ELKRIDGE CROSSING
LOTS 1-36, OPEN SPACE LOT 37
AND BULK PARCEL 'F'
FINAL WATER & SEWER PLAN
HOWARD COUNTY, MARYLAND
CONTRACT No. 14-4713-D

QUANTITIES

NAME OF UTILITY CONTRACTOR:

SURVEY AND DRAFTING DIVISION AS-BUILT DATE:

ITEMS	QUANTITIES ESTIMATED	AS-BUILT		
		QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
8" P.V.C. C900 SDR-18	650 LF	622 LF	.PVC	.JM Eagle
8"x 8" T.S & V.	1 EA.	.1 EA	M.J Tapping Sete Valve	.American Flow Control
8"x 8" TEE	2 EA.	.2 EA	Epoxy Coated	.Tyler Union
8" VALVE	3 EA.	.3 EA	Epoxy Coated	.American Flow Control
8" CAP & BUTTRESS	3 EA.	3 EA	. ——	.Tyler Union
[illegible]	[illegible]	.	.	.
8" 1/8 H.B.	2 EA.	.2 EA	. ——	. ——
8" H.D.C.	2 EA.	.2 EA	.PVC	Certainteed Pipe
8" 5° SWEEP	2 EA.	2EA	.PVC	.Multi Fittings
1 1/2" COPPER	340 LF	340 LF	.Type K	.Cambridge Lee
8" P.V.C. SEWER	634 LF	692 LF	.PVC	.JM Eagle
4" P.V.C. SEWER	400 LF	400 LF	.PVC	.JM Eagle
4' MANHOLES	6 EA.	.6 EA	.	.Prism Precast
TYPE B DROP	2 EA.	.2 EA	.	.Prism Precast
AIR RELEASE VALVE	1 EA.	.1 EA	.	Contractors Precast Corp.
Continuity Test Station	2 EA	.2 EA	Vault	Prism Precast
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HOWARD COUNTY BENCHMARKS

NO.	NORTHING	EASTING	ELEV.	DESCRIPTION
38A9	561,056.341	1,389,634.145	223.417	BRASS DISK ON CONC. MONUMENT IN GRASS PLOT ON SOUTHEAST SIDE OF U.S. RTE. #1 AND MONTGOMERY ROAD.
361B	562,553.293	1,390,967.941	166.939	BRASS DISC ON CONC. MONUMENT ON WEST SIDE OF RTE. #1 APPROXIMATELY 100' NORTH OF BONNIE VIEW LANE.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 308 IN VOLUME IV OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN SDP-06-078

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.

DEVELOPER'S SIGNATURE DATE

DEVELOPER'S NAME

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson 9/23/14

SOIL CONSERVATION DISTRICT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

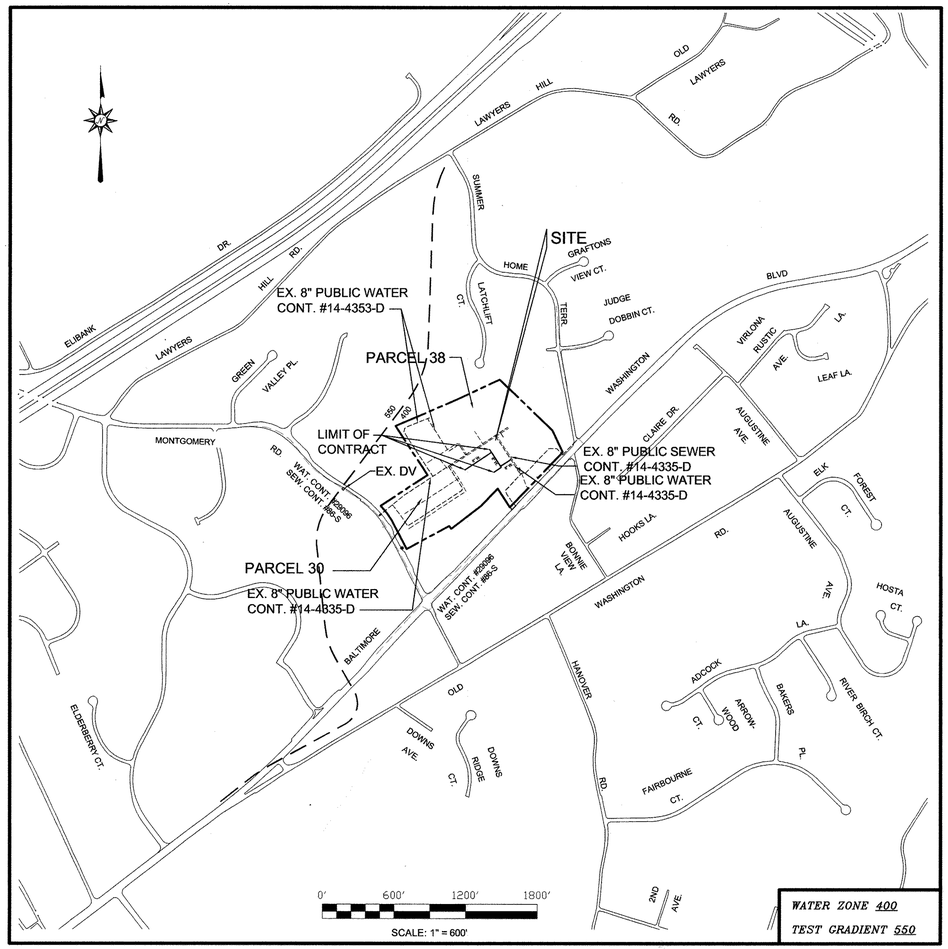
9/23/14

CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

Chad Edmondson 9.30.14

CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. DATE

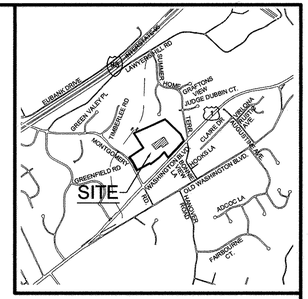


WATER ZONE 400

TEST GRADIENT 550

TYPE OF BUILDING	RESIDENTIAL
No. OF UNITS\PARCELS	36
No. OF WATER HOUSE CONNECTIONS	24
No. OF SEWER HOUSE CONNECTIONS	24
DRAINAGE AREA	PATAPSCO
TREATMENT PLANT	PATAPSCO

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 NUMBER 16597, EXPIRATION DATE: 08-15-2015



LOCATION MAP

SCALE: 1" = 2000'
ADC MAP: 4937 GRID D-7

GENERAL NOTES

1. 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 APRIL, 2004 BY MILDENBERG-BOENDER ASSOCIATES, INC.
3. HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD '83/'91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 38A9, NO. 38BA.
ALL VERTICAL CONTROLS ARE BASED ON NAVD '88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE BRASS DISKS ON CONCRETE MONUMENTS.
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
6. FOR DETAILS NOT SHOWN ON THE DRAWING, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
7. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. 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)	410-313-4900
COLONIAL PIPELINE CO.	410-795-1390
MISS UTILITY	1-800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033

9. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
11. 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.

PART II WATER

1. ALL WATER MAINS SHALL BE AWWA C900 PVC SDR-18 UNLESS OTHERWISE NOTED.
2. TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.
3. VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
4. ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
5. FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD SPECIFICATIONS.
6. THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
7. TRACER WIRES AND CONTINUITY TEST STATIONS SHALL BE INSTALLED ON ALL DIP AND PVC WATER MAINS IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL.
8. FOR PVC WATER MAINS; ALL RECORDS FOR THE QUALITY CONTROL AND QUALIFICATION TEST REQUIREMENTS NOTED IN SECTION 5.1 OF THE AWWA STANDARD C900 FOR PVC PRESSURE PIPE SHALL BE SUBMITTED WITH THE PIPE MATERIAL CERTIFICATIONS OR SHOP DRAWINGS PRIOR TO APPROVAL OF THE MATERIAL FOR USE. THE TEST RECORDS SHALL BE FOR THE PIPE TO BE INSTALLED UNDER THIS CONTRACT. ALL PVC PIPE SHALL CONTAIN MARKINGS TO ALLOW CROSS REFERENCING OF THE PIPE SUPPLIED TO THE TEST RECORDS RECEIVED.
9. UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL VALVES AND METALLIC FITTINGS USED WITH PVC WATER MAINS IN ACCORDANCE WITH VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. SEVENTEEN (17) POUND MAGNESIUM ANODES SHALL BE INSTALLED ON ALL VALVES AND DUCTILE IRON FITTINGS INCLUDING RESTRAINTS AND HARNESSES. TWELVE (12) POUND ZINC ANODES SHALL BE INSTALLED ON ALL STAINLESS STEEL FITTINGS AND SADDLES USED WITH PVC MAINS. ALL "TEES" USED WITH PVC MAINS SHALL BE DUCTILE IRON.
10. PROPER ASSEMBLY OF GASKETED PVC PIPE JOINTS: THE MANUFACTURER'S INSERTION LINE OF GASKETED PVC PIPE JOINTS INDICATES THE MAXIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. AFTER ASSEMBLY OF THE JOINT, THE INSERTION LINE SHALL REMAIN VISIBLE. DUAL INSERTION LINES ON GASKETED PVC PIPE INDICATE THE MAXIMUM AND MINIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. THE CONTRACTOR SHALL NOT OVER INSERT OR OVER HOME THE SPIGOT INTO THE BELL OF PVC PIPE.
11. ALL CHANGES IN HORIZONTAL OR VERTICAL DIRECTION OF PVC WATER PIPE SHALL BE MADE WITH STANDARD BENDS, 5-DEGREE SWEEPS OR HIGH DEFLECTION (HD) COUPLINGS. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE HIGH 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 Y2-DEGREE ON EITHER END OF THE COUPLING), SHALL BE RATED FOR A MINIMUM 200 PSI MEETING THE REQUIREMENTS OF A WW A 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 (HD) STOP COUPLINGS OR EQUAL. FIVE DEGREE SWEEPS SHALL BE BELL BY SPIGOT, RATED FOR A MINIMUM 225 PSI, DR18 MEETING THE REQUIREMENTS OF A WW A 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 A WW A 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 SPRING TO ALLOW FOR PIPE EXPANSION AND CONTRACTION. THE BELL STOPS SHALL BE SERIES 5000 MEGA-STOP, AS MANUFACTURED BY EBAA IRON, INC. OR APPROVED EQUAL.
13. FIRE SPRINKLER SYSTEMS FOR ALL SINGLE FAMILY DWELLINGS SHALL HAVE A MINIMUM OF A 1-1/2" CONNECTION WITH A 1" OUTSIDE METER SETTING.
14. FOR PROPOSED LOTS 1, 2, 5-7,11 AND 12 EXISTING "SINGLE" SHC (CONTRACT #14-4353-D) WILL BE USED. FOR PROPOSED LOTS 3-4 AND 9-10 EXISTING (TWIN) TSHC (CONTRACT #14-4353-D) WILL BE UTILIZED. FOR PROPOSED LOTS 13 AND 14 NEW (TWIN) TSHC WILL BE CONSTRUCTED, UTILIZING EXISTING WATER MAIN (CONTRACT #14-4353-D). ALL OTHER WHC WILL BE CONSTRUCTED UNDER THIS CONTRACT.

PART III SEWER

1. ALL SEWER MAINS SHALL BE D.I.P. OR P.V.C. UNLESS OTHERWISE NOTED.
2. ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
3. FORCE MAINS SHALL BE D.I.P. ONLY.
4. MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
5. MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVERS, STANDARD DETAIL G5.52. WHERE WATERTIGHT FRAME AND COVER IS USED, SET TOP OF FRAME 1"-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
6. HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT CELLAR CANNOT BE SERVED.

AS-BUILT
By [illegible] Date 7/3/18

DEVELOPER

GWENRIDGE, LLC
5551 OAKLAND MILLS ROAD
ELKRIDGE, MARYLAND 21075
(410) 730-3961

Richardson Engineering, LLC
30 E. Padonia Road, Suite 500
Timonium, Maryland 21093
Phone: 410-560-1502 Fax: 443-901-1208
www.RichardsonEngineering.net

STATE OF MARYLAND — PATRICK C. RICHARDSON — No. 16597 — REGISTERED PROFESSIONAL ENGINEER — 9/16/14
PATRICK C. RICHARDSON JR. PE No. 16597

DES: CND
DRN: CND
CHK: PCR
SEPT. DATE: 2014

BY	NO.	REVISION	DATE
CND	1	ADDED AIR RELEASE VALVE, 20 LF PIPE, 5° SWEEP	8-11-15

FINAL
WATER & SEWER
COVER SHEET

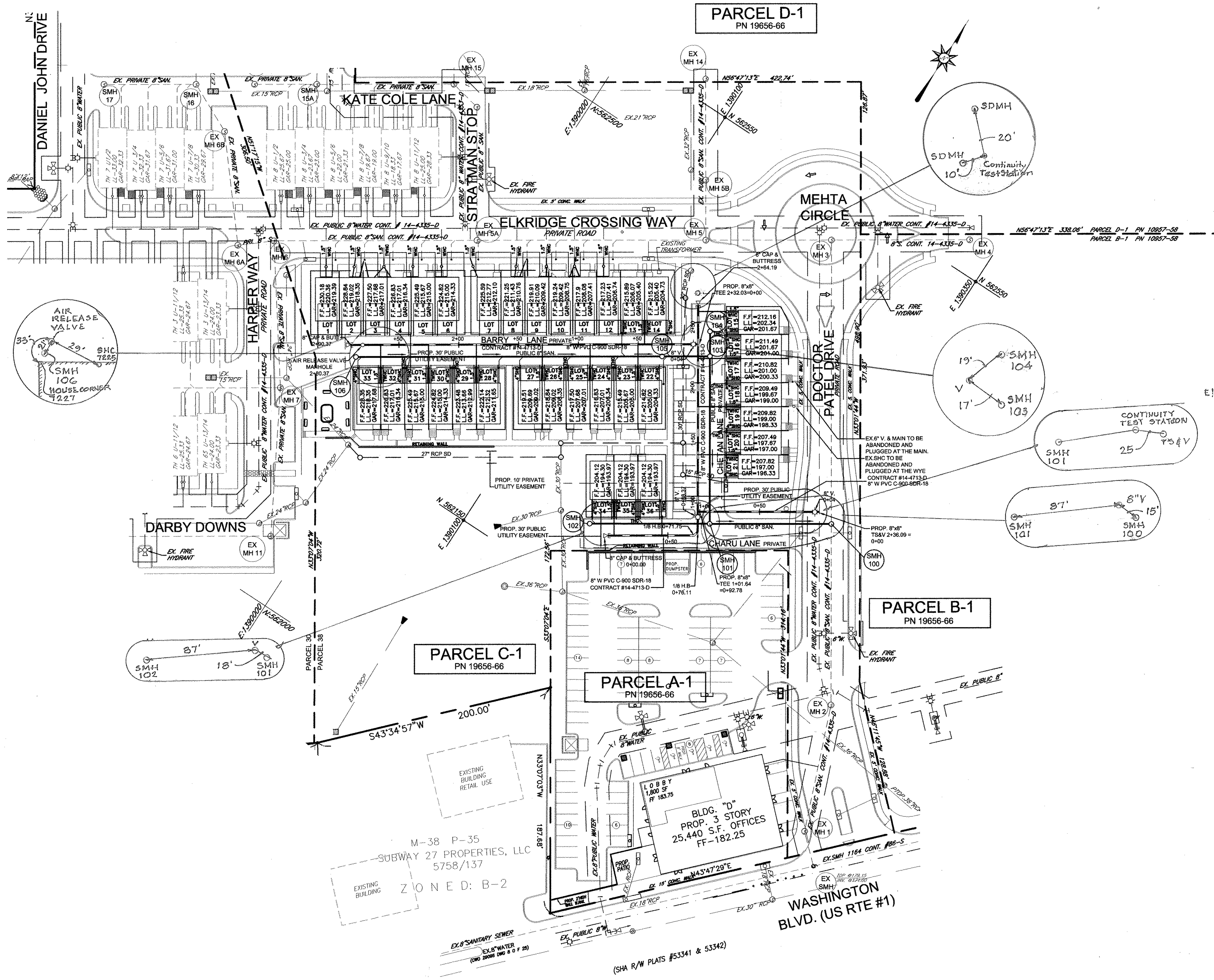
600' SCALE MAP #38 BLOCK #2&3

ELKRIDGE CROSSING
LOTS 1-36, OPEN SPACE LOT 37
AND BULK PARCEL 'F'
CONTRACT # 14-4713-D

TAX MAP #38 PARCEL #30 & 38
1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET: 1 OF 4



PLAN VIEW

SCALE: 1" = 50'

	ELKRIDGE CROSSING				
	LOCATION	Measurement	WHC	Measurement	SHC
Elkridge Crossing Way	LOT 1	EX.SMH 5A 123'	EX.SMH 6 49'	EX.SMH 5A 117'	EX.SMH 6 56'
	LOT 2	EX.SMH 5A 103'	EX.SMH 6 69'	EX.SMH 5A 101'	EX.SMH 6 72'
	LOT 3	EX.SMH 5A 76'	EX.SMH 6 78'	EX.SMH 5A 93'	EX.SMH 6 96'
	LOT 4	EX.SMH 5A 76'	EX.SMH 6 78'	EX.SMH 5A 69'	EX.SMH 6 103'
	LOT 5	EX.SMH 5A 55'	EX.SMH 6 119'	EX.SMH 5A 48'	EX.SMH 6 126'
	LOT 6	EX.SMH 5A 31'	EX.SMH 6 144'	EX.SMH 5A 25'	EX.SMH 6 151'
	LOT 7	EX.SMH 5 168'	EX.SMH 5A 21'	EX.SMH 5 161'	EX.SMH 5A 23'
	LOT 8	EX.SMH 5 132'	EX.SMH 5A 39'	EX.SMH 5 129'	EX.SMH 5A 43'
	LOT 9	EX.SMH 5 105'	EX.SMH 5A 48'	EX.SMH 5 121'	EX.SMH 5A 64'
	LOT 10	EX.SMH 5 83'	EX.SMH 5A 85'	EX.SMH 5 97'	EX.SMH 5A 71'
	LOT 11	EX.SMH 5 83'	EX.SMH 5A 85'	EX.SMH 5 74'	EX.SMH 5A 94'
Elkridge Crossing Way	LOT 12	EX.SMH 5 60'	EX.SMH 5A 109'	EX.SMH 5 51'	EX.SMH 5A 118'
Barry Lane	LOT 13	SMH 105 21'	SMH 106 243'	SMH 106 235'	SMH 105 34'
Barry Lane	LOT 14	SMH 105 21'	SMH 106 243'	SMH 105 19'	SMH 103 12'
Chetan Lane	LOT 15	SMH 103 41'	SMH 104 21'	SMH 103 30'	SMH 104 14'
	LOT 16	SMH 103 16'	SMH 101 142'	SMH 103 24'	SMH 104 14'
	LOT 17	SMH 103 16'	SMH 101 142'	SMH 103 21'	SMH 101 126'
	LOT 18	SMH 103 42'	SMH 101 102'	SMH 103 26'	SMH 101 120'
	LOT 19	SMH 103 42'	SMH 101 102'	SMH 103 57'	SMH 101 66'
	LOT 20	SMH 103 82'	SMH 101 62'	SMH 103 63'	SMH 101 81'
Chetan Lane	LOT 21	SMH 103 82'	SMH 101 62'	SMH 103 101'	SMH 101 43'
Barry Lane	LOT 22	SMH 106 211'	SMH 105 20'	SMH 105 14'	SMH 103 42'
	LOT 23	SMH 106 211'	SMH 105 20'	SMH 106 223'	SMH 105 37'
	LOT 24	SMH 106 200'	SMH 105 58'	SMH 106 216'	SMH 105 73'
	LOT 25	SMH 106 200'	SMH 105 58'	SMH 106 182'	SMH 105 76'
	LOT 26	SMH 106 160'	SMH 105 92'	SMH 106 176'	SMH 105 82'
	LOT 27	SMH 106 160'	SMH 105 92'	SMH 106 138'	SMH 105 120'
	LOT 28	SMH 106 105'	SMH 105 153'	SMH 106 124'	SMH 105 134'
	LOT 29	SMH 106 105'	SMH 105 153'	SMH 106 87'	SMH 105 171'
	LOT 30	SMH 106 65'	SMH 105 193'	SMH 106 80'	SMH 105 178'
	LOT 31	SMH 106 65'	SMH 105 193'	SMH 106 48'	SMH 105 211'
	LOT 32	SMH 106 26'	SMH 105 234'	SMH 106 42'	SMH 105 217'
Barry Lane	LOT 33	SMH 106 26'	SMH 105 234'	SMH 106 14'	SMH 105 253'
Chary Lane	LOT 34	SMH 101 84'	SMH 102 21'	SMH 101 105'	SMH 102 10'
	LOT 35	SMH 101 84'	SMH 102 21'	SMH 101 68'	SMH 102 36'
Charu Lane	LOT 36	SMH 101 47'	SMH 102 57'	SMH 101 64'	SMH 102 40'

Dr. Patel Drive	VALVE #1	SMH 100 15'	SMH 101 87'
Chetan Lane	VALVE #2	SMH 101 18'	SMH 102 87'
Barry Lane	VALVE #3	SMH 103 17'	SMH 104 19'

AS-BUILT

By [signature] Date 7/3/18

NOTE:
REFER TO STANDARD DETAIL W-3.32 FOR TWIN 1" METER SETTING.

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 NUMBER 16597, EXPIRATION DATE: 08-15-2017

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[signature] 10/13/15
CHIEF, BUREAU OF UTILITIES — DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

[signature] 10.16.15
CHIEF. DEVELOPMENT ENGINEERING DIVISION M.G. — DATE

Richardson Engineering, LLC
30 East Padonia Road, Suite 500
Timonium, Maryland 21093
Phone: 410-560-1502 Fax: 443-901-1208

STATE OF MARYLAND — PATRICK C. RICHARDSON JR — NO. 16597 REGISTERED — PROFESSIONAL ENGINEER — 9/24/15
PATRICK C. RICHARDSON JR. PE No. 16597

DES: CND
DRN: CND
CHK: PCR
DATE: SEPT. 2014

BY	NO.	REVISION	DATE
CND	2	LOT 9 SINGLE WHC, LOT 10 & 11 TWIN WHC LOT 2&3 TWIN SHC, LOT 8&9 TWIN SHC	11/19/15
CND	1	ADDED AIR RELEASE VALVE, 20 LF PILI, 5' SWEEP	6/27/07

FINAL
WATER & SEWER PLAN

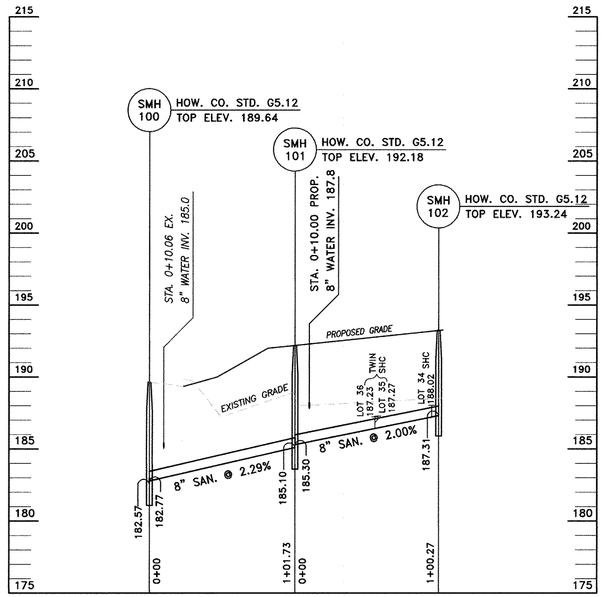
600' SCALE MAP #38 — BLOCK #2&3

ELKRIDGE CROSSING
LOTS 1-36, OPEN SPACE LOT 37
AND BULK PARCEL 'F'
CONTRACT # 14-4713-D

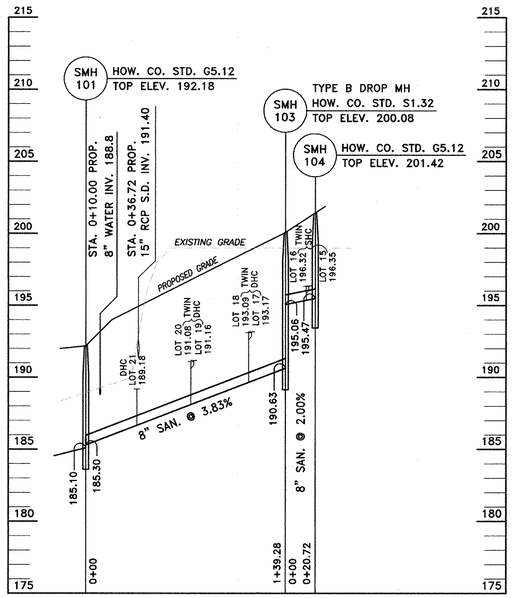
TAX MAP #38 — PARCEL #30 & 38
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN

SHEET: 2 OF 4



SMH 100 TO SMH 102



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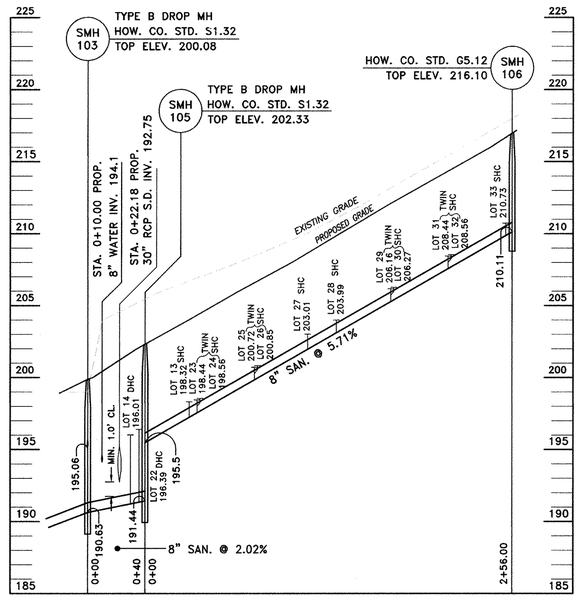
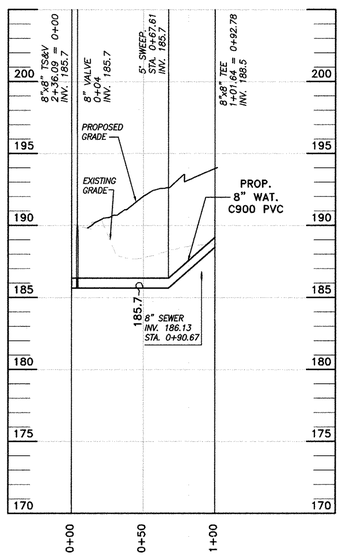


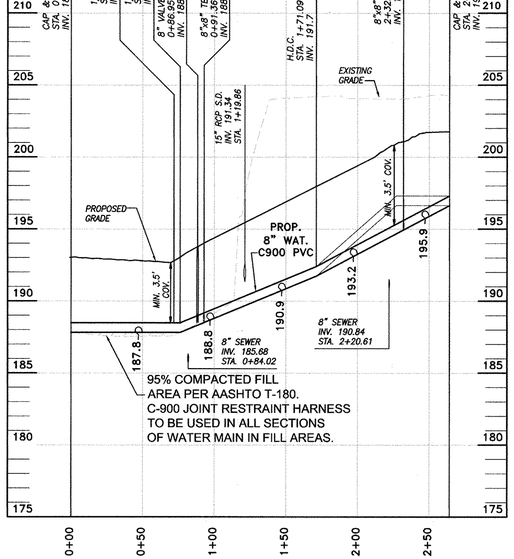
SMH 103 TO SMH 106

SEWER PROFILES

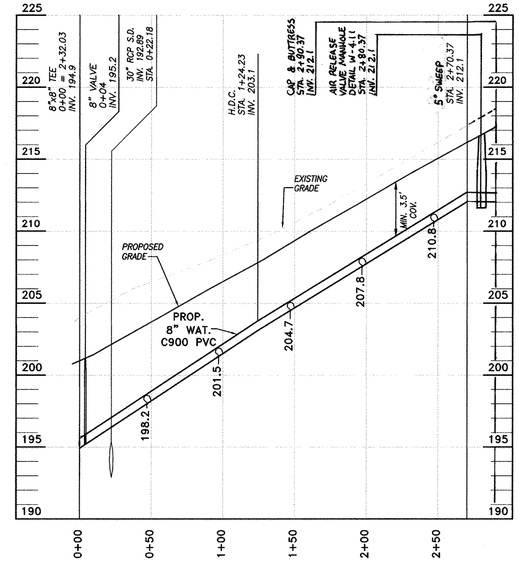
SCALE
HORZ: 1" = 50'
VERT: 1" = 5'



WATERLINE IN CHARU LANE
(SOUTH OF LOT 21)



WATERLINE IN CHARU LANE &
CHETAN LANE (WEST OF LOTS 15-21)



WATERLINE IN BARRY LANE
(SOUTH OF LOTS 3-14)

AS-BUILT
By [illegible] Date 7/3/18

WATER PROFILES

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

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 NUMBER 16597, EXPIRATION DATE: 08-15-2015

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
9/23/14
CHIEF, BUREAU OF UTILITIES — DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
9.30.14
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

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STATE OF MARYLAND — PATRICK C. RICHARDSON — No. 16597 — REGISTERED PROFESSIONAL ENGINEER
PATRICK C. RICHARDSON JR. PE No. 16597 — 6/6/14

DES: CND
DRN: CND
CHK: PCR
SEPT. DATE: 2014

BY	NO.	REVISION	DATE
CND	1	ADDED AIR RELEASE VALVE, 20 LF PIPE, 5' SWEEP.	8-11-15

FINAL
WATER & SEWER PROFILES

ELKRIDGE CROSSING
LOTS 1-36, OPEN SPACE LOT 37
AND BULK PARCEL 'F'
CONTRACT # 14-4713-D

600' SCALE MAP #38 — BLOCK #2&3
TAX MAP #38 — PARCEL #30 & 38
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET: 3 OF 4

DIVISION 5
SPECIAL PROVISIONS
5.01 UTILIZATION OF PLANS AND SPECIFICATIONS

5.01

(A) THIS CONTRACT WILL BE CONSTRUCTED UNDER THE PROVISIONS OF THE "HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION", DATED JANUARY, 1991, AND ANY SUBSEQUENT AMENDMENTS WHICH ARE HEREBY INCORPORATED BY REFERENCE:: INTO THE CONTRACT DOCUMENTS. IN THE EVENT OF A CONFLICT BETWEEN PORTIONS OF "THE CONTRACT DOCUMENTS, THE PROVISIONS OF SECTION 105.04 OF VOLUME IV WILL GOVERN, THE ORDER OF WHICH IS:

1. SPECIAL PROVISIONS
2. PLANS (DRAWINGS)
3. SUPPLEMENTAL SPECIFICATIONS
4. STANDARD SPECIFICATIONS AND DETAILS

5.02 WORK TO BE DONE:

(A) THE WORK TO BE DONE UNDER THIS CONTRACT CONSISTS OF THE FURNISHING OF ALL MATERIALS AND THE CONSTRUCTING COMPLETE IN PLACE OF THE WATER AND SEWER PIPELINES, AND ALL APPURTENANCES. FOR THE ABOVE ITEMS, AS SHOWN ON THE CONTRACT DRAWINGS OR AS DIRECTED BY THE ENGINEER.
(B) THE PLANS AND SPECIFICATIONS ARE INTENDED TO COVER A COMPLETE PROJECT INCLUDING THE TESTING OF THE PIPELINES, EQUIPMENT AND APPURTENANCES. IT SHOULD BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE DEVELOPER OF HIS RESPONSIBILITY TO PERFORM SUCH WORK.
(C) FIVE DRAWINGS ACCOMPANY THESE SPECIFICATIONS AND SHOW THE EXTENT OF THE WORK TO BE DONE UNDER THIS CONTRACT.

5.03 ACCESS TO PROJECT:

(A) THE DEVELOPER SHALL PERMIT FREE ACCESS TO ALL PARTS OF THE PROJECT AT: ALL TIMES FOR INSPECTION PURPOSES FOR REPRESENTATIVES OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES AND FOR REPRESENTATIVES OF THE DEPARTMENT OF HEALTH OF THE STATE OF MARYLAND, AND SHALL PROVIDE PROPER FACILITIES FOR SUCH ACCESS AND INSPECTION WHEREVER IT IS REQUIRED.

5.04 DEVELOPER'S PIPE MATERIAL SPECIFICATIONS:

(A) ALTHOUGH UNDER THIS CONTRACT "THE DEVELOPER HAS THE OPTION OF FURNISHING PIPE OF VARIOUS MATERIALS, IT IS THE INTENT THAT ONCE A MATERIAL FOR PIPE HAS BEEN SELECTED, THIS MATERIAL SHALL BE USED EXCLUSIVELY THROUGHOUT THIS CONTRACT EXCEPT, HOWEVER, WITHIN LIMITS WHERE PIPELINE TYPE AND MATERIAL ARE SPECIFIED ON THE DRAWINGS. THE DEVELOPER SHALL NOT CHANGE MATERIALS DURING THE PROSECUTION OF THIS CONTRACT UNLESS HE IS AUTHORIZED IN WRITING TO DO SO BY THE COUNTY.

5.05 TESTING WATER MAINS:

(A) THE COMPLETED WATER MAINS SHALL BE FILLED WITH WATER. AND BROUGHT TO A TEST GRADIENT OF ELEVATION 700.00 AS SPECIFIED UNDER PARAGRAPH 1002.04.

5.06 TEMPORARY PROTECTIVE CHANNEL COVER:

(A) IN ALL SEWER MANHOLES A TEMPORARY PROTECTIVE CHANNEL COVER AS SHOWN ON THE DRAWING ENTITLED TEMPORARY PROTECTIVE CHANNEL COVER" SHALL BE PROVIDED.

(B) THE PROTECTIVE CHANNEL COVER SHALL BE INSTALLED WHEN THE SEWER MAINS HAVE BEEN INSPECTED AND TESTED.

5.07 TIE-IN AT WATER MAIN:

(A) THE DEVELOPER SHALL NOTIFY THE HOWARD COUNTY BUREAU OF UTILITIES (313-4900) PRIOR TO MAKING ANY TIE TO THE EXISTING SYSTEM.

(B) THE DEVELOPER SHALL NOT OPERATE ANY WATER MAIN VALVE ON THE EXISTING SYSTEM.

(C) THE DEVELOPER SHALL NOTIFY ALL WATER CUSTOMERS OF THE COUNTY WHO WILL BE WITHOUT SERVICE A MINIMUM OF FORTY-EIGHT (48) HOURS IN ADVANCE OF THE SCHEDULED SHUTDOWN.

5.08 PRECONSTRUCTION MEETING:

(A) A PRECONSTRUCTION MEETING WILL BE HELD WITH THE DEVELOPER, HIS CONTRACTOR AND THE COUNTY TO DISCUSS THE PROJECT AND SEQUENCE OF WORK PRIOR TO BEGINNING ANY WORK.

5.09 STERILIZATION AND DISINFECTION OF WATER MAINS:

(A) STERILIZATION AND DISINFECTION OF WATER MAINS INCLUDING BACTERIOLOGICAL TESTINGS SHALL BE DONE BY THE CONTRACTOR AS SPECIFIED IN SECTIONS 1006 AND 1007.

(1) DISINFECTING OF WATER MAINS SHALL BE DONE BY THE CONTRACTOR AS SPECIFIED AND DIRECTED WITHOUT ADDITIONAL PAYMENT THEREOF. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT FOR THE COMPLETE STERILIZING OPERATIONS.

(2) DISINFECTING OF WATER MAINS SHALL BE DONE IN ACCORDANCE WITH AWWA C651-86 USING THE CONTINUOUS FEED METHOD. THE OPTION OF PLACING CALCIUM HYPO CHLORITE GRANULES IN THE PIPE DURING CONSTRUCTION SHALL NOT BE USED. AN AIR GAP OR A DEVICE TO PREVENT BACKFLOW OF THE CHLORINE SOLUTION INTO THE COUNTY WATER SYSTEM MUST BE APPROVED BY THE COUNTY AND USED DURING THE TESTING PROCEDURES.

(3) PRIOR TO THE BEGINNING OF DISINFECTING OPERATIONS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A SCHEDULE LISTING DETAIL OF DISINFECTING PROCEDURES TO BE FOLLOWED.

5.10 PERMITS:

(A) STATE OF MARYLAND DEPARTMENT OF THE ENVIRONMENT.

THE GENERAL NOTES ARE AMENDED TO INCLUDE THE FOLLOWING

1. ALL DUCTILE IRON PIPES TO BE USED ON THE PUBLIC WATER SYSTEM SHALL BE CLASS 54. DUCTILE IRON FITTINGS SHALL MEET THE REQUIREMENTS OF THE HOWARD COUNTY DESIGN MANUAL VOLUME IV -STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND SHALL BE EXTERIOR EPOXY COATED IN ACCORDANCE WITH AWWA CII6.

2. ALL WATER HOUSE 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.

3. 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.

4. ALL WATER MAINS CONSTRUCTED IN FILL AREAS SHALL BE RESTRAINED DUCTILE IRON PIPE CLASS 54 MEETING THE REQUIREMENTS OF AND CONSTRUCTED IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL VOLUME IV -STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.

5. ALL WATER MAINS WITHIN CASING PIPES SHALL BE RESTRAINED DUCTILE IRON PIPE CLASS 54 MEETING THE REQUIREMENTS OF AND CONSTRUCTED IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL VOLUME IV -STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.

6. THE FOLLOWING NOTE IS ADDED TO HOWARD COUNTY STANDARD DETAIL W2.22, BUTTRESSES AND ANCHORAGE'S FOR VERTICAL BENDS. "WHEN ANCHORING PVC PIPE, THE STRAPPING IN CONTACT WITH THE PIPE SURFACE SHALL BE 1-INCH WIDE BY 14-INCH THICK STEEL. THE REMAINING PORTION OF THE STRAP SHALL BE REINFORCING BAR SIZED IN ACCORDANCE WITH THE PERTINENT CHART SHOWN ON THE DETAIL."

7. EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF AWWA C900 DRI8, PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV -STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.

AMENDMENT TO THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION

EXCEPT AS INDICATED HEREIN, ALL WORK SHALL BE IN ACCORDANCE WITH THE PERTINENT SECTIONS OF THE HOWARD COUNTY DESIGN MANUAL VOLUME IV -STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. ARTICLE 9, SECTIONS 908 NONMETALLIC PIPES AND DRAINAGE TILES AND ARTICLE 10, SECTION 1002 WATER MAINS OF THE HOWARD COUNTY STANDARD SPECIFICATIONS ARE AMENDED TO INCLUDE THE FOLLOWING REQUIREMENTS.

GENERAL

1. POLYVINYL CHLORIDE (PVC) PIPE AND COUPLINGS SHALL BE HOMOGENEOUS THROUGHOUT AND FREE FROM VISIBLE CRACKS, BUBBLES, BLISTERS, HOLES, FOREIGN INCLUSIONS, CUTS, OR SCRAPES ON INSIDE OR OUTSIDE SURFACES, OR OTHER IMPERFECTIONS, WHICH MAY IMPAIR THE PERFORMANCE OR LIFE OF THE PIPE. EACH PIPE SHALL BE STRAIGHT TO WITHIN 1 1/4-INCH PER 20-FOOT LENGTH OF PIPE WHEN UNIFORMLY SUPPORTED ALONG ITS ENTIRE LENGTH, AND SHALL HAVE A TRUE CIRCULAR CROSS-SECTION TO WITHIN ± 1/64 INCH.

2. PVC PIPE MANUFACTURED MORE THAN SIX MONTHS PRIOR TO WORK SITE INSPECTION WILL NOT BE ACCEPTED.

3. LOADING, UNLOADING, HANDLING, INSPECTION AND STORAGE OF PVC PIPE AND FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C605. PVC PIPE SHALL BE STORED SUCH THAT IT DOES NOT DEFORM OR BEND.

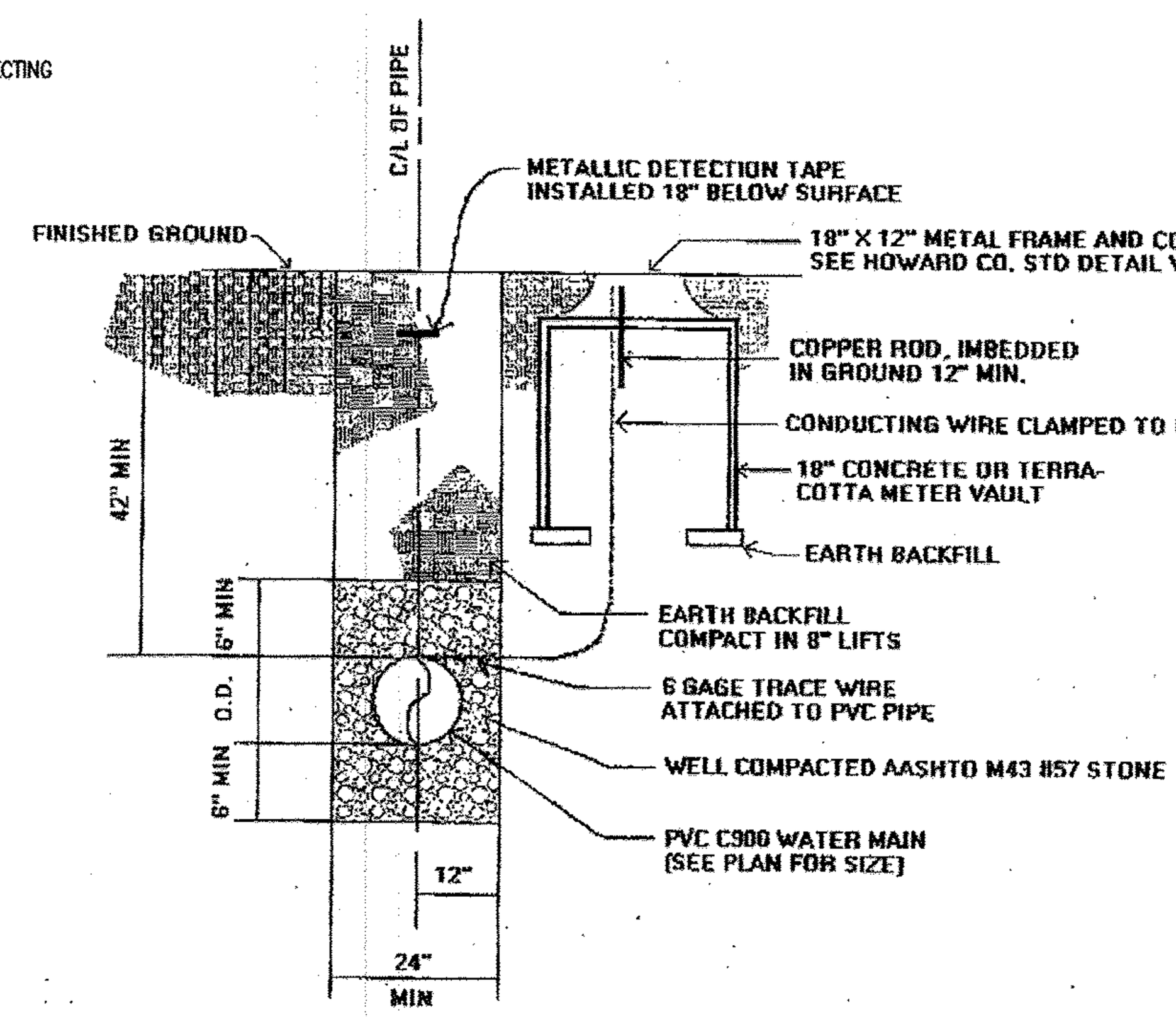
4. SUBMITTALS: THE FOLLOWINGS ITEMS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. MATERIALS NOT APPROVED WILL NOT BE ACCEPTED.

A. PVC PIPE:
SUBMIT MANUFACTURER'S LITERATURE AND CERTIFICATES OF COMPLIANCE FOR PVC PIPE ALONG WITH THE MANUFACTURER'S IDENTIFICATION CODES FOR NOMINAL SIZE, DIMENSION RATIO, PRESSURE CLASS, PRODUCTION RECORD CODE AND DATE OF MANUFACTURE. SUBMIT MANUFACTURER'S WRITTEN TRANSCRIPT OF TEST RESULTS, FOR SUSTAINED PRESSURE, PIPE DIMENSION, BURST PRESSURE, FLATTENING RESISTANCE, AND EXTRUSION QUALITY TEST. FREQUENCY OF PERFORMING THE TESTS AND THE METHODS OF SELECTING TEST SPECIMENS SHALL BE IN ACCORDANCE WITH AWWA C900.

B. PVC PIPE FITTINGS:
SUBMIT MANUFACTURER'S LITERATURE AND CERTIFICATES OF COMPLIANCE FOR PVC PIPE FITTINGS ALONG WITH THE MANUFACTURER'S IDENTIFICATION CODES FOR NOMINAL SIZE, PRESSURE CLASS, PRODUCTION RECORD CODE AND DATE OF MANUFACTURE. SUBMIT MANUFACTURER'S WRITTEN TRANSCRIPT OF RESULTS FOR ACCELERATED-REGRESSION TEST, BURST PRESSURE AND HEAT-REVERSION TEST IN ACCORDANCE WITH AWWA C907

C. MISCELLANEOUS FOR PVC WATER PIPE:
SUBMIT MANUFACTURERS' LITERATURE AND CERTIFICATES OF COMPLIANCE, FOR JOINT RESTRAINT DEVICES, PIPE COUPLINGS, TRACER WIRE, WIRE CONNECTOR SPLICE KITS, DETECTION TAPE, AND SERVICE SADDLES.

D. SUBMIT MANUFACTURERS' INSTALLATION INSTRUCTIONS FOR PVC PIPE AND FITTINGS, JOINT RESTRAINT DEVICES, PIPE COUPLINGS, WIRE CONNECTOR SPLICE KITS, SERVICE SADDLES, AND MANUFACTURER'S INSTRUCTIONS FOR TAPPING PIPE.



TRENCH FOR PVC PIPE AND CONTINUITY TEST STATION DETAIL

MATERIALS

THE ENGINEER WILL INSPECT ALL MATERIALS BEFORE, DURING AND AFTER INSTALLATION TO ENSURE COMPLIANCE WITH THE CONTRACT DOCUMENTS. WHEN SPECIFIC TESTS OF MATERIALS ARE CALLED FOR IN THE REFERENCED STANDARDS AND SPECIFICATIONS, THE ENGINEER HAS THE OPTION OF REQUIRING THAT ANY OR ALL OF THESE TESTS BE PERFORMED FOR THE SPECIFIED MATERIALS.

1. PVC PIPE AND FITTINGS:

A. PVC PIPE 4 INCHES THROUGH 12 INCHES IN DIAMETER SHALL BE MANUFACTURED IN 20 -FOOT LENGTHS IN ACCORDANCE WITH AWWA C900 WITH CAST/DUCTILE IRON PIPE EQUIVALENT OUTSIDE DIAMETERS. PIPE SHALL HAVE A DIMENSION RATIO (DR) OF 18, PRESSURE CLASS OF 150 PSI, AND SHALL UTILIZE ELASTOMERIC-GASKETED PUSH-ON JOINTS FOR JOINING PIPES IN ACCORDANCE WITH AWWA C900. PIPE, GASKETS, AND GASKET LUBRICANT SHALL BE SUITABLE FOR POTABLE WATER SYSTEMS AND SHALL MEET NSF 61. ALL PVC PIPE SHALL BE FACTORY MARKED ON THE SPIGOT END FOR DEPTH OF INSERTION INTO THE BELL AND FACTORY TESTED IN ACCORDANCE WITH AWWA C900. PVC PIPE SHALL BE MANUFACTURED BY ONE OF THE FOLLOWING:

1. UPONOR ETI
2. J-M PIPE
3. DIAMOND PLASTICS CORP.
4. NATIONAL PIPE AND PLASTICS, INC.

B. FITTINGS FOR USE WITH PVC WATER MAINS SHALL BE DUCTILE IRON IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OR PVC FITTINGS. PVC FITTINGS SHALL HAVE PUSH-ON RUBBER GASKETED JOINTS, BE INJECTION-MOLDED MEETING AWWA C907, PRESSURE CLASS 150; OR FABRICATED MEETING AWWA C900, CLASS 200. PVC FITTINGS SHALL BE MANUFACTURED BY THE HARRINGTON CORPORATION (HARCO) OR APPROVED EQUAL. PIPE JOINTS SHALL BE IN ACCORDANCE WITH THE STANDARDS SPECIFIED FOR THE PIPE AND FITTINGS.

C. PIPE COUPLINGS FOR PVC AND DUCTILE IRON WATER MAINS SHALL BE SUITABLE FOR POTABLE WATER SERVICE AND SHALL HAVE EPOXY OR NYLON COATED DUCTILE IRON CENTER AND END RINGS. PIPE COUPLINGS SHALL BE ROMAC STYLE 501, FORD FC2W OR APPROVED EQUAL.

2. JOINT RESTRAINING MATERIALS FOR PVC PIPE:

HORIZONTAL AND VERTICAL BENDS, TEES, CAPS AND FITTINGS SHALL BE BUTTRESSED OR ANCHORED IN ACCORDANCE WITH THE PLANS, THE STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION, OR AS DIRECTED BY THE ENGINEER. VALVES, WHEN CONNECTED TO PVC PIPE, SHALL BE IRON BODY RESILIENT SEAT GATE VALVES AND ANCHORED IN ACCORDANCE WITH THE DETAIL SHOWN ON THE PLANS AND SHALL HAVE ONE FULL LENGTH OF PIPE ON EACH SIDE OF THE VALVE.

JOINT RESTRAINTS FOR HARNESSING JOINTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THE REQUIREMENTS BELOW:

A. ALL JOINT RESTRAINT DEVICES SHALL BE FACTORY MUTUAL APPROVED.

B. IN RESTRAINED JOINTS, PVC PIPE SHALL NOT BE DEFLECTED. IF DEFLECTION IS REQUIRED IN A RESTRAINED JOINT, USE DUCTILE IRON PIPE OR FITTINGS.

C. WHERE A RESTRAINED JOINT IS REQUIRED BETWEEN PVC PIPE AND A FITTING, THE FITTING SHALL BE DUCTILE IRON MECHANICAL JOINT. JOINT RESTRAINT FOR THIS JOINT SHALL MEET ASTM F1674 AND SHALL BE UNIFLANGE SERIES 1500, EBAA IRON SERIES 2000PV, OR APPROVED EQUAL

D. WHERE A RESTRAINED JOINT IS REQUIRED FOR PVC PUSH-ON JOINT, JOINT RESTRAINT SHALL BE UNI-B-13, ICM 620 SUR-GRIP, EBBA IRON SERIES 1600, UNIFLANGE SERIES 1390-C, OR APPROVED EQUAL.

3. TRACER WIRE FOR NON METALLIC PIPELINES:

TRACER WIRE SHALL BE 6-GAGE, 7-STRAND CONTINUOUS COPPER WIRE WITH A 45-MIL POLYETHYLENE INSULATION. THE WIRE SHALL BE BLUE, HAVE "UL" MARKINGS AND SUITABLE FOR DIRECT BURY APPLICATIONS.

4. CONTINUITY TEST STATION:

CONTINUITY TEST STATIONS SHALL BE LOCATED ADJACENT TO EACH FIRE HYDRANT WITHIN THE PUBLIC EASEMENT FOR LOCATING PVC WATER MAINS. THE TEST STATION SHALL BE HOUSED IN A STANDARD HOWARD COUNTY I8-INCH DIAMETER METER VAULT WITH AN 18" X 12" METAL FRAME AND COVER AS SHOWN IN THE DETAILS ON THE PLANS. A 1-INCH DIAMETER BY 30-INCH LONG COPPER GROUNDING ROD IMBEDDED A MINIMUM OF 12 INCHES INTO THE GROUND SHALL BE USED FOR THE ATTACHMENT OF THE TRACER WIRE. THE TRACER WIRE SHALL BE FASTENED TO THE COPPER ROD USING TWO COPPER CLAMPS.

5. DETECTION TAPE:

VISUAL DETECTION TAPE SHALL BE 3 INCHES WIDE (MINIMUM) METALLIC BLUE PLASTIC TAPE LETTERED "WATER" IN BLACK GRAPHICS.

6. CONNECTION TO PVC WATERLINES:

A. CONNECTIONS TO PVC WATERLINES SHALL BE BY USING FITTINGS, SUCH AS TEES, INDICATED ON THE PLANS.

B. SADDLES MAY BE USED FOR 2-INCH AND SMALLER CONNECTIONS TO PVC WATERLINES. SADDLES WITH CLAMPS SHALL PROVIDE FULL SUPPORT AROUND THE CIRCUMFERENCE OF THE PIPE AND SHALL NOT DISTORT, SCRATCH, OR DAMAGE THE PIPE WHEN TIGHTENED. ONLY TAPPING SADDLES MANUFACTURED SPECIFICALLY FOR AWWA C900 PVC PIPE SHALL BE USED. SADDLE AND CLAMPS/STRAPS SHALL BE FORMED TO MEET THE CURVATURE OF THE PIPE. SADDLES WITH CLAMPS SHALL BE MANUFACTURED FOR UNDERGROUND SERVICE, SHALL BE RATED FOR A MINIMUM SERVICE OF 150 PSI AND SHALL BE BRASS OR BRONZE ALLOY MEETING ASTM B62 OR B584 AND AWWA C800 OR DUCTILE IRON SADDLES MEETING ASTM A536 OR A395 WITH TWO 18-8 STAINLESS STEEL STRAPS AND SHALL BE EPOXY OR NYLON COATED. SADDLES SHALL HAVE WATERTIGHT GASKETS OF BUMA-N RUBBER MEETING ASTM D2000 OR NITRILE AROUND THE TAP HOLE. SADDLES SHALL BE ONE OF THE FOLLOWING:
1. FORD FC-202
2. MUELLER SERIES DR2S
3. ROMAC 202N
4. SMITH BLAIR 317 NYLON COATED
5. JCM 406

EXECUTION

ALL CONSTRUCTION METHODS AND DETAILS SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL VOLUME IV -STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND THE FOLLOWING CRITERIA.

1. INSTALLATION OF PVC WATER MAINS:

A. PVC PIPE AND FITTINGS SHALL BE HANDLED IN ACCORDANCE WITH AWWA C605.

B. BEDDING:
PROVIDE 6 INCHES OF STONE BEDDING UNDER THE PIPE IN ACCORDANCE WITH STANDARD DETAIL G2.01 AND THE DETAIL SHOWN ON THE PLANS FOR TRENCH FOR PVC PIPE USING AASHTO M 43, SIZE NUMBER 57 AGGREGATE. THE STONE BEDDING SHALL BE INSTALLED TO GRADE PRIOR TO LAYING PIPE. EXCAVATE BELL HOLES IN BEDDING AT EACH JOINT TO ASSEMBLE THE JOINT AND TO INSURE THAT THE ENTIRE LENGTH OF EACH PIPE BARREL, FITTING AND VALVE IS SUPPORTED ON FIRM BEDDING.

C. INSTALL PVC AWWA C900 PRESSURE PIPE:

INSTALLATION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS EXCEPT AS MODIFIED HEREIN. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT AND CURVED ALIGNMENTS SHOWN ON THE PLANS SHALL BE MADE BY USING FITTINGS OR HIGH-DEFLECTION COUPLINGS. DEFLECTING PVC PIPE JOINTS OR BENDING PVC PIPE WILL NOT BE PERMITTED.

WHENEVER A PIPE REQUIRES CUTTING, THE WORK SHALL BE DONE IN A MANNER THAT LEAVES A SMOOTH, SQUARE END. CUT PVC PIPE ENDS SHALL HAVE BURRS REMOVED AND THE END BEVELED TO MATCH FACTORY BEVEL. TO ENSURE THE PROPER LENGTH OF INSERTION OF THE SPIGOT INTO THE BELL, PVC PIPE CUT IN THE FIELD SHALL BE BEVELED AND MARKED ON THE SPIGOT END TO THE DIMENSIONS SPECIFIED BY THE MANUFACTURER PRIOR TO ASSEMBLY.

PRIOR TO MAKING GASKETED JOINTS, BOTH MATING PIPE ENDS AND THE GASKET SHALL BE CLEANED OF ALL FOREIGN MATERIAL. THE RUBBER GASKET SHALL THEN BE INSERTED IN OR STRETCHED OVER THE CLEAN GASKET SEAT AND LUBRICANT APPLIED TO THE GASKET AND MATING PIPE END. THE METHOD FOR INSERTING THE SPIGOT INTO THE BELL SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE COUNTY. THE PIPE ENDS SHALL BE CAREFULLY ALIGNED AND PUSHED TOGETHER TO MEET THE REQUIRED MANUFACTURER'S INSERTION DEPTH. INSERTION OF THE SPIGOT END OF THE PIPE SHALL BE MADE TO A POINT WHERE THE FACTORY MARK IS EVEN WITH THE FACE OF THE BELL.

D. TRACER WIRES:

INSTALL TRACER WIRES WITH THE PIPE. TAPE WIRE TO THE TOP OF THE PIPE WITH MINIMUM 2-INCH WIDE X 1/2-PIPE-CIRCUMFERENCE LONG PVC TAPE EVERY 4 FEET ALONG THE PIPE. THE COPPER WIRE SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE PIPELINE INCLUDING ALL FIRE HYDRANT LEADS AND SHALL TERMINATE AT CONTINUITY TEST STATIONS. CONTINUITY TEST STATIONS SHALL BE LOCATED ADJACENT TO ALL FIRE HYDRANTS. WHERE REQUIRED, SPLICING SHALL BE DONE WITH DIRECTBURY WIRE CONNECTOR, WIRE NUT, OR SPLICE KIT LISTED AND LABELED FOR DIRECT BURY, INSTALLED AS RECOMMENDED BY MANUFACTURER, AND TAPED TO THE PIPE. CONNECTIONS TO CONTINUITY TEST STATIONS SHALL BE IN ACCORDANCE WITH THE DETAIL SHOWN ON THE PLANS.

AFTER BACKFILLING, THE CONTRACTOR SHALL TEST THE TRACER WIRE IN THE PRESENCE OF THE COUNTY TO DEMONSTRATE ELECTRICAL CONTINUITY BETWEEN TEST STATIONS THROUGH THE LENGTH OF THE PVC PIPELINE INSTALLED. THE CONTRACTOR SHALL NOTIFY THE COUNTY 48 HOURS IN ADVANCE OF THE TESTS. ANY DISCONTINUITY SHALL BE LOCATED, REPAIRED AND RETESTED AT THE CONTRACTOR'S EXPENSE UNTIL CONTINUITY IS ACHIEVED.

E. BACKFILL:

BACKFILL OVER THE PVC PIPE IN ACCORDANCE WITH STANDARD DETAIL G2.01 AND THE DETAIL SHOWN ON THE PLANS FOR TRENCH FOR PVC PIPE USING WELL COMPACTED AASHTO M 43, SIZE NUMBER 57 AGGREGATE TO A MINIMUM OF 6 INCHES OVER THE CROWN OF THE PIPE. TRENCH BACKFILL SHALL PROCEED THEREAFTER IN 8-INCH LAYERS. CONTRACTOR SHALL PROVIDE FULL TRENCH COMPACTION DENSITY OF 95% AS DETERMINED BY AASHTO T-180-A.

F. DETECTION TAPE:

INSTALL DETECTION TAPE DIRECTLY OVER THE CENTERLINE OF THE WATER MAINS ON COMPACTED BACKFILL NOT LESS THAN IS INCHES OR MORE THAN 24 INCHES BELOW FINISHED SURFACE. TAPE SHALL BE INSTALLED WITH MINIMAL SPLICES. SPLICES SHALL OVERLAP A MINIMUM OF 6 INCHES.

2. JOINTS:

A. MECHANICAL JOINTS:
FOR PVC PLAIN-END TO BE CONNECTED TO DUCTILE IRON MECHANICAL JOINT BELL, ASSEMBLE THE JOINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, AS MODIFIED IN AWWA C605, THE PIPE MANUFACTURER'S RECOMMENDATIONS AND AS SPECIFIED HEREIN. FOR PVC PIPE PLAIN ENDS TO BE INSERTED INTO MECHANICAL JOINT BELLS, CUT OFF THE BEVEL SO THE PLAIN-END IS SQUARE CUT. DO NOT DEFLECT PVC PIPE AT CONNECTION TO CAST OR DUCTILE IRON PIPE OR FITTINGS.

B. PUSH-ON JOINTS:
FOR PVC PIPE PLAIN ENDS TO BE INSERTED IN DUCTILE IRON OR CAST IRON PUSH-ON BELL, THE SPIGOT TAPER SHALL BE CUT TO 1/4-INCH LONG. PLACE AN IDENTIFYING MARK ON PIPE THAT IS NOT FURNISHED WITH A DEPTH MARK ON THE PLAIN END TO SHOW THE DEPTH OF THE SOCKET AND TO VERIFY THAT PIPE IS PROPERLY SET IN THE BELL. ASSEMBLE JOINTS IN ACCORDANCE WITH AWWA C600 AND C605, THE MANUFACTURER'S RECOMMENDATIONS, AND AS SPECIFIED HEREIN.

DO NOT DEFLECT PVC PIPE AT CONNECTION TO CAST OR DUCTILE IRON PIPE OR FITTINGS. THE CONTRACTOR SHALL ACHIEVE CHANGE IN ALIGNMENT AS INDICATED ELSEWHERE HEREIN. ASSEMBLY OF THE PLAIN END INTO THE BELL SHALL BE DONE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE SPIGOT SHALL NOT BE INSERTED DEEPER THAN MANUFACTURER'S RECOMMENDATIONS. INSTALL PUSH-ON RESTRAINED JOINTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

C. RESTRAINED JOINT:.
IN A RESTRAINED JOINT, PVC PIPE SHALL NOT BE DEFLECTED. IF DEFLECTION IS REQUIRED IN A RESTRAINT JOINT, USE RESTRAINED DUCTILE IRON PIPE.

3. WHERE THE CONTRACTOR CHOOSES TO USE PVC FITTINGS, THE PRESSURE CLASS OF THE FITTING SHALL BE THE SAME AS, OR GREATER THAN, THE PRESSURE CLASS OF THE PIPE TO WHICH IT CONNECTS. IF THE PRESSURE CLASS IS NOT AVAILABLE, THE CONTRACTOR SHALL USE A DUCTILE IRON FITTING. WHERE A FITTING WITH RESTRAINED JOINTS IS REQUIRED, A DUCTILE IRON MECHANICAL JOINT SHALL BE USED.

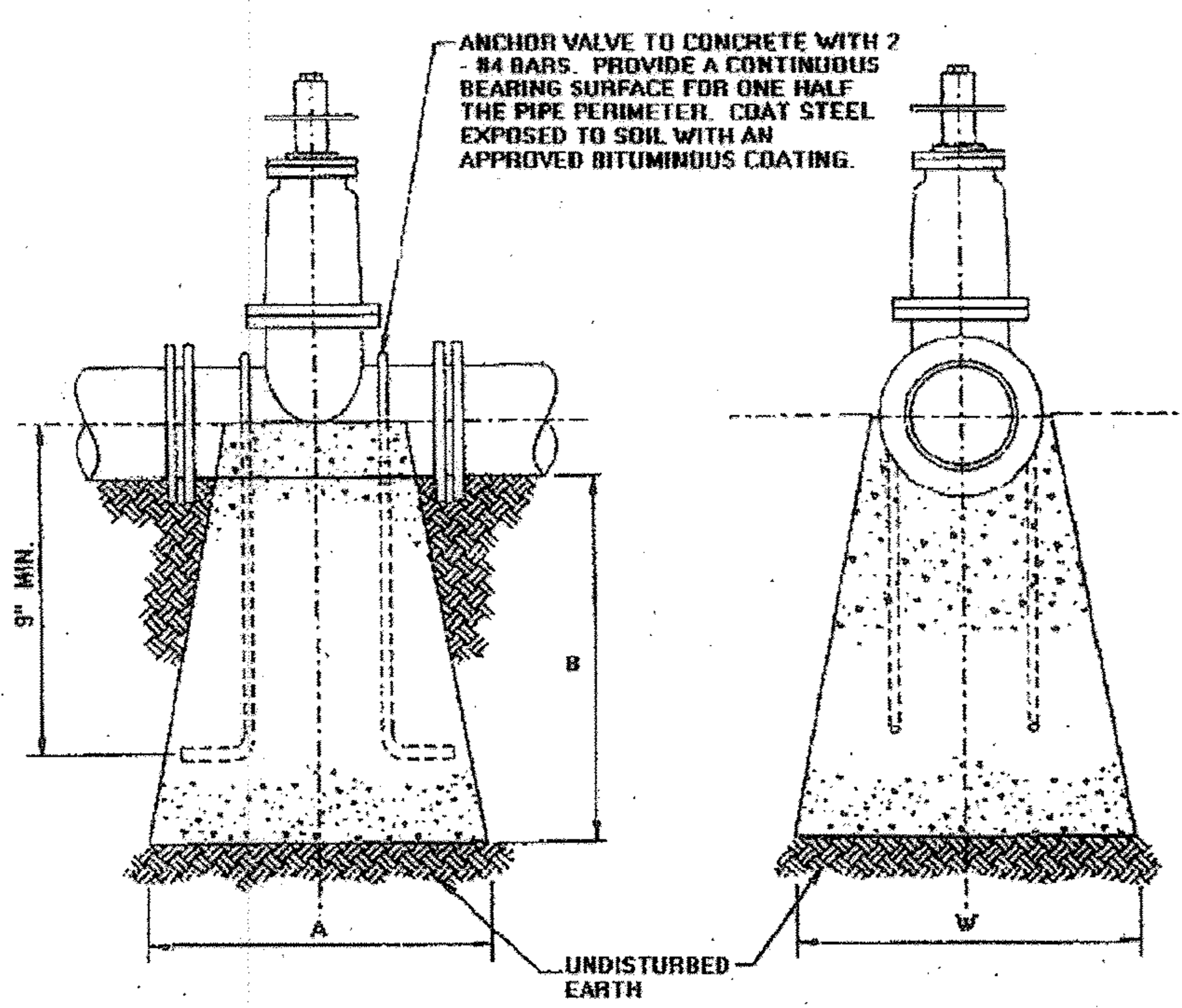
4. FIRE HYDRANT LEAD, INCLUDING MAINLINE TEE, SHALL BE DUCTILE IRON ONLY.

5. CONNECTIONS TO PVC PIPE FOR WATER HOUSE CONNECTIONS:

A. PERFORM TAPS ON PVC PIPE IN ACCORDANCE WITH AWWA C605, THE PIPE MANUFACTURER'S RECOMMENDATIONS, AND AS INDICATED HEREIN.
B. INSTALL A SERVICE SADDLE WHEN TAPPING A PVC WATER MAIN. MAINTAIN A MINIMUM OF 24 INCHES BETWEEN TAPS AND PVC PIPE BELLS.

C. FOR PVC WATER PIPE, USE ONLY CUTTING/TAPPING TOOLS AND MACHINES MADE SPECIFICALLY FOR CUTTING AWWA C900 PIPE AND AS DESCRIBED IN AWWA C605. THE CUTTING/TAPPING MACHINE SHALL BE INSTALLED SO THAT IT DOES NOT DISTORT THE PIPE. THE MACHINE SHALL BE SUPPORTED SO THAT ITS WEIGHT IS NOT CARRIED BY THE PIPE. WHEN TAPPING PVC PIPE, FOLLOW THE MANUFACTURER'S SAFETY PRECAUTIONS AND THE SAFETY PRECAUTIONS CITED IN AWWA C605.

D. MULTIPLE TAPS IN A SINGLE PIPE SHALL BE STAGGERED AROUND THE PIPE CIRCUMFERENCE SO THEY ARE NOT ON A COMMON LINE PARALLEL TO THE LONGITUDINAL AXIS OF THE PIPE AND BE AT LEAST 18-INCHS APART WHEN MEASURED LONGITUDINALLY.



PIPE SIZE	A	B	W
4"	9"	1' - 0"	1' - 0"
6"	10"	1' - 6"	1' - 0"
8"	1' - 0"	2' - 0"	2' - 0"
12"	1' - 0"	2' - 0"	3' - 0"

ALL CONCRETE TO BE MIX NO. 2

ANCHORAGES FOR VALVES WITH PVC PIPE

AS-BUILT
By [signature] Date 7/3/18

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 NUMBER 16597, EXPIRATION DATE: 08-15-2015

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	DEPARTMENT OF PLANNING AND ZONING HOWARD COUNTY, MARYLAND	Richardson Engineering, LLC
[signature] 9/23/14 CHIEF, BUREAU OF UTILITIES DATE	[signature] 9.30.14 CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. DATE	30 East Padonia Road, Suite 500 Timonium, Maryland 21093 Phone: 410-560-1502 Fax: 443-901-1208

STATE OF MARYLAND — PATRICK C. RICHARDSON, JR. — NO. 16597 — REGISTERED PROFESSIONAL ENGINEER

DES: CND			
DRN: CND			
CHK: PCR			
SEPT. DATE: 2014	BY	NO.	REVISION	DATE

FINAL
WATER & SEWER NOTES

600' SCALE MAP #38 — BLOCK #2&3

ELKRIDGE CROSSING
LOTS 1-36, OPEN SPACE LOT 37 AND BULK PARCEL 'F'
CONTRACT # 14-4713-D

TAX MAP #38 — PARCEL #30 & 38
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET: 4 OF 4