95.00	2.50	400.88	STD SHC	293	0.62	<u> </u>	<u> </u>	-	YES	10-FT
293	411.50	401.50								399.38	STD SHC	294	0.62		<u> </u>	<u> </u>	YES	10-FT
294	410.00	400.00	390.94	32.80	5.0%	392.58	5.0%	86.00	2.50							-	YES	10-FT
295	408.50	398.50	389.91	32.80	5.0%	391.55	5.0%	83.00	2.50	398.20	STD SHC	295	0.30				<del> </del>	-
296	407.00	397.00	388.86	32.80	4.0%	390.17	4.0%	83.00	2.50	395.99	STD SHC	296	1.01			<del> </del>	YES	10-F7
297	406.25	396.25	388.10	34.30	4.0%	389.47	4.0%	83.00	2.50	395.29	STD SHC	297	0.96				YES	10-F7
298	403.50	393.50	386.64	48.40	2.5%	387.85	2.5%	90.50	2.50	392.61	STD SHC	298	0.89		<del> </del>		YES	10-F
299	401.50	391.50	385.06	18.60	3.0%	385.62	3.0%	90.80	2.50	390.84	STD SHC	299	0.66		<b> </b>	-	YES	10-F7
300	396.50	386.50	383.93	18.60	2.0%	384.30	2.0%	90.50	2.50	388.61	STD SHC	300	-2.11		<del> </del>		NO	10-F
301	387.00	377.00	368,35	20.80	5.0%	369.39	5.0%	88.00	2.50	376.29	STD SHC	301	0.71				YES	10-F
302	383.25	373.25	368.73	10.00	2.0%	368.93	2.0%	81.50	2.50	373.06	STD SHC	302	0.19				YES	10-F
303	388.00	378.00	368.30	10.80	5.0%	368.84	5.0%	81.50	2.50	375.42	DROP TYPE A	303	2.58	370.89	2.0%	371.10	YES	10-F
304	397.00	387.00	384.10	10.80	2.0%	384.32	1.0%	81.50	2.50	387.63	STD SHC	304	-0.63				NO	10-F
305	403.75	393.75	385.38	10.80	4.0%	385.81	4.0%	117,00	2.50	392.99	STD SHC	305	0.76				YES	10-F
306	406.75	396.75	389.24	18.80	4.0%	389.99	4.0%	84.80	2.50	395.88	STD SHC	306	0.87				YES	10-F
307	409.00	399.00	390.28	18.80	5.0%	391.22	5.0%	84.80	2.50	397.96	STD SHC	307	1.04				YES	10-F
308	410.50	400.50	391.32	18.80	5.0%	392.26	5.0%	84.80	2.50	399.00	STD SHC	308	1.50				YES	10-F
309	412.25	402.25	392.55	18.80	5.0%	393.49	5.0%	84.80	2.50	400.23	STD SHC	309	2.02				YES	10-F
310	414.00	404.00	393.94	16.90	5.0%	394.79	5.0%	84.80	2.50	401.53	STD SHC	310	2.47				YES	10-F
311	414.25	404.25	395.06	22.50	5.0%	396.19	5.0%	84.30	2.50	402.90	STD SHC	311	1.35			1	YES	10-F
312	422.00	412.00	396.63	22.00	5.0%	397.73	5.0%	87.80	2.50	404.62	DROP TYPE A	312	7.38	404.01	2.0%	404.45	YES	10-F
313	424.00	414.00	406.62	20.30	4.0%	407.43	4.0%	84.30	2.50	413.30	STD SHC	313	0.70		1		YES	10-F
	426.00	416.00	408.65	21.30	3.5%	409.40	3.5%	84.30	2.50	414.85	STD SHC	314	1.15				YES	10-F
31/	420.00			16.50	3.5%	411.26	3.5%	84.50	2.50	416.72	STD SHC	315	1.04				YES	10-F
314	427 7F	11775			1:176	. +++1.∠U	3,370	04.00	4.00	710.74	3103110		1.04			1	1 120	1 .02
314 315 316	427.75 429.75	417.75	410.68	22.00	4.0%	412.97	4.0%	84.50	2.50	418.85	STD SHC	316	0.90	<u> </u>			YES	10-F

PROFESSIONAL CERTIFICATION
I, BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017

THE FOLLOWING STATES REQUIRE NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE. IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AND DELAWARE CALL - 811

(WV 1-800-245-4848) (PA 1-800-242-1776) (DC 1-800-257-7777) (VA 1-800-552-7001) (MD 1-800-257-7777) (DE 1-800-282-8555)

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Phone: (410) 821-7987
www.BohlerEngineering.com



	DES: J.A.					PUBLIC		
	DRN: R.L.B.					STRUCT	URE SCH	EDULES
	CHK: B.R.R.							
SSS CREATED						PARCEL NO.	N/	/A
National Section 1	DATE: 4/13/16	REV.	DATE	DESCRIPTION	BY	600' SCALE MAP NO.	17	BLOCK NO. 5

ESTATES AT PATAPSCO PARK ROGERS AVENUE

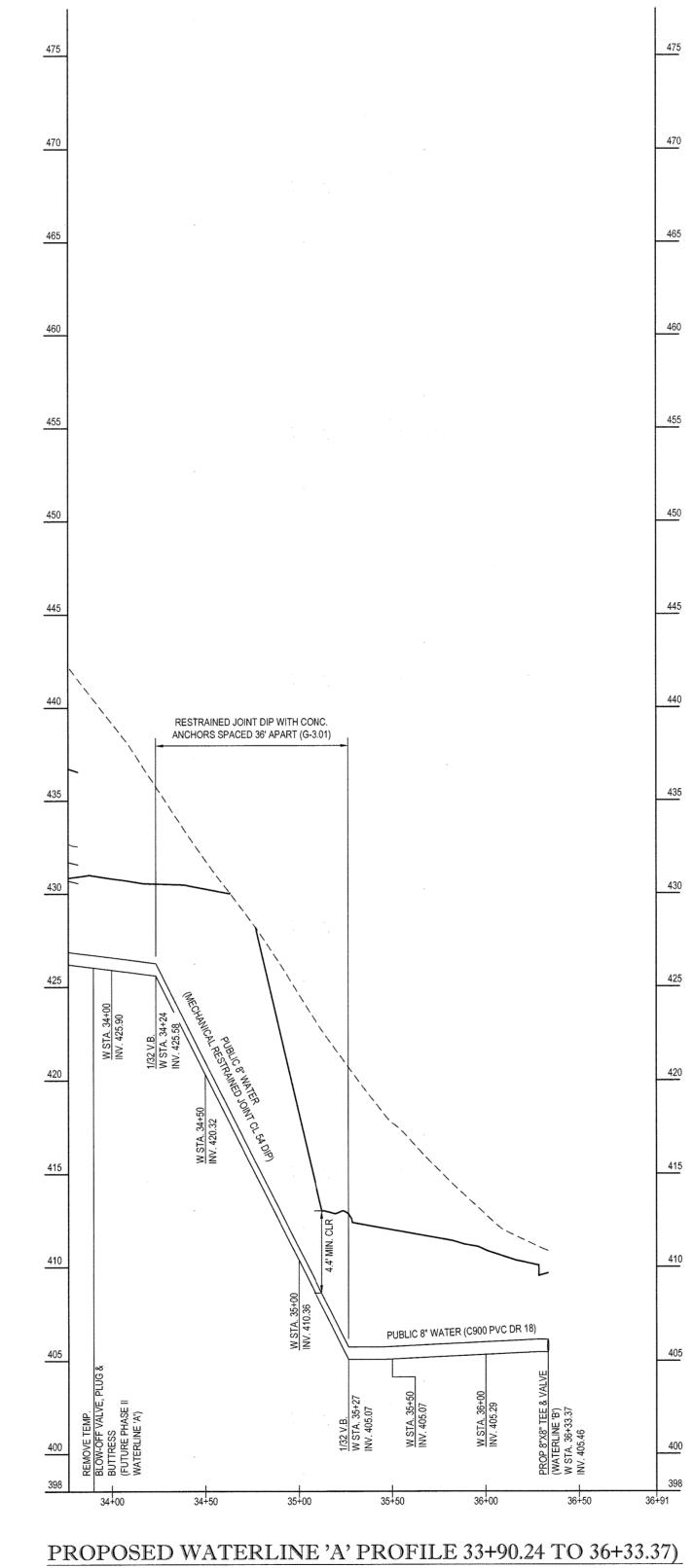
ROGERS AVENUE
BUILDABLE LOTS 253 - 317 (W&S)
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
CONTRACT NO.: 14-4967-D

