Draper Aden Associates
Engineering • Surveying • Environmental Services

2206 South Main Street
Blacksburg, Virginia 24060
540.552.0444
www.daa.com

September 10, 2019

Ms. Kafi Howard, Town Engineer
Town of Blacksburg
400 S Main St.
Blacksburg, VA 24060

RE: Virginia Tech Foundation
Gilbert Street Mixed-Use
Draper Aden Associates Project No.18010245

Dear Kafi,

Thank you for your comments dated regarding the Gilbert Street Mixed-Use Conceptual Stormwater Management Calculations dated August 1, 2019. Attached is an updated Gilbert Street Mixed-Use Conceptual Stormwater Management Calculations dated September 10, 2019 and a revised Stormwater Management Narrative dated September 10, 2019*. We offer the following responses (shown in bold) to your comments.

* Note: The Stormwater Management Narrative was originally included as Section 4.2.3 Stormwater Management Narrative included in the Change of Zoning Classification (Rezone) Application, and Section 3.1.3 Stormwater Management Narrative included in the Conditional Use Permit Application.

1. There appears to be a discrepancy between Town's calculations (7854 cubic feet) and Draper Aden's calculations (1875 cubic feet) regarding the size of the existing stormwater management facility to be removed from this project. Please clarify. **We revised our calculations, which results in an existing volume of 7,363 cubic feet.**

2. The 2014 Filterra design calculations show the treatment 0.73 lbs/yr. of water quality while new project calculations estimate only 0.65 lbs/yr. for the existing on-site water quality. While there have been changes to the regulatory efficiency allotted to the Filterra system, when replacing them, the same efficiency needs to be used as the original design (74%). **The enclosed calculations were updated using the RRMM spreadsheet with a 74% efficiency resulting in a phosphorous removal rate of approximately 0.96 pounds per year. The discrepancy is likely the impervious area treated.**

3. It is assumed that there is an error the dimensions described on page 26 where it describes the height, width and length, and the length is described as 90-inches long. The dimension illustrated on the masterplan should be consistent with the proposed size as well. **The dimension of the chamber is 45" x 77" x 86.**

4. Please review sizing of the facility chambers. The pond elevations show a 10-year storm reaching an elevation that exceeds the height of the underground stormwater chambers. **Refer to revised calculations included in the attachments.**

5. Stormwater calculations assume the installation of a green roof. A green roof is not shown on the Master Plan, dated August 1, 2019 and therefor is not part of the proffered requirements of this site. If this stormwater feature is not included as part of the substantial conformance requirements for the site, credit can't be assumed within the stormwater concept plan. **A green roof is currently proposed for the project, and therefore, the green roof is included in the stormwater management calculations.**

6. Note: If the use of a green roof would like to be considered as an alternative but not committed to at this early stage, this feature can always be added during the site plan phase. The addition of a green roof would be considered an improved stormwater site design and would be considered to be automatically in conformance of the original masterplan. This is not the case if a green roof were shown on the rezoning masterplan package and then removed at a later time. **So noted.**

If you have any questions, please feel free to contact Tyson Catlett or me at 540-552-0444.

We appreciate your continued assistance with this project.

Sincerely,
Draper Aden Associates

Carolyn A. Howard

Carolyn A. Howard, P.E.
Vice President / Regional Manager
Site Development & Infrastructure

Attachments:
1. Stormwater Management Narrative dated September 10, 2019
2. Gilbert Street Mixed-Use Conceptual Stormwater Management Calculations dated September 10, 2019

cc: Mr. Mark Wawner, Senior Development Manager, W. M. Jordan Development Company
Mr. B. Tyson Catlett, PE, DBIA, Project Engineer, Draper Aden Associates

Stormwater Management Narrative

The project is designed to be in compliance with Part II B Technical Criteria for Regulated Land-Disturbing Activities. The Town's Stormwater Management Ordinance (Ordinance 1728) adopted the State mandated stormwater regulations, which are referenced below. The following summary describes the approach to compliance with the Virginia Stormwater Management Regulations. Refer to Appendix E for detailed and supplemental stormwater management calculations, which may be outlined or summarized below. The proposed underground detention system serves to provide the required storage volume for the redevelopment project while preserving the existing underground detention storage, which is to remain or be replicated as a condition of this project. Loss of volume from the existing system will be replaced/replicated by expanding the proposed system such that the existing storage volume is retained on-site as an "excess" as discussed with the Town Engineer.

Water Quantity – Channel Protection [9VAC25-870-66. Water quantity. (B)(3)]

The site discharges to a natural channel (Stroubles Creek) at a point taken where the site's contributing drainage area is less than or equal to 1.0% of the total watershed area. The drainage area to this point in Stroubles Creek is estimated to be 500 acres. The limits of disturbance for the project is estimated to be approximately 2.6 acres. The energy balance method is used show compliance with this criteria. The following summary table identifies that the 1-year, 24-hour storm event post-development peak flow rate, Q, of 4.53 cubic feet per second (cfs) is less than the allowable peak flow rate of 5.24 cfs.

ENERGY BALANCE COMPLIANCE TABLE									
	1 - YEAR STORM EVENT								
						FORESTED CONDITION			
OUTFALL	VOLUME (AC-FT)		PEAK (CFS)		Q ALLOW (CFS)	VOL (AC-FT)	PEAK (CFS)	Q ALLOW (CFS)	COMPLIANCE?
	PRE	POST	PRE	POST					
A	0.382	0.395	6.77	4.53	5.24	0.132	2.29	0.77	YES
NOTE: UNDER NO CONDITION SHALL Q DEVELOPED BE GREATER THAN Q PRE-DEVELOPED NOR SHALL Q DEVELOPED BE REQUIRED TO BE LESS THAN THAT CALCULATED AS Q ALLOW IN THE FORESTED CONDITION SECTION ABOVE.									

Water Quantity – Flood Protection [9VAC25-870-66. Water quantity. (C)(1)]

Concentrated stormwater flow shall be released into a stormwater conveyance system that, following the land-disturbing activity, confines the post-development peak flow rate from the 10-year, 24-hour storm event within the stormwater conveyance system.

The downstream pipe system will be analyzed to the point where, based on land area, the site's contributing drainage area is less than or equal to 1.0% of the total watershed area. The analysis point will end at Stroubles Creek with a drainage area estimated to be 500 acres. Peak flow reduction is proposed onsite for the 10-year, 24-hour storm event to demonstration compliance with 9VAC25-870-66, if necessary. As per the calculations provided in Appendix E and with the implementation of the underground detention system, the post-development peak flow rate is reduced by 0.36 CFS, for the 10-year, 24-hour storm event.

Water Quality [9VAC25-870-65]

Compliance with the water quality design criteria set out in subdivisions A 1 and A 2 of 9VAC25-870-63 shall be determined by utilizing the Virginia Runoff Reduction Method or another equivalent methodology that is approved by the board.

The project proposes to replace the existing best management practices (BMPs) (Filterras) and treat the increased impervious areas with the implementation of a Stormtech Isolator Row.

The project meets the criteria to qualify for off-site nutrient credits as it meets the requirements of 9VAC25-870-69(B), which includes land disturbance of less than five acres, the phosphorus control requirement is less than 10 pounds per year (lbs./yr.), **or** at least 75% of the required phosphorus nutrient reductions are achieved on-site. This approach complies with Section 18-616. Offsite Compliance Options. (b)(3) of the Town's ordinance. See below summary of the calculations for stormwater quantity and quality, and refer to Appendix E for additional calculations.

Stormwater Management Calculation Summary

Impervious area increase for project = 6,400 SF

The green roof is included in the project and is reflected in these calculations.

1. Existing Water Quality Systems

   Filterra Units on Prices Fork Level (x2) - Treatment Efficiency (TP removal) = 74%

   Drainage Area = 26,000 square feet (sf)

   As per VRRM calculations, existing TP removed = 0.96 lbs. /yr.

2. Proposed Water Quality Systems

   The VRRM spreadsheet for redevelopment yields a TP removal requirement of 1.23 lbs. /yr. When adding the existing TP removal of 0.96 lbs. /yr., the total removal requirement is 2.19 lbs. / yr. See below summary table; however, as noted in the section above, Water Quality [9VAC25-870-65], any combination of BMPs and/or purchase of nutrient credits may be utilized to demonstrate compliance. See Appendix E for more information related to the VRRM calculations.

WATER QUALITY / BMP SUMMARY TABLE

SWM / BMP FACILITY	**TOTAL AREA TREATED**	**TOTAL PHOSPHORUS REMOVAL OR REQUIREMENT**
1. VRRM SPREADSHEET	-	*1.23 LB/YR*
2. EXISTING FILTERRA UNITS (2 TOTAL)	*0.60 AC*	*0.96 LB/YR**
TOTAL REMOVAL REQUIREMENT	*SITE*	*2.19 LB/YR*
3. STORMTECH ISOLATOR ROWS	**1.86 AC**	**1.39 LB/YR**
4. GREEN ROOF	**0.08 AC**	**0.08 LB/YR**
If 3 & 4 are linked together (treatment train)	*1.86AC*	*1.51 LB/YR*
5. NUTRIENT CREDITS	**SITE**	**2.19 LB/YR**

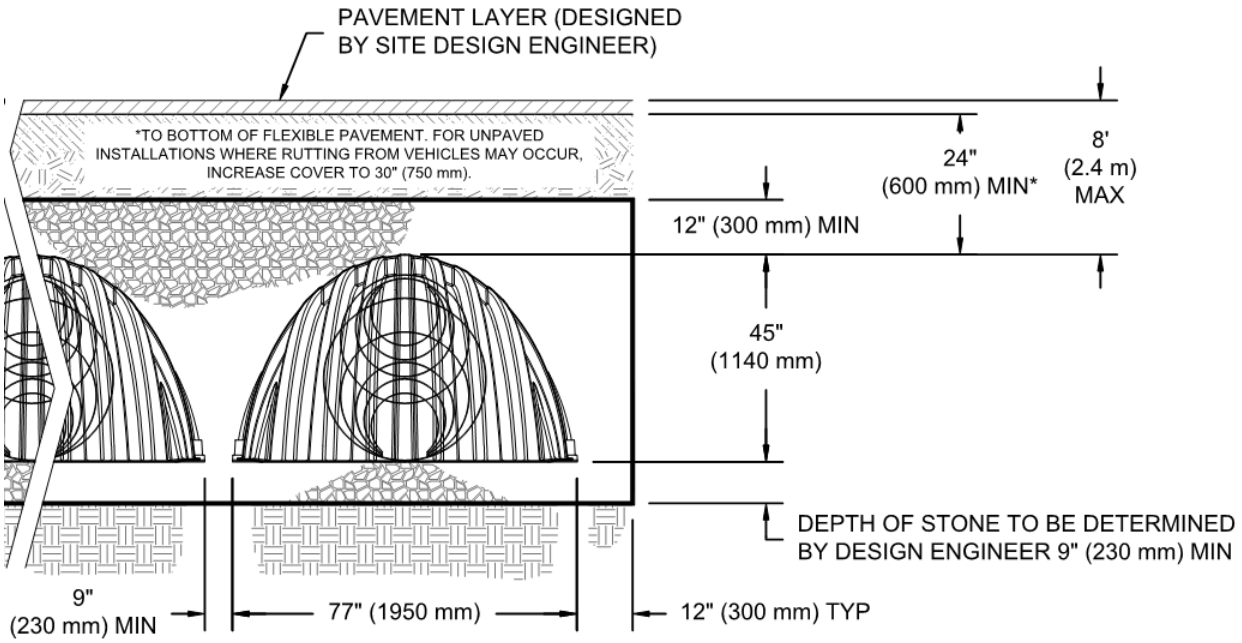
**(0.73 LB/YR per 2014 Filterra design calculations)*

3. Existing Water Quantity Systems: Underground Storage System

   5 Rows x 75 LF x 60" RCP = 7,363 cf of storage

4. Proposed Water Quantity Systems: Underground Storage System - Stormtech Isolator Rows

   As described in the section above, Water Quantity – Channel Protection [9VAC25-870-66. Water quantity. (B)(3)], the proposed system volume is 6,534 cf. The system is anticipated to be comprised an arched chambers subsurface stormwater detention system, complete with stone and fabric, and with a typical chamber dimension of 45-inches high x 77-inches wide x 86-inches long. The footprint of this system is approximately 2008 square feet.



An outlet control structure will be used to assist with detaining the stormwater within the underground storage system. The outlet control structure is anticipated to be a weir plate that will be inserted into a manhole with a configuration of low-flow orifice(s) to control the release of stormwater.

Gilbert Street Mixed-Use

Conceptual Stormwater Management Calculations

NORTH END
shop. dine. enjoy.

Prepared for:
Virginia Tech Foundation, Inc.
University Gateway Center
902 Prices Fork Road
Suite 130 (MC 0490)
Blacksburg, Virginia 24061

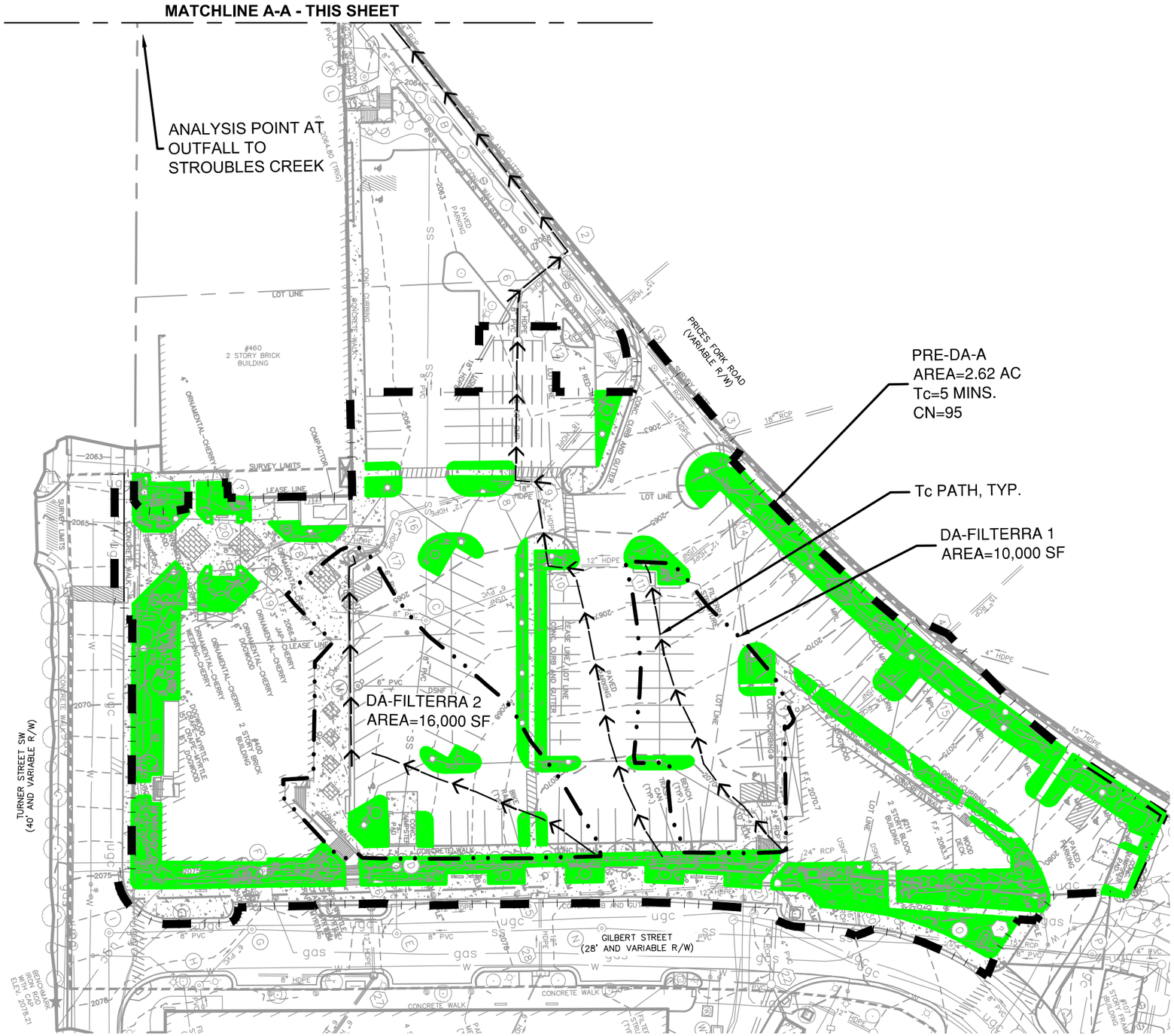
W.M. Jordan COMPANY

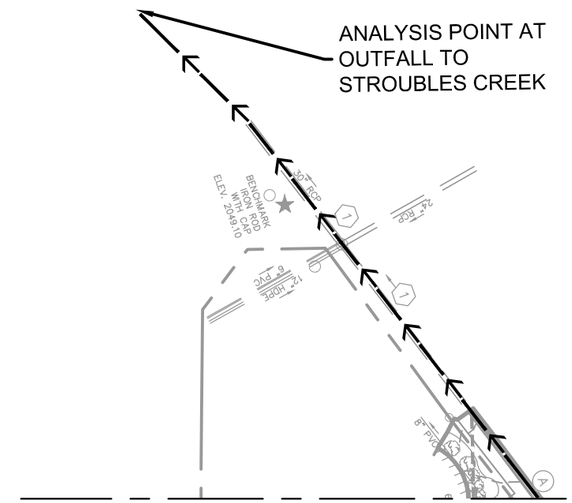
HANBURY

August 1, 2019
Revised September 10, 2019

Draper Aden Associates
Engineering • Surveying • Environmental Services

PRE- & POST-DEVELOPMENT HYDROLOGY PLANS





TOTAL AREA (PRE-DA-A) = 2.62 AC

TOTAL PERVIOUS AREA PRE- DEVELOPMENT = 21,250 SF (0.49 AC)

TOTAL IMPERVIOUS AREA PRE- DEVELOPMENT = 2.13 AC

ALL TIME OF CONCENTRATION (Tc) PATHS TAKEN AT 5 MINS.
ALL SOILS ARE HYDROLOGIC SOIL GROUP (HSG) D.
DRAINAGE AREAS TO FILTERRA UNITS ARE SHOWN TO DEMONSTRATE HOW THE TOTAL PHOSPHORUS (TP) AMOUNT WAS DERIVED IN THE VRRM SPREADSHEET.

THE ANALYSIS POINT IS TAKEN AT STROUBLES CREEK, WHERE RUNOFF FROM THE ENTIRE DRAINAGE AREA (PRE-DA-A) CONVERGES AT THE PIPE OUTFALL.

LEGEND

DRAINAGE AREA DIVIDE

PERVIOUS AREA

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

VIRGINIA TECH FOUNDATION - GILBERT STREET MIXED USE

HANBURY

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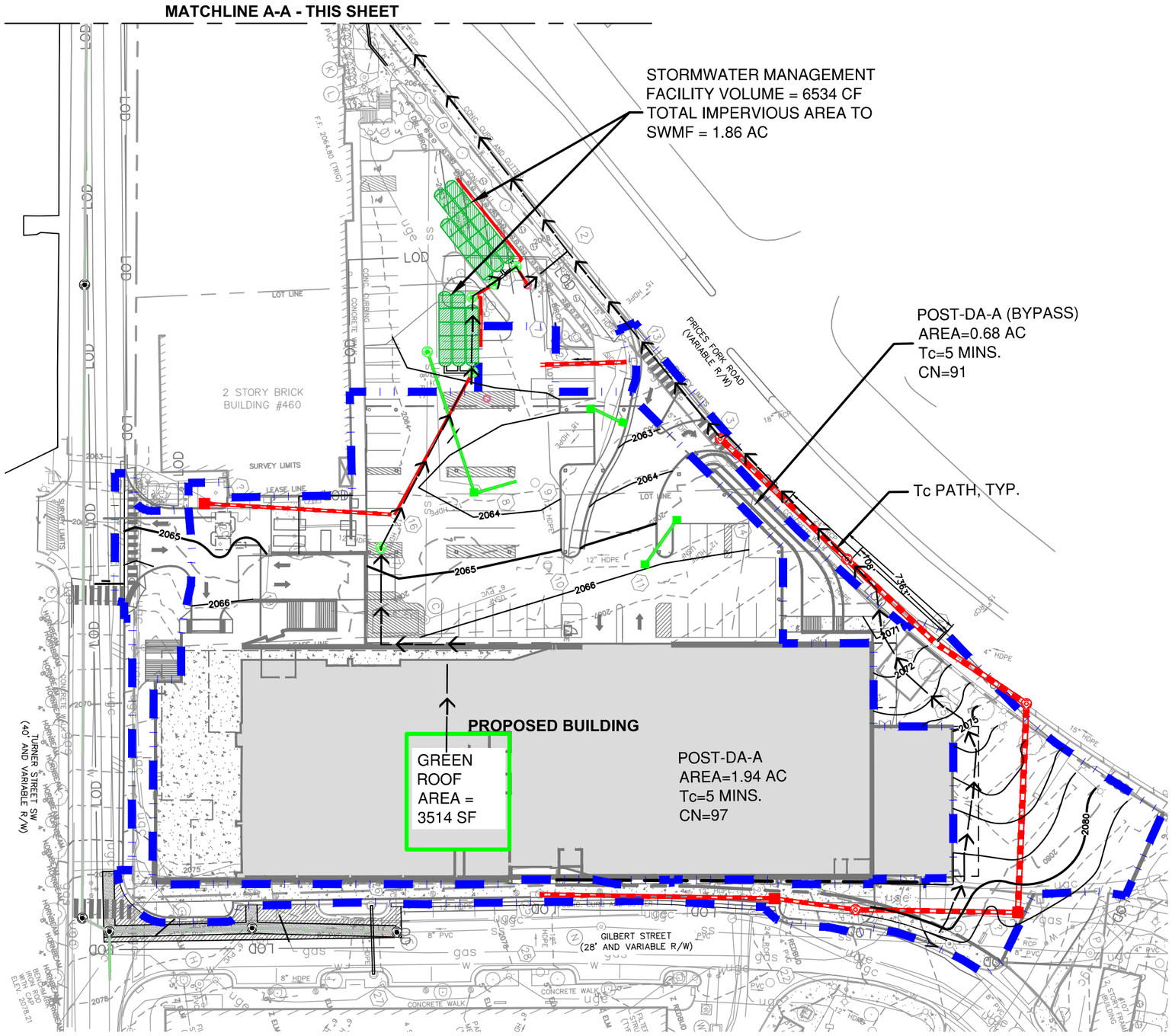
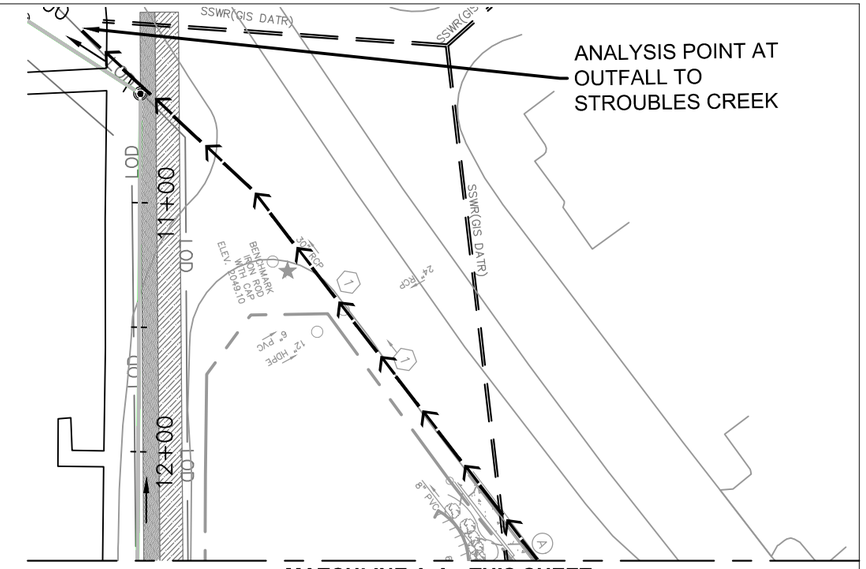
W.M. Jordan COMPANY

DRAWING NUMBER:	DRAWING NAME:	DATE:
1	**PRE-DEVELOPMENT HYDROLOGY PLAN**	1 August 2019





TOTAL AREA (POST-DA-A) = 2.62 AC

TOTAL PERVIOUS AREA POST- DEVELOPMENT = 0.34 AC

TOTAL IMPERVIOUS AREA POST- DEVELOPMENT = 2.28 AC

ALL TIME OF CONCENTRATION (Tc) PATHS TAKEN AT 5 MINS.
ALL SOILS ARE HYDROLOGIC SOIL GROUP (HSG) D.
DRAINAGE AREA TO SWMF SHOWN TO DEMONSTRATE HOW THE TOTAL PHOSPHORUS (TP) AMOUNT WAS DERIVED IN THE VRRM SPREADSHEET.

THE ANALYSIS POINT IS TAKEN AT STROUBLES CREEK, WHERE RUNOFF FROM THE ENTIRE DRAINAGE AREA (POST-DA-A) CONVERGES AT THE PIPE OUTFALL.

LEGEND

DRAINAGE AREA DIVIDE

GREEN ROOF AREA

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

VIRGINIA TECH FOUNDATION - GILBERT STREET MIXED-USE

NORTH END

HANBURY

Draper Aden Associates
Engineering • Surveying • Environmental Services

W.M. Jordan COMPANY

DRAWING NUMBER: 2

DRAWING NAME: **POST-DEVELOPMENT HYDROLOGY PLAN**

DATE: 1 AUGUST 2019

TR-55 ROUTING CALCULATIONS

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Subsection: User Notifications

User Notifications

Message Id	7
Scenario	10 Year
Element Type	Catchment
Element Id	40
Label	POST-DA-A
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 1.7 % is greater than 1.5 %. Computed peak flow= 10.19 ft³/s Interp. peak flow= 10.02 ft³/s. Output increment for this catchment may be too large.
Source	Warning
Message Id	7
Scenario	10 Year
Element Type	Catchment
Element Id	70
Label	POST-DA-A (bypass)
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.5 % is greater than 1.5 %. Computed peak flow= 3.20 ft³/s Interp. peak flow= 3.12 ft³/s. Output increment for this catchment may be too large.
Source	Warning
Message Id	7
Scenario	10 Year
Element Type	Catchment
Element Id	19
Label	PRE-DA-A
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 1.9 % is greater than 1.5 %. Computed peak flow= 13.39 ft³/s Interp. peak flow= 13.13 ft³/s. Output increment for this catchment may be too large.
Source	Warning
Message Id	7
Scenario	1 Year
Element Type	Catchment
Element Id	40
Label	POST-DA-A
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.0 % is greater than 1.5 %. Computed peak flow= 5.50 ft³/s Interp. peak flow= 5.40 ft³/s. Output increment for this catchment may be too large.
Source	Warning

Subsection: User Notifications

User Notifications

Message Id	7
Scenario	1 Year
Element Type	Catchment
Element Id	70
Label	POST-DA-A (bypass)
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 3.6 % is greater than 1.5 %. Computed peak flow= 1.51 ft^3/s Interp. peak flow= 1.45 ft^3/s. Output increment for this catchment may be too large.
Source	Warning
Message Id	7
Scenario	1 Year
Element Type	Catchment
Element Id	19
Label	PRE-DA-A
Time	(N/A)
Message	The difference between calculated peak flow and interpolated peak flow 2.5 % is greater than 1.5 %. Computed peak flow= 6.94 ft^3/s Interp. peak flow= 6.77 ft^3/s. Output increment for this catchment may be too large.
Source	Warning
Message Id	15
Scenario	1 Year
Element Type	Composite Outlet Structure
Element Id	31
Label	Composite Outlet Structure - 1
Time	(N/A)
Message	Kr (reverse flow entrance loss coefficient) was not specified. Kr was set to same value as Ke= 0.200 .
Source	Warning
Message Id	15
Scenario	10 Year
Element Type	Composite Outlet Structure
Element Id	31
Label	Composite Outlet Structure - 1
Time	(N/A)
Message	Kr (reverse flow entrance loss coefficient) was not specified. Kr was set to same value as Ke= 0.200 .
Source	Warning
Message Id	67
Scenario	1 Year
Element Type	Composite Outlet Structure
Element Id	31
Label	Composite Outlet Structure - 1
Time	(N/A)
Message	Flow direction set to reverse for one ore more structures in composite outlet structure Composite Outlet Structure - 1. To eliminate this warning, edit outlet data and select forward only. If reverse flow analysis is required, then the tailwater conditions must be set to interconnected pond.
Source	Warning

Subsection: User Notifications

User Notifications

Message Id	67
Scenario	10 Year
Element Type	Composite Outlet Structure
Element Id	31
Label	Composite Outlet Structure - 1
Time	(N/A)
Message	Flow direction set to reverse for one ore more structures in composite outlet structure Composite Outlet Structure - 1. To eliminate this warning, edit outlet data and select forward only. If reverse flow analysis is required, then the tailwater conditions must be set to interconnected pond.
Source	Warning

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
PRE-DA-A	1 Year	1	16,637.000	714.000	6.77
PRE-DA-A	10 Year	10	33,447.000	714.000	13.13
POST-DA-A	1 Year	1	13,697.000	714.000	5.40
POST-DA-A	10 Year	10	26,323.000	714.000	10.02
POST-DA-A (bypass)	1 Year	1	3,481.000	714.000	1.45
POST-DA-A (bypass)	10 Year	10	7,653.000	714.000	3.12

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)
PRE-A-OUTFALL	1 Year	1	16,637.000	714.000	6.77
PRE-A-OUTFALL	10 Year	10	33,447.000	714.000	13.13
POST-A-Outfall	1 Year	1	15,835.000	720.000	4.53
POST-A-Outfall	10 Year	10	31,467.000	717.000	12.77

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ft³)	Time to Peak (min)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ft³)
PO-1 (IN)	1 Year	1	13,697.000	714.000	5.40	(N/A)	(N/A)
PO-1 (OUT)	1 Year	1	12,354.000	723.000	3.42	2,058.23	5,212.000
PO-1 (IN)	10 Year	10	26,323.000	714.000	10.02	(N/A)	(N/A)
PO-1 (OUT)	10 Year	10	23,814.000	717.000	9.79	2,059.05	5,972.000

Subsection: Unit Hydrograph Summary
Label: POST-DA-A
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Storm Event	1 Year
Return Event	1 years
Duration	1,440.000 min
Depth	2.3 in
Time of Concentration (Composite)	5.000 min
Area (User Defined)	1.940 acres

Computational Time Increment	0.667 min
Time to Peak (Computed)	715.333 min
Flow (Peak, Computed)	5.50 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	714.000 min
Flow (Peak Interpolated Output)	5.40 ft³/s

Drainage Area	
SCS CN (Composite)	97.000
Area (User Defined)	1.940 acres
Maximum Retention (Pervious)	0.3 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.9 in
Runoff Volume (Pervious)	13,709.132 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	13,697.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	5.000 min
Computational Time Increment	0.667 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	26.38 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-DA-A
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	3.333 min
Unit receding limb, Tr	13.333 min
Total unit time, Tb	16.667 min

Storm Event	10 Year
Return Event	10 years
Duration	1,440.000 min
Depth	4.1 in
Time of Concentration (Composite)	5.000 min
Area (User Defined)	1.940 acres

Computational Time Increment	0.667 min
Time to Peak (Computed)	715.333 min
Flow (Peak, Computed)	10.19 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	714.000 min
Flow (Peak Interpolated Output)	10.02 ft³/s

Drainage Area	
SCS CN (Composite)	97.000
Area (User Defined)	1.940 acres
Maximum Retention (Pervious)	0.3 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.7 in
Runoff Volume (Pervious)	26,344.294 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	26,323.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	5.000 min
Computational Time Increment	0.667 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	26.38 ft³/s

Subsection: Unit Hydrograph Summary
Label: POST-DA-A
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	3.333 min
Unit receding limb, Tr	13.333 min
Total unit time, Tb	16.667 min

Storm Event	1 Year
Return Event	1 years
Duration	1,440.000 min
Depth	2.3 in
Time of Concentration (Composite)	5.000 min
Area (User Defined)	0.680 acres

Computational Time Increment	0.667 min
Time to Peak (Computed)	715.333 min
Flow (Peak, Computed)	1.51 ft^3/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	714.000 min
Flow (Peak Interpolated Output)	1.45 ft^3/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	0.680 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.4 in
Runoff Volume (Pervious)	3,484.575 ft^3

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3,481.000 ft^3

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	5.000 min
Computational Time Increment	0.667 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	9.25 ft^3/s

Subsection: Unit Hydrograph Summary
Label: POST-DA-A (bypass)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	3.333 min
Unit receding limb, Tr	13.333 min
Total unit time, Tb	16.667 min

Storm Event	10 Year
Return Event	10 years
Duration	1,440.000 min
Depth	4.1 in
Time of Concentration (Composite)	5.000 min
Area (User Defined)	0.680 acres

Computational Time Increment	0.667 min
Time to Peak (Computed)	715.333 min
Flow (Peak, Computed)	3.20 ft^3/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	714.000 min
Flow (Peak Interpolated Output)	3.12 ft^3/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	0.680 acres
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.1 in
Runoff Volume (Pervious)	7,660.865 ft^3

Hydrograph Volume (Area under Hydrograph curve)	
Volume	7,653.000 ft^3

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	5.000 min
Computational Time Increment	0.667 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	9.25 ft^3/s

Subsection: Unit Hydrograph Summary
Label: POST-DA-A (bypass)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	3.333 min
Unit receding limb, Tr	13.333 min
Total unit time, Tb	16.667 min

Storm Event	1 Year
Return Event	1 years
Duration	1,440.000 min
Depth	2.3 in
Time of Concentration (Composite)	5.000 min
Area (User Defined)	2.620 acres

Computational Time Increment	0.667 min
Time to Peak (Computed)	715.333 min
Flow (Peak, Computed)	6.94 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	714.000 min
Flow (Peak Interpolated Output)	6.77 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	2.620 acres
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.8 in
Runoff Volume (Pervious)	16,652.832 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	16,637.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	5.000 min
Computational Time Increment	0.667 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	35.62 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-DA-A
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	3.333 min
Unit receding limb, Tr	13.333 min
Total unit time, Tb	16.667 min

Storm Event	10 Year
Return Event	10 years
Duration	1,440.000 min
Depth	4.1 in
Time of Concentration (Composite)	5.000 min
Area (User Defined)	2.620 acres

Computational Time Increment	0.667 min
Time to Peak (Computed)	715.333 min
Flow (Peak, Computed)	13.39 ft³/s
Output Increment	3.000 min
Time to Flow (Peak Interpolated Output)	714.000 min
Flow (Peak Interpolated Output)	13.13 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	2.620 acres
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	33,475.670 ft³

Hydrograph Volume (Area under Hydrograph curve)	
Volume	33,447.000 ft³

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	5.000 min
Computational Time Increment	0.667 min
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	35.62 ft³/s

Subsection: Unit Hydrograph Summary
Label: PRE-DA-A
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	3.333 min
Unit receding limb, Tr	13.333 min
Total unit time, Tb	16.667 min

Subsection: Time vs. Elevation
Label: PO-1 (OUT)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
15.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
30.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
45.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
60.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
75.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
90.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
105.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
120.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
135.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
150.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
165.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
180.000	2,054.26	2,054.26	2,054.26	2,054.26	2,054.26
195.000	2,054.26	2,054.26	2,054.26	2,054.26	2,054.27
210.000	2,054.27	2,054.27	2,054.27	2,054.27	2,054.27
225.000	2,054.28	2,054.28	2,054.28	2,054.28	2,054.28
240.000	2,054.29	2,054.29	2,054.29	2,054.29	2,054.29
255.000	2,054.30	2,054.30	2,054.30	2,054.30	2,054.30
270.000	2,054.31	2,054.31	2,054.31	2,054.31	2,054.32
285.000	2,054.32	2,054.32	2,054.32	2,054.32	2,054.33
300.000	2,054.33	2,054.33	2,054.34	2,054.34	2,054.34
315.000	2,054.34	2,054.35	2,054.35	2,054.35	2,054.35
330.000	2,054.36	2,054.36	2,054.36	2,054.37	2,054.37
345.000	2,054.37	2,054.37	2,054.38	2,054.38	2,054.38
360.000	2,054.39	2,054.39	2,054.39	2,054.39	2,054.40
375.000	2,054.40	2,054.40	2,054.41	2,054.41	2,054.41
390.000	2,054.42	2,054.42	2,054.42	2,054.43	2,054.43
405.000	2,054.43	2,054.44	2,054.44	2,054.44	2,054.44
420.000	2,054.45	2,054.45	2,054.45	2,054.46	2,054.46
435.000	2,054.46	2,054.47	2,054.47	2,054.48	2,054.48
450.000	2,054.48	2,054.49	2,054.49	2,054.49	2,054.50
465.000	2,054.50	2,054.51	2,054.51	2,054.51	2,054.52
480.000	2,054.52	2,054.53	2,054.53	2,054.54	2,054.54
495.000	2,054.55	2,054.55	2,054.56	2,054.56	2,054.57
510.000	2,054.58	2,054.58	2,054.59	2,054.60	2,054.60
525.000	2,054.61	2,054.62	2,054.63	2,054.64	2,054.65
540.000	2,054.66	2,054.67	2,054.67	2,054.68	2,054.69
555.000	2,054.70	2,054.71	2,054.72	2,054.73	2,054.74
570.000	2,054.75	2,054.76	2,054.77	2,054.78	2,054.79
585.000	2,054.80	2,054.81	2,054.82	2,054.83	2,054.84
600.000	2,054.86	2,054.87	2,054.88	2,054.89	2,054.90
615.000	2,054.92	2,054.93	2,054.95	2,054.96	2,054.98

Subsection: Time vs. Elevation
Label: PO-1 (OUT)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
630.000	2,054.99	2,055.01	2,055.03	2,055.05	2,055.06
645.000	2,055.08	2,055.09	2,055.11	2,055.12	2,055.14
660.000	2,055.16	2,055.18	2,055.20	2,055.22	2,055.25
675.000	2,055.27	2,055.30	2,055.33	2,055.36	2,055.40
690.000	2,055.44	2,055.48	2,055.56	2,055.67	2,055.82
705.000	2,056.05	2,056.35	2,056.76	2,057.32	2,057.85
720.000	2,058.18	2,058.23	2,058.03	2,057.83	2,057.69
735.000	2,057.60	2,057.53	2,057.48	2,057.44	2,057.41
750.000	2,057.38	2,057.35	2,057.33	2,057.31	2,057.29
765.000	2,057.27	2,057.26	2,057.25	2,057.24	2,057.23
780.000	2,057.22	2,057.21	2,057.20	2,057.19	2,057.18
795.000	2,057.17	2,057.16	2,057.16	2,057.15	2,057.14
810.000	2,057.13	2,057.13	2,057.12	2,057.11	2,057.11
825.000	2,057.10	2,057.09	2,057.09	2,057.08	2,057.08
840.000	2,057.07	2,057.07	2,057.06	2,057.06	2,057.05
855.000	2,057.05	2,057.05	2,057.04	2,057.04	2,057.03
870.000	2,057.03	2,057.03	2,057.02	2,057.02	2,057.01
885.000	2,057.01	2,057.00	2,057.00	2,057.00	2,056.99
900.000	2,056.99	2,056.98	2,056.98	2,056.97	2,056.97
915.000	2,056.96	2,056.96	2,056.95	2,056.94	2,056.94
930.000	2,056.93	2,056.93	2,056.92	2,056.91	2,056.91
945.000	2,056.90	2,056.89	2,056.89	2,056.88	2,056.87
960.000	2,056.86	2,056.85	2,056.85	2,056.84	2,056.83
975.000	2,056.82	2,056.81	2,056.81	2,056.80	2,056.79
990.000	2,056.78	2,056.77	2,056.77	2,056.76	2,056.75
1,005.000	2,056.74	2,056.73	2,056.72	2,056.71	2,056.71
1,020.000	2,056.70	2,056.69	2,056.68	2,056.67	2,056.66
1,035.000	2,056.65	2,056.65	2,056.64	2,056.63	2,056.62
1,050.000	2,056.61	2,056.60	2,056.59	2,056.58	2,056.57
1,065.000	2,056.57	2,056.56	2,056.55	2,056.54	2,056.53
1,080.000	2,056.52	2,056.51	2,056.50	2,056.49	2,056.48
1,095.000	2,056.47	2,056.47	2,056.46	2,056.45	2,056.44
1,110.000	2,056.43	2,056.42	2,056.41	2,056.40	2,056.39
1,125.000	2,056.38	2,056.37	2,056.36	2,056.35	2,056.34
1,140.000	2,056.33	2,056.32	2,056.32	2,056.31	2,056.30
1,155.000	2,056.29	2,056.28	2,056.27	2,056.26	2,056.25
1,170.000	2,056.24	2,056.23	2,056.22	2,056.21	2,056.20
1,185.000	2,056.19	2,056.18	2,056.17	2,056.16	2,056.15
1,200.000	2,056.14	2,056.13	2,056.12	2,056.11	2,056.10
1,215.000	2,056.09	2,056.08	2,056.07	2,056.06	2,056.05
1,230.000	2,056.04	2,056.03	2,056.02	2,056.01	2,056.00
1,245.000	2,055.99	2,055.99	2,055.98	2,055.97	2,055.96

Subsection: Time vs. Elevation
Label: PO-1 (OUT)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,260.000	2,055.95	2,055.94	2,055.93	2,055.92	2,055.91
1,275.000	2,055.90	2,055.90	2,055.89	2,055.88	2,055.87
1,290.000	2,055.86	2,055.85	2,055.84	2,055.83	2,055.83
1,305.000	2,055.82	2,055.81	2,055.80	2,055.79	2,055.78
1,320.000	2,055.78	2,055.77	2,055.76	2,055.75	2,055.74
1,335.000	2,055.73	2,055.73	2,055.72	2,055.71	2,055.70
1,350.000	2,055.69	2,055.69	2,055.68	2,055.67	2,055.66
1,365.000	2,055.66	2,055.65	2,055.64	2,055.63	2,055.62
1,380.000	2,055.62	2,055.61	2,055.60	2,055.59	2,055.59
1,395.000	2,055.58	2,055.57	2,055.56	2,055.56	2,055.55
1,410.000	2,055.54	2,055.53	2,055.53	2,055.52	2,055.51
1,425.000	2,055.50	2,055.50	2,055.49	2,055.48	2,055.47
1,440.000	2,055.47	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Elevation
Label: PO-1 (OUT)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
15.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
30.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
45.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
60.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
75.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
90.000	2,054.25	2,054.25	2,054.25	2,054.25	2,054.25
105.000	2,054.25	2,054.26	2,054.26	2,054.26	2,054.26
120.000	2,054.26	2,054.27	2,054.27	2,054.27	2,054.28
135.000	2,054.28	2,054.28	2,054.29	2,054.29	2,054.29
150.000	2,054.30	2,054.30	2,054.30	2,054.31	2,054.31
165.000	2,054.32	2,054.32	2,054.33	2,054.33	2,054.33
180.000	2,054.34	2,054.34	2,054.35	2,054.35	2,054.36
195.000	2,054.36	2,054.37	2,054.37	2,054.38	2,054.38
210.000	2,054.39	2,054.39	2,054.40	2,054.40	2,054.41
225.000	2,054.41	2,054.42	2,054.42	2,054.43	2,054.43
240.000	2,054.44	2,054.44	2,054.45	2,054.45	2,054.46
255.000	2,054.46	2,054.47	2,054.47	2,054.48	2,054.49
270.000	2,054.49	2,054.50	2,054.50	2,054.51	2,054.52
285.000	2,054.52	2,054.53	2,054.53	2,054.54	2,054.55
300.000	2,054.56	2,054.56	2,054.57	2,054.58	2,054.58
315.000	2,054.59	2,054.60	2,054.61	2,054.61	2,054.62
330.000	2,054.63	2,054.64	2,054.64	2,054.65	2,054.66
345.000	2,054.67	2,054.68	2,054.68	2,054.69	2,054.70
360.000	2,054.71	2,054.72	2,054.73	2,054.74	2,054.74
375.000	2,054.75	2,054.76	2,054.77	2,054.78	2,054.79
390.000	2,054.80	2,054.81	2,054.82	2,054.83	2,054.84
405.000	2,054.84	2,054.85	2,054.86	2,054.87	2,054.88
420.000	2,054.88	2,054.89	2,054.90	2,054.91	2,054.92
435.000	2,054.92	2,054.93	2,054.94	2,054.95	2,054.96
450.000	2,054.97	2,054.98	2,054.99	2,055.00	2,055.01
465.000	2,055.01	2,055.02	2,055.03	2,055.04	2,055.05
480.000	2,055.06	2,055.06	2,055.07	2,055.08	2,055.08
495.000	2,055.09	2,055.10	2,055.11	2,055.12	2,055.13
510.000	2,055.13	2,055.14	2,055.15	2,055.17	2,055.18
525.000	2,055.19	2,055.20	2,055.21	2,055.22	2,055.24
540.000	2,055.25	2,055.26	2,055.28	2,055.29	2,055.30
555.000	2,055.32	2,055.33	2,055.34	2,055.36	2,055.37
570.000	2,055.39	2,055.40	2,055.41	2,055.43	2,055.44
585.000	2,055.46	2,055.47	2,055.49	2,055.51	2,055.52
600.000	2,055.54	2,055.56	2,055.58	2,055.60	2,055.62
615.000	2,055.65	2,055.67	2,055.69	2,055.72	2,055.75

Subsection: Time vs. Elevation
Label: PO-1 (OUT)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
630.000	2,055.77	2,055.80	2,055.83	2,055.86	2,055.89
645.000	2,055.93	2,055.96	2,056.00	2,056.04	2,056.08
660.000	2,056.13	2,056.18	2,056.23	2,056.28	2,056.34
675.000	2,056.40	2,056.46	2,056.53	2,056.61	2,056.68
690.000	2,056.77	2,056.87	2,057.03	2,057.27	2,057.56
705.000	2,057.87	2,058.23	2,058.68	2,059.00	2,059.05
720.000	2,058.96	2,058.79	2,058.52	2,058.20	2,057.95
735.000	2,057.81	2,057.72	2,057.66	2,057.61	2,057.57
750.000	2,057.54	2,057.50	2,057.47	2,057.45	2,057.43
765.000	2,057.41	2,057.40	2,057.39	2,057.37	2,057.36
780.000	2,057.35	2,057.34	2,057.33	2,057.32	2,057.31
795.000	2,057.30	2,057.30	2,057.29	2,057.28	2,057.28
810.000	2,057.27	2,057.27	2,057.26	2,057.26	2,057.25
825.000	2,057.25	2,057.24	2,057.24	2,057.23	2,057.22
840.000	2,057.22	2,057.21	2,057.21	2,057.20	2,057.19
855.000	2,057.19	2,057.18	2,057.18	2,057.17	2,057.17
870.000	2,057.16	2,057.16	2,057.16	2,057.15	2,057.15
885.000	2,057.15	2,057.14	2,057.14	2,057.14	2,057.14
900.000	2,057.13	2,057.13	2,057.13	2,057.12	2,057.12
915.000	2,057.12	2,057.11	2,057.11	2,057.11	2,057.10
930.000	2,057.10	2,057.10	2,057.10	2,057.09	2,057.09
945.000	2,057.09	2,057.09	2,057.08	2,057.08	2,057.08
960.000	2,057.07	2,057.07	2,057.07	2,057.07	2,057.06
975.000	2,057.06	2,057.06	2,057.06	2,057.06	2,057.05
990.000	2,057.05	2,057.05	2,057.05	2,057.05	2,057.05
1,005.000	2,057.05	2,057.04	2,057.04	2,057.04	2,057.04
1,020.000	2,057.04	2,057.03	2,057.03	2,057.03	2,057.03
1,035.000	2,057.02	2,057.02	2,057.02	2,057.02	2,057.01
1,050.000	2,057.01	2,057.01	2,057.01	2,057.00	2,057.00
1,065.000	2,057.00	2,056.99	2,056.99	2,056.99	2,056.99
1,080.000	2,056.98	2,056.98	2,056.98	2,056.97	2,056.97
1,095.000	2,056.96	2,056.96	2,056.96	2,056.95	2,056.95
1,110.000	2,056.94	2,056.94	2,056.94	2,056.93	2,056.93
1,125.000	2,056.92	2,056.92	2,056.91	2,056.91	2,056.90
1,140.000	2,056.90	2,056.89	2,056.89	2,056.88	2,056.88
1,155.000	2,056.87	2,056.86	2,056.86	2,056.85	2,056.85
1,170.000	2,056.84	2,056.83	2,056.83	2,056.82	2,056.81
1,185.000	2,056.81	2,056.80	2,056.79	2,056.79	2,056.78
1,200.000	2,056.77	2,056.77	2,056.76	2,056.75	2,056.74
1,215.000	2,056.74	2,056.73	2,056.72	2,056.72	2,056.71
1,230.000	2,056.70	2,056.69	2,056.69	2,056.68	2,056.67
1,245.000	2,056.66	2,056.66	2,056.65	2,056.64	2,056.64

Subsection: Time vs. Elevation
Label: PO-1 (OUT)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Elevation (ft)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,260.000	2,056.63	2,056.62	2,056.61	2,056.61	2,056.60
1,275.000	2,056.59	2,056.59	2,056.58	2,056.57	2,056.56
1,290.000	2,056.56	2,056.55	2,056.54	2,056.54	2,056.53
1,305.000	2,056.52	2,056.52	2,056.51	2,056.50	2,056.49
1,320.000	2,056.49	2,056.48	2,056.47	2,056.47	2,056.46
1,335.000	2,056.45	2,056.45	2,056.44	2,056.43	2,056.43
1,350.000	2,056.42	2,056.41	2,056.40	2,056.40	2,056.39
1,365.000	2,056.38	2,056.38	2,056.37	2,056.36	2,056.36
1,380.000	2,056.35	2,056.34	2,056.34	2,056.33	2,056.32
1,395.000	2,056.32	2,056.31	2,056.30	2,056.30	2,056.29
1,410.000	2,056.28	2,056.27	2,056.27	2,056.26	2,056.26
1,425.000	2,056.25	2,056.24	2,056.24	2,056.23	2,056.22
1,440.000	2,056.21	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: PO-1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
0.000	0.000	0.000	0.000	0.000	0.000
15.000	0.000	0.000	0.000	0.000	0.000
30.000	0.000	0.000	0.000	0.000	0.000
45.000	0.000	0.000	0.000	0.000	0.000
60.000	0.000	0.000	0.000	0.000	0.000
75.000	0.000	0.000	0.000	0.000	0.000
90.000	0.000	0.000	0.000	0.000	0.000
105.000	0.000	0.000	0.000	0.000	0.000
120.000	0.000	0.000	0.000	0.000	0.000
135.000	0.000	0.000	0.000	0.000	0.000
150.000	0.000	0.000	0.000	0.000	1.000
165.000	1.000	2.000	2.000	3.000	3.000
180.000	4.000	5.000	6.000	7.000	8.000
195.000	9.000	10.000	11.000	12.000	13.000
210.000	14.000	16.000	17.000	18.000	20.000
225.000	21.000	22.000	24.000	25.000	27.000
240.000	28.000	30.000	31.000	33.000	35.000
255.000	36.000	38.000	40.000	42.000	43.000
270.000	45.000	47.000	49.000	51.000	53.000
285.000	54.000	56.000	58.000	60.000	62.000
300.000	64.000	66.000	69.000	71.000	73.000
315.000	75.000	77.000	79.000	82.000	84.000
330.000	86.000	88.000	90.000	93.000	95.000
345.000	97.000	100.000	102.000	104.000	107.000
360.000	109.000	111.000	114.000	116.000	119.000
375.000	121.000	123.000	126.000	129.000	131.000
390.000	134.000	136.000	138.000	141.000	144.000
405.000	146.000	149.000	151.000	154.000	156.000
420.000	159.000	161.000	164.000	167.000	169.000
435.000	172.000	175.000	178.000	181.000	184.000
450.000	187.000	190.000	193.000	196.000	199.000
465.000	202.000	205.000	208.000	212.000	215.000
480.000	219.000	222.000	225.000	229.000	233.000
495.000	237.000	242.000	246.000	251.000	256.000
510.000	261.000	267.000	273.000	279.000	285.000
525.000	292.000	298.000	305.000	311.000	318.000
540.000	326.000	333.000	341.000	349.000	356.000
555.000	364.000	371.000	379.000	386.000	394.000
570.000	401.000	408.000	415.000	423.000	431.000
585.000	439.000	448.000	457.000	467.000	477.000
600.000	486.000	495.000	504.000	514.000	524.000
615.000	535.000	546.000	558.000	571.000	584.000

Subsection: Time vs. Volume
Label: PO-1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
630.000	597.000	621.000	650.000	682.000	703.000
645.000	725.000	749.000	774.000	800.000	828.000
660.000	857.000	887.000	920.000	956.000	994.000
675.000	1,036.000	1,081.000	1,130.000	1,181.000	1,237.000
690.000	1,295.000	1,372.000	1,486.000	1,658.000	1,911.000
705.000	2,257.000	2,709.000	3,316.000	4,107.000	4,806.000
720.000	5,161.000	5,212.000	5,029.000	4,774.000	4,593.000
735.000	4,468.000	4,380.000	4,314.000	4,264.000	4,221.000
750.000	4,181.000	4,144.000	4,111.000	4,083.000	4,060.000
765.000	4,041.000	4,025.000	4,011.000	3,998.000	3,985.000
780.000	3,971.000	3,958.000	3,946.000	3,933.000	3,921.000
795.000	3,909.000	3,897.000	3,887.000	3,877.000	3,867.000
810.000	3,857.000	3,847.000	3,838.000	3,829.000	3,821.000
825.000	3,813.000	3,805.000	3,797.000	3,790.000	3,783.000
840.000	3,776.000	3,770.000	3,763.000	3,758.000	3,752.000
855.000	3,747.000	3,742.000	3,737.000	3,731.000	3,726.000
870.000	3,721.000	3,715.000	3,709.000	3,704.000	3,698.000
885.000	3,693.000	3,687.000	3,681.000	3,675.000	3,668.000
900.000	3,661.000	3,654.000	3,647.000	3,639.000	3,632.000
915.000	3,624.000	3,615.000	3,607.000	3,597.000	3,588.000
930.000	3,579.000	3,570.000	3,560.000	3,550.000	3,540.000
945.000	3,530.000	3,520.000	3,509.000	3,498.000	3,487.000
960.000	3,475.000	3,463.000	3,452.000	3,440.000	3,427.000
975.000	3,415.000	3,403.000	3,391.000	3,379.000	3,367.000
990.000	3,355.000	3,343.000	3,330.000	3,318.000	3,306.000
1,005.000	3,293.000	3,280.000	3,267.000	3,255.000	3,242.000
1,020.000	3,230.000	3,217.000	3,204.000	3,191.000	3,178.000
1,035.000	3,165.000	3,152.000	3,139.000	3,126.000	3,112.000
1,050.000	3,099.000	3,086.000	3,073.000	3,060.000	3,047.000
1,065.000	3,033.000	3,020.000	3,006.000	2,993.000	2,979.000
1,080.000	2,966.000	2,952.000	2,939.000	2,925.000	2,911.000
1,095.000	2,897.000	2,884.000	2,870.000	2,857.000	2,843.000
1,110.000	2,829.000	2,815.000	2,801.000	2,787.000	2,773.000
1,125.000	2,759.000	2,745.000	2,731.000	2,717.000	2,703.000
1,140.000	2,688.000	2,674.000	2,660.000	2,646.000	2,631.000
1,155.000	2,617.000	2,603.000	2,588.000	2,574.000	2,560.000
1,170.000	2,545.000	2,530.000	2,516.000	2,501.000	2,486.000
1,185.000	2,472.000	2,457.000	2,442.000	2,427.000	2,412.000
1,200.000	2,397.000	2,382.000	2,368.000	2,353.000	2,338.000
1,215.000	2,323.000	2,308.000	2,294.000	2,279.000	2,264.000
1,230.000	2,250.000	2,236.000	2,222.000	2,208.000	2,195.000
1,245.000	2,181.000	2,166.000	2,151.000	2,137.000	2,122.000

Subsection: Time vs. Volume
Label: PO-1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
1,260.000	2,108.000	2,093.000	2,079.000	2,065.000	2,051.000
1,275.000	2,037.000	2,023.000	2,009.000	1,995.000	1,981.000
1,290.000	1,967.000	1,953.000	1,940.000	1,927.000	1,914.000
1,305.000	1,900.000	1,887.000	1,873.000	1,860.000	1,847.000
1,320.000	1,834.000	1,820.000	1,807.000	1,794.000	1,782.000
1,335.000	1,769.000	1,756.000	1,743.000	1,730.000	1,718.000
1,350.000	1,705.000	1,692.000	1,679.000	1,667.000	1,654.000
1,365.000	1,642.000	1,629.000	1,617.000	1,604.000	1,592.000
1,380.000	1,580.000	1,567.000	1,555.000	1,543.000	1,531.000
1,395.000	1,519.000	1,507.000	1,495.000	1,483.000	1,471.000
1,410.000	1,459.000	1,447.000	1,436.000	1,425.000	1,413.000
1,425.000	1,401.000	1,389.000	1,378.000	1,366.000	1,355.000
1,440.000	1,343.000	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Time vs. Volume
Label: PO-1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
0.000	0.000	0.000	0.000	0.000	0.000
15.000	0.000	0.000	0.000	0.000	0.000
30.000	0.000	0.000	0.000	0.000	0.000
45.000	0.000	0.000	0.000	0.000	0.000
60.000	0.000	0.000	0.000	0.000	0.000
75.000	0.000	0.000	0.000	0.000	0.000
90.000	0.000	0.000	1.000	1.000	2.000
105.000	3.000	5.000	6.000	8.000	9.000
120.000	11.000	13.000	16.000	18.000	20.000
135.000	23.000	26.000	29.000	32.000	35.000
150.000	37.000	40.000	44.000	47.000	50.000
165.000	54.000	57.000	61.000	64.000	68.000
180.000	72.000	75.000	79.000	83.000	87.000
195.000	90.000	94.000	98.000	102.000	106.000
210.000	110.000	114.000	118.000	122.000	127.000
225.000	131.000	134.000	138.000	142.000	146.000
240.000	150.000	154.000	158.000	162.000	166.000
255.000	171.000	175.000	180.000	185.000	190.000
270.000	194.000	199.000	204.000	209.000	214.000
285.000	219.000	224.000	229.000	234.000	240.000
300.000	245.000	251.000	257.000	262.000	268.000
315.000	274.000	280.000	286.000	293.000	299.000
330.000	304.000	310.000	317.000	323.000	330.000
345.000	336.000	342.000	349.000	355.000	362.000
360.000	369.000	376.000	383.000	390.000	396.000
375.000	403.000	411.000	418.000	426.000	433.000
390.000	440.000	447.000	454.000	462.000	470.000
405.000	477.000	484.000	490.000	496.000	503.000
420.000	509.000	516.000	522.000	529.000	535.000
435.000	542.000	549.000	556.000	564.000	571.000
450.000	578.000	586.000	593.000	600.000	612.000
465.000	626.000	640.000	655.000	670.000	684.000
480.000	694.000	704.000	714.000	724.000	736.000
495.000	748.000	760.000	773.000	787.000	801.000
510.000	816.000	831.000	847.000	864.000	882.000
525.000	900.000	919.000	937.000	956.000	976.000
540.000	997.000	1,019.000	1,041.000	1,062.000	1,084.000
555.000	1,106.000	1,127.000	1,149.000	1,170.000	1,192.000
570.000	1,213.000	1,235.000	1,257.000	1,279.000	1,303.000
585.000	1,327.000	1,352.000	1,378.000	1,405.000	1,434.000
600.000	1,463.000	1,493.000	1,525.000	1,557.000	1,592.000
615.000	1,628.000	1,665.000	1,704.000	1,744.000	1,785.000

Subsection: Time vs. Volume
Label: PO-1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
630.000	1,828.000	1,873.000	1,920.000	1,969.000	2,021.000
645.000	2,076.000	2,134.000	2,193.000	2,252.000	2,315.000
660.000	2,382.000	2,452.000	2,526.000	2,605.000	2,690.000
675.000	2,781.000	2,879.000	2,983.000	3,093.000	3,210.000
690.000	3,333.000	3,491.000	3,720.000	4,039.000	4,423.000
705.000	4,824.000	5,216.000	5,629.000	5,933.000	5,972.000
720.000	5,891.000	5,740.000	5,487.000	5,182.000	4,931.000
735.000	4,747.000	4,633.000	4,552.000	4,490.000	4,436.000
750.000	4,387.000	4,343.000	4,305.000	4,273.000	4,248.000
765.000	4,227.000	4,207.000	4,188.000	4,170.000	4,154.000
780.000	4,139.000	4,125.000	4,113.000	4,101.000	4,089.000
795.000	4,079.000	4,069.000	4,061.000	4,054.000	4,047.000
810.000	4,039.000	4,031.000	4,024.000	4,017.000	4,011.000
825.000	4,005.000	3,998.000	3,991.000	3,983.000	3,975.000
840.000	3,967.000	3,959.000	3,951.000	3,943.000	3,936.000
855.000	3,929.000	3,922.000	3,915.000	3,909.000	3,903.000
870.000	3,898.000	3,893.000	3,888.000	3,883.000	3,879.000
885.000	3,875.000	3,871.000	3,867.000	3,863.000	3,859.000
900.000	3,854.000	3,850.000	3,846.000	3,842.000	3,839.000
915.000	3,835.000	3,831.000	3,826.000	3,822.000	3,818.000
930.000	3,814.000	3,811.000	3,807.000	3,803.000	3,800.000
945.000	3,797.000	3,794.000	3,790.000	3,787.000	3,783.000
960.000	3,779.000	3,775.000	3,771.000	3,768.000	3,764.000
975.000	3,761.000	3,759.000	3,757.000	3,755.000	3,753.000
990.000	3,751.000	3,749.000	3,747.000	3,746.000	3,743.000
1,005.000	3,741.000	3,738.000	3,736.000	3,733.000	3,731.000
1,020.000	3,729.000	3,726.000	3,723.000	3,720.000	3,716.000
1,035.000	3,713.000	3,710.000	3,706.000	3,702.000	3,698.000
1,050.000	3,695.000	3,692.000	3,689.000	3,685.000	3,681.000
1,065.000	3,677.000	3,672.000	3,667.000	3,663.000	3,659.000
1,080.000	3,655.000	3,650.000	3,645.000	3,639.000	3,633.000
1,095.000	3,627.000	3,622.000	3,617.000	3,611.000	3,605.000
1,110.000	3,598.000	3,592.000	3,585.000	3,577.000	3,571.000
1,125.000	3,564.000	3,557.000	3,550.000	3,542.000	3,535.000
1,140.000	3,526.000	3,518.000	3,510.000	3,502.000	3,494.000
1,155.000	3,486.000	3,477.000	3,469.000	3,460.000	3,451.000
1,170.000	3,442.000	3,432.000	3,422.000	3,413.000	3,403.000
1,185.000	3,393.000	3,382.000	3,372.000	3,362.000	3,352.000
1,200.000	3,341.000	3,331.000	3,320.000	3,309.000	3,298.000
1,215.000	3,288.000	3,277.000	3,266.000	3,256.000	3,245.000
1,230.000	3,234.000	3,222.000	3,211.000	3,201.000	3,190.000
1,245.000	3,180.000	3,169.000	3,158.000	3,147.000	3,137.000

Subsection: Time vs. Volume
Label: PO-1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Time vs. Volume (ft³)

Output Time increment = 3.000 min
Time on left represents time for first value in each row.

Time (min)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)	Volume (ft³)
1,260.000	3,126.000	3,115.000	3,104.000	3,094.000	3,083.000
1,275.000	3,072.000	3,062.000	3,052.000	3,042.000	3,031.000
1,290.000	3,020.000	3,009.000	2,999.000	2,989.000	2,979.000
1,305.000	2,969.000	2,958.000	2,947.000	2,937.000	2,926.000
1,320.000	2,916.000	2,905.000	2,895.000	2,885.000	2,875.000
1,335.000	2,864.000	2,854.000	2,844.000	2,834.000	2,824.000
1,350.000	2,813.000	2,802.000	2,791.000	2,782.000	2,772.000
1,365.000	2,762.000	2,751.000	2,740.000	2,730.000	2,720.000
1,380.000	2,710.000	2,699.000	2,690.000	2,680.000	2,670.000
1,395.000	2,659.000	2,649.000	2,640.000	2,630.000	2,619.000
1,410.000	2,609.000	2,599.000	2,589.000	2,580.000	2,570.000
1,425.000	2,560.000	2,550.000	2,540.000	2,530.000	2,520.000
1,440.000	2,510.000	(N/A)	(N/A)	(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	2,054.25 ft
Increment (Headwater)	0.20 ft
Maximum (Headwater)	2,059.75 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	2,054.25	2,059.75
Orifice-Circular	Orifice - 2	Forward	Culvert - 1	2,057.00	2,059.75
Rectangular Weir	Weir - 1	Forward	Culvert - 1	2,058.50	2,059.75
Culvert-Circular	Culvert - 1	Forward	TW	2,054.00	2,059.75
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Structure ID: Orifice - 1
Structure Type: Orifice-Circular

Number of Openings	1
Elevation	2,054.25 ft
Orifice Diameter	2.0 in
Orifice Coefficient	0.600

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	35.00 ft
Length (Computed Barrel)	35.01 ft
Slope (Computed)	0.019 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.012
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.086
T2 ratio (HW/D)	1.187
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	2,056.17 ft	T1 Flow	15.55 ft³/s
T2 Elevation	2,056.37 ft	T2 Flow	17.77 ft³/s

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	2,057.00 ft
Orifice Diameter	12.0 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	2,058.50 ft
Weir Length	4.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	2,054.25 ft
Increment (Headwater)	0.20 ft
Maximum (Headwater)	2,059.75 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	2,054.25	2,059.75
Orifice-Circular	Orifice - 2	Forward	Culvert - 1	2,057.00	2,059.75
Rectangular Weir	Weir - 1	Forward	Culvert - 1	2,058.50	2,059.75
Culvert-Circular	Culvert - 1	Forward	TW	2,054.00	2,059.75
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Structure ID: Orifice - 1
Structure Type: Orifice-Circular

Number of Openings	1
Elevation	2,054.25 ft
Orifice Diameter	2.0 in
Orifice Coefficient	0.600

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	35.00 ft
Length (Computed Barrel)	35.01 ft
Slope (Computed)	0.019 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.012
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.086
T2 ratio (HW/D)	1.187
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	2,056.17 ft	T1 Flow	15.55 ft³/s
T2 Elevation	2,056.37 ft	T2 Flow	17.77 ft³/s

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	2,057.00 ft
Orifice Diameter	12.0 in
Orifice Coefficient	0.600

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	2,058.50 ft
Weir Length	4.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

Subsection: Elevation-Volume-Flow Table (Pond)
Label: PO-1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,054.25 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
2,054.25	0.00	0.000	0.000	0.00	0.00	0.00
2,054.45	0.04	160.640	0.000	0.00	0.04	1.82
2,054.65	0.06	321.280	0.000	0.00	0.06	3.63
2,054.85	0.08	481.920	0.000	0.00	0.08	5.43
2,055.05	0.09	681.741	0.000	0.00	0.09	7.66
2,055.25	0.10	999.103	0.000	0.00	0.10	11.20
2,055.45	0.11	1,316.464	0.000	0.00	0.11	14.74
2,055.65	0.12	1,633.827	0.000	0.00	0.12	18.27
2,055.85	0.13	1,951.188	0.000	0.00	0.13	21.81
2,056.05	0.14	2,263.790	0.000	0.00	0.14	25.29
2,056.25	0.14	2,562.110	0.000	0.00	0.14	28.61
2,056.45	0.15	2,860.430	0.000	0.00	0.15	31.93
2,056.65	0.16	3,158.750	0.000	0.00	0.16	35.26
2,056.85	0.17	3,457.070	0.000	0.00	0.17	38.58
2,057.00	0.17	3,680.810	0.000	0.00	0.17	41.07
2,057.05	0.18	3,746.628	0.000	0.00	0.18	41.81
2,057.25	0.38	4,009.900	0.000	0.00	0.38	44.94
2,057.45	0.81	4,273.172	0.000	0.00	0.81	48.29
2,057.65	1.42	4,536.444	0.000	0.00	1.42	51.82
2,057.85	2.16	4,799.716	0.000	0.00	2.16	55.49
2,058.05	2.99	5,043.912	0.000	0.00	2.99	59.03
2,058.25	3.46	5,230.880	0.000	0.00	3.46	61.59
2,058.45	3.88	5,417.848	0.000	0.00	3.88	64.08
2,058.50	3.98	5,464.590	0.000	0.00	3.98	64.69
2,058.65	4.95	5,604.816	0.000	0.00	4.95	67.22
2,058.85	7.07	5,791.784	0.000	0.00	7.07	71.42
2,059.05	9.79	5,972.170	0.000	0.00	9.79	76.15
2,059.25	12.99	6,132.810	0.000	0.00	12.99	81.13
2,059.45	16.57	6,293.450	0.000	0.00	16.57	86.50
2,059.65	20.52	6,454.090	0.000	0.00	20.52	92.23

Subsection: Elevation-Volume-Flow Table (Pond)
Label: PO-1
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Elevation (ft)	Outflow (ft^3/s)	Storage (ft^3)	Area (acres)	Infiltration (ft^3/s)	Flow (Total) (ft^3/s)	2S/t + O (ft^3/s)
2,059.75	22.60	6,534.410	0.000	0.00	22.60	95.21

Subsection: Elevation-Volume-Flow Table (Pond)
Label: PO-1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,054.25 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft³/s)	Storage (ft³)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
2,054.25	0.00	0.000	0.000	0.00	0.00	0.00
2,054.45	0.04	160.640	0.000	0.00	0.04	1.82
2,054.65	0.06	321.280	0.000	0.00	0.06	3.63
2,054.85	0.08	481.920	0.000	0.00	0.08	5.43
2,055.05	0.09	681.741	0.000	0.00	0.09	7.66
2,055.25	0.10	999.103	0.000	0.00	0.10	11.20
2,055.45	0.11	1,316.464	0.000	0.00	0.11	14.74
2,055.65	0.12	1,633.827	0.000	0.00	0.12	18.27
2,055.85	0.13	1,951.188	0.000	0.00	0.13	21.81
2,056.05	0.14	2,263.790	0.000	0.00	0.14	25.29
2,056.25	0.14	2,562.110	0.000	0.00	0.14	28.61
2,056.45	0.15	2,860.430	0.000	0.00	0.15	31.93
2,056.65	0.16	3,158.750	0.000	0.00	0.16	35.26
2,056.85	0.17	3,457.070	0.000	0.00	0.17	38.58
2,057.00	0.17	3,680.810	0.000	0.00	0.17	41.07
2,057.05	0.18	3,746.628	0.000	0.00	0.18	41.81
2,057.25	0.38	4,009.900	0.000	0.00	0.38	44.94
2,057.45	0.81	4,273.172	0.000	0.00	0.81	48.29
2,057.65	1.42	4,536.444	0.000	0.00	1.42	51.82
2,057.85	2.16	4,799.716	0.000	0.00	2.16	55.49
2,058.05	2.99	5,043.912	0.000	0.00	2.99	59.03
2,058.25	3.46	5,230.880	0.000	0.00	3.46	61.59
2,058.45	3.88	5,417.848	0.000	0.00	3.88	64.08
2,058.50	3.98	5,464.590	0.000	0.00	3.98	64.69
2,058.65	4.95	5,604.816	0.000	0.00	4.95	67.22
2,058.85	7.07	5,791.784	0.000	0.00	7.07	71.42
2,059.05	9.79	5,972.170	0.000	0.00	9.79	76.15
2,059.25	12.99	6,132.810	0.000	0.00	12.99	81.13
2,059.45	16.57	6,293.450	0.000	0.00	16.57	86.50
2,059.65	20.52	6,454.090	0.000	0.00	20.52	92.23

Subsection: Elevation-Volume-Flow Table (Pond)
Label: PO-1
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Elevation (ft)	Outflow (ft^3/s)	Storage (ft^3)	Area (acres)	Infiltration (ft^3/s)	Flow (Total) (ft^3/s)	2S/t + O (ft^3/s)
2,059.75	22.60	6,534.410	0.000	0.00	22.60	95.21

Subsection: Detention Time
Label: PO-1 (IN)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Approximate Detention Times	
Time to Peak (Outflow + Infiltration, Peak to Peak Detention Time)	723.000 min
Time to Peak (Inflow, Peak to Peak Detention Time)	714.000 min
Detention Time (Peak to Peak)	9.000 min
Time to Centroid (Outflow)	882.859 min
Time to Centroid (Inflow)	769.574 min
Detention Time (Centroid to Centroid)	113.285 min
Weighted Average Plug Time	174.570 min
Maximum Plug Volume Plug Time	88.496 min
Maximum Inflow Plug Volume	943.064 ft^3
Time (Maximum Plug Volume, Start)	714.000 min
Time (Maximum Plug Volume, End)	717.000 min

Subsection: Level Pool Pond Routing Summary
Label: PO-1 (IN)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,054.25 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	3.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	5.40 ft³/s	Time to Peak (Flow, In)	714.000 min
Flow (Peak Outlet)	3.42 ft³/s	Time to Peak (Flow, Outlet)	723.000 min

Elevation (Water Surface, Peak)	2,058.23 ft
Volume (Peak)	5,211.595 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	13,697.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	12,354.000 ft³
Volume (Retained)	1,323.000 ft³
Volume (Unrouted)	-20.000 ft³
Error (Mass Balance)	0.1 %

Subsection: Detention Time
Label: PO-1 (IN)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Approximate Detention Times	
Time to Peak (Outflow + Infiltration, Peak to Peak Detention Time)	717.000 min
Time to Peak (Inflow, Peak to Peak Detention Time)	714.000 min
Detention Time (Peak to Peak)	3.000 min
Time to Centroid (Outflow)	812.653 min
Time to Centroid (Inflow)	754.167 min
Detention Time (Centroid to Centroid)	58.486 min
Weighted Average Plug Time	120.763 min
Maximum Plug Volume Plug Time	21.741 min
Maximum Inflow Plug Volume	1,746.594 ft^3
Time (Maximum Plug Volume, Start)	714.000 min
Time (Maximum Plug Volume, End)	717.000 min

Subsection: Level Pool Pond Routing Summary
Label: PO-1 (IN)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	2,054.25 ft
Volume (Initial)	0.000 ft³
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	3.000 min

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	10.02 ft³/s	Time to Peak (Flow, In)	714.000 min
Flow (Peak Outlet)	9.79 ft³/s	Time to Peak (Flow, Outlet)	717.000 min

Elevation (Water Surface, Peak)	2,059.05 ft
Volume (Peak)	5,972.159 ft³

Mass Balance (ft³)	
Volume (Initial)	0.000 ft³
Volume (Total Inflow)	26,323.000 ft³
Volume (Total Infiltration)	0.000 ft³
Volume (Total Outlet Outflow)	23,814.000 ft³
Volume (Retained)	2,484.000 ft³
Volume (Unrouted)	-26.000 ft³
Error (Mass Balance)	0.1 %

Subsection: Pond Inflow Summary
Label: PO-1 (IN)
Scenario: 1 Year

Return Event: 1 years
Storm Event: 1 Year

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-DA-A

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	POST-DA-A	13,697.331	714.000	5.40
Flow (In)	PO-1	13,697.331	714.000	5.40

Subsection: Pond Inflow Summary
Label: PO-1 (IN)
Scenario: 10 Year

Return Event: 10 years
Storm Event: 10 Year

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	POST-DA-A

Node Inflows

Inflow Type	Element	Volume (ft³)	Time to Peak (min)	Flow (Peak) (ft³/s)
Flow (From)	POST-DA-A	26,323.207	714.000	10.02
Flow (In)	PO-1	26,323.207	714.000	10.02

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VRRM CALCULATIONS

VRRM CALCULATIONS FOR EXISTING FILTERRA UNITS x 2

Drainage Area A

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)					0.00	0.00
Impervious Cover (acres)			0.60		0.60	0.95
				Total	0.60	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	1.30
Post Development Treatment Volume in D.A. A (ft^3)	2,069

14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0		0.60	0	0	2,069	2,069	74	0.00	1.30	0.96	0.34	
14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	

TOTAL IMPERVIOUS COVER TREATED (ac)	0.60	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	AREA CHECK: OK.

TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)	4.04
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	1.30
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.96
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr)	0.96
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr)	0.34

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr)	0.00

VRRM CALCULATIONS FOR RE-DEVELOPMENT

Project Name:	VTF - Gilbert St	CLEAR ALL	data input cells
Date:	7/27/2019		constant values
	Linear Development Project?	No	calculation cells
Site Information			final results

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* →	2.62	*Check:*	
		BMP Design Specifications List:	2013 Draft Stds & Specs
Maximum reduction required:	*20%*	*Linear project?*	No
The site's net increase in impervious cover (acres) is:	*0.15*	*Land cover areas entered correctly?*	✓
Post-Development TP Load Reduction for Site (lb/yr):	*1.23*	*Total disturbed area entered?*	✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed				0.49	0.49
Impervious Cover (acres)				2.13	2.13
					2.62

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 land					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed				0.34	0.34
Impervious Cover (acres)				2.28	2.28
Area Check	**OK.**	**OK.**	**OK.**	**OK.**	2.62

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre

Pre-ReDevelopment	Listed	Adjusted[1]
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	0.49	0.34
Weighted Rv(turf)	0.25	0.25
% Managed Turf	19%	14%
Impervious Cover (acres)	2.13	2.13
Rv(impervious)	0.95	0.95
% Impervious	81%	86%
Total Site Area (acres)	**2.62**	**2.47**
Site Rv	**0.82**	**0.85**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)

Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.34
Weighted Rv (turf)	0.25
% Managed Turf	13%
Impervious Cover (acres)	2.28
Rv(impervious)	0.95
% Impervious	87%
Final Site Area (acres)	**2.62**
Final Post Dev Site Rv	**0.86**

Land Cover Summary-Post

Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.34
Weighted Rv (turf)	0.25
% Managed Turf	14%
ReDev. Impervious Cover (acres)	2.13
Rv(impervious)	0.95
% Impervious	86%
Total ReDev. Site Area (acres)	**2.47**
ReDev Site Rv	**0.85**

Land Cover Summary-Post

Post-Development New Impervious	
New Impervious Cover (acres)	0.15
Rv(impervious)	0.95

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.1788	0.1757
Pre-ReDevelopment Treatment Volume (cubic feet)	7,790	7,654
Pre-ReDevelopment TP Load (lb/yr)	**4.89**	**4.81**
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	1.87	1.95
Baseline TP Load (lb/yr) (**0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*1.01*

Treatment Volume and Nutrient Load

Final Post-Development Treatment Volume (acre-ft)	0.1876
Final Post-Development Treatment Volume (cubic feet)	8,171
Final Post-Development TP Load (lb/yr)	**5.13**
Final Post-Development TP Load per acre (lb/acre/yr)	1.96

Post-ReDevelopment Treatment Volume (acre-ft)	0.1757
Post-ReDevelopment Treatment Volume (cubic feet)	7,654
Post-ReDevelopment Load (TP) (lb/yr)*	**4.81**
Post-ReDevelopment TP Load per acre (lb/acre/yr)	1.95
Max. Reduction Required (Below Pre-ReDevelopment Load)	**20%**
TP Load Reduction Required for Redeveloped Area (lb/yr)	**0.96**

Post-Development Treatment Volume (acre-ft)	0.0119
Post-Development Treatment Volume (cubic feet)	517
Post-Development TP Load (lb/yr)	**0.33**
TP Load Reduction Required for New Impervious Area (lb/yr)	**0.26**

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requriement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**1.23**

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	35.01	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	36.73

Drainage Area A

CLEAR BMP AREAS

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)					0.00	0.00
Managed Turf (acres)					0.00	0.00
Impervious Cover (acres)			1.86		1.86	0.95
				Total	1.86	

Total Phosphorus Available for Removal in D.A. A (lb/yr)	4.03
Post Development Treatment Volume in D.A. A (ft^3)	6,414

Stormwater Best Management Practices (RR = Runoff Reduction)

--Select from dropdown lists--

Practice	Runoff Reduction Credit (%)	Managed Turf Credit Area (acres)	Impervious Cover Credit Area (acres)	Volume from Upstream Practice (ft^3)	Runoff Reduction (ft^3)	Remaining Runoff Volume (ft^3)	Total BMP Treatment Volume (ft^3)	Phosphorus Removal Efficiency (%)	Phosphorus Load from Upstream Practices (lb)	Untreated Phosphorus Load to Practice (lb)	Phosphorus Removed By Practice (lb)	Remaining Phosphorus Load (lb)	Downstream Practice to be Employed
1. Vegetated Roof (RR)													
1.a. Vegetated Roof #1 (Spec #5)	45		0.08		124	152	276	0		0.17	0.08	0.10	14.b. MTD - Filtering
1.b. Vegetated Roof #2 (Spec #5)	60				0	0	0	0		0.00	0.00	0.00	
2. Rooftop Disconnection (RR)													
2.a. Simple Disconnection to A/B Soils (Spec #1)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.b. Simple Disconnection to C/D Soils (Spec #1)	25			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.c. To Soil Amended Filter Path as per specifications (existing C/D soils) (Spec #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.d. To Dry Well or French Drain #1, Micro-Infilration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.e. To Dry Well or French Drain #2, Micro-Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.f. To Rain Garden #1, Micro-Bioretention #1 (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
2.g. To Rain Garden #2, Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
2.h. To Rainwater Harvesting (Spec #6)	0			0	0	0	0	0	0.00	0.00	0.00	0.00	
2.i. To Stormwater Planter, Urban Bioretention (Spec #9, Appendix A)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
3. Permeable Pavement (RR)													
3.a. Permeable Pavement #1 (Spec #7)	45			0	0	0	0	25	0.00	0.00	0.00	0.00	
3.b. Permeable Pavement #2 (Spec #7)	75				0	0	0	25		0.00	0.00	0.00	
4. Grass Channel (RR)													

4.a. Grass Channel A/B Soils (Spec #3)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.b. Grass Channel C/D Soils (Spec #3)	10			0	0	0	0	15	0.00	0.00	0.00	0.00	
4.c. Grass Channel with Compost Amended Soils as per specs (see Spec #4)	20			0	0	0	0	15	0.00	0.00	0.00	0.00	
5. Dry Swale (RR)													
5.a. Dry Swale #1 (Spec #10)	40			0	0	0	0	20	0.00	0.00	0.00	0.00	
5.b. Dry Swale #2 (Spec #10)	60			0	0	0	0	40	0.00	0.00	0.00	0.00	
6. Bioretention (RR)													
6.a. Bioretention #1 or Micro-Bioretention #1 or Urban Bioretention (Spec #9)	40			0	0	0	0	25	0.00	0.00	0.00	0.00	
6.b. Bioretention #2 or Micro-Bioretention #2 (Spec #9)	80			0	0	0	0	50	0.00	0.00	0.00	0.00	
7. Infiltration (RR)													
7.a. Infiltration #1 (Spec #8)	50			0	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	90			0	0	0	0	25	0.00	0.00	0.00	0.00	
8. Extended Detention Pond (RR)													
8.a. ED #1 (Spec #15)	0			0	0	0	0	15	0.00	0.00	0.00	0.00	
8.b. ED #2 (Spec #15)	15			0	0	0	0	15	0.00	0.00	0.00	0.00	
9. Sheetflow to Filter/Open Space (RR)													
9.a. Sheetflow to Conservation Area, A/B Soils (Spec #2)	75			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.b. Sheetflow to Conservation Area, C/D Soils (Spec #2)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	
9.c. Sheetflow to Vegetated Filter Strip, A Soils or Compost Amended B/C/D Soils (Spec #2 & #4)	50			0	0	0	0	0	0.00	0.00	0.00	0.00	

TOTAL IMPERVIOUS COVER TREATED (ac)	0.08	**AREA CHECK: OK.**
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	**AREA CHECK: OK.**
TOTAL RUNOFF REDUCTION IN D.A. A (ft^3)	124	

TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	4.03
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.08
TOTAL PHOSPHORUS REMAINING AFTER APPLYING RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	3.95

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

10. Wet Swale (no RR)													
10.a. Wet Swale #1 (Spec #11)	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
10.b. Wet Swale #2 (Spec #11)	0			0	0	0	0	40	0.00	0.00	0.00	0.00	
11. Filtering Practices (no RR)													
11.a.Filtering Practice #1 (Spec #12)	0			0	0	0	0	60	0.00	0.00	0.00	0.00	
11.b. Filtering Practice #2 (Spec #12)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
12. Constructed Wetland (no RR)													
12.a.Constructed Wetland #1 (Spec #13)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
12.b. Constructed Wetland #2 (Spec #13)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13. Wet Ponds (no RR)													
13.a. Wet Pond #1 (Spec #14)	0			0	0	0	0	50	0.00	0.00	0.00	0.00	
13.b. Wet Pond #1 (Coastal Plain) (Spec #14)	0			0	0	0	0	45	0.00	0.00	0.00	0.00	
13.c. Wet Pond #2 (Spec #14)	0			0	0	0	0	75	0.00	0.00	0.00	0.00	
13.d. Wet Pond #2 (Coastal Plain) (Spec #14)	0			0	0	0	0	65	0.00	0.00	0.00	0.00	
14. Manufactured Treatment Devices (no RR)													
14.a. Manufactured Treatment Device-Hydrodynamic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	
14.b. Manufactured Treatment Device-Filtering	0		1.60	152	0	5,669	5,669	40	0.10	3.46	1.42	2.13	
14.c. Manufactured Treatment Device-Generic	0			0	0	0	0	20	0.00	0.00	0.00	0.00	

TOTAL IMPERVIOUS COVER TREATED (ac)	1.68	**AREA CHECK: OK.**
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	**AREA CHECK: OK.**
TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)	1.23	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	4.03	
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	1.42	

TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.08
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr)	1.50
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr)	2.53

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.56
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr)	0.56

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER (ac)	1.86	0.11	0.15	0.00	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	1.68	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA (ac)	0.00	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA TREATED (ac)	0.00	0.00	0.00	0.00	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

Site Treatment Volume (ft^3)	8,171

Runoff Reduction Volume and TP By Drainage Area	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft^3)	124	0	0	0	0	124
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	4.03	0.24	0.33	0.00	0.00	4.59
TP LOAD REDUCTION ACHIEVED (lb/yr)	1.50	0.00	0.00	0.00	0.00	1.50
TP LOAD REMAINING (lb/yr)	2.53	0.24	0.33	0.00	0.00	3.09
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.56	0.00	0.00	0.00	0.00	0.56

Total Phosphorus		
FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	5.13	
TP LOAD REDUCTION REQUIRED (lb/yr)	1.23	
TP LOAD REDUCTION ACHIEVED (lb/yr)	1.50	
TP LOAD REMAINING (lb/yr):	3.63	
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	0.00	**

** TARGET TP REDUCTION EXCEEDED BY 0.28 LB/YEAR **

Total Nitrogen (For Information Purposes)	
POST-DEVELOPMENT LOAD (lb/yr)	36.73
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.56
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	36.17