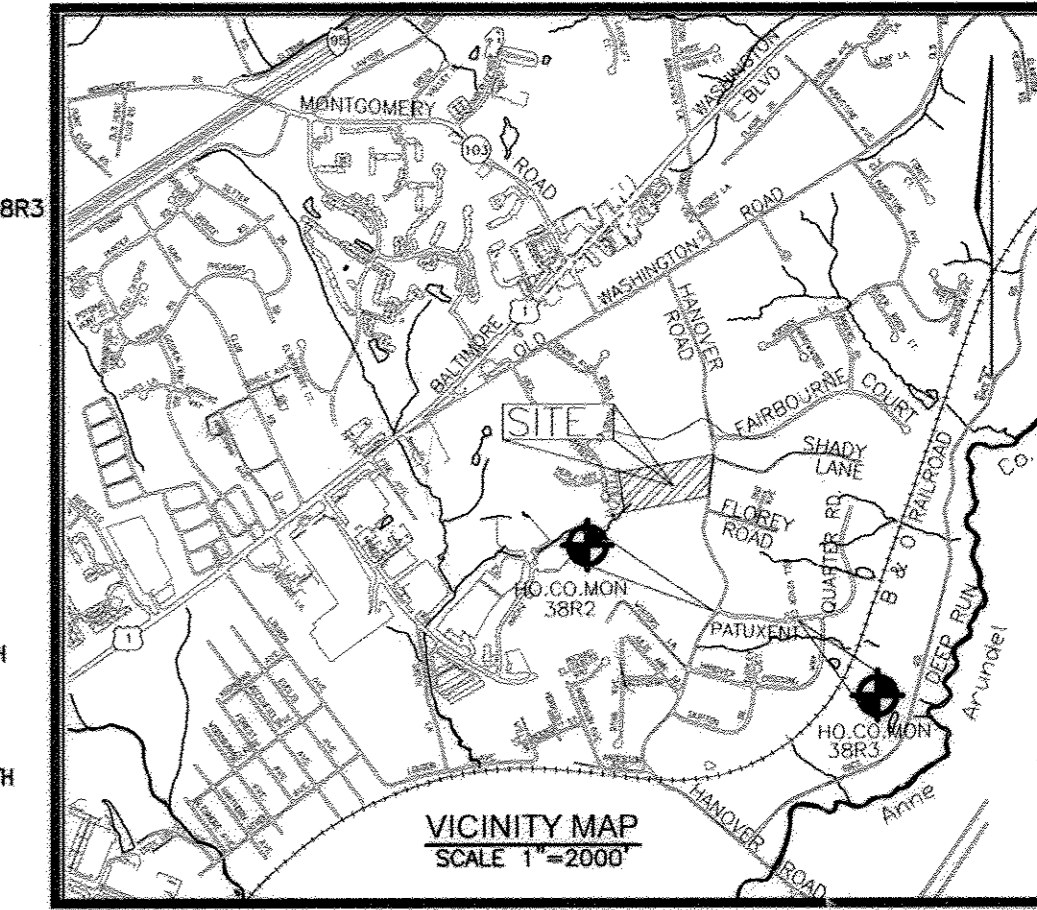


# FINAL ROAD CONSTRUCTION PLANS SHADY LANE CROSSING LOTS 1 THRU 25 HOWARD COUNTY, MARYLAND

**SITE DATA**  
 LOCATION: TAX MAP 38, PARCEL 235  
 FIRST ELECTION DISTRICT  
 EXISTING ZONING: R-12  
 GROSS AREA OF PARCEL: 8,902.12 ACRES  
 PER LIBER 8848, FOLIO 244  
 AREA OF 1871 ACCESS EASEMENT: 8072.43 SF (0.185 AC.)  
 PER LIBER 3436, FOLIO 410  
 AREA OF RIGHT OF WAY: 0.67845 ACRES  
 AREA OF FLOODPLAIN: 0.16460 AC.  
 AREA OF STEEP SLOPES: 0.059 AC.  
 NET AREA OF PROJECT: 8,902.12 AC. = 0.16460 AC. = 8.7375 AC.  
 NUMBER OF PROPOSED RESIDENTIAL LOTS: 21  
 AREA OF PROPOSED RESIDENTIAL LOTS: 4,989.8 AC.  
 AREA OF SMALLEST BUILDABLE LOT PROPOSED: 8402 SQ. FT (LOT 10)  
 NUMBER OF PROPOSED OPEN SPACE LOTS: 5 (LOT 12, 13, 19, 24 & 25)  
 AREA OF OPEN SPACE LOTS: 3.44 ACRES  
 AREA OF OPEN SPACE REQUIRED: 30% OF GROSS AREA OF PARCEL (2,670.6 AC.)  
 TOTAL AREA OF CREDITED OPEN SPACE PROVIDED: 3.02 ACRES (LOTS 12, 13 AND 19)  
 TOTAL AREA OF NON-CREDITED OPEN SPACE PROVIDED: 0.32 ACRES (LOTS 24 AND 25)  
 AREA OF RECREATION OPEN SPACE REQUIRED: 4200 SF  
 AREA OF RECREATION OPEN SPACE PROVIDED: 4366 SF ON LOT 19

**BENCHMARK**  
 HOWARD COUNTY CONTROL STATION 38R2  
 NORTH 557,500.663'  
 EAST 1,391,227.052'  
 ELEVATION 168.788' (NAVD 1988)

HOWARD COUNTY CONTROL STATION 38R3  
 NORTH 557,417.823'  
 EAST 1,391,963.177'  
 ELEVATION 124.653' (NAVD 1988)



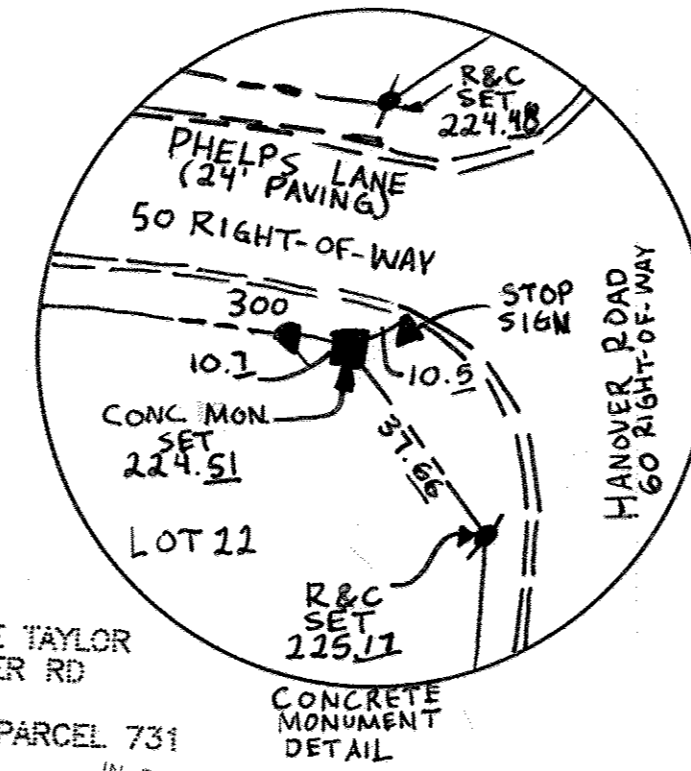
**SHEET INDEX**

SHEET NO.	TITLE
1	COVER SHEET
2	ROAD PLAN AND PROFILE
3	GRADING & SEDIMENT CONTROL PLAN
4	STORM DRAIN DRAINAGE AREA MAP
5	STORM DRAIN PROFILES
6	STORMWATER MANAGEMENT NOTES AND DETAILS
7	STORMWATER MANAGEMENT NOTES
8	SEDIMENT & EROSION CONTROL NOTES
9	LANDSCAPE AND FOREST CONSERVATION PLAN
10	LANDSCAPE & FOREST CONSERVATION DETAILS
11	RETAINING WALL PLAN
12	RETAINING WALL PLAN
13	RETAINING WALL PLAN
14	RETAINING WALL PLAN
15	RETAINING WALL PLAN
16	RETAINING WALL PLAN
17	RETAINING WALL PLAN
18	RETAINING WALL PLAN

**AS-BUILT CERTIFICATION**

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

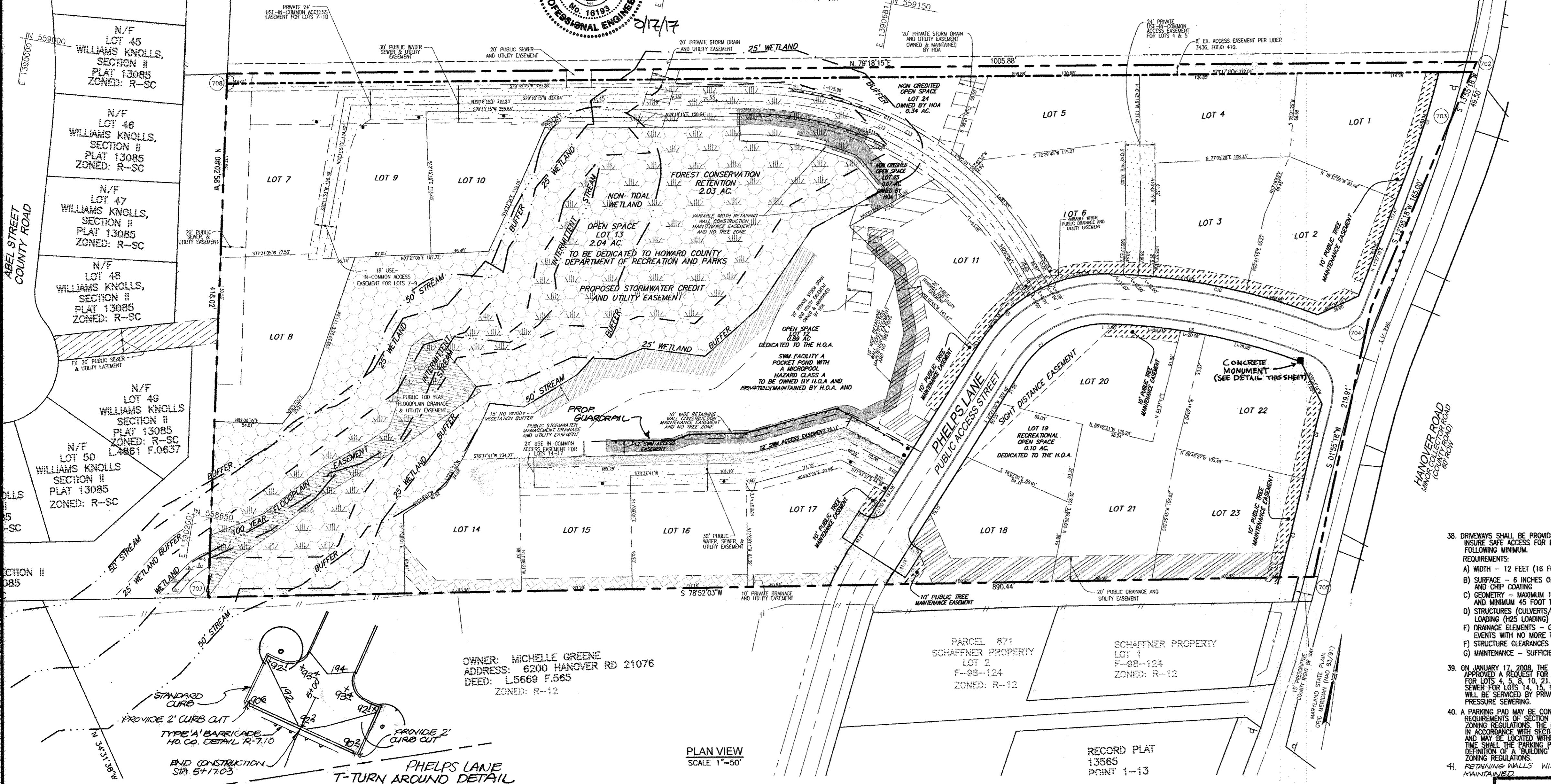
ROBERT H. VOGEL PE NO. 16195



**LEGEND**

[Symbol]	BOUNDARY LINE
[Symbol]	ADJACENT BOUNDARY LINE
[Symbol]	LOT LINES
[Symbol]	FOREST CONSERVATION EASEMENT
[Symbol]	RETAINING WALL EASEMENT
[Symbol]	Q STREAM
[Symbol]	STREAM BUFFER
[Symbol]	WETLAND BUFFER
[Symbol]	12' SWM ACCESS
[Symbol]	10' PRIVATE DRAINAGE AND UTILITY EASEMENT
[Symbol]	NO WOODY VEGETATION BUFFER
[Symbol]	TREE MAINTENANCE EASEMENT
[Symbol]	100 YEAR FLOODPLAIN EASEMENT
[Symbol]	PUBLIC DRAINAGE & UTILITY EASEMENT
[Symbol]	PUBLIC SWM DRAINAGE AND UTILITY EASEMENT
[Symbol]	NON TIDAL WETLAND

- GENERAL NOTES**
- ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS OTHERWISE NOTED.
  - DEED REFERENCE: 505/295
  - DENSITY: NUMBER OF DWELLING UNITS - OPTIONAL 8,400 SF LOTS WITH 10% OPEN SPACE. NUMBER OF DWELLING UNITS PROPOSED: 21.
  - THE PROJECT BOUNDARY IS BASED ON A SURVEY PERFORMED BY FREDERICK WARD AND ASSOCIATES, DATED JANUARY 2002.
  - THE TOPOGRAPHY SHOWN HEREON IS BASED ON A TOPOGRAPHIC SURVEY PERFORMED BY FREDERICK WARD AND ASSOCIATES, DATED JANUARY 2002.
  - DEVELOPER RESERVES UNTO ITSELF, ITS SUCCESSORS AND ASSIGNS, ALL EASEMENTS SHOWN ON THIS PLAN FOR WATER, SEWER, STORM DRAINAGE, OTHER PUBLIC UTILITIES AND FOREST CONSERVATION (FOREST CONSERVATION AREA). LOCATED IN, ON, OVER AND THROUGH LOTS 1 THROUGH 25. DEVELOPER SHALL EXECUTE AND MAINTAIN THE FOREST CONSERVATION EASEMENTS HERIN RESERVED TO HOWARD COUNTY WITH METES AND BOUNDS DESCRIPTION OF THE FOREST CONSERVATION AREA, UPON COMPLETION OF THE PUBLIC UTILITIES AND THEIR ACCEPTANCE BY HOWARD COUNTY, AND IN THE CASE OF THE FOREST CONSERVATION EASEMENTS, UPON COMPLETION OF THE DEVELOPER'S OBLIGATIONS UNDER THE FOREST CONSERVATION ACT AND MAINTENANCE AGREEMENT EXECUTED BY THE DEVELOPER AND THE COUNTY, AND THE RELEASE OF DEVELOPER'S SURETY POSTED WITH SAID AGREEMENT. THE COUNTY SHALL ACCEPT THE EASEMENTS AND RECORD THE DEED OF EASEMENT IN THE LAND RECORDS OF HOWARD COUNTY.
  - STORM WATER MANAGEMENT TO BE PROVIDED FOR THIS DEVELOPMENT IN ACCORDANCE WITH 2000 MDE STORMWATER DESIGN MANUAL. THE FACILITY WILL BE LOCATED ON OPEN SPACE LOT 12. OPEN SPACE LOT 12 WILL BE OWNED BY THE H.O.A. WITH PUBLIC STORMWATER MANAGEMENT AND UTILITY EASEMENT BY THE H.O.A. TO BE MAINTAINED BY THE H.O.A.
  - WETLAND SHOWN ON SITE ARE BASED ON A WETLAND DELINEATION PERFORMED BY ECO-SCIENCE PROFESSIONALS, INC., DATED FEBRUARY 2000.
  - THERE ARE NO STEEP SLOPES ON SITE WITH A MIN. CONTIGUOUS AREA OF 20,000 SF.
  - FLOODPLAIN SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC. DATED NOVEMBER 2004.
  - STORMWATER MANAGEMENT PLAN PREPARED BY FREDERICK WARD AND ASSOCIATES, DATED JANUARY 2002.
  - FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL FOR THIS SUBDIVISION WILL BE FULFILLED BY THE RETENTION OF 11.40 AC. (81457.2 x \$8.00 = \$652,044) OF FOREST IN A FOREST CONSERVATION EASEMENT PAYABLE BY THE DEVELOPER AS PART OF THE DEVELOPER'S AGREEMENT. A FEE-IN-LIEU PAYMENT FOR REMAINING 1.06 AC. (46,173.60 x \$0.75 = \$34,630.20) IS REQUIRED, WHICH IS PAID TO THE FOREST CONSERVATION FUND.
  - APPROXIMATE STORMWATER DRAINAGE DATED FEBRUARY, 2000.
  - PLANNING AND ZONING FILE NUMBERS: S-02-19, WP-03-05, P-05-11.
  - LANDSCAPING SURETY IN THE AMOUNT OF \$11,700.00 FOR 37 SHADE TREES AND 4 EVERGREEN TREES WILL BE PAID WITH THE DEVELOPER'S AGREEMENT.
  - SEEDING AND EROSION CONTROL WILL BE PROVIDED FOR THIS SITE.
  - THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
  - TO THE BEST OF THE OWNER'S KNOWLEDGE, THERE ARE NO BURIAL/CEMETERY LOCATIONS ON SITE.
  - STREET TREES ARE REQUIRED FOR THIS SUBDIVISION IN ACCORDANCE WITH SECTION 16.12401(f) OF THE SUBDIVISION ACT IN THE AMOUNT OF \$9,600.00 FOR 32 STREET TREES WILL BE PAID WITH THE DEVELOPER'S AGREEMENT.
  - STREET LIGHTING IS PROVIDED FOR THIS SITE.
  - A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
  - OPEN SPACE LOT 19 - RESERVATIONAL OPEN SPACE MAINTAINED BY HOA.
  - OPEN SPACE LOTS 24 & 25 - OPEN SPACE MAINTAINED BY HOA.
  - OPEN SPACE LOT 13 - STORMWATER MANAGEMENT MAINTAINED BY HOA.
  - FOREST CONSERVATION EASEMENT DEDICATED TO HOWARD COUNTY DEPARTMENT OF REC AND PARKS.
  - A NOISE STUDY IS NOT REQUIRED FOR THIS SITE.
  - LOTS 4 & 5, 7 THRU 10, LOTS 14 THRU 17, LOTS 19, 20, 21, 22, 23, 24, 25 WILL UTILIZE A USE-IN-COMMON DRIVEWAY. HOWARD COUNTY STANDARD DETAIL NO. 6-03E SHALL BE UTILIZED AT THE INTERSECTION OF THE PUBLIC ROAD.
  - TREE PROTECTION FENCING WILL BE PROVIDED AT THE LIMITS OF DISTURBANCE WHERE GRADING IS ADJACENT TO FOREST CONSERVATION RETENTION AREAS AND SENSITIVE ENVIRONMENTAL AREAS, SUCH AS STREAM BUFFERS AND STEEP SLOPES.
  - FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM DRIVE AND RIGHT-OF-WAY LINE AND NOT TO THE PIPESTEM DRIVEWAY.
  - ON 2/7/02, DOW BUREAU OF ENGINEERING APPROVED 8 LOTS TO HAVE NO BASEMENT GRAVITY SEWER SERVICE. SAID LOTS HAVE BEEN IDENTIFIED AT PRELIMINARY PLAN PHASE AND AT FINAL PLAN STAGE.
  - THIS PLAN IS SUBJECT TO A DESIGN WALKER TO DESIGN MANUAL, VOLUME III SECTION 2.5.2.H APPROVED APRIL 10, 2003. THIS APPROVAL IS DUE TO THE FOLLOWING:
    - THE APPLICANT HAS SUBMITTED SUFFICIENT EVIDENCE THAT A SIGHT DISTANCE EASEMENT WAS REQUESTED FROM THE ADJACENT PROPERTY OWNER(S) AS A MINIMUM REQUIREMENT FOR APPROVING A WATER TO THE CURRENT INTERSECTION SIGHT DISTANCE REQUIREMENT.
    - THE PROPOSED INTERSECTIONS AS DESIGNED WILL MEET THE REQUIREMENTS FOR ADEQUATE STOPPING SIGHT DISTANCE.
  - THIS PLAN IS SUBJECT TO WP-03-05 TO WAVE SECTION 16.116(a) TO ALLOW DISTURBANCE OF WETLANDS, WETLANDS BUFFER AND STREAM BUFFER FOR THE CONSTRUCTION OF A USE-IN-COMMON DRIVEWAY TO SERVE 4 RESIDENTIAL LOTS. THE CROSSING FOR THE SEWER MAIN WAS APPROVED. THE FOLLOWING CONDITIONS FOR APPROVAL OF WP-03-05 ARE AS FOLLOWS:
    - COMPLY WITH THE COMMENTS FROM THE DEVELOPMENT ENGINEERING DIVISION REGARDING CAPACITY AND LIMITING DISTURBANCE TO THAT SHOWN ON THE EXHIBITS DATED 1-14-03 WHICH ACCOMPANIED THE REVISED WALKER PETITION.
    - COMPLY WITH THE COMMENTS FROM THE SOIL CONSERVATION DISTRICT DURING SUBMISSION DESIGN DEVELOPMENT TO MINIMIZE THE IMPACT OF THE DESIGN AND CONSTRUCTION OF THE DRIVEWAY ON THE WETLANDS.
    - THE DEVELOPER MUST OBTAIN ALL NECESSARY STATE AND/OR COE PERMITS FOR THE PROPOSED ENVIRONMENTAL IMPACTS.
  - A STOP SIGN IS REQUIRED AT THE INTERSECTION OF HANOVER ROAD.
  - THIS SUBMISSION IS SUBJECT TO THE SIXTH EDITION SUBMISSION REGULATIONS, THE ZONING REGULATIONS, AND THE 1993 ZONING REGULATIONS AMENDED BY CE 50-2001, EFFECTIVE 1-08-02.
  - ALL SIGN POST USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL POST (14 CHAIRS) INSERTED INTO A 2-1/2" GALVANIZED SQUARE TUBE (12 GAUGE - 3' LONG). A GALVANIZED STEEL POLYCAP SHALL BE MOUNTED ON TOP OF EACH POST.
  - STRUCTURE CLEARANCE - MINIMUM 12 INCHES.
  - PARKING IS PROHIBITED ON THE 60'X25' TURNAROUND.
  - NO WELLS OR SEPTIC SYSTEMS WERE FOUND ON SITE. IF WELLS AND/OR SEPTIC SYSTEMS ARE ENCOUNTERED DURING GRADING OR CONSTRUCTION, CONTRACTOR TO CONTACT THE HEALTH DEPARTMENT FOR PROPER REMEDIATION.
  - ALL RETAINING WALLS LOCATED IN PRIVATE PROPERTY SHALL BE MAINTAINED BY HOMEOWNER'S ASSOCIATION (H.O.A.). ALL RETAINING WALLS LOCATED IN THE PUBLIC SWM FACILITY AND STORMWATER & UTILITY EASEMENTS SHALL BE MAINTAINED BY THE HOA.
  - AT SITE DEVELOPMENT PLAN STAGE, THE BRL'S SHALL BE ESTABLISHED IN ACCORDANCE WITH CURRENT ZONING REGULATIONS.
  - THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.12002 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
  - WATER AND SEWER FOR THIS PROJECT WILL BE PROVIDED THROUGH CONTRACT NO. 649-S AND 650-S. WATER TO BE PROVIDED THROUGH CONTRACT NO. 650-S.



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 11-14-08  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 11/16/08  
 CHIEF, DIVISION OF LAND DEVELOPMENT

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 11/20/08

REVIEWED FOR HOWARD S.C.D. & MECHANICAL REQUIREMENTS.  
 BY THE DEVELOPER:  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL AND THAT ALL 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.

