WASHINGTONIAN NORTH
OUTLOT D, PRIVATE ROAD
(aka PRIVATE INTERIOR ROAD)
BLOCK "D"

PRELIMINARY
STORMWATER MANAGEMENT
REPORT

Submitted: June, 2013

Prepared on Behalf of:
Washingtonian North Associates, LP
c/o Boston Properties
Contact: Jake Stroman

SDP-3878-2013
Exhibit #33

STATE OF MARYLAND
AMY X. QUANT
No. 36060
PROFESSIONAL ENGINEER
1/10/14

Prepared By:
Soltesz
2 Research Place, Suite 100
Rockville, MD 20850
(301) 948-2750
Soltesz No.: 1184-00-01

Prepared by: Yee-Mei Tse P.E.
Checked by: Amy Quant P.E.

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PRELIMINARY
STORMWATER MANAGEMENT
REPORT
Offsite Drainage and Outlot "D" (POND)
Washingtonian North

INTRODUCTION

The project site is part of Washingtonian Center which consists Lots 4, 7 &8, Access roadway and Outlot "D". It is located west & northwest of the intersection of Washingtonian Boulevard and Sam Eig Highway in Gaithersburg, Maryland. The site is bounded on the east by Sam Eig Highway and on the south and west by an existing residential development. The site is currently zoned MXD and is located within the Muddy Branch Watershed, Use Class I/I-P.

The site is currently vacant. The previous approved Sediment Basin with its outfall appurtenances is still existed. Due to the SWM new regulation, and as per direction from City of Gaithersburg Public Work, Outlot "D" (previous approved SWM Pond location) should only use for control Offsite runoff and the private access road that cannot be treated by ESD practice. The runoff of all 3 lots (lots 4, 7 & 8) should be individually Controlled by using ESD to MEP.

Since the Outlot "D" (previous approved SWM Pond) Drainage Area was reduced from the approved design 39.4 Acre to 30.12 Acre, 12.84 Acres is controlled using ESD and required control Offsite runoff area for pond is 17.28 Acre; the SWM Pond will be adequate for providing the quantity & quality control for the Offsite runoff.

Currently ESD in the Private Roadway does control full required drainage, however, that may change in final design and there is capacity in SWM Pond to control any additional drainage in the Private Roadway if Road design changes later.

The following report is concentrated on Private Roadway ESD.

STORMWATER MANAGEMENT REQUIREMENTS

The Maryland Department of the Environment *2009 Stormwater Management Design* Manual and the Montgomery County Stormwater Regulations require that all new developments meet the criteria for Water Quality Volume (WQ_v), Recharge Volume (Re_v) and Channel Protection Volume (Cp_v) through ESD practices to the maximum extent practicable (MEP). Tables in the report below are referenced from the 2009 manual, unless otherwise indicated.

STORMWATER MANAGEMENT METHODOLOGY

For Private Roadway, a new SWM is provided via Environmental Site Design (ESD) facilities. 7 ESD facilities are proposed.

ESD for the Private Roadway of this project will be provided through the following practice:

1) ESD practice will be used to treat the full P_E target (Table 5.3), in turn satisfying all Water Quality, Quantity and Recharge Volume requirements. 100% ESDv have been achieved through the following method:

    a. Planter Box Micro-Bioretention are being used to provide volume via wet storage above the media and volume with the voids of the filter media below the facility.

To verify compliance with the intent of ESD design, we offer the following (please note that tables referenced are from the 2009 Maryland Stormwater Management Design Manual:

Natural Resource Protection and Enhancement
Site and resource mapping indicate minor natural resources located onsite as listed in Table 5.1.

- Please refer to the attached NRI/FSD for additional information.

Therefore, natural resources will be protected and preserved to like existing conditions to the MEP.

Soil Types Include:

16D – Brinklow-Blocktown channery Silt Loams, 15 to 25 percent slopes. Hydrologic Soil Group "B"
116D – Blocktown channery silt loam, 15 to 25 percent slopes, very rocky, Hydrologic Soil Group "C"
54A – Hatboro Silt loam, 0 to 3 percent slopes. Hydrologic Soil Group "D"
66UB – Wheaton-Urban land complex, 0 to 8 percent slopes. Hydrologic Soil Group "B"
66UC – Wheaton-Urban land complex, 8 to 15 percent slopes. Hydrologic Soil Group "B"

See appendix for the full web soil survey.

Implementation of ESD Planning Techniques

The following techniques in Table 5.2 were used; all others are not applicable. These items include: parking lot runoff, rooftop runoff, and clearing & grading. Parking lot

runoff will be directed to planter box bioretention or other stormwater practices within landscaped areas. Rooftop runoff shall be directed to proposed ESD facilities for treatment. Clearing and grading has been limited by the required needs for the proposed development mostly within existing developed areas. Therefore, implementation of ESD planning techniques has been explored and will be used to the MEP.

This package includes drainage area map, stormwater management preliminary plan with preliminary storm drain profiles and details, and supporting ESD computations for your review.

CONCLUSION

For Private Roadway ESD stormwater management requirements will be met or exceeded.

ESD Computations

SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	4/10/2013
Project Name	Washingtonian North Interior Road
Project No.	1184-00-01
By	CX / YMT
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LOD
ESDv COMPUTATIONS

LOD Target

Enter Total Site Property Area = **72462 sqft**
Enter Total Impervious Area = **55345 sqft**
% of Impervious D.A., I = **76.4%**
Volumetric Runoff Coefficient, Rv = 0.737 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)
A	38		0%	2.4 in			
B	55	62925	87%	2.2 in	9229 sqft	0.195 ac-ft	8507 cu-ft
C	70	4955	7%	2.0 in	661 sqft	0.014 ac-ft	609 cu-ft
D	77	4582 sqft	6%	1.8 in	550 sqft	0.012 ac-ft	507 cu-ft
Totals			100%	2.2 in	**10440 sqft**	**0.221 ac-ft**	**9623 cu-ft**

Equations

Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 57

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2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	4/10/2013
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ESD 1
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Micro Bioretention = 6763 sqft
Enter Total Impervious Area = 5224 sqft
% of Impervious D.A., I = 77.2%
Volumetric Runoff Coefficient, Rv = 0.745 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.35 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	6763	100%	2.2 in	992 sqft	0.021 ac-ft	924 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	992 sqft	0.021 ac-ft	924 cu-ft			0 sqft

Equations

Target Planning Surface Area of Mirco Bioretention, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 55
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = 1092 cu-ft
Enter Filter Surface Area Provided = 430 sqft
Depth Provided Above Micro Bioretention = 6 in
Depth of Filter Media = 4.5 ft
Surface Area of Micro Bioretention =
Actual Volume Provided = 989 cu-ft
Volume Credited Above/Below Micro Bioretention = 989 cu-ft **Target ESDv is Satisfied**
Excess Volume Provided = 65 cu-ft
ESD P_E Treatment Provided = 2.35 in (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 55
Additional ESD Volume Required = ESDv is Satisfied **(Applied to ESD Practices)**
Additional ESD Treatment Required = ESD is Satisfied
Effective % Impervious (Table 5.3) = 0.0%
Effective Impervious Area = 0 sqft
If Used, Additional Structural Treatment Volume = Treatment is Satisfied **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of micro-bioretention practices shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.
See manual for addition limitations.

SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

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ESD 1A
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Micro Bioretention = **5925 sqft**
Enter Total Impervious Area = **4145 sqft**
% of Impervious D.A., I = **70.0%**
Volumetric Runoff Coefficient, Rv = 0.680 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.46 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	5925	100%	2.2 in	869 sqft	0.017 ac-ft	738 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	869 sqft	0.017 ac-ft	738 cu-ft			0 sqft

Equations

Target Planning Surface Area of Mirco Bioretention, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **872 cu-ft**
Enter Filter Surface Area Provided = **550 sqft**
Depth Provided Above Micro Bioretention = **6 in**
Depth of Filter Media = **2.5 ft**
Surface Area of Micro Bioretention = **550 sqft**
Actual Volume Provided = **825 cu-ft**
Volume Credited Above/Below Micro Bioretention = **825 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **87 cu-ft**
ESD P_E Treatment Provided = **2.46 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of micro-bioretention practices shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
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SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

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ESD 1B
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Micro Bioretention = **6562 sqft**
Enter Total Impervious Area = **4316 sqft**
% of Impervious D.A., I = **65.8%**
Volumetric Runoff Coefficient, Rv = 0.642 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.14 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	6562	100%	2.0 in	875 sqft	0.016 ac-ft	702 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.0 in	875 sqft	0.016 ac-ft	702 cu-ft			0 sqft

Equations

Target Planning Surface Area of Mirco Bioretention, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **913 cu-ft**
Enter Filter Surface Area Provided = **396 sqft**
Depth Provided Above Micro Bioretention = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Micro Bioretention = **396 sqft**
Actual Volume Provided = **752 cu-ft**
Volume Credited Above/Below Micro Bioretention = **752 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **50 cu-ft**
ESD P_E Treatment Provided = **2.14 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of micro-bioretention practices shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
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ESD 2
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **14220 sqft**
Enter Total Impervious Area = **11279 sqft**
% of Impervious D.A., I = **79.3%**
Volumetric Runoff Coefficient, Rv = 0.764 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	14220	100%	2.2 in	2086 sqft	0.046 ac-ft	1991 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2086 sqft	0.046 ac-ft	1991 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2353 cu-ft**
Enter Filter Surface Area Provided = **1145 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.00 ft**
Surface Area of Planter Box = **1145 sqft**
Actual Volume Provided = **2405 cu-ft**
Volume Credited Above/Below Planter Box = **2353 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **362 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
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ESD 3
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **7725 sqft**
Enter Total Impervious Area = **6254 sqft**
% of Impervious D.A., I = **81.0%**
Volumetric Runoff Coefficient, Rv = 0.779 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.85 in)	Reduced %I (RCN 66)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	7725	100%	2.2 in	1133 sqft	0.025 ac-ft	1103 cu-ft	66	10.0%	773 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	1133 sqft	0.025 ac-ft	1103 cu-ft			773 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1303 cu-ft**
Enter Filter Surface Area Provided = **332 sqft**
Depth Provided Above Filter Surface = **12 in**
Depth of Filter Media = **4.50 ft**
Surface Area of Planter Box = **332 sqft**
Actual Volume Provided = **930 cu-ft**
Volume Credited Above/Below Planter Box = **930 cu-ft** **ESDv is not Satisfied (PE < 2.2 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **1.85 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **66**
Additional ESD Volume Required = **173 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.35 in**
Effective % Impervious (Table 5.3) = **10.0%**
Effective Impervious Area = **773 sqft**
If Used, Additional Structural Treatment Volume = **171 cu-ft** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
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ESD 4
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **16862 sqft**
Enter Total Impervious Area = **13136 sqft**
% of Impervious D.A., I = **77.9%**
Volumetric Runoff Coefficient, Rv = 0.751 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.45 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	16862	100%	2.2 in	2473 sqft	0.053 ac-ft	2322 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2473 sqft	0.053 ac-ft	2322 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2744 cu-ft**
Enter Filter Surface Area Provided = **1231 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.00 ft**
Surface Area of Planter Box = **1231 sqft**
Actual Volume Provided = **2585 cu-ft**
Volume Credited Above/Below Planter Box = **2585 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **263 cu-ft**
ESD P_E Treatment Provided = **2.45 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
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SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
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ESD 5
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = 9429 sqft
Enter Total Impervious Area = 6026 sqft
% of Impervious D.A., I = 63.9%
Volumetric Runoff Coefficient, Rv = 0.625 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 63)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	6031	64%	2.0 in	804 sqft	0.014 ac-ft	628 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77	3398 sqft	36%	1.8 in	408 sqft	0.007 ac-ft	319 cu-ft	77	0.0%	0 sqft
Totals			100%	1.9 in	1212 sqft	0.022 ac-ft	947 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 63
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = 1277 cu-ft
Enter Filter Surface Area Provided = 1266 sqft
Depth Provided Above Filter Surface = 6 in
Depth of Filter Media = 2.00 ft
Surface Area of Planter Box = 1266 sqft
Actual Volume Provided = 1646 cu-ft — Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = 1277 cu-ft — **Target ESDv is Satisfied**
Excess Volume Provided = 330 cu-ft — **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = 2.60 in — (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 63
Additional ESD Volume Required = ESDv is Satisfied — **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** — **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	4/10/2013 Revised: 12/09/2013
Project Name	Washingtonian North Interior Road
Project No.	1184-00-01
By	CX / YMT
Checked	AXQ

Ultimate ESD Summary Table

Overall Site Target

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
LOD	72,462	55,345	76%	0%	87%	7%	6%	**2.2**	**2.2**	0.74	9,623	9,712	89	**57**	See ESD Practices Below	Site Compliance
				2.4	**2.2 in**	**2.0 in**	**1.8 in**					(Provided ESDv Below)				
					(Individual Target P_E)											

Total Site Target Composite RCN for "Woods in Good Cond." = 57
Total Site Reduced Composite RCN for "Woods in Good Cond." = 57

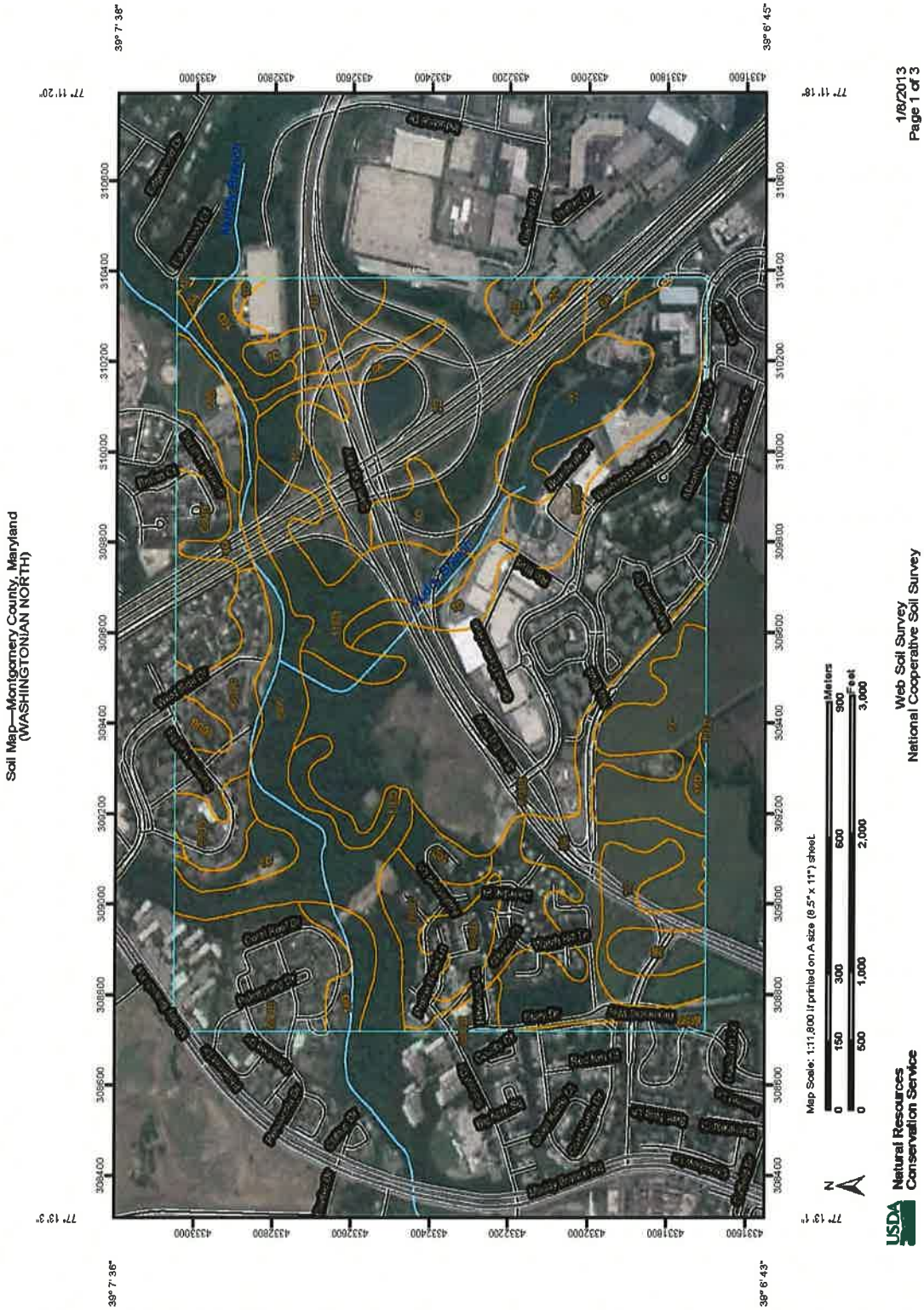
Phase 1 Individual Facility Summary

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
1	6,763	5,224	77%	0%	100%	0%	0%	2.2	2.4	0.75	924	989	65	55	Planter Box	
1A	5,925	4,145	70%	0%	100%	0%	0%	2.2	2.5	0.68	738	825	87	55	Planter Box	
1B	6,562	4,316	66%	0%	100%	0%	0%	2.0	2.1	0.64	702	752	50	55	Planter Box	
2	14,220	11,279	79%	0%	100%	0%	0%	2.2	2.6	0.76	1,991	2,353	362	55	Planter Box	
3	7,725	6,254	81%	0%	100%	0%	0%	2.2	1.9	0.78	1,103	930	0	66	Planter Box	
4	16,862	13,136	78%	0%	100%	0%	0%	2.2	2.4	0.75	2,322	2,585	263	55	Planter Box	
5	9,429	6,026	64%	0%	64%	0%	36%	1.9	2.6	0.63	947	1,277	330	63	Planter Box	
TOTALS	**67,486 sqft**	**50,380 sqft**										**9,712 cu-ft**				

Qp10 Summary

A downstream storm drain study will be prepared to show sufficient capacity or any necessary upgrades to safely convey the 10yr storm. Please refer to the downstream analysis map for additional information.

Appendix


Soil Map—Montgomery County, Maryland
(WASHINGTONIAN NORTH)
39° 7' 38"
39° 6' 45"
77° 11' 18"
77° 11' 20"
39° 7' 36"
39° 6' 43"
77° 13' 1"
77° 13' 3"
N
Map Scale: 1:11,800 if printed on A size (8.5" x 11") sheet.
0 150 300 600 900 Meters
0 500 1,000 2,000 3,000 Feet
USDA Natural Resources Conservation Service
Web Soil Survey
National Cooperative Soil Survey
1/8/2013
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:11,800 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Maryland
Survey Area Data: Version 7, Feb 2, 2007

Date(s) aerial images were photographed: 6/21/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Montgomery County, Maryland (MD031)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1B	Gaila silt loam, 3 to 8 percent slopes	11.0	2.0%
1C	Gaila silt loam, 8 to 15 percent slopes	73.5	13.2%
2B	Glenelg silt loam, 3 to 8 percent slopes	102.8	18.5%
2C	Glenelg silt loam, 8 to 15 percent slopes	2.0	0.4%
4B	Elloak silt loam, 3 to 8 percent slopes	3.7	0.7%
6A	Baile silt loam, 0 to 3 percent slopes	8.3	1.5%
16D	Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	19.5	3.5%
54A	Hatboro silt loam, 0 to 3 percent slopes, frequently flooded	41.4	7.5%
65B	Wheaton silt loam, 0 to 8 percent slopes	7.0	1.3%
66UB	Wheaton-Urban land complex, 0 to 8 percent slopes	178.2	32.1%
66UC	Wheaton-Urban land complex, 8 to 15 percent slopes	38.4	6.9%
67UB	Urban land-Wheaton complex, 0 to 8 percent slopes	25.8	4.6%
116D	Blocktown channery silt loam, 15 to 25 percent slopes, very rocky	28.1	5.1%
W	Census water	15.6	2.8%
Totals for Area of Interest		**555.2**	**100.0%**

HYDROLOGY
WATER QUALITY
WATER QUANTITY

Table 5.2 Summary of Site Development Strategies

Better Site Design Technique	Recommendations
Using narrower, shorter streets, rights-of-way, and sidewalks	Streets may be as narrow as 22 ft. in neighborhoods serving low traffic volumes; open space designs and clustering will reduce street lengths; rights-of-way can be reduced by minimizing sidewalk width, providing sidewalks on one side of the road, and reducing the border width between the street and sidewalks.
Cul-de-sacs	Allow smaller radii for turn arounds as low as 33 ft.; use a landscaped island in the center of the cul-de-sac and design these areas to treat stormwater runoff.
Open vegetated channels	Allow grass channels or biofilters for residential street drainage and stormwater treatment.
Parking ratios, parking codes, parking lots, and structured parking	Parking ratios should be interpreted as maximum number of spaces; use shared parking arrangements; minimum parking stall width should be less than 9 ft. and stall length less than 18 ft.; parking garages are encouraged rather than surface lots.
Parking lot runoff	Parking lots are required to be landscaped and setbacks are relaxed to allow for bioretention islands or other stormwater practices in landscaped areas.
Open space	Flexible design criteria should be provided to developers who wish to use clustered development and open space designs.
Setbacks and frontages	Relax setbacks and allow narrower frontages to reduce total road length; eliminate long driveways.
Driveways	Allow for shared driveways and alternative impervious surfaces.
Rooftop runoff	Direct to pervious surfaces.
Buffer systems	Designate a minimum buffer width and provide mechanisms for long-term protection.
Clearing and grading	Clearing, grading, and earth disturbance should be limited to that required to develop the lot.
Tree conservation	Provide long-term protection of large tracts of contiguous forested areas; promote the use of native plantings.
Conservation incentives	Provide incentives for conserving natural areas through density compensation, property tax reduction, and flexibility in the design process.

(Adapted from Center for Watershed Protection, 1998)

Review of Concept Plans

Concept plans should be submitted to the appropriate review agencies and include the information discussed above along with a narrative to support the design. The narrative should describe how important natural areas will be preserved and protected, and show how ESD may be achieved for meeting on-site stormwater requirements. Review authorities may require additional information at this phase, however, at a minimum a concept plan should include the following elements:

Site and Resource Mapping

The resource mapping component will be used as a basis for all subsequent decisions during project design. During this step, the developer shall identify significant natural resources and demonstrate that these areas will be protected and preserved. Additionally, options will be evaluated to enhance important hydrologic functions. Approving authorities may require that other features be shown depending on site characteristics. This map shall be field verified by the project designer. Specific areas that should be mapped are organized by government regulatory authority in Table 5.1 below.

Table 5.1 Natural Resources and the Corresponding Regulatory Authorities:

Federal	State	Local
• Wetlands • Major waterways • Floodplains	• Tidal and nontidal wetlands • Wetlands of Special State Concern • Wetland buffers • Stream buffers • Perennial streams • Floodplains • Forests • Forest buffers • Critical Areas	• Steep slopes • Highly erodible soils • Enhanced stream buffers • Topography/slopes • Springs • Seeps • Intermittent streams • Vegetative cover • Soils • Bedrock/geology • Existing drainage areas

The mapping process will identify important natural resources as well as areas that are highly susceptible to erosion caused by construction activities. Identifying these important resources and high risk locations and protecting them from disturbance is the first step in the planning process. When steep slopes and highly erodible soils are found measures need to be taken to limit disturbance and minimize impacts. This may be done by using information developed by the local SCDs. These offices maintain lists that identify highly erodible soil map units for each county in Maryland. Additionally, steep slopes are defined as those with gradients of 20 percent or more and moderately steep slopes fall within the range of 10 to 30 percent (USDA NRCS, Soil Survey Manual, October, 1993). For the purpose of project planning, steep slopes are considered to be any mapping unit with a slope class of 15 percent or greater.

While it may not be practicable to eliminate earth disturbing activities exclusively on the basis of soil erodibility or slope alone, constraints are warranted when both steep slopes and highly erodible soils occupy the same area within the development footprint. Areas with highly erodible soils and slopes equal to or greater than 25 percent should be incorporated into adjacent buffers, remain undisturbed, protected during the construction process, and/or preserved as open space.

Table 5.3 Rainfall Targets/Runoff Curve Number Reductions used for ESD

Hydrologic Soil Group A										
%I	RCN*	P_E = 1"	1.2"	1.4"	1.6"	1.8"	2.0"	2.2"	2.4"	2.6"
0%	40									
5%	43									
10%	46									
15%	48	**38**								
20%	51	40	**38**	**38**						
25%	54	41	40	39						
30%	57	42	41	39	**38**					
35%	60	44	42	40	39					
40%	61	44	42	40	39					
45%	66	48	46	41	40					
50%	69	51	48	42	41	**38**				
55%	72	54	50	42	41	39				
60%	74	57	52	44	42	40	**38**			
65%	77	61	55	47	44	42	40			
70%	80	66	61	55	50	45	40			
75%	84	71	67	62	56	48	40	**38**		
80%	86	73	70	65	60	52	44	40		
85%	89	77	74	70	65	58	49	42	**38**	
90%	92	81	78	74	70	65	58	48	42	**38**
95%	95	85	82	78	75	70	65	57	50	39
100%	98	89	86	83	80	76	72	66	59	40

Hydrologic Soil Group B										
%I	RCN*	P_E = 1"	1.2"	1.4"	1.6"	1.8"	2.0"	2.2"	2.4"	2.6"
0%	61									
5%	63									
10%	65									
15%	67	**55**								
20%	68	60	**55**	**55**						
25%	70	64	61	58						
30%	72	65	62	59	**55**					
35%	74	66	63	60	56					
40%	75	66	63	60	56					
45%	78	68	66	62	58					
50%	80	70	67	64	60					
55%	81	71	68	65	61	**55**				
60%	83	73	70	67	63	58				
65%	85	75	72	69	65	60	**55**			
70%	87	77	74	71	67	62	57			
75%	89	79	76	73	69	65	59			
80%	91	81	78	75	71	66	61			
85%	92	82	79	76	72	67	62	**55**		
90%	94	84	81	78	74	70	65	59	**55**	
95%	96	87	84	81	77	73	69	63	57	
100%	98	89	86	83	80	76	72	66	59	**55**

Cp_v Addressed (RCN = Woods in Good Condition)

RCN Applied to Cp_v Calculations

Table 5.3 Runoff Curve Number Reductions used for Environmental Site Design (continued)

Hydrologic Soil Group C										
%I	RCN*	P_E = 1"	1.2"	1.4"	1.6"	1.8"	2.0"	2.2"	2.4"	2.6"
0%	74									
5%	75									
10%	76									
15%	78									
20%	79	**70**								
25%	80	72	**70**	**70**						
30%	81	73	72	71						
35%	82	74	73	72	**70**					
40%	84	77	75	73	71					
45%	85	78	76	74	71					
50%	86	78	76	74	71					
55%	86	78	76	74	71	**70**				
60%	88	80	78	76	73	71				
65%	90	82	80	77	75	72				
70%	91	82	80	78	75	72				
75%	92	83	81	79	75	72				
80%	93	84	82	79	76	72				
85%	94	85	82	79	76	72				
90%	95	86	83	80	77	73	**70**			
95%	97	88	85	82	79	75	71			
100%	98	89	86	83	80	76	72	**70**		

Hydrologic Soil Group D										
%I	RCN*	P_E = 1"	1.2"	1.4"	1.6"	1.8"	2.0"	2.2"	2.4"	2.6"
0%	80									
5%	81									
10%	82									
15%	83									
20%	84	**77**								
25%	85	78								
30%	85	78	**77**	**77**						
35%	86	79	78	78						
40%	87	82	81	79	**77**					
45%	88	82	81	79	78					
50%	89	83	82	80	78					
55%	90	84	82	80	78					
60%	91	85	83	81	78					
65%	92	85	83	81	78					
70%	93	86	84	81	78					
75%	94	86	84	81	78					
80%	94	86	84	82	79					
85%	95	86	84	82	79					
90%	96	87	84	82	79	**77**				
95%	97	88	85	82	80	78				
100%	98	89	86	83	80	78	**77**			

Cp_v Addressed (RCN = Woods in Good Condition)

RCN Applied to Cp_v Calculations

HYDROLOGY
WATER QUALITY
WATER QUANTITY

JOB:	WASHINGTONIA			YMT
DRAINAGE AREA NAME:	P-DEV SWM OFFSITE D.A.			9-Jan-13
COVER DESCRIPTION	SOIL NAME	GROUP A,B,C,D?	CN from TABLE 2-2	AREA (in acres)
OFF-SITE				
COMMERCIAL		B	92	10.18 Ac.
SAM EIG HWY				
IMP.		B	98	4.80 Ac.
GREEN SPACE		B	61	2.30 Ac.
		AREA SUBTOTALS:		17.28 Ac.

2-Yr 24 Hr Rainfall = 3.2 in	Surface Cover Cross Section	Manning 'n' Wetted Per	Flow Length Avg Velocity	Slope Tt (Hrs)
Sheet Flow	dense grass	n =0.24	100 Ft.	2.50% 0.22 Hrs
Shallow Flow	UNPAVED		331 Ft. 2.50 F.P.S.	2.40% 0.04 Hrs.
Channel Flow Hydraulic Radius =0.63	4.9 SqFt	'n'=0.013 7.9 Ft.	840 Ft. 8.38 F.P.S.	1.00% 0.03 Hrs.

Total Area in Acres =	17.28 Ac.	Total Sheet Flow=	Total Shallow Flow=	Total Channel Flow =
Weighted CN =	90	0.22 Hrs.	0.04 Hrs.	0.03 Hrs.
Time Of Concentration =	0.28 Hrs.			
Pond Factor =	1	RAINFALL TYPE II		

STORM	Precipitation (P) inches	Runoff (Q)	Qp, PEAK DISCHARGE	TOTAL STORM Volumes
1 Year	2.6 in.	1.6 in.	30.4 CFS	101,650 Cu. Ft.
2 Year	3.2 in.	2.2 in.	40.7 CFS	136,028 Cu. Ft.
5 Year	4.2 in.	3.1 in.	58 CFS	195,033 Cu. Ft.
10 Year	5.1 in.	4.0 in.	75 CFS	249,200 Cu. Ft.
25 Year	5.6 in.	4.5 in.	84 CFS	279,567 Cu. Ft.
50 Year	6.3 in.	5.1 in.	96 CFS	322,313 Cu. Ft.
100 Year	7.2 in.	6.0 in.	113 CFS	377,569 Cu. Ft.

JOB:	WASHINGTONIA			MTB
DRAINAGE AREA NAME:	POST-COMPEN	PROP. D.A. FOR ROUTING		7-Mar-00
COVER DESCRIPTION	SOIL NAME	GROUP A,B,C,D?	CN from TABLE 2-2	AREA (in acres)
OFF-SITE				
COMMERCIAL		B	92	10.18 Ac.
ON-SITE				
COMMERCIAL		B	92	10.94 Ac.
COMMERCIAL		C	94	0.40 Ac.
COMMERCIAL		D	95	1.50 Ac.
SAM EIG HWY				
IMP.		B	98	4.80 Ac.
OPEN SPACE		B	61	2.30 Ac.
		AREA SUBTOTALS:		30.12 Ac.
2-Yr 24 Hr Rainfall = 3.2 In	Surface Cover Cross Section	Manning 'n' Wetted Per	Flow Length Avg Velocity	Slope Tt (Hrs)
Sheet Flow	dense grass	'n'=0.24	100 Ft.	3.00% 0.20 Hrs
Shallow Flow	UNPAVED		350 Ft. 2.79 F.P.S.	3.00% 0.04 Hrs.
Channel Flow Hydraulic Radius =0.63	4.9 SqFt	'n'=0.013 7.9 Ft.	800 Ft. 8.38 F.P.S.	1.00% 0.03 Hrs.
Total Area In Acres =	30.12 Ac.	Total Sheet Flow=	Total Shallow Flow=	Total Channel Flow =
Weighted CN =	91			
Time Of Concentration =	0.26 Hrs.	0.20 Hrs.	0.04 Hrs.	0.03 Hrs.
Pond Factor =	1	RAINFALL TYPE II		
STORM	Precipitation (P) inches	Runoff (Q)	Qp, PEAK DISCHARGE	TOTAL STORM Volumes
1 Year	2.6 In.	1.7 In.	57.2 CFS	186,048 Cu. Ft.
2 Year	3.2 In.	2.3 In.	75.9 CFS	246,908 Cu. Ft.
5 Year	4.2 In.	3.2 In.	108 CFS	350,875 Cu. Ft.
10 Year	5.1 In.	4.1 In.	137 CFS	446,004 Cu. Ft.
25 Year	5.6 In.	4.6 In.	153 CFS	499,252 Cu. Ft.
50 Year	6.3 In.	5.3 In.	176 CFS	574,135 Cu. Ft.
100 Year	7.2 In.	6.1 In.	206 CFS	670,838 Cu. Ft.

LOIEDERMAN SOLTESZ ASSOCIATES, INC. 2 Research Pl, Suite 100 Rockville, Maryland 20850 301-948-2750 Fax 301-948-9067	Date: 8-Jan-13 Revised Date: ____ Project Name: Washingtonian North Project No.: 1184-00-01 Prepared By: YMT Checked: AXQ	Sheet ___ of ___

Channel Protection Storage Volume Computations

Post-Development Drainage Area A = 17.28 AC

Time of Concentration, t_c = 0.27 hr. (FROM TR-55 RUN FOR POST-DEVELOPMENT CONDITIONS)

Post-Development Curve Number, CN = 90 (FROM TR-55 RUN FOR POST-DEVELOPMENT CONDITIONS)

One-Year Post-Development Runoff Depth, Q_a = 1.62 in. (FROM TR-55 RUN FOR POST-DEVELOPMENT CONDITIONS)

Initial Abstraction, $I_a = \frac{200}{CN} - 2$

Initial Abstraction, $I_a = \frac{200}{90} - 2$

Initial Abstraction, I_a = 0.22

One-Year Rainfall Depth, P = 2.60 in. (FROM TABLE 2-2 OF 2000 MD STORMWATER DESIGN MANUAL)

I_a/P = 0.10

Unit Peak Factor, q_u = 700 cfs/sq. mi./in. runoff (FROM FIG. D.11.1 OF 2000 MD STORMWATER DESIGN MANUAL)

Post-Development Peak Inflow Discharge, $q_i = q_u \times A \times Q_a$

q_i = 700 x 17.28/640 x 1.62

q_i = 30.62 cfs

12-Hour Outflow-to-Inflow Ratio, q_o/q_i = 0.030 (FROM FIG. D.11.2 OF 2000 MD STORMWATER DESIGN MANUAL)

Post-Development Peak Outflow Discharge, $q_o = \left(q_o/q_i\right) \times q_i$

q_o = 0.92 *

Post-Development Runoff Volume, $V_r = Q_a/12 \times A$

V_r = 2.333 acre-ft

Storage-to-Runoff Volume Ratio, $V_s/V_r = 0.683 - 1.43\left(q_o/q_i\right) + 1.64\left(q_o/q_i\right)^2 - 0.604\left(q_o/q_i\right)^3$

$V_s/V_r = 0.683 - 1.43\,(0.03\ ) + 1.64\,(0.03\ )^2 - 0.604\,(0.03\ )^3$

V_s/V_r = 0.642

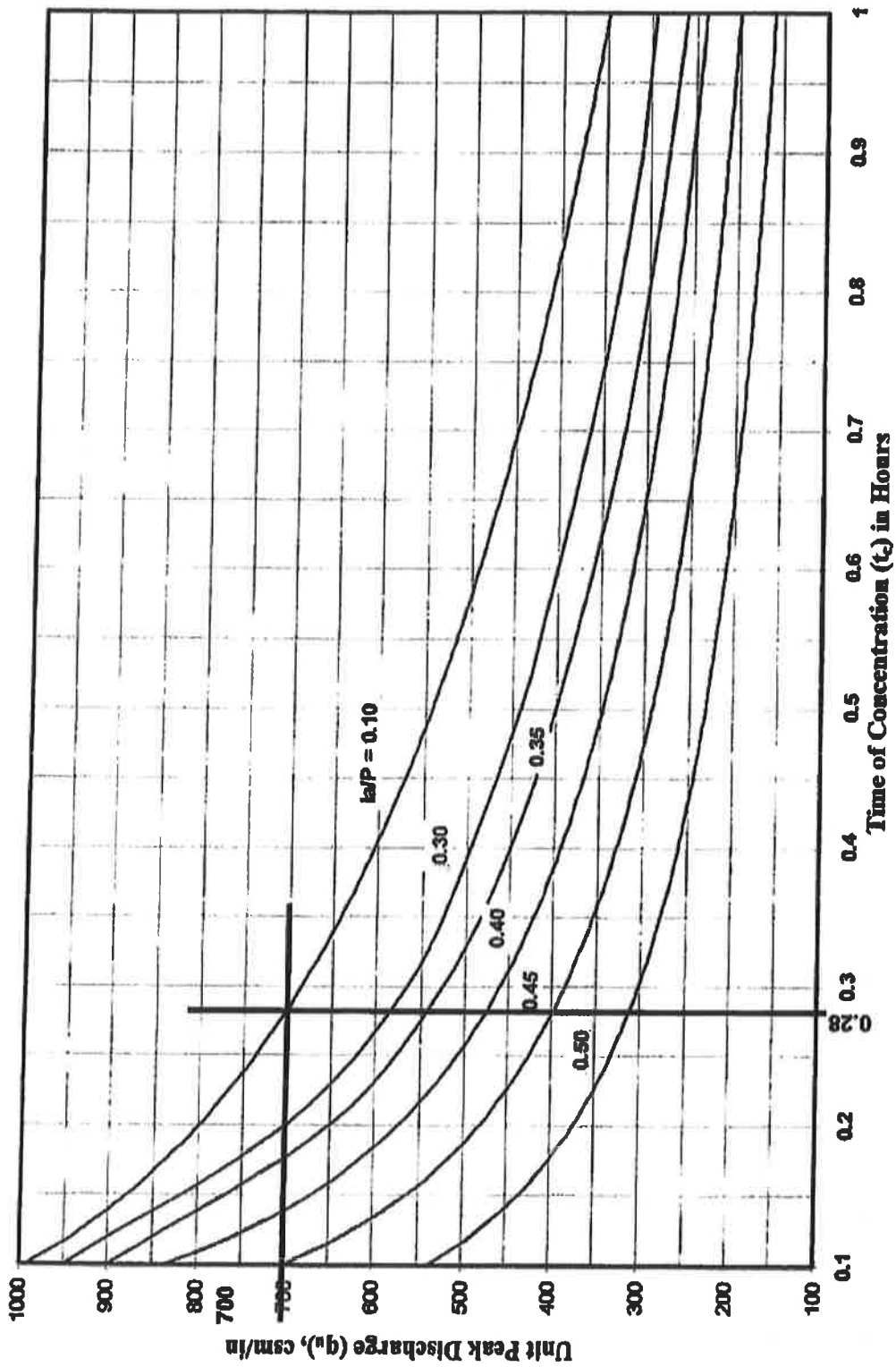
Post-Development Storage Volume, $V_s = (V_s/V_r) \times V_r$

V_s = 1.497 ** (To Work Sheet 6a - Line 9)

Q:\11840001\HYD\SWM_POND_PREL\comps pond_TEST_4_5_RD.xlsx

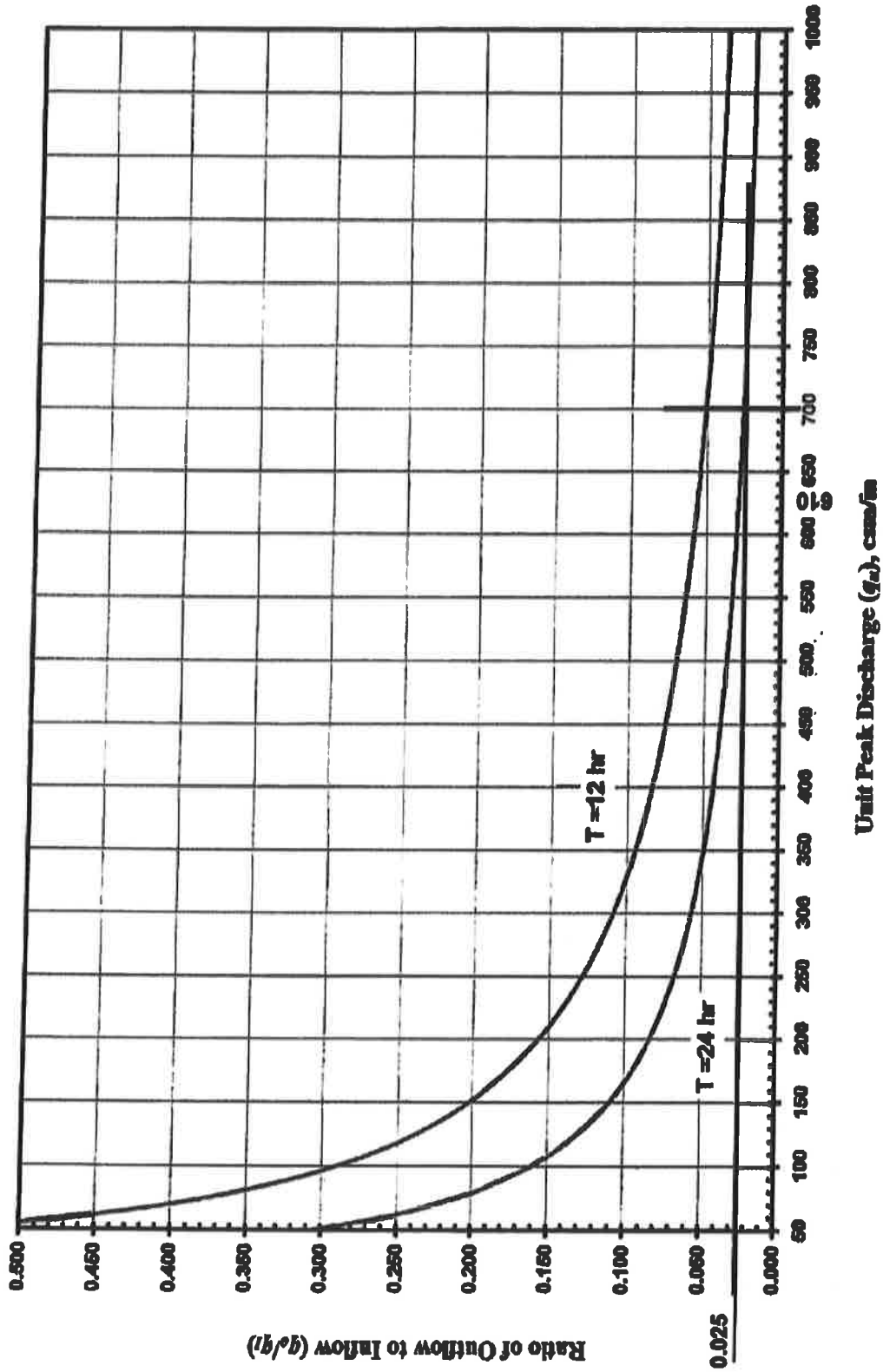
Figure D.11.1

SCS Graphical Method of Determining Peak Discharge (q_u) in csm/in for 24-Hour Type II Storm Distribution



Q:\1184000\HYD\SWM_POND_PREL\comps pond_TEST_4_5_RD.xlsx.xls

Figure D.11.2 Detention Time Versus Discharge Ratios (q_o/q_i)



Q:\1184000\HYDSWM_POND_PREL\cwps pond_TEST_4_5_RD.xlsx.xls

30

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl, Suit 100
Rockville, MD 20850
(301) 948-2750

Date	4/3/2013
Project Name	Washingtonian North - Pond
Project No.	1184-00-01
By	YMT
Checked	AXQ

WATER QUALITY VOLUME (WQ_V) COMPUTATIONS

Inches of Rainfall, P = 1.0 in.

Drainage Area, A = 17.20 Acres

Impervious Area, A_I = 14.98 Acres

Percent Imperviousness, I = 86.7 %

Volumetric Runoff Coefficient, R_V = 0.05 + 0.009(I)

R_V = 0.05 + 0.009(86.7)

R_V = 0.83

Water Quality Volume, WQ_V = (P x R_V x A)/12

WQ_V = (1 in. x 0.83 x Ac.)/12

WQ_V = 1.20 Ac-Ft
= (52063 Ft^3)

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LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl, Suite 100
Rockville, MD 20850
(301) 948-2750

Date 4/3/13
Project Name Washingtonian North-Pond
Project No. 1184-00-01
By YMT
Checked AXQ

ORIFICE CALCULATION - POND

Vs =	1.497	Ac. Ft.	From Channel Protection Storage Volume
Elev. (Vs) =	401.80		Elevation corresponding to Vs=1.497 Ac. Ft.
Pond Bottom =	394.00		Elevation of the bottom of the pond
H =	7.80 Ft.		

Qo = 0.92 CFS — From Channel Protection Storage Volume

$$A = \frac{Qo}{0.6 \times (2gH)^{0.5}}$$ g = 32.20

= 0.06841 Ft^2

$$D = \left(\frac{4 \times A}{3.1416}\right)^{0.5}$$

= 0.29514 Ft.

= **3.54 In.**

Use D = **6 in pipe**

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2 Research Pl, Suite 100
Rockville, MD 20850
(301) 948-2750

Date	4/3/2013
Project Name	Washingtonian North
Project No.	1184-00-01
By	YMT
Checked	AXQ

Quality Stage - Storage Table (FOREBAY)

Elevation (ft.)	Area (sq.ft.)	Average Area (sq.ft.)	Differential Depth (ft.)	Incremental Volume (cu.ft.)	Cumulative Volume (cu.ft.)	Cumulative Volume (ac.ft.)
396.00	530				0	0.00
		998	2.00	1,995		
398.00	1,465				1,995	0.05
		2,130	2.00	4,260		
400.00	2,795				6,255	0.14
		3,462	1.50	5,192		
401.50	4,128				11,447	0.26

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LOIEDERMAN SOLTESZ ASSOCIATES, INC
2 Research Pl, Suite 100
Rockville, MD 20850
(301) 948-2750

PROJECT NAME: **Washingtonian North SWM Pond**
LSA PROJECT NO.: 1184-00-01

Prepared By: YMT
Checked By: AXQ
Date: 01/29/13

Plan Scale:

Main Cell

Elevation (msl)	Area (sq. ft.)	Average Area (sq. ft.)	Depth (ft.)	Incremental Volume (cu. ft.)	Cumulative Volume (cu. ft.)	Volume (ac. ft.)
394.0	3501.0				0.0	0.00
		5174.0	2.0	10348.0		
396.0	6847.0				10348.0	0.24
		8746.0	2.0	17492.0		
398.0	10645.0				27840.0	0.64
		12662.5	2.0	25325.0		
400.0	14680.0				53165.0	1.22
		16867.0	1.5	25300.5		
401.5	19054.0				78465.5	1.80
		23775.5	0.5	11887.8		
402.0	28497.0				90353.3	2.07
		32710.0	2.0	65420.0		
404.0	36923.0				155773.3	3.58
		40940.0	2.0	81880.0		
406.0	44957.0				237653.3	5.46
		50826.5	2.0	101653.0		
408.0	56696.0				339306.3	7.79
		58360.0	1.0	58360.0		
409.0	60024.0				397666.3	9.13
					#VALUE!	#VALUE!

LOIEDERMAN SOLTESZ ASSOCIATES, INC
2 Research Pl, Suite 100
Rockville, MD 20850
(301) 948-2750

PROJECT NAME: Washingtonian North SWM Pond
LSA PROJECT NO.: 1184-00-01

Prepared By: YMT
Checked By: AXQ
Date: 01/29/13

Plan Scale:

Main Cell Above Perm. Pool

Elevation (msl)	Area (sq. ft.)	Average Area (sq. ft.)	Depth (ft.)	Incremental Volume (cu. ft.)	Cumulative Volume (cu. ft.)	Cumulative Volume (ac. ft.)
402.0	28497.0				0.0	0.00
		30603.5	1.0	30603.5		
403.0	32710.0				30603.5	0.70
		34816.5	1.0	34816.5		
404.0	36923.0				65420.0	1.50
		38931.5	1.0	38931.5		
405.0	40940.0				104351.5	2.40
		42948.5	1.0	42948.5		
406.0	44957.0				147300.0	3.38
		45749.5	0.5	22874.8		
406.5	46542.0				170174.8	3.91
		47341.5	0.5	23670.8		
407.0	48141.0				193845.5	4.45
		48952.0	0.5	24476.0		
407.5	49763.0				218321.5	5.01
		53229.5	0.5	26614.8		
408.0	56696.0				244936.3	5.62
		57524.5	0.5	28762.3		
408.5	58353.0				273698.5	6.28
		59188.5	0.5	29594.3		
409.0	60024.0				303292.8	6.96

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2 Research Pl, Suite 100
Rockville, Maryland 20850
301-948-2750
Fax 301-948-9067

Date: 4/3/2013 Revised Date: _____ Sheet 1 of 2
Project Name: Washingtonian North - Pond
Project No.: 1184-00-01
Prepared By: YMT Checked: AXQ

Stage - Discharge Equations - SWM POND

Riser

Low Flow Orifice

Q=CxAx(2gh)^1/2
C= 0.6
D (in)= 5.75
Inv.= 402.0
Area(sf)= 0.18
h=WSEL - (inv.+ D/2)

Low Weir

Low Weir as Weir

Q=CxL1x(H)^3/2
C= 3.1
L1(ft)= 37.8
Inv.= 406.5
H=(WSEL - Inv.)

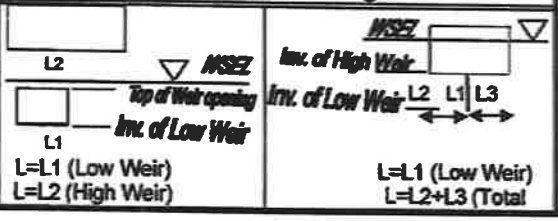
Low Weir as Orifice

Top of opening = 406.5
h=WSEL-(Inv.+(Top of opening - Inv.)/2)
Q=CxAx(2gh)^1/2
C= 0.6
Area= 80.00

High Stage Weir

Q=CxLx(H)^3/2
C=
L2+L3(ft)=
Inv.=
H=(WSEL - Inv.)
L=

Schematic of Low and High weir



L=L1 (Low Weir)
L=L2 (High Weir)

L=L1 (Low Weir)
L=L2+L3 (Total

Barrel

D (in)= 54 L(ft)= 68

Inlet Control

Q=Nomograph

Inv. in = 393.23

HW=(WSEL - Inv.in)
HW/D

Outlet Control

Q=A(((2gxh)/(1+Km+kpxL))^1/2)

Inv. out = 392.28
Area(sf)= 15.90
Km= 0.5
Kp= 0.00421
h=(WSEL - Inv.out+D/2)

Emergency Spillway

Width= 20
Inv.= 407.50

H=(WSEL-Inv.)

Q shall be taken from table 14 of the Maryland Standard and Specifications for Soil Erosion and Sediment Control (page C-10-17)

NOTES:

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LOIEDERMAN SOLTESZ ASSOCIATES
2 Research Pl, Suite 100
Rockville, Maryland 20850
301-948-2750
Fax 301-948-9067

Date: 4/3/2013 Revised Date: _____ Sheet 2 of 2
Project Name: Washingtonian North - Pond
Project No.: 1184-00-01
Prepared By: YMT Checked: AXQ

Stage - Discharge Tabulation - SWM POND

Water Surface Elevation	Riser: Low Flow Orifice		Riser: Weir							Total Q Riser	Barrel					Riser or Barrel Control	Emergency Spillway		Total Q
	D (in)= 5.75		Low Weir: L (ft)= 37.75			Low Weir as Orif.: Inv.= 406.50		Weir: L (ft)=			D (in)= 54	L(ft)= 68			I or O		W(ft)= 20		
	Inv.= 402.00		Inv.= 406.50		as	Top elev 406.50		Inv.=			Inlet Control: Inv. in = 393.23		Outlet Control: Inv. Out= 392.28				Inv.= 407.50		
	h	Q1	H	Q2	O	H	Q2	H	Q3	Qr	HW/D	Q4	h	Q4	Ctr.	Qc	H	Q5	(Qc+Q5)
(ft.)	(ft.)	(cfs)	(ft.)	(cfs)				(ft.)	(cfs)	(cfs)	(ft)	(cfs)	(ft)	(cfs)		(cfs)	(ft.)	(cfs)	(cfs)
402.00	0.00	0.00																	0.00
403.00	0.76	0.76								0.76						0.76			0.76
404.00	1.76	1.15								1.15						1.15			1.15
405.00	2.76	1.44								1.44						1.44			1.44
406.00	3.76	1.68								1.68						1.68			1.68
406.50	4.26	1.79	0.00	0.00		0.00	0.00			1.79						1.79			1.79
407.00	4.76	1.89	0.50	41.37		0.50	272.38			43.27	11.52	259.92	12.10	332.18	I	43.27			43.27
407.50	5.26	1.99	1.00	117.03		1.00	385.20			119.02	12.02	265.50	12.60	338.98	I	119.02			119.02
408.00	5.76	2.08	1.50	214.99		1.50	471.77			217.07	12.52	270.96	13.10	345.64	I	217.07	0.50	14.00	231.07
408.50	6.26	2.17	2.00	331.00		2.00	544.75			333.17	13.02	276.32	13.60	352.17	I	276.32	1.00	47.00	323.32
409.00	6.76	2.26	2.50	462.58		2.50	609.05			464.84	13.52	281.58	14.10	358.59	I	281.58	1.50	92.00	373.58

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LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, Maryland 20850
301-948-2750
Fax 301-948-9067

Date: 4/3/2013 Revised Date: _____ Sheet ____ of ____
Project Name: Washingtonian North - Pond
Project No.: 1184-00-01
Prepared By: YMT Checked: AXQ

TR- 20 input

Water Surface Elevation (ft.)	Total Discharge Q (cfs)	Cumulative Volume (ac.ft.)	Remarks
402.00	0.00	0.00	
403.00	0.76	0.70	
404.00	1.15	1.50	
405.00	1.44	2.40	
406.00	1.68	3.38	
406.50	1.79	3.91	
407.00	43.27	4.45	
407.50	119.02	5.01	
408.00	231.07	5.62	
408.50	323.32	6.28	
409.00	373.58	6.96	
		0.00	
		0.00	

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W
8

Muddy Branch Watershed USE I/I-P

Name of printed page file:
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STORM 1 year

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
area 1	0.047		1.527		12.05	61.93	1317.71
Reach 1	0.047	Upstream	1.527		12.05	61.93	1317.71
Reach 1	0.047	Downstream	1.037	405.49	16.60	1.56	33.14
OUTLET	0.047		1.037		16.60	1.56	33.14

STORM 2 year

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
area 1	0.047		2.205		12.04	81.38	1731.41
Reach 1	0.047	Upstream	2.205		12.04	81.38	1731.41
Reach 1	0.047	Downstream	1.705	406.51	15.42	2.55	54.30
OUTLET	0.047		1.705		15.42	2.55	54.30

STORM 10 year

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
area 1	0.047		4.030		12.04	142.88	3040.10
Reach 1	0.047	Upstream	4.030		12.04	142.88	3040.10
Reach 1	0.047	Downstream	3.491	407.23	12.19	77.50	1648.83
OUTLET	0.047		3.491		12.19	77.50	1648.83

STORM 100 year

Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Peak Flow Elevation (ft)	Peak Flow Time (hr)	Peak Flow Rate (cfs)	Peak Flow Rate (csm)
area 1	0.047		6.099		12.04	210.09	4469.94
Reach 1	0.047	Upstream	6.099		12.04	210.09	4469.94
Reach 1	0.047	Downstream	5.544	407.78	12.10	182.32	3879.23
OUTLET	0.047		5.544		12.10	182.32	3879.23

WASHINGTONIAN NORTH LOT 4
PRELIMINARY STORMWATER MANAGEMENT PLAN

To verify compliance with the intent of ESD design, we offer the following (please note that tables referenced are from the 2009 Maryland Stormwater Management Design Manual):

Natural Resource Protection and Enhancement
Site and resource mapping indicate minor natural resources located onsite as listed in Table 5.1.

- One specimen tree American Sycamore (Platanus occidentalis) was located onsite +/-100 feet from the southwest boundary of the property. Proposed development will be done under supervision of certified Arborist to protect the tree.
- Please refer to the attached NRI/FSD for additional information.

Therefore, natural resources will be protected and preserved to like existing conditions to the MEP.

Soil Types Include:
16D Brinklow-Blocktown channery Silt Loams, 15 to 25 percent slopes. Hydrologic Soil Group "B"
54A Hatboro Silt loam, 0 to 3 percent slopes. Hydrologic Soil Group "D"
66UB Wheaton-Urban land complex, 0 to 8 percent slopes. Hydrologic Soil Group "B"
66UC Wheaton-Urban land complex, 8 to 15 percent slopes. Hydrologic Soil Group "B"

See appendix for the full web soil survey.

Implementation of ESD Planning Techniques

The following techniques in Table 5.2 were used; all others are not applicable. These items include: parking lot runoff, rooftop runoff, and clearing & grading. Parking lot runoff will be directed to planter box bioretention or other stormwater practices within landscaped areas. Rooftop runoff shall be directed to proposed ESD facilities for treatment. Clearing and grading has been limited by the required needs for the proposed development mostly within existing developed areas. Therefore, implementation of ESD planning techniques has been explored and will be used to the MEP.

This package includes drainage area map, stormwater management concept plan and details, and supporting ESD computations for your review.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXQ

Ultimate ESD Summary Table

Overall Site Target

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target P.E (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
LOD	374,451	151,185	40%	0%	96%	0%	4%	1.8	2.0	0.41	23,218	26,315	3,097	66	See ESD Practices Below	Site Compliance
				1.8	1.8 in	1.8 in	1.8 in					(Provided ESDv Below)				
					(Individual Target Pe)											

Total Site Target Composite RCN for "Woods in Good Cond." = 56
Total Site Reduced Composite RCN for "Woods in Good Cond." = 56

Phase 1 Individual Facility Summary

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target P.E (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
1	19,965	17,559	88%	0%	100%	0%	0%	2.4	2.5	0.84	3,360	3,539	178	55	Planter Box	
2	19,961	17,508	88%	0%	100%	0%	0%	2.4	2.6	0.84	3,351	3,610	259	55	Planter Box	
3	20,361	14,837	73%	0%	100%	0%	0%	2.2	1.8	0.71	2,635	2,197	0	62	Planter Box	
4	19,997	17,886	89%	0%	100%	0%	0%	2.4	2.6	0.85	3,419	3,704	285	55	Planter Box	
5	7,077	3,428	48%	0%	100%	0%	0%	1.8	2.3	0.49	516	650	134	55	Planter Box	
6	15,561	8,272	53%	0%	100%	0%	0%	1.8	1.9	0.53	1,233	1,284	50	55	Micro Bioretention	
7	17,604	13,530	77%	0%	100%	0%	0%	2.2	2.2	0.74	2,394	2,358	0	59	Planter Box	
8	17,923	11,821	66%	0%	100%	0%	0%	2.2	2.2	0.66	2,109	2,153	43	55	Micro Bioretention	
9	19,305	16,224	84%	0%	97%	0%	3%	2.2	2.3	0.81	2,838	3,012	174	58	Planter Box	
10	15,139	12,387	82%	0%	76%	0%	24%	2.1	2.1	0.79	2,087	2,125	38	65	Planter Box	
11	6,535	4,696	72%	0%	100%	0%	0%	2.2	2.4	0.70	835	922	86	55	Planter Box	
12	2,652	1,463	55%	0%	100%	0%	0%	1.8	2.2	0.55	217	260	43	55	Planter Box	
13	10,974	5,779	53%	0%	100%	0%	0%	1.8	1.1	0.52	862	504	0	70	Planter Box	
TOTALS	192,454 sqft	146,392 sqft										26,315 cu-ft				

RELATED REQUIRED PERMITS

IT IS THE RESPONSIBILTY OF PERMITTEE/OWNER OF THIS SITE TO OBTAIN ALL REQUIRED PERMITS PRIOR TO ISSUANCE OF THE APPROVED SEDIMENT CONTROL PERMIT

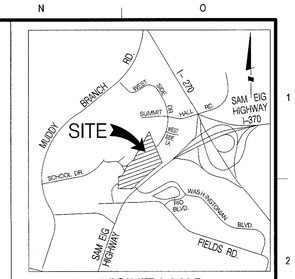
TYPE OF PERMIT	REQ'D	NOT REQ'D	PERMIT NO.	EXPIRATION DATE	WORK RESTRICTION DATES
MDE WATERWAY		X			
MDE DAM SAFETY		X			
M.C.D.P.E. FLOODPLAIN DISTRICT		X			
CORPS OF ENGINEERS WETLANDS(					
a. CORPS OF ENGINEERS		X			
b. M.D.E. NONTIDAL		X			
C. M.D.E. EATER QUALITY CERT		X			
OTHERS (PLEASE LIST)					

MAINTENANCE CERTIFICATION ON PRIVATE LANDS

I/WE HEREBY CERTIFY THAT I/WE ASSUME MAINTENANCE RESPONSIBILITIES FOR ALL STORMWATER MANAGEMENT STRUCTURES SHOWN HEREON. IF MAINTENANCE RESPONSIBILITY IS LEGALLY TRANSFERRED, I/WE AGREE TO SUPPLY THE CITY OF GAITHERSBURG WITH A COPY OF THE DOCUMENT (SIGNED BY BOTH PARTIES) TRANSFERRING SAID MAINTENANCE RESPONSIBILITY AT THAT TIME.

OWNER/DEVELOPER _____ DATE _____
PRINTED NAME _____ TITLE _____

LOCATION MAP
SCALE: 1" = 100'



VICINITY MAP
SCALE : 1" = 2,000'

SHEET INDEX

1. COVER SHEET
2. STORMWATER MANAGEMENT DRAINAGE AREA MAP
3. PRELIMINARY STORMWATER MANAGEMENT PLAN
4. PRELIMINARY STORMWATER MANAGEMENT TYPICAL DETAILS
5. PRELIMINARY STORM DRAIN PROFILES
6. PRELIMINARY STORM DRAIN PROFILES
7. SEDIMENT CONTROL DRAINAGE AREA MAP
8. PRELIMINARY SEDIMENT CONTROL PLAN
9. PRELIMINARY SEDIMENT CONTROL NOTES & DETAILS
10. PRELIMINARY SEDIMENT CONTROL NOTES & DETAILS
11. PRELIMINARY SEDIMENT CONTROL SEQUENCE OF CONSTRUCTION

NOTE:
THIS LOT, INCLUDED 8-STORY OFFICE BUILDING AND 2 1/2 LEVEL PARKING GARAGE, MAY NOT BE BUILT IN YEARS.
IT DEPENDS ON THE MARKET DEMAND AND ECONOMIC CONDITIONS.

SDP-3878-2013
Exhibit #34

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3387-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3384-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

CERTIFICATION OF THE QUANTITIES

I HEREBY CERTIFY THAT THE ESTIMATED TOTAL AMOUNT OF EXCAVATION AND FILL AS SHOWN ON THESE PLANS HAS BEEN COMPUTED TO BE XXXXXX CUBIC YARDS OF EXCAVATION AND XXXXXX CUBIC YARDS OF FILL AND THE TOTAL AREA TO BE DISTURBED AS SHOWN ON THESE PLANS HAS BEEN DETERMINED TO BE XXXXXX SQ.FT.

SIGNATURE _____ DATE _____
PRINTED NAME AND TITLE _____ REGISTRATION NUMBER _____

DESIGN CERTIFICATION AND QUANTITIES

I HEREBY CERTIFY THAT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION, BELIEF, THAT THIS PLAN HAS BEEN PREPARED WITH THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL," CITY OF GAITHERSBURG CHAPTER 8 AND MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION "STORM DRAIN DESIGN CRITERIA" DATED AUGUST 1988.

SIGNATURE _____ DATE _____
PRINTED NAME AND TITLE _____ REGISTRATION NUMBER _____

OWNER/ DEVELOPER'S CERTIFICATE

I HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION AND /OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A STATE OF MARYLAND DEPARTMENT OF NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION, BEFORE BEGINNING THE PROJECT.

SIGNATURE _____ DATE _____
PRINTED NAME AND TITLE _____ REGISTRATION NUMBER _____

100 50 0 100 200
GRAPHIC SCALE: 1" = 100'

THIS PLAN IS FOR THE MAINTENANCE AND CONSTRUCTION OF SEDIMENT CONTROL AND STORMWATER MANAGEMENT MEASURES ONLY.

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. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND AMY X. QUANG No. 36060 PROFESSIONAL ENGINEER
1/10/14

COVER SHEET

PRELIMINARY STORMWATER MANAGEMENT PLAN
WASHINGTONIAN NORTH
PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN
SHEET 1 OF 11
PROJECT NO. 1184-00-01

SOLTESZ
Engineering
Planning
Environmental Sciences
Rockville
Lanham
Waldorf
Leonardtown
ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
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NO.	REVISIONS	BY	DATE

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MISS UTILITY NOTE
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OWNER/DEVELOPER/APPLICANT
WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0947
CONTACT: MR. JAKE STROMAN

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MAP 5153 GRID G-H 1&2
TAX MAP FS342 & 343 ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83

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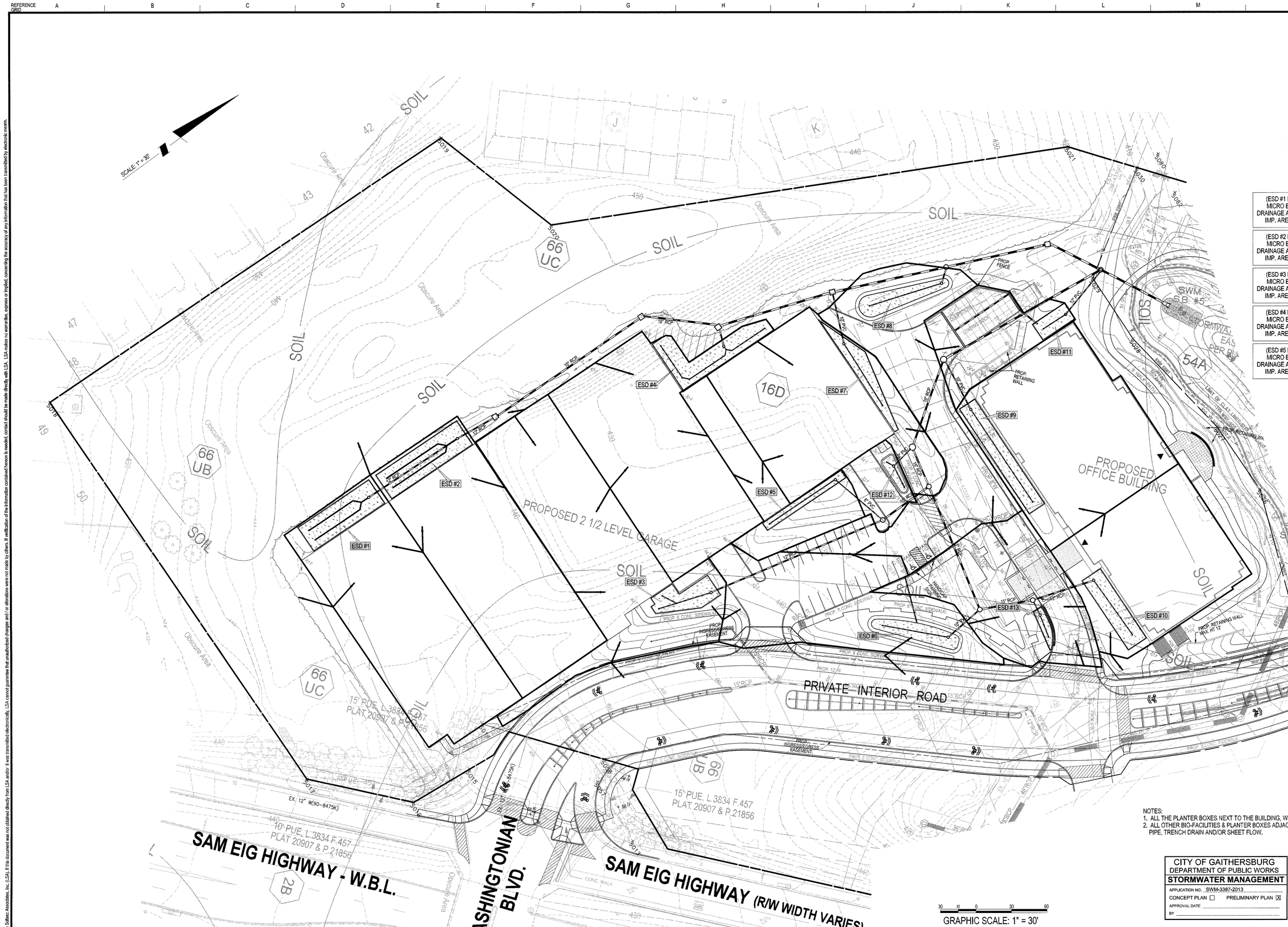

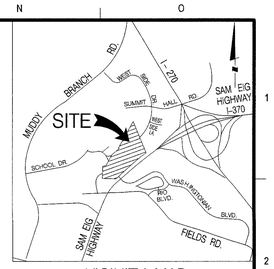

VICINITY MAP
SCALE : 1" = 2,000'

(ESD #1 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,965 sq.ft. IMP. AREA = 17,559 sq.ft.	(ESD # 6) MICRO BIORETENTION DRAINAGE AREA = 8,338 sq.ft. IMP. AREA = 1,192 sq.ft.
(ESD #2 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,961 sq.ft. IMP. AREA = 17,508 sq.ft.	(ESD #7 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 17,198 sq.ft. IMP. AREA = 13,528 sq.ft.
(ESD #3 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 20,088 sq.ft. IMP. AREA = 14,837 sq.ft.	(ESD # 8) MICRO BIORETENTION DRAINAGE AREA = 12,819 sq.ft. IMP. AREA = 8,394 sq.ft.
(ESD #4 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,997 sq.ft. IMP. AREA = 17,886 sq.ft.	(ESD #9 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,305 sq.ft. IMP. AREA = 16,224 sq.ft.
(ESD #5 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 17,465 sq.ft. IMP. AREA = 11,665 sq.ft.	(ESD #10 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 15,139 sq.ft. IMP. AREA = 12,387 sq.ft.
	(ESD #11 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 7,921 sq.ft. IMP. AREA = 5,062 sq.ft.
	(ESD #12 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 6,353 sq.ft. IMP. AREA = 4,999 sq.ft.
	(ESD #13 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 8,088 sq.ft. IMP. AREA = 4,643 sq.ft.

NOTES:
1. ALL THE PLANTER BOXES NEXT TO THE BUILDING, WILL RECEIVE WATER VIA DOWN SPOUTS.
2. ALL OTHER BIO-FACILITIES & PLANTER BOXES ADJACENT TO CURB, WILL RECEIVEWATER VIA PIPE, TRENCH DRAIN AND/OR SHEET FLOW.

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS STORMWATER MANAGEMENT	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS SEDIMENT EROSION CONTROL
APPLICATION NO. SWM-3387-2013	APPLICATION NO. SEC-3384-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

THIS PLAN IS FOR THE MAINTENANCE AND CONSTRUCTION OF SEDIMENT CONTROL AND STORMWATER MANAGEMENT MEASURES ONLY.

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. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND AMY X. QUANTY No. 36060 PROFESSIONAL ENGINEER
1/10/14

STORMWATER MANAGEMENT DRAINAGE AREA MAP

PRELIMINARY STORMWATER MANAGEMENT PLAN
WASHINGTONIAN NORTH
PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

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Engineering
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ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
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WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP	GRID
5163	G-14,15,2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD

WSSC 200' SHEET: 221NW 10, 222NW 10

SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

1" = 30'

SHEET 2 OF 11

PROJECT NO. 1184-00-01

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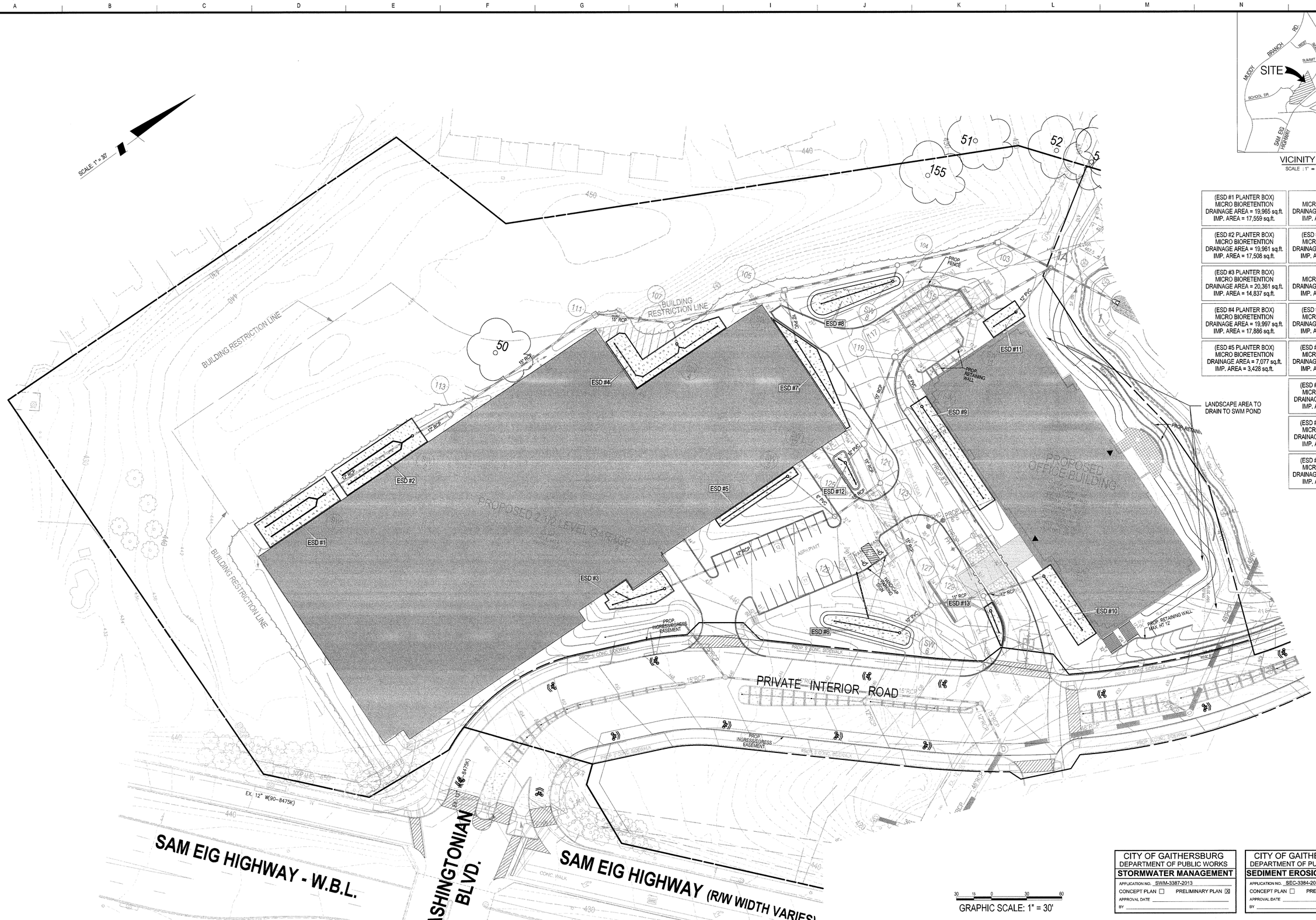

VICINITY MAP

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(ESD #3 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 20,361 sq.ft. IMP. AREA = 14,837 sq.ft.	(ESD # 8) MICRO BIORETENTION DRAINAGE AREA = 17,323 sq.ft. IMP. AREA = 11,821 sq.ft.
(ESD #4 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,997 sq.ft. IMP. AREA = 17,886 sq.ft.	(ESD #9 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,305 sq.ft. IMP. AREA = 16,224 sq.ft.
(ESD #5 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 7,077 sq.ft. IMP. AREA = 3,428 sq.ft.	(ESD #10 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 15,139 sq.ft. IMP. AREA = 12,387 sq.ft.
	(ESD #11 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 6,535 sq.ft. IMP. AREA = 4,698 sq.ft.
	(ESD #12 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 2,652 sq.ft. IMP. AREA = 1,463 sq.ft.
	(ESD #13 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 10,974 sq.ft. IMP. AREA = 5,779 sq.ft.

GRAPHIC SCALE: 1" = 30'

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **STORMWATER MANAGEMENT**	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3387-2013	APPLICATION NO. SEC-3384-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
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LICENSE NO. 36060 EXPIRATION DATE: 06/25/2014

STATE OF MARYLAND — AMY X. QUANTY — No. 36060 — PROFESSIONAL ENGINEER

11/01/14

PRELIMINARY STORMWATER MANAGEMENT PLAN

PRELIMINARY STORMWATER MANAGEMENT PLAN
WASHINGTONIAN NORTH

PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856

GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = 30'

SHEET 3 OF 11

PROJECT NO. 1184-00-01

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CONTACT: MR. JAKE STROMAN

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PERMITTED USE NUMBER 21001230

MAP	GRID
5183	G,H,1&2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD

WSSC 200' SHEET
221NW 10 222NW 10

SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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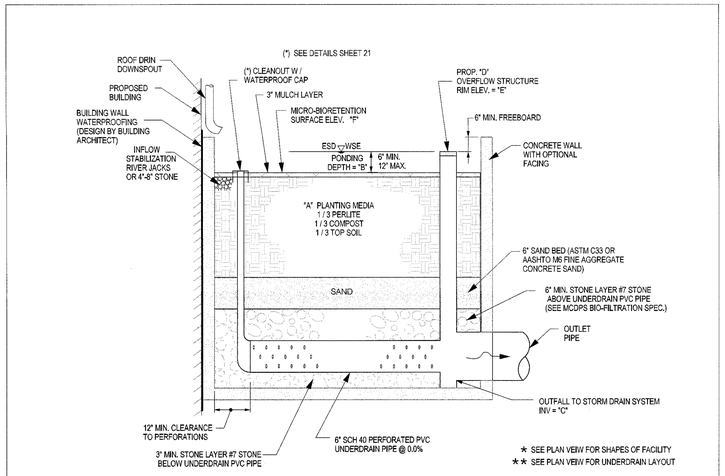
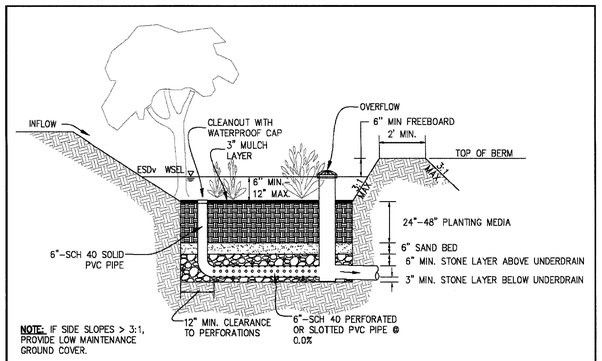


PLANTER BOX MICRO-BIORETENTION TYPICAL SECTION

N.T.S.

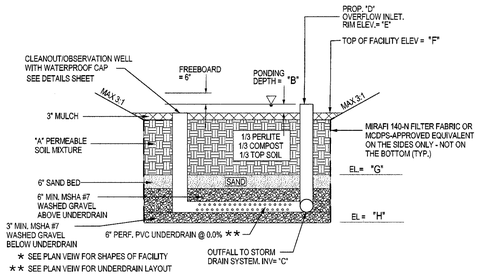
NOTE: 1. FOR PLANTER BOX WALL DETAILS, SEE STRUCTURAL PLAN.
2. FINAL RECOMMENDATION FOR IMPERVIOUS LINER AND ADDITIONAL UNDERDRAIN GRAVEL TO BE DETERMINED BY ONSITE GEOTECHNIAL ENGINEER BASED ON FIELD SOIL CONDTIONS.



NOTE: IF SIDE SLOPES > 3:1, PROVIDE LOW MAINTENANCE GROUND COVER.

MICRO-BIORETENTION TYPICAL CROSS SECTION

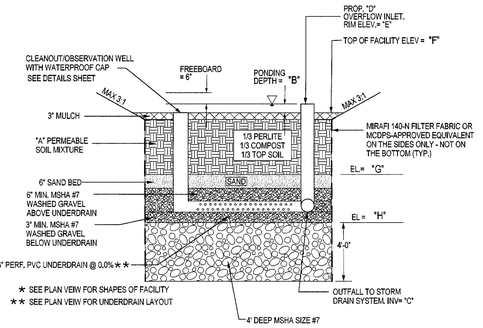
NTS



TYPICAL SECTION THROUGH MICRO-BIORETENTION FACILITY *

N. T. S.

NOTE: FINAL RECOMMENDATION FOR IMPERVIOUS LINER AND ADDITIONAL UNDERDRAIN GRAVEL TO BE DETERMINED BY ONSITE GEOTECHNIAL ENGINEER BASED ON FIELD SOIL CONDTIONS.



TYPICAL SECTION THROUGH MICRO-BIORETENTION FACILITY WITH RECHARGE LAYER *

N. T. S.

NOTE: FINAL RECOMMENDATION FOR IMPERVIOUS LINER AND ADDITIONAL UNDERDRAIN GRAVEL TO BE DETERMINED BY ONSITE GEOTECHNIAL ENGINEER BASED ON FIELD SOIL CONDTIONS.

LOCATION	DIMENSION SCHEDULE						SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"		
ESD #1	36"	6"		24"	443.50	443.00	1,685	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #2	36"	6"		24"	443.50	443.00	1,900	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #3	48"	6"		24"	442.50	442.00	985	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #4	36"	6"		24"	434.00	433.50	1,985	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #5	24"	6"		24"	443.50	433.00	500	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #7	48"	6"		24"	429.50	429.00	1,040	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #9	36"	6"		24"	430.50	430.00	1,585	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #10	30"	6"		24"	430.50	430.00	1,250	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #11	36"	6"		24"	417.50	417.00	485	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #12	24"	6"		24"	432.00	431.50	225	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								
ESD #13	48"	6"		24"	430.50	430.00	243	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT								

LOCATION	DIMENSION SCHEDULE								SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"		
ESD #6	42"	6"	0	24"	435.50	435.00	431.25	429.50	850	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #8	42"	6"		24"	420.50	420.00	416.25	414.50	1,025	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										

WASHINGTONIAN NORTH - LOT 4

SUMMARY OF ESD - MICRO-BIORETENTION

ESD BIO#	DRAINAGE AREA (SQ. FT.)	FILTER SURFACE AREA PROVIDED (SQ. FT.)	ESD VOLUME PROVIDED (CU.FT.)	TOP OF FACILITY (FT) (TOP OF MULCH)	PONDING (FT)	DEPTH OF SOIL MEDIA (FT)	BOTTOM OF FACILITY (FT)
1	19,965	1,685	3,202	443.0	0.5	3.0	438.00
2	19,961	1,900	3,610	443.0	0.5	3.0	438.00
3	20,361	985	2,266	442.0	0.5	4.0	437.00
4	19,997	1,985	3,704	433.5	0.5	3.0	428.50
5	7,077	500	745	433.0	0.5	2.0	429.00
6	14,994	850	1,785	435.0	0.5	3.5	429.50
7	17,604	1,040	2,392	429.0	0.5	4.0	423.00
8	17,323	1,025	2,153	420.0	0.5	3.5	414.50
9	19,305	1,585	3,012	430.0	0.5	3.0	425.00
10	15,139	1,250	2,125	430.0	0.5	2.5	425.50
11	6,535	485	922	417.0	0.5	3.0	412.00
12	2,652	225	293	431.5	0.5	2.0	427.50
13	12,419	243	559	430.0	0.5	4.0	424.00
TOTAL	193,332		26,768				

PROFILE SCALE:
HORIZ. 1" = 50'
VERT. 1" = 5'

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3387-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE
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SEDIMENT EROSION CONTROL
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STATE OF MARYLAND · AMY K. GUANT · NO. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY STORMWATER MANAGEMENT TYPICAL DETAILS

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1" = AS SHOWN
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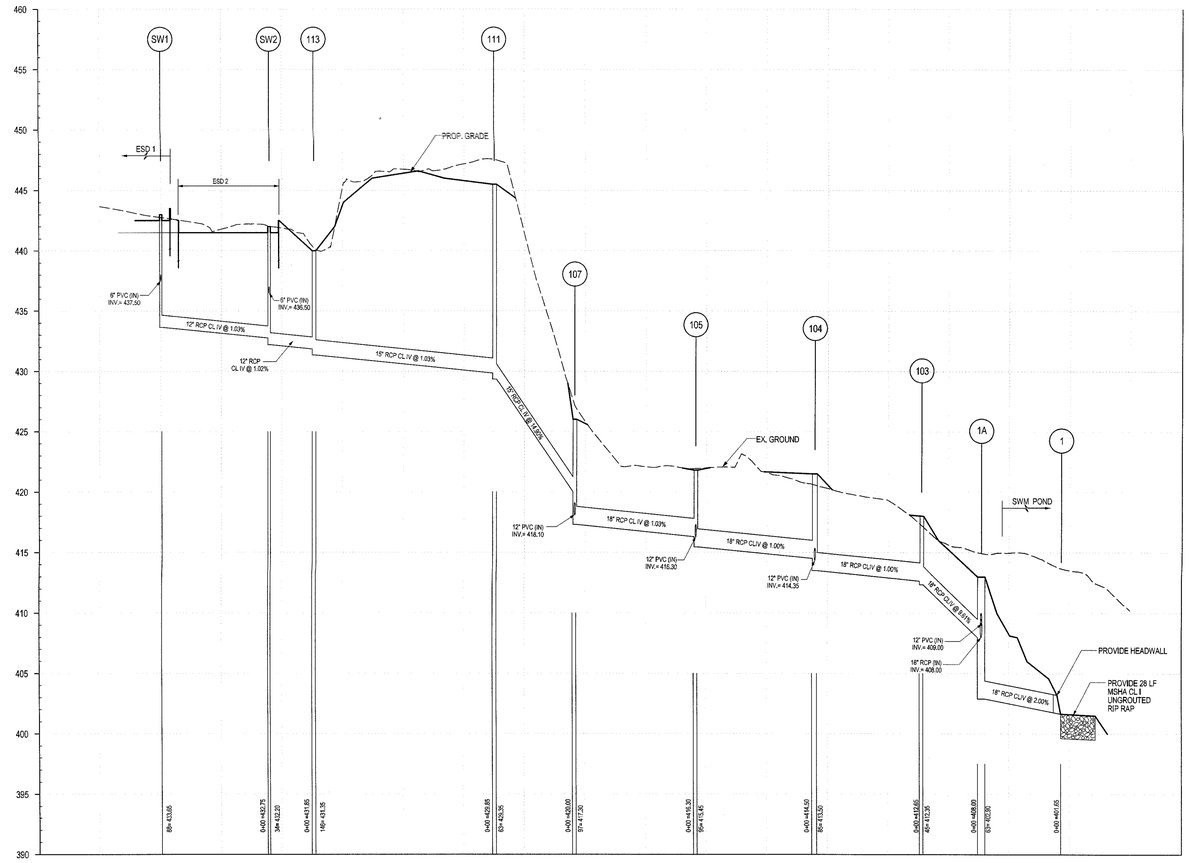
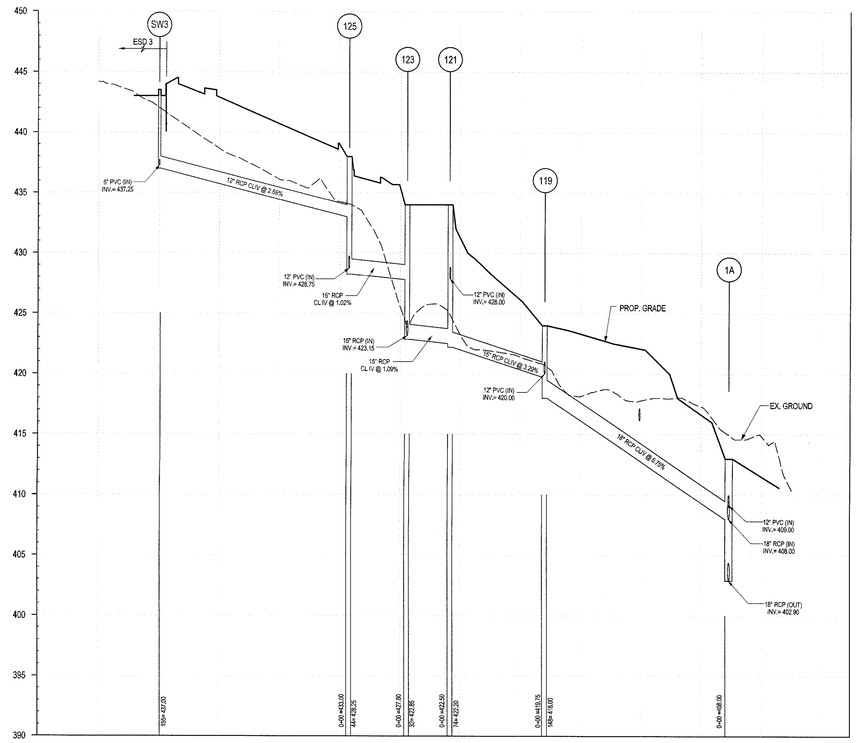
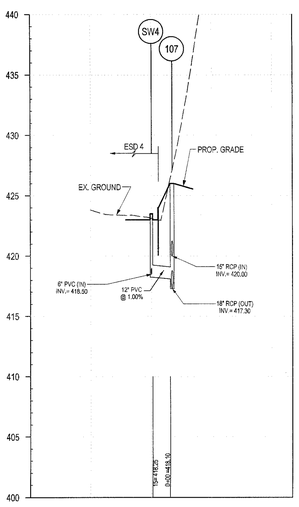
SW1-1



SW3-1A



SW4-107



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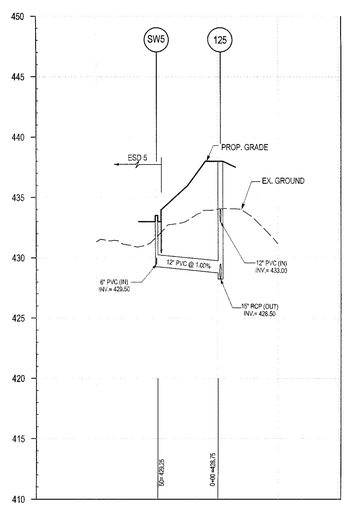

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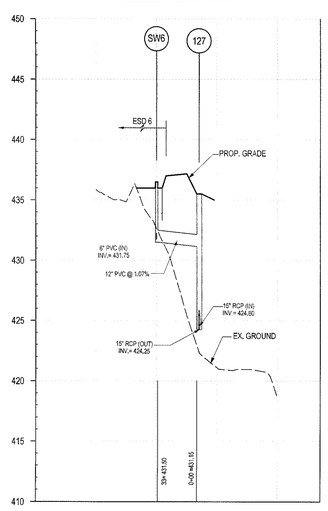

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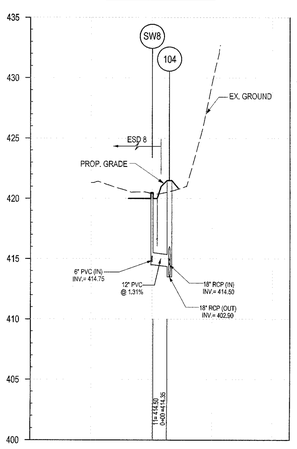

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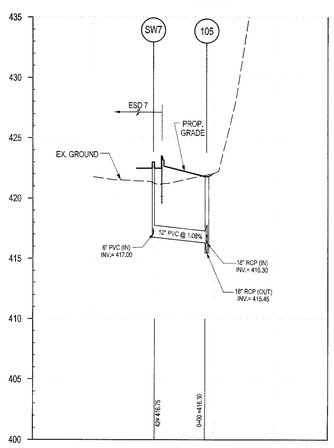

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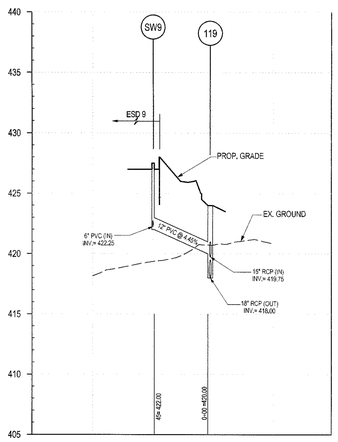

PROFILE SCALE:
HORIZ. 1" = 50'
VERT. 1" = 5'

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS STORMWATER MANAGEMENT	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS SEDIMENT EROSION CONTROL
APPLICATION NO. SWM-3387-2013	APPLICATION NO. SEC-3384-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

THIS PLAN IS FOR THE MAINTENANCE AND CONSTRUCTION OF SEDIMENT CONTROL AND STORMWATER MANAGEMENT MEASURES ONLY.

PROFESSIONAL CERTIFICATION
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LICENSE NO. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · JAMES K. GUANT · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY STORM DRAIN PROFILES

PRELIMINARY STORMWATER MANAGEMENT PLAN
WASHINGTONIAN NORTH
PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 5 OF 11

PROJECT NO. 1184-00-01

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ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
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DATE: JANUARY 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: YMT | TECHNICIAN: YMT | CHECKED: AXQ

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OWNER/DEVELOPER/APPLICANT
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C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP	5163	GRID	G-11&12
TAX MAP	FS342 & 343	ZONING CATEGORY:	MXD
WSSC 200' SHEET	221NW 10 222NW 10		
SITE DATUM			
HORIZONTAL:	NAD 83		
VERTICAL:	NAD 83		

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REFERENCE GRID A B C D E F G H I J K L M N O

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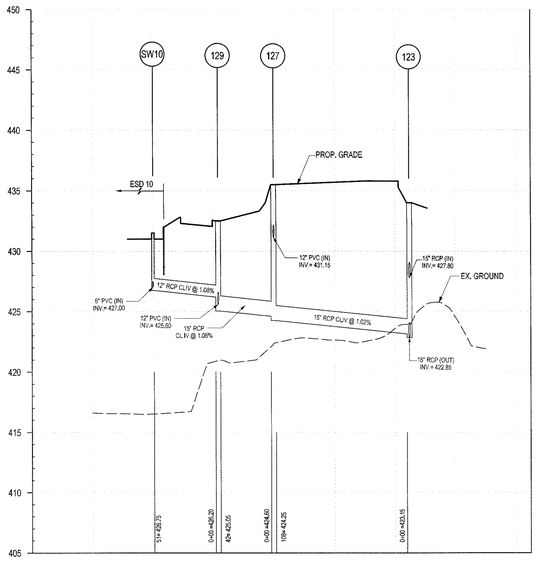

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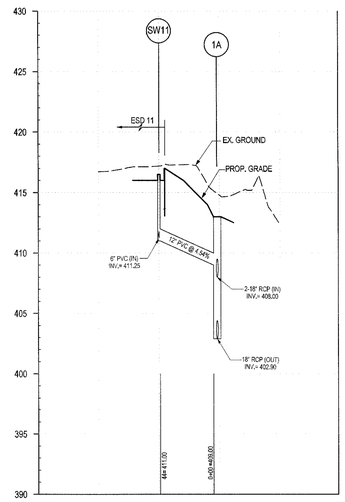

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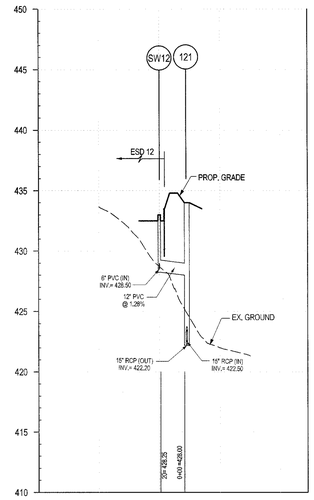

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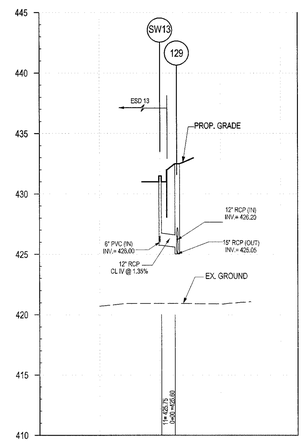

PROFILE SCALE:

HORIZ. 1" = 50'
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CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT	**SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3387-2013	APPLICATION NO. SEC-3384-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
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PRELIMINARY STORM DRAIN PROFILES

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2 Research Place, Suite 100
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MAP 5153 GRID G,H 1&2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD
WSSC 200' SHEET	
221NW 10 222NW 10	

SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

STATE OF MARYLAND
AMY X. QUANG
No. 36060
PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY STORMWATER MANAGEMENT PLAN
WASHINGTONIAN NORTH
PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856

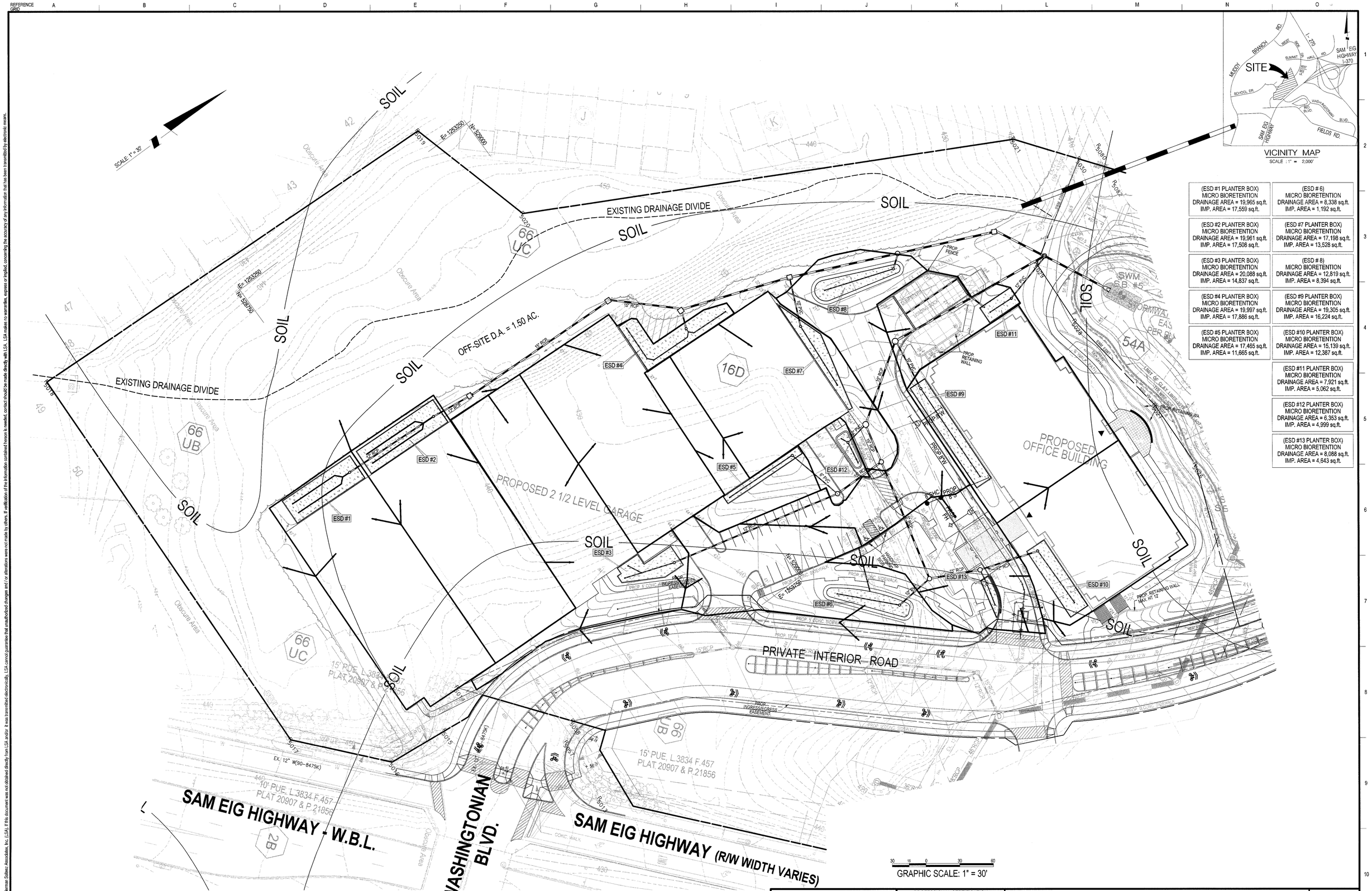
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

DWG. UNIT

1" = AS SHOWN

SHEET 6 OF 11

PROJECT NO. 1184-00-01



VICINITY MAP
SCALE : 1" = 2,000'

(ESD #1 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,965 sq.ft. IMP. AREA = 17,559 sq.ft.	(ESD # 6) MICRO BIORETENTION DRAINAGE AREA = 8,338 sq.ft. IMP. AREA = 1,192 sq.ft.
(ESD #2 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,961 sq.ft. IMP. AREA = 17,508 sq.ft.	(ESD #7 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 17,198 sq.ft. IMP. AREA = 13,528 sq.ft.
(ESD #3 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 20,088 sq.ft. IMP. AREA = 14,837 sq.ft.	(ESD # 8) MICRO BIORETENTION DRAINAGE AREA = 12,819 sq.ft. IMP. AREA = 8,394 sq.ft.
(ESD #4 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,997 sq.ft. IMP. AREA = 17,886 sq.ft.	(ESD #9 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 19,305 sq.ft. IMP. AREA = 16,224 sq.ft.
(ESD #5 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 17,465 sq.ft. IMP. AREA = 11,665 sq.ft.	(ESD #10 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 15,139 sq.ft. IMP. AREA = 12,387 sq.ft.
	(ESD #11 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 7,921 sq.ft. IMP. AREA = 5,062 sq.ft.
	(ESD #12 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 6,353 sq.ft. IMP. AREA = 4,999 sq.ft.
	(ESD #13 PLANTER BOX) MICRO BIORETENTION DRAINAGE AREA = 8,088 sq.ft. IMP. AREA = 4,943 sq.ft.

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DESIGNED: | TECHNICIAN: | CHECKED: AXQ

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DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
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MAP 5153 GRID G,H 1&2
TAX MAP FS342 & 343
ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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STATE OF MARYLAND
AMY X. QUANTY
No. 36060
PROFESSIONAL ENGINEER
1/10/14

SEDIMENT CONTROL DRAINAGE AREA MAP

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

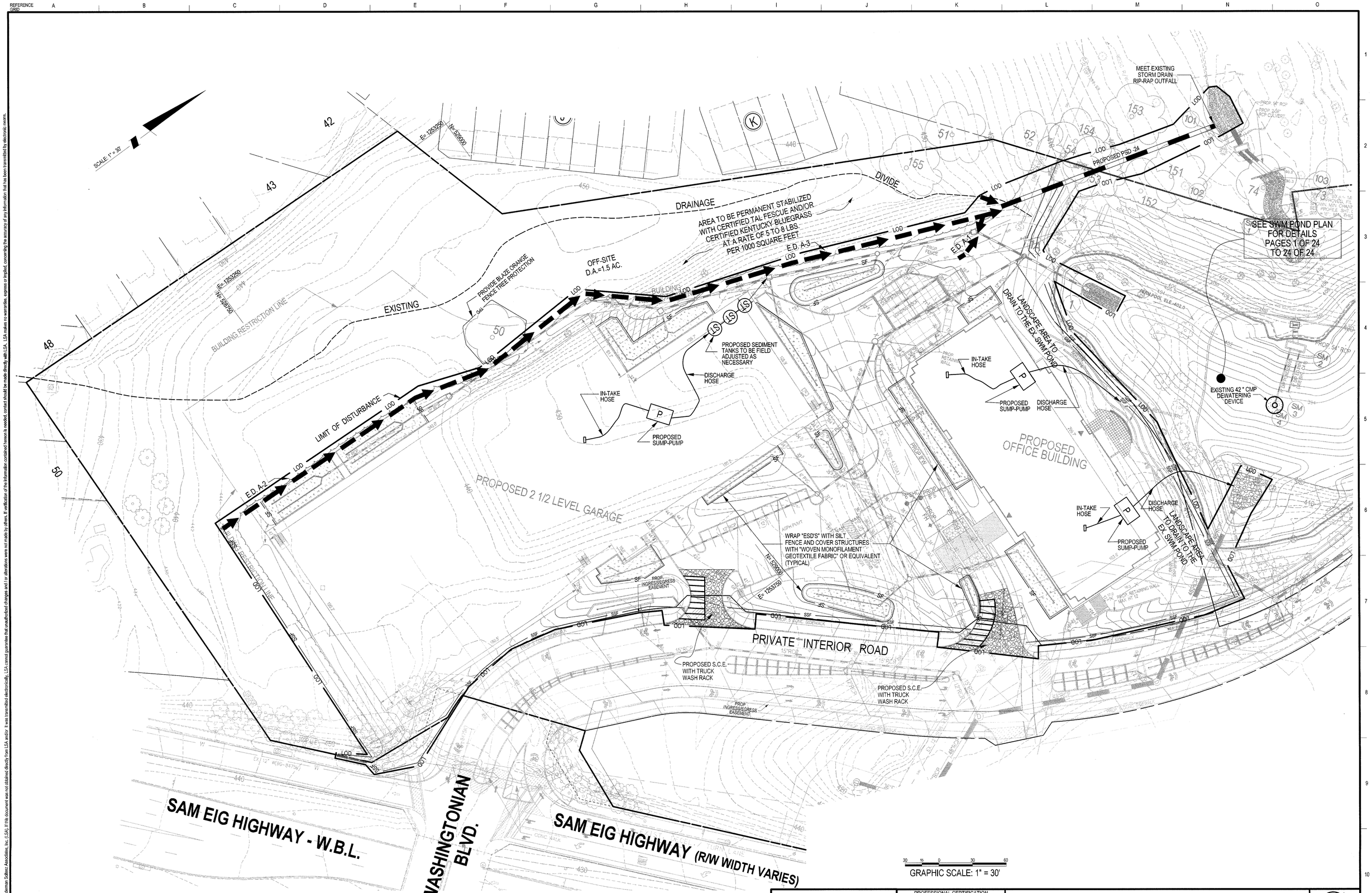
PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856

GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = 30'

SHEET 7 OF 11

PROJECT NO. 1184-00-01



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PRELIMINARY SEDIMENT CONTROL PLAN

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856

GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

CAD INCH
1" = 30'

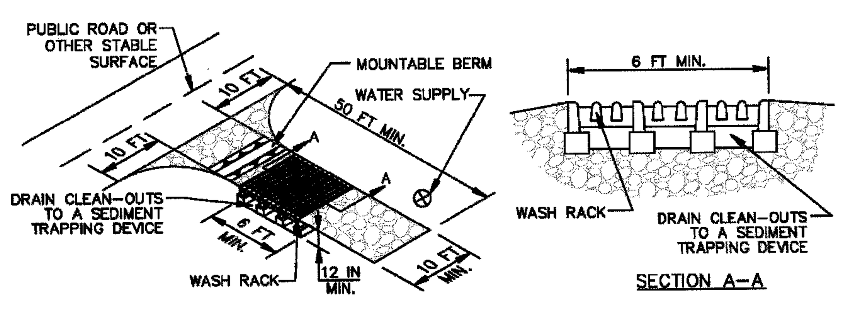
SHEET 8 OF 11

PROJECT NO. 1184-00-01

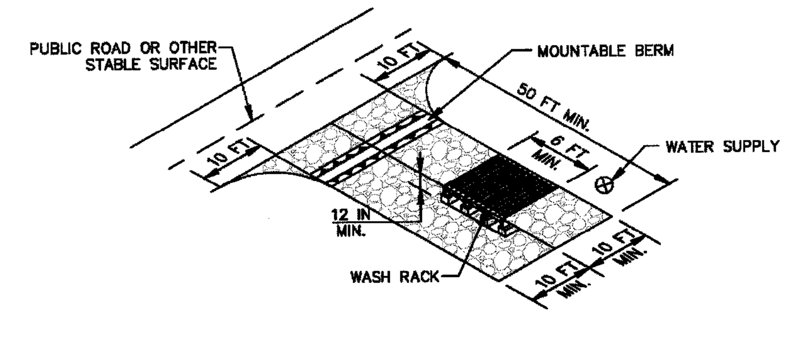
REFERENCE GRID A B C D E F G H I J K L M N O

DETAIL B-2 WASH RACK OPTION

STANDARD SYMBOL WR



ISOMETRIC VIEW – WASH RACK IN SCE



ISOMETRIC VIEW– WASH RACK ALONG SCE

CONSTRUCTION SPECIFICATIONS

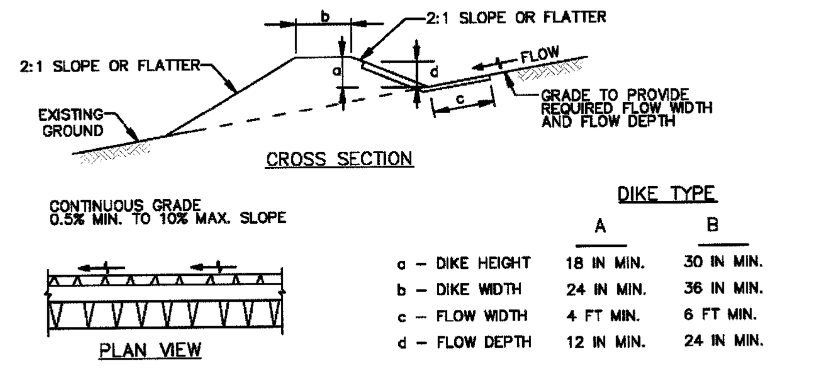
1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET x 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE SCE.
3. DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL A-1 PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE.



DIKE TYPE

	A	B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

A-1	SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2	SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3	4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

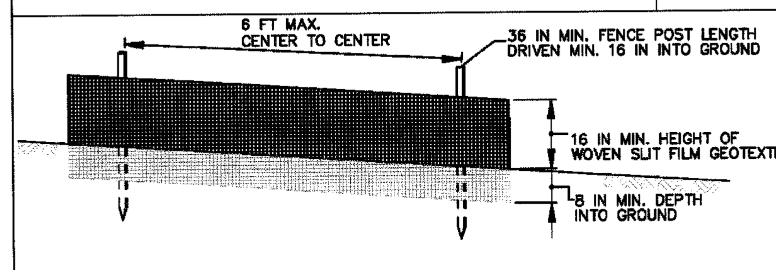
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

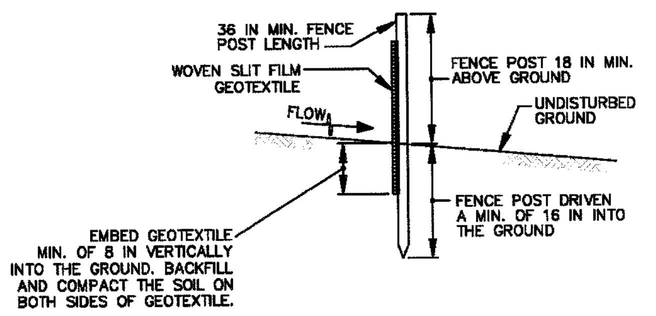
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

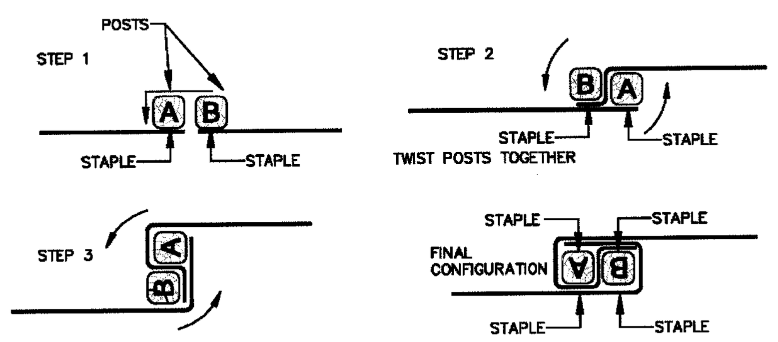
STANDARD SYMBOL —SF—



ELEVATION



CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL —SF—

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

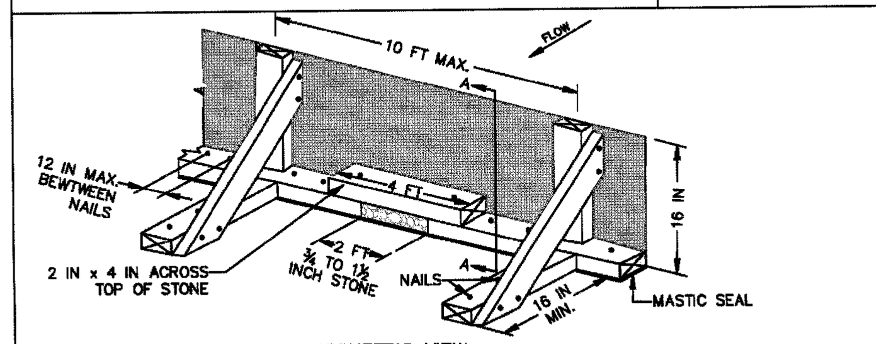
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

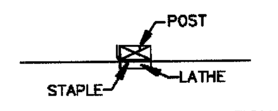
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-2 SILT FENCE ON PAVEMENT

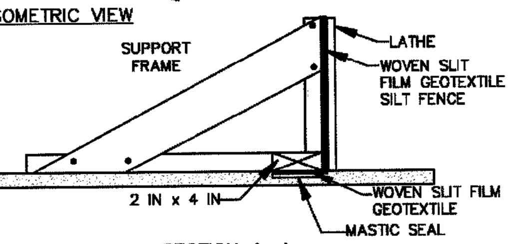
STANDARD SYMBOL —SFOP—



ISOMETRIC VIEW



JOINING ADJACENT SECTIONS OF GEOTEXTILE



SECTION A-A

CONSTRUCTION SPECIFICATIONS

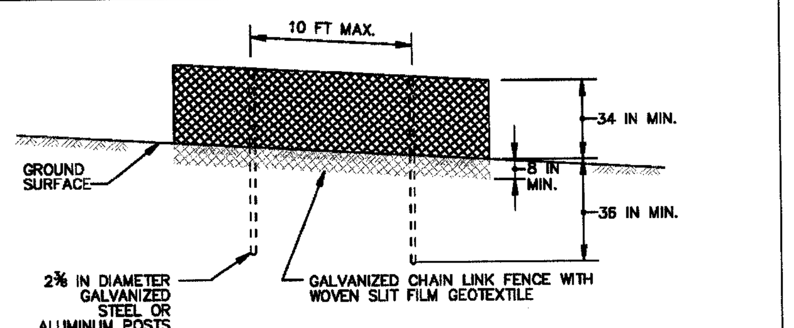
1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. USE WOVEN SLIT FILM GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT-LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 40D 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

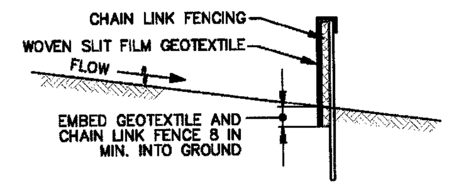
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL —SSF—



ELEVATION



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

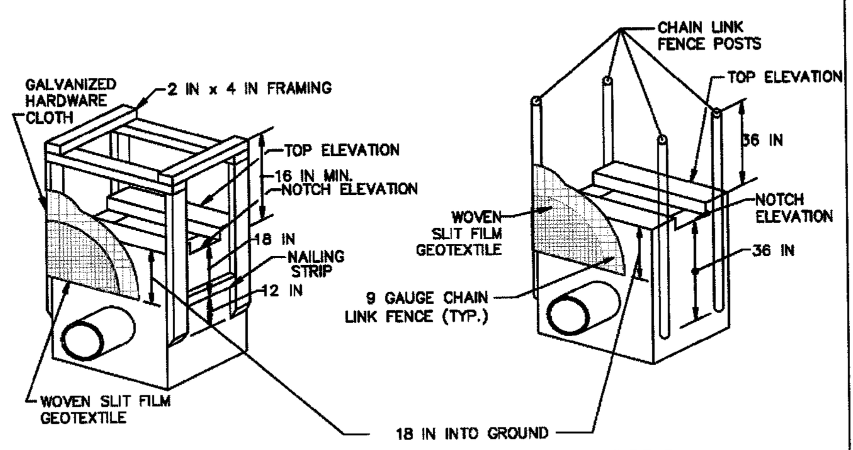
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

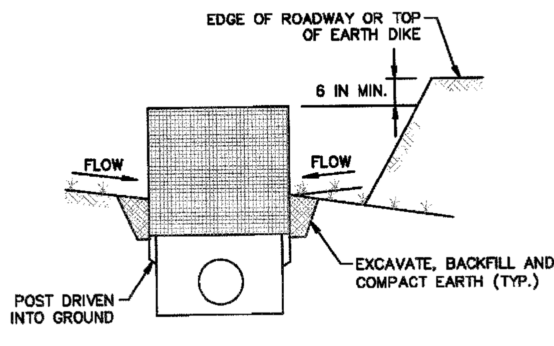
DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL SIP

TYPE A MAXIMUM DRAINAGE AREA = ¼ ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE



ISOMETRIC VIEW



SECTION FOR TYPE A AND B

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

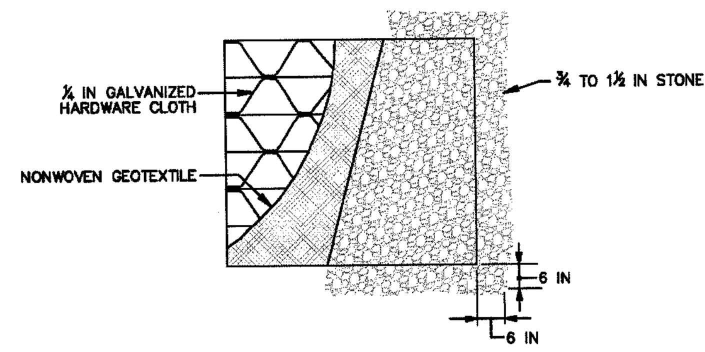
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

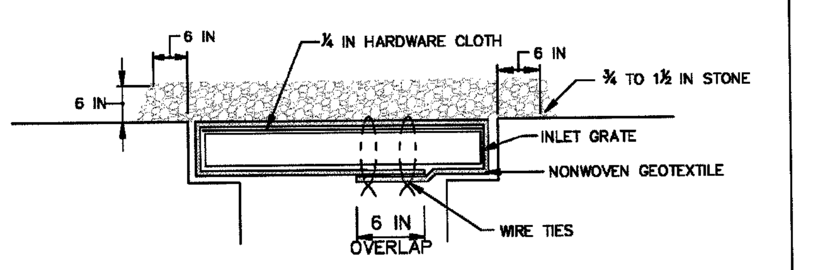
DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



PLAN / CUT AWAY VIEW



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

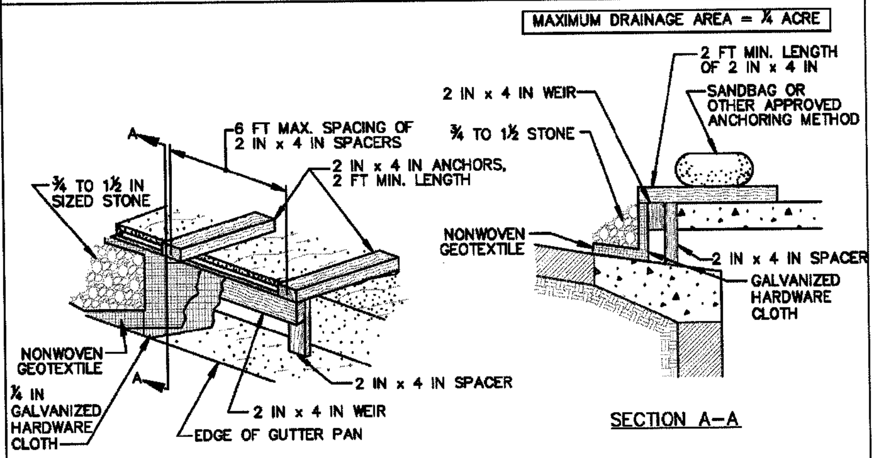
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



ISOMETRIC SECTION A-A

CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON-SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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SOLTESZ
Rockville Lanham Waldorf Leonardtown
Engineering Planning Environmental Sciences
ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 CAD STANDARDS VERSION: V8 - 2000
DESIGNED: TECHNICIAN: CHECKED: AXQ

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND, WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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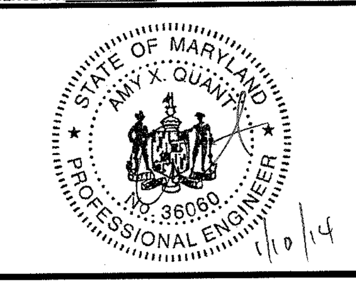
MAP 5163 GRID G,H 1&2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD
WSSC 200' SHEET	
221NW 10 222NW 10	
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83	

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. 36060, EXPIRATION DATE: 06/26/2014



PRELIMINARY SEDIMENT CONTROL NOTES & DETAILS

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856

GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

ONE INCH
1" = AS SHOWN

SHEET 9 OF 11

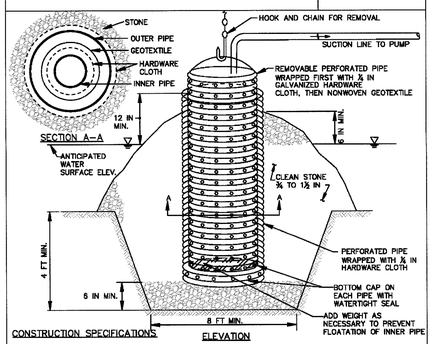
PROJECT NO. 1184-00-01

City of Gaithersburg Department of Public Works
STANDARD EROSION AND SEDIMENT CONTROL NOTES

1. The permittee shall notify the City Inspector at 301-258-6330, 48 hours before commencing any land disturbing activity and shall be required to hold a preconstruction meeting between himself or his representative, and authorized representatives of the City.
2. The permittee must obtain inspection and approval by Planning and Code Enforcement at the following points:
   a. At the required pre-construction meeting.
   b. Following installation of sediment control measures and prior to any other land disturbing activity.
   c. During the installation of a sediment basin or stormwater management structure at the required inspection points (see Inspection Checklist on plan). Notification prior to commencing construction is mandatory.
   d. Prior to removal or modification of any sediment control devices.
   e. Prior to final acceptance.
3. All erosion control measures are to be constructed and maintained in accordance with applicable published standards and specifications and the most current "Maryland Standards and Specifications for Soil Erosion and Sediment Control."
4. The permittee shall construct all erosion and sediment control measures per the approved plan and construction sequence, shall have them inspected and approved by the City Inspector prior to beginning any other land disturbances, shall ensure that all runoff from disturbed areas is directed to the sediment control devices, and shall not remove any erosion or sediment control measures without prior permission from City inspector.
5. Any request for changes to the approved sediment control plan or sequence of construction must be submitted to the Sediment Control Inspector and approved before implementing changes. Major changes will require a plan revision.
6. The permittee shall protect all points of construction ingress and egress to prevent the deposition of materials onto traversed public thoroughfare(s). All materials deposited onto public thoroughfare(s) shall be removed immediately.
7. The permittee shall inspect daily and maintain continuously in effective operating condition all erosion and sediment control measures until such times as they are removed with prior permission from Department of Planning and Code Enforcement.
8. All sediment basins, trap embankments, swales, perimeter dikes and permanent slopes steeper or equal to 3:1 shall be stabilized with sod, seed and anchored straw mulch, or other approved stabilization measures, within three (3) calendar days of establishment. All areas disturbed outside of the perimeter sediment control system must be minimized and stabilized immediately. Maintenance must be performed as necessary to ensure continued stabilization. Restabilization or overseeding will be required, if necessary.
9. The permittee shall apply sod, seed and anchored straw, mulch, or other approved stabilization measures to all disturbed areas within 7 calendar days after stripping and grading activities have ceased on that area. Maintenance shall be performed as necessary to ensure continued stabilization. Active construction areas, such as borrow or stockpile areas, roadway improvements, and areas within 50 feet of a building under construction may be exempted from this requirement, provided that erosion and sediment control measures are installed and maintained to protect those areas.
10. Prior to removal of sediment control measures, the permittee shall stabilize all contributory disturbed areas using sod or an approved permanent seed mixture with required soil amendments and an approved anchored mulch. Wood fiber mulch may only be used in seeding season when the slope does not exceed 10% to promote sheet flow drainage. Areas brought to finished grade during the seeding season shall be permanently stabilized within 7 calendar days of establishment. When property is brought to finished grade during the months of November through February, and permanent stabilization is found to be impractical, an approved temporary seed and straw anchored mulch shall be applied to disturbed areas. The final permanent stabilization of such property shall be completed prior to the following April 15.
11. The site work, materials, aproved SC and SWM plans and any required test reports shall be available at the site for inspection by duly authorized officials of the City of Gaithersburg.
12. Surface drainage flows over unstabilized cut and fill slopes shall be controlled by either preventing drainage flows from traversing the slopes or by installing mechanical devices to lower the water downslope without causing erosion. Dikes shall be installed and maintained at the top of cut or fill slopes until the slope and drainage area to it are fully stabilized, at which time they must be removed and final grading done to promote sheet flow drainage. Mechanical devices must be provided at points of concentrated flow where erosion is likely to occur.
13. Permanent swales or other points of concentrated water flow shall be stabilized with sod or seed with an approved erosion control matting or by other approved stabilization measures.
14. Temporary sediment control devices shall be removed, with permission of the City inspector, within (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. If establishment is not full and uniform as determined by the Sediment Control Inspector, overseeding will be required. Stormwater management structures used temporarily for sediment control shall be converted to the permanent configuration within this time period as well.
15. No permanent cut or fill slope with a gradient steeper than 3:1 will be permitted in lawn maintenance areas. A slope gradient of up to 2:1 will be permitted in areas that are not to be maintained provided that those areas are indicated on the erosion and sediment control plan with a low-maintenance ground cover specified for permanent stabilization. Slope gradient steeper than 2:1 will not be permitted with vegetative stabilization.
16. The permittee shall install a splashblock at the bottom of each downspout unless the downspout is connected by a drain line to an acceptable outlet.
17. All water pumped from excavation during construction shall be pumped either to sediment tanks and/or sediment traps. No water will be pumped to the storm drain system. Dewatering shall be performed in accordance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
18. For finished grading, the permittee shall provide adequate gradients so as to: (1) prevent water from standing on the surface of lawns more than 24 hours after the end of a rainfall, except in designated drainage courses and swale flow areas which may drain as long as 48 hours after the end of a rainfall, and (2) provide positive drainage away from all building foundations or openings.
19. Sediment traps or basins are not permitted within 20 feet of a building which is existing or under construction. No building may be constructed within 20 feet of a sediment trap or basin.
20. All inlets in non-sump areas shall have asphalt berms installed at the time of base paving establishment.
21. The Sediment Control Inspector has the option of requiring additional sediment control measures, if deemed necessary.
22. All trap elevations are relative to the outlet elevation, which must be on existing undisturbed ground.
23. Vegetative stabilization shall be performed in accordance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
24. Temporary sediment trap(s) shall be cleaned out and restored to the original dimensions when sediment has accumulated to a point one half (1/2) the depth between the outlet crest and the bottom of the trap.
25. Sediment removed from traps shall be placed and stabilized in approved areas in such a manner that it does not foul existing or proposed storm drainage systems or areas already stabilized. Sediment shall not be placed within a flood plain or wetland.
26. All sediment basins and traps must be surrounded with a welded wire safety fence. The fence must be at least 42 inches high, have posts spaced no farther apart than 8 feet, have mesh openings no greater than 2 inches in width and 4 inches in height, with a minimum of 14-gauge wire. Safety fence must be maintained in good condition at all times.
27. No excavation in the area of existing utilities is permitted unless their location has been determined. Call **Miss Utility at 1-800-257-7777** 48 hours prior to the start of work.
28. Off-site spoil or borrow areas must have approved **SC plans**.
29. Protect all trees to be preserved during construction in accordance with the approved Forest Conservation Plan and Forest Stand Delineation.
30. Permittee is responsible for all actions of subcontractors, including repairing damages of sediment control devices.

DETAIL F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL ☒RPS



CONSTRUCTION SPECIFICATIONS

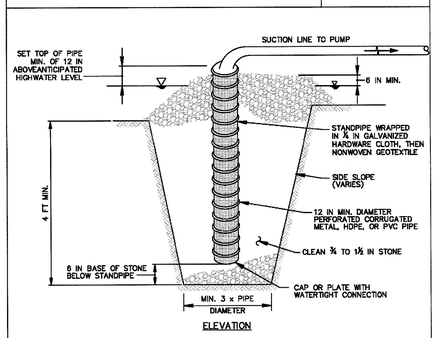
1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
4. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
5. SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN).
6. BACKFILL PIT AROUND THE OUTER PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
7. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-2 SUMP PIT

STANDARD SYMBOL ☒SP



CONSTRUCTION SPECIFICATIONS

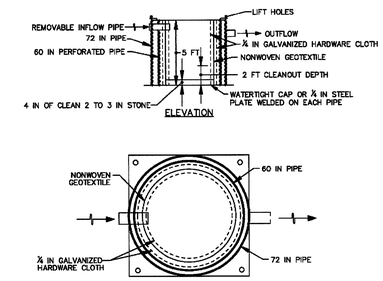
1. USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
2. WRAP PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
3. EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
4. SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
5. BACKFILL PIT AROUND THE PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
6. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
7. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-3 PORTABLE SEDIMENT TANK

STANDARD SYMBOL ☒PST



CONSTRUCTION SPECIFICATIONS

1. PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
2. USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, ¼ INCH HARDWARE CLOTH.
3. OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
4. ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE.
5. USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE
6. INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
7. PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOGS, PULL OUT INNER PIPE. REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

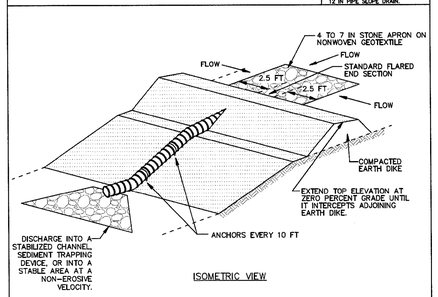
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

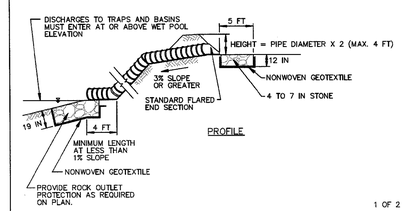
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL PSD – 12

DESIGNATION PSD–12 REFERS TO 12 IN PIPE SLOPE DRAIN.





1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL PSD – 12

DESIGNATION PSD–12 REFERS TO 12 IN PIPE SLOPE DRAIN.

CONSTRUCTION SPECIFICATIONS

1. THE HEIGHT OF THE EARTH DIKE MUST BE AT LEAST 2 TIMES THE PIPE DIAMETER MEASURED FROM THE INVERT OF THE PIPE. EXTEND THE TOP ELEVATION OF DIKE AT ZERO PERCENT GRADE UNTIL IT INTERCEPTS THE TOP OF THE ADJOINING EARTH DIKE.
2. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. ALL CONNECTIONS MUST BE WATERTIGHT.
3. ATTACH A FLARED END SECTION TO THE INLET END OF PIPE WITH A WATERTIGHT CONNECTION. AT THE INLET OF THE PIPE SLOPE DRAIN, INSTALL 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PLACED 12 INCHES IN DEPTH ON NONWOVEN GEOTEXTILE AND EXTEND OUT 5 FEET FROM THE INLET IN ALL DIRECTIONS.
4. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
5. SECURELY ANCHOR THE PIPE SLOPE DRAIN (PSD) TO THE SLOPE. SPACE THE ANCHORS EVERY 10 FEET.
6. HAND TAMP THE SOIL AROUND AND UNDER THE PIPE AND END SECTION IN 4 INCH LIFTS TO THE TOP OF THE EARTH DIKE.
7. UPON COMPLETING INSTALLATION OF THE PSD, STABILIZE ASSOCIATED DISTURBANCES WITH SEED, MULCH, AND TACK.
8. INSTALL OUTLET PROTECTION AS SPECIFIED ON APPROVED PLAN.
9. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REMOVE ACCUMULATED SEDIMENT AND DEBRIS.

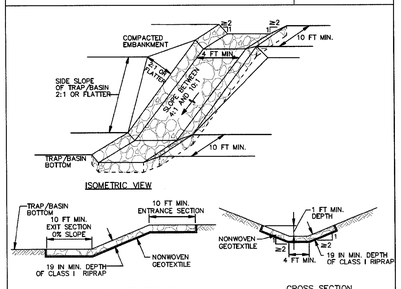
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-3-1 RIPRAP INFLOW PROTECTION

STANDARD SYMBOL RRP-3



CONSTRUCTION SPECIFICATIONS

1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
2. CONSTRUCT INFLOW CHANNEL WITH CLASS I RIPRAP OR EQUIVALENT RECYCLED CONCRETE LINING TO A MINIMUM DEPTH OF 19 INCHES (2 x D_{50}) AND A 1 FOOT DEEP FLOW CHANNEL. INFLOW RIPRAP PROTECTION CHANNEL MUST HAVE A TRAPEZOIDAL CROSS SECTION WITH 2:1 OR FLATTER SIDE SLOPES AND A 4 FOOT MINIMUM BOTTOM WIDTH.
3. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
4. BLEND RIPRAP INTO EXISTING GROUND.
5. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

D.10

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SOLTESZ
Engineering
Planning
Environmental Sciences
Rockville
Lanham
Walsorf
Leonardtown
ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.soltesz.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: | TECHNICIAN: | CHECKED: AXQ

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND. WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5163	GRID G,H,1&2
TAX MAP FS342 & 343	ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10	
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83	

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. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANT · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY SEDIMENT CONTROL NOTES & DETAILS

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 10 OF 11

PROJECT NO. 1184-00-01

General Notes
And
Sequence of Construction for
Preliminary SWM-SC plan
Lot 4
"Washingtonian North"

General Notes for Grading:

Lot 4 includes 8 story office building and 2 ½ level parking garage, may not be built in years. It depends on the market demands and economics conditions.

A. Obtain written approval from the City of Gaithersburg DPW Sediment Control Inspector before altering or removing any existing or proposed sediment control device.

B. The work included in this permit comprises: clearing and rough grading within the indicated limit of disturbance; the installation of primary utilities, including construction of the site sanitary sewer outfall; the grading and paving of the private streets; the installation of the proposed storm drain system, including the extension of the proposed 48" RCP discharging into the existing SWM Pond and the proposed ESD structures

C. The primary sediment control device to be used for the work included in this permit are double-row of super silt fence, regular silt fence, inlet protection, earth dike and construction entrances. The site has been rough graded early and permanent stabilized as requested by The City of Gaithersburg DPW.

D. The Permittee and the Contractor are responsible for the implementation of this sequence and co-ordination with the DPW Inspector of any revisions to it. It is also the responsibility of the Contractor to comply with all applicable provisions of the "Standard Erosion and Sediment Control Notes", this Sheet, and the "Stormwater Management Construction Specifications and Structural Construction Notes", Sheet.

E. Contact Miss Utility at 1-800-257-7777 to mark the location of all existing utilities within the disturbed area before starting the work.

F. Engage a geotechnical engineer to supervise all sub-surface construction, including the proposed extension/reconstruction of the existing storm drain system, the proposed ESD structures and proposed building as necessary.

G. Obtain DPW approval of the shop drawings as required.

H. Any items specified by brand name on this plan, including landscaping materials, are to be installed as such. Any revision to or substitution of such items must be approved by the design engineer before their delivery to the site.

I. The contractor shall maintain a record of all materials used in the construction of the stormwater management pond, including the landscaping materials. Provide this information to the design engineer at the completion of the work so that an as-built plan can be prepared.

Sequence of construction

1. **Prior to clearing trees, installing sediment control measures, or grading, a preconstruction meeting must be conducted on-site with the City of Gaithersburg Department of Public Works DPW (301) 258-6330 (48 hours' notice) the Owners representative, and the site Engineer.**
2. **The permittee must obtain written approval form the City of Gaithersburg – DPW inspector, certifying that the limits of disturbance and tree protection measures are correctly marked and installed prior to commencing any clearing.**
3. **Clear and grade for installation of sediment control devices.**
4. **Install sediment control devices. Traps and basins shall be constructed prior to construction of any earth dikes that convey drainage to a trap and/or basin.**
5. **Once the sediment control devices are installed, the permittee must obtain written approval from the City of Gaithersburg – DPW**

NOTE1: All sequences should call for the permittee to obtain written approval from DPW inspector, prior to the removal of any sediment control device.

NOTE 2: Any site that has a proposed storm drain diversion should have its Sequence of Construction state the following:

1) **The construction of the diversion in the storm drain construction step; once**
2) **Once the drainage area is stabilized, the storm drain system must be flushed, and temporary pipes removed, and any permanent pipes unblocked or constructed.**

6. **Install Sediment Control Devices**
   - **Clear and grub area as necessary to install proposed Sediment Control Devices as shown on plan.**
   - **Install temporary construction entrances as shown.**
   - **Install proposed 24" Pipe Slope.**
   - **Install temporary Earth Dike (E.D.-A2) on the North West side of the property as shown to feed the 24" pipe slope.**
   - **Provide DOUBLE ROW OF SUPER-SILT FENCE at the north end of the site above the existing SWM Pond**
   - **Obtain written approval from the City of Gaithersburg DPW inspector.**
7. **Begin with the proposed clearing and grubbing of the site as necessary.**
8. **Begin with the rough grading of the site and proposed storm drain system as shown on plans, provide inlet protection as required and leave storm drains open to convey run-off to the existing SWM Pond.**
9. **Install proposed water sewer systems as per plans.**
10. **Obtain approval from the WSSC inspector.**
11. **Continue with the site grading building construction and utility installation as necessary.**
12. **As the building excavation progresses, contractor to provide sump-pumps and sediment tanks and discharge as shown on plan.**
13. **Install all proposed ESD structures and accessories wrap the structures with regular silt fence and cover them with woven monofilament geotextile fabric or approved equivalent to prevent contamination during the on-going construction activities.**
14. **Immediately stabilize cell areas which are to be unpaved after they are brought to grade.**
15. **Install all proposed curb and gutter to grade.**
16. **Install pavement base course.**
17. **Install all site amenities and provide all landscape to site.**
18. **Complete site grading and stabilize site as required, flush all storm drain system free of sediment.**
19. **Obtain written approval from the City of Gaithersburg DPW inspector for the removal of the Sediment Control devices.**
20. **Remove all Sediment Control devices use for the completion of the interior road construction.**

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. 36080 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUAN · No. 36080 · PROFESSIONAL ENGINEER
11/9/14

PRELIMINARY SEDIMENT CONTROL SEQUENCE OF CONSTRUCTION

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

PART OF LOT 4
WASHINGTONIAN CENTER
PLAT 21856
GAITHERSBURG (6th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN
SHEET 11 OF 11
PROJECT NO. 1184-00-01

SOLTESZ
Engineering
Planning
Environmental Sciences

Rockville
Lanham
Walkort
Leonardtown

ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: | TECHNICIAN: | CHECKED: AXQ

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CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
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2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

COPYRIGHT ADC THE MAP PEOPLE PERMITTED USE NUMBER 21001200
MAP 5163 GRID G-H 1&2
TAX MAP FS342 & 343 | ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83

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SOLTESZ

WASHINGTONIAN NORTH
"LOT 4 – OFFICE BUILDING"

PRELIMINARY STORMWATER MANAGEMENT REPORT

Submitted: June, 2013

Prepared on Behalf of:
Washingtonian North Associates, LP
c/o Boston Properties
Contact: Jake Stroman

SDP-3878-2013
Exhibit #35

Prepared By:
Soltesz
2 Research Place, Suite 100
Rockville, MD 20850
(301) 948-2750
Soltesz No.: 1184-00-01

Prepared by: Yee-Mei Tse P.E.
Checked by: Amy Quant P.E.

STATE OF MARYLAND
AMY X. QUANT
No. 36060
PROFESSIONAL ENGINEER
1/10/14

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3. Appendix (Soil Map)	29

PRELIMINARY
STORMWATER MANAGEMENT
REPORT
Lot 4 – BP Office Building, Washingtonian North

INTRODUCTION

The project site, Lot 4-BP Office Building, is located west & northwest of the intersection of Washingtonian Boulevard and Sam Eig Highway in Gaithersburg, Maryland. The site is bounded on the east by Sam Eig Highway and on the south and west by an existing residential development. The site is currently zoned MXD and is located within the Muddy Branch Watershed, Use Class I/I-P.

The site is currently vacant. The applicant proposes to build 240,000 S.F. of office building and 2 2/1 level of parking garage building that provided for 800 parking spaces. Associated driveways, parking, and stormwater management areas will also be constructed.

STORMWATER MANAGEMENT REQUIREMENTS

The Maryland Department of the Environment *2009 Stormwater Management Design* Manual and the Montgomery County Stormwater Regulations require that all new developments meet the criteria for Water Quality Volume (WQ_v), Recharge Volume (Re_v) and Channel Protection Volume (Cp_v) through ESD practices to the maximum extent practicable (MEP). Tables in the report below are referenced from the 2009 manual, unless otherwise indicated.

STORMWATER MANAGEMENT METHODOLOGY

The existing site is vacant and partially wooded. All new SWM must be provided via 100% Environmental Site Design (ESD) facilities to the maximum extent practicable MEP. ESD for this project will be provided through the following practices:

1) ESD practices will be used to treat the full P_E target (Table 5.3), in turn satisfying all Water Quality, Quantity and Recharge Volume requirements. 100% ESDv have been achieved through the following method:

    a. Micro Bio-Retentions are being used to provide volume via wet storage above the media and volume with the voids of the filter media below the facility.

    b. Planter Box Micro-Bioretention are being used to provide volume via wet storage above the media and volume with the voids of the filter media below the facility.

To verify compliance with the intent of ESD design, we offer the following (please note that tables referenced are from the 2009 Maryland Stormwater Management Design Manual:

Natural Resource Protection and Enhancement
Site and resource mapping indicate minor natural resources located onsite as listed in Table 5.1.

- One specimen tree American Sycamore (Platanus occidentalis) was located onsite +/-100 feet from the southwest boundary of the property. Proposed development will be done under supervision of certified Arborist to protect the tree.
- Please refer to the attached NRI/FSD for additional information.

Therefore, natural resources will be protected and preserved to like existing conditions to the MEP.

Soil Types Include:

16D – Brinklow-Blocktown channery Silt Loams, 15 to 25 percent slopes. Hydrologic Soil Group "B"
54A – Hatboro Silt loam, 0 to 3 percent slopes. Hydrologic Soil Group "D"
66UB – Wheaton-Urban land complex, 0 to 8 percent slopes. Hydrologic Soil Group "B"
66UC – Wheaton-Urban land complex, 8 to 15 percent slopes. Hydrologic Soil Group "B"

See appendix for the full web soil survey.

Implementation of ESD Planning Techniques

The following techniques in Table 5.2 were used; all others are not applicable. These items include: parking lot runoff, rooftop runoff, and clearing & grading. Parking lot runoff will be directed to planter box bioretention or other stormwater practices within landscaped areas. Rooftop runoff shall be directed to proposed ESD facilities for treatment. Clearing and grading has been limited by the required needs for the proposed development mostly within existing developed areas. Therefore, implementation of ESD planning techniques has been explored and will be used to the MEP.

This package includes drainage area map, preliminary stormwater management plan with preliminary storm drain profiles and details, and supporting ESD computations for your review.

CONCLUSION

All ESD stormwater management requirements will be met or exceeded to the MEP.

ESD Computations

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXQ

LOD
ESDv COMPUTATIONS

LOD Target

Enter Total Site Property Area = **374451 sqft**
Enter Total Impervious Area = **151185 sqft**
% of Impervious D.A., I = **40.4%**
Volumetric Runoff Coefficient, Rv = 0.413 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)
A	38		0%	1.8 in			
B	55	359489	96%	1.8 in	43139 sqft	0.512 ac-ft	22291 cu-ft
C	70		0%	1.8 in			
D	77	14962 sqft	4%	1.8 in	1795 sqft	0.021 ac-ft	928 cu-ft
Totals			100%	1.8 in	**44934 sqft**	**0.533 ac-ft**	**23218 cu-ft**

Equations

Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 56

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXO

ESD 1
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **19965 sqft**
Enter Total Impervious Area = **17559 sqft**
% of Impervious D.A., I = **87.9%**
Volumetric Runoff Coefficient, Rv = 0.842 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.53 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	19965	100%	2.4 in	3194 sqft	0.077 ac-ft	3360 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	3194 sqft	0.077 ac-ft	3360 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **3640 cu-ft**
Enter Filter Surface Area Provided = 1685 sqft
Depth Provided Above Filter Surface = 6 in
Depth of Filter Media = 4.00 ft
Surface Area of Planter Box = **1685 sqft**
Actual Volume Provided = **3539 cu-ft**
Volume Credited Above/Below Planter Box = **3539 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **178 cu-ft**
ESD P_E Treatment Provided = 2.53 in (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 55
Additional ESD Volume Required = ESDv is Satisfied **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXQ

ESD 2
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **19961 sqft**
Enter Total Impervious Area = **17508 sqft**
% of Impervious D.A., I = **87.7%**
Volumetric Runoff Coefficient, Rv = 0.839 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.59 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	19961	100%	2.4 in	3194 sqft	0.077 ac-ft	3351 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	3194 sqft	0.077 ac-ft	3351 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **3630 cu-ft**
Enter Filter Surface Area Provided = **1900 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.50 ft**
Surface Area of Planter Box = **1900 sqft**
Actual Volume Provided = **3610 cu-ft**
Volume Credited Above/Below Planter Box = **3610 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **259 cu-ft**
ESD P_E Treatment Provided = 2.59 in (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 55
Additional ESD Volume Required = ESDv is Satisfied **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
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Date	1/9/2013
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Project No.	1184-00-01
By	YMT
Checked	AXQ

ESD 3
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = 20361 sqft
Enter Total Impervious Area = 14837 sqft
% of Impervious D.A., I = 72.9%
Volumetric Runoff Coefficient, Rv = 0.706 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.83 in)	Reduced %I (RCN 62)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	20361	100%	2.2 in	2986 sqft	0.060 ac-ft	2635 cu-ft	62	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2986 sqft	0.060 ac-ft	2635 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 55
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = 3114 cu-ft
Enter Filter Surface Area Provided = 955 sqft
Depth Provided Above Filter Surface = 6 in
Depth of Filter Media = 4.50 ft
Surface Area of Planter Box = 955 sqft
Actual Volume Provided = 2197 cu-ft
Volume Credited Above/Below Planter Box = 2197 cu-ft — **ESDv is not Satisfied (PE < 2.2 in.)**
Excess Volume Provided = 0 cu-ft
ESD P_E Treatment Provided = 1.83 in — (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 62
Additional ESD Volume Required = 438 cu-ft — **(Applied to ESD Practices)**
Additional ESD Treatment Required = 0.37 in
Effective % Impervious (Table 5.3) = 0.0%
Effective Impervious Area = 0 sqft
If Used, Additional Structural Treatment Volume = 255 cu-ft — **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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By	YMT
Checked	AXQ

ESD 4
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = 19997 sqft
Enter Total Impervious Area = 17886 sqft
% of Impervious D.A., I = 89.4%
Volumetric Runoff Coefficient, Rv = 0.855 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	19997	100%	2.4 in	3200 sqft	0.078 ac-ft	3419 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	3200 sqft	0.078 ac-ft	3419 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 55
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = 3704 cu-ft
Enter Filter Surface Area Provided = 1985 sqft
Depth Provided Above Filter Surface = 6 in
Depth of Filter Media = 3.50 ft
Surface Area of Planter Box = 1985 sqft
Actual Volume Provided = 3772 cu-ft
Volume Credited Above/Below Planter Box = 3704 cu-ft — **Target ESDv is Satisfied**
Excess Volume Provided = 285 cu-ft — **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = 2.60 in — (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 55
Additional ESD Volume Required = ESDv is Satisfied — **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = 0.0%
Effective Impervious Area = 0 sqft
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** — **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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2 Research Pl., Suite 100
Rockville, MD 20850
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Project No.	1184-00-01
By	YMT
Checked	AXQ

ESD 5
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **7077 sqft**
Enter Total Impervious Area = **3428 sqft**
% of Impervious D.A., I = **48.4%**
Volumetric Runoff Coefficient, Rv = 0.486 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.27 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	1.8 in				0	0.0%	0 sqft
B	55	7077	100%	1.8 in	849 sqft	0.012 ac-ft	516 cu-ft	55	0.0%	0 sqft
C	70		0%	1.8 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	1.8 in	849 sqft	0.012 ac-ft	516 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **745 cu-ft**
Enter Filter Surface Area Provided = **500 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **2.00 ft**
Surface Area of Planter Box = **500 sqft**
Actual Volume Provided = **650 cu-ft**
Volume Credited Above/Below Planter Box = **650 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **134 cu-ft**
ESD P_E Treatment Provided = **2.27 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
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Date	1/9/2013
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By	YMT
Checked	AXQ

ESD 6
ESDv COMPUTATIONS

Micro Bioretention

Enter Total Drainage Area to Planter Box =	15561 sqft
Enter Total Impervious Area =	8272 sqft
% of Impervious D.A., I =	53.2%
Volumetric Runoff Coefficient, Rv =	0.528

(Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.87 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.0 in				0	0.0%	0 sqft
B	55	15561	100%	1.8 in	1867 sqft	0.028 ac-ft	1233 cu-ft	55	0.0%	0 sqft
C	70		0%	1.8 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	1.8 in	1867 sqft	0.028 ac-ft	1233 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"

Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." =	**55**	
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) =	**1782 cu-ft**	
Enter Filter Surface Area Provided =	755 sqft	
Depth Provided Above Filter Surface =	6 in	
Depth of Filter Media =	3.00 ft	
Surface Area of Planter Box =	755 sqft	
Actual Volume Provided =	**1284 cu-ft**	
Volume Credited Above/Below Planter Box =	**1284 cu-ft**	**Target ESDv is Satisfied**
Excess Volume Provided =	**50 cu-ft**	
ESD P_E Treatment Provided =	**1.87 in**	(ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN =	**55**	
Additional ESD Volume Required =	ESDv is Satisfied	**(Applied to ESD Practices)**
Additional ESD Treatment Required =	**ESD is Satisfied**	
Effective % Impervious (Table 5.3) =	**0.0%**	
Effective Impervious Area =	**0 sqft**	
If Used, Additional Structural Treatment Volume =	**Treatment is Satisfied**	**(Use With Structural Practices Downstream Only)**

Notes:

The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, MD 20850
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Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXO

ESD 7
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **17604 sqft**
Enter Total Impervious Area = **13530 sqft**
% of Impervious D.A., I = **76.9%**
Volumetric Runoff Coefficient, Rv = 0.742 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.17 in)	Reduced %I (RCN 59)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	17604	100%	2.2 in	2582 sqft	0.055 ac-ft	2394 cu-ft	59	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2582 sqft	0.055 ac-ft	2394 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 55
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = 2829 cu-ft
Enter Filter Surface Area Provided = **1025 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.50 ft**
Surface Area of Planter Box = 1025 sqft
Actual Volume Provided = 2358 cu-ft
Volume Credited Above/Below Planter Box = **2358 cu-ft** **ESDv is not Satisfied (PE < 2.2 in.)**
Excess Volume Provided = 0 cu-ft
ESD P_E Treatment Provided = **2.17 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **59**
Additional ESD Volume Required = 36 cu-ft **(Applied to ESD Practices)**
Additional ESD Treatment Required = 0.03 in
Effective % Impervious (Table 5.3) = 0.0%
Effective Impervious Area = 0 sqft
If Used, Additional Structural Treatment Volume = 114 cu-ft **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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2 Research Pl., Suite 100
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Date	1/9/2013
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By	YMT
Checked	AXQ

ESD 8
ESDv COMPUTATIONS

Micro Bioretention

Enter Total Drainage Area to Planter Box = **17323 sqft**
Enter Total Impervious Area = **11821 sqft**
% of Impervious D.A., I = **68.2%**
Volumetric Runoff Coefficient, Rv = 0.664 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.25 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	17323	100%	2.2 in	2541 sqft	0.048 ac-ft	2109 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2541 sqft	0.048 ac-ft	2109 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2493 cu-ft**
Enter Filter Surface Area Provided = **1025 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.00 ft**
Surface Area of Planter Box = **1025 sqft**
Actual Volume Provided = **2153 cu-ft**
Volume Credited Above/Below Planter Box = **2153 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **43 cu-ft**
ESD P_E Treatment Provided = **2.25 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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2 Research Pl., Suite 100
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Date	1/9/2013
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By	YMT
Checked	AXQ

ESD 9
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **19305 sqft**
Enter Total Impervious Area = **16224 sqft**
% of Impervious D.A., I = **84.0%**
Volumetric Runoff Coefficient, Rv = 0.806 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.32 in)	Reduced %I (RCN 56)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	18707	97%	2.2 in	2744 sqft	0.063 ac-ft	2766 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77	598	3%	1.8 in	72 sqft	0.002 ac-ft	72 cu-ft	77	0.0%	0 sqft
Totals			100%	2.2 in	2815 sqft	0.065 ac-ft	2838 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **56**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **3373 cu-ft**
Enter Filter Surface Area Provided = **1585 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.50 ft**
Surface Area of Planter Box = **1585 sqft**
Actual Volume Provided = **3012 cu-ft**
Volume Credited Above/Below Planter Box = **3012 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **174 cu-ft**
ESD P_E Treatment Provided = **2.32 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **56**
Additional ESD Volume Required = ESDv is Satisfied **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research PL, Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXO

ESD 10
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = 15139 sqft
Enter Total Impervious Area = 12387 sqft
% of Impervious D.A., I = 81.8%
Volumetric Runoff Coefficient, Rv = 0.786 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.14 in)	Reduced %I (RCN 65)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	11504	76%	2.2 in	1687 sqft	0.038 ac-ft	1659 cu-ft	61	5.0%	575 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77	3635	24%	1.8 in	436 sqft	0.010 ac-ft	429 cu-ft	77	0.0%	0 sqft
Totals			100%	2.1 in	2123 sqft	0.048 ac-ft	2087 cu-ft			575 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 60
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = 2579 cu-ft
Enter Filter Surface Area Provided = 1250 sqft
Depth Provided Above Filter Surface = 6 in
Depth of Filter Media = 3.00 ft
Surface Area of Planter Box = 1250 sqft
Actual Volume Provided = 2125 cu-ft
Volume Credited Above/Below Planter Box = 2125 cu-ft — **Target ESDv is Satisfied**
Excess Volume Provided = 38 cu-ft
ESD P_E Treatment Provided = 2.14 in — (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 65
Additional ESD Volume Required = ESDv is Satisfied — **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = 3.8%
Effective Impervious Area = 575 sqft
If Used, Additional Structural Treatment Volume = 154 cu-ft — **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research PL, Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXQ

ESD 11
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **6535 sqft**
Enter Total Impervious Area = **4698 sqft**
% of Impervious D.A., I = **71.9%**
Volumetric Runoff Coefficient, Rv = 0.697 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.43 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	6535	100%	2.2 in	958 sqft	0.019 ac-ft	835 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	958 sqft	0.019 ac-ft	835 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **987 cu-ft**
Enter Filter Surface Area Provided = **485 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.50 ft**
Surface Area of Planter Box = **485 sqft**
Actual Volume Provided = **922 cu-ft**
Volume Credited Above/Below Planter Box = **922 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **86 cu-ft**
ESD P_E Treatment Provided = **2.43 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = ESDv is Satisfied **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

LOIEDERMAN SOLTESZ ASSOCIATES, INC.
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXO

ESD 12
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = 2652 sqft
Enter Total Impervious Area = 1463 sqft
% of Impervious D.A., I = 55.2%
Volumetric Runoff Coefficient, Rv = 0.546 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.15 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.0 in				0	0.0%	0 sqft
B	55	2652	100%	1.8 in	318 sqft	0.005 ac-ft	217 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	1.8 in	318 sqft	0.005 ac-ft	217 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = 55
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **314 cu-ft**
Enter Filter Surface Area Provided = [redacted]
Depth Provided Above Filter Surface = [redacted]
Depth of Filter Media = [redacted]
Surface Area of Planter Box = **200 sqft**
Actual Volume Provided = **260 cu-ft**
Volume Credited Above/Below Planter Box = 260 cu-ft — Target ESDv is Satisfied
Excess Volume Provided = 43 cu-ft
ESD P_E Treatment Provided = 2.15 in — (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = 55
Additional ESD Volume Required = ESDv is Satisfied — (Applied to ESD Practices)
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**
If Used, Additional Structural Treatment Volume = **Treatment is Satisfied** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXQ

ESD 13
ESDv COMPUTATIONS

Planter Box

Enter Total Drainage Area to Planter Box = **10974 sqft**
Enter Total Impervious Area = **5779 sqft**
% of Impervious D.A., I = **52.7%**
Volumetric Runoff Coefficient, Rv = 0.524 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.05 in)	Reduced %I (RCN 70)	Effective Imp. Area
A	38		0%	2.0 in				0	0.0%	0 sqft
B	55	10974	100%	1.8 in	1317 sqft	0.020 ac-ft	862 cu-ft	70	25.0%	2744 sqft
C	70		0%	1.8 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	1.8 in	1317 sqft	0.020 ac-ft	862 cu-ft			2744 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1246 cu-ft**
Enter Filter Surface Area Provided = **240 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.00 ft**
Surface Area of Planter Box = **240 sqft**
Actual Volume Provided = **504 cu-ft**
Volume Credited Above/Below Planter Box = **504 cu-ft** **ESDv is not Satisfied (PE < 1.8 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **1.05 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **70**
Additional ESD Volume Required = **358 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.75 in**
Effective % Impervious (Table 5.3) = **25.0%**
Effective Impervious Area = **2744 sqft**
If Used, Additional Structural Treatment Volume = **368 cu-ft** **(Use With Structural Practices Downstream Only)**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	1/9/2013
Project Name	Washingtonian North Lot 4
Project No.	1184-00-01
By	YMT
Checked	AXQ

Ultimate ESD Summary Table

Overall Site Target

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
LOD	374,451	151,185	40%	0%	96%	0%	4%	1.8	2.0	0.41	23,218	26,315	3,097	56	See ESD Practices Below	Site Compliance
				1.8	1.8 in	1.8 in	1.8 in					(Provided ESDv Below)				

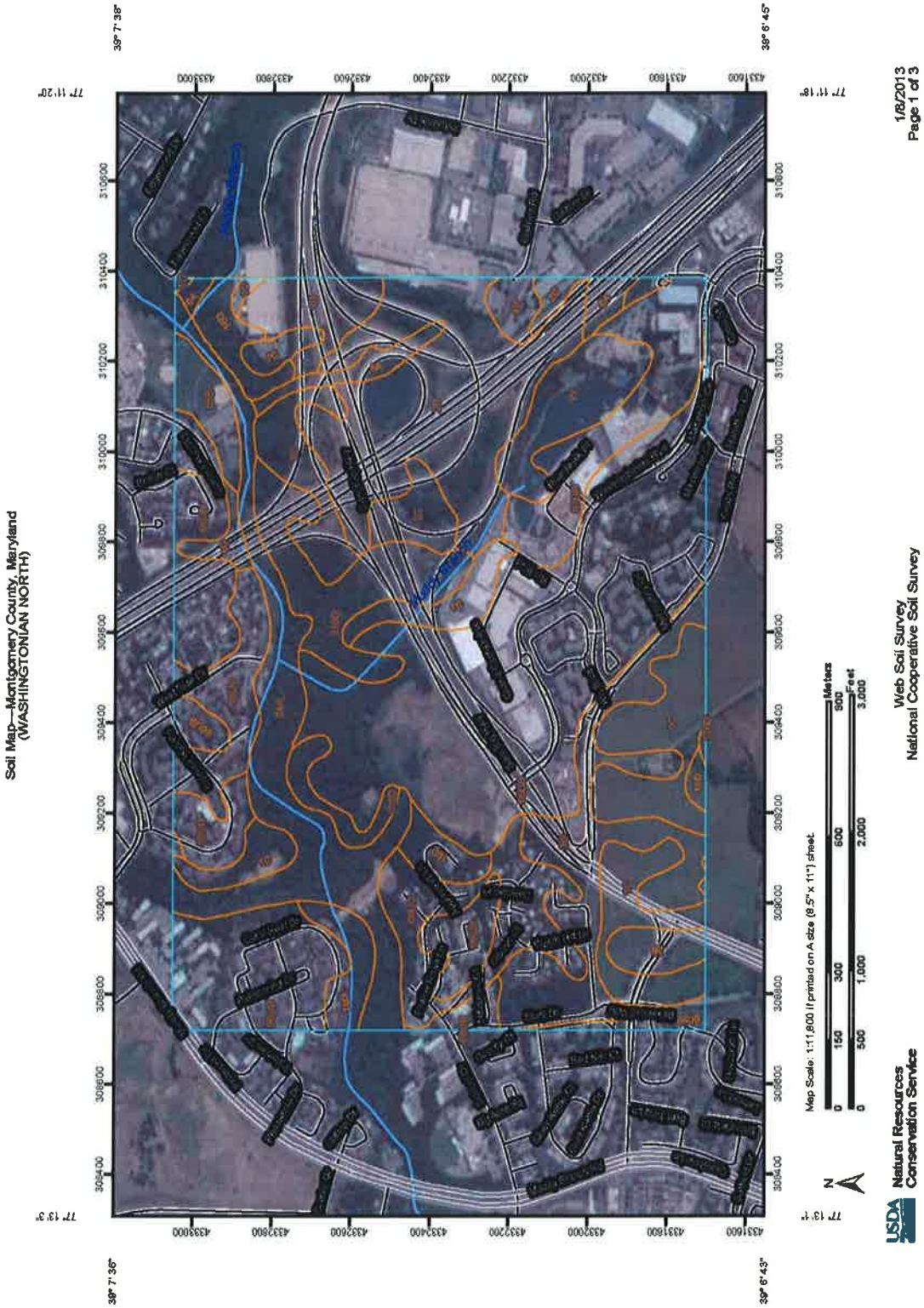
(Individual Target P_E)

Total Site Target Composite RCN for "Woods in Good Cond." = 56
Total Site Reduced Composite RCN for "Woods in Good Cond." = 56

Phase 1 Individual Facility Summary

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
1	19,965	17,559	88%	0%	100%	0%	0%	2.4	2.5	0.84	3,360	3,539	178	55	Planter Box	
2	19,961	17,508	88%	0%	100%	0%	0%	2.4	2.6	0.84	3,351	3,610	259	55	Planter Box	
3	20,361	14,837	73%	0%	100%	0%	0%	2.2	1.8	0.71	2,635	2,197	0	62	Planter Box	
4	19,997	17,886	89%	0%	100%	0%	0%	2.4	2.6	0.85	3,419	3,704	285	55	Planter Box	
5	7,077	3,428	48%	0%	100%	0%	0%	1.8	2.3	0.49	516	650	134	55	Planter Box	
6	15,561	8,272	53%	0%	100%	0%	0%	1.8	1.9	0.53	1,233	1,284	50	55	Micro Bioretention	
7	17,604	13,530	77%	0%	100%	0%	0%	2.2	2.2	0.74	2,394	2,358	0	59	Planter Box	
8	17,323	11,821	68%	0%	100%	0%	0%	2.2	2.2	0.66	2,109	2,153	43	55	Micro Bioretention	
9	19,305	16,224	84%	0%	97%	0%	3%	2.2	2.3	0.81	2,838	3,012	174	56	Planter Box	
10	15,139	12,387	82%	0%	76%	0%	24%	2.1	2.1	0.79	2,087	2,125	38	65	Planter Box	
11	6,535	4,698	72%	0%	100%	0%	0%	2.2	2.4	0.70	835	922	86	55	Planter Box	
12	2,652	1,463	55%	0%	100%	0%	0%	1.8	2.2	0.55	217	260	43	55	Planter Box	
13	10,974	5,779	53%	0%	100%	0%	0%	1.8	1.1	0.52	862	504	0	70	Planter Box	
TOTALS	192,454 sqft	145,392 sqft										26,315 cu-ft				

Appendix


Soil Map—Montgomery County, Maryland
(WASHINGTONIAN NORTH)
Map Scale: 1:11,800 if printed on A size (8.5" x 11") sheet.
Meters
Feet
Web Soil Survey
National Cooperative Soil Survey
Natural Resources
Conservation Service
1/8/2013
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:11,800 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Maryland
Survey Area Data: Version 7, Feb 2, 2007

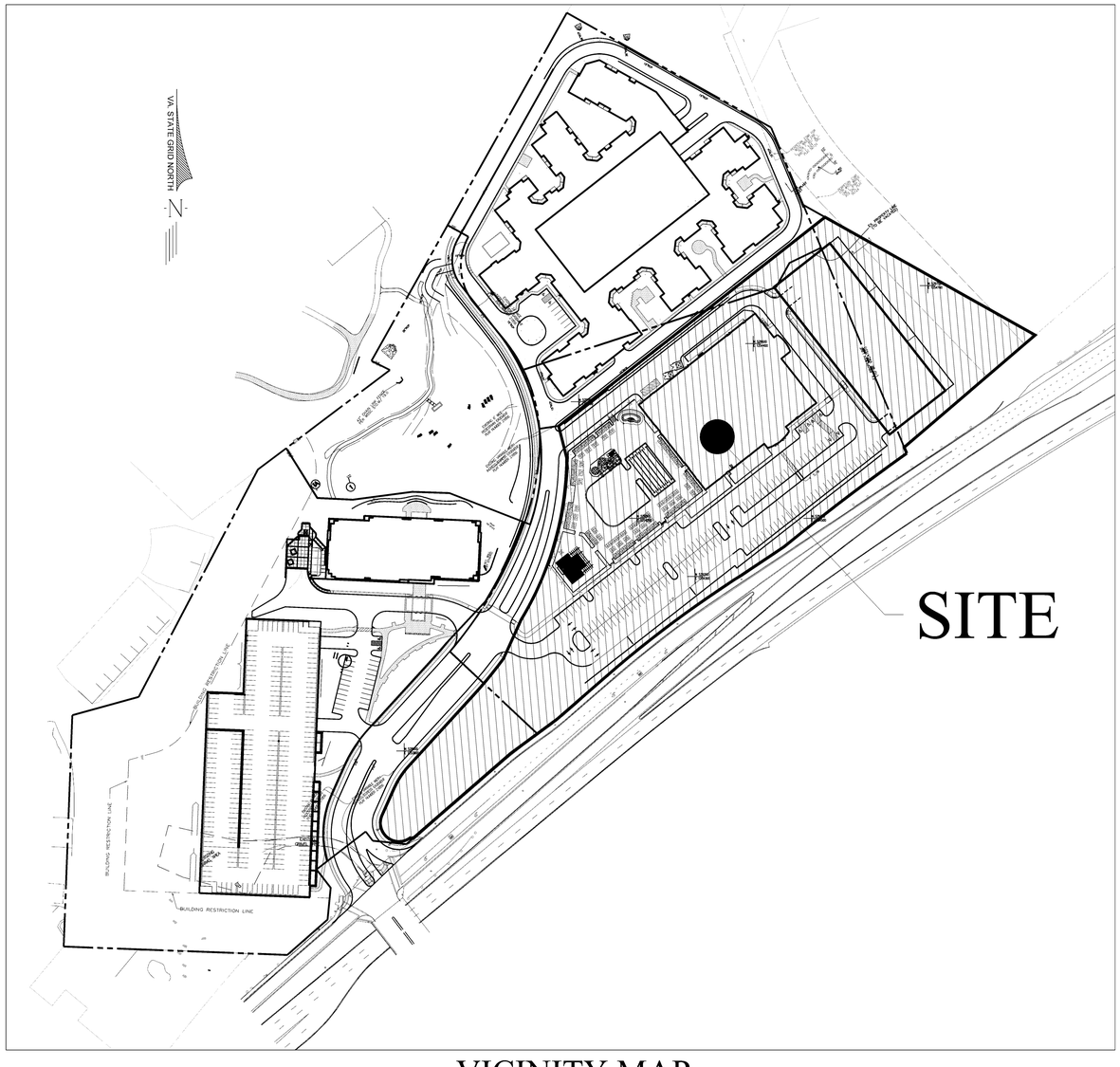
Date(s) aerial images were photographed: 6/21/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Montgomery County, Maryland (MD031)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1B	Galla silt loam, 3 to 8 percent slopes	11.0	2.0%
1C	Galla silt loam, 8 to 15 percent slopes	73.5	13.2%
2B	Glenelg silt loam, 3 to 8 percent slopes	102.8	18.5%
2C	Glenelg silt loam, 8 to 15 percent slopes	2.0	0.4%
4B	Elioak silt loam, 3 to 8 percent slopes	3.7	0.7%
6A	Baile silt loam, 0 to 3 percent slopes	8.3	1.5%
16D	Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	19.5	3.5%
54A	Hatboro silt loam, 0 to 3 percent slopes, frequently flooded	41.4	7.5%
65B	Wheaton silt loam, 0 to 8 percent slopes	7.0	1.3%
66UB	Wheaton-Urban land complex, 0 to 8 percent slopes	178.2	32.1%
66UC	Wheaton-Urban land complex, 8 to 15 percent slopes	38.4	6.9%
67UB	Urban land-Wheaton complex, 0 to 8 percent slopes	25.8	4.6%
116D	Blocktown channery silt loam, 15 to 25 percent slopes, very rocky	28.1	5.1%
W	Census water	15.6	2.8%
Totals for Area of Interest		**555.2**	**100.0%**

WASHINTONIAN NORTH
STORMWATER MANAGEMENT PRELIMARY PLAN
LOT 5
CITY OF GAITHERSBURG, 9TH ELECTION DISTRICT
MONTGOMERY COUNTY, MARYLAND



VICINITY MAP

SCALE: 1" = 100'

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	PRE-DEVELOPMENT DRAINAGE DIVIDES
3	POST-DEVELOPMENT DRAINAGE DIVIDES
4	STORM PROFILES
5	STORM PROFILES
6	STORM COMPUTATIONS
7	STORMWATER MANAGEMENT PLAN & DETAILS
8	ADEQUATE OUTFALL ANALYSIS
9	EROSION & SEDIMENT CONTROL PHASE I
10	EROSION & SEDIMENT CONTROL PHASE II
11	EROSION & SEDIMENT CONTROL DETAILS
12	EROSION & SEDIMENT CONTROL DETAILS

TOTAL SHEETS = 12

APPLICANT

LIFETIME FITNESS
2902 CORPORATE PLACE
CHANHASSEN, MN 55317
(952) 947-0000

OWNER

WASHINTONIAN NORTH ASSOCIATES LLC
2200 PENNSYLVANIA AVENUE, NW
SUITE 200W
WASHINGTON, DC 20037
(202) 585-0847

SDP-3878-2013
Exhibit #36

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-25-13
12-16-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703.642.8306
FAX 703.378.7688
www.urban-ltd.com
urban
Planners/Engineers/Landscape Architects/Land Surveyors

STATE OF MARYLAND
GREG S. SHUGAR
No. 28896
PROFESSIONAL ENGINEER

COVER SHEET

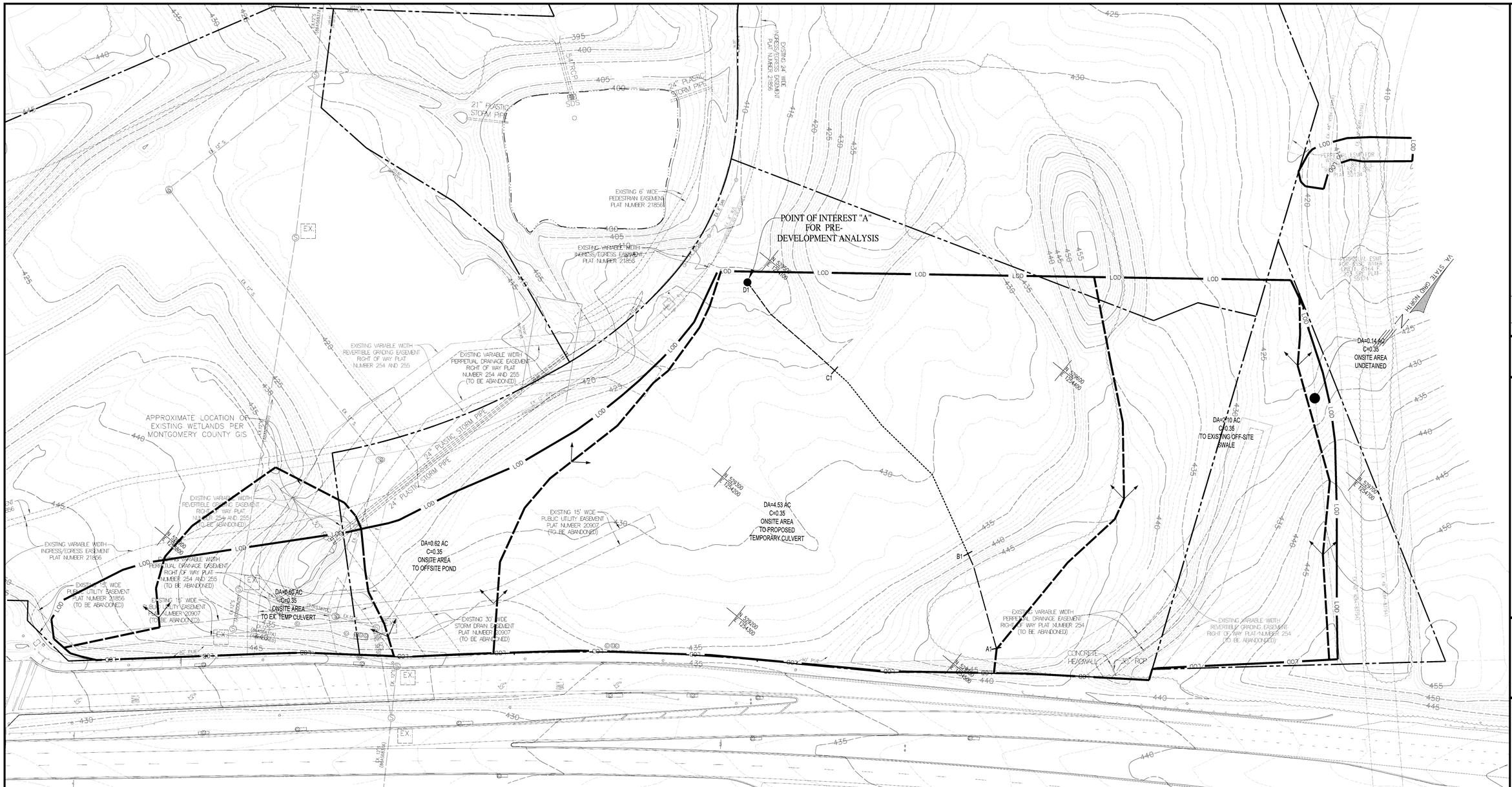
WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: AS NOTED
CL= N/A
DATE: SEPT. 2013

SHEET 1 OF 12

FILE No. SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-01-Cover.dwg [COVER] January 10, 2014 – 10:07am gallwood



PROJECT: Washintonian North Lot 5

PRE-DEVELOPED TIME OF CONCENTRATION			
SHEET FLOW:	*SEGMENT ID*		**A1 TO B1**
1	SURFACE DESCRIPTION		Grass
2	MANNING'S ROUGHNESS COEFF., n		0.3
3	FLOW LENGTH, L (TOTAL L < 300 ft)	ft	100
4	TWO-YR 24-HR RAINFALL, P	in	3.2
5	LAND SLOPE, s	ft/ft	0.05
6	T = .007(nL)^.8/P^.5s^.4 **COMPUTE T**	**hr**	**0.1971**

SHALLOW CONCENTRATED FLOW:	*SEGMENT ID*		**B1 TO C1**
7	SURFACE DESCRIPTION (PAVED OR UNPAVED)		Grass
8	FLOW LENGTH, L	ft	232.24
9	WATERCOURSE SLOPE, s	ft/ft	0.0234
10	AVERAGE VELOCITY, V	ft/s	2.4681
11	T = L/(3600*V) **COMPUTE T**	**hr**	**0.0261**

***NOTE: Average Velocity, V obtained using equation taken from TR-55**
V=16.1345*s^0.5

CHANNEL FLOW	*SEGMENT ID*		**C1 TO D1**
12	V = (1.49*r^(2/3)*s^(1/2))/n ASSUME V	ft/s	3.50
13	FLOW LENGTH, L	ft	125.74
14	T = L/(3600*V) **COMPUTE T**	**hr**	**0.0100**

15	***WATERSHED OR SUBAREA, T*** ***TOTAL T***	***hr***	***0.2332***
		min.	***14.0***
	USE Tc	***min.***	14

0 20 40 80 120
SCALE – 1 inch = 40 ft.

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-23-13
12-09-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703.642.2306
FAX 703.378.7888
www.urban-ltd.com
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STATE OF MARYLAND
STEVEN S. SIEGEL
No. 28896
PROFESSIONAL ENGINEER

PRE-DEVELOPMENT DRAINAGE DIVIDES

WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER

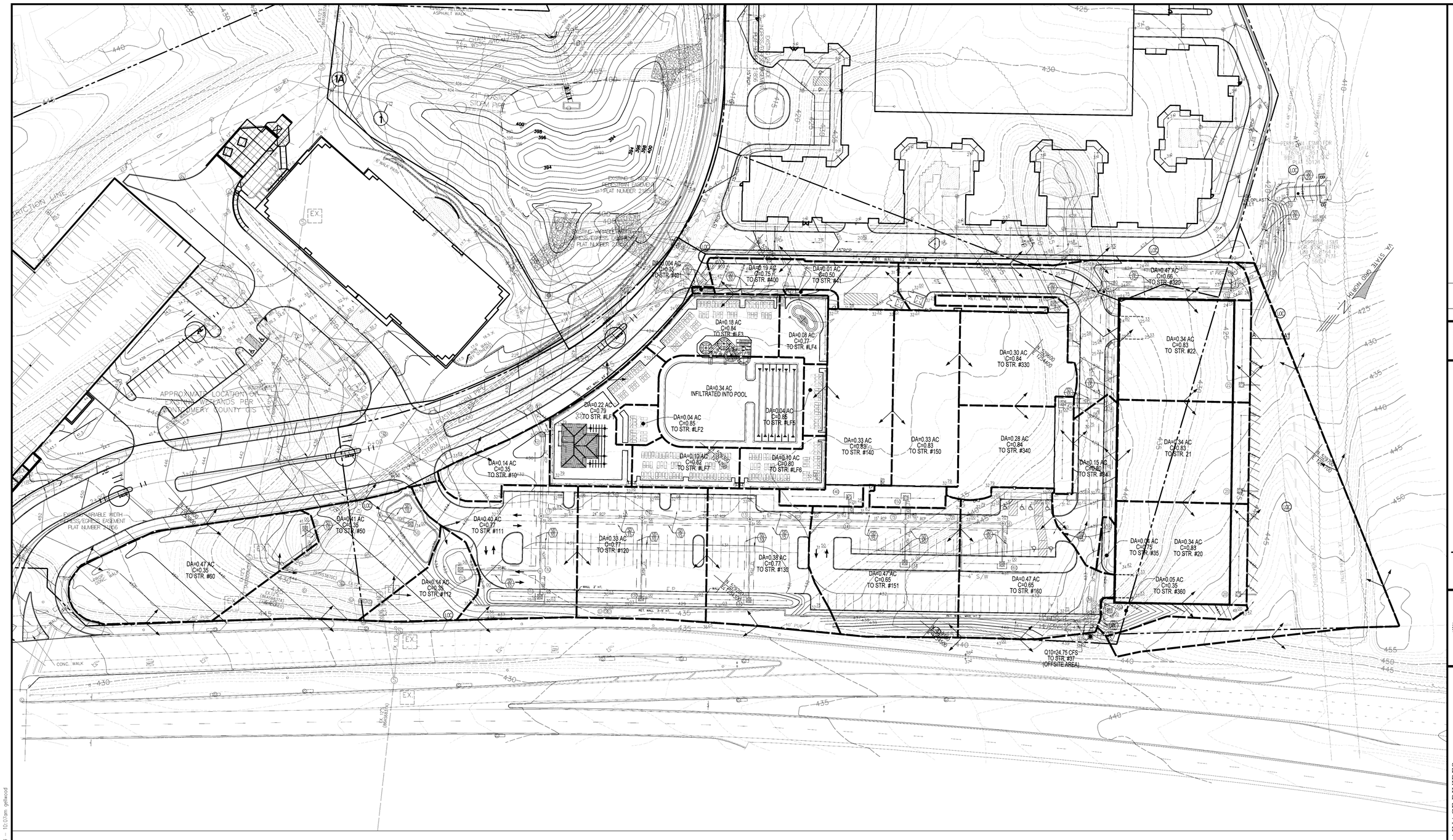
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=40'
C.I.= 1'
DATE: SEPT. 2013

SHEET 2 OF 12

FILE No. SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-12-Pre Dev-Divides.dwg [PRE-DIV] January 10, 2014 – 10:07am gellwood



NOTES:

1.) OFFSITE AREA TO STRUCTURE #37 TO BE DETERMINED AT FINAL DESIGN. THE PIPE IS CURRENTLY SIZE FOR 10 ACRES OFFSITE PERVIOUS AREA.

2.) AT TIME OF FINAL DEVELOPMENT PLAN, A MONTGOMERY COUNTY PERMIT WILL BE FILED TO MODIFY OUTFALL AT STR. #37.

0 20 40 80 120

SCALE – 1 inch = 40 ft.

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-25-13
12-12-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703.642.2306
FAX 703.378.7888
www.urban-ltd.com
Planners/Engineers/Landscape Architects/Land Surveyors

STATE OF MARYLAND
JOHN S. SIEGEL
No. 28896
PROFESSIONAL ENGINEER

POST-DEVELOPMENT DRAINAGE DIVIDES

WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER

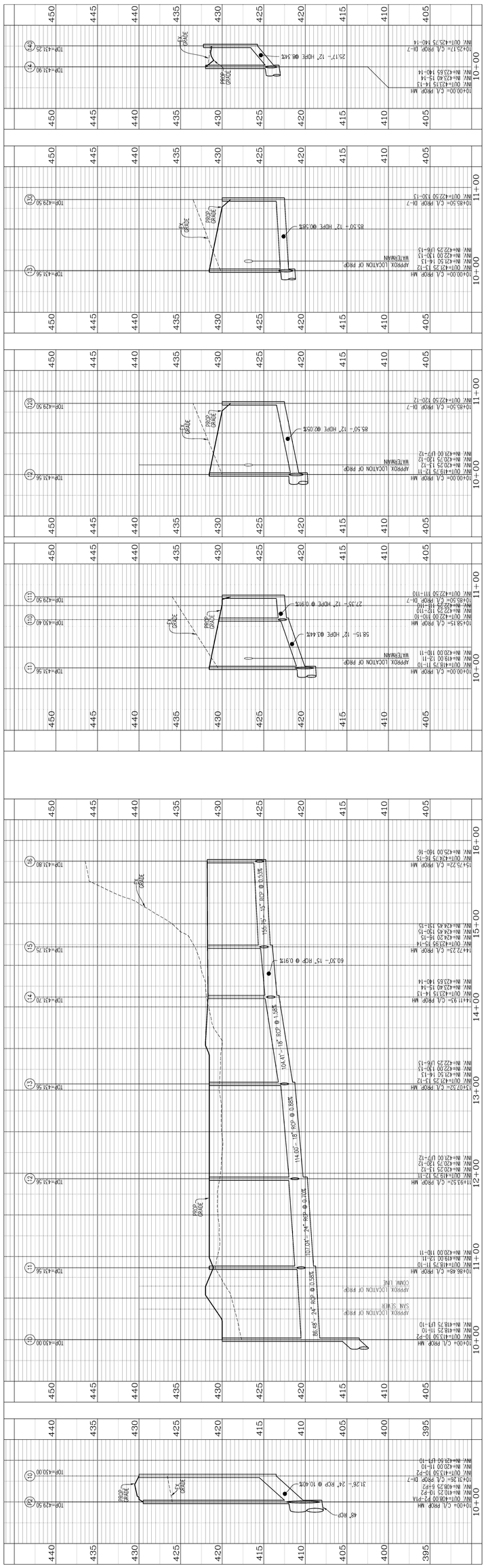
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

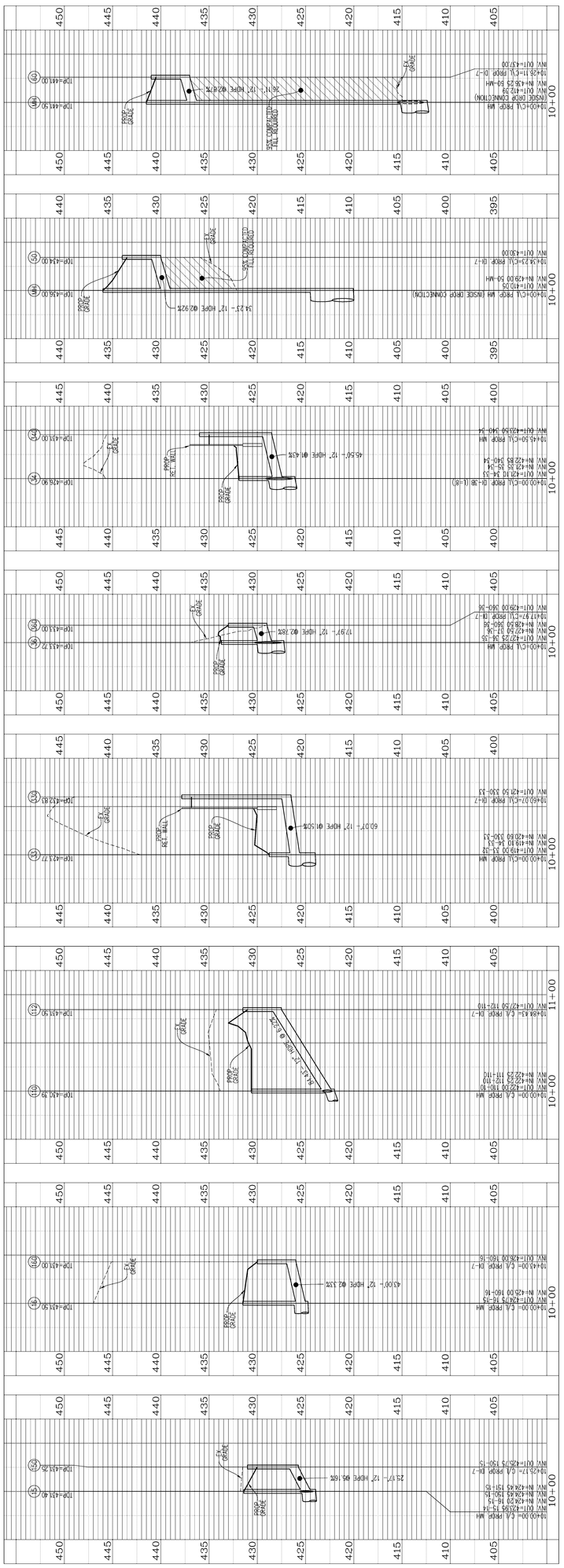
SCALE: 1"=40'
C.I.= 1'
DATE: SEPT. 2013

SHEET
3
OF
12

FILE No.
SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-13-Drainage Divides.dwg [POST-DEV] january 10, 2014 – 10:07am gatlewood





PLAN DATE
12-23-13
12-16-13
01-10-14

urban
Urban, Ltd.
4200 D TECHNOLOGY CT.
GAITHERSBURG, MD. 20877
TEL. 703.642.2906
FAX 703.378.3889
www.urban-ltd.com
Planners-Engineers-Landscape Architects-Land Surveyors

REVISIONS

No.	DATE	DESCRIPTION
-		
-		
-		
-		
-		

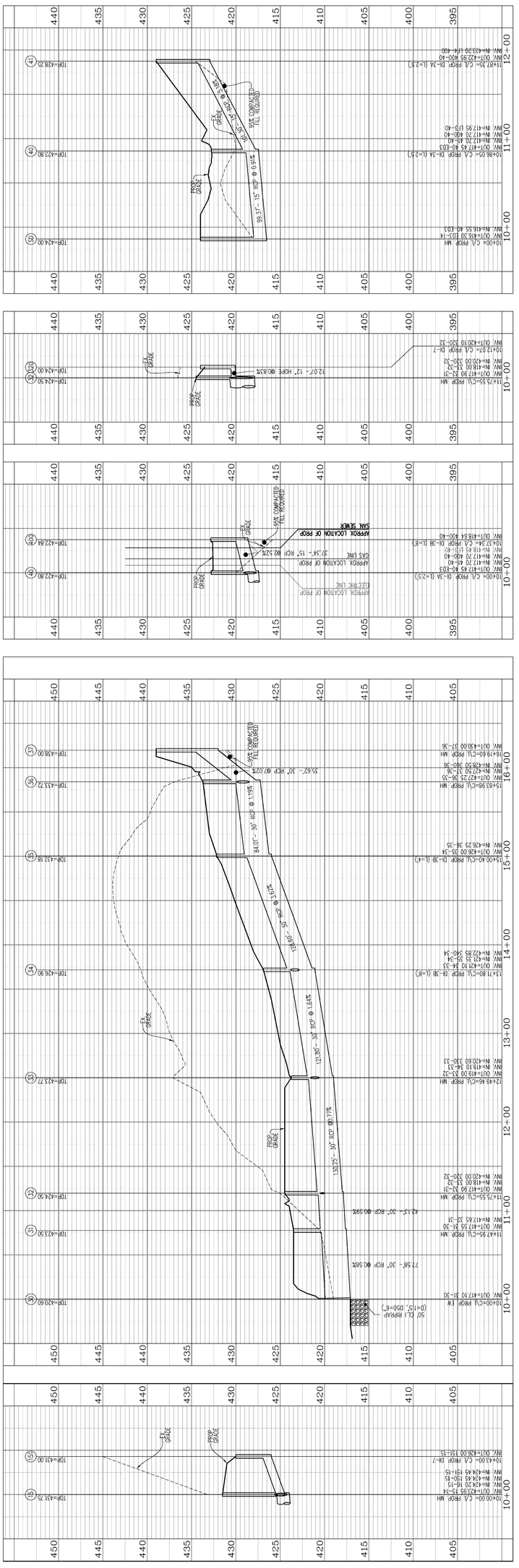
STORM PROFILES

WASHINGTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=50' (H); 1"=5' (V) CL= N/A DATE: SEPT. 2013

SHEET 4 OF 12

FILE No. SP-12727



STORM PROFILES

WASHINGTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=50' (H); 1"=5' (V) CL= N/A DATE: SEPT. 2013

SHEET 5 OF 12

FILE No. SP-12727

PLAN DATE
10-23-13
12-16-13
01-10-14

Urban, Ltd.
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Planners-Engineers-Landscape Architects-Land Surveyors

No.	DATE	DESCRIPTION
-		
-		
-		
-		
-		
-		
-		

REVISIONS

Urban, Ltd. - J:\JOBS\Washintonian North\SP\12700-10-Storm Profiles.dwg [STM COMPS] January 10, 2014 - 10:07am gellwood

STORM SEWER INLET COMPUTATIONS

Life Time Fitness - Gaithersburg

INLET NUMBER	INLET TYPE	INLET L, LENGTH (FT)	INLET STATION	STRUCTURE TOP	DRAINAGE AREA (AC)	C	C x A	INTENSITY (IN/HR)	Q INCR (CFS)	UPSTREAM INLET 1	UPSTREAM INLET 2	UPSTREAM INLET 3	UPSTREAM INLET 4	Qc CARRYOVER (CFS)	Qt TOTAL FLOW (CFS)	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T SPREAD (FT)	W GUTTER WIDTH (FT)	W/T	Sw GUTTER CROSS SLOPE (FT/FT)	Sw/Sx	Eo GUTTER FLOW RATIO	LD LOCAL DEPRESSION (IN)	a TOTAL DEPRESSION (IN)	S'w GUTTER CROSS SLOPE (FT/FT)	Se EQUIV. CROSS SLOPE (FT/FT)	Lt REQUIRED INLET LENGTH (FT)	L/Lt	E EFFICIENCY	Qint INTERCEPTED FLOW (CFS)	Qb BYPASS FLOW (CFS)	SAG INLETS d DEPTH AT CURB (FT)	SAG INLETS h THROAT HEIGHT (FT)	SAG INLETS d/H	SAG INLETS T SPREAD AT SAG (FT)
10	DI-7			430.50	0.14	0.35	0.05	7.07	0.35					0.00	0.35	PERIMETER = 12.80				AREA = 6.00		H = 0.04			NO CLOGGING			OVERLAND RELIEF ELEV =				0.35				
																PERIMETER = 6.40				AREA = 3.00		H = 0.07			50% CLOGGING							0.35				
111	DI-7			429.50	0.40	0.77	0.31	7.07	2.18					0.00	2.18	PERIMETER = 12.80				AREA = 6.00		H = 0.15			NO CLOGGING			OVERLAND RELIEF ELEV =				2.18				
																PERIMETER = 6.40				AREA = 3.00		H = 0.23			50% CLOGGING							2.18				
120	DI-7			429.50	0.33	0.77	0.25	7.07	1.80					0.00	1.80	PERIMETER = 12.80				AREA = 6.00		H = 0.13			NO CLOGGING			OVERLAND RELIEF ELEV =				1.80				
																PERIMETER = 6.40				AREA = 3.00		H = 0.21			50% CLOGGING							1.80				
130	DI-7			429.50	0.38	0.77	0.29	7.07	2.07					0.00	2.07	PERIMETER = 12.80				AREA = 6.00		H = 0.14			NO CLOGGING			OVERLAND RELIEF ELEV =				2.07				
																PERIMETER = 6.40				AREA = 3.00		H = 0.23			50% CLOGGING							2.07				
112	DI-7			431.50	0.14	0.35	0.05	7.07	0.35					0.00	0.35	PERIMETER = 12.80				AREA = 6.00		H = 0.04			NO CLOGGING			OVERLAND RELIEF ELEV =				0.35				
																PERIMETER = 6.40				AREA = 3.00		H = 0.07			50% CLOGGING							0.35				
140	DI-7			431.25	0.33	0.83	0.27	7.07	1.94					0.00	1.94	PERIMETER = 12.80				AREA = 6.00		H = 0.14			NO CLOGGING			OVERLAND RELIEF ELEV =				1.94				
																PERIMETER = 6.40				AREA = 3.00		H = 0.22			50% CLOGGING							1.94				
150	DI-7			431.25	0.33	0.83	0.27	7.07	1.94					0.00	1.94	PERIMETER = 12.80				AREA = 6.00		H = 0.14			NO CLOGGING			OVERLAND RELIEF ELEV =				1.94				
																PERIMETER = 6.40				AREA = 3.00		H = 0.22			50% CLOGGING							1.94				
151	DI-7			431.00	0.47	0.65	0.31	7.07	2.16					0.00	2.16	PERIMETER = 12.80				AREA = 6.00		H = 0.15			NO CLOGGING			OVERLAND RELIEF ELEV =				2.16				
																PERIMETER = 6.40				AREA = 3.00		H = 0.23			50% CLOGGING							2.16				
160	DI-7			431.00	0.47	0.65	0.31	7.07	2.16					0.00	2.16	PERIMETER = 12.80				AREA = 6.00		H = 0.15			NO CLOGGING			OVERLAND RELIEF ELEV =				2.16				
																PERIMETER = 6.40				AREA = 3.00		H = 0.23			50% CLOGGING							2.16				
320	DI-7			424.00	0.50	0.87	0.44	7.07	3.08					0.00	3.08	PERIMETER = 12.80				AREA = 6.00		H = 0.19			NO CLOGGING			OVERLAND RELIEF ELEV =				3.08				
																PERIMETER = 6.40				AREA = 3.00		H = 0.29			50% CLOGGING							3.08				
330	DI-7			431.00	0.30	0.84	0.25	7.07	1.78					0.00	1.78	PERIMETER = 12.80				AREA = 6.00		H = 0.13			NO CLOGGING			OVERLAND RELIEF ELEV =				1.78				
																PERIMETER = 6.40				AREA = 3.00		H = 0.20			50% CLOGGING							1.78				
340	DI-7			431.00	0.28	0.84	0.24	7.07	1.66					0.00	1.66	PERIMETER = 12.80				AREA = 6.00		H = 0.12			NO CLOGGING			OVERLAND RELIEF ELEV =				1.66				
																PERIMETER = 6.40				AREA = 3.00		H = 0.20			50% CLOGGING							1.66				
360	DI-7			433.00	0.05	0.35	0.02	7.07	0.12					0.00	0.12	PERIMETER = 12.80				AREA = 6.00		H = 0.02			NO CLOGGING			OVERLAND RELIEF ELEV =				0.12				
																PERIMETER = 6.40				AREA = 3.00		H = 0.03			50% CLOGGING							0.12				
37	DI-7			438.00	10.00	0.35	3.50	7.07	24.75					0.00	24.75	PERIMETER = 12.80				AREA = 6.00		H = 0.75			NO CLOGGING			OVERLAND RELIEF ELEV =				24.75				
																PERIMETER = 6.40				AREA = 3.00		H = 2.35			50% CLOGGING							24.75				
34	DI-3B	8.0		426.90	0.15	0.80	0.12	7.07	0.85					0.00	0.85	0.0400	0.0208	4.97	0.01	0.00	0.0833	4.01	0.01	2.00	2.01	16.73	0.11	9.91	0.81	0.95	0.80	0.04				
35	DI-3B	4.0		432.67	0.04	0.75	0.03	7.07	0.21					0.00	0.21	0.0400	0.0208	1.24	0.01	0.01	0.0833	4.01	1.00	2.00	2.01	16.73	16.75	0.27	14.66	1.00	0.21	0.00				
41	DI-3A	2.5		429.00	0.02	0.50	0.01	7.07	0.07					0.00	0.07	0.0600	0.0208	0.76	2.00	2.62	0.0833	4.01	1.00	2.00	3.50	0.15	0.17	3.09	0.81	0.95	0.07	0.00				
400	DI-3B	8.0		422.84	0.20	0.73	0.15	7.07	1.03					0.00	1.03	0.0480	0.0208	2.70	2.00	0.74	0.0833	4.01	1.00	2.00	3.50	0.15	0.17	8.93	0.90	0.98	1.01	0.02				
40	DI-3A	2.5		422.80	0.00	0.35	0.00	7.07	0.01					0.00	0.01	0.0210	0.0208	0.44	2.00	4.50	0.0833	4.01	1.00	2.00	3.50	0.15	0.17	0.99	2.53	1.00	0.01	0.00				
*																																				
50	DI-7			434.00	0.41	0.35	0.14	7.07	1.01					0.00	1.01	PERIMETER = 12.80				AREA = 6.00		H = 0.09			NO CLOGGING			OVERLAND RELIEF ELEV =				1.01				
																PERIMETER = 6.40				AREA = 3.00		H = 0.14			50% CLOGGING							1.01				
60	DI-7			441.00	0.47	0.35	0.16	7.07	1.16					0.00	1.16	PERIMETER = 12.80				AREA = 6.00		H = 0.10			NO CLOGGING			OVERLAND RELIEF ELEV =				1.16				
																PERIMETER = 6.40				AREA = 3.00		H = 0.15			50% CLOGGING							1.16				
20	DI-7			447.00	0.34	0.83	0.28	7.07	2.00					0.00	2.00	PERIMETER = 12.80				AREA = 6.00		H = 0.14			NO CLOGGING			OVERLAND RELIEF ELEV =				2.00				
																PERIMETER = 6.40				AREA = 3.00		H = 0.22			50% CLOGGING							2.00				
21	DI-7			440.00	0.34	0.83	0.28	7.07	2.00					0.00	2.00	PERIMETER = 12.80				AREA = 6.00		H = 0.14			NO CLOGGING			OVERLAND RELIEF ELEV =				2.00				
																PERIMETER = 6.40				AREA = 3.00		H = 0.22			50% CLOGGING							2.00				
22	DI-7			427.00	0.34	0.83	0.28	7.07	2.00					0.00	2.00	PERIMETER = 12.80				AREA = 6.00		H = 0.14			NO CLOGGING			OVERLAND RELIEF ELEV =				2.00				
																PERIMETER = 6.40				AREA = 3.00		H = 0.22			50% CLOGGING							2.00				
11	MH			431.56																																
12	MH			431.56																																
13	MH			431.56																																
14	MH			431.70																																
15	MH			431.75																																
16	MH			431.80																																
31	MH			423.50																																
32	MH			424.50																																
33	MH			423.80																																
36	MH			433.75																																
110	MH			430.40																																
*																																				

STORM SEWER DESIGN COMPUTATIONS

Life Time Fitness - Gaithersburg

FROM POINT	TO POINT	RAINAG AREA (AC)	C FACTOR	C x A INCR.	C x A PIPED IN	C x A SUM	INLET TIME (MIN)	TIME OF CONC. (MIN)	RAINFALL I (IN/HR)	RUNOFF Q (CFS)	PIPED IN FLOW, Q (CFS)	TOTAL RUNOFF, (CFS)	INVERT ELEV. UPPER END	INVERT ELEV. LOWER END	LENGTH (FT)	SLOPE (%)	DIA. (IN)	CAP. Q (CFS)	VEL. V (FPS)	FLOW TIME (MIN)
16	15	0.00	0.00	0.00	0.00	0.31	5.00	5.11	7.03	2.16	0.00	2.16	424.75	424.20	102.99	0.53	15	4.73	3.76	0.46
15	14	0.00	0.00	0.00	0.00	0.88	5.00	5.57	6.88	6.09	0.00	6.09	423.95	423.40	60.30	0.91	15	6.19	5.75	0.17
14	13	0.00	0.00	0.00	0.00	1.16	5.00	5.74	6.82	7.91	0.00	7.91	423.15	421.50	104.41	1.58	18	13.24	7.82	0.22
13	12	0.00	0.00	0.00	0.00	1.45	5.00	5.96	6.75	9.79	0.00	9.79	421.25	420.25	114.00	0.88	18	9.86	6.37	0.30
12	11	0.00	0.00	0.00	0.00	1.71	5.00	6.26	6.65	11.34	0.00	11.34	419.75	419.00	107.04	0.70	24	18.99	6.31	0.28
11	10	0.00	0.00	0.00	0.00	2.06	5.00	6.54	6.55	13.52	0.00	13.52	418.75	418.25	86.48	0.58	24	17.25	6.08	0.24
10	P2	0.14	0.35	0.05	0.00	2.11	5.00	6.78	6.48	13.67	0.00	13.67	413.50	410.25	31.26	10.40	24	73.14	17.84	0.03
*																				
160	16	0.47	0.65	0.31	0.00	0.31	5.00	5.00	7.07	2.16	0.00	2.16	426.00	425.00	43.00	2.33	12	5.45	6.54	0.11
*																				
151	15	0.47	0.65	0.31	0.00	0.31	5.00	5.00	7.07	2.16	0.00	2.16	426.00	424.45	43.00	3.60	12	6.78	7.68	0.09
*																				
150	15	0.33	0.83	0.27	0.00	0.27	5.00	5.00	7.07	1.94	0.00	1.94	425.75	424.45	25.17	5.16	12	8.12	8.46	0.05
*																				
140	14	0.33	0.83	0.27	0.00	0.27	5.00	5.00	7.07	1.94	0.00	1.94	425.75	423.65	25.17	8.34	12	10.32	10.05	0.04
*																				
130	13	0.38	0.77	0.29	0.00	0.29	5.00	5.00	7.07	2.07	0.00	2.07	422.50	422.00	85.50	0.58	12	2.73	3.83	0.37
*																				
120	12	0.33	0.77	0.25	0.00	0.25	5.00	5.00	7.07	1.80	0.00	1.80	422.50	420.75	85.50	2.05	12	5.11	5.92	0.24
*																				
111	110	0.40	0.77	0.31	0.00	0.31	5.00	5.00	7.07	2.18	0.00	2.18	422.50	422.25	27.35	0.91	12	3.42	4.61	0.10
110	11	0.00	0.00	0.00	0.00	0.36	5.00	5.26	6.98	2.49	0.00	2.49	422.00	420.00	58.15	3.44	12	6.63	7.85	0.12
*																				
112	110	0.14	0.35	0.05	0.00	0.05	5.00	5.00	7.07	0.35	0.00	0.35	427.50	422.25	84.43	6.22	12	8.91	5.48	0.26
*																				
41	40	0.02	0.50	0.01	0.00	0.01	5.00	5.00	7.07	0.07	0.00	0.07	422.95	417.70	101.30	5.18	15	14.75	3.01	0.56
40	SD	0.00	0.35	0.00	0.00	0.16	5.00	5.56	6.88	1.08	0.00	1.08	417.45	416.55	99.37	0.91	15	6.16	3.79	0.44
*																				
400	40	0.20	0.73	0.15	0.00	0.15	5.00	5.00	7.07	1.03	0.00	1.03	418.64	417.70	37.34	2.52	15	10.28	5.37	0.12
*																				
37	36	10.00	0.35	3.50	0.00	3.50	5.00	5.00	7.07	24.75	0.00	24.75	430.00	427.50	35.62	7.02	30	108.96	17.97	0.03
36	35	0.00	0.00	0.00	0.00	3.52	5.00	5.10	7.04	24.75	0.00	24.75	427.25	426.25	84.01	1.19	30	44.87	9.37	0.15
35	34	0.04	0.75	0.03	0.00	3.55	5.00	5.25	6.99	24.79	0.00	24.79	426.00	421.35	128.60	3.62	30	78.21	14.13	0.15
34	33	0.15	0.80	0.12	0.00	3.90	5.00	5.40	6.94	27.07	0.00	27.07	421.10	419.10	121.80	1.64	30	52.70	10.81	0.19
33	32	0.00	0.00	0.00	0.00	4.15	5.00	5.59	6.87	28.56	0.00	28.56	419.00	418.00	130.25	0.77	30	36.04	8.14	0.27
32	31	0.00	0.00	0.00	0.00	4.59	5.00	5.86	6.78	31.14	0.00	31.14	417.90	417.65	42.13	0.59	30	31.68	7.36	0.10
31	30	0.00	0.00	0.00	0.00	4.59	5.00	5.95	6.75	31.14	0.00	31.14	417.55	417.10	77.58	0.58	30	31.32	7.27	0.18
*																				
320	32	0.50	0.87	0.44	0.00	0.44	5.00	5.00	7.07	3.08	0.00	3.08	420.10	420.00	12.07	0.83	12	3.25	4.71	0.04
*																				
340	34	0.28	0.84	0.24	0.00	0.24	5.00	5.00	7.07	1.66	0.00	1.66	423.50	422.85	45.50	1.43	12	4.27	5.09	0.15
*																				
330	33	0.30	0.84	0.25	0.00	0.25	5.00	5.00	7.07	1.78	0.00	1.78	421.50	420.60	60.07	1.50	12	4.37	5.28	0.19
*																				
360	36	0.05	0.35	0.02	0.00	0.02	5.00	5.00	7.07	0.12	0.00	0.12	429.25	428.75	17.97	2.78	15	10.80	3.00	0.10
*																				
50	B	0.41	0.35	0.14	0.00	0.14	5.00	5.00	7.07	1.01	0.00	1.01	430.00	429.00	34.23	2.92	12	6.11	5.77	0.10
*																				
60	A	0.47	0.35	0.16	0.00	0.16	5.00	5.00	7.07	1.16	0.00	1.16	437.00	436.25	26.11	2.87	12	6.05	5.95	0.07
*																				

HYDRAULIC GRADE LINE COMPUTATIONS

Life Time Fitness - Gaithersburg

INLET STRUCTURE	UPSTREAM INLET	OUTLET WATER SURFACE ELEV.	Do (IN)	Qo (CFS)	Lo (FT)	Sfo (%)	Hf (FT)	JUNCTION LOSS Vo (FPS)	Ho (FT)	Qi (CFS)	Vi (FPS)	QiVi	2 Vi /2g (FT)	Hi (FT)	Defl. Angle	Hd (FT)	Ht (FT)	1.3 x Ht (FT)	0.5 x Ht (FT)	FINAL H (FT)	INLET WATER SURFACE ELEV.	TOP ELEV.
P2																			Starting Elevation		411.85	
10		411.85	24	13.67	31.26	0.3654	0.11	17.84	1.23					0.20		0.40	1.84	2.39	1.19	1.31	413.16	430.50
	11		24							13.52	6.08	82.16	0.57		90							
11		419.85	24	13.52	86.48	0.3572	0.31	6.08	0.14					0.22		0.67	1.03	0.00	0.51	0.82	420.67	431.56
	12		24							11.34	6.31	71.56	0.62	0.22	90	0.43						
	110		12							2.49	7.85	19.56	0.96	0.33	90	0.67						
12		420.67	24	11.34	107.04	0.2513	0.27	6.31	0.15					0.22		0.44	0.82	0.00	0.41	0.68	421.35	431.56
	13		18							9.79	6.37	62.38	0.63	0.22	90	0.44						
	120		12							1.80	5.92	10.64	0.54	0.19	90	0.38						
13		421.45	18	9.79	114.00	0.8697	0.99	6.37	0.16					0.33		0.67	1.16	0.00	0.58	1.57	423.02	431.56
	14		18							7.91	7.82	61.84	0.95	0.33	90	0.67						
	130		12							2.07	3.83	7.91	0.23	0.08	90	0.16						
14		423.02	18	7.91	104.41	0.5667	0.59	7.82	0.24					0.18		1.10	1.52	0.00	0.76	1.35	424.37	431.70
	15		15							6.09	5.75	34.99	0.51	0.18	90	0.36						
	140		12							1.94	10.05	19.47	1.57	0.55	90	1.10						
15		424.40	15	6.09	60.30	0.8888	0.54	5.75	0.13					0.32		0.78	1.23	0.00	0.61	1.15	425.55	431.75
	16		15							2.16	3.76	8.13	0.22	0.08	90	0.15						
	151		12							2.16	7.68	16.58	0.92	0.32	90	0.64						
	150		12							1.94	8.46	16.38	1.11	0.39	90	0.78						
16		425.55	15	2.16	102.99	0.1118	0.12	3.76	0.05					0.23		0.46	0.75	0.00	0.38	0.49	426.04	431.80
	160		12							2.16	6.54	14.12	0.66		90							
110		420.80	12	2.49	58.15	0.4899	0.28	7.85	0.24					0.12		0.33	0.68	0.00	0.34	0.63	421.43	430.40
	111		12							2.18	4.61	10.04	0.33	0.12	90	0.23						
	112		12							0.35	5.48	1.90	0.47	0.16	90	0.33						
111		423.05	12	2.18	27.35	0.3737	0.10	4.61	0.10								0.10	0.13	0.06	0.17	423.22	429.50
112		423.05	12	0.35	84.43	0.0095	0.01	5.48	0.14								0.14	0.18	0.09	0.10	423.15	431.50
120		421.55	12	1.80	85.50	0.2543	0.22	5.92	0.16								0.16	0.21	0.11	0.32	421.87	429.50
130		423.02	12	2.07	85.50	0.3372	0.29	3.83	0.07								0.07	0.09	0.04	0.33	423.35	429.50
140		424.45	12	1.94	25.17	0.2955	0.07	10.05	0.47								0.47	0.61	0.31	0.38	424.83	431.25
150		425.55	12	1.94	25.17	0.2955	0.07	8.46	0.33								0.33	0.43	0.22	0.29	425.84	431.25
151		425.55	12	2.16	43.00	0.3676	0.16	7.68	0.27								0.27	0.36	0.18	0.34	425.89	431.00
160		426.04	12	2.16	43.00	0.3676	0.16	6.54	0.20								0.20	0.26	0.13	0.29	426.33	431.00
SD																			Starting Elevation		417.55	
40		417.55	15	1.08	99.37	0.0281	0.03	3.79	0.06					0.16		0.31	0.53	0.00	0.26	0.29	417.84	422.80
	41		15							0.07	3.01	0.21	0.14	0.05	90	0.10						
	400		15							1.03	5.37	5.54	0.45	0.16	90	0.31						
41		418.70	15	0.07	101.30	0.0001	0.00	3.01	0.04								0.04	0.05	0.03	0.03	418.73	429.00
400		418.70	15	1.03	37.34	0.0255	0.01	5.37	0.13								0.13	0.17	0.09	0.10	418.80	422.84
30																			Starting Elevation		419.10	
31		419.10	30	31.14	77.58	0.5765	0.45	7.27	0.21					0.29		0.59	1.09	0.00	0.54	0.99	420.09	423.50
	32		30							31.14	7.36	229.04	0.84		90							
32		420.09	30	31.14	42.13	0.5765	0.24	7.36	0.21					0.36		0.72	1.29	0.00	0.65	0.89	420.98	424.50
	33		30							28.56	8.14	232.48	1.03	0.36	90	0.72						
	320		12							3.08	4.71	14.47	0.34	0.12	90	0.24						
33		420.98	30	28.56	130.25	0.4849	0.63	8.14	0.26					0.63		1.27	2.16	0.00	1.08	1.71	422.69	423.80
	34		30							27.07	10.81	292.55	1.81	0.63	90	1.27						
	330		12							1.78	5.28	9.41	0.43	0.15	90	0.30						
34		422.69	30	27.07	121.80	0.4357	0.53	10.81	0.45					1.09		2.17	3.71	0.00	1.86	2.39	425.08	426.90
	35		30							24.79	14.13	350.33	3.10	1.09	90	2.17						
	340		12							1.66	5.09	8.47	0.40	0.14	90	0.28						
35		425.08	30	24.79	128.60	0.3653	0.47	14.13	0.78					0.48		0.95	2.21	0.00	1.10	1.57	426.65	432.67
	36		30							24.75	9.37	231.82	1.36		90							
36		428.25	30	24.75	84.01	0.3643	0.31	9.37	0.34					1.75		3.51	5.60	0.00	2.80	3.11	431.36	433.75
	37		30							24.75	17.97	444.55	5.01	1.75	90	3.51						
	360		15							0.12	3.00	0.37	0.14	0.05	90	0.10						
37		431.36	30	24.75	35.62	0.3641	0.13	17.97	1.50								1.50	1.95	0.98	1.11	432.46	438.00
320		420.98	12	3.08	12.07	0.7454	0.09	4.71	0.10								0.10	0.13	0.07	0.16	421.14	424.00
330		422.69	12	1.78	60.07	0.2501	0.15	5.28	0.13								0.13	0.17	0.08	0.23	422.93	431.00
340		425.08	12	1.66	45.50	0.2179	0.10	5.09	0.12								0.12	0.16	0.08	0.18	425.26	431.00
360		431.36	15	0.12	17.97	0.0004	0.00	3.00	0.04								0.04	0.05	0.03	0.03	431.38	433.00

REVISIONS

No.	DATE	DESCRIPTION

PLAN DATE
10-23-13
12-16-13
01-10-14

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Planners·Engineers·Landscape Architects·Land Surveyors
Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA. 20151
TEL. 703.642.2306
FAX 703.378.7888
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STATE OF MARYLAND · ERIC S. SIEGEL · No. 28085 · PROFESSIONAL ENGINEER

STORM COMPUTATIONS

WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER

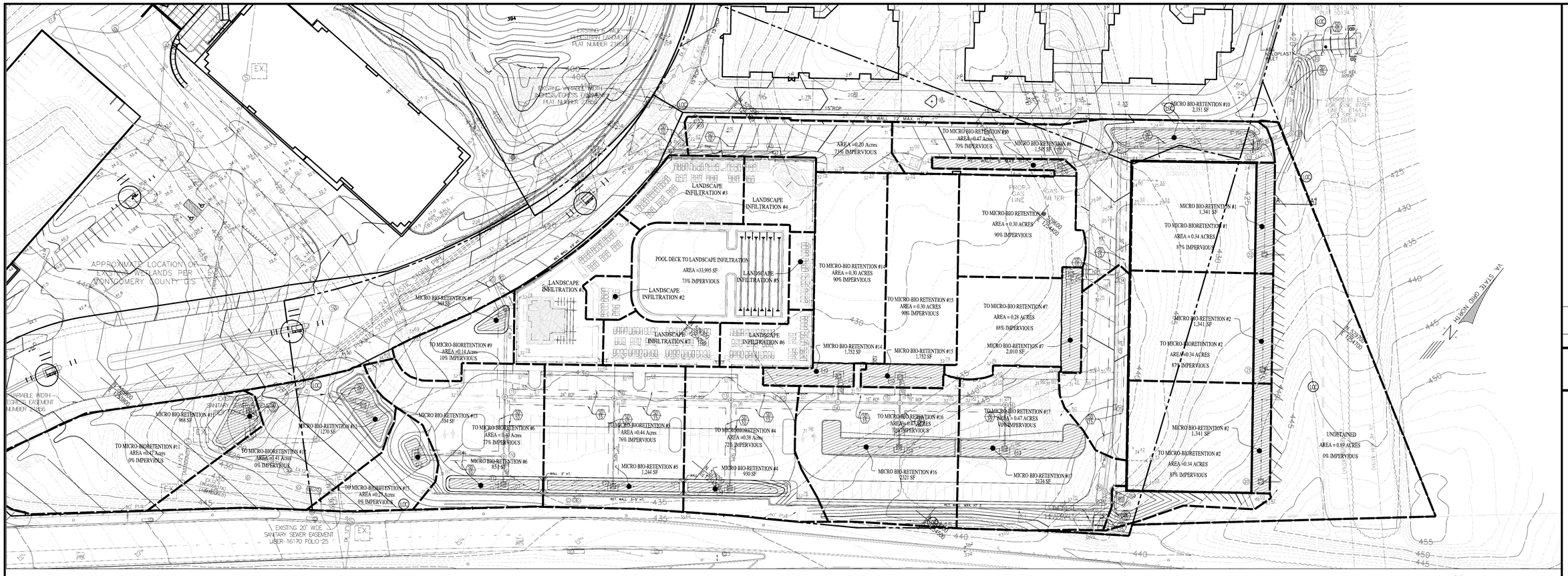
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

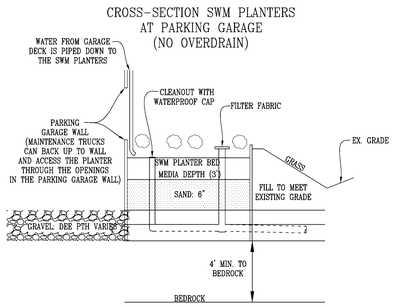
DATE: SEPT, 2013

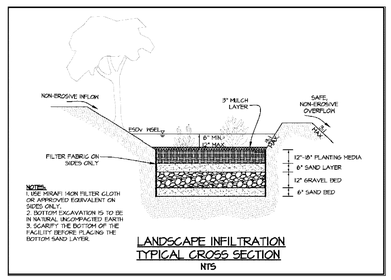
SCALE: 1"=50' (H); 1"=5' (V)   C.I.= N/A

SHEET 6 OF 12

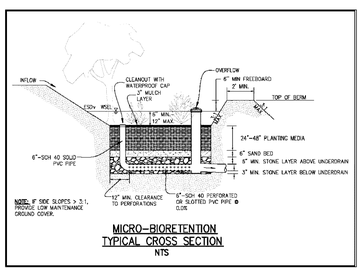
FILE No. SP-12727



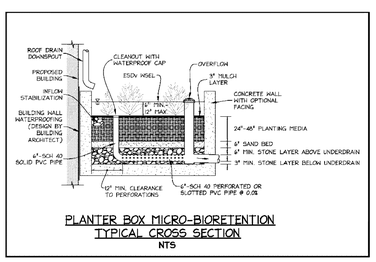




LANDSCAPE INFILTRATION
TYPICAL CROSS SECTION
NTS



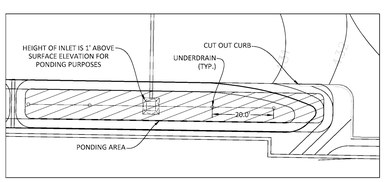
MICRO-BIORETENTION
TYPICAL CROSS SECTION
NTS



PLANTER BOX MICRO-BIORETENTION
TYPICAL CROSS SECTION
NTS

LEGEND

SURFACE AREA OF SWM TREATMENT FACILITIES



MICRO-BIORETENTION - PLAN VIEW
SCALE: 1" = 20'

NOTES:
1.) LANDSCAPE DESIGN TO BE APPROVED BY LANDSCAPE ARCHITECT AT THE TIME OF FINAL DESIGN.
2.) PLANTING SOIL MIXTURE TO BE DETERMINED AT A LATER DATE.

STORMWATER MANAGEMENT COMPUTATIONS

Lot 5
Life Time Fitness
Washingtonian North

Site Area= 371566 sq. ft

Drainage Area Treated = 307,740 sf
Target Pe = 2.0 inches
Target Qe = 1.2 inches

Total Pe Achieved 2.35 inches

Total Treatment Volume Required 36,188 cf per Maryland Stormwater Spreadsheet
*Note: 37,138 ft can be reduced by 950 cf (11,400 sf * 1"/1 ft) for area of the proposed pool which does not create surface runoff

Bioretention Facilty	Drainage Area (DA in ft)	Impervious Area (ft)	% Impervious	Soil Type	Approx. % Site	Surface Area of SWM Facility	Target Pe for Facility (in.)	Rv Coefficient	ESD Target Credits (cf)	Actual Pe for Facility (in.)	ESD Credits (cf)	Reduced RCN	Media Depth (Ft)
Micro-Bioretention #1	14,665	12,758	87%	B	0.04	1,820	2.4	0.833	2443.09	2.5	2,749	55	3
Micro-Bioretention #2	14,561	12,668	87%	B	0.04	1,820	2.4	0.833	2425.85	2.5	2,729	55	3
Micro-Bioretention #3	14,526	12,637	87%	B	0.04	1,820	2.4	0.833	2419.92	2.5	2,723	55	3
Micro-Bioretention #4	19,287	14,512	75%	B	0.05	930	2.2	0.727	2571.28	1.0	1,911	79	4
Micro-Bioretention #5	19,188	14,598	76%	B	0.05	1,244	2.2	0.735	2584.56	1.3	3,234	73	4
Micro-Bioretention #6	17,397	13,397	77%	B	0.05	780	2.2	0.743	2369.98	0.9	2,028	79	4
Micro-Bioretention #7	11,080	9,778	88%	B	0.03	2,010	2.4	0.844	1870.84	3.6	1,937	55	2
Micro-Bioretention #8	13,147	11,602	88%	B	0.04	1,545	2.4	0.844	2219.83	2.4	3,790	55	4
Micro-Bioretention #9	5,916	591	10%	B	0.02	342	1.0	0.140	68.98	1.2	186	55	2
Micro-Bioretention #10	20,230	11,430	57%	B	0.05	2,351	1.8	0.559	1694.78	2.3	2,522	55	2
Micro-Bioretention #11	20,331	0	0%	B	0.05	1,000	1.0	0.050	84.71	1.0	270	55	2
Micro-Bioretention #12	16,987	0	0%	B	0.05	912	1.0	0.050	70.78	1.1	226	55	2
Micro-Bioretention #13	7,158	0	0%	B	0.02	354	1.0	0.050	29.83	1.0	95	55	2
Micro-Bioretention #14	14,783	13,031	88%	B	0.04	1,752	2.4	0.843	2493.41	2.4	2,861	55	2
Micro-Bioretention #15	14,783	13,031	88%	B	0.04	1,752	2.4	0.843	2493.41	2.4	2,861	55	2
Micro-Bioretention #16	20,400	14,280	70%	B	0.05	2,321	2.2	0.680	2543.20	2.3	3,015	55	2
Micro-Bioretention #17	20,400	14,200	70%	B	0.05	2,174	2.2	0.676	2530.00	2.1	3,015	57	2
Landscape infiltration #1	9,488	7,590	80	B	0.03	1,895	2.2	0.050	86.97	4.0	1,644	55	
Landscape infiltration #2	1,845	1,621	90	B	0.00	220	2.4	0.050	18.45	2.4	357	55	
Landscape infiltration #3	7,954	7,080	89	B	0.02	886	2.2	0.050	72.91	2.2	1,523	55	
Landscape infiltration #4	3,478	2,679	77	B	0.01	812	2.2	0.050	31.88	4.7	581	55	
Landscape infiltration #5	1,864	1,566	84	B	0.01	297	2.2	0.050	17.09	3.2	338	55	
Landscape infiltration #6	4,324	3,502	81	B	0.01	804	2.2	0.050	39.64	3.7	758	55	
Landscape infiltration #7	5,042	4,286	85	B	0.01	765	2.2	0.050	46.22	3.0	925	55	
	298,834	**196,837**			0.80	**30,606**			**31227.59**		**42,278.0**		
Site Imperviousness		65.87%											

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-25-13
12-12-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703.642.2306
FAX 703.378.7888
www.urban-ltd.com
Planners/Engineers/Landscape Architects/Land Surveyors

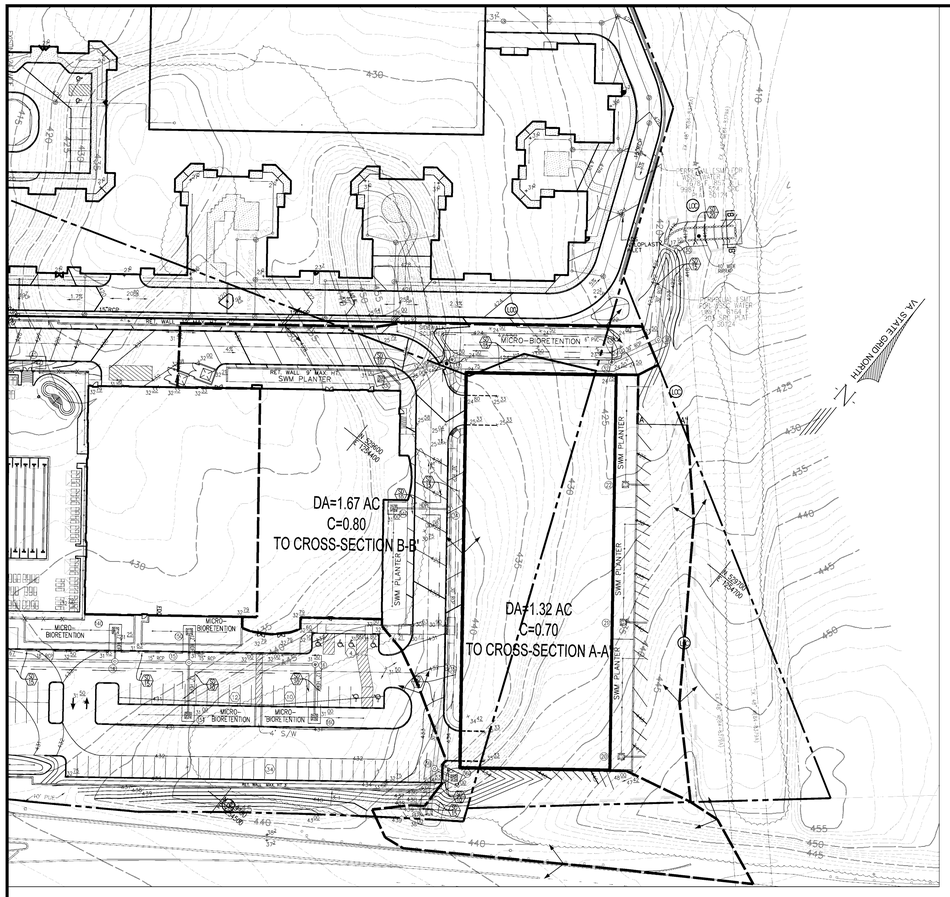
STORMWATER MANAGEMENT PLAN & DETAILS
WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=40'
C.I.= 1'
DATE: SEPT. 2013

SHEET 7 OF 12

FILE No. SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-08-SWM Concept.dwg [SWM Layout] January 10, 2014 – 10:08am gellwood



0 25 50 100 150

SCALE – 1 inch = 50 ft.

S.W.M. & B.M.P. OUTFALL NARRATIVE

The following project is for the construction of a health club on approximately 8.63 acres in Montgomery County, Maryland. The site is situated on the Northwest quadrant of the I-270 and I-370 intersection.

The site has been designed to convey sheet flow via adequately engineering grades overland to proposed storm inlets on-site. There IS one outfall proposed, it is located at the north corner of the parking garage. Two cross-sections have been provided to the show that adequate measures have been provided to minimize erosion damage.

Two separate storm systems on-site convey water from the site to proposed inlets along the main access road provided between the parcels. Approximately 13.67 cfs is conveyed from STM Pipes 10-16 to Structure P2 through a 24" RCP pipe. Approximately 1.08 cfs is convey from STM Pipes 40-42 to Structure SD through a 15" RCP pipe.

The STM Pipes 37-30 have been designed to convey offsite water from SAM EIG highway . The off-site is conveyed through the site via 30" RCP pipes to an outfall outside the northeast corner of the site. An additional 6.39 cfs is added from the proposed to site to offsite area. A total of 31.14 cfs drains outfalls at structure #30. Since structure #30 does not outfall into the existing swale, a manmade swale was designed to transport the water to the existing swale.. As the computations show the slope is too high, and the velocities are well over the minimum needed to require rip-rap. Thus rip-rap has been provided from outfall pipe 30 passed cross-section B-B'. Further analysis will be provided with final submission.

The cross-section A-A shows the area draining from the micro-bioretentions provided for the garage, is minimal, and the flow going through the section is not high enough to require rip-rap.

It is our opinion that an adequate outfall exists.

CROSS SECTION A-A' 2YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	5.19	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
10+00	425.00
10+09	423.00
10+09	422.50
10+10	423.00
10+20	424.00
10+20	425.00
10+35	426.00
10+40	426.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00, 425.00)	(10+40, 426.50)	0.030

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.42	ft
Elevation Range	422.90 to 426.50 ft	
Flow Area	1.25	ft²
Wetted Perimeter	8.08	ft
Hydraulic Radius	0.21	ft

Bentley Systems, Inc. Haestad Methods SolBentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]
12/16/2013 9:36:26 PM 27 Siemons Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Page 1 of 2

Top Width	5.99	ft
Normal Depth	0.42	ft
Critical Depth	0.50	ft
Critical Slope	0.02112	ft/ft
Velocity	4.07	ft/s
Velocity Head	0.26	ft
Specific Energy	0.68	ft
Froude Number	1.57	
Flow Type	Supercritical	

CROSS SECTION A-A' 10YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00500	ft/ft
Discharge	9.53	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
10+00	425.00
10+09	423.00
10+09	422.50
10+10	423.00
10+20	424.00
10+20	425.00
10+35	426.00
10+40	426.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00, 425.00)	(10+40, 426.50)	0.030

Options

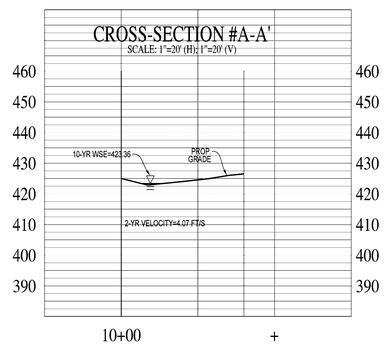
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.48	ft
Elevation Range	422.90 to 426.50 ft	
Flow Area	1.51	ft²
Wetted Perimeter	8.65	ft
Hydraulic Radius	0.23	ft

Bentley Systems, Inc. Haestad Methods SolBentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]
12/16/2013 9:31:15 PM 27 Siemons Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Page 1 of 2

Top Width	8.57	ft
Normal Depth	0.48	ft
Critical Depth	0.58	ft
Critical Slope	0.02044	ft/ft
Velocity	4.32	ft/s
Velocity Head	0.29	ft
Specific Energy	0.75	ft
Froude Number	1.59	
Flow Type	Supercritical	



CROSS SECTION B-B' 2 YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.10000	ft/ft
Discharge	25.33	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
10+00	413.00
10+12	412.00
10+22	412.00
10+26	412.75
10+28	412.00
10+30	412.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00, 413.00)	(10+30, 412.00)	0.069

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.46	ft
Elevation Range	412.00 to 413.00 ft	
Flow Area	7.53	ft²
Wetted Perimeter	21.70	ft
Hydraulic Radius	0.35	ft
Top Width	21.10	ft
Normal Depth	0.46	ft
Critical Depth	0.45	ft
Critical Slope	0.10194	ft/ft
Velocity	3.36	ft/s
Velocity Head	0.18	ft
Specific Energy	0.63	ft
Froude Number	0.99	
Flow Type	Subcritical	

CROSS SECTION B-B' 10 YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.10000	ft/ft
Discharge	31.14	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
10+00	413.00
10+12	412.00
10+22	412.00
10+26	412.75
10+28	412.00
10+30	412.00

Roughness Segment Definitions

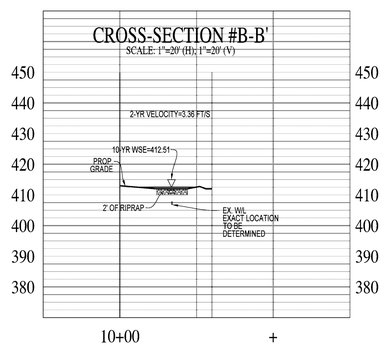
Start Station	Ending Station	Roughness Coefficient
(10+00, 413.00)	(10+30, 412.00)	0.069

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.51	ft
Elevation Range	412.00 to 413.00 ft	
Flow Area	8.70	ft²
Wetted Perimeter	22.85	ft
Hydraulic Radius	0.38	ft
Top Width	22.18	ft
Normal Depth	0.51	ft
Critical Depth	0.51	ft
Critical Slope	0.09550	ft/ft
Velocity	3.58	ft/s
Velocity Head	0.20	ft
Specific Energy	0.71	ft
Froude Number	1.01	
Flow Type	Supercritical	



No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-25-13
12-16-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703-642-2306
FAX 703.378.7888
www.urban-ltd.com
Planners/Engineers/Landscape Architects/Land Surveyors

STATE OF MARYLAND
STEVEN S. SIEGEL
No. 18886
PROFESSIONAL ENGINEER

ADEQUATE OUTFALL ANALYSIS

WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER

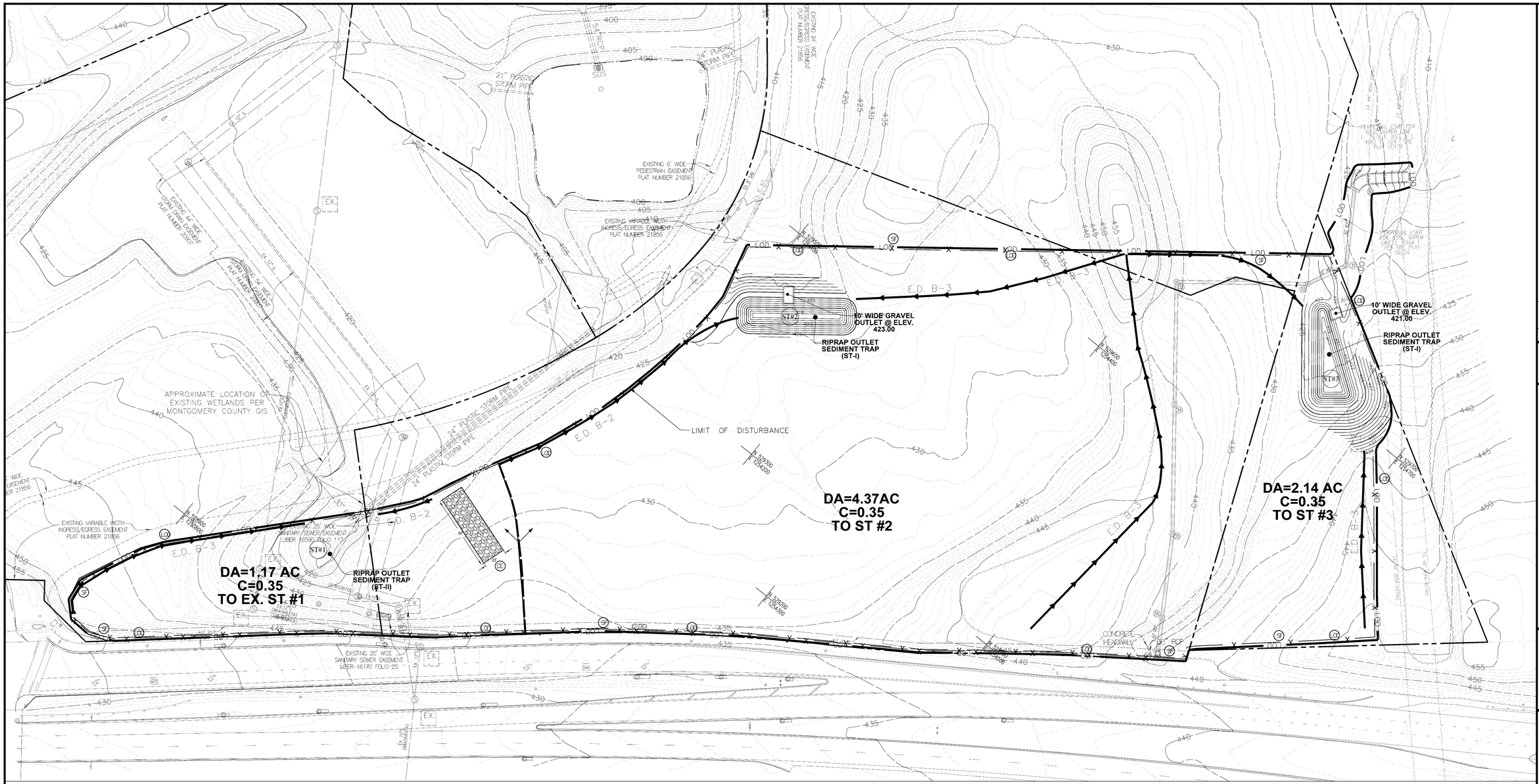
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=50'
C.I.= 1'
DATE: SEPT. 2013

SHEET 8 OF 12

FILE No. SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-14-Adequate Outfall.dwg [outfall] January 10, 2014 – 10:08am gellwood



THIS SHEET FOR E&S PURPOSES ONLY!
SEE SHEET #11 FOR E&S LEGEND.

0 20 40 80 120
SCALE – 1 inch = 40 ft.

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-25-13
12-12-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703.642.2506
FAX 703.378.7888
www.urban-ltd.com
Planners/Engineers/Landscape Architects/Land Surveyors

STATE OF MARYLAND
STEVEN S. SEGEL
No. 29895
PROFESSIONAL ENGINEER

EROSION & SEDIMENT CONTROL PHASE I

WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER

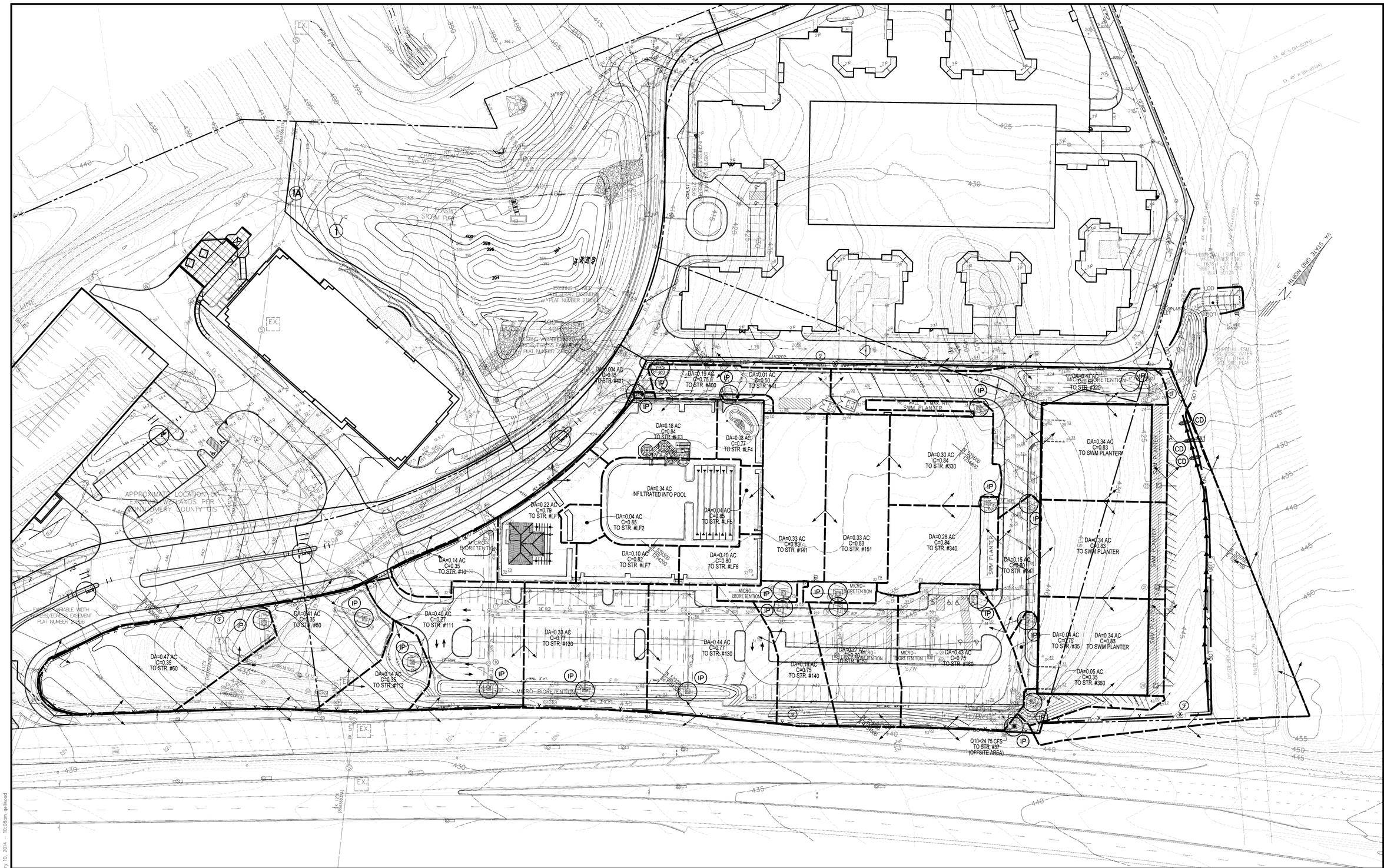
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=40'
C.I.= 1'
DATE: SEPT. 2013

SHEET
9
OF
12

FILE No.
SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-15-FS1.dwg [ES1] January 10, 2014 – 10:08am gsilwood



NOTE: ALL PROPOSED INLET ASSUMED TO BE FIVE MINUTES. IN ADDITION, FLOW TIMES WITHIN CLOSE CONDUIT SYSTEMS HAVE BEEN IGNORED FOR THE PURPOSE OF THIS ANALYSIS. APPLICANT RESERVES THE RIGHT TO UTILIZE TRUE TIMES OF CONCENTRATION AND TRUE FLOW TIMES WITHIN THE CLOSE CONDUIT SYSTEMS AT THE TIME OF FINAL SITE PLAN.

0 20 40 80 120

SCALE – 1 inch = 40 ft.

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
10-25-13
12-11-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA 20151
TEL 703.642.2306
FAX 703.378.7888
www.urban-ltd.com
Planners/Engineers/Landscape Architects/Land Surveyors

STATE OF MARYLAND
PAUL S. SHEARER
No. 28895
PROFESSIONAL ENGINEER

EROSION & SEDIMENT CONTROL PHASE II

WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER

9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: 1"=40'
C.I.= 1'
DATE: SEPT. 2013

SHEET
10
OF
12

FILE No.
SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-15-FS2a.dwg [FS2] January 10, 2014 – 10:08am gethwood

EROSION & SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION
The purpose of this project is for the construction of a Health Club Center as part of the Washingtonian North Commercial Site. The site is located in the City of Gaithersburg, Maryland in the 9th Election District. Approximately 7.40 acres will be disturbed during construction of this site and its associated infrastructure.

EXISTING SITE CONDITIONS
The site generally slopes to the middle of the site from east to west towards an existing pond located just west of the property. There is a ridge to the north that runs from the property line along I-270 to the middle of the site where there is a small hill reaching to an elevation of 455 feet. To the north of the ridge, the site slopes toward the northern property line. On the south side of the ridge, the site slopes to west to an existing small pond.

ADJACENT PROPERTY
North and West of the site are existing residential communities consisting of single family detached and attached homes. To south is Washingtonian South which consists of commercial and retail buildings. To the East is Dwight D. Eisenhower Memorial Highway.

OFF-SITE AREAS
Topsoil must be stripped from graded areas and stockpiled for use in final grading and permanent stabilization. The stockpiles may have to be kept off site to stay clear of all construction activity. The stockpile shall be stabilized with temporary vegetation to prevent soil loss and sediment transport from the stockpile itself until needed. Prior to land-disturbing activities, it may become necessary for the contractor to submit a supplementary E&S plan to the owner covering the off-site stockpile area which would have to be approved by the plan approving authority before any off-site activity commences. Any off-site area utilized requires a valid grading permit.

SEQUENCE OF CONSTRUCTION:

SEDIMENT CONTROL PROGRAM (PHASE ONE):
The Phase One Erosion Control Plan is intended to establish entrances and perimeter control measures, which include Silt Fence (SF), Storm Drain Inlet Protection(IP), Stone Check Dams (CD), Earth Dikes (ED), and Sediment Traps (ST#) and other controls specified on the plans. All erosion and sediment control measures are to comply with all applicable Federal, State, and local regulations.

1. Pre-construction meeting with developer, contractor and county inspector.

2. Install temporary construction entrances with wash racks. Mud and debris shall be washed from all construction equipment exiting the site. Any dirt carried onto public roadways shall be cleaned at the end of each day by sweeping and scraping before flushing.

3. Install perimeter controls Silt Fence, Inlet Protection, and Earth Dikes as shown on the E&S Phase One plan. Seed and mulch all earthen controls.

4. Clear the site to the limits shown on the E&S Phase I plan. Site to be previously graded by Developer before work to be done. Road will be graded before site can be worked on.

5. Commence construction of utilities and begin grading of the site. Contractor shall evaluate site to determine extensive cut and fill areas and shall work these areas to minimize the extent of heavy equipment work. Contractor shall strive to bring areas to grade and to stabilize these disturbed areas prior to beginning work in another area.

6. Temporary soil stabilization shall be applied to any area not continuously worked for 7 days.

7. The Montgomery County Inspector has the authority to add, modify, or delete erosion and sedimentation control as needed in the field, as site conditions warrant. Inspection and approval of perimeter controls will be required before proceeding from Phase One to Phase Two.

SEDIMENT CONTROL PROGRAM (PHASE TWO):
The Phase Two Sediment Measures are intended to provide controls during the final stages of improvements. It is anticipated that Phase One Controls will remain in place until their removal is required to construct the proposed improvements. No sediment traps or basins shall be removed without prior approval of the County Inspector.

1. Once site grading is brought near to final grade and storm drainage system constructed, the Inlet Protection Measures shall be installed.

2. Fill slopes shall be left in a roughened condition to reduce sheet and rill erosion of the slopes. The contractor shall redirect concentrated flow away from the fill slopes by installing earth berms and outletting the runoff to a stabilized outlet or sediment trapping device.

3. In pavement areas, place the aggregate base on the finished subgrade at the earliest possible time. Paving shall begin at the earliest possible time in order to stabilize the site.

4. With the completion of all land disturbing and construction activities and permanent ground stabilization completed the remaining erosion and sediment controls may be removed upon the approval of the Montgomery County Inspector.

STORMWATER MANAGEMENT
See Outfall Narrative on adequate outfall sheet #7.

EROSION AND SEDIMENT CONTROL LEGEND

B-1	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
E-1	SILT FENCE	SF	—X—X—X—
E-9-3	STORM DRAIN INLET PROTECTION	SIP	
E-9-3	STONE CHECK DAM	CD	
C-1	EARTH DIKE	ED3	

City of Gaithersburg Department of Public Works
STANDARD EROSION AND SEDIMENT CONTROL NOTES

1. The permittee shall notify the City Inspector at 301-258-6330, 48 hours before commencing any land disturbing activity and shall be required to hold a preconstruction meeting between himself or his representative, and authorized representatives of the City.

2. The permittee must obtain inspection and approval by Planning and Code Enforcement at the following points:
   a. At the required pre-construction meeting.
   b. Following installation of sediment control measures and prior to any other land disturbing activity.
   c. During the installation of a sediment basin or stormwater management structure at the required inspection points (see Inspection Checklist on plan). Notification prior to commencing construction is mandatory.
   d. Prior to removal or modification of any sediment control devices.
   e. Prior to final acceptance.

3. All erosion control measures are to be constructed and maintained in accordance with applicable published standards and specifications and the most current "Maryland Standards and Specifications for Soil Erosion and Sediment Control."

4. The permittee shall construct all erosion and sediment control measures per the approved plan and construction sequence, shall have them inspected and approved by the City inspector prior to beginning any other land disturbances, shall ensure that all runoff from disturbed areas is directed to the sediment control devices, and shall not remove any erosion or sediment control measures without prior permission from City inspector.

5. Any request for changes to the approved sediment control plan or sequence of construction must be submitted to the Sediment Control Inspector and approved before implementing changes. Major changes will require a plan revision.

6. The permittee shall protect all points of construction ingress and egress to prevent the deposition of materials onto traversed public thoroughfare(s). All materials deposited onto public thoroughfare(s) shall be removed immediately.

7. The permittee shall inspect daily and maintain continuously in effective operating condition all erosion and sediment control measures until such times as they are removed with prior permission from Department of Planning and Code Enforcement.

1

8. All sediment basins, trap embankments, swales, perimeter dikes and permanent slopes steeper or equal to 3:1 shall be stabilized with sod, seed and anchored straw mulch, or other approved stabilization measures, within three (3) calendar days of establishment. All areas disturbed outside of the perimeter sediment control system must be minimized and stabilized immediately. Maintenance must be performed as necessary to ensure continued stabilization. Restabilization or overseeding will be required, if necessary.

9. The permittee shall apply sod, seed and anchored straw, mulch, or other approved stabilization measures to all disturbed areas within 7 calendar days after stripping and grading activities have ceased on that area. Maintenance shall be performed as necessary to ensure continued stabilization. Active construction areas, such as borrow or stockpile areas, roadway improvements, and areas within 50 feet of a building under construction may be exempted from this requirement, provided that erosion and sediment control measures are installed and maintained to protect those areas.

10. Prior to removal of sediment control measures, the permittee shall stabilize all contributory disturbed areas using sod or an approved permanent seed mixture with required soil amendments and an approved anchored mulch. Wood fiber mulch may only be used in seeding season when the slope does not exceed 10% to promote sheet flow drainage. Areas brought to finished grade during the seeding season shall be permanently stabilized within 7 calendar days of establishment. When property is brought to finished grade during the months of November through February, and permanent stabilization is found to be impractical, an approved temporary seed and straw anchored mulch shall be applied to disturbed areas. The final permanent stabilization of such property shall be completed prior to the following April 15.

11. The site work, materials, approved SC and SWM plans and any required test reports shall be available at the site for inspection by duly authorized officials of the City of Gaithersburg.

12. Surface drainage flows over unstabilized cut and fill slopes shall be controlled by either preventing drainage flows from traversing the slopes or by installing mechanical devices to lower the water downslope without causing erosion. Dikes shall be installed and maintained at the top of cut or fill slopes until the slope and drainage area to it are fully stabilized, at which time they must be removed and final grading done to promote sheet flow drainage. Mechanical devices must be provided at points of concentrated flow where erosion is likely to occur.

13. Permanent swales or other points of concentrated water flow shall be stabilized with sod or seed with an approved erosion control matting or by other approved stabilization measures.

14. Temporary sediment control devices shall be removed, with permission of the City inspector, within (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. If establishment is not full and uniform as determined by

2

the Sediment Control Inspector, overseeding will be required. Stormwater management structures used temporarily for sediment control shall be converted to the permanent configuration within this time period as well.

15. No permanent cut or fill slope with a gradient steeper than 3:1 will be permitted in lawn maintenance areas. A slope gradient of up to 2:1 will be permitted in areas that are not to be maintained provided that those areas are indicated on the erosion and sediment control plan with a low-maintenance ground cover specified for permanent stabilization. Slope gradient steeper than 2:1 will not be permitted with vegetative stabilization.

16. The permittee shall install a splashblock at the bottom of each downspout unless the downspout is connected by a drain line to an acceptable outlet.

17. All water pumped from excavation during construction shall be pumped either to sediment tanks and/or sediment traps. No water will be pumped to the storm drain system. Dewatering shall be performed in accordance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.

18. For finished grading, the permittee shall provide adequate gradients so as to: (1) prevent water from standing on the surface of lawns more than 24 hours after the end of a rainfall, except in designated drainage courses and swale flow areas which may drain as long as 48 hours after the end of a rainfall, and (2) provide positive drainage away from all building foundations or openings.

19. Sediment traps or basins are not permitted within 20 feet of a building which is existing or under construction. No building may be constructed within 20 feet of a sediment trap or basin.

20. All inlets in non-sump areas shall have asphalt berms installed at the time of base paving establishment.

21. The Sediment Control Inspector has the option of requiring additional sediment control measures, if deemed necessary.

22. All trap elevations are relative to the outlet elevation, which must be on existing undisturbed ground.

23. Vegetative stabilization shall be performed in accordance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.

24. Temporary sediment trap(s) shall be cleaned out and restored to the original dimensions when sediment has accumulated to a point one half (1/2) the depth between the outlet crest and the bottom of the trap.

3

25. Sediment removed from traps shall be placed and stabilized in approved areas in such a manner that it does not foul existing or proposed storm drainage systems or areas already stabilized. Sediment shall not be placed within a flood plain or wetland.

26. All sediment basins and traps must be surrounded with a welded wire safety fence. The fence must be at least 42 inches high, have posts spaced no farther apart than 8 feet, have mesh openings no greater than 2 inches in width and 4 inches in height, with a minimum of 14-gauge wire. Safety fence must be maintained in good condition at all times.

27. No excavation in the area of existing utilities is permitted unless their location has been determined. Call **Miss Utility at 1-800-257-7777** 48 hours prior to the start of work.

28. Off-site spoil or borrow areas must have approved **SC plans**.

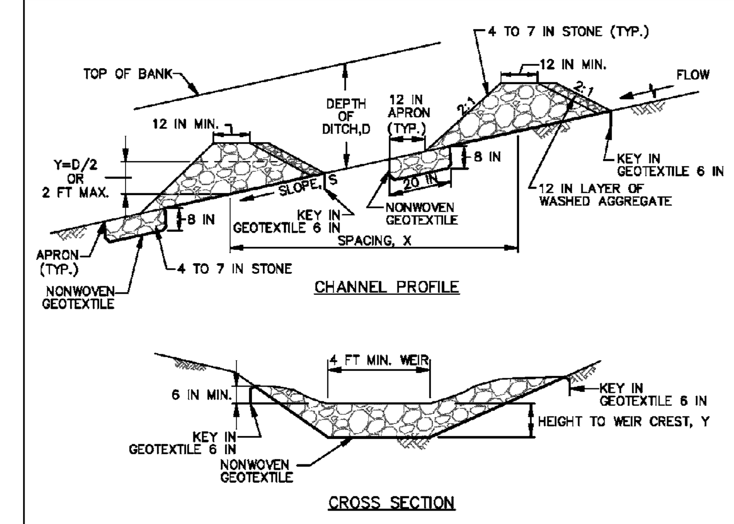
29. Protect all trees to be preserved during construction in accordance with the approved Forest Conservation Plan and Forest Stand Delineation.

30. Permittee is responsible for all actions of subcontractors, including repairing damages of sediment control devices.

4

DETAIL D-2 STONE CHECK DAM

STANDARD SYMBOL CD



CONSTRUCTION SPECIFICATIONS

1. PREPARE SWALES IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS DESCRIBED IN SECTION C-2, STANDARDS AND SPECIFICATIONS FOR TEMPORARY SWALE, OR AS SPECIFIED ON PLAN.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND SIDES OF THE DAM PRIOR TO PLACEMENT OF STONE. CONSTRUCT THE CHECK DAM WITH WASHED 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) WITH SIDE SLOPES OF 2:1 OR FLATTER AND A MINIMUM TOP WIDTH OF 12 INCHES. PLACE THE STONE SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL AND CHANNEL BANKS. FORM THE WEIR SO THAT TOP OF THE OUTLET CREST IS APPROXIMATELY 6 INCHES LOWER THAN THE OUTER EDGES. LINE THE UPSTREAM FACE OF THE DAM WITH A 1 FOOT THICK LAYER OF WASHED AGGREGATE (¾ TO 1½ INCH).
3. SET THE HEIGHT FOR THE WEIR CREST EQUAL TO ONE-HALF THE DEPTH OF THE CHANNEL OR DITCH. TO AVOID SCOUR THE MAXIMUM HEIGHT OF THE WEIR CREST MUST NOT EXCEED 2.0 FEET.
4. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE-HALF OF THE HEIGHT OF THE WEIR CREST. MAINTAIN LINE, GRADE, AND CROSS SECTION.

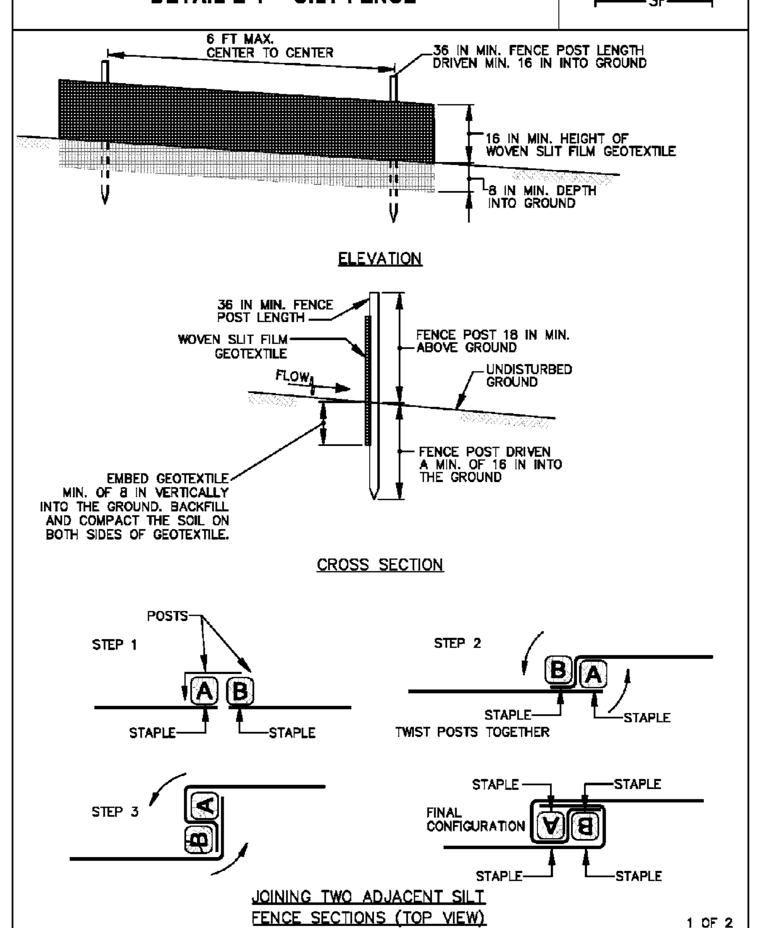
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

D.8

DETAIL E-1 SILT FENCE

STANDARD SYMBOL —SF—



1 OF 2

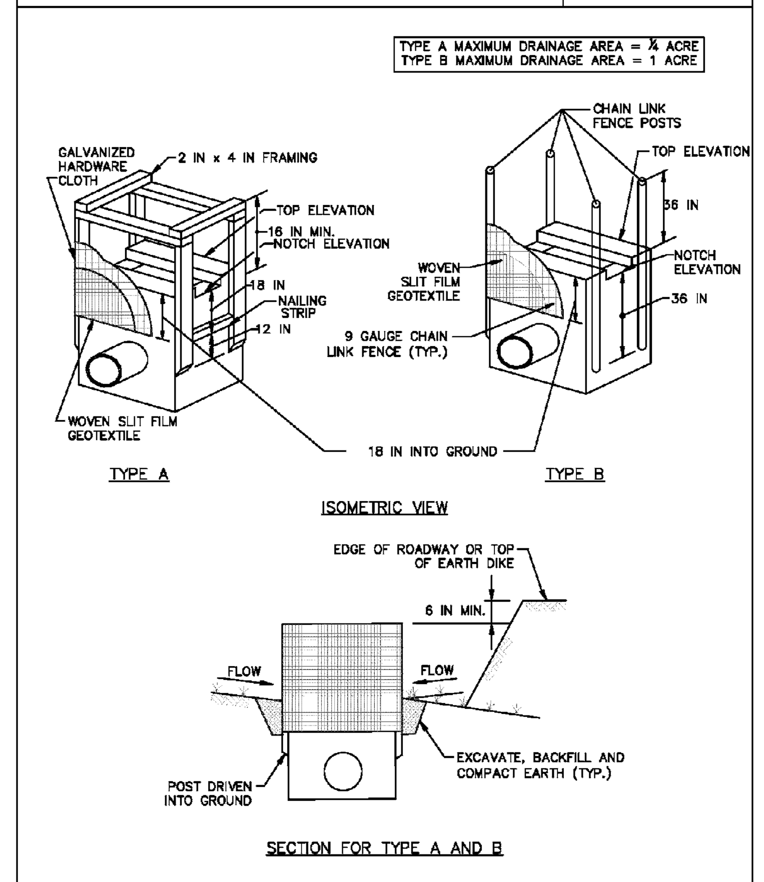
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.2

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL SIP



1 OF 2

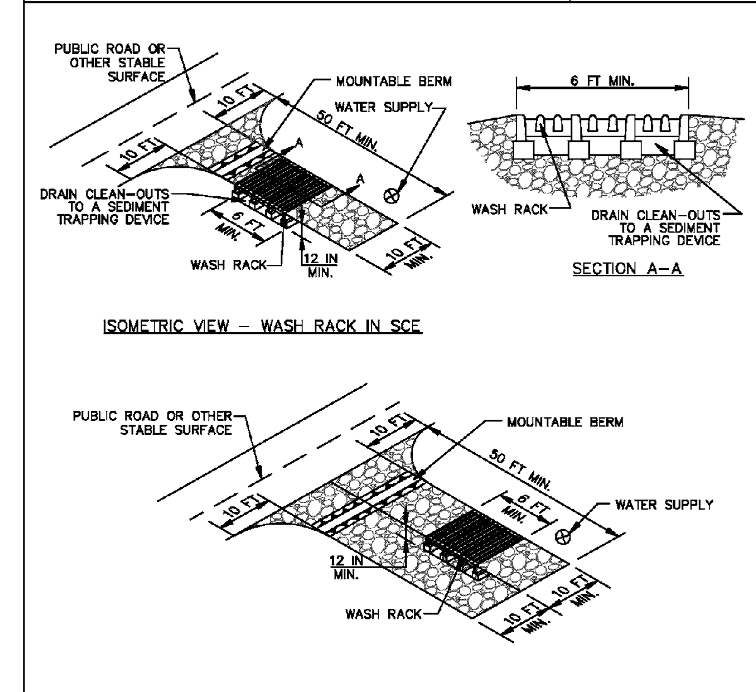
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.24

DETAIL B-2 WASH RACK OPTION

STANDARD SYMBOL WR



CONSTRUCTION SPECIFICATIONS

1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET x 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE SCE.
3. DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

B.4

DETAIL E-1 SILT FENCE

STANDARD SYMBOL —SF—

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅙ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.3

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

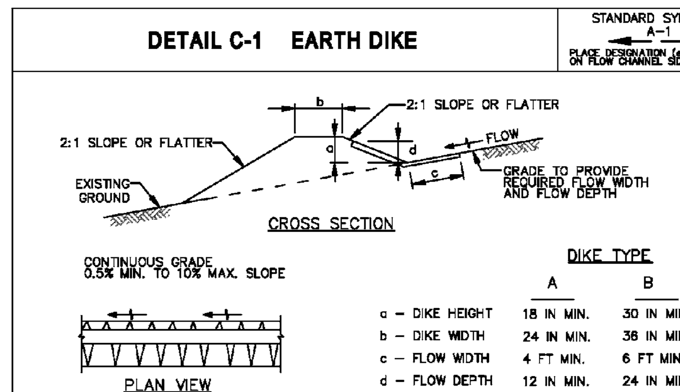
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

E.25

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL A-1 PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE.



	DIKE TYPE A	DIKE TYPE B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

A-1	SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2	SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3	4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

C.5

REVISIONS

No.	DATE	DESCRIPTION

PLAN DATE
10-23-13
12-16-13
01-10-14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA. 20151
TEL. 703.642.2306
FAX 703.378.7888
www.urban-ltd.com
urban
Planners • Engineers • Landscape Architects • Land Surveyors
STATE OF MARYLAND
ERIC S. SIEGEL
No. 28085
PROFESSIONAL ENGINEER

EROSION & SEDIMENT CONTROL DETAILS
WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

DATE: SEPT, 2013
C.I.= N/A
SCALE: N/A

SHEET 11 OF 12

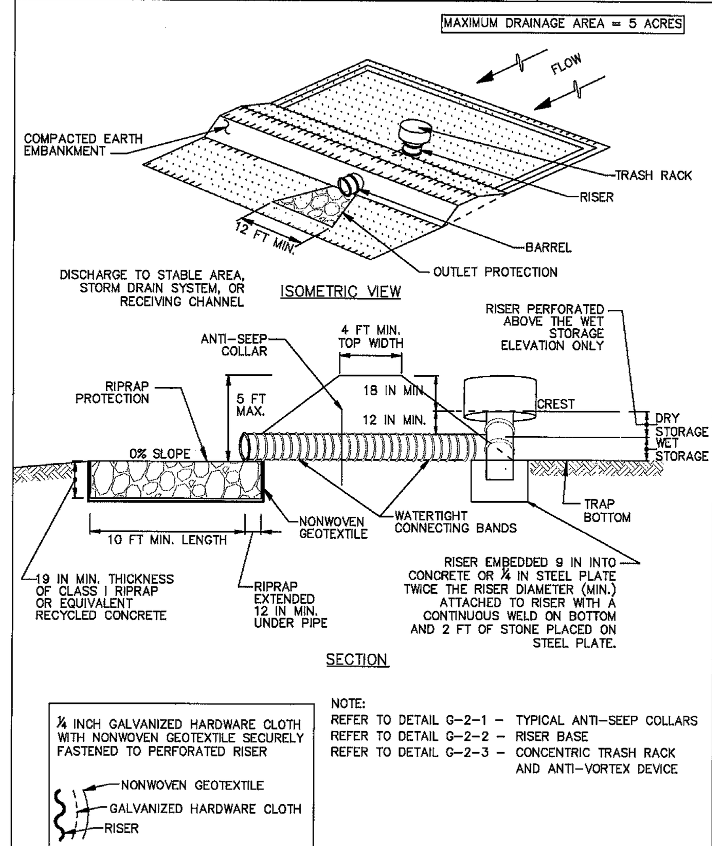
FILE No. SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-15-ES DETAILS.dwg [DETAILS] January 10, 2014 – 10:08am gellwood

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL: ST–I

MAXIMUM DRAINAGE AREA = 5 ACRES



NOTE:
REFER TO DETAIL G–2–1 – TYPICAL ANTI–SEEP COLLARS
REFER TO DETAIL G–2–2 – RISER BASE
REFER TO DETAIL G–2–3 – CONCENTRIC TRASH RACK AND ANTI–VORTEX DEVICE

1 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

G.6

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL: ST–I

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TRAP IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE AVOIDED.
2. CLEAR, GRUB, AND STRIP ANY VEGETATION AND ROOT MAT FROM THE AREA UNDER THE EMBANKMENT AND TRAP BOTTOM.
3. PERFORATE THE RISER WITH 1 INCH DIAMETER HOLES SPACED 6 INCHES ON CENTER WITH THE LOWEST PERFORATIONS AT THE WET STORAGE ELEVATION OR PROVIDE A HORIZONTAL OR VERTICAL DRAW–DOWN DEVICE PERFORATED ACCORDING TO APPROVED PLAN. DO NOT PERFORATE THE RISER WITHIN 6 INCHES OF THE TOP OF THE HORIZONTAL BARREL.
4. SET RISER/BARREL ASSEMBLY PRIOR TO EMBANKMENT CONSTRUCTION. MAKE ALL PIPE CONNECTIONS WATERTIGHT. OFFSET RISER FROM EMBANKEMENT TO ACCOMODATE PLACEMENT OF THE TRASH RACK. ANCHOR THE RISER WITH EITHER A REINFORCED CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. MAKE CONCRETE BASES AT LEAST TWICE THE RISER DIAMETER AND 18 INCHES THICK WITH THE RISER EMBEDDED 9 INCHES.
5. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL FOR THE EMBANKMENT.
6. HAND COMPACT IN 4 INCH LAYERS FILL MATERIAL AROUND THE PIPE SPILLWAY. PLACE A MINIMUM OF 2 FEET OF HAND COMPACTED BACKFILL OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
7. CONSTRUCT TOP OF EMBANKMENT 1 FOOT MINIMUM ABOVE RISER CREST. COMPACT THE EMBANKMENT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
8. MAKE ALL CUT AND FILL SLOPES 2:1 OR FLATTER.
9. WRAP THE RISER WITH ¼ INCH GALVANIZED HARDWARE CLOTH THEN WRAP WITH NONWOVEN GEOTEXTILE. DO NOT WRAP WITH MORE THAN ONE LAYER OF GEOTEXTILE. EXTEND HARDWARE CLOTH AND GEOTEXTILE AT LEAST 6 INCHES ABOVE THE HIGHEST PERFORATIONS AND AT LEAST 6 INCHES BELOW THE LOWEST PERFORATIONS. OVERLAP, FOLD AND FASTEN WHERE ENDS OF GEOTEXTILE COME TOGETHER TO PREVENT BYPASS. REPLACE GEOTEXTILE AS NECESSARY TO PREVENT CLOGGING.
10. USE STRAPS OR CONNECTING BANDS AT THE TOP AND BOTTOM OF THE GEOTEXTILE TO HOLD THE GEOTEXTILE AND HARDWARE CLOTH IN PLACE.
11. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
12. STABILIZE THE EMBANKMENT AND INTERIOR SLOPES WITH SEED AND MULCH. STABILIZE POINTS OF CONCENTRATED INFLOW AS SHOWN ON APPROVED PLAN.
13. CONSTRUCT AND MAINTAIN THE OUTLET ACCORDING TO THE APPROVED PLAN AND IN SUCH A MANNER THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
14. REMOVE SEDIMENT AND RESTORE TRAP TO ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO CLEANOUT ELEVATION (50% OF WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. KEEP POINTS OF INFLOW AND OUTFLOW AS WELL AS INTERIOR OF THE TRAP FREE FROM EROSION, AND REMOVE ACCUMULATED DEBRIS. MAINTAIN EMBANKMENTS TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION. REMOVE ANY TREES, BRUSH, OR OTHER WOODY VEGETATION GROWING ON EMBANKMENT OR NEAR PRINCIPAL SPILLWAY. MAINTAIN LINE, GRADE, AND CROSS SECTION. MAINTAIN WATER TIGHT CONNECTIONS. REPLACE GEOTEXTILE AROUND PERFORATED RISER IF DRY STORAGE VOLUME DOES NOT DRAW DOWN WITHIN 10 HOURS.
15. WHEN DEWATERING TRAP, PASS REMOVED WATER THROUGH AN APPROVED SEDIMENT CONTROL PRACTICE.
16. UPON REMOVAL, GRADE AND STABILIZE THE AREA OCCUPIED BY TRAP.

2 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

G.7

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL: ST–I

PIPE OUTLET SEDIMENT TRAP ST–I, TRAP NO. 1		
DRAINAGE AREA – INTIAL	1.17	ACRES
DRAINAGE AREA – INTERIM	1.17	ACRES
DRAINAGE AREA – FINAL	1.17	ACRES
TOTAL STORAGE REQUIRED	4,212	CF
TOTAL STORAGE PROVIDED	9,331	CF
WET STORAGE REQUIRED	2,106	CF
WET STORAGE PROVIDED	3,032	CF
DRY STORAGE REQUIRED	4,212	CF
DRY STORAGE PROVIDED	9,331	CF
TRAP BOTTOM ELEVATION	415	FT
TRAP BOTTOM DIMENSIONS	56x25	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	416	FT
OUTLET (WET STORAGE) ELEVATION	410	FT
CLEANOUT ELEVATION	417.50	FT
TOP OF EMBANKMENT ELEVATION	420	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	10'	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI–SEEP COLLAR)	BARREL	
RISER DIAMETER	–	IN
BARREL DIAMETER	TWIN 24" RCP	IN
TRASH RACK DIAMETER	–	IN
TRASH RACK HEIGHT	–	IN
ANTI–SEEP COLLAR DIMENSIONS	–	FT
OUTLET PROTECTION – LENGTH	–	FT
OUTLET PROTECTION – WIDTH	–	FT
OUTLET PROTECTION – DEPTH	–	IN

3 OF 3

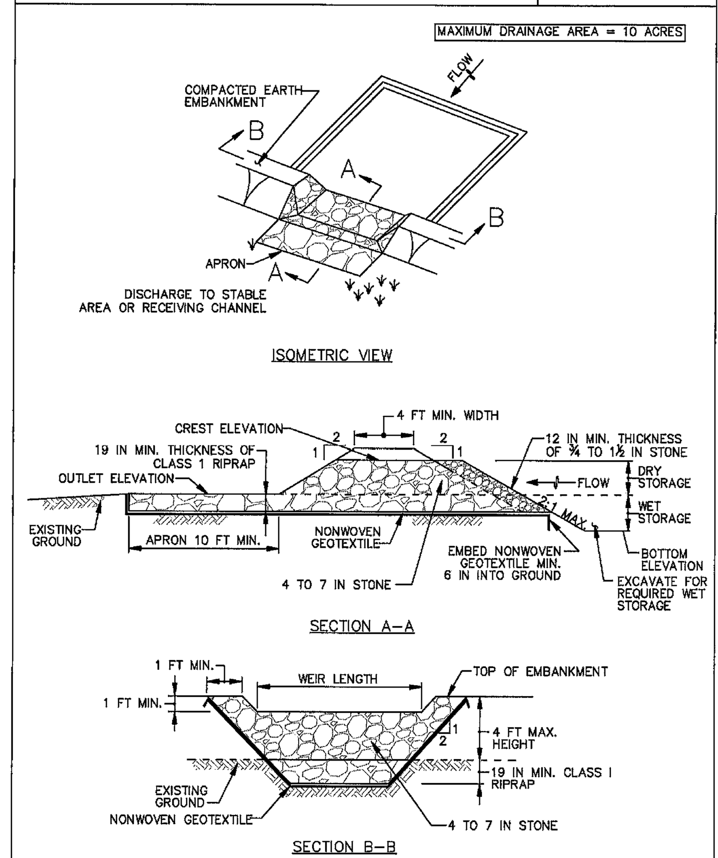
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-2 STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II

STANDARD SYMBOL: ST–II

MAXIMUM DRAINAGE AREA = 10 ACRES



1 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

G.11

DETAIL G-1-2 STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II

STANDARD SYMBOL: ST–II

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TRAP IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE AVOIDED.
2. CLEAR, GRUB, AND STRIP ANY VEGETATION AND ROOT MAT FROM THE AREA UNDER THE EMBANKMENT AND TRAP BOTTOM.
3. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL FOR THE EMBANKMENT.
4. CONSTRUCT TOP OF EMBANKMENT 1 FOOT MINIMUM ABOVE WEIR CREST. COMPACT THE EMBANKMENT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
5. MAKE ALL CUT AND FILL SLOPES 2:1 OR FLATTER.
6. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE BOTTOM AND SIDES OF OUTLET AND APRON PRIOR TO PLACEMENT OF RIPRAP. OVERLAP SECTIONS OF GEOTEXTILE AT LEAST 1 FOOT WITH THE SECTION NEARER TO THE TRAP PLACED ON TOP. EMBED GEOTEXTILE AT LEAST 6 INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
7. USE CLEAN 4 TO 7 INCH RIPRAP TO CONSTRUCT THE WEIR. USE CLASS I RIPRAP FOR THE APRON. USE OF RECYCLED CONCRETE EQUIVALENT IS ACCEPTABLE.
8. PLACE 1 FOOT OF CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE ON THE UPSTREAM FACE OF THE WEIR.
9. CONSTRUCT AND MAINTAIN THE OUTLET ACCORDING TO APPROVED PLAN, AND IN SUCH A MANNER THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
10. STABILIZE THE EMBANKMENT AND INTERIOR SLOPES WITH SEED AND MULCH. STABILIZE POINTS OF CONCENTRATED INFLOW AS SHOWN ON APPROVED PLAN.
11. REMOVE SEDIMENT AND RESTORE TRAP TO ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO CLEANOUT ELEVATION (50% OF WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. KEEP POINTS OF INFLOW AND OUTFLOW AS WELL AS INTERIOR OF THE TRAP FREE FROM EROSION, AND REMOVE ACCUMULATED DEBRIS. MAINTAIN EMBANKMENTS TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION. REMOVE ANY TREES, BRUSH, OR OTHER WOODY VEGETATION GROWING ON EMBANKMENT OR NEAR PRINCIPAL SPILLWAY. MAINTAIN LINE, GRADE, AND CROSS SECTION.
12. WHEN DEWATERING TRAP, PASS REMOVED WATER THROUGH AN APPROVED SEDIMENT CONTROL PRACTICE.
13. UPON REMOVAL, GRADE AND STABILIZE THE AREA OCCUPIED BY TRAP.

2 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

G.12

DETAIL G-1-2 STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II

STANDARD SYMBOL: ST–II

STONE/RIPRAP OUTLET SEDIMENT TRAP ST–II, TRAP NO. 2		
DRAINAGE AREA – INITIAL	4.37	ACRES
DRAINAGE AREA – INTERIM	4.37	ACRES
DRAINAGE AREA – FINAL	4.37	ACRES
TOTAL STORAGE REQUIRED	15,732	CF
TOTAL STORAGE PROVIDED	16,846	CF
WET STORAGE REQUIRED	97,866	CF
WET STORAGE PROVIDED	9,589	CF
DRY STORAGE REQUIRED	15,732	CF
DRY STORAGE PROVIDED	16,846	CF
EXISTING GROUND ELEVATION AT OUTLET (WET STORAGE ELEVATION)	423	FT
TRAP BOTTOM ELEVATION	417	FT
TRAP BOTTOM DIMENSIONS	80x10	FT x FT
WEIR LENGTH	17'	FT
WEIR CREST (DRY STORAGE) ELEVATION	425	FT
CLEANOUT ELEVATION	423	FT
TOP OF EMBANKMENT ELEVATION	426	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	5'	FT
OUTLET PROTECTION – LENGTH	17'	FT
OUTLET PROTECTION – DEPTH	3'	IN

3 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-2 STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II

STANDARD SYMBOL: ST–II

STONE/RIPRAP OUTLET SEDIMENT TRAP ST–II, TRAP NO. 3		
DRAINAGE AREA – INITIAL	2.14	ACRES
DRAINAGE AREA – INTERIM	2.14	ACRES
DRAINAGE AREA – FINAL	2.14	ACRES
TOTAL STORAGE REQUIRED	7,704	CF
TOTAL STORAGE PROVIDED	8,065	CF
WET STORAGE REQUIRED	3,852	CF
WET STORAGE PROVIDED	5,594	CF
DRY STORAGE REQUIRED	7,704	CF
DRY STORAGE PROVIDED	8,065	CF
EXISTING GROUND ELEVATION AT OUTLET (WET STORAGE ELEVATION)	421	FT
TRAP BOTTOM ELEVATION	417	FT
TRAP BOTTOM DIMENSIONS	60x10	FT x FT
WEIR LENGTH	10'	FT
WEIR CREST (DRY STORAGE) ELEVATION	7,704	FT
CLEANOUT ELEVATION	420.50	FT
TOP OF EMBANKMENT ELEVATION	423	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	4'	FT
OUTLET PROTECTION – LENGTH	10'	FT
OUTLET PROTECTION – DEPTH	3'	IN

3 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

REVISIONS

No.	DATE	DESCRIPTION

PLAN DATE
10–23–13
12–16–13
01–10–14

Urban, Ltd.
4200 D TECHNOLOGY CT.
CHANTILLY, VA. 20151
TEL. 703.642.2306
FAX 703.378.7888
www.urban-ltd.com
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Planners · Engineers · Landscape Architects · Land Surveyors

STATE OF MARYLAND · ERIC S. SIEGEL · No. 28085 · PROFESSIONAL ENGINEER

EROSION & SEDIMENT CONTROL DETAILS
WASHINTONIAN NORTH LOT 7
LIFE TIME FITNESS CENTER
9TH ELECTION DISTRICT, CITY OF GAITHERSBURG
MONTGOMERY COUNTY, MARYLAND

SCALE: N/A
C.I.= N/A
DATE: SEPT, 2013

SHEET 12 OF 12

FILE No. SP-12727

Urban, Ltd. – J:\JOBS\Washintonian North\SP\12700-15-ES DETAILS.dwg [DETAILS (2)] January 10, 2014 – 10:08am gellwood

PLANNERS

ENGINEERS

LANDSCAPE ARCHITECTS

LAND SURVEYORS

Stormwater Management Preliminary Plan – Life Time Fitness

Washintonian North – Lot 7

Ellwood, Greg

1/10/2014

SDP-3878-2013
Exhibit #37

The new criteria for the ESD are based on the runoff curve number (RCN) hydrology method. The basic goal is that ESD planning techniques and practices are to be implemented to replicate runoff characteristics similar to "woods in good condition." When soil type and proposed site imperviousness is known, Table 5.3 is used to determine the amount of rainfall required to be captured and treated in ESD practices to mimic wooded conditions. Per Table 5.3 the Pre-Developed Condition for "woods in good condition" based on the amount of impervious on the site (62.8% Impervious) and the soil type which is Hydrologic Soil Group B, the resultant RCN is 55, and a P_E of 2.0".

The proposed site (Lot 5) is a new development which is part of the Washingtonian North site plan. The site is 8.53 acres in size with approximately 61.1% of which is impervious. The stormwater management design for this property intends to treat more than the required ESD credits for the site. Micro-bio retention, landscape infiltration, and pervious concrete, will treat the stormwater runoff from the site.

Per the attached Maryland ESD Stormwater runoff calculation sheet, the total ESD Runoff Volume to be treated is 37,138 cf. The 37,138 cf can be reduced by 950 cf (11,400 sf * 1"/1 ft) for the area of the proposed pool which does not create surface runoff. Thus a total required volume which needs to be treated for the site is 36,188 cf of runoff. Using different treatment types our proposed ESD treated is 51,001 cf of runoff. The entire ESD volume will be treated through Environmental Site Design. The target Pe for the site is 2.0" a P_E of 2.75" was achieved for the site. All areas to SWM facilities have been delineated on the Stormwater Management Concept Plan.

Micro--Bio Retention

Micro-Bio Retentions are proposed throughout the property to treat runoff from parking lots, buildings, and open space. Level 2 design is proposed for the micro-bio retentions, which is allowed with HSG B soils and a filter depth of 36 inches or more. All the facilities have a media depth between 2" to 4" and a ponding depth of 6 to 12 inches. Fifteen micro-bio retention areas are spread out around the site treat a total contributing area of 224,039 sf, totaling 39,236 cf of ESD credits. Five micro-bio retentions treat the parking lot area and adjacent open space. Two of which, located in the center of the parking lot, are SWM planters with concrete walls on the outside. There are curb cuts every two parking spaces to allow the water to flow into the SWM facility. Four micro-bio retentions treat the runoff from the roof, another three treat the parking garage, while the last five treat the road around the building and the open space in the front of the property near Sam EIG highway.

The level 2 Design TP micro-bio retentions have 75% baseline phosphorous removal efficiency. The minimum depth of the filter bed shall be no less than 18 inches, and the minimum separation distance of two feet is needed to groundwater. The design will include landscaping planting plan that includes shrubs, vegetation, and trees to achieve surface coverage

of at least 75% within two years. Each of the micro-bio retentions will have an under drain that will connect to the proposed storm sewer system. All the micro - bio retention facilities will be graded to provide 100 year storm overland relief.

Landscape Infiltration

Landscape infiltration is proposed on the outside areas of the pool deck. Several landscape infiltrations line the outside and connect into the proposed storm system. For the purposes of these calculations the pool is considered impervious area. Since the pool does not create stormwater runoff and when drained, it goes into the sanitary sewer system, the area of the pool can be removed from the ESD runoff volume. The total area of the pool 11,400 sf multiplied by the 1 in./1 ft of runoff and you can reduce the ESD runoff volume by 950 cf. The area up to 6' outside of the pool will drain to under drains and connected to the sanitary system. All other areas of the pool deck will runoff into the several landscape infiltration areas. Seven separate landscape infiltration systems with a total contributing drainage area of 33,995 sf. All of the infiltration areas have a ponding depth of 0.5' and a media depth of 3.5'. A total of 6,111 ESD credits will be credited to the site per the seven landscape infiltration systems.

The baseline phosphorous removal efficiency for landscape infiltration is 75%. The maximum area to each of the individual landscape facilities is 10,000 sf. Only one facility comes close to the 10,000 sf mark, most of the facilities are less 5,000 sf. Each of which have plenty of room to collect all the runoff conveyed from the pool area.

Groundwater Recharge

The intent of the recharge criteria is to maintain existing groundwater recharge rates at development sites. This helps to preserve existing water table elevations thereby maintaining the hydrology of streams and wetlands during dry weather. The volume of recharge that occurs on a site depends on slope, soil type, vegetative cover, precipitation and evapotranspiration. Sites with natural ground cover, such as forest and meadow, have higher recharge rates, less runoff and greater transpiration losses under most conditions. Because development increases impervious surfaces, a net decrease in recharge rates is inevitable.

The Site Recharge Volume Requirement using the percent area method can be calculated using the formula below:

$Re_v = (S)(A_i)$ (percent area method)

Where: Ai = the measured impervious cover

S = Soil Specific Recharge Factor, for HSG B soils is 0.26

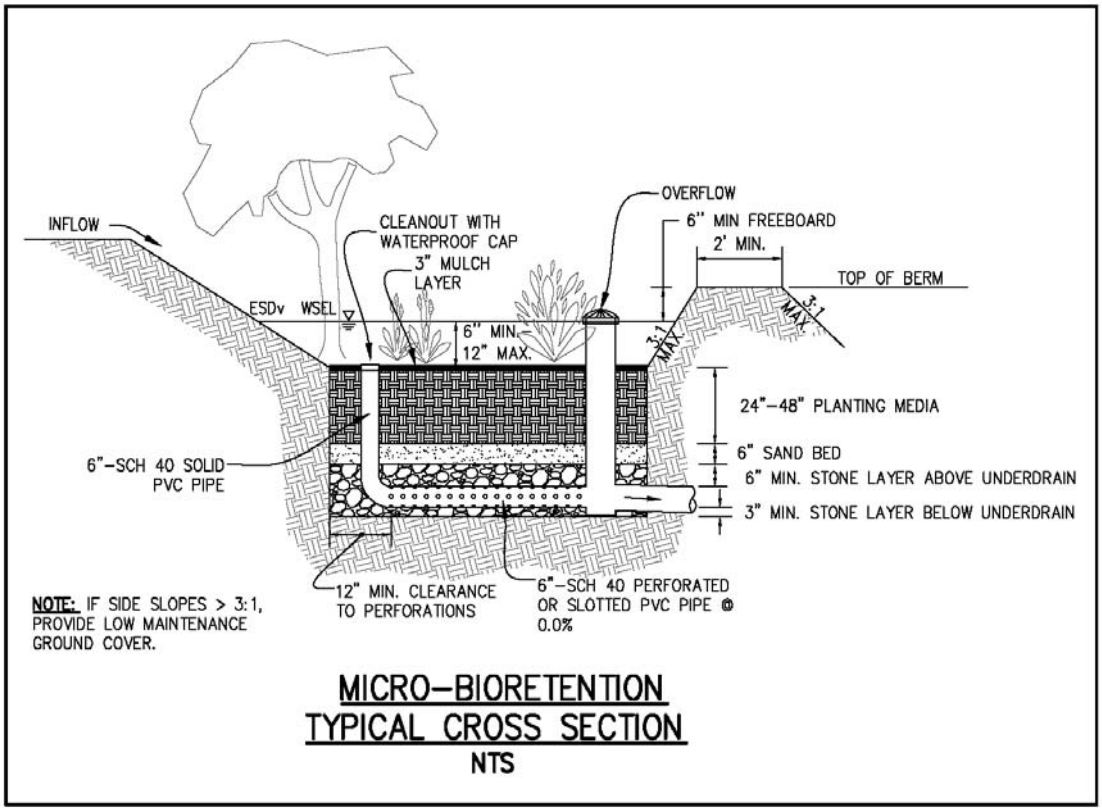
$Re_v = (0.26)(5.21)$

= 1.35 inches

Groundwater recharge will be provided on site by the 45,000 square feet of permeable pavement.

Per the three types of stormwater management facilities, the required ESD credits will be met and groundwater recharge will be provided on site.

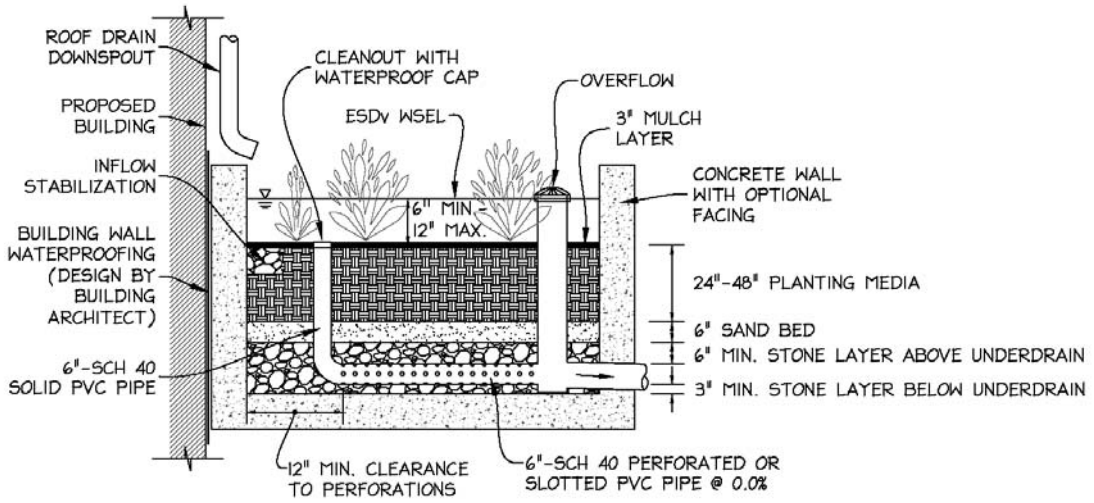
Department of Permitting Services
Land Development Division
255 Rockville Pike, 2nd Floor
Rockville, MD 20850-4166
Phone: 311 in Montgomery County or (240)-777-0311
Fax (240)-777-6339
http://www.montgomerycountymd.gov/permittingservices/



MICRO-BIORETENTION
TYPICAL CROSS SECTION
NTS

Revised 9/6/2012

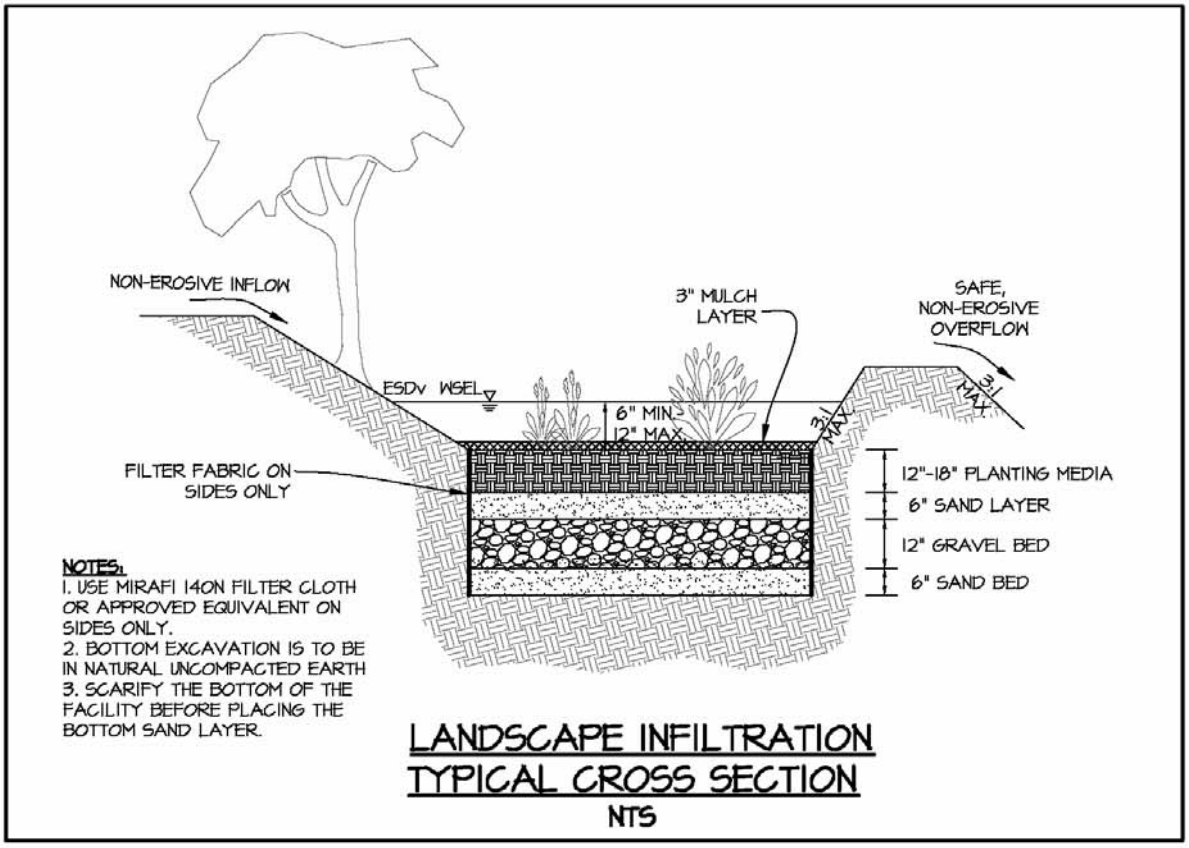
Department of Permitting Services
Land Development Division
255 Rockville Pike, 2nd Floor
Rockville, MD 20850-4166
Phone: 311 in Montgomery County or (240)-777-0311
Fax (240)-777-6339
http://www.montgomerycountymd.gov/permittingservices/



PLANTER BOX MICRO-BIORETENTION
TYPICAL CROSS SECTION
NTS

Revised 9/6/2012

Department of Permitting Services
Land Development Division
255 Rockville Pike, 2nd Floor
Rockville, MD 20850-4166
Phone: 311 in Montgomery County or (240)-777-0311
Fax (240)-777-6339
http://www.montgomerycountymd.gov/permittingservices/



Lot 5
Life Time Fitness
Washingtonian North

Site Area= 371566 sq. ft

Drainage Area Treated = 307,740 sf
Target Pe = 2.0 inches
Target Qe = 1.2 inches

Total Treatment Volume Required 36,188 cf per Maryland Stormwater Spreadsheet
Total Pe Achieved 2.35 inches *Note: 37,138 ft can be reduced by 950 cf (11,400 sf * 1"/1 ft) for area of the proposed pool which does not create surface runoff

Bioretention Faciilty	Drainage Area (DA in ft)	Impervious Area (ft)	% Impervious	Soil Type	Approx. % Site	Surface Area of SWM Facility	Target Pe for Facility (in.)	Rv Coefficient	ESD Target Credits (cf)	Actual Pe for Facility (in.)	ESD Credits (cf)	Reduced RCN	Media Depth (Ft)
Micro-Bioretention #1	14,665	12,758	87%	B	0.04	1,820	2.4	0.833	2443.09	2.5	2,749	55	3
Micro-Bioretention #2	14,561	12,668	87%	B	0.04	1,820	2.4	0.833	2425.85	2.5	2,729	55	3
Micro-Bioretention #3	14,526	12,637	87%	B	0.04	1,820	2.4	0.833	2419.92	2.5	2,723	55	3
Micro-Bioretention #4	19,287	14,512	75%	B	0.05	930	2.2	0.727	2571.28	1.0	1,911	79	4
Micro-Bioretention #5	19,188	14,598	76%	B	0.05	1,244	2.2	0.735	2584.56	1.3	3,234	73	4
Micro-Bioretention #6	17,397	13,397	77%	B	0.05	780	2.2	0.743	2369.98	0.9	2,028	79	4
Micro-Bioretention #7	11,080	9,778	88%	B	0.03	2,010	2.4	0.844	1870.84	3.6	1,937	55	2
Micro-Bioretention #8	13,147	11,602	88%	B	0.04	1,545	2.4	0.844	2219.83	2.4	3,790	55	4
Micro-Bioretention #9	5,916	591	10%	B	0.02	342	1.0	0.140	68.98	1.2	186	55	2
Micro-Bioretention #10	20,230	11,430	57%	B	0.05	2,351	1.8	0.559	1694.78	2.3	2,522	55	2
Micro-Bioretention #11	20,331	0	0%	B	0.05	1,000	1.0	0.050	84.71	1.0	270	55	2
Micro-Bioretention #12	16,987	0	0%	B	0.05	912	1.0	0.050	70.78	1.1	226	55	2
Micro-Bioretention #13	7,158	0	0%	B	0.02	354	1.0	0.050	29.83	1.0	95	55	2
Micro-Bioretention #14	14,783	13,031	88%	B	0.04	1,752	2.4	0.843	2493.41	2.4	2,861	55	2
Micro-Bioretention #15	14,783	13,031	88%	B	0.04	1,752	2.4	0.843	2493.41	2.4	2,861	55	2
Micro-Bioretention #16	20,400	14,280	70%	B	0.05	2,321	2.2	0.680	2543.20	2.3	3,015	55	2
Micro-Bioretention #17	20,400	14,200	70%	B	0.05	2,174	2.2	0.676	2530.00	2.1	3,015	57	2
Landscape infiltration #1	9,488	7,590	80	B	0.03	1,895	2.2	0.050	86.97	4.0	1,644	55	
Landscape infiltration #2	1,845	1,621	90	B	0.00	220	2.4	0.050	18.45	2.4	357	55	
Landscape infiltration #3	7,954	7,080	89	B	0.02	886	2.2	0.050	72.91	2.2	1,523	55	
Landscape infiltration #4	3,478	2,679	77	B	0.01	812	2.2	0.050	31.88	4.7	581	55	
Landscape infiltration #5	1,864	1,566	84	B	0.01	297	2.2	0.050	17.09	3.2	338	55	
Landscape infiltration #6	4,324	3,502	81	B	0.01	804	2.2	0.050	39.64	3.7	758	55	
Landscape infiltration #7	5,042	4,286	85	B	0.01	765	2.2	0.050	46.22	3.0	925	55	
	298,834	**196,837**			0.80	**30,606**			**31227.59**		**42,278.0**		
Site Imperviousness		65.87%											

Pipe Computations

FROM POINT	TO POINT	DRAINAGE AREA (AC)	C FACTOR	C x A INCR.	C x A PIPED IN	C x A SUM	INLET TIME (MIN)	TIME OF CONC. (MIN)	RAINFALL I (IN/HR)	RUNOFF Q (CFS)	PIPED IN FLOW, Q (CFS)	TOTAL RUNOFF, Q (CFS)	INVERT ELEV. UPPER END	INVERT ELEV. LOWER END	LENGTH (FT)	SLOPE (%)	DIA. (IN)	CAP. Q (CFS)	VEL. V (FPS)	FLOW TIME (MIN)	REMARKS
16	15	0.00	0.00	0.00	0.00	0.31	5.00	5.11	7.03	2.16	0.00	2.16	424.75	424.20	102.99	0.53	15	4.73	3.76	0.46	
15	14	0.00	0.00	0.00	0.00	0.88	5.00	5.57	6.88	6.09	0.00	6.09	423.95	423.40	60.30	0.91	15	6.19	5.75	0.17	Above 90% Capacity
14	13	0.00	0.00	0.00	0.00	1.16	5.00	5.74	6.82	7.91	0.00	7.91	423.15	421.50	104.41	1.58	18	13.24	7.82	0.22	
13	12	0.00	0.00	0.00	0.00	1.45	5.00	5.96	6.75	9.79	0.00	9.79	421.25	420.25	114.00	0.88	18	9.86	6.37	0.30	Above 90% Capacity
12	11	0.00	0.00	0.00	0.00	1.71	5.00	6.26	6.65	11.34	0.00	11.34	419.75	419.00	107.04	0.70	24	18.99	6.31	0.28	
11	10	0.00	0.00	0.00	0.00	2.06	5.00	6.54	6.55	13.52	0.00	13.52	418.75	418.25	86.48	0.58	24	17.25	6.08	0.24	
10	P2	0.14	0.35	0.05	0.00	2.11	5.00	6.78	6.48	13.67	0.00	13.67	413.50	410.25	31.26	10.40	24	73.14	17.84	0.03	
*																					
160	16	0.47	0.65	0.31	0.00	0.31	5.00	5.00	7.07	2.16	0.00	2.16	426.00	425.00	43.00	2.33	12	5.45	6.54	0.11	
*																					
151	15	0.47	0.65	0.31	0.00	0.31	5.00	5.00	7.07	2.16	0.00	2.16	426.00	424.45	43.00	3.60	12	6.78	7.68	0.09	
*																					
150	15	0.33	0.83	0.27	0.00	0.27	5.00	5.00	7.07	1.94	0.00	1.94	425.75	424.45	25.17	5.16	12	8.12	8.46	0.05	
*																					
140	14	0.33	0.83	0.27	0.00	0.27	5.00	5.00	7.07	1.94	0.00	1.94	425.75	423.65	25.17	8.34	12	10.32	10.05	0.04	
*																					
130	13	0.38	0.77	0.29	0.00	0.29	5.00	5.00	7.07	2.07	0.00	2.07	422.50	422.00	85.50	0.58	12	2.73	3.83	0.37	
*																					
120	12	0.33	0.77	0.25	0.00	0.25	5.00	5.00	7.07	1.80	0.00	1.80	422.50	420.75	85.50	2.05	12	5.11	5.92	0.24	
*																					
111	110	0.40	0.77	0.31	0.00	0.31	5.00	5.00	7.07	2.18	0.00	2.18	422.50	422.25	27.35	0.91	12	3.42	4.61	0.10	
110	11	0.00	0.00	0.00	0.00	0.36	5.00	5.26	6.98	2.49	0.00	2.49	422.00	420.00	58.15	3.44	12	6.63	7.85	0.12	
*																					
112	110	0.14	0.35	0.05	0.00	0.05	5.00	5.00	7.07	0.35	0.00	0.35	427.50	422.25	84.43	6.22	12	8.91	5.48	0.26	
*																					
41	40	0.02	0.50	0.01	0.00	0.01	5.00	5.00	7.07	0.07	0.00	0.07	422.95	417.70	101.30	5.18	15	14.75	3.01	0.56	
40	SD	0.00	0.35	0.00	0.00	0.16	5.00	5.56	6.88	1.08	0.00	1.08	417.45	416.55	99.37	0.91	15	6.16	3.79	0.44	
*																					
400	40	0.20	0.73	0.15	0.00	0.15	5.00	5.00	7.07	1.03	0.00	1.03	418.64	417.70	37.34	2.52	15	10.28	5.37	0.12	
*																					
37	36	10.00	0.35	3.50	0.00	3.50	5.00	5.00	7.07	24.75	0.00	24.75	430.00	427.50	35.62	7.02	30	108.96	17.97	0.03	
36	35	0.00	0.00	0.00	0.00	3.52	5.00	5.10	7.04	24.75	0.00	24.75	427.25	426.25	84.01	1.19	30	44.87	9.37	0.15	
35	34	0.04	0.75	0.03	0.00	3.55	5.00	5.25	6.99	24.79	0.00	24.79	426.00	421.35	128.60	3.62	30	78.21	14.13	0.15	
34	33	0.15	0.80	0.12	0.00	3.90	5.00	5.40	6.94	27.07	0.00	27.07	421.10	419.10	121.80	1.64	30	52.70	10.81	0.19	
33	32	0.00	0.00	0.00	0.00	4.15	5.00	5.59	6.87	28.56	0.00	28.56	419.00	418.00	130.25	0.77	30	36.04	8.14	0.27	
32	31	0.00	0.00	0.00	0.00	4.59	5.00	5.86	6.78	31.14	0.00	31.14	417.90	417.65	42.13	0.59	30	31.68	7.36	0.10	Above 90% Capacity
31	30	0.00	0.00	0.00	0.00	4.59	5.00	5.95	6.75	31.14	0.00	31.14	417.55	417.10	77.58	0.58	30	31.32	7.27	0.18	Above 90% Capacity
*																					
320	32	0.50	0.87	0.44	0.00	0.44	5.00	5.00	7.07	3.08	0.00	3.08	420.10	420.00	12.07	0.83	12	3.25	4.71	0.04	Above 90% Capacity
*																					
340	34	0.28	0.84	0.24	0.00	0.24	5.00	5.00	7.07	1.66	0.00	1.66	423.50	422.85	45.50	1.43	12	4.27	5.09	0.15	
*																					
330	33	0.30	0.84	0.25	0.00	0.25	5.00	5.00	7.07	1.78	0.00	1.78	421.50	420.60	60.07	1.50	12	4.37	5.28	0.19	
*																					
360	36	0.05	0.35	0.02	0.00	0.02	5.00	5.00	7.07	0.12	0.00	0.12	429.25	428.75	17.97	2.78	15	10.80	3.00	0.10	
*																					
50	B	0.41	0.35	0.14	0.00	0.14	5.00	5.00	7.07	1.01	0.00	1.01	430.00	429.00	34.23	2.92	12	6.11	5.77	0.10	
*																					
60	A	0.47	0.35	0.16	0.00	0.16	5.00	5.00	7.07	1.16	0.00	1.16	437.00	436.25	26.11	2.87	12	6.05	5.95	0.07	
*																					

INLET										UPSTREAM																							SAG INLETS				
NUMBER	TYPE	L, LENGTH (FT)	STATION	STRUCTURE TOP	DRAINAGE AREA (AC)	C	C x A	INTENSITY (IN/HR)	Q INCR (CFS)	INLET 1	INLET 2	INLET 3	INLET 4	CARRYOVER (CFS)	TOTAL FLOW (CFS)	GUTTER SLOPE (FT/FT)	CROSS SLOPE (FT/FT)	SPREAD (FT)	GUTTER WIDTH (FT)	W/T	GUTTER CROSS SLOPE (FT/FT)	Sw/Sx	GUTTER FLOW RATIO	LOCAL DEPRESSION (IN)	TOTAL DEPRESSION (IN)	GUTTER CROSS SLOPE (FT/FT)	EQUIV. CROSS SLOPE (FT/FT)	REQUIRED INLET LENGTH (FT)	L/Lt	EFFICIENCY	INTERCEPTED FLOW (CFS)	BYPASS FLOW (CFS)	DEPTH AT CURB (FT)	THROAT HEIGHT (FT)	d/H	SPREAD AT SAG (FT)	REMARKS
10	DI-7			430.50	0.14	0.35	0.05	7.07	0.35					0.00	0.35	PERIMETER = 12.80			AREA = 6.00			H = 0.04		NO CLOGGING			OVERLAND RELIEF ELEV =					0.35					
																PERIMETER = 6.40			AREA = 3.00			H = 0.07		50% CLOGGING								0.35					
111	DI-7			429.50	0.40	0.77	0.31	7.07	2.18					0.00	2.18	PERIMETER = 12.80			AREA = 6.00			H = 0.15		NO CLOGGING			OVERLAND RELIEF ELEV =					2.18					
																PERIMETER = 6.40			AREA = 3.00			H = 0.23		50% CLOGGING								2.18					
120	DI-7			429.50	0.33	0.77	0.25	7.07	1.80					0.00	1.80	PERIMETER = 12.80			AREA = 6.00			H = 0.13		NO CLOGGING			OVERLAND RELIEF ELEV =					1.80					
																PERIMETER = 6.40			AREA = 3.00			H = 0.21		50% CLOGGING								1.80					
130	DI-7			429.50	0.38	0.77	0.29	7.07	2.07					0.00	2.07	PERIMETER = 12.80			AREA = 6.00			H = 0.14		NO CLOGGING			OVERLAND RELIEF ELEV =					2.07					
																PERIMETER = 6.40			AREA = 3.00			H = 0.23		50% CLOGGING								2.07					
112	DI-7			431.50	0.14	0.35	0.05	7.07	0.35					0.00	0.35	PERIMETER = 12.80			AREA = 6.00			H = 0.04		NO CLOGGING			OVERLAND RELIEF ELEV =					0.35					
																PERIMETER = 6.40			AREA = 3.00			H = 0.07		50% CLOGGING								0.35					
140	DI-7			431.25	0.33	0.83	0.27	7.07	1.94					0.00	1.94	PERIMETER = 12.80			AREA = 6.00			H = 0.14		NO CLOGGING			OVERLAND RELIEF ELEV =					1.94					
																PERIMETER = 6.40			AREA = 3.00			H = 0.22		50% CLOGGING								1.94					
150	DI-7			431.25	0.33	0.83	0.27	7.07	1.94					0.00	1.94	PERIMETER = 12.80			AREA = 6.00			H = 0.14		NO CLOGGING			OVERLAND RELIEF ELEV =					1.94					
																PERIMETER = 6.40			AREA = 3.00			H = 0.22		50% CLOGGING								1.94					
151	DI-7			431.00	0.47	0.65	0.31	7.07	2.16					0.00	2.16	PERIMETER = 12.80			AREA = 6.00			H = 0.15		NO CLOGGING			OVERLAND RELIEF ELEV =					2.16					
																PERIMETER = 6.40			AREA = 3.00			H = 0.23		50% CLOGGING								2.16					
160	DI-7			431.00	0.47	0.65	0.31	7.07	2.16					0.00	2.16	PERIMETER = 12.80			AREA = 6.00			H = 0.15		NO CLOGGING			OVERLAND RELIEF ELEV =					2.16					
																PERIMETER = 6.40			AREA = 3.00			H = 0.23		50% CLOGGING								2.16					
320	DI-7			424.00	0.50	0.87	0.44	7.07	3.08					0.00	3.08	PERIMETER = 12.80			AREA = 6.00			H = 0.19		NO CLOGGING			OVERLAND RELIEF ELEV =					3.08					
																PERIMETER = 6.40			AREA = 3.00			H = 0.29		50% CLOGGING								3.08					
330	DI-7			431.00	0.30	0.84	0.25	7.07	1.78					0.00	1.78	PERIMETER = 12.80			AREA = 6.00			H = 0.13		NO CLOGGING			OVERLAND RELIEF ELEV =					1.78					
																PERIMETER = 6.40			AREA = 3.00			H = 0.20		50% CLOGGING								1.78					
340	DI-7			431.00	0.28	0.84	0.24	7.07	1.66					0.00	1.66	PERIMETER = 12.80			AREA = 6.00			H = 0.12		NO CLOGGING			OVERLAND RELIEF ELEV =					1.66					
																PERIMETER = 6.40			AREA = 3.00			H = 0.20		50% CLOGGING								1.66					
360	DI-7			433.00	0.05	0.35	0.02	7.07	0.12					0.00	0.12	PERIMETER = 12.80			AREA = 6.00			H = 0.02		NO CLOGGING			OVERLAND RELIEF ELEV =					0.12					
																PERIMETER = 6.40			AREA = 3.00			H = 0.03		50% CLOGGING								0.12					
37	DI-7			438.00	10.00	0.35	3.50	7.07	24.75					0.00	24.75	PERIMETER = 12.80			AREA = 6.00			H = 0.75		NO CLOGGING			OVERLAND RELIEF ELEV =					24.75					
																PERIMETER = 6.40			AREA = 3.00			H = 2.35		50% CLOGGING								24.75					
34	DI-3B	8.0		426.90	0.15	0.80	0.12	7.07	0.85					0.00	0.85	0.0400	0.0208	4.97	0.01	0.00	0.0833	4.01	0.01	2.00	2.01	16.73	0.11	9.91	0.81	0.95	0.80	0.04					
35	DI-3B	4.0		432.67	0.04	0.75	0.03	7.07	0.21					0.00	0.21	0.0400	0.0208	1.24	0.01	0.01	0.0833	4.01	1.00	2.00	2.01	16.73	16.75	0.27	14.66	1.00	0.21	0.00					
41	DI-3A	2.5		429.00	0.02	0.50	0.01	7.07	0.07					0.00	0.07	0.0600	0.0208	0.76	2.00	2.62	0.0833	4.01	1.00	2.00	3.50	0.15	0.17	3.09	0.81	0.95	0.07	0.00					
400	DI-3B	8.0		422.84	0.20	0.73	0.15	7.07	1.03					0.00	1.03	0.0480	0.0208	2.70	2.00	0.74	0.0833	4.01	1.00	2.00	3.50	0.15	0.17	8.93	0.90	0.98	1.01	0.02					
40	DI-3A	2.5		422.80	0.00	0.35	0.00	7.07	0.01					0.00	0.01	0.0210	0.0208	0.44	2.00	4.50	0.0833	4.01	1.00	2.00	3.50	0.15	0.17	0.99	2.53	1.00	0.01	0.00					
*																																					
50	DI-7			434.00	0.41	0.35	0.14	7.07	1.01					0.00	1.01	PERIMETER = 12.80			AREA = 6.00			H = 0.09		NO CLOGGING			OVERLAND RELIEF ELEV =					1.01					
																PERIMETER = 6.40			AREA = 3.00			H = 0.14		50% CLOGGING								1.01					
60	DI-7			441.00	0.47	0.35	0.16	7.07	1.16					0.00	1.16	PERIMETER = 12.80			AREA = 6.00			H = 0.10		NO CLOGGING			OVERLAND RELIEF ELEV =					1.16					
																PERIMETER = 6.40			AREA = 3.00			H = 0.15		50% CLOGGING								1.16					
20	DI-7			447.00	0.34	0.83	0.28	7.07	2.00					0.00	2.00	PERIMETER = 12.80			AREA = 6.00			H = 0.14		NO CLOGGING			OVERLAND RELIEF ELEV =					2.00					
																PERIMETER = 6.40			AREA = 3.00			H = 0.22		50% CLOGGING								2.00					
21	DI-7			440.00	0.34	0.83	0.28	7.07	2.00					0.00	2.00	PERIMETER = 12.80			AREA = 6.00			H = 0.14		NO CLOGGING			OVERLAND RELIEF ELEV =					2.00					
																PERIMETER = 6.40			AREA = 3.00			H = 0.22		50% CLOGGING								2.00					
22	DI-7			427.00	0.34	0.83	0.28	7.07	2.00					0.00	2.00	PERIMETER = 12.80			AREA = 6.00			H = 0.14		NO CLOGGING			OVERLAND RELIEF ELEV =					2.00					
																PERIMETER = 6.40			AREA = 3.00			H = 0.22		50% CLOGGING								2.00					
11	MH			431.56																																	
12	MH			431.56																																	
13	MH			431.56																																	
14	MH			431.70																																	
15	MH			431.75																																	
16	MH			431.80																																	
31	MH			423.50																																	
32	MH			424.50																																	
33	MH			423.80																																	
36	MH			433.75																																	
110	MH			430.40																																	
*																																					

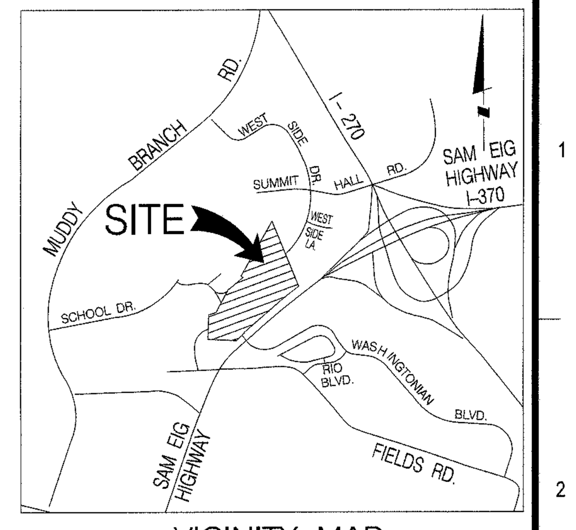
INLET STRUCTURE	UPSTREAM INLET	OUTLET WATER SURFACE ELEV.	Do (IN)	Qo (CFS)	Lo (FT)	Sfo (%)	Hf (FT)	JUNCTION LOSS Vo (FPS)	Ho (FT)	Qi (CFS)	Vi (FPS)	QiVi	2 Vi /2g (FT)	Hi (FT)	Defl. Angle	Hd (FT)	Ht (FT)	1.3 x Ht (FT)	0.5 x Ht (FT)	FINAL H (FT)	INLET WATER SURFACE ELEV.	TOP ELEV.
P2																			Starting Elevation		411.85	
10		411.85	24	13.67	31.26	0.3654	0.11	17.84	1.23					0.20		0.40	1.84	2.39	1.19	1.31	413.16	430.50
	11		24							13.52	6.08	82.16	0.57		90							
11		419.85	24	13.52	86.48	0.3572	0.31	6.08	0.14					0.22		0.67	1.03	0.00	0.51	0.82	420.67	431.56
	12		24							11.34	6.31	71.56	0.62	0.22	90	0.43						
	110		12							2.49	7.85	19.56	0.96	0.33	90	0.67						
12		420.67	24	11.34	107.04	0.2513	0.27	6.31	0.15					0.22		0.44	0.82	0.00	0.41	0.68	421.35	431.56
	13		18							9.79	6.37	62.38	0.63	0.22	90	0.44						
	120		12							1.80	5.92	10.64	0.54	0.19	90	0.38						
13		421.45	18	9.79	114.00	0.8697	0.99	6.37	0.16					0.33		0.67	1.16	0.00	0.58	1.57	423.02	431.56
	14		18							7.91	7.82	61.84	0.95	0.33	90	0.67						
	130		12							2.07	3.83	7.91	0.23	0.08	90	0.16						
14		423.02	18	7.91	104.41	0.5667	0.59	7.82	0.24					0.18		1.10	1.52	0.00	0.76	1.35	424.37	431.70
	15		15							6.09	5.75	34.99	0.51	0.18	90	0.36						
	140		12							1.94	10.05	19.47	1.57	0.55	90	1.10						
15		424.40	15	6.09	60.30	0.8888	0.54	5.75	0.13					0.32		0.78	1.23	0.00	0.61	1.15	425.55	431.75
	16		15							2.16	3.76	8.13	0.22	0.08	90	0.15						
	151		12							2.16	7.68	16.58	0.92	0.32	90	0.64						
	150		12							1.94	8.46	16.38	1.11	0.39	90	0.78						
16		425.55	15	2.16	102.99	0.1118	0.12	3.76	0.05					0.23		0.46	0.75	0.00	0.38	0.49	426.04	431.80
	160		12							2.16	6.54	14.12	0.66		90							
110		420.80	12	2.49	58.15	0.4899	0.28	7.85	0.24					0.12		0.33	0.68	0.00	0.34	0.63	421.43	430.40
	111		12							2.18	4.61	10.04	0.33	0.12	90	0.23						
	112		12							0.35	5.48	1.90	0.47	0.16	90	0.33						
111		423.05	12	2.18	27.35	0.3737	0.10	4.61	0.10								0.10	0.13	0.06	0.17	423.22	429.50
112		423.05	12	0.35	84.43	0.0095	0.01	5.48	0.14								0.14	0.18	0.09	0.10	423.15	431.50
120		421.55	12	1.80	85.50	0.2543	0.22	5.92	0.16								0.16	0.21	0.11	0.32	421.87	429.50
130		423.02	12	2.07	85.50	0.3372	0.29	3.83	0.07								0.07	0.09	0.04	0.33	423.35	429.50
140		424.45	12	1.94	25.17	0.2955	0.07	10.05	0.47								0.47	0.61	0.31	0.38	424.83	431.25
150		425.55	12	1.94	25.17	0.2955	0.07	8.46	0.33								0.33	0.43	0.22	0.29	425.84	431.25
151		425.55	12	2.16	43.00	0.3676	0.16	7.68	0.27								0.27	0.36	0.18	0.34	425.89	431.00
160		426.04	12	2.16	43.00	0.3676	0.16	6.54	0.20								0.20	0.26	0.13	0.29	426.33	431.00
SD																			Starting Elevation		417.55	
40		417.55	15	1.08	99.37	0.0281	0.03	3.79	0.06					0.16		0.31	0.53	0.00	0.26	0.29	417.84	422.80
	41		15							0.07	3.01	0.21	0.14	0.05	90	0.10						
	400		15							1.03	5.37	5.54	0.45	0.16	90	0.31						
41		418.70	15	0.07	101.30	0.0001	0.00	3.01	0.04								0.04	0.05	0.03	0.03	418.73	429.00
400		418.70	15	1.03	37.34	0.0255	0.01	5.37	0.13								0.13	0.17	0.09	0.10	418.80	422.84
30																			Starting Elevation		419.10	
31		419.10	30	31.14	77.58	0.5765	0.45	7.27	0.21					0.29		0.59	1.09	0.00	0.54	0.99	420.09	423.50
	32		30							31.14	7.36	229.04	0.84		90							
32		420.09	30	31.14	42.13	0.5765	0.24	7.36	0.21					0.36		0.72	1.29	0.00	0.65	0.89	420.98	424.50
	33		30							28.56	8.14	232.48	1.03	0.36	90	0.72						
	320		12							3.08	4.71	14.47	0.34	0.12	90	0.24						
33		420.98	30	28.56	130.25	0.4849	0.63	8.14	0.26					0.63		1.27	2.16	0.00	1.08	1.71	422.69	423.80

HGL Computations

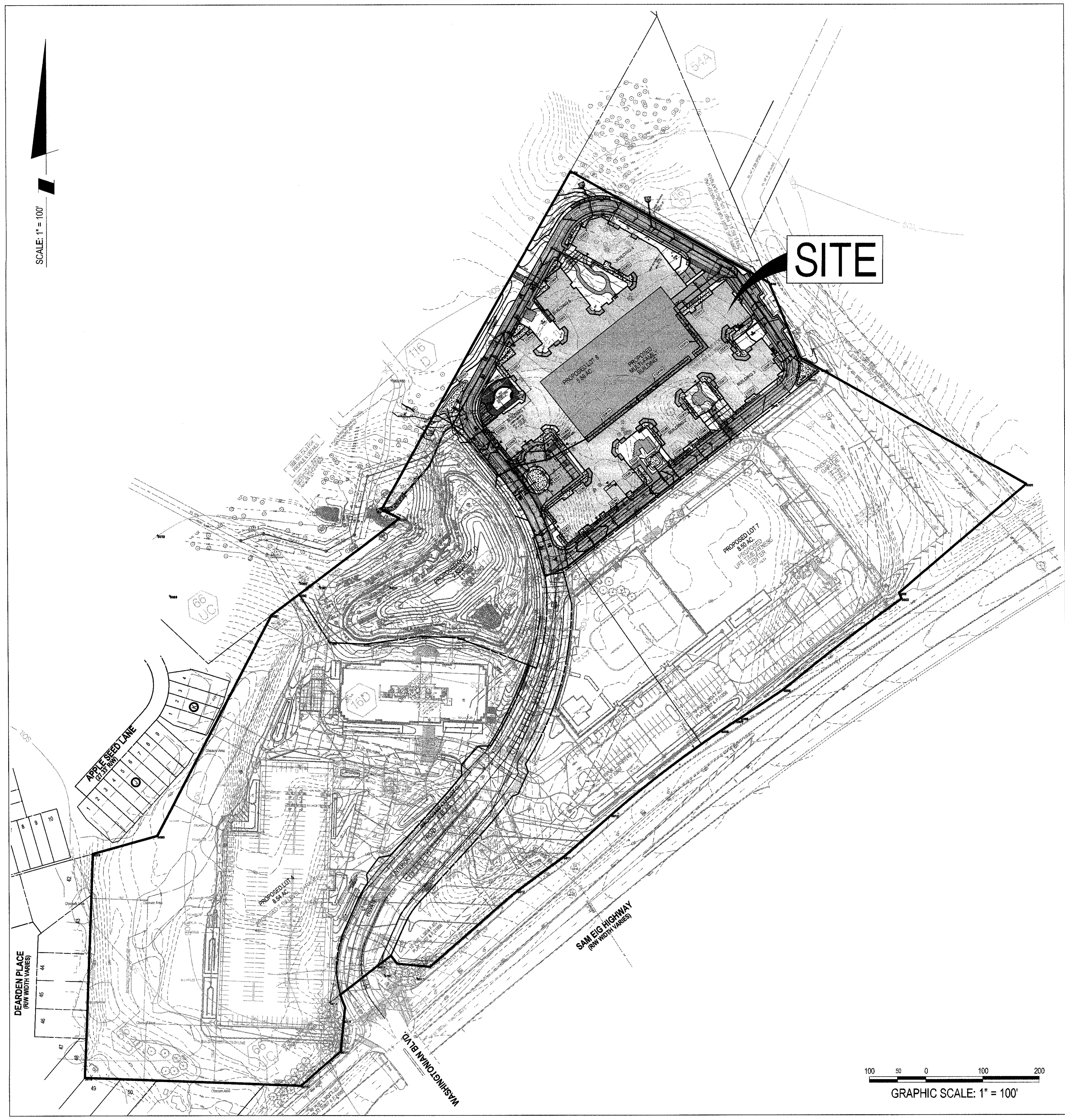
INLET STRUCTURE	UPSTREAM INLET	OUTLET WATER SURFACE ELEV.	Do (IN)	Qo (CFS)	Lo (FT)	Sfo (%)	Hf (FT)	JUNCTION LOSS Vo (FPS)	Ho (FT)	Qi (CFS)	Vi (FPS)	QiVi	2 Vi /2g (FT)	Hi (FT)	Defl. Angle	Hd (FT)	Ht (FT)	1.3 x Ht (FT)	0.5 x Ht (FT)	FINAL H (FT)	INLET WATER SURFACE ELEV.	TOP ELEV.
	34		30							27.07	10.81	292.55	1.81	0.63	90	1.27						
	330		12							1.78	5.28	9.41	0.43	0.15	90	0.30						
34		422.69	30	27.07	121.80	0.4357	0.53	10.81	0.45					1.09		2.17	3.71	0.00	1.86	2.39	425.08	426.90
	35		30							24.79	14.13	350.33	3.10	1.09	90	2.17						
	340		12							1.66	5.09	8.47	0.40	0.14	90	0.28						
35		425.08	30	24.79	128.60	0.3653	0.47	14.13	0.78					0.48		0.95	2.21	0.00	1.10	1.57	426.65	432.67
	36		30							24.75	9.37	231.82	1.36		90							
36		428.25	30	24.75	84.01	0.3643	0.31	9.37	0.34					1.75		3.51	5.60	0.00	2.80	3.11	431.36	433.75
	37		30							24.75	17.97	444.55	5.01	1.75	90	3.51						
	360		15							0.12	3.00	0.37	0.14	0.05	90	0.10						
37		431.36	30	24.75	35.62	0.3641	0.13	17.97	1.50								1.50	1.95	0.98	1.11	432.46	438.00
320		420.98	12	3.08	12.07	0.7454	0.09	4.71	0.10								0.10	0.13	0.07	0.16	421.14	424.00
330		422.69	12	1.78	60.07	0.2501	0.15	5.28	0.13								0.13	0.17	0.08	0.23	422.93	431.00
340		425.08	12	1.66	45.50	0.2179	0.10	5.09	0.12								0.12	0.16	0.08	0.18	425.26	431.00
360		431.36	15	0.12	17.97	0.0004	0.00	3.00	0.04								0.04	0.05	0.03	0.03	431.38	433.00

REFERENCE GRID A B C D E F G H I J K L M N O

WASHINGTONIAN NORTH
CAMDEN DEVELOPMENT OF LOT 8
STORMWATER MANAGEMENT PRELIMINARY PLAN



VICINITY MAP
SCALE : 1" = 2,000'



LOCATION MAP
SCALE: 1" = 100'

NOTES:
- SOIL TYPES INCLUDE:
66UB - WHEATON-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES. (HSG "B")
116D - BLOCKTOWN CHANNERY SILT LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY. (HSG "C")
54A - HATBORO SILT LOAM, 0 TO 3 PERCENT SLOPES. FREQUENTLY FLOODED. (HSG "D")

SEE SWM COMPUTATIONS FOR THE FULL WEB SOIL SURVEY.

- CONSTRUCTION EQUIPMENT SHALL TRY TO AVOID ALL AREAS WHERE ESD FACILITIES ARE PROPOSED. IF SOILS ARE COMPACTED IN THESE AREAS, REHABILITATION MAY NEED TO BE PREFORMED VIA SCARIFICATION OR SIMILAR METHODS, PRIOR TO PLACEMENT OF THE FACILITY.

- ALL STORMWATER MANAGEMENT FACILITIES ARE TO BE DESIGNED IN ACCORDANCE WITH MCDPS LATEST STANDARD SPECIFICATIONS.

CERTIFICATION OF THE QUANTITIES

I HEREBY CERTIFY THAT THE ESTIMATED TOTAL AMOUNT OF EXCAVATION AND FILL AS SHOWN ON THESE PLANS HAS BEEN COMPUTED TO BE XXXXXX CUBIC YARDS OF EXCAVATION AND XXXXXX CUBIC YARDS OF FILL AND THE TOTAL AREA TO BE DISTURBED AS SHOWN ON THESE PLANS HAS BEEN DETERMINED TO BE XXXXXX SQ.FT.

SIGNATURE ____ DATE ____

PRINTED NAME AND TITLE ____ REGISTRATION NUMBER ____

DESIGN CERTIFICATION AND QUANTITIES

I HEREBY CERTIFY THAT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION, BELIEF, THAT THIS PLAN HAS BEEN PREPARED WITH THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL." CITY OF GAITHERSBURG CHAPTER 8 AND MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION "STORM DRAIN DESIGN CRITERIA" DATED AUGUST 1988.

SIGNATURE ____ DATE ____

PRINTED NAME AND TITLE ____ REGISTRATION NUMBER ____

OWNER/ DEVELOPER'S CERTIFICATE

I HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION AND /OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A STATE OF MARYLAND DEPARTMENT OF NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION, BEFORE BEGINNING THE PROJECT.

SIGNATURE ____ DATE ____

PRINTED NAME AND TITLE ____ REGISTRATION NUMBER ____

SOLTESZ

Date 12/12/2013
Project Name Washingtonian North-Lot 8
Project No. 1184-00-01
By CX
Checked AXQ

Ultimate ESD Summary Table

Overall Site Target

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
LOD	250,825	191,362	76%	0%	79%	19%	3%	2.2	2.2	0.74	33,143	34,036	893	58	See ESD Practices Below	Site Compliance
				2.4	2.2 in	2.0 in	1.8 in					(Provided ESDv Below)				

(Individual Target P_E)

Total Site Target Composite RCN for "Woods in Good Cond." = 58
Total Site Reduced Composite RCN for "Woods in Good Cond." = 58

Individual Facility Summary

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
ESD#01	20,275	16,089	79%	0%	83%	17%	0%	2.2	2.3	0.76	2,797	2,970	173	58	Micro-bioretention Planter Box	Target RCN is 58 with Soil B & C.
ESD#02	7,409	6,055	82%	0%	100%	0%	0%	2.2	2.6	0.79	1,067	1,261	194	55	Micro-bioretention Planter Box	
ESD#03	8,931	6,626	74%	0%	94%	6%	0%	2.2	2.3	0.72	1,169	1,231	62	56	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 56 with Soil B & C
ESD#04	2,213	1,954	88%	0%	100%	0%	0%	2.4	2.6	0.84	374	399	25	55	Micro-bioretention Planter Box	
ESD#05	6,568	5,719	87%	0%	100%	0%	0%	2.4	2.6	0.83	1,095	1,186	91	55	Micro-bioretention Planter Box	
ESD#06	4,889	4,312	88%	0%	100%	0%	0%	2.4	2.6	0.84	825	894	69	55	Micro-bioretention Planter Box	
ESD#07	12,904	7,283	56%	0%	100%	0%	0%	2.0	1.4	0.56	1,200	865	0	65	Micro Bioretention	Compensate by ESD #2, #3, #6.
ESD#08	1,516	1,225	81%	0%	100%	0%	0%	2.2	2.6	0.78	216	255	39	55	Micro-bioretention Planter Box	
ESD#09	2,809	1,460	52%	0%	100%	0%	0%	1.8	2.6	0.52	218	315	97	55	Micro-bioretention Planter Box	
ESD#10	5,296	4,335	82%	0%	100%	0%	0%	2.2	2.4	0.79	764	825	61	55	Micro-bioretention Planter Box	
ESD#11	5,297	4,317	81%	0%	100%	0%	0%	2.2	2.4	0.78	761	821	60	55	Micro-bioretention Planter Box	
ESD#12	3,947	2,493	63%	0%	100%	0%	0%	2.0	2.6	0.62	407	529	122	55	Micro-bioretention Planter Box	
ESD#13	2,734	2,391	87%	0%	100%	0%	0%	2.4	2.6	0.84	458	496	38	55	Micro-bioretention Planter Box	
ESD#15	20,250	14,925	74%	0%	81%	19%	0%	2.2	1.3	0.71	2,602	1,527	0	75	Micro Bioretention	Compensate by ESD #1,#4, #5, #8~#14, #23.
ESD#16	8,111	7,410	91%	0%	100%	0%	0%	2.6	2.0	0.87	1,533	1,155	0	70	Micro-bioretention Planter Box	Compensate by ESD #18, #20.
ESD#18	4,015	3,126	78%	0%	100%	0%	0%	2.2	2.6	0.75	553	653	101	55	Micro-bioretention Planter Box	
ESD#19	10,624	9,720	91%	0%	100%	0%	0%	2.6	2.6	0.87	2,010	2,010	0	55	Micro-bioretention Planter Box	
ESD#19A	13,283	12,217	92%	0%	100%	0%	0%	2.6	2.6	0.88	2,526	2,498	0	55	Micro-bioretention Planter Box	
ESD#19B	13,323	12,217	92%	0%	100%	0%	0%	2.6	2.6	0.88	2,527	2,498	0	55	Micro-bioretention Planter Box	
ESD#20	13,907	9,702	70%	0%	51%	49%	0%	2.1	2.2	0.68	1,652	1,756	104	62	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 62 with Soil B & C.
ESD#21	13,407	10,487	78%	0%	29%	58%	12%	2.0	1.2	0.75	1,714	974	0	82	Micro-bioretention Planter Box	Compensated by ESD #24 ~ #31.
ESD#23	8,448	6,076	72%	0%	95%	5%	0%	2.2	2.6	0.70	1,075	1,276	201	56	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 56 with Soil B & C.
ESD#24	9,161	6,098	67%	0%	75%	25%	0%	2.2	2.2	0.65	1,066	1,098	33	59	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 59 with Soil B & C.
ESD#25	5,706	5,050	89%	0%	68%	32%	0%	2.3	2.5	0.85	914	1,007	93	60	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 60 with Soil B & C.
ESD#26	7,605	3,730	49%	0%	60%	40%	0%	1.8	2.6	0.49	561	810	249	61	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 61 with Soil B & C.
ESD#27	10,547	8,116	77%	0%	80%	20%	0%	2.2	2.3	0.74	1,409	1,530	120	58	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 58 with Soil B & C.
ESD#28	1,637	1,431	87%	0%	100%	0%	0%	2.4	2.6	0.84	274	297	23	55	Micro-bioretention Planter Box	
ESD#29	1,750	1,355	77%	0%	100%	0%	0%	2.2	2.6	0.75	240	283	44	55	Micro-bioretention Planter Box	
ESD#30	5,665	5,013	88%	0%	100%	0%	0%	2.4	2.6	0.85	959	1,039	80	55	Micro-bioretention Planter Box	
ESD#31	20,088	10,426	52%	0%	21%	77%	2%	1.8	1.8	0.52	1,558	1,579	20	67	Micro Bioretention	Meet ESDv target. Target RCN is 67 with Soil B, C & D.
TOTALS	252,315 sqft	191,362 sqft										34,036 cu-ft				

SHEET INDEX

1. COVER SHEET
2. STORMWATER MANAGEMENT GRADING & DRAINAGE AREAS
3. STORMWATER MANAGEMENT COMPOSITE PLAN
4. MICRO-BIORETENTION FACILITIES - PLAN VIEW
5. MICRO-BIORETENTION FACILITIES - TYPICAL SECTION DETAILS
6. MICRO-BIORETENTION FACILITIES - TYPICAL SECTION DETAILS
7. STORMWATER MANAGEMENT NOTES AND DETAILS
8. PRELIMINARY STORMDRAIN PROFILES
9. PRELIMINARY STORMDRAIN PROFILES
10. PRELIMINARY STORMDRAIN PROFILES
11. PRELIMINARY STORMDRAIN PROFILES
12. PRELIMINARY SEDIMENT CONTROL PLAN - DRAINAGE AREA MAP
13. PRELIMINARY SEDIMENT CONTROL PLAN
14. PRELIMINARY SEDIMENT CONTROL NOTES AND DETAILS
15. PRELIMINARY SEDIMENT CONTROL NOTES AND DETAILS
16. PRELIMINARY SEDIMENT CONTROL SEQUENCE OF CONSTRUCTION

RELATED REQUIRED PERMITS

IT IS THE RESPONSIBILTY OF PERMITTEE/OWNER OF THIS SITE TO OBTAIN ALL REQUIRED PERMITS PRIOR TO ISSUANCE OF THE APPROVED SEDIMENT CONTROL PERMIT

TYPE OF PERMIT	REQ'D	NOT REQ'D	PERMIT NO.	EXPIRATION DATE	WORK RESTRICTION DATES
MDE WATERWAY		X			
MDE DAM SAFETY		X			
M.C.D.P.S FLOODPLAIN DEISTRICT		X			
CORPS OF ENGINEERS WETLAND(S)					
a. CORPS OF ENGINEERS		X			
b. M.D.E. NONTIDAL		X			
c. M.D.E. EATER QUALITY CERT		X			
OTHERS (PLEASE LIST)					

MAINTENANCE CERTIFICATION ON PRIVATE LANDS

I/WE HEREBY CERTIFY THAT I/WE ASSUME MAINTENANCE RESPONSIBILITIES FOR ALL STORMWATER MANAGEMENT STRUCTURES SHOWN HEREON. IF MAINTENANCE RESPONSIBILITY IS LEGALLY TRANSFERRED, I/WE AGREE TO SUPPLY THE CITY OF GAITHERSBURG WITH A COPY OF THE DOCUMENT (SIGNED BYBOTH PARTIES) TRANSFERRING SAID MAINTENANCE RESPONSIBILITY AT THAT TIME.

OWNER/DEVELOPER ____ DATE ____

PRINTED NAME____ TITLE ____

SDP-3878-2013
Exhibit #38

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3889-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE ____
BY ____

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE ____
BY ____

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. 36060, EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANT · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

SOLTESZ
Rockville
Lanham
Waldorf
Leonardtown

Engineering
Planning
Environmental Sciences

ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: CX / MN | TECHNICIAN: CX / MN | CHECKED: AXQ

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND, WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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PERMITTED USE NUMBER 21001200
MAP 5163 GRID G,H 1&2
TAX MAP FS342 & 343 | ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10, 222NW 10
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83

COVER SHEET

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

ONE INCH
1" = AS SHOWN

SHEET 01 OF 16

PROJECT NO. 1184-00-01

$LSAPLOTCOMMENTS$

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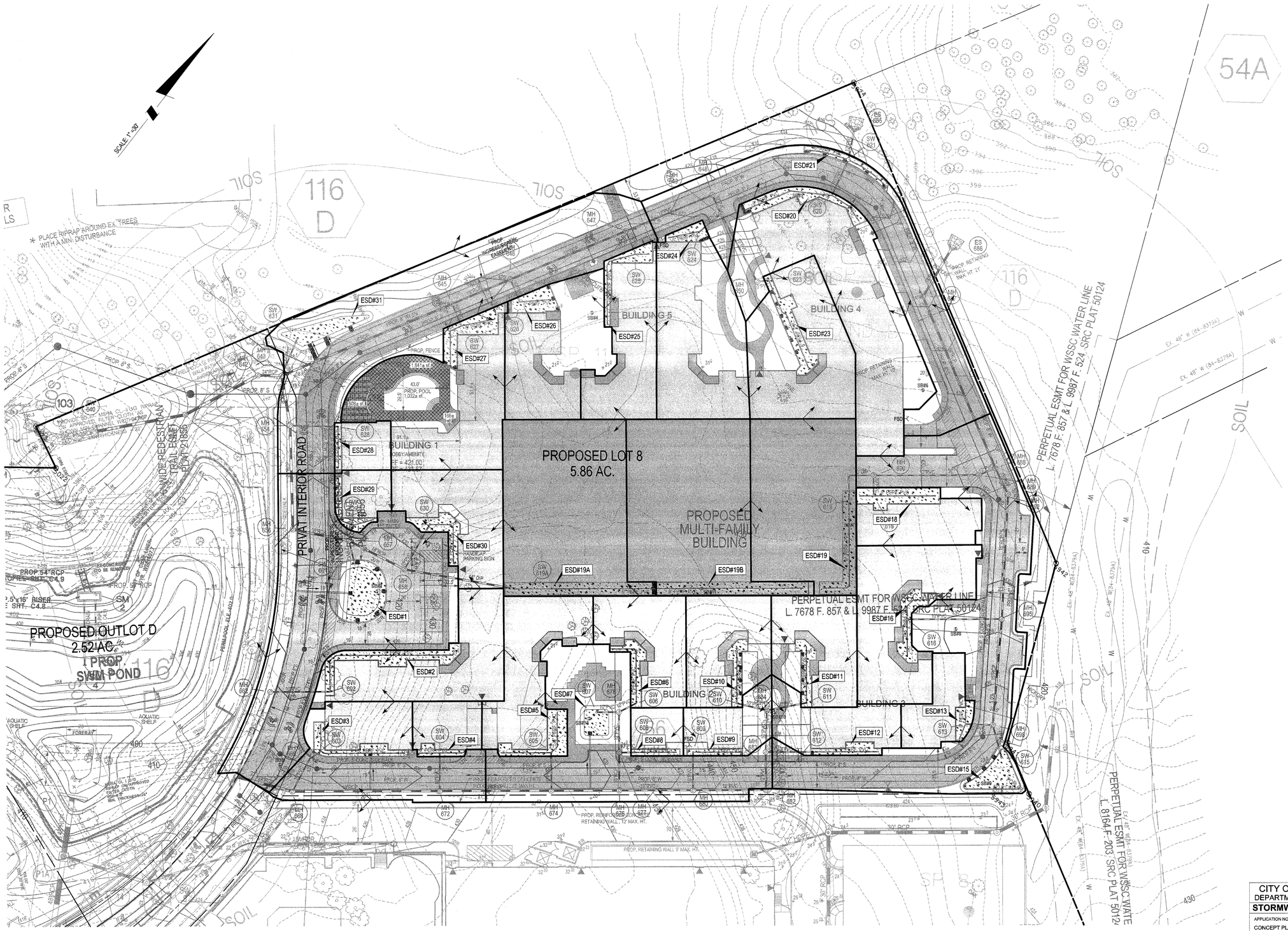

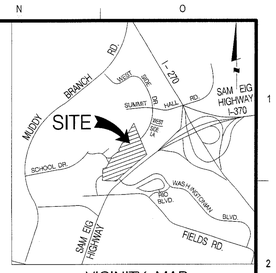

VICINITY MAP
SCALE : 1" = 2,000'

ESD FACILITIES	DRAINAGE AREA (SF)	C-FACTOR
SW-601	20,275	0.77
SW-602	7,409	0.78
SW-603	8,931	0.73
SW-604	2,213	0.82
SW-605	6,568	0.82
SW-606	4,889	0.82
SW-607	12,904	0.62
SW-608	1,516	0.78
SW-609	2,809	0.59
SW-610	5,296	0.78
SW-611	5,297	0.78
SW-612	3,947	0.66
SW-613	2,734	0.82
SW-615	20,250	0.73
SW-616	8,111	0.84
SW-618	4,015	0.76
SW-619	10,624	0.84
SW-619A	13,283	0.85
SW-619B	13,323	0.85
SW-620	13,907	0.70
SW-621	13,407	0.76
SW-623	8,448	0.72
SW-624	9,161	0.68
SW-625	5,706	0.83
SW-626	7,605	0.57
SW-627	10,547	0.75
SW-628	1,637	0.82
SW-629	1,750	0.75
SW-630	5,665	0.83
SW-631	20,088	0.59

SWM LEGEND

PROP. DRAINAGE DIVIDE

PROP. MICRO-BIORETENTION FACILITY

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3889-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

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NO.	REVISIONS	BY	DATE

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DESIGNED: CX | TECHNICIAN: CX | CHECKED: AXQ

MISS UTILITY NOTE

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DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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PERMITTED USE NUMBER 21001290

MAP 5163	GRID G-H 1&2
TAX MAP FS342 & 343	ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10	
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83	

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. 36090 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANTZ · No. 36090 · PROFESSIONAL ENGINEER
11/01/14

STORMWATER MANAGEMENT GRADING & DRAINAGE AREAS

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH
LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (6th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = 30'
SHEET 02 OF 16
PROJECT NO. 1184-00-01

$LSAPLOTCOMMENTS

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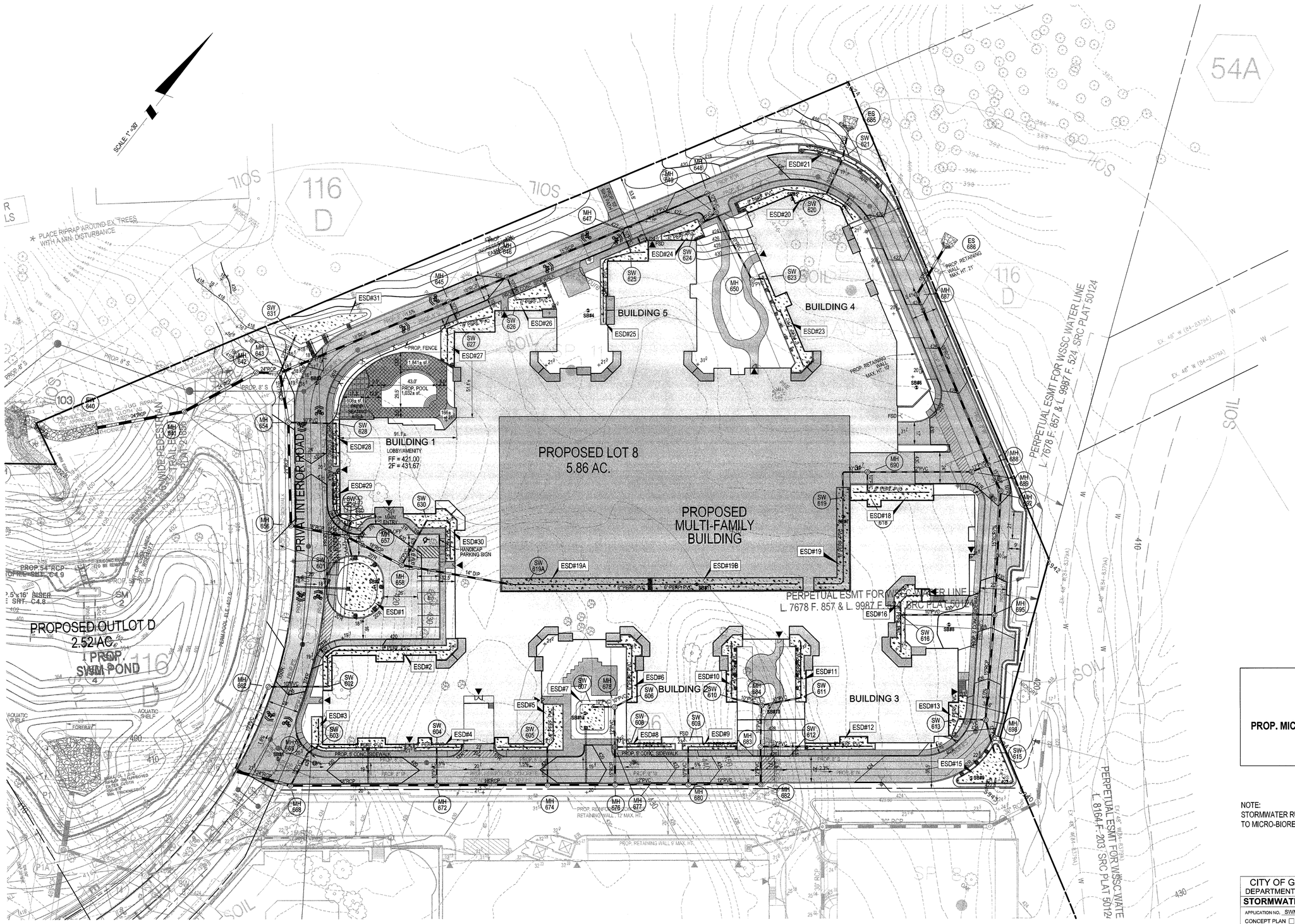

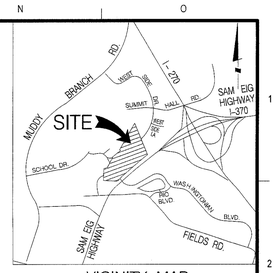

VICINITY MAP
SCALE : 1" = 2,000'

SWM LEGEND

PROP. MICRO-BIORETENTION FACILITY

NOTE:
STORMWATER RUNOFF FROM BUILDING ROOF AND GARAGE IS DIVERTED TO MICRO-BIORETENTION FACILITIES THROUGH ROOF LEADERS.

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT	**SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

GRAPHIC SCALE: 1" = 30'

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PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP	5153	GRID	G,H 1&2
TAX MAP	FS342 & 343	ZONING CATEGORY:	MXD
WSSC 200' SHEET	221NW 10 222NW 10		
SITE DATUM			
HORIZONTAL:	NAD 83		
VERTICAL:	NAD 83		

PROFESSIONAL CERTIFICATION
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LICENSE NO.: 36090 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANT · No. 36090 · PROFESSIONAL ENGINEER
11/01/14

STORMWATER MANAGEMENT COMPOSITE PLAN

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = 30'
SHEET 03 OF 16
PROJECT NO. 1184-00-01

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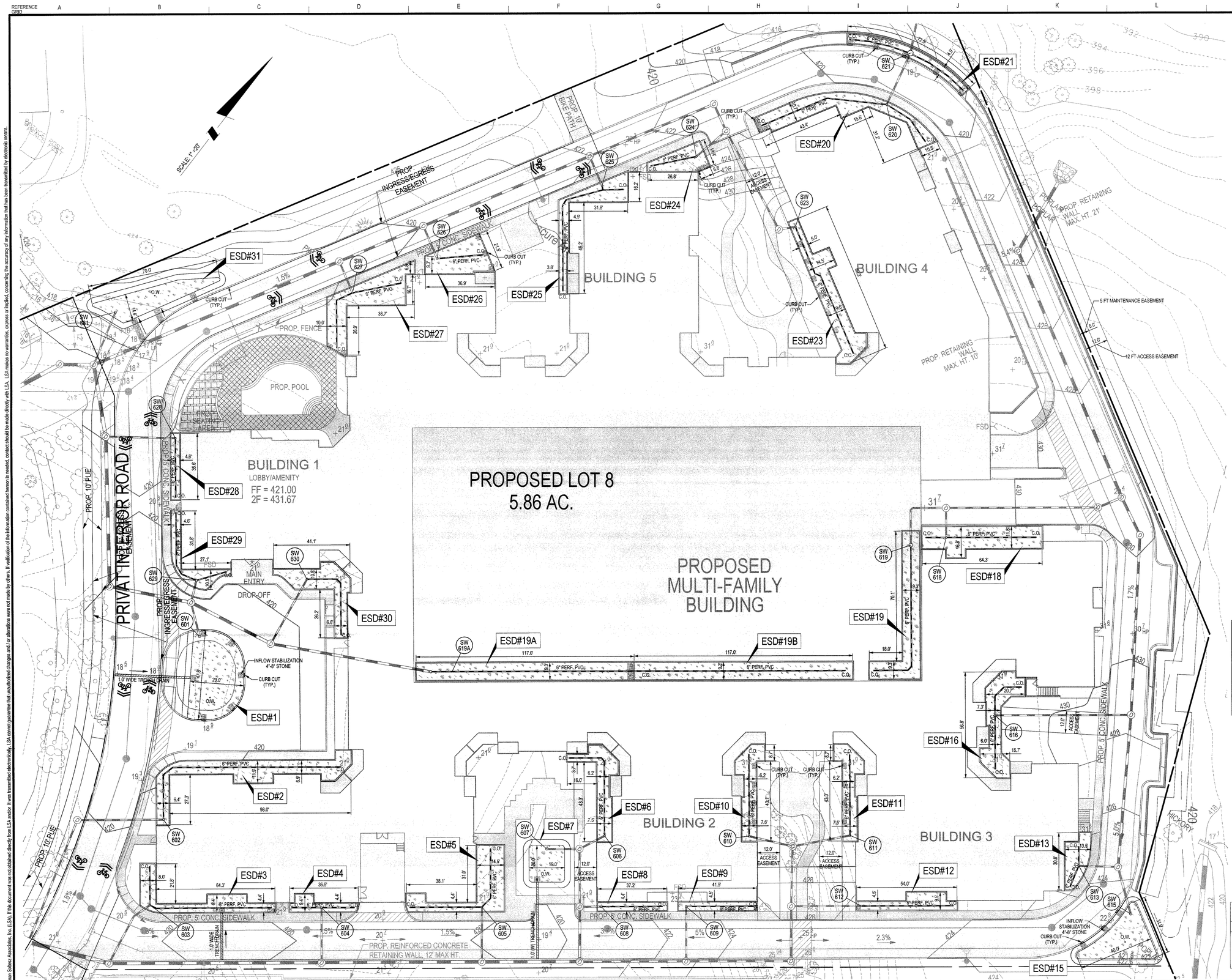
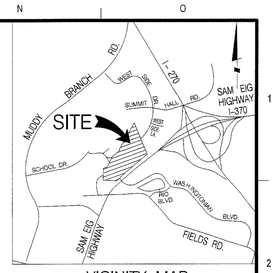


GRAPHIC SCALE: 1" = 20'



VICINITY MAP
SCALE : 1" = 2,000'

SWM LEGEND

PROP. MICRO-BIORETENTION FACILITY

NOTE:
STORMWATER RUNOFF FROM BUILDING ROOF AND GARAGE IS DIVERTED TO MICRO-BIORETENTION FACILITIES THROUGH ROOF LEADERS.

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS STORMWATER MANAGEMENT	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS SEDIMENT EROSION CONTROL
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
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STATE OF MARYLAND AMY X. GUANG PROFESSIONAL ENGINEER No. 36090
10/10/14

MICRO-BIORETENTION FACILITIES - PLAN VIEW

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

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CONTACT: MR. JAKE STROMAN

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MAP 5163	GRID G,H 1&2
TAX MAP FS342 & 343	ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10	
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83	

1" = 20'

SHEET 04 OF 16

PROJECT NO. 1184-00-01

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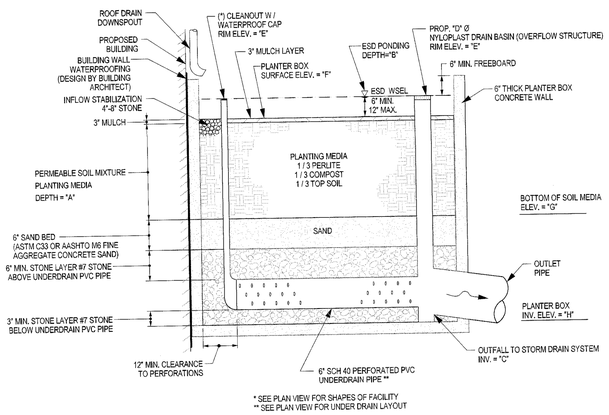
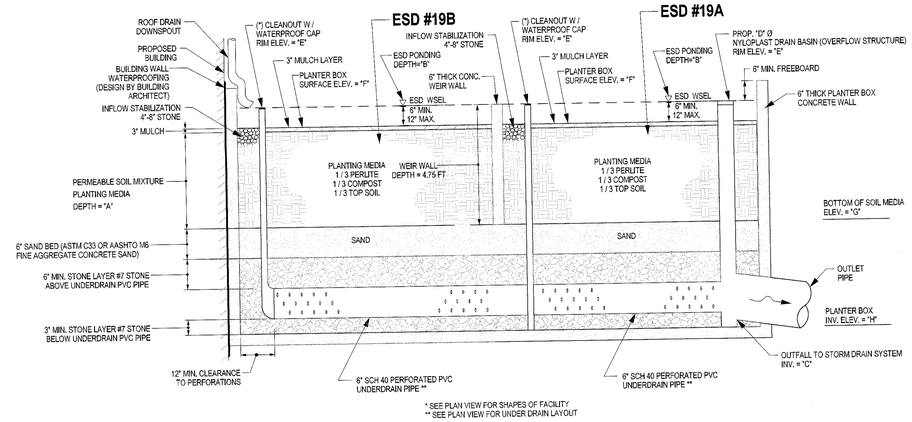


TYPICAL SECTION THROUGH MCRO-BIORETENTION FACILITY *

N.T.S.

FOR ESD #2 ~ #6, #8 ~ #13, #16, #18, #19, #20, #23 ~ #30

LOCATION	DIMENSION SCHEDULE								SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"		
ESD #2	2.0'	6"	415.10	12"	419.50	419.00	416.75	415.00	1029.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #3	3.5'	6"	413.30	12"	419.20	418.70	414.95	413.20	586.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #4	3.0'	6"	414.10	12"	419.50	419.00	415.75	414.00	210.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #5	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	730.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #6	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	475.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #8	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	165.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #9	3.0'	6"	417.60	12"	423.00	422.50	419.25	417.50	189.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #10	3.0'	6"	425.10	12"	430.50	430.00	426.75	425.00	434.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #11	3.0'	6"	425.10	12"	430.50	430.00	426.75	425.00	432.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #12	3.0'	6"	419.10	12"	424.50	424.00	420.75	419.00	348.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #13	3.0'	6"	419.10	12"	424.50	424.00	420.75	419.00	301.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #16	3.0'	6"	425.10	12"	430.50	430.00	426.75	425.00	608.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #18	3.0'	6"	424.50	12"	429.90	429.40	426.15	424.40	805.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #19	4.0'	6"	416.60	15"	423.00	422.50	418.25	416.50	904.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #20	3.5'	6"	413.60	12"	419.50	419.00	415.25	413.50	836.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #23	3.0'	6"	425.10	12"	430.50	430.00	426.75	425.00	786.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #24	3.5'	6"	416.10	12"	422.00	421.50	417.75	416.00	523.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #25	3.0'	6"	416.10	12"	421.50	421.00	417.75	416.00	530.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #26	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	515.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #27	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	805.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #28	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	165.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #29	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	326.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #30	3.0'	6"	415.10	12"	420.50	420.00	416.75	415.00	570.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										

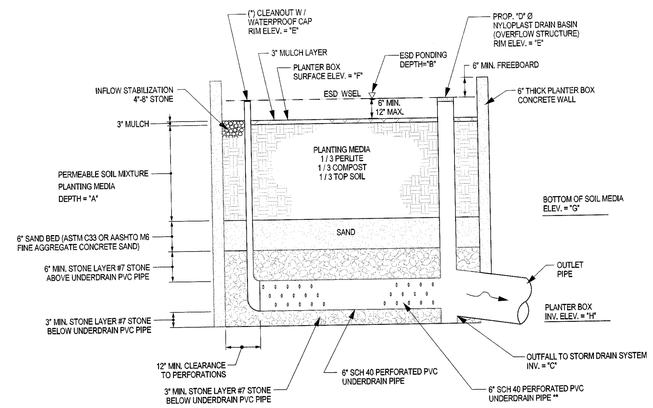


TYPICAL SECTION THROUGH MCRO-BIORETENTION FACILITY *

N.T.S.

FOR ESD #19A, #19B

LOCATION	DIMENSION SCHEDULE								SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"		
ESD #19A	4.0'	6"	416.60	15"	423.00	422.50	418.25	416.50	1086.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #19B	4.0'	6"	416.60	15"	423.00	422.50	418.25	416.50	1086.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										



"PLANTER BOX" MICRO-BIORETENTION TYPICAL SECTION (WITHOUT BOTTOM WALL)

N.T.S.

FOR ESD #21

LOCATION	DIMENSION SCHEDULE								SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"		
ESD #21	4.0'	12"	411.60	15"	418.50	417.50	413.25	411.50	348.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3889-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3886-2013
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LICENSE NO.: 36090 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND — AMY X. QUANG — No. 36090 — PROFESSIONAL ENGINEER
9/9/14

MICRO-BIORETENTION FACILITIES - TYPICAL SECTION DETAILS

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER
PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21956
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN
SHEET 05 OF 16
PROJECT NO. 1184-00-01

SLSAPLOTCOMMENTS

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DESIGNED: CX TECHNICIAN: CX CHECKED: AXQ

MISS UTILITY NOTE

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DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5153	GRID G,H 1&2
TAX MAP FS342 & 343	ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10	
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83	

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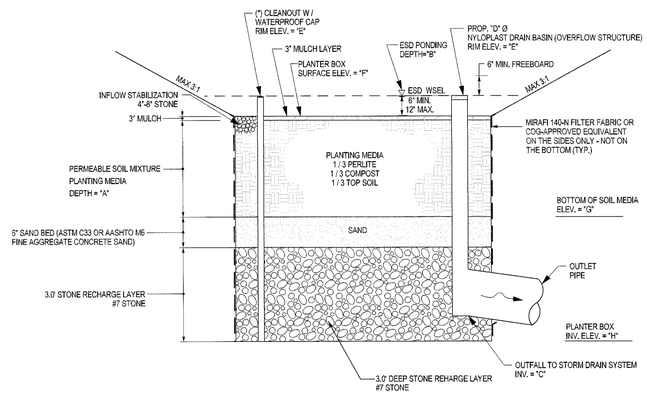


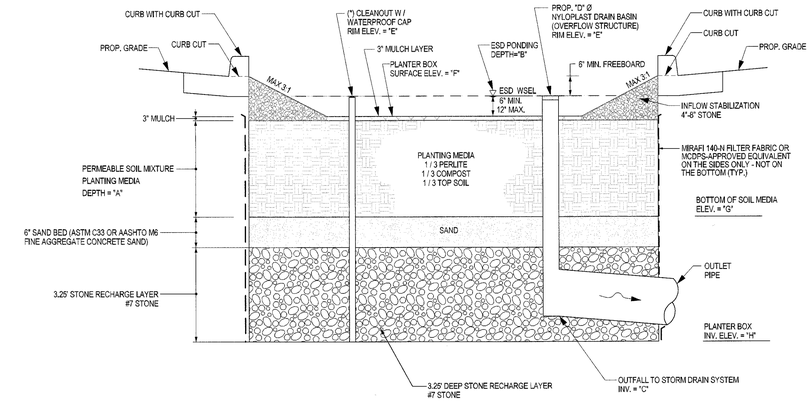
* SEE PLAN VIEW FOR SHAPES OF FACILITY

TYPICAL SECTION THROUGH MCRO-BIORETENTION FACILITY *

N.T.S.

FOR ESD #7, #15, #31

LOCATION	DIMENSION SCHEDULE								SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"		
ESD #7	4.0'	6"	412.60	15"	419.00	418.50	414.25	410.75	376.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #15	4.0'	6"	415.60	15"	422.00	421.50	417.25	413.75	664.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										
ESD #31	4.0'	8"	411.93	15"	418.50	417.83	413.58	410.08	640.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										



* SEE PLAN VIEW FOR SHAPES OF FACILITY

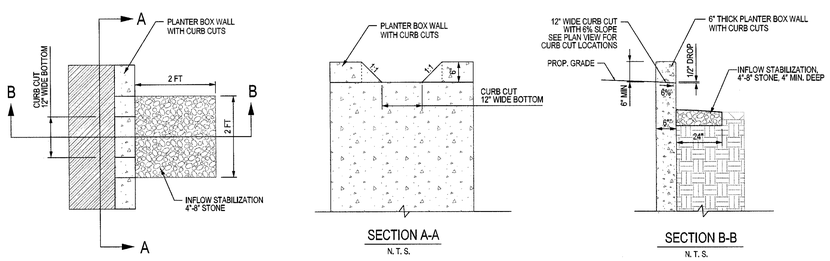
TYPICAL SECTION THROUGH MCRO-BIORETENTION FACILITY *

N.T.S.

FOR ESD #1

LOCATION	DIMENSION SCHEDULE								SURFACE AREA (SQ.FT.)	REMARK / NOTE
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"		
ESD #1	4.0'	8"	410.93	15"	417.50	416.83	412.58	408.83	1204.0	OVERFLOW STRUCTURE - NYLOPLAST BASIN W/ DOME GRATE
AS-BUILT										

ESD Facilities providing Recharge Trench	Drainage Area (DA)	Impervious Area (I)	Vol. Runoff Coefficient Rv=0.05+(I)(DA)*100	Rainfall to Recharge (P) P=12 x Rev / ((DA) x (Rv))	Runoff to Recharge (Q) Q=P x Rv	Field Infiltration Boring #	Field Infiltration Rate
ESD #1	20,275 sqft	16,089 sqft	0.76	1.21 in	0.93 in	I-2	0.75 in/hr
ESD #7	12,904 sqft	7,283 sqft	0.56	0.75 in	0.42 in	I-12	1.35 in/hr
ESD #15	20,250 sqft	14,925 sqft	0.71	0.66 in	0.47 in	I-9	2.25 in/hr
ESD #31	20,088 sqft	10,426 sqft	0.52	0.89 in	0.46 in	I-3	0.90 in/hr



SECTION A-A

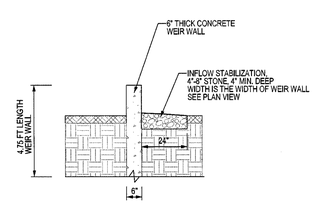
N. T. S.

SECTION B-B

N. T. S.

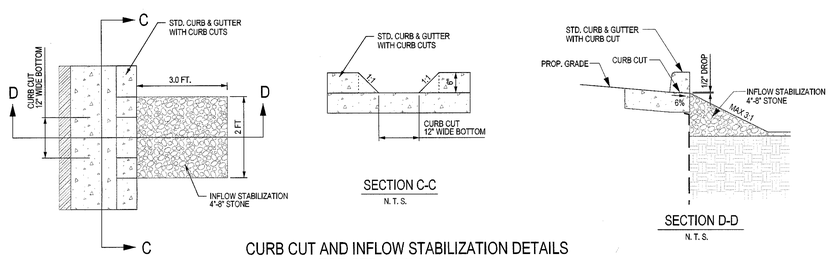
CURB CUT AND INFLOW STABILIZATION DETAILS FOR PLANTER BOX WALL

N. T. S.



WEIR WALL SECTION WITH ROCK SPASH PAD BETWEEN ESD#19A & ESD#19B

N. T. S.



SECTION C-C

N. T. S.

SECTION D-D

N. T. S.

CURB CUT AND INFLOW STABILIZATION DETAILS FOR STD. CURB & GUTTER

N. T. S.

WASHINGTONIAN NORTH - LOT 8, CAMDEN DEVELOPMENT

SUMMARY OF ESD - MICRO-BIORETENTION

ESD BIO#	DRAINAGE AREA (SQ. FT.)	FILTER SURFACE AREA PROVIDED (SQ. FT.)	ESD VOLUME PROVIDED (CU.FT.)	TOP OF FACILITY (FT) (TOP OF MULCH)	PONDING (IN)	DEPTH OF SOIL MEDIA (FT)	BOTTOM OF FACILITY (FT)
ESD#01	20,275	1,204	2,970	416.8	6.0 in	4.0 ft	408.83
ESD#02	7,409	1,029	1,261	419.0	6.0 in	2.0 ft	415.00
ESD#03	8,931	586	1,231	418.7	6.0 in	3.5 ft	413.20
ESD#04	2,213	210	399	419.0	6.0 in	3.0 ft	414.00
ESD#05	6,568	730	1,186	420.0	6.0 in	3.0 ft	415.00
ESD#06	4,889	475	894	420.0	6.0 in	3.0 ft	415.00
ESD#07	12,904	376	865	418.5	6.0 in	4.0 ft	410.75
ESD#08	1,516	165	255	420.0	6.0 in	3.0 ft	415.00
ESD#09	2,809	189	315	422.5	6.0 in	3.0 ft	417.50
ESD#10	5,296	434	825	430.0	6.0 in	3.0 ft	425.00
ESD#11	5,297	432	821	430.0	6.0 in	3.0 ft	425.00
ESD#12	3,947	348	529	424.0	6.0 in	3.0 ft	419.00
ESD#13	2,734	301	496	424.0	6.0 in	3.0 ft	419.00
ESD#15	20,250	664	1,527	421.5	6.0 in	4.0 ft	413.75
ESD#16	8,111	608	1,155	430.0	6.0 in	3.0 ft	425.00
ESD#18	4,015	805	653	429.4	6.0 in	3.0 ft	424.40
ESD#19	10,624	904	2,010	422.5	6.0 in	4.0 ft	416.50
ESD#19A	13,283	1,086	2,498	422.5	6.0 in	4.0 ft	416.50
ESD#19B	13,323	1,086	2,498	422.5	6.0 in	4.0 ft	416.50
ESD#20	13,907	836	1,756	419.0	6.0 in	3.5 ft	413.50
ESD#21	13,407	348	974	417.5	6.0 in	4.0 ft	411.50
ESD#23	8,448	786	1,276	430.0	6.0 in	3.0 ft	425.00
ESD#24	9,161	523	1,098	421.5	6.0 in	3.5 ft	416.00
ESD#25	5,706	530	1,007	421.0	6.0 in	3.0 ft	416.00
ESD#26	7,605	515	810	420.0	6.0 in	3.0 ft	415.00
ESD#27	10,547	805	1,530	420.0	6.0 in	3.0 ft	415.00
ESD#28	1,637	165	297	420.0	6.0 in	3.0 ft	415.00
ESD#29	1,750	326	283	420.0	6.0 in	3.0 ft	415.00
ESD#30	5,665	570	1,039	420.0	6.0 in	3.0 ft	415.00
ESD#31	20,088	640	1,579	417.8	6.0 in	4.0 ft	410.08
TOTAL	252,315		34,036				

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3889-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE
BY

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE
BY

SOLTESZ
Engineering
Planning
Environmental Sciences
Rockville
Lanham
Waldorf
Leonardtown
ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: CX | TECHNICIAN: CX | CHECKED: AXQ

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CONTACT: MR. JAKE STROMAN

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MAP 5163 GRID G,H 1&2
TAX MAP FS342 & 343 | ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY K. QUANTY · No. 36060 · PROFESSIONAL ENGINEER
10/10/14

MICRO-BIORETENTION FACILITIES - TYPICAL SECTION DETAILS

STORMWATER MANAGEMENT PRELIMINARY PLAN WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER
PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN
SHEET 06 OF 16
PROJECT NO. 1184-00-01

$LSAPLOTCOMMENTS

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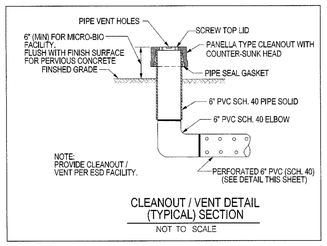
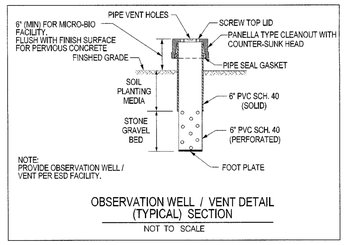


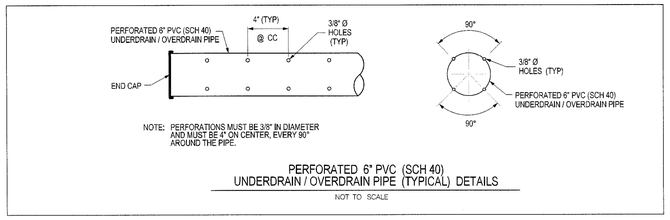
CLEANOUT / VENT DETAIL (TYPICAL) SECTION

NOT TO SCALE



OBSERVATION WELL / VENT DETAIL (TYPICAL) SECTION

NOT TO SCALE



PERFORATED 6" PVC (SCH 40) UNDERDRAIN / OVERDRAIN PIPE (TYPICAL) DETAILS

NOT TO SCALE

SAND SPECIFICATIONS:

Washed ASTM C33 Fine Aggregate Concrete Sand is utilized for stormwater management applications in Montgomery County. In addition to the ASTM C33 specification, sand must meet ALL of the following conditions:

1. Sand must meet gradation requirements for ASTM C-33 Fine Aggregate Concrete Sand AASHTO M-6 gradation is also acceptable.
2. Sand must be silica based ... no limestone based products may be used. If the material is white or gray in color, it is probably not acceptable.
3. Sand must be clean. Natural, unwashed sand deposits may not be used. Likewise, sand that has become contaminated by improper storage or installation practices will be rejected.
4. Manufactured sand or stone dust is not acceptable under any circumstance.

UNDERDRAIN / OVERDRAIN PIPE SPECS

4. Underdrain Pipe

The underdrain pipe consists of 6-inch diameter schedule 40 or stronger perforated PVC pipe at 0.00% slope. The underdrain pipe will be placed within the gravel layer. A minimum of three inches of gravel must be placed under the pipe, with a minimum of 6 inches of gravel over the pipe. Perforations must be 3/8 inch in diameter and must be located 4 inches on center, every 90 degrees around the pipe. Perforated pipe must begin at least 12" inside the filter media. If this cannot be achieved, then sides of the filter media must be lined with filter fabric. Filter fabric must **not** be wrapped around the underdrain pipe. An acceptable alternative to perforated pipe is 6" diameter schedule 40 slotted PVC pipe with 0.125 inch slots. Slots shall be 0.125 inches wide and a minimum of 1.9 inches in length, with a minimum of 4 slots per row and 4 rows per linear foot of pipe.

Access for cleaning all underdrain piping is needed. Watertight clean-outs for each pipe shall be level with the top of the mulch. All cleanouts shall have a removable waterproof cap. Cleanouts must be capped immediately after filter media is in place.

The required number of perforated underdrain pipes is proportional to the surface area of the micro-bioretention facility. The length of perforated pipe shall be 0.05 times the surface area of the facility, rounded to the nearest foot. In no case shall less than 2 ft. of perforated pipe be provided.

2

MICRO-BIORETENTION SPECIFICATIONS AND DETAILS

C. Specifications and Details

1. Sizing

The facility shall be sized to capture and store 100% of the target treatment volume. A minimum of 6" and maximum of 12" of surface ponding must be provided above the filter media. The surface area (A) of a Micro-Bioretention practice shall be at least 2% of the contributing drainage area. Planting media shall be between 24 and 48 inches deep. The total storage provided in the facility shall be computed as the storage provided in the temporary ponding area and the storage provided in the planting media and sand layers. Computations shall account for the porosity (n = 0.40) of the planting media and sand. Storage provided in excess of that required to treat the runoff for the 1 year, 24-hour design storm shall not be counted towards the total ESDv provided.

See "Enhanced Filter" design guidelines if additional storage is proposed below the underdrain pipe.

To the extent possible, facilities should have irregular outlines to blend naturally into the environment. Rectangular is not natural.

2. Inflow Design Criteria

Runoff shall enter the Micro-Bioretention facility in a non-erosive manner (less than 2 fps). Inflow may be through depressed curbs with wheel stops, curb cuts, level spreaders, bubblers, or conveyed directly using downspouts, covered drains, catch basins, over grass, or other acceptable conveyance methods. Particular care must be taken to prevent erosion of the surface mulch layer.

3. Overflow Design Criteria

If an internal overflow device is needed, a yard inlet or dome cap inlet may be used. Dome inlet caps may be stacked on top of clean-outs to serve as the overflow devices. When this method is used, the overflow invert of the domed cap must be set at the design storage level. Overflow devices cannot feed into perforated pipe sections.

A safe non-erosive outlet below the outfall must be provided. Safe conveyance of the developed 10-year storm through the facility must be demonstrated.

4. Underdrain Pipe

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5. Gravel Bed

The gravel layer surrounding the underdrain pipe(s) must meet MSHA size #7 (Table 901A), and must provide a minimum of 6 inches cover over the pipe(s), and minimum 3 inches under the pipe. No geotextile or filter fabric is allowed to be placed horizontally anywhere within the filter media.

6. Sand Bed

A minimum 6-inch fine aggregate sand layer shall be provided below the planting media. ASTM C33 or AASHTO M6 Fine Aggregate Concrete Sand is required per Montgomery County sand specifications.

7. Planting Media

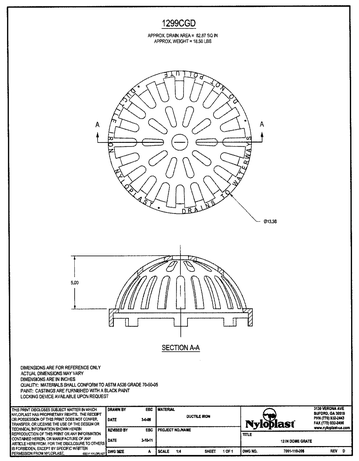
The planting media shall be 24"-48" thick and shall consist of 1/3 perlite or Solite, 1/3 compost and 1/3 topsoil. The perlite shall be coarse grade horticultural perlite. The compost shall be high grade compost free of stones and partially composted woody material. The soil shall meet the following minimum criteria: contain no more than 10% clay, 30-55% silts and 35-60% sand. The soil shall be free of stones, stumps, roots or other similar objects larger than 2 inches. The first layer of the planting media shall be lightly tilled to mix it into the sand layer, so as not to create a definitive boundary. The planting material shall be flooded after placement. Any settlement that occurs shall be filled back to the design elevation.

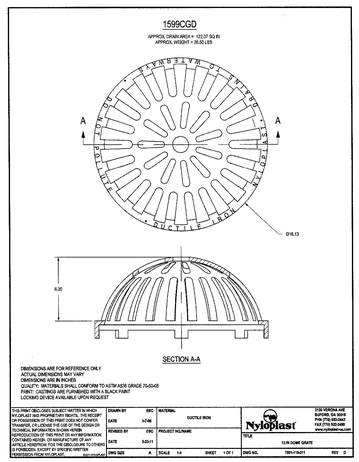
8. Mulch

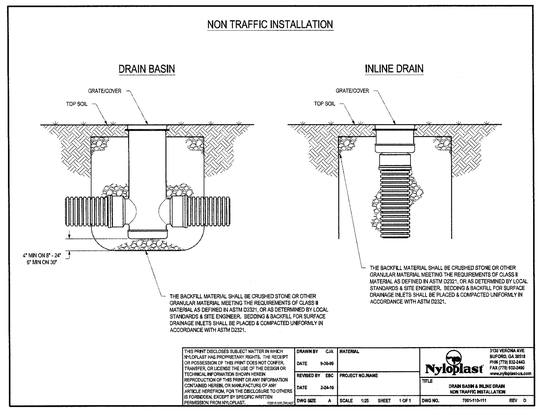
The mulch layer is an important part of the Micro-Bioretention device. Much of the pollutant removal capacity of the Micro-Bioretention system is within the mulch layer. The surface mulch layer will consist of standard double shredded aged hardwood mulch. The mulch should be applied uniformly to a depth of 3 inches. Yearly replenishing may be necessary. Pine bark is not acceptable.

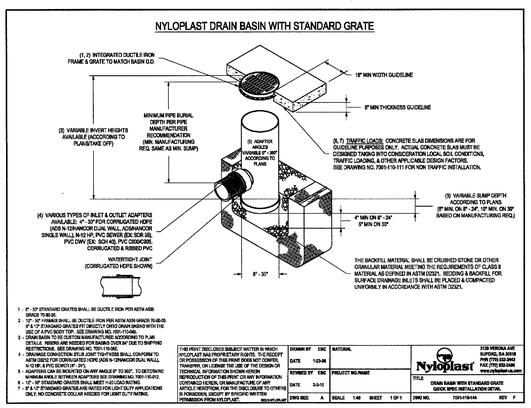
9. Plant Materials

Plants, through their pollutant uptake and evapo-transpiration of stormwater runoff, play a key role in the overall effectiveness of the Micro-Bioretention device. Both the number and type of tree and shrub plantings for the system may vary, especially where aesthetics or other considerations are critical to site development. While native plants are encouraged, they are not always appropriate in all situations. While no hard planting rule exists, the plants should be a mix of trees, shrubs and herbaceous materials. However, there should be 2 to 3 shrubs planted per tree and herbaceous plantings shall make up 40% of the total number of plants. Trees shall be a minimum of 1 ½ in. caliper, shrubs shall be minimum 2 gal. size and herbaceous plants shall be a minimum 1 gal size. Mature plant canopy should cover 85% of the Micro-Bioretention device. Alternative planting schemes, including use of grasses, may be considered in some situations, so long as the planting plan is designed by a Registered Landscape Architect registered in the State of Maryland, however lawn grasses are not appropriate for these facilities. All plantings shall be in accordance with the Montgomery County landscape guidelines. All landscape plans must be sealed by a registered landscape architect. Since the plants are an integral part of the Micro-Bioretention system, no changes to the approved landscape plan will be allowed unless an alternate plant list, prepared by a registered landscape architect, has been approved by DPS prior to installation. Since plant availability can change, DPS suggests including an alternate plant list on the landscaping plans.









CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS STORMWATER MANAGEMENT	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS SEDIMENT EROSION CONTROL
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

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LICENSE NO. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANG · No. 36060 · PROFESSIONAL ENGINEER · 1/10/14

STORMWATER MANAGEMENT NOTES AND DETAILS

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (6th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

SOLTESZ
Engineering
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Rockville
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Leonardtown

ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: CX | TECHNICIAN: CX | CHECKED: AXQ

MISS UTILITY NOTE

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DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP	GRID
5163	GJH 182

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD
WSSC 200' SHEET	
221NW 10 222NW 10	
SITE DATUM	
HORIZONTAL: NAD 83	
VERTICAL: NAD 83	

1" = AS SHOWN

SHEET 07 OF 16

PROJECT NO. 1184-00-01

$LSAPLOTCOMMENTS

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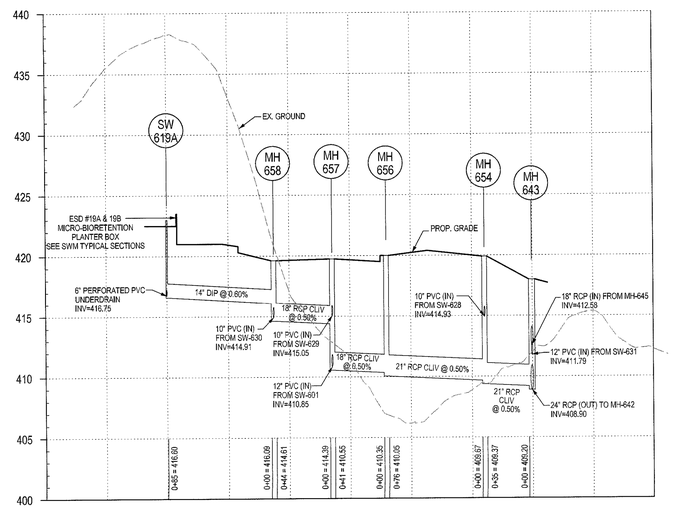

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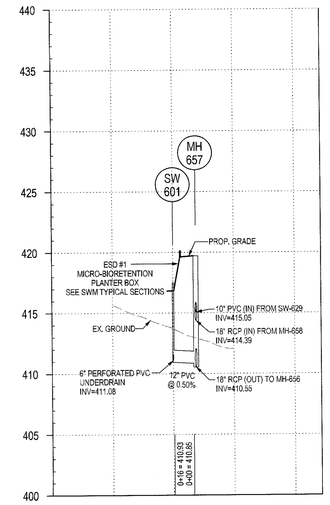

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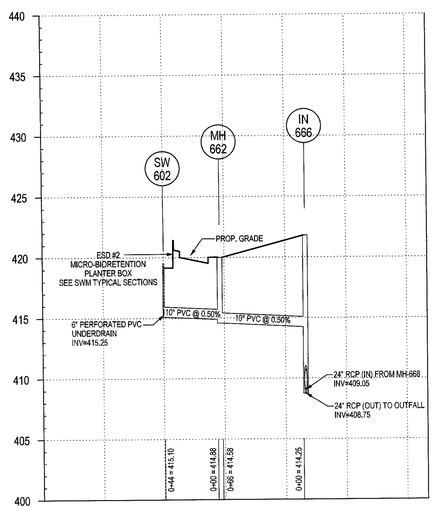

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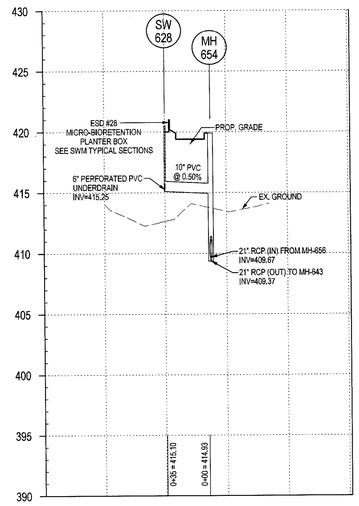

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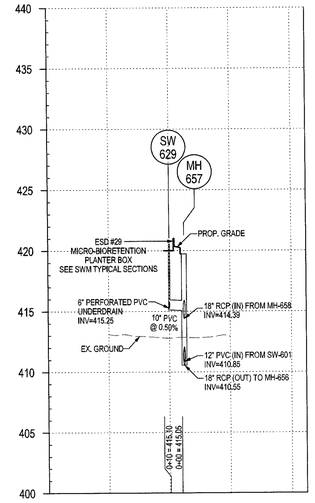

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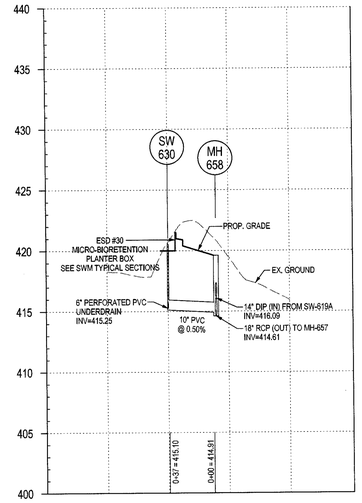

PROFILE SCALE: HORIZONTAL: 1"=50'
VERTICAL: 1"=5

50 25 0 50 100

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **STORMWATER MANAGEMENT**	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

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. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANG · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY STORMDRAIN PROFILES

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 08 OF 16

PROJECT NO. 1184-00-01

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2 Research Place, Suite 100
Rockville, MD 20850
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NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: CX | TECHNICIAN: CX | CHECKED: AXQ

MISS UTILITY NOTE

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WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5153	GRID G,H 1&2
TAX MAP FS342 & 343	ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10	
SITE DATUM HORIZONTAL: NAD 83 VERTICAL: NAD 83	

SLSAPLOTCOMMENTS

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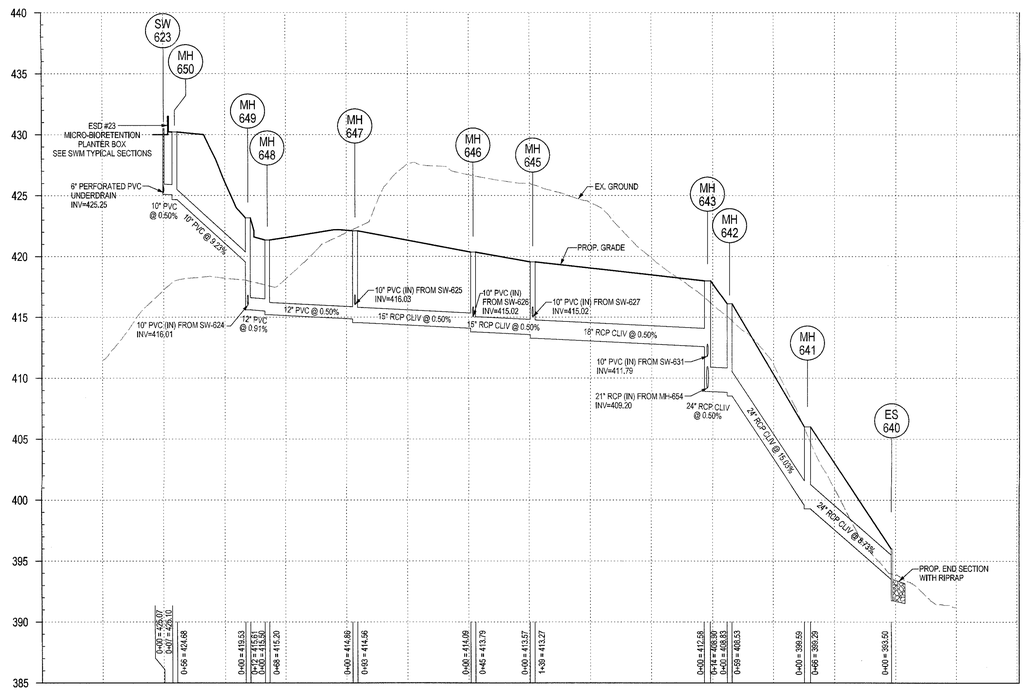

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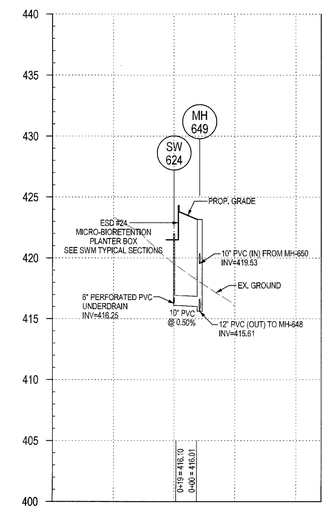

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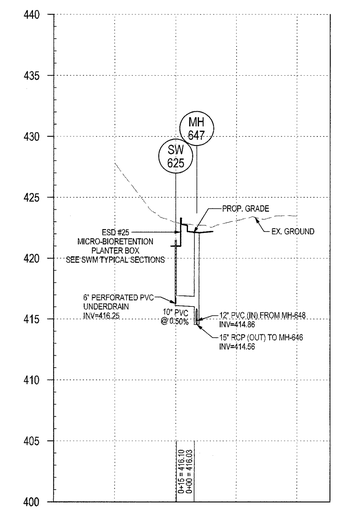

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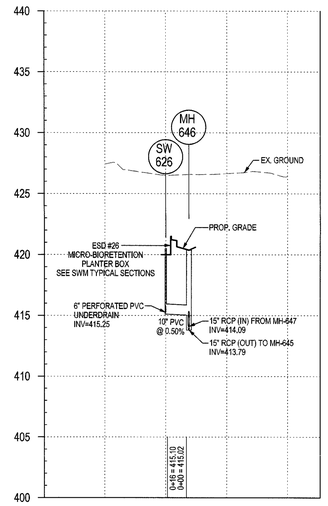

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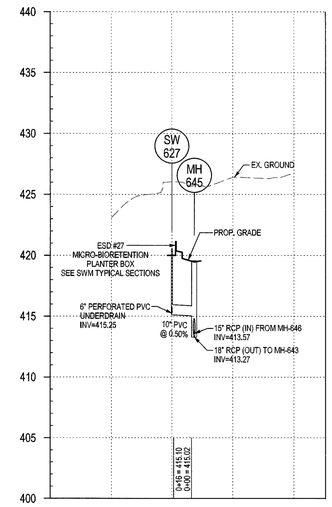

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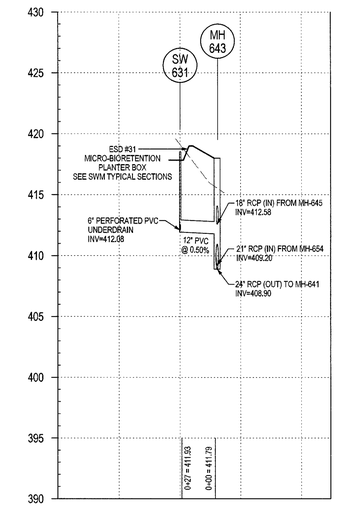

PROFILE SCALE: HORIZONTAL: 1"=50'
VERTICAL: 1"=5

50 25 0 50 100

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT	**SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY:	BY:

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LICENSE NO. 36080 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND AMY K. QUARK No. 36080 PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY STORMDRAIN PROFILES

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21658
GAITHERSBURG (6th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 09 OF 16

PROJECT NO. 1184-00-01

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NO.	REVISIONS	BY	DATE

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WSSC 200' SHEET	221NW 10 222NW 10		
SITE DATUM	HORIZONTAL: NAD 83 VERTICAL: NAD 83		

$LSAPLOTCOMMENT$

REFERENCE GRID A B C D E F G H I J K L M N O

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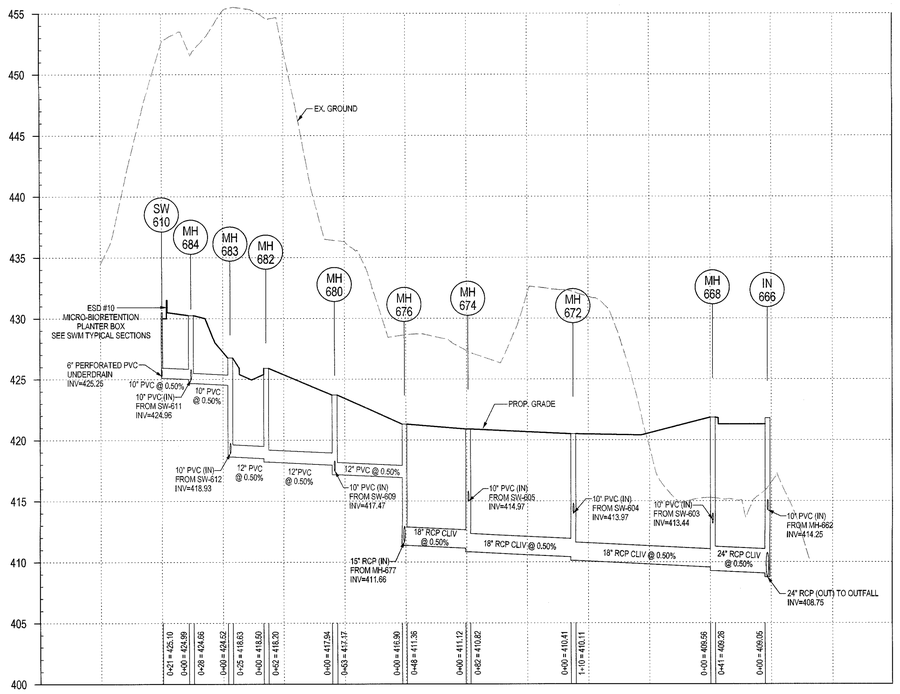

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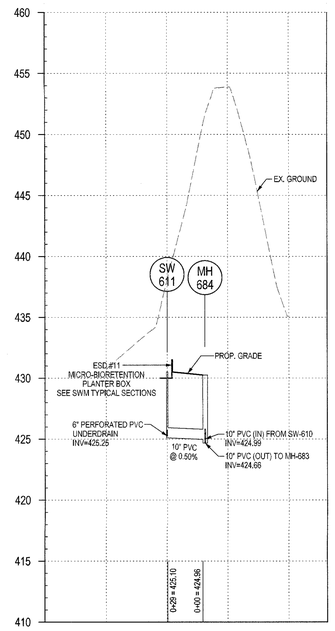

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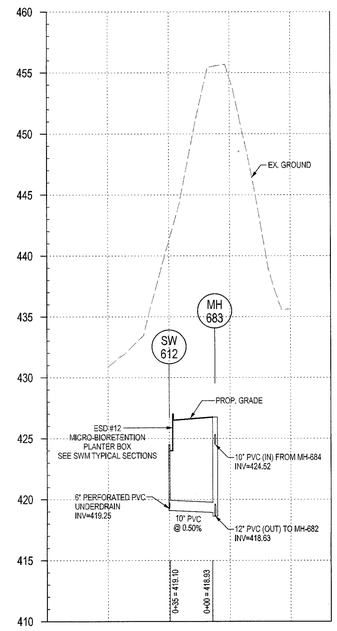

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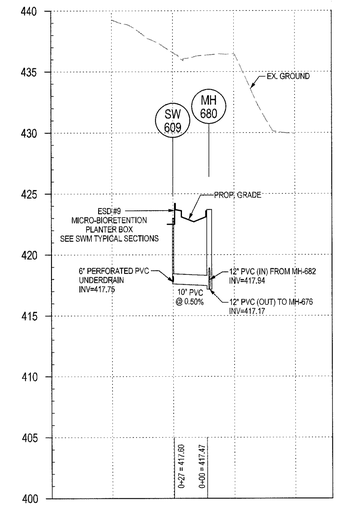

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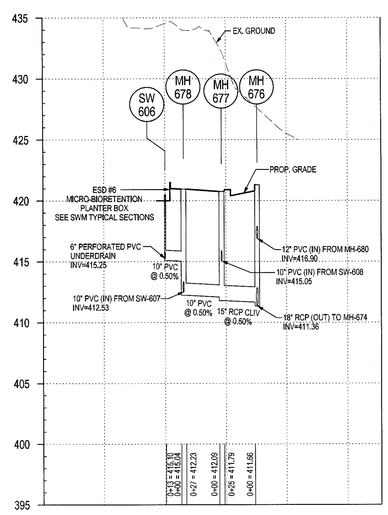

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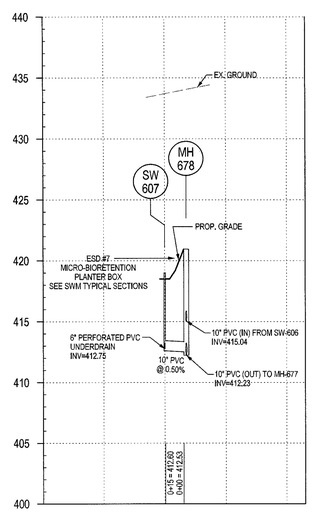

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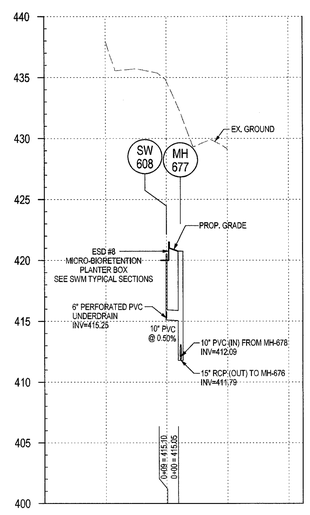

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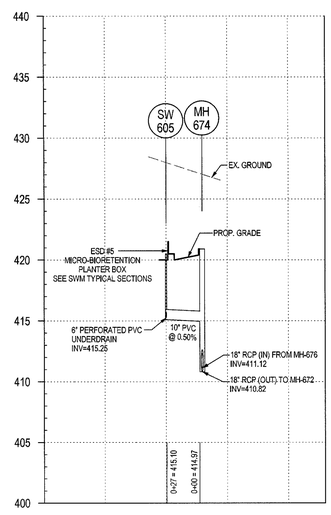

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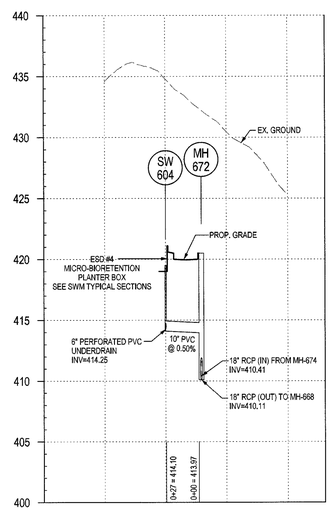

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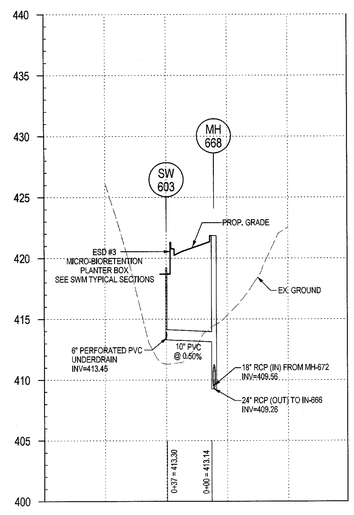

PROFILE SCALE: HORIZONTAL: 1"=50'
VERTICAL: 1"=5

50 25 0 50 100

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS STORMWATER MANAGEMENT	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS SEDIMENT EROSION CONTROL
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

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LICENSE NO. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND — AMY L. QUANTY — No. 36060 — PROFESSIONAL ENGINEER — 11/01/13

PRELIMINARY STORMDRAIN PROFILES

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER
PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 10 OF 16

PROJECT NO. 1184-00-01

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P. 301.948.2750 F. 301.948.9067
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CONTACT: MR. JAKE STROMAN

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MAP	GRID
5163	G,H 1&2
TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD
WSSC 200' SHEET	
221NW 10	
222NW 10	
SITE DATUM	
HORIZONTAL: NAD 83	
VERTICAL: NAD 83	

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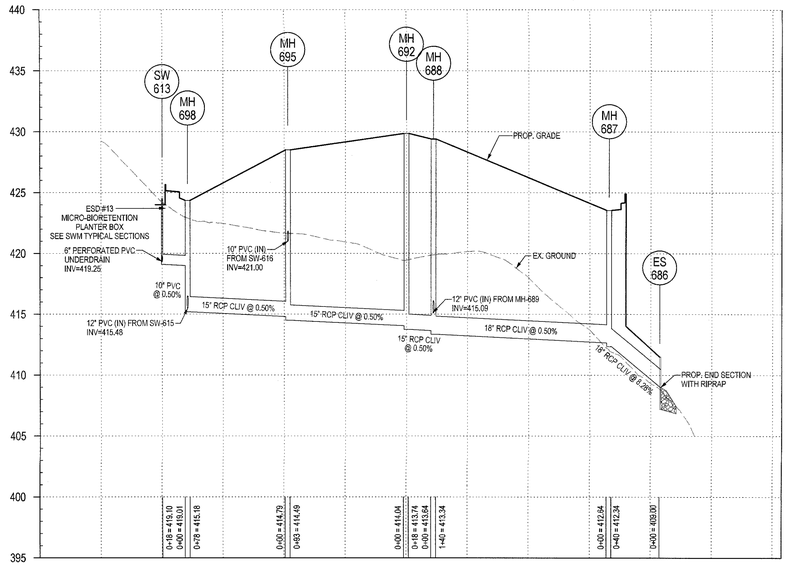
$LSAPLOTCOMMENTS

SW613-ES686



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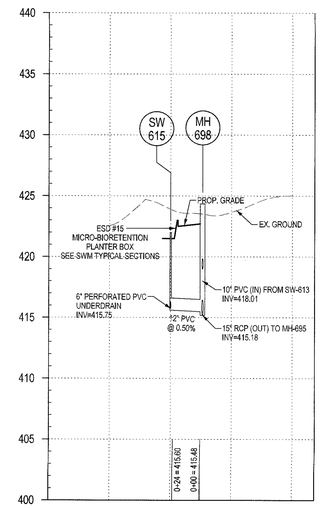

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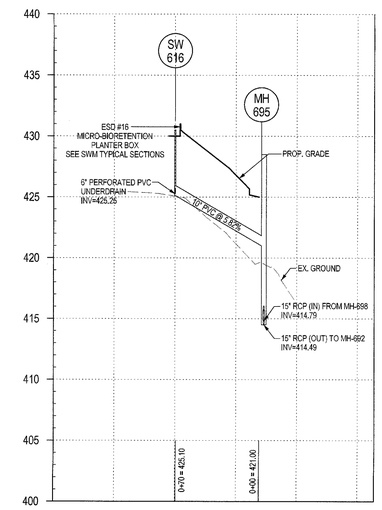

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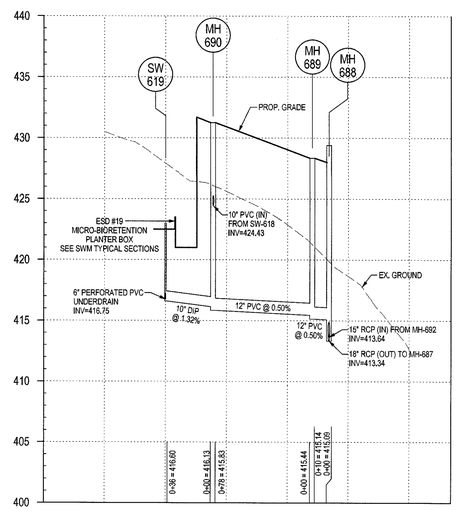

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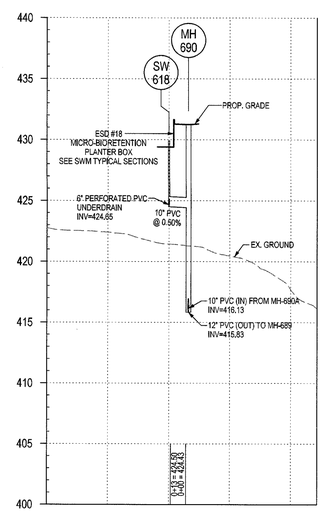

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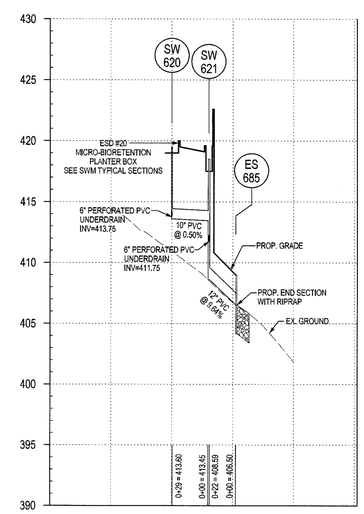

PROFILE SCALE: HORIZONTAL: 1"=50'
VERTICAL: 1"=5

50 25 0 50 100

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **STORMWATER MANAGEMENT**	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
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LICENSE NO. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY K. QUARLES · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY STORMDRAIN PROFILES

STORMWATER MANAGEMENT PRELIMINARY PLAN
WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 11 OF 16

PROJECT NO. 1184-00-01

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ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 CAD STANDARDS VERSION: V8 - 2000
DESIGNED: CX TECHNICIAN: CX CHECKED: AXQ

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND. WELL IN ADVANCE OF THE START OF EXCAVATION, CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5153 GRID G,H 1&2
TAX MAP FS342 & 343
ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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$LSAPLOTCOMMENTS

ESD FACILITIES	DRAINAGE AREA (SF)	C-FACTOR
SW-601	20,275	0.77
SW-602	7,409	0.78
SW-603	8,931	0.73
SW-604	2,213	0.82
SW-605	6,568	0.82
SW-606	4,889	0.82
SW-607	12,904	0.62
SW-608	1,516	0.78
SW-609	2,809	0.59
SW-610	5,296	0.78
SW-611	5,297	0.78
SW-612	3,947	0.66
SW-613	2,734	0.82
SW-615	20,250	0.73
SW-616	8,111	0.84
SW-618	4,015	0.76
SW-619	10,624	0.84
SW-619A	13,283	0.85
SW-619B	13,323	0.85
SW-620	13,907	0.70
SW-621	13,407	0.76
SW-623	8,448	0.72
SW-624	9,161	0.68
SW-625	5,706	0.83
SW-626	7,605	0.57
SW-627	10,547	0.75
SW-628	1,637	0.82
SW-629	1,750	0.75
SW-630	5,665	0.83
SW-631	20,088	0.59

NOTE:

ALL PROPOSED "ESD's WILL BE WRAPPED WITH SILT FENCE AND COVER WITH WOVEN MONOFILAMENT GEOTEXTILE FABRIC OR EQUIVALENT TO PREVENT CONTAMINATION DURING CONSTRUCTION ACTIVITIES

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3889-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE
BY

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE
BY

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. 36080 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUARTZ · No. 36080 · PROFESSIONAL ENGINEER
1/10/14

SEDIMENT CONTROL DRAINAGE AREA MAP

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = 30'
SHEET 12 OF 16
PROJECT NO. 1184-00-01

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DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: MN | TECHNICIAN: MN | CHECKED: AXQ

MISS UTILITY NOTE

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DIRECTOR OF NEW DEVELOPMENT

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CONTACT: MR. JAKE STROMAN

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MAP 5153 GRID G,H 1&2
TAX MAP FS342 & 343
ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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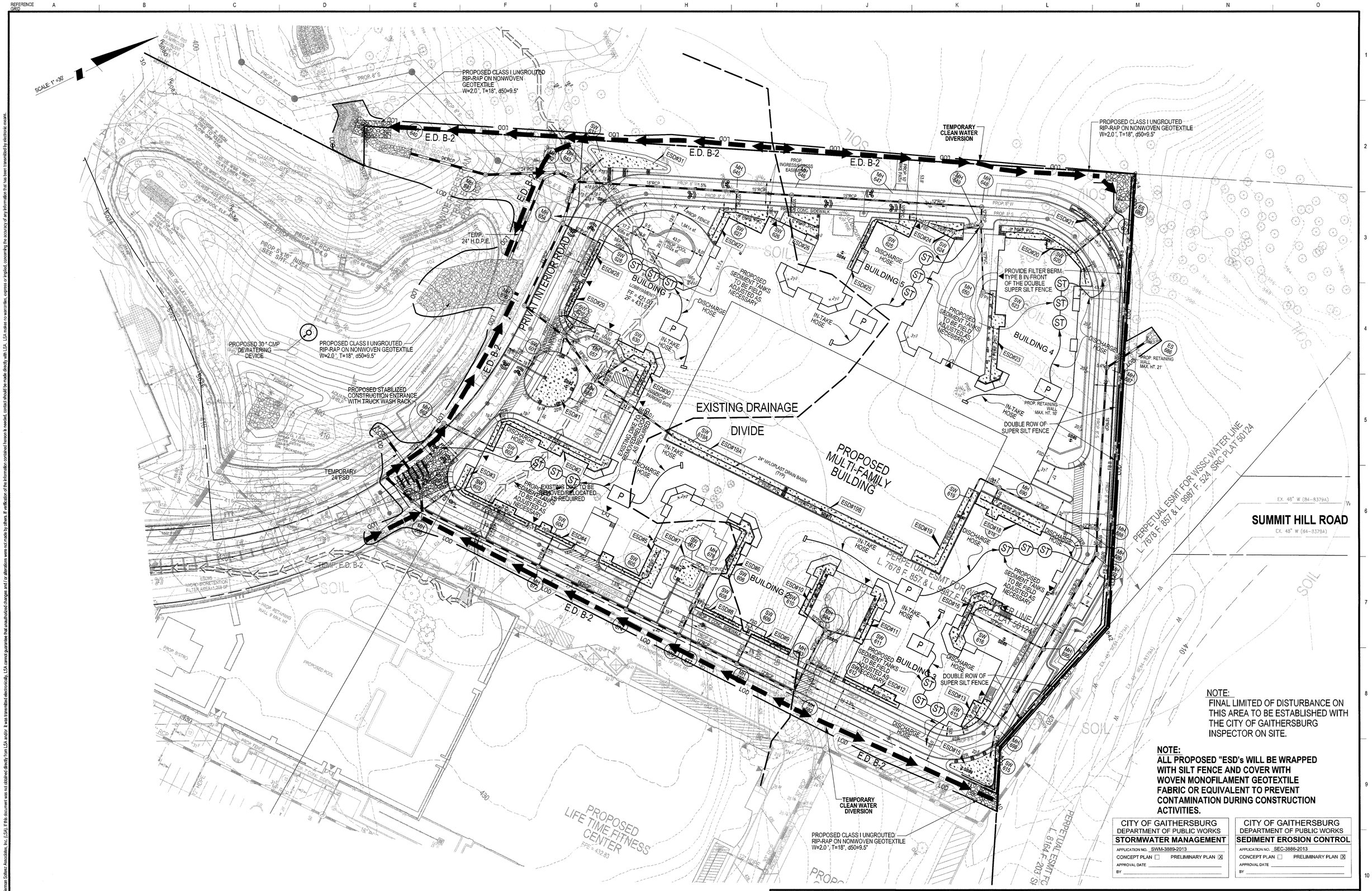
$LSAPLOTCOMMENTS



NOTE:
FINAL LIMITED OF DISTURBANCE ON THIS AREA TO BE ESTABLISHED WITH THE CITY OF GAITHERSBURG INSPECTOR ON SITE.

NOTE:
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CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT	**SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

GRAPHIC SCALE: 1" = 30'

THIS PLAN IS FOR THE MAINTENANCE AND CONSTRUCTION OF SEDIMENT CONTROL AND STORMWATER MANAGEMENT MEASURES ONLY.

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. 36060 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND — ANN K. QUAIN — NO. 36060 — PROFESSIONAL ENGINEER — 1/10/14

PRELIMINARY SEDIMENT CONTROL PLAN

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PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
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MAP	GRID
5153	G-H 1&2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD

WSSC 200' SHEET: 221NW 10, 222NW 10

SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

1" = 30'
SHEET 13 OF 16
PROJECT NO. 1184-00-01

SLSAPLOTCOMMENTS

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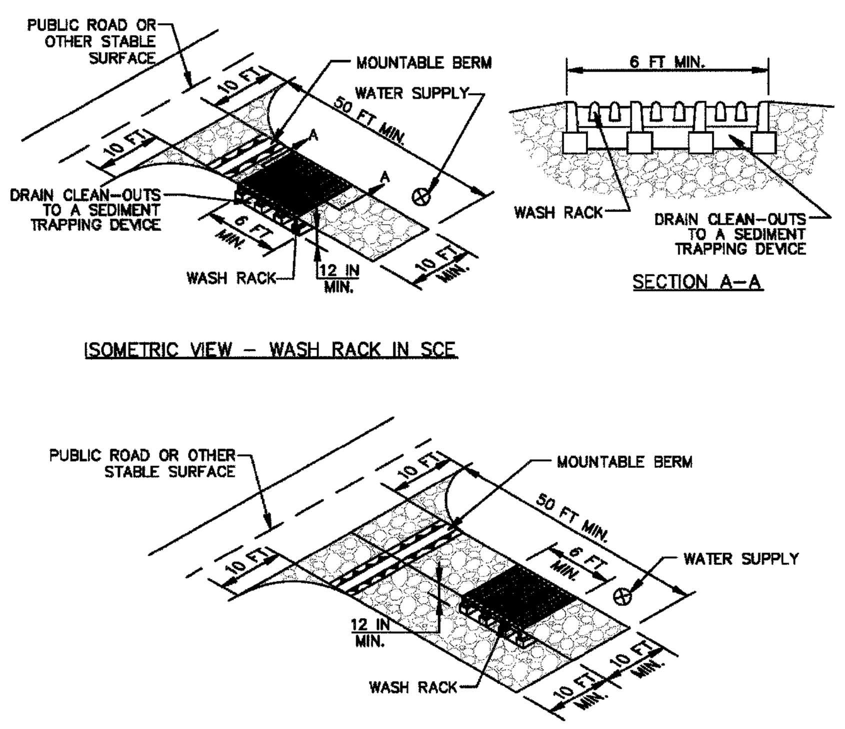
REFERENCE GRID A B C D E F G H I J K L M N O

DETAIL B-2 WASH RACK OPTION

STANDARD SYMBOL: WR



CONSTRUCTION SPECIFICATIONS

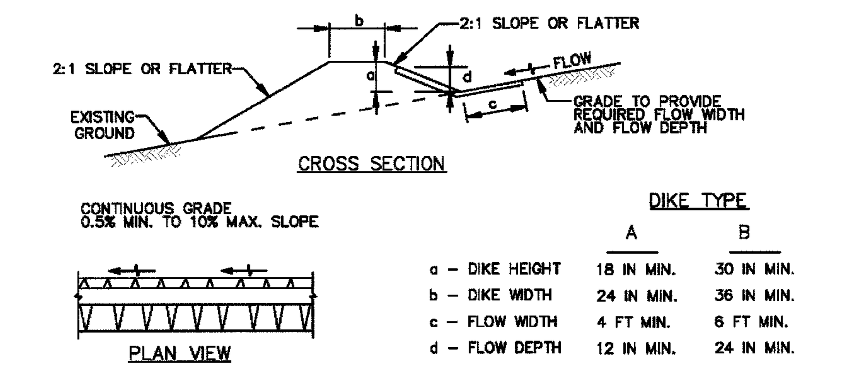
1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE–FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET x 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE SCE.
3. DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A–1 ◄— PLACE DESIGNATION (e.g. A–1) ON FLOW CHANNEL SIDE OF DIKE.



	DIKE TYPE A	DIKE TYPE B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

A–1	SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A–2/B–2	SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A–3/B–3	4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

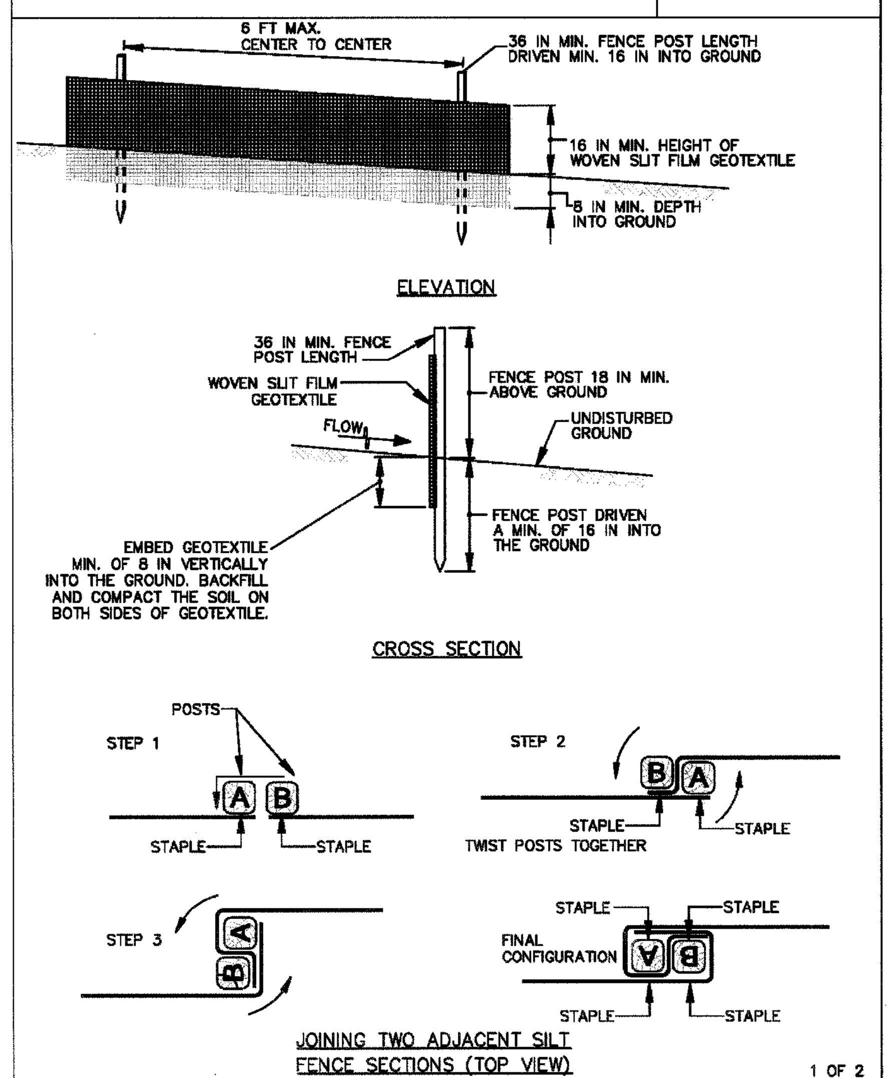
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ——SF——



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: ——SF——

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID–SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

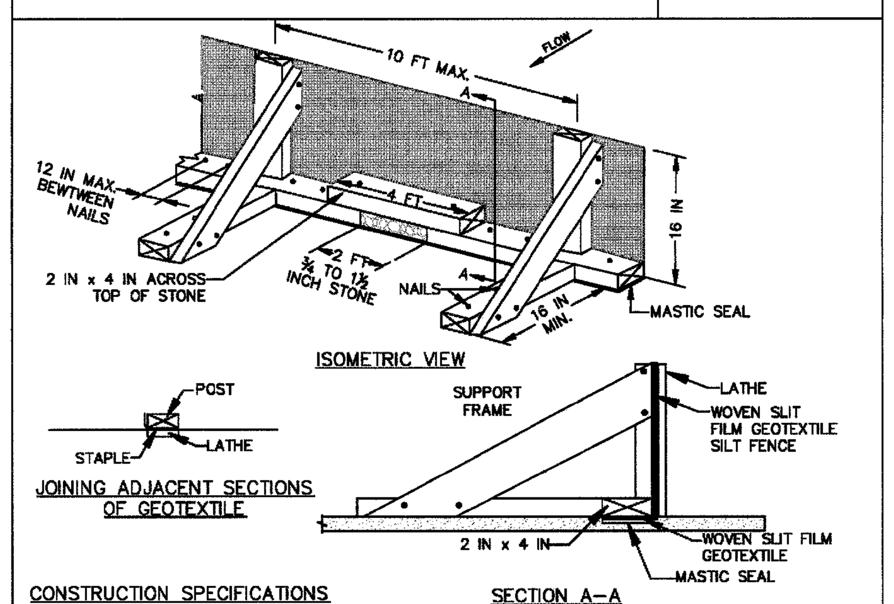
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-2 SILT FENCE ON PAVEMENT

STANDARD SYMBOL: ——SFOP——



CONSTRUCTION SPECIFICATIONS

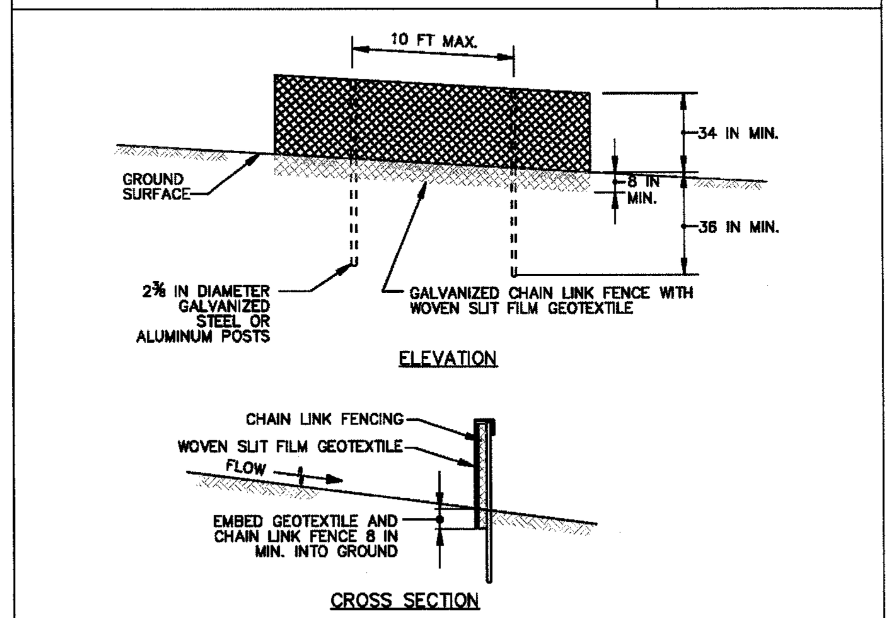
1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. USE WOVEN SLIT FILM GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS.
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT–LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 40D 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: ——SSF——



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

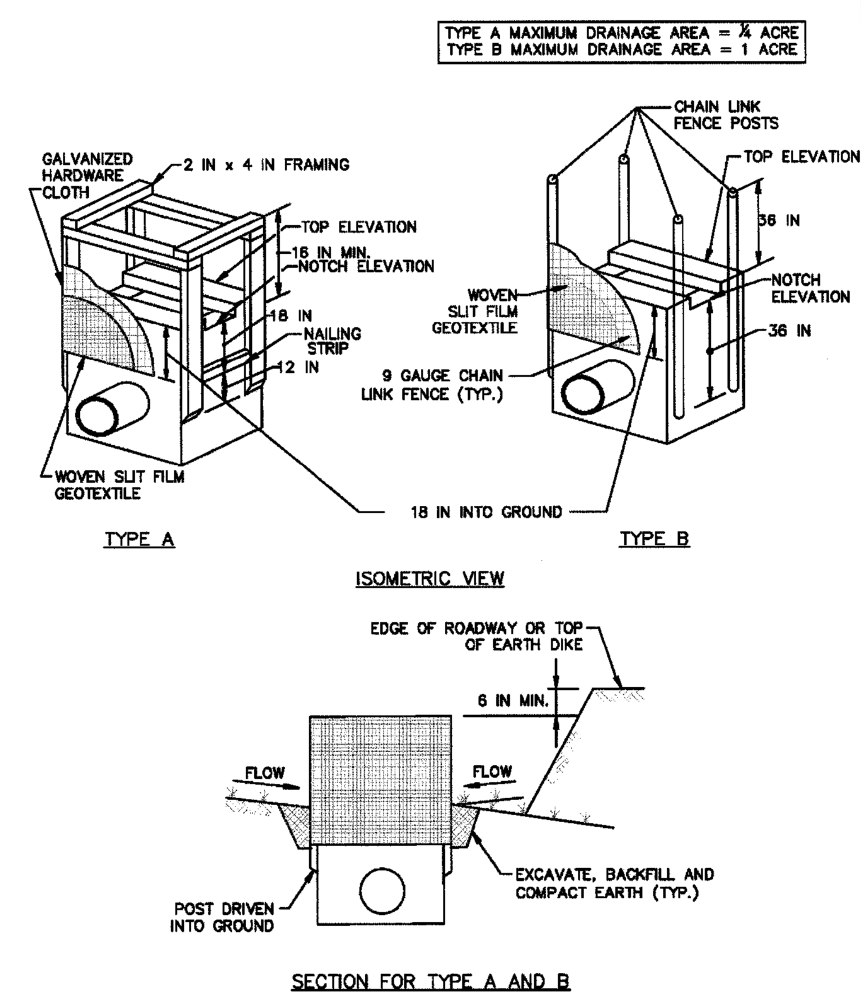
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

TYPE A MAXIMUM DRAINAGE AREA = ¼ ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

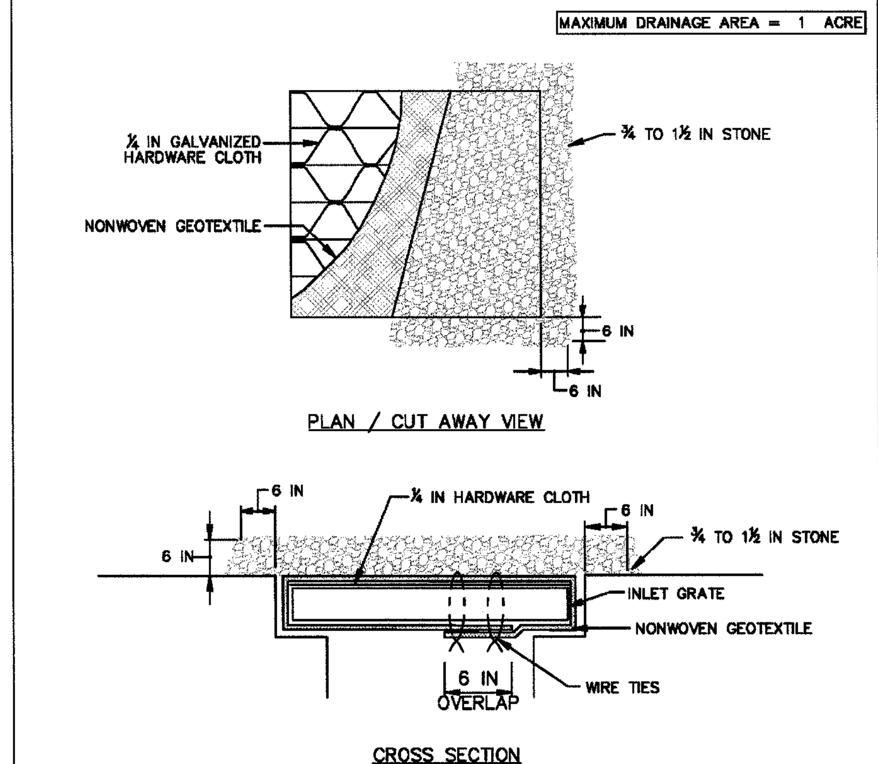
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS

1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

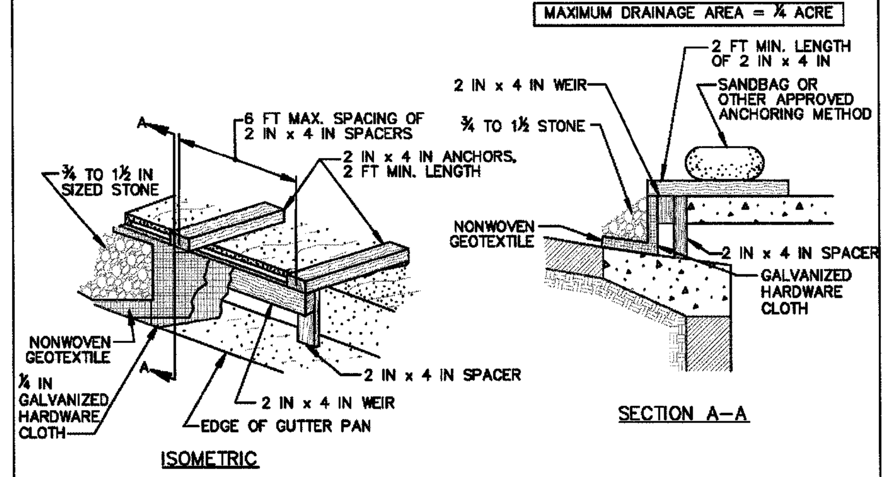
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON–SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT	**SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE ______	APPROVAL DATE ______
BY ______	BY ______

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SOLTESZ
Rockville
Lanham
Waldorf
Leonardtown
Engineering
Planning
Environmental Sciences
ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: MN | TECHNICIAN: MN | CHECKED: AXQ

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND, WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5163 GRID G,H 1&2
TAX MAP: FS342 & 343 | ZONING CATEGORY: MXD
WSSC 200' SHEET: 221NW 10, 222NW 10
SITE DATUM: HORIZONTAL: NAD 83 VERTICAL: NAD 83

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. 36060 , EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANT · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY SEDIMENT CONTROL NOTES & DETAILS

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

ONE INCH
1" = AS SHOWN

SHEET 14 OF 16

PROJECT NO. 1184-00-01

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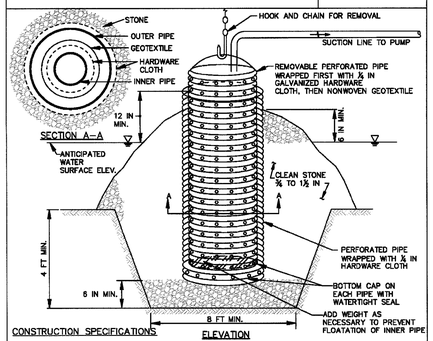
City of Gaithersburg Department of Public Works
STANDARD EROSION AND SEDIMENT CONTROL NOTES

1. The permittee shall notify the City Inspector at 301-258-6330, 48 hours before commencing any land disturbing activity and shall be required to hold a preconstruction meeting between himself or his representative, and authorized representatives of the City.
2. The permittee must obtain inspection and approval by Planning and Code Enforcement at the following points:
   a. At the required pre-construction meeting.
   b. Following installation of sediment control measures and prior to any other land disturbing activity.
   c. During the installation of a sediment basin or stormwater management structure at the required inspection points (see Inspection Checklist on plan). Notification prior to commencing construction is mandatory.
   d. Prior to removal or modification of any sediment control devices.
   e. Prior to final acceptance.
3. All erosion control measures are to be constructed and maintained in accordance with applicable published standards and specifications and the most current "Maryland Standards and Specifications for Soil Erosion and Sediment Control."
4. The permittee shall construct all erosion and sediment control measures per the approved plan and construction sequence, shall have them inspected and approved by the City inspector prior to beginning any other land disturbances, shall ensure that all runoff from disturbed areas is directed to the sediment control devices, and shall not remove any erosion or sediment control measures without prior permission from City inspector.
5. Any request for changes to the approved sediment control plan or sequence of construction must be submitted to the Sediment Control Inspector and approved before implementing changes. Major changes will require a plan revision.
6. The permittee shall protect all points of construction ingress and egress to prevent the deposition of materials onto traversed public thoroughfare(s). All materials deposited onto public thoroughfare(s) shall be removed immediately.
7. The permittee shall inspect daily and maintain continuously in effective operating condition all erosion and sediment control measures until such times as they are removed with prior permission from Department of Planning and Code Enforcement.
8. All sediment basins, trap embankments, swales, perimeter dikes and permanent slopes steeper or equal to 3:1 shall be stabilized with sod, seed and anchored straw mulch, or other approved stabilization measures, within three (3) calendar days of establishment. All areas disturbed outside of the perimeter sediment control system must be minimized and stabilized immediately. Maintenance must be performed as necessary to ensure continued stabilization. Restabilization or overseeding will be required, if necessary.
9. The permittee shall apply sod, seed and anchored straw, mulch, or other approved stabilization measures to all disturbed areas within 7 calendar days after stripping and grading activities have ceased on that area. Maintenance shall be performed as necessary to ensure continued stabilization. Active construction areas, such as borrow or stockpile areas, roadway improvements, and areas within 50 feet of a building under construction may be exempted from this requirement, provided that erosion and sediment control measures are installed and maintained to protect those areas.
10. Prior to removal of sediment control measures, the permittee shall stabilize all contributory disturbed areas using sod or an approved permanent seed mixture with required soil amendments and an approved anchored mulch. Wood fiber mulch may only be used in seeding season when the slope does not exceed 10% to promote sheet flow drainage. Areas brought to finished grade during the seeding season shall be permanently stabilized within 7 calendar days of establishment. When property is brought to finished grade during the months of November through February, and permanent stabilization is found to be impractical, an approved temporary seed and straw anchored mulch shall be applied to disturbed areas. The final permanent stabilization of such property shall be completed prior to the following April 15.
11. The site work, materials, approved SC and SWM plans and any required test reports shall be available at the site for inspection by duly authorized officials of the City of Gaithersburg.
12. Surface drainage flows over unstabilized cut and fill slopes shall be controlled by either preventing drainage flows from traversing the slopes or by installing mechanical devices to lower the water downslope without causing erosion. Dikes shall be installed and maintained at the top of cut or fill slopes until the slope and drainage area to it are fully stabilized, at which time they must be removed and final grading done to promote sheet flow drainage. Mechanical devices must be provided at points of concentrated flow where erosion is likely to occur.
13. Permanent swales or other points of concentrated water flow shall be stabilized with sod or seed with an approved erosion control matting or by other approved stabilization measures.
14. Temporary sediment control devices shall be removed, with permission of the City inspector, within (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. If establishment is not full and uniform as determined by the Sediment Control Inspector, overseeding will be required. Stormwater management structures used temporarily for sediment control shall be converted to the permanent configuration within this time period as well.
15. No permanent cut or fill slope with a gradient steeper than 3:1 will be permitted in lawn maintenance areas. A slope gradient of up to 2:1 will be permitted in areas that are not to be maintained provided that those areas are indicated on the erosion and sediment control plan with a low-maintenance ground cover specified for permanent stabilization. Slope gradient steeper than 2:1 will not be permitted with vegetative stabilization.
16. The permittee shall install a splashblock at the bottom of each downspout unless the downspout is connected by a drain line to an acceptable outlet.
17. All water pumped from excavation during construction shall be pumped either to sediment tanks and/or sediment traps. No water will be pumped to the storm drain system. Dewatering shall be performed in accordance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
18. For finished grading, the permittee shall provide adequate gradients so as to: (1) prevent water from standing on the surface of lawns more than 24 hours after the end of a rainfall, except in designated drainage courses and swale flow areas which may drain as long as 48 hours after the end of a rainfall, and (2) provide positive drainage away from all building foundations or openings.
19. Sediment traps or basins are not permitted within 20 feet of a building which is existing or under construction. No building may be constructed within 20 feet of a sediment trap or basin.
20. All inlets in non-sump areas shall have asphalt berms installed at the time of base paving establishment.
21. The Sediment Control Inspector has the option of requiring additional sediment control measures, if deemed necessary.
22. All trap elevations are relative to the outlet elevation, which must be on existing undisturbed ground.
23. Vegetative stabilization shall be performed in accordance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
24. Temporary sediment trap(s) shall be cleaned out and restored to the original dimensions when sediment has accumulated to a point one half (1/2) the depth between the outlet crest and the bottom of the trap.
25. Sediment removed from traps shall be placed and stabilized in approved areas in such a manner that it does not foul existing or proposed storm drainage systems or areas already stabilized. Sediment shall not be placed within a flood plain or wetland.
26. All sediment basins and traps must be surrounded with a welded wire safety fence. The fence must be at least 42 inches high, have posts spaced no farther apart than 8 feet, have mesh openings no greater than 2 inches in width and 4 inches in height, with a minimum of 14-gauge wire. Safety fence must be maintained in good condition at all times.
27. No excavation in the area of existing utilities is permitted unless their location has been determined. Call **Miss Utility at 1-800-257-7777** 48 hours prior to the start of work.
28. Off-site spoil or borrow areas must have approved SC plans.
29. Protect all trees to be preserved during construction in accordance with the approved Forest Conservation Plan and Forest Stand Delineation.
30. Permittee is responsible for all actions of subcontractors, including repairing damages of sediment control devices.

DETAIL F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL ⊠RPS



CONSTRUCTION SPECIFICATIONS

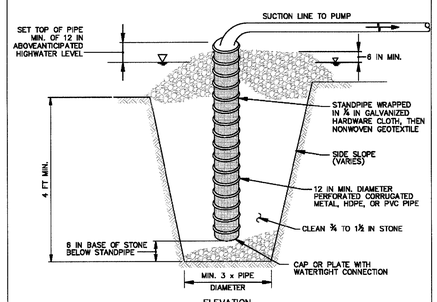
1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE HARDWARE CLOTH.
4. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
5. SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN).
6. BACKFILL PIT AROUND THE OUTER PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 8 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
7. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-2 SUMP PIT

STANDARD SYMBOL ⊠SP



CONSTRUCTION SPECIFICATIONS

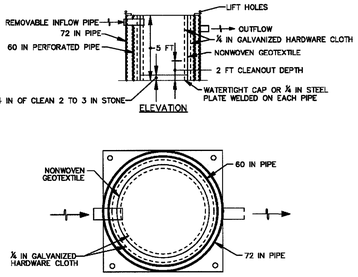
1. USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
2. WRAP PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE HARDWARE CLOTH.
3. EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
4. SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
5. BACKFILL PIT AROUND THE PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
6. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
7. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-3 PORTABLE SEDIMENT TANK

STANDARD SYMBOL ⊠PST



CONSTRUCTION SPECIFICATIONS

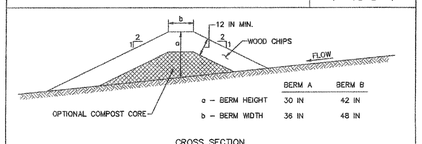
1. PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
2. USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, ¼ INCH HARDWARE CLOTH.
3. OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
4. ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE.
5. USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE
6. INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
7. PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOGS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

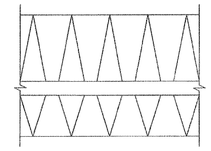
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-5 FILTER BERM

STANDARD SYMBOL ⊢---FB–A---⊣ ⊢---FB–B---⊣





CONSTRUCTION SPECIFICATIONS

1. PLACE BERM ON THE CONTOUR WITH ENDS TURNED UPGRADE TO PREVENT BYPASS. DO NOT EXCEED GRADES OF 5 PERCENT ALONG THE BERM FOR A DISTANCE GREATER THAN 50 FEET.
2. CONSTRUCT BERM OF CLEAN WOOD CHIPS A MINIMUM SIZE OF 1X2 INCH AND A MAXIMUM OF 3X3 INCH.
3. COMPACT AND SHAPE MATERIAL TO CONFORM TO DIMENSIONS SPECIFIED ON THE APPROVED PLAN.
4. DO NOT PLACE UN–CHIPPED TREE PIECES, BRUSH, OR STUMPS IN THE BERM. BERM MUST BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES.
5. THE BERM MAY CONTAIN UP TO 50% COMPOST MATERIAL IN ACCORDANCE WITH SECTION H–1 MATERIALS.
6. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD WOOD CHIPS OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN THEY REACH 25% OF BERM HEIGHT.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

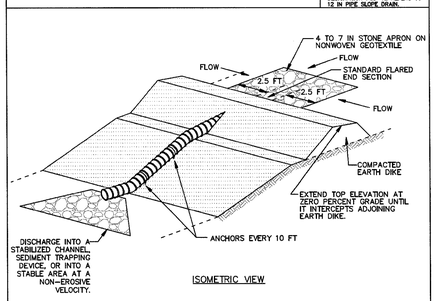
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

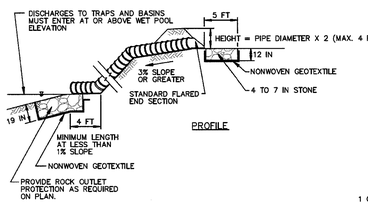
E.12

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL PSD – 12

DESIGNATION PSD–12 REFERS TO 12 IN PIPE SLOPE DRAIN.





1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL PSD – 12

DESIGNATION PSD–12 REFERS TO 12 IN PIPE SLOPE DRAIN.

CONSTRUCTION SPECIFICATIONS

1. THE HEIGHT OF THE EARTH DIKE MUST BE AT LEAST 2 TIMES THE PIPE DIAMETER MEASURED FROM THE INVERT OF THE PIPE. EXTEND THE TOP ELEVATION OF DIKE AT ZERO PERCENT GRADE UNTIL IT INTERCEPTS THE TOP OF THE ADJOINING EARTH DIKE.
2. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. ALL CONNECTIONS MUST BE WATERTIGHT.
3. ATTACH A FLARED END SECTION TO THE INLET END OF PIPE WITH A WATERTIGHT CONNECTION. AT THE INLET OF THE PIPE SLOPE DRAIN, INSTALL 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PLACED 12 INCHES IN DEPTH ON NONWOVEN GEOTEXTILE AND EXTEND OUT 5 FEET FROM THE INLET IN ALL DIRECTIONS.
4. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
5. SECURELY ANCHOR THE PIPE SLOPE DRAIN (PSD) TO THE SLOPE. SPACE THE ANCHORS EVERY 10 FEET.
6. HAND TAMP THE SOIL AROUND AND UNDER THE PIPE AND END SECTION IN 4 INCH LIFTS TO THE TOP OF THE EARTH DIKE.
7. UPON COMPLETING INSTALLATION OF THE PSD, STABILIZE ASSOCIATED DISTURBANCES WITH SEED, MULCH, AND TACK.
8. INSTALL OUTLET PROTECTION AS SPECIFIED ON APPROVED PLAN.
9. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REMOVE ACCUMULATED SEDIMENT AND DEBRIS.

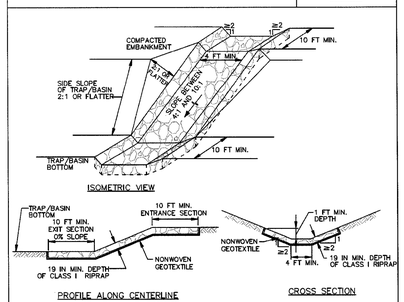
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-3-1 RIPRAP INFLOW PROTECTION

STANDARD SYMBOL ⊠RRP-1



CONSTRUCTION SPECIFICATIONS

1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
2. CONSTRUCT INFLOW CHANNEL WITH CLASS I RIPRAP OR EQUIVALENT RECYCLED CONCRETE LINING TO A MINIMUM DEPTH OF 19 INCHES ($2 \times D_{50}$) AND A 1 FOOT DEEP FLOW CHANNEL. INFLOW RIPRAP PROTECTION CHANNEL MUST HAVE A TRAPEZOIDAL CROSS SECTION WITH 2:1 OR FLATTER SIDE SLOPES AND A 4 FOOT MINIMUM BOTTOM WIDTH.
3. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
4. BLEND RIPRAP INTO EXISTING GROUND.
5. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

D.10

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
STORMWATER MANAGEMENT
APPLICATION NO. SWM-3889-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

CITY OF GAITHERSBURG
DEPARTMENT OF PUBLIC WORKS
SEDIMENT EROSION CONTROL
APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE _____
BY _____

SOLTESZ
Engineering
Planning
Environmental Sciences
Rockville
Laneham
Waldorf
Leonardtown
ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 – 2000
DESIGNED: MN | TECHNICIAN: MN | CHECKED: AXO

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND. WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR THREE (3) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

DEVELOPER/APPLICANT

CAMDEN LIVING
1420 SPRING HILL ROAD, SUITE 200
McLEAN, VIRGINIA 22102
PHONE # (703) 556-5741
CONTACT: MR. JAY JOHNSON
DIRECTOR OF NEW DEVELOPMENT

OWNER

WASHINGTONIAN NORTH ASSOCIATES, LP
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE NW, SUITE 200W
WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5153 GRID G,H 1&2
TAX MAP FS342 & 343
ZONING CATEGORY: MXD
WSSC 200' SHEET 221NW 10 222NW 10
SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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. 36060 , EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · ANY X. QUANG · No. 36060 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY SEDIMENT CONTROL NOTES & DETAILS

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN
SHEET 15 OF 16
PROJECT NO. 1194-00-01

General Notes
And
Sequence of Construction for
Preliminary SWM-SC plan
Camden Lot 8
"Washingtonian North"

General Notes for Grading:

A. Obtain written approval from the City of Gaithersburg DPW Sediment Control Inspector before altering or removing any existing or proposed sediment control device.

B. The work included in this permit comprises: clearing and rough grading within the indicated limit of disturbance; the installation of primary utilities, including construction of the site water and sanitary sewer systems, the proposed storm drain system, proposed dry utilities, grading and paving of the private street; the construction of the proposed building, site amenities the propose ESD structures and the restoration of the existing sediment basin to a permanent stormwater management pond.

C. The primary sediment control device to be used for the work included in this permit are: earth dikes, construction entrance, double row of super silt fence in combination with a proposed filter berm type B and regular silt fence. The existing sediment basin,(constructed by Washingtonian North Associates, LP c/o Boston Properties), will also provide a sediment control for this area. Camden Living to restore the sediment basin as necessary after completion of the site.

D. The Permittee and the Contractor are responsible for the implementation of this sequence and co-ordination with the DPW Inspector of any revisions to it. It is also the responsibility of the Contractor to comply with all applicable provisions of the "Standard Erosion and Sediment Control Notes", this Sheet, and the "Stormwater Management Construction Specifications and Structural Construction Notes", Sheet.

E. Contact Miss Utility at 1-800-257-7777 to mark the location of all existing utilities within the disturbed area before starting the work.

F. Engage a geotechnical engineer to supervise all sub-surface construction, including the proposed ESD structures, proposed roadway and proposed building as necessary.

G. Obtain DPW approval of the shop drawings as required.

H. Any items specified by brand name on this plan, including landscaping materials, are to be installed as such. Any revision to or substitution of such items must be approved by the design engineer before their delivery to the site.

I. The contractor shall maintain a record of all materials used in the construction of the stormwater management pond, including the landscaping materials. Provide this information to the design engineer at the completion of the work so that an as-built plan can be prepared.

Sequence of construction

1. **Prior to clearing trees, installing sediment control measures, or grading, a preconstruction meeting must be conducted on-site with the City of Gaithersburg Department of Public Works DPW (301) 258-6330 (48 hours' notice) the Owners representative, and the site Engineer.**
2. **The permittee must obtain written approval form** the City of Gaithersburg – DPW inspector, certifying that the limits of disturbance and tree protection measures are correctly marked and installed prior to commencing any clearing.
3. **Clear and grade for installation of sediment control devices.**
4. Install sediment control devices. Traps and basins shall be constructed prior to **construction of any earth dikes that convey drainage to a trap and/or basin.**
5. Once the sediment control devices are installed, the permittee must obtain written approval from the City of Gaithersburg – DPW

NOTE1: All sequences should call for the permittee to obtain written approval from DPW inspector, prior to the removal of any sediment control device.

NOTE 2: Any site that has a proposed storm drain diversion should have its Sequence of Construction state the following:

1) **The construction of the diversion in the storm drain construction step; once**
2) **Once the drainage area is stabilized, the storm drain system must be flushed, and temporary pipes removed, and any permanent pipes unblocked or constructed.**

6. **Install Sediment Control Devices**
   - **Clear and grub area as necessary to install proposed Sediment Control Devices as shown on plan.**
   - **Install temporary construction entrance as shown**
   - **Install proposed temporary 24"-PSD and ungrouted RIP-Rap at the inflow point of the sediment basin**
   - **Install temporary Earth Dike (E.D.-B2) and ungrouted rip-rap as shown on plan.**
   - **Provide DOUBLE ROW OF SUPER-SILT FENCE at the north end of the site.**
   - **Install proposed Filter Berm Type "B" in front of the double row of super silt fence.**
   - **Obtain written approval from the City of Gaithersburg DPW inspector.**
7. **Begin with the proposed clearing and grubbing of the site as necessary.**
8. **Begin with the rough grading of the site and proposed storm drain system as shown on plans.**
9. **Install proposed water and sewer systems as per plan.**
10. **Obtain approval from the WSSC inspector and City of Gaithersburg Inspector.**
11. **Continue with the site grading building construction and utility installation as necessary.**
12. **As the buildings excavation progresses, contractor to remove the sediment laden on the low areas with the use of sump pumps and sediment tanks, discharge to be done directly into the storm drain system with inlet protection.**
13. **Install all proposed ESD structures and accessories wrap the structures with regular silt fence and cover them with woven monofilament geotextile fabric or approved equivalent to prevent contamination during the on-going construction activities.**
14. **Immediately stabilize cell areas which are to be unpaved after they are brought to grade.**
15. **Install all proposed curb and gutter to grade.**
16. **Install pavement base course.**
17. **Install all site amenities and provide the proposed landscape to site.**
18. **Complete site grading and stabilize site as required, flush all storm drain system free of sediment.**
19. **Obtain written approval from the City of Gaithersburg DPW inspector for the removal of the Sediment Control devices.**
20. **Remove all Sediment Control devices use for the completion of the site construction.**
21. **Begin the restoration of the existing sediment basin to a permanent SWM pond, contractor to remove all trapped sediment and repair any damages to any structure. Also re-grade all areas that were disturbed.**
22. **Obtain approval from the City of Gaithersburg Inspector.**
23. **Submit an As-Built plan to The City of Gaithersburg for review and approval.**

CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **STORMWATER MANAGEMENT**	CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS **SEDIMENT EROSION CONTROL**
APPLICATION NO. SWM-3889-2013	APPLICATION NO. SEC-3886-2013
CONCEPT PLAN ☐ PRELIMINARY PLAN ☒	CONCEPT PLAN ☐ PRELIMINARY PLAN ☒
APPROVAL DATE	APPROVAL DATE
BY	BY

PROFESSIONAL CERTIFICATION
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LICENSE NO. 36090 EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · ANDY K. QUAN · No. 36090 · PROFESSIONAL ENGINEER
1/10/14

PRELIMINARY SEDIMENT CONTROL SEQUENCE OF CONSTRUCTION

PRELIMINARY SEDIMENT CONTROL PLAN

WASHINGTONIAN NORTH

LOT 8, BLOCK D
WASHINGTONIAN CENTER

PREVIOUSLY LOT 6, BLOCK D, WASHINGTONIAN CENTER, PLAT #21856
GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = AS SHOWN

SHEET 16 OF 16

PROJECT NO. 1184-00-01

SOLTESZ
Engineering
Planning
Environmental Sciences

Rockville
Lanham
Waldorf
Leonardtown

ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: OCTOBER 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: MN | TECHNICIAN: MN | CHECKED: AXQ

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DEVELOPER/APPLICANT

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WASHINGTON, DC 20037
PHONE # (202) 585-0847
CONTACT: MR. JAKE STROMAN

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MAP 5163 GRID G,H 1&2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD

WSSC 200' SHEET
221NW 10
222NW 10

SITE DATUM
HORIZONTAL: NAD 83
VERTICAL: NAD 83

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WASHINGTONIAN NORTH CAMDEN DEVELOPMENT OF LOT 8

STORMWATER MANAGEMENT PRELIMINARY REPORT

Submitted:December 13, 2013

Prepared on Behalf of:
Camden Living
1420 Spring Hill Road, Suite 200
McLean, Virginia 22102
Contact: Mr. Jay Johnson
Director of New Development

Prepared By:
SOLTESZ
2 Research Place, Suite 100
Rockville, MD 20850
(301) 948-2750
Project No.: 1184-00-01
Prepared by: Cathy Xie
Checked by: Amy Quant

SDP-3878-2013
Exhibit #39

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STORMWATER MANAGEMENT PRELIMINARY REPORT
Washingtonian North - Camden Development of Lot 8

INTRODUCTION:

On behalf of our client, Camden Living, we are submitting the enclosed Stormwater Management Preliminary Plan package for Camden Development of Lot 8 (Formerly Lot 6), Washingtonian North project.

The project site, Lot 8, is located northeast of the intersection of Washingtonian Boulevard and Sam Eig Highway in Gaithersburg, Maryland. The site is slightly to moderately sloped and partially occupied by woods. The site is currently zoned MXD and is located within the Muddy Branch Watershed, Use Class I/I-P.

The proposed development is to construct one five-story timber frame residential building built around a 5.5 level, above grade pre-cast parking garage.

This package includes drainage area map, stormwater management preliminary plan and details, supporting ESD computations and Soil Report for your review.

STORMWATER MANAGEMENT:

Requirements:

The Maryland Department of the Environment *2009 Stormwater Management Design Manual* and the Montgomery County Stormwater Regulations require that all new developments meet the criteria for Water Quality Volume (WQv), Recharge Volume (Re_v) and Channel Protection Volume (Cp_v) through ESD practices to the maximum extent practicable (MEP). Tables in the report are referenced from the 2009 Manual, unless otherwise indicated.

Methodology:

Because the site is currently vacant and partially wooded with no impervious area, stormwater management new development requirements will be used with ESD to the MEP.

Proposed Facilities:

Micro Bioretention (Planter Box) – Thirty (30) micro-bioretention facilities will be utilized to capture runoff from roof top, court yard area and loop road to minimize the impact of land development on water resources. These micro-facilities will be designed with 6”-12” of ponding and 24” to 48” filter media over 6” perforated underdrain. These facilities are designed to capture a maximum of one-year storm and designed with outfall structures to bypass 10 year storm safely into the storm drain system.

To verify compliance with the intent of ESD design, we offer the following (please note that tables referenced are from the 2009 Maryland Stormwater Management Design Manual):

Natural Resource Protection and Enhancement

Site and resource mapping indicate minor natural resources located onsite as listed in Table 5.1.

- Forty (40) specimen trees were found in or near the property boundaries. No rare, threatened or endangered species exist on the site. No champion trees exist on the site. Proposed development will be done under supervision of certified Arborist to protect/remove the trees.
- Please refer to the attached NRI/FSD for additional information.

Therefore, natural resources will be protected and preserved to like existing conditions to the MEP.

Soil Types Include:

66UB – Wheaton-Urban land complex, 0 to 8 percent slopes, HSG "B"
116D – Blocktown channery silt loam, 15 to 25 percent slopes, very rocky, HSG "C"
54A – Hatboro silt loam, 0 to 3 percent slopes, frequently flooded, HSG "D"

See appendix for the full web soil survey.

Implementation of ESD Planning Techniques

The following techniques in Table 5.2 were used; all others are not applicable. These items include: Using narrower, shorter streets and sidewalks, structured parking garage, rooftop runoff, and clearing and grading.
Streets are designed to be as narrow as 20 feet width. Sidewalks are provided on one side of the road with 5' width. Parking garage is proposed on site rather than surface parking lots. Rooftop runoff shall be directed to proposed ESD facilities for treatment. Clearing and grading has been limited by the required needs for the proposed development. Therefore, implementation of ESD planning techniques has been explored and will be used to the MEP.

<u>Summary:</u>

All ESD practices try to meet full P_E target volume. However, in efforts to compensate for areas during site limit that P_E target treatment was not obtainable, excess ESD volume has been provided throughout the site where available.

Designed to the maximum extent practicable, the proposed ESD volume treated by micro facilities provides an effective treatment volume for 2.2 inches of rainfall runoff. This meets and exceeds the new development required treatment of 2.2 inches.

Therefore, implementation of ESD planning techniques have been explored and used to the MEP.

2. ESDv Computations &

Ultimate ESD Summary Table

SOLTESZ

Date	12/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

LOD
ESDv COMPUTATIONS

LOD Target

Enter Total Site Property Area = **250825 sqft**
Enter Total Impervious Area = **191362 sqft**
% of Impervious D.A., I = **76.3%**
Volumetric Runoff Coefficient, Rv = 0.737 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)
A	38		0%	**2.4 in**			
B	55	**197640 sqft**	79%	**2.2 in**	28987 sqft	0.613 ac-ft	26691 cu-ft
C	70	**46860 sqft**	19%	**2.0 in**	6248 sqft	0.132 ac-ft	5753 cu-ft
D	77	**6325 sqft**	3%	**1.8 in**	759 sqft	0.016 ac-ft	699 cu-ft
Totals			100%	**2.2 in**	**35994 sqft**	**0.761 ac-ft**	**33143 cu-ft**

Equations

Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **58**

SOLTESZ
2 Research Pl., Suite 100
Rockville, MD 20850
(301) 948-2750

Date	6/14/2014
Project Name	Washingtonian - Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

Recharge Volume (Rev)
Computations for Entire Site of Lot 8

Total Site Property Area =	**250825 sqft**	
Total Impervious Area =	**191362 sqft**	
% of Impervious D.A., I =	**76.3%**	
Volumetric Runoff Coefficient, Rv =	0.737	(Rv = 0.05 + 0.009 (I))

Hydrologic Soil Group (HSG)	Soil Specific Recharge Fact (S)	Area (sqft)	Area Percentage	Composite S	Target Recharge Volume (Rev)
A	0.38	**0**	0%	0.00	0 cu-ft
B	0.26	**197640 sqft**	79%	0.20	3154 cu-ft
C	0.13	**46860 sqft**	19%	0.02	374 cu-ft
D	0.06	**6325 sqft**	3%	0.00	23 cu-ft
Totals		250825 sqft	100%	**0.231**	**3552 cu-ft**

Equations:
Target Recharge Volume, Rev = (S * Rv *A) / 12

Recharge Volume Required =	**3552 cu-ft**	
Total Recharge Volume Provided =	**3581 cu-ft**	**Rev Target is Satisfied.**

ESD Facilities providing Recharge Trench	Recharge Trench Area A(recharge)	Recharge Trench Depth D	Recharge Volume Provided Rev=(A) x (D) x (40%)
ESD #1	1204 sqft	3.25 ft	1565 cu-ft
ESD #7	376 sqft	3.00 ft	451 cu-ft
ESD #15	664 sqft	3.00 ft	797 cu-ft
ESD #31	640 sqft	3.00 ft	768 cu-ft
Totals	**2884 sqft**		**3581 cu-ft**

ESD Facilities providing Recharge Trench	Drainage Area (DA)	Impervious Area (I)	Vol. Runoff Coefficient Rv=0.05+(I)/(DA)*100	Rainfall to Recharge (P) P=12 x Rev / ((DA) x (Rv))	Runoff to Recharge (Q) Q=P x Rv	Field Infiltration Boring #	Field Infiltration Rate
ESD #1	**20,275 sqft**	**16,089 sqft**	0.76	1.21 in	0.93 in	I-2	0.75 in/hr
ESD #7	**12,904 sqft**	**7,283 sqft**	0.56	0.75 in	0.42 in	I-12	1.35 in/hr
ESD #15	**20,250 sqft**	**14,925 sqft**	0.71	0.66 in	0.47 in	I-9	2.25 in/hr
ESD #31	**20,088 sqft**	**10,426 sqft**	0.52	0.89 in	0.46 in	I-3	0.90 in/hr

Equations
Recharge Volume Provided, Rev=A(recharge) x D x 40%

SOLTESZ

Date	12/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

Ultimate ESD Summary Table

Overall Site Target

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
LOD	250,825	191,362	76%	0%	79%	19%	3%	**2.2**	**2.2**	0.74	33,143	34,036	893	**58**	See ESD Practices Below	Site Compliance
				2.4	**2.2 in**	**2.0 in**	**1.8 in**					(Provided ESDv Below)				

(Individual Target P_E)

Total Site Target Composite RCN for "Woods in Good Cond." = 58

Total Site Reduced Composite RCN for "Woods in Good Cond." = 58

Individual Facility Summary

ESD Facility	Drainage Area sq. ft.	Imp. D.A. sq. ft.	% of Imp. Cover	A Soil	B Soil	C Soil	D Soil	Target PE (in.) Table 5.3	Provided P_E (in.)	Rv	Target ESDv cu. ft.	Provided ESDv cu. ft.	Excess ESDv cu. ft.	Reduced RCN	Type of Facility	Remarks
ESD#01	20,275	16,089	79%	0%	83%	17%	0%	2.2	2.3	0.76	2,797	2,970	173	58	Micro-bioretention Planter Box	Target RCN is 58 with Soil B & C.
ESD#02	7,409	6,055	82%	0%	100%	0%	0%	2.2	2.6	0.79	1,067	1,261	194	55	Micro-bioretention Planter Box	
ESD#03	8,931	6,628	74%	0%	94%	6%	0%	2.2	2.3	0.72	1,169	1,231	62	56	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 56 with Soil B & C.
ESD#04	2,213	1,954	88%	0%	100%	0%	0%	2.4	2.6	0.84	374	399	25	55	Micro-bioretention Planter Box	
ESD#05	6,568	5,719	87%	0%	100%	0%	0%	2.4	2.6	0.83	1,095	1,186	91	55	Micro-bioretention Planter Box	
ESD#06	4,889	4,312	88%	0%	100%	0%	0%	2.4	2.6	0.84	825	894	69	55	Micro-bioretention Planter Box	
ESD#07	12,904	7,283	56%	0%	100%	0%	0%	2.0	1.4	0.56	1,200	865	0	65	Micro Bioretention	Compensate by ESD #2, #3, #6.
ESD#08	1,516	1,225	81%	0%	100%	0%	0%	2.2	2.6	0.78	216	255	39	55	Micro-bioretention Planter Box	
ESD#09	2,809	1,460	52%	0%	100%	0%	0%	1.8	2.6	0.52	218	315	97	55	Micro-bioretention Planter Box	
ESD#10	5,296	4,335	82%	0%	100%	0%	0%	2.2	2.4	0.79	764	825	61	55	Micro-bioretention Planter Box	
ESD#11	5,297	4,317	81%	0%	100%	0%	0%	2.2	2.4	0.78	761	821	60	55	Micro-bioretention Planter Box	
ESD#12	3,947	2,493	63%	0%	100%	0%	0%	2.0	2.6	0.62	407	529	122	55	Micro-bioretention Planter Box	
ESD#13	2,734	2,391	87%	0%	100%	0%	0%	2.4	2.6	0.84	458	496	38	55	Micro-bioretention Planter Box	
ESD#15	20,250	14,925	74%	0%	81%	19%	0%	2.2	1.3	0.71	2,602	1,527	0	75	Micro Bioretention	Compensate by ESD #1,#4, #5, #8~#14, #23.
ESD#16	8,111	7,410	91%	0%	100%	0%	0%	2.6	2.0	0.87	1,533	1,155	0	70	Micro-bioretention Planter Box	Compensate by ESD #18, #20.
ESD#18	4,015	3,128	78%	0%	100%	0%	0%	2.2	2.6	0.75	553	653	101	55	Micro-bioretention Planter Box	
ESD#19	10,624	9,720	91%	0%	100%	0%	0%	2.6	2.6	0.87	2,010	2,010	0	55	Micro-bioretention Planter Box	
ESD#19A	13,283	12,217	92%	0%	100%	0%	0%	2.6	2.6	0.88	2,526	2,498	0	55	Micro-bioretention Planter Box	
ESD#19B	13,323	12,217	92%	0%	100%	0%	0%	2.6	2.6	0.88	2,527	2,498	0	55	Micro-bioretention Planter Box	
ESD#20	13,907	9,702	70%	0%	51%	49%	0%	2.1	2.2	0.68	1,652	1,756	104	62	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 62 with Soil B & C.
ESD#21	13,407	10,487	78%	0%	29%	58%	12%	2.0	1.2	0.75	1,714	974	0	82	Micro-bioretention Planter Box	Compensated by ESD #24 ~ #31.
ESD#23	8,448	6,076	72%	0%	95%	5%	0%	2.2	2.6	0.70	1,075	1,276	201	56	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 56 with Soil B & C.
ESD#24	9,161	6,098	67%	0%	75%	25%	0%	2.2	2.2	0.65	1,066	1,098	33	59	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 59 with Soil B & C.
ESD#25	5,706	5,050	89%	0%	68%	32%	0%	2.3	2.5	0.85	914	1,007	93	60	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 60 with Soil B & C.
ESD#26	7,605	3,730	49%	0%	60%	40%	0%	1.8	2.6	0.49	561	810	249	61	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 61 with Soil B & C.
ESD#27	10,547	8,116	77%	0%	80%	20%	0%	2.2	2.3	0.74	1,409	1,530	120	58	Micro-bioretention Planter Box	Meet ESDv target. Target RCN is 58 with Soil B & C.
ESD#28	1,637	1,431	87%	0%	100%	0%	0%	2.4	2.6	0.84	274	297	23	55	Micro-bioretention Planter Box	
ESD#29	1,750	1,355	77%	0%	100%	0%	0%	2.2	2.6	0.75	240	283	44	55	Micro-bioretention Planter Box	
ESD#30	5,665	5,013	88%	0%	100%	0%	0%	2.4	2.6	0.85	959	1,039	80	55	Micro-bioretention Planter Box	
ESD#31	20,088	10,426	52%	0%	21%	77%	2%	1.8	1.8	0.52	1,558	1,579	20	67	Micro Bioretention	Meet ESDv target. Target RCN is 67 with Soil B, C & D.
TOTALS	**252,315 sqft**	**191,362 sqft**										**34,036 cu-ft**				

3. 10-YR Runoff Computations for By-Pass Structures

FACILITIES	DRAINAGE AREA (SF)	C-FACTOR	I (IN/HR)	*Q (CFS)*
SW-601	20,275	0.77	7.07	***2.53***
SW-602	7,409	0.78	7.07	***0.94***
SW-603	8,931	0.73	7.07	***1.06***
SW-604	2,213	0.82	7.07	***0.29***
SW-605	6,568	0.82	7.07	***0.87***
SW-606	4,889	0.82	7.07	***0.65***
SW-607	12,904	0.62	7.07	***1.30***
SW-608	1,516	0.78	7.07	***0.19***
SW-609	2,809	0.59	7.07	***0.27***
SW-610	5,296	0.78	7.07	***0.67***
SW-611	5,297	0.78	7.07	***0.67***
SW-612	3,947	0.66	7.07	***0.42***
SW-613	2,734	0.82	7.07	***0.36***
SW-615	20,250	0.73	7.07	***2.40***
SW-616	8,111	0.84	7.07	***1.11***
SW-618	4,015	0.76	7.07	***0.50***
SW-619	10,624	0.84	7.07	***1.45***
SW-619A	13,283	0.85	7.07	***1.83***
SW-619B	13,323	0.85	7.07	***1.84***
SW-620	13,907	0.70	7.07	***1.58***
SW-621	13,407	0.76	7.07	***1.65***
SW-623	8,448	0.72	7.07	***0.99***
SW-624	9,161	0.68	7.07	***1.01***
SW-625	5,706	0.83	7.07	***0.77***
SW-626	7,605	0.57	7.07	***0.70***
SW-627	10,547	0.75	7.07	***1.28***
SW-628	1,637	0.82	7.07	***0.22***
SW-629	1,750	0.75	7.07	***0.21***
SW-630	5,665	0.83	7.07	***0.76***
SW-631	20,088	0.59	7.07	***1.92***

4. Computations for Each ESD Facility

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#01
ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **20275 sqft**
Enter Total Impervious Area = **16089 sqft**
% of Impervious D.A., I = **79.4%**
Volumetric Runoff Coefficient, Rv = 0.764 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.3 in)	Reduced %I (RCN 58)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	16849	83%	2.2 in	2471 sqft	0.054 ac-ft	2361 cu-ft	55	0.0%	0 sqft
C	70	3426	17%	2.0 in	457 sqft	0.010 ac-ft	436 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2928 sqft	0.064 ac-ft	2797 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **58**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **3357 cu-ft**
Enter Filter Surface Area Provided = **1204 sqft**
Depth Provided Above Filter Surface = **8 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Planter Box = **1204 sqft**
Actual Volume Provided = **2970 cu-ft**
Volume Credited Above/Below Planter Box = **2970 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **173 cu-ft**
ESD P_E Treatment Provided = **2.30 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **58**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#02

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **7409 sqft**
Enter Total Impervious Area = **6055 sqft**
% of Impervious D.A., I = **81.7%**
Volumetric Runoff Coefficient, Rv = 0.786 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	7409	100%	2.2 in	1087 sqft	0.024 ac-ft	1067 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	1087 sqft	0.024 ac-ft	1067 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1261 cu-ft**
Enter Filter Surface Area Provided = **1029 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **2.5 ft**
Surface Area of Planter Box = **1029 sqft**
Actual Volume Provided = **1544 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **1261 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **194 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#03

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **8931 sqft**
Enter Total Impervious Area = **6628 sqft**
% of Impervious D.A., I = **74.2%**
Volumetric Runoff Coefficient, Rv = 0.718 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.3 in)	Reduced %I (RCN 56)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	8382	94%	2.2 in	1229 sqft	0.025 ac-ft	1103 cu-ft	55	0.0%	0 sqft
C	70	549	6%	2.0 in	73 sqft	0.002 ac-ft	66 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	1303 sqft	0.027 ac-ft	1169 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **56**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1389 cu-ft**
Enter Filter Surface Area Provided = **586 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.0 ft**
Surface Area of Planter Box = **586 sqft**
Actual Volume Provided = **1231 cu-ft**
Volume Credited Above/Below Planter Box = **1231 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **62 cu-ft**
ESD P_E Treatment Provided = **2.30 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **56**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#04

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **2213 sqft**
Enter Total Impervious Area = **1954 sqft**
% of Impervious D.A., I = **88.3%**
Volumetric Runoff Coefficient, Rv = 0.845 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.56 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	2213	100%	2.4 in	354 sqft	0.009 ac-ft	374 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	354 sqft	0.009 ac-ft	374 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **405 cu-ft**
Enter Filter Surface Area Provided = **210 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **210 sqft**
Actual Volume Provided = **399 cu-ft**
Volume Credited Above/Below Planter Box = **399 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **25 cu-ft**
ESD P_E Treatment Provided = **2.56 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#05

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **6568 sqft**
Enter Total Impervious Area = **5719 sqft**
% of Impervious D.A., I = **87.1%**
Volumetric Runoff Coefficient, Rv = 0.834 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	6568	100%	2.4 in	1051 sqft	0.025 ac-ft	1095 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	1051 sqft	0.025 ac-ft	1095 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1186 cu-ft**
Enter Filter Surface Area Provided = **730 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **730 sqft**
Actual Volume Provided = **1387 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **1186 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **91 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#06

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **4889 sqft**
Enter Total Impervious Area = **4312 sqft**
% of Impervious D.A., I = **88.2%**
Volumetric Runoff Coefficient, Rv = 0.844 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	4889	100%	2.4 in	782 sqft	0.019 ac-ft	825 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	782 sqft	0.019 ac-ft	825 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **894 cu-ft**
Enter Filter Surface Area Provided = **475 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **475 sqft**
Actual Volume Provided = **903 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **894 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **69 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	6/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD #7
ESDv COMPUTATIONS

Micro Bioretention

Enter Total Drainage Area to Micro Bioretention = **12904 sqft**
Enter Total Impervious Area = **7283 sqft**
% of Impervious D.A., I = **56.4%**
Volumetric Runoff Coefficient, Rv = 0.558 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.44 in)	Reduced %I (RCN 65)	Effective Imp. Area
A	38		0%	2.0 in				0	0.0%	0 sqft
B	55	12904	100%	2.0 in	1721 sqft	0.028 ac-ft	1200 cu-ft	65	10.0%	1290 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.0 in	1721 sqft	0.028 ac-ft	1200 cu-ft			1290 sqft

Equations

Target Planning Surface Area of Mirco Bioretention, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1560 cu-ft**
Enter Filter Surface Area Provided = **376 sqft**
Depth Provided Above Micro Bioretention = **6 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Micro Bioretention = **376 sqft**
Actual Volume Provided = **865 cu-ft**
Volume Credited Above/Below Micro Bioretention = **865 cu-ft**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **1.44 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **65**
Additional ESD Volume Required = **335 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.56 in**
Effective % Impervious (Table 5.3) = **10.0%**
Effective Impervious Area = **1290 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of micro-bioretention practices shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.
See manual for addition limitations.

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Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
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ESD#08

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **1516 sqft**
Enter Total Impervious Area = **1225 sqft**
% of Impervious D.A., I = **80.8%**
Volumetric Runoff Coefficient, Rv = 0.777 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	1516	100%	2.2 in	222 sqft	0.005 ac-ft	216 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	222 sqft	0.005 ac-ft	216 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **255 cu-ft**
Enter Filter Surface Area Provided = **165 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **165 sqft**
Actual Volume Provided = **314 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **255 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **39 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
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ESD#09

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **2809 sqft**
Enter Total Impervious Area = **1460 sqft**
% of Impervious D.A., I = **52.0%**
Volumetric Runoff Coefficient, Rv = 0.518 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.0 in				0	0.0%	0 sqft
B	55	2809	100%	1.8 in	337 sqft	0.005 ac-ft	218 cu-ft	55	0.0%	0 sqft
C	70		0%	1.8 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	1.8 in	337 sqft	0.005 ac-ft	218 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **315 cu-ft**
Enter Filter Surface Area Provided = **189 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **189 sqft**
Actual Volume Provided = **359 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **315 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **97 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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Date	4/12/2013
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ESD#10

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **5296 sqft**
Enter Total Impervious Area = **4335 sqft**
% of Impervious D.A., I = **81.9%**
Volumetric Runoff Coefficient, Rv = 0.787 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.38 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	5296	100%	2.2 in	777 sqft	0.018 ac-ft	764 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	777 sqft	0.018 ac-ft	764 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **903 cu-ft**
Enter Filter Surface Area Provided = **434 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **434 sqft**
Actual Volume Provided = **825 cu-ft**
Volume Credited Above/Below Planter Box = **825 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **61 cu-ft**
ESD P_E Treatment Provided = **2.38 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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ESD#11
ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **5297 sqft**
Enter Total Impervious Area = **4317 sqft**
% of Impervious D.A., I = **81.5%**
Volumetric Runoff Coefficient, Rv = 0.783 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.37 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	5297	100%	2.2 in	777 sqft	0.017 ac-ft	761 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	777 sqft	0.017 ac-ft	761 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **899 cu-ft**
Enter Filter Surface Area Provided = **432 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **432 sqft**
Actual Volume Provided = **821 cu-ft**
Volume Credited Above/Below Planter Box = **821 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **60 cu-ft**
ESD P_E Treatment Provided = **2.37 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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ESD#12

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **3947 sqft**
Enter Total Impervious Area = **2493 sqft**
% of Impervious D.A., I = **63.2%**
Volumetric Runoff Coefficient, Rv = 0.618 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	3947	100%	2.0 in	526 sqft	0.009 ac-ft	407 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.0 in	526 sqft	0.009 ac-ft	407 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **529 cu-ft**
Enter Filter Surface Area Provided = **348 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **348 sqft**
Actual Volume Provided = **661 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **529 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **122 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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ESD#13

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **2734 sqft**
Enter Total Impervious Area = **2391 sqft**
% of Impervious D.A., I = **87.5%**
Volumetric Runoff Coefficient, Rv = 0.837 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	2734	100%	2.4 in	437 sqft	0.011 ac-ft	458 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	437 sqft	0.011 ac-ft	458 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **496 cu-ft**
Enter Filter Surface Area Provided = **301 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **301 sqft**
Actual Volume Provided = **572 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **496 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **38 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
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ESD#15
ESDv COMPUTATIONS

Micro Bioretention

Enter Total Drainage Area to Micro Bioretention = **20250 sqft**
Enter Total Impervious Area = **14925 sqft**
% of Impervious D.A., I = **73.7%**
Volumetric Runoff Coefficient, Rv = 0.713 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.27 in)	Reduced %I (RCN 75)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	16396	81%	2.2 in	2405 sqft	0.049 ac-ft	2144 cu-ft	74	40.0%	6558 sqft
C	70	3854	19%	2.0 in	514 sqft	0.011 ac-ft	458 cu-ft	80	5.0%	193 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	2919 sqft	0.060 ac-ft	2602 cu-ft			6751 sqft

Equations

Target Planning Surface Area of Mirco Bioretention, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **58**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **3130 cu-ft**
Enter Filter Surface Area Provided = **664 sqft**
Depth Provided Above Micro Bioretention = **6 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Micro Bioretention = **664 sqft**
Actual Volume Provided = **1527 cu-ft**
Volume Credited Above/Below Micro Bioretention = **1527 cu-ft** **ESDv is not Satisfied (PE < 2.16 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **1.27 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **75**
Additional ESD Volume Required = **1075 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.89 in**
Effective % Impervious (Table 5.3) = **33.3%**
Effective Impervious Area = **6751 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of micro-bioretention practices shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.
See manual for addition limitations.

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Date	4/12/2013
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ESD#16

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **8111 sqft**
Enter Total Impervious Area = **7410 sqft**
% of Impervious D.A., I = **91.4%**
Volumetric Runoff Coefficient, Rv = 0.872 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.96 in)	Reduced %I (RCN 70)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	8111	100%	2.6 in	1406 sqft	0.035 ac-ft	1533 cu-ft	70	25.0%	2028 sqft
C	70		0%	2.2 in				0	0.0%	0 sqft
D	77		0%	2.0 in				0	0.0%	0 sqft
Totals			100%	2.6 in	1406 sqft	0.035 ac-ft	1533 cu-ft			2028 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1533 cu-ft**
Enter Filter Surface Area Provided = **608 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **608 sqft**
Actual Volume Provided = **1155 cu-ft**
Volume Credited Above/Below Planter Box = **1155 cu-ft** **ESDv is not Satisfied (PE < 2.6 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **1.96 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **70**
Additional ESD Volume Required = **378 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.64 in**
Effective % Impervious (Table 5.3) = **25.0%**
Effective Impervious Area = **2028 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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ESD#18

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **4015 sqft**
Enter Total Impervious Area = **3128 sqft**
% of Impervious D.A., I = **77.9%**
Volumetric Runoff Coefficient, Rv = 0.751 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	4015	100%	2.2 in	589 sqft	0.013 ac-ft	553 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	589 sqft	0.013 ac-ft	553 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **653 cu-ft**
Enter Filter Surface Area Provided = **805 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **805 sqft**
Actual Volume Provided = **1530 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **653 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **101 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#19

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **10624 sqft**
Enter Total Impervious Area = **9720 sqft**
% of Impervious D.A., I = **91.5%**
Volumetric Runoff Coefficient, Rv = 0.873 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	10624	100%	2.6 in	1841 sqft	0.046 ac-ft	2010 cu-ft	55	0.0%	0 sqft
C	70		0%	2.2 in				0	0.0%	0 sqft
D	77		0%	2.0 in				0	0.0%	0 sqft
Totals			100%	2.6 in	1841 sqft	0.046 ac-ft	2010 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2010 cu-ft**
Enter Filter Surface Area Provided = **904 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Planter Box = **904 sqft**
Actual Volume Provided = **2079 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **2010 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **0 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **0 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#19A
ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **13283 sqft**
Enter Total Impervious Area = **12217 sqft**
% of Impervious D.A., I = **92.0%**
Volumetric Runoff Coefficient, Rv = 0.878 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.57 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	13283	100%	2.6 in	2302 sqft	0.058 ac-ft	2526 cu-ft	55	0.0%	0 sqft
C	70		0%	2.2 in				0	0.0%	0 sqft
D	77		0%	2.0 in				0	0.0%	0 sqft
Totals			100%	2.6 in	2302 sqft	0.058 ac-ft	2526 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2526 cu-ft**
Enter Filter Surface Area Provided = **1086 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Planter Box = **1086 sqft**
Actual Volume Provided = **2498 cu-ft**
Volume Credited Above/Below Planter Box = **2498 cu-ft** **ESDv is not Satisfied (PE < 2.6 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **2.57 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **28 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.03 in**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#19B
ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **13323 sqft**
Enter Total Impervious Area = **12217 sqft**
% of Impervious D.A., I = **91.7%**
Volumetric Runoff Coefficient, Rv = 0.875 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.57 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	13323	100%	2.6 in	2309 sqft	0.058 ac-ft	2527 cu-ft	55	0.0%	0 sqft
C	70		0%	2.2 in				0	0.0%	0 sqft
D	77		0%	2.0 in				0	0.0%	0 sqft
Totals			100%	2.6 in	2309 sqft	0.058 ac-ft	2527 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2527 cu-ft**
Enter Filter Surface Area Provided = **1086 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Planter Box = **1086 sqft**
Actual Volume Provided = **2498 cu-ft**
Volume Credited Above/Below Planter Box = **2498 cu-ft** **ESDv is not Satisfied (PE < 2.6 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **2.57 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **29 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.03 in**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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Date	4/12/2013
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ESD#20

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **13907 sqft**
Enter Total Impervious Area = **9702 sqft**
% of Impervious D.A., I = **69.8%**
Volumetric Runoff Coefficient, Rv = 0.678 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.23 in)	Reduced %I (RCN 62)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	7150	51%	2.2 in	1049 sqft	0.020 ac-ft	889 cu-ft	55	0.0%	0 sqft
C	70	6757	49%	2.0 in	901 sqft	0.018 ac-ft	763 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.1 in	1950 sqft	0.038 ac-ft	1652 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **62**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2043 cu-ft**
Enter Filter Surface Area Provided = **836 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.0 ft**
Surface Area of Planter Box = **836 sqft**
Actual Volume Provided = **1756 cu-ft**
Volume Credited Above/Below Planter Box = **1756 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **104 cu-ft**
ESD P_E Treatment Provided = **2.23 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **62**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#21

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **13407 sqft**
Enter Total Impervious Area = **10487 sqft**
% of Impervious D.A., I = **78.2%**
Volumetric Runoff Coefficient, Rv = 0.754 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.16 in)	Reduced %I (RCN 82)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	3950	29%	2.2 in	579 sqft	0.013 ac-ft	546 cu-ft	79	55.0%	2173 sqft
C	70	7813	58%	2.0 in	1042 sqft	0.023 ac-ft	982 cu-ft	83	35.0%	2735 sqft
D	77	1644	12%	1.8 in	197 sqft	0.004 ac-ft	186 cu-ft	86	10.0%	164 sqft
Totals			100%	2.0 in	1818 sqft	0.039 ac-ft	1714 cu-ft			5071 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **66**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2190 cu-ft**
Enter Filter Surface Area Provided = **348 sqft**
Depth Provided Above Filter Surface = **12 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Planter Box = **348 sqft**
Actual Volume Provided = **974 cu-ft**
Volume Credited Above/Below Planter Box = **974 cu-ft** **ESDv is not Satisfied (PE < 2.03 in.)**
Excess Volume Provided = **0 cu-ft**
ESD P_E Treatment Provided = **1.16 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **82**
Additional ESD Volume Required = **739 cu-ft** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **0.88 in**
Effective % Impervious (Table 5.3) = **37.8%**
Effective Impervious Area = **5071 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#23

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **8448 sqft**
Enter Total Impervious Area = **6076 sqft**
% of Impervious D.A., I = **71.9%**
Volumetric Runoff Coefficient, Rv = 0.697 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 56)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	8011	95%	2.2 in	1175 sqft	0.024 ac-ft	1024 cu-ft	55	0.0%	0 sqft
C	70	437	5%	2.0 in	58 sqft	0.001 ac-ft	51 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	1233 sqft	0.025 ac-ft	1075 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **56**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1276 cu-ft**
Enter Filter Surface Area Provided = **786 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **786 sqft**
Actual Volume Provided = **1493 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **1276 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **201 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **56**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

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Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
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Checked	AXQ

ESD#24

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **9161 sqft**
Enter Total Impervious Area = **6098 sqft**
% of Impervious D.A., I = **66.6%**
Volumetric Runoff Coefficient, Rv = 0.649 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.22 in)	Reduced %I (RCN 59)	Effective Imp. Area
A	38		0%	2.2 in				0	0.0%	0 sqft
B	55	6909	75%	2.2 in	1013 sqft	0.019 ac-ft	822 cu-ft	55	0.0%	0 sqft
C	70	2252	25%	2.0 in	300 sqft	0.006 ac-ft	244 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	1314 sqft	0.024 ac-ft	1066 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **59**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1288 cu-ft**
Enter Filter Surface Area Provided = **523 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **4.0 ft**
Surface Area of Planter Box = **523 sqft**
Actual Volume Provided = **1098 cu-ft**
Volume Credited Above/Below Planter Box = **1098 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **33 cu-ft**
ESD P_E Treatment Provided = **2.22 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **59**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
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Checked	AXQ

ESD#25

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **5706 sqft**
Enter Total Impervious Area = **5050 sqft**
% of Impervious D.A., I = **88.5%**
Volumetric Runoff Coefficient, Rv = 0.847 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.5 in)	Reduced %I (RCN 60)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	3873	68%	2.4 in	620 sqft	0.015 ac-ft	656 cu-ft	55	0.0%	0 sqft
C	70	1833	32%	2.0 in	244 sqft	0.006 ac-ft	259 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.3 in	864 sqft	0.021 ac-ft	914 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **60**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1047 cu-ft**
Enter Filter Surface Area Provided = **530 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **530 sqft**
Actual Volume Provided = **1007 cu-ft**
Volume Credited Above/Below Planter Box = **1007 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **93 cu-ft**
ESD P_E Treatment Provided = **2.50 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **60**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#26

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **7605 sqft**
Enter Total Impervious Area = **3730 sqft**
% of Impervious D.A., I = **49.0%**
Volumetric Runoff Coefficient, Rv = 0.491 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 61)	Effective Imp. Area
A	38		0%	1.8 in				0	0.0%	0 sqft
B	55	4590	60%	1.8 in	551 sqft	0.008 ac-ft	338 cu-ft	55	0.0%	0 sqft
C	70	3015	40%	1.8 in	362 sqft	0.005 ac-ft	222 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	1.8 in	913 sqft	0.013 ac-ft	561 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **61**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **810 cu-ft**
Enter Filter Surface Area Provided = **515 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **515 sqft**
Actual Volume Provided = **979 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **810 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **249 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **61**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#27

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **10547 sqft**
Enter Total Impervious Area = **8116 sqft**
% of Impervious D.A., I = **77.0%**
Volumetric Runoff Coefficient, Rv = 0.743 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.34 in)	Reduced %I (RCN 58)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	8418	80%	2.2 in	1235 sqft	0.026 ac-ft	1146 cu-ft	55	0.0%	0 sqft
C	70	2129	20%	2.0 in	284 sqft	0.006 ac-ft	263 cu-ft	70	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	1519 sqft	0.032 ac-ft	1409 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **58**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1697 cu-ft**
Enter Filter Surface Area Provided = **805 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **805 sqft**
Actual Volume Provided = **1530 cu-ft**
Volume Credited Above/Below Planter Box = **1530 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **120 cu-ft**
ESD P_E Treatment Provided = **2.34 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **58**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#28

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **1637 sqft**
Enter Total Impervious Area = **1431 sqft**
% of Impervious D.A., I = **87.4%**
Volumetric Runoff Coefficient, Rv = 0.837 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	1637	100%	2.4 in	262 sqft	0.006 ac-ft	274 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	262 sqft	0.006 ac-ft	274 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **297 cu-ft**
Enter Filter Surface Area Provided = **165 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **165 sqft**
Actual Volume Provided = **314 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **297 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **23 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#29

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **1750 sqft**
Enter Total Impervious Area = **1355 sqft**
% of Impervious D.A., I = **77.4%**
Volumetric Runoff Coefficient, Rv = 0.747 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.4 in				0	0.0%	0 sqft
B	55	1750	100%	2.2 in	257 sqft	0.006 ac-ft	240 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.2 in	257 sqft	0.006 ac-ft	240 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **283 cu-ft**
Enter Filter Surface Area Provided = **326 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **326 sqft**
Actual Volume Provided = **619 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **283 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **44 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	4/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#30

ESDv COMPUTATIONS

Micro-bioretention Planter Box

Enter Total Drainage Area to Planter Box = **5665 sqft**
Enter Total Impervious Area = **5013 sqft**
% of Impervious D.A., I = **88.5%**
Volumetric Runoff Coefficient, Rv = 0.846 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (2.6 in)	Reduced %I (RCN 55)	Effective Imp. Area
A	38		0%	2.6 in				0	0.0%	0 sqft
B	55	5665	100%	2.4 in	906 sqft	0.022 ac-ft	959 cu-ft	55	0.0%	0 sqft
C	70		0%	2.0 in				0	0.0%	0 sqft
D	77		0%	1.8 in				0	0.0%	0 sqft
Totals			100%	2.4 in	906 sqft	0.022 ac-ft	959 cu-ft			0 sqft

Equations

Target Planning Surface Area of Planter Box, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **55**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **1039 cu-ft**
Enter Filter Surface Area Provided = **570 sqft**
Depth Provided Above Filter Surface = **6 in**
Depth of Filter Media = **3.5 ft**
Surface Area of Planter Box = **570 sqft**
Actual Volume Provided = **1083 cu-ft** Exceeds Max Allowable 1-Yr 24-Hr Volume!
Volume Credited Above/Below Planter Box = **1039 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **80 cu-ft** **Max Allowable 1-Yr 24-Hr ESDv Used**
ESD P_E Treatment Provided = **2.60 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **55**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of planter box shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.

SOLTESZ

Date	6/12/2013
Project Name	Washingtonian North-Lot 8
Project No.	1184-00-01
By	CX
Checked	AXQ

ESD#31
ESDv COMPUTATIONS

Micro Bioretention

Enter Total Drainage Area to Micro Bioretention = **20088 sqft**
Enter Total Impervious Area = **10426 sqft**
% of Impervious D.A., I = **51.9%**
Volumetric Runoff Coefficient, Rv = 0.517 (Rv = 0.05 + 0.009 (I))

HSG	RCN	Area (sqft)	Percentage	Target P_E	Target Af (sqft)	Target ESDv (ac-ft)	Target ESDv (cu-ft)	Reduced RCN's (1.82 in)	Reduced %I (RCN 67)	Effective Imp. Area
A	38		0%	**2.0 in**				**0**	**0.0%**	0 sqft
B	55	**4188**	21%	**1.8 in**	503 sqft	0.007 ac-ft	325 cu-ft	**55**	**0.0%**	0 sqft
C	70	**15529**	77%	**1.8 in**	1863 sqft	0.028 ac-ft	1205 cu-ft	**70**	**0.0%**	0 sqft
D	77	**371**	2%	**1.8 in**	45 sqft	0.001 ac-ft	29 cu-ft	**77**	**0.0%**	0 sqft
Totals			100%	**1.8 in**	**2411 sqft**	**0.036 ac-ft**	**1558 cu-ft**			**0 sqft**

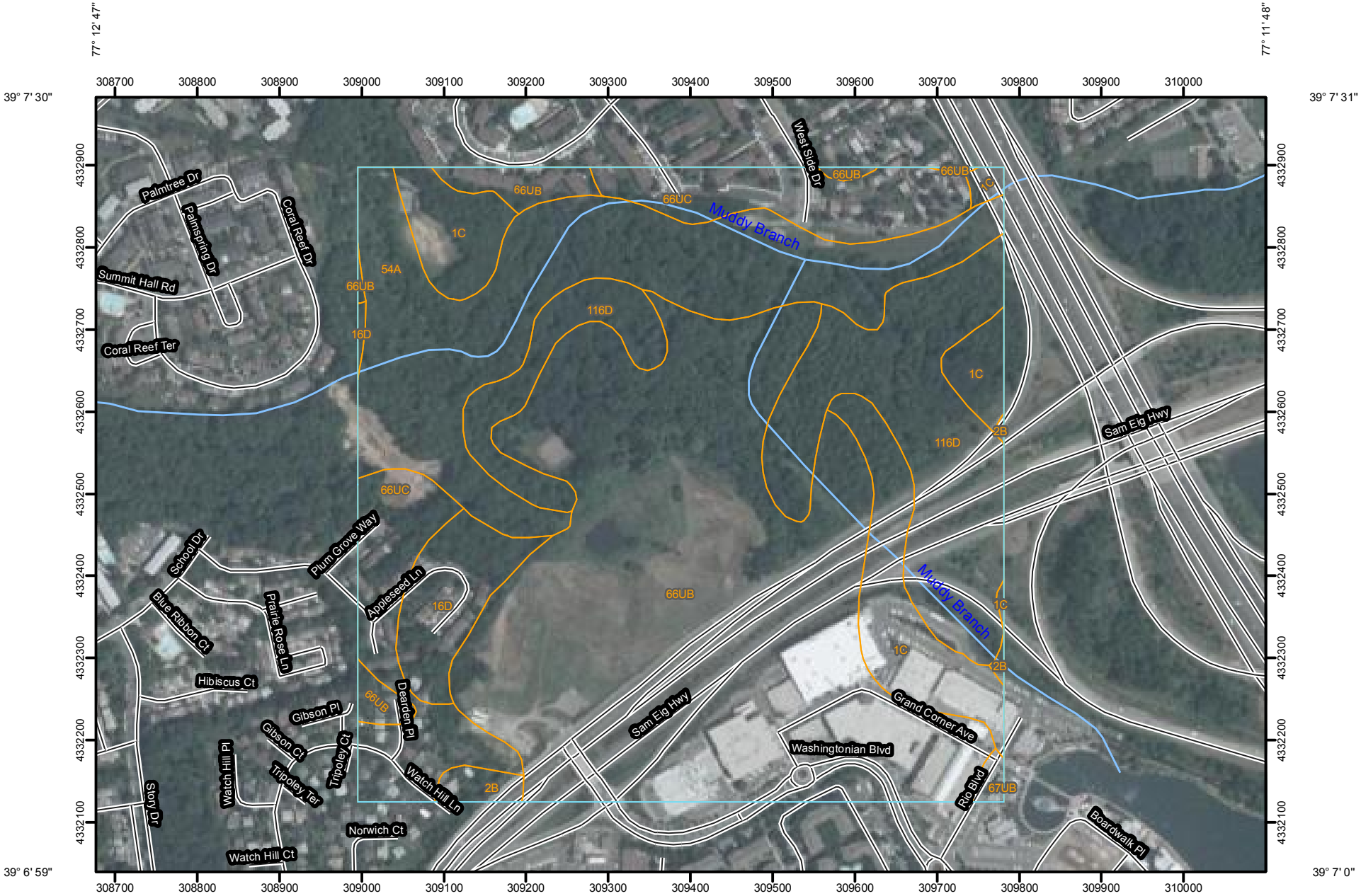
Equations

Target Planning Surface Area of Mirco Bioretention, A_f = (PE*DA) / 15"
Target Design Runoff Volume, ESDv = (PE * Rv *(A/43560)) / 12

Composite RCN for "Woods in Good Cond." = **67**
Max Allowable Vol. Based on 1-yr 24-hr Storm (2.6in) = **2251 cu-ft**
Enter Filter Surface Area Provided = **640 sqft**
Depth Provided Above Micro Bioretention = **8 in**
Depth of Filter Media = **4.5 ft**
Surface Area of Micro Bioretention = **640 sqft**
Actual Volume Provided = **1579 cu-ft**
Volume Credited Above/Below Micro Bioretention = **1579 cu-ft** **Target ESDv is Satisfied**
Excess Volume Provided = **20 cu-ft**
ESD P_E Treatment Provided = **1.82 in** (ESD P_E Treatment Provided = (ESD_{VP} * 12) / (Rv * A))
Reduced Composite RCN = **67**
Additional ESD Volume Required = **ESDv is Satisfied** **(Applied to ESD Practices)**
Additional ESD Treatment Required = **ESD is Satisfied**
Effective % Impervious (Table 5.3) = **0.0%**
Effective Impervious Area = **0 sqft**

Notes:
The drainage area to any individual practice shall be 20,000sq-ft or less.
The surface area of micro-bioretention practices shall be at least 2% of the contributing drainage area.
A two to four foot deep layer of filter media shall be provided.
Filter beds shall not intercept groundwater. If designed as infiltration practices, filter bed inverts shall be separated at least four feet vertically (two feet on the lower Eastern shore) from the seasonal high water table.
A surface mulch layer (maximum 2 to 3 inches thick) should be provided to enhance plant survival and inhibit weed growth.
The filtering media or planting soil, mulch and underdrain systems shall conform to the specifications found in Appendix B.4. of the MDE Stormwater Manual.
See manual for addition limitations.

5. Appendix (Soil Map)



Map Scale: 1:6,750 if printed on A size (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 350 700 1,400 2,100

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:6,750 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Maryland
Survey Area Data: Version 7, Feb 2, 2007

Date(s) aerial images were photographed: 6/21/2005

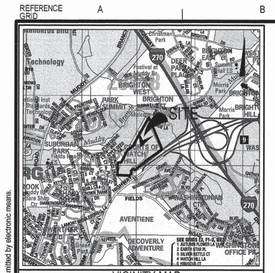
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

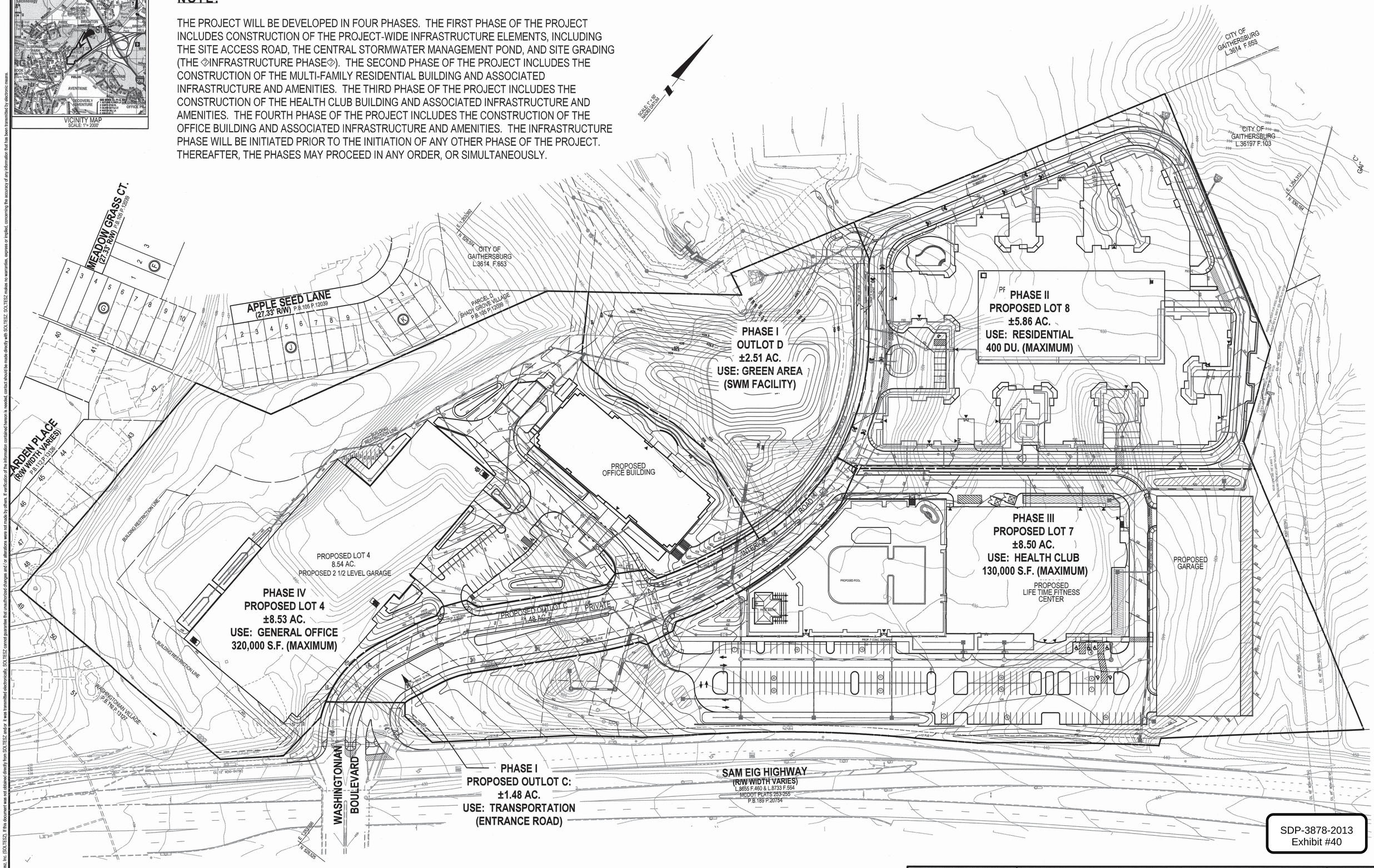
Montgomery County, Maryland (MD031)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1C	Gaila silt loam, 8 to 15 percent slopes	13.0	8.7%
2B	Glenelg silt loam, 3 to 8 percent slopes	1.2	0.8%
16D	Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	5.2	3.5%
54A	Hatboro silt loam, 0 to 3 percent slopes, frequently flooded	27.4	18.3%
66UB	Wheaton-Urban land complex, 0 to 8 percent slopes	64.6	43.0%
66UC	Wheaton-Urban land complex, 8 to 15 percent slopes	15.7	10.5%
67UB	Urban land-Wheaton complex, 0 to 8 percent slopes	0.4	0.3%
116D	Blocktown channery silt loam, 15 to 25 percent slopes, very rocky	22.6	15.0%
Totals for Area of Interest		**150.2**	**100.0%**

NOTE:

THE PROJECT WILL BE DEVELOPED IN FOUR PHASES. THE FIRST PHASE OF THE PROJECT INCLUDES CONSTRUCTION OF THE PROJECT-WIDE INFRASTRUCTURE ELEMENTS, INCLUDING THE SITE ACCESS ROAD, THE CENTRAL STORMWATER MANAGEMENT POND, AND SITE GRADING (THE ◇INFRASTRUCTURE PHASE◇). THE SECOND PHASE OF THE PROJECT INCLUDES THE CONSTRUCTION OF THE MULTI-FAMILY RESIDENTIAL BUILDING AND ASSOCIATED INFRASTRUCTURE AND AMENITIES. THE THIRD PHASE OF THE PROJECT INCLUDES THE CONSTRUCTION OF THE HEALTH CLUB BUILDING AND ASSOCIATED INFRASTRUCTURE AND AMENITIES. THE FOURTH PHASE OF THE PROJECT INCLUDES THE CONSTRUCTION OF THE OFFICE BUILDING AND ASSOCIATED INFRASTRUCTURE AND AMENITIES. THE INFRASTRUCTURE PHASE WILL BE INITIATED PRIOR TO THE INITIATION OF ANY OTHER PHASE OF THE PROJECT. THEREAFTER, THE PHASES MAY PROCEED IN ANY ORDER, OR SIMULTANEOUSLY.



VICINITY MAP
SCALE: 1"= 2000'



SDP-3878-2013
Exhibit #40

50 25 0 50 100

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.: 36080 , EXPIRATION DATE: 06/26/2014

STATE OF MARYLAND · AMY X. QUANG · No. 36080 · PROFESSIONAL ENGINEER
12/16/13

PHASING PLAN

WASHINGTONIAN NORTH

LOTS 4, 7, 8, & OUTLOT B, C
WASHINGTONIAN CENTER

PREVIOUSLY LOTS 4 - 6, & OUTLOT 'B', BLOCK D, 'WASHINGTONIAN CENTER', PLAT # 21856
CITY OF GAITHERSBURG (9th) ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND

1" = 50'

C-4.2

PROJECT NO. 1184-00-01

SOLTESZ
Engineering
Planning
Environmental Sciences

ROCKVILLE OFFICE
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067

Rockville
Lanham
Waldorf
Leonardtown
Frederick

www.solteszco.com

NO.	REVISIONS	BY	DATE

DATE: JANUARY 2013 | CAD STANDARDS VERSION: V8 - 2000
DESIGNED: JDC | TECHNICIAN: CDA | CHECKED: AQ

MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND, WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

APPLICANT

WASHINGTONIAN NORTH ASSOCIATES, LLC
C/O BOSTON PROPERTIES
2200 PENNSYLVANIA AVENUE, NW
SUITE 200W
WASHINGTON, DC 20037
202.585.0847
JAKE STROMAN

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MAP 5163 GRID G,H 1&2

TAX MAP	ZONING CATEGORY:
FS342 & 343	MXD
WSSC 200' SHEET	XXXX:
221NW 10 222NW 10	
SITE DATUM	XXXX:
HORIZONTAL: NAD 83	
VERTICAL: NAD 83	

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Q:\1184000\PREL\SDP\C-4.2 PHASING EXHIBIT.aht Scale=50.0000 ft / in. User=AZou PLTdrv=Grey.pltcfg Pentbl=TEXT_SUB.tbl 12/13/2013 11:27:42 AM