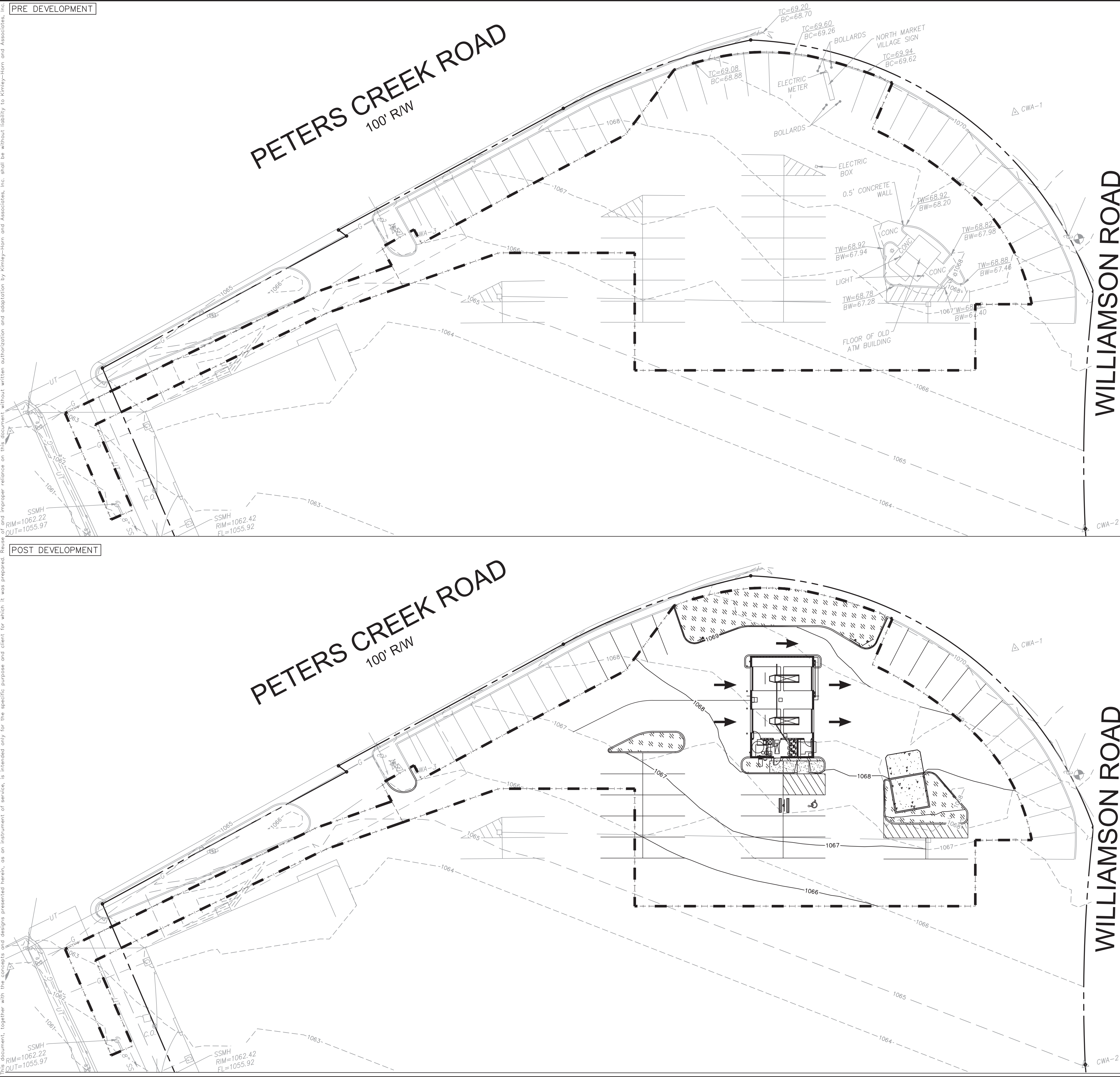


Plotted By: Anderson, Laura    Sheet: Set:kha    Layout:CG-201 STORMWATER QUANTITY MANAGEMENT PLAN    February 23, 2022    01:09:19pm    K:\NRIC-CIV\113418 - Take 5\005 - Williamson Rd - Roanoke\CAD\PlanSheets\CG-201 STORMWATER QUANTITY MANAGEMENT PLAN.dwg    This document, together with the concepts and designs presented herein, is intended only for the specific purpose and client for which it was prepared. Reuse of it and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



DRAINAGE LEGEND	
IMPERVIOUS AREA C-VALUE = 0.9	
PERVIOUS AREA C-VALUE = 0.3	
LIMITS OF DISTURBANCE	

DRAINAGE AREA

Project: Take 5 Williamson									
Project #: 113418012		LAND USE TYPE		C	CN				
Date: 2/23/2022		IMPERVIOUS		0.90	98				
Locality: ROANOKE		MANAGED TURF		0.30	80				
HSG: Type D		FOREST/ OPEN SPACE		0.20	77				
DRAINAGE AREA LABEL	INLET	TOTAL AREA (AC.)	IMPERVIOUS AREA (AC.)	MANAGED TURF AREA (AC.)	FOREST/ OPEN SPACE AREA (AC.)	C	CN	TIME OF CONC. Tc (min)	TREATMENT VOLUME Tv (cu ft)
Pre - Development		0.510	0.510	0.000	0.000	0.90	98.0	5.0	1,666
Pre Total Overall		0.510	0.510	0.000	0.000	0.90	98.0	5.0	1,666
Post - Development		0.510	0.463	0.047	0.000	0.84	96.3	5.0	1,564
Post Total Overall		0.510	0.463	0.047	0.000	0.84	96.3	5.0	1,564

OUTFALL 1 DRAINAGE SUMMARY

Pre-Development				
Runoff Curve Number (CN)	98	Storm Event	Runoff Volume V	Peak Flow q (cfs)
Drainage Area	0.51 acres			
Impervious Area	0.51 acres	1 -year	3,576	1.56
Managed Turf	0.00 acres	10 -year		2.86
Forest/Open Space	0.00 acres			
Time of Concentration (Tc)	5.00 min			

Post-Development				
Runoff Curve Number (CN)	1 yr 96	Storm Event	Runoff Volume V	Peak Flow q (cfs)
Runoff Curve Number (CN)	10 yr 96			
Drainage Area	0.51 acres	1 -year	3,275	1.49
Impervious Area	0.46 acres	10 -year		2.81
Managed Turf	0.05 acres			
Forest/Open Space	0.00 acres			
Time of Concentration (Tc)	5.00 min			

Channel Protection Compliance	
Energy Balance Equation, 1-year Storm	
Improvement Factor	0.9
Q <sub>post</sub>	I.F. x Q <sub>pre</sub> x RV <sub>pre</sub> /RV <sub>post</sub>
	0.9 x 1.56 x 3576 / 3275
1.49	1.53
PASS	

Flood Protection Compliance	
10-year storm	
Q <sub>post</sub>	Q <sub>pre</sub>
2.81	2.86
PASS	

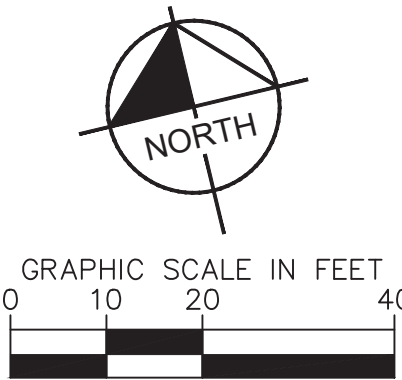
STORMWATER MANAGEMENT NARRATIVE

THIS PROJECT FALLS UNDER THE VIRGINIA PART II-B STORMWATER REGULATIONS FOR WATER QUANTITY AND QUALITY COMPLIANCE. THE LIMITS OF ANALYSIS IS THE TOTAL CONTRIBUTING LIMITS OF DISTURBANCE TO THE OUTFALL. THE LIMITS OF DISTURBANCE IS 0.51 AC. THE SITE CONSISTS OF UDORTHENTS - URBAN LAND COMPLEX. THIS SOIL IS TYPE D PER THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK.

THERE IS ONE OUTFALL FOR THIS SITE. OUTFALL 1 IS THE EXISTING STORM GRATE INLET LOCATED IN THE DRIVE AISLE OF THE SOUTHERN MOST BUILDING PER MARKET SQUARE NORTH PLANS (DATED JUNE 26TH, 1981). SEE SHEET CG-202 FOR OUTFALL LOCATION.

CHANNEL PROTECTION:  
THE ENERGY BALANCE EQUATION WAS USED TO ANALYZE THE SITE WITHIN THE LIMITS OF ANALYSIS FOR THE 1-YEAR STORM. THE ENERGY BALANCE WAS SATISFIED BY DECREASING THE AMOUNT OF POST-DEVELOPMENT IMPERVIOUS AREA. THIS REDUCED THE POST-DEVELOPMENT FLOW (1.49 CFS) BELOW THE PRE-DEVELOPMENT FLOW (2.81 CFS) THEREFORE, THE SYSTEM IS CONSIDERED ADEQUATE. SEE THIS SHEET FOR CALCULATIONS.

FLOOD PROTECTION:  
FLOOD PROTECTION COMPLIANCE FOR THE SITE IS MET THROUGH 9VAC25-870-66.C.1. THE REDUCTION IN IMPERVIOUS AREA WITHIN THE LIMITS OF ANALYSIS PROVIDED A 10-YEAR POST-DEVELOPMENT PEAK FLOW (2.81 CFS) LESS THAN 10-YEAR PRE-DEVELOPMENT PEAK FLOW (2.86 CFS). THEREFORE, THE SYSTEM IS CONSIDERED ADEQUATE. SEE THIS SHEET FOR CALCULATIONS.



Kimley»Horn

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COMMONWEALTH OF VIRGINIA

LAURA P. ANDERSON  
Lic. No. 069885  
02/23/2023  
PROFESSIONAL ENGINEER

KHA PROJECT  
113418012

DATE  
02/23/2022

SCALE AS SHOWN

DESIGNED BY MFB

DRAWN BY MFB

CHECKED BY LPA

STORMWATER  
QUANTITY  
MANAGEMENT PLAN

TAKE 5  
WILLIAMSON ROAD  
PREPARED FOR  
EB PARTNERS LLC

VA

SHEET NUMBER  
CG-201

ROANOKE COUNTY

REVISIONS

NO.

DATE

BY