

GENERAL NOTES
PART I

- APPROXIMATE LOCATION 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.
- THE TOPOGRAPHY SHOWN HEREON IS BASED ON AN AERIAL SURVEY BY VRM DATED FEBRUARY 2004; SUPPLEMENTED WITH FIELD RUN TOPO DATED OCTOBER 14, 2005.
- 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. 3805 AND NO. 3806.
ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON DRAWINGS ARE:
GEODETIC SURVEY CONTROL 3805 (ELEV. 193.726 FT.)
BRASS DISC SET ON TOP OF A CONCRETE MONUMENT, 5.6' NORTH OF CONCRETE CURB ON ROUTE 1, WEST OF AMBERMAN AVENUE.
GEODETIC SURVEY CONTROL 3806 (ELEV. 175.228 FT.)
BRASS DISC SET ON TOP OF A CONCRETE MONUMENT, 44' SOUTH OF LIGHTPOLE AND 6.5' WEST OF ADJACENT ATLANTIC SUPPLY CO., EAST OF ROUTE 1.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED.
- 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 DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
- FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL AT THE LOCATION OF THE TEST PIT. A NOTES 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 OPERATION AT HIS OWN EXPENSE.
- THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN THESE PLANS:
AT&T 1-800-252-1133
BGE (CONTRACTOR SERVICE) 410-850-4620
BGE (EMERGENCY) 410-685-1400
BUREAU OF UTILITIES 410-313-4900
COLONIAL PIPELINE CO. 410-795-1390
WESS UTILITY 1-800-257-7777
STATE HIGHWAY ADMINISTRATION 410-531-5533
VERIZON 1-800-743-0033/410-224-9210
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
- 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 THE CONSTRUCTION OF THE MAIN.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE ANY 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(c) OF THE HOWARD COUNTY CODE.

PART II - WATER

- EXCEPT AS INDICATED ON THE PLANS AND NOTED BELOW, ALL WATER MAINS SHALL BE POLYETHYLENE GLYCOL (PE) PIPE MEETING THE REQUIREMENTS OF SECTION 2000 OR 18, PRESSURE CLASS 150 AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV-STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THEREOF.
- TOPS OF ALL WATER MAINS TO HAVE A MINIMUM OF 3'-6" COVER UNLESS OTHERWISE NOTED.
- VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
- ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
- FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND 1005 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- ALL DUCTILE IRON PIPE 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 SPECIFICATION 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 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 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 PERKIN CHART SHOWN ON THE DETAIL.

PART III - 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 18" WALLS ARE FOR BRICK MANHOLES ONLY.
- MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL CS-52, WHERE WATERTIGHT MANHOLE FRAME 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." INDICATES THAT CELLAR CANNOT BE SERVED.

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND WITH SITE DEVELOPMENT PLAN F-06-169

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.

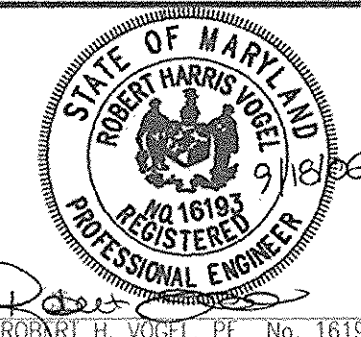
J. H. Robertson 9/21/06
SOIL CONSERVATION DISTRICT DATE

Jim M. Jones 9/21/06
S.O. SOIL CONSERVATION DISTRICT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL
ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET TEL: 410.461.7666
ELLCOTT CITY, MD 21043 FAX: 410.461.8961



DES:	DZ				
DRN:	DZ				
CHK:	RHV				
DATE:	SEPT. 2006				
BY:	KCI	1	AS BUILT AS SHOWN	10/28/07	
NO.					
REVISION					

FINAL WATER AND SEWER PLAN
COVER SHEET

600' SCALE MAP NO. 37 BLOCK NO. 18

TAX MAP 37, BLOCK 18 PARCELS 198, 199, 197
1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

BELMONT STATION
BUILDABLE BULK PARCELS 'A' & 'B'
AND OPEN SPACE LOT 1
CONTRACT NO. 14-4316-D

SCALE AS SHOWN

SHEET 1 OF 4

FINAL WATER AND SEWER PLAN

BELMONT STATION

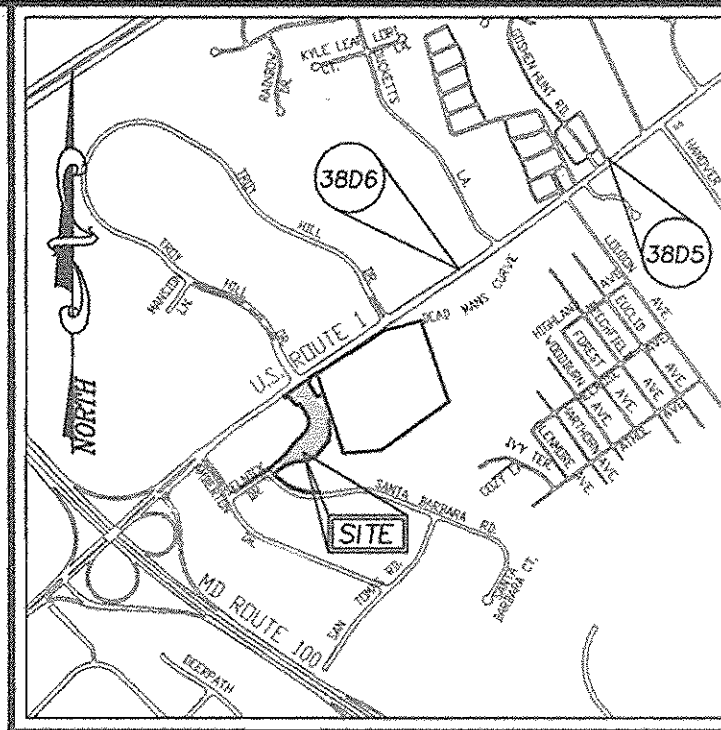
SELNICK ROAD EXTENTION & P/O RED CLAY FORGE

BUILDABLE BULK PARCELS 'A' & 'B' & OPEN SPACE LOT 1

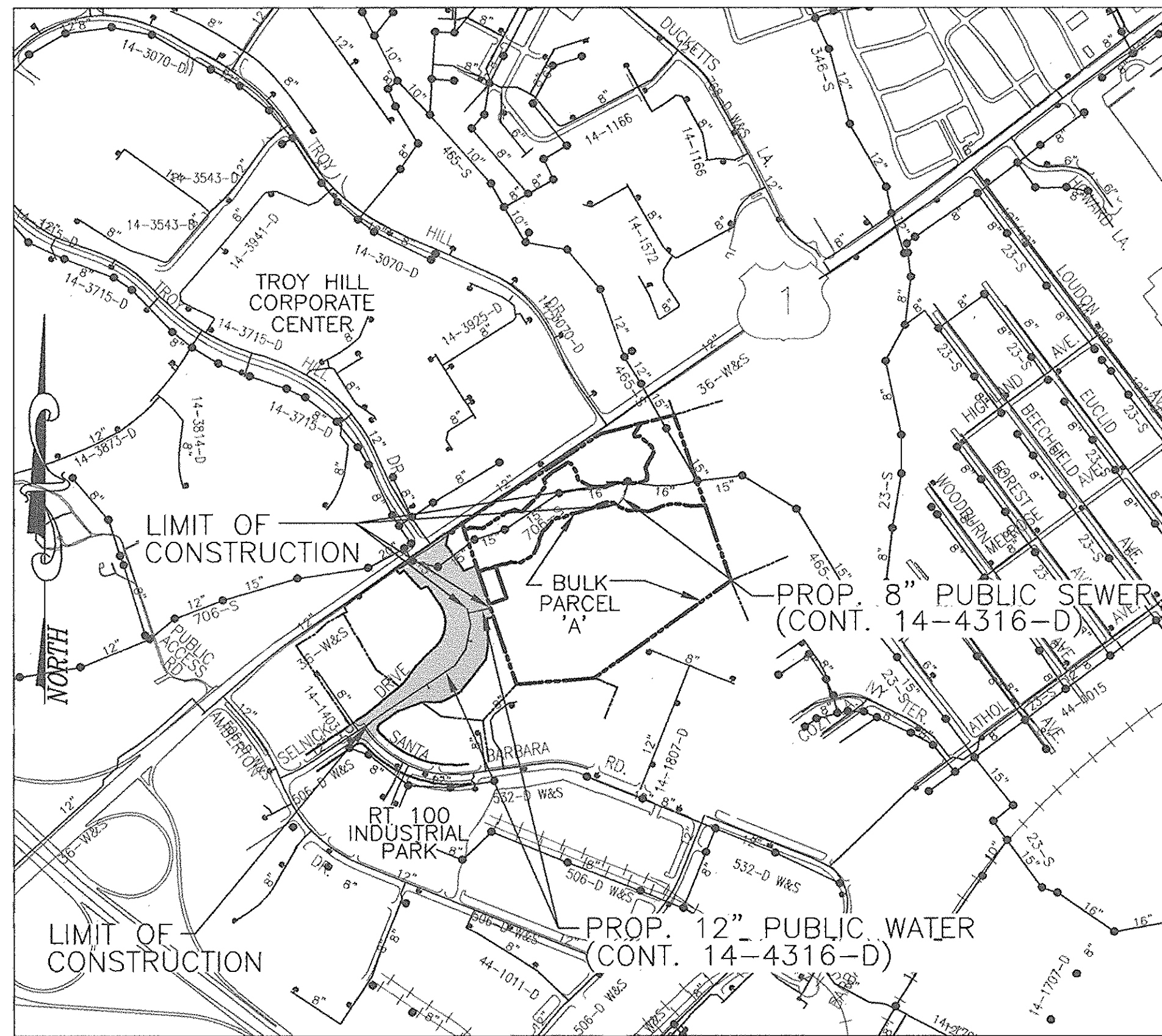
CONT. 14-4316-D

BENCHMARKS

HOWARD COUNTY BENCHMARK 3806
N 557155.459 E 1381992.262 ELEV. 175.228
HOWARD COUNTY BENCHMARK 3805
N 558378.575 E 1386524.158 ELEV. 193.726



VICINITY MAP
SCALE: 1"=2000'



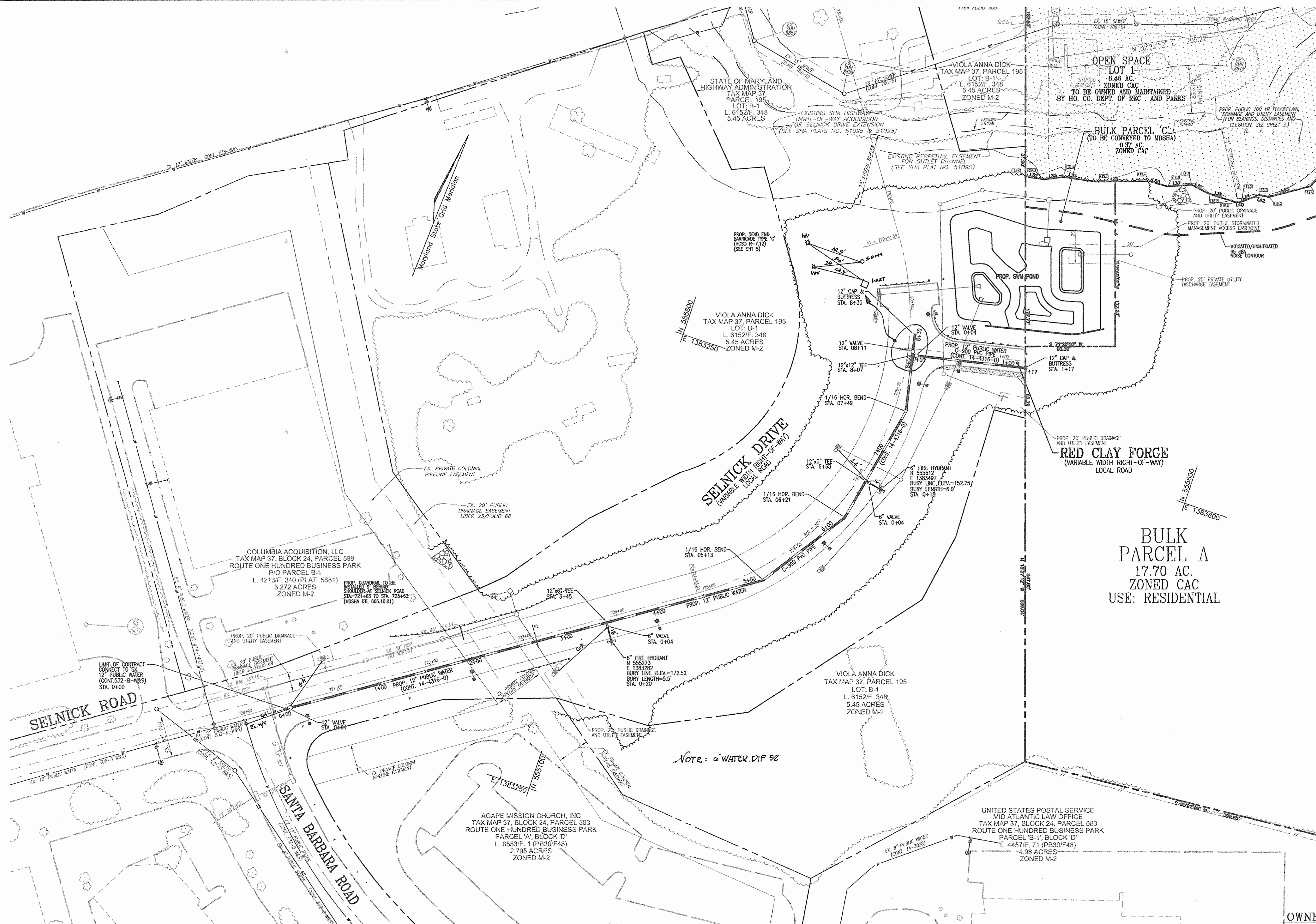
LOCATION MAP
SCALE: 1"=600'

WATER CODE: A03
SEWER CODE: 2152200
TEST GRADIENT: 450

Type of Building :	TOWNHOUSES & APARTMENTS
No. of Lots/Parcels :	3
No. of single Water House Connections :	0
No. of Twin Water House Connections :	0
No. of Sewer House Connections :	0
Drainage Area :	PATAPSCO
Treatment Plant :	PATAPSCO RIVER

QUANTITIES

NAME OF UTILITY CONTRACTOR :		SURVEY AND DRAFTING DIVISION AS-BUILT DATE :		AS-BUILT	
ITEMS	QUANTITIES ESTIMATED	QUANTITIES	TYPE	MANUFACTURER/SUPPLIER	
WATER					
12" WATER	940 LF	940	C-200	NORTH AMERICAN / FERROUSON	
6" WATER	38 LF	38	DIP 52	"	
12" X 6" TEE	2 EA	2	M.J.	SIGMA	
12" X 12" TEE	1 EA	1	M.J.	SIGMA	
12" VALVE	3 EA	3	M.J. G/V	MUELLER	
12" COUPLING	4 EA	4	M.J.	SIGMA	
12" - 1/32 BEND	3 EA	3	M.J.	SIGMA	
6" VALVE	2 EA	2	M.J. G/V	MUELLER	
6" FIRE HYDRANT	2 EA	2	M.J.	MUELLER	
12" CAP AND BUTTRESS	2 EA	2	M.J.	SIGMA	
SEWER					
8" PVC SEWER	134 LF	134	S.D.-35	NATIONAL PIPE/BRS	
MANHOLE	2 EA	2	P/4	FREDERICK PIPE/BSAHE	



NOTE: 6" WATER DIP 5/2

PLAN VIEW
SCALE: 1"=50'

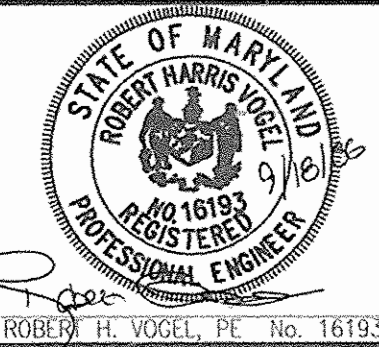
OWNER/DEVELOPER

ELKRIDGE DEVELOPMENT, LLC ELKRIDGE DEVELOPMENT NO.2, LLC
301 TRANSYLVANIA AVENUE 301 TRANSYLVANIA AVENUE
RALEIGH, NC 27609 RALEIGH, NC 27609
(919) 789-9289 (919) 789-9289

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
9-21-06
DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
9/21/06
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DES:	DZ				
DRN:	DZ				
CHK:	RHW				
DATE:	SEPT. 2006	BY:	NO.	REVISION	DATE
					10/8/07

**FINAL WATER AND SEWER PLAN
PLAN VIEW**

600' SCALE MAP NO. 37 BLOCK NO. 18

**BELMONT STATION
BUILDABLE BULK PARCELS 'A' & 'B'
AND OPEN SPACE LOT 1
CONTRACT NO. 14-4316-D**
TAX MAP 37, BLOCK 18 PARCELS 196, 198, 199
1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SHEET 2 OF 4

BALTIMORE WASHINGTON BOULEVARD (U.S. ROUTE 1)
 CURBLINE
 INTERMEDIATE ARTERIAL
 VARIABLE WIDTH RIGHT-OF-WAY
 SRC PLATS NOS. 5549 AND 51905, PLAT 11810 HOWARD COUNTY, MARYLAND LAND RECORDS

BULK PARCEL B
 3.20 AC.
 ZONED CAC
 USE: COMMERCIAL

BULK PARCEL A
 17.70 AC.
 ZONED CAC
 USE: RESIDENTIAL

PLAN VIEW
 SCALE: 1"=50'

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 1007 Water Mains of the Howard County Standard Specifications are amended to include the following requirements:

GENERAL

- All polyvinyl chloride (PVC) pipe, fabricated fittings, and couplings shall be manufactured and tested in accordance with AWWA C900. Third-party certification (listing) by Underwriters Laboratory (UL) shall also be required for all PVC pipe. All injection molded polyvinyl chloride (PVC) fittings shall be manufactured and tested in accordance with AWWA C907. All products 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 pipeline. 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 one year 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 supported during storage so 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 AWWA C900.
 - PVC Pipe Fittings: Submit manufacturer's literature and certificates of compliance for PVC

- 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.

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. Pipe shall have a dimension ratio (DR) of 18, Pressure Class of 150 psi, and shall utilize elastomeric-gasketed, push-on joints. Pipes, 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:
 - Upouev 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 and shall be fusion bonded epoxy coated in conformance with AWWA C116, or PVC. PVC fittings shall have push-on rubber gasketed joints, be injection-molded meeting AWWA C907, Pressure Class 150 or higher, or fabricated meeting AWWA C900, Pressure Class 200. PVC fittings shall be manufactured by the Harrington Corporation (Harrco) or approved equal. Pipe joints shall be in accordance

- with the standards specified for the pipe and fittings.
- 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 coated to provide corrosion resistance. All coatings shall be impact and UV resistant.
 - In restrained joints, PVC pipe shall not be deflected. If deflection is required in a restrained joint, a wide-angle sweep or fitting shall be used with approved restraints, or use ductile iron pipe fittings with restraints.
 - Where a restrained joint is required between PVC pipe and a fitting, the fitting shall be ductile iron mechanical joint. Joint restraint devices shall be suitable for potable water systems and shall meet NSF 61. Joint restraint shall be UniFlange Series 1500, EBAA Iron series 2000PV, or approved equal.
 - Where a restrained joint is required for PVC push-on joint, the joint restraint device shall meet ASTM F1674 and shall be EBBA Iron Series 1600, UniFlange Series 1390-C, or approved equal.

- Detection Tape: Visual Detection Tape shall be 3 inches wide (minimum) metallic blue plastic tape labeled "water" in black graphics.
- Connection to PVC waterlines:
 - Connections to PVC waterlines shall be by using fittings, such as tees, in accordance with 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. Saddles and clamp/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 B6 or B584 and AWWA C800 or ductile iron saddles meeting ASTM A53 or A395 with two 1/8-inch stainless steel straps and shall be epoxy or nylon coated. Saddles shall have wetsight gaskets of Buna-N rubber meeting ASTM D2000 or nitrile around the tap hole. Saddles shall be one of the following:
 - Ford FC-202
 - Muelter Series DR2S
 - Romas 202N
 - Smith Blair 317 Nylon Coated
 - JCM 406
- Tracer Wire for Non Metallic Pipelines: Tracer wire shall be insulated 8-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

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 following Criteria:
- Installation of PVC Water Mains:
 - PVC pipe and fittings shall be handled in accordance with AWWA C

- 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 AWWA C605, the Standard Specification 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. Lubricant shall be applied to the gasket and mating pipe end per the pipe manufacturer's recommendations. 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. For connections to mechanical joint fittings and appurtenances, cut the bevel off of the PVC pipe and insert the PVC pipe spigot, in straight alignment, until it contacts the bell taper of the mechanical joint fittings or appurtenance.
- Tracer Wires: Install tracer wires with the pipe. Tape wire to the top of the pipe with minimum 2-inch wide x 1/2-inch diameter 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-compact 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.
- Mechanical Joints: For PVC pipe 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

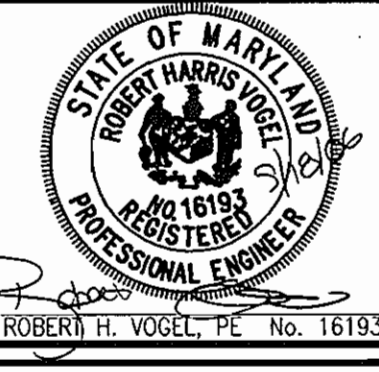
- Where the Contractor chooses to use PVC fittings, the pressure class of the fitting shall be the same as, or greater than, the pressure class of the pipe to which it connects. If the pressure class is not available, the Contractor shall use a ductile iron fitting. Where a fitting with restrained joints 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 distance of 24 inches from 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.

OWNER/DEVELOPER
 ELKRIDGE DEVELOPMENT, LLC ELKRIDGE DEVELOPMENT NO.2, LLC
 301 TRANSYLVANIA AVENUE 301 TRANSYLVANIA AVENUE
 RALEIGH, NC 27609 RALEIGH, NC 27609
 (919) 789-9289 (919) 789-9289

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 9-21-06
 CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PLANNING & ZONING
 HOWARD COUNTY, MARYLAND
 DEVELOPMENT ENGINEERING DIVISION

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
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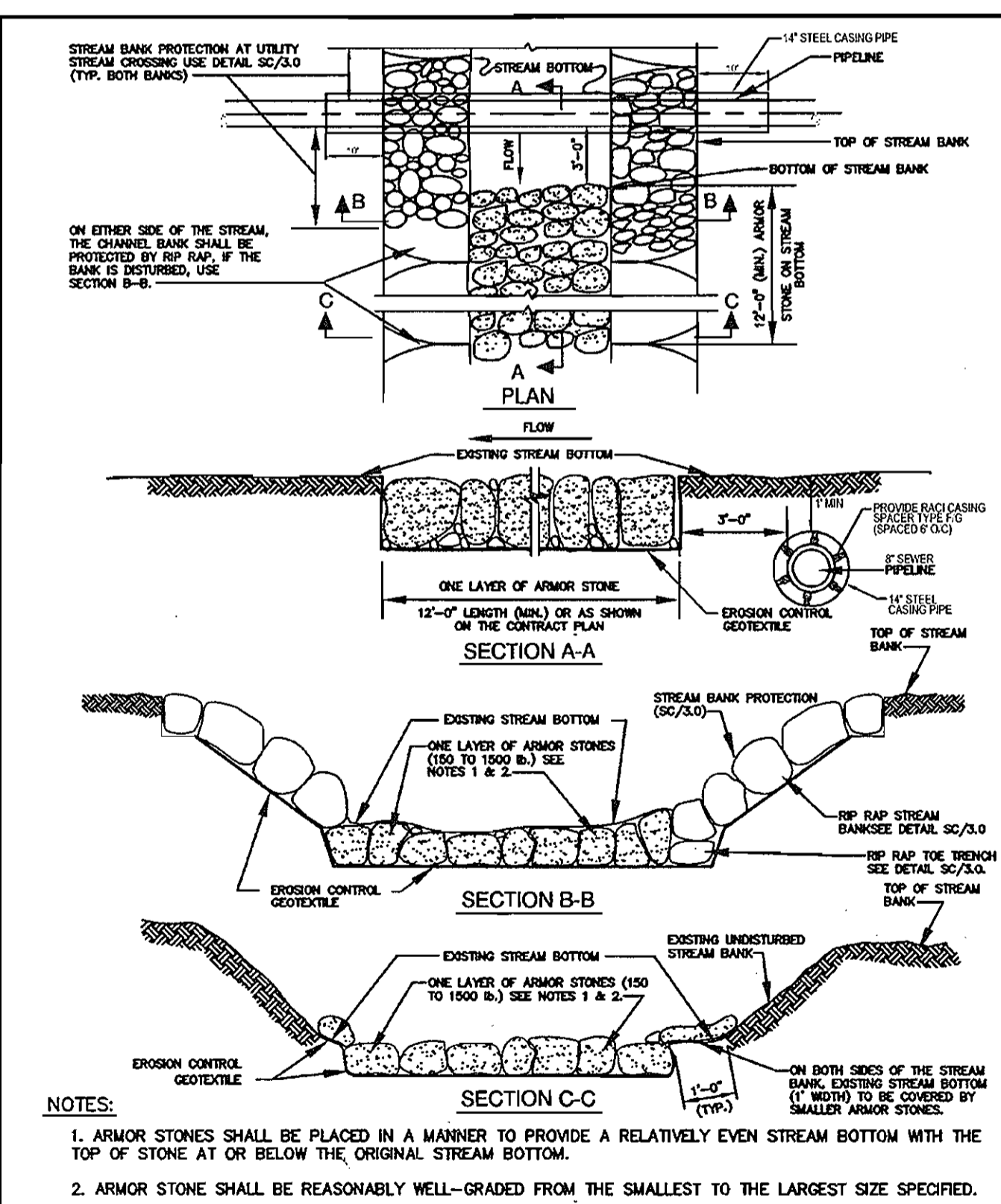
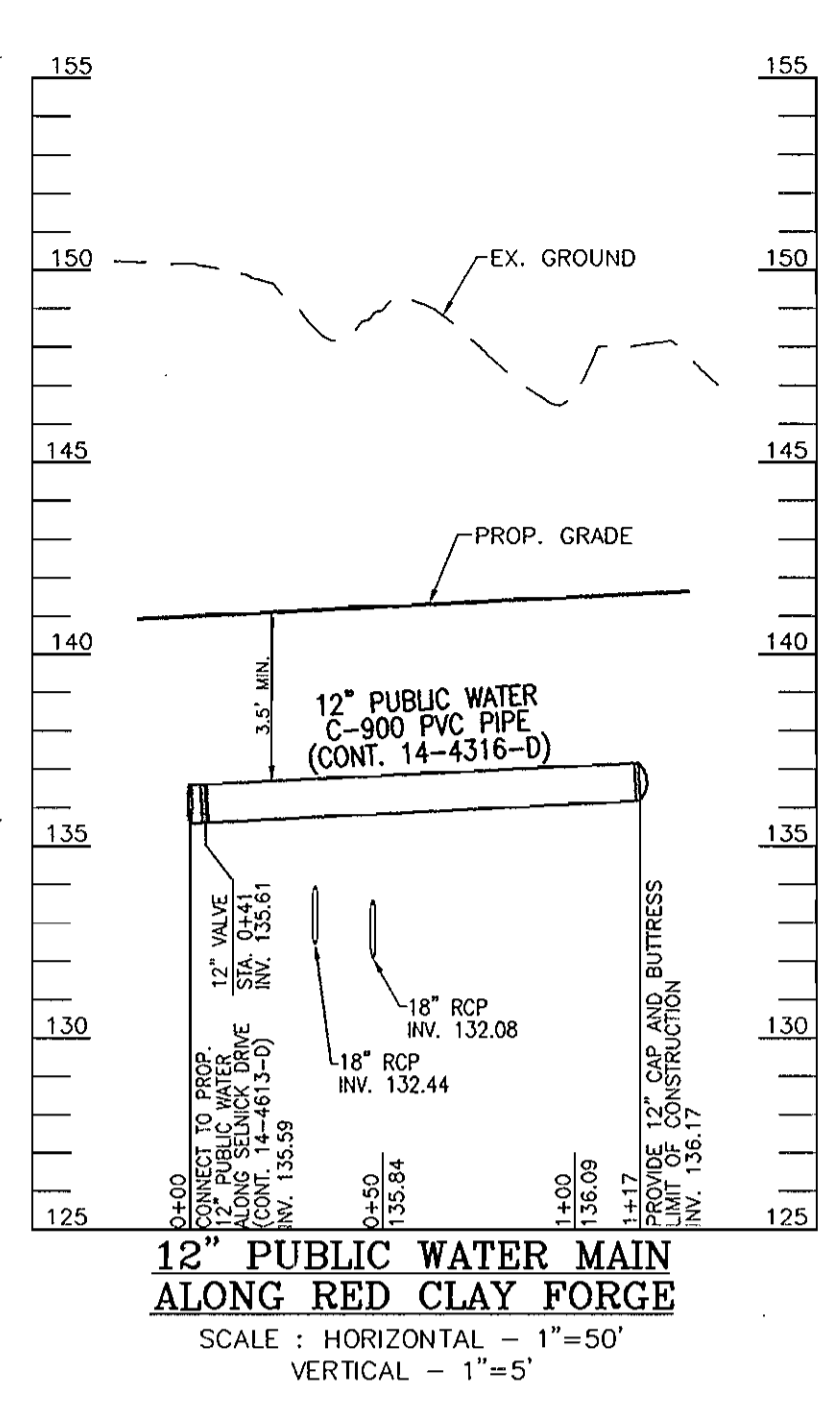
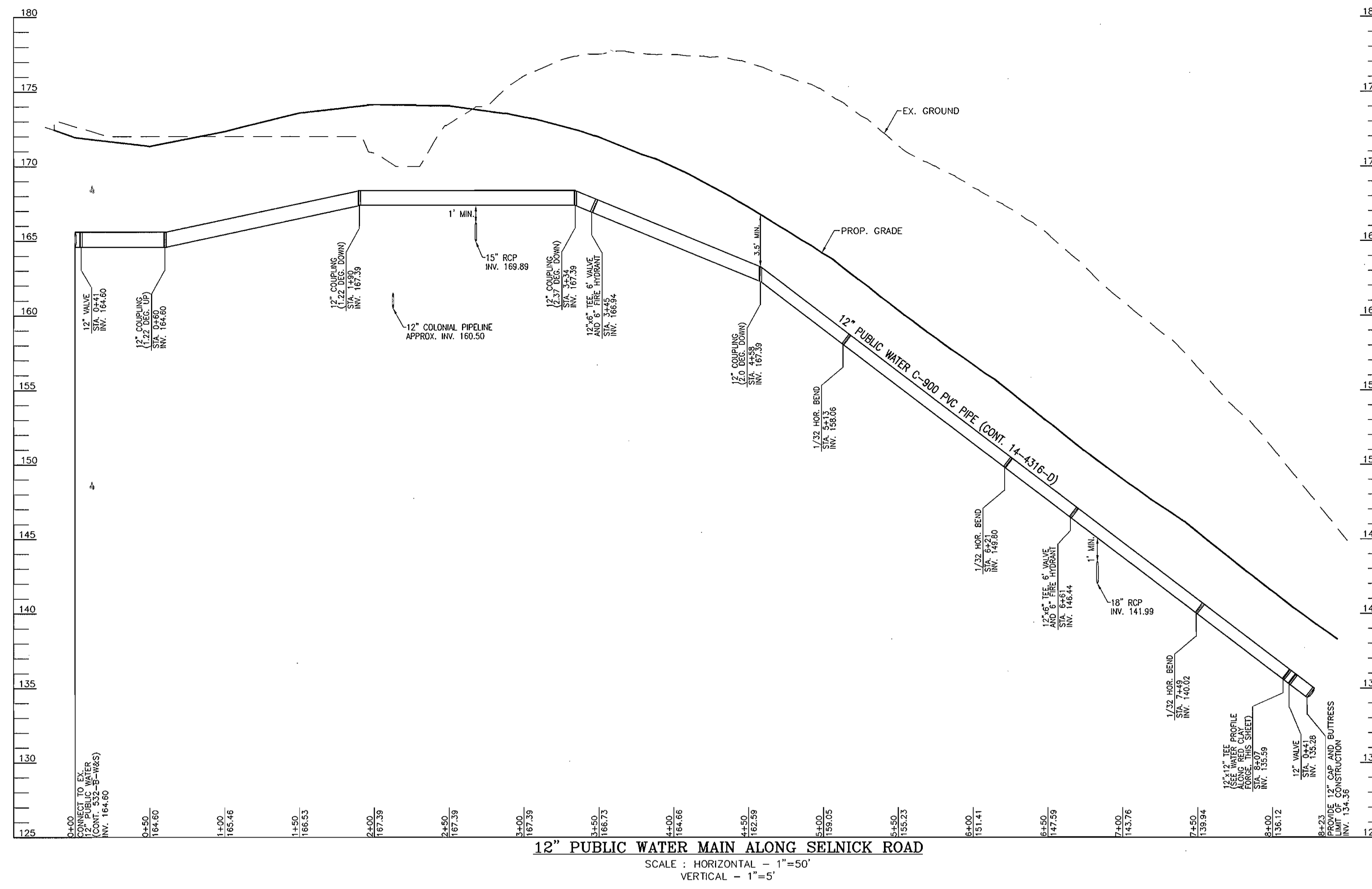
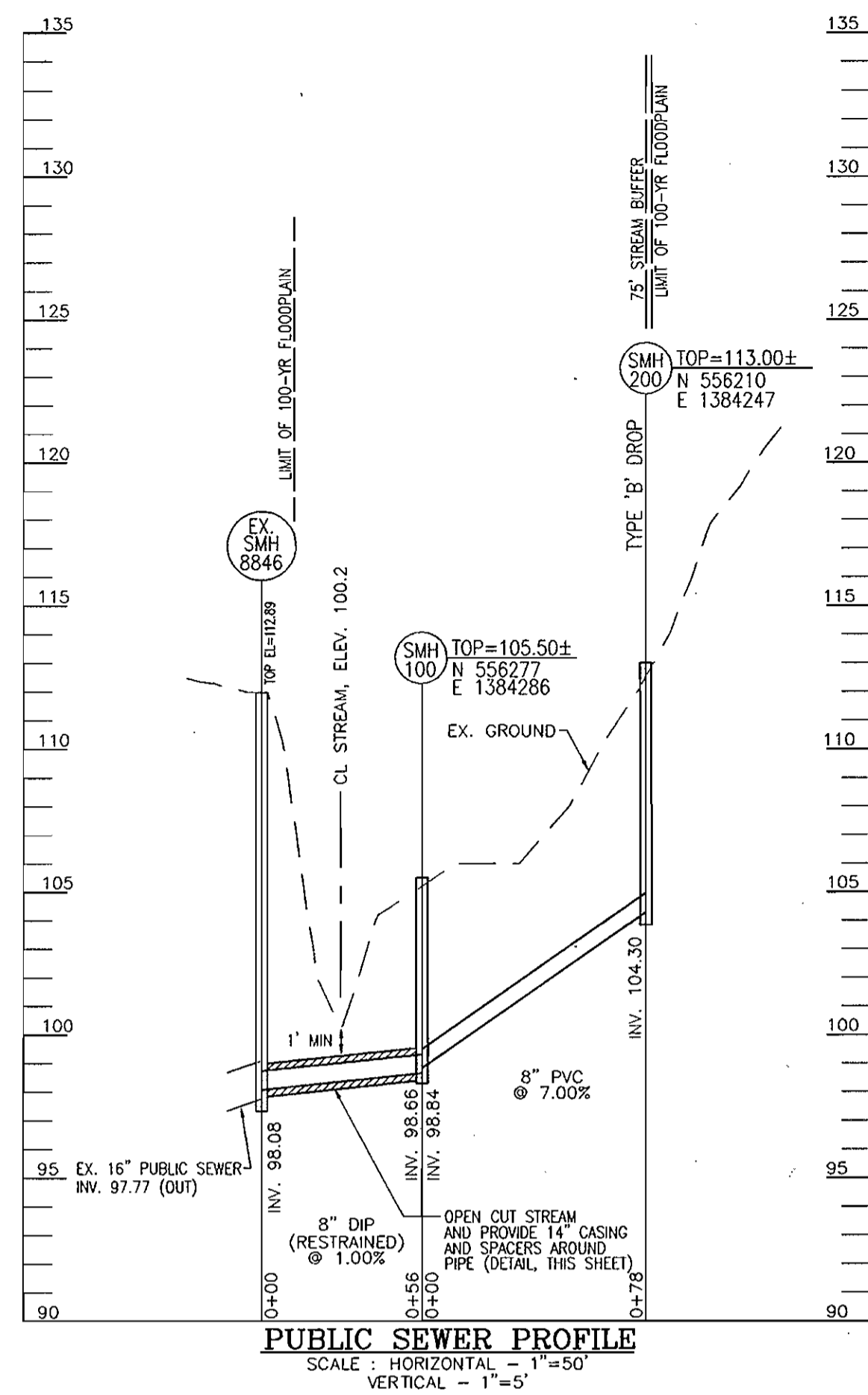
DES:	DZ				
DRN:	DZ				
CHK:	RHV				
DATE:	SEPT. 2006	BY	NO.	REVISION	DATE

FINAL WATER AND SEWER PLAN
PLAN VIEW

CONTRACT NO. 14-431E-D

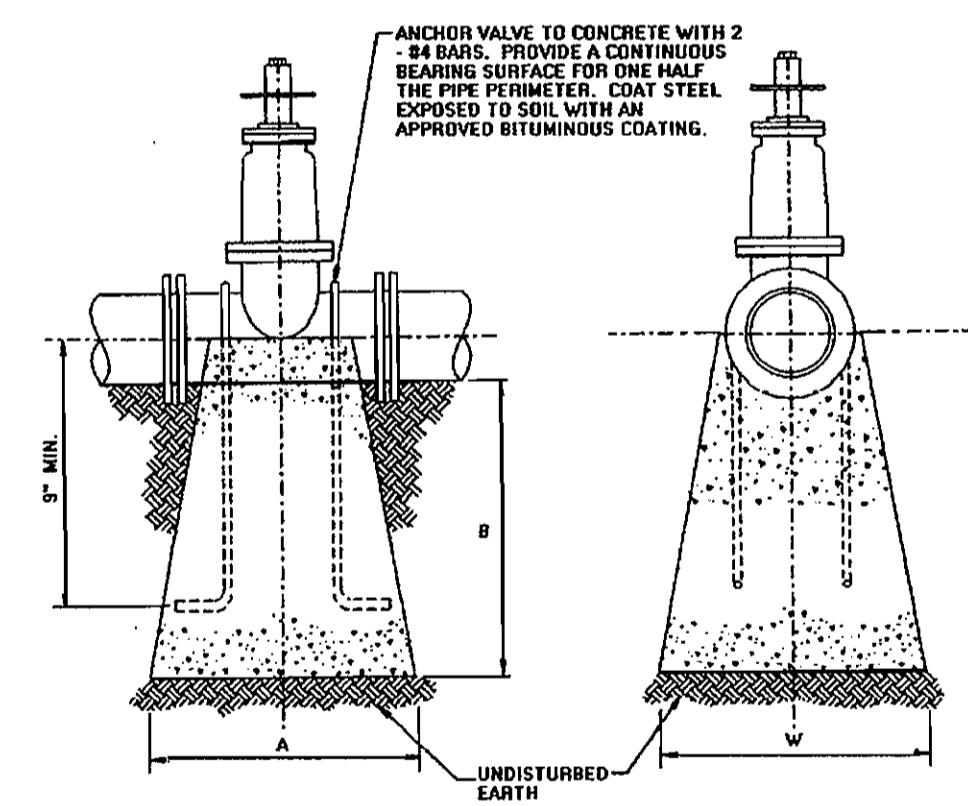
600' SCALE MAP NO. 37
 BLOCK NO. 18
 SHEET 3 OF 4

TAX MAP 37, BLOCK 18
 1ST ELECTION DISTRICT
 PARCELS 196, 198, 199
 HOWARD COUNTY, MARYLAND



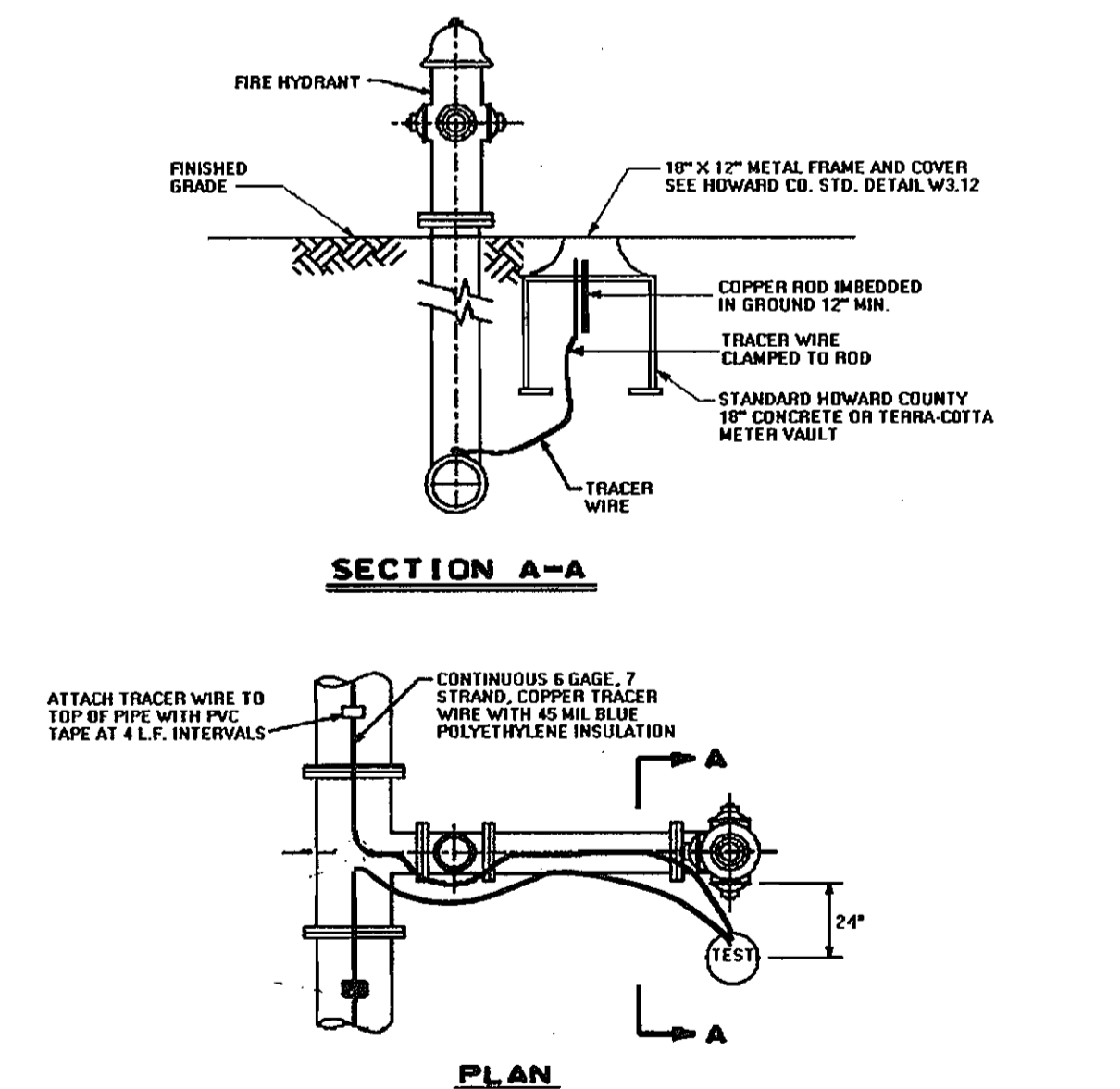
NOTES:
 1. ARMOR STONES SHALL BE PLACED IN A MANNER TO PROVIDE A RELATIVELY EVEN STREAM BOTTOM WITH THE TOP OF STONE AT OR BELOW THE ORIGINAL STREAM BOTTOM.
 2. ARMOR STONE SHALL BE REASONABLY WELL-GRADED FROM THE SMALLEST TO THE LARGEST SIZE SPECIFIED.

WASHINGTON SUBURBAN SANITARY COMMISSION APPROVED: JULY 1, 2005
 STANDARD DETAIL STREAM INVERT PROTECTION FOR SHALLOW UTILITY STREAM CROSSING SC 3.1



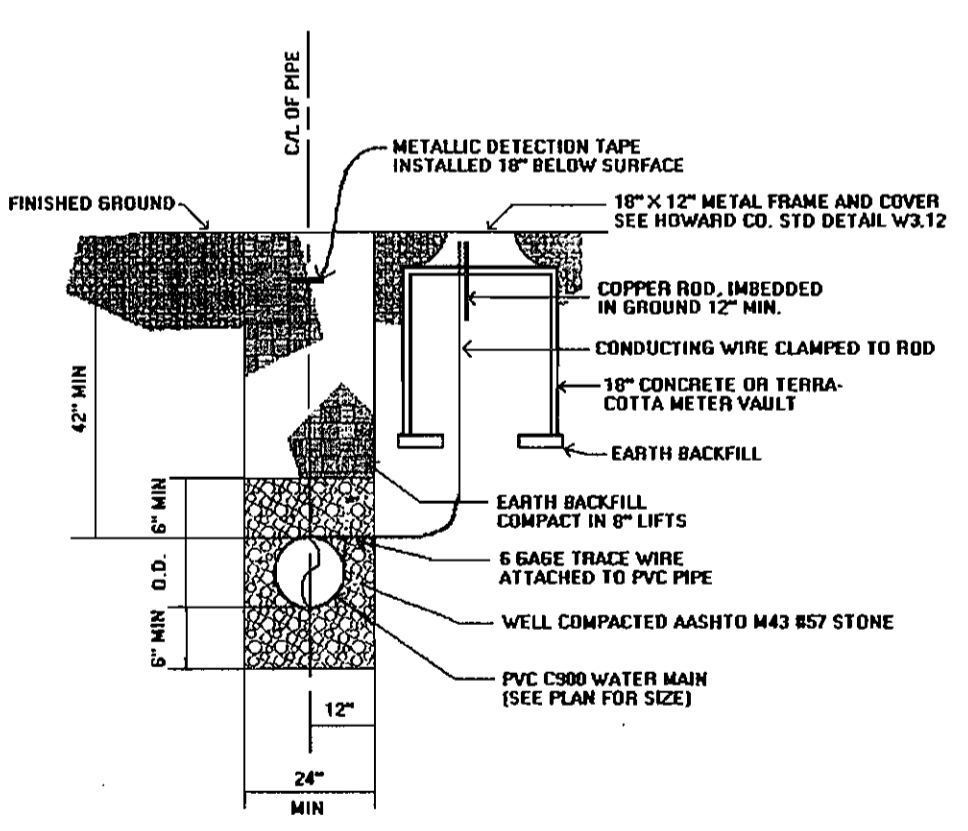
PIPE SIZE	A	B	W
4"	9"	1'-0"	1'-0"
6"	10"	1'-0"	1'-0"
8"	1'-0"	2'-0"	2'-0"
12"	1'-0"	2'-0"	3'-0"

NOTE: TO BE USED WHERE VALVE IS NOT ATTACHED TO TEE
ANCHORAGES FOR VALVES WITH PVC PIPE



NOTES:
 1. TEST STATION MUST BE PLACED TO THE RIGHT OR LEFT SIDE OF THE FIRE HYDRANT.
 2. VALVE VAULT FRAME AND COVER TO BE SET FLUSH WITH FINAL GRADE.
 3. BUTTRESSES AND STRAPPING NOT SHOWN FOR CLARITY

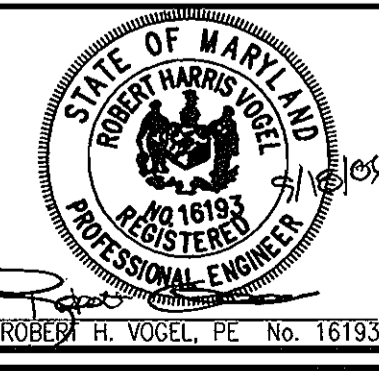
CONTINUITY TEST STATION AT FIRE HYDRANT



TRENCH FOR PVC PIPE AND CONTINUITY TEST STATION DETAIL

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND
 DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND
 Robert H. Vogel, Chief, Development Engineering Division

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET ELLICOTT CITY, MD 21043 TEL: 410.461.7666 FAX: 410.461.8961



DES:	DZ				
DRN:	DZ				
CHK:	RHV				
DATE:	SEPT. 2006				
BY:	NO.	REVISION	DATE	600' SCALE MAP NO.	37
				BLOCK NO.	18

FINAL WATER AND SEWER PLAN PROFILES

BELMONT STATION BUILDABLE BULK PARCELS 'A' & 'B' AND OPEN SPACE LOT 1
 CONTRACT NO. 14-4316-D
 SCALE AS SHOWN
 SHEET 4 OF 4