



DRAINAGE ANALYSIS

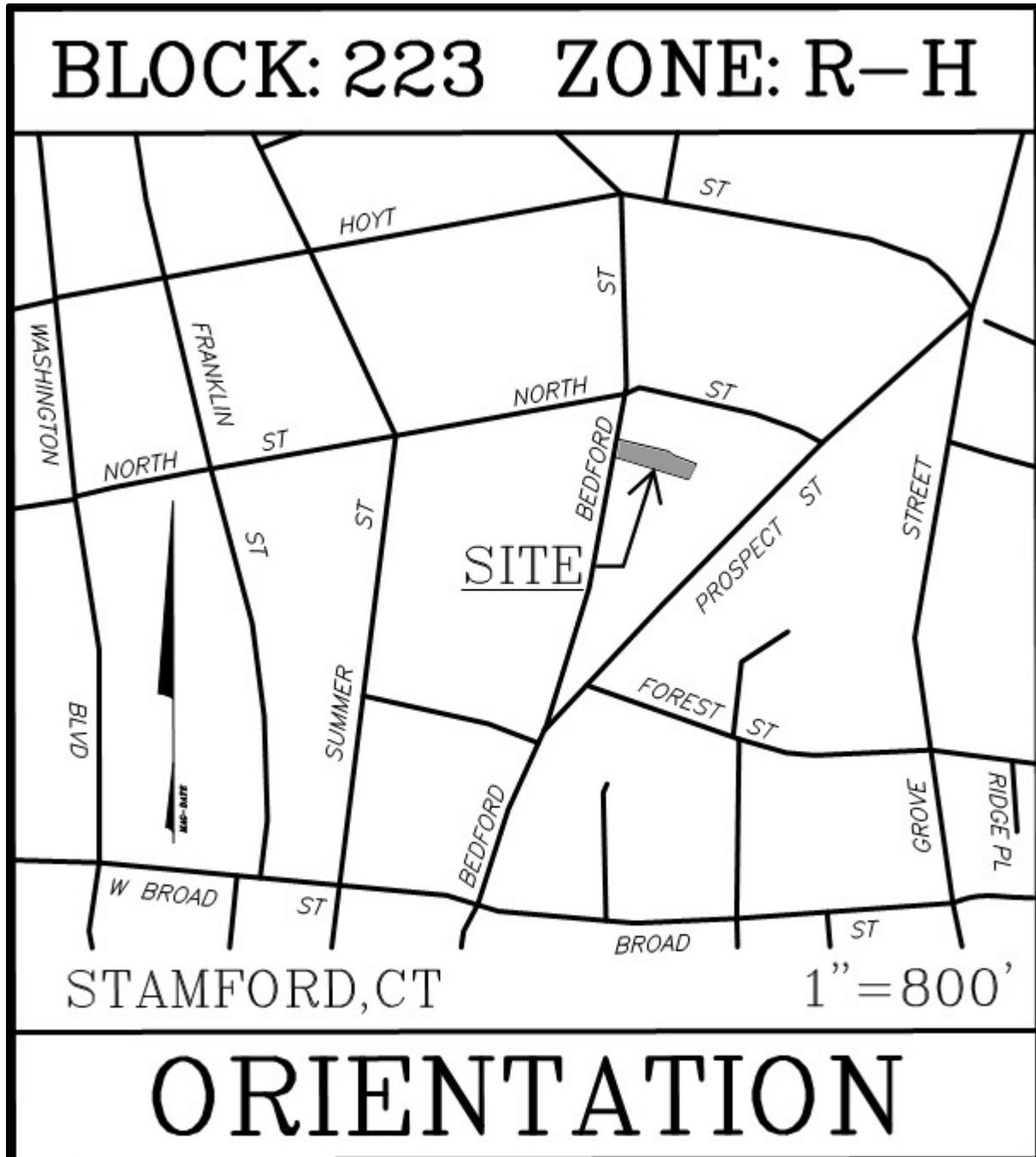
LOCATED AT
589 BEDFORD STREET
STAMFORD, CONNECTICUT

PREPARED FOR
BEDFORD PROPERTIES, LLC

March 08, 2023

Jim Kousidis, P.E.
CT License No. 26830

Site Vicinity Map



1. EXISTING CONDITIONS

This 11,807-sq. ft. residential property is currently developed with a parking lot. Test pits at the site indicate highly pervious soils that are adequate to accept a subsurface storm drain system. The topography of the property slopes to the south and east. According to the Web Soil Survey website (map and soil table attached) the soils in the subject area consist of Urban land, a fair-drained soil with a Hydrologic Soil Group “D”.

2. PROPOSED CONDITIONS

A new development is being proposed for the subject property. The owner is proposing to demolish the existing parking lot and construct a new multi-family residence with a parking garage below, and a new driveway, with associated site improvements. The total proposed impervious surface is 9,650-sq.ft. A stormwater retention system will be installed to satisfy the City of Stamford’s requirements of zero increase in runoff rate for the 24-hour, type III rainfall, 1 through 50-year storm events. The new roof area and the catch basin drains must be directed to the proposed retention systems as depicted on the Site Development Plan provided by Kousidis Engineering, LLC dated 03/08/2023.

3. DRAINAGE

According to Section 2.4 of the City of Stamford Stormwater Drainage Manual, there are no required water quality volume concerns for the subject property, as the total area of disturbance is less than ½ an acre. However, a stormwater treatment system has been proposed to provide water quality prior to discharge to the City of Stamford Drainage System. The design considerations for the property are to control the peak flow rate of stormwater for the 1 through 50-year storm events. For all watersheds, the peak flow rate is equivalent to or below the flow rate when compared to existing conditions.

Under proposed conditions, the entire site will maintain historic flow patterns as depicted in the attached watershed maps. Refer to the following table for a summary of all existing vs. proposed peak stormwater flow rates and volumes. For all watersheds, the proposed flow rate is below or equivalent to the existing flow.

EXISTING vs PROPOSED CONDITIONS DRAINAGE SUMMARY TABLE
Peak Flows (cfs) & Runoff Volumes (cf)

Description	POC	Flow/Volume	Existing	Proposed	Δ	Δ%
1 yr	1	$Q(ft^3/sec)$	0.15	0.15	0.00	0%
		$V(ft^3)$	516	993	477	92%
2 yr	1	$Q(ft^3/sec)$	0.21	0.19	-0.02	-10%
		$V(ft^3)$	739	1,326	587	79%
5 yr	1	$Q(ft^3/sec)$	0.26	0.22	-0.04	-15%
		$V(ft^3)$	939	1,620	681	73%
10 yr	1	$Q(ft^3/sec)$	0.32	0.25	-0.07	-22%
		$V(ft^3)$	1,170	1,957	787	67%
25 yr	1	$Q(ft^3/sec)$	0.42	0.38	-0.04	-10%
		$V(ft^3)$	1,581	2,549	968	61%
50 yr	1	$Q(ft^3/sec)$	0.49	0.47	-0.02	-4%
		$V(ft^3)$	1,847	2,930	1,083	59%

Description	POC	Flow/Volume	Existing	Proposed	Δ	$\Delta\%$
1 yr	2	$Q(ft^3/sec)$	0.46	0.35	-0.11	-24%
		$V(ft^3)$	1,507	836	-671	-45%
2 yr	2	$Q(ft^3/sec)$	0.60	0.41	-0.19	-32%
		$V(ft^3)$	2,028	1,253	-775	-38%
5 yr	2	$Q(ft^3/sec)$	0.73	0.50	-0.23	-32%
		$V(ft^3)$	2,486	1,628	-858	-35%
10 yr	2	$Q(ft^3/sec)$	0.87	0.61	-0.26	-30%
		$V(ft^3)$	3,009	2,059	-950	-32%
25 yr	2	$Q(ft^3/sec)$	1.12	0.80	-0.32	-29%
		$V(ft^3)$	3,927	2,817	-1,110	-28%
50 yr	2	$Q(ft^3/sec)$	1.27	0.91	-0.36	-28%
		$V(ft^3)$	4,517	3,306	-1,211	-27%

Description	POC	Flow/Volume	Existing	Proposed	Δ	$\Delta\%$
1 yr	3	$Q(ft^3/sec)$	0.01	0.00	-0.01	-100%
		$V(ft^3)$	41	10	-31	-76%
2 yr	3	$Q(ft^3/sec)$	0.02	0.01	-0.01	-50%
		$V(ft^3)$	59	16	-43	-73%
5 yr	3	$Q(ft^3/sec)$	0.03	0.01	-0.02	-67%
		$V(ft^3)$	75	22	-53	-71%
10 yr	3	$Q(ft^3/sec)$	0.03	0.01	-0.02	-67%
		$V(ft^3)$	93	28	-65	-70%
25 yr	3	$Q(ft^3/sec)$	0.04	0.01	-0.03	-75%
		$V(ft^3)$	126	40	-86	-68%
50 yr	3	$Q(ft^3/sec)$	0.05	0.02	-0.03	-60%
		$V(ft^3)$	147	48	-99	-67%

For watershed #1, the proposed peak flow rate is below the existing conditions peak flow rate for the 1 through 50-year storm events. A Vortech Model 1000 has been proposed to provide water quality treatment of stormwater, prior to discharge to the City of Stamford Stormwater Drainage System.

Under existing conditions, watershed #2 flows to a natural depression that has been created by the building on the property line to the east, a higher grade to the northeast, and the retaining wall associated with the neighboring development to the southeast, which then overflows over the retaining wall on the southeastern property. To mitigate adverse impacts to the neighboring properties, the flow rates and volumes have been decreased for watershed #2 under proposed conditions, and the natural depression remains with a stormwater detention system to collect additional runoff prior to discharging over the retaining wall at the neighboring property as is has under historic conditions.

Watershed #3 is proposed to decrease under proposed conditions, thus no stormwater mitigations measures are necessary.

4. CONCLUSION

The proposed development will increase the amount of impervious area to this site, resulting in higher peak runoff rates. However, with the installation of the proposed stormwater retention systems, the original flow patterns will be maintained and there will be no increase in peak runoff rate up to the 50-year storm event. In addition to controlling stormwater peak runoff, the proposed design incorporates stormwater treatment to control pollution and provide groundwater recharge capacity. The implementation of these techniques and the overall site design layout will result in a finished project that will minimize sediment and erosion impacts during construction and will have no adverse impacts to adjoining properties upon completion. Based on the above information, the proposed improvements are designed in accordance with the City of Stamford Stormwater Drainage Manual and will not adversely impact adjacent or downstream properties or City-owned drainage facilities.

Conveyance Calculations

For the **6" PVC Pipes @** a minimum 0.5% Slope, the maximum flow does not exceed 0.40 cfs under the 100-year storm event from the driveway area. Utilizing the Manning's Equation, the capacity of the 6" pvc pipe at full gravity flow is 0.468 cfs:

$$Q = (0.463/n)(d)^{2.667}(S)^{0.5} = (0.463/0.011)(0.50)^{2.667}(0.005)^{0.5}$$
$$Q = 42.09 * 0.1571 * 0.0707 = \mathbf{0.468 \text{ cfs} > 0.40 \text{ cfs}}$$

For the **4" PVC Pipes @** a minimum 1% Slope the maximum flow does not exceed 0.20 cfs under the 100-year storm event from the roof area. Utilizing the Manning's Equation, the capacity of the 4" pipe at full gravity flow is 0.665 cfs:

$$Q = (0.463/n)(d)^{2.667}(S)^{0.5} = (0.463/0.011)(0.33)^{2.667}(0.005)^{0.5}$$
$$Q = 42.09 * 0.052 * 0.01 = \mathbf{0.219 \text{ cfs} > 0.20 \text{ cfs}}$$

All proposed pipe flows are below the maximum conveyance capabilities of the pipe.

EXISTING DRAINAGE CONDITIONS

EXHIBIT "A"

589 BEDFORD STREET, STAMFORD, CT

PREPARED FOR

BEDFORD PROPERTIES, LLC



KOUSIDIS ENGINEERING, LLC

Land Development Consultants and Site Design

10-B First Street, Norwalk, CT 06855

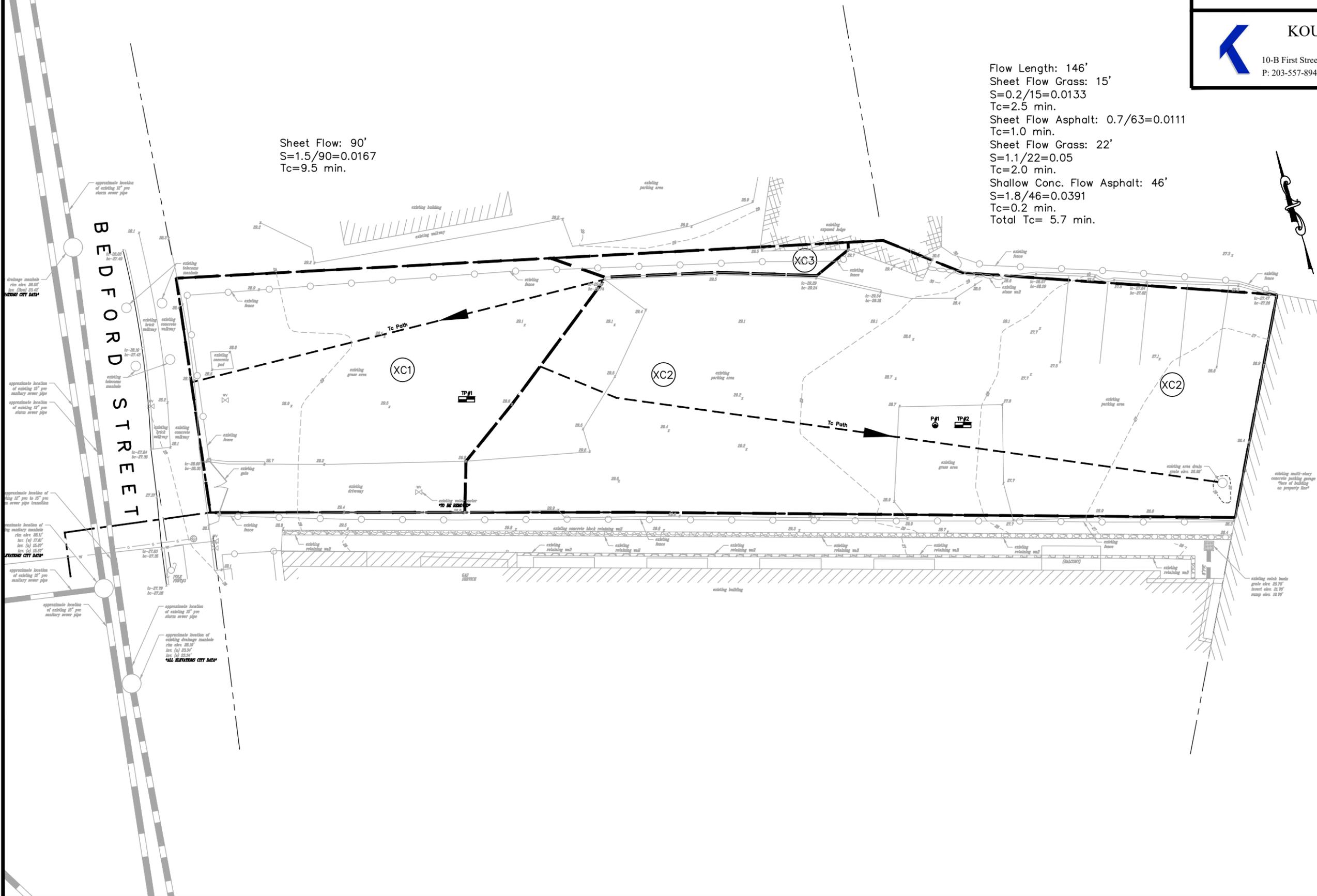
E: jim@kousidisengineering.com

P: 203-557-8943 F: 203-557-8944

Web: www.kousidisengineering.com

Flow Length: 146'
Sheet Flow Grass: 15'
 $S=0.2/15=0.0133$
 $T_c=2.5$ min.
Sheet Flow Asphalt: $0.7/63=0.0111$
 $T_c=1.0$ min.
Sheet Flow Grass: 22'
 $S=1.1/22=0.05$
 $T_c=2.0$ min.
Shallow Conc. Flow Asphalt: 46'
 $S=1.8/46=0.0391$
 $T_c=0.2$ min.
Total $T_c= 5.7$ min.

Sheet Flow: 90'
 $S=1.5/90=0.0167$
 $T_c=9.5$ min.



SCALE:
1" = 20'

PROPOSED DRAINAGE CONDITIONS

EXHIBIT "B"

589 BEDFORD STREET, STAMFORD, CT

PREPARED FOR

BEDFORD PROPERTIES, LLC



KOUSIDIS ENGINEERING, LLC

Land Development Consultants and Site Design

10-B First Street, Norwalk, CT 06855

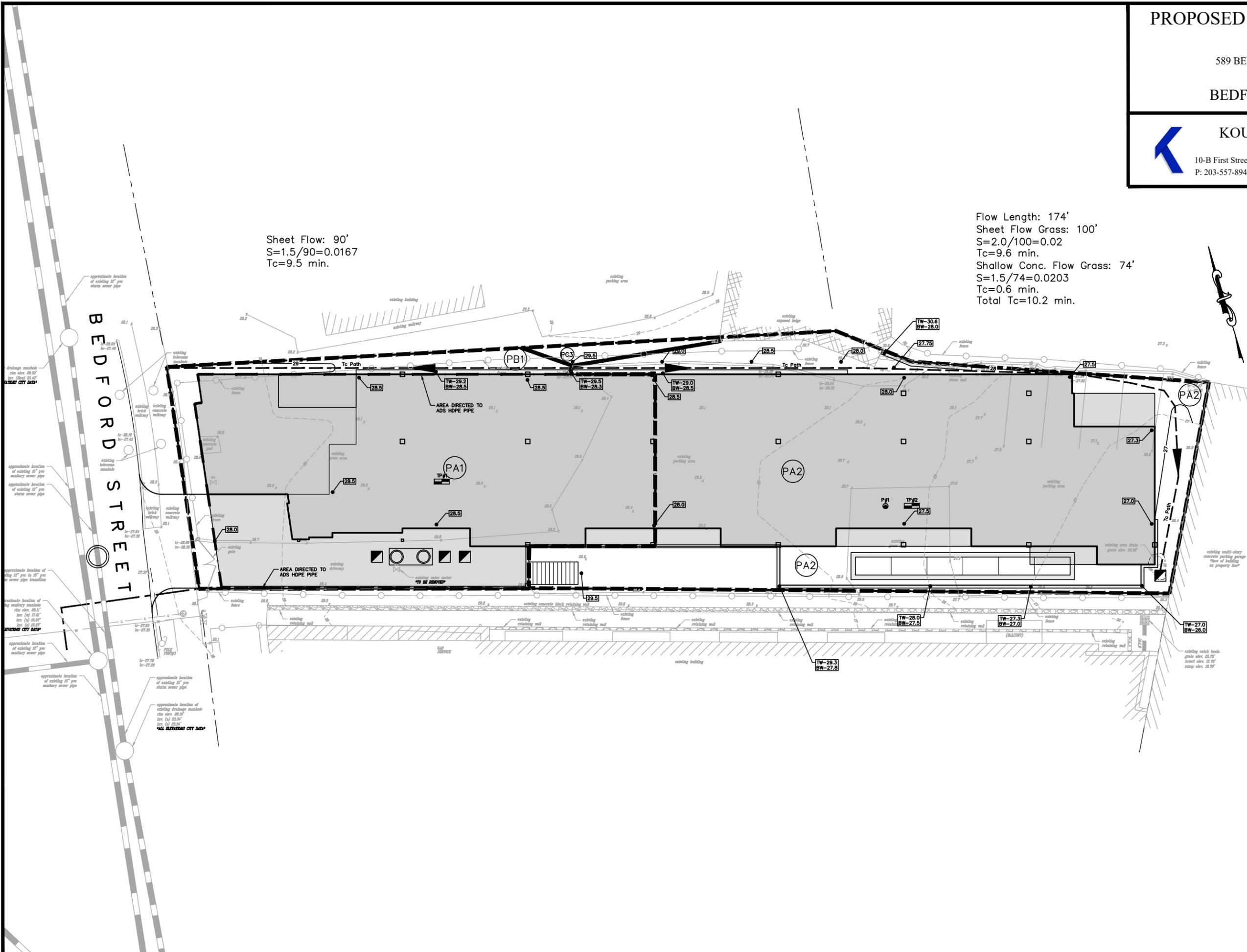
E: jim@kousidisengineering.com

P: 203-557-8943 F: 203-557-8944

Web: www.kousidisengineering.com

Sheet Flow: 90'
 $S=1.5/90=0.0167$
 $T_c=9.5$ min.

Flow Length: 174'
Sheet Flow Grass: 100'
 $S=2.0/100=0.02$
 $T_c=9.6$ min.
Shallow Conc. Flow Grass: 74'
 $S=1.5/74=0.0203$
 $T_c=0.6$ min.
Total $T_c=10.2$ min.



SCALE:

1" = 20'



Existing Conditions
Runoff Watershed #1



Impervious Area #1 to
Detention System 1



Proposed Bypass Area
Watershed #1



24" ADS HDPE Pipe



Overall Runoff
Watershed #1



Existing Conditions
Runoff Watershed #3



Existing Runoff to
Natural Depression
Watershed #2



Existing Depression
Watershed #2



Proposed Conditions
Runoff Watershed #3



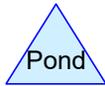
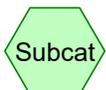
Impervious Area #2 to
Detention System 2



24" High precast
Concrete Galleries



Proposed Depression
Watershed #2



Routing Diagram for 589BedfordSt(01-10-23)_Exist&PropConditions

Prepared by Kousidis Engineering, LLC, Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 2

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PA1: Impervious Area #1 to Runoff Area=4,600 sf 100.00% Impervious Runoff Depth>2.47"
 Tc=6.0 min CN=98 Runoff=0.27 cfs 946 cf

Subcatchment PA2: Impervious Area #2 to Runoff Area=6,574 sf 77.78% Impervious Runoff Depth>2.06"
 Flow Length=174' Tc=10.2 min CN=94 Runoff=0.30 cfs 1,127 cf

Subcatchment PB1: Proposed Bypass Area Runoff Area=516 sf 24.22% Impervious Runoff Depth>1.27"
 Flow Length=91' Slope=0.0165 '/' Tc=9.7 min CN=84 Runoff=0.02 cfs 55 cf

Subcatchment PC3: Proposed Conditions Runoff Area=117 sf 0.00% Impervious Runoff Depth>1.03"
 Tc=3.0 min CN=80 Runoff=0.00 cfs 10 cf

Subcatchment XC1: Existing Conditions Runoff Area=3,628 sf 16.10% Impervious Runoff Depth>1.71"
 Flow Length=90' Slope=0.0167 '/' Tc=9.5 min CN=90 Runoff=0.15 cfs 516 cf

Subcatchment XC2: Existing Runoff to Runoff Area=7,891 sf 83.56% Impervious Runoff Depth>2.36"
 Flow Length=146' Tc=5.7 min CN=97 Runoff=0.46 cfs 1,552 cf

Subcatchment XC3: Existing Conditions Runoff Area=288 sf 7.64% Impervious Runoff Depth>1.71"
 Tc=3.0 min CN=90 Runoff=0.01 cfs 41 cf

Pond DB1: 24" ADS HDPE Pipe Peak Elev=24.82' Storage=142 cf Inflow=0.27 cfs 946 cf
 Primary=0.14 cfs 938 cf Secondary=0.00 cfs 0 cf Outflow=0.14 cfs 938 cf

Pond DB2: 24" High precast Concrete Galleries Peak Elev=26.06' Storage=280 cf Inflow=0.30 cfs 1,127 cf
 Outflow=0.41 cfs 854 cf

Pond PD2: Proposed Depression Watershed #2 Peak Elev=26.45' Storage=23 cf Inflow=0.41 cfs 854 cf
 Outflow=0.35 cfs 836 cf

Pond XD2: Existing Depression Watershed #2 Peak Elev=26.46' Storage=57 cf Inflow=0.46 cfs 1,552 cf
 Outflow=0.46 cfs 1,507 cf

Link OR1: Overall Runoff Watershed #1 Inflow=0.15 cfs 993 cf
 Primary=0.15 cfs 993 cf

Summary for Subcatchment PA1: Impervious Area #1 to Detention System 1

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 946 cf, Depth> 2.47"

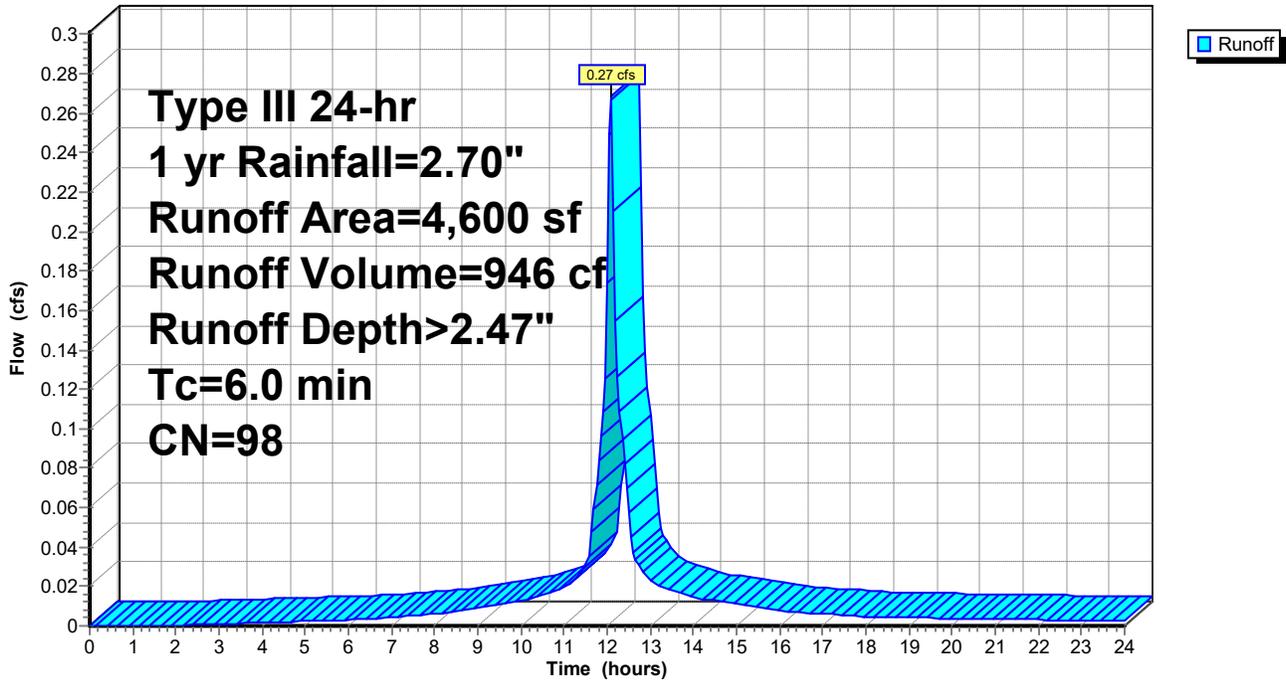
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 yr Rainfall=2.70"

Area (sf)	CN	Description
* 4,600	98	Building
4,600		100.00% Impervious Area

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

Subcatchment PA1: Impervious Area #1 to Detention System 1

Hydrograph



Summary for Subcatchment PA2: Impervious Area #2 to Detention System 2

Runoff = 0.30 cfs @ 12.14 hrs, Volume= 1,127 cf, Depth> 2.06"

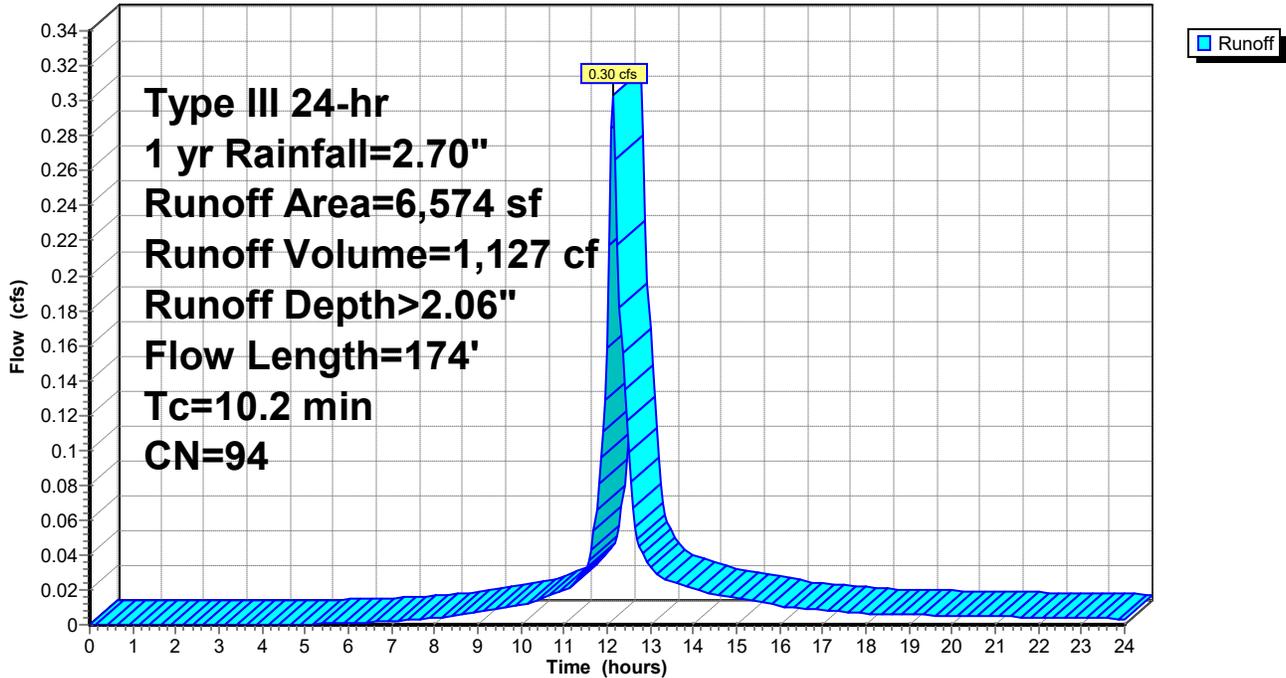
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 yr Rainfall=2.70"

	Area (sf)	CN	Description
*	4,400	98	Building
*	625	98	Driveway
*	88	98	Ledge
	1,461	80	>75% Grass cover, Good, HSG D
	6,574	94	Weighted Average
	1,461		22.22% Pervious Area
	5,113		77.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Sheet Flow Grass Grass: Short n= 0.150 P2= 3.30"
0.6	74	0.0203	2.14		Shallow Concentrated Flow, Shallow Concentrated Flow Grass Grassed Waterway Kv= 15.0 fps
10.2	174	Total			

Subcatchment PA2: Impervious Area #2 to Detention System 2

Hydrograph



Summary for Subcatchment PB1: Proposed Bypass Area Watershed #1

Runoff = 0.02 cfs @ 12.14 hrs, Volume= 55 cf, Depth> 1.27"

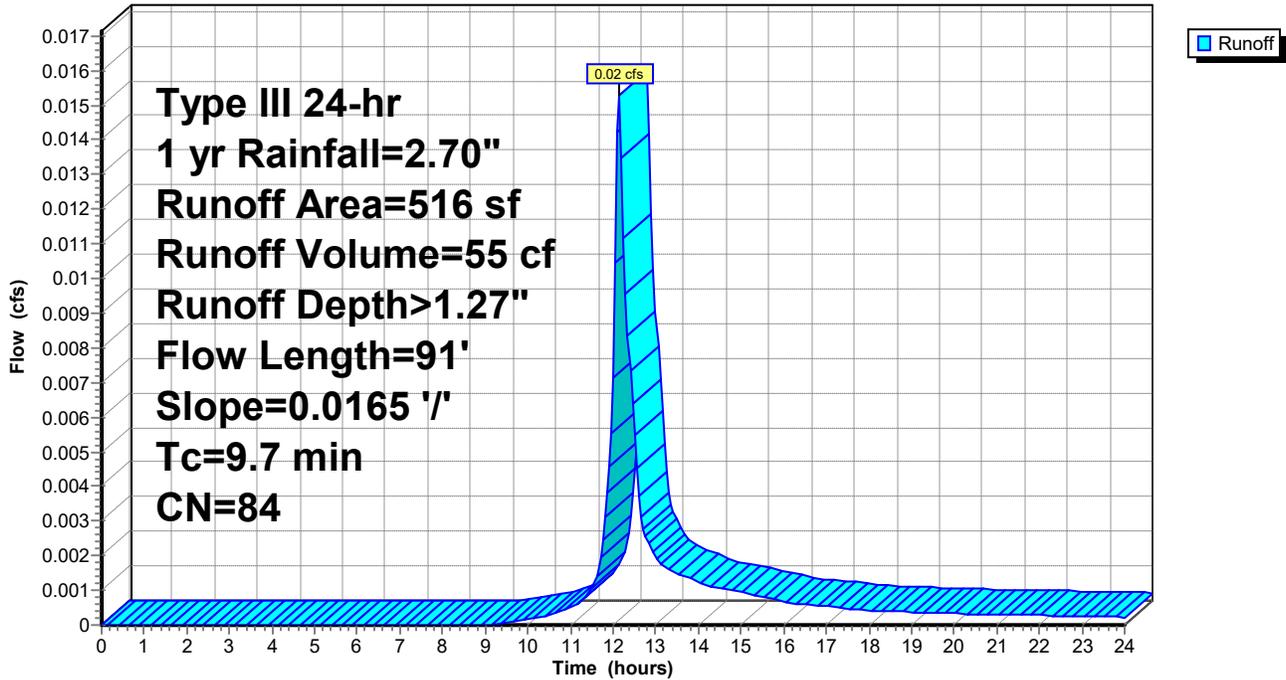
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 yr Rainfall=2.70"

Area (sf)	CN	Description
391	80	>75% Grass cover, Good, HSG D
* 125	98	Driveway
516	84	Weighted Average
391		75.78% Pervious Area
125		24.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	91	0.0165	0.16		Sheet Flow, Sheet Flow Grass Grass: Short n= 0.150 P2= 3.30"

Subcatchment PB1: Proposed Bypass Area Watershed #1

Hydrograph



Summary for Subcatchment PC3: Proposed Conditions Runoff Watershed #3

Runoff = 0.00 cfs @ 12.05 hrs, Volume= 10 cf, Depth> 1.03"

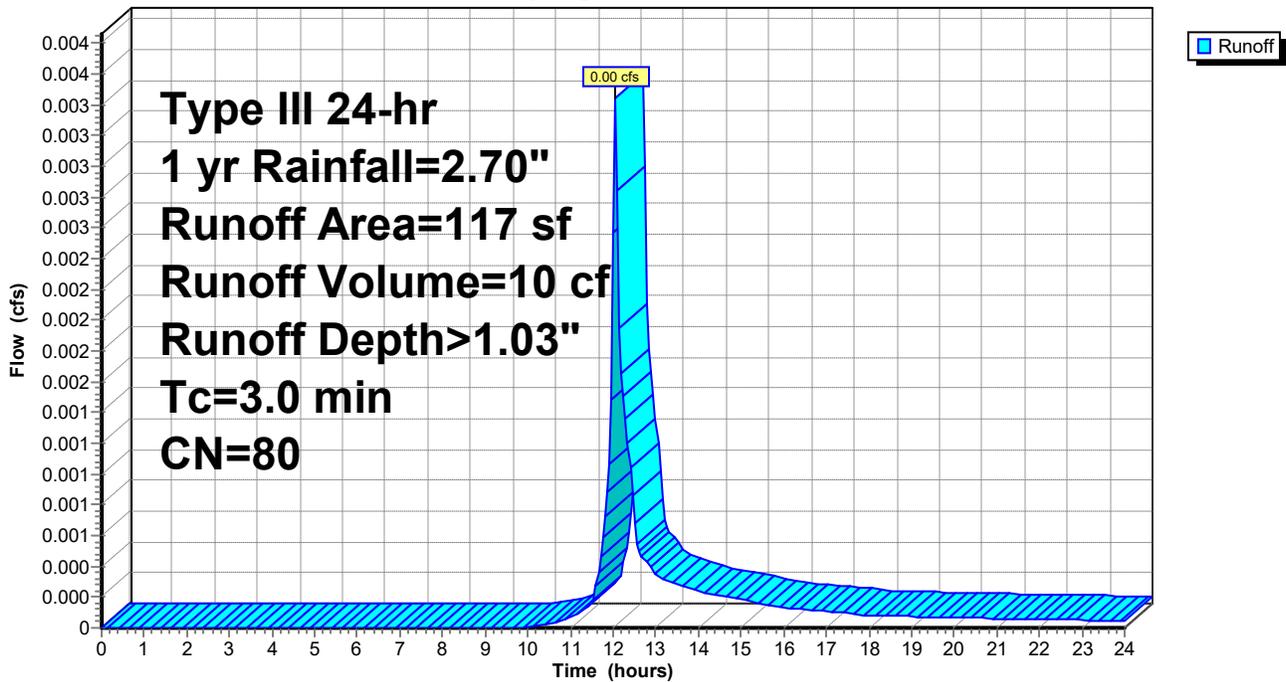
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 yr Rainfall=2.70"

Area (sf)	CN	Description
117	80	>75% Grass cover, Good, HSG D
117		100.00% Pervious Area

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

Subcatchment PC3: Proposed Conditions Runoff Watershed #3

Hydrograph



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 7

Summary for Subcatchment XC1: Existing Conditions Runoff Watershed #1

Runoff = 0.15 cfs @ 12.14 hrs, Volume= 516 cf, Depth> 1.71"

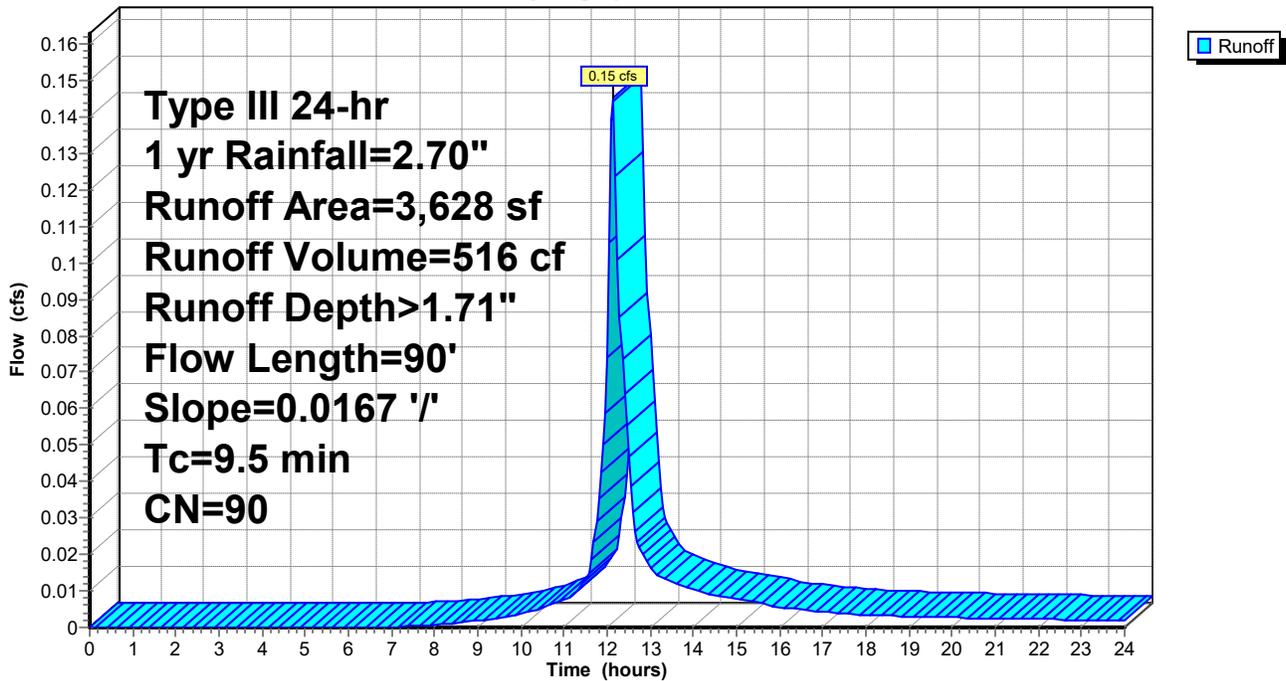
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 yr Rainfall=2.70"

Area (sf)	CN	Description
* 568	98	Driveway
* 16	98	Concrete Pad
3,044	89	<50% Grass cover, Poor, HSG D
3,628	90	Weighted Average
3,044		83.90% Pervious Area
584		16.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	90	0.0167	0.16		Sheet Flow, Sheet Flow Grass Grass: Short n= 0.150 P2= 3.30"

Subcatchment XC1: Existing Conditions Runoff Watershed #1

Hydrograph



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 8

Summary for Subcatchment XC2: Existing Runoff to Natural Depression Watershed #2

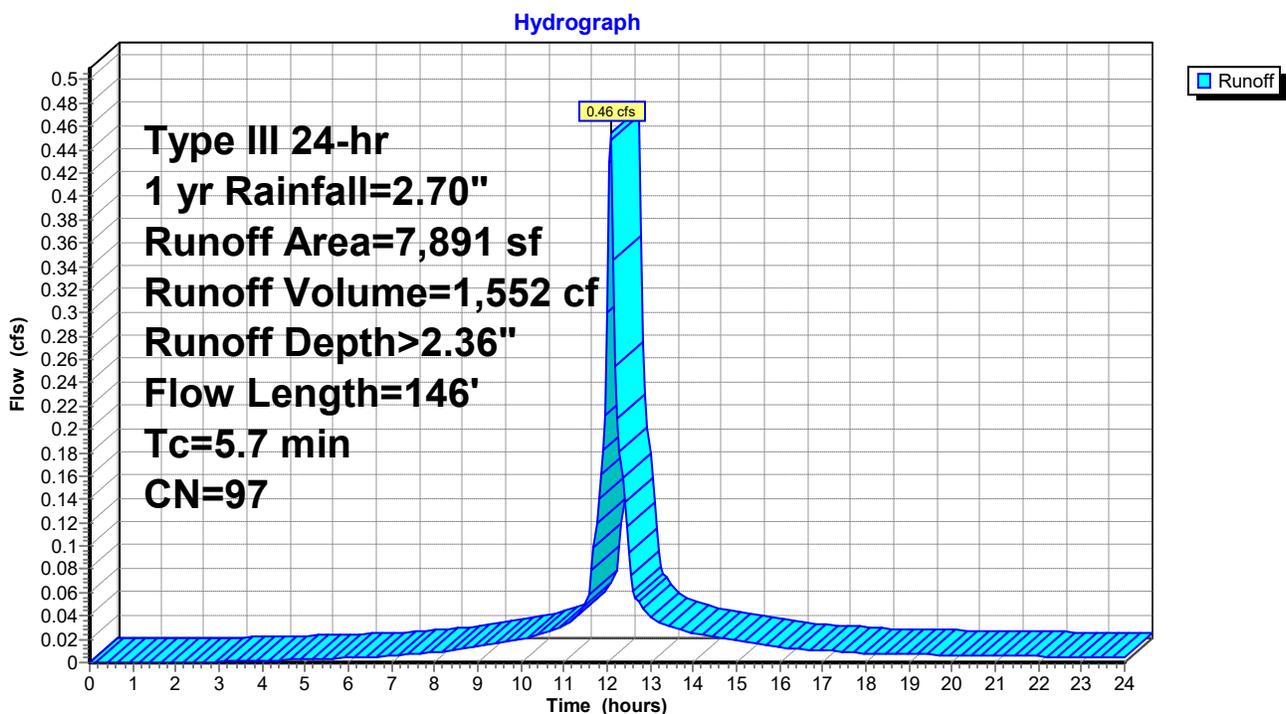
Runoff = 0.46 cfs @ 12.08 hrs, Volume= 1,552 cf, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 yr Rainfall=2.70"

	Area (sf)	CN	Description
*	6,528	98	Driveway
*	66	98	Ledge
	1,297	89	<50% Grass cover, Poor, HSG D
	7,891	97	Weighted Average
	1,297		16.44% Pervious Area
	6,594		83.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	15	0.0133	0.10		Sheet Flow, Sheet Flow Grass Grass: Short n= 0.150 P2= 3.30"
1.0	63	0.0111	1.01		Sheet Flow, Sheet Flow Asphalt Smooth surfaces n= 0.011 P2= 3.30"
2.0	22	0.0500	0.18		Sheet Flow, Sheet Flow Grass Grass: Short n= 0.150 P2= 3.30"
0.2	46	0.0391	4.01		Shallow Concentrated Flow, Shallow Concentrated Asphalt Paved Kv= 20.3 fps
5.7	146	Total			

Subcatchment XC2: Existing Runoff to Natural Depression Watershed #2



Summary for Subcatchment XC3: Existing Conditions Runoff Watershed #3

Runoff = 0.01 cfs @ 12.05 hrs, Volume= 41 cf, Depth> 1.71"

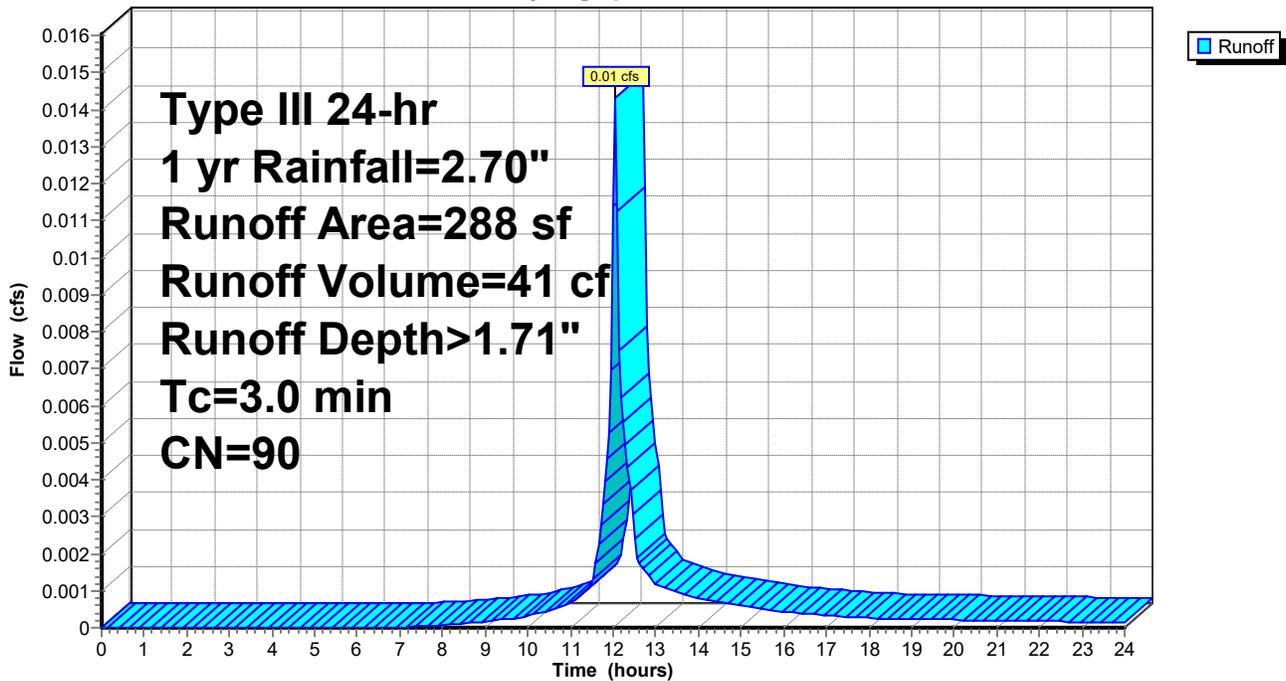
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 1 yr Rainfall=2.70"

Area (sf)	CN	Description
* 22	98	Ledge
266	89	<50% Grass cover, Poor, HSG D
288	90	Weighted Average
266		92.36% Pervious Area
22		7.64% Impervious Area

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

Subcatchment XC3: Existing Conditions Runoff Watershed #3

Hydrograph



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 10

Summary for Pond DB1: 24" ADS HDPE Pipe

Inflow Area = 4,600 sf, 100.00% Impervious, Inflow Depth > 2.47" for 1 yr event
 Inflow = 0.27 cfs @ 12.09 hrs, Volume= 946 cf
 Outflow = 0.14 cfs @ 12.22 hrs, Volume= 938 cf, Atten= 48%, Lag= 8.3 min
 Primary = 0.14 cfs @ 12.22 hrs, Volume= 938 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 24.82' @ 12.22 hrs Surf.Area= 283 sf Storage= 142 cf

Plug-Flow detention time= 16.4 min calculated for 936 cf (99% of inflow)
 Center-of-Mass det. time= 11.0 min (770.6 - 759.7)

Volume	Invert	Avail.Storage	Storage Description
#1	24.00'	465 cf	ADS N-12 24" @ 150.00' L Inside= 23.8"W x 23.8"H => 3.10 sf x 150.00'L = 465.0 cf Outside= 28.0"W x 28.0"H => 3.92 sf x 150.00'L = 588.2 cf
#2	22.00'	28 cf	2.00'W x 2.00'L x 7.00'H Yard Drain
		493 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	28.50'	8.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#2	Primary	26.00'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	25.50'	3.0" Vert. Orifice/Grate C= 0.600
#4	Primary	24.50'	2.0" Vert. Orifice/Grate C= 0.600
#5	Primary	24.00'	2.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.14 cfs @ 12.22 hrs HW=24.81' (Free Discharge)

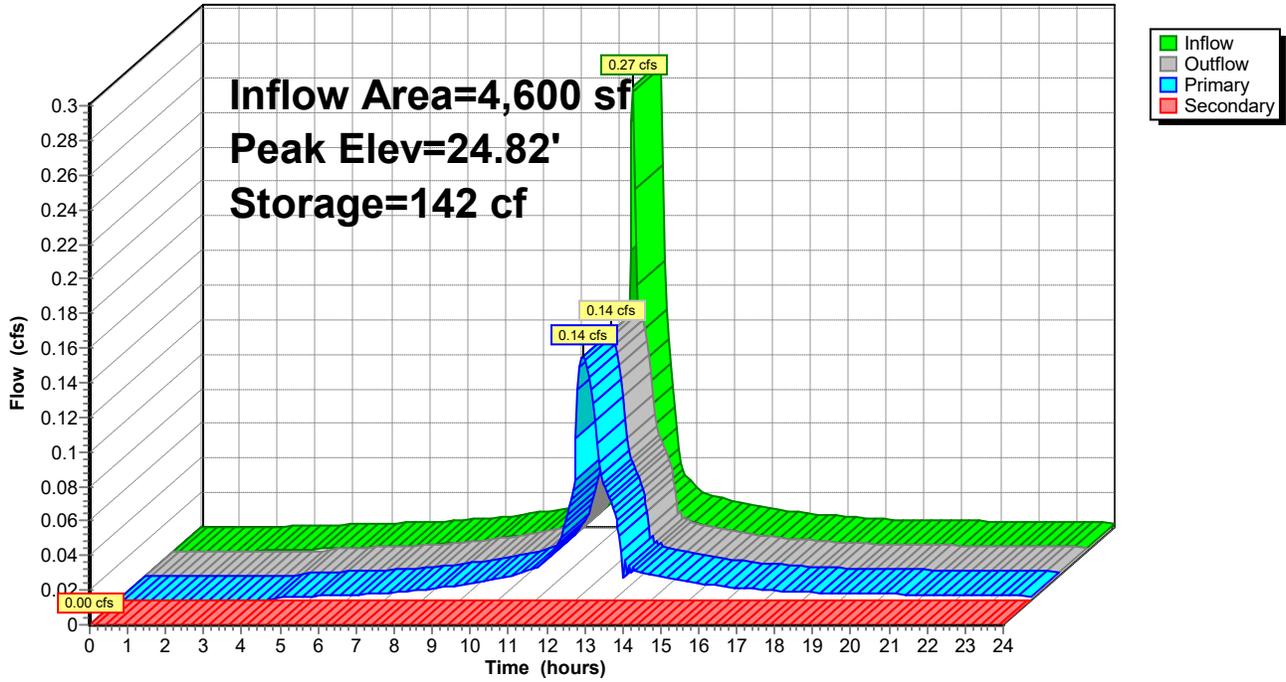
- ↑ 2=Orifice/Grate (Controls 0.00 cfs)
- ↑ 3=Orifice/Grate (Controls 0.00 cfs)
- ↑ 4=Orifice/Grate (Orifice Controls 0.05 cfs @ 2.32 fps)
- ↑ 5=Orifice/Grate (Orifice Controls 0.09 cfs @ 4.12 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.00' (Free Discharge)

- ↑ 1=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond DB1: 24" ADS HDPE Pipe

Hydrograph



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 12

Stage-Area-Storage for Pond DB1: 24" ADS HDPE Pipe

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
22.00	0	27.20	486
22.10	0	27.30	486
22.20	1	27.40	487
22.30	1	27.50	487
22.40	2	27.60	487
22.50	2	27.70	488
22.60	2	27.80	488
22.70	3	27.90	489
22.80	3	28.00	489
22.90	4	28.10	489
23.00	4	28.20	490
23.10	4	28.30	490
23.20	5	28.40	491
23.30	5	28.50	491
23.40	6	28.60	491
23.50	6	28.70	492
23.60	6	28.80	492
23.70	7	28.90	493
23.80	7	29.00	493
23.90	8		
24.00	8		
24.10	8		
24.20	10		
24.30	22		
24.40	39		
24.50	60		
24.60	84		
24.70	110		
24.80	137		
24.90	166		
25.00	195		
25.10	225		
25.20	255		
25.30	285		
25.40	315		
25.50	344		
25.60	372		
25.70	398		
25.80	423		
25.90	445		
26.00	463		
26.10	477		
26.20	482		
26.30	482		
26.40	483		
26.50	483		
26.60	483		
26.70	484		
26.80	484		
26.90	485		
27.00	485		
27.10	485		

Summary for Pond DB2: 24" High precast Concrete Galleries

Inflow Area = 6,574 sf, 77.78% Impervious, Inflow Depth > 2.06" for 1 yr event
 Inflow = 0.30 cfs @ 12.14 hrs, Volume= 1,127 cf
 Outflow = 0.41 cfs @ 12.10 hrs, Volume= 854 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.41 cfs @ 12.10 hrs, Volume= 854 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 26.06' @ 12.11 hrs Surf.Area= 4 sf Storage= 280 cf

Plug-Flow detention time= 132.9 min calculated for 853 cf (76% of inflow)
 Center-of-Mass det. time= 51.5 min (847.3 - 795.8)

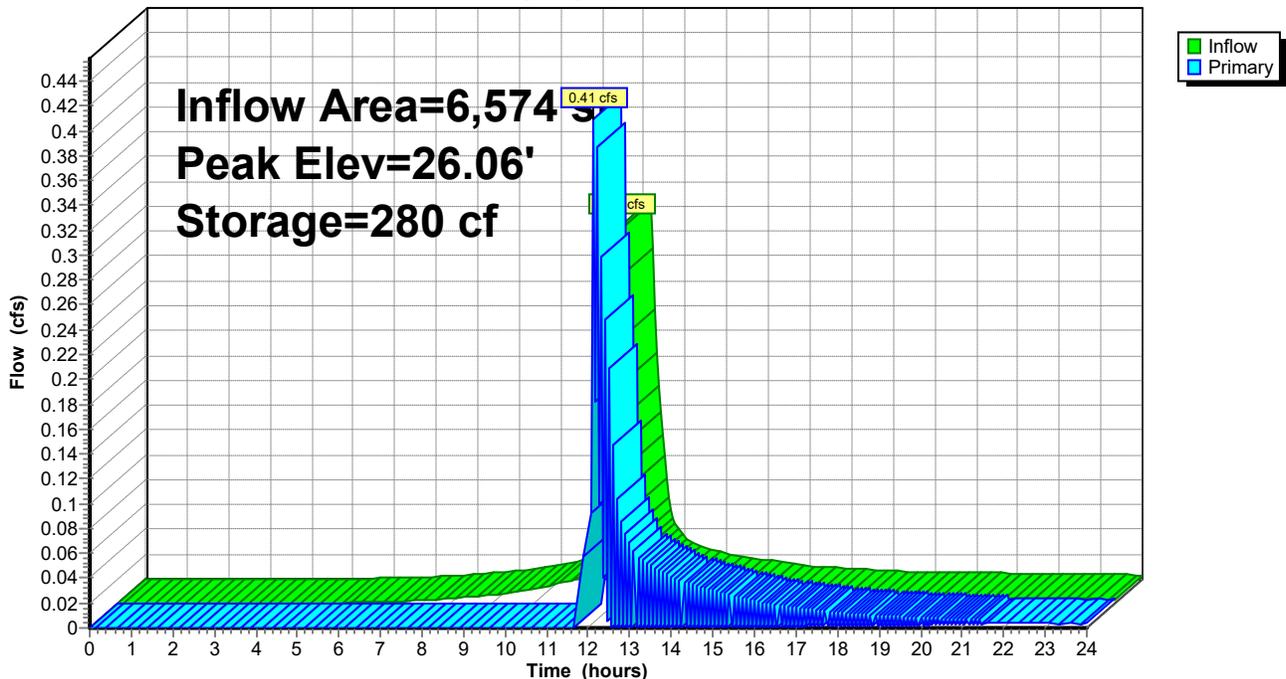
Volume	Invert	Avail.Storage	Storage Description
#1	24.00'	272 cf	Concrete Galley 4x8x2 x 6 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf
#2	24.00'	20 cf	2.00'W x 2.00'L x 5.00'H Yard Drain
		292 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	26.00'	8.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.37 cfs @ 12.10 hrs HW=26.06' (Free Discharge)
 ↑1=Sharp-Crested Rectangular Weir (Weir Controls 0.37 cfs @ 0.79 fps)

Pond DB2: 24" High precast Concrete Galleries

Hydrograph



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 14

Stage-Area-Storage for Pond DB2: 24" High precast Concrete Galleries

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
24.00	0	26.60	282
24.05	8	26.65	282
24.10	16	26.70	283
24.15	24	26.75	283
24.20	32	26.80	283
24.25	40	26.85	283
24.30	48	26.90	283
24.35	57	26.95	284
24.40	65	27.00	284
24.45	73	27.05	284
24.50	81	27.10	284
24.55	89	27.15	284
24.60	97	27.20	285
24.65	105	27.25	285
24.70	113	27.30	285
24.75	121	27.35	285
24.80	129	27.40	285
24.85	137	27.45	286
24.90	145	27.50	286
24.95	153	27.55	286
25.00	162	27.60	286
25.05	170	27.65	286
25.10	178	27.70	287
25.15	186	27.75	287
25.20	194	27.80	287
25.25	202	27.85	287
25.30	210	27.90	287
25.35	218	27.95	288
25.40	226	28.00	288
25.45	234	28.05	288
25.50	242	28.10	288
25.55	250	28.15	288
25.60	258	28.20	289
25.65	265	28.25	289
25.70	272	28.30	289
25.75	279	28.35	289
25.80	279	28.40	289
25.85	279	28.45	290
25.90	279	28.50	290
25.95	280	28.55	290
26.00	280	28.60	290
26.05	280	28.65	290
26.10	280	28.70	291
26.15	280	28.75	291
26.20	281	28.80	291
26.25	281	28.85	291
26.30	281	28.90	291
26.35	281	28.95	292
26.40	281	29.00	292
26.45	282		
26.50	282		
26.55	282		

