

Exhibit D

Civil Design

Former Palmer Sand & Gravel Redevelopment

700 W Capitol Drive, Hartland WI

Last Updated: May 31, 2023

Development Challenges:

Redevelopment of the former Palmer Sand & Gravel property for multi-family residential development presents some unique challenges and construction costs that would not be incurred in a greenfield development.

Grade differences between adjacent land uses

The lowest elevations on the property (~945') are located west of the Village cemetery and are approximately 10' lower than the lowest adjacent elevation of Capitol Drive. The highest elevations surrounding the property (~1025) are at the northwest corner at the intersection of Hill Street and Palmer Drive adjacent to the Village water tower. Much of the east property line is at elevation ~1020. The elevation at the intersection of Palmer Drive and W. Capitol Drive is ~983.



soils were removed from the site. As a result of the closure request, a groundwater use deed restriction was recorded against the property in 2001. In 1998, Duraset, a concrete admixture spill occurred as the result of a valve failure. In 1991, a leaking underground storage tank was removed from an area west of the office and adjacent to the original cement silo.

Water Meter Vaults

The Village of Hartland is requiring the potable water system serving the property to be owned and maintained by the land owner with redundant water supplies due to the anticipated number of residential units. Two meter vaults with bypass valve assembly, backflow preventer and pressure reducing valve are required to be constructed at each connection point between the public watermain and the private water system.

W. Capitol Drive Improvements

The Village is requiring that concrete sidewalks be constructed along the north side of W. Capitol Drive between the Palmer Drive intersection and the residential properties east of the subject property. Due to the available right-of-way, curb and gutter is anticipated along with the public concrete sidewalk. Additionally, improvements to the existing Vettleson Road intersection have been requested to mitigate lane discipline concerns for the westbound Capitol Drive to westbound Vettleson Road left turn movement. It is anticipated that an island to separate the eastbound right and left turn lanes at the intersection with Capitol Drive will be required.



Site Design Features

Several site features have been designed to mitigate some of the development challenges and create an urban residential community with a unique sense of place and usable open spaces adjacent to the higher density areas in the development.

Slope mitigation

In order to minimize the risks of slope failure on the future residents in the development, a slope stability model was developed for the site. Based on the shear strength of the well drained, gravelly soils present in the slopes around the perimeter of the site, the sand and gravel deposits are generally stable at inclinations of 1H:1V to 1.5H:1V. For the development of the site grading and drainage plans for this project, an inclination of 2H:1V was used to develop the slope stability model. All site drainage features, parking areas and buildings have been designed to be clear of the 2:1 inclination plane projected from the top of existing slopes. Slopes between 4H:1V and 10H:1V have been designed as a bench between the perimeter drainage features and the existing perimeter slopes with the vegetation above intended to remain in their existing condition.

Gravity Sewer & Site balance

The elevations of the buildings within the proposed development were designed to provide gravity sanitary sewer flow from the rear of the property to the existing sanitary sewer in W. Capitol Drive. This avoids the additional construction expense and perpetual operating and maintenance costs of a sanitary lift station. The building elevations were also designed to make use of the available on-site overburden stockpile along the east side of Palmer Drive. Additional import structural fill is anticipated to be available as a result of planned development of the commercial property on the west side of Capitol Drive to aid in the earthwork balance of both developments to reduce overall construction costs.

Emergency Vehicle Secondary Access

A secondary means of egress has been provided to the development. The access point has been designed to connect the first cross drive within the development with Palmer Drive. Due to the grade differential between the finished floor elevation of Townhome 1 and Palmer Drive, a retaining wall is required between the fire lane and the residential units. The retaining wall reduces the visibility of the Townhome from Palmer Drive and leaving an undesirable front view from the units.

Grade differences along Capitol Drive

W. Capitol Drive has a grade difference of approximately 30' between the intersection of Palmer Drive and the new entrance to the subject development. As a result, the orientation of the townhomes and clubhouse are north-south to minimize the length of building parallel to the change in elevation along Capitol Drive. Additionally, retaining walls have been designed along the south sides of the Clubhouse and Townhome 3. The retaining walls are anticipated to be gravity block walls with exposed heights of 8' or less.

Retaining Walls to preserve setbacks to adjacent land uses

In order to minimize grading of the unmined slopes around the perimeter of the development and preserve the wooded slopes adjacent to the surrounding residential land uses, retaining walls have been included in the design. The walls with heights >18' are anticipated to be constructed with soldier pile and timber lagging using a top down construction method. Portions of the larger walls (<24') are anticipated to have soil anchors. Retaining walls less than 18' in height are anticipated to be gravity block walls. Wall height in excess of 12' will be terraced where real estate is available to separate the tiers by 2/3 of the height or more.

One-way boulevards, Mountable Median Curbs & Pedestrian Safety

As part of the site planning process, it was determined that a walkable community with low vehicular speeds is desirable. Additionally, an inviting raised grass boulevard with street trees and seasonal plantings is desired for Center Street. It was also determined that separating traffic flows with a boulevard will make the pedestrian crossings more visible to vehicles and separate the crossing into two distinct movements for the pedestrian. Lane widths of 16' measured face of curb to face of curb were selected for each direction of travel. In addition, a mountable curb was selected for the median island. The 16' lane width and mountable curb provide sufficient width for an emergency vehicle to pass a disabled vehicle and is the same used by WisDOT for a interstate ramp widths and for single lane divided approaches to roundabout intersections. Where parallel parking spaces are provided, an additional 10' of width is provided to ensure car doors aren't opened into on-coming traffic.

Private Drives

All private drives will be 24' in width without curb and gutter and have an inverted section for drainage. Where concrete carriage walks are adjacent to the asphalt drives and parking areas, the concrete flatwork will be flush. This simplifies snow removal operations, eliminates trip hazards near the entries to the units and improves the drainage across the turf areas on the garage side of the buildings. All parking spaces will comply with the dimensional standards in the Village's ordinances.

Alternative BMPs for water quality

With the townhome and clubhouse portions of the site being located within an area of known petroleum contamination, alternative best management practices are being considered for water quality. These practices include porous pavers, bio-retention or wet detention with an impermeable liner. The use of wet detention is less than desired due to the small size of the ponds and long term maintenance concerns. Sediment removed from wet detention ponds is considered a hazardous material and requires landfill disposal. Wet ponds are also considered wetlands by Wisconsin DNR, with wetland alternation permitting required for any future redevelopment and major modifications.

Infiltration basins / Internally Drained Site

The majority of the former sand and gravel pit is internally drained. The majority of the proposed development will also be internally drained with three infiltration basins. The infiltration basins are anticipated to have wet forebays or other means of pre-treatment. Pre-treatment may include porous pavers to eliminate the long term sediment disposal challenges

associated with wet forebays. Additionally, the lowest points on the site have been collecting silt in the runoff for the past several decades. An accumulation of silt is present at two locations where infiltration basins are planned. The accumulated silt will be removed and gravelly fill placed to restore the infiltration rates of the underlying soils.

Watermain loop in east and west perimeter drives

A looped private watermain system is required by the Village to minimize impacts to residents of the development in the future when maintenance to the system is required. A second connection to the Village water system is planned to be made within the Hill Street right-of-way and requires a second meter vault with backflow preventer.

Sanitary main in Center Street

A single sanitary main is provided in Center Street to serve each of the buildings with the exception of the two townhomes west of Center Street, where separate sewer laterals will connect directly to the existing sanitary sewer in Capitol Drive.

Capitol Drive Sidewalk

At the request of the Village, the sidewalk east of the development along the north side of Capitol Drive is proposed to be extended to the Palmer Drive intersection. In order to accommodate the sidewalk within the existing right-of-way, curb and gutter will be constructed along north side of Capitol Drive with a zero width terrace. This is the same typical section that presently exists from the east property line of the development along the residential properties that front Capitol Drive west of North Avenue. Additionally, a right-turn island was recommended at the intersection of Capitol Drive and Vettelson Road to separate left and right turning vehicles on the west leg of the intersection. No geometric modifications or additional lanes were recommended in the traffic study for W. Capitol Drive or the intersections with Palmer Drive nor STH 83.

TECHNICAL MEMORANDUM

DATE: May 30, 2023

RE: Preliminary Hartland Apartments
Stormwater

TO: Project Team

The project study area discussed below refers to development of the 3 parcels at 700 and 701 W. Capitol Drive in the Village of Hartland. The study area is approximately 49 acres.

Per Village of Hartland Chapter 76 – Stormwater Management, Sec. 76-7 – Performance Standards, the proposed site shall meet the following requirements:

Total suspended solids. BMPs shall be designed, installed and maintained to control total suspended solids carried in runoff from the post-construction site as follows: for new development TSS Reduction shall be $\geq 80\%$.

Total phosphorous. BMPs shall be designed, installed and maintained to control total phosphorous carried in runoff from the post-construction site as follows: for new development TP Reduction shall be $\geq 30\%$.

Peak discharge. The stormwater management facilities shall contain sufficient storage to contain the runoff from the 100-year, 24-hour rainfall event under developed conditions, while utilizing a peak discharge rate from the developed site which does not exceed the peak runoff rate from the site for a 10-year, 24-hour rainfall even under pre-developed conditions. By design, BMPs shall be employed to maintain or reduce the 10-year, 24-hour post-construction peak runoff discharge rates to the 2-year, 24-hour pre-development peak runoff discharge rate. Peak discharges shall be calculated using TR-55 runoff curve number methodology, Atlas 14 precipitation depths, and the appropriate NRCS Wisconsin MSE3 precipitation distribution.

Infiltration. For development with more than 40 percent and up to 80 percent connected imperviousness, such as medium and high density residential, multi-family development, industrial and institutional development, and office parks, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 75 percent of the predevelopment infiltration volume, based on an average annual rainfall.

NOAA Atlas 14, Volume 8, Version 2 for Village of Harland, WI, USA

Lat: 43.1028°, Long: -88.3577°

Storm Recurrence Interval	24-hour Rainfall Depth
1-year	2.40 inches
2-year	2.71 inches
10-year	3.83 inches
100-year	6.26 inches

Web Soil Survey National Cooperative Soil Survey Hydrologic Soil Group – Waukesha County, WI

Map Unit Name	Rating
Gravel Pit	
Casco-Rodman Complex	B
Theresa Silt Loam	C
Hocheim Loam	D

In the existing condition the project site is mostly internally drained. There is a portion of the site that has potential to drain south towards Capitol Drive prior to infiltrating during larger storm events. The design intent and drainage

areas remain similar in the proposed condition – 3 infiltration ponds with wet forebays for pretreatment serve the majority of the site and 2 connected bioretention basins are provided upstream of Capitol Drive. Alternatives to the wet forebays will be explored at final design due to concerns of long-term operation and maintenance. The small size of these wet areas will tend towards less aesthetic value and sediment removed from the wet forebays will likely be considered hazardous needing to be disposed of in landfills. Porous pavement, bioretention or sand filters for pretreatment may be better suited for this site. The calculations show that the peak flows toward Capitol Drive are nearly reduced post 100-year to pre 10-year and post 10-year to pre 2-year in the post-developed condition even without detention because of depaving and a smaller drainage area. Preliminary hydrologic and hydraulic calculations were completed to ensure that the Village ordinances are met through the proposed stormwater design. The calculations are summarized below:

Hydrologic Analysis of Pre-Developed Conditions

	Area (Ac)	Runoff Curve Number	Time of Conc. (min.)	Peak Flow Rate (cfs)			
				1-year	2-year	10-year	100-year
S2 (south)	13.94	73	6.0	11.84	16.35	35.07	82.38

Hydrologic Analysis of Post-Developed Conditions

	Area (Ac)	Runoff Curve Number	Time of Conc. (min.)	Peak Flow Rate (cfs)			
				1-year	2-year	10-year	100-year
1S	12.21	65	6.0	3.66	6.44	19.33	55.71
2S	14.19	64	6.0	3.46	6.50	20.93	62.37
3S	14.23	68	6.0	6.92	10.71	27.33	72.18
4S (south)	8.39	66	6.0	3.01	5.04	14.21	39.71
Total (w/o detention)	49.02	---	---	17.01	28.66	81.78	229.95

Detention Features				1-year	2-year	10-year	100-year
Inf Pond 1P	Peak Inflow (cfs)			3.66	6.44	19.33	55.71
	Peak Outflow (cfs)			0.80	0.96	1.40	2.02
	High Water Level			962.30	962.54	963.51	965.92
Inf Pond 2P	Peak Inflow (cfs)			3.46	6.50	20.93	62.37
	Peak Outflow (cfs)			1.34	1.48	2.10	2.59
	High Water Level			960.10	960.24	960.91	962.85
Inf Pond 3P	Peak Inflow (cfs)			6.92	10.71	27.33	72.18
	Peak Outflow (cfs)			1.24	1.44	1.91	2.46
	High Water Level			961.36	961.58	962.50	964.90
Bioretention 4P	Peak Inflow (cfs)			3.01	5.04	14.21	39.71
	Peak Outflow (cfs)			0.18	0.48	1.44	5.01
	High Water Level			957.50	957.70	959.77	961.70

Pond 1P Controls

Forebay NWL = 962.00
 Forebay Surface area = 4545 sf
 Forebay Bottom Elev. = 957.00
 Inf. Bottom Elev. = 962.00
 Top of pond elev. = 966.00

Pond 2P Controls

Forebay NWL = 960.00
 Forebay Surface area = 7056 sf
 Forebay Bottom Elev. = 955.00
 Inf. Bottom Elev. = 960.00
 Top of pond elev. = 964.00

Pond 3P Controls

Forebay NWL = 961.00
 Forebay Surface area = 6958 sf
 Forebay Bottom Elev. = 956.00
 Inf. Bottom Elev. = 961.00
 Top of pond elev. = 965.00

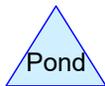
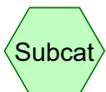
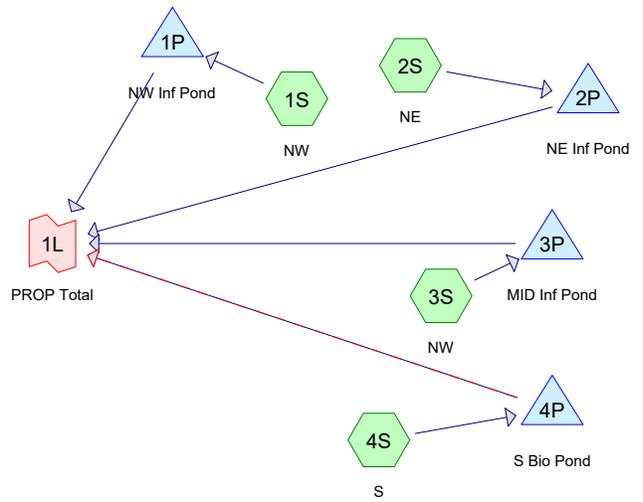
Pond 4P Controls

Pond Bottom Elev. = 960.00
 15" Outflow Culvert ie = 956.25
 8" Underdrain ie = 957.23
 Top of berm Elev. = 962.10

Water Quality Modeling Results

Site	% Reduction
Total Suspended Solids	75%
Total Phosphorous	55%

Note: TSS reduction is provided via the 3 infiltration ponds' forebays and the bioretention basin(s). The infiltration basins themselves are not modeled in WinSLAMM otherwise the output would read 100%. Per WDNR Technical Standard pretreatment for residential development is required upstream of the infiltration basins to remove 60% of the total suspended solids and for ponds 1P, 2P and 3P provide 71.09%, 75.61% and 75.35% reductions respectively. The bioretention basin(s) provides 80.41%.



Preliminary Hartland Apartments

Prepared by Payne & Dolan

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MSE 24-hr 3 1-year Rainfall=2.40"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: NW	Runoff Area=12.206 ac 32.01% Impervious Runoff Depth=0.26" Tc=6.0 min CN=65 Runoff=3.66 cfs 0.265 af
Subcatchment2S: NE	Runoff Area=14.192 ac 26.39% Impervious Runoff Depth=0.24" Tc=6.0 min CN=64 Runoff=3.46 cfs 0.279 af
Subcatchment3S: NW	Runoff Area=14.232 ac 38.40% Impervious Runoff Depth=0.35" Tc=6.0 min CN=68 Runoff=6.92 cfs 0.409 af
Subcatchment4S: S	Runoff Area=8.389 ac 38.46% Impervious Runoff Depth=0.29" Tc=6.0 min CN=66 Runoff=3.01 cfs 0.201 af
SubcatchmentS2: SOUTH	Runoff Area=13.941 ac 39.85% Impervious Runoff Depth=0.51" Tc=6.0 min CN=73 Runoff=11.84 cfs 0.598 af
Pond 1P: NW Inf Pond	Peak Elev=962.30' Storage=2,538 cf Inflow=3.66 cfs 0.265 af Outflow=0.80 cfs 0.265 af
Pond 2P: NE Inf Pond	Peak Elev=960.10' Storage=1,555 cf Inflow=3.46 cfs 0.279 af Outflow=1.34 cfs 0.279 af
Pond 3P: MID Inf Pond	Peak Elev=961.36' Storage=4,696 cf Inflow=6.92 cfs 0.409 af Outflow=1.24 cfs 0.409 af
Pond 4P: S Bio Pond	Peak Elev=957.50' Storage=5,323 cf Inflow=3.01 cfs 0.201 af Primary=0.18 cfs 0.104 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.104 af
Link 1L: PROP Total	Inflow=3.38 cfs 1.058 af Primary=3.38 cfs 1.058 af

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MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Subcatchment 1S: NW

Runoff = 3.66 cfs @ 12.16 hrs, Volume= 0.265 af, Depth= 0.26"
 Routed to Pond 1P : NW Inf Pond

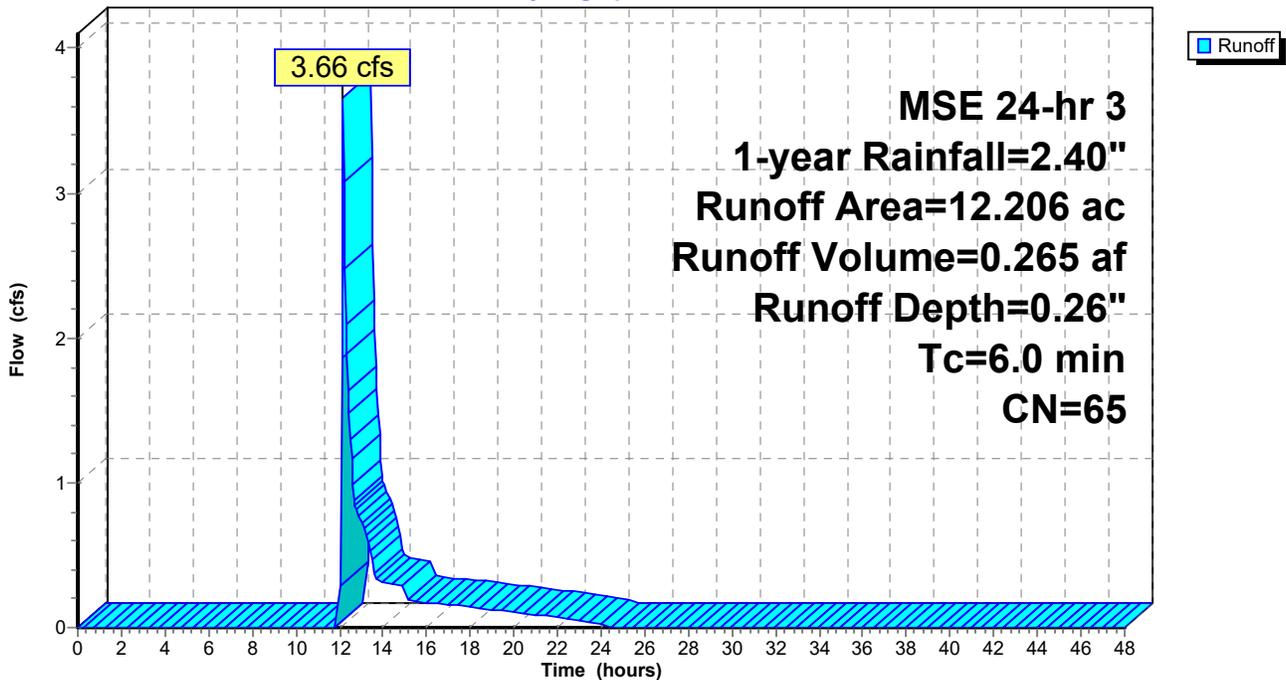
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-year Rainfall=2.40"

Area (ac)	CN	Description
0.675	98	Paved roads, HSG B
1.303	98	Roofs, HSG A
1.638	98	Paved parking, HSG A
* 0.291	98	Paved walks, HSG A
0.317	98	Water Surface, 0% imp, HSG A
3.899	39	>75% Grass cover, Good, HSG A
4.083	57	Woods/grass comb., Poor, HSG A
12.206	65	Weighted Average
8.299		67.99% Pervious Area
3.907		32.01% Impervious Area

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

Subcatchment 1S: NW

Hydrograph



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Hydrograph for Subcatchment 1S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.40	0.26	0.00
0.50	0.00	0.00	0.00	27.00	2.40	0.26	0.00
1.00	0.01	0.00	0.00	27.50	2.40	0.26	0.00
1.50	0.01	0.00	0.00	28.00	2.40	0.26	0.00
2.00	0.02	0.00	0.00	28.50	2.40	0.26	0.00
2.50	0.03	0.00	0.00	29.00	2.40	0.26	0.00
3.00	0.04	0.00	0.00	29.50	2.40	0.26	0.00
3.50	0.05	0.00	0.00	30.00	2.40	0.26	0.00
4.00	0.06	0.00	0.00	30.50	2.40	0.26	0.00
4.50	0.08	0.00	0.00	31.00	2.40	0.26	0.00
5.00	0.09	0.00	0.00	31.50	2.40	0.26	0.00
5.50	0.11	0.00	0.00	32.00	2.40	0.26	0.00
6.00	0.12	0.00	0.00	32.50	2.40	0.26	0.00
6.50	0.14	0.00	0.00	33.00	2.40	0.26	0.00
7.00	0.16	0.00	0.00	33.50	2.40	0.26	0.00
7.50	0.18	0.00	0.00	34.00	2.40	0.26	0.00
8.00	0.20	0.00	0.00	34.50	2.40	0.26	0.00
8.50	0.22	0.00	0.00	35.00	2.40	0.26	0.00
9.00	0.25	0.00	0.00	35.50	2.40	0.26	0.00
9.50	0.29	0.00	0.00	36.00	2.40	0.26	0.00
10.00	0.33	0.00	0.00	36.50	2.40	0.26	0.00
10.50	0.38	0.00	0.00	37.00	2.40	0.26	0.00
11.00	0.46	0.00	0.00	37.50	2.40	0.26	0.00
11.50	0.60	0.00	0.00	38.00	2.40	0.26	0.00
12.00	1.11	0.00	0.00	38.50	2.40	0.26	0.00
12.50	1.80	0.09	1.30	39.00	2.40	0.26	0.00
13.00	1.94	0.12	0.73	39.50	2.40	0.26	0.00
13.50	2.02	0.14	0.49	40.00	2.40	0.26	0.00
14.00	2.07	0.15	0.31	40.50	2.40	0.26	0.00
14.50	2.11	0.17	0.30	41.00	2.40	0.26	0.00
15.00	2.15	0.18	0.29	41.50	2.40	0.26	0.00
15.50	2.18	0.19	0.18	42.00	2.40	0.26	0.00
16.00	2.20	0.19	0.17	42.50	2.40	0.26	0.00
16.50	2.22	0.20	0.17	43.00	2.40	0.26	0.00
17.00	2.24	0.21	0.16	43.50	2.40	0.26	0.00
17.50	2.26	0.21	0.15	44.00	2.40	0.26	0.00
18.00	2.28	0.22	0.14	44.50	2.40	0.26	0.00
18.50	2.29	0.22	0.13	45.00	2.40	0.26	0.00
19.00	2.31	0.23	0.13	45.50	2.40	0.26	0.00
19.50	2.32	0.23	0.12	46.00	2.40	0.26	0.00
20.00	2.34	0.24	0.11	46.50	2.40	0.26	0.00
20.50	2.35	0.24	0.10	47.00	2.40	0.26	0.00
21.00	2.36	0.25	0.09	47.50	2.40	0.26	0.00
21.50	2.37	0.25	0.08	48.00	2.40	0.26	0.00
22.00	2.38	0.25	0.07				
22.50	2.39	0.26	0.06				
23.00	2.39	0.26	0.05				
23.50	2.40	0.26	0.04				
24.00	2.40	0.26	0.03				
24.50	2.40	0.26	0.00				
25.00	2.40	0.26	0.00				
25.50	2.40	0.26	0.00				
26.00	2.40	0.26	0.00				

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MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Subcatchment 2S: NE

Runoff = 3.46 cfs @ 12.17 hrs, Volume= 0.279 af, Depth= 0.24"
 Routed to Pond 2P : NE Inf Pond

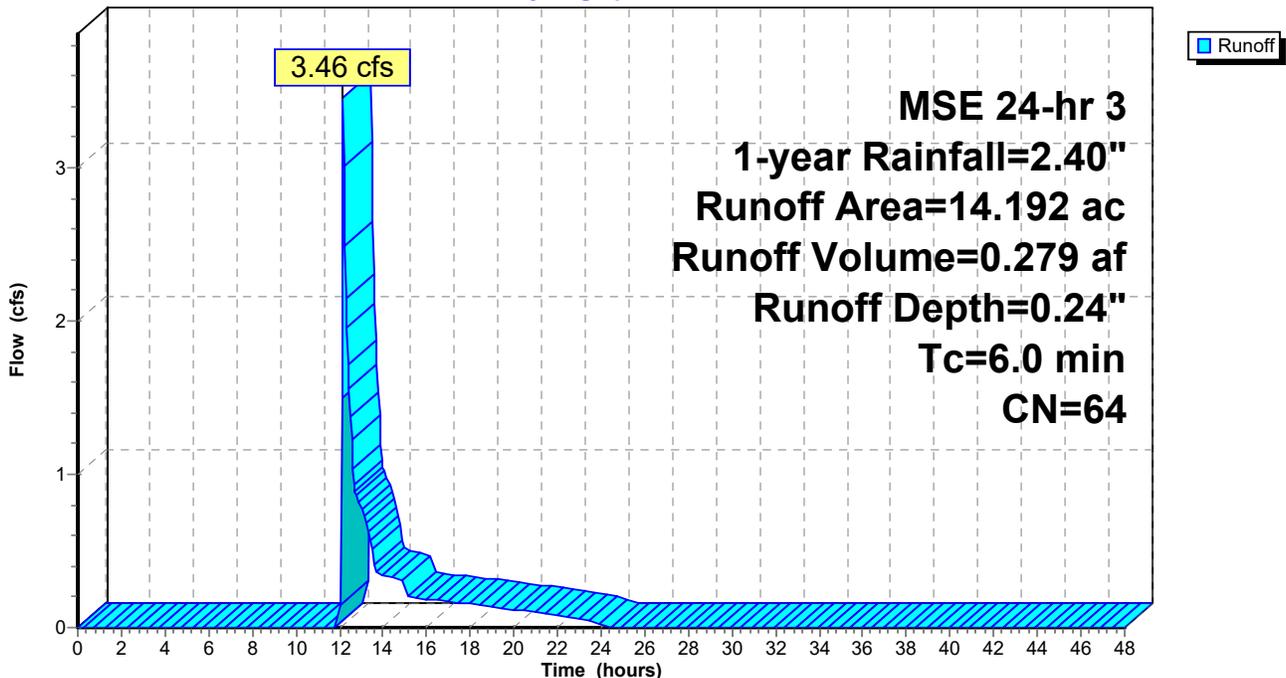
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-year Rainfall=2.40"

Area (ac)	CN	Description
* 0.299	98	Paved roads, HSG B
1.431	98	Roofs, HSG A
1.611	98	Paved parking, HSG A
* 0.404	98	Paved walks, HSG A
0.561	98	Water Surface, 0% imp, HSG A
4.036	39	>75% Grass cover, Good, HSG A
5.850	57	Woods/grass comb., Poor, HSG A
14.192	64	Weighted Average
10.447		73.61% Pervious Area
3.745		26.39% Impervious Area

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

Subcatchment 2S: NE

Hydrograph



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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Subcatchment 2S: NE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.40	0.24	0.00
0.50	0.00	0.00	0.00	27.00	2.40	0.24	0.00
1.00	0.01	0.00	0.00	27.50	2.40	0.24	0.00
1.50	0.01	0.00	0.00	28.00	2.40	0.24	0.00
2.00	0.02	0.00	0.00	28.50	2.40	0.24	0.00
2.50	0.03	0.00	0.00	29.00	2.40	0.24	0.00
3.00	0.04	0.00	0.00	29.50	2.40	0.24	0.00
3.50	0.05	0.00	0.00	30.00	2.40	0.24	0.00
4.00	0.06	0.00	0.00	30.50	2.40	0.24	0.00
4.50	0.08	0.00	0.00	31.00	2.40	0.24	0.00
5.00	0.09	0.00	0.00	31.50	2.40	0.24	0.00
5.50	0.11	0.00	0.00	32.00	2.40	0.24	0.00
6.00	0.12	0.00	0.00	32.50	2.40	0.24	0.00
6.50	0.14	0.00	0.00	33.00	2.40	0.24	0.00
7.00	0.16	0.00	0.00	33.50	2.40	0.24	0.00
7.50	0.18	0.00	0.00	34.00	2.40	0.24	0.00
8.00	0.20	0.00	0.00	34.50	2.40	0.24	0.00
8.50	0.22	0.00	0.00	35.00	2.40	0.24	0.00
9.00	0.25	0.00	0.00	35.50	2.40	0.24	0.00
9.50	0.29	0.00	0.00	36.00	2.40	0.24	0.00
10.00	0.33	0.00	0.00	36.50	2.40	0.24	0.00
10.50	0.38	0.00	0.00	37.00	2.40	0.24	0.00
11.00	0.46	0.00	0.00	37.50	2.40	0.24	0.00
11.50	0.60	0.00	0.00	38.00	2.40	0.24	0.00
12.00	1.11	0.00	0.00	38.50	2.40	0.24	0.00
12.50	1.80	0.07	1.37	39.00	2.40	0.24	0.00
13.00	1.94	0.10	0.78	39.50	2.40	0.24	0.00
13.50	2.02	0.12	0.53	40.00	2.40	0.24	0.00
14.00	2.07	0.14	0.34	40.50	2.40	0.24	0.00
14.50	2.11	0.15	0.33	41.00	2.40	0.24	0.00
15.00	2.15	0.16	0.32	41.50	2.40	0.24	0.00
15.50	2.18	0.17	0.19	42.00	2.40	0.24	0.00
16.00	2.20	0.17	0.19	42.50	2.40	0.24	0.00
16.50	2.22	0.18	0.18	43.00	2.40	0.24	0.00
17.00	2.24	0.18	0.17	43.50	2.40	0.24	0.00
17.50	2.26	0.19	0.16	44.00	2.40	0.24	0.00
18.00	2.28	0.20	0.16	44.50	2.40	0.24	0.00
18.50	2.29	0.20	0.15	45.00	2.40	0.24	0.00
19.00	2.31	0.21	0.14	45.50	2.40	0.24	0.00
19.50	2.32	0.21	0.13	46.00	2.40	0.24	0.00
20.00	2.34	0.21	0.12	46.50	2.40	0.24	0.00
20.50	2.35	0.22	0.11	47.00	2.40	0.24	0.00
21.00	2.36	0.22	0.10	47.50	2.40	0.24	0.00
21.50	2.37	0.23	0.09	48.00	2.40	0.24	0.00
22.00	2.38	0.23	0.08				
22.50	2.39	0.23	0.07				
23.00	2.39	0.23	0.05				
23.50	2.40	0.23	0.04				
24.00	2.40	0.24	0.03				
24.50	2.40	0.24	0.00				
25.00	2.40	0.24	0.00				
25.50	2.40	0.24	0.00				
26.00	2.40	0.24	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Subcatchment 3S: NW

Runoff = 6.92 cfs @ 12.15 hrs, Volume= 0.409 af, Depth= 0.35"
 Routed to Pond 3P : MID Inf Pond

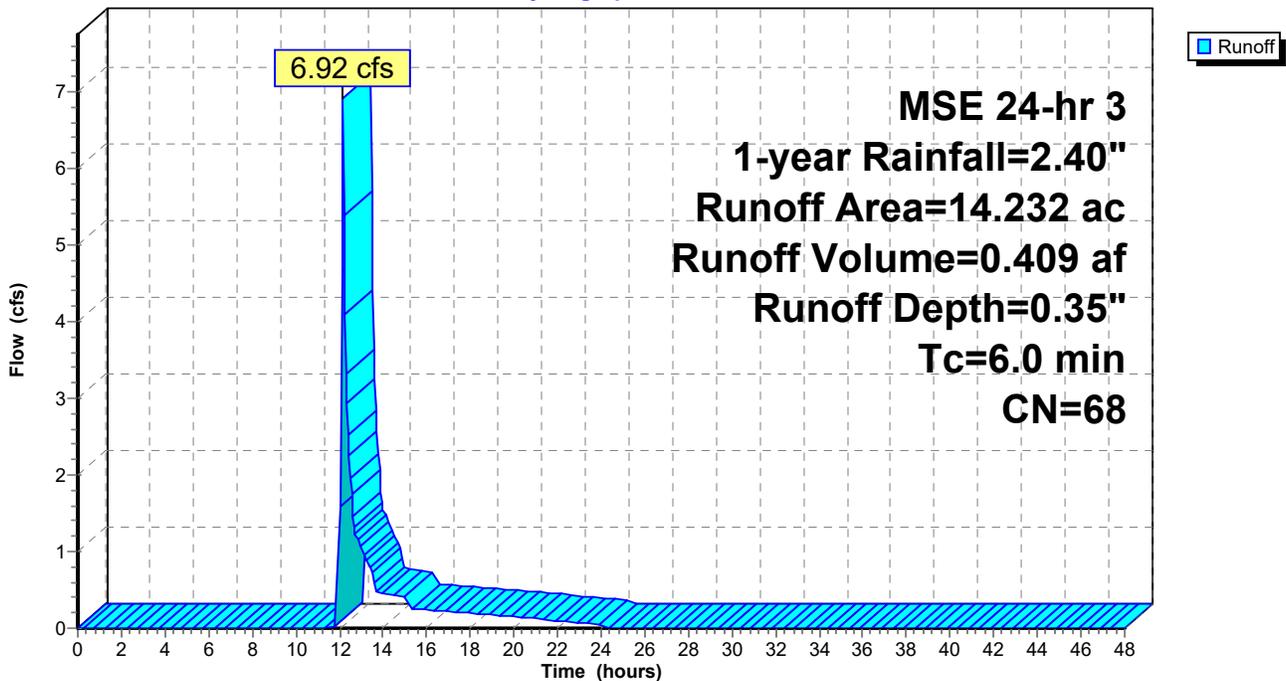
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-year Rainfall=2.40"

Area (ac)	CN	Description
2.033	98	Roofs, HSG A
2.731	98	Paved parking, HSG A
* 0.701	98	Paved walks, HSG A
0.466	98	Water Surface, 0% imp, HSG A
5.188	39	>75% Grass cover, Good, HSG A
3.113	57	Woods/grass comb., Poor, HSG A
14.232	68	Weighted Average
8.767		61.60% Pervious Area
5.465		38.40% Impervious Area

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

Subcatchment 3S: NW

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Subcatchment 3S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.40	0.35	0.00
0.50	0.00	0.00	0.00	27.00	2.40	0.35	0.00
1.00	0.01	0.00	0.00	27.50	2.40	0.35	0.00
1.50	0.01	0.00	0.00	28.00	2.40	0.35	0.00
2.00	0.02	0.00	0.00	28.50	2.40	0.35	0.00
2.50	0.03	0.00	0.00	29.00	2.40	0.35	0.00
3.00	0.04	0.00	0.00	29.50	2.40	0.35	0.00
3.50	0.05	0.00	0.00	30.00	2.40	0.35	0.00
4.00	0.06	0.00	0.00	30.50	2.40	0.35	0.00
4.50	0.08	0.00	0.00	31.00	2.40	0.35	0.00
5.00	0.09	0.00	0.00	31.50	2.40	0.35	0.00
5.50	0.11	0.00	0.00	32.00	2.40	0.35	0.00
6.00	0.12	0.00	0.00	32.50	2.40	0.35	0.00
6.50	0.14	0.00	0.00	33.00	2.40	0.35	0.00
7.00	0.16	0.00	0.00	33.50	2.40	0.35	0.00
7.50	0.18	0.00	0.00	34.00	2.40	0.35	0.00
8.00	0.20	0.00	0.00	34.50	2.40	0.35	0.00
8.50	0.22	0.00	0.00	35.00	2.40	0.35	0.00
9.00	0.25	0.00	0.00	35.50	2.40	0.35	0.00
9.50	0.29	0.00	0.00	36.00	2.40	0.35	0.00
10.00	0.33	0.00	0.00	36.50	2.40	0.35	0.00
10.50	0.38	0.00	0.00	37.00	2.40	0.35	0.00
11.00	0.46	0.00	0.00	37.50	2.40	0.35	0.00
11.50	0.60	0.00	0.00	38.00	2.40	0.35	0.00
12.00	1.11	0.01	0.30	38.50	2.40	0.35	0.00
12.50	1.80	0.13	1.96	39.00	2.40	0.35	0.00
13.00	1.94	0.17	1.06	39.50	2.40	0.35	0.00
13.50	2.02	0.20	0.70	40.00	2.40	0.35	0.00
14.00	2.07	0.22	0.44	40.50	2.40	0.35	0.00
14.50	2.11	0.23	0.43	41.00	2.40	0.35	0.00
15.00	2.15	0.25	0.41	41.50	2.40	0.35	0.00
15.50	2.18	0.26	0.25	42.00	2.40	0.35	0.00
16.00	2.20	0.27	0.24	42.50	2.40	0.35	0.00
16.50	2.22	0.27	0.23	43.00	2.40	0.35	0.00
17.00	2.24	0.28	0.22	43.50	2.40	0.35	0.00
17.50	2.26	0.29	0.21	44.00	2.40	0.35	0.00
18.00	2.28	0.30	0.20	44.50	2.40	0.35	0.00
18.50	2.29	0.30	0.19	45.00	2.40	0.35	0.00
19.00	2.31	0.31	0.17	45.50	2.40	0.35	0.00
19.50	2.32	0.31	0.16	46.00	2.40	0.35	0.00
20.00	2.34	0.32	0.15	46.50	2.40	0.35	0.00
20.50	2.35	0.32	0.14	47.00	2.40	0.35	0.00
21.00	2.36	0.33	0.12	47.50	2.40	0.35	0.00
21.50	2.37	0.33	0.11	48.00	2.40	0.35	0.00
22.00	2.38	0.34	0.09				
22.50	2.39	0.34	0.08				
23.00	2.39	0.34	0.07				
23.50	2.40	0.34	0.05				
24.00	2.40	0.35	0.04				
24.50	2.40	0.35	0.00				
25.00	2.40	0.35	0.00				
25.50	2.40	0.35	0.00				
26.00	2.40	0.35	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Subcatchment 4S: S

Runoff = 3.01 cfs @ 12.16 hrs, Volume= 0.201 af, Depth= 0.29"
 Routed to Pond 4P : S Bio Pond

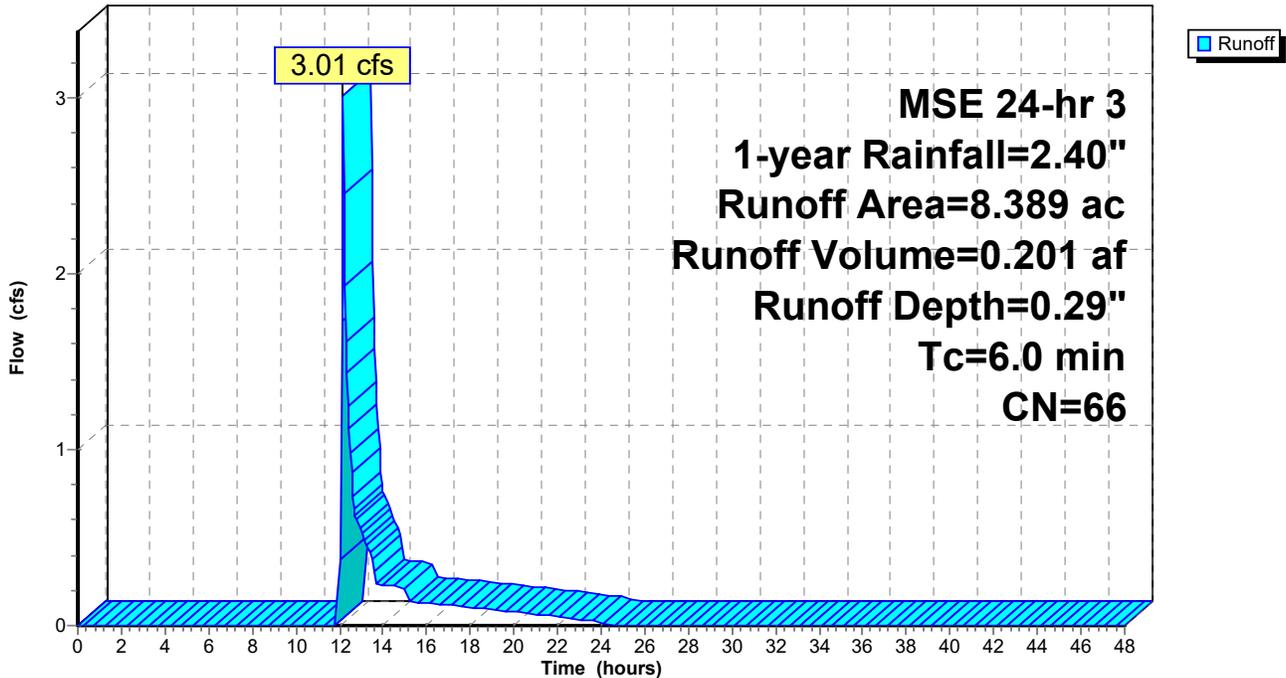
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-year Rainfall=2.40"

Area (ac)	CN	Description
0.269	98	Paved roads, HSG B
1.067	98	Roofs, HSG A
1.430	98	Paved parking, HSG A
* 0.460	98	Paved walks, HSG A
0.300	98	Water Surface, 0% imp, HSG A
3.716	39	>75% Grass cover, Good, HSG A
1.147	57	Woods/grass comb., Poor, HSG A
8.389	66	Weighted Average
5.163		61.54% Pervious Area
3.226		38.46% Impervious Area

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

Subcatchment 4S: S

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Subcatchment 4S: S

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.40	0.29	0.00
0.50	0.00	0.00	0.00	27.00	2.40	0.29	0.00
1.00	0.01	0.00	0.00	27.50	2.40	0.29	0.00
1.50	0.01	0.00	0.00	28.00	2.40	0.29	0.00
2.00	0.02	0.00	0.00	28.50	2.40	0.29	0.00
2.50	0.03	0.00	0.00	29.00	2.40	0.29	0.00
3.00	0.04	0.00	0.00	29.50	2.40	0.29	0.00
3.50	0.05	0.00	0.00	30.00	2.40	0.29	0.00
4.00	0.06	0.00	0.00	30.50	2.40	0.29	0.00
4.50	0.08	0.00	0.00	31.00	2.40	0.29	0.00
5.00	0.09	0.00	0.00	31.50	2.40	0.29	0.00
5.50	0.11	0.00	0.00	32.00	2.40	0.29	0.00
6.00	0.12	0.00	0.00	32.50	2.40	0.29	0.00
6.50	0.14	0.00	0.00	33.00	2.40	0.29	0.00
7.00	0.16	0.00	0.00	33.50	2.40	0.29	0.00
7.50	0.18	0.00	0.00	34.00	2.40	0.29	0.00
8.00	0.20	0.00	0.00	34.50	2.40	0.29	0.00
8.50	0.22	0.00	0.00	35.00	2.40	0.29	0.00
9.00	0.25	0.00	0.00	35.50	2.40	0.29	0.00
9.50	0.29	0.00	0.00	36.00	2.40	0.29	0.00
10.00	0.33	0.00	0.00	36.50	2.40	0.29	0.00
10.50	0.38	0.00	0.00	37.00	2.40	0.29	0.00
11.00	0.46	0.00	0.00	37.50	2.40	0.29	0.00
11.50	0.60	0.00	0.00	38.00	2.40	0.29	0.00
12.00	1.11	0.00	0.02	38.50	2.40	0.29	0.00
12.50	1.80	0.10	0.98	39.00	2.40	0.29	0.00
13.00	1.94	0.14	0.54	39.50	2.40	0.29	0.00
13.50	2.02	0.16	0.36	40.00	2.40	0.29	0.00
14.00	2.07	0.17	0.23	40.50	2.40	0.29	0.00
14.50	2.11	0.19	0.22	41.00	2.40	0.29	0.00
15.00	2.15	0.20	0.21	41.50	2.40	0.29	0.00
15.50	2.18	0.21	0.13	42.00	2.40	0.29	0.00
16.00	2.20	0.22	0.13	42.50	2.40	0.29	0.00
16.50	2.22	0.22	0.12	43.00	2.40	0.29	0.00
17.00	2.24	0.23	0.12	43.50	2.40	0.29	0.00
17.50	2.26	0.24	0.11	44.00	2.40	0.29	0.00
18.00	2.28	0.24	0.10	44.50	2.40	0.29	0.00
18.50	2.29	0.25	0.10	45.00	2.40	0.29	0.00
19.00	2.31	0.25	0.09	45.50	2.40	0.29	0.00
19.50	2.32	0.26	0.09	46.00	2.40	0.29	0.00
20.00	2.34	0.26	0.08	46.50	2.40	0.29	0.00
20.50	2.35	0.27	0.07	47.00	2.40	0.29	0.00
21.00	2.36	0.27	0.06	47.50	2.40	0.29	0.00
21.50	2.37	0.28	0.06	48.00	2.40	0.29	0.00
22.00	2.38	0.28	0.05				
22.50	2.39	0.28	0.04				
23.00	2.39	0.28	0.04				
23.50	2.40	0.29	0.03				
24.00	2.40	0.29	0.02				
24.50	2.40	0.29	0.00				
25.00	2.40	0.29	0.00				
25.50	2.40	0.29	0.00				
26.00	2.40	0.29	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Subcatchment S2: SOUTH

Runoff = 11.84 cfs @ 12.15 hrs, Volume= 0.598 af, Depth= 0.51"
 Routed to nonexistent node 2L

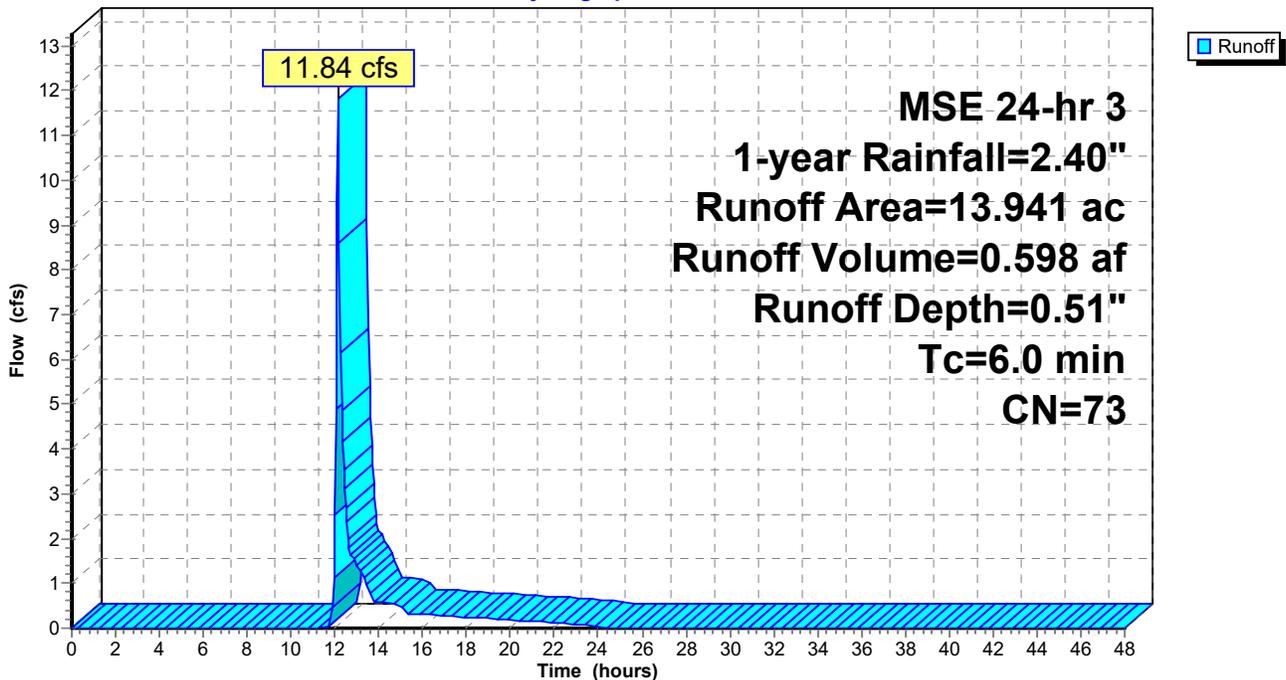
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-year Rainfall=2.40"

Area (ac)	CN	Description
* 0.269	98	Paved roads, HSG B
* 5.287	98	Gravel, HSG A
8.385	57	Woods/grass comb., Poor, HSG A
13.941	73	Weighted Average
8.385		60.15% Pervious Area
5.556		39.85% Impervious Area

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

Subcatchment S2: SOUTH

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Subcatchment S2: SOUTH

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.40	0.51	0.00
0.50	0.00	0.00	0.00	27.00	2.40	0.51	0.00
1.00	0.01	0.00	0.00	27.50	2.40	0.51	0.00
1.50	0.01	0.00	0.00	28.00	2.40	0.51	0.00
2.00	0.02	0.00	0.00	28.50	2.40	0.51	0.00
2.50	0.03	0.00	0.00	29.00	2.40	0.51	0.00
3.00	0.04	0.00	0.00	29.50	2.40	0.51	0.00
3.50	0.05	0.00	0.00	30.00	2.40	0.51	0.00
4.00	0.06	0.00	0.00	30.50	2.40	0.51	0.00
4.50	0.08	0.00	0.00	31.00	2.40	0.51	0.00
5.00	0.09	0.00	0.00	31.50	2.40	0.51	0.00
5.50	0.11	0.00	0.00	32.00	2.40	0.51	0.00
6.00	0.12	0.00	0.00	32.50	2.40	0.51	0.00
6.50	0.14	0.00	0.00	33.00	2.40	0.51	0.00
7.00	0.16	0.00	0.00	33.50	2.40	0.51	0.00
7.50	0.18	0.00	0.00	34.00	2.40	0.51	0.00
8.00	0.20	0.00	0.00	34.50	2.40	0.51	0.00
8.50	0.22	0.00	0.00	35.00	2.40	0.51	0.00
9.00	0.25	0.00	0.00	35.50	2.40	0.51	0.00
9.50	0.29	0.00	0.00	36.00	2.40	0.51	0.00
10.00	0.33	0.00	0.00	36.50	2.40	0.51	0.00
10.50	0.38	0.00	0.00	37.00	2.40	0.51	0.00
11.00	0.46	0.00	0.00	37.50	2.40	0.51	0.00
11.50	0.60	0.00	0.00	38.00	2.40	0.51	0.00
12.00	1.11	0.03	2.52	38.50	2.40	0.51	0.00
12.50	1.80	0.24	2.70	39.00	2.40	0.51	0.00
13.00	1.94	0.29	1.41	39.50	2.40	0.51	0.00
13.50	2.02	0.33	0.91	40.00	2.40	0.51	0.00
14.00	2.07	0.35	0.57	40.50	2.40	0.51	0.00
14.50	2.11	0.37	0.55	41.00	2.40	0.51	0.00
15.00	2.15	0.39	0.52	41.50	2.40	0.51	0.00
15.50	2.18	0.40	0.32	42.00	2.40	0.51	0.00
16.00	2.20	0.41	0.30	42.50	2.40	0.51	0.00
16.50	2.22	0.42	0.29	43.00	2.40	0.51	0.00
17.00	2.24	0.43	0.27	43.50	2.40	0.51	0.00
17.50	2.26	0.44	0.26	44.00	2.40	0.51	0.00
18.00	2.28	0.45	0.25	44.50	2.40	0.51	0.00
18.50	2.29	0.46	0.23	45.00	2.40	0.51	0.00
19.00	2.31	0.47	0.22	45.50	2.40	0.51	0.00
19.50	2.32	0.48	0.20	46.00	2.40	0.51	0.00
20.00	2.34	0.48	0.18	46.50	2.40	0.51	0.00
20.50	2.35	0.49	0.17	47.00	2.40	0.51	0.00
21.00	2.36	0.49	0.15	47.50	2.40	0.51	0.00
21.50	2.37	0.50	0.13	48.00	2.40	0.51	0.00
22.00	2.38	0.50	0.12				
22.50	2.39	0.51	0.10				
23.00	2.39	0.51	0.08				
23.50	2.40	0.51	0.07				
24.00	2.40	0.51	0.05				
24.50	2.40	0.51	0.00				
25.00	2.40	0.51	0.00				
25.50	2.40	0.51	0.00				
26.00	2.40	0.51	0.00				

Preliminary Hartland Apartments

MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Pond 1P: NW Inf Pond

Inflow Area = 12.206 ac, 32.01% Impervious, Inflow Depth = 0.26" for 1-year event
Inflow = 3.66 cfs @ 12.16 hrs, Volume= 0.265 af
Outflow = 0.80 cfs @ 12.82 hrs, Volume= 0.265 af, Atten= 78%, Lag= 39.3 min
Primary = 0.80 cfs @ 12.82 hrs, Volume= 0.265 af
Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 962.30' @ 12.82 hrs Surf.Area= 9,574 sf Storage= 2,538 cf

Plug-Flow detention time= 27.7 min calculated for 0.265 af (100% of inflow)
Center-of-Mass det. time= 27.7 min (909.6 - 881.8)

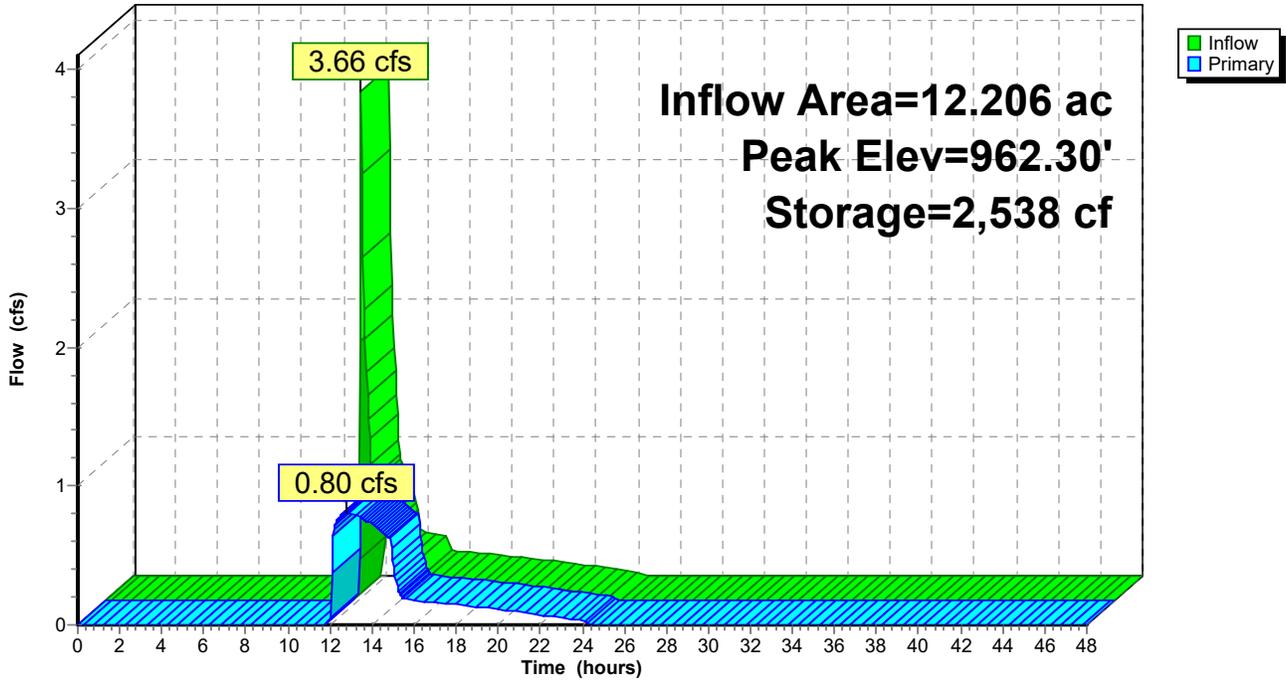
Volume	Invert	Avail.Storage	Storage Description
#1	962.00'	70,699 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
962.00	7,070	0	0
963.00	15,280	11,175	11,175
964.00	18,264	16,772	27,947
965.00	21,350	19,807	47,754
966.00	24,540	22,945	70,699

Device	Routing	Invert	Outlet Devices
#1	Primary	962.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=0.80 cfs @ 12.82 hrs HW=962.30' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.80 cfs)

Pond 1P: NW Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Pond 1P: NW Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	962.00	0.00
1.00	0.00	0	962.00	0.00
2.00	0.00	0	962.00	0.00
3.00	0.00	0	962.00	0.00
4.00	0.00	0	962.00	0.00
5.00	0.00	0	962.00	0.00
6.00	0.00	0	962.00	0.00
7.00	0.00	0	962.00	0.00
8.00	0.00	0	962.00	0.00
9.00	0.00	0	962.00	0.00
10.00	0.00	0	962.00	0.00
11.00	0.00	0	962.00	0.00
12.00	0.00	0	962.00	0.00
13.00	0.73	2,519	962.30	0.80
14.00	0.31	1,492	962.19	0.72
15.00	0.29	220	962.03	0.47
16.00	0.17	82	962.01	0.17
17.00	0.16	75	962.01	0.16
18.00	0.14	68	962.01	0.14
19.00	0.13	60	962.01	0.13
20.00	0.11	52	962.01	0.11
21.00	0.09	43	962.01	0.09
22.00	0.07	34	962.00	0.07
23.00	0.05	24	962.00	0.05
24.00	0.03	15	962.00	0.03
25.00	0.00	0	962.00	0.00
26.00	0.00	0	962.00	0.00
27.00	0.00	0	962.00	0.00
28.00	0.00	0	962.00	0.00
29.00	0.00	0	962.00	0.00
30.00	0.00	0	962.00	0.00
31.00	0.00	0	962.00	0.00
32.00	0.00	0	962.00	0.00
33.00	0.00	0	962.00	0.00
34.00	0.00	0	962.00	0.00
35.00	0.00	0	962.00	0.00
36.00	0.00	0	962.00	0.00
37.00	0.00	0	962.00	0.00
38.00	0.00	0	962.00	0.00
39.00	0.00	0	962.00	0.00
40.00	0.00	0	962.00	0.00
41.00	0.00	0	962.00	0.00
42.00	0.00	0	962.00	0.00
43.00	0.00	0	962.00	0.00
44.00	0.00	0	962.00	0.00
45.00	0.00	0	962.00	0.00
46.00	0.00	0	962.00	0.00
47.00	0.00	0	962.00	0.00
48.00	0.00	0	962.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Pond 2P: NE Inf Pond

Inflow Area = 14.192 ac, 26.39% Impervious, Inflow Depth = 0.24" for 1-year event
 Inflow = 3.46 cfs @ 12.17 hrs, Volume= 0.279 af
 Outflow = 1.34 cfs @ 12.51 hrs, Volume= 0.279 af, Atten= 61%, Lag= 20.7 min
 Primary = 1.34 cfs @ 12.51 hrs, Volume= 0.279 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 960.10' @ 12.51 hrs Surf.Area= 16,121 sf Storage= 1,555 cf

Plug-Flow detention time= 10.6 min calculated for 0.278 af (100% of inflow)
 Center-of-Mass det. time= 10.6 min (898.2 - 887.6)

Volume	Invert	Avail.Storage	Storage Description
#1	960.00'	111,091 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

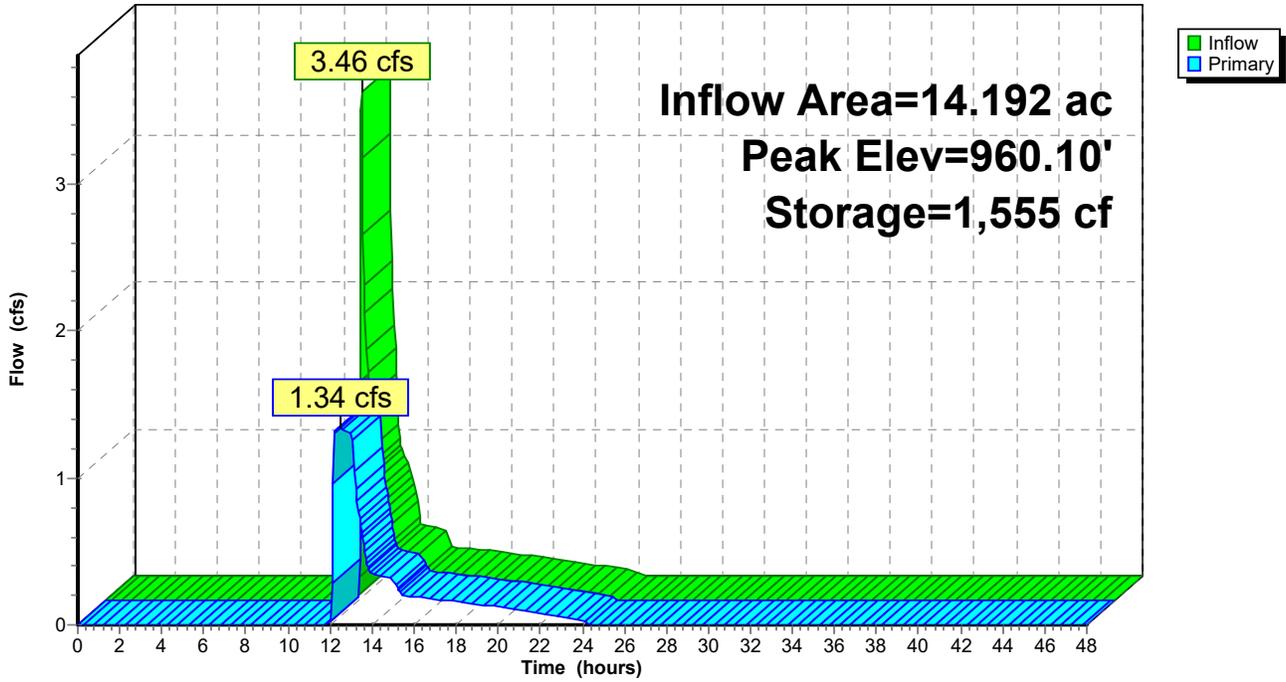
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
960.00	14,993	0	0
961.00	26,284	20,639	20,639
962.00	28,806	27,545	48,184
963.00	31,428	30,117	78,301
964.00	34,152	32,790	111,091

Device	Routing	Invert	Outlet Devices
#1	Primary	960.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=1.34 cfs @ 12.51 hrs HW=960.10' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.34 cfs)

Pond 2P: NE Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Pond 2P: NE Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	960.00	0.00
1.00	0.00	0	960.00	0.00
2.00	0.00	0	960.00	0.00
3.00	0.00	0	960.00	0.00
4.00	0.00	0	960.00	0.00
5.00	0.00	0	960.00	0.00
6.00	0.00	0	960.00	0.00
7.00	0.00	0	960.00	0.00
8.00	0.00	0	960.00	0.00
9.00	0.00	0	960.00	0.00
10.00	0.00	0	960.00	0.00
11.00	0.00	0	960.00	0.00
12.00	0.00	0	960.00	0.00
13.00	0.78	855	960.06	1.30
14.00	0.34	166	960.01	0.35
15.00	0.32	151	960.01	0.32
16.00	0.19	89	960.01	0.19
17.00	0.17	82	960.01	0.17
18.00	0.16	75	960.00	0.16
19.00	0.14	66	960.00	0.14
20.00	0.12	57	960.00	0.12
21.00	0.10	47	960.00	0.10
22.00	0.08	37	960.00	0.08
23.00	0.05	27	960.00	0.06
24.00	0.03	16	960.00	0.03
25.00	0.00	0	960.00	0.00
26.00	0.00	0	960.00	0.00
27.00	0.00	0	960.00	0.00
28.00	0.00	0	960.00	0.00
29.00	0.00	0	960.00	0.00
30.00	0.00	0	960.00	0.00
31.00	0.00	0	960.00	0.00
32.00	0.00	0	960.00	0.00
33.00	0.00	0	960.00	0.00
34.00	0.00	0	960.00	0.00
35.00	0.00	0	960.00	0.00
36.00	0.00	0	960.00	0.00
37.00	0.00	0	960.00	0.00
38.00	0.00	0	960.00	0.00
39.00	0.00	0	960.00	0.00
40.00	0.00	0	960.00	0.00
41.00	0.00	0	960.00	0.00
42.00	0.00	0	960.00	0.00
43.00	0.00	0	960.00	0.00
44.00	0.00	0	960.00	0.00
45.00	0.00	0	960.00	0.00
46.00	0.00	0	960.00	0.00
47.00	0.00	0	960.00	0.00
48.00	0.00	0	960.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 1-year Rainfall=2.40"

Prepared by Payne & Dolan

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Summary for Pond 3P: MID Inf Pond

Inflow Area = 14.232 ac, 38.40% Impervious, Inflow Depth = 0.35" for 1-year event
 Inflow = 6.92 cfs @ 12.15 hrs, Volume= 0.409 af
 Outflow = 1.24 cfs @ 12.71 hrs, Volume= 0.409 af, Atten= 82%, Lag= 33.3 min
 Primary = 1.24 cfs @ 12.71 hrs, Volume= 0.409 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 961.36' @ 12.71 hrs Surf.Area= 14,909 sf Storage= 4,696 cf

Plug-Flow detention time= 33.4 min calculated for 0.409 af (100% of inflow)
 Center-of-Mass det. time= 33.3 min (900.2 - 866.9)

Volume	Invert	Avail.Storage	Storage Description
#1	961.00'	93,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

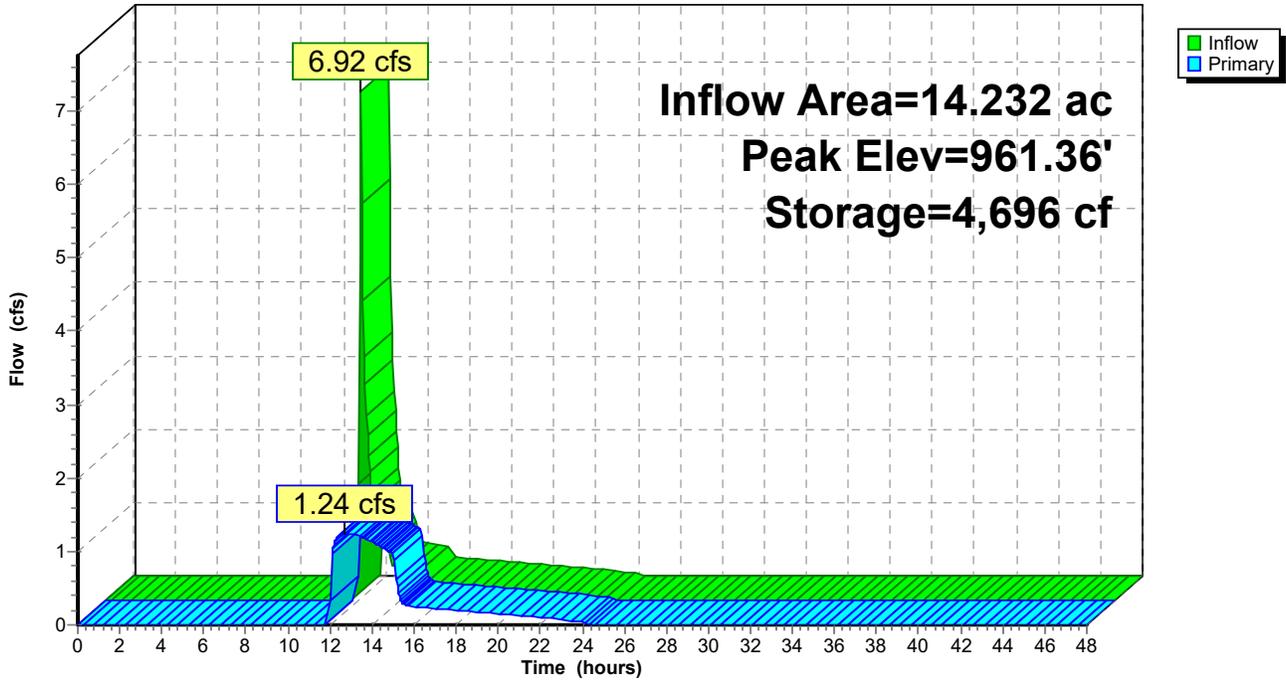
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
961.00	11,137	0	0
962.00	21,600	16,369	16,369
963.00	24,250	22,925	39,294
964.00	27,000	25,625	64,919
965.00	29,850	28,425	93,344

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=1.24 cfs @ 12.71 hrs HW=961.36' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.24 cfs)

Pond 3P: MID Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Pond 3P: MID Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	961.00	0.00
1.00	0.00	0	961.00	0.00
2.00	0.00	0	961.00	0.00
3.00	0.00	0	961.00	0.00
4.00	0.00	0	961.00	0.00
5.00	0.00	0	961.00	0.00
6.00	0.00	0	961.00	0.00
7.00	0.00	0	961.00	0.00
8.00	0.00	0	961.00	0.00
9.00	0.00	0	961.00	0.00
10.00	0.00	0	961.00	0.00
11.00	0.00	0	961.00	0.00
12.00	0.30	24	961.00	0.05
13.00	1.06	4,602	961.35	1.24
14.00	0.44	2,799	961.23	1.13
15.00	0.41	567	961.05	0.97
16.00	0.24	115	961.01	0.24
17.00	0.22	105	961.01	0.22
18.00	0.20	94	961.01	0.20
19.00	0.17	83	961.01	0.18
20.00	0.15	71	961.01	0.15
21.00	0.12	59	961.01	0.13
22.00	0.09	47	961.00	0.10
23.00	0.07	34	961.00	0.07
24.00	0.04	20	961.00	0.04
25.00	0.00	0	961.00	0.00
26.00	0.00	0	961.00	0.00
27.00	0.00	0	961.00	0.00
28.00	0.00	0	961.00	0.00
29.00	0.00	0	961.00	0.00
30.00	0.00	0	961.00	0.00
31.00	0.00	0	961.00	0.00
32.00	0.00	0	961.00	0.00
33.00	0.00	0	961.00	0.00
34.00	0.00	0	961.00	0.00
35.00	0.00	0	961.00	0.00
36.00	0.00	0	961.00	0.00
37.00	0.00	0	961.00	0.00
38.00	0.00	0	961.00	0.00
39.00	0.00	0	961.00	0.00
40.00	0.00	0	961.00	0.00
41.00	0.00	0	961.00	0.00
42.00	0.00	0	961.00	0.00
43.00	0.00	0	961.00	0.00
44.00	0.00	0	961.00	0.00
45.00	0.00	0	961.00	0.00
46.00	0.00	0	961.00	0.00
47.00	0.00	0	961.00	0.00
48.00	0.00	0	961.00	0.00

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MSE 24-hr 3 1-year Rainfall=2.40"

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Summary for Pond 4P: S Bio Pond

Inflow Area = 8.389 ac, 38.46% Impervious, Inflow Depth = 0.29" for 1-year event
 Inflow = 3.01 cfs @ 12.16 hrs, Volume= 0.201 af
 Outflow = 0.18 cfs @ 15.07 hrs, Volume= 0.104 af, Atten= 94%, Lag= 174.8 min
 Primary = 0.18 cfs @ 15.07 hrs, Volume= 0.104 af
 Routed to Link 1L : PROP Total
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 957.50' @ 15.07 hrs Surf.Area= 12,900 sf Storage= 5,323 cf

Plug-Flow detention time= 388.9 min calculated for 0.104 af (52% of inflow)
 Center-of-Mass det. time= 263.5 min (1,140.0 - 876.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	956.25'	45,690 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
956.25	12,900	0.0	0	0
957.42	12,900	33.0	4,981	4,981
957.75	12,900	33.0	1,405	6,386
960.00	12,900	27.0	7,837	14,222
962.00	16,880	100.0	29,780	44,002
962.10	16,880	100.0	1,688	45,690