HOWARD S.C.D. DATE: 10/27/08

BY THE ENGINEER:  
 I HEREBY CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

DATE: 9-26-08

**COORDINATE TABLE BOUNDARY POINTS**

POINT	NORTHING	EASTING
702	559187.4866	1391152.9777
703	559139.4407	1391141.0682
704	558978.6191	1391104.1708
705	558758.8283	1391096.7964
707	559000.8020	1390164.5732
708	558586.9023	1390223.1079

**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 NO. 16193  
 EXPIRATION DATE: SEPTEMBER 27, 2008.

**OWNER/DEVELOPER**  
 6168 INVESTMENT & RENTAL PROPERTIES, LLC  
 5705 LANDING ROAD  
 ELKBRIDGE, MARYLAND 21075  
 (410) 796-1830

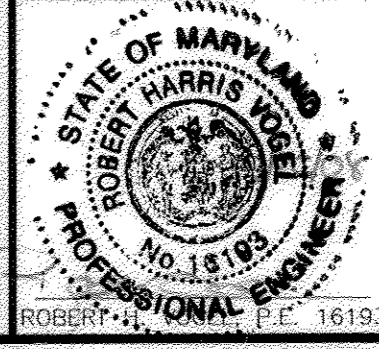
**COVER SHEET**  
 FINAL ROAD CONSTRUCTION PLANS  
 SHADY LANE CROSSING  
 LOTS 1 THRU 25  
 6168 HANOVER ROAD  
 LIBER 505 AND FOLIO 295

TAX MAP #38 GRID 9  
 1ST ELECTION DISTRICT  
 PARCEL 235  
 HOWARD COUNTY, MARYLAND

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

DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
 CHECKED BY: RHV  
 DATE: SEPTEMBER, 2008  
 SCALE: AS SHOWN  
 W.O. NO.: 04-33.03

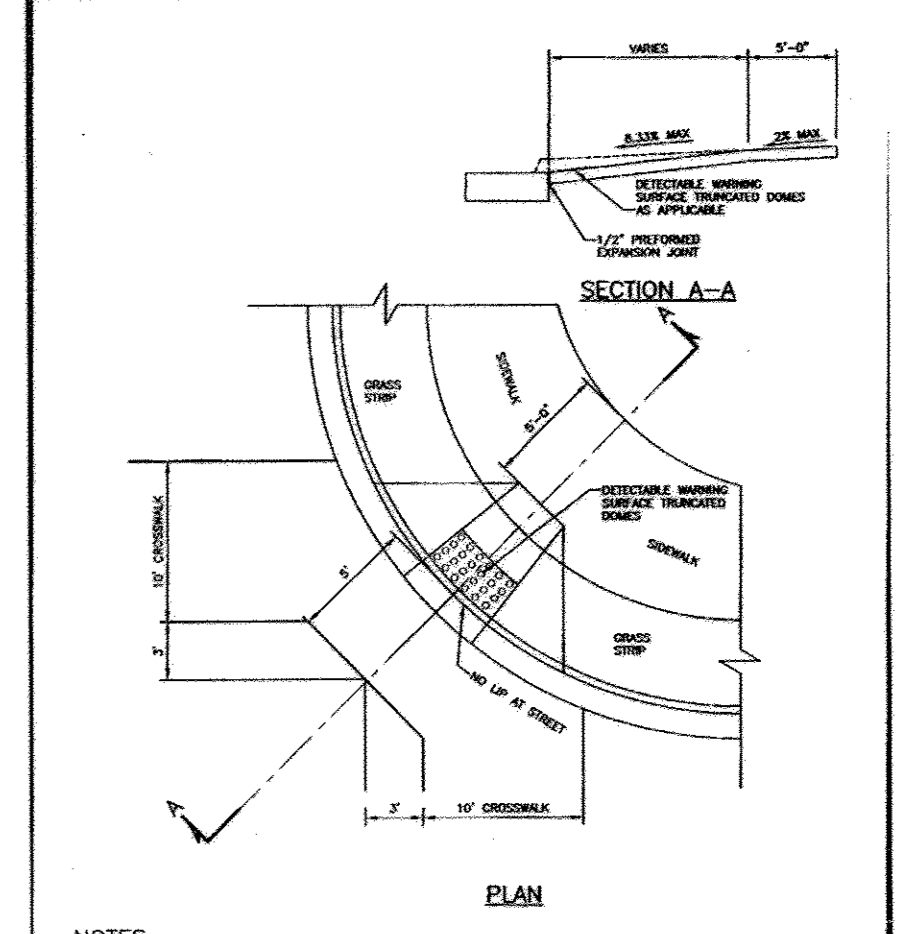
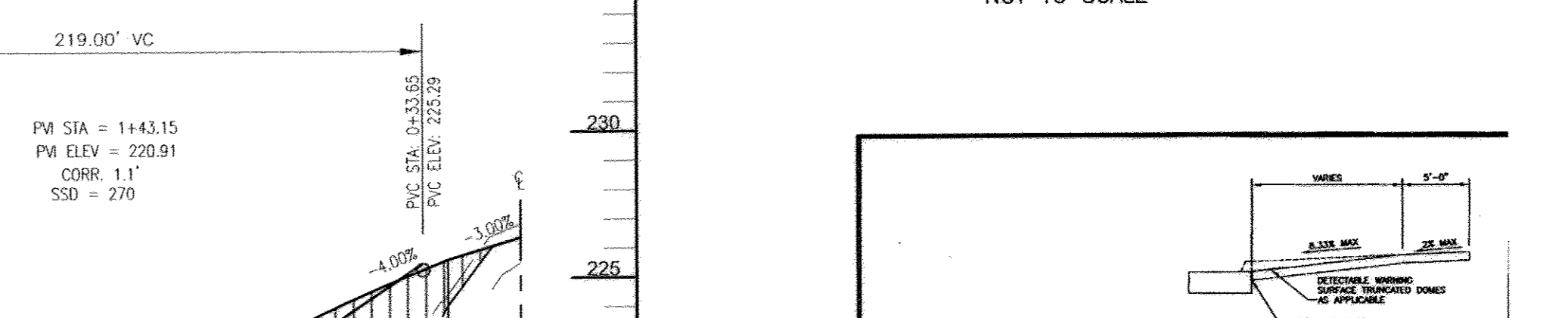
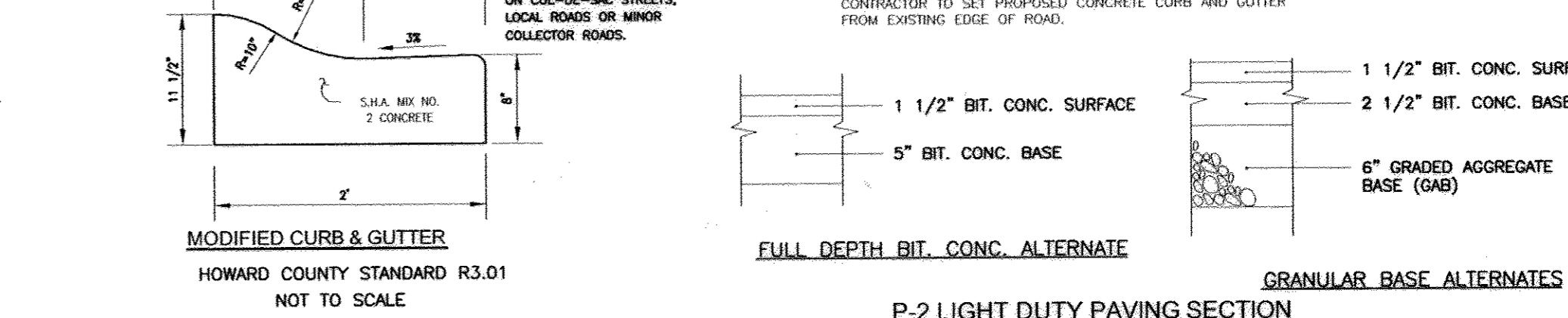
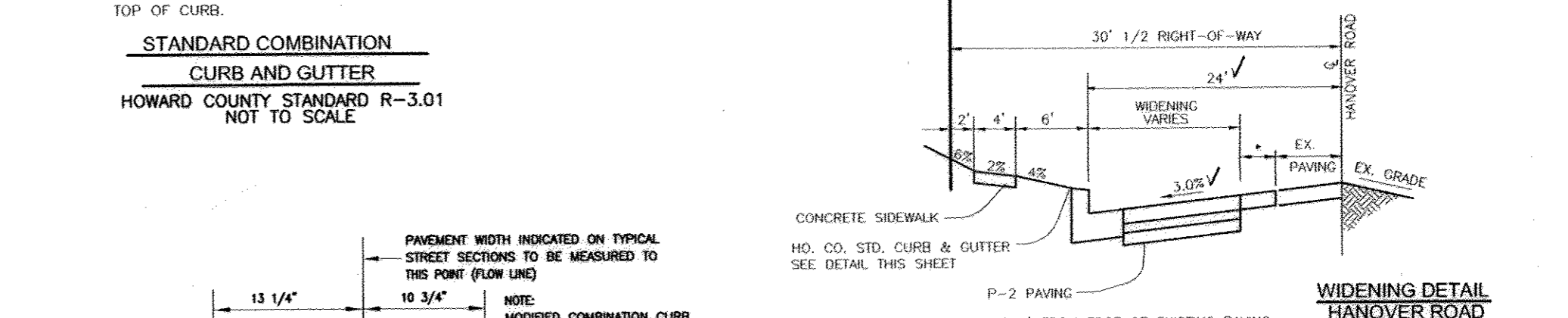
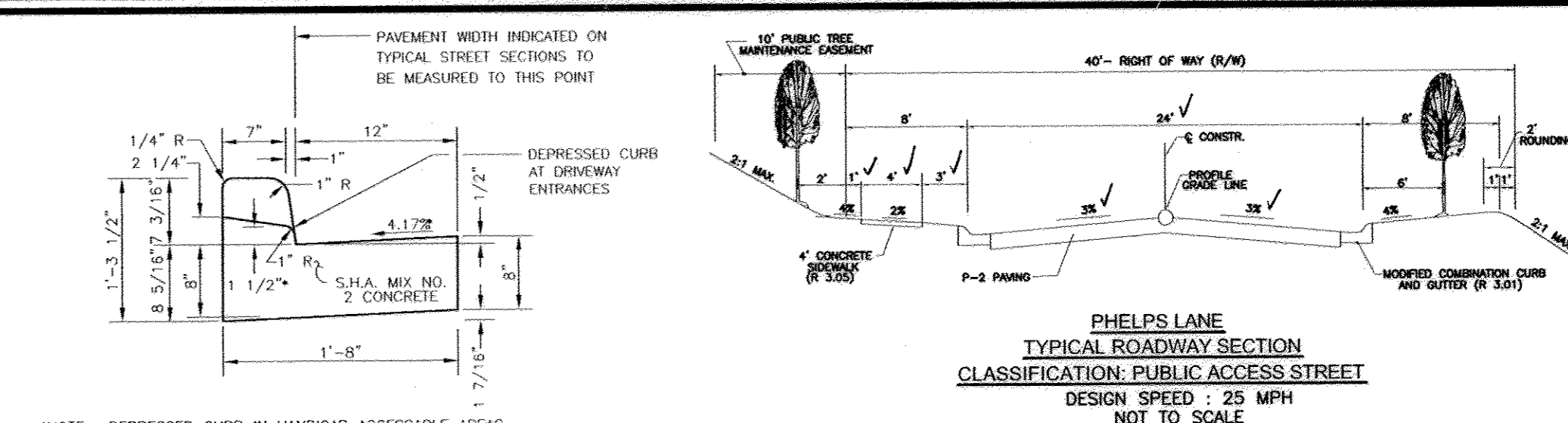
1 SHEET OF 13



OWNERS: SCHULTZ GRACE TAYLOR  
 ADDRESS: 6132 HANOVER RD  
 DEED: L3436 F.401  
 LOCATION: TAXMAP 38 PARCEL 731  
 ZONED: R-12

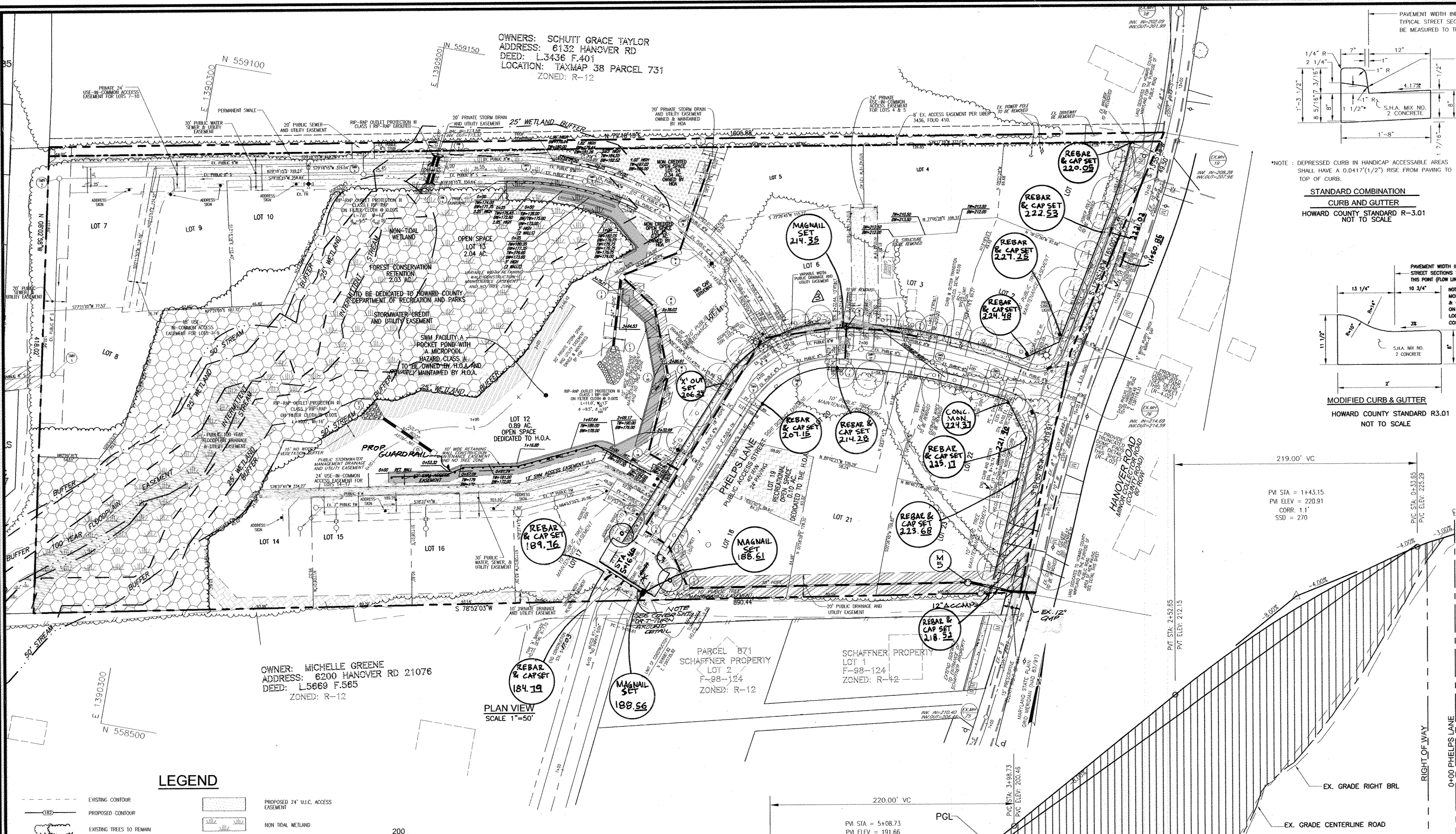
OWNER: MICHELLE GREENE  
 ADDRESS: 6200 HANOVER RD 21076  
 DEED: L5668 F.565  
 ZONED: R-12

PLAN VIEW  
 SCALE 1"=50'



NOTES:  
 1. ALL ANGLES SHALL BE EXISTING UNLESS SHOWN OTHERWISE.  
 2. CURVE AREA ADJACENT TO SIDEWALK SHALL BE SLOPED TO MEET MAIN.

Howard County, Maryland Department of Public Works	SEWALK RAMP Type B Single Ramp	Detail R-4.02
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**LEGEND**

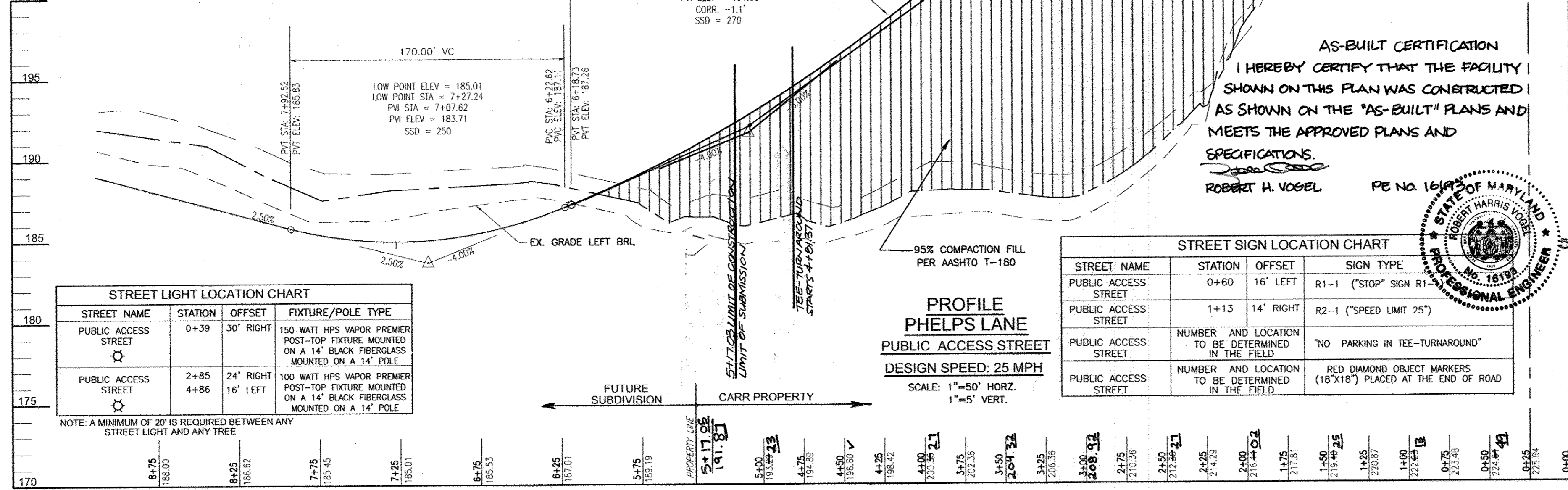
EXISTING CONTOUR	PROPOSED 24" W.C. ACCESS EASEMENT	NON TIDAL WETLAND
PROPOSED CONTOUR	12' WIDE ACCESS 10% MAX. SLOPE	15% - 24.9% STEEP SLOPE AREA
EXISTING TREES TO REMAIN	10' PRIVATE DRAINAGE AND UTILITY EASEMENT	25% OR GREATER STEEP SLOPE AREA
15% - 24.9% STEEP SLOPE AREA	CREDITED OPEN SPACE REC. OPENSPACE	FOREST CONSERVATION EASEMENT (PROFESSIONAL)
25% OR GREATER STEEP SLOPE AREA	NO WOODY VEGETATION BUFFER	FOREST CONSERVATION EASEMENT (RECREATION)
FOREST CONSERVATION EASEMENT (PROFESSIONAL)	TREE MAINTENANCE EASEMENT	NON-CREDITED OPEN SPACE
FOREST CONSERVATION EASEMENT (RECREATION)	PRIVATE 20' STORM DRAIN AND UTILITY EASEMENT OWNED & MAINTAINED BY HOA	100 YEAR FLOODPLAIN EASEMENT 0.24 AC.
NON-CREDITED OPEN SPACE	PRIVATE 30' DRAINAGE AND UTILITY EASEMENT	PUBLIC DRAINAGE & UTILITY EASEMENT
100 YEAR FLOODPLAIN EASEMENT 0.24 AC.	RETAINING WALL EASEMENT	6" STREAM
PUBLIC DRAINAGE & UTILITY EASEMENT	SOIL BORING	STREAM BUFFER
6" STREAM	WETLAND BUFFER	WETLAND
STREAM BUFFER	SPOT ELEVATION	SOIL TYPE
WETLAND	DIRECTION OF FLOW	FCM
SOIL TYPE	RICE "TRADITIONAL" STYLE LIGHT POLE	WALK OUT BASEMENT
FCM		PROPOSED STREET TREE

NOTE: ALL RETAINING WALLS LOCATED IN PRIVATE PROPERTY SHALL BE PRIVATELY OWNED AND MAINTAINED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 DATE: 11-14-08  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 DATE: 11/21/08  
 CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS  
 DATE: 11/21/08  
 COUNTY HEALTH OFFICER  
 HOWARD COUNTY HEALTH DEPARTMENT



**STREET LIGHT LOCATION CHART**

STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE
PUBLIC ACCESS STREET	0+39	30' RIGHT	150 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS MOUNTED ON A 14' POLE
PUBLIC ACCESS STREET	2+85	24' RIGHT	100 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS MOUNTED ON A 14' POLE

**STREET SIGN LOCATION CHART**

STREET NAME	STATION	OFFSET	SIGN TYPE
PUBLIC ACCESS STREET	0+60	16' LEFT	R1-1 ("STOP" SIGN R1-1)
PUBLIC ACCESS STREET	1+13	14' RIGHT	R2-1 ("SPEED LIMIT 25")
PUBLIC ACCESS STREET	NUMBER AND LOCATION TO BE DETERMINED IN THE FIELD		"NO PARKING IN TEE-TURNAROUND"
PUBLIC ACCESS STREET	NUMBER AND LOCATION TO BE DETERMINED IN THE FIELD		RED DIAMOND OBJECT MARKERS (18"x18") PLACED AT THE END OF ROAD

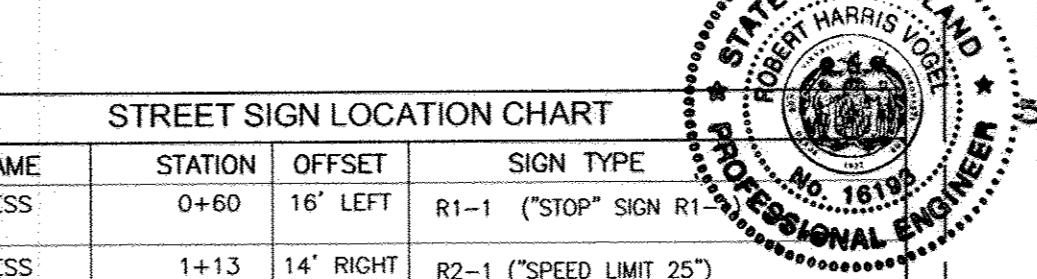
**LINE TABLE**

LINE	LENGTH	BEARING
L1	64.79	S80°24'49"E
L2	205.26	N22°20'28"E
L3	196.49	N06°02'01"E

**CURVE TABLE**

CURVE	LENGTH	RADIUS	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C1	157.85	500.00	79.59	N89°27'28"W	157.20	
C2	103.25	100.00	56.76	S51°55'10"W	98.72	
C3	28.46	100.00	14.33	S14°11'14"W	28.37	

**AS-BUILT CERTIFICATION**  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.  
 ROBERT H. VOGEL  
 PE NO. 16194



**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 NO. 16193  
 EXPIRATION DATE: SEPTEMBER 27, 2008.

**OWNER/DEVELOPER**  
 6168 INVESTMENT & RENTAL PROPERTIES, LLC  
 5705 LANDING ROAD  
 ELKDRIDGE, MARYLAND 21075  
 (410) 798-1850

NO.	REVISION	DATE
5	REVISED TO PROVIDE AS-BUILT CONDITION OF STORM DRAIN PIPE	11/22/08
4	SHIFT GUARDRAIL/SUBSTITUTE SKIM PLANTINGS	6/9/10
3	SUBSTITUTE RETAINING WALL SHEETS	
3	MOVE MH 3 FOUR FEET INTO PHELPS LANE RIGHT-OF-WAY	9/27/14
2	REVISE STORM DRAIN TO ACCOMMODATE EXISTING CONDITIONS	6/24/14
2	REVISE T-TURNAROUND, AND REVISE POND TO AS-BUILT	
NO.	REVISION	DATE

**ROAD PLAN, STREET TREES, AND PROFILE FINAL ROAD CONSTRUCTION PLANS**  
**SHADY LANE CROSSING**  
**LOTS 1 THRU 25**  
 6168 HANOVER ROAD  
 LIBER 505 AND FOLIO 295

TAX MAP #38 GRID 9  
 1ST ELECTION DISTRICT

PARCEL 235  
 HOWARD COUNTY, MARYLAND

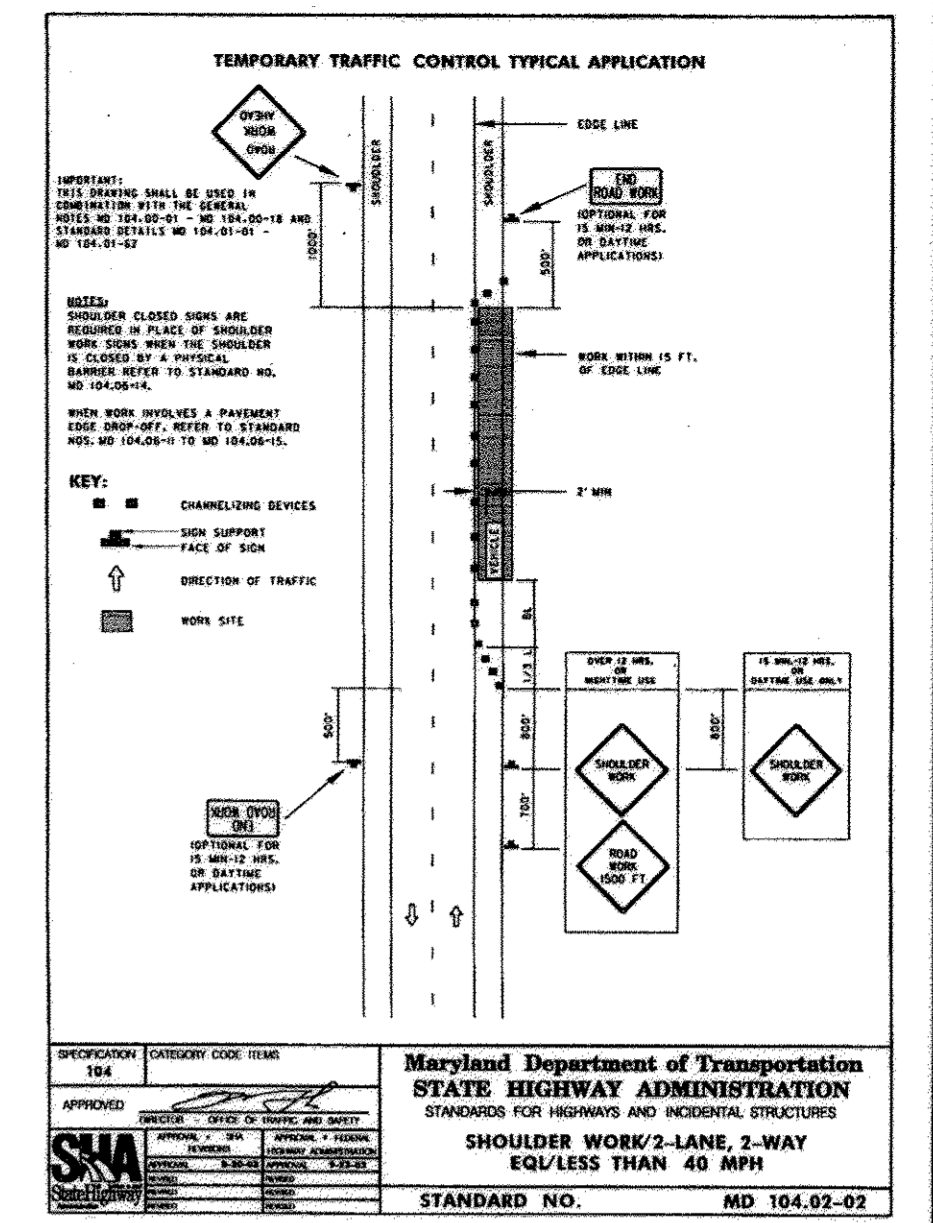
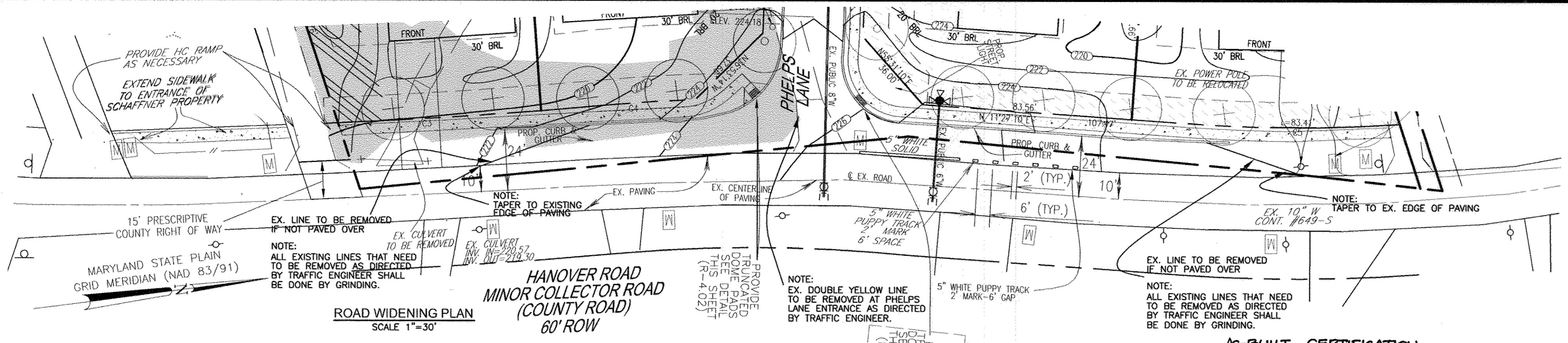
**ROBERT H. VOGEL ENGINEERING, INC.**  
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 ELICHT CITY, MD 21043  
 TEL: 410.461.7666  
 FAX: 410.461.8991

DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
 CHECKED BY: RHY  
 DATE: SEPTEMBER, 2008  
 SCALE: AS SHOWN  
 W.O. NO.: 04-33-03