589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 15

Summary for Pond PD2: Proposed Depression Watershed #2

Inflow Area = 6,574 sf, 77.78% Impervious, Inflow Depth > 1.56" for 1 yr event
 Inflow = 0.41 cfs @ 12.10 hrs, Volume= 854 cf
 Outflow = 0.35 cfs @ 12.15 hrs, Volume= 836 cf, Atten= 15%, Lag= 2.8 min
 Primary = 0.35 cfs @ 12.15 hrs, Volume= 836 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 26.45' @ 12.15 hrs Surf.Area= 100 sf Storage= 23 cf

Plug-Flow detention time= 14.8 min calculated for 835 cf (98% of inflow)
 Center-of-Mass det. time= 3.0 min (850.3 - 847.3)

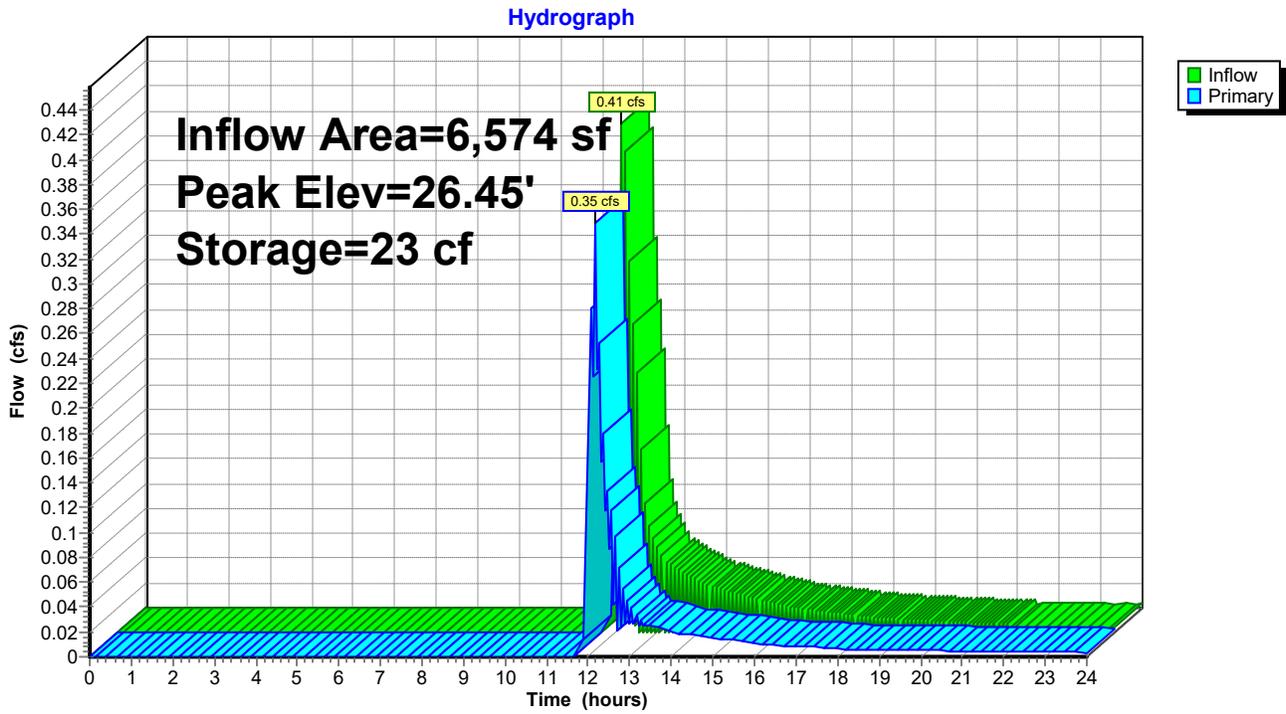
Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	361 cf	Existing Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.00	0	0	0
26.50	112	28	28
27.00	1,221	333	361

Device	Routing	Invert	Outlet Devices
#1	Primary	26.40'	10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.35 cfs @ 12.15 hrs HW=26.45' (Free Discharge)
 ↳ **1=Sharp-Crested Rectangular Weir** (Weir Controls 0.35 cfs @ 0.72 fps)

Pond PD2: Proposed Depression Watershed #2



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 17

Stage-Area-Storage for Pond PD2: Proposed Depression Watershed #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
26.00	0	0	26.52	156	31
26.01	2	0	26.53	179	32
26.02	4	0	26.54	201	34
26.03	7	0	26.55	223	36
26.04	9	0	26.56	245	39
26.05	11	0	26.57	267	41
26.06	13	0	26.58	289	44
26.07	16	1	26.59	312	47
26.08	18	1	26.60	334	50
26.09	20	1	26.61	356	54
26.10	22	1	26.62	378	57
26.11	25	1	26.63	400	61
26.12	27	2	26.64	423	65
26.13	29	2	26.65	445	70
26.14	31	2	26.66	467	74
26.15	34	3	26.67	489	79
26.16	36	3	26.68	511	84
26.17	38	3	26.69	533	89
26.18	40	4	26.70	556	95
26.19	43	4	26.71	578	100
26.20	45	4	26.72	600	106
26.21	47	5	26.73	622	112
26.22	49	5	26.74	644	119
26.23	52	6	26.75	667	125
26.24	54	6	26.76	689	132
26.25	56	7	26.77	711	139
26.26	58	8	26.78	733	146
26.27	60	8	26.79	755	154
26.28	63	9	26.80	777	161
26.29	65	9	26.81	800	169
26.30	67	10	26.82	822	177
26.31	69	11	26.83	844	186
26.32	72	11	26.84	866	194
26.33	74	12	26.85	888	203
26.34	76	13	26.86	910	212
26.35	78	14	26.87	933	221
26.36	81	15	26.88	955	231
26.37	83	15	26.89	977	240
26.38	85	16	26.90	999	250
26.39	87	17	26.91	1,021	260
26.40	90	18	26.92	1,044	271
26.41	92	19	26.93	1,066	281
26.42	94	20	26.94	1,088	292
26.43	96	21	26.95	1,110	303
26.44	99	22	26.96	1,132	314
26.45	101	23	26.97	1,154	326
26.46	103	24	26.98	1,177	337
26.47	105	25	26.99	1,199	349
26.48	108	26	27.00	1,221	361
26.49	110	27			
26.50	112	28			
26.51	134	29			

Summary for Pond XD2: Existing Depression Watershed #2

Inflow Area = 7,891 sf, 83.56% Impervious, Inflow Depth > 2.36" for 1 yr event
 Inflow = 0.46 cfs @ 12.08 hrs, Volume= 1,552 cf
 Outflow = 0.46 cfs @ 12.09 hrs, Volume= 1,507 cf, Atten= 0%, Lag= 0.4 min
 Primary = 0.46 cfs @ 12.09 hrs, Volume= 1,507 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 26.46' @ 12.09 hrs Surf.Area= 228 sf Storage= 57 cf

Plug-Flow detention time= 30.8 min calculated for 1,507 cf (97% of inflow)
 Center-of-Mass det. time= 13.5 min (783.3 - 769.8)

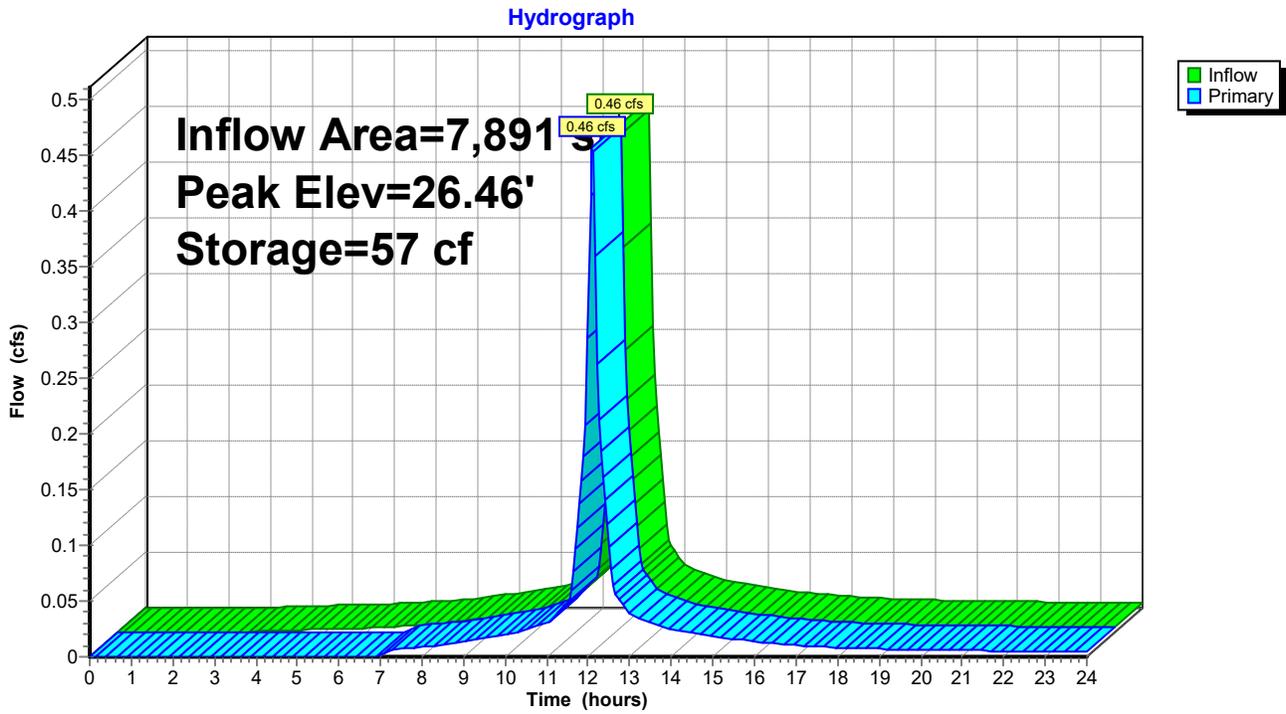
Volume	Invert	Avail.Storage	Storage Description
#1	25.92'	365 cf	Existing Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
25.92	0	0	0
26.00	17	1	1
26.50	247	66	67
27.00	948	299	365

Device	Routing	Invert	Outlet Devices
#1	Primary	26.40'	10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.44 cfs @ 12.09 hrs HW=26.46' (Free Discharge)
 ↑1=Sharp-Crested Rectangular Weir (Weir Controls 0.44 cfs @ 0.78 fps)

Pond XD2: Existing Depression Watershed #2



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 1 yr Rainfall=2.70"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 20

Stage-Area-Storage for Pond XD2: Existing Depression Watershed #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
25.92	0	0	26.96	892	329
25.94	4	0	26.98	920	347
25.96	9	0	27.00	948	365
25.98	13	0			
26.00	17	1			
26.02	26	1			
26.04	35	2			
26.06	45	3			
26.08	54	4			
26.10	63	5			
26.12	72	6			
26.14	81	8			
26.16	91	9			
26.18	100	11			
26.20	109	13			
26.22	118	16			
26.24	127	18			
26.26	137	21			
26.28	146	23			
26.30	155	26			
26.32	164	30			
26.34	173	33			
26.36	183	37			
26.38	192	40			
26.40	201	44			
26.42	210	48			
26.44	219	53			
26.46	229	57			
26.48	238	62			
26.50	247	67			
26.52	275	72			
26.54	303	78			
26.56	331	84			
26.58	359	91			
26.60	387	98			
26.62	415	106			
26.64	443	115			
26.66	471	124			
26.68	499	134			
26.70	527	144			
26.72	555	155			
26.74	583	166			
26.76	612	178			
26.78	640	191			
26.80	668	204			
26.82	696	218			
26.84	724	232			
26.86	752	246			
26.88	780	262			
26.90	808	278			
26.92	836	294			
26.94	864	311			

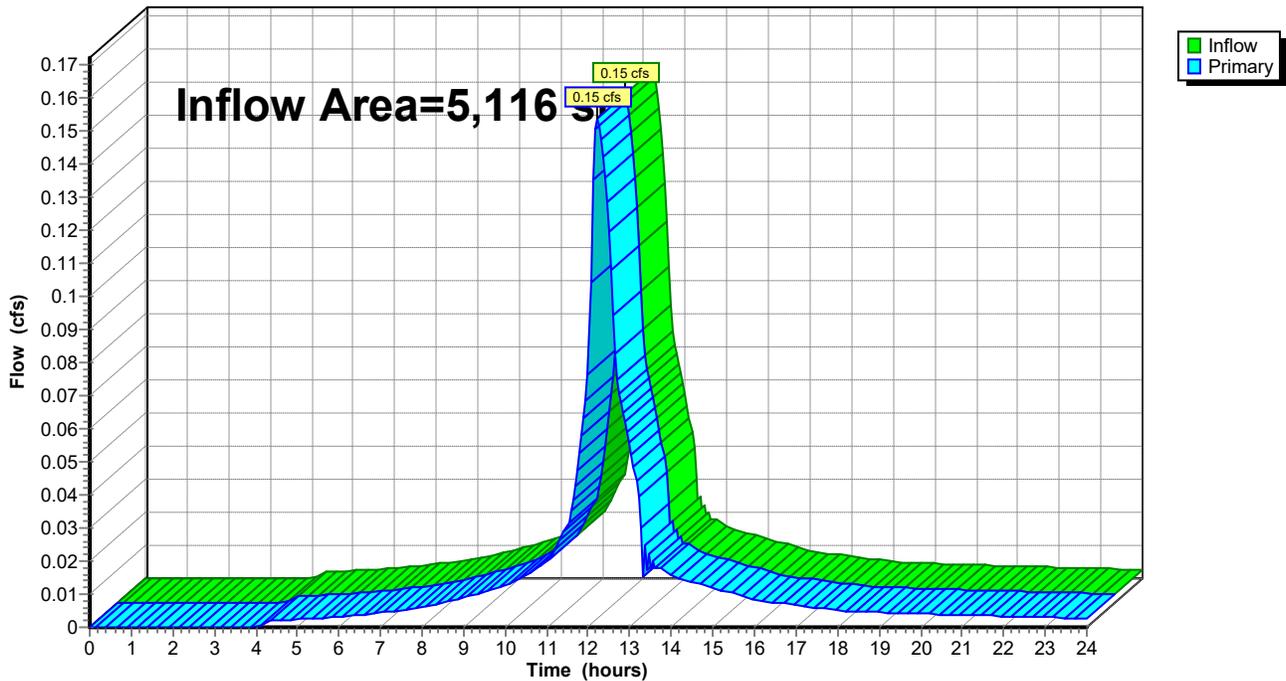
Summary for Link OR1: Overall Runoff Watershed #1

Inflow Area = 5,116 sf, 92.36% Impervious, Inflow Depth > 2.33" for 1 yr event
Inflow = 0.15 cfs @ 12.20 hrs, Volume= 993 cf
Primary = 0.15 cfs @ 12.20 hrs, Volume= 993 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link OR1: Overall Runoff Watershed #1

Hydrograph



589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 2 yr Rainfall=3.50"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 22

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PA1: Impervious Area #1 to Runoff Area=4,600 sf 100.00% Impervious Runoff Depth>3.26"
 Tc=6.0 min CN=98 Runoff=0.35 cfs 1,251 cf

Subcatchment PA2: Impervious Area #2 to Runoff Area=6,574 sf 77.78% Impervious Runoff Depth>2.83"
 Flow Length=174' Tc=10.2 min CN=94 Runoff=0.41 cfs 1,551 cf

Subcatchment PB1: Proposed Bypass Area Runoff Area=516 sf 24.22% Impervious Runoff Depth>1.93"
 Flow Length=91' Slope=0.0165 '/' Tc=9.7 min CN=84 Runoff=0.02 cfs 83 cf

Subcatchment PC3: Proposed Conditions Runoff Area=117 sf 0.00% Impervious Runoff Depth>1.64"
 Tc=3.0 min CN=80 Runoff=0.01 cfs 16 cf

Subcatchment XC1: Existing Conditions Runoff Area=3,628 sf 16.10% Impervious Runoff Depth>2.44"
 Flow Length=90' Slope=0.0167 '/' Tc=9.5 min CN=90 Runoff=0.21 cfs 739 cf

Subcatchment XC2: Existing Runoff to Runoff Area=7,891 sf 83.56% Impervious Runoff Depth>3.15"
 Flow Length=146' Tc=5.7 min CN=97 Runoff=0.60 cfs 2,073 cf

Subcatchment XC3: Existing Conditions Runoff Area=288 sf 7.64% Impervious Runoff Depth>2.45"
 Tc=3.0 min CN=90 Runoff=0.02 cfs 59 cf

Pond DB1: 24" ADS HDPE Pipe Peak Elev=25.02' Storage=200 cf Inflow=0.35 cfs 1,251 cf
 Primary=0.17 cfs 1,243 cf Secondary=0.00 cfs 0 cf Outflow=0.17 cfs 1,243 cf

Pond DB2: 24" High precast Concrete Galleries Peak Elev=26.06' Storage=280 cf Inflow=0.41 cfs 1,551 cf
 Outflow=0.40 cfs 1,272 cf

Pond PD2: Proposed Depression Watershed #2 Peak Elev=26.45' Storage=23 cf Inflow=0.40 cfs 1,272 cf
 Outflow=0.41 cfs 1,253 cf

Pond XD2: Existing Depression Watershed #2 Peak Elev=26.47' Storage=59 cf Inflow=0.60 cfs 2,073 cf
 Outflow=0.60 cfs 2,028 cf

Link OR1: Overall Runoff Watershed #1 Inflow=0.19 cfs 1,326 cf
 Primary=0.19 cfs 1,326 cf

589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 5 yr Rainfall=4.20"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 23

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PA1: Impervious Area #1 to Runoff Area=4,600 sf 100.00% Impervious Runoff Depth>3.96"
 Tc=6.0 min CN=98 Runoff=0.42 cfs 1,519 cf

Subcatchment PA2: Impervious Area #2 to Runoff Area=6,574 sf 77.78% Impervious Runoff Depth>3.52"
 Flow Length=174' Tc=10.2 min CN=94 Runoff=0.50 cfs 1,926 cf

Subcatchment PB1: Proposed Bypass Area Runoff Area=516 sf 24.22% Impervious Runoff Depth>2.54"
 Flow Length=91' Slope=0.0165 '/' Tc=9.7 min CN=84 Runoff=0.03 cfs 109 cf

Subcatchment PC3: Proposed Conditions Runoff Area=117 sf 0.00% Impervious Runoff Depth>2.21"
 Tc=3.0 min CN=80 Runoff=0.01 cfs 22 cf

Subcatchment XC1: Existing Conditions Runoff Area=3,628 sf 16.10% Impervious Runoff Depth>3.11"
 Flow Length=90' Slope=0.0167 '/' Tc=9.5 min CN=90 Runoff=0.26 cfs 939 cf

Subcatchment XC2: Existing Runoff to Runoff Area=7,891 sf 83.56% Impervious Runoff Depth>3.85"
 Flow Length=146' Tc=5.7 min CN=97 Runoff=0.72 cfs 2,530 cf

Subcatchment XC3: Existing Conditions Runoff Area=288 sf 7.64% Impervious Runoff Depth>3.11"
 Tc=3.0 min CN=90 Runoff=0.03 cfs 75 cf

Pond DB1: 24" ADS HDPE Pipe Peak Elev=25.20' Storage=254 cf Inflow=0.42 cfs 1,519 cf
 Primary=0.19 cfs 1,511 cf Secondary=0.00 cfs 0 cf Outflow=0.19 cfs 1,511 cf

Pond DB2: 24" High precast Concrete Galleries Peak Elev=26.07' Storage=280 cf Inflow=0.50 cfs 1,926 cf
 Outflow=0.51 cfs 1,646 cf

Pond PD2: Proposed Depression Watershed #2 Peak Elev=26.46' Storage=24 cf Inflow=0.51 cfs 1,646 cf
 Outflow=0.50 cfs 1,628 cf

Pond XD2: Existing Depression Watershed #2 Peak Elev=26.48' Storage=62 cf Inflow=0.72 cfs 2,530 cf
 Outflow=0.73 cfs 2,486 cf

Link OR1: Overall Runoff Watershed #1 Inflow=0.22 cfs 1,620 cf
 Primary=0.22 cfs 1,620 cf

589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 10 yr Rainfall=5.00"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 24

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PA1: Impervious Area #1 to Runoff Area=4,600 sf 100.00% Impervious Runoff Depth>4.76"
 Tc=6.0 min CN=98 Runoff=0.50 cfs 1,825 cf

Subcatchment PA2: Impervious Area #2 to Runoff Area=6,574 sf 77.78% Impervious Runoff Depth>4.30"
 Flow Length=174' Tc=10.2 min CN=94 Runoff=0.61 cfs 2,357 cf

Subcatchment PB1: Proposed Bypass Area Runoff Area=516 sf 24.22% Impervious Runoff Depth>3.27"
 Flow Length=91' Slope=0.0165 '/' Tc=9.7 min CN=84 Runoff=0.04 cfs 140 cf

Subcatchment PC3: Proposed Conditions Runoff Area=117 sf 0.00% Impervious Runoff Depth>2.89"
 Tc=3.0 min CN=80 Runoff=0.01 cfs 28 cf

Subcatchment XC1: Existing Conditions Runoff Area=3,628 sf 16.10% Impervious Runoff Depth>3.87"
 Flow Length=90' Slope=0.0167 '/' Tc=9.5 min CN=90 Runoff=0.32 cfs 1,170 cf

Subcatchment XC2: Existing Runoff to Runoff Area=7,891 sf 83.56% Impervious Runoff Depth>4.64"
 Flow Length=146' Tc=5.7 min CN=97 Runoff=0.86 cfs 3,054 cf

Subcatchment XC3: Existing Conditions Runoff Area=288 sf 7.64% Impervious Runoff Depth>3.88"
 Tc=3.0 min CN=90 Runoff=0.03 cfs 93 cf

Pond DB1: 24" ADS HDPE Pipe Peak Elev=25.42' Storage=321 cf Inflow=0.50 cfs 1,825 cf
 Primary=0.22 cfs 1,817 cf Secondary=0.00 cfs 0 cf Outflow=0.22 cfs 1,817 cf

Pond DB2: 24" High precast Concrete Galleries Peak Elev=26.08' Storage=280 cf Inflow=0.61 cfs 2,357 cf
 Outflow=0.63 cfs 2,077 cf

Pond PD2: Proposed Depression Watershed #2 Peak Elev=26.47' Storage=25 cf Inflow=0.63 cfs 2,077 cf
 Outflow=0.61 cfs 2,059 cf

Pond XD2: Existing Depression Watershed #2 Peak Elev=26.49' Storage=64 cf Inflow=0.86 cfs 3,054 cf
 Outflow=0.87 cfs 3,009 cf

Link OR1: Overall Runoff Watershed #1 Inflow=0.25 cfs 1,957 cf
 Primary=0.25 cfs 1,957 cf

589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 25 yr Rainfall=6.40"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 25

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PA1: Impervious Area #1 to Runoff Area=4,600 sf 100.00% Impervious Runoff Depth>6.16"
 Tc=6.0 min CN=98 Runoff=0.65 cfs 2,360 cf

Subcatchment PA2: Impervious Area #2 to Runoff Area=6,574 sf 77.78% Impervious Runoff Depth>5.69"
 Flow Length=174' Tc=10.2 min CN=94 Runoff=0.79 cfs 3,115 cf

Subcatchment PB1: Proposed Bypass Area Runoff Area=516 sf 24.22% Impervious Runoff Depth>4.57"
 Flow Length=91' Slope=0.0165 '/' Tc=9.7 min CN=84 Runoff=0.05 cfs 196 cf

Subcatchment PC3: Proposed Conditions Runoff Area=117 sf 0.00% Impervious Runoff Depth>4.14"
 Tc=3.0 min CN=80 Runoff=0.01 cfs 40 cf

Subcatchment XC1: Existing Conditions Runoff Area=3,628 sf 16.10% Impervious Runoff Depth>5.23"
 Flow Length=90' Slope=0.0167 '/' Tc=9.5 min CN=90 Runoff=0.42 cfs 1,581 cf

Subcatchment XC2: Existing Runoff to Runoff Area=7,891 sf 83.56% Impervious Runoff Depth>6.04"
 Flow Length=146' Tc=5.7 min CN=97 Runoff=1.11 cfs 3,972 cf

Subcatchment XC3: Existing Conditions Runoff Area=288 sf 7.64% Impervious Runoff Depth>5.23"
 Tc=3.0 min CN=90 Runoff=0.04 cfs 126 cf

Pond DB1: 24" ADS HDPE Pipe Peak Elev=25.76' Storage=412 cf Inflow=0.65 cfs 2,360 cf
 Primary=0.33 cfs 2,352 cf Secondary=0.00 cfs 0 cf Outflow=0.33 cfs 2,352 cf

Pond DB2: 24" High precast Concrete Galleries Peak Elev=26.10' Storage=280 cf Inflow=0.79 cfs 3,115 cf
 Outflow=0.78 cfs 2,835 cf

Pond PD2: Proposed Depression Watershed #2 Peak Elev=26.48' Storage=26 cf Inflow=0.78 cfs 2,835 cf
 Outflow=0.80 cfs 2,817 cf

Pond XD2: Existing Depression Watershed #2 Peak Elev=26.51' Storage=68 cf Inflow=1.11 cfs 3,972 cf
 Outflow=1.12 cfs 3,927 cf

Link OR1: Overall Runoff Watershed #1 Inflow=0.38 cfs 2,549 cf
 Primary=0.38 cfs 2,549 cf

589BedfordSt(01-10-23)_Exist&PropConditions

Type III 24-hr 50 yr Rainfall=7.30"

Prepared by Kousidis Engineering, LLC

Printed 3/8/2023

HydroCAD® 10.00-20 s/n 09068 © 2017 HydroCAD Software Solutions LLC

Page 26

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PA1: Impervious Area #1 to Runoff Area=4,600 sf 100.00% Impervious Runoff Depth>7.06"
 Tc=6.0 min CN=98 Runoff=0.74 cfs 2,705 cf

Subcatchment PA2: Impervious Area #2 to Runoff Area=6,574 sf 77.78% Impervious Runoff Depth>6.58"
 Flow Length=174' Tc=10.2 min CN=94 Runoff=0.91 cfs 3,604 cf

Subcatchment PB1: Proposed Bypass Area Runoff Area=516 sf 24.22% Impervious Runoff Depth>5.42"
 Flow Length=91' Slope=0.0165 '/' Tc=9.7 min CN=84 Runoff=0.06 cfs 233 cf

Subcatchment PC3: Proposed Conditions Runoff Area=117 sf 0.00% Impervious Runoff Depth>4.97"
 Tc=3.0 min CN=80 Runoff=0.02 cfs 48 cf

Subcatchment XC1: Existing Conditions Runoff Area=3,628 sf 16.10% Impervious Runoff Depth>6.11"
 Flow Length=90' Slope=0.0167 '/' Tc=9.5 min CN=90 Runoff=0.49 cfs 1,847 cf

Subcatchment XC2: Existing Runoff to Runoff Area=7,891 sf 83.56% Impervious Runoff Depth>6.94"
 Flow Length=146' Tc=5.7 min CN=97 Runoff=1.27 cfs 4,562 cf

Subcatchment XC3: Existing Conditions Runoff Area=288 sf 7.64% Impervious Runoff Depth>6.12"
 Tc=3.0 min CN=90 Runoff=0.05 cfs 147 cf

Pond DB1: 24" ADS HDPE Pipe Peak Elev=25.99' Storage=462 cf Inflow=0.74 cfs 2,705 cf
 Primary=0.41 cfs 2,697 cf Secondary=0.00 cfs 0 cf Outflow=0.41 cfs 2,697 cf

Pond DB2: 24" High precast Concrete Galleries Peak Elev=26.11' Storage=280 cf Inflow=0.91 cfs 3,604 cf
 Outflow=0.90 cfs 3,324 cf

Pond PD2: Proposed Depression Watershed #2 Peak Elev=26.49' Storage=27 cf Inflow=0.90 cfs 3,324 cf
 Outflow=0.91 cfs 3,306 cf

Pond XD2: Existing Depression Watershed #2 Peak Elev=26.52' Storage=71 cf Inflow=1.27 cfs 4,562 cf
 Outflow=1.27 cfs 4,517 cf

Link OR1: Overall Runoff Watershed #1 Inflow=0.47 cfs 2,930 cf
 Primary=0.47 cfs 2,930 cf

Directly Connected Impervious Area Tracking Worksheet
 City of Stamford Drainage Manual



Note to user: complete all cells of this color only, as indicated by section headings

Part 1: General Information (All Projects)	
Project Name	589 Bedford
Project Address	589 Bedford Street
Project Applicant	Bedford Properties, LLC
Title of Plan	Site Development Plan
Revision Date of Plan	8-Mar-23
Tax Account Number	001-4057

Part 2: Project Details (All Projects)	
1. What type of development is this? (choose from dropdown)	Redevelopment
2. What is the total area of the project site?	11,807 ft ²
3. What is the total area of land disturbance for this project?	11,807 ft ²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No
Does Standard 1 apply based on information above?	No, You Are Done. Do NOT do Parts 3, 4, and 5

Part 3: Water Quality Target Total (Only for Standard 1 Projects)	
5. What is the <u>current</u> (pre-development) DCIA for the site?	ft ²
6. Will the proposed development increase DCIA (without consideration of proposed stormwater management)? (Yes/No)	Yes
7. What is the <u>proposed-development</u> total impervious area for the site?	ft ²
Water Quality Volume (WQV)	N/A
Standard 1 requirement	N/A
Required treatment/retention volume	N/A
Provided treatment/retention volume for proposed development	ft ³

Part 4: Proposed DCIA Tracking (Only for Standard 1 Projects)	
<u>Pre-development</u> total impervious area	ft ²
<u>Current</u> DCIA	ft ²
<u>Proposed-development</u> total impervious area	ft ²
<u>Proposed-development</u> DCIA (after stormwater management)	ft ²
<u>Net change in DCIA</u> from <u>current</u> to <u>proposed-development</u>	ft ²

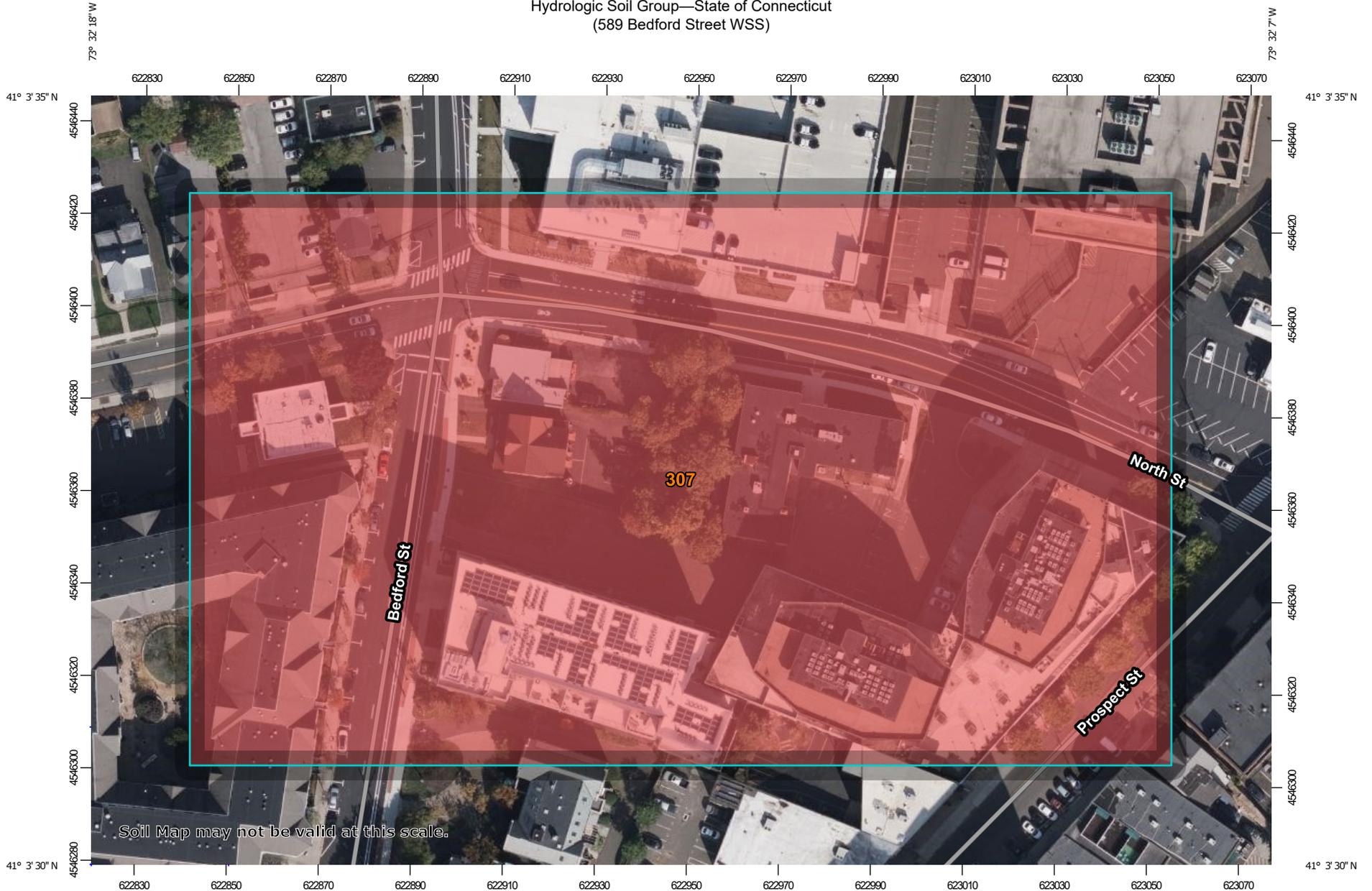
Part 5: Post-Development (As-Built Certified) DCIA Tracking (Only for Standard 1 Projects)	
<u>Post-development</u> (per as-built) total impervious area	ft ²
<u>Post-development</u> (per as-built) DCIA (after stormwater management)	ft ²
<u>Net change in DCIA</u> from <u>current</u> to <u>post-development</u>	ft ²

Certification Statement

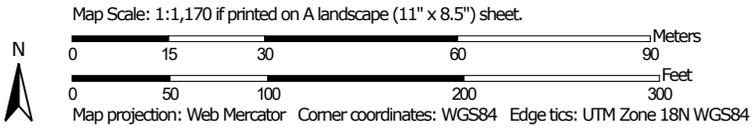
I hereby certify that the information contained in this worksheet is true and correct.

Engineer's Signature J. Verito at 03/08/2023 Engineer's Seal 

Hydrologic Soil Group—State of Connecticut
(589 Bedford Street WSS)



Soil Map may not be valid at this scale.



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
307	Urban land	D	6.6	100.0%
Totals for Area of Interest			6.6	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified