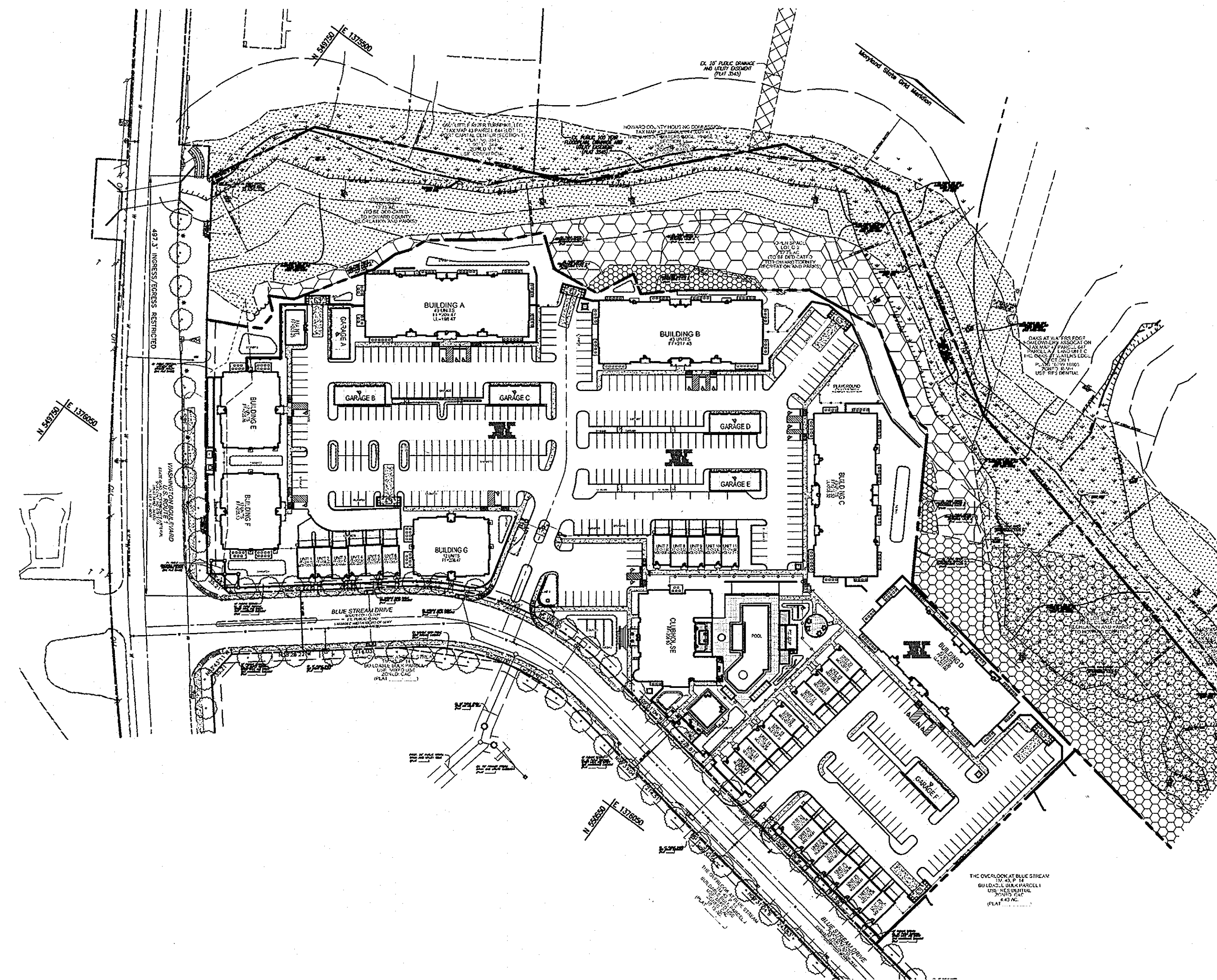


GENERAL NOTES

- ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS ALTERNATIVE COMPLIANCE HAS BEEN SPECIFIED.
- EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND AND SEWER EXTENSION PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- THE COORDINATES SHOWN HEREON ARE BASED UPON HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE SYSTEM. HOWARD COUNTY MONUMENT NOS. 4362 AND 4366 WERE USED FOR THIS PROJECT.
- THE PROPERTY LINES SHOWN HEREON IS BASED ON A BOUNDARY SURVEY PERFORMED BY VOGEL & ASSOCIATES, INC., DATED FEBRUARY 1998.
- THE EXISTING TOPOGRAPHY SHOWN HEREON IS TAKEN FROM AN AERIAL TOPOGRAPHIC SURVEY PREPARED BY POTOMAC AERIAL SURVEYS; DATED MARCH, 1998.
- WETLANDS AND STREAMS SHOWN ON SITE ARE BASED ON A FIELD INVESTIGATION PERFORMED BY CAMPBELL-NOLAN ASSOCIATES; DATED MARCH, 2006 AND ARE CONTAINED WITHIN OPEN SPACE LOT G-2, WHICH IS CONSIDERED NON-BUILDABLE.
- FLOODPLAIN SHOWN ON SITE IS BASED ON "HOWARD COUNTY DEEP RUN FLOODPLAIN STUDY", CAPITAL PROJECT NO. D-1084; DATED JANUARY, 1997, AND APPROVED IN CONJUNCTION WITH F-02-035.
- GEOTECHNICAL REPORT PREPARED BY ECS-MIDATLANTIC, LLC, DATED 06/01/09, REVISED 09/10/09. INFILTRATION STUDY PREPARED BY HILLIS-CARNES ENGINEERING ASSOCIATES, INC.; DATED 12/15/09.
- PUBLIC WATER AVAILABLE THROUGH CONTRACT NO. 14-4083-F.
- PUBLIC SEWER AVAILABLE THROUGH CONTRACT NO. 14-4083-D.
- APFO TRAFFIC STUDY PREPARED BY THE TRAFFIC GROUP DATED MAY 30, 2006, REVISED JUNE 5, 2008.
- THE UNMITIGATED NOISE STUDY WAS PREPARED BY ROBERT H. VOGEL ENGINEERING DATED JUNE 2006. THE MITIGATED NOISE STUDY IS BASED ON CONCEPTUAL BUILDING LOCATIONS AND ELEVATIONS. AN ADDITIONAL NOISE STUDY MAY BE REQUIRED AT THE SITE DEVELOPMENT STAGE.
- THE SUBJECT PROPERTY IS ZONED CAC PER THE 02/02/2004 COMPREHENSIVE ZONING PLAN AND THE COMP LITE ZONING REGULATION AMENDMENTS EFFECTIVE ON 07/28/06.
- THERE ARE NO STEEP SLOPES WITH A CONTIGUOUS AREA GREATER THAN 20,000sf LOCATED ON PARCEL 'H'.
- ALL BUILDINGS TO HAVE ROOF LEADERS WHICH EMPTY INTO STORM DRAIN SYSTEM.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE, AND THE LANDSCAPE MANUAL.
- FOREST STAND DELINEATION PLAN PREPARED BY KOPECK AND ASSOCIATES DATED NOVEMBER, 1998. THE FOREST CONSERVATION REQUIREMENTS FOR THIS PROJECT HAVE PREVIOUSLY ADDRESSED UNDER F-02-035 AND F-10-055 BY PROVIDING 1.09 AC. OF ON-SITE RETENTION, 6.91 AC. OF ON-SITE AFFORESTATION, 0.15 AC. OF ON-SITE REFORESTATION, AND 5.29 AC. OF OFF-SITE AFFORESTATION IN THE HOWARD COUNTY WILDLIFE CONSERVATION BANK. FINANCIAL SURETY IN THE AMOUNT OF \$173,867.30 HAS BEEN POSTED WITH THE FC INSTALLATION AND MAINTENANCE AGREEMENT, AS WELL AS \$435.60 FEE-IN-LIEU PAYMENT FOR 871.2 SF OF OUTSTANDING AFFORESTATION UNDER F-02-035. A \$31,581.00 FOREST CONSERVATION ABANDONMENT FEE HAS ALSO BEEN PAID UNDER THE HOWARD COUNTY WILDLIFE CONSERVATION FUND F-10-055.
- EXISTING BLUE STREAM DRIVE IS CLASSIFIED AS A MAJOR COLLECTOR, AND QUIDDICH LANE IS CLASSIFIED AS AN ACCESS STREET.
- THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
- THE PROPOSED BUILDINGS WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
- A KNOX BOX IS REQUIRED TO BE PLACED ON THE FRONT OF THE BUILDING. IT SHALL BE PLACED TO THE RIGHT OF THE MAIN ENTRANCE AT A RANGE OF 4'-5" IN HEIGHT AND NO MORE THAN 6' LATERALLY FROM THE DOOR. ITS LOCATION IS SHOWN ON THESE PLANS. THE BOX SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSSED (INTEGRATED WITH THE FIRE ALARM SYSTEM).
- LANDSCAPING NOT PERMITTED WITHIN 7'-1/2' OF EACH SIDE OF THE FIRE DEPARTMENT CONNECTION. PROVIDE A CLEAR UNOBSTRUCTED ACCESS PATH TO THE FIRE DEPARTMENT CONNECTION. NFPA-1 13.1.4.
- FIRE LANES SHOULD BE PROVIDED IN THIS SITE TO ALLOW EMERGENCY VEHICLE ACCESS. EITHER FIRE LANE SIGNAGE SHOULD BE INSTALLED, OR THE CURBS SHOULD BE PAINTED IN RED AND STENCILED TO IDENTIFY THE ROAD AS A FIRE LANE.
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL PERFORATED SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL PERFORATED SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- ALL EXTERIOR LIGHTING TO COMPLY WITH THE REQUIREMENTS FOUND IN ZONING SECTION 13.4 OF THE HOWARD COUNTY ZONING REGULATIONS. (DETAILS ON SHEET 2 AND 3)
- SIGNAGE SHALL BE PROVIDED ON THE BUILDING IDENTIFYING THE BUILDING ADDRESS, AND EACH SUITE SEPARATED BY LETTER.
- TRASH COLLECTION TO BE PRIVATE. RECYCLABLES COLLECTION WILL BE PUBLIC.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAM, THEIR BUFFERS, FOREST CONSERVATION AREAS, STEEP SLOPES, OR 100 YEAR FLOODPLAIN.
- STORMWATER MANAGEMENT FOR P/O PARCEL 'H' IS PROVIDED BY THE UNDERGROUND FACILITY LOCATED ON PARCEL 'J' UNDER F-02-035. THE REMAINDER OF PARCEL 'H' WILL BE PROVIDED BY ENVIRONMENTAL SITE DESIGN UTILIZING MICRO-BIORETENTIONS, AND POROUS CONCRETE WITH STONE STORAGE. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- THIS PROJECT COMPLES WITH THE ROUTE 1 MANUAL IN REGARDS TO THE "CAC" ZONING DISTRICT.
- INGRESS AND EGRESS TO ROUTE 1 IS RESTRICTED. ACCESS WILL BE PROVIDED BY BLUE STREAM DRIVE.
- A SIGNAL WARRANT ANALYSIS STUDY MAY BE REQUIRED ANNUALLY DURING THE DEVELOPMENT OF THE PROJECT TO DETERMINE WHEN A SIGNAL IS WARRANTED.
- UPDATED TRAFFIC STUDIES WILL BE REQUIRED PERIODICALLY IN THE FUTURE TO ACCURATELY DETERMINE THE SPECIFIC TIMING OF POSSIBLE INTERSECTION IMPROVEMENTS FOR MD ROUTE 103 AND ROUTE 1 AND MONTEVIDEO ROAD AND ROUTE 1. SHOULD THESE INTERSECTIONS BE PROJECTED TO FAIL THEN THE STUDY WILL SPECIFY THE EXTENT OF IMPROVEMENTS AND THE DEVELOPER WILL BE REQUIRED TO CONSTRUCT SUCH IMPROVEMENTS OR CONTRIBUTE A PRO RATA FEE FOR THE CAPITAL PROJECT IMPROVEMENTS. IF THE STUDY CONCLUDES THAT THE INTERSECTION WILL FAIL, THE ROAD IMPROVEMENTS OR A FEE WILL BE REQUIRED PRIOR TO THE SITE DEVELOPMENT PLAN PHASE WHICH CORRESPONDS TO THE YEAR IN WHICH ONE OR BOTH INTERSECTIONS FAIL.
- THIS PLAN IS SUBJECT TO WP-10-120, APPROVED APRIL 22, 2010, TO WAIVE SUBDIVISION SECTION:
 - 16.116(b)(1), REQUEST TO BE PERMITTED TO CLEAR, GRADE AND DEVELOP ON 3 AREAS (425 SF., 1873 SF. & 9958 SF.) OF PROTECTED STEEP SLOPE (CURRENTLY NON-FORRESTED) TOTALING 12,158 SF. FOR RESIDENTIAL DEVELOPMENT ON PARCEL H AND OPEN SPACE LOT G-1, AS SHOWN ON THE WEAVER PETITION EXHIBIT/PLAN, AND
 - 16.120(b)(4)(ii), REQUEST TO PERMIT CONSTRUCTION OF CONDOMINIUM UNITS AND/OR RENTAL APARTMENTS LESS THAN 15 FEET FROM ENVIRONMENTAL FEATURES ON PARCEL H.
 APPROVAL OF THIS WEAVER PETITION IS SUBJECT TO COMPLIANCE WITH THE FOLLOWING CONDITIONS OF APPROVAL:
 - ANY AREA(S) OF THE EXISTING REFORESTATION FOREST CONSERVATION EASEMENTS ON STEEP SLOPES TO BE DISTURBED AS SHOWN ON THIS WEAVER PETITION EXHIBIT/PLAN THAT CANNOT BE REFORESTED, SHALL BE RELOCATED ONSITE, OFFSITE, OR SATISFIED WITH A FEE-IN-LIEU PAYMENT TO THE HO. CO. FOREST CONSERVATION FUND.
 - TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL/CEMETERY LOCATIONS ON SITE.
- THIS PROJECT COMPLES WITH THE ROUTE 1 MANUAL IN REGARDS TO THE CAC ZONING DISTRICT REQUIREMENTS.

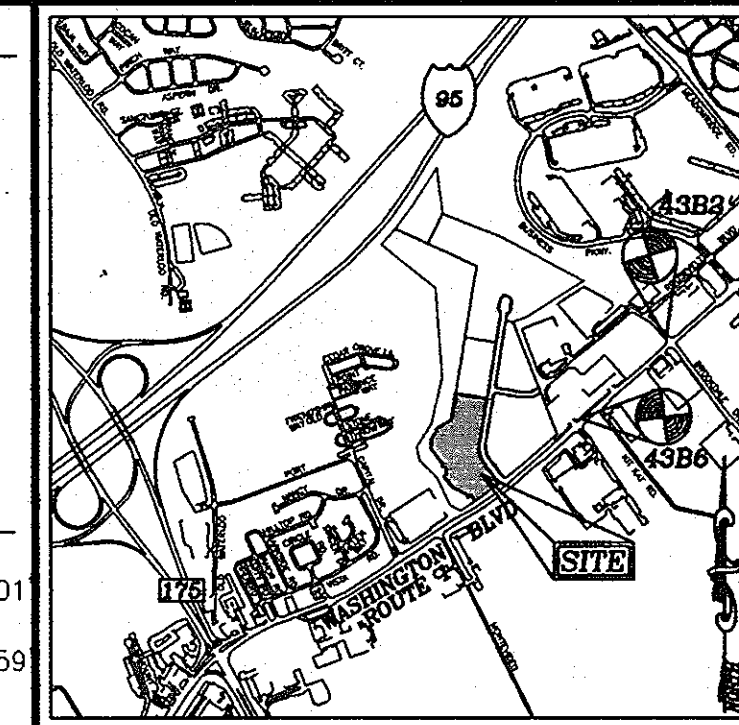
GROSVENOR HOUSE APARTMENTS AND TOWNHOMES BLUE STREAM, PARCEL H ENVIRONMENTAL CONCEPT PLAN



LOCATION MAP
SCALE: 1"=100'

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- EXISTING TREES TO REMAIN
- LIGHT POLES
- CONCRETE



VICINITY MAP
SCALE: 1"=2000'
ADC MAP COORDINATES:
16 J11,K11,J12,K12

BENCHMARKS

- HOWARD COUNTY BENCHMARK 43B2
N 551,654.993 E 1,378,176.951 ELEV.: 209.601
- HOWARD COUNTY BENCHMARK 43B6
N 550,601.597 E 1,376,866.072 ELEV.: 210.559

SITE DATA

- LOCATION: TAX MAP 43, BLOCKS 4 & 5, PARCEL 14
- 1ST ELECTION DISTRICT
- PRESENT ZONING: CAC
- SUBDIVISION: BLUE STREAM
- SECTION/AREA: N/A
- USE OF STRUCTURES: APARTMENTS AND TOWNHOMES
- TOTAL BUILDING COVERAGE: 115,167 SF (2.64 AC. OR 25.91% OF GROSS AREA)
- PAVED PARKING LOT/AREA ON SITE: 164,142 SF (3.77 AC. OR 37.00% OF GROSS AREA)
- SIDEWALKS/PAVED AREAS ON SITE: 27,390 SF. (0.63 AC. OR 6.18% OF GROSS AREA)
- WETLANDS ON SITE: 0.00 AC.
- WETLAND BUFFERS ON SITE: 0.00 AC.
- STREAM BUFFERS ON SITE: 0.12 AC.
- AREA OF ON-SITE 100 YEAR FLOODPLAIN: 0.00 AC.
- AREA OF EXISTING FOREST ON SITE: 0.00 AC.
- AREA OF STEEP SLOPES: 0.09 AC.
- AREA OF ERODIBLE SLOPES: 0.00 AC.
- DEED/PLAT REFERENCES: L 4389/F 156, L 4389/F 150, L 4389/F 138, L 11086/F 215, L 11086/F 220, PLAT 14421 & 14422, PLAT 17021
- DPZ REFERENCES: S-99-00, WP-99-80, F-00-126, P-00-20, WP-00-118, F-02-035, WP-03-66, S-06-018, WP-08-003, WP-08-126, WP-09-116, P-08-011, P-09-004, F-10-055, WP-10-120.
- SITE AREA: 10.19 AC.
- LIMIT OF DISTURBED AREA: 10.17 AC.
- AREA MANAGED PER F-02-035: 2.32 AC.
- AREA MANAGED BY ESDY (THIS PLAN): 7.85 AC.
- IMPERVIOUS AREA: 5.42 AC.
- *GREEN AREA: 2.43 AC.

ENVIRONMENTAL SITE DESIGN NARRATIVE:

- BLUE STREAM, PARCEL 'H' WAS CONFIGURED TO AVOID AND RESPECT THE ADJACENT ENVIRONMENTAL FEATURES INCLUDING STEEP SLOPES, STREAM AND STREAM BUFFER, WETLAND AND WETLAND BUFFER, FLOODPLAIN AND WOODED RESOURCES.
- THE NORTHEASTERN SECTION OF PARCEL 'H' IS ACCOMMODATED BY THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM TO BE CONSTRUCTED WITH THE BLUE STREAM PROJECT (F-02-035).
- GRADING AND SEDIMENT CONTROL FOR THE MASS GRADING IS PROVIDED IN CONJUNCTION WITH THE APPROVED FINAL ROAD CONSTRUCTION PLAN (F-02-035).
- SEDIMENT CONTROL FOR THE SPECIFIC SITE PLAN WILL BE PROVIDED BY THE EXISTING SEDIMENT TRAP AND EARTH DIKES OF F-02-035. SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH CURRENT REQUIREMENTS AND WILL BE APPROVED BY THE HOWARD COUNTY CONSERVATION DISTRICT.
- STORMWATER MANAGEMENT FOR THE UNMANAGED SECTION OF PARCEL 'H' IS TO BE PROVIDED BY A SYSTEM OF MICRO-BIORETENTION FACILITIES AND POROUS PAVING.
- THE RESULTS OF THE ENVIRONMENTAL SITE DESIGN WILL REFLECT "WOODS IN GOOD CONDITION".

All comments regarding outfalls are being addressed with SDP.

OWNER/DEVELOPER

BLUE STREAM 1, LLC
P.O. BOX 416
ELLCOTT CITY, MD 21041
C/O: ARNOLD SAGNER
410-465-2020

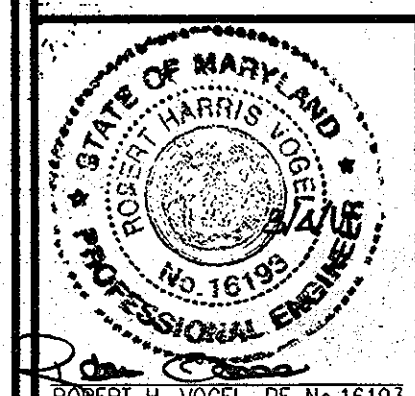
NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
COVER SHEET

GROSVENOR HOUSE
BLUE STREAM, PARCEL H
APARTMENTS AND TOWNHOMES

TAX MAP 43 GRID 4 & 5 PARCEL P/O 5, 14 & 553
1ST ELECTION DISTRICT 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



PROFESSIONAL CERTIFICATE
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. 16195, EXPIRATION DATE 08-27-2012.
DESIGN BY: RHV
DRAWN BY: DZ
CHECKED BY: RHV
DATE: MARCH 2010
SCALE: AS SHOWN
W.O. NO.: 06-26.01

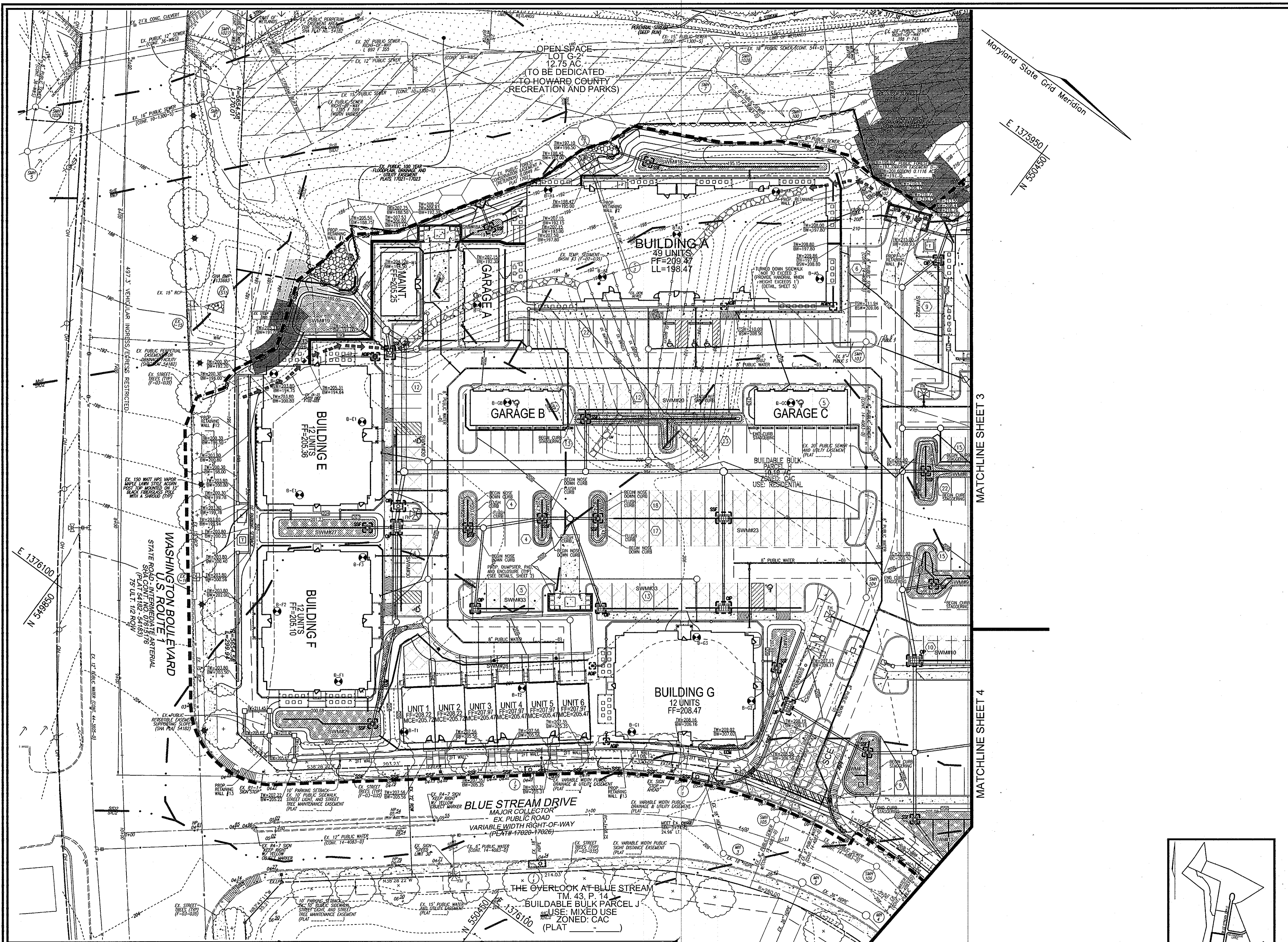
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 3/14/11
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 3/09/11
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 18
SITE PLAN	2 OF 18
SITE PLAN	3 OF 18
SITE PLAN	4 OF 18
SWM DRAINAGE AREA MAP	5 OF 18



LEGEND:

	EXISTING CONTOUR
	PROPOSED CONTOUR
	EXISTING SPOT ELEVATION
	PROPOSED SPOT ELEVATION
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLETS
	EXISTING TREE LINE
	EXISTING STREET TREES (F-02-35)
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	SOILS BOUNDARY
	PROPOSED SIDEWALK
	EX. FOREST CONSERVATION EASEMENT (REFORESTATION)
	EX. FOREST CONSERVATION EASEMENT (AFFORESTATION)
	EX. FOREST CONSERVATION EASEMENT (RETENTION)
	MODERATE SLOPES (15% - 24.99%)
	STEEP SLOPE (>25%)
	EX. PUBLIC 100 YR FLOODPLAIN
	SILT FENCE
	SUPER SILT FENCE
	LIMIT OF DISTURBANCE
	CURB INLET PROTECTION
	AT GRADE INLET PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE
	PERMEABLE PAVEMENT
	MICRO-BIORETENTMENT FACILITY

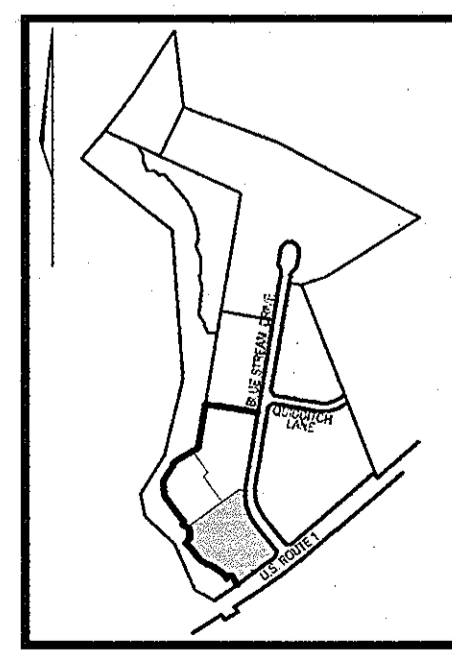
Maryland State Grid Meridian
E 1375950
N 5504930

MATCHLINE SHEET 3

MATCHLINE SHEET 4

OWNER/DEVELOPER
BLUE STREAM 1, LLC.
P.O. BOX 416
ELLCOTT CITY, MD 21041
C/O: ARNOLD SAGNER
410-465-2020

NO.	REVISION	DATE



KEY MAP
NOT TO SCALE

ENVIRONMENTAL CONCEPT PLAN

SITE PLAN

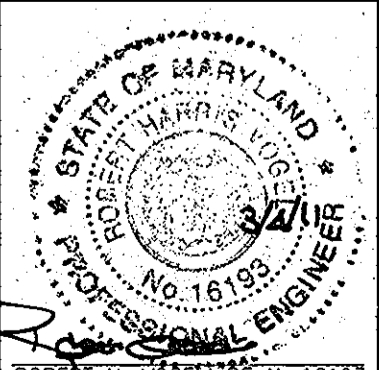
GROSVENOR HOUSE

BLUE STREAM, PARCEL H
APARTMENTS AND TOWNHOMES

TAX MAP 43 GRID 4 & 5
1ST ELECTION DISTRICT

PARCEL P/O S, 14 & 553
HOWARD COUNTY, MARYLAND

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



PROFESSIONAL CERTIFICATE
DESIGN BY: RHV
DRAWN BY: OZ
CHECKED BY: RHV
DATE: MARCH 2010
SCALE: AS SHOWN
W.O. NO.: 05-26.01

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: 05-27-2012

2 SHEET OF 6

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 2/14/11
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[Signature] 3/09/11
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

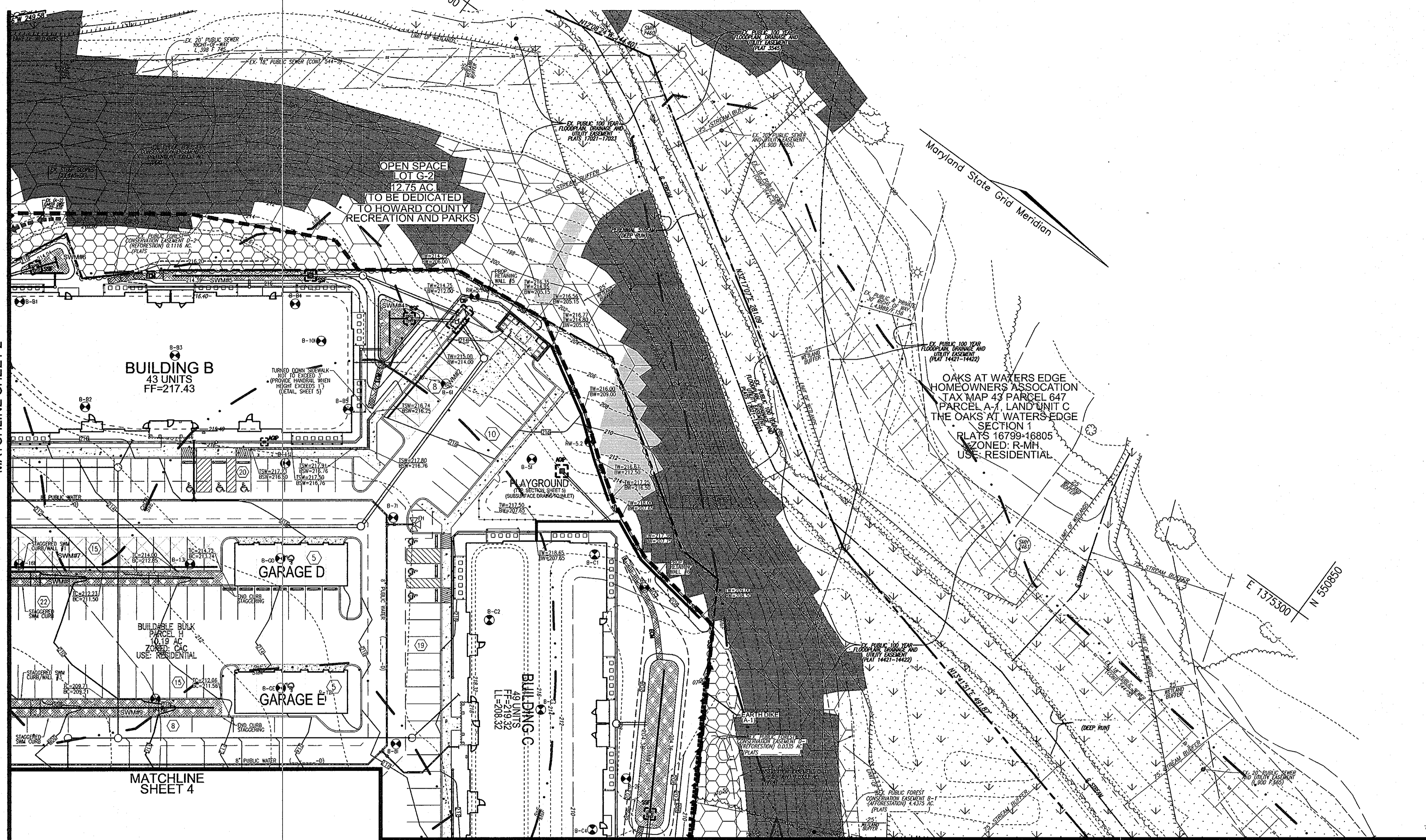
THE DEVELOPER:
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I/WE WILL PERFORM PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

THE ENGINEER:
I 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.

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

LEGEND:

- 388 --- EXISTING CONTOUR
- 400 --- PROPOSED CONTOUR
- +02.88 EXISTING SPOT ELEVATION
- 02.88 PROPOSED SPOT ELEVATION
- ==== EXISTING CURB AND GUTTER
- ==== PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLETS
- EXISTING TREELINE
- EXISTING STREET TREES (F-02-35)
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- M1B2 SOILS BOUNDARY
- M1D3 SOILS BOUNDARY
- PROPOSED SIDEWALK
- EX. FOREST CONSERVATION EASEMENT (REFORESTATION)
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- STABILIZED CONSTRUCTION ENTRANCE
- PERMEABLE PAVEMENT
- MICRO-BIORETENTION FACILITY



Maryland State Grid Meridian

OPEN SPACE
LOT G-2
12.75 AC.
(TO BE DEDICATED
TO HOWARD COUNTY
RECREATION AND PARKS)

BUILDING B
43 UNITS
FF=217.43

GARAGE D

GARAGE E

PLAYGROUND
(SUBSURFACE DRAINAGE PLAN)

OAKS AT WAXERS EDGE
HOMEOWNERS ASSOCIATION
TAX MAP 43 PARCEL 647
PARCEL A-7, LAND UNIT C
THE OAKS AT WAXERS EDGE
SECTION 1
PLATS 16799-16805
ZONED: R-MH
USE: RESIDENTIAL

OWNER/DEVELOPER
BLUE STREAM 1, LLC.
P.O. BOX 416
ELLCOTT CITY, MD 21041
C/O: ARNOLD SAGNER
410-465-2020

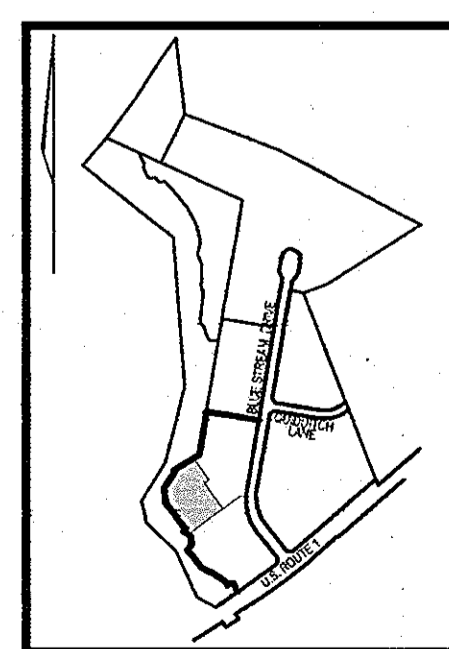
NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN
SITE PLAN**

GROSVENOR HOUSE

BLUE STREAM, PARCEL H
APARTMENTS AND TOWNHOMES
TAX MAP 43 GRID 4 & 5 PARCEL P/O S, 14 & 553
1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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ENGINEERS • SURVEYORS • PLANNERS
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KEY MAP
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 3/14/11
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 3/09/11
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

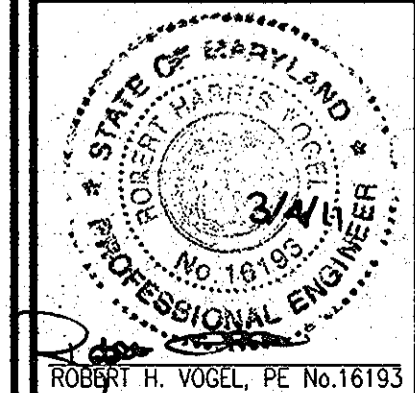
BY THE DEVELOPER:
"I CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROCESS WILL HAVE CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER DATE

BY THE ENGINEER:
"I 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."

SIGNATURE OF ENGINEER DATE

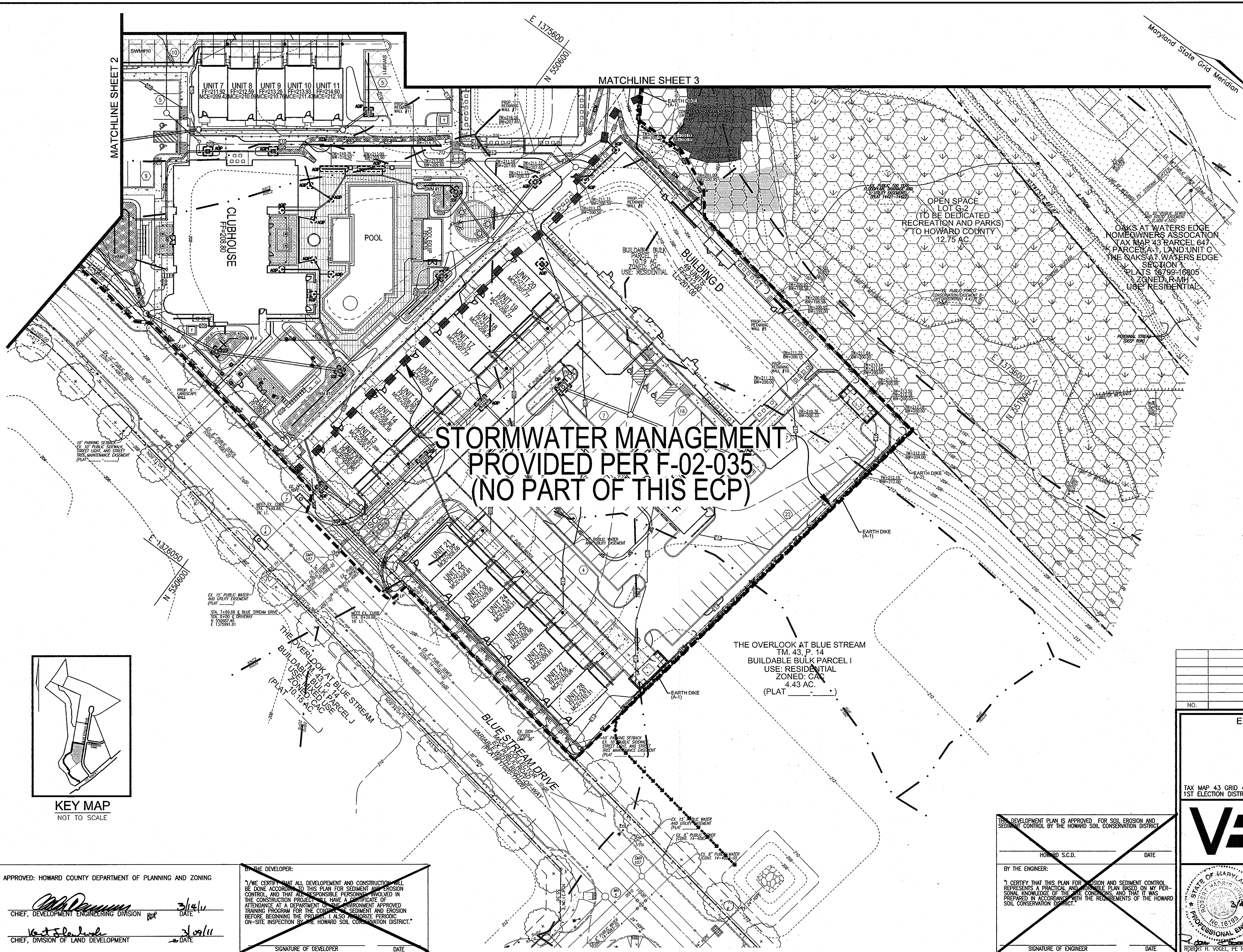
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD S.C.D. DATE



PROFESSIONAL CERTIFICATE
DESIGN BY: RHV
DRAWN BY: DZ
CHECKED BY: RHV
DATE: MARCH 2010
SCALE: AS SHOWN
W.O. NO.: 06-26.01

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: 06-27-2012.

3 SHEET OF 6



**STORMWATER MANAGEMENT
PROVIDED PER F-02-035
(NO PART OF THIS ECP)**

LEGEND:

	EXISTING CONTOUR
	PROPOSED CONTOUR
	EXISTING SPOT ELEVATION
	PROPOSED SPOT ELEVATION
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
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	EXISTING SANITARY LINE
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	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLETS
	EXISTING TREE LINE
	EXISTING STREET TREES (F-02-35)
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	SOILS BOUNDARY
	PROPOSED SIDEWALK
	EX. FOREST CONSERVATION EASEMENT (REFORESTATION)
	EX. FOREST CONSERVATION EASEMENT (AFFORESTATION)
	EX. FOREST CONSERVATION EASEMENT (RETENTION)
	MODERATE SLOPES (15% - 24.99%)
	STEEP SLOPE (>25%)
	EX. PUBLIC 100 YR FLOODPLAIN
	SILT FENCE
	SUPER SILT FENCE
	LIMIT OF DISTURBANCE
	CURB INLET PROTECTION
	AT GRADE INLET PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE
	PERMEABLE PAVEMENT
	MICRO-BIORETENTION FACILITY

OWNER/DEVELOPER
 BLUE STREAM 1, LLC.
 P.O. BOX 416
 ELLICOTT CITY, MD 21041
 C/O: ARNOLD SAGNER
 410-465-2020

NO.	REVISION	DATE

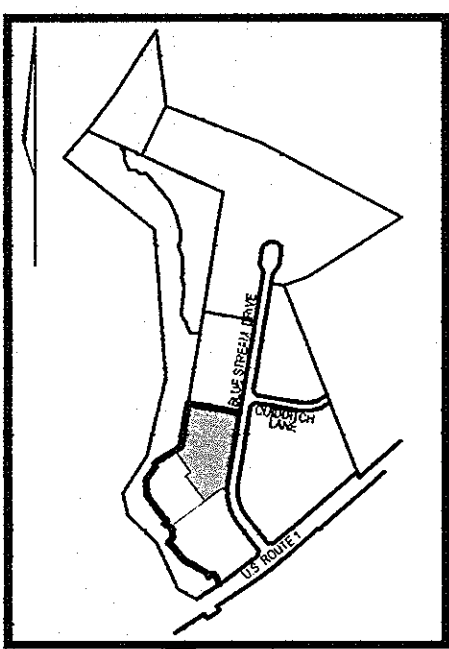
**ENVIRONMENTAL CONCEPT PLAN
SITE PLAN**
GROSVENOR HOUSE
 BLUE STREAM, PARCEL H
 APARTMENTS AND TOWNHOMES
 TAX MAP 43 GRID 4 & 5 PARCEL P/O 5, 14 & 553
 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE
 DESIGN BY: RHV
 DRAWN BY: DZ
 CHECKED BY: RHV
 DATE: MARCH 2010
 SCALE: AS SHOWN
 W.O. NO.: 08-26.01

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 08-27-2012

4 SHEET OF 6



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 3/4/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 3/09/11
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

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 SIGNIFICATE OF ATTENDANCE AT A DEPARTMENT OF PLANNING AND ZONING APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AGREE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF DEVELOPER DATE

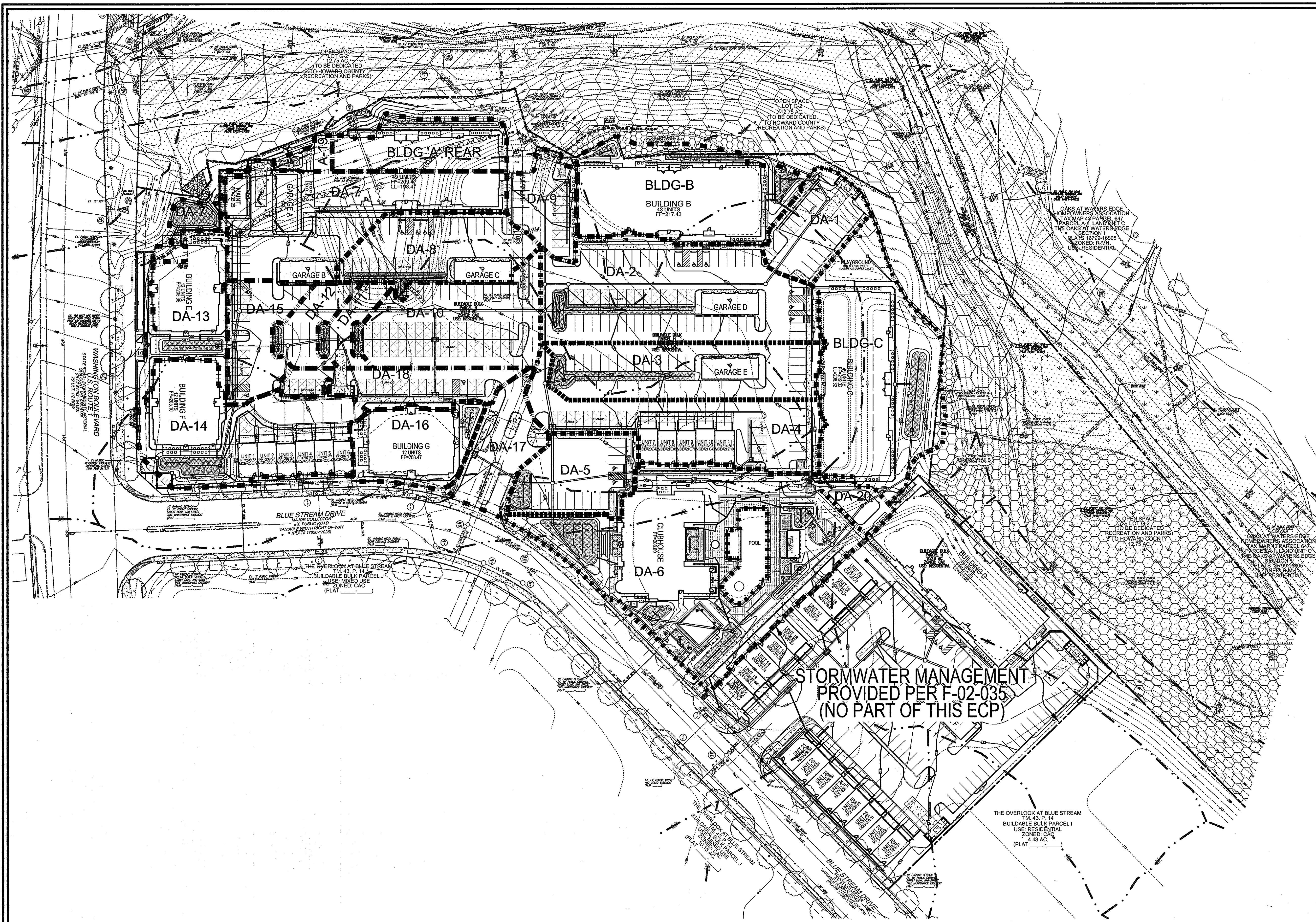
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT

HOWARD S.C.D. DATE

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR DESIGN AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND FEASIBLE 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.

SIGNATURE OF ENGINEER DATE



- LEGEND:**
- EXISTING CONTOUR
 - - - - - PROPOSED CONTOUR
 - +402.88 PROPOSED SPOT ELEVATION
 - +402.88 EXISTING SPOT ELEVATION
 - ===== EXISTING CURB AND GUTTER
 - ===== PROPOSED CURB AND GUTTER
 - EXISTING UTILITY POLE
 - EXISTING LIGHT POLE
 - EXISTING MAILBOX
 - EXISTING SIGN
 - EXISTING SANITARY MANHOLE
 - EXISTING SANITARY LINE
 - EXISTING CLEANOUT
 - EXISTING FIRE HYDRANT
 - EXISTING WATER LINE
 - PROPOSED STORM DRAIN
 - PROPOSED STORM DRAIN INLET
 - EXISTING TREELINE
 - EXISTING STREET TREES (F-02-35)
 - EXISTING FENCE
 - PROPERTY LINE
 - RIGHT-OF-WAY LINE
 - SOILS BOUNDARY
 - MIB2 PROPOSED SIDEWALK
 - MID3 EX. FOREST CONSERVATION EASEMENT (REFORESTATION)
 - EX. FOREST CONSERVATION EASEMENT (AFFORESTATION)
 - EX. FOREST CONSERVATION EASEMENT (RETENTION)
 - MODERATE SLOPES (15% - 24.99%)
 - STEEP SLOPE (>25%)
 - EX. PUBLIC 100 YR FLOODPLAIN

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP
CdO3	CHILLUM EARFAX LOAM, 5 TO 15 PERCENT SLOPES	C
KhC2	KEYPORT SILT LOAM, 3 TO 10 PERCENT SLOPES, MODERATELY ERODED	C
LuB	LUKA LOAM, 15 TO 30 PERCENT SLOPES, SEVERELY ERODED	C
Msf	MONTALTO AND REALY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES	B
StB2	SASSAFRAS LOAM, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	B
SsE	SANDY AND CLAYEY SAND, MODERATELY STEEP	B
SfB2	SASSAFRAS GRAVELY SANDY LOAM, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	B
SfC2	SASSAFRAS GRAVELY SANDY LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
SfD2	SASSAFRAS GRAVELY SANDY LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
SsE	SASSAFRAS SOIL, 15 TO 40 PERCENT SLOPES	B
SuB2	SUNNYSIDE FINE SANDY SAND, 1 TO 5 PERCENT SLOPES, MODERATELY SLOPES	B

NOTE: BASED ON HOWARD SOIL SURVEY

OWNER/DEVELOPER
 BLUE STREAM 1, LLC.
 P.O. BOX 416
 ELLICOTT CITY, MD 21041
 C/O: ARNOLD SAGNER
 410-465-2020

STORMWATER MANAGEMENT PROVIDED PER F-02-035 (NO PART OF THIS ECP)

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT DRAINAGE AREA MAP
GROSVENOR HOUSE
 BLUE STREAM, PARCEL H
 APARTMENTS AND TOWNHOMES
 TAX MAP 43 GRID 4 & 5 1ST ELECTION DISTRICT PARCEL P/O 5, 14 & 553 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
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 ELLICOTT CITY, MD 21043 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV
 DRAWN BY: DZ
 CHECKED BY: RHV
 DATE: MARCH 2010
 SCALE: 1"=50'
 W.O. NO.: 06-26.01

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: 06-27-2012

5 SHEET OF 6

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 3/14/11
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 3/09/11
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

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 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.

SIGNATURE OF DEVELOPER DATE

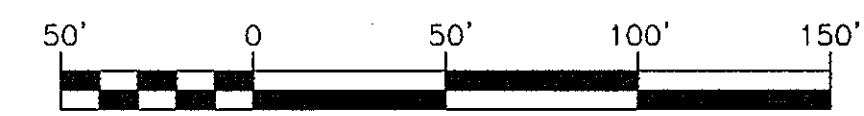
THE ENGINEER:

I 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.

SIGNATURE OF ENGINEER DATE

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

HOWARD S.C.D. DATE



APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS
 THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL
 THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH OR PROVE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.06.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- SOIL COMPOSITION - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
- ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974) IN GENERAL. THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (50%), COARSE SAND (50%), AND COMPOST (40%).
- CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
- PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

THESE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT. ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY POINDED WATER INTO THE PREPARED DRAINAGE (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF SAND OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL
 RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION
 COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. IMMEDIATELY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEISURE SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEISURE PLUGS SHALL BE PLANTED FOLLOWING THE HIGH-CROWN GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS BY NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS, DEFECTS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS
 UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:

- PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F756, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER.
- PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER FOOT. PIPE SHALL BE MINIMUM 1/4" TO 1/2" OR 4" OR 4" GALVANIZED HARDWARE CLOTH.
- GRAVEL - THE GRAVEL LAYER (NO. 57 STONE) PREFERRED SHALL BE AT LEAST 1" THICK ABOVE AND BELOW THE UNDERDRAIN.
- THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
- A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT POINT AND MONITOR PERFORMANCE OF THE FILTER.
- A 1/2" LAYER OF #4 GRAVEL (1/8" TO 3/4" STONES) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS
 THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

OPERATION AND MAINTENANCE SCHEDULE FOR MICROBIORETENTION AREAS

- ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 WATKINSON STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DECIDENT STAKES AND WIRES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF
 THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

1. PERVIOUS CONCRETE SPECIFICATIONS
 DESIGN THICKNESS - PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING OTHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, A19.3, 19.3, A19.3R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.

MIX & INSTALLATION - PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHOROUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TENSILE STRENGTH) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.

AGGREGATE - PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4" IN. TO NO. 4), NO. 9 (3/8" IN. TO NO. 10) AND NO. 59 (5/8" IN. TO NO. 50) SIZES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.

WATER CONTENT - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET ACI 308 AS A GENERAL RULE. POTABLE WATER SHOULD BE USED ALTHOUGH RECYCLED CONCRETE PRODUCTION WATER MEETING ASTM C 94 OR AASHTO M 157 MAY ALSO BE USED.

ADMIXTURES - CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERVIOUS CONCRETE. USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 260 (AIR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS.

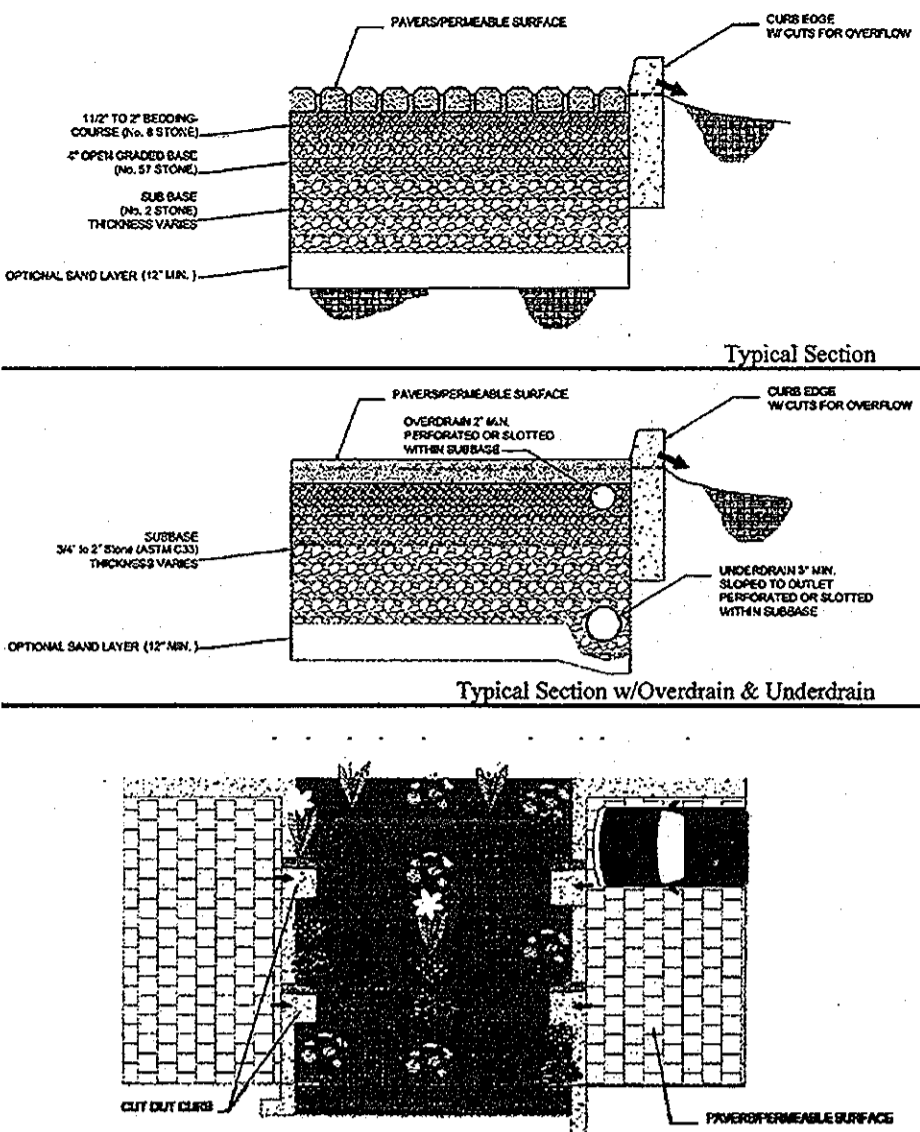
BASE COURSE - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)
 PAVEMENT BLOCKS - BLOCKS SHOULD BE EITHER 37 IN. OR 4 IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (WET PREPARED) OF THE SURFACE AREA OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INFILL AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.

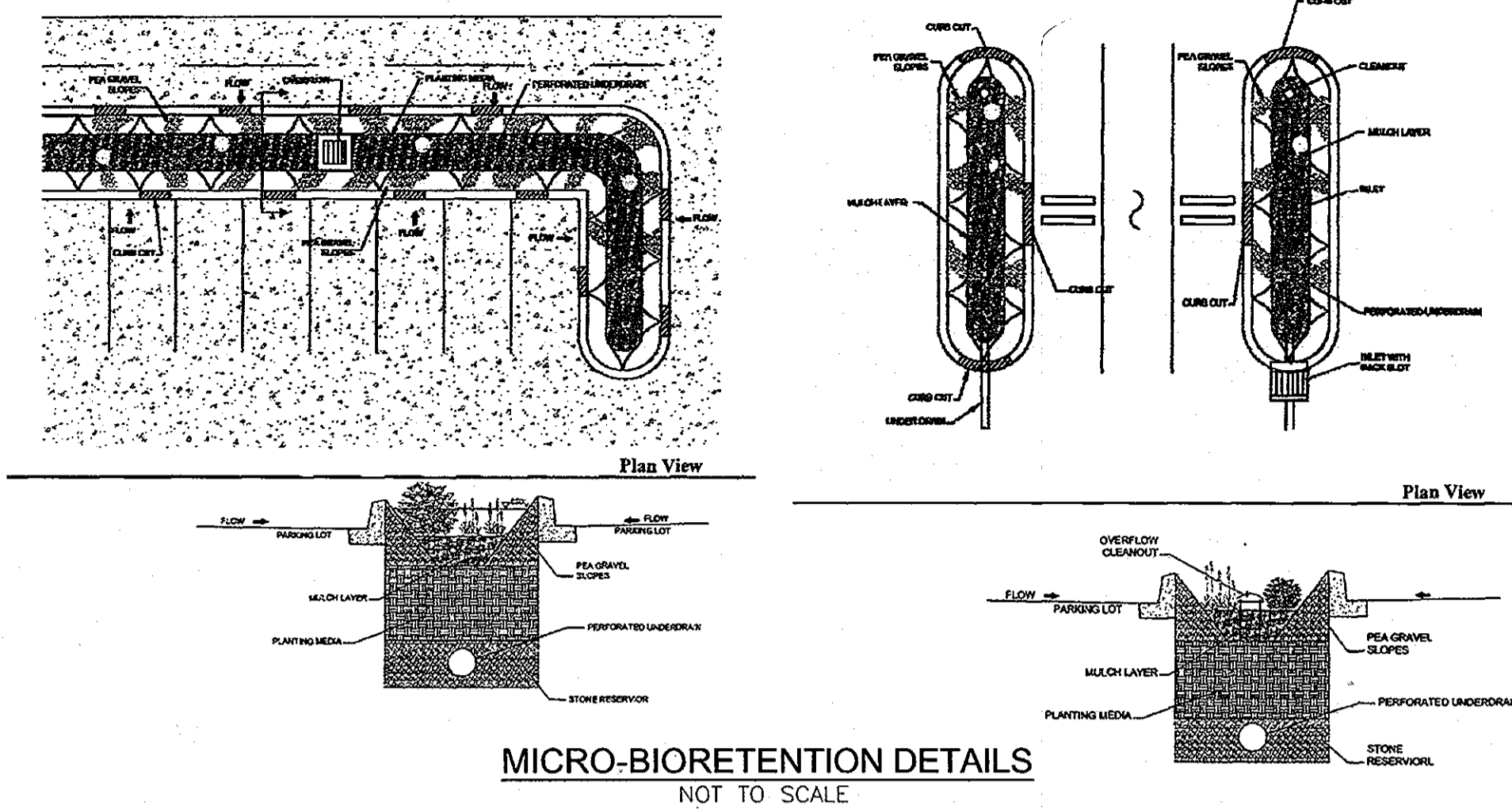
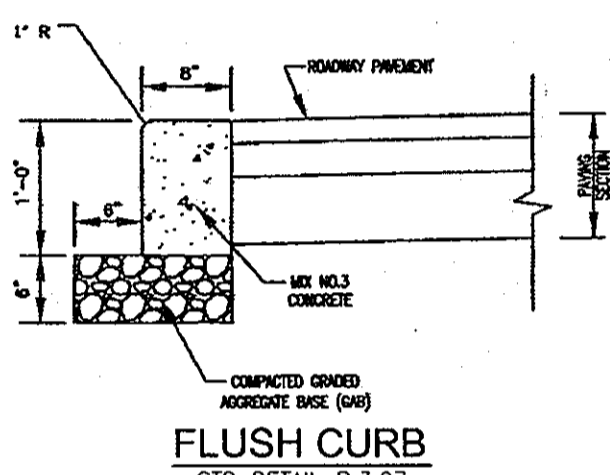
INFILL MATERIALS AND LEVELING COURSE - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.

BASE COURSE - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

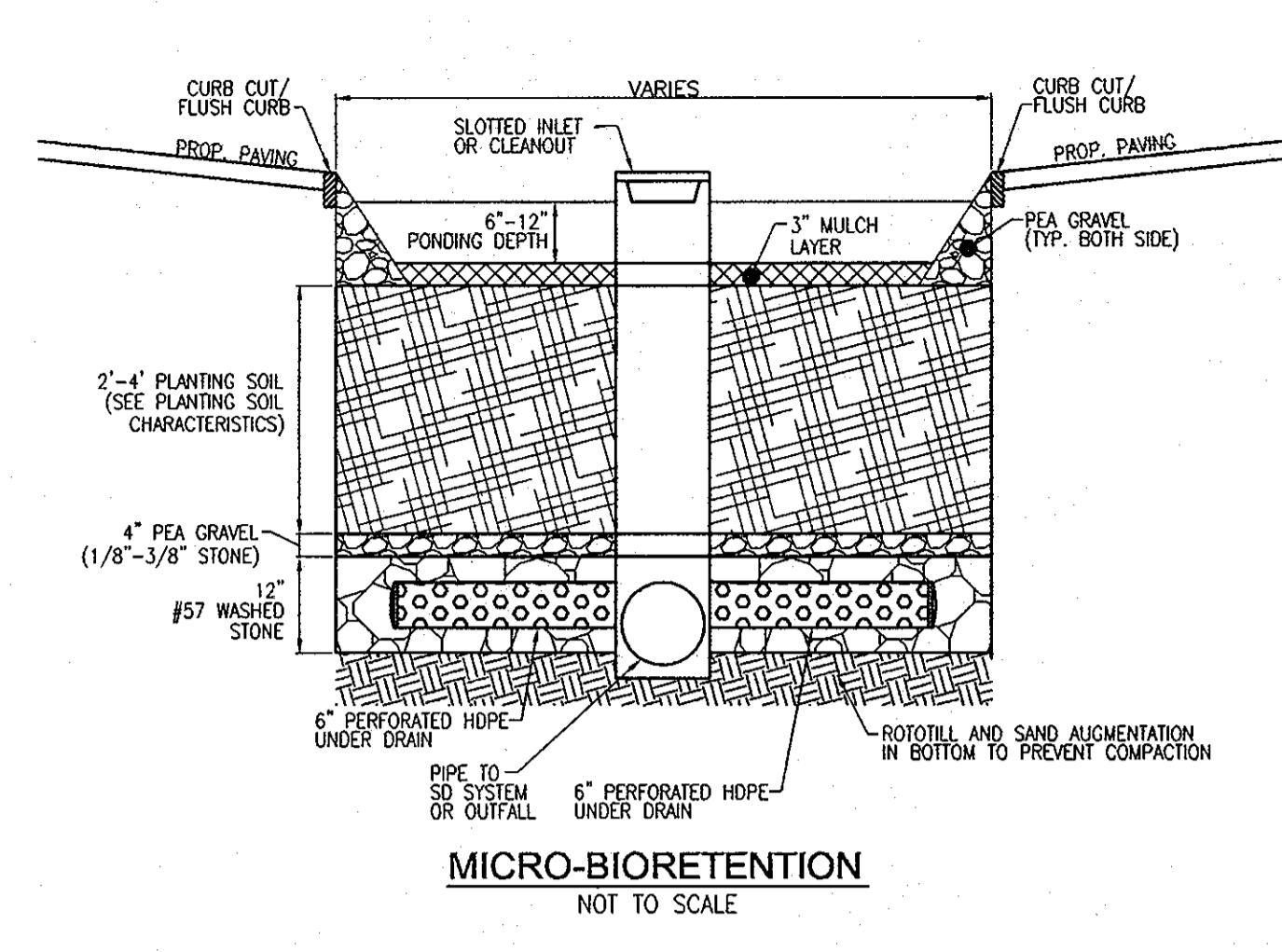
3. REINFORCED TURF
 REINFORCED GRASS PAVEMENT (RGP) - WHETHER USED WITH GRASS OR GRAVEL, THE RGP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.



PERMEABLE PAVEMENT DETAIL
 NOT TO SCALE



MICRO-BIORETENTION DETAILS
 NOT TO SCALE



MICRO-BIORETENTION
 NOT TO SCALE

Appendix B.4. Construction Specifications for Environmental Site Design Practices

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil (2' to 4' deep)	loamy sand (60-65%) & compost (35-40%) or sandy loam (50%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	aged 6 months, minimum no pine or wood chips
Mulch	shredded hardwood	n/a	
Pea gravel (drainage)	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Gravel (underdrains and infiltration berms)	AASHTO M-63	NO. 57 OR NO. 6 AGGREGATE (3/8" TO 1/2")	FE Type 1 removed
Underdrain piping	F 756, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipe; not necessary underdrain berms. Perforated pipe shall be wrapped with 1/2-inch galvanized hardware cloth.
Poured in place concrete (if required)	MSHA Mix No. 3, f'c = 3500 psi @ 28 days, normal weight, air-entrained, reinforcing to meet ASTM-G15-60	n/a	on-site testing of poured-in-place concrete required. 28 day strength and slump test. All concrete design (cast-in-place or pre-cast) not using previously approved store or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 308.2R; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil permeability and analysis of potential cracking).
Sand	AASHTO-M-6 or ASTM-C-33	0.075" to 0.04"	Sand substitutions such as Dolomite and Gypsumite (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

DRAINAGE AREA #	AREA TREATED	FACILITY NUMBER	ENVIRONMENTAL SITE DESIGN PRACTICE							ESDV VOLUME	
			PERMEABLE PAVEMENT	MICRO BIO RETENTION	LANDSCAPE INFILTRATION	GREEN ROOF	BIO SWALE	GRAVEL TRENCH	X		X
BLDG C	28807	1	0	3453	0	0	0	0	0	0	3453
DA 1	8170	2	643	0	0	0	0	0	0	0	643
BLDG B	10073	4	0	876	0	0	0	0	0	0	876
	7639	5	0	533	0	0	0	0	0	0	533
	3389	6	0	371	0	0	0	0	0	0	371
DA 2	28807	7	476	0	0	0	0	0	0	0	476
		8	0	3900	0	0	0	0	0	0	3900
DA 3	16928	9	0	3204	0	0	0	0	0	0	3204
DA 4	18667	10	1925	0	0	0	0	0	0	0	1925
		11	0	0	0	0	0	0	0	0	0
DA 5	9930	12	0	1534	0	0	0	0	0	0	1534
DA 6	13361	13	0	0	1200	0	0	0	0	0	1200
	2630	14	0	356	0	0	0	0	0	0	356
	11532	15	0	1370	0	0	0	0	0	0	1370
	5812	16	0	574	0	0	0	0	0	0	574
	9370	17	0	993	0	0	0	0	0	0	993
BLD A RR	9253	18	0	1419	0	0	0	0	0	0	1419
BLD A RR2	840	18A	0	195	0	0	0	0	0	0	195
DA 7	24896	19	0	2259	0	0	0	0	0	0	2259
DA 8	13118	20	381	0	0	0	0	0	0	0	381
		21	0	2011	0	0	0	0	0	0	2011
DA 9	6400	22	772	0	0	0	0	0	0	0	772
DA 10	16853	23	2402	0	0	0	0	0	0	0	2402
		24	0	918	0	0	0	0	0	0	918
DA 11	3333	25	0	706	0	0	0	0	0	0	706
DA 12	4320	26	0	918	0	0	0	0	0	0	918
DA 13	10650	27	0	1496	0	0	0	0	0	0	1496
DA 14	22407	28	517	0	0	0	0	0	0	0	517
		29	0	2722	0	0	0	0	0	0	2722
DA 15	7740	30	1019	0	0	0	0	0	0	0	1019
DA 16	8717	31	0	798	0	0	0	0	0	0	798
DA 17	8102	32	0	0	0	0	0	756	0	0	756
DA 18	8572	33	1283	0	0	0	0	0	0	0	1283
											0

TOTAL AREA 320316 SF
 7.35 AC

TOTAL ESDV PROVIDED 41980

OWNER/DEVELOPER
 BLUE STREAM 1, LLC.
 P.O. BOX 416
 ELLICOTT CITY, MD 21041
 C/O: ARNOLD SAGNER
 410-465-2020

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN

STORMWATER MANAGEMENT

NOTES AND DETAILS

GROSVENOR HOUSE

BLUE STREAM, PARCEL H
 APARTMENTS AND TOWNHOMES

TAX MAP 43 GRID 4 & 5 PARCEL P/O 5, 14 & 553
 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 181193, EXPIRATION DATE: 06-27-2012.

DESIGN BY: RHV
 DRAWN BY: DZ
 CHECKED BY: RHV
 DATE: MARCH 2010
 SCALE: 1"=50'
 W.O. NO.: 06-26.01

6 SHEET OF 6

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 3/14/11
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 3/09/11
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE