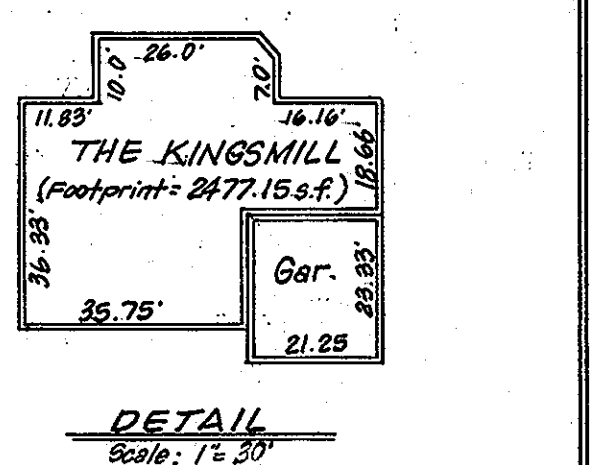


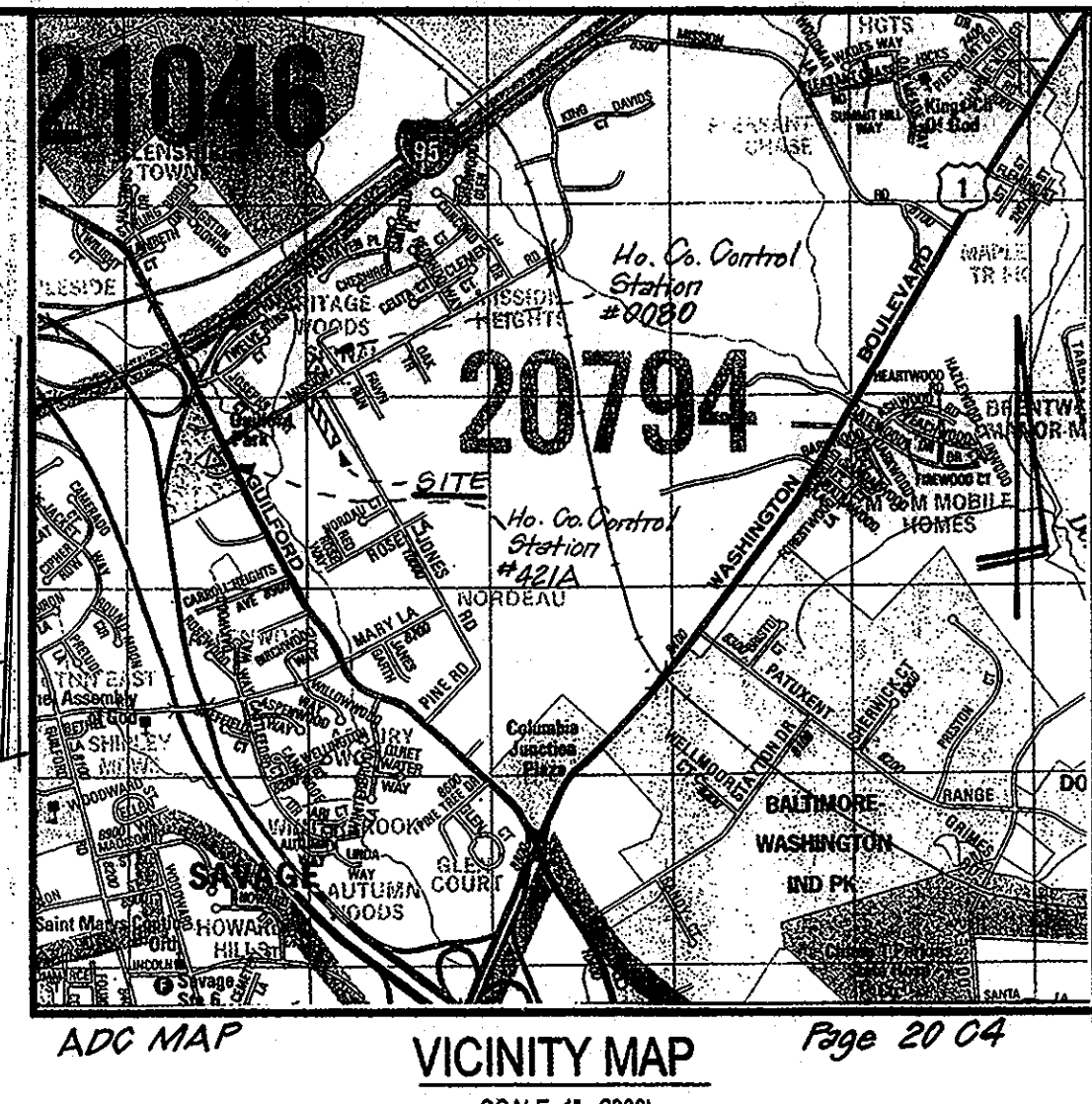
SEWER HOUSE CONNECTION DATA

LOT #	SEWER ELEV. @ PROPERTY LINE	LOWEST SEWER ELEV. CL BSMT. @ 2%
59	280.92	284.62
60	282.16	288.58
61	279.86	283.08
62	276.11	279.34



LEGEND

- Existing Elevations: 100.00
- Proposed Elevations: 100.00
- Existing Contours: 100
- Proposed Contours: 100
- Ex. Woods Line
- Stream/Creek
- Duffer Set back Line
- Edge of Existing Sewer Line
- Water Line
- Gas Line
- 20' Delimitation Area
- Tree Preservation Area
- Water Valve (W.V.)
- Fire Hydrant (F.H.)
- Utility Pole
- Anchor / Guy wire
- Restoration Area
- Woodland Conservation Signage
- Soil Barring
- Rain Gardens



GENERAL NOTES CONTINUED

- THIS SUBDIVISION IS SUBJECT TO SECTION 16.122 B OF THE HOWARD COUNTY CODE PUBLIC WATER AND SEWER SERVICE HAS BEEN GRANTED UNDER THE TERMS AND PROVISIONS THEREOF EFFECTIVE 07/28/06.
- LANDSCAPING TO BE PROVIDED WITH THE S.D.P.
- THE RESUBDIVISION OF LOT 10 IS FOR THE PURPOSE TO ESTABLISH A NEW LOT AND PRIVATE AND PUBLIC EASEMENTS.
- EXISTING UTILITIES ARE BASED ON BEST AVAILABLE RECORDS AND FIELD LOCATIONS.
- ANY DAMAGE TO THE COUNTY RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- SHC ELEVATIONS SHOWN ARE LOCATED AT THE PROPERTY LINE.
- FOR DRIVEWAY ENTRANCE DETAILS REFER TO THE HOWARD COUNTY DESIGN MANUAL VOLUME IV, STD. DETAIL R-6/1

GENERAL NOTES CONTINUED

- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- RAIN GARDENS AND SWALES USED FOR STORMWATER MANAGEMENT AS PER THE APPROVED FINAL PLAN F07-219.
- EXISTING UTILITIES ARE BASED ON BEST AVAILABLE RECORDS AND FIELD LOCATIONS.
- ANY DAMAGE TO THE COUNTY RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- SHC ELEVATIONS SHOWN ARE LOCATED AT THE PROPERTY LINE.
- FOR DRIVEWAY ENTRANCE DETAILS REFER TO THE HOWARD COUNTY DESIGN MANUAL VOLUME IV, STD. DETAIL R-6/1

SITE ANALYSIS DATA CHART

- Total Project Area = 1.49 ac.
- Area of plan submission = 1.42 ac.
- Limit of disturbance = 38,990 = 0.89 ac.
- Present Zoning Designation = R-12.
- Proposed uses of site and structures = residential.
- Floor space on each level of the buildings = n/a.
- Total number of units allowed for project as shown on final plat = 4 units.
- Total number of units proposed on submission = 4 units.
- Maximum number of employees, tenants on site per use = n/a.
- Number of parking spaces required by Howard County Zoning Regulations and or FDP Criteria = 2 spaces per unit.
- Number of parking spaces provided on site = 8 parking spaces.
- Open space on site = 0 (zero) acres.
- Area of recreation open space required by subdivision and Land Development Regulations = 0 (zero) acres.
- Building coverage of site: n/a.
- Application DPZ file references = F-07-219 and Contract number 24-4545-b (sewer ext.)

SEQUENCE OF CONSTRUCTION

- NOTIFY HOWARD COUNTY DEPARTMENT OF CODE ENFORCEMENT 48 HOURS PRIOR TO COMMENCEMENT OF WORK (410-222-7780) 1 DAY
- PRECONSTRUCTION MEETING PRIOR TO THE ISSUANCE OF BUILDING PERMIT AND FIELD VERIFICATION OF TOPOGRAPHY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR 1 DAY
- OBTAIN NECESSARY PERMITS 2 DAYS
- NOTIFY "MISS UTILITY" AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION (1-800-257-7777) 1 DAY
- CLEAR FOR AND INSTALL SEDIMENT CONTROL DEVICES:
 - STABILIZED CONSTRUCTION ENTRANCE
 - SUPER SILT FENCE
 - SILT FENCE
 - TREE PROTECTION
 20 DAYS
- WITH THE HOWARD COUNTY SEDIMENT CONTROL INSPECTORS APPROVAL, BEGIN CONSTRUCTION:
 - SANITARY SEWER
 - HOUSE'S
 - UTILITIES
 - DRIVEWAYS
 - INFILTRATION TRENCHES
 - EROSION CONTROL MATTING (FOR SWALES)
 400 DAYS
- FINAL SITE GRADING 10 DAYS
- STABILIZE ALL AREAS DISTURBED BY THIS CONSTRUCTION 30 DAYS
- WITH THE HOWARD COUNTY SEDIMENT CONTROL INSPECTORS APPROVAL, REMOVE ALL SEDIMENT CONTROL DEVICES, STABILIZE REMAINING DISTURBED AREA'S 5 DAYS

SEDIMENT CONTROL NOTES

- This plan is in compliance with the approved F-07-219 plan.
- The Builder and/or Developer have not changed from the approved F-07-219 plan.



PROFESSIONALS' REVIEWERS STATEMENT

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. 16513, expiration date 6-10-2011.

DEVELOPER'S/BUILDERS CERTIFICATE

"I/We certify that all development an construction will be done according to this plan of development and 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 Soils conservation District or their authorized agents, as are deemed necessary."

Michael Collins
12-7-09
Date

ENGINEER'S CERTIFICATE

I hereby certify that this plan for Sediment and Erosion 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.

Gregory Benfey
Professional L.S. Surveyor
Maryland Registration No. 10224
12-7-09
Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division: 12/3/10
Chief, Division of Land Development: 7/6/10
Director: 7/6/10

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

John K. Robertson
11/1/10
Date

OWNER / DEVELOPER

LEGENDS BUILDERS, INC.
P.O. BOX 511
BURTONSVILLE, MD. 20866
MICHAEL COLLINS
301-490-3651

SHEET INDEX

NO.	DESCRIPTION
1	SITE, GRADING, SWM AND DETAILS
2	SWM, DETAILS
3	LANDSCAPE, SWM AND DETAILS

ADDRESS CHART

Lot / Parcel #	Street Address
Lot 59	8821 Mission Road
Lot 60	8829 Mission Road
Lot 61	8827 Mission Road
Lot 62	8825 Mission Road

PERMIT INFORMATION CHART

Subdivision Name	Section/Area/Lot/Parcel	No.			
"NORDAU SUBDIVISION"	"6"	Lots 59 - 62			
Plat # or L/F	Zoning	Tax Map No	Elect Dist	Census Tract	
20711	24	R-12	42	6th	606901

SITE DEVELOPMENT PLAN

LOTS 59 thru 62
(Single Family Residential)

NORDAU SUBDIVISION

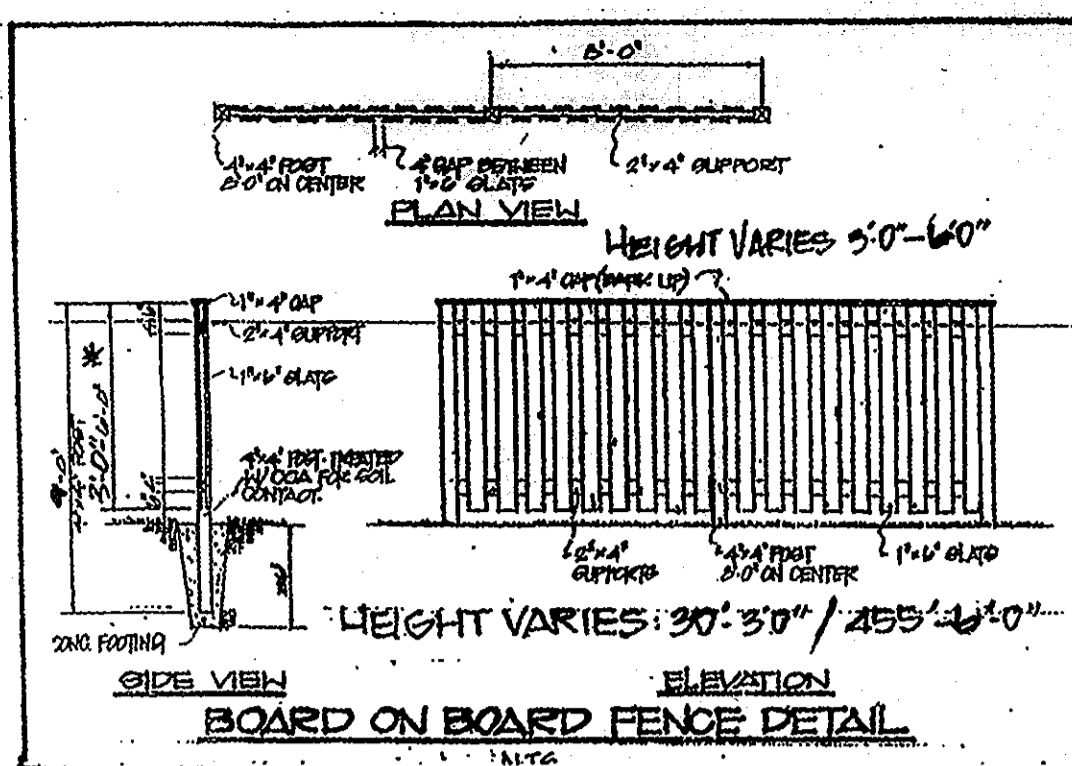
6th Election District
Howard County, Maryland
Tax Map 42-Grid 24, P. 396, L. 8435, F. 835

SURVEYS, INC.

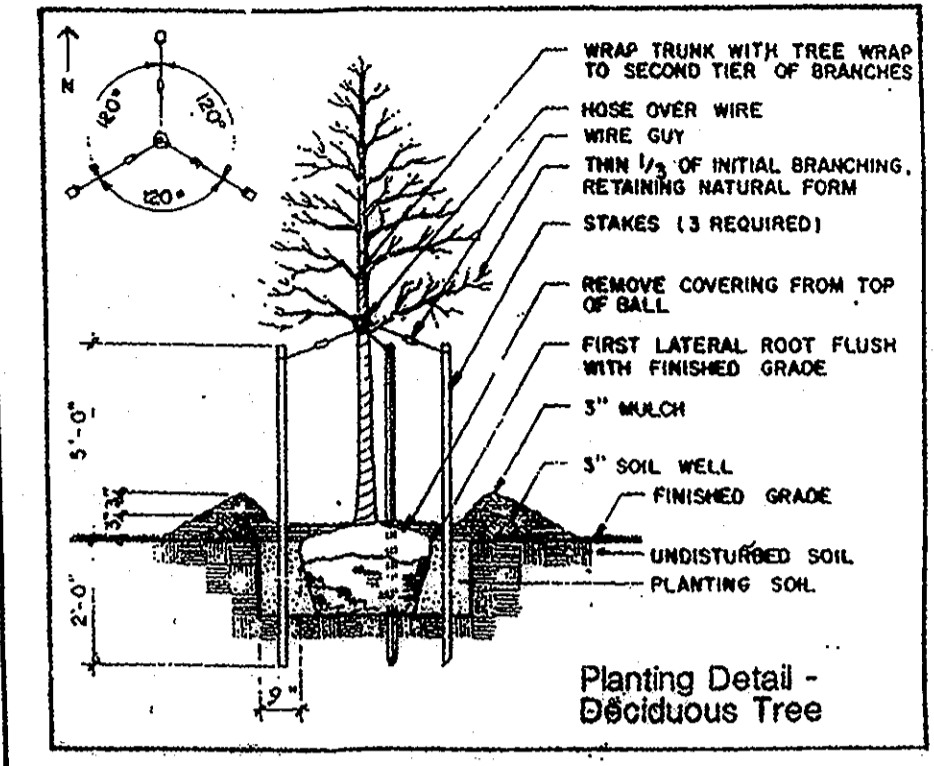
SURVEYORS • ENGINEERS • LAND PLANNERS

PERMIT SERVICES
350 MAIN STREET
LAUREL, MARYLAND, 20707
PHONE 301-778-0591 FAX 301-778-0642

Job No: 09-43
Drawing No: L-280



NO.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	METHOD	QTY
1.	F.M.	Acer rubrum	Red Maple	12'-14'	As shown	B&B	3
2.	F.C.	Prunus. Sp	Flowering Cherry	7'-9'		B&B	4
3.	X.M.	Acer griseum	Paper bark Maple	12'-14'		B&B	4



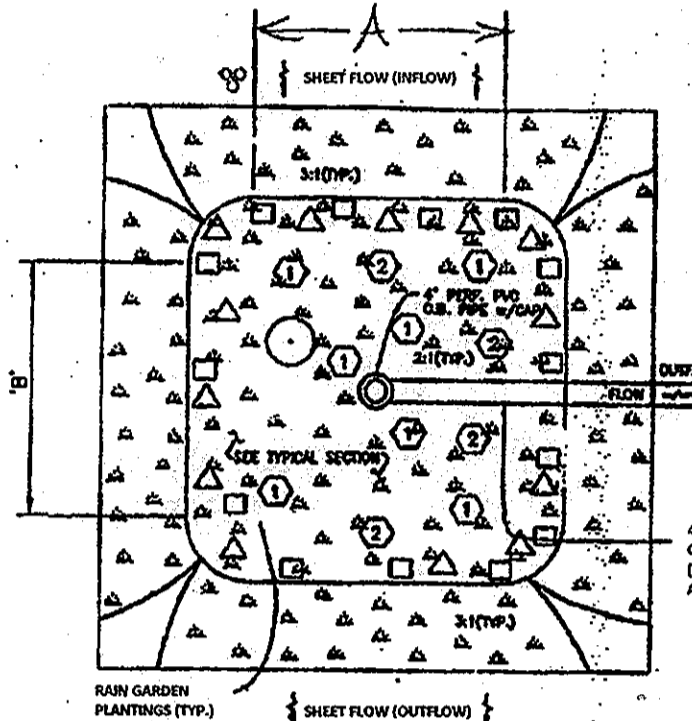
OPERATION & MAINTENANCE SCHEDULE FOR RAIN GARDENS

- ANNUAL MAINTENANCE OF PLANT MATERIAL AND MULCH LAYER IS REQUIRED. MAINTENANCE OF MULCH IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH-OUT. ANY REPLACEMENT OF MULCH SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE & INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL & PRUNING.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN THE SPRING AND FALL. THIS INSPECTION WILL INCLUDE: REMOVAL OF DEAD & DISEASED VEGETATION CONSIDERED BEYOND TREATMENT; TREATMENT OF ALL DISEASED TREES & SHRUBS; AND REPLACEMENT OF ALL DEFICIENT STAKES & WIRES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE THE 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.

MATERIAL	SPECIFICATION	SIZE	PLANTINGS ARE SITE SPECIFIC	NOTES:
PLANTING SOIL (25 TO 42" DEEP)	USDA 20-200 SOIL 30-200 SLAN 6-2000	N/A	USDA SOIL TYPES: LOAMY SAND; SANDY LOAM OR LOAM	
MULCH	SHREDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM	FOR USE AS NECESSARY BENEATH UNDERDRAIN ONLY
UNDERDRAIN GRAVEL	ASTM M-83	0.375" TO 0.750"	4" DIA. PER 6" DIA. 4 HOLES PER ROW. MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERDRAIN PIPES	

RAIN GARDEN - PLANTING DATA

- PLANTINGS WITHIN THE PONDING AREA OF THE RAIN GARDEN ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE. SUGGESTED SPECIES: CREEPING BUZZLEWEED (AJUGA REPTANS), COMMON PERIWINKLE (VINCA MINOR), LILY-TURF (LIRIOPE SP.)
- PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE RAIN GARDEN ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE. SUGGESTED SPECIES: PERENNIALS/ANNUALS IRIS (IRS VERSICOLOR), DAYLILY (HEMEROCALLIS SP.)



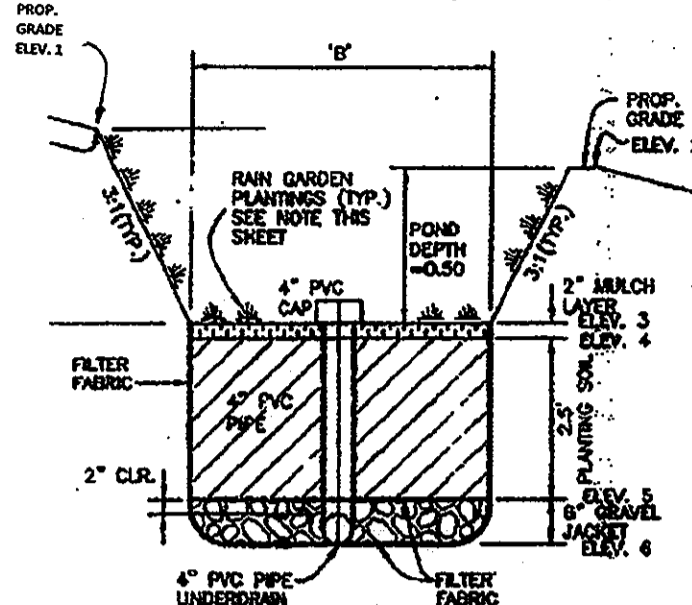
RAIN GARDEN - PLANTING DATA

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- PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE RAIN GARDEN ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE. SUGGESTED SPECIES: PERENNIALS/ANNUALS IRIS (IRS VERSICOLOR), DAYLILY (HEMEROCALLIS SP.)
- AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE RAIN GARDEN NEAR PIPE AND UNDERDRAIN.

TYPICAL RAIN GARDEN - PLANTING SCHEDULE	QTY
1 VINCA MINOR (COMMON PERIWINKLE)	7
2 AJUGA REPTANS (CREEPING BUZZLEWEED)	13
3 IRS VERSICOLOR (IRIS)	14
4 HEMEROCALLIS SP (DAYLILY)	4
5 ACER RUBRUM (RED MAPLE)	1

AT THE TIME OF INSTALLATION, ALL SHRUBS AND OTHER PLANTINGS HEREBY LISTED AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN WILL RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.

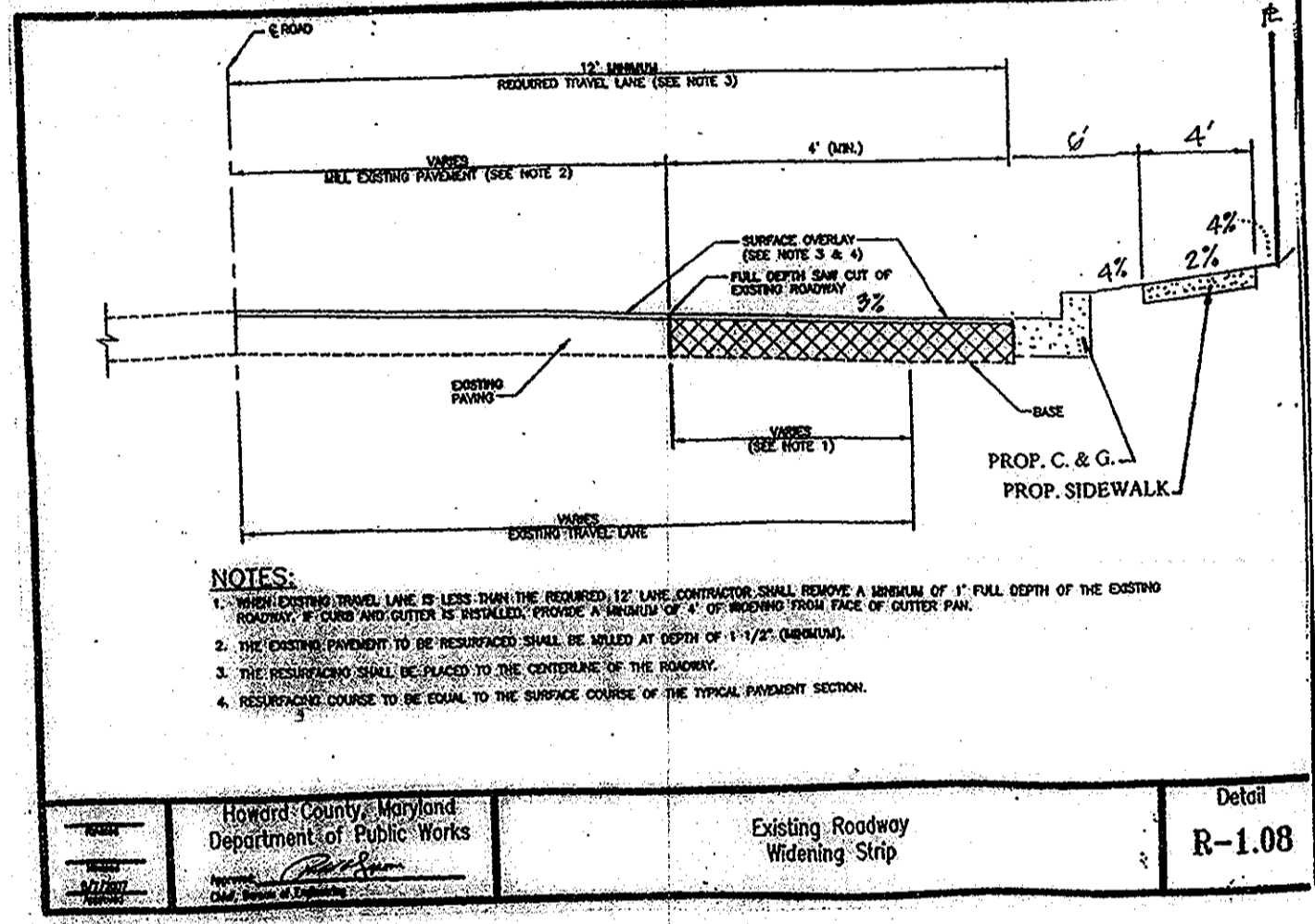
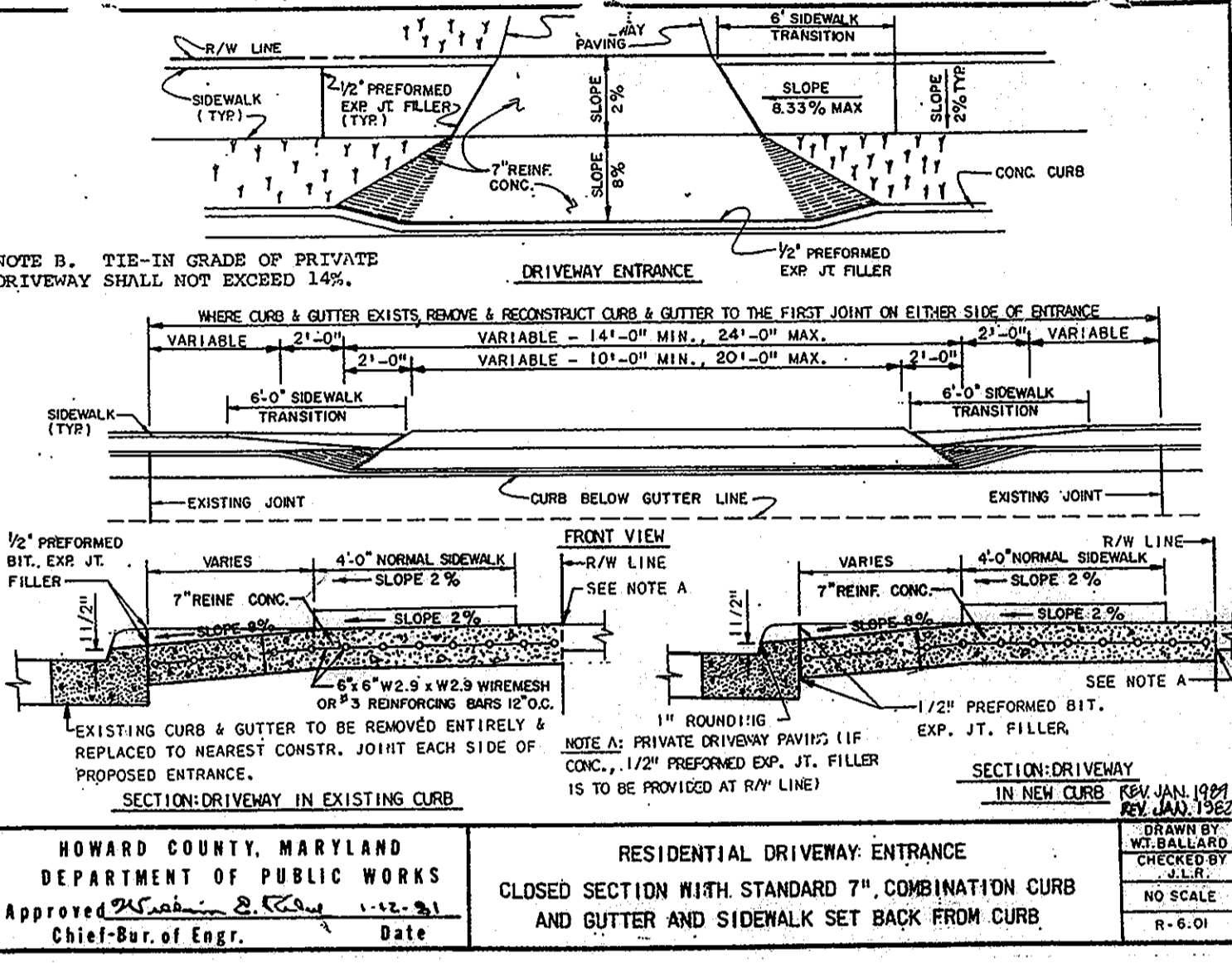
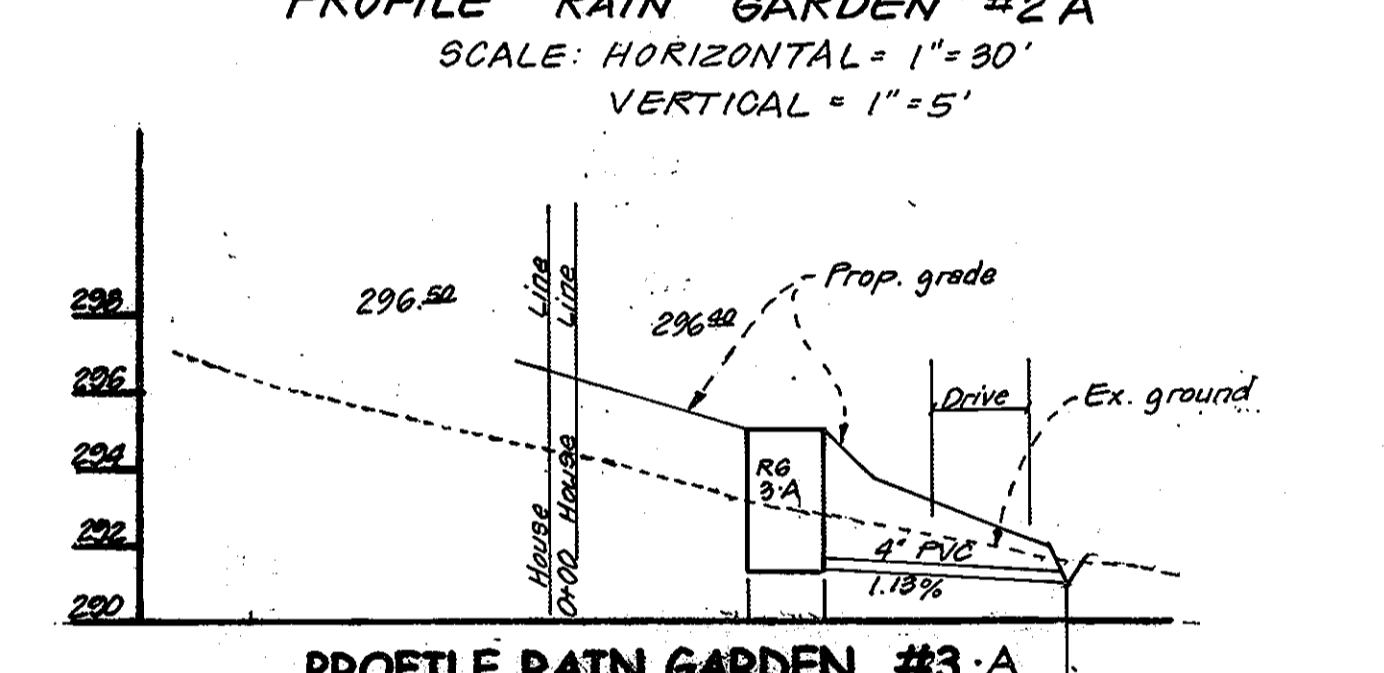
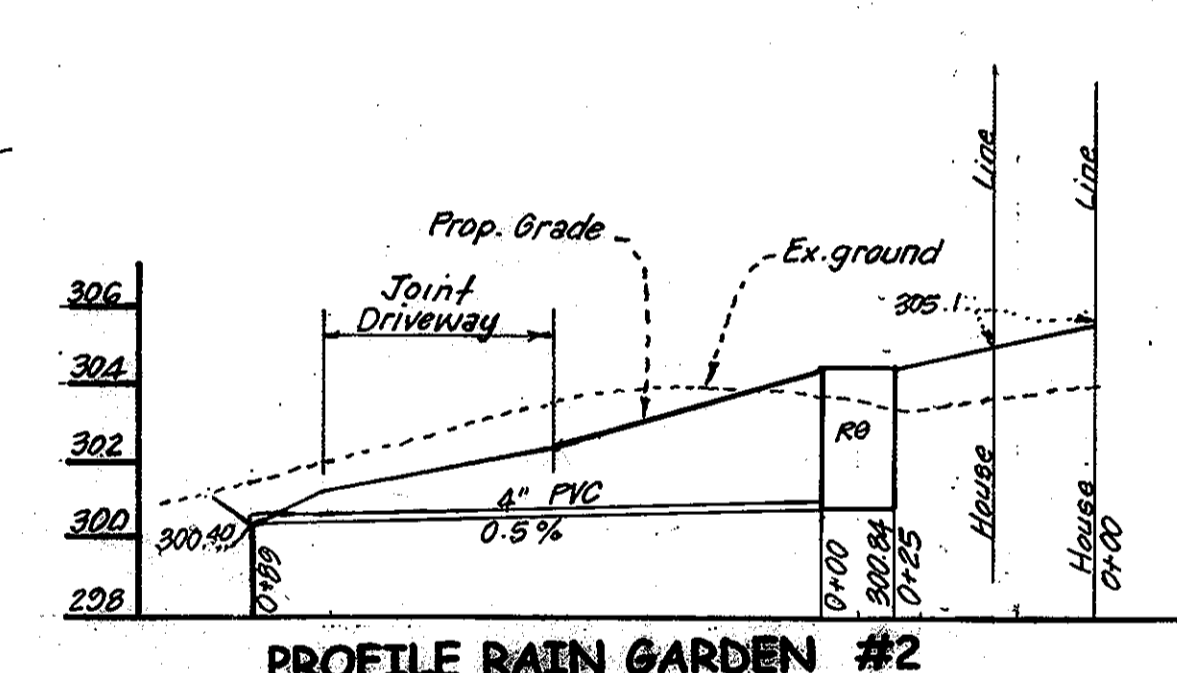
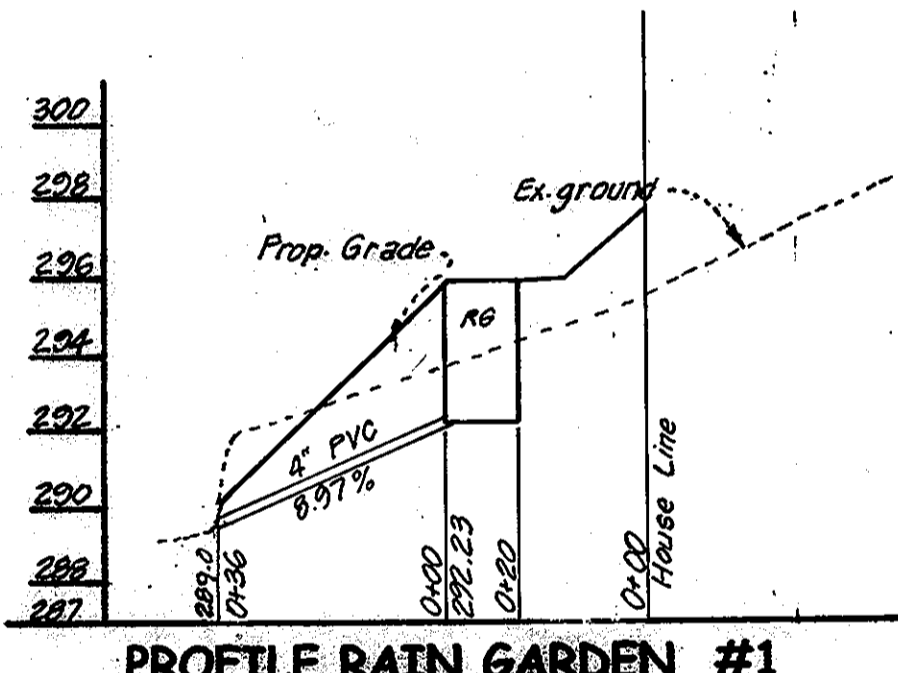
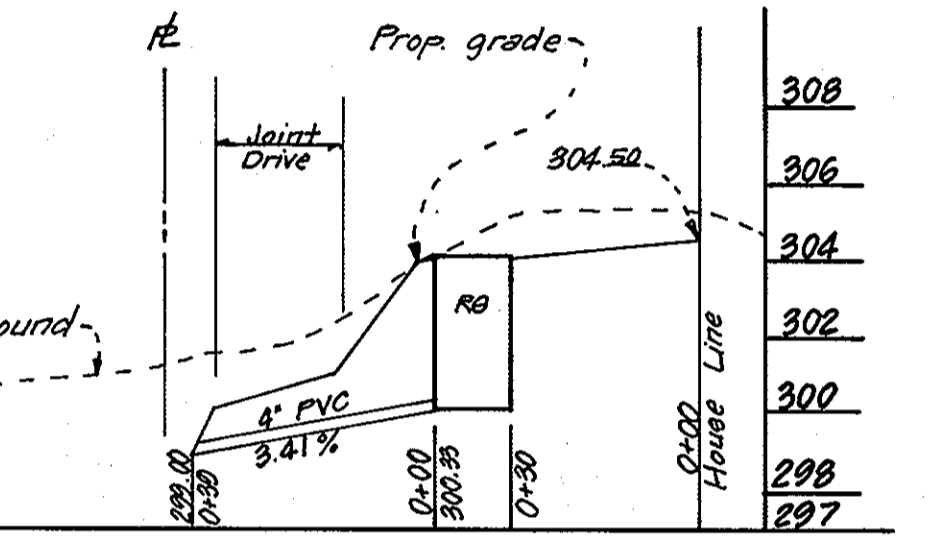
TYPICAL SECTION



LOT 59	RG 1-A	LOT 60	RG 2	LOT 60	RG 2-A
ELEV. 1	299.10	ELEV. 1	304.01	ELEV. 1	304.10
ELEV. 2	299.00	ELEV. 2	304.51	ELEV. 2	304.00
ELEV. 3	298.50	ELEV. 3	304.01	ELEV. 3	303.50
ELEV. 4	298.33	ELEV. 4	303.84	ELEV. 4	303.33
ELEV. 5	298.23	ELEV. 5	301.34	ELEV. 5	300.83
ELEV. 6	298.23	ELEV. 6	300.84	ELEV. 6	300.33

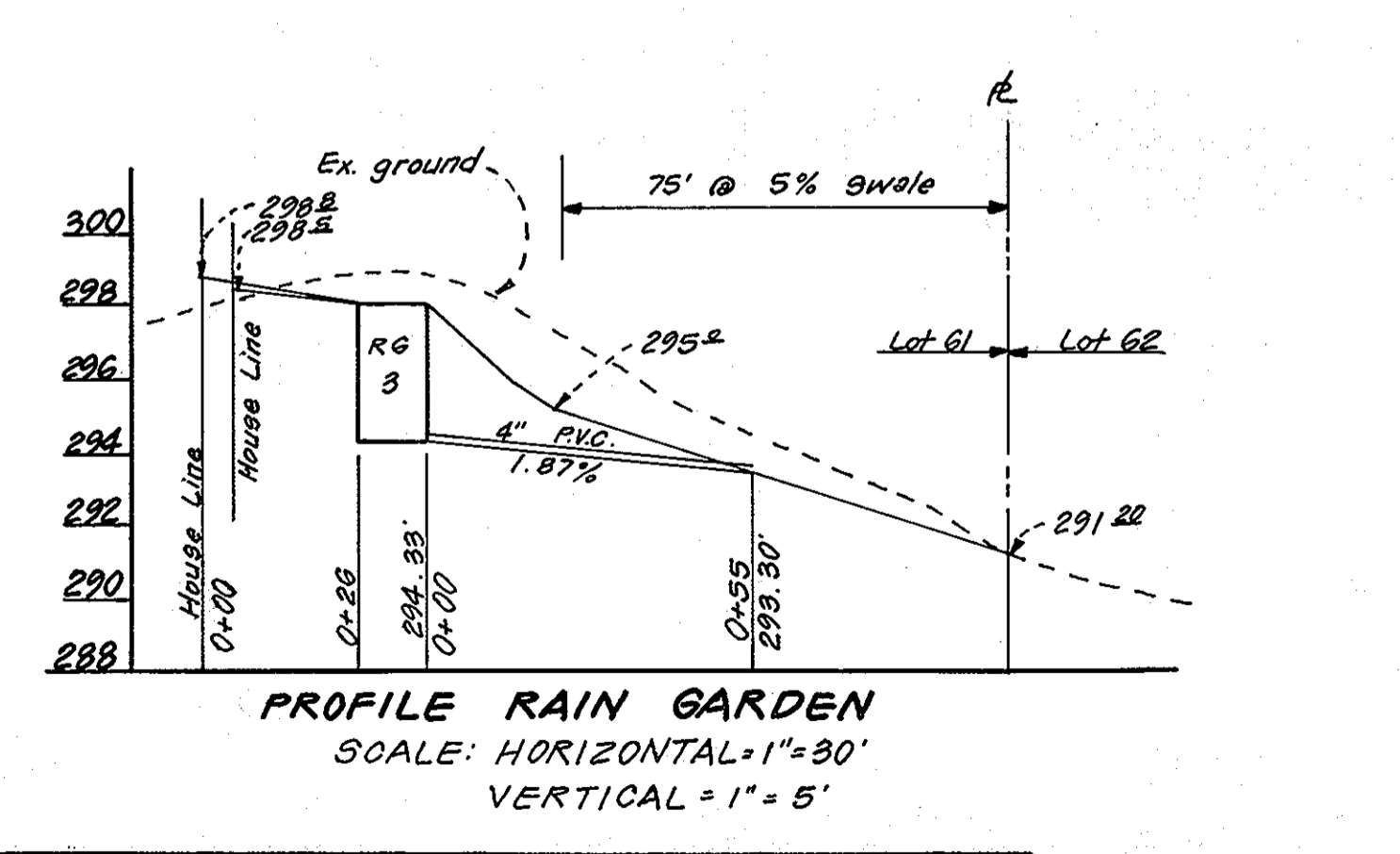
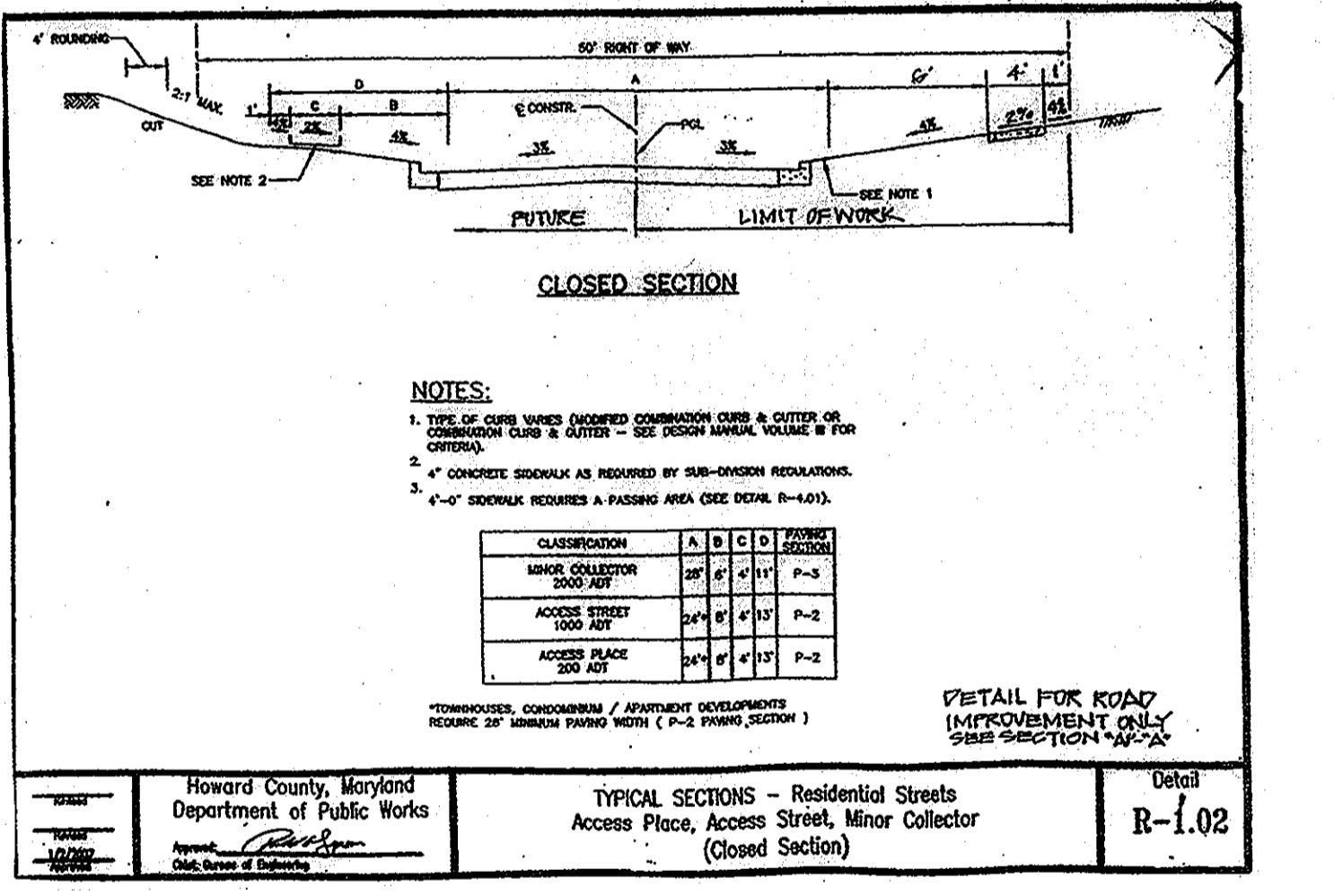
RAIN GARDEN TABLE	RAIN GARDEN
LOT 1	RG 3
ELEV. 1	298.20
ELEV. 2	298.10
ELEV. 3	298.70
ELEV. 4	298.53
ELEV. 5	298.03
ELEV. 6	298.53

RAIN GARDEN TABLE	RAIN GARDEN
LOT 2	RG 4
ELEV. 1	297.10
ELEV. 2	297.00
ELEV. 3	297.50
ELEV. 4	297.33
ELEV. 5	297.83
ELEV. 6	297.33



SITE DEVELOPMENT PLAN AND LANDSCAPING NOTES

- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- FINANCIAL SURETY FOR THE REQUIRED 13 TREES IN THE AMOUNT OF \$2,100.00 IS PART OF THE BUILDERS GRADING PERMIT APPLICATION FOR LOTS 59-62.
- IN ACCORDANCE WITH SECTION 128 OF THE HOWARD COUNTY ZONING REGULATIONS BAY WINDOWS, CHIMNEYS, OR EXTERIOR STAIRWAYS NOT MORE THAN 16 FEET IN WIDTH MAY PROJECT NOT MORE THAN 4 FEET INTO ANY SETBACKS, PORCHES OR DECKS, OPEN OR ENCLOSED MAY PROJECT NOT MORE THAN 10 FEET INTO THE FRONT OR REAR SETBACK.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100 YEAR FLOODPLAIN.
- "A PRIVATE RANGE OF ADDRESS SIGN ASSEMBLY SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 FOR DETAILS AND COST ESTIMATES."
- "AT THE TIME OF INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THE APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO THE APPLICABLE PLANS."
- "THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED."
- "NO CLEARING OF EXISTING VEGETATION IS PERMITTED WITHIN THE LANDSCAPE EDGE FOR WHICH CREDIT IS BEING TAKEN. HOWEVER, LANDSCAPE MAINTENANCE IS AUTHORIZED."



APPROVED: DEPARTMENT OF PLANNING AND ZONING

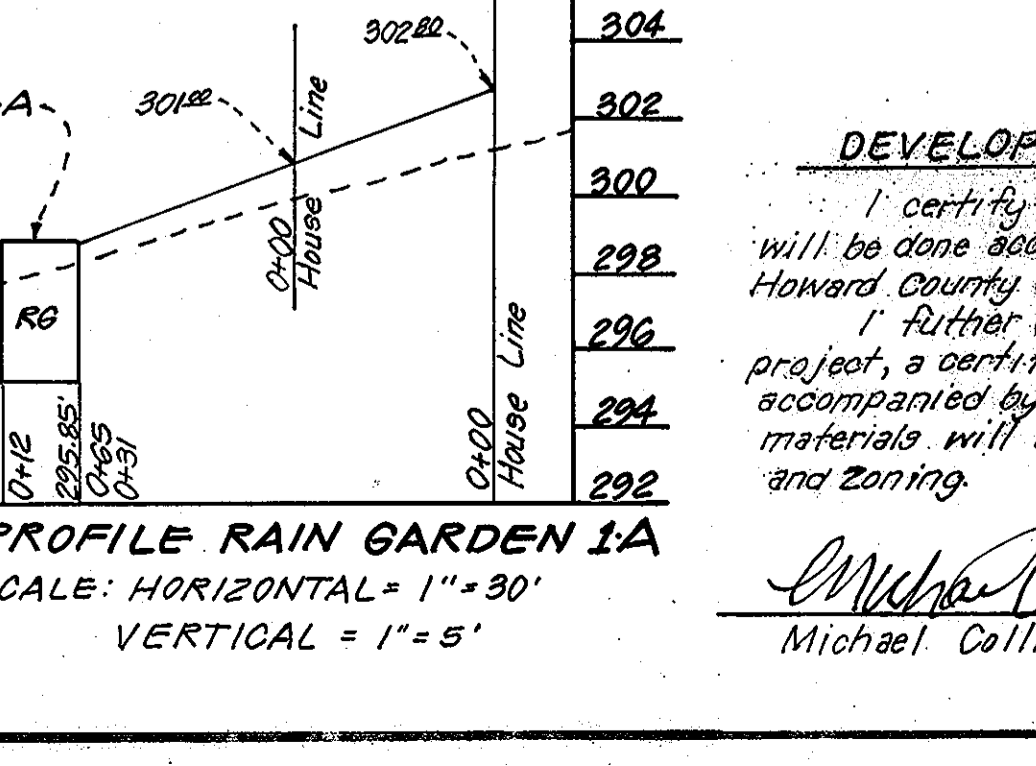
John R. Robertson 7/16/10
Chief, Development Engineering Division

Michael Collins 7/16/10
Chief, Division of Land Development

Morgan E. Butler
Director

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

John R. Robertson 7/16/10
Soil Conservation District

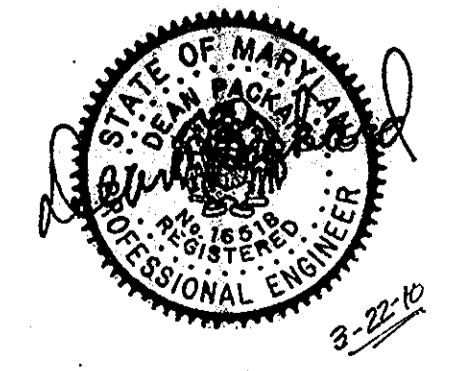


DEVELOPER'S / OWNER'S CERTIFICATE

I certify that the landscaping shown on this plan will be done according to the plan, Section 16.124 of the Howard County Landscape Manual.

I further certify that upon completion of the project, a certification of landscape installation accompanied by an executed one year guarantee of plant materials will be submitted to the Department of Planning and Zoning.

Michael Collins
Date: Jan. 19, 2010



Professionals' Review Statement

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer/landscape architect under the laws of the State of Maryland, License No. 16218, Expiration Date 6-12-2011.

SURVEYS, INC.
SURVEYORS • ENGINEERS • LAND PLANNERS
PERMIT SERVICES
250 MARK STREET
LAUREL, MARYLAND, 20701
PHONE 301-716-0561 FAX 301-716-0641

DATE	REVISION
3-22-10	Ho. Co. Comments
10-20-10	House Type Revision

SITE DEVELOPMENT PLAN
Lots 59 thru 62
Single Family Residential

NORDAU SUBDIVISION
6th Election District
Howard County, Maryland
TM 42, Grid 24, P. 306 L.835 F. 335

SCALE	DESIGNER	CHECKED BY
As-shown	lyor	10/13

DATE	DESIGNER	FIELD BOOK
1-12-2010	lyor	

09-43 2 of 3 L-230

SDP-10-065

SWM FACILITY SUMMARY TABLE

Drainage Area #1	Disconnection of non-rooftop runoff from driveway, non-engineered swale	WqV Storage Volume Required	Rev Storage Volume Required	Reduced WqV volume - Rev Req'd.			
0.010 ac.ft	414 cu.ft	0.001 ac.ft	29 cu.ft	0.001 ac.ft	35 cu.ft	0.000 ac.ft	7 cu.ft

Part of driveway on Lot 59 treated in the non-engineered swale along common d/w
Part of common driveway across Lots 60, 61 & 62 is treated in the non-engineered swale along the common d/w

Drainage Area #2

Disconnection of rooftop runoff and raingarden	WqV Storage Volume Required	Rev Storage Volume Required	Reduced WqV volume - Rev Req'd.
0.013 ac.ft	569 cu.ft	0.001 ac.ft	40 cu.ft
0.002 ac.ft	73 cu.ft	0.001 ac.ft	33 cu.ft

Drainage Area #3

Disconnection of rooftop and non-rooftop runoff, raingardens and non-engineered swale	WqV Storage Volume Required	Rev Storage Volume Required	Reduced WqV volume - Rev Req'd.
0.031 ac.ft	1,352 cu.ft	0.002 ac.ft	95 cu.ft
0.004 ac.ft	170 cu.ft	0.002 ac.ft	75 cu.ft

Non-Rooftop Disconnection Credits
Part of driveway on Lot 59 treated in non-engineered swale along common driveway
Part of driveway on Lot 60 treated across grass in yard

Rooftop Disconnection Credits
996 s.f. from part of house on Lot 59 treated in rain garden 1
494 s.f. from part of house on Lot 59 treated across grass in yard
996 s.f. from part of house on Lot 59 treated in raingarden 1a
996 s.f. from part of house on Lot 60 treated in rain garden 2

INTRODUCTION
This report shall address and describe the methods and details for final stormwater management design for this property. The design criteria of the Howard County Design Manual, Volume 1 and the MDE Stormwater Management Manual, Volumes 1 and 2 have been used in the design. Justification for existing and develop hydrology, Rev, WqV and Cpv for each drainage area are described in the narrative and how each management is provided for using structural or non-structural measures. A geotechnical report is attached supporting the design methods.

NARRATIVE
The total project area is 1.49 acres and the existing zoning is R-12 for the property. The site is located in Savage Maryland, northeast of the intersection of Route 95 and Route 32, off of Guilford Road on the south side of Mission Road. The site is on a ridge with drainage sheet flowing in three different directions off of the site into an unnamed watercourse to the Little Patuxent River, basin designation 02-13-11. The Little Patuxent River within this area is classified as class I stream use designation. The site is not forested but has several small to medium sized individual trees scattered throughout and is generally meadow in good condition. The soils on the site are 100% soils group "D" per the latest Soil Survey. The site is currently vacant.

There are no proposed public BMP's for this site. All BMP's are raingardens, disconnect credits and a non-engineered grass swale to address water quality and groundwater recharge. These BMP's shall be bonded and a developer agreement shall be executed for the long term maintenance by the proposed homeowner, thus encumbering the individual lots. There are no wetlands or floodplain on this property.

This property is affected minimally by drainage from the adjoining properties. A small drainage area, including 1/2 of the house on Lot 2, northeast of the property, drains to meet the northeastern corner of the property and enters Mission Road. Since this drainage is picked up in the non-engineered grass swale, parallel to the common driveway for the adjoining lot it does not affect the individual lot computations. The only other offsite area draining to the property is a small area adjoining the existing house on lot 31, southwest of the property. This small area drains as sheet flow across lot 61 and 62 and has no tangible effect on the property.

The front 1/3 of our property drains to Mission Road to the stream, southwest of the site. The rear 2/3 of our property drains through lots 61 and 62 and exits southeasterly to the property owned by Calvin Boone. There are no drainage structures located on the Boone property. Beyond the treatment we are proposing onsite, the runoff from our property shall exit as sheet flow in a non-erosive manner. Per sheet 9, the total runoff from the one year storm exiting the property is 0.7 CFS. This value is not concentrated and shall exit as sheet flow across the entire 150 foot property line in the same manner that it is in the pre-development condition, without changing the natural and traditional characteristics of the waterway. The underdrains coming from raingardens (Lots 60, 61 & 62) are proposed to be connected to the non-engineered grassed swale. These underdrains shall be directed to different discharge points within the site. Development of this property will have no adverse effects on the adjacent properties.

The layout of the property does not warrant concentrated flows piped drainage or sediment traps for the site. Sediment control can be adequately managed using silt fence or silt fence to contain all of the sediment onsite. Sediment control will not be a large issue since one house will be built at a time and runoff from the proposed driveway will be pitched to silt fence and ultimately to the non-engineered grassed swale.

The site grading follows the existing contours with excavation from the basements being filled under the garage and around the house so that site is balanced. As each house is built, the earthwork for each lot shall be balanced separately. Excavated top soil shall be reused on each lot.

Water, Electric, Telephone and Cable TV shall primarily be extended to existing utilities in Mission Road through the proposed 30 foot use in common access, stormwater management and utility easement located where the proposed driveway is located. Sewer to lots 59 and 60 shall be extended through the common easement to the existing utilities in Mission Road. The sewer for lots 61 and 62 exit the rear of the property and extend as a main line to existing service in Jones Road. The proposed sewer main runs through an existing 20 foot sewer easement on Calvin Boone's property and is recorded in Liber 1754 at Folio 281. This easement is accompanied by a 15 foot construction strip. Therefore, our proposed develop shall have no adverse impact on the existing utilities abutting the site.

METHODOLOGY
In accordance with the Design Manual, Volume 1 a pre-development drainage area map was developed as sheet 8 of 9. This plan shows the three drainage areas for the site prior to development on the site. The soils, areas, zoning, percentage impervious and RCN are shown for each area. In the summary table the total runoff from the one year Q is shown. The TR55 methodology was used to establish the runoff curve numbers, times of concentration and runoff (Q) for the one year storm. The methodology used in Appendix D.11 of the MDE SWM Design Manual was used to compute the pre-development peak discharge, qi.

In a similar manner, sheet 9 of 9 represents the post-development drainage area map for the property. This plan was used to compute the post-development peak discharge from each of the property.

* Continued top of this sheet

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

John R. Blanton 7/6/10
Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Calvin Boone 7/2/10
Date
Chief, Development Engineering Division

Veit Schenker 7/6/10
Date
Chief, Division of Land Development

Thomas G. Butler 7/6/10
Date
Director

Rooftop Disconnection Credits
996 s.f. from part of house on Lot 60 treated in Rain Garden 2-A
494 s.f. from part of house on Lot 60 treated across grass in yard
494 s.f. from part of house on Lot 61 treated in Rain Garden 3
494 s.f. from part of house on Lot 61 treated across grass in yard
996 s.f. from part of house on Lot 61 treated in rain garden 3-A
494 s.f. from part of house on Lot 62 treated in rain garden 3
996 s.f. from part of house on Lot 62 treated in Rain Garden 4
996 s.f. from part of house on Lot 62 treated in rain gardens - 5

Non-rooftop Disconnection Credits
Part of driveway on Lot 60 treated in the non-engineered swale along the common d/w
Part of the common driveway across Lots 60, 61 & 62 treated in the non-engineered swale along the common d/w
All of the driveway on Lot 61 treated in the non-engineered swale along the common d/w
All of the emergency turnaround across Lots 61 & 62 treated across grass in yard
All of the private driveway on Lot 62 treated across grass in yard

SPECIMEN TREE LIST

No.	Common Name	Botanical Name	DBH	Condition
1.	Tulip poplar	Liriodendron tulipifera	32"	Good
2.	Pin oak	Quercus palustris	36"	Good
3.	Red maple	Acer rubrum	30"	Poor
4.	Red Maple	Acer rubrum	34"	Good
5.	Red Maple	Acer rubrum	36"	Good

Note SP# denotes Specimen Tree.
SP#24 & 44 off-site

⊙ - Trees to be saved (600)

AREA # 1 0.14 ac. R-12
87 85%
D=100%

AREA # 2 - 0.40 ac. R-12
87 38%
D=100%

AREA # 3 - 0.95 ac R-12
87 38%
D=100%

PLAN
Scale: 1"=50'

PERIMETER-1 (P-1)
100' LF Note

PERIMETER-2 (P-2)

PERIMETER-3 (P-3)

PERIMETER-4 (P-4)

PERIMETER-5 (P-5)

PERIMETER-6 (P-6)

PERIMETER-7 (P-7)

PERIMETER-8 (P-8)

PERIMETER-9 (P-9)

PERIMETER-10 (P-10)

PERIMETER-11 (P-11)

PERIMETER-12 (P-12)

PERIMETER-13 (P-13)

PERIMETER-14 (P-14)

3. NARRATIVE (Continued)
three drainage areas. As shown in the summary table on the plan, the one year peak discharge is less than 2 CFS and therefore Cpv storage design is not required. The methodology used in attaining the peak discharges follows was described above for the pre-development design.

The onsite drainage area map represents the design map to illustrate the proposed water quality and recharge measures for each of the lots and common driveway. As further described, the following measures shall be used to provide onsite water quality and recharge design.

The area for drainage area #1, including the use-in-common driveway is 0.14 ac. The impervious cover is 85%. The area for drainage area #2, including the buildings and individual driveways is 0.40 ac. The impervious cover is 38%. The area for drainage area #3, including the use-in-common driveway, buildings and individual driveways is 0.95 ac. The impervious cover is 38%.

Three methods shall be used for the design, dry swale, rain garden and credits and is summarized as follows.

Dry Swale - MDE BMP type, O-1. Located in the common easement and referred to as the non-engineered grass swale. Runoff from the common driveway shall flow to the swale designed in accordance with the MDE design criteria.

Rain Garden - MDE BMP type, F-6, designed as a bioretention facility. Located on Lot 59 - 62 to manage the rooftop runoff from roof drains for the individual house.

Credits - as further described lot by lot, credits for the rooftop and non-rooftop disconnect shall be identified.

Common Driveway - the non-engineered dry swale has been graded to parallel the driveway so water will flow to the swale. The swale is sloped at or less than 3% slope. The velocity is non-erosive and is acceptable to flow in the grassed swale.

Lot 59 - Runoff from the roof drain on the left front corner of the house shall spill across the yard and qualify for disconnect credit, flowing at least 75 feet across the property through grass.

Runoff from the left rear house corner shall spill across the yard and flow around the house, qualifying for disconnect credit, flowing 75 feet across the property through grass.

The impervious area to this downspout is 350 s.f.

Runoff from the right side of the house shall flow to the proposed rain garden. The total impervious area draining to the rain garden is 630 s.f. The required sizing of the rain garden is 7% of the impervious area 44 s.f. The proposed raingarden shall be 10' x 5' or 50 s.f.

There is a small area of driveway that will flow disconnected across the front yard of Lot 59 toward Mission Road.

Lot 60 - Runoff from the downspout at the left front corner of the house shall drain across the common driveway and receive disconnect credit through the dry swale. The impervious area from this downspout is 350 s.f.

Runoff from the left rear downspout shall drain across the grass in the rear yard and receive disconnect credit. The impervious area from this downspout is 350 s.f.

Runoff from the right front and rear downspout shall flow to the proposed rain garden. The total impervious area draining to the rain garden is 660 s.f. The required sizing of the rain garden is 7% of the impervious area 46 s.f. The proposed raingarden shall be 10' x 5' or 50 s.f.

There is a small area of driveway in front of the garage that will drain across the common driveway and flow into the grassed swale for disconnect credit.

In the rear of lot 61 there is part of a required truck turnaround. The paving has been sloped to provide as much flow across grass before the runoff crosses onto lot 62.

Lot 61 - Runoff from the left front downspout shall drain across the grass for 75' on the property to receive disconnect credit. The impervious area from this downspout is 350 s.f.

Runoff from the left and right rear house downspouts flow shall flow to the proposed rain garden. The total impervious area draining to the rain garden is 660 s.f. The required sizing of the rain garden is 7% of the impervious area 46 s.f. The proposed raingarden shall be 10' x 5' or 50 s.f.

Runoff from the right front downspout shall drain across the grass for 75' on the property to receive disconnect credit. The impervious area from this downspout is 310 s.f.

There is a small area of driveway in front of the garage that shall drain across the common driveway and flow into the grassed swale for disconnect credit.

In the rear of lot 61 there is part of a required truck turnaround. The paving has been sloped to provide as much flow across grass before the runoff crosses onto lot 62.

Lot 62 - Runoff from the left front corner downspout shall flow across the grass for disconnect credit before leaving the property as sheet flow. The impervious area from this downspout is 350 s.f.

Runoff from the left and right rear house downspouts flow shall flow to the proposed rain garden. The total impervious area draining to the rain garden is 660 s.f. The required sizing of the rain garden is 7% of the impervious area 46 s.f. The proposed raingarden shall be 10' x 5' or 50 s.f.

Runoff from the right front downspout shall drain across the grass for 75' on the property to receive disconnect credit. The impervious area from this downspout is 310 s.f.

Runoff from the onlot driveway and turnaround shall drain across the lot and receive disconnect credits.

Post DEVELOPMENT TABLE

DA#1	Area	RCN	Tc	Soils	Zoning	Impervious	Q1 CFS ¹	Q1 CFS ²
1	0.36 ac	84	0.20 hr	100%	R-12	30.9%	0.49	0.31
2	0.41 ac	87	0.18 hr	100%	R-12	15.2%	0.72	0.46
3	0.95 ac	87	0.18 hr	100%	R-12	21.8%	1.68	0.50

1 Flow release (Q) without credits being applied.
2 Flow release (Q) with credits being applied.

CONCLUSION
Volume storage calculations are provided in the CALCULATIONS section of the report for each of the post development drainage areas. The calculations are based on the methodology and charts from the MDE SWM Design Manual and are included in the Appendix B.

The soils report indicates six soil borings across the site and is attached as Appendix C. A location of the soil borings on a reduced copy of an old site plan are attached as Appendix A. The infiltration rates vary from 0.5 to 4.0 inches per hour.

Why and Rev for the four new houses are being provided by the use of raingardens, disconnect credits and a non-engineered grass swale to comply with the stormwater management requirements. Cpv is not required because the developed 1-year runoff volume (Q) is less than 2 cfs. Overbank flood protection (Op) and extreme flood protection (Q) are not required for this development per the Development Engineering Division bulletin, dated February 13, 2000. Within the Howard County Design Manual Volume 1, Section 5.2.1.A, the county reserves the right on a case by case basis to require that management measures be provided as necessary to maintain the post-development peak discharge for the 24-hour, 1, 10, 25 and 100 year storm at or below the respective pre-development discharge rate. Based on this site utilizing raingardens, a non-engineered dry swale and disconnect on rooftop and non-rooftop, a comparison of the 1 year post development peak discharge rate to the pre-development discharge rate indicated a reduction in runoff. A review of the downstream conditions indicated that this runoff will have no adverse effect on the downstream property.

Therefore, I believe that the attached design meets the criteria requirements for the Design Manual, Volume 1 and is in accordance with the requirements of the MDE SWM Design Manual.

Sincerely,
Dean Packard
Dean Packard, PE
President

Lot 60 - Runoff from the downspout at the left front corner of the house shall drain across the common driveway and receive disconnect credit through the dry swale. The impervious area from this downspout is 350 s.f.

Runoff from the left rear downspout shall drain across the grass in the rear yard and receive disconnect credit. The impervious area from this downspout is 350 s.f.

Runoff from the right front and rear downspout shall flow to the proposed rain garden. The total impervious area draining to the rain garden is 660 s.f. The required sizing of the rain garden is 7% of the impervious area 46 s.f. The proposed raingarden shall be 10' x 5' or 50 s.f.

There is a small area of driveway in front of the garage that will drain across the common driveway and flow into the grassed swale for disconnect credit.

In the rear of lot 61 there is part of a required truck turnaround. The paving has been sloped to provide as much flow across grass before the runoff crosses onto lot 62.

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CONCLUSION
Volume storage calculations are provided in the CALCULATIONS section of the report for each of the post development drainage areas. The calculations are based on the methodology and charts from the MDE SWM Design Manual and are included in the Appendix B.

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