SCALE

AS
SHOWN

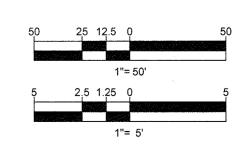
SHEET

8 OF 1<del>4</del>-



SCALE: 1"=50' HORZ. 1"=5' VERT

PROFESSIONAL CERTIFICATION
I, BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017





DEPARTMENT OF PLANNING & ZONING DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



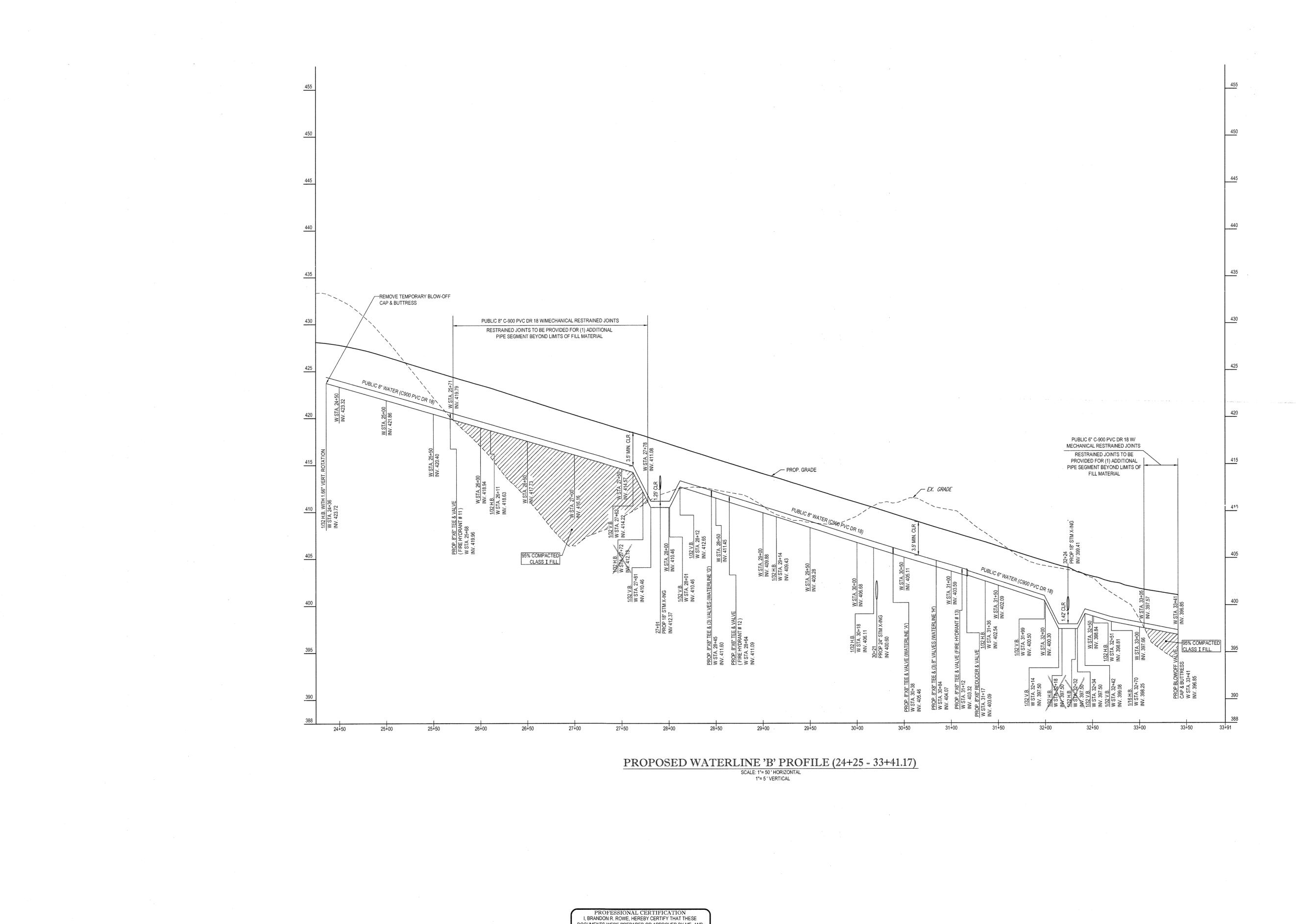
BRANG WE
PRO ESSIONAL ENGINEER  O MAR THAGLINE NO TORRE

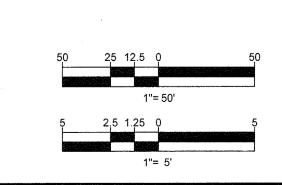
NAME OF TAXABLE	250 14					PHASE III	
A CONTRACTOR OF THE CONTRACTOR	DES: J.A.			·		PUBLIC WATER PROFILES	
	DRN: R.L.B.						
A CONTRACTOR		-					
	CHK: B.R.R.						
CONSTRUCTOR						PARCEL NO. N/A	
	DATE: 4/13/16	REV.	DATE	DESCRIPTION	BY	600' SCALE MAP NO. <u>17</u> BLOCK NO. <u>5</u>	

ESTATES	AT PATAPSCO PARK
	ROGERS AVENUE

BUILDABLE LOTS 253 - 317 (W&S) 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO.: 14-4967-D

SCALE AS SHOWN SHEET 9 OF 14







PROFESSIONAL CERTIFICATION
I, BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

BOHLER
ENGINEERING

901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
www.BohlerEngineering.com

5.12.16

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

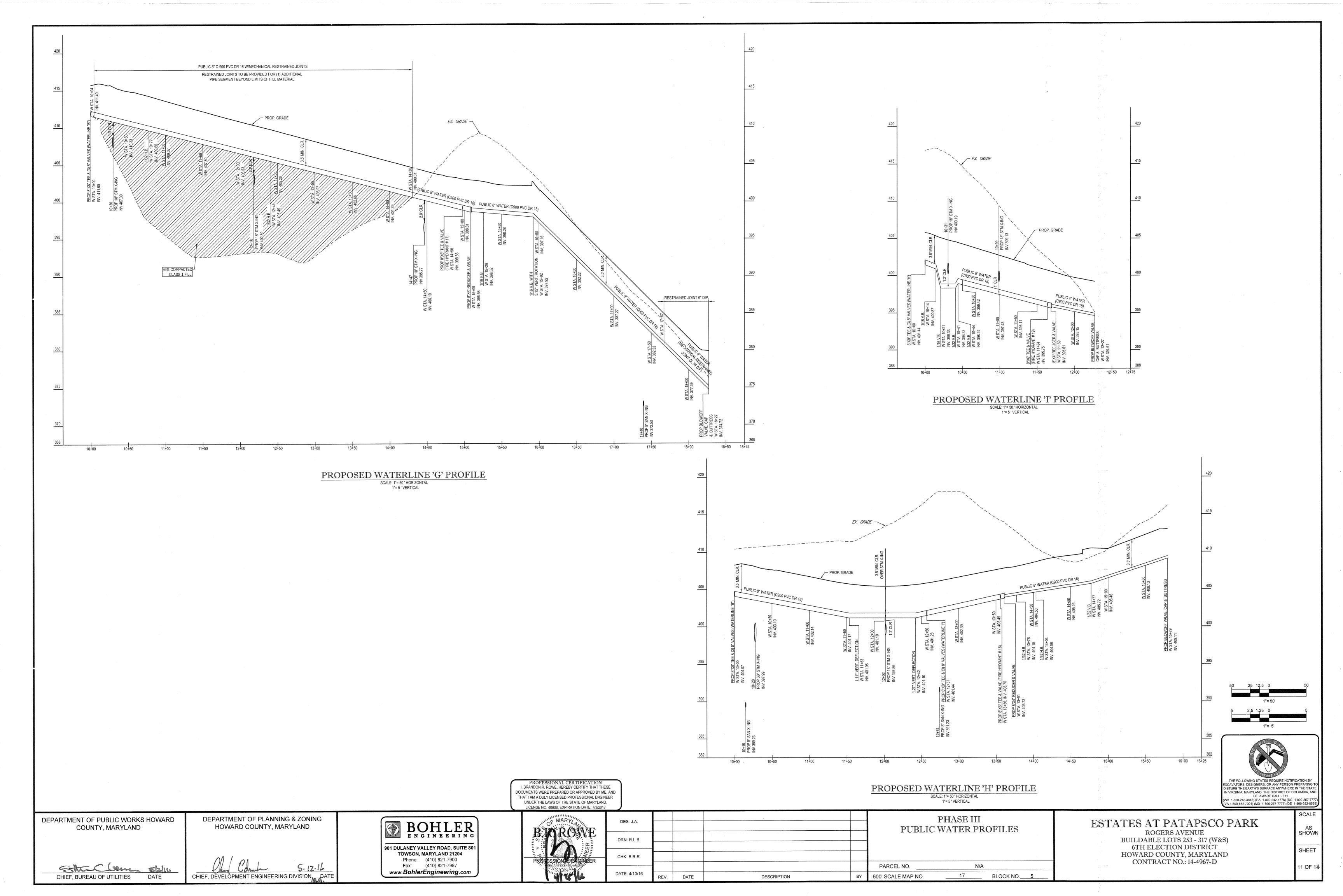


					D.	HASE III		
DES: J.A.					PUBLIC W			
DRN: R.L.B.	·					AILKI		
CHK: B.R.R.								
					PARCEL NO.	N/.	'A	
DATE: 4/13/16	REV.	DATE	DESCRIPTION.	BY	600' SCALE MAP NO.	17	BLOCK NO. 5	

ESTATES AT PATAPSCO PARK ROGERS AVENUE

ROGERS AVENUE
BUILDABLE LOTS 253 - 317 (W&S)
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
CONTRACT NO.: 14-4967-D

AS SHOWN SHEET 10 OF 14



### WATER FITTING CHART WATER MAIN CL NORTHING FITTING EASTING STATION N 598007.38 E 1363410.38 33+90.24 TEMP. BLOW-OFF CAP & BUTTRESS WATERLINE - 'A' 34+23.57 N 597910.58 1/32 V.B. E 1363224.25 WATERLINE - 'A' N 597958.09 35+26.55 1/32 V.B. E 1363315.61 WATERLINE - 'A' N 598007.38 E 1363410.38 36+33.37 PROP 8"X8" TEE & VALVE (WATERLINE 'B') WATERLINE - 'A'

WATER MAIN CL STATION	FITTING	NORTHING EASTING
24+26.24 WATERLINE - 'B'	1/32 H.B. WITH 0.72° VERT. ROTATION	N 597410.80 E 1363438.43
24+31.22 WATERLINE - 'B'	AIR RELEASE VALVE & BOX	N 597415.52 E 1363440.02
24+36.20 WATERLINE - 'B'	1/32 H.B. WITH 1.66° VERT, ROTATION	N 597420.24 E 1363441.60
25+67.96 WATERLINE - 'B'	8"X6" TEE & VALVE (FIRE HYDRANT #11)	N 597548.72 E 1363470.80
26+10.62 WATERLINE - 'B'	1/32 H.B.	N 597590.32 E 1363480.26
27+62.00 WATERLINE - 'B'	1/32 V.B.	N 597741.69 E 1363480.96
27+72.49 WATERLINE - 'B'	1/32 H.B.	N 597752.19 E 1363481.01
27+80.90 WATERLINE - 'B'	1/32 V.B.	N 597760.45 E 1363479.41
28+00.90 WATERLINE - 'B'	1/32 V.B.	N 597780.08 E 1363475.60
28+11.92 WATERLINE - 'B'	1/32 V.B.	N 597790.90 E 1363473.50
28+45.29 WATERLINE - 'B'	PROP 8"X8" TEE & (3) VALVES (WATERLINE 'G')	N 597823.65 E 1363467.14
28+64.27 WATERLINE - 'B'	8"X6" TEE & VALVE (FIRE HYDRANT #12)	N 597842.29 E 1363463.52
29+14.20 WATERLINE - 'B'	1/32 H.B.	N 597891.30 E 1363454.01
30+17.68 WATERLINE - 'B'	1/32 H.B.	N 597989.00 E 1363419.93
30+38.39 WATERLINE - 'B'	8"X8" TEE & VALVE (WATERLINE 'A')	N 598007.38 E 1363410.38
30+84.15 WATERLINE - 'B'	8"X8" TEE & (3) VALVES (WATERLINE 'H')	N 598047.97 E 1363389.26
31+11.54 WATERLINE - 'B'	8"X6" TEE & VALVE (FIRE HYDRANT #13)	N 598072.28 E 1363376.62
31+16.54 WATERLINE - 'B'	PROP 8"X6" REDUCER & VALVE	N 598076.72 E 1363374.31
31+36.18 WATERLINE - 'B'	1/32 H.B.	N 598094.14 E 1363365.25
31+98.96 WATERLINE - 'B'	1/32 V.B.	N 598143.88 E 1363326.95
32+14.08 WATERLINE - 'B'	1/32 V.B.	N 598155.86 E 1363317.72

1/32 H.B.

1/32 H.B.

1/32 V.B.

1/32 V.B.

1/32 H.B.

1/16 H.B.

BLOWOFF VALVE, CAP & BUTTRESS

WATERLINE - 'B'

WATERLINE - 'B'

32+34.08

WATERLINE - 'B'

WATERLINE - 'B'

32+51.27 WATERLINE - 'B'

WATERLINE - 'B'

WATERLINE - 'B'

N 598158.74

E 1363315.51 N 598168.28

E 1363305.03 N 598169.45

E 1363303.17 N 598173.70

E 1363296.42

N 598178.61

E 1363288.63 N 598185.71

E 1363271.14 N 598185.22

E 1363200.16

WAIER	R FITTING CH	IAKI
WATER MAIN CL STATION	FITTING	NORTHING EASTING
10+00.00 WATERLINE - 'G'	8"X8" TEE & 8" VALVE (WATERLINE "B")	N 597823.65 E 1363467.14
10+76.75 WATERLINE - 'G'	1/32 H.B.	N 597837.89 E 1363542.56
12+41.18 WATERLINE - 'G'	1/32 H.B.	N 597892.72 E 1363697.58
14+97.99 WATERLINE - 'G'	NULL STRUCTURE	N 598011.22 E 1363925.42
15+08.72 WATERLINE - 'G'	8"X6" REDUCER & VALVE	N 598016.17 E 1363934.94
15+25.69 WATERLINE - 'G'	1/16 H.B. WITH 0.81° VERT. ROTATION	N 598024.00 E 1363949.99
15+92.33 WATERLINE - 'G'	1/16 H.B. WITH 5.15° VERT. ROTATION	N 598029.78 E 1364016.38
18+26.96 WATERLINE - 'G'	BLOWOFF VALVE, PLUG & BUTTRESS	N 598138.05 E 1364224.54

WATER FITTING CHART								
WATER MAIN CL STATION	FITTING	NORTHING EASTING						
10+00.00 WATERLINE - 'H'	8"X8" TEE & (3) VALVES (WATERLINE "B")	N 598047.97 E 1363389.26						
12+41.97 WATERLINE - 'H'	1/32 V.B.	N 598159.63 E 1363603.94						
12+57.23 WATERLINE - 'H'	8"X8" TEE & (3) VALVES (WATERLINE "I")	N 598165.67 E 1363617.48						
13+55.89 WATERLINE - 'H'	8"X6" TEE & VALVE (FIRE HYDRANT #18)	N 598212.19 E 1363705.00						
13+60.91 WATERLINE - 'H'	PROP 8"X4" REDUCER	N 598214.50 E 1363709.45						
13+77.53 WATERLINE - 'H'	1/32 H.B.	N 598222.17 E 1363724.20						
14+03.54 WATERLINE - 'H'	1/32 H.B.	N 598238.32 E 1363744.60						
14+77.19 WATERLINE - 'H'	1/32" V.B.	N 598272.31 E 1363809.93						
15+79.43 WATERLINE - 'H'	BLOWOFF VALVE, CAP & BUTTRESS	N 598319.51 E 1363900.62						

WATER FITTING CHART						
WATER MAIN CL STATION	FITTING	NORTHING EASTING N 598166.67 E 1363617.48				
10+00.00 WATERLINE - 'I'	8"X8" TEE & (3) VALVES (WATERLINE 'H')					
10+14.43 WATERLINE - 'I'	1/16 V.B.	N 598179.47 E 1363610.82 N 598185.07 E 1363607.91				
10+20.75 WATERLINE - 'I'	1/16 V.B.					
10+40.75 WATERLINE - 'I'	1/32 H.B.	N 598202.82 E 1363598.68				
10+44.09 WATERLINE - 'I'	1/32 H.B.	N 598205.78 E 1363597.14				
11+63.60 WATERLINE - 'I'	8"X6" TEE & VALVE (FIRE HYDRANT #19)	N 598311.83 E 1363542.02				
11+68.63 WATERLINE - 'I'	8"X4" REDUCER & VALVE	N 598316.29 E 1363539.70				
12+26.91 WATERLINE - 'I'	BLOWOFF VALVE, CAP & BUTTRESS	N 598367.99 E 1363512.81				

PROFESSIONAL CERTIFICATION
I, BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

$\mathbf{B}$	_			ER
901 DULANEY				
TOWSO	N, MA	RYLAN	ID 212	04
Phone	e: (4	10) 82	1-7900	
Fax:	(4	10) 82	1-7987	
www.Boh	lerEr	ngine	ering	.com

AND A STATE OF THE
222224444
MARY
D. D. D. MAL
D. O. A. T.
S S S S S S S S S S S S S S S S S S S
H. H
PROF SSIONAL ENGINEER
SSIGNA ASSISTANT OF THE PROPERTY OF THE PROPER
SSIGNAL

DES: J.A.					PHASE III WATER FITTING CHARTS		
DRN: R.L.B.	-						
CHK: B.R.R.							
					PARCEL NO. N/A		
DÀTE: 4/13/16	REV.	DATE	DESCRIPTION	BY	600' SCALE MAP NO. <u>17</u> BLOCK NO. <u>5</u>		

THE FOLLOWING STATES REQUIRE NOTIFICATION BY EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE. IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AND DELAWARE CALL - 811

(WV 1-800-245-4848) (PA 1-800-242-1776) (DC 1-800-257-7777) (VA 1-800-552-7001) (MD 1-800-257-7777) (DE 1-800-282-8555)

SCALE

ESTATES AT PATAPSCO PARK ROGERS AVENUE BUILDABLE LOTS 253 - 317 (W&S)

ROGERS AVENUE
BUILDABLE LOTS 253 - 317 (W&S)
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
CONTRACT NO.: 14-4967-D

SHEET
12 OF 14

### 20.0 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Using vegetation as cover for barren soil to protect it from forces that cause erosion

PURPOSE

Vegetative stabilization specifications are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and run-off to downstream areas, and CONDITIONS WHERE PRACTICE APPLIES

This practice shall be used on denuded areas as specified on the plans and may be used on highly erodible or critically eroding areas. This specification is divided into Temporary Seeding to quickly establish vegetative cover for short duration (up to one year), and Permanent Seeding, for long term vegetative cover. Examples of applicable areas for Temporary Seeding are temporary Soil Stockpiles, cleared areas being left idle between construction phases, earth dikes, etc. and for Permanent Seeding are lawns, dams, cut and fill slopes and other areas of final grade, former stockpile and staging areas,

EFFECTS OF WATER QUALITY AND QUANTITY

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of run-off, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Vegetation over time, will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth. Vegetation will help reduce the movement of sediment, nutrients and other chemicals carried by run-off to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone. Sediment control devices must retain in place during grading, seeded preparation, seeding, mulching and vegetative establishment to prevent large quantities of sediment and associated chemicals and nutrients from washing into surface

### SECTION 1 - VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. Site Preparation

i. Install erosion and sediment control structures (either temporary or permanent) such as diversion, grade stabilization structures, berms, waterways, or sediment control basins.

ii. Perform all grading operations at right angles to the slope. Final grading and shaping is not

iii. Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed area over 5 acres

B. Soil Amendments (Fertilizer and Lime Specifications)

i. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis maybe performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposed may also be used for chemical analyses.

ii. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers shall all be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the

iii. Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98-100% will pass through a #20 mesh sieve. iv. Incorporate lime and fertilizer into the top 3-5" of soil by disking or other suitable

### C. Seedbed Preparation

i. Temporary Seeding a. Seedbed preparation shall consist of loosening soil to a depth of 3" to 5" 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 should not be rolled or dragged smooth, but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the contour of the slope. b. Apply fertilizer and lime as prescribed on the plane. c. In corporate lime and fertilizer into the top 3-5" of soil by disking or other suitable means.

### ii. Permanent Seeding

a. Minimum soil conditions required for permanent vegetative establishment:

1. Soil pH shall be between 6.0 and 7.0. 2. Soluble salts shall be less than 500 parts per million (ppm)

3. The soil shall contain less than 40% clay, but enough fine grained material (>30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lovegrass or serecia lespedezas is to be planted, then a sandy soil (<30% silt plus clay) would be acceptable.

4. Soil shall contain 1.5% minimum organic matter by weight. 5. Soil must contain sufficient pore space to permit adequate root penetration. 6. If these conditions cannot be met by soils on site, adding topsoil is required in

accordance with Section 21 Standard and Specification for Topsoil.

b. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3-5" to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.

c. Apply soil amendments as per soil test or as included on the plans.

d. Mix soil amendments into the top 3-5" ot topsoil by disking or other suitable means. Lawn areas area for seed and application. Where site conditions will not permit normal seedbed preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slopoe. The top 1-3" of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas.

### D. Seed Specifications

i. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job. Note: Seed tags shall be made available to the inspector to verify type and rate of seed used

ii. Inoculant - The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared specially for the species. Inoculants shall not be used later than the date indicated in the container. Add fresh inoculant as directed on package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperature above 75°-80°F. can weaken bacteria amd make the inoculant less effective.

i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or dropo seeded, or a cultipacker seeder

a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen; maximum of 100 lbs. per acre total of soluble nitrogen: P205 (phosphorus); 200 lbs/ac; K20 (potassium); 200 lbs/ac.

b. 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.

c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without

ii. Dry Seeding: This includes use of conventional drop or broadcast spreaders. a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 265 or 26. The seeded area shall then be roiled with a weighted roller to provide good seed to soil contact. b. Where practical, seed should be applied in two directions perpendicular

to each other. Apply half the seeding rate in each direction. iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.

a. Cultipacking 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.

b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half

the seed rate in each direction. F. Mulch Specifications (In order of preference)

i. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonable bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.

ii. Wood Cellulose Fiber Mulch (WCFM)

a. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical

b. WCFM shall 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.

c. WCFM, including dye, shall contain no germination or growth inhibiting factors. d. WCFM materials shall 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 shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedings

E. WCFM material shall contain no elements or compounds at concentration levels that will be phytol-toxic

F. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm., diameter approximately 1 mm., pH range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum. Note: Only sterile straw mulch should be used in areas where one species of grass is desired,

G. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.

i. If grading is completed outside of the seeding season. mulch along shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.

ii. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons/acre. Mulch shall be applied to a uniform loose depth of between 1" and 2". Mulch applied shall achieve a uniform distribution and depth so that the soil surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons/acre. iii. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 lbs. per acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons of water.

H. Securing Straw Mulch (Mulch Anchoring): Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion

i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (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 be used on the contour

ii. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 lbs./acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per

iii. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and crest of banks The remainder of area should appear uniform after binder application. Synthetic binders- such as Acrylic DLR (Agro-Tack), DCA-70 Perroset, Terra Tax II. Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to

iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' wide and 300 to 3,000 feet long.

I. Incremental Stabilization - Cut Slopes

i. All cuts slopes shall be dressed, prepared, seeded and mulched as the work progresses. Slopes shall be excavated and stabilized in equal increments not to exceed 15'

ii. Construction sequence (Refer to Figure 3 below): a. Excavate and stabilize all temporary swales, side ditches, or

berms that will be used to convey runoff from the excavation.

b. Perform Phase 1 excavation, dress, and stabilize. c. Perform Phase 2 excavation, dress, and stabilize. Overseed Phase 1 as necessary

d. Perform final phase excavation, dress, and stabilize. Overseed previously seeded areas as necessary. Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation of completing out of the seeding season will necessitate the application of temporary stabilization.

J. Incremental Stabilization of Embankments - Fill Slopes i. Embankments shall be constructed in lifts as prescribed on the

iii. At the end of each day, temporary berms and pipe slope drains

should be constructed along the top edge of the embankment to

ii. Slopes shall be stabilized immediately when the vertical height of the multiple lifts reaches 15", or when the grading operation ceases as prescribed in the plans. a sediment trapping device.

inrercept surface runoff and convey it down the slope in a non-erosive manner to iv. Construction sequence: Refer to Figure 4 (below).

a Excavate and stabilize all temporary swales, side ditches, or berms that will be used to divert runoff around the fill. Construct slopr silt fence on low side of fill as shown in Figure 5, unless other methods shown on the plans address this area.

b. Place Phase 1 embankment, dress, and stabilize.

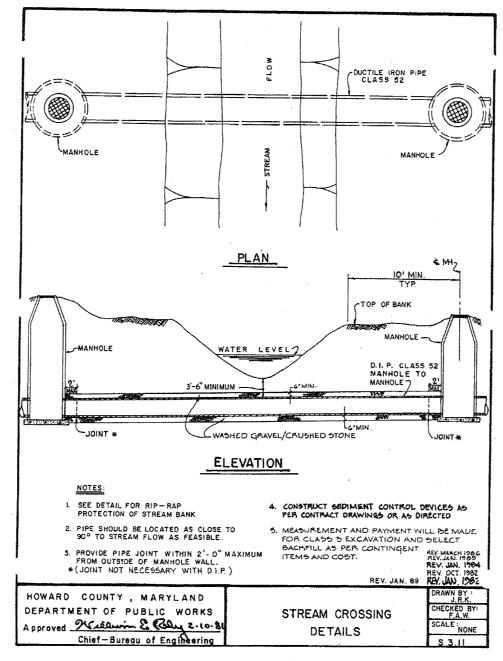
c. Place Phase 2 embankment, dress, and stabilize

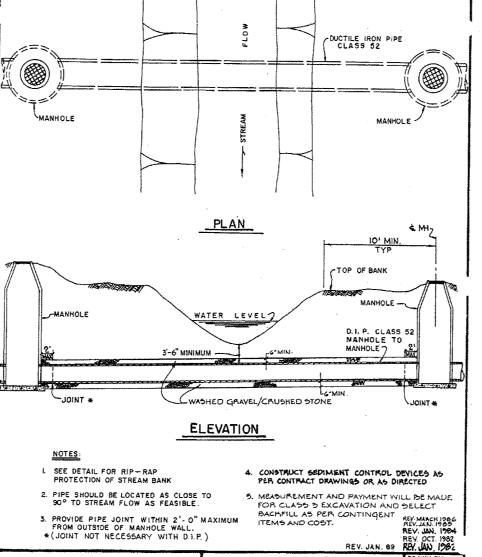
d. Place final phase embankment, dress, and stabilize. Overseed previously seeded areas as necessary. Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season

will necessitate the application of temporary stabilization.

# TOP OF BANK MANHOLE -3'-6" MINIMUM -\* TAIOL WASHED GRAVEL/CRUSHED STONE JOINT # ELEVATION NOTES: I. SEE DETAIL FOR RIP-RAP 4. CONSTRUCT SEPIMENT CONTROL DEVICES AS PER CONTRACT DRAWINGS OR AS DIRECTED 5. MEASUREMENT AND PAYMENT WILL BE MAI FOR CLASS & EXCAVATION AND SELECT 3. PROVIDE PIPE JOINT WITHIN 2'-0" MAXIMUM FROM OUTSIDE OF MANHOLE WALL. \*(JOINT NOT NECESSARY WITH D.I.P.) BACKFILL AS PER CONTINGENT HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS STREAM CROSSING Approved Wielum & Roly 2.10. DETAILS

# Chief-Bureau of Engin





### **MGWC 4.2: UTILITY CROSSING** Temporary in-stream construction DESCRIPTION The work should consist of installing erosion control devices in and adjacent to the construction of utility crossings. NSTALLATION 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. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control) The proposed construction sequence is as follows (refer to The contractor should insure that a continuous perimeter control barrier is in place to minimize the amount of pollutants entering the flow. A diversion pipe as shown in MGWC 1.4: Diversion Pipe or other measure should be installed and sandbag or stone barriers as shown in MGWC 1.5: Sandbag/Stone Diversion should be constructed according to specifications to divert the streamflow. Excavated topsoil and subsoil should be kept separate, placed on the upland side of the excavation, and replaced All construction should take place during stream low flows. The length of construction time should be limited to a maximum of 5 consecutive days for each crossing. All utility crossings should be placed a minimum of 3 feet (1 meter) beneath the stream bed unless an alternative section is specifically approved by the WMA. For instances where a 3-foot cover is not viable, two alternate stabilization options are given in the Detail 4.2. A low flow channel shall be constructed through all riprap placements across the stream bed. The stream should be diverted by an approved temporary stream diversion, the construction area should be dewatered, and any disturbed banks should be stabilized. The contractor may elect to construct the utility crossing in two stages. In this case, a WMA approved flow barrier may be constructed to keep the construction Once the crossing is completed, the diversion should be removed from upstream to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal. MARYLAND DEPARTMENT OF THE ENVIRONMENT STREAM CROSSING WATERWAY CONSTRUCTION GUIDELINES PAGE 4.2 - 1

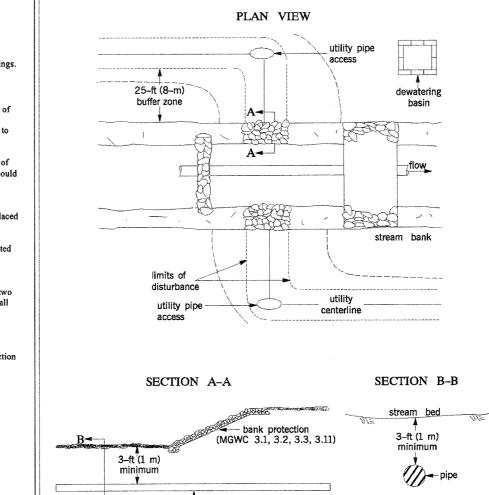
DESCRIPTION

stream construction sites.

IMPLEMENTATION SEQUENCE

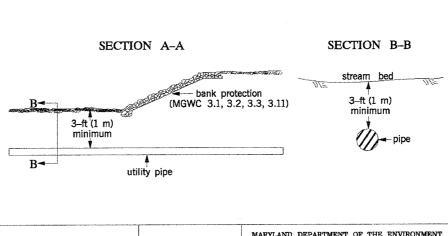
completed in the following sequence (refer to Detail 1.2):

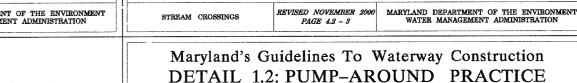
local utilities a minimum of 48 hours before starting construction



Maryland's Guidelines To Waterway Construction

DETAIL 4.2(a): UTILITY CROSSING





dewatering device

sediment dike

pumps should discharge

dissipator made of rip rap

onto a stable velocity

or sandbags

15 to 24-in

riprap

(38 to 61–cm) →

Maryland's Guidelines To Waterway Construction

DETAIL 4.2(b): UTILITY CROSSING

SECTION VIEW:

ALTERNATE OPTION

- 6 ft (2 m)

SECTION VIEW:

ALTERNATE OPTION 2

PLAN VIEW

discharge hoses

dewatering pump

- intake hose

---- work area

length not to exceed that which can be

clean water dike

encasement

low flow channel

low flow channel

18 in (46 cm)

6 in (15 cm)

diversion pumps

sump-hole

18 in (46 cm)

the channel below the downstream sandbag dike. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary

All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross- sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans

flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work

2. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed

3. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.

4. After construction, all disturbed areas should be regraded and revegetated as per the planting plan

SECTION A-A impervious sheeting

MGWC 2.8: Brush Mattresses

MARYLAND DEPARTMENT OF THE ENVIRONMENT

WATERWAY CONSTRUCTION GUIDELINE

REVISED NOVEMBER 200

MGWC 1.2: PUMP-AROUND PRACTICE

emporary measure for dewatering in

channel construction sites

The work should consist of installing a temporary pump around and supporting measures to divert flow around in-

Sediment control measures, pump-around practices, and associated channel and bank construction should be

Construction activities including the installation of erosion and sediment control measures should not begin

in the field prior to construction. The contractor is responsible for any damage to existing utilities that may

result from construction and should repair the damage at his/her own expense to the county's or utility

at least 5 days before beginning construction. Additionally, the contractor should inform the local

until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked

The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector

environmental protection and resource management inspection and enforcement division and the provider of

The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the

requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior

to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's

hould not be removed within the limit of disturbance without approval from the WMA or local authority.

staging areas and flag all trees within the limit of disturbance which will be removed for construction access.

Construction should not begin until all sediment and erosion control measures have been installed and approved

Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should

begin work at the upstream section and proceed downstream beginning with the establishment of stabilized

authority. The contractor should only begin work in an area which can be completed by the end of the day

the pump around removed from the channel. Work should not be conducted in the channel during rain event

including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and

Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans,

and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity

construction must be followed unless the contractor gets written approval for deviations from the WMA or local

by the engineer and the sediment control inspector. The contractor should stay within the limits of the

disturbance as shown on the plans and minimize disturbance within the work area whenever possible.

construction entrances. In some cases, work may begin downstream if appropriate. The sequence

county project manager, and the engineer to review limits of disturbance, erosion and sediment control

Woody vegetative system for bank stabilization

DESCRIPTION

dissipater made of riprap or sandbags.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

Brush mattresses are formed from live branches which are wired together to create an erosion resistant mat. This mat is then secured to the bank by live and/or dead stakes and partially covered with fill soil to initiate growth of the

EFFECTIVE USES & LIMITATIONS Brush mattresses provide bank protection soon after establishment. They are generally resistant to wave and current

action and function to: capture sediment and rebuild streambanks facilitate the colonization of native riparian vegetation; and provide long-term durability and erosion control, especially when used on Rosgen stream types B3, B4, B5, B6,

conditions whenever possible with the following guidelines:

onservation Service is presented in MGWC 2.4: Live Stakes.

C1, C2, C3, C4, C5, C6, DA, E3, E4, E5, and E6. Brush mattresses should be limited to use on:

sites having only low to moderate water level fluctuations and slope gradients not exceeding 2H:1V, streams with low to moderate suspended sediment loads since high loads may precipitate the burial of these bioengineering systems and complicate future planting efforts at the site, and native fill soils which contain enough fine material to allow the live branches to root and grow readily; key

trenches backfilled with topsoil may be required on rocky slopes Additionally, this measure should be initiated in conjunction with a revegetation strategy since brush mattresses make it more difficult to propagate vegetative plantings once the mats become established

MATERIAL SPECIFICATIONS When choosing and preparing woody material for brush mattresses, the following guidelines should be followed: Live brancher should be cut from fresh, green, healthy, dormant parent plants which are adapted to the site

1. Woody branches up to 2.5 inches (6 centimeters) in diameter and 5 to 10 feet (1 to 3 meters) in length can 2. Commonly used woody plants for this measure include willow, poplar, and alder since they are versatile and have high growth rates with shrubby habits, fibrous root systems, and high transpiration rates,

3. A partial listing of woody plants recommended by the United States Department of Agriculture's Soil

Live branch cuttings should be kept covered and moist at all times and should be placed in cold storage if more than a few hours elapse before installation

MARYLAND DEPARTMENT OF THE ENVIRONMENT SLOPE PROTECTION AND STABILIZATION TECHNIQUE WATERWAY CONSTRUCTION GUIDELINE REVISED NOVEMBER 2000 PAGE 2.8 - 1

MGWC 1.2: Pump-Around Practice Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into

and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).

0. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment

area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around

work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.

TEMPORARY INSTREAM CONSTRUCTION MEASURE

MARYLAND DEPARTMENT OF THE ENVIRONMEN WATERWAY CONSTRUCTION GUIDELINE PAGE 1.2 - 2

MGWC 2.8: Brush Mattresses

Approximate Cost (\$1999)

\$33.50 per square ft

INSTALLATION GUIDELINES

pulling the mattress firmly to ground

Brush mattresses should be installed as follows (refer to Detail 2.8):

Live branches should be oriented in crisscross layers perpendicularly to the flow of water in slight manmade depressions along the embankment. The butt ends should alternate to provide a uniform mat thickness of at least 12 inches (0.3 meters) and a minimum percentage of air voids. Approximately 20 to 50 branches should be used per running meter provided their lengths are the same as

should be utilized with the branches in the lower layers overlapping those in the upper layers by at least 1 Once in position, the mattresses should be bound with wire and secured with 3-foot (0.9-meter) wooden stakes spaced at 2 to 3-foot (0.60 to 0.90-meter) intervals. The wire should be tied to notches in the stakes before they are driven into the ground; this allows for tension to develop in the wire when the stakes are driven, thereby

If the branches are not long enough to cover the entire slope from the toe to the top of slope, multiple layers

Upon being bound and secured to the embankment, the mattresses should be covered with alternating layers of soil and water until only a portion of the top layer of branches is exposed, but all butt ends must be covered The use of alternating applications of soil and water helps to insure a proper soil-branch interface to initiate

Finally, the toe of the embankment should be reinforced against undercutting with a rock toe and vegetative measure such as a live fascine. (Refer to MGWC 2.1: Riprap and Figure 2.1.)

Maryland's Guidelines To Waterway Construction **DETAIL 2.8: BRUSH MATTRESSES** min. 12-inch (30-cm) thickness live or dead stake -\_\_**\_\_**(0.6 - 0.9 m notched for wire or rope w/min. 3-ft (0.9-m) length PLAN VIEW DETAIL Adapted From USDA-SCS (1994) rock toe and live fascine to prevent undermining of brush based on site characteristics and to prevent failure due to scour SECTION VIEW

REVISED NOVEMBER 2000 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION stakes 3 (0.9 m) o.c. minimum toe trench depth below channel invert shall be designed

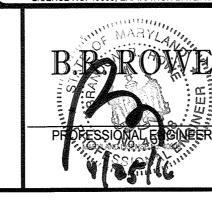
THE FOLLOWING STATES REQUIRE NOTIFICATION BY AVATORS, DESIGNERS, OR ANY PERSON PREPARING T TURB THE EARTH'S SURFACE ANYWHERE IN THE STATE IN VIRGINIA, MARYLAND, THE DISTRICT OF COLUMBIA, AN REVISED NOVEMBER 2000 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION 1-800-245-4848) (PA 1-800-242-1776) (DC 1-800-257-(1-800-552-7001) (MD 1-800-257-7777) (DE 1-800-282-855

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION.

901 DULANEY VALLEY ROAD, SUITE 801 **TOWSON, MARYLAND 21204** 



I. BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017 DES: J.A. DRN: R.L.B. CHK: B.R.R. DATE: 4/13/16 REV. DATE DESCRIPTION

PHASE III STREAM CROSSING DETAILS

PAGE 2.8 - 2

PARCEL NO. BLOCK NO.\_ 600' SCALE MAP NO.

MARYLAND DEPARTMENT OF THE ENVIRONMEN

WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000

ESTATES AT PATAPSCO PARK **ROGERS AVENUE** 

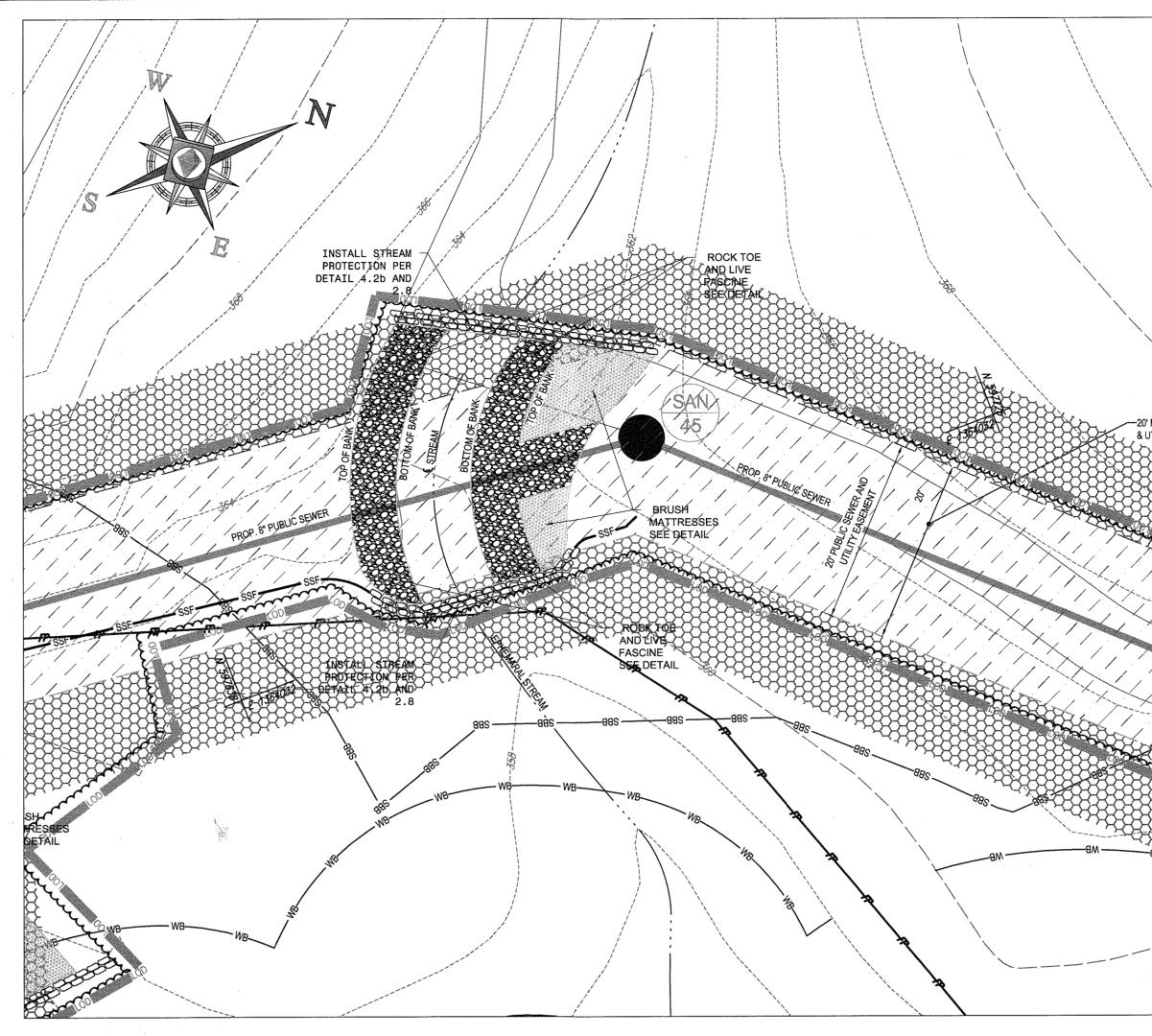
BUILDABLE LOTS 253 - 317 (W&S) 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND CONTRACT NO.: 14-4967-D

SHEET

13 OF 14

Stecker 5/2/16 CHIEF, BUREAU OF UTILITIES

Phone: (410) 821-7900 (410) 821-7987 www.BohlerEngineering.com



EXPLODED VIEW
SCALE: 1"=10"

## SEQUENCE OF CONSTRUCTION

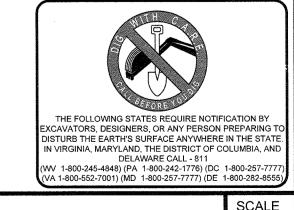
- ACTIVITIES WITHIN STREAM CHANNELS ARE PROHIBITED AS DETERMINED BY THIS
  CLASSIFICATION OF STREAM (COMAR 26.08.02.03): PATAPSCO RIVER AREA 02130900 IS A USE-I
  WATERWAY; IN-STREAM WORK MAY NOT BE CONDUCTED FROM MARCH 1 THROUGH JUNE 15
  INCLUSIVE, OF ANY YEAR. REFER TO MDE'S LETTER OF AUTHORIZATION PERTAINING TO THIS CROSSING FOR ADDITIONAL DETAILS AND INFORMATION.
- OBTAIN GRADING PERMIT.
- ONCE ALL PERMITS ARE IN HAND SCHEDULE MEETING IN THE FIELD WITH THE SEDIMENT CONTROL INSPECTOR. 1 DAY
- 4. INSTALL STABILIZED CONSTRUCTION ENTRANCE 1 DAY
- 5. INSTALL SILT FENCE AND OTHER EROSION AND SEDIMENT CONTROL MEASURES. 1 WEEK
- 6. INSTALL SUPER SILT FENCE PARALLEL TO THE STREAM BANKS AS SHOWN. 3 DAYS
- 7. INSTALL PUMP AROUND PRACTICE PER DETAIL MGWC 1.2. 2 DAYS
- 8. INSTALL 8" SEWER MAIN PIPE. CONSTRUCT ENOUGH FOR ONE DAY'S WORK, INCLUDING BACKFILL AND STABILIZING AREA DISTURBED. STABILIZE STREAM BOTTOM PER OPTION # 2 OF
- 9. STABILIZE SLOPES UP GRADIENT OF THE STREAM BOTTOM PROTECTION WITH BRUSH MATTRESSES PER DETAIL MGWC 2.8. 2 DAYS
- 10. SEED AND STABILIZE AREAS OUTSIDE OF THE STREAM BANKS PER "STANDARDS SPECIFICATIONS FOR VEGETATIVE STABILIZATION". - 2 DAYS
- 11. REMOVE TEMPORARY PUMP AROUND PRACTICE. 1 DAY
- ONCE SEDIMENT CONTROL INSPECTOR'S SATISFIED THAT THE DISTURBED AREAS HAVE BEEN STABILIZED REMOVE SEDIMENT CONTROL. 3 DAYS

PROFESSIONAL CERTIFICATION I, BRANDON R. ROWE, 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. 40808, EXPIRATION DATE: 7/3/2017

BOHLER ERING 901 DULANEY VALLEY ROAD, SUITE 801 TOWSON, MARYLAND 21204 Phone: (410) 821-7900 Fax: (410) 821-7987



)17									**************************************
	DES: J.A.	-				PHASE III STREAM CROSSING DETAILS			AMORPHISM
STATE OF THE STATE	DRN: R.L.B.								
POST OF THE PERSON	CHK: B.R.R.								
THE CASE						PARCEL NO.	N/A	1	
A POST NEWSCOOL	DATE: 4/13/16	REV.	DATE	DESCRIPTION	BY	600' SCALE MAP NO.	17	BLOCK NO	5



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

Stacken of the

CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

www.BohlerEngineering.com

ESTATES AT PATAPSCO PARK ROGERS AVENUE

BUILDABLE LOTS 253 - 317 (W&S) **6TH ELECTION DISTRICT** HOWARD COUNTY, MARYLAND CONTRACT NO.: 14-4967-D

SHEET 14 OF 14