2 SHEET OF 13

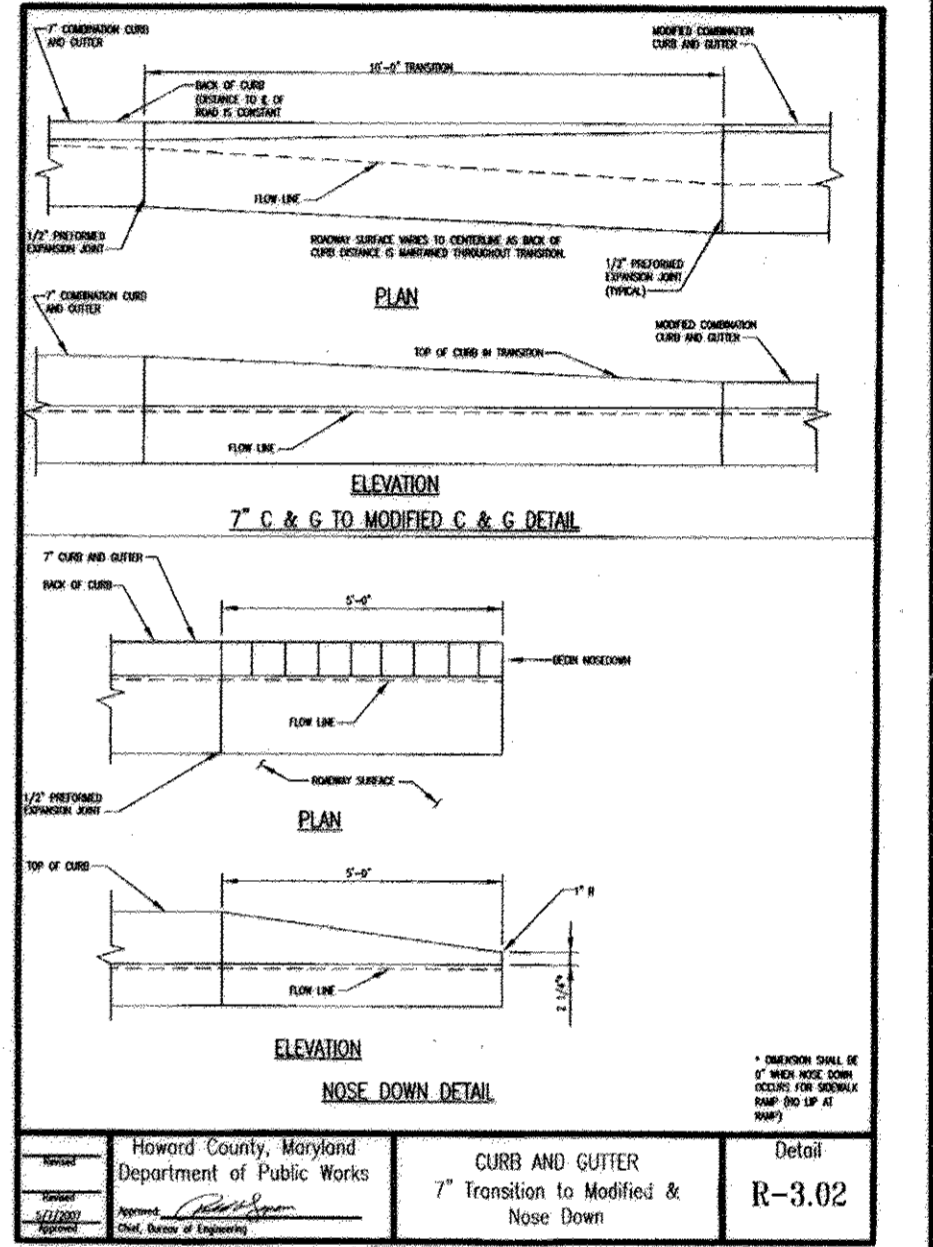
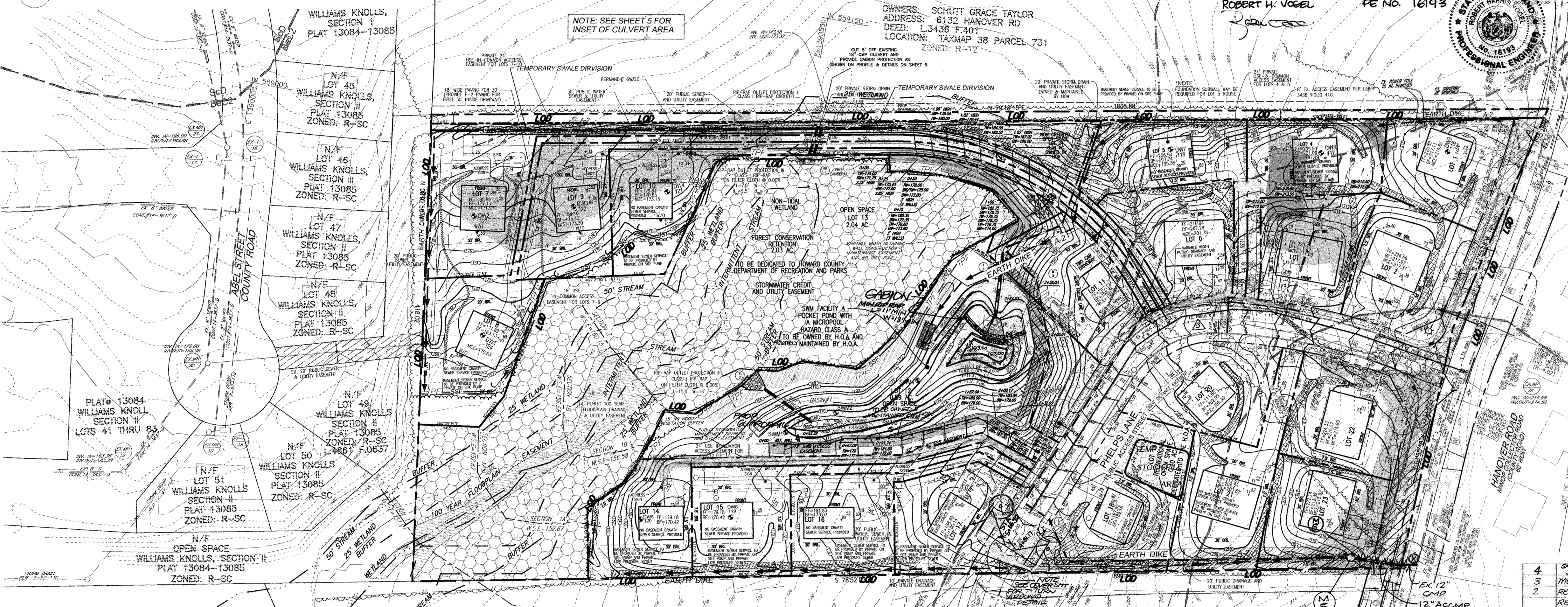
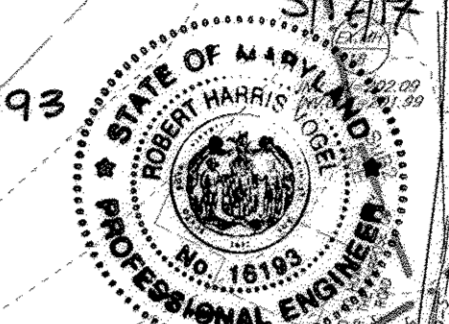
**LEGEND**

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING TREES TO REMAIN
- 15% - 24.99% STEEP SLOPE AREA
- 25% OR GREATER STEEP SLOPE AREA
- FOREST CONSERVATION EASEMENT (REFORESTATION)
- FOREST CONSERVATION EASEMENT (RETENTION)
- NON-CREATED OPEN SPACE
- 100 YEAR FLOODPLAIN EASEMENT 0.04 AC.
- PUBLIC DRAINAGE & UTILITY EASEMENT
- STREAM
- STREAM BUFFER
- WETLAND
- SOIL TYPE
- LEM
- WALK OUT BASEMENT
- PROPOSED STREET TREE
- PROPOSED 24" U.I.C. ACCESS EASEMENT
- NON TIDAL WETLAND
- 12" WIDE ACCESS 10% MAX. SLOPE
- 10' PRIVATE DRAINAGE AND UTILITY EASEMENT
- CREDITED OPEN SPACE REC. OPENSPACE
- NO WOODY VEGETATION BUFFER
- TREE MAINTENANCE EASEMENT
- PRIVATE 20" STORM DRAIN AND UTILITY EASEMENT OWNED & MAINTAINED BY HOA
- PRIVATE SIM DRAINAGE AND UTILITY EASEMENT
- RETAINING WALL EASEMENT
- SOIL BORING
- WETLAND BUFFER
- SPOT ELEVATION
- DIRECTION OF FLOW
- EDGE "TRADITIONAL" STYLE LIGHT POLE



**AS-BUILT CERTIFICATION**  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

ROBERT H. VOGEL PE NO. 16193



**POCKET POND**  
 PRIVATELY OWNED AND MAINTAINED BY HOA AND HOWARD COUNTY JOINTLY.  
 1 YR WSEL=168.48  
 10 YR WSEL=169.53  
 BOTTOM EL=166.00  
 TOP WQV EL=166.68

**BASIN #1**  
 EX. DA=3.02 AC.  
 DV. DA=4.59 AC.  
 VOLUME REQUIRED=16884 CF  
 VOLUME PROVIDED=16884 CF  
 WET STORAGE=166.00-168.10(1.2')  
 DRY STORAGE=168.10-169.30(1.2')  
 TOTAL DEPTH=2.10'  
 CREST EL=169.30  
 BOTTOM EL=166.00  
 CLEANOUT EL=167.10  
 EX. Q<sub>1</sub>=0.56 CFS  
 DEV. Q<sub>1</sub>=16.03 CFS  
 TSMW Q<sub>1</sub>=0.52 CFS

NO.	REVISION	DATE
4	SWIFT GRADING, SUBSTITUTE SWIM PLANTINGS, SUBSTITUTE RETAINING WALL SHEETS	6/6/16
3	MOVES POCKET POND TO SHOULDER TO THE RIGHT OF WAY	8/27/14
2	REVISE STORM DRAIN TO ACCOMMODATE EXISTING CONDITIONS, REVISE TREE TURNAROUND, AND REVISE POND TO AS-BUILT	9/24/14

NO.	REVISION	DATE
5	REVISE TO PROVIDE AS-BUILT CONDITIONS OF STORM DRAIN	11/22/16

APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

COUNTY HEALTH OFFICER  
 HOWARD COUNTY HEALTH DEPARTMENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] DATE 11-14-07  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] DATE 11/21/10  
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] DATE 11/20/08  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

NOTE: FINAL HOUSE SITE GRADES SHALL TIE TO PROPOSED GRADES AROUND FOUNDATIONS AS SHOWN ON THIS PLAN.

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.

BY THE DEVELOPER:  
 [Signature] DATE 10/16/08  
 HOWARD S.C.D.

BY THE ENGINEER:  
 [Signature] DATE 9-26-09  
 PROFESSIONAL ENGINEER

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 NO. 16193. EXPIRATION DATE: SEPTEMBER 27, 2008.

OWNER/DEVELOPER  
 6168 HANOVER ROAD  
 LIBER 505 AND FOLIO 295  
 PARCEL 235  
 1ST ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

**GRADING AND SEDIMENT CONTROL PLAN**  
**FINAL ROAD CONSTRUCTION PLANS**  
**SHADY LANE CROSSING**  
**LOTS 1 THRU 25**  
 6168 HANOVER ROAD  
 LIBER 505 AND FOLIO 295

TAX MAP #38 GRID 9 PARCEL 235  
 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 8407 MAIN STREET, ELICOTT CITY, MD 21043  
 TEL: 410.461.7666 FAX: 410.461.9661

DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
 CHECKED BY: RHW  
 DATE: NOVEMBER, 2005  
 SCALE: AS SHOWN  
 W.O. NO.: 04-93.03

3 SHEET OF 13

**LEGEND**

	EXISTING CONTOUR		PROPOSED 24' UAC ACCESS EASEMENT
	PROPOSED CONTOUR		NON-TIDAL WETLAND
	EXISTING TREES TO REMAIN		12' WIDE ACCESS
	15%-24.99% STEEP SLOPE AREA		10% PRIVATE DRAINAGE AND UTILITY EASEMENT
	25% OR GREATER STEEP SLOPE AREA		CREDITED OPEN SPACE
	FOREST CONSERVATION EASEMENT (RETENTION)		NO WOODY VEGETATION
	FOREST CONSERVATION EASEMENT (RETENTION)		TREE MAINTENANCE EASEMENT
	NON-CREDITED OPEN SPACE		PRIVATE 20' STORM DRAIN AND UTILITY EASEMENT
	100 YEAR FLOODPLAIN EASEMENT		PRIVATE 50' STORM DRAIN AND UTILITY EASEMENT
	PUBLIC DRAINAGE & UTILITY EASEMENT		RETAINING WALL EASEMENT
	STREAM		SOIL BORING
	STREAM BUFFER		WETLAND BUFFER
	WETLAND		SPOT ELEVATION
	SOIL TYPE		DIRECTION OF FLOW
	ECM		BCC "TRADITIONAL" STYLE LIGHT POLE
	WALK OUT BASEMENT		
	PROPOSED STREET TREE		

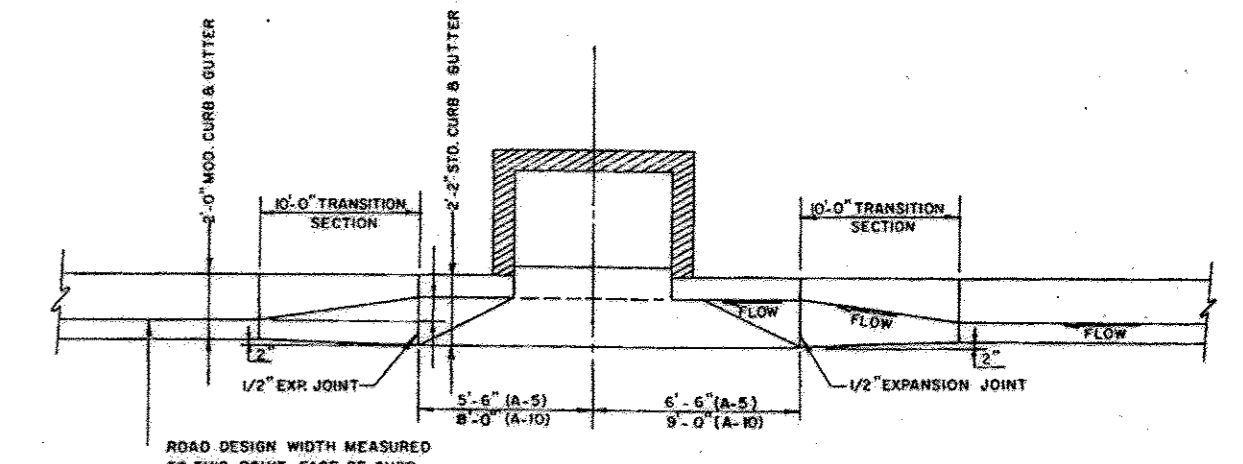
EX. LINE TO BE REMOVED IF NOT PAVED OVER  
 NOTE: ALL EXISTING LINES THAT NEED TO BE REMOVED AS DIRECTED BY TRAFFIC ENGINEER SHALL BE DONE BY GRINDING.

**STRIPING PLAN**  
 SCALE 1"=30'

EX. LINE TO BE REMOVED IF NOT PAVED OVER  
 NOTE: ALL EXISTING LINES THAT NEED TO BE REMOVED AS DIRECTED BY TRAFFIC ENGINEER SHALL BE DONE BY GRINDING.

**DRAINAGE AREA TABULATIONS**

No.	Area	'C'	% Imp.	Soil Types	Zone
1-1	0.37 Ac.	0.43	52	B & C	R-12
1-2	0.49 Ac.	0.35	43	B	R-12
1-3	0.86 Ac.	0.29	38	B	R-12
1-4	0.10 Ac.	0.56	58	B	R-12
1-5	0.17 Ac.	0.46	54	B	R-12
1-6	0.29 Ac.	0.31	38	B & C	R-12
1-7	1.16 Ac.	0.29	38	B & C	R-12
CULVERT	0.70 Ac.	0.29	38	B	R-12



**MODIFIED COMBINATION CURB AND GUTTER**  
 SCALE: NTS No AS-BUILT INFORMATION ON THIS SHEET

NO.	REVISION	DATE
5	REVISE TO PROVIDE AS-BUILT CONDITIONS OF STORM DRAIN PIPE	11/22/16
4	SHIFT SUBPARALLEL SUBSTITUTE SWIM PLANTAINS	01/01/16
3	SUBSTITUTE RETAINING WALL SHEETS	01/27/16
2	MOVE MH'S FOUR FEET INTO PHELPS LANE RIGHT OF WAY	01/27/16
1	REVISE STORM DRAIN TO ACCOMMODATE EXISTING CONDITIONS	01/24/16
	REVISE T-TURWARDING AND REVISE POND TO AS-BUILT	

**STORM DRAIN DRAINAGE AREA MAP**  
**FINAL ROAD CONSTRUCTION PLANS**  
**SHADY LANE CROSSING**  
**LOTS 1 THRU 25**  
 6188 HANOVER ROAD  
 LIBER 505 AND FOLIO 295

TAX MAP #38 GRID 9 1ST ELECTION DISTRICT  
 PARCEL 235 HOWARD COUNTY, MARYLAND

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

DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
 CHECKED BY: RHW  
 DATE: SEPTEMBER, 2008  
 SCALE: AS SHOWN  
 W.O. NO.: 04-33-03

4 SHEET OF 13

**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 NO. 161193, EXPIRATION DATE: SEPTEMBER 27, 2008.

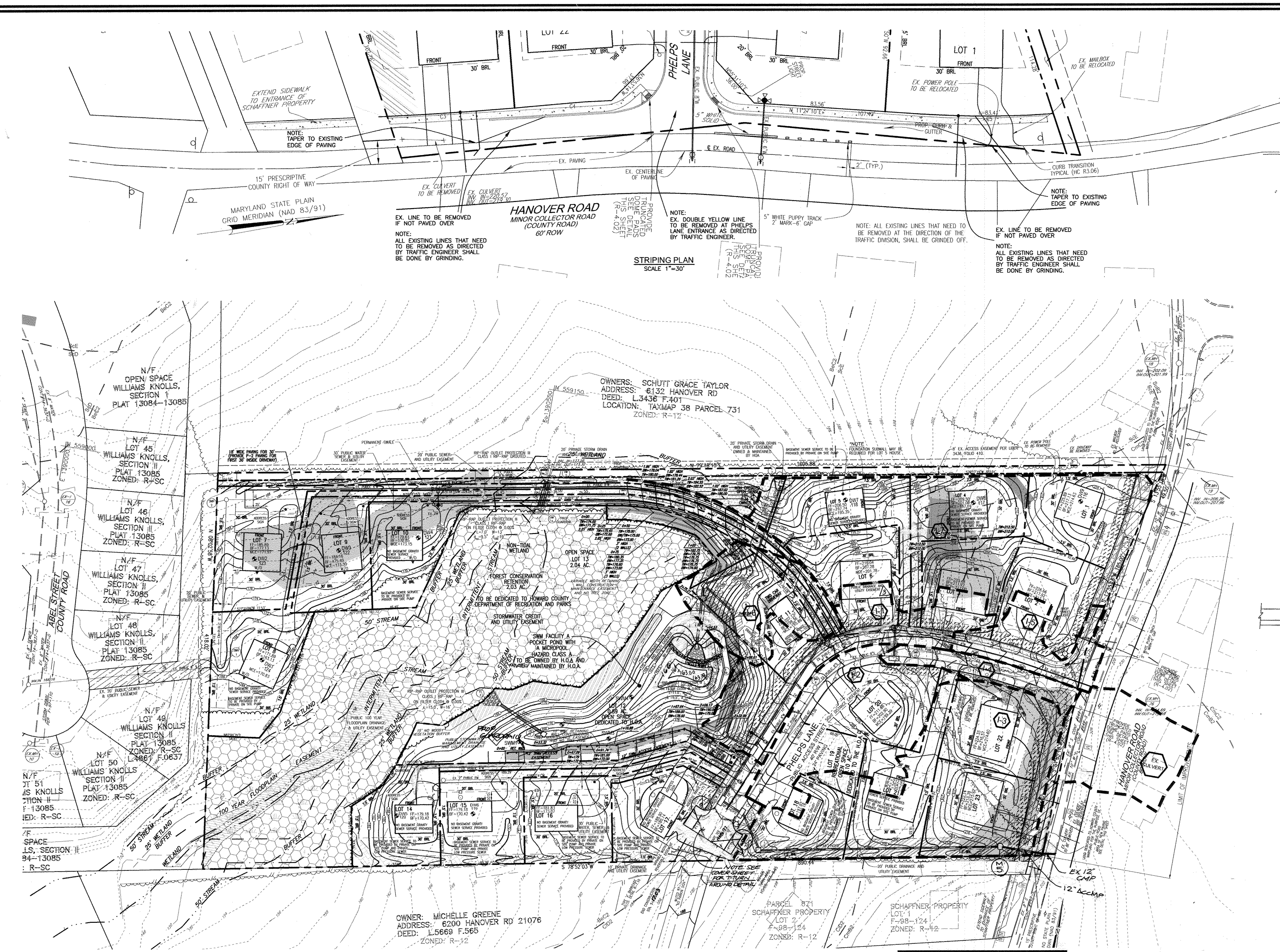
APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS  
 COUNTY HEALTH OFFICER  
 HOWARD COUNTY HEALTH DEPARTMENT  
 DATE

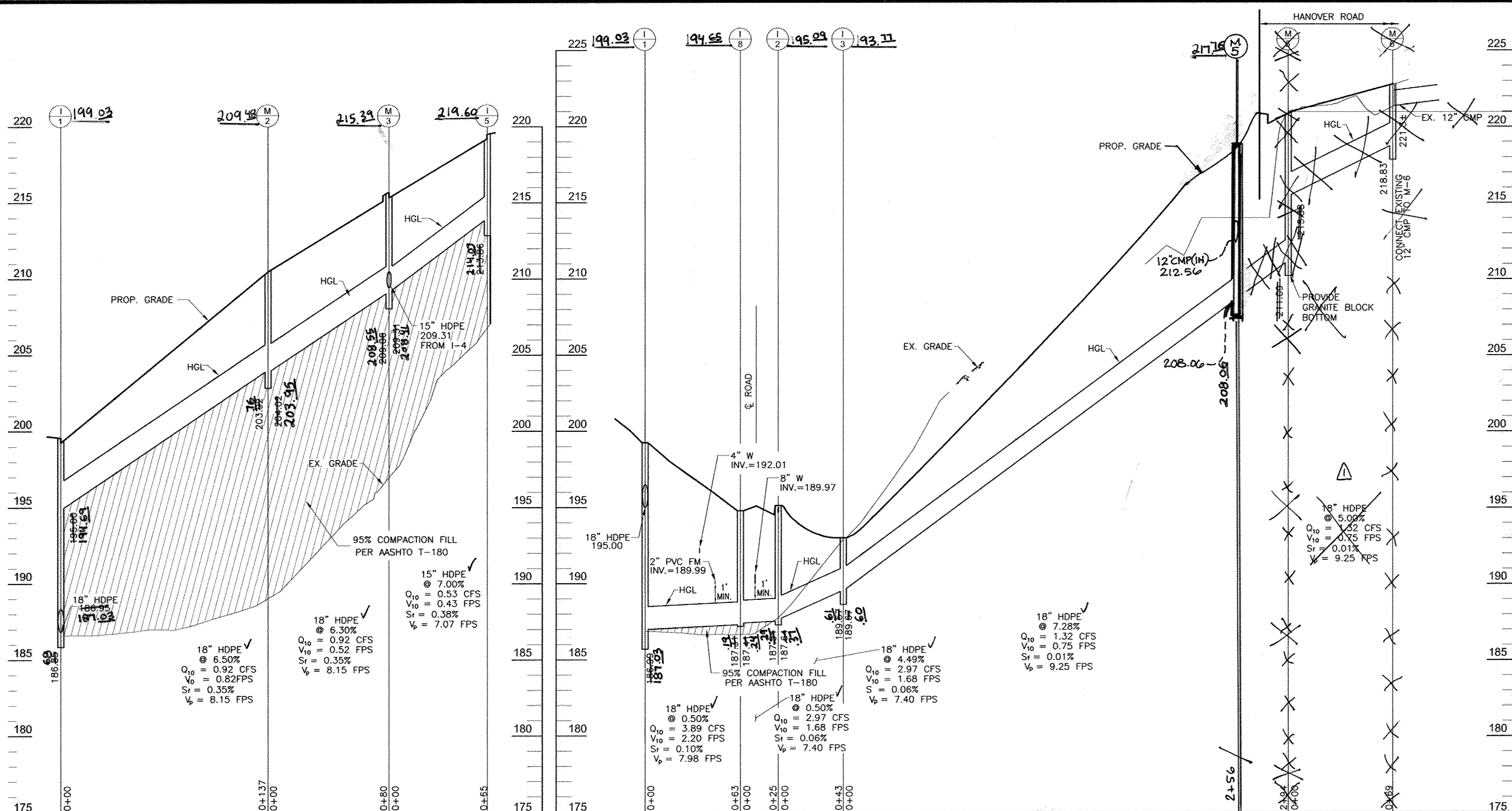
BY THE ENGINEER:  
 I HEREBY CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

BY THE DEVELOPER:  
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL 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.

