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September 1, 2022

9R Burlake Road, LLC
c/o Tarbell, Heintz & Assoc. Inc.
1227 Burnside Ave.
East Hartford, Connecticut

Re: Supplemental Hydraulic Calculations
Gay Hill Road
Montville, Connecticut

Dear Mr. Tarbell:

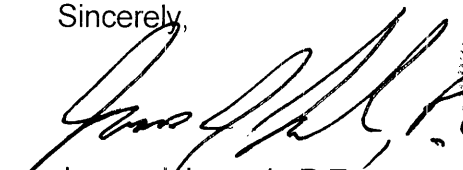
Please find attached, our supplemental hydraulic calculations pertaining to the proposed site development at 120 Gay Hill Road, Montville, Connecticut. As requested, the following calculations were run to update the rainfall data from TP-40 to the new Northeast Regional Climate Center (NRCC) 24-hour values. No other information from the original report was altered.

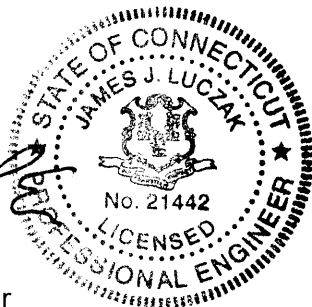
A TR-55 computer models were developed to show the peak flow for the present site conditions and for the proposed site improvements. The results of these models are summarized on the following pages and well as the TR-55 output for each drainage area.

In conclusion, the proposed site improvements and structures will decrease the peak flows for all rainfall return periods, except the 2-year rainfall period on 5 of the 8 post development drainage areas. These small increases will be reduced to below pre-development values by the incorporation of individual underground infiltration systems for roof runoff.

If you have any questions regarding this report, please contact me at your convenience at 860-896-0222.

Sincerely,


James J. Luczak, P.E.
Design/Construction Engineer



Storm Data

New London NRCC_C County, CT (NRCS)

To replace these storm data with those compiled by the NRCS for New London NRCC_C County, CT, click on the command button below.

Please select a rainfall distribution type from the list below. The list includes the standard WinTR-20 / WinTR-55 types and any number of user-defined distributions.

Rainfall Distribution Type:

Type NR_C

Rainfall Return Period (yr)	24-Hr Rainfall Amount (in)
<input type="text" value="2"/>	3.35
<input type="text" value="5"/>	4.14
10	4.85
25	5.99
50	7.03
100	8.25
<input type="text" value="1"/>	2.8

OLD TP-40

3.4"

5.5"

5.7"

6.3"

7.1"

WinTR-55 frequently asked precipitation questions

September 27, 2012

Why were NOAA 14 and Northeast Regional Climate Center (NRCC) rainfall data added to WinTR-55 and how do I use the data?

NOAA National Weather Service has been developing new rainfall atlases for over ten years and has completed seven volumes which cover the states of CA, NV, AZ, UT, NM, IN, OH, KY, TN, SC, NC, VA, WV, MD, DE, PA, NJ, AK, and HI. Rainfall atlases were also completed for the District of Columbia, Puerto Rico, US Virgin Islands, and selected Pacific Islands. These new rainfall atlases update and supersede data contained in TP-40, NOAA Atlas 2, and other prior atlases in the various states and possessions.

NOAA National Weather Service (NWS) has a web site where site-specific rainfall values may be accessed. It is: <http://hdsc.nws.noaa.gov/hdsc/pfds/>

The Northeast Regional Climate Center (NRCC) completed rainfall-frequency analyses for CT, MA, ME, NH, NY, RI, and VT. These data are available at the web site: <http://www.precip.net>

Both web sites provide a table of rainfall frequency data at specific locations (such as specific latitude and longitude) in a user-friendly map-based web-browser environment.

WinTR-55 has an associated rainfall database with 24-hour rainfall values. To save the user's time, values for counties and parts of counties in a number of states with NOAA 14 and NRCC data are included in the WinTR-55 rainfall database. These generally represent mean values for the various return periods from 1-year to 100-years. To use NOAA or NRCC data, select the state and county where the project is located. Open the Storm Data window and click the NRCS Storm Data button. If site-specific rainfall data are desired, it is recommended to visit the appropriate web site and download the rainfall data. These may then be entered into the WinTR-55 Storm Data window.

For IN, OH, KY, TN, SC, NC, VA, WV, MD, DC, DE, PA, and NJ new rainfall distributions were developed based on the NOAA 14 rainfall data. These are defined as NO_A, NO_B, NO_C, and NO_D rainfall distributions in the WinTR-55 software. These replace the Type II and Type III rainfall distributions which were used previously in these states. The Type II and Type III rainfall distributions were based on the TP-40 and Hydro-35 rainfall atlases which were published in 1961 and 1977, respectively.

For CT, MA, ME, NH, NY, RI, and VT new rainfall distributions were developed based on the NRCC rainfall data. These are defined as NR_A, NR_B, NR_C, and NR_D rainfall distributions in the WinTR-55 software. These replace the Type II and Type III rainfall distributions which were used previously in these states. The Type II and Type III rainfall distributions were based on the TP-40 and Hydro-35 rainfall atlases which were published in 1961 and 1977, respectively.

The WinTR-55 rainfall database includes both the 24-hour rainfall values and the recommended rainfall distribution to be used in that county. These data are imported when the NRCS Storm Data button is clicked.

Why were more dimensionless hydrographs added to WinTR-55 and how do I use them?

In the updated version of the NRCS National Engineering Handbook (NEH) Part 630 Chapter 16 – Hydrographs, dimensionless hydrographs for peak rate factors from 100 to 600 at an interval of 50 were published. These have been added to WinTR-55 to allow more choices than just the standard NRCS and Delmarva dimensionless unit hydrographs that were in WinTR-55 previously. The dimensionless unit hydrographs were added in order to make the WinTR-55 software more consistent with the NRCS technical publication. Chapter 16 is available from the internet at the web site: <http://go.usa.gov/rXYw> and click Technical Information and National Engineering Handbook.

Chapter 16 explains how the dimensionless hydrographs were developed and their various uses. At the most basic level, the dimensionless unit hydrograph is a representation of storage in a watershed. Storage not in the sense of dams, detention ponds, and storage structures but storage in the sense of watershed land storage reflected by the slope, efficiency of drainage network, and how much the soil acts as a storage element. The 100 and 600 limits on the peak rate factor of the dimensionless unit hydrograph are based on some research in various parts of the United States. No specific guidance has been developed to select the peak rate factor for a watershed. The Delmarva dimensionless unit hydrograph with peak rate factor of 282 was developed for use in the Delaware, Maryland, Virginia Peninsula. It was based on analysis of flood events in several gaged watersheds. The watersheds in this region are generally characterized by rural land uses, mild slopes, with significant amounts of wetlands and sandy soils.

Chapter 16 explains use of dimensionless hydrographs in model calibration. Calibration is the adjustment of the peak rate factor (and other model parameters such as time of concentration and curve number) to bring model results closer to measured peak discharges. Hopefully, the model will then be more realistic for making estimates of significant flood events such as the 1-year through 100-year events.

To use the dimensionless unit hydrographs, on the main WinTR-55 window, open the pull-down selection for Dimensionless Unit Hydrographs and select the appropriate one. To plot any of the dimensionless unit hydrographs, open the Dimensionless Unit Hydrograph data window, select one and then select plot.

SUMMARY

Area to Champion Mortgage to the Northeast

Return Period (Years)	Type	Pre-Development (cfs)	Post-Development (cfs)	Impact
100	Rate	3.5	3.5	no change
50	Rate	2.8	2.8	no change
25	Rate	2.2	2.2	no change
10	Rate	1.5	1.5	no change
2	Rate	0.7	.8*	see note

Output File

E3

P36

* - Further reduction of 1.2 cfs is achieved by inclusion of underground infiltration systems that serve as detention basins for roof runoff on individual lots. Net reduction for 2 year storm is 1.8 cfs.

Area to Fernandes Property to East

Return Period (Years)	Type	Pre-Development (cfs)	Post-Development (cfs)	Impact
100	Rate	3.3	3.1	reduced by 0.2 cfs
50	Rate	2.6	2.5	reduced by 0.1 cfs
25	Rate	2.0	2.0	no change
10	Rate	1.4	1.4	no change
2	Rate	0.7	0.7	no change

Output File

E4

P35

Area to Jenson Property to Southeast

Return Period (Years)	Type	Pre-Development (cfs)	Post-Development (cfs)	Impact
100	Rate	9.2	9.0	reduced by 0.2 cfs
50	Rate	7.3	7.2	reduced by 0.1 cfs
25	Rate	5.6	5.6	no change
10	Rate	3.9	3.9	no change
2	Rate	1.9	2.0*	see note

Output File

E7

P32

* - Further reduction of 1.2 cfs is achieved by inclusion of underground infiltration systems that serve as detention basins for roof runoff on individual lots. Net reduction for 2 year storm is 1.8 cfs.

Area to Pond 3 to Marsela Property Southeast

Return Period (Years)	Type	Pre-Development (cfs)	Post-Development (cfs)	Impact
100	Rate	51.5	47.9	reduced by 3.6 cfs
50	Rate	40.8	38.3	reduced by 2.5 cfs
25	Rate	31.8	30.2	reduced by 0.6 cfs
10	Rate	22.3	21.7	reduced by 0.5cfs
2	Rate	10.8	11.4*	see note

Output File

E8

P8_DB3

* - Further reduction of 1.2 cfs is achieved by inclusion of underground infiltration systems that serve as detention basins for roof runoff on individual lots. Net reduction for 2 year storm is 1.8 cfs.

WinTR-55 Current Data Description

--- Identification Data ---

User: JJLuczak Date: 9/1/2022
 Project: Gay Hill Road - Cornerstone Units: English
 SubTitle: Updated drainage calcs - Existing Conditions Areal Units: Acres
 State: Connecticut
 County: New London NRCC_C
 Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_pre2.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
E1		Outlet	8	76	0.420
E2		Outlet	2.49	73	0.373
E3		Outlet	0.9	73	0.376
E4		Outlet	0.69	73	0.246
E5		Outlet	13.19	74	0.680
E6		Outlet	3.41	73	0.405
E7		Outlet	2.42	73	0.396
E8		Outlet	16.13	74	0.576

Total area: 47.23 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
 Rainfall Distribution Type: Type NR_C
 Dimensionless Unit Hydrograph: <standard>

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Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
E1	7.17	14.15	19.82	25.15	31.42
E2	1.98	4.16	5.97	7.68	9.76
E3	0.72	1.50	2.15	2.78	3.52
E4	0.67	1.41	2.02	2.59	3.28
E5	8.07	16.62	23.71	30.38	38.45
E6	2.61	5.47	7.85	10.11	12.81
E7	1.87	3.92	5.63	7.26	9.19
E8	10.84	22.32	31.81	40.80	51.55
REACHES					
OUTLET	31.93	65.72	93.58	119.93	151.35

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
E1	7.17 12.32	14.15 12.31	19.82 12.29	25.15 12.30	31.42 12.31
E2	1.98 12.28	4.16 12.29	5.97 12.27	7.68 12.28	9.76 12.27
E3	0.72 12.29	1.50 12.27	2.15 12.29	2.78 12.27	3.52 12.27
E4	0.67 12.20	1.41 12.20	2.02 12.19	2.59 12.20	3.28 12.19
E5	8.07 12.49	16.62 12.49	23.71 12.48	30.38 12.45	38.45 12.45
E6	2.61 12.31	5.47 12.31	7.85 12.30	10.11 12.30	12.81 12.30
E7	1.87 12.32	3.92 12.30	5.63 12.28	7.26 12.28	9.19 12.29
E8	10.84 12.43	22.32 12.40	31.81 12.41	40.80 12.41	51.55 12.40
REACHES					
OUTLET	31.93	65.72	93.58	119.93	151.35

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period				
Structure Identifier	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
E1	8.00	0.420	76	Outlet	
E2	2.49	0.373	73	Outlet	
E3	.90	0.376	73	Outlet	
E4	.69	0.246	73	Outlet	
E5	13.19	0.680	74	Outlet	
E6	3.41	0.405	73	Outlet	
E7	2.42	0.396	73	Outlet	
E8	16.13	0.576	74	Outlet	
Total Area:		47.23 (ac)			

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Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
E1							
User-provided							0.420
					Time of Concentration		0.420 =====
E2							
User-provided							0.373
					Time of Concentration		0.373 =====
E3							
User-provided							0.376
					Time of Concentration		0.376 =====
E4							
User-provided							0.246
					Time of Concentration		0.246 =====
E5							
User-provided							0.680
					Time of Concentration		0.680 =====
E6							
User-provided							0.405
					Time of Concentration		0.405 =====
E7							
User-provided							0.396
					Time of Concentration		0.396 =====
E8							
User-provided							0.576
					Time of Concentration		0.576 =====

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Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
E1	CN directly entered by user	-	8	76
	Total Area / Weighted Curve Number		8 =	76 ==
E2	CN directly entered by user	-	2.49	73
	Total Area / Weighted Curve Number		2.49 ====	73 ==
E3	CN directly entered by user	-	.9	73
	Total Area / Weighted Curve Number		.9 ==	73 ==
E4	CN directly entered by user	-	.69	73
	Total Area / Weighted Curve Number		.69 ===	73 ==
E5	CN directly entered by user	-	13.19	74
	Total Area / Weighted Curve Number		13.19 =====	74 ==
E6	CN directly entered by user	-	3.41	73
	Total Area / Weighted Curve Number		3.41 =====	73 ==
E7	CN directly entered by user	-	2.42	73
	Total Area / Weighted Curve Number		2.42 =====	73 ==
E8	CN directly entered by user	-	16.13	74
	Total Area / Weighted Curve Number		16.13 =====	74 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Existing Conditions
New London NRCC_C County, Connecticut
Structure Rating Details - Computed

WinTR-55 Current Data Description

--- Identification Data ---

User: JJLuczak Date: 9/1/2022
 Project: Gay Hill Road - Cornerstone Units: English
 SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
 State: Connecticut
 County: New London NRCC_C
 Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB1.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P1		P1DB1	1.81	80	0.300
P1-bypass		Outlet	6.43	76	0.436

Total area: 8.24 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
 Rainfall Distribution Type: Type NR_C
 Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P1	2.36	4.33	5.87	7.32	9.01
P1-bypass	5.65	11.15	15.63	19.84	24.80
REACHES					
P1DB1	2.36	4.33	5.87	7.32	9.01
Down	1.76	2.22	2.54	2.83	3.18
OUTLET	7.41	13.27	18.03	22.42	27.69

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P1	2.36 12.23	4.33 12.22	5.87 12.23	7.32 12.23	9.01 12.23
P1-bypass	5.65 12.33	11.15 12.31	15.63 12.30	19.84 12.31	24.80 12.29
REACHES					
P1DB1	2.36 12.23	4.33 12.22	5.87 12.23	7.32 12.23	9.01 12.23
Down	1.76 12.37	2.22 12.45	2.54 12.50	2.83 12.55	3.18 12.57
OUTLET	7.41	13.27	18.03	22.42	27.69

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier Peak Flow (PF), Storage Volume (SV), Stage (STG)
by Rainfall Return Period

Structure Identifier 2-Yr 10-Yr 25-Yr 50-Yr 100-Yr

Reach: P1DB1

Pipe : DB1

8(in)

PF (cfs)	1.76	2.22	2.54	2.83	3.18
SV (ac ft)	.02	.06	.09	.14	.19
STG (ft)	.44	1.10	1.68	2.27	2.98

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P1	1.81	0.300	80	P1DB1	
P1-bypass	6.43	0.436	76	Outlet	
Total Area:	8.24 (ac)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
P1DB1	Outlet		STRUCTURE(DB1)

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Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P1							
User-provided							0.300
					Time of Concentration		0.300
							=====
P1-bypass							
User-provided							0.436
					Time of Concentration		0.436
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P1	CN directly entered by user	-	1.81	80
	Total Area / Weighted Curve Number		1.81 ====	80 ==
P1-bypass	CN directly entered by user	-	6.43	76
	Total Area / Weighted Curve Number		6.43 ====	76 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
P1DB1	(This reach is a structure: DB1)				

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
P1DB1	(This reach is a structure: DB1)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)
P1DB1	0.042	3.2	0.084	8	1	

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Rating Details - Computed

Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Pipe Diameter		
			Dia #1 8in	Dia #2 in	Dia #3 in
DB1	0	0.00	0.000		
	0.33	0.01	1.676		
	0.67	0.03	1.935		
	1.33	0.07	2.370		
	3.33	0.21	3.351		
	6.67	0.57	4.537		
	13.33	1.73	6.269		

WinTR-55 Current Data Description

--- Identification Data ---

User: JLuczak Date: 9/1/2022
Project: Gay Hill Road - Cornerstone Units: English
SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
State: Connecticut
County: New London NRCC_C
Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB1.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P2		Outlet	1.61	78	0.373

Total area: 1.61 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P2	1.71	3.25	4.49	5.63	6.98
REACHES					
OUTLET	1.71	3.25	4.49	5.63	6.98

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P2	1.71	3.25	4.49	5.63	6.98
	12.29	12.27	12.27	12.28	12.25
REACHES					
OUTLET	1.71	3.25	4.49	5.63	6.98

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period				
Structure Identifier	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P2	1.61	0.373	78	Outlet	

Total Area: 1.61 (ac)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P2							
User-provided							0.373
					Time of Concentration		0.373
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P2	CN directly entered by user	-	1.61	78
Total Area / Weighted Curve Number			1.61 ====	78 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut
Structure Rating Details - Computed

WinTR-55 Current Data Description

--- Identification Data ---

User: JLuczak Date: 9/1/2022
 Project: Gay Hill Road - Cornerstone Units: English
 SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
 State: Connecticut
 County: New London NRCC_C
 Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB1.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P36		Outlet	0.86	76	0.376

Total area: .86 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
 Rainfall Distribution Type: Type NR_C
 Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P36	0.81	1.60	2.24	2.85	3.56
REACHES					
OUTLET	0.81	1.60	2.24	2.85	3.56

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P36	0.81	1.60	2.24	2.85	3.56
	12.29	12.29	12.28	12.28	12.28
REACHES					
OUTLET	0.81	1.60	2.24	2.85	3.56

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period				
Structure Identifier	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P36	.86	0.376	76	Outlet	

Total Area:	.86 (ac)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P36							
User-provided							0.376
					Time of Concentration		0.376
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P36	CN directly entered by user	-	.86	76
Total Area / Weighted Curve Number			.86 ===	76 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut
Structure Rating Details - Computed

WinTR-55 Current Data Description

--- Identification Data ---

User: JLuczak Date: 9/1/2022
Project: Gay Hill Road - Cornerstone Units: English
SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
State: Connecticut
County: New London NRCC_C
Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB1.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P35		Outlet	0.6	77	0.246

Total area: .60 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: New London NRCC_C County, CT (NRCS)
Rainfall Distribution Type: Type NR_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P35	0.74	1.42	1.97	2.48	3.10
REACHES					
OUTLET	0.74	1.42	1.97	2.48	3.10

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P35	0.74	1.42	1.97	2.48	3.10
	12.20	12.20	12.19	12.20	12.20
REACHES					
OUTLET	0.74	1.42	1.97	2.48	3.10

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period				
Structure Identifier	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P35	.60	0.246	77	Outlet	

Total Area:	.60 (ac)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P35							
User-provided							0.246
					Time of Concentration		0.246
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P35	CN directly entered by user	-	.6	77
Total Area / Weighted Curve Number			.6 ==	77 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut
Structure Rating Details - Computed

WinTR-55 Current Data Description

--- Identification Data ---

User: JJLuczak Date: 9/2/2022
 Project: Gay Hill Road - Cornerstone Units: English
 SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
 State: Connecticut
 County: New London NRCC_C
 Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB1.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P5		P5DB2	1.25	82	0.100
P5-Bypass		Outlet	10.38	76	0.577

Total area: 11.63 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: NRCC_C
 Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: NRCC_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P5	2.68	4.70	6.26	7.70	9.38
P5-Bypass	7.84	15.48	21.70	27.56	34.59
REACHES					
P5DB2	2.68	4.70	6.26	7.70	9.38
Down	1.35	1.48	1.59	1.69	1.80
OUTLET	9.04	16.95	23.29	29.24	36.37

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P5	2.68 12.12	4.70 12.12	6.26 12.12	7.70 12.12	9.38 12.12
P5-Bypass	7.84 12.42	15.48 12.42	21.70 12.42	27.56 12.38	34.59 12.39
REACHES					
P5DB2	2.68 12.12	4.70 12.12	6.26 12.12	7.70 12.12	9.38 12.12
Down	1.35 12.21	1.48 12.29	1.59 12.35	1.69 12.38	1.80 12.43
OUTLET	9.04	16.95	23.29	29.24	36.37

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier Peak Flow (PF), Storage Volume (SV), Stage (STG)
by Rainfall Return Period

Structure Identifier 2-Yr 10-Yr 25-Yr 50-Yr 100-Yr

Reach: P5DB2

Pipe : DB2

6(in)

PF (cfs)	1.35	1.48	1.59	1.69	1.80
SV (ac ft)	.02	.06	.09	.12	.16
STG (ft)	.30	.72	1.11	1.50	1.94

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P5	1.25	0.100	82	P5DB2	
P5-Bypass	10.38	0.577	76	Outlet	
Total Area:	11.63 (ac)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
P5DB2	Outlet		STRUCTURE(DB2)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P5							
User-provided							0.100
					Time of Concentration		0.100
							=====
P5-Bypass							
User-provided							0.577
					Time of Concentration		0.577
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P5	CN directly entered by user	-	1.25	82
	Total Area / Weighted Curve Number		1.25 ====	82 ==
P5-Bypass	CN directly entered by user	-	10.38	76
	Total Area / Weighted Curve Number		10.38 =====	76 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
P5DB2	(This reach is a structure: DB2)				

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
P5DB2	(This reach is a structure: DB2)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)
P5DB2	0.08	5	0.1	6	2	

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Rating Details - Computed

Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Pipe Diameter		
			Dia #1 6in	Dia #2 in	Dia #3 in
DB2	0	0.00	0.000		
	0.25	0.02	1.333		
	0.5	0.04	1.414		
	1	0.08	1.563		
	2.5	0.21	1.943		
	5	0.45	2.449		
	10	1.00	3.231		

WinTR-55 Current Data Description

--- Identification Data ---

User: JLuczak Date: 9/2/2022
Project: Gay Hill Road - Cornerstone Units: English
SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
State: Connecticut
County: New London NRCC_C
Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB2.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P33		Outlet	2.72	75	0.405

Total area: 2.72 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: NRCC_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: NRCC_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P33	2.35	4.72	6.67	8.50	10.68
REACHES					
OUTLET	2.35	4.72	6.67	8.50	10.68

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P33	2.35	4.72	6.67	8.50	10.68
	12.31	12.29	12.29	12.29	12.29
REACHES					
OUTLET	2.35	4.72	6.67	8.50	10.68

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period				
Structure Identifier	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P33	2.72	0.405	75	Outlet	
Total Area:		2.72 (ac)			

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P33							
User-provided							0.405
					Time of Concentration		0.405
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P33	CN directly entered by user	-	2.72	75
Total Area / Weighted Curve Number			2.72 ====	75 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut
Structure Rating Details - Computed

WinTR-55 Current Data Description

--- Identification Data ---

User: JLuczak Date: 9/2/2022
 Project: Gay Hill Road - Cornerstone Units: English
 SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
 State: Connecticut
 County: New London NRCC_C
 Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB2.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P32		Outlet	2.28	75	0.396

Total area: 2.28 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: NRCC_C
 Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: NRCC_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P32	1.99	3.99	5.65	7.20	9.03
REACHES					
OUTLET	1.99	3.99	5.65	7.20	9.03

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS

P32	1.99	3.99	5.65	7.20	9.03
	12.31	12.28	12.27	12.28	12.29

REACHES

OUTLET	1.99	3.99	5.65	7.20	9.03
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JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period				
Structure Identifier	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P32	2.28	0.396	75	Outlet	

Total Area:	2.28 (ac)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P32							
User-provided							0.396
					Time of Concentration		0.396
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P32	CN directly entered by user	-	2.28	75
Total Area / Weighted Curve Number			2.28 ====	75 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut
Structure Rating Details - Computed

WinTR-55 Current Data Description

--- Identification Data ---

User: JJLuczak Date: 9/20/2022
 Project: Gay Hill Road - Cornerstone Units: English
 SubTitle: Updated drainage calcs - Proposed Conditions Areal Units: Acres
 State: Connecticut
 County: New London NRCC_C
 Filename: C:\Users\Civil_X\AppData\Roaming\WinTR-55\GayHill_post_DB3.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
P8		P8DB3	8.75	81	0.374
P8-Bypass		Outlet	10.94	74	0.348

Total area: 19.69 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
 Rainfall Distribution Type: NRCC_C
 Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.35	4.14	4.85	5.99	7.03	8.25	2.8

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: NRCC_C
Dimensionless Unit Hydrograph: <standard>

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period				
	2-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)

SUBAREAS					
P8	10.76	19.44	26.22	32.54	39.95
P8-Bypass	9.60	19.70	28.00	35.88	45.30
REACHES					
P8DB3	10.76	19.44	26.22	32.54	39.95
Down	2.04	2.51	2.81	3.09	3.40
OUTLET	11.35	21.72	30.23	38.31	47.90

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period				
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)

SUBAREAS					
P8	10.76 12.27	19.44 12.27	26.22 12.28	32.54 12.27	39.95 12.27
P8-Bypass	9.60 12.27	19.70 12.26	28.00 12.25	35.88 12.25	45.30 12.25
REACHES					
P8DB3	10.76 12.27	19.44 12.27	26.22 12.28	32.54 12.27	39.95 12.27
Down	2.04 13.19	2.51 13.54	2.81 13.72	3.09 13.85	3.40 14.06
OUTLET	11.35	21.72	30.23	38.31	47.90

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Output Table

Reach Identifier Peak Flow (PF), Storage Volume (SV), Stage (STG)
by Rainfall Return Period

Structure Identifier 2-Yr 10-Yr 25-Yr 50-Yr 100-Yr

Reach: P8DB3

Pipe : DB3

8(in)

PF (cfs)	2.04	2.51	2.81	3.09	3.40
SV (ac ft)	.44	.93	1.35	1.74	2.24
STG (ft)	.83	1.62	2.23	2.80	3.47

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
P8	8.75	0.374	81	P8DB3	
P8-Bypass	10.94	0.348	74	Outlet	
Total Area:	19.69 (ac)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
P8DB3	Outlet		STRUCTURE(DB3)

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)

P8							
User-provided							0.374
					Time of Concentration		0.374
							=====
P8-Bypass							
User-provided							0.348
					Time of Concentration		0.348
							=====

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
P8	CN directly entered by user	-	8.75	81
	Total Area / Weighted Curve Number		8.75 ====	81 ==
P8-Bypass	CN directly entered by user	-	10.94	74
	Total Area / Weighted Curve Number		10.94 =====	74 ==

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope

P8DB3	(This reach is a structure: DB3)				
Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)

P8DB3	(This reach is a structure: DB3)				

JJLuczak

Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)
P8DB3	0.49	2	0.66	8	1	

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Gay Hill Road - Cornerstone
Updated drainage calcs - Proposed Conditions
New London NRCC_C County, Connecticut

Structure Rating Details - Computed

Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Pipe Diameter		
			Dia #1 8in	Dia #2 in	Dia #3 in
DB3	0	0.00	0.000		
	0.33	0.17	1.676		
	0.67	0.35	1.935		
	1.33	0.73	2.370		
	3.33	2.11	3.351		
	6.67	5.16	4.537		
	13.33	14.09	6.269		