

Memorandum



To: Town of Kill Devil Hills

From: Kimley-Horn & Associates

Date: April 6, 2020

Subject: Harris Teeter Fuel Center #175 - Stormwater Memorandum

KHA #: 015640095

Harris Teeter Fuel Center #175 - Stormwater Memorandum

This memorandum is provided to describe the stormwater design and analysis conducted for the future Harris Teeter Fuel Center in Kill Devil Hills, NC. The 1.85 ± acre project site is located on South Croatan Highway (U.S. Highway 158) between West Fresh Pond Drive and West 8th Street. The development will consist of a 540 SF building and all associated site appurtenances for operation (i.e. parking, drive aisles, utilities, stormwater management, landscaping, etc.). Approximately 1.96 acres of land disturbance are proposed.

Generally, the site will be high-pointed at the fueling kiosk and drainage patterns will be maintained. Due to the decrease in impervious cover within the limits of disturbance, stormwater management practices to mitigate stormwater runoff are not required, as the post-development peak-runoff for the 10-year, 2-hour storm is less than the pre-development for the same storm event. However, infiltration swales are proposed as to not release water into the existing stormwater conveyance system adjacent to the site.

In accordance with stormwater requirements of the City of Kill Devil Hills, the proposed site shall be designed to attenuate the 10-year, 2-hour storm post-development peak discharge rates to pre-development peak discharge rates. This requirement will be met through the reduction in impervious area on the site compared to the pre-development condition.

The proposed development will detain the majority of the runoff on-site and utilize infiltration swales to reduce the overall post-development flow from the site and detain the 10-year, 2-hour storm onsite.

The system was modeled in Bentley HydroCAD 10.00-15, which utilizes the NRCS TR-55 (SCS) Method of calculating runoff, curve numbers, and time of concentration. A time of concentration of 5 minutes was used for both the pre-development and post-development

condition. Drainage area maps are provided as Figure 1 and Figure 2 for both the pre-development and post-development.

The Town of Kill Devil Hills provided a 10-year, 2-hour rainfall depth of 4.3 inches that was used to analyze the pre- and post-development conditions. Table 1 below shows the peak flow results from the HydroCAD model.

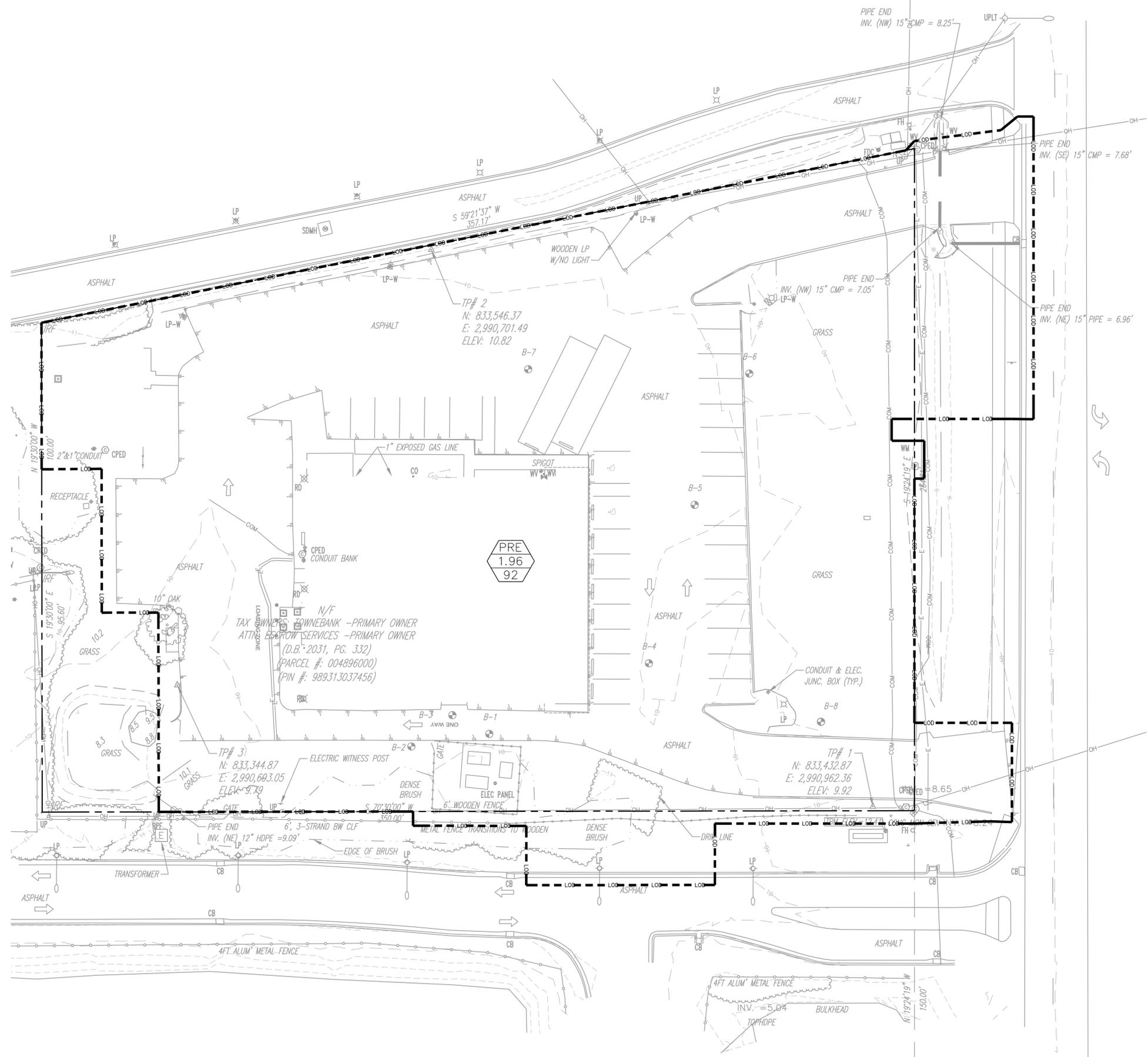
Table 1: Routing Results

Design Storm	Pre Development Peak Flow	Post Development Peak Flow	West Infiltration Swale Max Stage Elevation	East Infiltration Swale Max Stage Elevation
10-yr, 2-hour	38.61 cfs	17.41 cfs	10.91'	10.93'

The HydroCAD routing analysis is included as an attachment to this document.

FIGURE 1 - PRE-DEVELOPMENT DRAINAGE AREA MAP

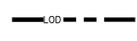
March 02, 2020 - 5:23pm By: dshahimkims
 K:\VAB_CWA\015640095 - HT Kill Devil Hills 02 - DWG\PreSheets\VA-01 PRE-DEVELOPMENT DRAINAGE AREA MAP.dwg



LEGEND



— DRAINAGE AREA DESCRIPTION
 — AREA (AC)
 — CURVE NUMBER



— LIMITS OF DISTURBANCE

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 200 SOUTH TRYON ST.
 SUITE 200
 CHARLOTTE, NC 28202
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NO.	DATE	REVISIONS

CLIENT: **HARRIS TEETER**

PROJECT: **HARRIS TEETER FUEL CENTER
 STORE #175 KILL DEVIL HILLS**
 2006 S CROATAN HIGHWAY
 KILL DEVIL HILLS, NORTH CAROLINA 27948
 DARE COUNTY

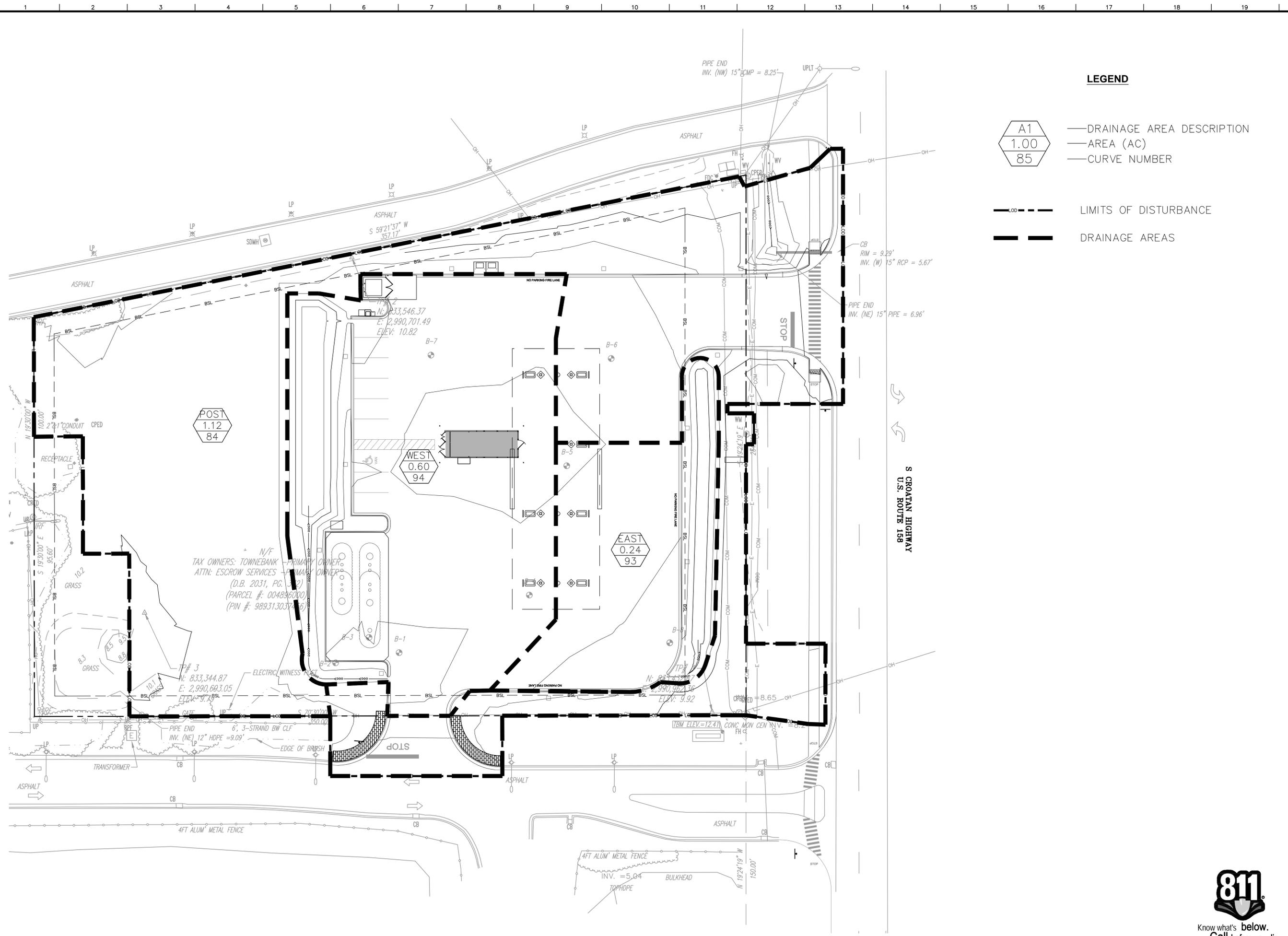
TITLE: **PRE-DEVELOPMENT
 DRAINAGE AREA MAP**

