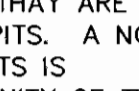


GENERAL NOTES

- APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON APRIL 1997 BY O'CONNELL & LAWRENCE, INC. BOUNDARY SHOWN HEREON BASED ON FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED ON OR ABOUT MARCH 2003 BY MILDENBERG BOENDER & ASSOCIATES.
- 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. 241A AND NO. 241B.
ALL VERTICAL CONTROLS ARE BASED ON NAVD 29. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE HO.CO. GEODETIC CONTROL STA. 241A & 241B.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF POLES OR DAMAGE TO POLES SHALL BE DEDUCTED FROM MONIES OWNED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
- FOR DETAILS NOT SHOWN ON THE DRAWING, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL  THE LOCATIONS OF THE TEST PITS, A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
- THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:
AT&T1-800-252-1133
BGE(CONSTRUCTION SERVICES).....410-850-4620
BGE(EMERGENCY).....410-685-1400
BUREAU OF UTILITIES.....410-313-4900
COLONIAL PIPELINE CO.....410-795-1390
STATE HIGHWAY ADMINISTRATION.....410-531-5533
VERIZON.....1-800-743-0033/410-224-9210
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(g) OF THE HOWARD COUNTY CODE.

- WATER**
- ALL WATER MAINS SHALL BE C-900 PVC UNLESS OTHERWISE NOTED.
 - TOPS OF ALL WATER MAINS SHALL 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 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 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.
 - THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
 - 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 C116.
 - 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 VERTICAL BENDS. "WHEN ANCHORING PVC PIPE, THE STRAPPING IN CONTACT WITH THE PIPE SURFACE SHALL BE 1-INCH WIDE BY 1/4-INCH THICK STEEL. THE REMAINING PORTION OF THE STRAP SHALL BE REINFORCING BAR SIZED IN ACCORDANCE WITH THE PERTINENT CHART SHOWN ON THE DETAIL."
 - EXCEPT AS INDICATED ON THE PLANS AND NOTED ABOVE, ALL PUBLIC WATER MAINS SHALL BE POLYVINYLCHLORIDE (PVC) PIPE MEETING THE REQUIREMENTS OF AWWA C900 DR18, PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV-STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.
- SEWER**
- ALL SEWER MAINS SHALL BE D.I.P. OR P.V.C. UNLESS OTHERWISE NOTED.
 - ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
 - FORCE MAINS SHALL BE D.I.P. ONLY.
 - MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
 - MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL G5.52. WHERE WATERTIGHT MANHOLE FRAMES AND COVERS ARE USED, SET TOP OF FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
 - HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATED THAT THE CELLAR CANNOT BE SERVED.

QUANTITY TABLE

ITEMS	QUANTITIES ESTIMATED	QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
STANDARD MH (HO. CO. STD.G-5.12)	5	5	PRECAST	ATLANTIC PRECAST
8" SEWER MAIN	685 L.F.	593	PVC	JM
4" SEWER HOUSE CONNECTION	284 L.F.	276	PVC	JM
# SEWER HOUSE CONNECTIONS	11 EACH	11	PVC	
# MANHOLE SEWER HOUSE CONNECTIONS	2 EACH	2	PVC	JM
8" WATER MAIN (C-900 PVC)	1031 L.F.	1029	PVC	
1" WATER HOUSE CONNECTION	301 L.F.	294	"K" COPPER	
# 1" WHC	13 EACH	13	"K" COPPER	
8" CAP & BUTTRESS	1 EACH	1	D1	US
1/16 H.B. (8")	1 EACH	1	D1	US
1/32 H.B. (8")	1 EACH	1	D1	US
F.H.	2 EACH	2	D1	MUELLER
8"x6" F.H.T. & V.	2 EACH	2	D1	US
6" WATER MAIN	14 L.F.	29	D1	US
3" X 8" REDUCER	1 EACH	1	D1	US
8" X 6" TEE	1 EACH	1	D1	US
8" X 8" TEE	1 EACH	1	D1	US
8" VALVE	3 EACH	3	D1	US
NAME OF UTILITY CONTRACTOR:				
SURVEY AND DRAFTING DIVISION AS-BUILT DATE:				
1/8 HB 8" (45")	O TEA	4 TEA	D1	US

INDEX OF DRAWINGS

NO.	DESCRIPTION
1	TITLE SHEET
2	WATER AND SEWER PLAN
3	WATER PROFILE
4	SEWER PROFILE

EROSION AND SEDIMENT CONTROL FOR THIS CONTRACT IS PROVIDED UNDER F-04-52

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.

Robert Dorsey Jr. 10-06-05
DEVELOPER'S SIGNATURE DATE
DEVELOPER'S NAME

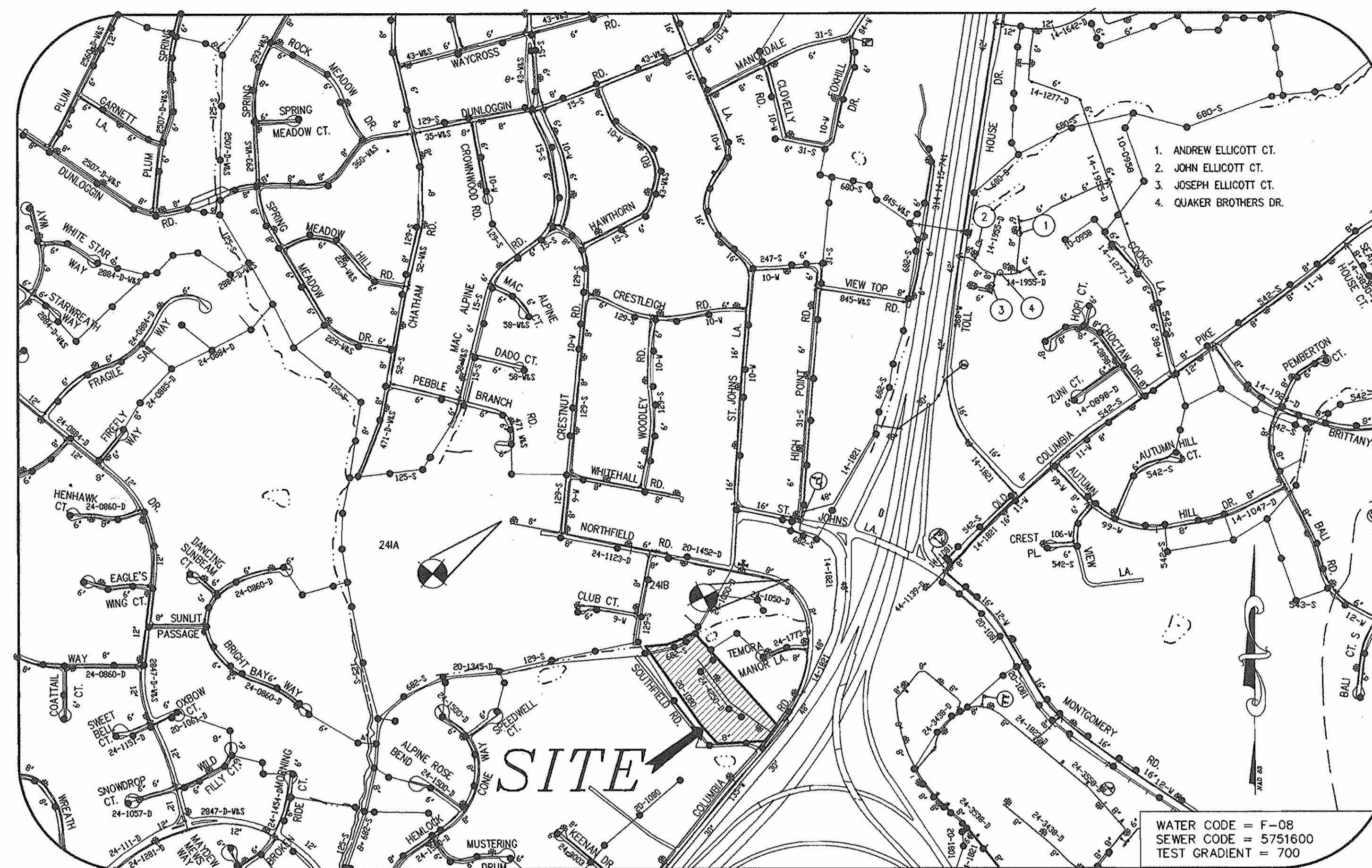
John B. Milenberg 10/6/05
ENGINEER'S SIGNATURE DATE
ENGINEER'S NAME

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS.
Jim Magnus 11/3/05
USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE SOIL CONSERVATION DISTRICT.
John R. Roberts 11/3/05
HOWARD SCD DATE

OWNER
ROSE-PARCEL 301, LLC
9926 CYPRESSMEDE DRIVE
ELLCOTT CITY, MD 21042
(410) 465-5739

PLAN REFERENCE NUMBERS:
F-04-52



VICINITY MAP

SCALE 1"=600'

TYPE OF BUILDING	SFD
No. OF UNITS	13
No. OF WATER HOUSE CONNECTION	13
No. OF SEWER HOUSE CONNECTIONS	13
DRAINAGE AREA	108 P.S.
TREATMENT PLANT	PATAPSCO WWTP

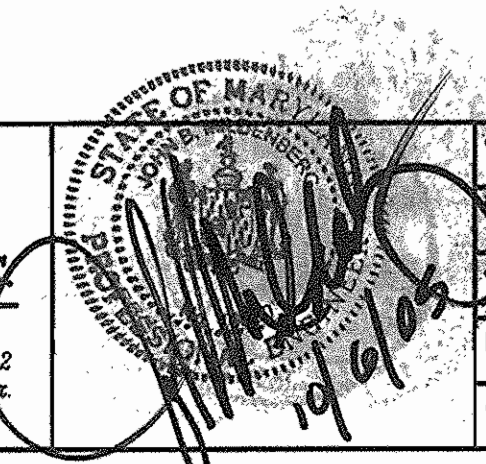
**CONTRACT NO.: 24-4250-D
FOREST CREEK
LOTS 1 THRU 13 &
OPEN SPACE LOTS 14 THRU 17
WATER AND SEWER MAIN EXTENSIONS
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS**

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors

5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0298 Ball (301) 821-5521 Wash. (410) 997-0298 Fax



DATE	BY	NO.	REVISION
AUG 2005			

TITLE SHEET

600' SCALE MAP NO. 24 BLOCK NO. 23

FOREST CREEK
LOTS 1 THRU 13 & OPEN SPACE LOTS 14 THRU 17
CONTRACT NO.: 24-4250-D
SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

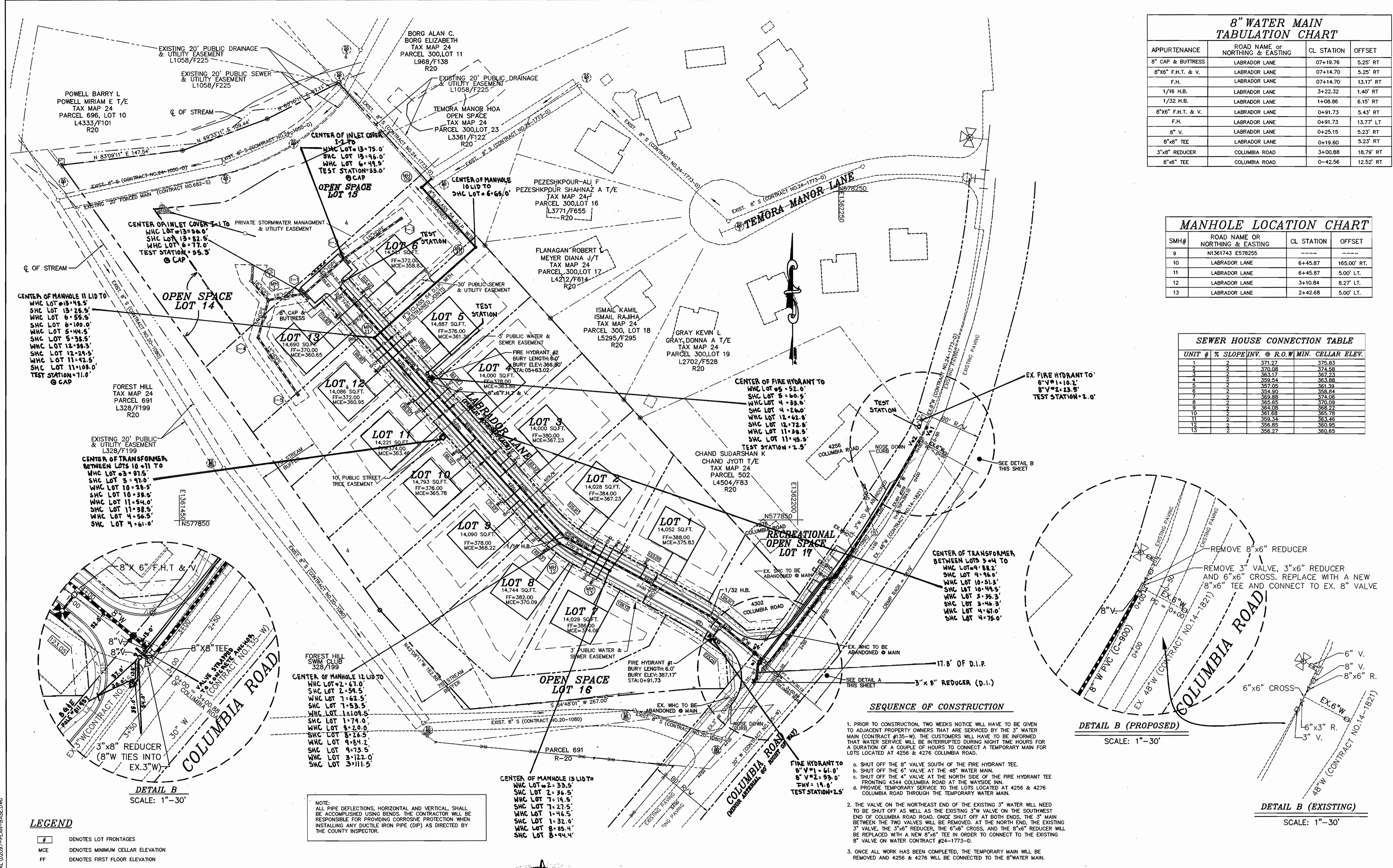
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1 of 5

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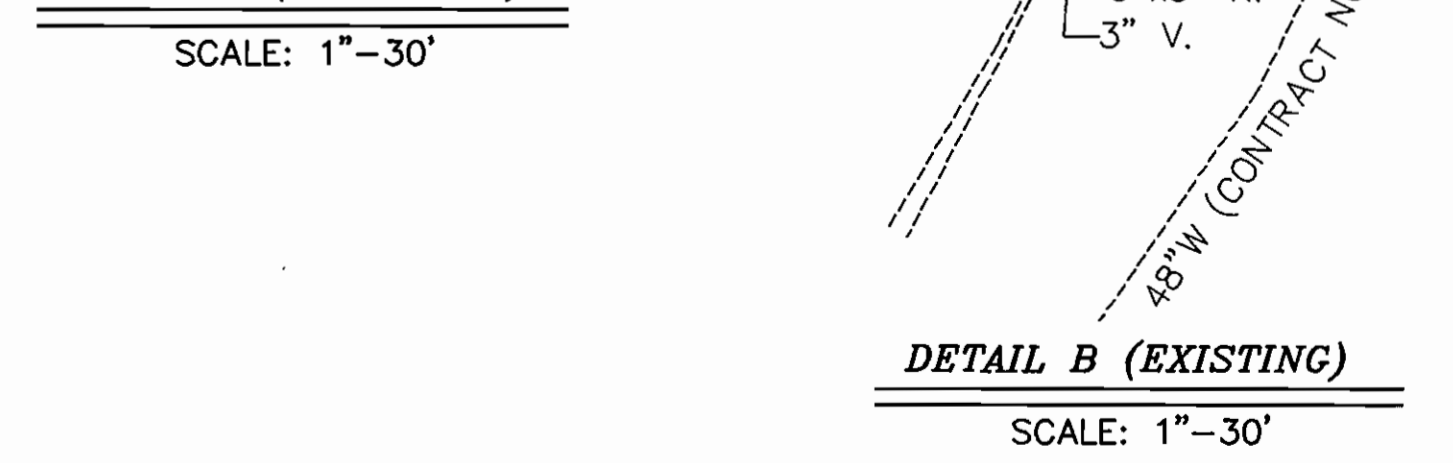
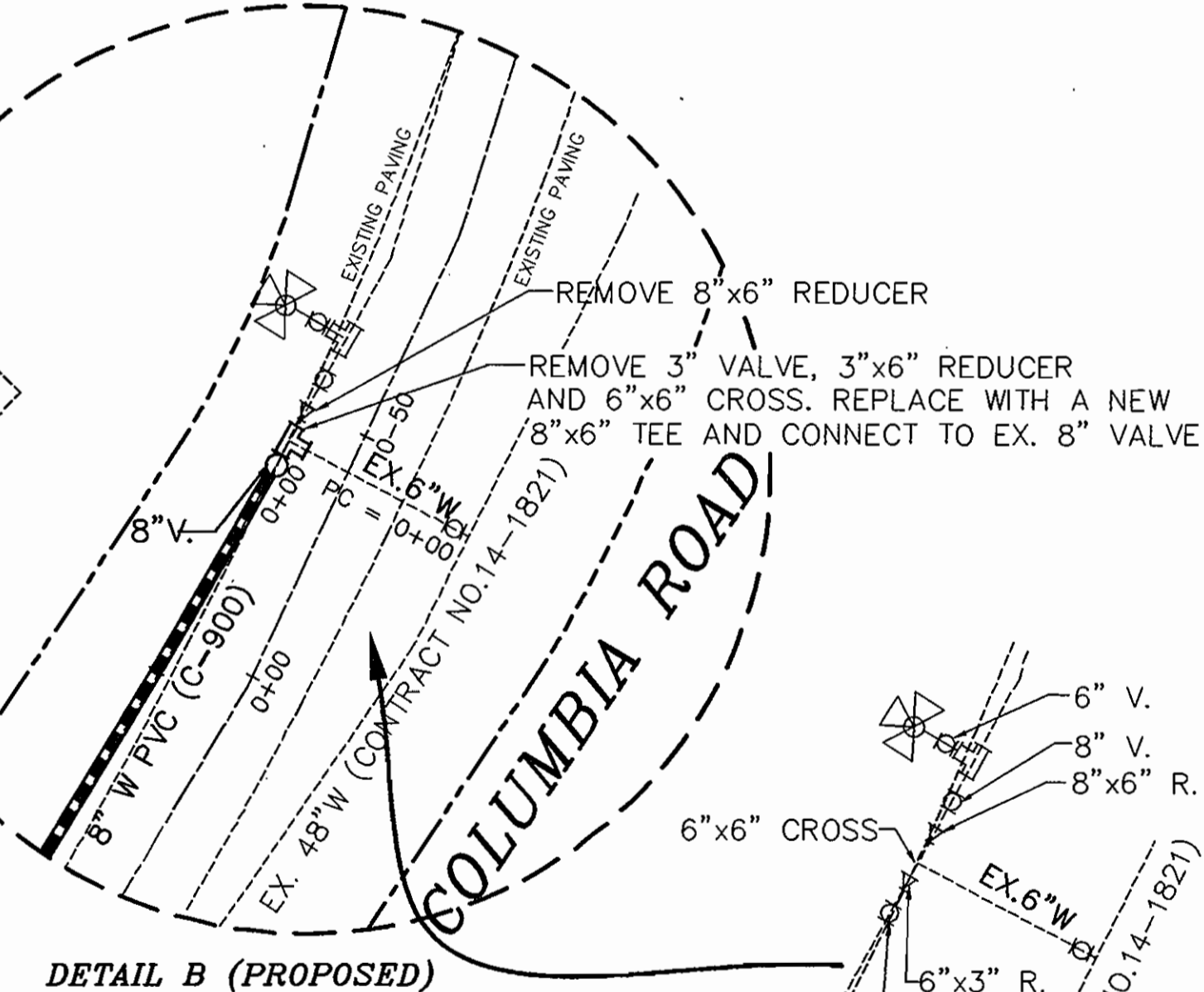
8" WATER MAIN TABULATION CHART			
APPURTENANCE	ROAD NAME OR NORTHING & EASTING	CL. STATION	OFFSET
8" CAP & BUTTRESS	LABRADOR LANE	07+19.76	5.25' RT
8"x6" F.H.T. & V.	LABRADOR LANE	07+14.70	5.25' RT
F.H.	LABRADOR LANE	07+14.70	13.17' RT
1/16" H.B.	LABRADOR LANE	3+22.32	1.40' RT
1/32" H.B.	LABRADOR LANE	1+08.86	6.15' RT
8"x6" F.H.T. & V.	LABRADOR LANE	0+91.73	5.43' RT
F.H.	LABRADOR LANE	0+91.73	13.77' LT
8" V.	LABRADOR LANE	0+25.15	5.23' RT
8"x8" TEE	LABRADOR LANE	0+19.60	5.23' RT
3"x8" REDUCER	COLUMBIA ROAD	3+00.88	18.79' RT
8"x6" TEE	COLUMBIA ROAD	0+42.56	12.52' RT

MANHOLE LOCATION CHART			
SMH#	ROAD NAME OR NORTHING & EASTING	CL. STATION	OFFSET
9	N1361743 E578255	---	---
10	LABRADOR LANE	6+45.87	165.00' RT.
11	LABRADOR LANE	6+45.87	5.00' LT.
12	LABRADOR LANE	3+10.84	8.27' LT.
13	LABRADOR LANE	2+42.68	5.00' LT.

SEWER HOUSE CONNECTION TABLE				
UNIT #	% SLOPE	INV. @ R.O.W.	MIN. CELLAR ELEV.	
1	2	371.27	375.85	
2	2	370.88	374.58	
3	2	363.17	367.23	
4	2	359.84	363.88	
5	2	357.05	361.39	
6	2	354.50	358.84	
7	2	353.88	374.06	
8	2	365.65	370.09	
9	2	364.08	368.22	
10	2	361.89	365.78	
11	2	359.34	363.46	
12	2	356.85	360.95	
13	2	356.27	360.65	



- SEQUENCE OF CONSTRUCTION**
- PRIOR TO CONSTRUCTION, TWO WEEKS NOTICE WILL HAVE TO BE GIVEN TO ADJACENT PROPERTY OWNERS THAT ARE SERVICED BY THE 3" WATER MAIN (CONTRACT #135-W). THE CUSTOMERS WILL HAVE TO BE INFORMED THAT WATER SERVICE WILL BE INTERRUPTED DURING NIGHT TIME HOURS FOR A DURATION OF A COUPLE OF HOURS TO CONNECT A TEMPORARY MAIN FOR LOTS LOCATED AT 4256 & 4276 COLUMBIA ROAD.
 - SHUT OFF THE 8" VALVE SOUTH OF THE FIRE HYDRANT TEE.
 - SHUT OFF THE 6" VALVE AT THE NORTH SIDE OF THE 3" WATER MAIN.
 - SHUT OFF THE 4" VALVE AT THE NORTH SIDE OF THE FIRE HYDRANT TEE FRONTING 4344 COLUMBIA ROAD AT THE WAYSIDE INN.
 - PROVIDE TEMPORARY SERVICE TO THE LOTS LOCATED AT 4256 & 4276 COLUMBIA ROAD THROUGH THE TEMPORARY WATER MAIN.
 - THE VALVE ON THE NORTHEAST END OF THE EXISTING 3" WATER WILL NEED TO BE SHUT OFF AS WELL AS THE EXISTING 3" VALVE ON THE SOUTHWEST END OF COLUMBIA ROAD ROAD. ONCE SHUT OFF AT BOTH ENDS, THE 3" MAIN BETWEEN THE TWO VALVES WILL BE REMOVED. AT THE NORTH END, THE EXISTING 3" VALVE, THE 3"x6" REDUCER, THE 6"x6" CROSS, AND THE 8"x6" REDUCER WILL BE REPLACED WITH A NEW 8"x6" TEE IN ORDER TO CONNECT TO THE EXISTING 8" VALVE ON WATER CONTRACT #24-1773-D.
 - ONCE ALL WORK HAS BEEN COMPLETED, THE TEMPORARY MAIN WILL BE REMOVED AND 4256 & 4276 WILL BE CONNECTED TO THE 8" WATER MAIN.

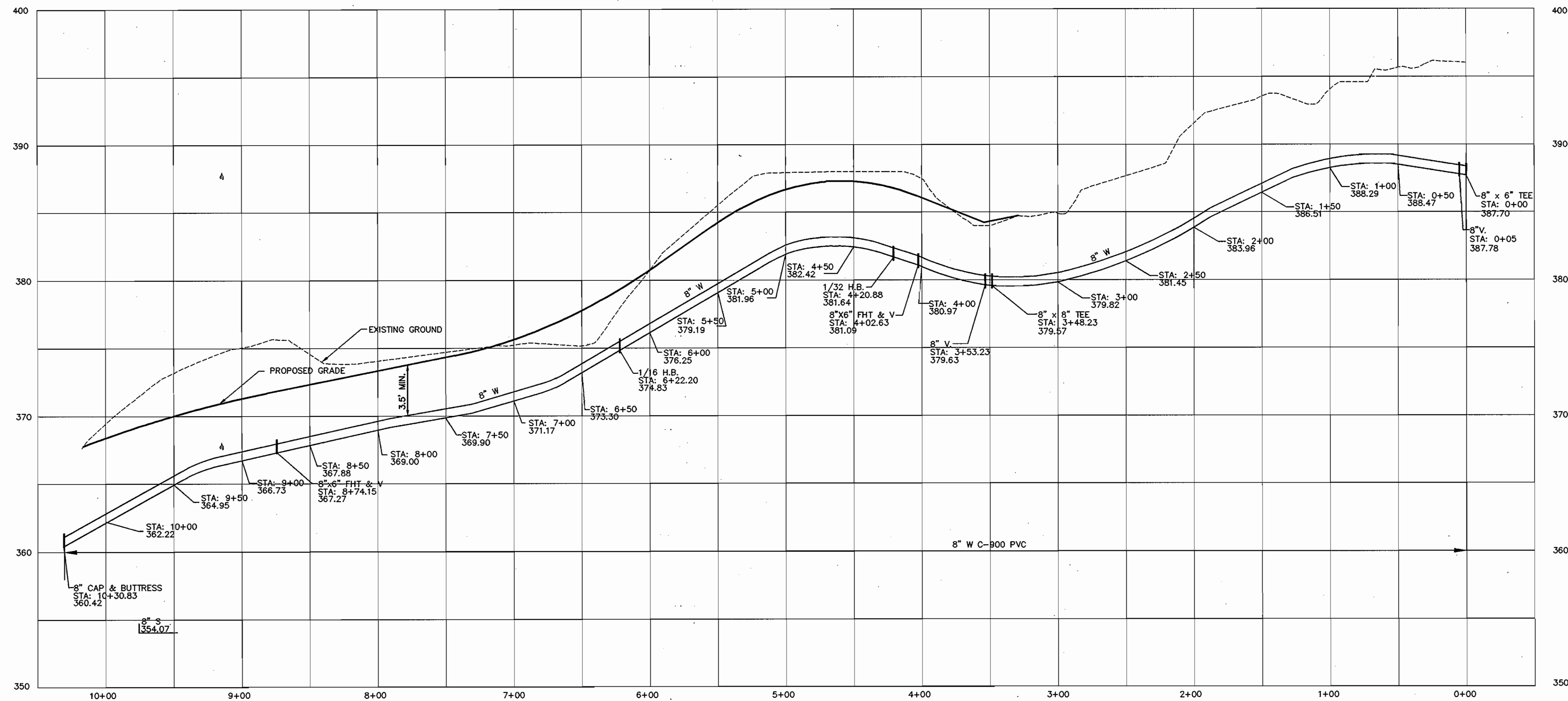


NOTE:
ALL PIPE DEFLECTIONS, HORIZONTAL AND VERTICAL, SHALL BE ACCOMPLISHED USING BENDS. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING CORROSION PROTECTION WHEN INSTALLING ANY DUCTILE IRON PIPE (DIP) AS DIRECTED BY THE COUNTY INSPECTOR.

LEGEND

- ▭ DENOTES LOT FRONTS
- MCE DENOTES MINIMUM CELLAR ELEVATION
- FF DENOTES FIRST FLOOR ELEVATION

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND APPROVED FOR BUREAU OF UTILITIES DATE: 6/10/05	DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND APPROVED FOR CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 6/10/05	MILDENBERG, BOENDER & ASSOC., INC. Engineers Planners Surveyors 5072 Dorsey Hall Drive, Suite 202, Beltsville, Maryland 20814 (410) 397-0286 Bell (301) 621-5521 Wash. (410) 397-0286 Fax	engineering: EGJ illustration: EGJ approval: JBM project: 02-097 date: JUN 2005	WATER & SEWER PLAN 600' SCALE MAP NO. 24 BLOCK NO. 23	FOREST CREEK LOTS 1 THRU 13 & OPEN SPACE LOTS 14 THRU 17 CONTRACT NO.: 24-4250-D SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND	scale: 1"=50' 2 OF 5
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WATER MAIN PROFILE
 SCALE: HOR. 1"=50'
 VER. 1"=5'

NOTE:
 ALL PIPE DEFLECTIONS, HORIZONTAL AND VERTICAL, SHALL BE ACCOMPLISHED USING BENDS. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING CORROSION PROTECTION WHEN INSTALLING ANY DUCTILE IRON PIPE (DIP) AS DIRECTED BY THE COUNTY INSPECTOR.

02-097.DWG/FINAL/02097-PROFILE.dwg

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING & ZONING
 HOWARD COUNTY, MARYLAND

MILDENBERG, BOENDER & ASSOC., INC.
 Engineers Planners Surveyors

5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
 (410) 987-0286 Ball. (301) 621-5521 Wash. (410) 987-0288 Fax



engineering	EGJ				
illustration	EGJ				
approval	JBM				
project	02-097				
date	AUG 2005	BY	NO.	REVISION	DATE

WATER PROFILE

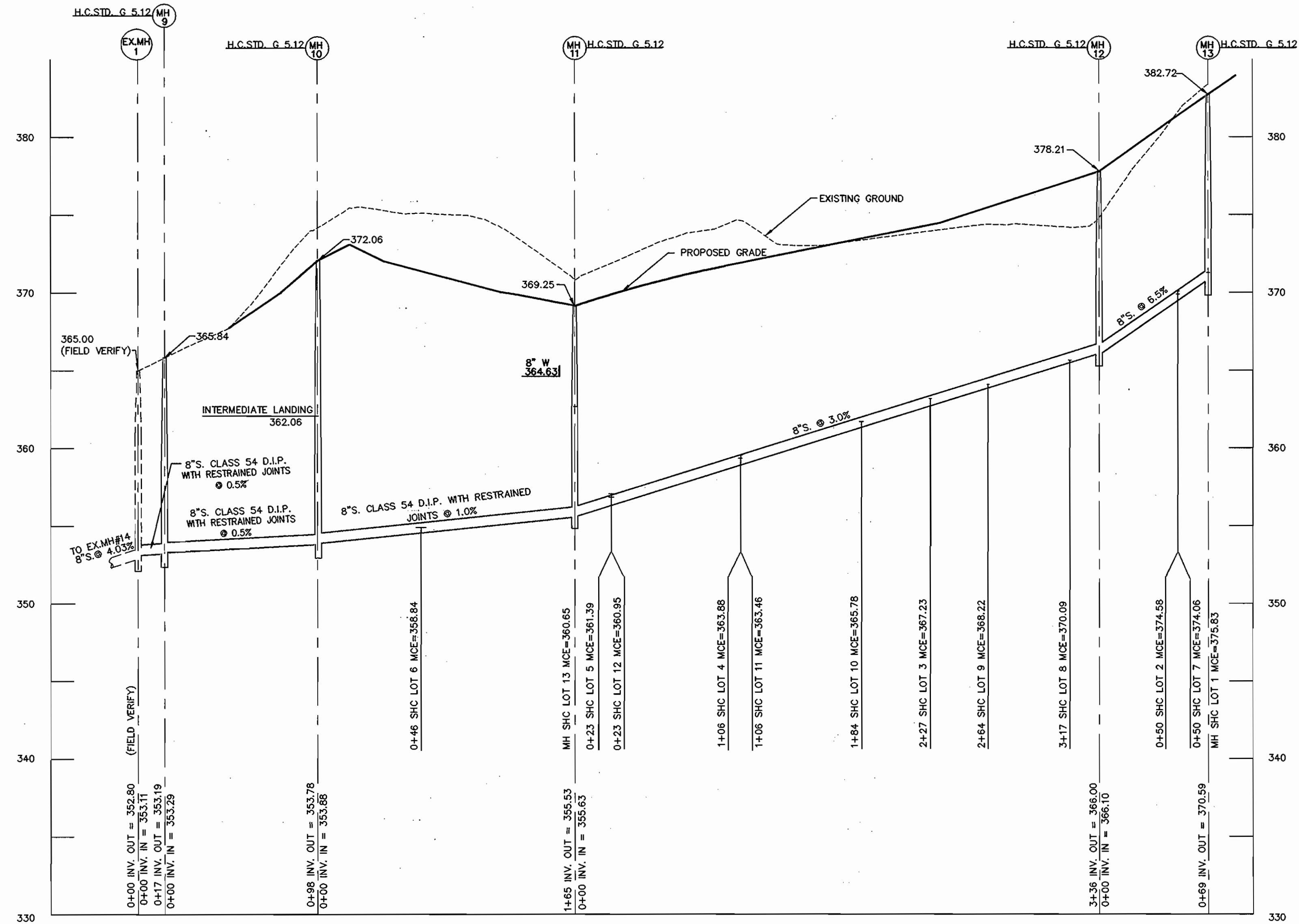
600' SCALE MAP NO. 24 BLOCK NO. 23

FOREST CREEK
 LOTS 1 THRU 13 & OPEN SPACE LOTS 14 THRU 17
 CONTRACT NO.: 24-4250-D
 SECOND ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

scale AS SHOWN
 3 of 5

R. L. Berman 9-19-05
 CHIEF, BUREAU OF UTILITIES DATE

John J. Berman 11/6/05
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



SEWER MAIN PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

NOTE:
ALL PIPE DEFLECTIONS, HORIZONTAL AND VERTICAL, SHALL BE ACCOMPLISHED USING BENDS. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING CORROSION PROTECTION WHEN INSTALLING ANY DUCTILE IRON PIPE (DIP) AS DIRECTED BY THE COUNTY INSPECTOR.

02-097.DWG\FINAL\02097-PROFILE.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>[Signature]</i> 10/17/05 CHIEF, BUREAU OF UTILITIES	DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND <i>[Signature]</i> 11/6/05 CHIEF, DEVELOPMENT ENGINEERING DIVISION	MILDENBERG, BOENDER & ASSOC., INC. <small>Engineers Planners Surveyors</small> <small>5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042 (410) 997-0296 Ball (301) 621-5521 Wash. (410) 997-0298 Fax.</small>	engineering EGJ illustration EGJ approval JBM project 02-097 date AUG 2005	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>BY</th> <th>NO.</th> <th>REVISION</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	BY	NO.	REVISION	DATE					<h2 style="margin:0;">SEWER PROFILE</h2> <p>600' SCALE MAP NO. <u>24</u> BLOCK NO. <u>23</u></p>	<h3 style="margin:0;">FOREST CREEK</h3> <p>LOTS 1 THRU 13 & OPEN SPACE LOTS 14 THRU 17 CONTRACT NO.: 24-4250-D SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND</p>	scale AS SHOWN 4 OF 5
BY	NO.	REVISION	DATE												

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

- Polyvinylchloride (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 1/4-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.
- 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 AWWA C605. PVC pipe shall be stored such that it does not deform or bend.
- Submittals: The followings 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 AWWA 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-reversion test in accordance with AWWA C907
 - 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.
 - 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.

MATERIALS

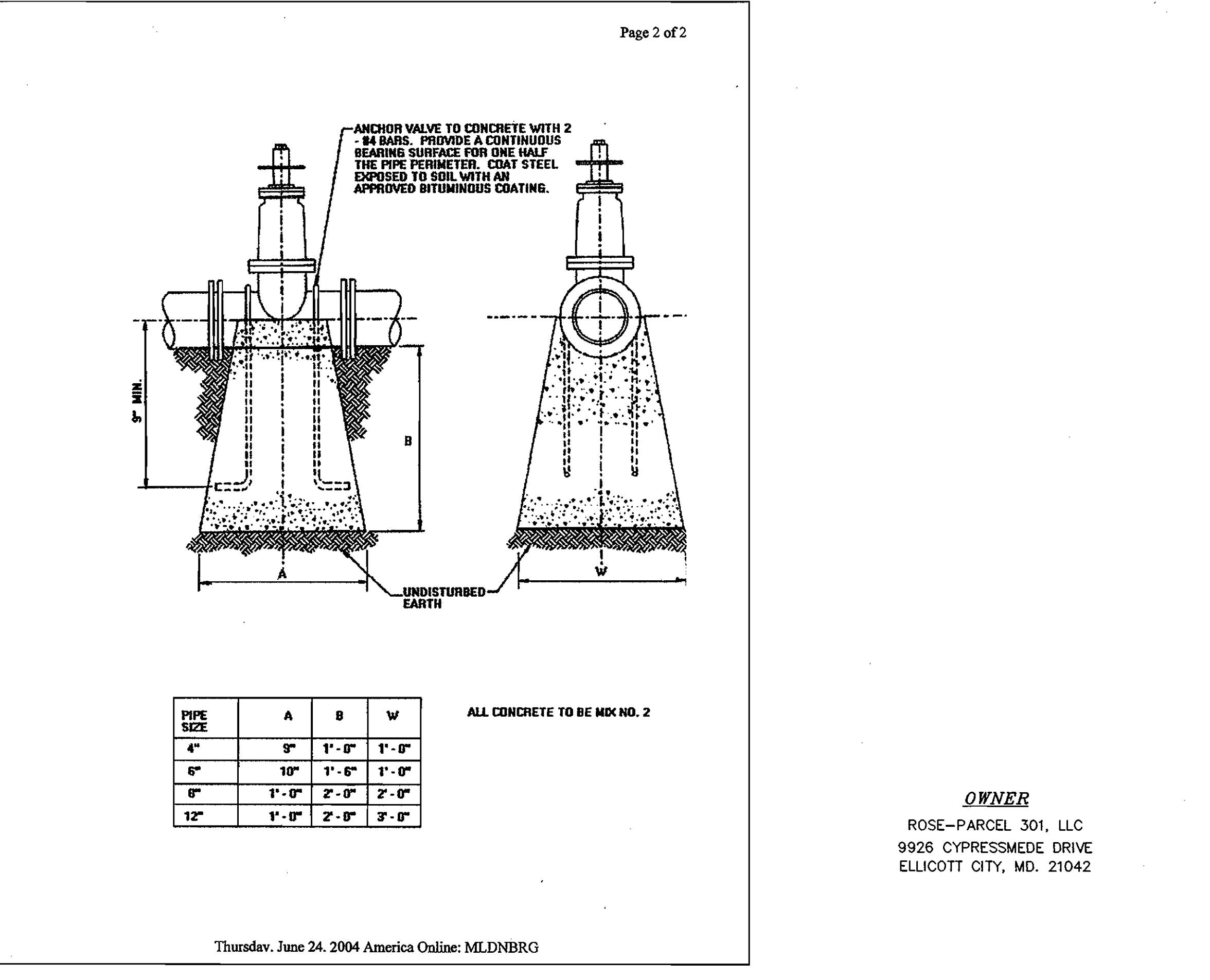
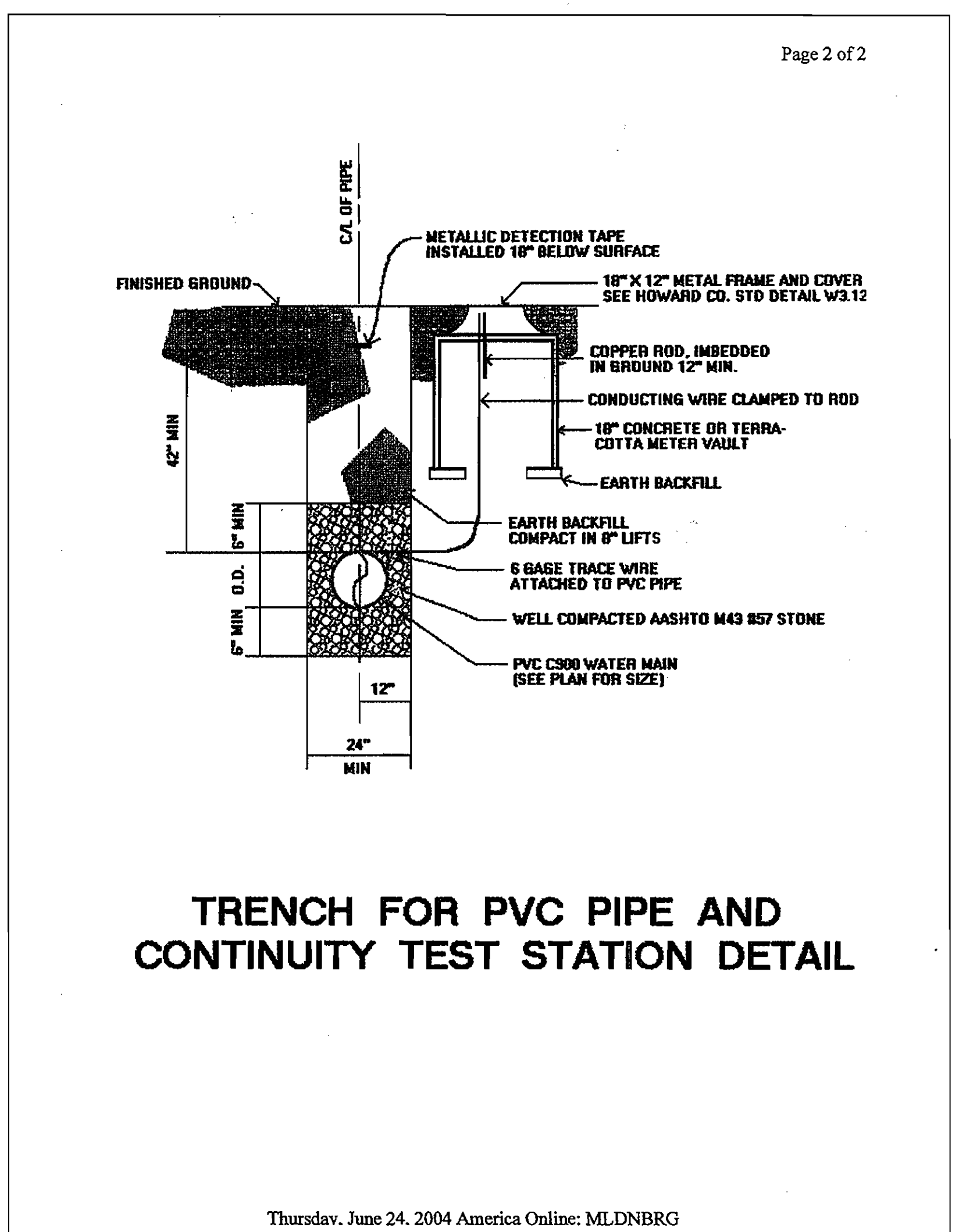
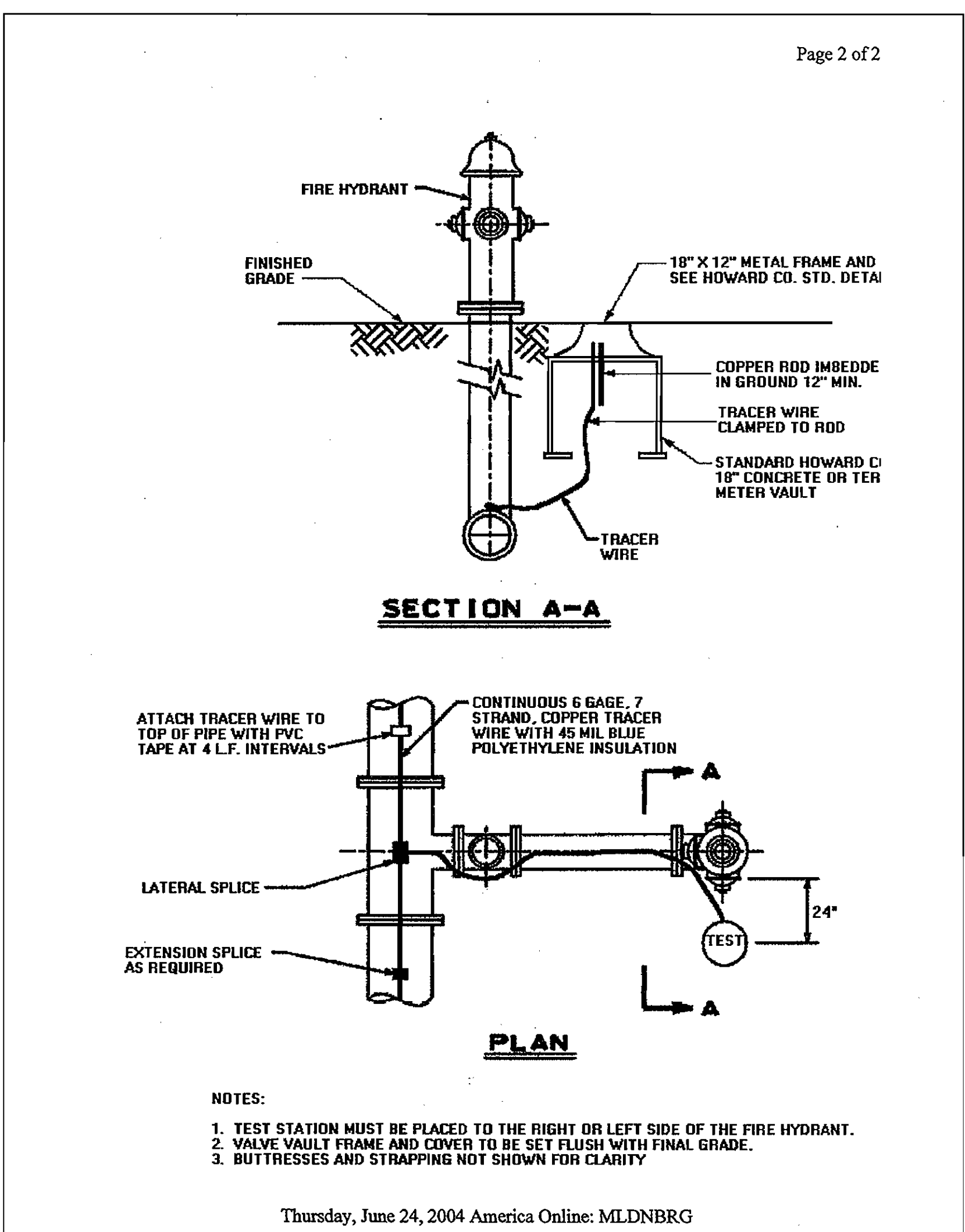
The Engineer will inspect all materials before, during and after installation to ensure compliance with the Contract Documents. When specific tests of materials are called for in the referenced standards and specifications, the Engineer has the option of requiring that any or all of these tests be performed for the specified materials.

- PVC pipe and fittings:
 - PVC pipe 4 inches through 12 inches in diameter shall be manufactured 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:
 - 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 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.
 - 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.
- 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:
 - 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, EBAA Iron series 2000PV, or approved equal
 - 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.
- 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 "UL" 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"x12" 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.
- Detection Tape: Visual Detection Tape shall be 3 inches wide (minimum) metallic blue plastic tape lettered "water" in black graphics.
- Connection to PVC waterlines:
 - Connections to PVC waterlines shall be by using fittings, such as tees, indicated on the Plans.
 - 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 Buna-N rubber meeting ASTM D2000 or nitrile around the tap hole. Saddles shall be one of the following:
 - Ford FC-202
 - Mueller Series DR2S
 - Romac 202N
 - Smith Blair 317 Nylon Coated
 - 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.

- Installation of PVC Water Mains:
 - PVC pipe and fittings shall be handled in accordance with AWWA C605.
 - 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.
 - 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.
 - 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 direct-bury 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 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.
 - Detection Tape: Install detection tape directly over the centerline of the water mains on compacted backfill not less than 18 inches or more than 24 inches below finished surface. Tape shall be installed with minimal splices. Splices shall overlap a minimum of 6 inches.
- Joints:
 - 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.
 - 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.
 - 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.
- 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 mainline tee, shall be ductile iron only.
- Connections to PVC pipe for Water House Connections:
 - Perform taps on PVC pipe in accordance with AWWA C605, 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 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.
 - 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.



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF BUREAU OF UTILITIES DATE 10/10/05

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 11/21/05

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dufferin Hall Drive, Suite 202, Ellicott City, Maryland 21112
(410) 997-0298 Fax: (301) 621-5521 Wash. (410) 997-0298

engineering	EGJ				
illustration	EGJ				
approval					
project	02-097				
date	AUG 2005	BY	NO.	REVISION	DATE

WATER & SEWER DETAILS

600' SCALE MAP NO. _____ BLOCK NO. 8

FOREST CREEK
LOTS: 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 17.
24-4250-D
SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

scale 1"=50'
5 OF 5