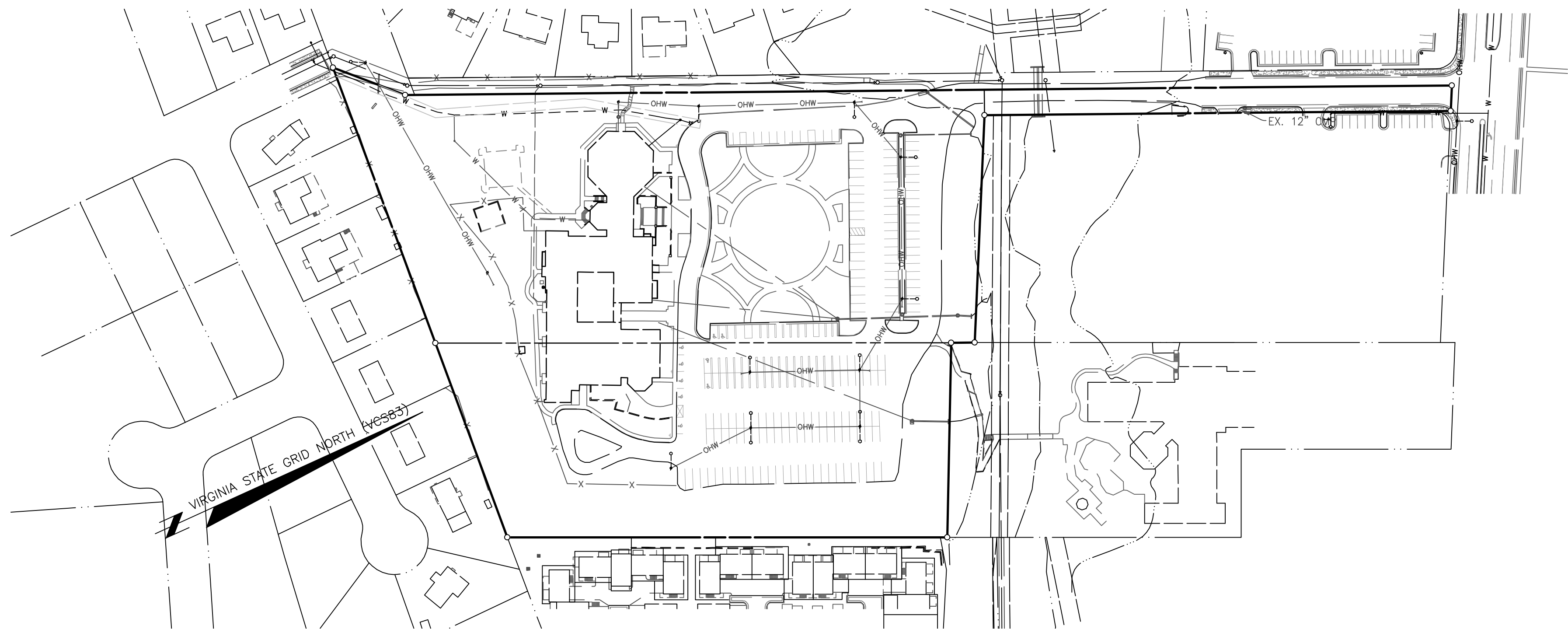
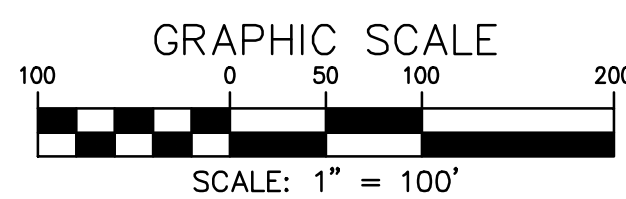


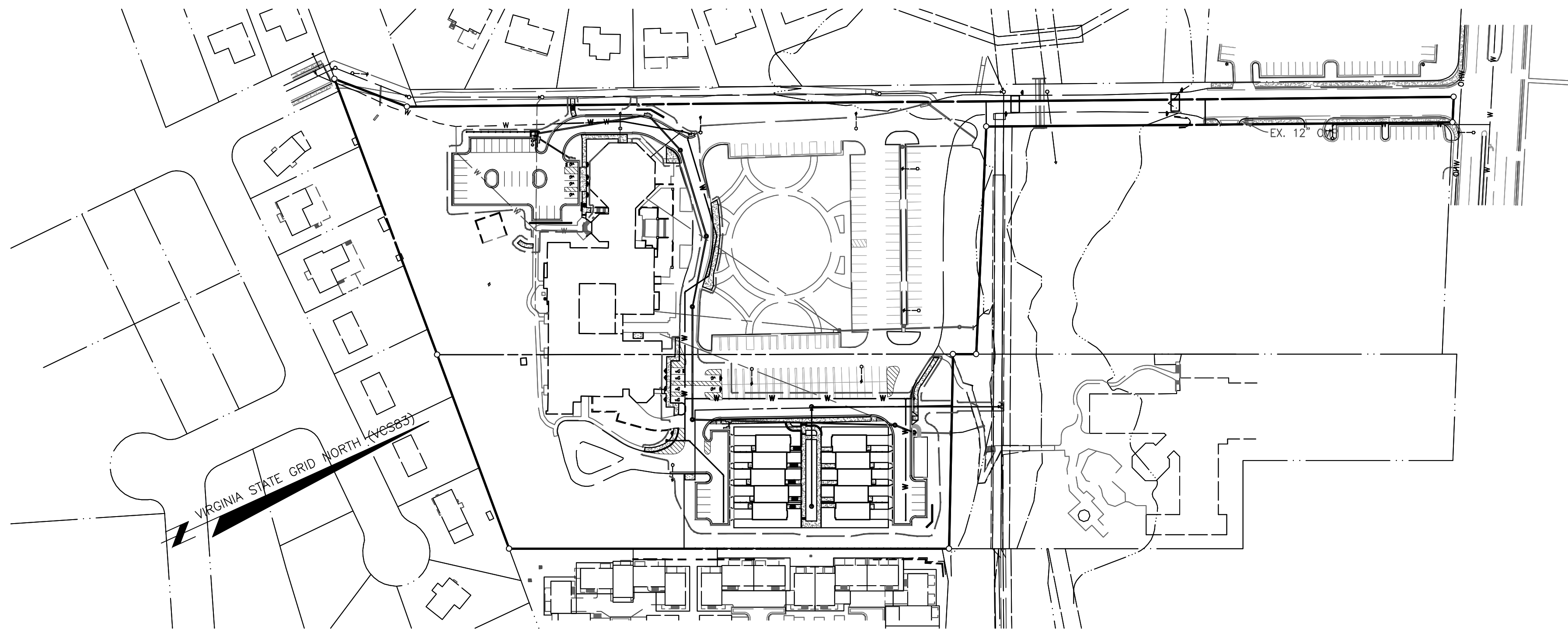


PRE-DEVELOPMENT
OVERALL DEVELOPMENT
SCALE: 1" = 100'

*FOR DETAILED INFORMATION OF EACH PHASE OF DEVELOPMENT, PLEASE SEE SHEETS 42 AND 43.



Pre-ReDevelopment Land Cover (acres)					
	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space		0.67		0.09	0.76
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.06	0.01	0.33	0.40
Impervious Cover (acres)		0.01	0.00	0.91	0.92
					2.08



POST-DEVELOPMENT
OVERALL DEVELOPMENT
SCALE: 1" = 100'

*FOR DETAILED INFORMATION OF EACH PHASE OF DEVELOPMENT, PLEASE SEE SHEETS 42 AND 43.

Post-Development Land Cover (acres)					
	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.41	0.01	0.40	0.82
Impervious Cover (acres)		0.33	0.00	0.93	1.26
Area Check	OK.	OK.	OK.	OK.	2.08

6. Bioretention (RR)													
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40	0.34	0.71	0	1,090	1,636	2,726	25	0.00	1.71	0.94	0.77	

14. Manufactured Treatment Devices (no RR)														
14.b.	ISOLATOR ROW	0	0.21	0.32	0	0	1,274	1,274	40	0.00	0.80	0.32	0.48	

OVERALL STORMWATER/OUTFALL NARRATIVE

THE OUTFALL POINT OF THIS PROJECT IS AT ACOTCING CREEK, ABOUT 340' DOWNSTREAM OF THE EXISTING CULVERTS UNDER PRESBYTERIAN WAY, PER 9VA025-870-66-B-4. AT THIS POINT, ONSITE RUNOFF DISCHARGES INTO A NATURAL CHANNEL, THROUGH AN EXISTING MAN-MADE STORM SEWER, A LEVEL 2 BIORETENTION AREA AND MULTIPLE MANUFACTURED TREATMENT FACILITIES ARE PROPOSED TO MITIGATE THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THE EXISTING PARKING LOT AND FORESTED AREAS WITHIN THE LIMITS OF CLEARING AND GRADING.

CHANNEL PROTECTION:
POST DEVELOPMENT RUNOFF DURING THE 1-YEAR STORM EVENT HAS BEEN
REDUCED IN ACCORDANCE WITH 9VAC25-870-66-B-3-A, AND AS SUCH,
CHANNEL PROTECTION REQUIREMENTS HAVE BEEN MET FOR THIS PORTION OF THE
SITE.

FLOOD PROTECTION:
THE POST DEVELOPMENT 2-YEAR STORM AND 10-YEAR 24-HOUR STORMS WILL HAVE PEAK RUNOFF RATES WHICH ARE LESS THAN THE PRE DEVELOPMENT CONDITION, PER 9VAC25-870-66-C-1. THE LIMIT OF ANALYSIS FOR FLOOD PROTECTION IS WITHIN ACCOTINK CREEK, 340' DOWNSTREAM OF THE EXISTING CULVERTS UNDER PRESBYTERIAN WAY, PER 9VAC25-870-66-C-3-C.

SEE RUNOFF SUMMARY TABLE ON THIS SHEET.

WATER QUALITY:
BIORETENTION, A LOW IMPACT DEVELOPMENT (LID) TECHNIQUE, IS BEING PROPOSED ON THE TOWN HOME PORTION OF THE PROJECT TO MEET WATER QUALITY REQUIREMENTS. A MANUFACTURED FILTERING DEVICE IS PROPOSED ON THE ADDITIONAL PARKING PORTION OF THE PROJECT TO ADDRESS WATER QUALITY REQUIREMENTS. THE BIORETENTION FACILITY AND THE MANUFACTURED TREATMENT DEVICE WILL BE PRIVATELY OWNED AND MAINTAINED.

SEE VRRM SUMMARY ON THIS SHEET.

THE BMP AND SWM DESIGN SHOWN ARE PRELIMINARY AND MAY CHANGE AT THE TIME OF FINAL ENGINEERING. THE PROJECT MAY USE NUTRIENT CREDITS OR ALTERNATE BMP/SWM FACILITIES TO MEET THE WATER QUALITY AND WATER QUANTITY REQUIREMENTS FOR THIS PROJECT AS NECESSARY.

OVERALL DEVELOPMENT	
1-Year Storm Channel Protection	
Pre Dev. Q Onsite	2.55 cfs
Pre Dev Rv	7,154 cf
Post Dev Rv	10,995 cf
Pre/post vol. ratio	0.65
Improvement Factor	0.8
Post Dev Q allowable	1.33 cfs
Offsite Controlled (UGS 1) (pre dev bypass)	0.55 cfs
Offsite Controlled (UGS 2) (pre dev bypass)	0.26 cfs
Total Allowable release	2.14 cfs
Post Dev Onsite Uncontrolled	1.09 cfs
Post Dev UGS 1 Release	0.95 cfs
Post Dev UGS 2 Release	0.05 cfs
Total Post Dev Release	2.09 cfs

Stormwater Quantity Summary - Overall Development			
	1-Year Storm Channel Protection (cfs)	2-Year Storm (cfs)	10-Year Storm Flood Protection (cfs)
Pre Development	3.36	4.88	10.01
Post Development allowable release	2.14	4.88	10.01
Post Development Release	2.09	4.36	9.76

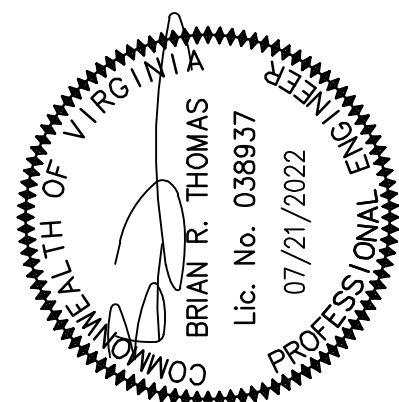
Total Phosphorus	
FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	3.15
TP LOAD REDUCTION REQUIRED (lb/yr)	1.21
TP LOAD REDUCTION ACHIEVED (lb/yr)	1.26
TP LOAD REMAINING (lb/yr):	1.89
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	0.00

**** TARGET TP REDUCTION EXCEEDED BY 0.05 LB/YEAR ****

OVERALL STORMWATER MANAGEMENT/BMP DESIGN

**FAIRFAX
PRESBYTERIAN
CHURCH**

CITY OF FAIRFAX, VIRGINIA

[illegible]

DESIGN GMP	DRAFT GMP
APPROVED	BRT
DATE JAN. 2021	
SCALE HORIZ: 1" = 100'	
VERT: ---	

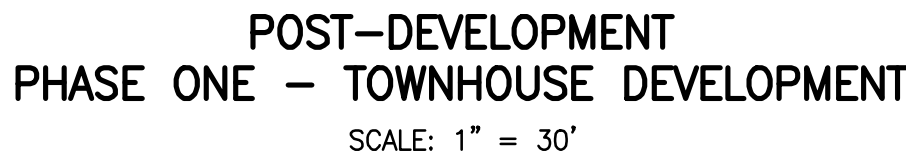
SHEET	OF
41	51

PRJ NO: 2017-2570

TYPE: MDP



Pre-ReDevelopment Land Cover (acres)					
	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space		0.50			0.50
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.01	0.01	0.05	0.07
Impervious Cover (acres)		0.01	0.00	0.93	0.94
					1.51



Post-Development Land Cover (acres)					
	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be		0.29	0.01	0.29	0.59
Impervious Cover (acres)		0.23	0.00	0.69	0.92
Area Check	OK.	OK.	OK.	OK.	1.51

6. Bioretention (RR)												
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40	0.34	0.71	0	1,090	1,636	2,726	25	0.00	1.71	0.94	0.77

PHASE ONE – TOWNHOUSE DEVELOPMENT STORMWATER/OUTFALL NARRATIVE

THE OUTFALL POINT OF THIS PORTION OF THE PROJECT IS AT ACOTCINK CREEK, ABOUT 340' DOWNSTREAM OF THE EXISTING CULVERTS UNDER PRESBYTERIAN WAY, PER 9VAC25-870-66-B-4. AT THIS POINT, ONSITE RUNOFF DISCHARGES INTO A NATURAL CHANNEL, THROUGH AN EXISTING MAN-MADE STORM SEWER. A LEVEL 2 BIOTORETENTION AREA IS PROPOSED TO MITIGATE THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THE EXISTING PARKING LOT AND FORESTED AREAS WITHIN THE LIMITS OF CLEARING AND GRADING.

CHANNEL PROTECTION:
POST DEVELOPMENT RUNOFF DURING THE 1-YEAR STORM EVENT HAS BEEN
REDUCED IN ACCORDANCE WITH 9VAC25-870-66-B-3-A, AND AS SUCH,
CHANNEL PROTECTION REQUIREMENTS HAVE BEEN MET FOR THIS PORTION OF THE
SITE.

FLOOD PROTECTION:
THE POST DEVELOPMENT 2-YEAR STORM AND 10-YEAR 24-HOUR STORMS WILL HAVE PEAK RUNOFF RATES WHICH ARE LESS THAN THE PRE DEVELOPMENT CONDITION, PER 9VAC25-870-66-C-1. THE LIMIT OF ANALYSIS FOR FLOOD PROTECTION IS WITHIN ACCOTINK CREEK, 340' DOWNSTREAM OF THE EXISTING CULVERTS UNDER PRESBYTERIAN WAY, PER 9VAC25-870-66-C-3-C.

SEE RUNOFF SUMMARY TABLE ON THIS SHEET.

WATER QUALITY:
BIORETENTION, A LOW IMPACT DEVELOPMENT (LID) TECHNIQUE, IS BEING PROPOSED ON THIS PORTION OF THE PROJECT TO MEET WATER QUALITY REQUIREMENTS. THE BIORETENTION FACILITY WILL BE PRIVATELY OWNED AND MAINTAINED.

SEE VRRM SUMMARY ON THIS SHEET.

THE BMP AND SWM DESIGN IS PRELIMINARY AND MAY CHANGE AT THE TIME OF FINAL ENGINEERING. THE PROJECT MAY USE NUTRIENT CREDITS OR ALTERNATE BMP/SWM FACILITIES TO MEET THE WATER QUALITY AND WATER QUANTITY REQUIREMENTS FOR THIS PROJECT AS NECESSARY.

PHASE 1 - TOWNHOMES 1-Year Storm Channel Protection	
Pre Dev. Q Onsite	2.35 cfs
Pre Dev Rv	6,485 cf
Post Dev Rv	7,982 cf
Pre/post vol. ratio	0.81
Improvement Factor	0.8
Post Dev Q allowable	1.53 cfs
Offsite Controlled (UGS 1) (pre dev bypass)	0.55 cfs
Total Allowable release	2.08 cfs
Post Dev Onsite Uncontrolled	0.71 cfs
Post Dev UGS 1 Release	0.95 cfs
Total Post Dev Release	1.66 cfs

Stormwater Quantity Summary - Phase 1 - Townhomes			
	1-Year Channel Protection	2-Year Storm (cfs)	10-Year Storm Flood Protection (cfs)
Pre Development	2.90	4.06	7.87
Post Development allowable release	2.08	4.06	7.87
Post Development Release	1.66	3.64	7.46

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	2.30
TP LOAD REDUCTION REQUIRED (lb/yr)	0.61
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.94
TP LOAD REMAINING (lb/yr):	1.36

REMAINING TP LOAD REDUCTION REQUIRED (lb/yr): 0.00

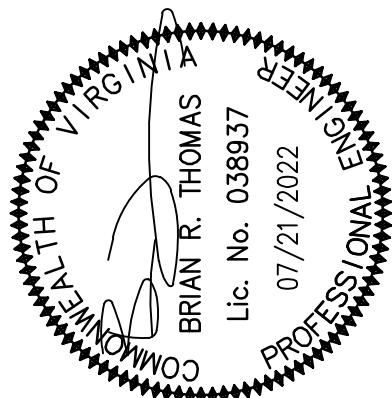
**** TARGET TP REDUCTION EXCEEDED BY 100%**

DESIGN GMP	DRAFT GMP	
APPROVED BRT		
DATE JAN. 2021		
SCALE		
HORIZ: 1" = 30'		
VERT: ---		
SHEET 42		OF 51
PRJ NO: 2017-2570		
TYPE: MDP		

PHASE ONE STORMWATER MANAGEMENT/BMP DESIGN

**FAIRFAX
PRESBYTERIAN
CHURCH**

CITY OF FAIRFAX, VIRGINIA



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Charles P. Johnson & Associates, Inc.
Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
3959 Pender Dr., Ste. 210 Fairfax, VA 22030 703.385-7555 FAX: 703.273-8595
www.cpaia.com • Silver Spring, MD • Gaithersburg, MD • Annapolis, MD • Greenbelt, MD • Frederick, MD • Fairfax, VA

PRE DEV. ONSITE - 1-YEAR	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

PRE DEV. ONSITE - 2-YEAR

PRE DEV. ONSITE - 10-YEAR

PRE DEV OFFSITE BYPASS/UGS 1 OFFSITE CONTROLLED 1-YEAR
--

PRE DEV OFFSITE BYPASS/UGS	1	OFFSITE CONTROLLED	2-YEAR
----------------------------	---	--------------------	--------

PRE DEV OFFSITE BYPASS/UGS 1 OFFSITE CONTROLLED 10-YEAR

PRE DEV OFFSITE BYPASS/UGS 2 OFFSITE CONTROLLED 1-YEAR

PRE DEV OFFSITE BYPASS/UGS 2 OFFSITE CONTROLLED 2-YEAR
--

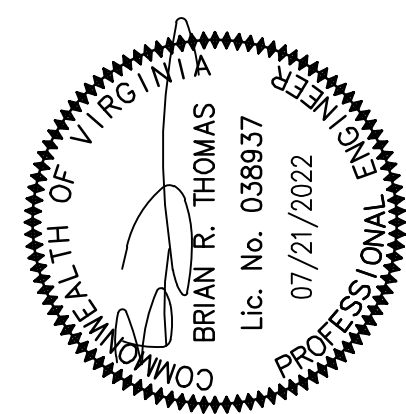
PRE DEV OFFSITE BYPASS/UGS 2 OFFSITE CONTROLLED 10-YEAR

Last Saved 7/21/2022 Last Plotted 7/22/2022 2:4

OVERALL DEVELOPMENT HYDROGRAPHS 1

**FAIRFAX
PRESBYTERIAN
CHURCH**

CITY OF FAIRFAX, VIRGINIA

[illegible]

DESIGN GMP	DRAFT GMP
APPROVED	BRT
DATE JAN. 2021	
SCALE 1" = 100'	
HORIZ: 1" = 100'	
VERT: -- --	

SHEET 44	OF 51
--------------------	-----------------

PRJ NO: 2017-2571
TYPE: MDP

UGS 1 ROUTING - 1-YEAR

BMP/SWM UGS 1 Routings

Hyd. No. 8 -- 1 Year

Q (cfs)

3.00

2.00

1.00

0.00

0 120 240 360 480 600 720 840 960 1080 1200 1320 1440 1560

Time (min)

Hyd. No. 8

Hyd. No. 7

Total storage used = 1,690 cuft

UGS 2 ROUTING - 1-YEAR

Routing UGS 2
Hyd. No. 14 -- 1 Year

Q (cfs)

2.00

1.00

0.00

0 240 480 720 960 1200 1440 1680 1920 2160 2400 2640

Time (min)

Hyd. No. 14

Hyd. No. 13

Total storage used = 1,962 cuft

POST DEV. UNCONTROLLED - 1-YEAR

POST - Overall UNCONTROLLED

Hyd. No. 19 -- 1 Year

Q (cfs)

Time (min)

Hyd. No. 19

The graph displays a hydrograph for Hyd. No. 19 over a 1560-minute period. The y-axis represents flow rate (Q) in cubic feet per second (cfs), ranging from 0.00 to 2.00. The x-axis represents time in minutes, ranging from 0 to 1560. A single red line shows the flow rate, which remains at 0.00 cfs until approximately 600 minutes, then rises sharply to a peak of about 1.1 cfs at 720 minutes. Following the peak, the flow rate decreases rapidly, returning to 0.00 cfs by approximately 1440 minutes.

UGS 1 ROUTING - 2-YEAR

BMP/SWM UGS 1 Routings

Hyd. No. 8 -- 2 Year

Q (cfs)

4.00

3.00

2.00

1.00

0.00

0 120 240 360 480 600 720 840 960 1080 1200 1320 1440 1560

Time (min)

Hyd No. 8

Hyd No. 7

Total storage used = 2,004 cuft

UGS 2 ROUTING - 2-YEAR

Routing UGS 2
Hyd. No. 14 -- 2 Year

Q (cfs)

2.00

1.00

0.00

0 240 480 720 960 1200 1440 1680 1920 2160 2400 2640

Time (min)

Hyd. No. 14

Hyd. No. 13

Total storage used = 2,238 cuft

POST DEV. UNCONTROLLED - 2-YEAR

POST - Overall UNCONTROLLED

Hyd. No. 19 -- 2 Year

Q (cfs)

Time (min)

Hyd. No. 19

UGS 1 ROUTING - 10-YEAR

BMP/SWM UGS 1 Routings

Hyd. No. 8 -- 10 Year

Q (cfs)

7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00

0 120 240 360 480 600 720 840 960 1080 1200 1320 1440 1560

Time (min)

Hyd No. 8 Hyd No. 7

Total storage used = 2,671 cuft

UGS 2 ROUTING - 10-YEAR

Routing UGS 2
Hyd. No. 14 -- 10 Year

Q (cfs)

3.00

2.00

1.00

0.00

0 240 480 720 960 1200 1440 1680 1920 2160 2400

Time (min)

Hyd. No. 14

Hyd. No. 13

Total storage used = 2,946 cuft

POST DEV. UNCONTROLLED - 10-YEAR

POST - Overall UNCONTROLLED
 Hyd. No. 19 -- 10 Year

Q (cfs)

Time (min)

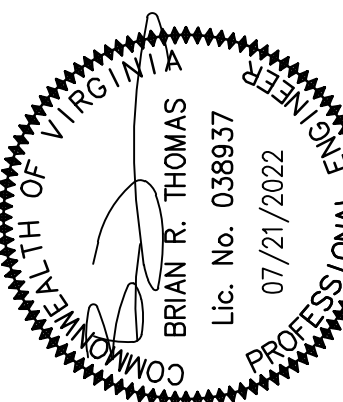
Hyd. No. 19

The graph displays a hydrograph for a 10-year event. The y-axis represents flow rate in cubic feet per second (cfs), ranging from 0.00 to 3.00. The x-axis represents time in minutes, ranging from 0 to 1560. A single red line shows the flow rate over time. The flow remains at 0.00 cfs until approximately 600 minutes, then rises sharply to a peak of about 2.85 cfs at 720 minutes. Following the peak, the flow rate decreases rapidly, returning to 0.00 cfs by approximately 1440 minutes.

OVERALL DEVELOPMENT HYDROGRAPHS 2

**FAIRFAX
PRESBYTERIAN
CHURCH**

CITY OF FAIRFAX, VIRGINIA

[illegible]

DESIGN	DRAFT
GMP	GMP
APPROVED	BRT
DATE	
JAN. 2021	
SCALE	
HORIZ: 1"=100'	
VERT: ---	

SHEET	OF
45	51
PRJ NO: 2017-2570	
TYPE: MDP	



OUTFALL MAP & PHOTOS

**FAIRFAX
PRESBYTERIAN
CHURCH**

CITY OF FAIRFAX, VIRGINIA

DESIGN
GMP
APPROVED
BRT
DATE
JAN. 2021
SCALE
HORIZ: 1" = 100'
VERT: ---

SHEET
47
PRJ NO: 2017-2570
TYPE: MDP

OF
51

DESIGN
GMP
APPROVED
BRT
DATE
JAN. 2021
SCALE
HORIZ: 1" = 100'
VERT: ---

REVISIONS

REVIEW
APPROV
BY
DATE

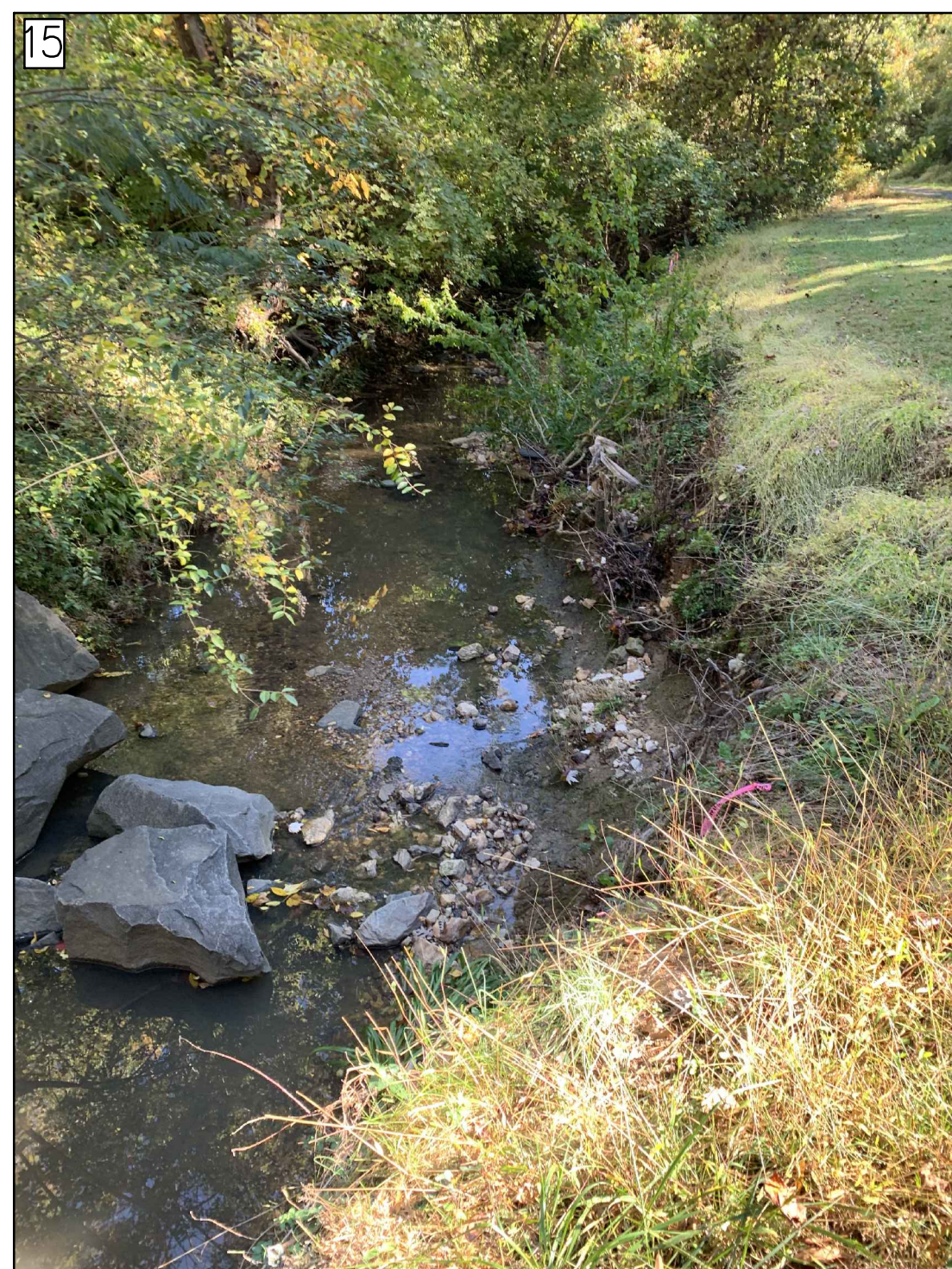
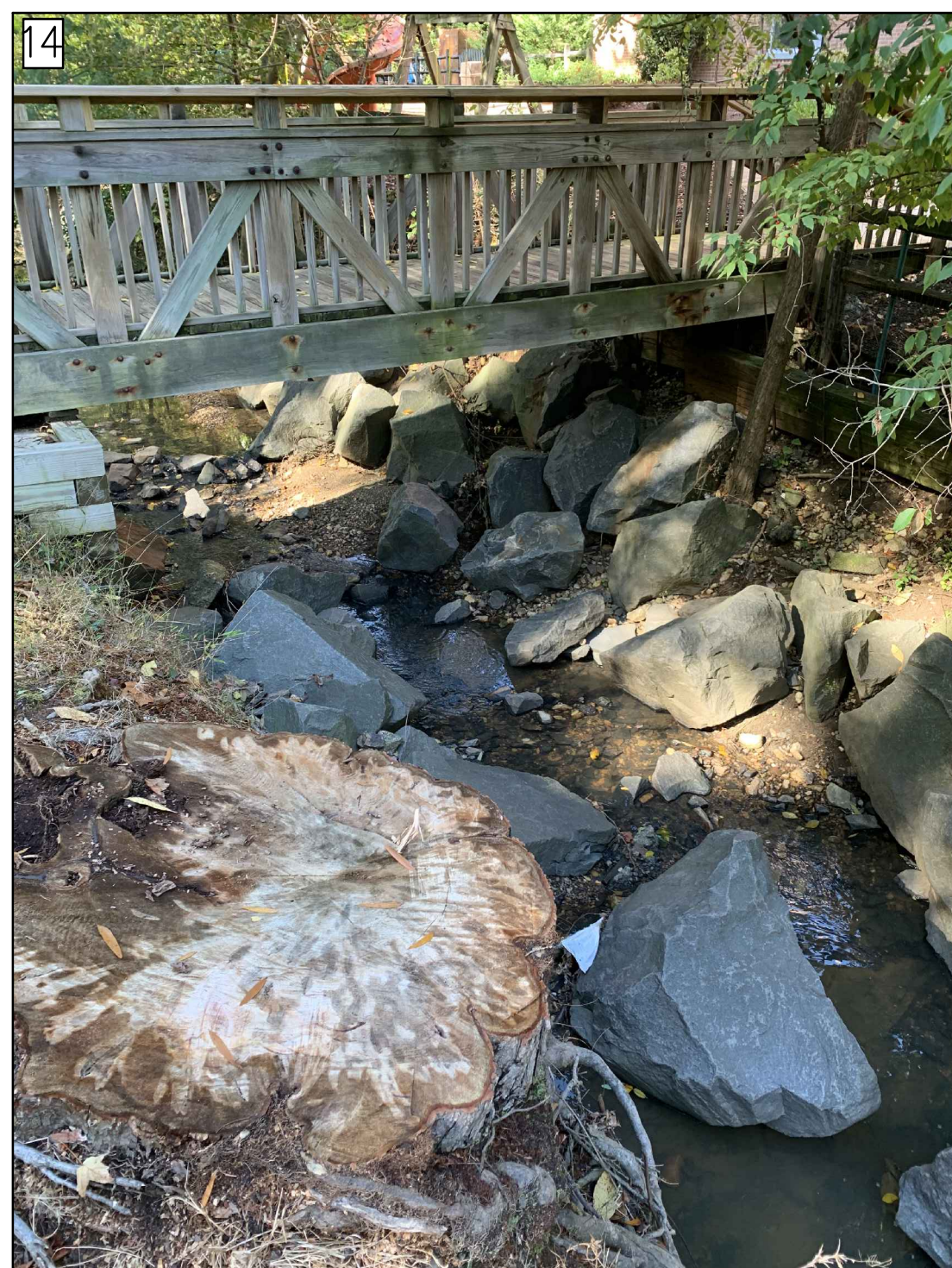
NO. DATE

REVISION PRIOR TO APPROVAL

Charles P. Johnson & Associates, Inc.
Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
9959 Pender Dr., Ste. 210 Fairfax, VA 22030 703-385-7555 Fax: 703-273-8595
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CPJ Associates

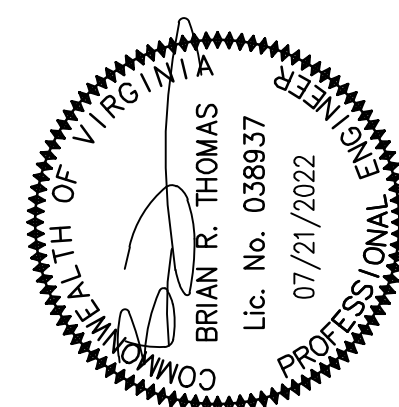
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[illegible]

OUTFALL PHOTOS

FAIRFAX PRESBYTERIAN CHURCH

CITY OF FAIRFAX, VIRGINIA

[illegible]



SCALE : $1/8" = 1'-0"$



SCALE : 1/8" = 1'-0"



SCALE : $1/8" = 1'-0"$



SCALE : $1/8" = 1'-0"$

NOTE : THESE DRAWINGS ARE CONCEPTUAL AND INTENDED TO ILLUSTRATE THE GENERAL CHARACTER OF THE BUILDING, QUALITY OF CONSTRUCTION, AND QUALITY OF MATERIALS. THESE DRAWINGS ARE NOT INTENDED TO REPRESENT FINAL BUILDING DESIGN, OR TO BE INTERPRETED AS A COMMITMENT TO SPECIFIC DIMENSIONS OR BUILDING ELEMENTS. FINAL DESIGN WILL BE DETERMINED AT TIME OF SITE PLAN SUBMISSION.

[illegible]



TYPICAL PHASE TWO/THREE STREET LIGHT & POLE
OR EQUIVALENT



TYPICAL PERGOLA
OR EQUIVALENT



TYPICAL TRANSITIONAL & REAR YARD PRIVACY FENCE
OR EQUIVALENT

VA DEQ STORMWATER DESIGN SPECIFICATION NO. 7 PERMEABLE PAVEMENT

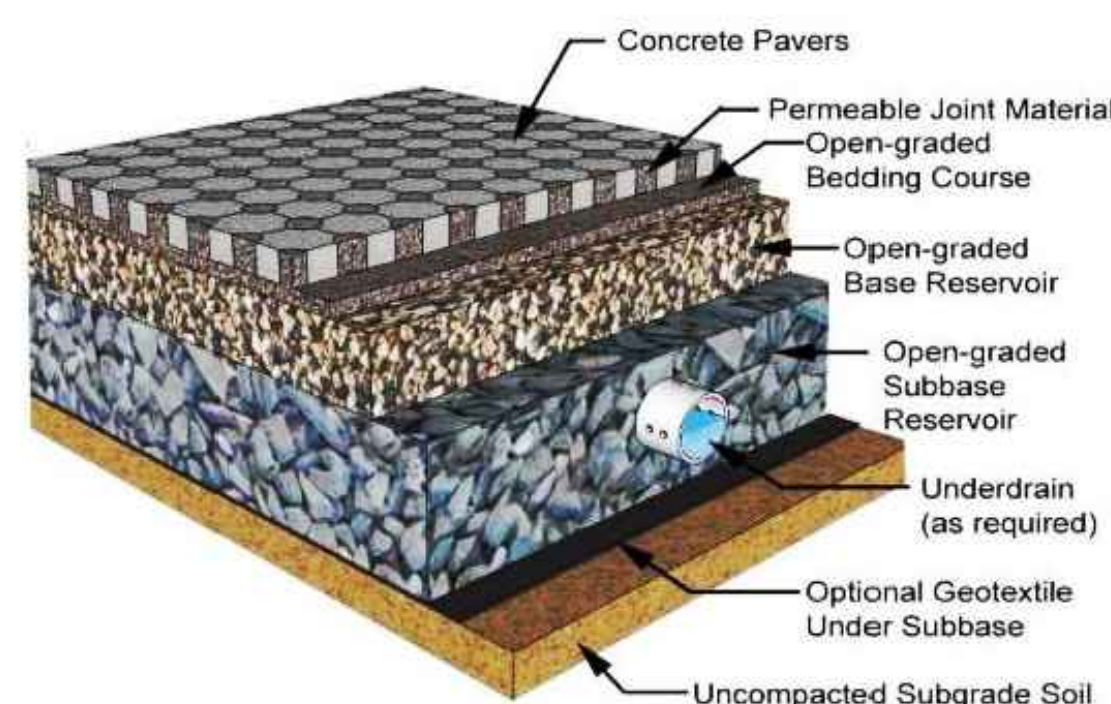


Figure 7.3. Typical Detail (Source: Smith, 2009)

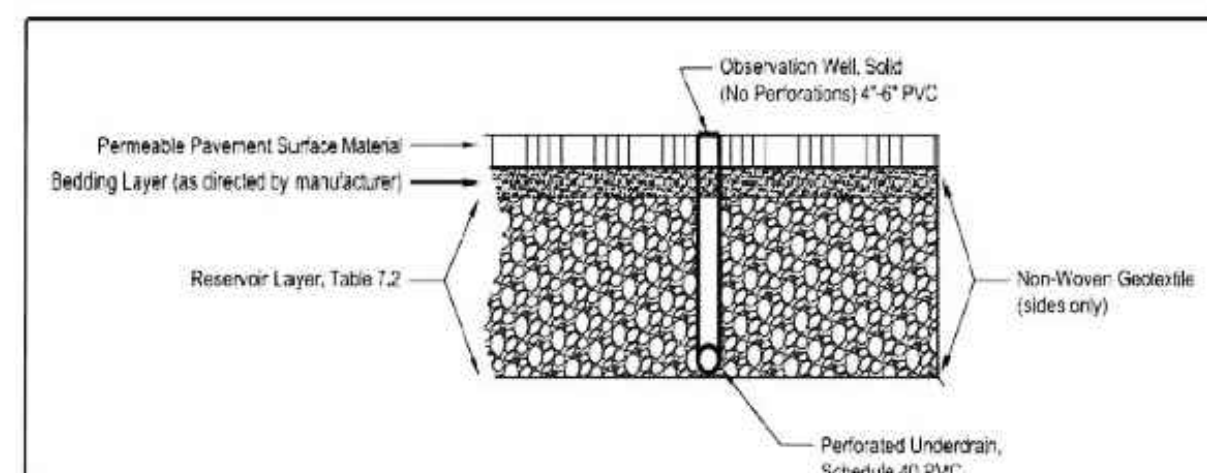


Figure 7.4. Typical Section Permeable Pavement Level 1

TYPICAL PERMEABLE PAVEMENT
OR EQUIVALENT



TYPICAL STAIR & PERGOLA LIGHTING
OR EQUIVALENT



TYPICAL SOLAR PATHWAY LIGHTING
OR EQUIVALENT



TYPICAL BIKE RACK
OR EQUIVALENT



TYPICAL BENCH
OR EQUIVALENT



TYPICAL FRONT DOOR LIGHT
OR EQUIVALENT

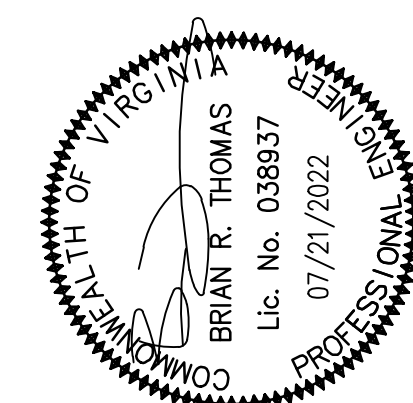


TYPICAL BACK DOOR LIGHT
OR EQUIVALENT

[illegible]

**FAIRFAX
PRESBYTERIAN
CHURCH**

CITY OF FAIRFAX, VIRGINIA

[illegible]

DESIGN KJV	DRAFT KJV	APPROVED HMF	DATE JAN. 2021	SCALE	HORIZ: --- VERT: ---
SHEET			OF		
51			51		
PRJ NO: 2017-2570					
TYPF: MDP					