DESIGNED BY: AES
 DRAWN BY: AES
 CHECKED BY: MFJ
 DATE: DATE
 PROJECT#: 015640095

DA-01



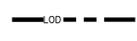
C:\Users\megan.fitzsimmons\OneDrive\Documents\995 Kill Devil Hills, NC Fuel Center\02 - DWG\PlanSheets\DA-02 POST-DEVELOPMENT DRAINAGE AREA MAP.dwg



LEGEND



— DRAINAGE AREA DESCRIPTION
 — AREA (AC)
 — CURVE NUMBER



--- LIMITS OF DISTURBANCE



--- DRAINAGE AREAS

N/F
 TAX OWNERS: TOWNEBANK - PRIMARY OWNER
 ATTN: ESCROW SERVICES - PRIMARY OWNER
 (D.B. 2031, PG. 3-2)
 (PARCEL #: 004836000)
 (PIN #: 98931303746)

T# 3
 N: 833,344.87
 E: 2,990,603.05
 ELEV: 9.73

T# 2
 N: 833,546.37
 E: 2,990,701.49
 ELEV: 10.82

EAST
 0.24
 93

WEST
 0.60
 94

POST
 1.12
 84

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CLIENT: **HARRIS TEETER**

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 STORE #175 KILL DEVIL HILLS**
 2006 S CROATAN HIGHWAY
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TITLE: **PRE-DEVELOPMENT
 DRAINAGE AREA MAP**

DESIGNED BY: AES
 DRAWN BY: AES
 CHECKED BY: MFJ
 DATE: 04/02/2020
 PROJECT#: 015640095

DA-01





Pre-DA



Swale West



West Swale



Swale East



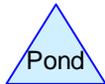
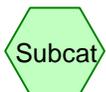
East Swale



Post-DA



Post-Dev



Routing Diagram for Kill Devil Hills - 175

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Kill Devil Hills - 175

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.960	92	(1S)
1.120	84	(2S)
0.600	94	(3S)
0.240	93	(6S)
3.920	90	TOTAL AREA

Kill Devil Hills - 175

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
3.920	Other	1S, 2S, 3S, 6S
3.920		TOTAL AREA

Kill Devil Hills - 175

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	3.920	3.920		1S, 2S, 3S, 6S
0.000	0.000	0.000	0.000	3.920	3.920	TOTAL AREA	

Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

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Time span=0.00-5.00 hrs, dt=0.05 hrs, 101 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Pre-DA Runoff Area=1.960 ac 0.00% Impervious Runoff Depth=3.41"
Tc=5.0 min CN=92 Runoff=38.61 cfs 0.557 af

Subcatchment 2S: Post-DA Runoff Area=1.120 ac 0.00% Impervious Runoff Depth=2.64"
Tc=5.0 min CN=84 Runoff=17.41 cfs 0.246 af

Subcatchment 3S: Swale West Runoff Area=0.600 ac 0.00% Impervious Runoff Depth=3.62"
Tc=5.0 min CN=94 Runoff=12.36 cfs 0.181 af

Subcatchment 6S: Swale East Runoff Area=0.240 ac 0.00% Impervious Runoff Depth=3.51"
Tc=5.0 min CN=93 Runoff=4.84 cfs 0.070 af

Pond 4P: West Swale Peak Elev=10.91' Storage=0.089 af Inflow=12.36 cfs 0.181 af
Discarded=2.49 cfs 0.181 af Primary=0.00 cfs 0.000 af Outflow=2.49 cfs 0.181 af

Pond 7P: East Swale Peak Elev=10.93' Storage=0.032 af Inflow=4.84 cfs 0.070 af
Discarded=1.03 cfs 0.070 af Primary=0.03 cfs 0.000 af Outflow=1.06 cfs 0.070 af

Link 10L: Post-Dev Inflow=17.41 cfs 0.246 af
Primary=17.41 cfs 0.246 af

Total Runoff Area = 3.920 ac Runoff Volume = 1.054 af Average Runoff Depth = 3.23"
100.00% Pervious = 3.920 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-DA

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 38.61 cfs @ 1.06 hrs, Volume= 0.557 af, Depth= 3.41"

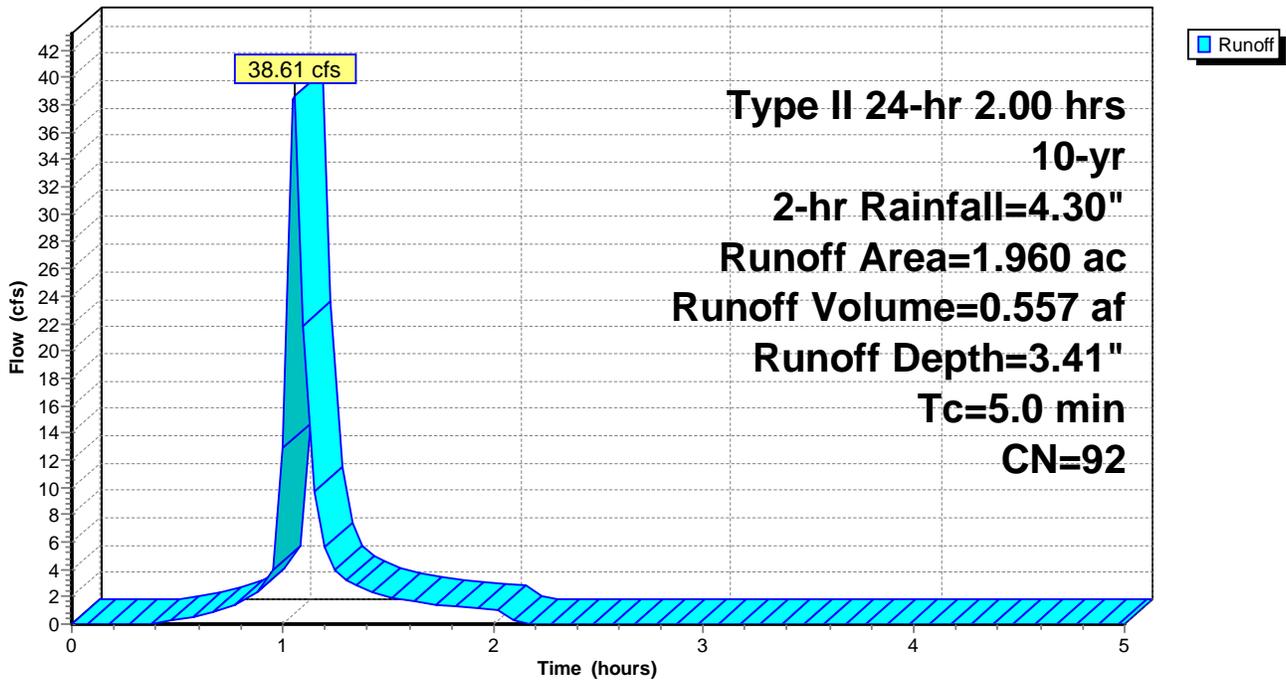
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-5.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Area (ac)	CN	Description
* 1.960	92	
1.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 1S: Pre-DA

Hydrograph



Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

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Hydrograph for Subcatchment 1S: Pre-DA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	2.70	4.30	3.41	0.00
0.05	0.03	0.00	0.00	2.75	4.30	3.41	0.00
0.10	0.05	0.00	0.00	2.80	4.30	3.41	0.00
0.15	0.08	0.00	0.00	2.85	4.30	3.41	0.00
0.20	0.12	0.00	0.00	2.90	4.30	3.41	0.00
0.25	0.15	0.00	0.00	2.95	4.30	3.41	0.00
0.30	0.18	0.00	0.00	3.00	4.30	3.41	0.00
0.35	0.22	0.00	0.02	3.05	4.30	3.41	0.00
0.40	0.26	0.01	0.09	3.10	4.30	3.41	0.00
0.45	0.30	0.02	0.20	3.15	4.30	3.41	0.00
0.50	0.34	0.03	0.33	3.20	4.30	3.41	0.00
0.55	0.39	0.04	0.47	3.25	4.30	3.41	0.00
0.60	0.44	0.06	0.62	3.30	4.30	3.41	0.00
0.65	0.50	0.09	0.78	3.35	4.30	3.41	0.00
0.70	0.56	0.12	0.95	3.40	4.30	3.41	0.00
0.75	0.63	0.16	1.21	3.45	4.30	3.41	0.00
0.80	0.72	0.21	1.59	3.50	4.30	3.41	0.00
0.85	0.81	0.27	1.97	3.55	4.30	3.41	0.00
0.90	0.95	0.37	2.64	3.60	4.30	3.41	0.00
0.95	1.17	0.53	3.99	3.65	4.30	3.41	0.00
1.00	2.85	2.02	12.87	3.70	4.30	3.41	0.00
1.05	3.20	2.35	38.37	3.75	4.30	3.41	0.00
1.10	3.37	2.51	21.80	3.80	4.30	3.41	0.00
1.15	3.49	2.63	9.72	3.85	4.30	3.41	0.00
1.20	3.59	2.72	5.61	3.90	4.30	3.41	0.00
1.25	3.67	2.80	3.96	3.95	4.30	3.41	0.00
1.30	3.74	2.87	3.21	4.00	4.30	3.41	0.00
1.35	3.80	2.93	2.76	4.05	4.30	3.41	0.00
1.40	3.86	2.98	2.40	4.10	4.30	3.41	0.00
1.45	3.91	3.03	2.17	4.15	4.30	3.41	0.00
1.50	3.96	3.08	2.00	4.20	4.30	3.41	0.00
1.55	4.00	3.12	1.85	4.25	4.30	3.41	0.00
1.60	4.05	3.16	1.70	4.30	4.30	3.41	0.00
1.65	4.08	3.20	1.56	4.35	4.30	3.41	0.00
1.70	4.12	3.23	1.41	4.40	4.30	3.41	0.00
1.75	4.15	3.26	1.31	4.45	4.30	3.41	0.00
1.80	4.18	3.29	1.26	4.50	4.30	3.41	0.00
1.85	4.21	3.32	1.22	4.55	4.30	3.41	0.00
1.90	4.24	3.35	1.19	4.60	4.30	3.41	0.00
1.95	4.27	3.38	1.16	4.65	4.30	3.41	0.00
2.00	4.30	3.41	1.13	4.70	4.30	3.41	0.00
2.05	4.30	3.41	0.84	4.75	4.30	3.41	0.00
2.10	4.30	3.41	0.26	4.80	4.30	3.41	0.00
2.15	4.30	3.41	0.06	4.85	4.30	3.41	0.00
2.20	4.30	3.41	0.01	4.90	4.30	3.41	0.00
2.25	4.30	3.41	0.00	4.95	4.30	3.41	0.00
2.30	4.30	3.41	0.00	5.00	4.30	3.41	0.00
2.35	4.30	3.41	0.00				
2.40	4.30	3.41	0.00				
2.45	4.30	3.41	0.00				
2.50	4.30	3.41	0.00				
2.55	4.30	3.41	0.00				
2.60	4.30	3.41	0.00				
2.65	4.30	3.41	0.00				

Summary for Subcatchment 2S: Post-DA

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 17.41 cfs @ 1.06 hrs, Volume= 0.246 af, Depth= 2.64"

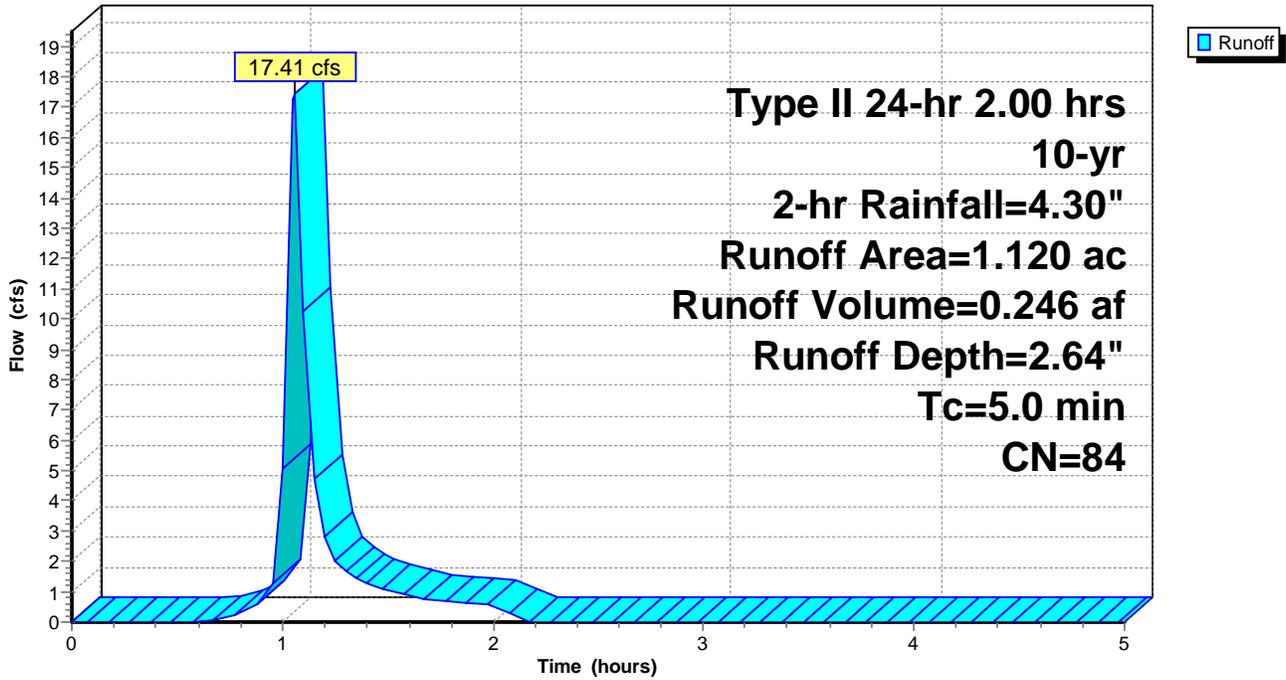
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-5.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Area (ac)	CN	Description
* 1.120	84	
1.120		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: Post-DA

Hydrograph



Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

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Hydrograph for Subcatchment 2S: Post-DA

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	2.70	4.30	2.64	0.00
0.05	0.03	0.00	0.00	2.75	4.30	2.64	0.00
0.10	0.05	0.00	0.00	2.80	4.30	2.64	0.00
0.15	0.08	0.00	0.00	2.85	4.30	2.64	0.00
0.20	0.12	0.00	0.00	2.90	4.30	2.64	0.00
0.25	0.15	0.00	0.00	2.95	4.30	2.64	0.00
0.30	0.18	0.00	0.00	3.00	4.30	2.64	0.00
0.35	0.22	0.00	0.00	3.05	4.30	2.64	0.00
0.40	0.26	0.00	0.00	3.10	4.30	2.64	0.00
0.45	0.30	0.00	0.00	3.15	4.30	2.64	0.00
0.50	0.34	0.00	0.00	3.20	4.30	2.64	0.00
0.55	0.39	0.00	0.00	3.25	4.30	2.64	0.00
0.60	0.44	0.00	0.01	3.30	4.30	2.64	0.00
0.65	0.50	0.01	0.05	3.35	4.30	2.64	0.00
0.70	0.56	0.01	0.11	3.40	4.30	2.64	0.00
0.75	0.63	0.03	0.19	3.45	4.30	2.64	0.00
0.80	0.72	0.05	0.32	3.50	4.30	2.64	0.00
0.85	0.81	0.08	0.47	3.55	4.30	2.64	0.00
0.90	0.95	0.13	0.73	3.60	4.30	2.64	0.00
0.95	1.17	0.23	1.25	3.65	4.30	2.64	0.00
1.00	2.85	1.39	5.07	3.70	4.30	2.64	0.00
1.05	3.20	1.68	17.23	3.75	4.30	2.64	0.00
1.10	3.37	1.83	10.26	3.80	4.30	2.64	0.00
1.15	3.49	1.93	4.74	3.85	4.30	2.64	0.00
1.20	3.59	2.01	2.81	3.90	4.30	2.64	0.00
1.25	3.67	2.08	2.02	3.95	4.30	2.64	0.00
1.30	3.74	2.15	1.65	4.00	4.30	2.64	0.00
1.35	3.80	2.20	1.42	4.05	4.30	2.64	0.00
1.40	3.86	2.25	1.24	4.10	4.30	2.64	0.00
1.45	3.91	2.29	1.12	4.15	4.30	2.64	0.00
1.50	3.96	2.34	1.04	4.20	4.30	2.64	0.00
1.55	4.00	2.38	0.96	4.25	4.30	2.64	0.00
1.60	4.05	2.41	0.89	4.30	4.30	2.64	0.00
1.65	4.08	2.44	0.81	4.35	4.30	2.64	0.00
1.70	4.12	2.47	0.74	4.40	4.30	2.64	0.00
1.75	4.15	2.50	0.68	4.45	4.30	2.64	0.00
1.80	4.18	2.53	0.66	4.50	4.30	2.64	0.00
1.85	4.21	2.56	0.64	4.55	4.30	2.64	0.00
1.90	4.24	2.59	0.63	4.60	4.30	2.64	0.00
1.95	4.27	2.61	0.61	4.65	4.30	2.64	0.00
2.00	4.30	2.64	0.59	4.70	4.30	2.64	0.00
2.05	4.30	2.64	0.44	4.75	4.30	2.64	0.00
2.10	4.30	2.64	0.13	4.80	4.30	2.64	0.00
2.15	4.30	2.64	0.03	4.85	4.30	2.64	0.00
2.20	4.30	2.64	0.01	4.90	4.30	2.64	0.00
2.25	4.30	2.64	0.00	4.95	4.30	2.64	0.00
2.30	4.30	2.64	0.00	5.00	4.30	2.64	0.00
2.35	4.30	2.64	0.00				
2.40	4.30	2.64	0.00				
2.45	4.30	2.64	0.00				
2.50	4.30	2.64	0.00				
2.55	4.30	2.64	0.00				
2.60	4.30	2.64	0.00				
2.65	4.30	2.64	0.00				

Summary for Subcatchment 3S: Swale West

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 12.36 cfs @ 1.05 hrs, Volume= 0.181 af, Depth= 3.62"

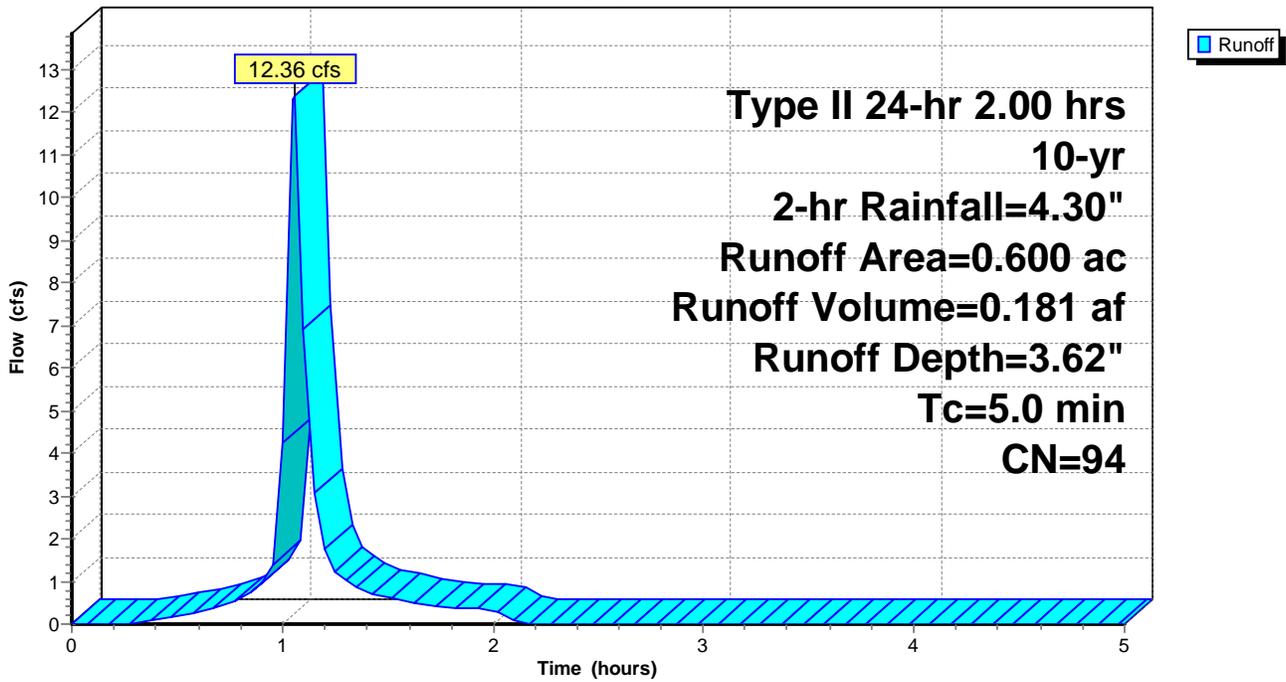
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 Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

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0.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, Tc

Subcatchment 3S: Swale West

Hydrograph



Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Prepared by Kimley-Horn and Associates

Printed 4/6/2020

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Hydrograph for Subcatchment 3S: Swale West

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	2.70	4.30	3.62	0.00
0.05	0.03	0.00	0.00	2.75	4.30	3.62	0.00
0.10	0.05	0.00	0.00	2.80	4.30	3.62	0.00
0.15	0.08	0.00	0.00	2.85	4.30	3.62	0.00
0.20	0.12	0.00	0.00	2.90	4.30	3.62	0.00
0.25	0.15	0.00	0.00	2.95	4.30	3.62	0.00
0.30	0.18	0.00	0.01	3.00	4.30	3.62	0.00
0.35	0.22	0.01	0.05	3.05	4.30	3.62	0.00
0.40	0.26	0.02	0.08	3.10	4.30	3.62	0.00
0.45	0.30	0.04	0.13	3.15	4.30	3.62	0.00
0.50	0.34	0.05	0.17	3.20	4.30	3.62	0.00
0.55	0.39	0.08	0.22	3.25	4.30	3.62	0.00
0.60	0.44	0.10	0.27	3.30	4.30	3.62	0.00
0.65	0.50	0.14	0.32	3.35	4.30	3.62	0.00
0.70	0.56	0.17	0.38	3.40	4.30	3.62	0.00
0.75	0.63	0.22	0.47	3.45	4.30	3.62	0.00
0.80	0.72	0.28	0.59	3.50	4.30	3.62	0.00
0.85	0.81	0.36	0.72	3.55	4.30	3.62	0.00
0.90	0.95	0.46	0.94	3.60	4.30	3.62	0.00
0.95	1.17	0.64	1.38	3.65	4.30	3.62	0.00
1.00	2.85	2.21	4.25	3.70	4.30	3.62	0.00
1.05	3.20	2.54	12.30	3.75	4.30	3.62	0.00
1.10	3.37	2.71	6.91	3.80	4.30	3.62	0.00
1.15	3.49	2.83	3.06	3.85	4.30	3.62	0.00
1.20	3.59	2.92	1.75	3.90	4.30	3.62	0.00
1.25	3.67	3.00	1.23	3.95	4.30	3.62	0.00
1.30	3.74	3.07	1.00	4.00	4.30	3.62	0.00
1.35	3.80	3.13	0.86	4.05	4.30	3.62	0.00
1.40	3.86	3.19	0.75	4.10	4.30	3.62	0.00
1.45	3.91	3.24	0.67	4.15	4.30	3.62	0.00
1.50	3.96	3.29	0.62	4.20	4.30	3.62	0.00
1.55	4.00	3.33	0.58	4.25	4.30	3.62	0.00
1.60	4.05	3.37	0.53	4.30	4.30	3.62	0.00
1.65	4.08	3.40	0.48	4.35	4.30	3.62	0.00
1.70	4.12	3.44	0.44	4.40	4.30	3.62	0.00
1.75	4.15	3.47	0.41	4.45	4.30	3.62	0.00
1.80	4.18	3.50	0.39	4.50	4.30	3.62	0.00
1.85	4.21	3.53	0.38	4.55	4.30	3.62	0.00
1.90	4.24	3.56	0.37	4.60	4.30	3.62	0.00
1.95	4.27	3.59	0.36	4.65	4.30	3.62	0.00
2.00	4.30	3.62	0.35	4.70	4.30	3.62	0.00
2.05	4.30	3.62	0.26	4.75	4.30	3.62	0.00
2.10	4.30	3.62	0.08	4.80	4.30	3.62	0.00
2.15	4.30	3.62	0.02	4.85	4.30	3.62	0.00
2.20	4.30	3.62	0.00	4.90	4.30	3.62	0.00
2.25	4.30	3.62	0.00	4.95	4.30	3.62	0.00
2.30	4.30	3.62	0.00	5.00	4.30	3.62	0.00
2.35	4.30	3.62	0.00				
2.40	4.30	3.62	0.00				
2.45	4.30	3.62	0.00				
2.50	4.30	3.62	0.00				
2.55	4.30	3.62	0.00				
2.60	4.30	3.62	0.00				
2.65	4.30	3.62	0.00				

Summary for Subcatchment 6S: Swale East

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 4.84 cfs @ 1.06 hrs, Volume= 0.070 af, Depth= 3.51"

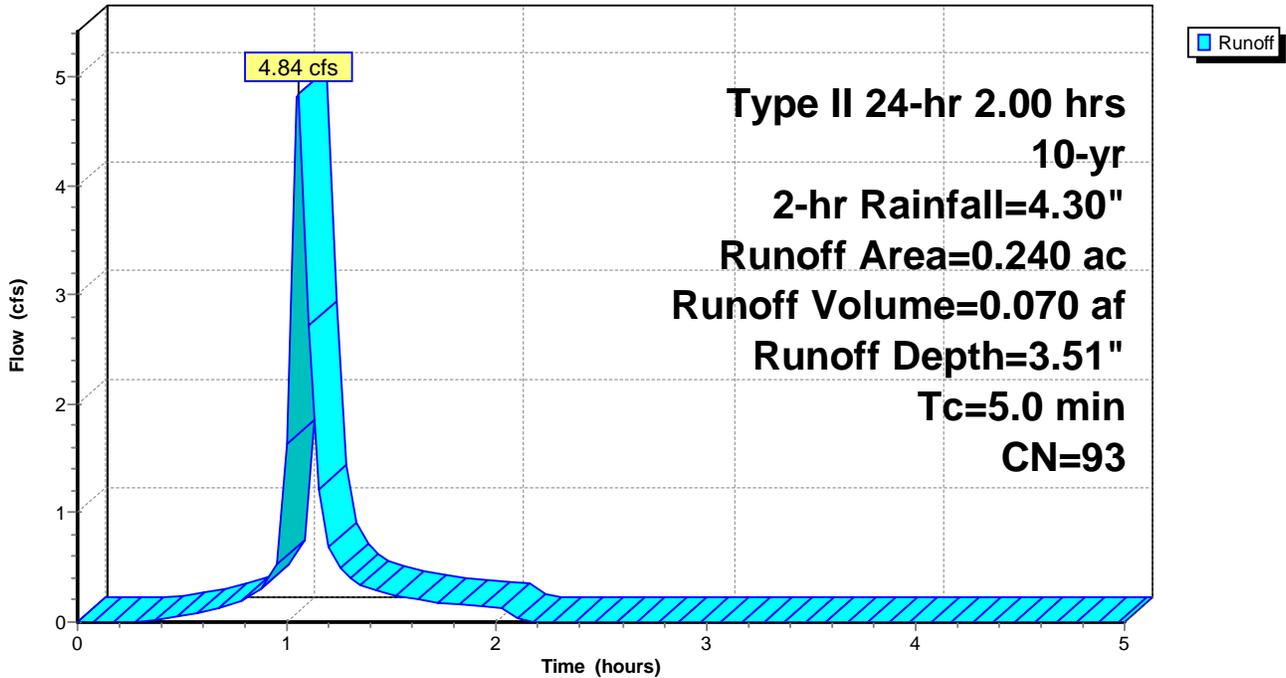
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-5.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Area (ac)	CN	Description
* 0.240	93	
0.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, Tc

Subcatchment 6S: Swale East

Hydrograph



Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Prepared by Kimley-Horn and Associates

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Hydrograph for Subcatchment 6S: Swale East

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	2.70	4.30	3.51	0.00
0.05	0.03	0.00	0.00	2.75	4.30	3.51	0.00
0.10	0.05	0.00	0.00	2.80	4.30	3.51	0.00
0.15	0.08	0.00	0.00	2.85	4.30	3.51	0.00
0.20	0.12	0.00	0.00	2.90	4.30	3.51	0.00
0.25	0.15	0.00	0.00	2.95	4.30	3.51	0.00
0.30	0.18	0.00	0.00	3.00	4.30	3.51	0.00
0.35	0.22	0.01	0.01	3.05	4.30	3.51	0.00
0.40	0.26	0.01	0.02	3.10	4.30	3.51	0.00
0.45	0.30	0.02	0.04	3.15	4.30	3.51	0.00
0.50	0.34	0.04	0.05	3.20	4.30	3.51	0.00
0.55	0.39	0.06	0.07	3.25	4.30	3.51	0.00
0.60	0.44	0.08	0.09	3.30	4.30	3.51	0.00
0.65	0.50	0.11	0.11	3.35	4.30	3.51	0.00
0.70	0.56	0.14	0.13	3.40	4.30	3.51	0.00
0.75	0.63	0.19	0.17	3.45	4.30	3.51	0.00
0.80	0.72	0.24	0.22	3.50	4.30	3.51	0.00
0.85	0.81	0.31	0.26	3.55	4.30	3.51	0.00
0.90	0.95	0.41	0.35	3.60	4.30	3.51	0.00
0.95	1.17	0.58	0.52	3.65	4.30	3.51	0.00
1.00	2.85	2.11	1.64	3.70	4.30	3.51	0.00
1.05	3.20	2.44	4.81	3.75	4.30	3.51	0.00
1.10	3.37	2.61	2.72	3.80	4.30	3.51	0.00
1.15	3.49	2.73	1.21	3.85	4.30	3.51	0.00
1.20	3.59	2.82	0.69	3.90	4.30	3.51	0.00
1.25	3.67	2.90	0.49	3.95	4.30	3.51	0.00
1.30	3.74	2.97	0.40	4.00	4.30	3.51	0.00
1.35	3.80	3.03	0.34	4.05	4.30	3.51	0.00
1.40	3.86	3.08	0.30	4.10	4.30	3.51	0.00
1.45	3.91	3.13	0.27	4.15	4.30	3.51	0.00
1.50	3.96	3.18	0.25	4.20	4.30	3.51	0.00
1.55	4.00	3.22	0.23	4.25	4.30	3.51	0.00
1.60	4.05	3.26	0.21	4.30	4.30	3.51	0.00
1.65	4.08	3.30	0.19	4.35	4.30	3.51	0.00
1.70	4.12	3.33	0.17	4.40	4.30	3.51	0.00
1.75	4.15	3.36	0.16	4.45	4.30	3.51	0.00
1.80	4.18	3.40	0.15	4.50	4.30	3.51	0.00
1.85	4.21	3.43	0.15	4.55	4.30	3.51	0.00
1.90	4.24	3.46	0.15	4.60	4.30	3.51	0.00
1.95	4.27	3.48	0.14	4.65	4.30	3.51	0.00
2.00	4.30	3.51	0.14	4.70	4.30	3.51	0.00
2.05	4.30	3.51	0.10	4.75	4.30	3.51	0.00
2.10	4.30	3.51	0.03	4.80	4.30	3.51	0.00
2.15	4.30	3.51	0.01	4.85	4.30	3.51	0.00
2.20	4.30	3.51	0.00	4.90	4.30	3.51	0.00
2.25	4.30	3.51	0.00	4.95	4.30	3.51	0.00
2.30	4.30	3.51	0.00	5.00	4.30	3.51	0.00
2.35	4.30	3.51	0.00				
2.40	4.30	3.51	0.00				
2.45	4.30	3.51	0.00				
2.50	4.30	3.51	0.00				
2.55	4.30	3.51	0.00				
2.60	4.30	3.51	0.00				
2.65	4.30	3.51	0.00				

Summary for Pond 4P: West Swale

Inflow Area = 0.600 ac, 0.00% Impervious, Inflow Depth = 3.62" for 10-yr, 2-hr event
 Inflow = 12.36 cfs @ 1.05 hrs, Volume= 0.181 af
 Outflow = 2.49 cfs @ 1.17 hrs, Volume= 0.181 af, Atten= 80%, Lag= 7.1 min
 Discarded = 2.49 cfs @ 1.17 hrs, Volume= 0.181 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-5.00 hrs, dt= 0.05 hrs
 Peak Elev= 10.91' @ 1.17 hrs Surf.Area= 0.056 ac Storage= 0.089 af