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



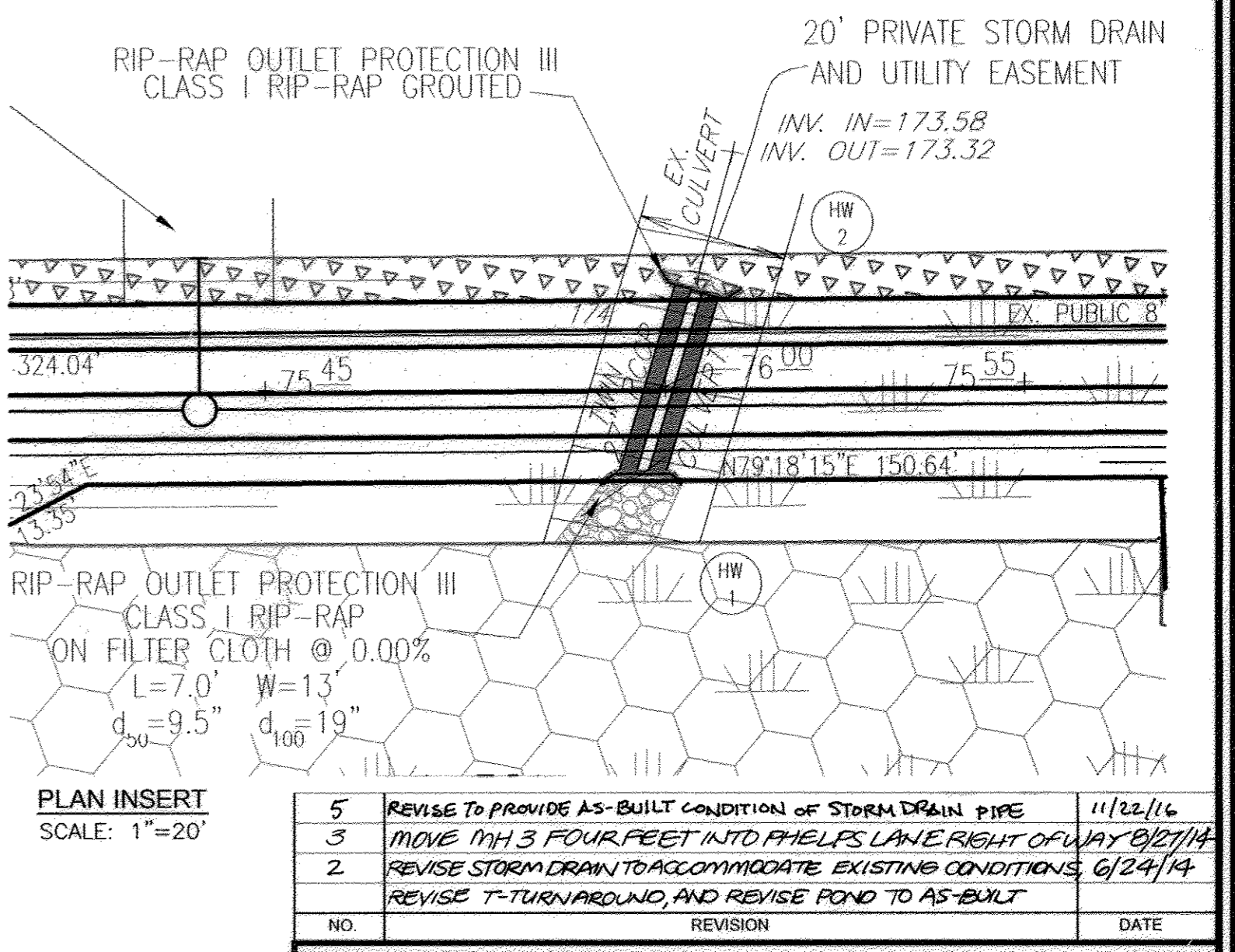
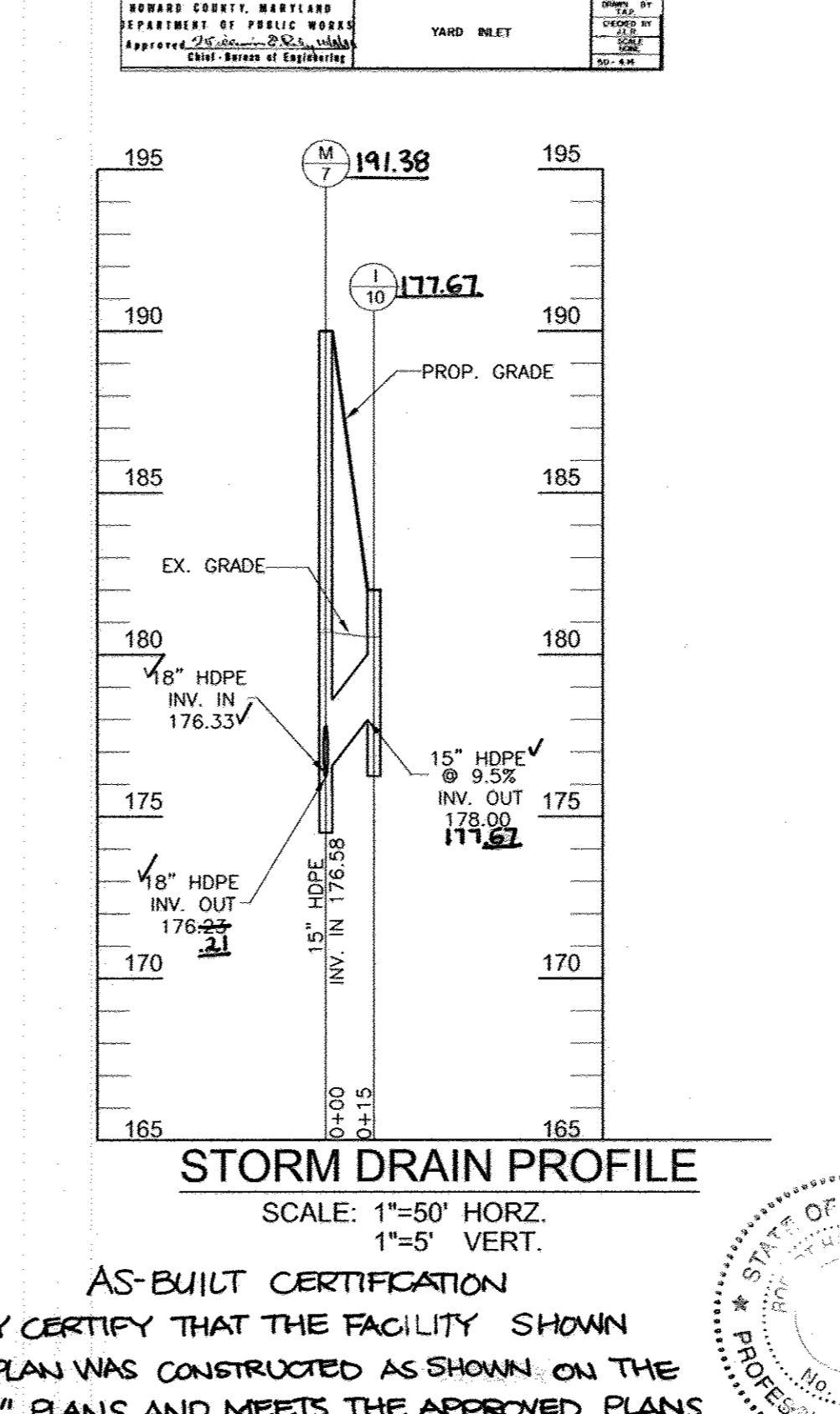
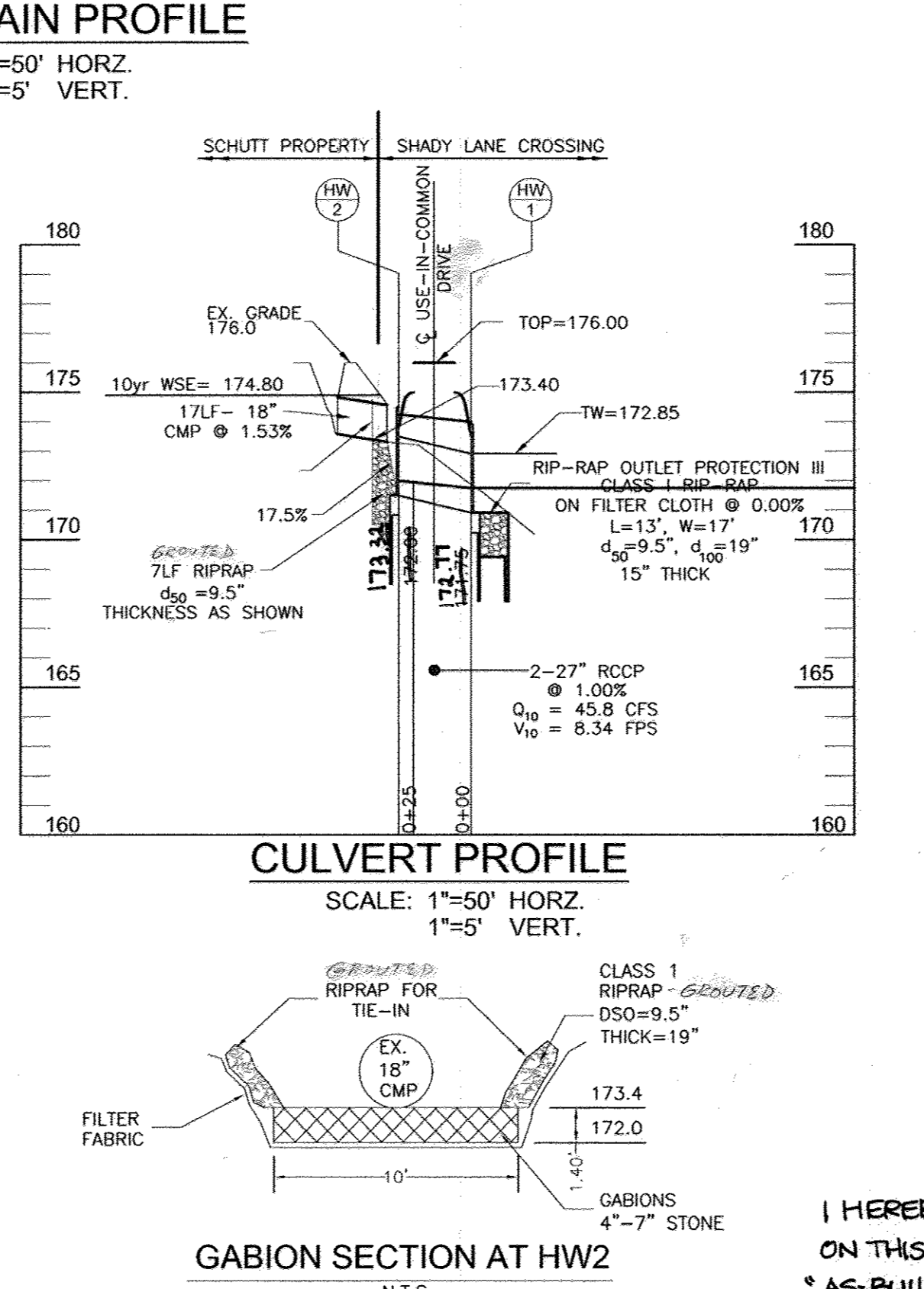
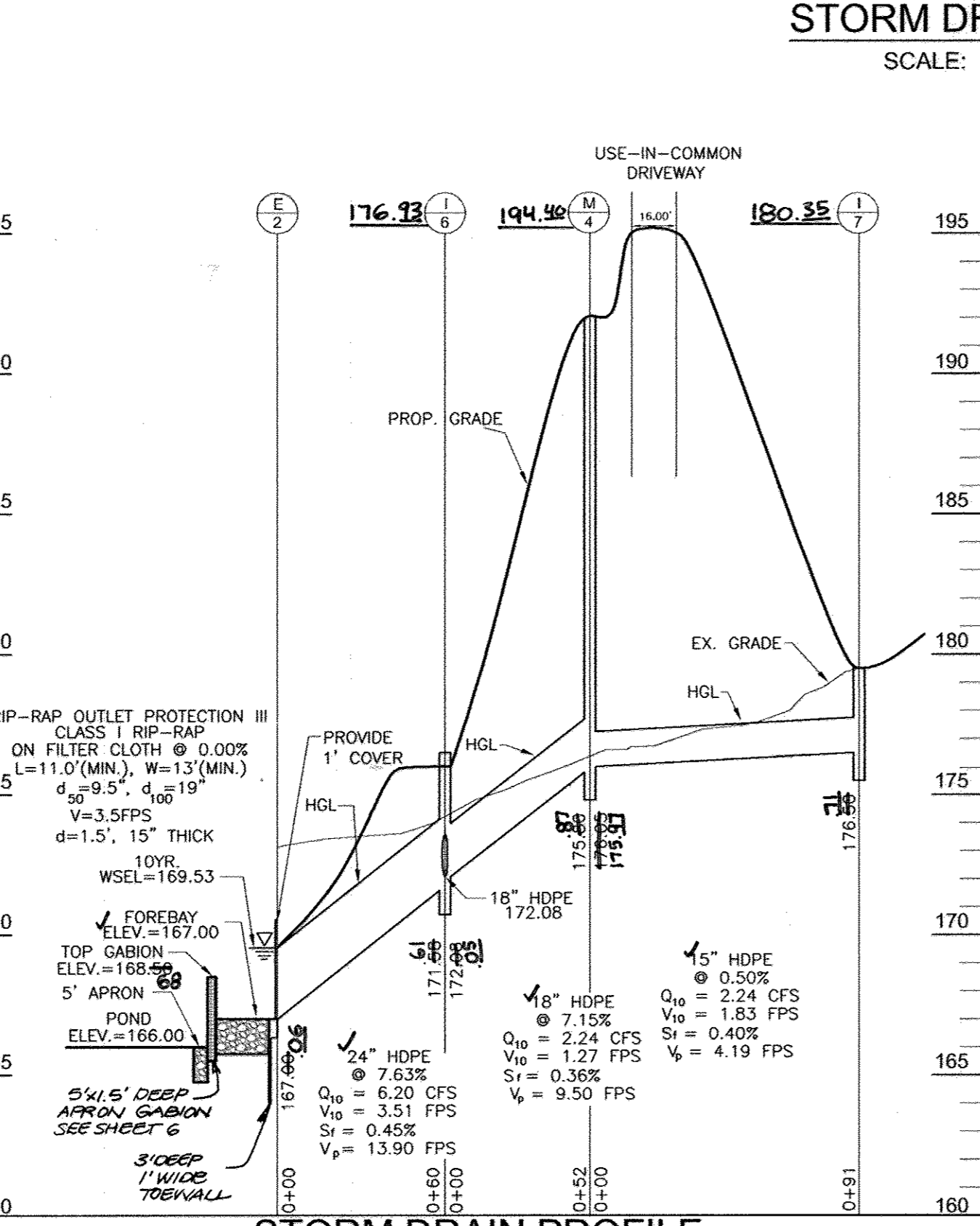
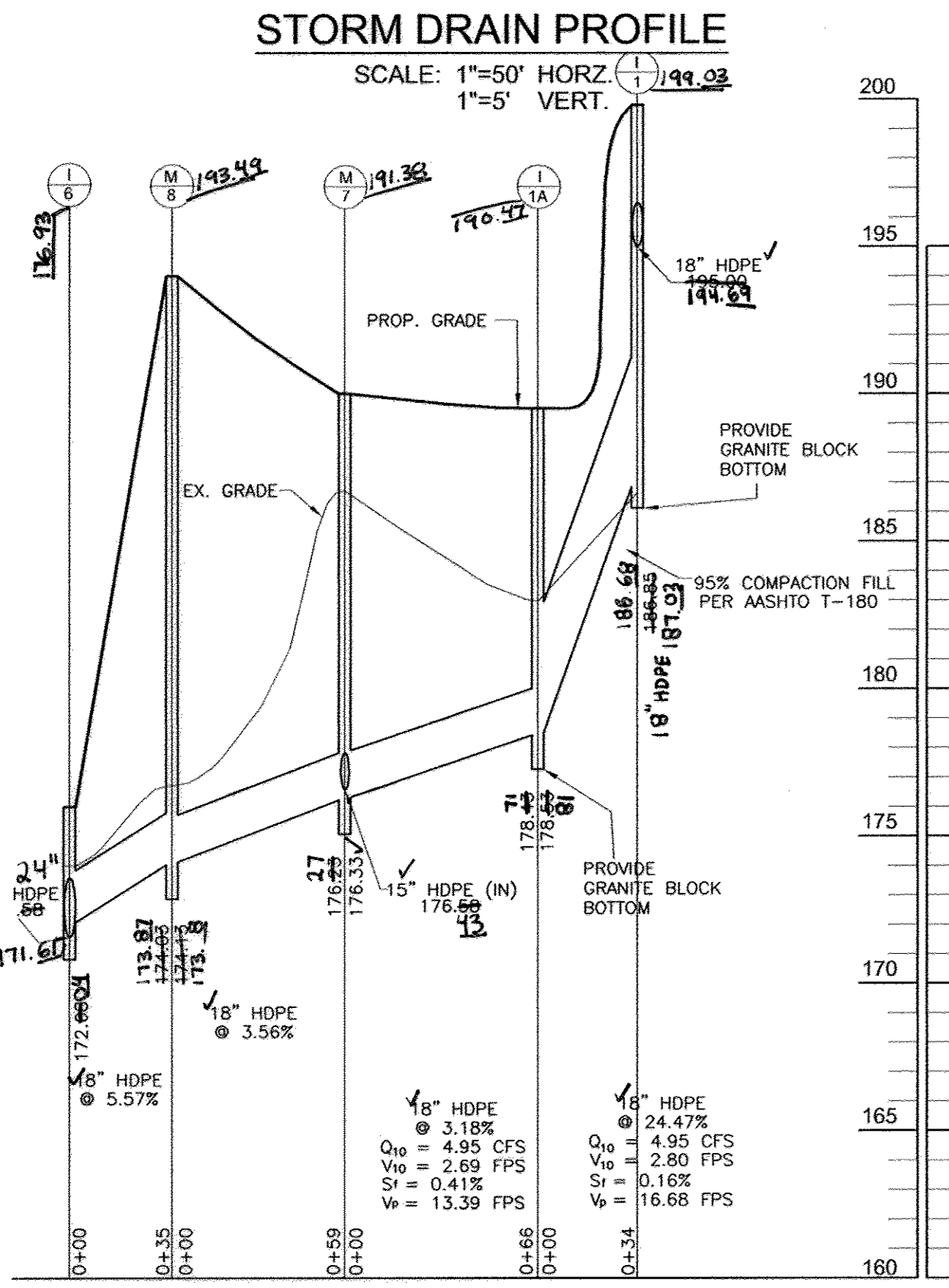
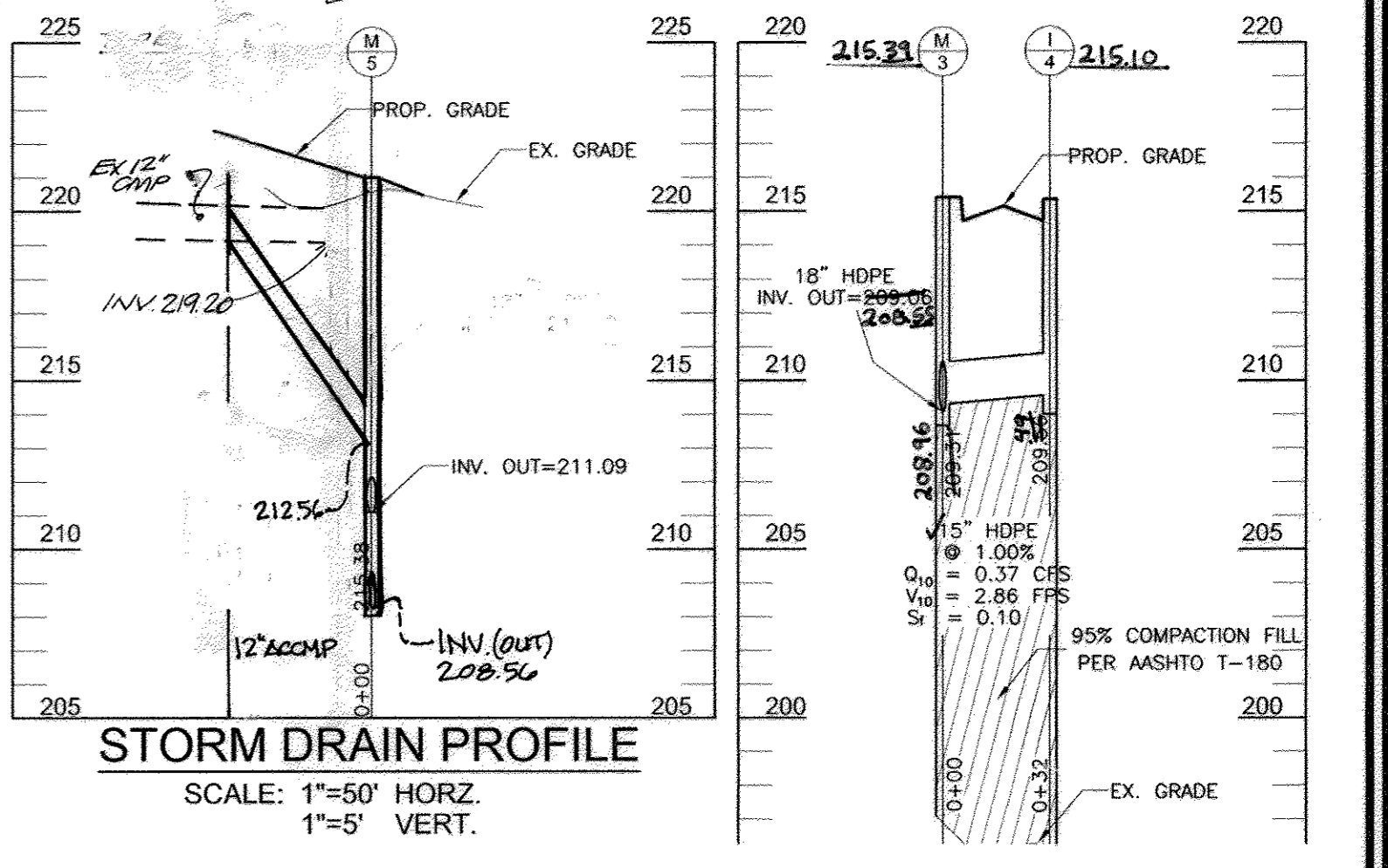
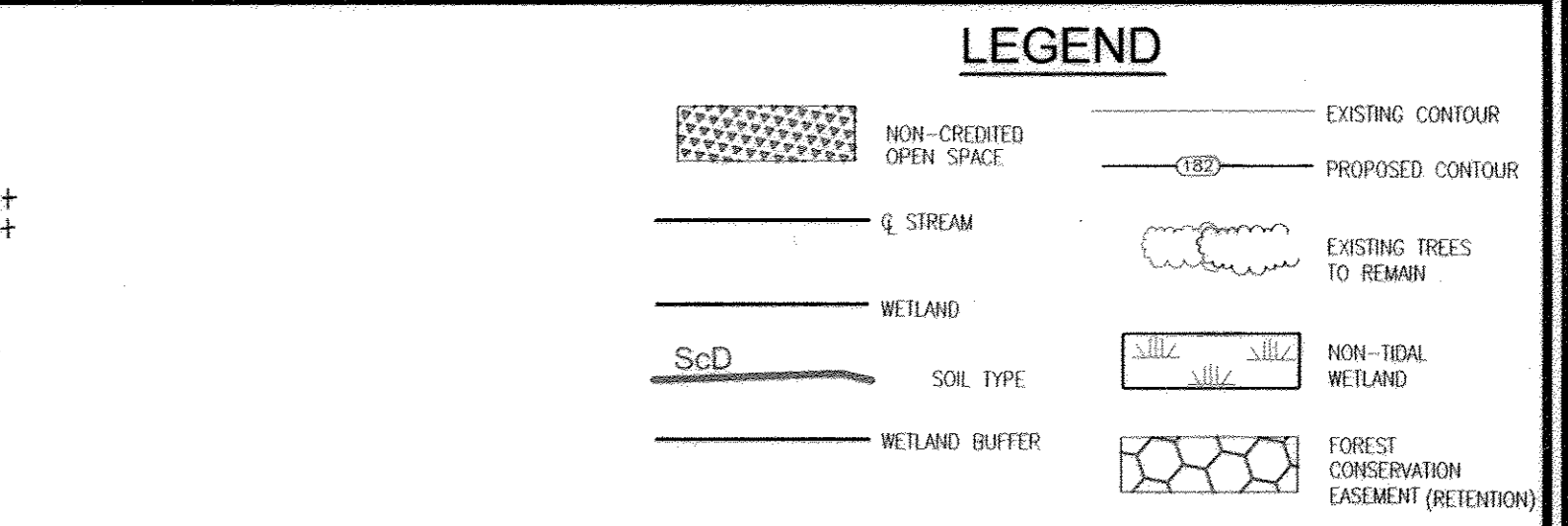


**STRUCTURE SCHEDULE**

NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
E-2	18" TYPE "A" ENDWALL	N 558910 E 1390697	-	-	167.00	SD 5.11
E-3	30" TYPE "A" ENDWALL	N 558814 E 1390502	-	-	164.00	SD 5.11
I-1	DOUBLE "S" COMB. INLET	4+73.19 PHELPS LANE, 12" RT.	199.25**	195.00	186.85	SD 4.34
I-1A	TYPE "D" INLET	N 558824 E 1390744	189.50*	178.53	178.43	SD 4.11
I-2	A-10 INLET	4+73.19 PHELPS LANE, 12" RT.	195.11**	187.64	187.54	SD 4.41
I-3	TYPE "D" INLET	N 558711 E 1390800	193.00*	189.67	189.57	SD 4.11
I-4	A-10 INLET	2+14.46 PHELPS LANE, 12" RT.	215.35**	-	209.56	SD 4.41
I-5	A-10 INLET	1+46.91 PHELPS LANE, 12" RT.	219.82**	-	213.86	SD 4.41
I-6	TYPE "D" INLET	N 558975 E 1390694	176.00*	172.08	171.58	SD 4.11
I-7	TYPE "D" INLET	N 559096 E 1390755	179.50*	-	176.50	SD 4.11
I-8	"S" COMB. INLET	4+73.19 PHELPS LANE, 12" RT.	194.77**	187.41	187.31	SD 4.34
I-10	YARD INLET	N 558879 E 1390740	182.00	-	178.00	SD 4.14
M-2	PRECAST CONCRETE MANHOLE	2+79.80 PHELPS LANE, 23.67 RT.	210.30	204.02	203.92	G 5.12
M-3	PRECAST CONCRETE MANHOLE	2+14.65 PHELPS LANE, 18.41 RT.	210.40	209.31	209.06	G 5.12
M-4	PRECAST CONCRETE MANHOLE	N 559006 E 1390741	192.00	176.05	175.80	G 5.12
M-5	PRECAST CONCRETE MANHOLE	N 558768 E 1391093	217.76	212.56	212.06	G 5.12
M-6	PRECAST CONCRETE MANHOLE	N 558836 E 1391095	122.80	221.34	218.83	G 5.12
M-7	PRECAST CONCRETE MANHOLE	N 558895 E 1390750	190.00	176.33	176.23	G 5.12
M-8	PRECAST CONCRETE MANHOLE	N 558954 E 1390727	194.00	174.13	174.03	G 5.12
CS-1	CONCRETE RISER STRUCTURE	N 558781 E 1390654	171.60	-	164.87	SEE DETAIL
HW-1	MODIFIED 24" TYPE "A" ENDWALL	N 559032 E 1390509	-	-	171.75	SD 5.11
HW-2	MODIFIED 24" TYPE "A" ENDWALL	N 559053 E 1390511	-	-	172.00	SD 5.11

**PIPE SCHEDULE**

SIZE	TYPE	TOTAL LENGTH
12"	RCCP ASTM C-361	20 LF
18"	HDPE	200 LF
18"	HDPE	800 LF
24"	HDPE	60 LF
27"	RCCP ASTM C-361	43 LF
30"	RCCP ASTM C-361	32 LF



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.  
 BY THE DEVELOPER:  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 HOWARD S.C.D.

BY THE ENGINEER:  
 I HEREBY CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 ROBERT H. VOGEL P.E. NO. 16193

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 NO. 16193  
 EXPIRATION DATE: SEPTEMBER 27, 2008.  
 OWNER/DEVELOPER  
 6168 INVESTMENT & RENTAL PROPERTIES, LLC  
 5705 LINDING ROAD  
 ELKIDGE, MARYLAND 21075  
 (410) 796-1850

**STORM DRAIN PROFILES  
 FINAL ROAD CONSTRUCTION PLANS  
 SHADY LANE CROSSING  
 LOTS 1 THRU 25**  
 6168 HANOVER ROAD  
 LIBER 505 AND FOLIO 295

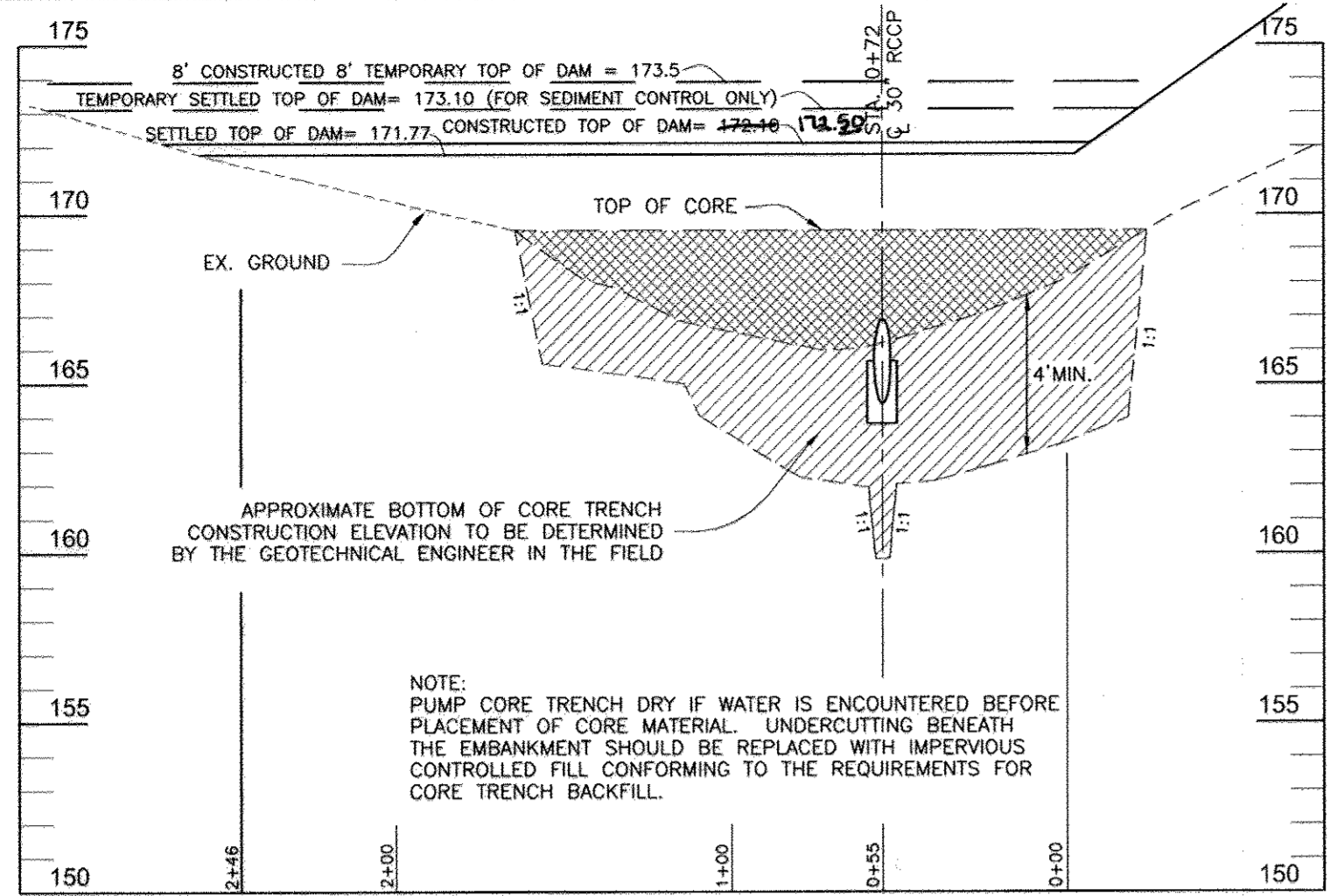
TAX MAP #38 GRID 9  
 1ST ELECTION DISTRICT

PARCEL 235  
 HOWARD COUNTY, MARYLAND

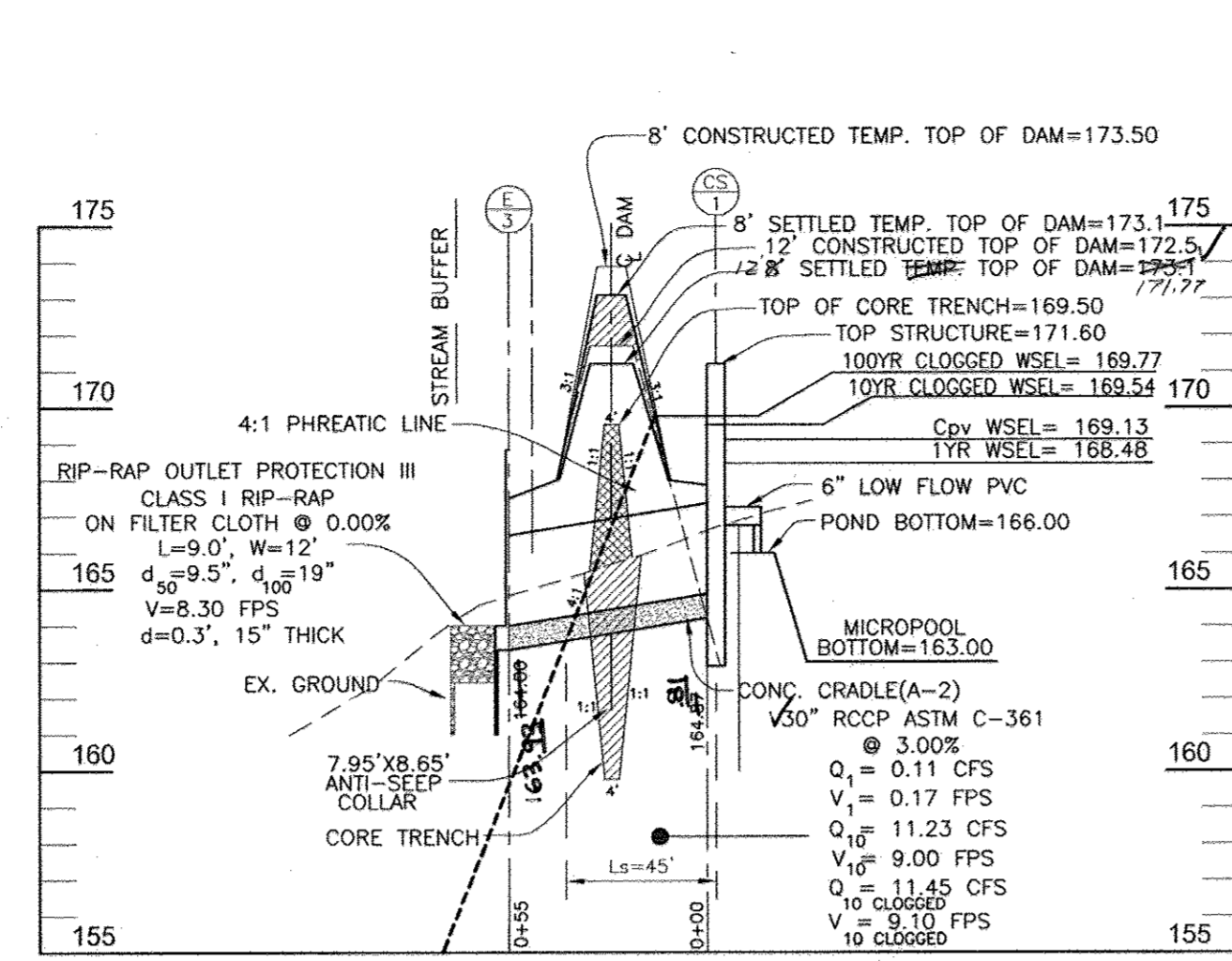
**ROBERT H. VOGEL  
 ENGINEERS • SURVEYORS • PLANNERS**  
 8407 MAIN STREET  
 ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666  
 FAX: 410.461.8961

DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
 CHECKED BY: RHV  
 DATE: SEPTEMBER, 2008  
 SCALE: AS SHOWN  
 W.O. NO.: 04-33.03

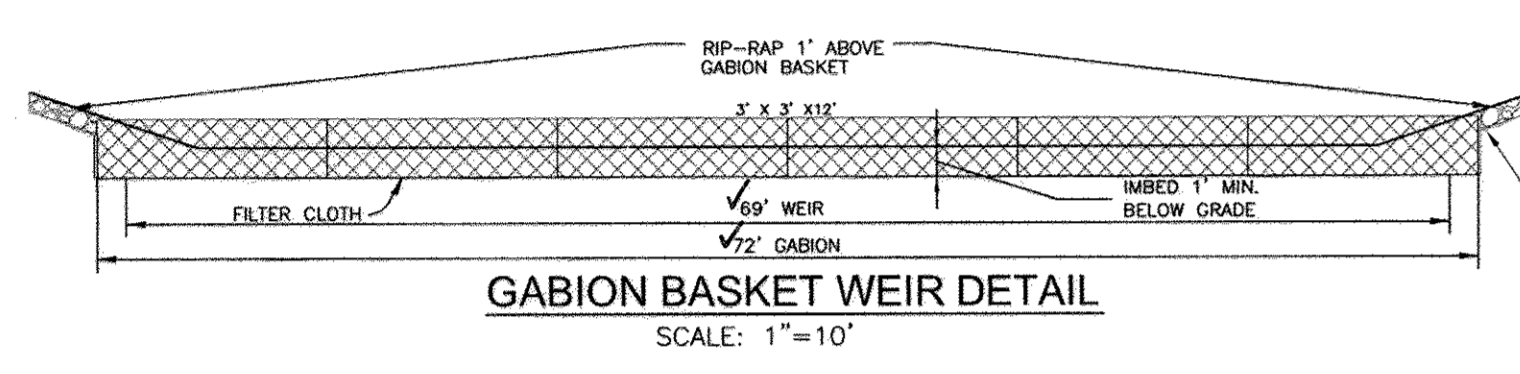
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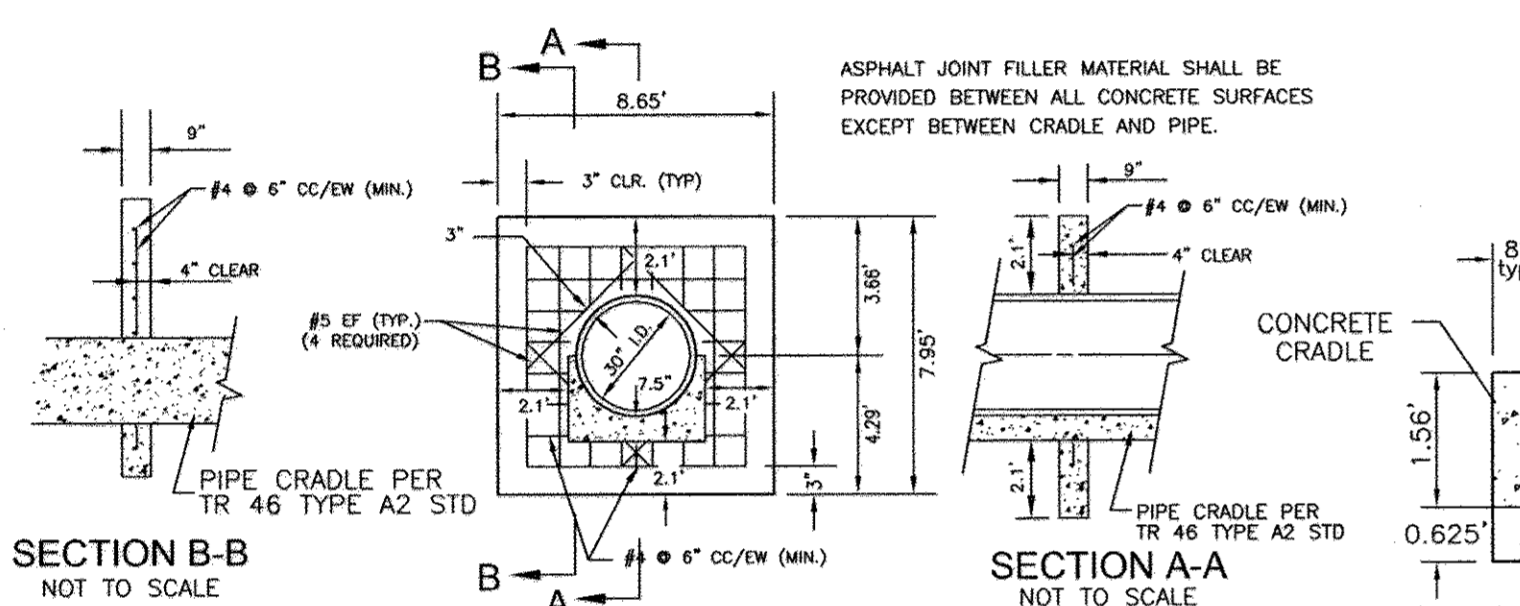
**PROFILE ALONG CENTERLINE OF DAM**  
SCALE: 1"=50' HORZ.  
1"=5' VERT.



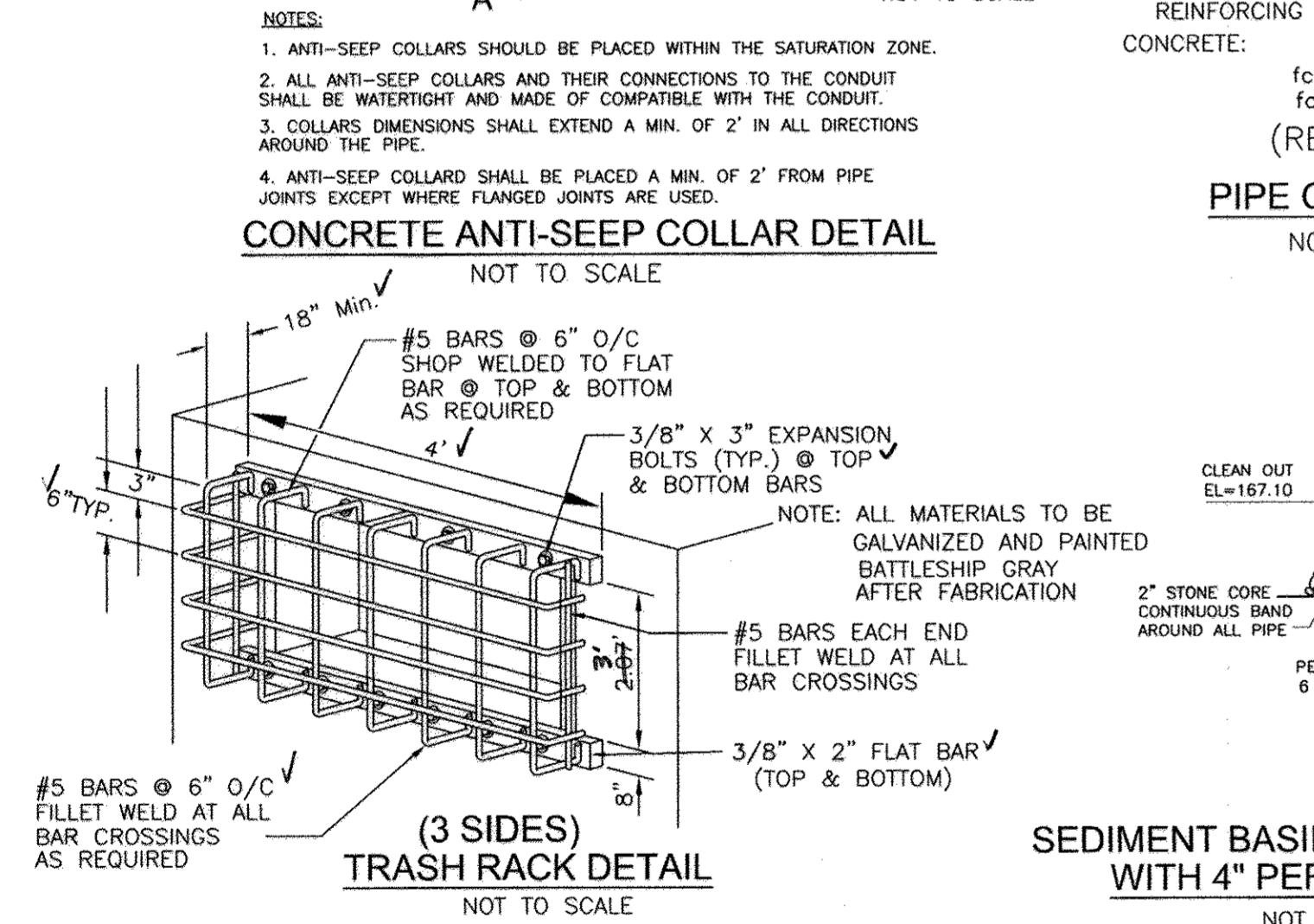
**PRINCIPAL SPILLWAY PROFILE**  
SCALE: 1"=50' HORZ.  
1"=5' VERT.



**GABION BASKET WEIR DETAIL**  
SCALE: 1"=10'



**CONCRETE ANTI-SEEP COLLAR DETAIL**  
NOT TO SCALE



**TRASH RACK DETAIL**  
NOT TO SCALE

STORMWATER MANAGEMENT REQUIREMENTS - POND 1				
AREA	REQUIREMENT	VOLUME REQUIREMENT WITHOUT CREDITS	CREDITS	NOTES
1	WATER QUALITY VOLUME (WQV)	0.13 AC. FT.	---	50% IN GROUND WATER POCKET POND
2	RECHARGE VOLUME (REV)	0.031 AC. FT. (0.36 AC.)	0.39 AC. (GRASS STRIP)	0.00 AC. FT.
3	CHANNEL PROTECTION VOLUME (CPV)	0.19 AC. FT.	---	POCKET POND
4	OVERHEAD FLOOD PROTECTION (OFP)	---	---	---
5	EXTREME FLOOD VOLUME (EFV)	---	---	---

STORMWATER MANAGEMENT REQUIREMENTS - AREA 2				
AREA	REQUIREMENT	VOLUME REQUIREMENT WITHOUT CREDITS	CREDITS	NOTES
1	WATER QUALITY VOLUME (WQV)	0.03 AC. FT.	RANGARDENS	0.0 AC. FT.
2	RECHARGE VOLUME (REV)	0.000 AC. FT. (0.06 AC.)	RANGARDENS	0.0 AC. FT.
3	CHANNEL PROTECTION VOLUME (CPV)	N/A	---	1 YEAR LESS THAN 20FS
4	OVERHEAD FLOOD PROTECTION (OFP)	---	---	---
5	EXTREME FLOOD VOLUME (EFV)	---	---	---

STORMWATER MANAGEMENT REQUIREMENTS - AREA 3				
AREA	REQUIREMENT	VOLUME REQUIREMENT WITHOUT CREDITS	CREDITS	NOTES
1	WATER QUALITY VOLUME (WQV)	0.03 AC. FT.	RANGARDENS	0.0 AC. FT.
2	RECHARGE VOLUME (REV)	0.004 AC. FT. (0.05 AC.)	RANGARDENS	0.0 AC. FT.
3	CHANNEL PROTECTION VOLUME (CPV)	N/A	---	1 YEAR LESS THAN 20FS
4	OVERHEAD FLOOD PROTECTION (OFP)	---	---	---
5	EXTREME FLOOD VOLUME (EFV)	---	---	---

STORMWATER MANAGEMENT REQUIREMENTS - AREA 4				
AREA	REQUIREMENT	VOLUME REQUIREMENT WITHOUT CREDITS	CREDITS	NOTES
1	WATER QUALITY VOLUME (WQV)	0.06 AC. FT.	NON-ROOFTOP DISCONNECTS RANGARDENS	0.0 AC. FT.
2	RECHARGE VOLUME (REV)	0.012 AC. FT. (0.13 AC.)	NON-ROOFTOP DISCONNECTS RANGARDENS	0.0 AC. FT.
3	CHANNEL PROTECTION VOLUME (CPV)	N/A	---	1 YEAR LESS THAN 20FS
4	OVERHEAD FLOOD PROTECTION (OFP)	---	---	---
5	EXTREME FLOOD VOLUME (EFV)	---	---	---

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 11-14-08  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 11/21/08  
 CHIEF, DIVISION OF LAND DEVELOPMENT

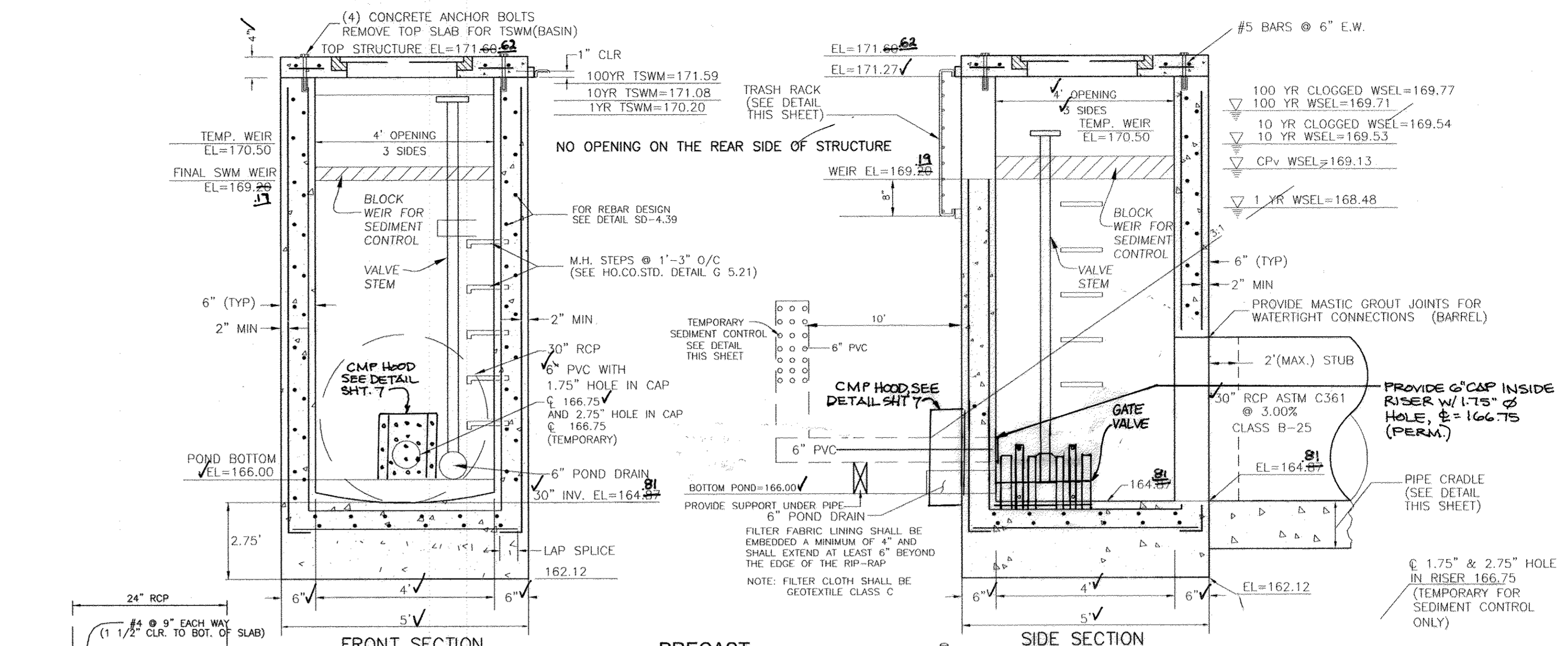
REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 10/27/08  
 HOWARD S.C.D.

BY THE DEVELOPER:  
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL AND THAT ALL 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.  
 9.26.08  
 SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

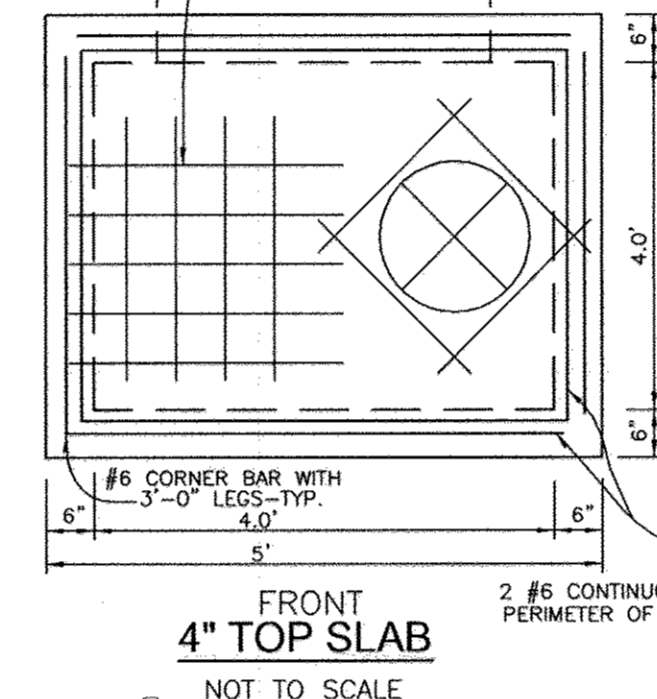
BY THE ENGINEER:  
 I HEREBY CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS  
 COUNTY HEALTH OFFICER  
 HOWARD COUNTY HEALTH DEPARTMENT

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 NO. 16193  
 EXPIRATION DATE: SEPTEMBER 27, 2008.  
 OWNER/DEVELOPER  
 6168 HANOVER ROAD  
 ELKRIE, MARYLAND 21075  
 (410) 796-1850

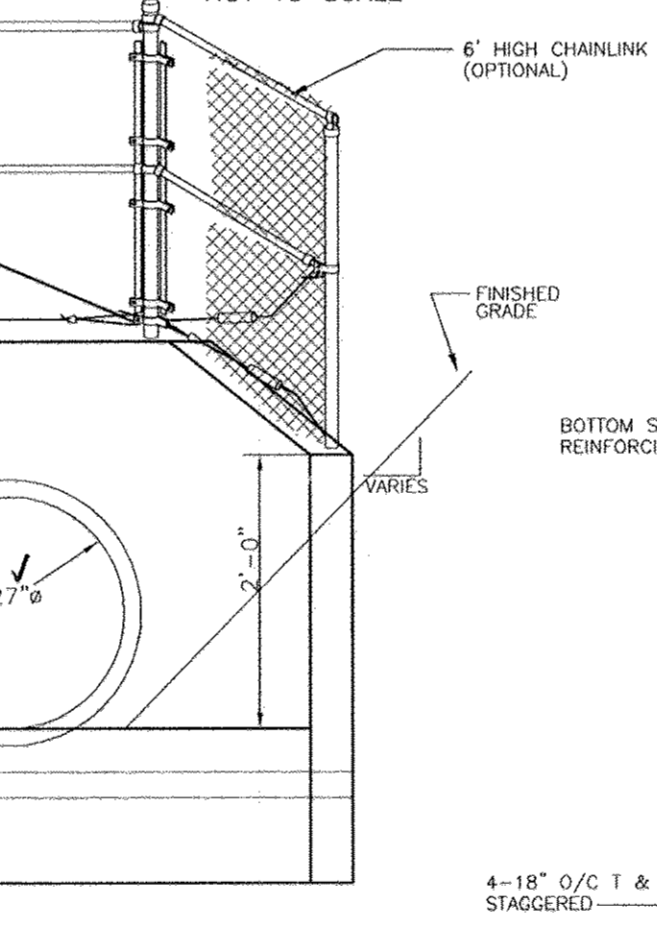
DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
 CHECKED BY: RHV  
 DATE: SEPTEMBER, 2008  
 SCALE: AS SHOWN  
 W.O. NO.: 04-33-09  
 6 SHEET OF 13



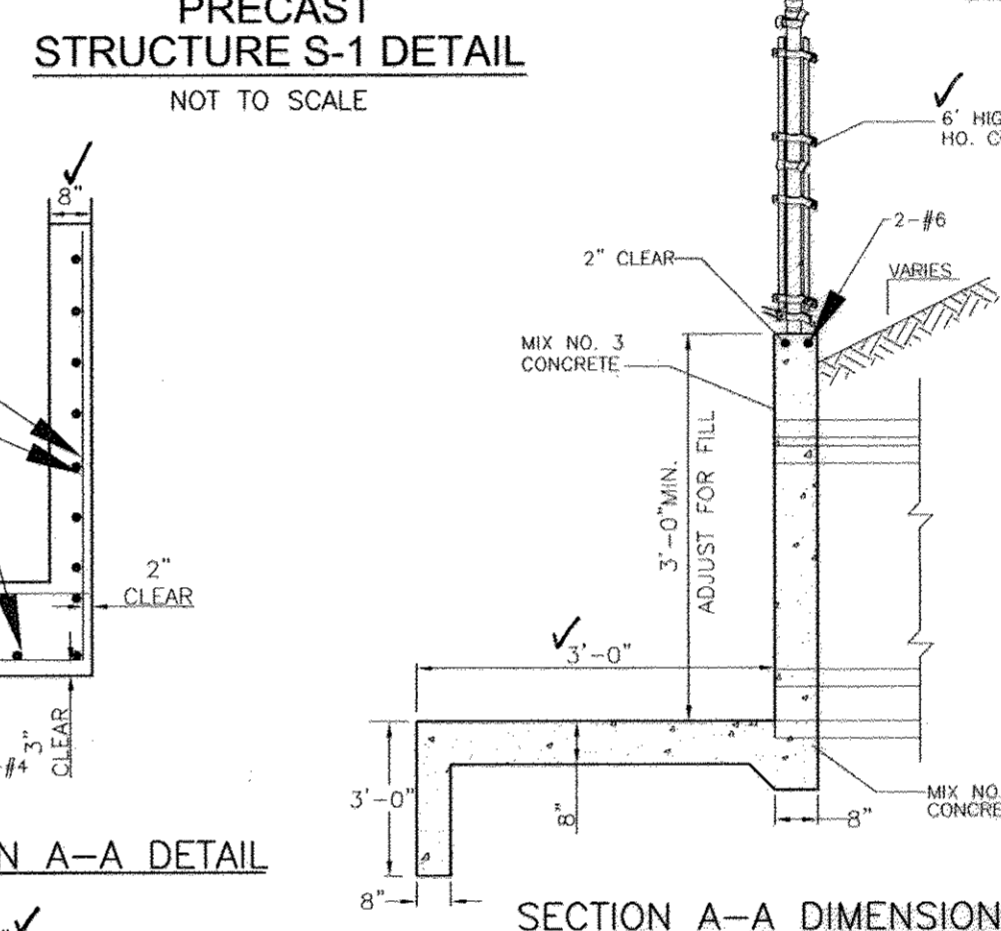
**PRECAST STRUCTURE S-1 DETAIL**  
NOT TO SCALE



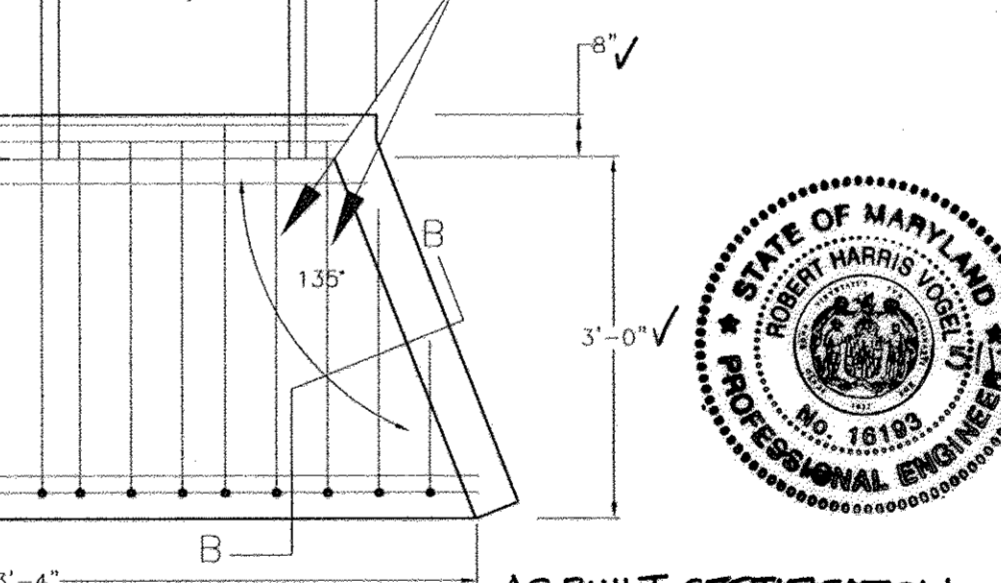
**PRECAST STRUCTURE S-1**  
SCALE: 1"=3"  
\*SEE ABOVE FOR DETAIL



**FRONT ELEVATION**  
**(MODIFIED) TYPE 'A' HEADWALL DETAIL (SD-5.11)**  
**FOR CULVERT @ USE-IN-COMMON DRIVE**  
NTS



**SECTION A-A DETAIL**  
**SECTION A-A DIMENSIONS**



**AS-BUILT CERTIFICATION**  
I HEREBY CERTIFY THAT FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

**OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER MANAGEMENT EXTENDED DETENTION FACILITY**

- STORMWATER MANAGEMENT FACILITY  
 ROUTINE MAINTENANCE BY Homeowner's association (H.O.A.)  
 1. FACILITY WILL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF FUNCTIONING PROPERLY.  
 2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.  
 3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.  
 4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.  
 NON-ROUTINE MAINTENANCE  
 1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.  
 2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERE WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

**POND #1 SUMMARY**

	2 YEAR	10 YEAR	100 YEAR
FLOW INTO POND	4.06 c.f.s.	14.35 c.f.s.	24.06 c.f.s.
FLOW OUT OF POND	0.11 c.f.s.	11.23 c.f.s.	17.09 c.f.s.
W.S. ELEVATION	168.48	169.53	169.71
STORAGE VOLUME	0.04 AC FT	0.42 AC FT	0.46 AC FT

	WQV	CPV	REV
	0.13 Ac.Ft.	0.18 Ac.Ft.	0.03 Ac.Ft.

**OPERATION, MAINTENANCE AND INSPECTION**  
 INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MO-378). HOA IS RESPONSIBLE FOR ROUTINE MAINTENANCE. HOMEOWNER IS RESPONSIBLE FOR NON-ROUTINE MAINTENANCE. ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

**STORMWATER MANAGEMENT NOTES AND DETAILS**  
**FINAL ROAD CONSTRUCTION PLANS**  
**SHADY LANE CROSSING**  
**LOTS 1 THRU 25**

6168 HANOVER ROAD  
 LIBER 505 AND FOLIO 295  
 TAX MAP #38 GRID 9  
 1ST ELECTION DISTRICT  
 PARCEL 235  
 HOWARD COUNTY, MARYLAND

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

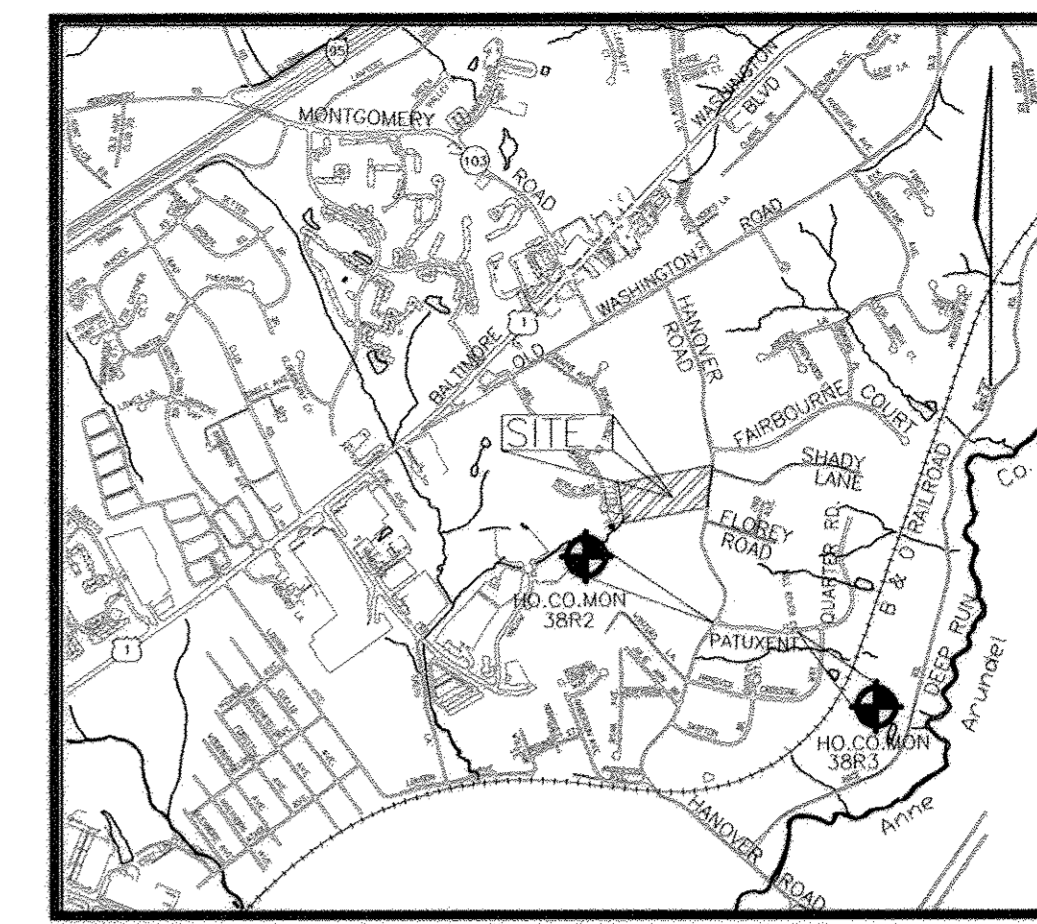
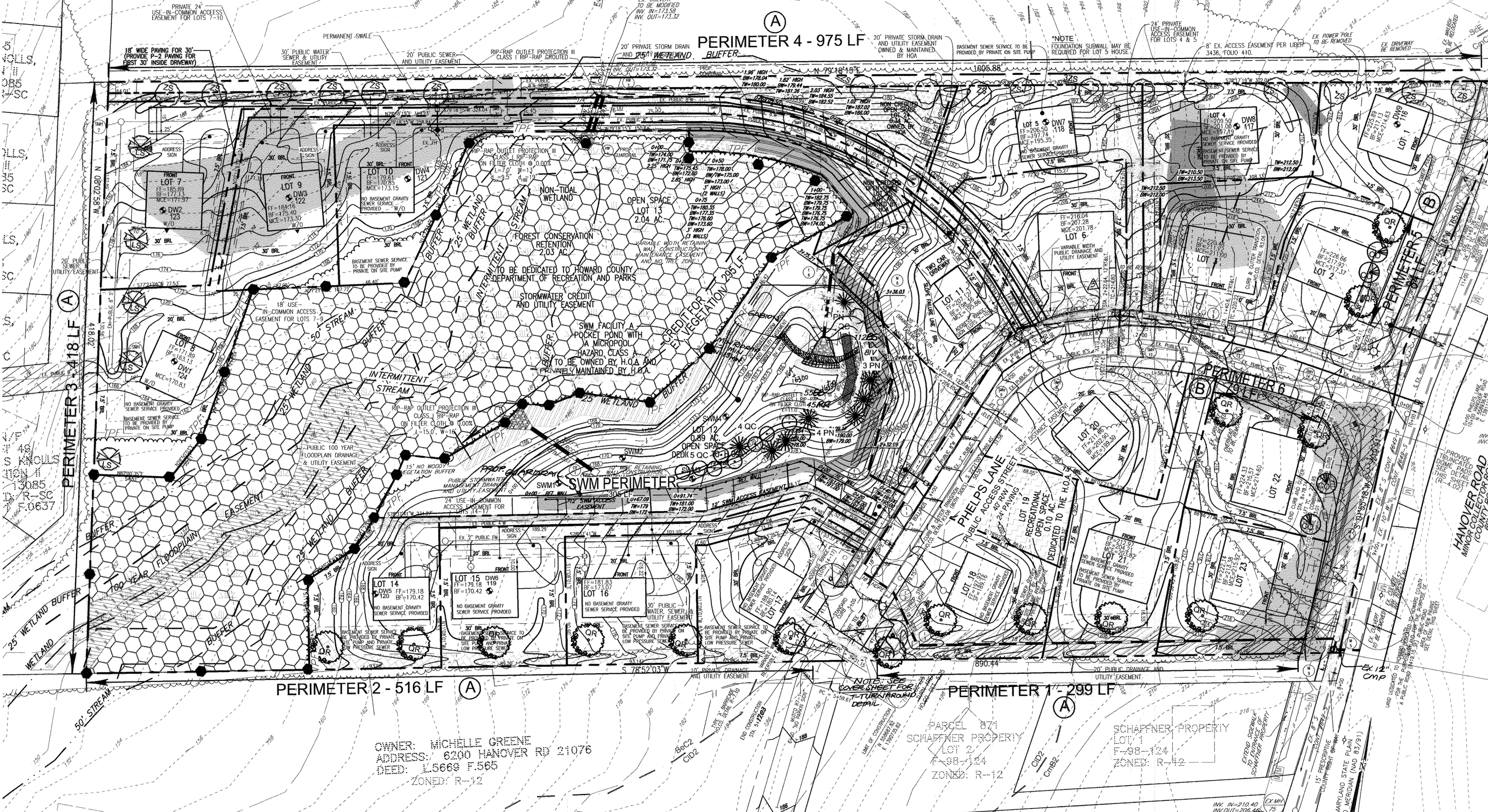
DESIGN BY: RJ/JCO  
 DRAWN BY: RJ/JCO  
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 DATE: SEPTEMBER, 2008  
 SCALE: AS SHOWN  
 W.O. NO.: 04-33-09  
 6 SHEET OF 13







SPACE  
KNOLLS,  
#CN 1  
184-13085



VICINITY MAP  
SCALE 1"=2000'

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING TREES TO REMAIN
- 15%-24.99% STEEP SLOPE AREA
- 25% OR GREATER STEEP SLOPE AREA
- FOREST CONSERVATION EASEMENT (PROFORESTATION)
- FOREST CONSERVATION EASEMENT (RETENTION)
- NON-CREDITED OPEN SPACE
- 100 YEAR FLOODPLAIN EASEMENT 0.04 AC.
- PUBLIC DRAINAGE & UTILITY EASEMENT
- 6' STREAM
- STREAM BUFFER
- WETLAND
- SOIL TYPE
- FCM
- WALK OUT BASEMENT
- PROPOSED STREET TREE
- PROPOSED 24' U.I.C. ACCESS EASEMENT
- NON TIDAL WETLAND
- 12' WIDE ACCESS
- 10% MAX SLOPE
- 10' PRIVATE DRAINAGE AND UTILITY EASEMENT
- CREDITED OPEN SPACE REF. OPEN SPACE
- NO WOODY VEGETATION BUFFER
- TREE MAINTENANCE EASEMENT
- PRIVATE 20' STORM DRAIN AND UTILITY EASEMENT OWNED & MAINTAINED BY HOA
- PRIVATE SWM DRAINAGE AND UTILITY EASEMENT
- RETAINING WALL EASEMENT
- SOIL BORING
- WETLAND BUFFER
- SPOT ELEVATION
- DIRECTION OF FLOW
- BGE "TRADITIONAL" STYLE LIGHT POLE
- FOREST CONSERVATION AREA SIGN

FACILITY #1

STORMWATER POND PERIMETER LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	REMARKS
QC	8	Quercus coccinea Scarlet Oak (shade tree)	2 1/2 - 3' cu.	B&B
PN	10	Pinus Nigra Austrian Pine (Evergreen Tree)	6-8' ht	B&B

STORMWATER POND HERBACEOUS LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	REMARKS
BS	112	BOTTLEBRUSH SEDGE CAREX LUMINOSSA	2' OC	PLUG
IV	8	Iris versicolor Blue Flag (wear gloves)	1.5' OC	PLUG
GB	55	GREEN BULRUSH SCOURIS ATROVIRIDANS	2' OC	RHIZOME
RR	45	RIVERBANK WILD RYE ELYMUS RIPARIUS	2' OC	PLUG

NO.	REVISION	DATE
4	SHIFT GUARDRAIL, SUBSTITUTE SWIM PLANTINGS, SUBSTITUTE RETAINING WALL SHEETS	6/6/16
3	MOVE MH 3 FOUR FEET INTO PHELPS LANE RIGHT OF WAY	6/21/16
2	REVISE STORM DRAIN TO ACCOMMODATE EXISTING CONDITIONS	6/21/16
1	REVISE T-TURN AROUND, AND REVISE POND TO AS-BUILT	

LANDSCAPE AND FOREST CONSERVATION PLAN  
FINAL ROAD CONSTRUCTION PLANS

SHADY LANE CROSSING  
LOTS 1 THRU 25

TAX MAP #38 GRID 9 1ST ELECTION DISTRICT PARCEL 235 HOWARD COUNTY, MARYLAND

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

DESIGN BY: RJ/JT	9 SHEET OF 13
DRAWN BY: RJ/JT	
CHECKED BY: RHY	
DATE: SEPTEMBER, 2008	
SCALE: AS SHOWN	
W.O. NO.: 04-33.03	

DEVELOPER'S/BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

*John S. Anon* 9.26.08  
SIGNATURE OF DEVELOPER DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Michelle J. Walters* 11-14-07  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cinda Hahn* 11/2/08  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
*John S. Anon* 11/2/08  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

SCHEDULE D: STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	POND #1 690 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	YES* 310'
CREDIT FOR OTHER LANDSCAPING (NO, YES AND X)	NO
NUMBER OF TREES REQUIRED (SHADE TREES (1:50) EVERGREEN TREES (1:40))	(380) 8 SHADE TREES 10 EVERGREEN TREES
NUMBER OF TREES PROVIDED (SHADE TREES EVERGREEN TREES SHRUBS)	8 SHADE TREES 10 EVERGREEN TREES

\*EXISTING WOODS TO REMAIN  
APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS  
*John Canoles* 9/26/08  
COUNTY HEALTH OFFICER DATE  
HOWARD COUNTY HEALTH DEPARTMENT

PLAN VIEW  
SCALE 1"=40'

SCHEDULE A: PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO PERIMETER PROPERTIES				ADJACENT TO ROADWAYS	
	1	2	3	4	(LOT-2) 5	(LOT-22) 6
PERIMETER/FRONTAGE DESIGNATION	1	2	3	4	5	6
LANDSCAPE TYPE	A	A	A	A	B	B
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	299	516	418	975	84	79
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	YES* 158'	YES* 140'	NO	NO	NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED (LF REMAINING)	299	350	278	975	84	79
SHADE TREES	1:60 5	1:60 6	1:60 5	1:60 17	1:50 2	1:40 2
EVERGREEN TREES	-	-	-	-	1:40 2	1:40 2
SHRUBS	-	-	-	-	-	-
NUMBER OF PLANTS PROVIDED	5	6	5	17	2	2
SHADE TREES	-	-	-	-	-	-
EVERGREEN TREES	-	-	-	-	-	-
OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION) DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	-	-	-	-	-	-

\* EXISTING WOODS TO REMAIN

NO AS-BUILT INFORMATION ON THIS SHEET

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 NO. 16193 EXPIRATION DATE: SEPTEMBER 27, 2008.

OWNER/DEVELOPER  
6168 INVESTMENT & RETAIL PROPERTIES, LLC  
5705 LANDING ROAD  
ELKRIE, MARYLAND 21075  
(410) 796-1850

**FOREST RETENTION AREAS AND NOTES**

1. FORESTED STREAM BUFFERS ARE RETAINED IN OPEN SPACE LOTS.
2. NO RARE, THREATENED OR ENDANGERED SPECIES WERE OBSERVED ON THIS SITE.
3. THE WOODED STEEP SLOPES ARE SUBSTANTIALLY RETAINED IN OPEN SPACE LOTS.
4. FORESTED AREAS ADJACENT TO FLOODPLAINS AND STREAM BUFFERS ARE SUBSTANTIALLY RETAINED IN OPEN SPACE LOTS.
5. THERE ARE NO ISOLATED FOREST STANDS ON THIS SITE.
6. CHANGES IN GRADING AND RUNOFF WITHIN CONSTRUCTION/INSTALLATION AREAS WILL NOT ADVERSELY AFFECT THE SOILS WITHIN THE FOREST RETENTION AREA. SEDIMENT CONTROL MEASURES WILL REDIRECT CONCENTRATED FLOW RUNOFF TO STORMWATER MANAGEMENT FACILITIES, RETAIN SEDIMENT WITHIN THE CONSTRUCTION SITE, AND/OR REDIRECT CLEAN WATER AWAY FROM CONSTRUCTION AREAS.
7. FOREST CONSERVATION PLAN PREPARED BY FREDERICK WARD AND ASSOCIATES, DATED JANUARY 2002. FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL FOR THIS SUBDIVISION WILL BE FULFILLED BY THE RETENTION OF 1.87 AC. (\$1457.2 x \$0.20 = \$16292) OF FOREST IN A FOREST CONSERVATION EASEMENT PAYABLE BY DEVELOPER AS PART OF THE DEVELOPERS AGREEMENT. A FEE-IN-LIEU PAYMENT FOR REMAINING 1.06 AC. (46,173.60 x \$0.75 = \$34,630.20) IS REQUIRED, WHICH IS PAID TO THE FOREST CONSERVATION FUND.
8. THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT, HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

**FOREST PROTECTION NOTES**

**PRE-CONSTRUCTION ACTIVITIES**

1. FOR RETENTION AREAS, INSTALL BLAZE ORANGE FENCE AND RETENTION SIGNS BEFORE CONSTRUCTION BEGINS.
2. FENCING SHALL BE MAINTAINED IN GOOD CONDITION AND PROMPTLY REPAIRED OR RESTORED AS THE SITUATION WARRANTS.
3. A QUALIFIED TREE CARE EXPERT SHALL DETERMINE IF ROOT PRUNING IS REQUIRED ALONG THE LIMIT OF DISTURBANCE. ROOT PRUNE TREES AS REQUIRED. WATER ANY ROOT-PRUNED TREES IMMEDIATELY AFTER ROOT-PRUNING AND MONITOR FOR SIGNS OF STRESS DURING CONSTRUCTION.

**CONSTRUCTION PHASE**

1. NO DISTURBANCE OR DUMPING IS ALLOWED INSIDE THE TREE RETENTION AREA.
2. NO EQUIPMENT SHALL BE OPERATED INSIDE THE TREE RETENTION AREA INCLUDING TREE CANOPIES.
3. IN THE EVENT OF DROUGHT, THE PROTECTED TREES SHALL BE MONITORED FOR SIGNS OF STRESS AND WATERED AS NEEDED.

**POST-CONSTRUCTION ACTIVITIES**

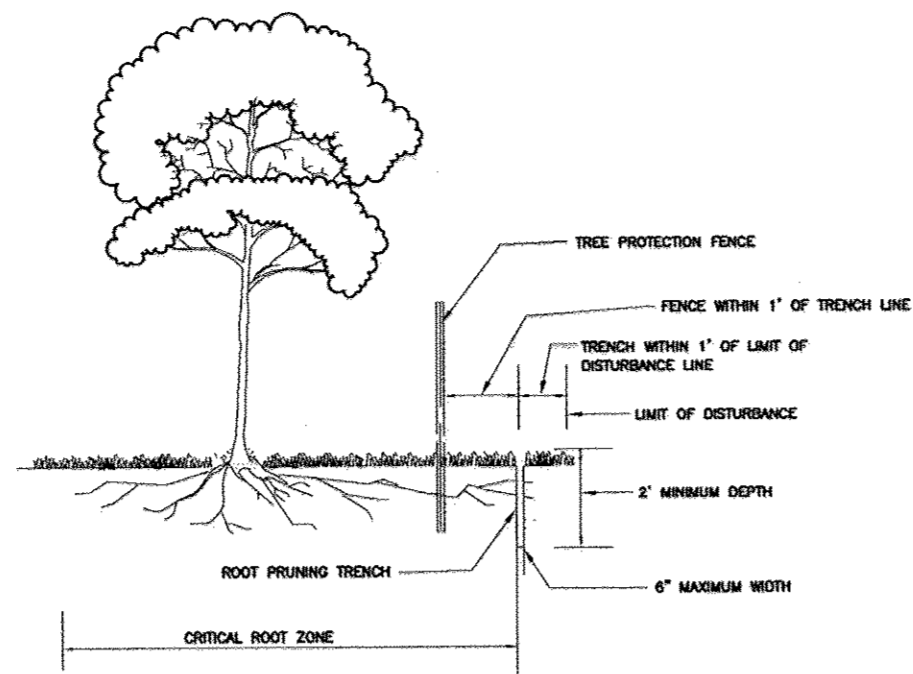
1. AT THE DIRECTION OF A QUALIFIED TREE CARE EXPERT, DAMAGES TO RETAINED TREES SHALL BE REPAIRED BY THE CONTRACTOR.
2. FENCE REMOVAL AND STABILIZATION SHALL BE AS PER THE SEDIMENT AND EROSION CONTROL PLAN.
3. DO NOT REMOVE SIGNS.

**COST ESTIMATE:** (For bonding purposes, only)

RETENTION OF 1.87 AC.

**SURETY NOTE**

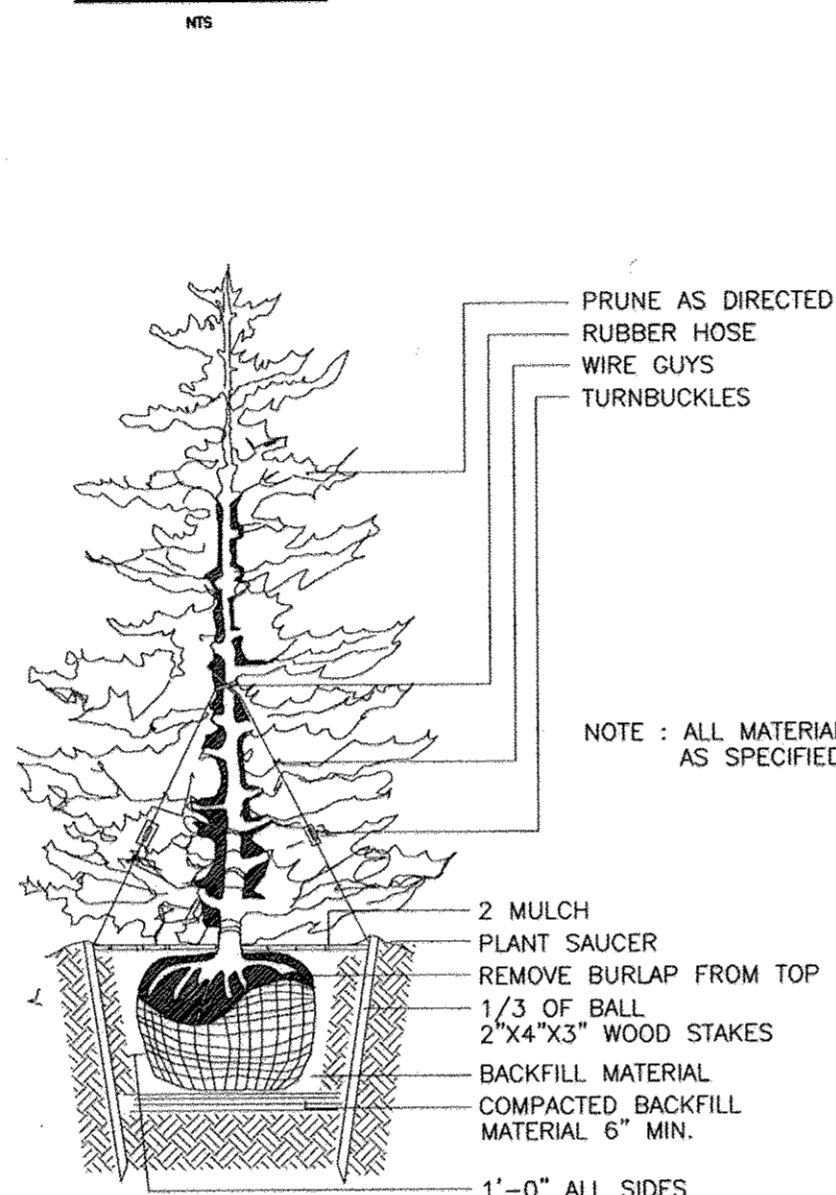
1.87 ACRES OF RETENTION WILL BE RETAINED IN A FOREST CONSERVATION EASEMENT (0.2X81,457SF=\$16,291.40) AND FEE-IN-LIEU OF 1.06 ACRES (0.5X46,174=\$23,087.00). THE FEE IS TO BE PAID WITH THE DEVELOPERS AGREEMENT.



**NOTES:**

1. RETENTION AREAS TO BE ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN REVIEW PROCESS.
2. BOUNDARIES OF RETENTION AREAS TO BE STAKED, FLAGGED AND/OR FENCED PRIOR TRENCHING.
3. EXACT LOCATION OF TRENCH SHOULD BE IDENTIFIED.
4. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR ORGANIC SOIL.
5. ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.

**ROOT PRUNING**



**TYPICAL EVERGREEN TREE PLANTING DETAIL**

NOT TO SCALE

**FOREST CONSERVATION WORKSHEET**

**NET TRACT AREA:**

- A. TOTAL TRACT AREA 8.90 AC
- B. AREA WITHIN 100 YEAR FLOODPLAIN 0.16 AC
- C. NET TRACT AREA 8.74 AC

**LAND USE CATEGORY (FROM TABLE 3.2.1, PAGE 40, MANUAL)**

INPUT THE NUMBER "1" UNDER THE APPROPRIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	1	0	0

- D. AFFOREST THRESHOLD 15% X D = 1.31 AC
- E. CONSERVATION THRESHOLD 20% X D = 1.75 AC

**EXISTING FOREST COVER:**

- F. EXISTING FOREST COVER (EXCLUDING FLOODPLAIN) = 6.59 AC
- G. AREA OF FOREST ABOVE CONSERVATION THRESHOLD = 4.84 AC

**BREAK EVEN POINT:**

- H. BREAK EVEN POINT = 2.72 AC
- I. CLEARING PERMITTED WITHOUT MITIGATION = 3.87 AC

**PROPOSED FOREST CLEARING:**

- K. TOTAL AREA OF FOREST TO BE CLEARED = 4.72 AC
- L. TOTAL AREA OF FOREST TO BE RETAINED = 1.87 AC

**PLANTING REQUIREMENTS:**

- M. REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD = 1.18 AC
- N. REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD = 0.00 AC
- P. CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD = 0.12 AC
- Q. TOTAL REFORESTATION REQUIRED = 1.06 AC
- R. TOTAL AFFORESTATION REQUIRED = 0.00 AC
- S. TOTAL REFORESTATION AND AFFORESTATION REQUIRED = 1.06 AC

FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL FOR THIS SUBDIVISION WILL BE FULFILLED BY THE RETENTION OF 1.87 AC. (\$1457.2 x \$0.20 = \$16,291.44) OF FOREST IN A FOREST CONSERVATION EASEMENT PAYABLE BY DEVELOPER AS PART OF THE DEVELOPERS AGREEMENT. A FEE-IN-LIEU PAYMENT FOR REMAINING 1.06 AC. (46,173.6 x \$0.75 = \$34,630.20) IS REQUIRED, WHICH IS PAID TO THE FOREST CONSERVATION FUND.

**NOTE**

1. THE TOPOGRAPHY SHOWN HEREIN IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY FREDERICK WARD ASSOCIATES IN JANUARY 2002.

**GENERAL NOTES**

A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED WITH THE DEVELOPER'S AGREEMENT AS PART OF THE FINAL PLAN.

**DEVELOPER'S AGREEMENT**

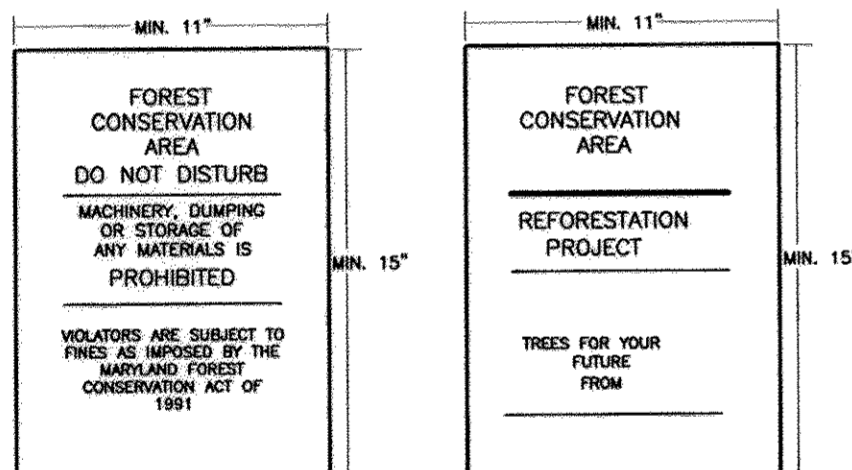
FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING PROVIDED PER THE LANDSCAPE MANUAL TO BE POSTED WITH THE DEVELOPER'S AGREEMENT. THE AMOUNT WILL BE \$11,700 FOR 4 EVERGREEN TREES AND 37 SHADE TREES. THE AMOUNT FOR STREET TREES WILL BE \$9,600 FOR 32 SHADE TREES.

LANDSCAPE SCHEDULE				
KEY	QUAN.	BOTANICAL NAME	SIZE	REM.
LS	5	LIQUIDAMBAR STYRACIFLUA AMERICAN SWEETGUM (SHADE)	2 1/2"-3" Cal.	B & B
OR	15	QUERCUS ROBUR 'FASTIGIATA' COLUMNAR ENGLISH OAK (SHADE)	2 1/2"-3" Cal.	B & B
ZS	17	ZELKOVA SERRATA 'VILLAGE GREEN' VILLAGE GREEN ZELKOVA (SHADE)	2 1/2"-3" Cal.	B & B
CO	4	CUPRESSOCYPARIS LEYLANDI LEYLAND CYPRESS (EVERGREEN)	5' - 6' HL.	B & B

1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT ANN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH LCAMW PLANTING SPECIFICATIONS.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
3. FINAL LOCATION OF PLANT MATERIAL MAY VARY TO MEET FINAL FIELD CONDITIONS.
4. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	REQUIRED TREES	PROVIDED TREES
PUBLIC ACCESS STREET-RAW	93840	23	23
HANOVER RD-RAW	33540	9	9

STREET TREE PLANT LIST				
SYMBOL	QTY	BOTANICAL NAME	SIZE	REMARKS
•	23	SHADE TREES ACER RUBRUM/ RED MAPLE	2 1/2"-3" Cal.	B & B
+	9	PRUNUS SARGENTII SARGENT CHERRY	2 1/2"-3" Cal.	B & B



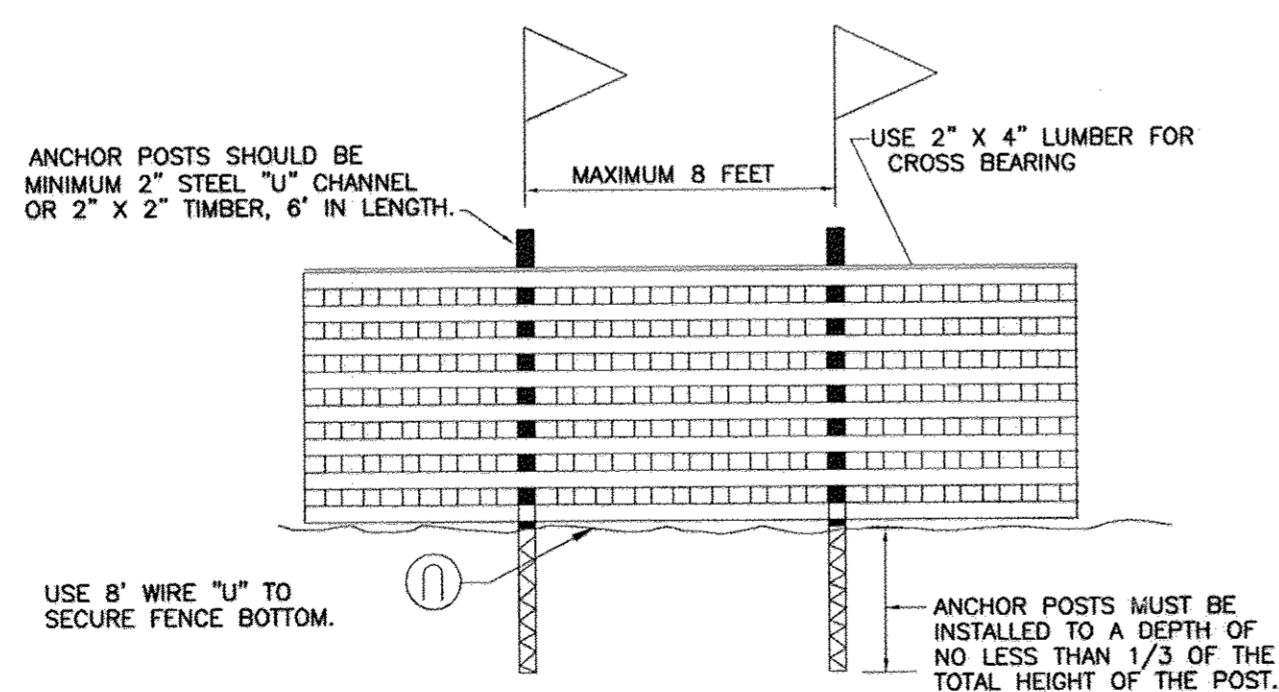
**NOTE:**

1. BOTTOM OF SIGNS TO BE HIGHER THAN TOP OF TREE PROTECTION FENCE.
2. SIGNS TO BE PLACED APPROXIMATELY 100' FEET APART, CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART.
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.

**FOREST CONSERVATION AREA SIGN**

NTS

**HIGHLY VISABLE FLAGGING**



**NOTES:**

1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTION SIGNAGE SHOULD BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

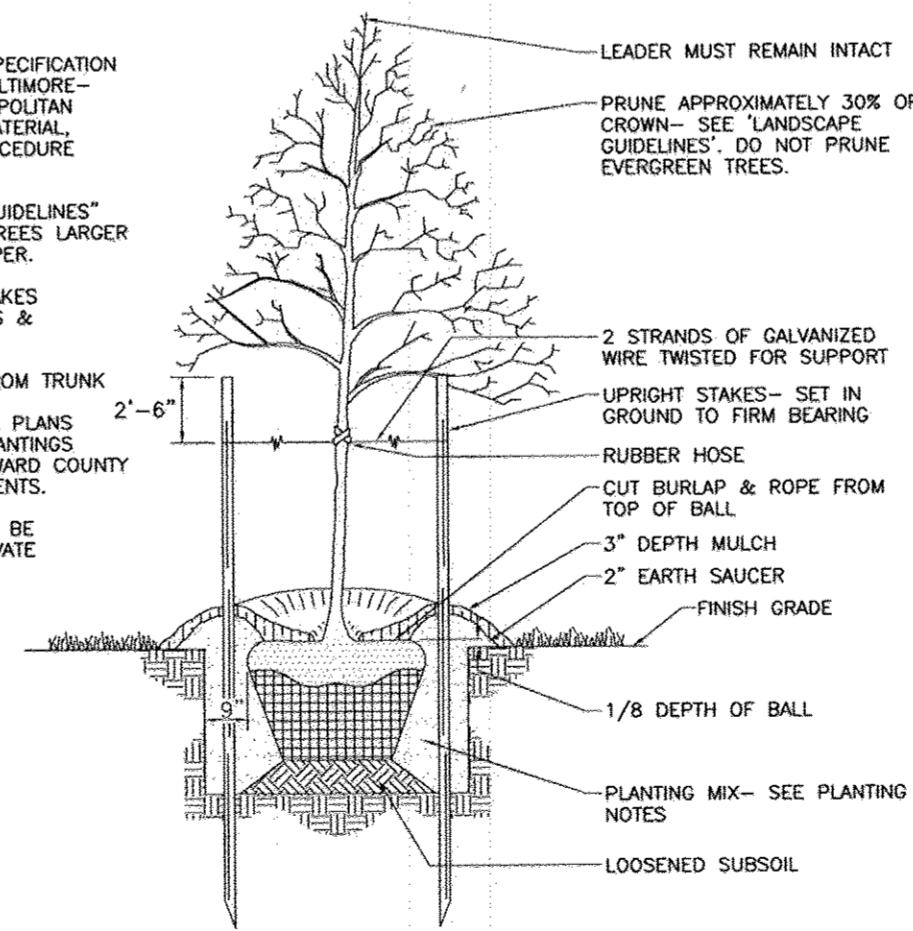
**BLAZE ORANGE PLASTIC MESH**

**TYPICAL TREE PROTECTION FENCE DETAIL**

NTS

**NOTES:**

1. SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
2. SEE "LANDSCAPE GUIDELINES" FOR SUPPORTING TREES LARGER THAN 2-1/2" CALIPER.
3. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
4. KEEP MULCH 1" FROM TRUNK.
5. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
6. TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.



**TREE PLANTING AND STAKING**

DECIDUOUS TREES UP TO 2-1/2" CALIPER  
NOT TO SCALE

**DEVELOPER'S/BUILDER'S CERTIFICATE**

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

Signature of Developer: *John S. Anoles* DATE: 9-26-08

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
Signature: *W. J. ...* DATE: 11-14-08  
CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
Signature: *...* DATE: 11/21/08  
CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *...* DATE: 11/21/08  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS  
Signature: *...* DATE: *...*  
COUNTY HEALTH OFFICER  
HOWARD COUNTY HEALTH DEPARTMENT

Signature: *John Anoles* DATE: 9/26/08  
JOHN ANOLES  
DNR QUALIFIED PROFESSIONAL

**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 NO. 16193 EXPIRATION DATE: SEPTEMBER 27, 2008.

**OWNER/DEVELOPER**  
6168 INVESTMENT & RENTAL PROPERTIES, LLC  
5705 LANDING ROAD  
ELKRIE, MARYLAND 21075  
(410) 796-1850

NO AS-BUILT INFORMATION ON THIS SHEET

NO.	REVISION	DATE

**LANDSCAPE AND FOREST CONSERVATION DETAILS**  
**FINAL ROAD CONSTRUCTION PLANS**  
**SHADY LANE CROSSING**  
**LOTS 1 THRU 25**  
6168 HANOVER ROAD  
LIBER 505 AND FOLIO 295

TAX MAP #38 GRID 9 PARCEL 235  
1ST ELECTION DISTRICT 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

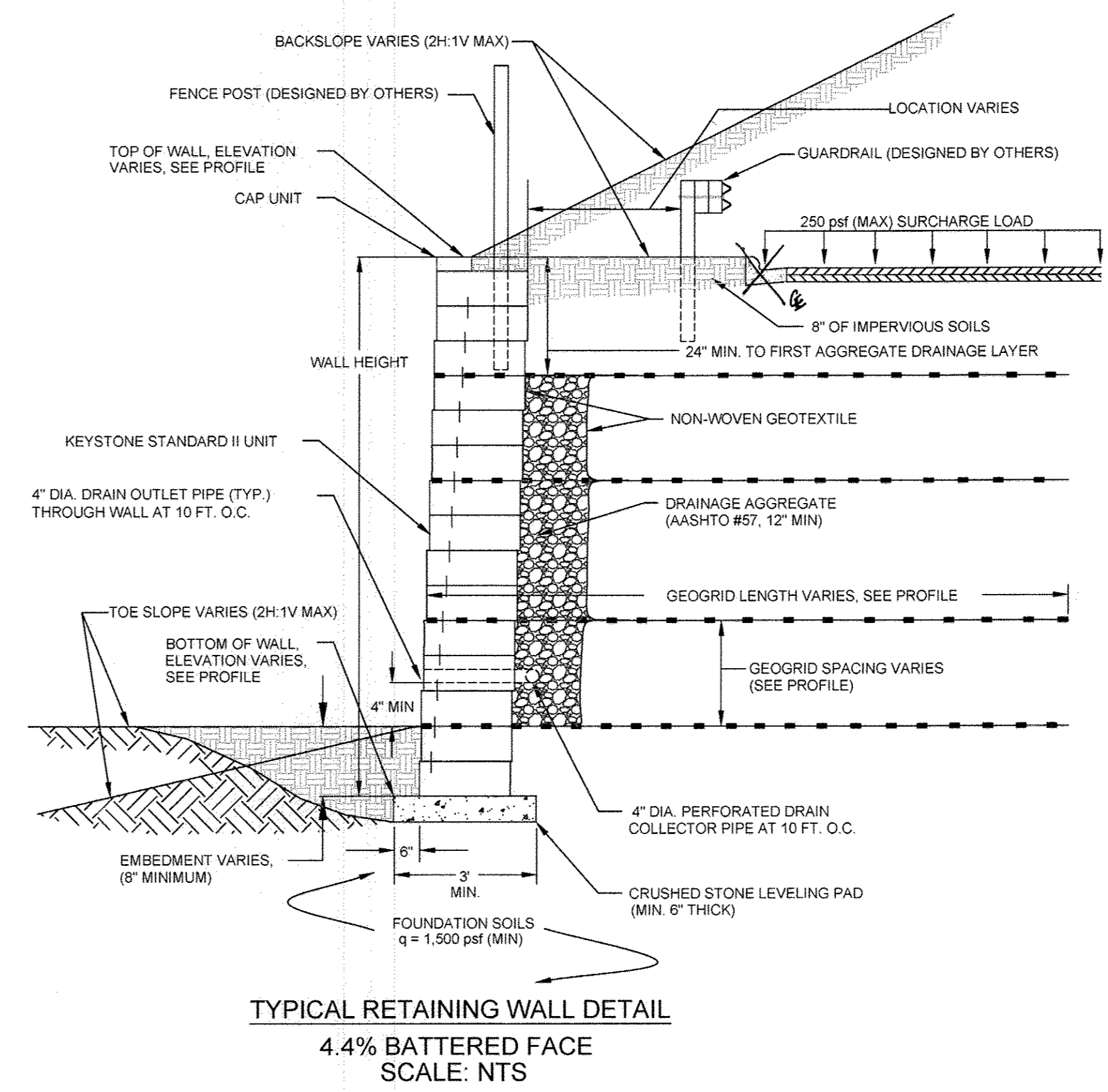
DESIGN BY: RJ/JCO  
DRAWN BY: RJ/JCO  
CHECKED BY: RHV  
DATE: SEPTEMBER, 2008  
SCALE: AS SHOWN  
W.O. NO.: 04-33.03

10 SHEET OF 13

**RETAINING WALL SPECIFICATION GUIDELINES**

- PART 1: GENERAL**
- 1.01 Description
- Retaining walls must be constructed under the supervision of a Maryland Registered Professional Engineer.
  - Work includes furnishing and installing concrete modular block retaining wall units to the lines and grades shown on the construction drawings and as specified herein.
  - Work includes preparing foundation soil, furnishing and installing leveling pad, unit fill and reinforced backfill to the lines and grades shown on the construction drawings.
  - Work includes furnishing and installing all related materials required for construction of the retaining wall as shown on the construction drawings.
- 1.02 Reference Standards
- ASTM C 90 Load Bearing Concrete Masonry Units.
  - ASTM C 140 Sampling and Testing Concrete Masonry Units.
  - ASTM D 448 Sizes of Aggregate for Road and Bridge Construction.
  - ASTM D 698 Laboratory Compaction Characteristics Using Standard Effort.
- 1.03 Delivery, Storage and Handling
- Contractor shall check the materials upon delivery to ensure that proper materials have been received.
  - Contractor shall prevent excessive mud, wet cement, epoxy, and similar materials (which may affix themselves) from coming in contact with the materials.
  - Contractor shall protect the materials from damage and exposure to sunlight. Damaged materials shall not be incorporated into the retaining wall structure and backfill.
- 1.04 Quality Assurance
- Owner will be responsible for soil testing and construction observations for quality control during earthwork and retaining wall construction operations.
- PART 2: MATERIALS**
- 2.01 Definitions
- Modular Wall Units - KEYSTONE or equivalent modular concrete facing and corner units, machine made from portland cement, water, and mineral aggregate.
  - Structural Geogrid - a structural geogrid formed by a regular network of integrally connected tensile elements with openings of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
  - Unit Fill/Drainage Aggregate - drainage aggregate, such as No. 57 Stone, which is placed within the cells of the modular concrete units and immediately behind the units to a width of at least 12 inches.
  - Reinforced Backfill - the interface between the reinforced backfill and the retained fill. During construction, measures shall be taken to develop a shear plane at this interface.
  - Retained Backfill - On-site material located behind the reinforced zone of soil.
- 2.02 Concrete Units
- Concrete segmental units shall conform to the requirements of NCMATX 2-4 and have a minimum 28-day compressive strength of 4,000 psi. The units shall also have 150 freeze thaw cycles in water with less than 1% weight loss samples tested in accordance with ASTM C-1262.
  - Wall Face Units for general wall construction shall be KEYSTONE Standard II Units or equivalent. Sculptured face or straight (flat) face may be used.
  - Top of wall Cap Units shall be KEYSTONE Cap Units or equivalent with fiberglass connecting pins.
- 2.03 Fiberglass Connecting Pins
- Connecting pins shall be 1/2" diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods supplied by the unit manufacturer.
- 2.04 Construction Adhesive
- Construction adhesive for top of wall cap blocks shall be KEYSTONE KapSealTM or an approved equivalent construction adhesive. Material shall conform to ASTM 2339 and shall be supplied by the block unit supplier.
- 2.05 Soil Fill Materials
- Base Leveling and Pad Material
    - Material shall consist of crushed stone (GA S/8) as shown on the construction drawing. The leveling pad shall be, at a minimum, 6-inches thick. MSHA No. 57 Stone or pea gravel is not permitted.
  - Unit Fill/Drainage Aggregate
    - Fill for units shall be free draining crushed stone or gravel, with a maximum aggregate size of 1/2" to 3/4" and no more than 5% passing the No. 50 sieve and conforming to ASTM D 448. Gradation of the unit fill shall be approved by the Geotechnical Engineer. Pea gravel shall not be used. MSHA No. 57 stone may be used.
  - Reinforced Backfill
    - Material shall consist of soil classified as SM, SC or more granular soils per USCS with minimum soil parameters as indicated under design parameters. The backfill material shall contain no particles greater than 2.5 inches in diameter. Other backfill materials may be approved by the Geotechnical Engineer.
  - Impervious Soil
    - Material may be imported or site excavated soils exhibiting a USCS designation of a lean clay (CL) or clayey sand (SC). The material shall contain no less than 40 percent by weight passing the US Standard No. 200 sieve and exhibit a plasticity index no less than 4 and no greater than 20. Other materials may be approved by the Geotechnical Engineer.
  - Sample Submittal
    - The contractor shall submit samples and material specifications of the proposed backfill soils (unit fill, pad material, reinforced backfill) to the Geotechnical Engineer for approval.
    - Soil must meet or exceed the friction angle specified in design parameters.
    - Direct shear testing is required for all soil samples used for Reinforced Backfill.
- 2.06 Structural Geogrid
- The geogrid identified for the retaining wall consists of the following:
    - Mirafi 10 XT
  - Other geogrid may be utilized provided the materials meet or exceed the minimum strength with similar or better strain characteristics of the Tensar geogrid and are approved by the Geotechnical Engineer for use with soil backfill. The material shall be protected from sunlight and weather while stored on site in accordance with the manufacturer's recommendation.
- 2.07 Geotextile
- A non-woven geotextile shall be utilized as shown on the plans to provide a filter between the unit fill/drainage aggregate and the reinforced backfill. The geotextile shall consist of a Mirafi 140N, or an approved equivalent.
  - Where geotextiles are located, the geotextile shall be placed as illustrated on the plans. At junctions and ends, the geotextile shall be overlapped at least 12 inches. The geotextile shall be placed so that intimate contact is made between the geotextile and the backfill material.
  - The material shall be protected from sunlight and weather while stored on site in accordance with the manufacturer's recommendation. Rippled or otherwise damaged material shall not be used.

- PART 3: INSTALLATION**
- 3.01 Excavation
- Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.
  - All existing topsoil, rootstock and other soft or unsuitable materials shall, at a minimum, be removed from the footprint of the retaining wall.
  - If groundwater is encountered during the excavation of the backslope, a backslope drainage system shall be utilized. The system shall tie into the internal wall drainage system to provide adequate release of any water which accumulates behind the reinforced zone.
- 3.02 Foundation Preparation
- Foundation shall be excavated as required for leveling pad dimensions shown on the construction drawings, or as directed by the Geotechnical Engineer.
  - The required bearing pressure beneath the footing of the wall must be verified in the field by a Geotechnical Engineer.
  - Unsuitable soils shall be removed and replaced with approved material.
  - Over-excavated areas shall be backfilled with approved, compacted backfill material or as approved by the Geotechnical Engineer.
- 3.03 Base Leveling Pad
- Leveling pad materials shall be placed upon an approved foundation as shown on the construction drawings to a minimum thickness of 6 inches.
  - Aggregate material shall be compacted to provide a dense, level surface on which to place the first course of modular units. Compaction shall be to at least 80% of the maximum dry density as determined by the Standard Proctor Compaction Test (ASTM D 698). Leveling pad shall be prepared and leveled to ensure complete contact of retaining wall units with base.
- 3.04 Unit Installation
- The first course of concrete modular units shall be carefully placed on the base leveling pad. Each unit shall be checked for level (in both directions) and alignment.
  - Install fiberglass connecting pins and fill all voids in and around the modular units with unit fill material.
  - Temp or rod unit fill to ensure that all voids are completely filled.
  - Sweep excess material from top of units and install the next course. Ensure that the units of each course are completely filled, backfilled and compacted prior to proceeding to next course.
  - Place each subsequent course, ensuring that pins protrude into adjoining courses a minimum of 1 inch. Two pins are required per unit. Pull each unit forward to obtain the desired offset (as noted on the plans), away from the fill zone, locking against the pins in the previous course and backfill as the course is completed.
  - Repeat procedure to extent of wall height. Wall construction shall not exceed 2 courses in height before reinforced backfill is placed.
  - Follow wall erection over unit fill placement closely with any other backfilling required. Compaction of all soils shall be to 85% of the maximum dry density as determined by ASTM D 698.
  - An appropriate where the wall changes elevation, units can be stepped with the grade or turned into the embankment with a convex return etc. Provide appropriate buried units on compacted leveling pad in area of convex return end.
- 3.05 Geogrid Installation
- The geogrid type and length (direction perpendicular to the wall face) shall conform to those indicated on the construction drawings. Geogrid shall be laid continuously at the proper elevation and orientation as shown on the construction drawings or as directed by the Geotechnical Engineer.
  - Correct orientation (roll direction) of the geogrid shall be verified by the Contractor.
  - The geogrid shall be connected to the modular wall units by placing the geogrid over fiberglass pins and forcing the grid back to the fill side.
  - A filtering, non-woven geotextile shall be located between the drainage aggregate/unit fill and the reinforced backfill. The geotextile shall be folded back parallel, above and below the geogrid as necessary to ensure continuous grid placement.
  - The geogrid shall be pulled taut to set the geogrid against the fiberglass pins and to eliminate loose folds in the material. The fill surface shall be level. To tension the geogrid, backfill shall be placed over the geogrid from immediately behind the wall to the back end of the geogrid.
  - No geogrid overlaps will be allowed in any length of geogrid perpendicular to the wall face except at corners or angled locations. The geogrid shall overlap rather than provide no coverage. A minimum of 4 inches of soil cover is required between over lapping layers of geogrid.
- 3.06 Fill Placement
- Backfill material shall be placed in 8 inch loose lifts and compacted to at least 95% of the maximum dry density as determined by ASTM D 698. The in-place moisture content shall be in the range of at the optimum moisture content to 2 percentage points higher than the optimum moisture content, as determined in accordance with ASTM D 698.
  - Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack or loss of pretension of the geogrid. Backfill shall be placed in horizontal layers. The excavation face shall be stepped or notched to provide compaction of backfill on a level surface and to increase the interlock between the retained soils and the reinforced backfill.
  - Only hand-operated compaction equipment shall be allowed within 5 feet of the back surface of the KEYSTONE or equivalent units.
  - Backfill shall be placed from immediately behind the wall towards the excavation face/retained soils and compacted to the specifications presented herein with appropriate compaction equipment.
  - Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles shall not be permitted over the geogrid.
  - Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 10 mph). Avoid sudden braking and sharp turning.
  - The suitability of the fill material must be confirmed by a Geotechnical Engineer.
  - The upper 8 inches of wall backfill shall consist of impervious soil, compacted to at least 85% of the maximum dry density as determined by ASTM D 698. The in-place moisture content shall be in the range of at the optimum moisture content to 2 percentage points higher than the optimum moisture content, as determined in accordance with ASTM D 698.
- 3.07 Cap Installation
- Provide permanent mechanical connection to wall units with KEYSTONE KapSealTM or equivalent construction adhesive. Apply adhesive to top surface of lower unit and place cap unit stop adhesive.
  - Place Cap Units over projecting pins from the units below. Pull forward to setback position.
  - Backfill and compact to finished grade.

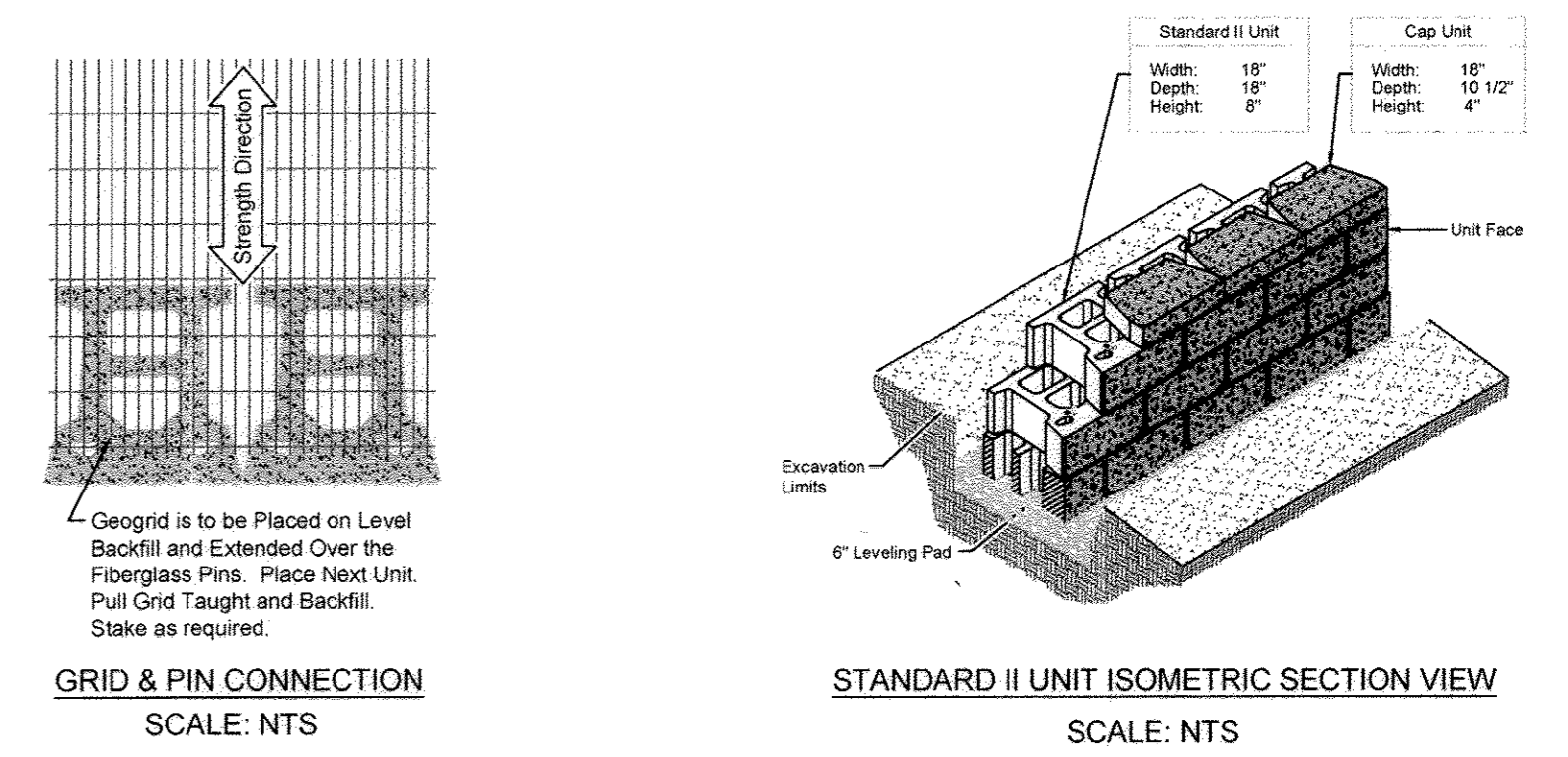
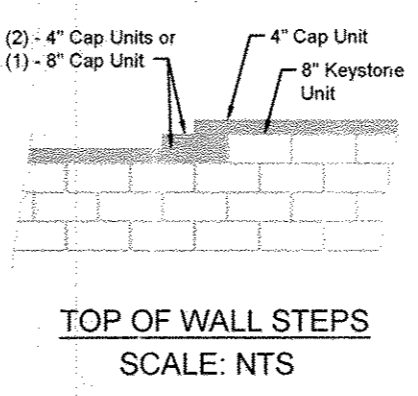
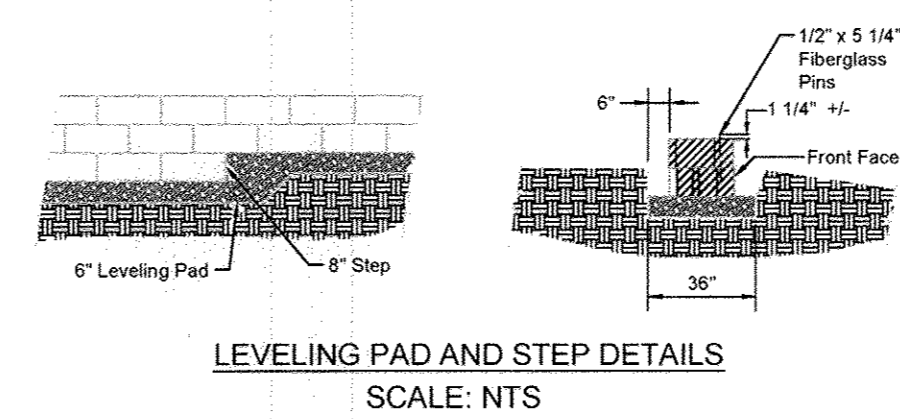
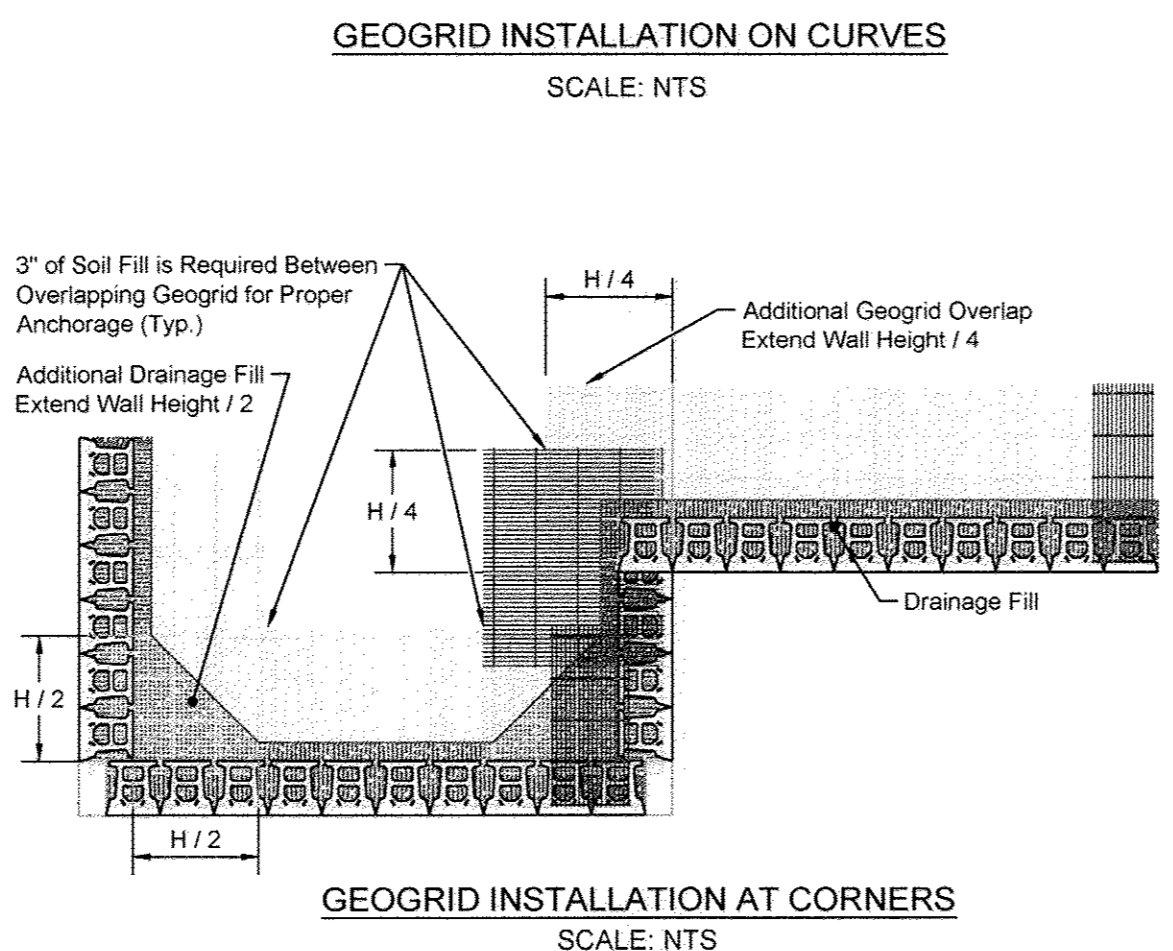
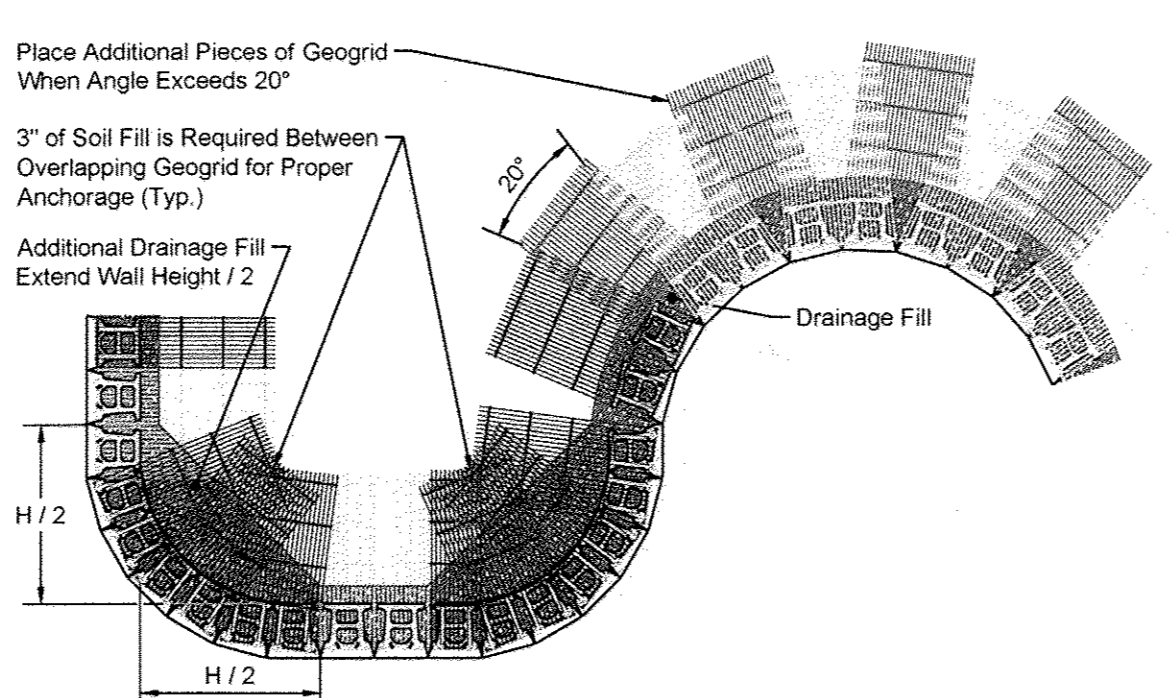
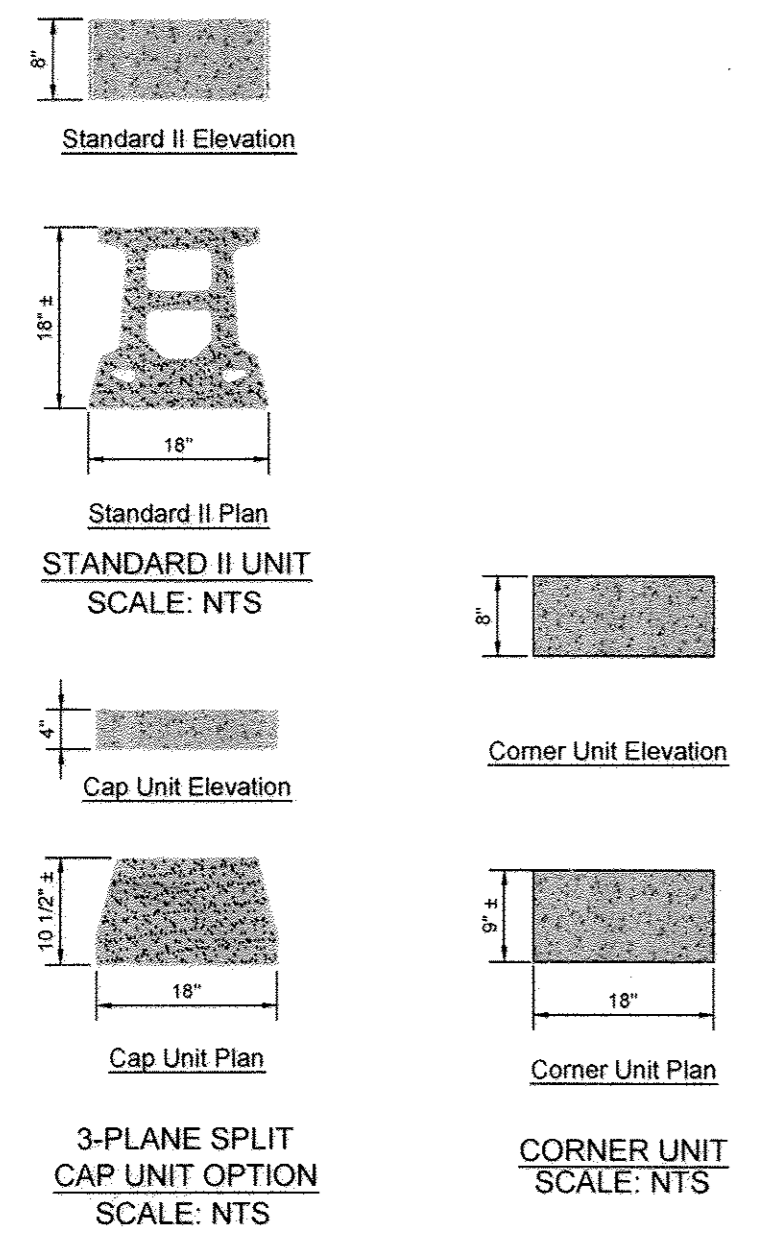


**TYPICAL RETAINING WALL DETAIL**  
4.4% BATTERED FACE  
SCALE: NTS

**DESIGN PARAMETERS**

Characteristics:	Soil Parameters:	Minimum Friction Angle	Minimum Unit Weight (pcf)
Configuration:	Soil Type	32	120
Maximum Grade Differential & Minimum Allowable Bearing Pressure:	Reinforced fill (DR, SR, or non-gravel)	30	120
	Retained soils	30	120
	Foundation soils	30	120

Backslope Angle: Varies (2H:1V max)  
Toe Slope Angle: Varies (2H:1V max)  
Wall Embedment: Varies (8 inch min)  
Pavement Surcharge: 250 psf max



**OWNER/DEVELOPER**  
6168 INVESTMENT & RENTAL PROPERTIES, LLC  
5705 LANDING ROAD  
ELKRDORS, MARYLAND 21075  
(410) 796-1850

**NO AS-BUILT INFORMATION ON THIS SHEET**

NO.	REVISIONS	DATE

**RETAINING WALL DETAILS & SPECIFICATIONS**  
SHADY LANE CROSSING  
LOTS 1 THROUGH 24  
HOWARD COUNTY

MAIN ST. BUILDERS

MDG	JMJ	09/11/13	3134	11 of 13
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**ECS MID-ATLANTIC, LLC**  
56 GRUMBACHER ROAD, SUITE D  
YORK, PENNSYLVANIA 17406  
OFFICE (717) 767-4788  
FAX (717) 767-6868

**ECS LLC**  
MID-ATLANTIC

"Setting The Standard For Service"

AS-BUILT 4/11/17 F-06-097

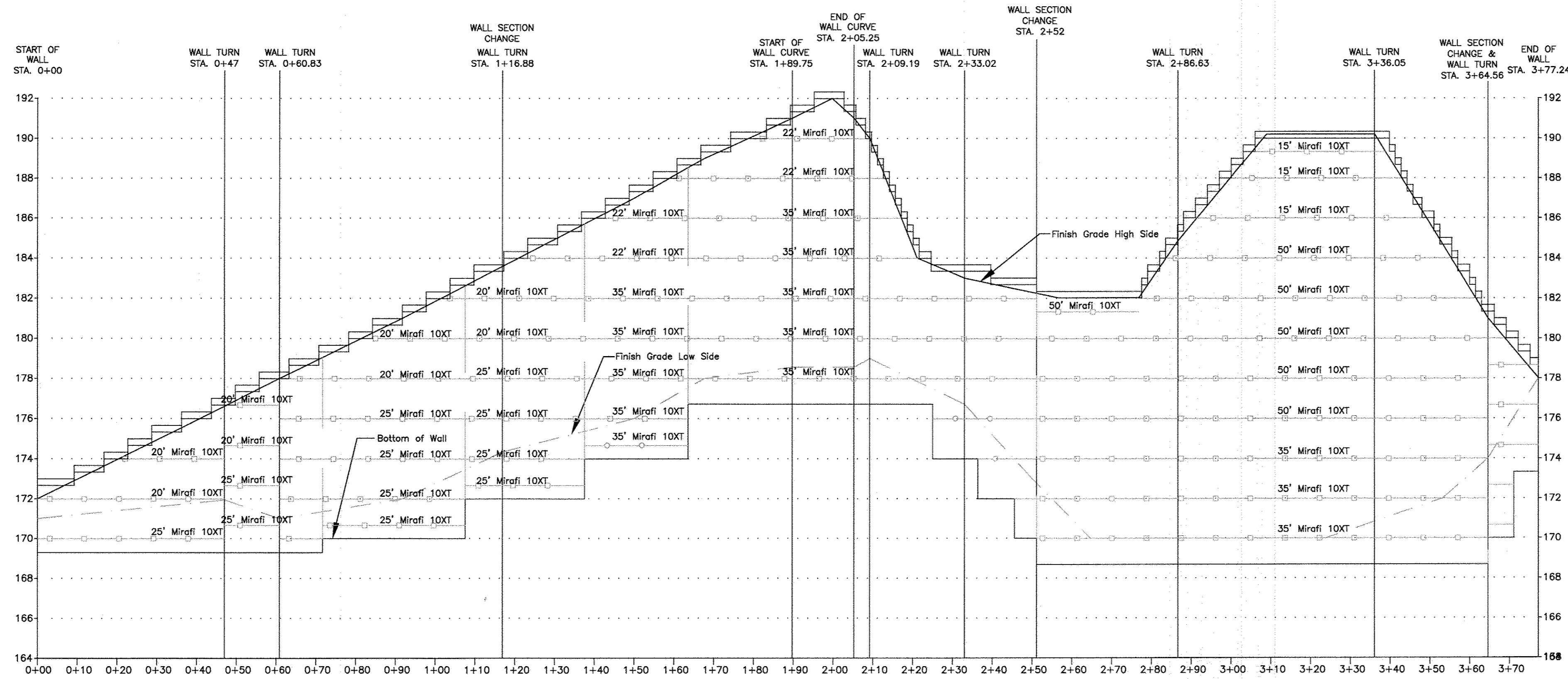
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Al Ch...* 4/25/16  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*Ve...* 4-25-16  
CHIEF, DIVISION OF LAND DEVELOPMENT

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 No. 42374, Expiration Date: 06/08/16





**WALL PROFILE**  
 SCALE  
 VERTICAL SCALE 1"=4'  
 HORIZONTAL SCALE 1"=20'

**LEGEND**

—○—○—○— MIRAFI 10XT GEOGRID

OWNER/DEVELOPER  
 6168 INVESTMENT & RENTAL PROPERTIES, LLC  
 5705 LANDING ROAD  
 ELKRDGE, MARYLAND 21075  
 (410) 786-1160

NO AS-BUILT INFORMATION ON THIS SHEET

NO.	REVISIONS	DATE		
<b>RETAINING WALL PROFILE</b> <b>SHADY LANE CROSSING</b> LOTS 1 THROUGH 24 HOWARD COUNTY, MARYLAND MAIN ST. BUILDERS				
MDG	JMJ	09/11/13	3134	12 OF 13

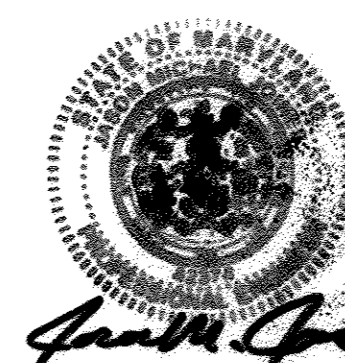
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chad Emond*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION *HE*      4-25-16      DATE

*Neil S. O'Neil*  
 CHIEF, DIVISION OF LAND DEVELOPMENT *NSO*      4-25-16      DATE

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 No. 42374, Expiration Date: 06/06/16



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 56 GRUMBACHER ROAD, SUITE D  
 YORK, PENNSYLVANIA 17406

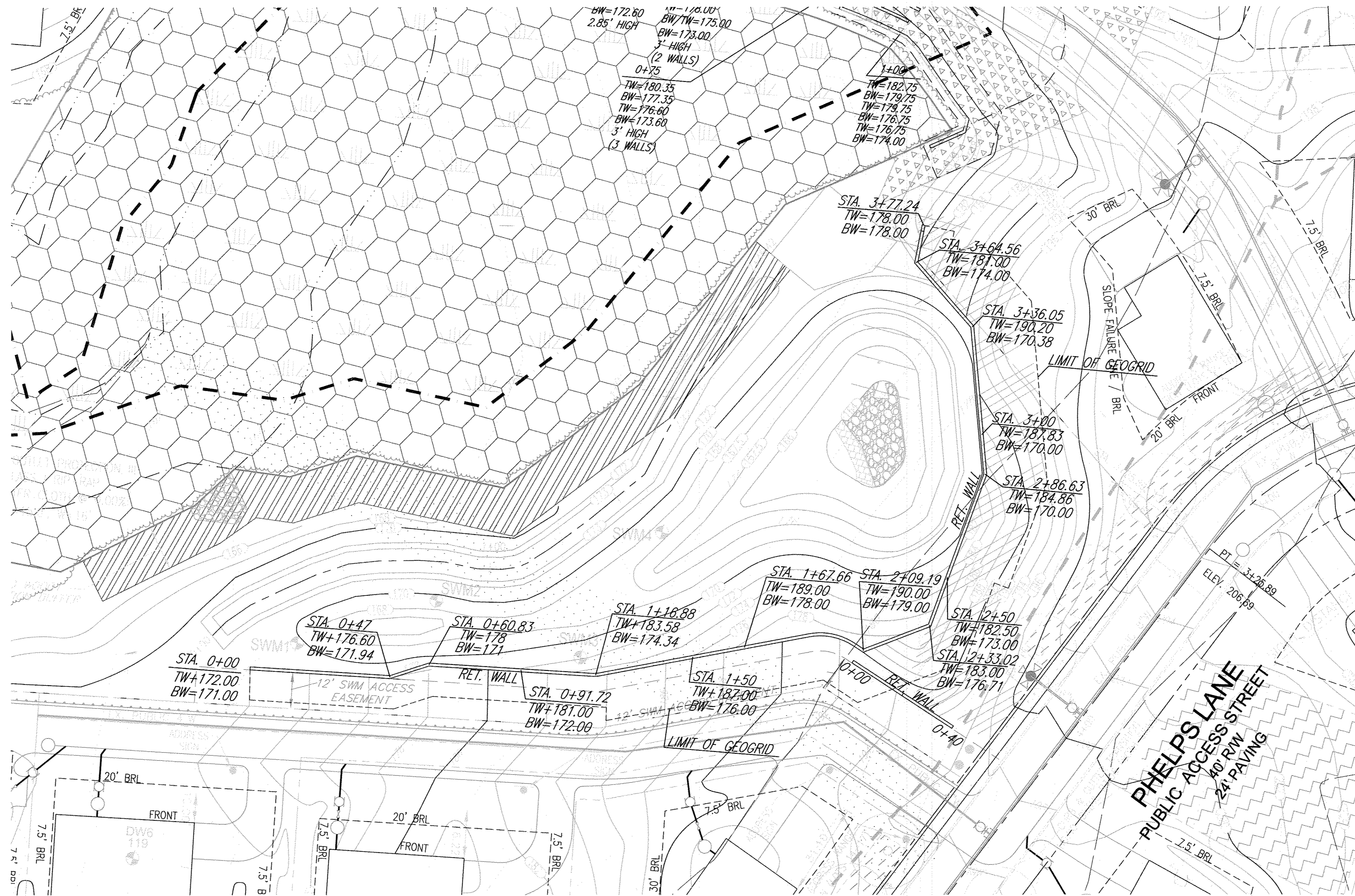
OFFICE (717) 767-4788  
 FAX (717) 767-5666



"Setting The Standard For Service"

AS-BUILT 4/11/17

F-06-097



PLAN VIEW  
1"=20'

OWNER/DEVELOPER  
6188 INVESTMENT & RENTAL PROPERTIES, LLC  
5705 LANDING ROAD  
ELKRIDGE, MARYLAND 21075  
(410) 796-1850

NO AS-BUILT INFORMATION ON THIS SHEET

NO.	REVISIONS	DATE
1	REVISE RETAINING WALL	6/18/13

RETAINING WALL PLAN  
SHADY LANE CROSSING  
LOTS 1 THROUGH 24  
HOWARD COUNTY, MARYLAND

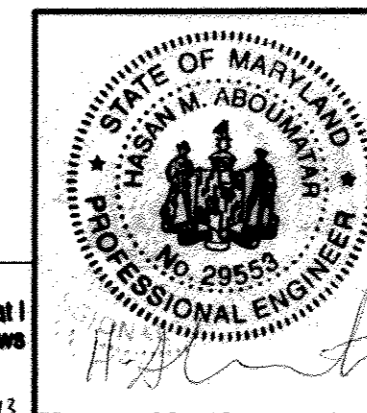
MAIN ST. BUILDERS

DMA	HMA	12/05/12	3463-A	13 OF 13
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ECS MID-ATLANTIC, LLC  
1340 CHARWOOD ROAD, SUITE A  
HANOVER, MARYLAND 21076

OFFICE (410) 859-4300  
FAX (410) 859-4324

"Setting The Standard For Service"



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 No. 29553, Expiration Date 12/31/2013

Hasan M. Aboumatar, P.E.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 7/1/13  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 8/27/13  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE