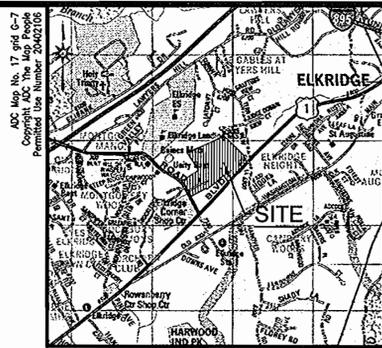
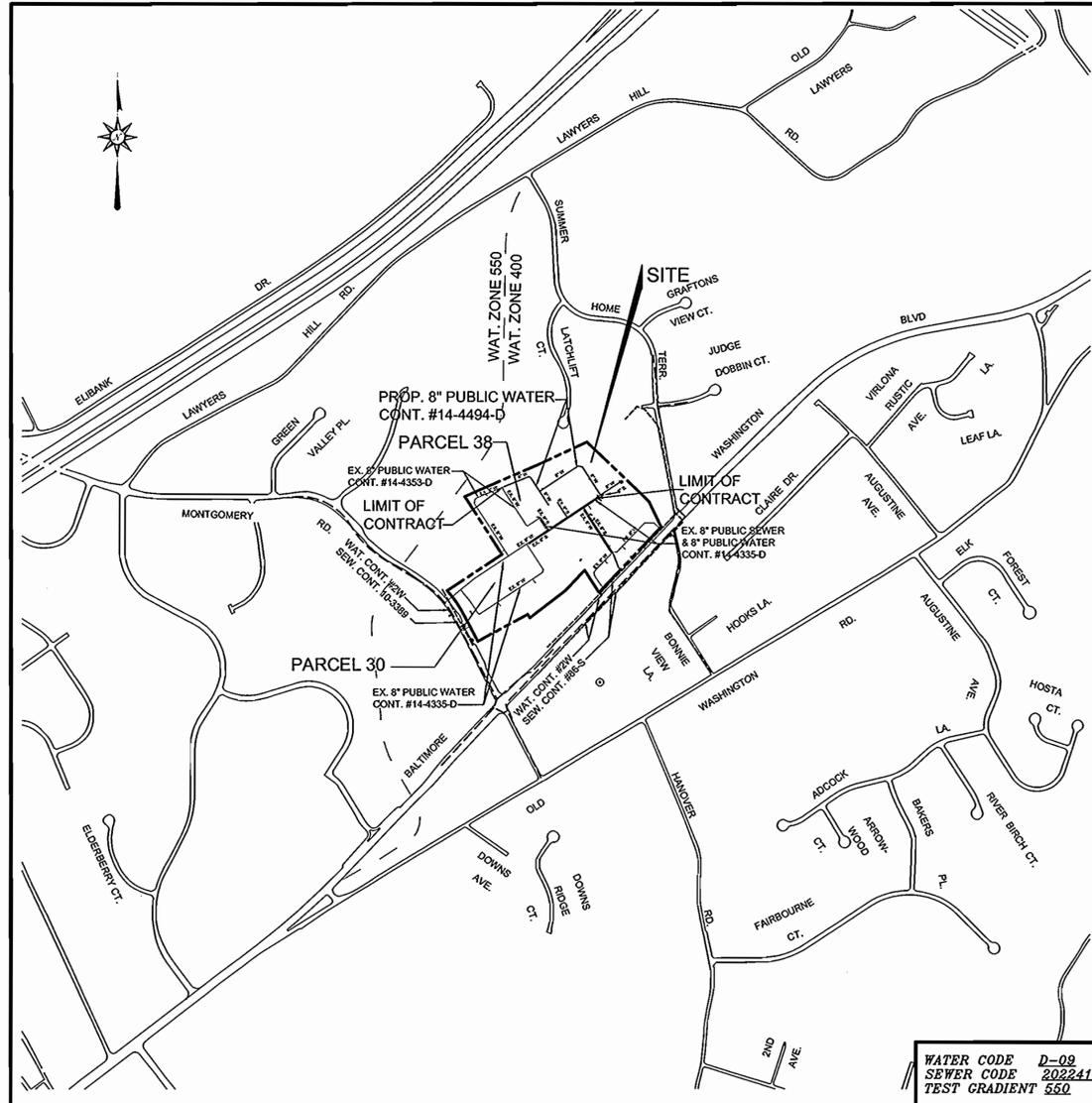


ELKRIDGE CROSSING MONTGOMERY ROAD & WASHINGTON BOULEVARD (U.S. RTE. #1) PRELIMINARY WATER & SEWER PLAN HOWARD COUNTY, MARYLAND CONTRACT No. 14 - 4494 - D



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. C -900	1,055 LF			
6" P.V.C. C -900	300 LF			
8" x 8" TEE	2 EA.			
8" x 6" TEE	7 EA.			
8" x 4" TEE	5 EA.			
8" VALVE	4 EA.			
6" VALVE	7 EA.			
4" VALVE	5 EA.			
1-1/2" x 1" WYE	21 EA.			
1" BALL VALVE	49 EA.			
1 1/2" COPPER	775 LF			
FIRE HYDRANT	4 EA.			
8" CAP & BUTTRESS	2 EA.			
8" x 4" T.S. V.&V.	2 EA.			
8" x 6" T.S. V.&V.	2 EA.			
1" COPPER	330 LF			
8" PVC SEWER	105 LF			
6" PVC SEWER	250 LF			
4" MANHOLE	1 EA.			

HOWARD COUNTY BENCHMARKS				
NO.	NORTHING	EASTING	ELEV.	DESCRIPTION
3849	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 DISK ON CONC. MONUMENT ON WEST SIDE OF RTE. #1 APPROXIMATELY 100' NORTH OF BONNIE VIEW LANE.



GENERAL NOTES

PART 1.

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 MILDBERG-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. 3849, NO. 385A.
4. ALL VERTICAL CONTROLS ARE BASED ON NAD '83 VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE BRASS DISKS ON CONCRETE MONUMENTS.
5. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
6. 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.
7. 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.
8. 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.
9. 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
BCE (CONSTRUCTION SERVICES)	410-650-4600
BCE (EMERGENCY)	410-685-1400
BUREAU OF UTILITIES	410-313-4900
COLORADO PIPELINE CO.	410-795-1390
MISS UTILITY	410-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033/410-224-9210

10. 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.
11. 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.
12. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)-313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/ANCHORING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DFM REQUIREMENTS PER SECTION 18.114(A) OF THE HOWARD COUNTY CODE.

PART II WATER

1. ALL WATER MAINS SHALL BE ANNA C500 P.V.C. 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. FOR SPRINKLER SYSTEM FOR ALL TOWNHOUSES OR MULTI-FAMILY DWELLING UNITS SHOULD HAVE A 1 1/2" CONNECTION WITH A 1" METER.
8. 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 ANNA C66.
9. 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.
10. 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.
11. 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.
12. 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.
13. THE FOLLOWING NOTE IS ADDED TO HOWARD COUNTY STANDARD DETAIL W2-22, BUTTRESSES AND ANCHORAGES FOR VERTICAL BENDS: WHEN ANCHORING PVC PIPE THE STRAPPING IN CONTACT WITH THE PIPE SURFACE SHALL BE 1-INCH WIDE BY 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.
14. EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF ANNA C500 D68, PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.

NOTE: THE MATERIAL TO BE USED FOR THE WATER MAIN CONSTRUCTION IS C-900 PVC. ALL DEFLECTIONS, VERTICAL & HORIZONTAL, MUST BE USING BENDS & AND NOT CRIMPS. THE JOINTS IN C-900 PIPE CANNOT BE DEFLECTED.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN SDP-04-0174 SDP 08-055

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

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

John R. Robertson 3/27/08
SOIL CONSERVATION DISTRICT DATE

[Signature]
SOIL CONSERVATION DISTRICT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

Stah C. Coan s1m108
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 4/1/08
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Richardson Engineering, LLC

30 East Potomac Road, Suite 500
Timonium, Maryland 21093
Phone: 410-560-1502 Fax: 443-901-1208



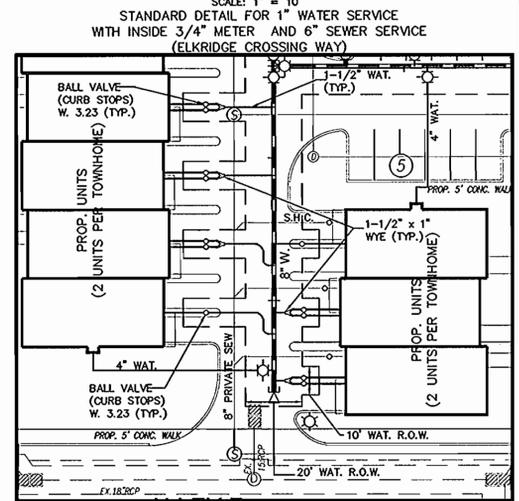
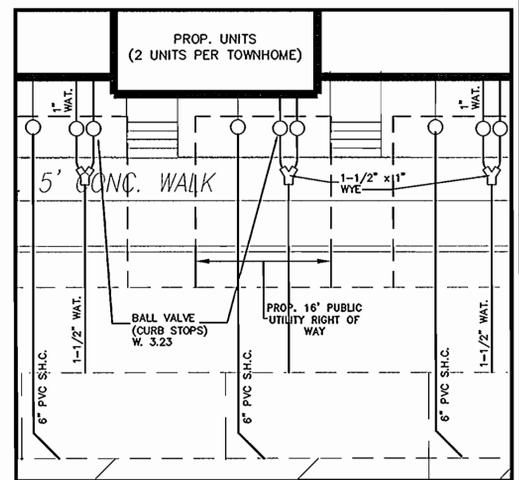
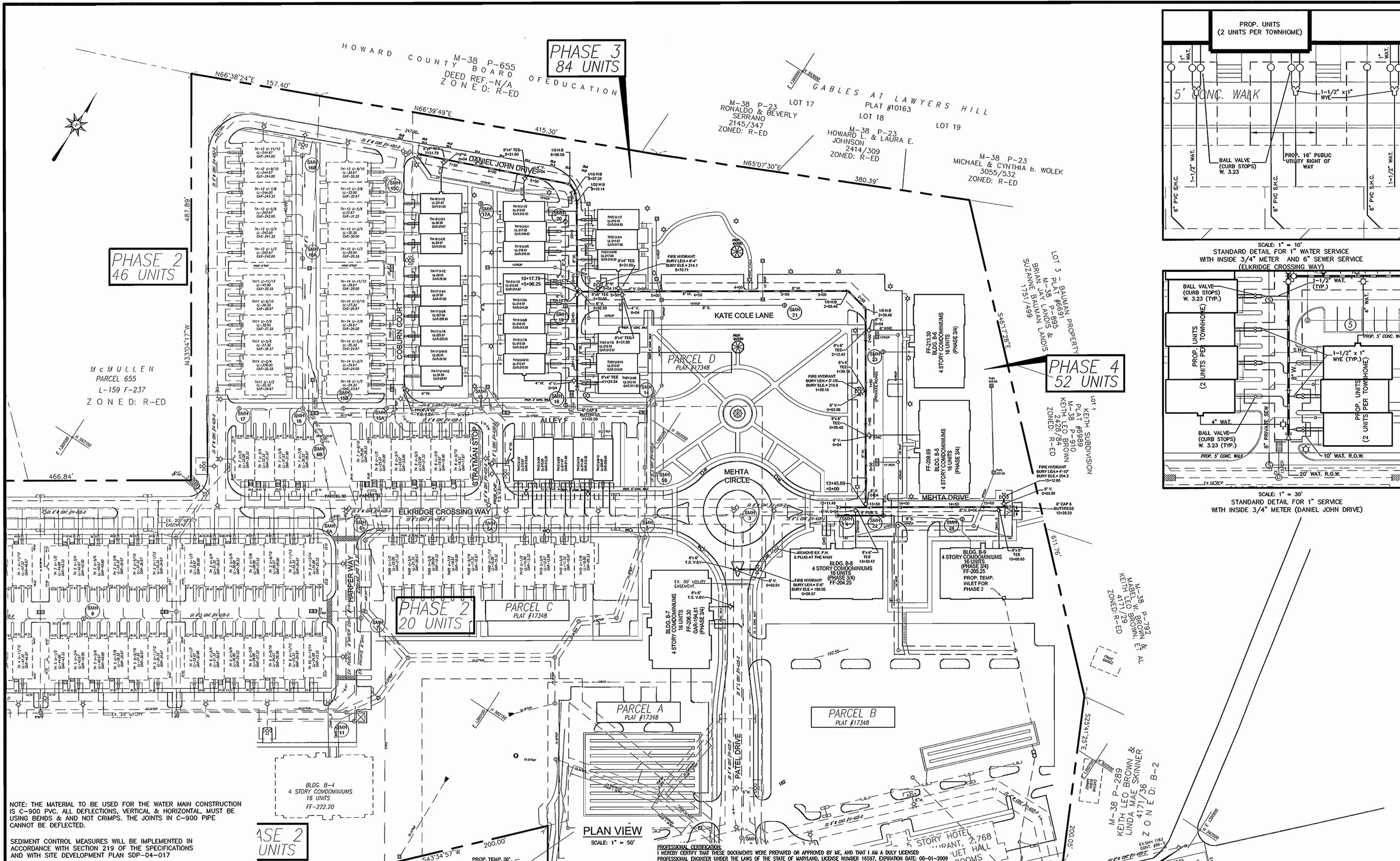
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DRN: CND				
CHK: PCR				
DEC.				
DATE: 2007	BY	NO.	REVISION	DATE

PHASE III & IV PRELIMINARY
WATER & SEWER PLAN
COVER SHEET

ELKRIDGE CROSSING
CONTRACT #14-4494-D

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

SCALE:
AS SHOWN
SHEET:
1 OF 4



NOTE: THE MATERIAL TO BE USED FOR THE WATER MAIN CONSTRUCTION IS C-900 PVC. ALL DEFLECTIONS, VERTICAL & HORIZONTAL, MUST BE USING BENDS & NOT CRIMPS. THE JOINTS IN C-900 PIPE CANNOT BE DEFLECTED.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN SDP-04-017

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: 08-01-2009

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Stella C. Con...
CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

Richardson Engineering, LLC
4/1/08
CHIEF, DEVELOPMENT ENGINEERING DIVISION

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



DES: CND					
DRN: CND					
CHK: PCR					
DEC: DATE: 2007	BY NO.	REVISION	DATE	600' SCALE MAP #38	BLOCK #2&3

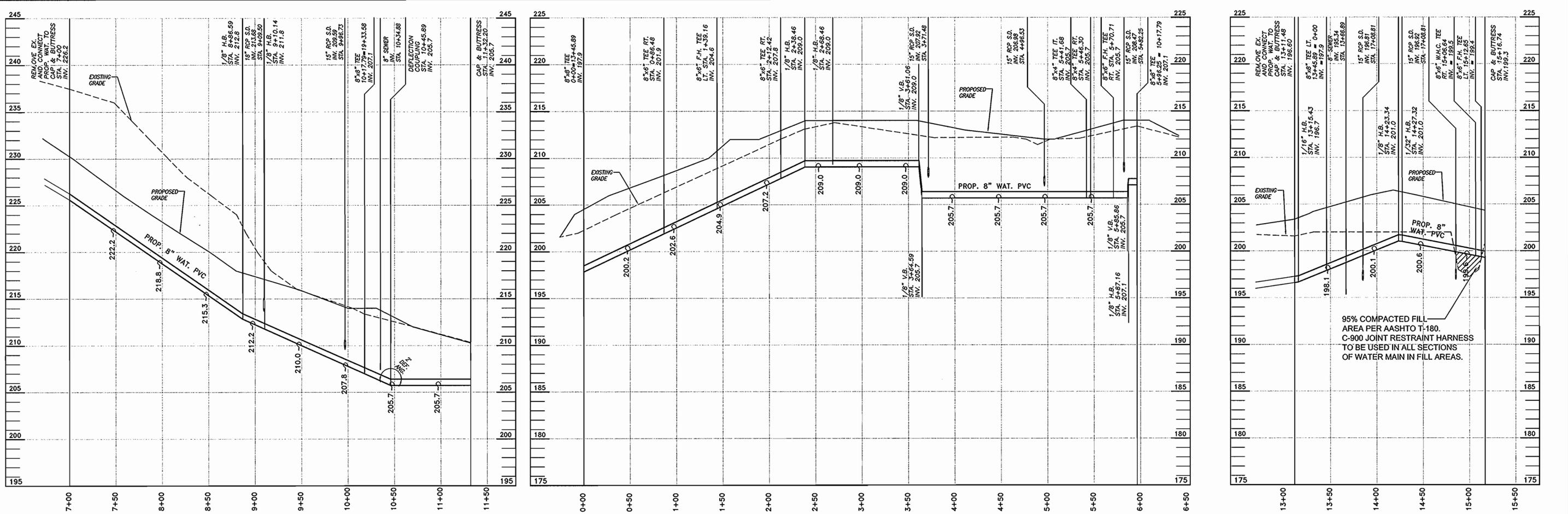
PHASE III & IV PRELIMINARY WATER & SEWER UTILITY PLAN

ELKDRIDGE CROSSING MONTGOMERY ROAD & WASHINGTON BOULEVARD (U.S. RTE. #1)
CONTRACT #14-4494-D

TAX MAP #38
1ST ELECTION DISTRICT

PARCEL #30 & 38
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET: 2 OF 4



DANIEL JOHN DRIVE KATE COLE LANE MEHTA DRIVE

SPECIFICATIONS FOR PIPE JOINT RESTRAINT SYSTEMS

1. SCOPE
This specification covers pipe joint restraint systems to be used on domestic water mains for PVC C-900 pipe sizes 4-inch through 12-inch diameter and PVC C-905 pipe sizes 16-inch through 24-inch diameter, and for Ductile Iron pipe sizes from 4-inch through 24-inch diameter. Joint restraint systems are classified as "compression," "mechanical joint" or "non-metallic restrained joint" for the specific type of pipe joint to be restrained.

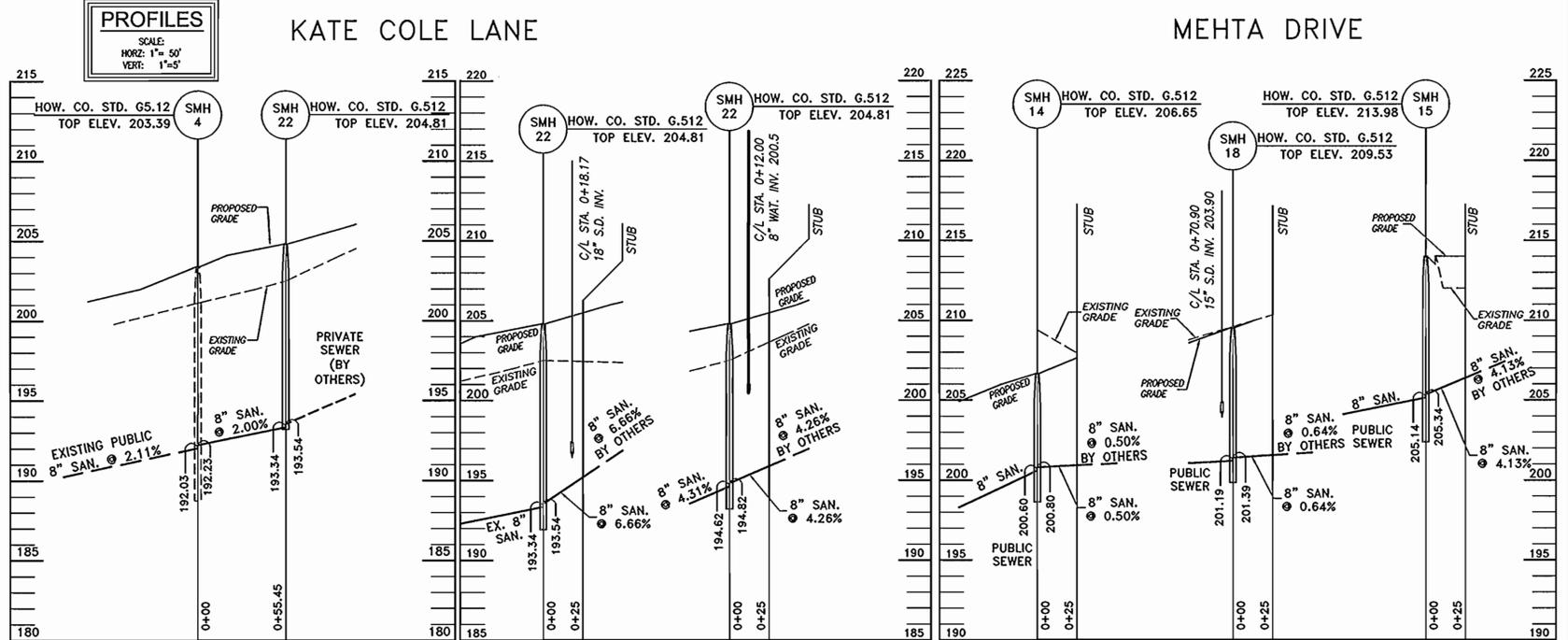
2. GENERAL REQUIREMENTS:
A. Underwriter Laboratories (UL) and Factory Mutual (FM) certifications are required on all restraint systems.
B. Unless otherwise noted, restraint systems to be used on PVC C-900 and C-905 pipe shall meet or exceed ASTM Standard F1674-01, "Standard Test Methods for Joint Restraint Products for Use with PVC Pipe," or the latest revision thereof. Restraint systems used on ductile iron pipe shall meet or exceed UL Standard 184.
C. Non-metallic restrained joint pipe and couplings shall be utilized specifically for C-900 PVC pipe and fittings in sizes 4"-12".
D. Each restraint system shall be packaged individually and include installation instructions.

3. SPECIFIC REQUIREMENTS:
A. Restraint for PVC C-900/C-905 & Ductile Iron Push-on Type Connections:
1. Pipe restraints shall be utilized to prevent movement for push-on D.I. or PVC (C900&C905) (compression type) bell and spigot pipe connections or where a flexible coupling has been used to join two sections of planned pipe O.I. or PVC (C900&C905). The restraint may be adapted to connect a plain end O.I. or PVC pipe to a ductile iron mechanical joint (MJ) bell fitting. The restraint must not be directionally sensitive.
2. The pipe shall be restrained by a split restraint band. The band shall be cast ductile iron, meeting or exceeding ASTM A536-80, Grade 65-45-12. The inside face or contact surface of the band shall be of sufficient width to incorporate cast or machined non-directionally sensitive serration to grip the outside circumference of the pipe. The serration shall provide full (360 degrees) contact and maintain pipe roundness and avoid any localized points of stress. The split band casting shall be designed to "bottom-out" before clamping bolt forces (11 0N-ft minimum torque) can over-stress the pipe, but will provide full non-directionally sensitive restraint at the rated pressure.
3. Bolts and nuts used to attach the split restraint ring shall comply with ANSI B 18.2.2, SAE Grade 5. Tee-bolts, nuts and restraining rods shall be fabricated from high-strength, low-alloy steel per ASTM A 11190.
4. The split ring type non-directionally sensitive restraint system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D and be for both D.I. and/or PVC C900.
5. Restraint systems sizes six through twelve inches shall be capable of use for both ductile iron and/or PVC C900.
6. The restraint system may consist of two types: the two split restraint rings and for new construction use only the one split and one solid cast backup ring.
B. Compression Ring Fitting Restraint for Ductile Iron Pipe & PVC C-900.
1. Compression ring with follower gland type of restraint may be utilized in conjunction with Mechanical Joint (MJ) bell end ductile iron pipe fittings for restraining PVC C-900 and ductile iron pipe.
2. The system shall utilize a standard MJ gasket with a color-coded compression ring and replacement gland conforming to ASTM A 536-80, Grade 65-45-12.
3. Standard MJ fitting Tee-bolts and nuts shall be fabricated from high strength steel conforming to ASTM A 11190 / A2111-90 and ASTM A536/A536-80.
4. Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.
5. The restraint system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D.
C. Non-metallic restrained joint pipe and couplings for PVC C-900 Type Connections:
1. Gasketed restrained coupling connections shall join two sections of factory grooved PVC (C900) pipe. The restraint coupling or must not be directionally sensitive.
2. The coupling shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F-477 and shall be OR-14 Class 200 C-900 PVC in all applications, meeting or exceeding the performance requirements of AWWA C-900, latest revision. The inside face or contact surface of the coupling connection shall be of sufficient width to incorporate a factory machined non-directionally sensitive groove in both pipe and coupling to grip the outside circumference of the pipe. The couplings shall provide full (360 degrees) contact and maintain pipe roundness and avoid any localized points of stress. The coupling shall be designed with an internal stop to align the precision-machined grooves in the coupling and pipe prior to installation of a non-metallic thermoplastic restraint system, and will provide full non-directionally sensitive restraint at the rated pressure.
3. High-strength flexible thermoplastic spacers shall be inserted into mating precision-machined grooves in the pipe and coupling to provide full non-directional restraint with evenly distributed loading.
4. The non-metallic restrained joint pipe and couplings for PVC C-900 type non-directionally sensitive restraint system shall be capable of a test pressure twice the maximum sustained working pressure listed in Section D and be for PVC (C900) pipe sizes four through twelve inch.
5. Non-metallic restrained joint pipe and couplings for PVC C-900 restrained systems sizes four through twelve inches shall be capable of use for both Class 150 (DR 18) and four through eight inches for Class 200 (DR 14) PVC C900 pipe.
6. The non-metallic restrained joint pipe and couplings for PVC C-900 restraint system shall consist of a pipe and couplings system produced by the same manufacturer meeting the performance qualifications of Factory Mutual (FM) and Underwriters Lab (UL).
D. Fitting Restraint for Ductile Iron Pipe (Only):
1. Radial bolt type restraint systems shall be limited to ductile iron pipe in conjunction with Mechanical Joint (MJ) bell end pipe fittings. The system shall utilize a standard MJ gasket with a ductile iron replacement gland conforming to ASTM A 536-80. The gland dimensions shall conform to Standard MJ bolt circle criteria.
2. Individual wedge restrainers shall be ductile iron heat treated to a minimum hardness of 370 BHN. The wedge screws shall be compressed to the outside wall of the pipe using a shoulder bolt and twist-off nuts to insure proper actuating of the restraining system.
3. Standard MJ fitting Tee-bolts and nuts shall be high strength steel conforming to AWWA C111/A21.11-90 and C153/A21.53-88.
4. Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.
D. Maximum Sustained Working Pressure Requirements:
Nominal Diameter PVC C-900 / C-905 DUCTILE IRON
4 & 6 inch 200 P.S.I. 350 P.S.I.
8 inch 200 P.S.I. 250 P.S.I.
10 & 12 inch 200 P.S.I. 200 P.S.I.
14 & 16 inch 200 P.S.I. 235 P.S.I.
20 & 24 inch 200 P.S.I. 235 P.S.I.

4. TESTS:
The Elkridge Crossing Water System may, at no cost to the manufacturer, subject random joint restraint system products to testing by an independent laboratory for compliance with these standards. Any visible defect of failure to meet the quality standards herein will be ground for rejecting the entire order.

5. PRODUCT LIST:
The attached qualified product list identifies specified manufacturers models approved for installation in SAMS water distribution systems.
Approved Manufacturers and Models:
A. Spigot Joint Restraint Systems: PVC C-900/C905 Ductile Iron D.I. 16" Above
Ford/Uni-Flange 1390C 1390C 1390C
EBA Iron Sales, Inc. 1500 1700 1700
Romac Industries, Inc. Model 611 Model 611 470S
Star Pipe Products 1100 1100 1100
B. Compression Ring Systems: PVC C-900 Ductile Iron
Romac Industries, Inc. Gripping-D 1 Gripping-D 1
Tyler Corporation MJR Gland MJR Gland
Star Pipe Products Ring Lock 3500 Series
C. Non-Metallic Restraint Joint Pipe and Couplings for PVC C-900 RJ Type Connections:
Certain Teed Corporation, CERIALOCK C-900/RJ
4" - 12" CLASS 150 (DR-18)
4" - 8" CLASS 200 (DR-14)

D. Fitting Restraint (MJ):
PVC C-900 Ductile Iron
2000 PV Megapkg1 100
EBA Iron Sales, Inc. Not Approved
Romac Industries, Inc. Not Approved
Ford/Uni-Flange UFR-1500-C4"-24" Series 1400
StarPipe Products Starpipe 4000 Starpipe 4000
Signo Corporation One Lock SLC One Lock SLD



NOTE: THE MATERIAL TO BE USED FOR THE WATER MAIN CONSTRUCTION IS C-900 PVC. ALL DEFLECTIONS, VERTICAL & HORIZONTAL, MUST BE USING BENDS & AND NOT CRIMPS. THE JOINTS IN C-900 PIPE CANNOT BE DEFLECTED.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN SDP-04-017

SMH 4 TO SMH 22 SMH 22 TO STUB NE & SMH 22 TO STUB NW SMH 14 TO STUB, SMH 18 TO STUB & SMH 15 TO STUB

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

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

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 16897, EXPIRATION DATE: 08-01-2009

DES: CND DRN: CND CHK: PCR DEC: DATE: 2007

PHASE III & IV PRELIMINARY WATER & SEWER PLAN DETAILS & PROFILES

ELKRIDGE CROSSING MONTGOMERY ROAD & WASHINGTON BOULEVARD (U.S. RTE. #1) CONTRACT #14-4494-D

TAX MAP #38 BLOCK #2&3 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

(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:

- SPECIAL PROVISIONS
- PLANS (DRAWINGS)
- SUPPLEMENTAL SPECIFICATIONS
- 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 INSTRUCTED 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 ADHERE SPECIFICALLY TO 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 PIPE 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 GRADE OF ELEVATION 700.00 AS SPECIFIED UNDER PARAGRAPH 1002.04.

5.06 TEMPORARY PROTECTIVE CHANNEL COVER:

(A) IN ALL SEWER MAINS 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) DISINFECTION OF WATER MAINS SHALL BE DONE BY THE CONTRACTOR AS SPECIFIED AND DISINFECTED WITHOUT ADDITIONAL PAINTMENT THEREOF, THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT FOR THE COMPLETE STERILIZING OPERATIONS.

(2) DISINFECTION OF WATER MAINS SHALL BE DONE IN ACCORDANCE WITH ANNA C651-58 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:

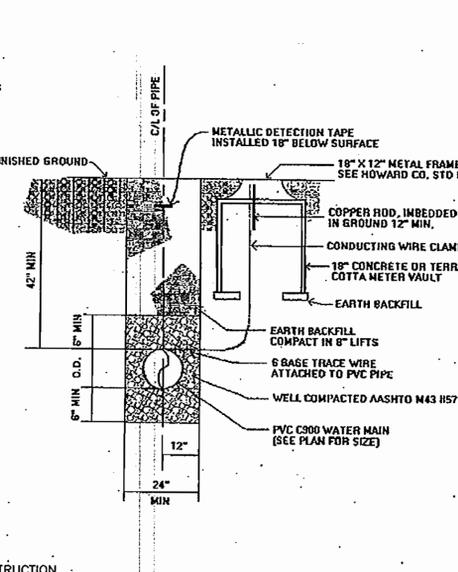
- ALL DUCTILE IRON PIPES TO BE USED ON THE PUBLIC WATER SYSTEM SHALL BE CLASS 54. DUCTILE IRON FITTINGS SHALL MEET THE REQUIREMENTS OF THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND SHALL BE EXTERIOR EPOXY COATED IN ACCORDANCE WITH ANNA C16.
- ALL 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.
- 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.
- 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.
- 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.
- THE FOLLOWING NOTE IS ADDED TO HOWARD COUNTY STANDARD DETAIL W2.22, BUTTRESSES AND ANCHORAGES FOR VALVES. WHEN ANCHORING PVC PIPE, THE STRAPPING IN CONTACT WITH THE PIPE SURFACE SHALL BE 1-INCH WIDE BY 1/4-INCH THICK STEEL. THE REMAINING PORTION OF THE STRAP SHALL BE REINFORCING BAR SIZED IN ACCORDANCE WITH THE PERTINENT CHART SHOWN ON THE DETAIL.
- EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF ANNA C900 ORB, PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERE TO.

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 1022 WATER MAINS OF THE HOWARD COUNTY STANDARD SPECIFICATIONS ARE AMENDED TO INCLUDE THE FOLLOWING REQUIREMENTS.

GENERAL

- 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 IMPROPERITIES, WHICH MAY IMPAIR THE PERFORMANCE OR LIFE OF THE PIPE. EACH PIPE SHALL BE STRAIGHT TO WITHIN 1/4-INCH PER 20-FOOT LENGTH OF PIPE WHEN UNSUPPORTED ALONG ITS ENTIRE LENGTH, AND SHALL HAVE A TRUE CIRCULAR CROSS-SECTION TO WITHIN ± 1/64 INCH.
- PVC PIPE MANUFACTURED MORE THAN SIX MONTHS PRIOR TO WORK SITE INSPECTION WILL NOT BE ACCEPTED.
- LOADING, UNLOADING, HANDLING, INSPECTION AND STORAGE OF PVC PIPE AND FITTINGS SHALL BE IN ACCORDANCE WITH ANNA C606. PVC PIPE SHALL BE STORED SUCH THAT IT DOES NOT DEFORM OR BEND.
- SUBMITTALS: THE FOLLOWING ITEMS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. MATERIALS NOT APPROVED WILL NOT BE ACCEPTED.
 - 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 ANNA C900.
 - 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-RETRACTION TEST IN ACCORDANCE WITH ANNA C907.
 - MISCELLANEOUS FOR PVC WATER PIPE: SUBMIT MANUFACTURER'S LITERATURE AND CERTIFICATES OF COMPLIANCE, FOR JOINT RESTRAINT DEVICES, PIPE COUPLINGS, TRACER WIRE, WIRE CONNECTOR SPLICE KITS, DETECTION TAPE, AND SERVICE SADDLES.
 - SUBMIT MANUFACTURER'S 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

NOTE: THE MATERIAL TO BE USED FOR THE WATER MAIN CONSTRUCTION IS C-900 PVC. ALL DEFLECTIONS, VERTICAL & HORIZONTAL, MUST BE USING BENDS & NOT CRIMPS. THE JOINTS IN C-900 PIPE CANNOT BE DEFLECTED.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN SDP-04-017

MATERIALS

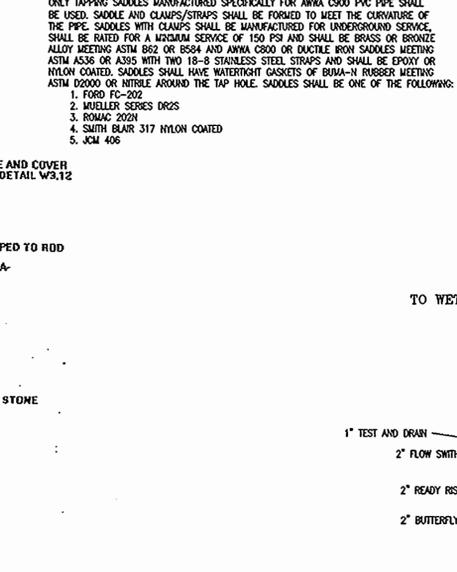
THE ENGINEER WILL INSPECT ALL MATERIALS BEFORE, DURING AND AFTER INSTALLATION TO ENSURE COMPLIANCE WITH THE CONTRACT DOCUMENTS. WHEN SPECIFIC TESTS OF MATERIALS ARE CALLED FOR IN THE REFERENCED STANDARDS AND SPECIFICATIONS, THE ENGINEER HAS THE OPTION OF REQUIRING THAT ANY OR ALL OF THESE TESTS BE PERFORMED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

- PVC PIPE AND FITTINGS:
 - PVC PIPE 4 INCHES THROUGH 12 INCHES IN DIAMETER SHALL BE MANUFACTURED BY 20-FOOT LENGTHS IN ACCORDANCE WITH ANNA 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 JOINTING PIPES IN ACCORDANCE WITH ANNA 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 SPOOT END FOR LENGTH OF INSERTION INTO THE BELL AND FACTORY TESTED IN ACCORDANCE WITH ANNA C900. PVC PIPE SHALL BE MANUFACTURED BY ONE OF THE FOLLOWING:
 - UPONOR ETI
 - J-M PIPE
 - DIAMOND PLASTICS CORP.
 - NATIONAL PIPE AND PLASTICS, INC.
 - 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 ANNA C907, PRESSURE CLASS 150, OR FABRICATED MEETING ANNA C900, CLASS 200. PVC FITTINGS SHALL BE MANUFACTURED BY THE HARRINGTON CORPORATION (HARO) OR APPROVED EQUAL. PIPE JOINTS SHALL BE IN ACCORDANCE WITH THE STANDARDS SPECIFIED FOR THE PIPE AND FITTINGS.
 - PIPE COUPLERS 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 COUPLERS SHALL BE ROMAC STYLE 501, FORD FC20R OR APPROVED EQUAL.
- JOINT RESTRAINT 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 HARRINGTON JOINTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THE REQUIREMENTS BELOW:
 - ALL JOINT RESTRAINT DEVICES SHALL BE FACTORY MUTUAL APPROVED.
 - IN RESTRAINED JOINTS, PVC PIPE SHALL NOT BE DEFLECTED. IF DEFLECTION IS REQUIRED IN A RESTRAINED JOINT, USE DUCTILE IRON PIPE OR FITTINGS.
 - 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, EBA IRON SERIES 2000PV, OR APPROVED EQUAL.
 - WHERE A RESTRAINED JOINT IS REQUIRED FOR PVC PUSH-ON JOINT, JOINT RESTRAINT SHALL BE UNB-8-13, ICM 620 SUR-GRP, EBA IRON SERIES 1800, UNIFLANGE SERIES 1390-C, OR APPROVED EQUAL.
 - TRACER WIRE FOR NON METALLIC PIPELINES:
 - TRACER WIRE SHALL BE 6-GAUGE, 7-STRAND CONTINUOUS COPPER WIRE WITH A 45-MIL POLYETHYLENE INSULATION. THE WIRE SHALL BE BLUE, HAVE "M" MARKINGS AND SUITABLE FOR DIRECT BURY APPLICATIONS.
 - 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 18-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.

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:

- INSTALLATION OF PVC WATER MAINS:
 - PVC PIPE AND FITTINGS SHALL BE HANDLED IN ACCORDANCE WITH ANNA C606.
 - 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 M43, 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 IN FIRM BEDDING.
 - INSTALL PVC ANNA C900 PRESSURE PIPE:
 - INSTALLATION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS EXCEPT AS INDICATED HEREIN. CHANGES IN HORIZONTAL AND VERTICAL ALIGNMENT AND CURVED ALIGNMENTS SHOWN ON THE PLANS SHALL BE MADE BY USING FITTINGS OR HIGH-DEFLECTION COUPLERS. 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 OF THE PIPE END THE METHOD FOR INSERTING THE SPOOT 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 SPOOT END OF THE PIPE SHALL BE MADE TO A POINT WHERE THE FACTORY MARK IS EVEN WITH THE FACE OF THE BELL.
 - TRACER WIRES:
 - INSTALL TRACER WIRES WITH THE PIPE. TAPE WIRE TO THE TOP OF THE PIPE WITH MINIMUM 2-INCH WIDE X 1/2"-PVC-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 OBSCURITY 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.
 - 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 M43, SIZE NUMBER 57 AGGREGATE TO A MINIMUM OF 6 INCHES OVER THE CROWN OF THE PIPE. TRENCH BACKFILL SHALL PROCEED THEREAFTER IN 6-INCH LAYERS. CONTRACTOR SHALL PROVIDE FULL TRENCH COMPACT DENSITY OF 95% AS DETERMINED BY AASHTO T-160-A.
 - DETECTION TAPE:
 - INSTALL DETECTION TAPE DIRECTLY OVER THE CENTERLINE OF THE WATER MAINS ON COMPACTED BACKFILL NOT LESS THAN 6 INCHES OR MORE THAN 24 INCHES BELOW FINISHED SURFACE. TAPE SHALL BE INSTALLED WITH MANUAL SPACERS. SPACERS SHALL OVERLAP A MINIMUM OF 6 INCHES.
- JOINTS:
 - MECHANICAL JOINTS: FOR PVC PLAN-END TO BE CONNECTED TO DUCTILE IRON MECHANICAL JOINT BELL, ASSEMBLE THE JOINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, AS MARKED BY ANNA C606, THE PIPE MANUFACTURER'S RECOMMENDATIONS AND AS SPECIFIED HEREIN. FOR PVC PIPE PLAN ENDS TO BE INSERTED INTO MECHANICAL JOINT BELLS, CUT OFF THE BEVEL SO THE PLAN-END IS SQUARE OUT. DO NOT DEFLECT PVC PIPE AT CONNECTION TO CAST OR DUCTILE IRON PIPE OR FITTINGS.
 - PUSH-ON JOINTS: FOR PVC PIPE PLAN ENDS TO BE INSERTED IN DUCTILE IRON OR CAST IRON PUSH-ON BELL, THE SPOOT 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 PLAN END TO SHOW THE DEPTH OF THE SOCKET AND TO VERIFY THAT PIPE IS PROPERLY SET IN THE BELL. ASSEMBLE JOINTS IN ACCORDANCE WITH ANNA C900 AND C606, 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 PLAN END INTO THE BELL SHALL BE DONE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE SPOOT SHALL NOT BE INSERTED DEEPER THAN MANUFACTURER'S RECOMMENDATIONS. INSTALL PUSH-ON RESTRAINED JOINTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 - RESTRAINED JOINT: IN A RESTRAINED JOINT, PVC PIPE SHALL NOT BE DEFLECTED. IF DEFLECTION IS REQUIRED IN A RESTRAINED JOINT, USE RESTRAINED DUCTILE IRON PIPE.
 - 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.
 - FIRE HYDRANT LEAD, INCLUDING MARLINE TEE, SHALL BE DUCTILE IRON ONLY.

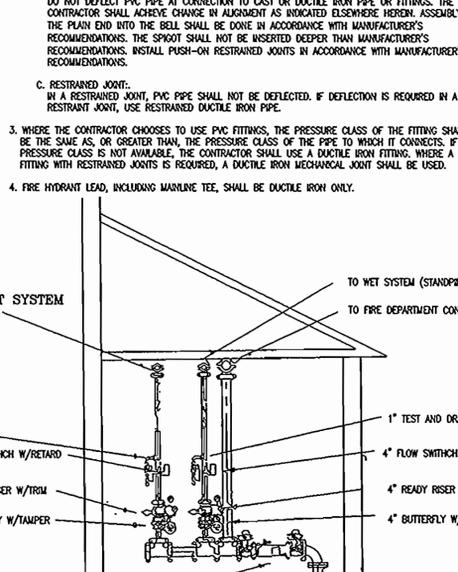
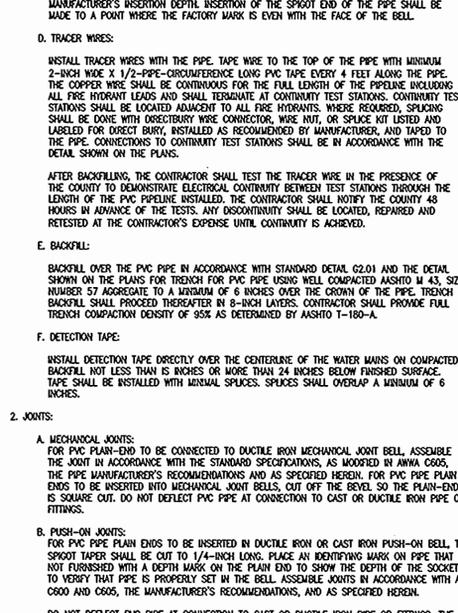


VALVE ROOM

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: 08-01-2009

CONNECTIONS TO PVC PIPE FOR WATER HOUSE CONNECTIONS:

- PERFORM TAPS ON PVC PIPE IN ACCORDANCE WITH ANNA C606, THE PIPE MANUFACTURER'S RECOMMENDATIONS, AND AS INDICATED HEREIN.
- INSTALL A SERVICE SADDLE WHEN TAPPING A PVC WATER MAIN. MAINTAIN A MINIMUM OF 24 INCHES BETWEEN TAPS AND PVC PIPE BELLS.
- FOR PVC WATER PIPE, USE ONLY CUTTING/TAPPING TOOLS AND MACHINES MADE SPECIFICALLY FOR CUTTING ANNA C900 PIPE AND AS DESCRIBED BY ANNA C606. 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 ANNA C606.
- 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-INCHES APART WHEN MEASURED LONGITUDINALLY.



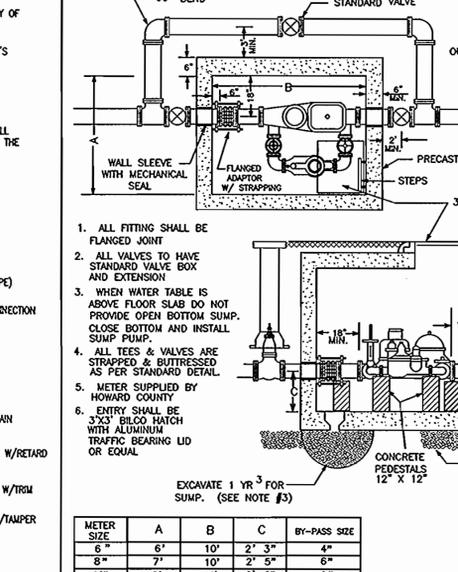
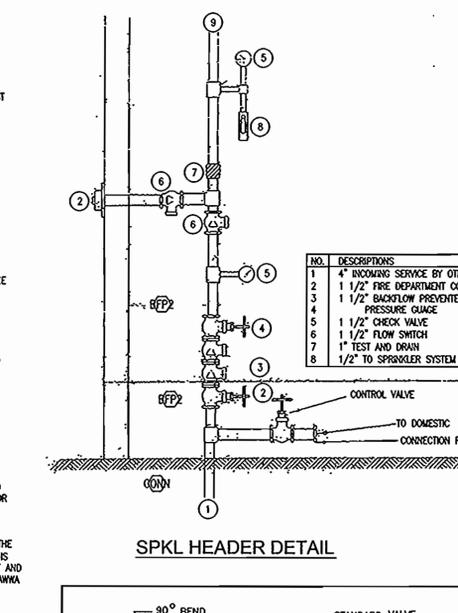
PIPE SIZE	A	B	W
4"	9"	1'-0"	1'-0"
6"	10"	1'-6"	1'-0"
8"	1'-0"	2'-0"	2'-0"
12"	1'-0"	2'-0"	3'-0"

ALL CONCRETE TO BE MIX NO. 2

TO BE USED ONLY WHERE VALVES ARE NOT ATTACHED TO TEES.

CONNECTIONS TO PVC PIPE FOR WATER HOUSE CONNECTIONS:

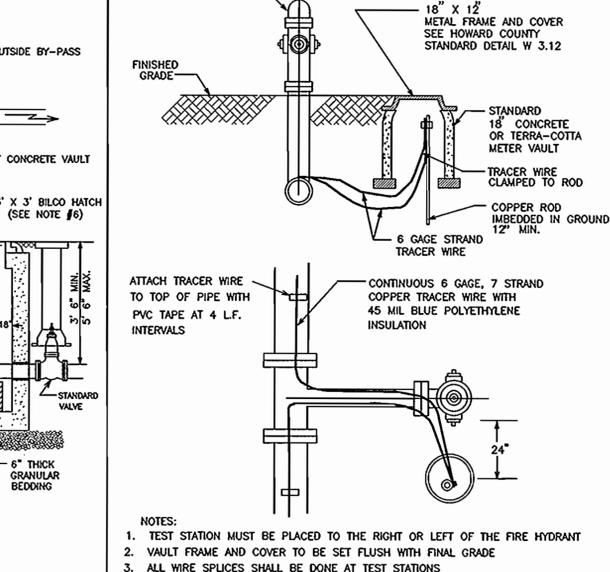
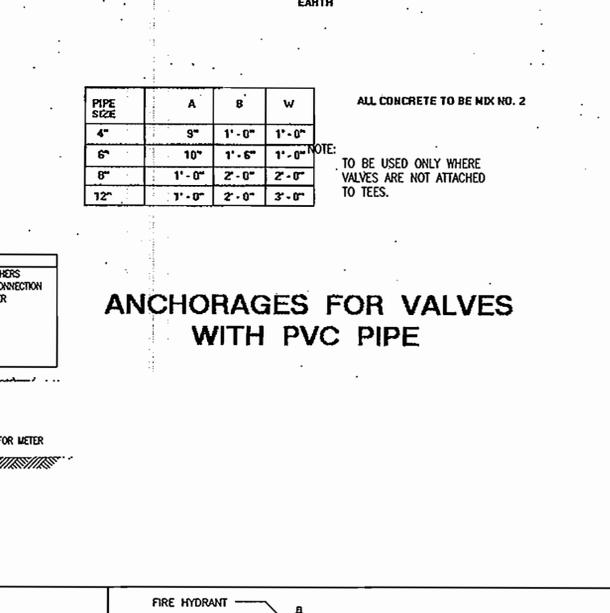
- PERFORM TAPS ON PVC PIPE IN ACCORDANCE WITH ANNA C606, THE PIPE MANUFACTURER'S RECOMMENDATIONS, AND AS INDICATED HEREIN.
- INSTALL A SERVICE SADDLE WHEN TAPPING A PVC WATER MAIN. MAINTAIN A MINIMUM OF 24 INCHES BETWEEN TAPS AND PVC PIPE BELLS.
- FOR PVC WATER PIPE, USE ONLY CUTTING/TAPPING TOOLS AND MACHINES MADE SPECIFICALLY FOR CUTTING ANNA C900 PIPE AND AS DESCRIBED BY ANNA C606. 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 ANNA C606.
- 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-INCHES APART WHEN MEASURED LONGITUDINALLY.



METER	A	B	C	BY-PASS SIZE
6"	6"	10"	2' 3"	4"
8"	7"	10"	2' 5"	6"
10"	8"	10"	2' 8"	6"

CONNECTIONS TO PVC PIPE FOR WATER HOUSE CONNECTIONS:

- PERFORM TAPS ON PVC PIPE IN ACCORDANCE WITH ANNA C606, THE PIPE MANUFACTURER'S RECOMMENDATIONS, AND AS INDICATED HEREIN.
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- 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-INCHES APART WHEN MEASURED LONGITUDINALLY.



HOWARD COUNTY	STANDARD INSTALLATION	REVISIONS
	6", 8" & 10" WATER SUPPLY SERVICE	FOR
	6", 8" & 10" COMBINED SERVICE	W 3.37

6" & 8" METERS TO BE INSTALLED BY DEVELOPER AND ALL 1" METERS WILL BE INSTALLED BY HOWARD COUNTY

HOWARD COUNTY STANDARD INSTALLATION CONTINUITY TEST STATION AT FIRE HYDRANT & SPLICES

ELKRIDGE CROSSING MONTGOMERY ROAD & WASHINGTON BOULEVARD (U.S. RTE. #1) CONTRACT #14-4494-D

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

SCALE: NTS

SHEET: 4 OF 4

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

S. C. CANN
CHEF, BUREAU OF UTILITIES

1/19/09
DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

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

4/1/09
DATE

Richardson Engineering, LLC

30 East Postonia Road, Suite 500
Timonium, Maryland 21093
Phone: 410-560-1502 Fax: 443-901-1208

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: 08-01-2009

DES: CND
DRN: CND
CHK: PCR
DEC: DEC
DATE: 2007

NO SCALE

BY NO. REVISION

PHASE III & IV PRELIMINARY WATER & SEWER PLAN NOTES & DETAILS

600' SCALE MAP #38

ELKRIDGE CROSSING MONTGOMERY ROAD & WASHINGTON BOULEVARD (U.S. RTE. #1) CONTRACT #14-4494-D

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

SCALE: NTS

SHEET: 4 OF 4