Plug-Flow detention time= 19.3 min calculated for 0.180 af (99% of inflow)
 Center-of-Mass det. time= 19.5 min (88.2 - 68.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.25'	0.094 af	6.00'W x 95.00'L x 2.75'H Prismatic Z=3.0

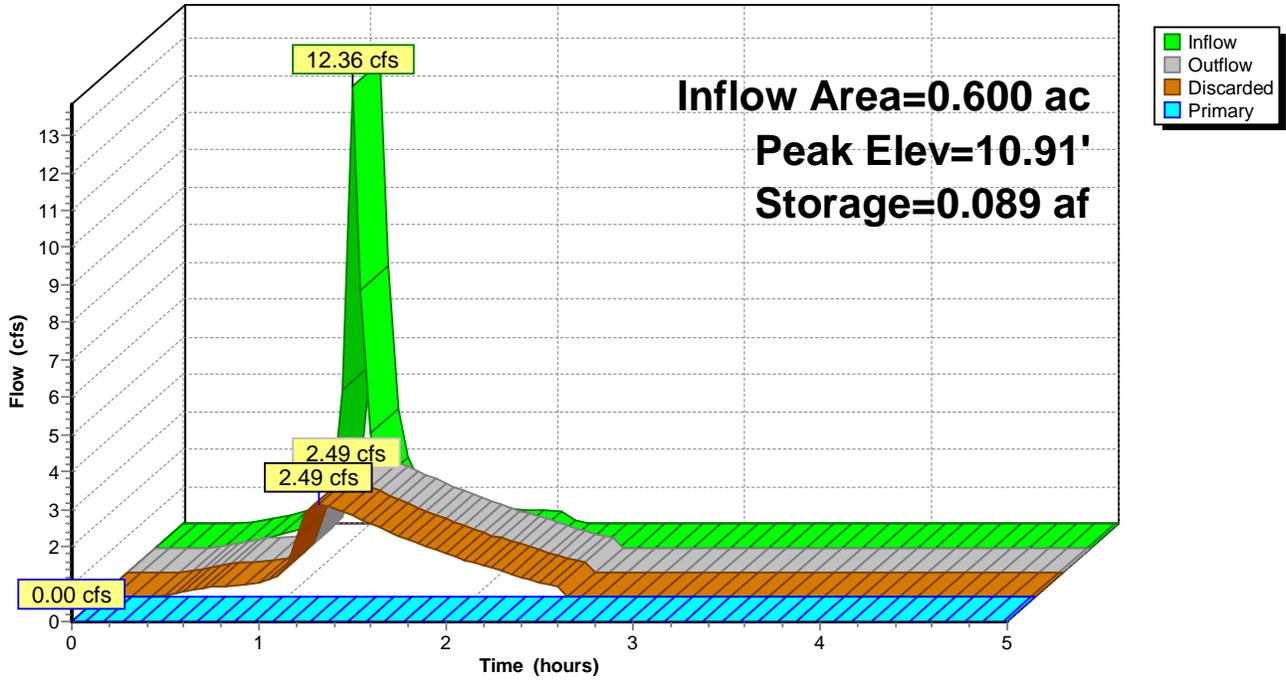
Device	Routing	Invert	Outlet Devices
#1	Discarded	8.25'	20.730 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 7.20'
#2	Primary	10.90'	5.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=2.46 cfs @ 1.17 hrs HW=10.88' (Free Discharge)
 ↑1=Exfiltration (Controls 2.46 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=8.25' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

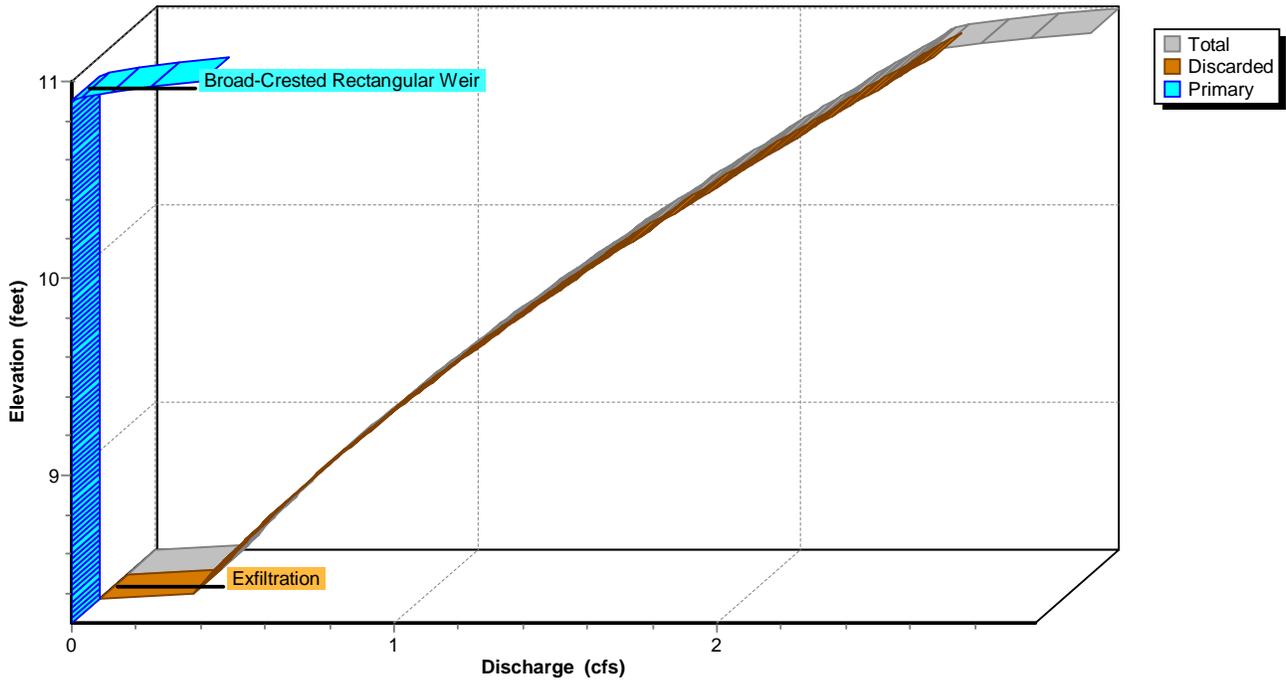
Pond 4P: West Swale

Hydrograph

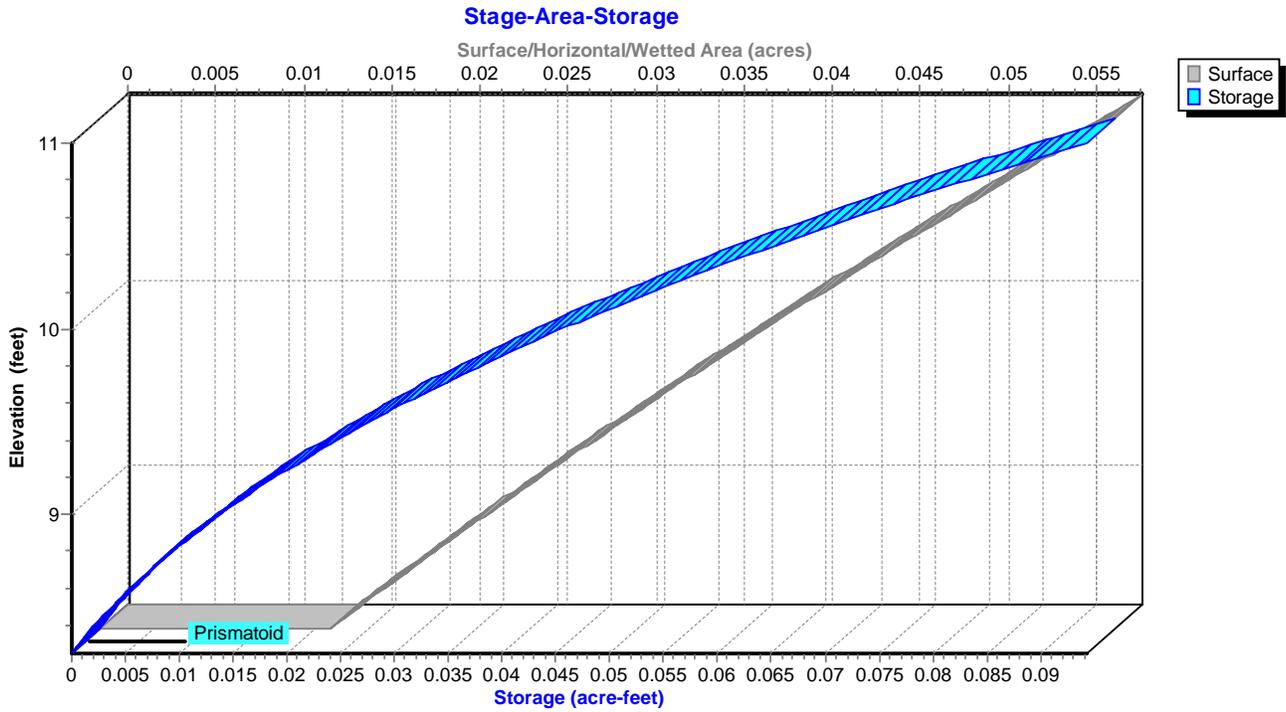


Pond 4P: West Swale

Stage-Discharge



Pond 4P: West Swale



Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Prepared by Kimley-Horn and Associates

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Hydrograph for Pond 4P: West Swale

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	8.25	0.00	0.00	0.00
0.10	0.00	0.000	8.25	0.00	0.00	0.00
0.20	0.00	0.000	8.25	0.00	0.00	0.00
0.30	0.01	0.000	8.25	0.01	0.01	0.00
0.40	0.08	0.000	8.25	0.08	0.08	0.00
0.50	0.17	0.000	8.25	0.17	0.17	0.00
0.60	0.27	0.000	8.25	0.27	0.27	0.00
0.70	0.38	0.000	8.28	0.29	0.29	0.00
0.80	0.59	0.002	8.37	0.34	0.34	0.00
0.90	0.94	0.005	8.55	0.45	0.45	0.00
1.00	4.25	0.016	9.09	0.83	0.83	0.00
1.10	6.91	0.077	10.68	2.25	2.25	0.00
1.20	1.75	0.088	10.88	2.46	2.46	0.00
1.30	1.00	0.079	10.72	2.29	2.29	0.00
1.40	0.75	0.068	10.50	2.07	2.07	0.00
1.50	0.62	0.057	10.28	1.85	1.85	0.00
1.60	0.53	0.048	10.05	1.64	1.64	0.00
1.70	0.44	0.039	9.83	1.43	1.43	0.00
1.80	0.39	0.031	9.61	1.25	1.25	0.00
1.90	0.37	0.025	9.41	1.08	1.08	0.00
2.00	0.35	0.020	9.22	0.93	0.93	0.00
2.10	0.08	0.014	9.03	0.78	0.78	0.00
2.20	0.00	0.009	8.78	0.61	0.61	0.00
2.30	0.00	0.005	8.56	0.45	0.45	0.00
2.40	0.00	0.001	8.35	0.33	0.33	0.00
2.50	0.00	0.000	8.25	0.00	0.00	0.00
2.60	0.00	0.000	8.25	0.00	0.00	0.00
2.70	0.00	0.000	8.25	0.00	0.00	0.00
2.80	0.00	0.000	8.25	0.00	0.00	0.00
2.90	0.00	0.000	8.25	0.00	0.00	0.00
3.00	0.00	0.000	8.25	0.00	0.00	0.00
3.10	0.00	0.000	8.25	0.00	0.00	0.00
3.20	0.00	0.000	8.25	0.00	0.00	0.00
3.30	0.00	0.000	8.25	0.00	0.00	0.00
3.40	0.00	0.000	8.25	0.00	0.00	0.00
3.50	0.00	0.000	8.25	0.00	0.00	0.00
3.60	0.00	0.000	8.25	0.00	0.00	0.00
3.70	0.00	0.000	8.25	0.00	0.00	0.00
3.80	0.00	0.000	8.25	0.00	0.00	0.00
3.90	0.00	0.000	8.25	0.00	0.00	0.00
4.00	0.00	0.000	8.25	0.00	0.00	0.00
4.10	0.00	0.000	8.25	0.00	0.00	0.00
4.20	0.00	0.000	8.25	0.00	0.00	0.00
4.30	0.00	0.000	8.25	0.00	0.00	0.00
4.40	0.00	0.000	8.25	0.00	0.00	0.00
4.50	0.00	0.000	8.25	0.00	0.00	0.00
4.60	0.00	0.000	8.25	0.00	0.00	0.00
4.70	0.00	0.000	8.25	0.00	0.00	0.00
4.80	0.00	0.000	8.25	0.00	0.00	0.00
4.90	0.00	0.000	8.25	0.00	0.00	0.00
5.00	0.00	0.000	8.25	0.00	0.00	0.00

Stage-Discharge for Pond 4P: West Swale

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
8.25	0.00	0.00	0.00	10.95	2.67	2.53	0.14
8.30	0.30	0.30	0.00	11.00	2.99	2.58	0.40
8.35	0.33	0.33	0.00				
8.40	0.36	0.36	0.00				
8.45	0.39	0.39	0.00				
8.50	0.42	0.42	0.00				
8.55	0.45	0.45	0.00				
8.60	0.48	0.48	0.00				
8.65	0.52	0.52	0.00				
8.70	0.55	0.55	0.00				
8.75	0.58	0.58	0.00				
8.80	0.62	0.62	0.00				
8.85	0.65	0.65	0.00				
8.90	0.69	0.69	0.00				
8.95	0.72	0.72	0.00				
9.00	0.76	0.76	0.00				
9.05	0.80	0.80	0.00				
9.10	0.83	0.83	0.00				
9.15	0.87	0.87	0.00				
9.20	0.91	0.91	0.00				
9.25	0.95	0.95	0.00				
9.30	0.99	0.99	0.00				
9.35	1.03	1.03	0.00				
9.40	1.07	1.07	0.00				
9.45	1.11	1.11	0.00				
9.50	1.15	1.15	0.00				
9.55	1.19	1.19	0.00				
9.60	1.24	1.24	0.00				
9.65	1.28	1.28	0.00				
9.70	1.32	1.32	0.00				
9.75	1.37	1.37	0.00				
9.80	1.41	1.41	0.00				
9.85	1.45	1.45	0.00				
9.90	1.50	1.50	0.00				
9.95	1.54	1.54	0.00				
10.00	1.59	1.59	0.00				
10.05	1.64	1.64	0.00				
10.10	1.68	1.68	0.00				
10.15	1.73	1.73	0.00				
10.20	1.78	1.78	0.00				
10.25	1.82	1.82	0.00				
10.30	1.87	1.87	0.00				
10.35	1.92	1.92	0.00				
10.40	1.97	1.97	0.00				
10.45	2.02	2.02	0.00				
10.50	2.07	2.07	0.00				
10.55	2.12	2.12	0.00				
10.60	2.17	2.17	0.00				
10.65	2.22	2.22	0.00				
10.70	2.27	2.27	0.00				
10.75	2.32	2.32	0.00				
10.80	2.37	2.37	0.00				
10.85	2.43	2.43	0.00				
10.90	2.48	2.48	0.00				

Stage-Area-Storage for Pond 4P: West Swale

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
8.25	0.013	0.000	10.95	0.057	0.091
8.30	0.014	0.001	11.00	0.058	0.094
8.35	0.014	0.001			
8.40	0.015	0.002			
8.45	0.016	0.003			
8.50	0.017	0.004			
8.55	0.017	0.005			
8.60	0.018	0.005			
8.65	0.019	0.006			
8.70	0.020	0.007			
8.75	0.020	0.008			
8.80	0.021	0.009			
8.85	0.022	0.010			
8.90	0.022	0.012			
8.95	0.023	0.013			
9.00	0.024	0.014			
9.05	0.025	0.015			
9.10	0.026	0.016			
9.15	0.026	0.018			
9.20	0.027	0.019			
9.25	0.028	0.020			
9.30	0.029	0.022			
9.35	0.029	0.023			
9.40	0.030	0.025			
9.45	0.031	0.026			
9.50	0.032	0.028			
9.55	0.033	0.029			
9.60	0.033	0.031			
9.65	0.034	0.033			
9.70	0.035	0.034			
9.75	0.036	0.036			
9.80	0.037	0.038			
9.85	0.037	0.040			
9.90	0.038	0.042			
9.95	0.039	0.044			
10.00	0.040	0.046			
10.05	0.041	0.048			
10.10	0.042	0.050			
10.15	0.043	0.052			
10.20	0.043	0.054			
10.25	0.044	0.056			
10.30	0.045	0.058			
10.35	0.046	0.061			
10.40	0.047	0.063			
10.45	0.048	0.065			
10.50	0.049	0.068			
10.55	0.049	0.070			
10.60	0.050	0.073			
10.65	0.051	0.075			
10.70	0.052	0.078			
10.75	0.053	0.080			
10.80	0.054	0.083			
10.85	0.055	0.086			
10.90	0.056	0.089			

Summary for Pond 7P: East Swale

Inflow Area = 0.240 ac, 0.00% Impervious, Inflow Depth = 3.51" for 10-yr, 2-hr event
 Inflow = 4.84 cfs @ 1.06 hrs, Volume= 0.070 af
 Outflow = 1.06 cfs @ 1.16 hrs, Volume= 0.070 af, Atten= 78%, Lag= 6.5 min
 Discarded = 1.03 cfs @ 1.17 hrs, Volume= 0.070 af
 Primary = 0.03 cfs @ 1.15 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-5.00 hrs, dt= 0.05 hrs
 Peak Elev= 10.93' @ 1.17 hrs Surf.Area= 0.037 ac Storage= 0.032 af

Plug-Flow detention time= 15.5 min calculated for 0.070 af (99% of inflow)
 Center-of-Mass det. time= 15.6 min (84.7 - 69.1)

Volume	Invert	Avail.Storage	Storage Description
#1	9.50'	0.035 af	3.00'W x 130.00'L x 1.50'H Prismatic Z=3.0

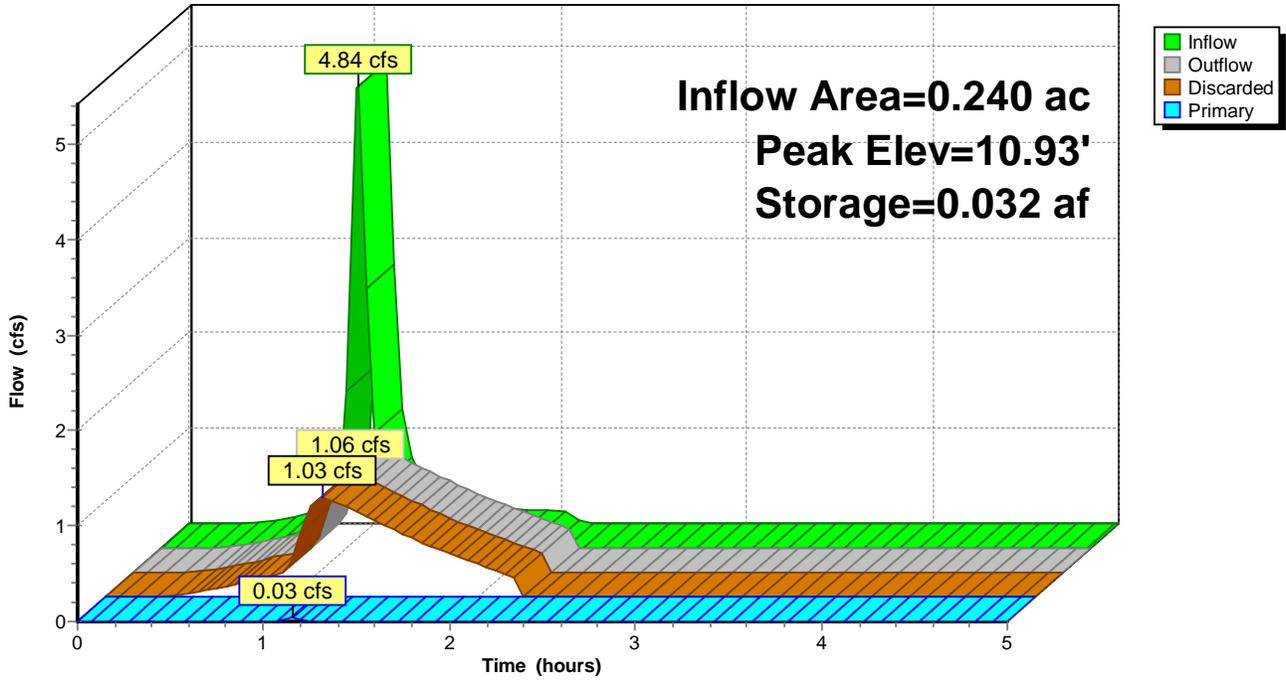
Device	Routing	Invert	Outlet Devices
#1	Discarded	9.50'	20.730 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 7.20'
#2	Primary	10.90'	5.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=1.02 cfs @ 1.17 hrs HW=10.91' (Free Discharge)
 ↑1=Exfiltration (Controls 1.02 cfs)

Primary OutFlow Max=0.03 cfs @ 1.15 hrs HW=10.92' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.03 cfs @ 0.34 fps)

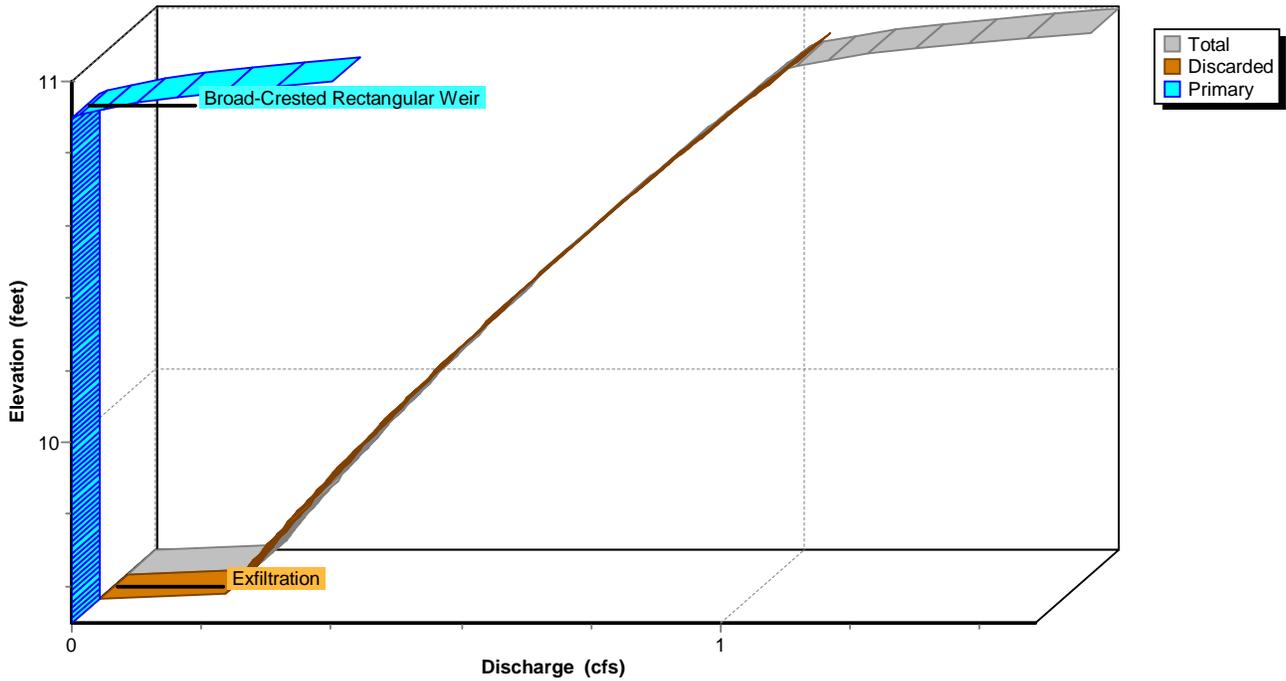
Pond 7P: East Swale

Hydrograph



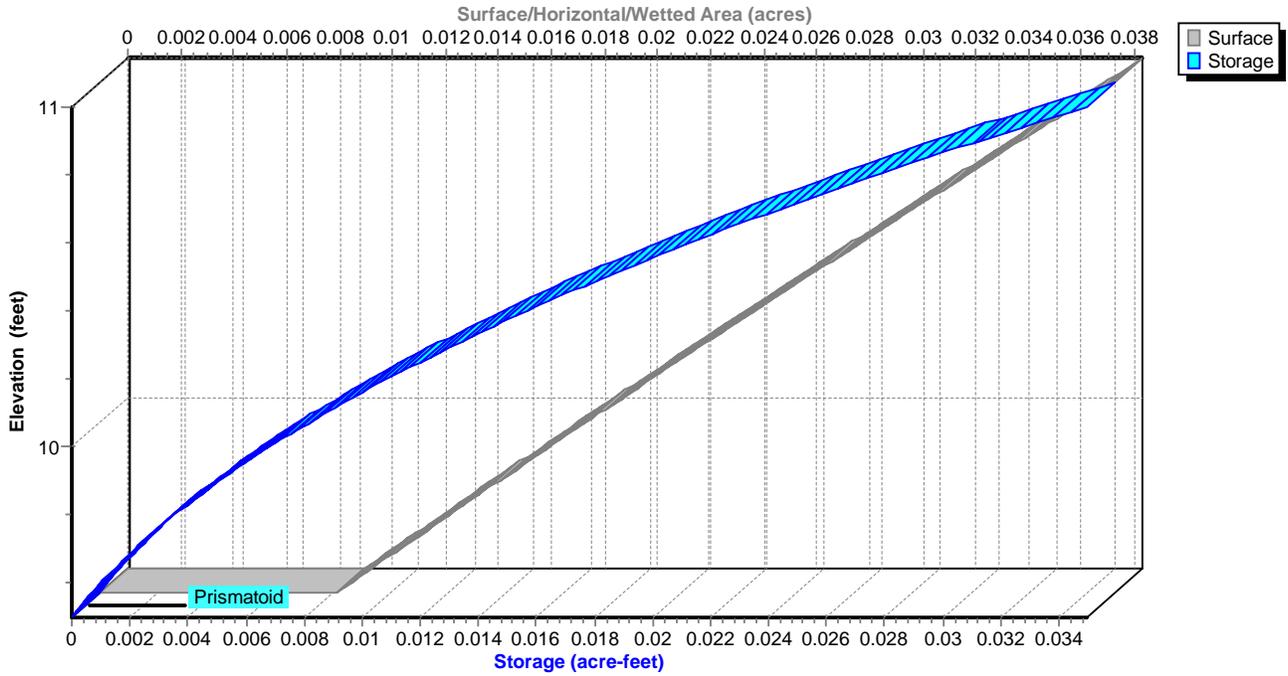
Pond 7P: East Swale

Stage-Discharge



Pond 7P: East Swale

Stage-Area-Storage



Hydrograph for Pond 7P: East Swale

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	9.50	0.00	0.00	0.00
0.10	0.00	0.000	9.50	0.00	0.00	0.00
0.20	0.00	0.000	9.50	0.00	0.00	0.00
0.30	0.00	0.000	9.50	0.00	0.00	0.00
0.40	0.02	0.000	9.50	0.02	0.02	0.00
0.50	0.05	0.000	9.50	0.05	0.05	0.00
0.60	0.09	0.000	9.50	0.09	0.09	0.00
0.70	0.13	0.000	9.50	0.13	0.13	0.00
0.80	0.22	0.000	9.51	0.19	0.19	0.00
0.90	0.35	0.001	9.57	0.22	0.22	0.00
1.00	1.64	0.005	9.87	0.37	0.37	0.00
1.10	2.72	0.028	10.81	0.95	0.95	0.00
1.20	0.69	0.032	10.91	1.03	1.02	0.01
1.30	0.40	0.028	10.80	0.94	0.94	0.00
1.40	0.30	0.023	10.66	0.85	0.85	0.00
1.50	0.25	0.019	10.51	0.75	0.75	0.00
1.60	0.21	0.015	10.37	0.66	0.66	0.00
1.70	0.17	0.011	10.22	0.57	0.57	0.00
1.80	0.15	0.008	10.08	0.49	0.49	0.00
1.90	0.15	0.006	9.95	0.41	0.41	0.00
2.00	0.14	0.004	9.83	0.35	0.35	0.00
2.10	0.03	0.002	9.69	0.28	0.28	0.00
2.20	0.00	0.000	9.52	0.20	0.20	0.00
2.30	0.00	0.000	9.50	0.00	0.00	0.00
2.40	0.00	0.000	9.50	0.00	0.00	0.00
2.50	0.00	0.000	9.50	0.00	0.00	0.00
2.60	0.00	0.000	9.50	0.00	0.00	0.00
2.70	0.00	0.000	9.50	0.00	0.00	0.00
2.80	0.00	0.000	9.50	0.00	0.00	0.00
2.90	0.00	0.000	9.50	0.00	0.00	0.00
3.00	0.00	0.000	9.50	0.00	0.00	0.00
3.10	0.00	0.000	9.50	0.00	0.00	0.00
3.20	0.00	0.000	9.50	0.00	0.00	0.00
3.30	0.00	0.000	9.50	0.00	0.00	0.00
3.40	0.00	0.000	9.50	0.00	0.00	0.00
3.50	0.00	0.000	9.50	0.00	0.00	0.00
3.60	0.00	0.000	9.50	0.00	0.00	0.00
3.70	0.00	0.000	9.50	0.00	0.00	0.00
3.80	0.00	0.000	9.50	0.00	0.00	0.00
3.90	0.00	0.000	9.50	0.00	0.00	0.00
4.00	0.00	0.000	9.50	0.00	0.00	0.00
4.10	0.00	0.000	9.50	0.00	0.00	0.00
4.20	0.00	0.000	9.50	0.00	0.00	0.00
4.30	0.00	0.000	9.50	0.00	0.00	0.00
4.40	0.00	0.000	9.50	0.00	0.00	0.00
4.50	0.00	0.000	9.50	0.00	0.00	0.00
4.60	0.00	0.000	9.50	0.00	0.00	0.00
4.70	0.00	0.000	9.50	0.00	0.00	0.00
4.80	0.00	0.000	9.50	0.00	0.00	0.00
4.90	0.00	0.000	9.50	0.00	0.00	0.00
5.00	0.00	0.000	9.50	0.00	0.00	0.00

Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Prepared by Kimley-Horn and Associates

Printed 4/6/2020

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Stage-Discharge for Pond 7P: East Swale

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
9.50	0.00	0.00	0.00	10.58	0.79	0.79	0.00
9.52	0.20	0.20	0.00	10.60	0.81	0.81	0.00
9.54	0.21	0.21	0.00	10.62	0.82	0.82	0.00
9.56	0.22	0.22	0.00	10.64	0.83	0.83	0.00
9.58	0.22	0.22	0.00	10.66	0.85	0.85	0.00
9.60	0.23	0.23	0.00	10.68	0.86	0.86	0.00
9.62	0.24	0.24	0.00	10.70	0.87	0.87	0.00
9.64	0.25	0.25	0.00	10.72	0.89	0.89	0.00
9.66	0.26	0.26	0.00	10.74	0.90	0.90	0.00
9.68	0.27	0.27	0.00	10.76	0.91	0.91	0.00
9.70	0.28	0.28	0.00	10.78	0.93	0.93	0.00
9.72	0.29	0.29	0.00	10.80	0.94	0.94	0.00
9.74	0.30	0.30	0.00	10.82	0.96	0.96	0.00
9.76	0.31	0.31	0.00	10.84	0.97	0.97	0.00
9.78	0.32	0.32	0.00	10.86	0.98	0.98	0.00
9.80	0.33	0.33	0.00	10.88	1.00	1.00	0.00
9.82	0.35	0.35	0.00	10.90	1.01	1.01	0.00
9.84	0.36	0.36	0.00	10.92	1.06	1.03	0.04
9.86	0.37	0.37	0.00	10.94	1.14	1.04	0.10
9.88	0.38	0.38	0.00	10.96	1.24	1.05	0.19
9.90	0.39	0.39	0.00	10.98	1.36	1.07	0.29
9.92	0.40	0.40	0.00	11.00	1.48	1.08	0.40
9.94	0.41	0.41	0.00				
9.96	0.42	0.42	0.00				
9.98	0.43	0.43	0.00				
10.00	0.44	0.44	0.00				
10.02	0.45	0.45	0.00				
10.04	0.47	0.47	0.00				
10.06	0.48	0.48	0.00				
10.08	0.49	0.49	0.00				
10.10	0.50	0.50	0.00				
10.12	0.51	0.51	0.00				
10.14	0.52	0.52	0.00				
10.16	0.53	0.53	0.00				
10.18	0.55	0.55	0.00				
10.20	0.56	0.56	0.00				
10.22	0.57	0.57	0.00				
10.24	0.58	0.58	0.00				
10.26	0.59	0.59	0.00				
10.28	0.61	0.61	0.00				
10.30	0.62	0.62	0.00				
10.32	0.63	0.63	0.00				
10.34	0.64	0.64	0.00				
10.36	0.65	0.65	0.00				
10.38	0.67	0.67	0.00				
10.40	0.68	0.68	0.00				
10.42	0.69	0.69	0.00				
10.44	0.70	0.70	0.00				
10.46	0.72	0.72	0.00				
10.48	0.73	0.73	0.00				
10.50	0.74	0.74	0.00				
10.52	0.76	0.76	0.00				
10.54	0.77	0.77	0.00				
10.56	0.78	0.78	0.00				

Stage-Area-Storage for Pond 7P: East Swale

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
9.50	0.009	0.000	10.58	0.030	0.021
9.52	0.009	0.000	10.60	0.030	0.021
9.54	0.010	0.000	10.62	0.031	0.022
9.56	0.010	0.001	10.64	0.031	0.023
9.58	0.010	0.001	10.66	0.031	0.023
9.60	0.011	0.001	10.68	0.032	0.024
9.62	0.011	0.001	10.70	0.032	0.024
9.64	0.012	0.001	10.72	0.033	0.025
9.66	0.012	0.002	10.74	0.033	0.026
9.68	0.012	0.002	10.76	0.033	0.026
9.70	0.013	0.002	10.78	0.034	0.027
9.72	0.013	0.002	10.80	0.034	0.028
9.74	0.013	0.003	10.82	0.035	0.028
9.76	0.014	0.003	10.84	0.035	0.029
9.78	0.014	0.003	10.86	0.035	0.030
9.80	0.015	0.004	10.88	0.036	0.031
9.82	0.015	0.004	10.90	0.036	0.031
9.84	0.015	0.004	10.92	0.037	0.032
9.86	0.016	0.004	10.94	0.037	0.033
9.88	0.016	0.005	10.96	0.037	0.033
9.90	0.016	0.005	10.98	0.038	0.034
9.92	0.017	0.005	11.00	0.038	0.035
9.94	0.017	0.006			
9.96	0.018	0.006			
9.98	0.018	0.006			
10.00	0.018	0.007			
10.02	0.019	0.007			
10.04	0.019	0.008			
10.06	0.019	0.008			
10.08	0.020	0.008			
10.10	0.020	0.009			
10.12	0.021	0.009			
10.14	0.021	0.010			
10.16	0.021	0.010			
10.18	0.022	0.010			
10.20	0.022	0.011			
10.22	0.023	0.011			
10.24	0.023	0.012			
10.26	0.023	0.012			
10.28	0.024	0.013			
10.30	0.024	0.013			
10.32	0.025	0.014			
10.34	0.025	0.014			
10.36	0.025	0.015			
10.38	0.026	0.015			
10.40	0.026	0.016			
10.42	0.027	0.016			
10.44	0.027	0.017			
10.46	0.027	0.017			
10.48	0.028	0.018			
10.50	0.028	0.018			
10.52	0.028	0.019			
10.54	0.029	0.020			
10.56	0.029	0.020			

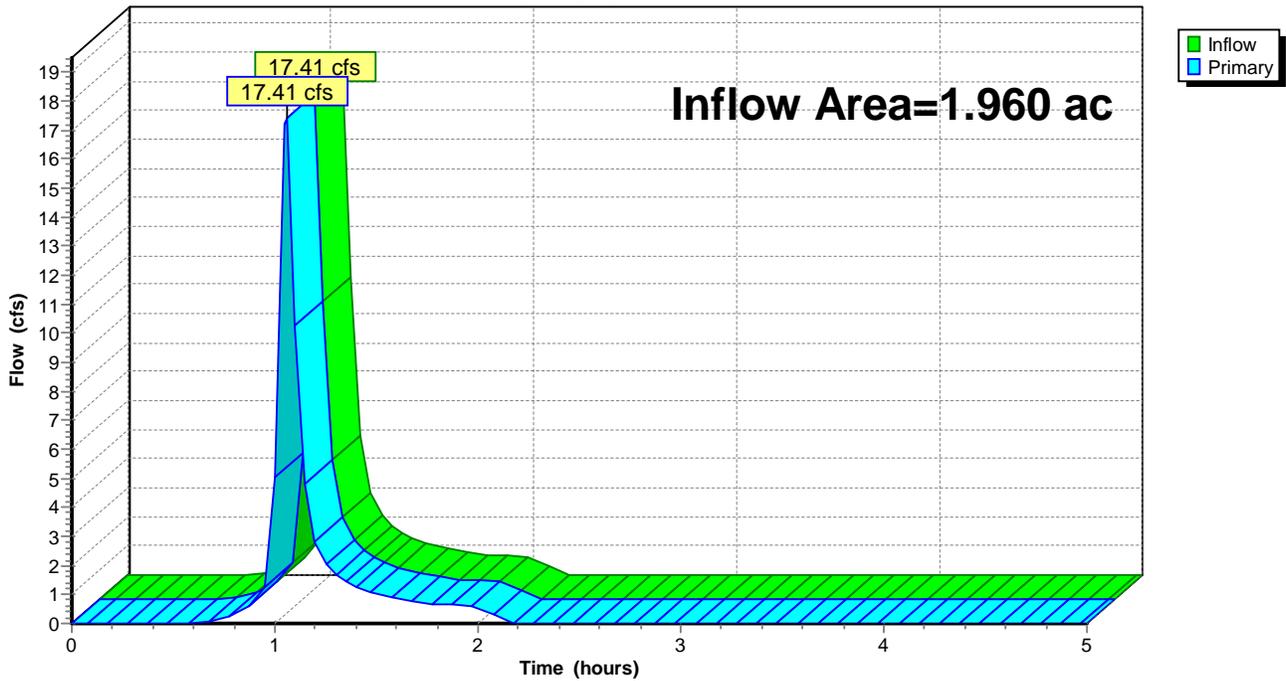
Summary for Link 10L: Post-Dev

Inflow Area = 1.960 ac, 0.00% Impervious, Inflow Depth = 1.51" for 10-yr, 2-hr event
Inflow = 17.41 cfs @ 1.06 hrs, Volume= 0.246 af
Primary = 17.41 cfs @ 1.06 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-5.00 hrs, dt= 0.05 hrs

Link 10L: Post-Dev

Hydrograph



Kill Devil Hills - 175

Type II 24-hr 2.00 hrs 10-yr, 2-hr Rainfall=4.30"

Prepared by Kimley-Horn and Associates

Printed 4/6/2020

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Hydrograph for Link 10L: Post-Dev

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	2.70	0.00	0.00	0.00
0.05	0.00	0.00	0.00	2.75	0.00	0.00	0.00
0.10	0.00	0.00	0.00	2.80	0.00	0.00	0.00
0.15	0.00	0.00	0.00	2.85	0.00	0.00	0.00
0.20	0.00	0.00	0.00	2.90	0.00	0.00	0.00
0.25	0.00	0.00	0.00	2.95	0.00	0.00	0.00
0.30	0.00	0.00	0.00	3.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	3.05	0.00	0.00	0.00
0.40	0.00	0.00	0.00	3.10	0.00	0.00	0.00
0.45	0.00	0.00	0.00	3.15	0.00	0.00	0.00
0.50	0.00	0.00	0.00	3.20	0.00	0.00	0.00
0.55	0.00	0.00	0.00	3.25	0.00	0.00	0.00
0.60	0.01	0.00	0.01	3.30	0.00	0.00	0.00
0.65	0.05	0.00	0.05	3.35	0.00	0.00	0.00
0.70	0.11	0.00	0.11	3.40	0.00	0.00	0.00
0.75	0.19	0.00	0.19	3.45	0.00	0.00	0.00
0.80	0.32	0.00	0.32	3.50	0.00	0.00	0.00
0.85	0.47	0.00	0.47	3.55	0.00	0.00	0.00
0.90	0.73	0.00	0.73	3.60	0.00	0.00	0.00
0.95	1.25	0.00	1.25	3.65	0.00	0.00	0.00
1.00	5.07	0.00	5.07	3.70	0.00	0.00	0.00
1.05	17.23	0.00	17.23	3.75	0.00	0.00	0.00
1.10	10.26	0.00	10.26	3.80	0.00	0.00	0.00
1.15	4.78	0.00	4.78	3.85	0.00	0.00	0.00
1.20	2.82	0.00	2.82	3.90	0.00	0.00	0.00
1.25	2.02	0.00	2.02	3.95	0.00	0.00	0.00
1.30	1.65	0.00	1.65	4.00	0.00	0.00	0.00
1.35	1.42	0.00	1.42	4.05	0.00	0.00	0.00
1.40	1.24	0.00	1.24	4.10	0.00	0.00	0.00
1.45	1.12	0.00	1.12	4.15	0.00	0.00	0.00
1.50	1.04	0.00	1.04	4.20	0.00	0.00	0.00
1.55	0.96	0.00	0.96	4.25	0.00	0.00	0.00
1.60	0.89	0.00	0.89	4.30	0.00	0.00	0.00
1.65	0.81	0.00	0.81	4.35	0.00	0.00	0.00
1.70	0.74	0.00	0.74	4.40	0.00	0.00	0.00
1.75	0.68	0.00	0.68	4.45	0.00	0.00	0.00
1.80	0.66	0.00	0.66	4.50	0.00	0.00	0.00
1.85	0.64	0.00	0.64	4.55	0.00	0.00	0.00
1.90	0.63	0.00	0.63	4.60	0.00	0.00	0.00
1.95	0.61	0.00	0.61	4.65	0.00	0.00	0.00
2.00	0.59	0.00	0.59	4.70	0.00	0.00	0.00
2.05	0.44	0.00	0.44	4.75	0.00	0.00	0.00
2.10	0.13	0.00	0.13	4.80	0.00	0.00	0.00
2.15	0.03	0.00	0.03	4.85	0.00	0.00	0.00
2.20	0.01	0.00	0.01	4.90	0.00	0.00	0.00
2.25	0.00	0.00	0.00	4.95	0.00	0.00	0.00
2.30	0.00	0.00	0.00	5.00	0.00	0.00	0.00
2.35	0.00	0.00	0.00				
2.40	0.00	0.00	0.00				
2.45	0.00	0.00	0.00				
2.50	0.00	0.00	0.00				
2.55	0.00	0.00	0.00				
2.60	0.00	0.00	0.00				
2.65	0.00	0.00	0.00				