Device	Routing	Invert	Outlet Devices
#1	Primary	956.25'	15.0" Round Culvert L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 956.25' / 955.00' S= 0.0125 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	957.23'	8.0" Round Culvert L= 280.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 957.23' / 956.25' S= 0.0035 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 1	961.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	962.00'	20.0' long x 8.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.18 cfs @ 15.07 hrs HW=957.50' (Free Discharge)

↑ **1=Culvert** (Passes 0.18 cfs of 5.70 cfs potential flow)

↑ **2=Culvert** (Barrel Controls 0.18 cfs @ 2.02 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=956.25' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Preliminary Hartland Apartments

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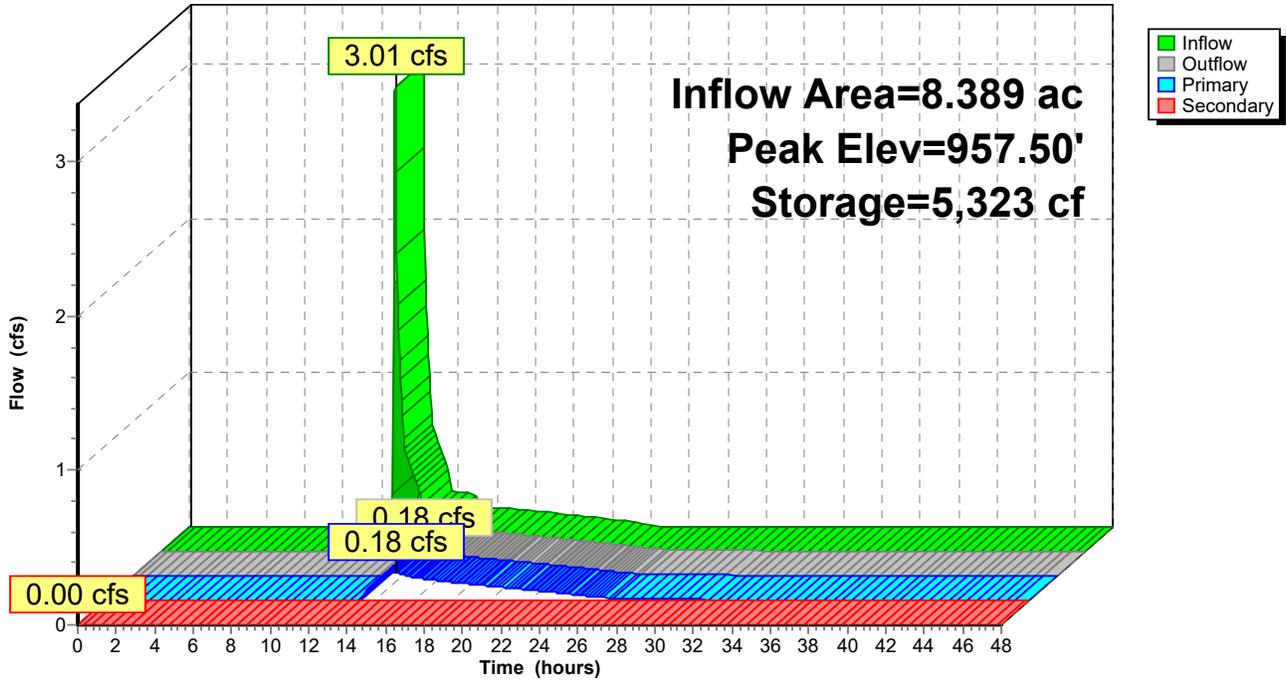
MSE 24-hr 3 1-year Rainfall=2.40"

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Pond 4P: S Bio Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Pond 4P: S Bio Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	956.25	0.00	0.00	0.00
1.00	0.00	0	956.25	0.00	0.00	0.00
2.00	0.00	0	956.25	0.00	0.00	0.00
3.00	0.00	0	956.25	0.00	0.00	0.00
4.00	0.00	0	956.25	0.00	0.00	0.00
5.00	0.00	0	956.25	0.00	0.00	0.00
6.00	0.00	0	956.25	0.00	0.00	0.00
7.00	0.00	0	956.25	0.00	0.00	0.00
8.00	0.00	0	956.25	0.00	0.00	0.00
9.00	0.00	0	956.25	0.00	0.00	0.00
10.00	0.00	0	956.25	0.00	0.00	0.00
11.00	0.00	0	956.25	0.00	0.00	0.00
12.00	0.02	1	956.25	0.00	0.00	0.00
13.00	0.54	3,957	957.18	0.00	0.00	0.00
14.00	0.23	5,065	957.44	0.11	0.11	0.00
15.00	0.21	5,318	957.50	0.18	0.18	0.00
16.00	0.13	5,215	957.47	0.15	0.15	0.00
17.00	0.12	5,142	957.46	0.13	0.13	0.00
18.00	0.10	5,087	957.45	0.12	0.12	0.00
19.00	0.09	5,037	957.43	0.11	0.11	0.00
20.00	0.08	4,986	957.42	0.09	0.09	0.00
21.00	0.06	4,931	957.41	0.08	0.08	0.00
22.00	0.05	4,866	957.39	0.07	0.07	0.00
23.00	0.04	4,797	957.38	0.06	0.06	0.00
24.00	0.02	4,723	957.36	0.04	0.04	0.00
25.00	0.00	4,605	957.33	0.03	0.03	0.00
26.00	0.00	4,524	957.31	0.02	0.02	0.00
27.00	0.00	4,472	957.30	0.01	0.01	0.00
28.00	0.00	4,431	957.29	0.01	0.01	0.00
29.00	0.00	4,398	957.28	0.01	0.01	0.00
30.00	0.00	4,370	957.28	0.01	0.01	0.00
31.00	0.00	4,346	957.27	0.01	0.01	0.00
32.00	0.00	4,326	957.27	0.01	0.01	0.00
33.00	0.00	4,310	957.26	0.00	0.00	0.00
34.00	0.00	4,296	957.26	0.00	0.00	0.00
35.00	0.00	4,285	957.26	0.00	0.00	0.00
36.00	0.00	4,275	957.25	0.00	0.00	0.00
37.00	0.00	4,267	957.25	0.00	0.00	0.00
38.00	0.00	4,260	957.25	0.00	0.00	0.00
39.00	0.00	4,254	957.25	0.00	0.00	0.00
40.00	0.00	4,250	957.25	0.00	0.00	0.00
41.00	0.00	4,246	957.25	0.00	0.00	0.00
42.00	0.00	4,242	957.25	0.00	0.00	0.00
43.00	0.00	4,240	957.25	0.00	0.00	0.00
44.00	0.00	4,237	957.25	0.00	0.00	0.00
45.00	0.00	4,235	957.24	0.00	0.00	0.00
46.00	0.00	4,234	957.24	0.00	0.00	0.00
47.00	0.00	4,232	957.24	0.00	0.00	0.00
48.00	0.00	4,231	957.24	0.00	0.00	0.00

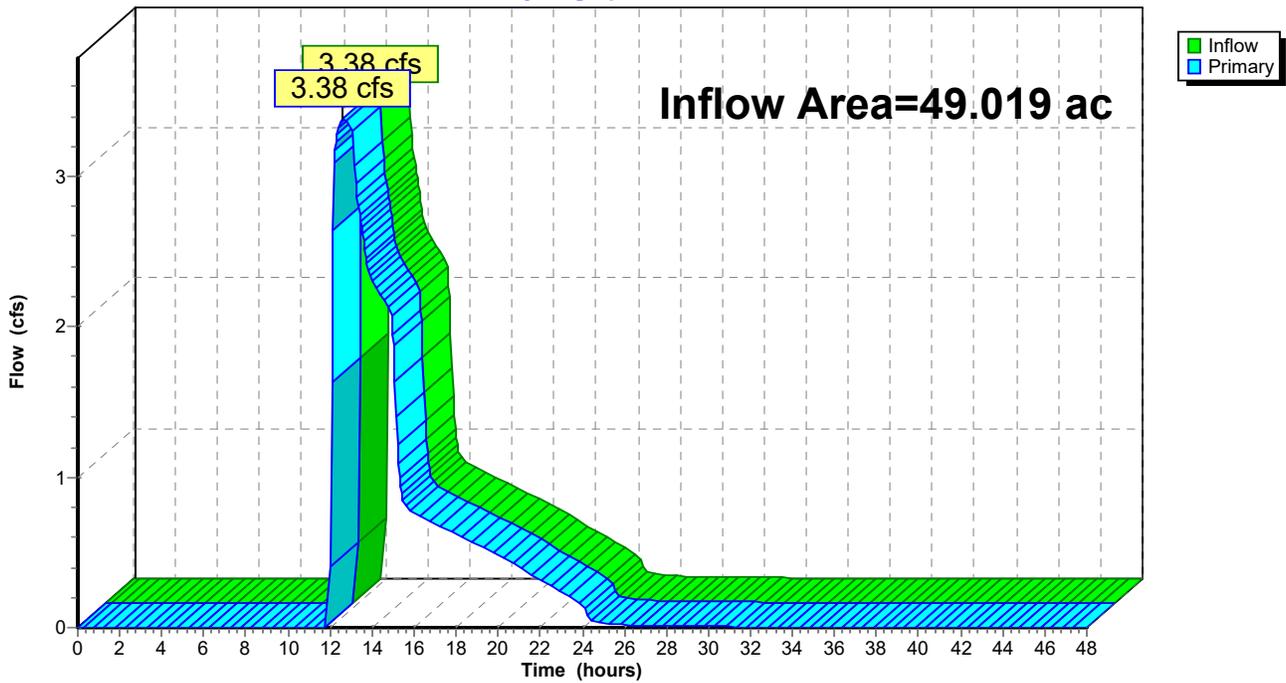
Summary for Link 1L: PROP Total

Inflow Area = 49.019 ac, 33.34% Impervious, Inflow Depth > 0.26" for 1-year event
Inflow = 3.38 cfs @ 12.62 hrs, Volume= 1.058 af
Primary = 3.38 cfs @ 12.62 hrs, Volume= 1.058 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: PROP Total

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 1-year Rainfall=2.40"

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Hydrograph for Link 1L: PROP Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	26.50	0.01	0.00	0.01
0.50	0.00	0.00	0.00	27.00	0.01	0.00	0.01
1.00	0.00	0.00	0.00	27.50	0.01	0.00	0.01
1.50	0.00	0.00	0.00	28.00	0.01	0.00	0.01
2.00	0.00	0.00	0.00	28.50	0.01	0.00	0.01
2.50	0.00	0.00	0.00	29.00	0.01	0.00	0.01
3.00	0.00	0.00	0.00	29.50	0.01	0.00	0.01
3.50	0.00	0.00	0.00	30.00	0.01	0.00	0.01
4.00	0.00	0.00	0.00	30.50	0.01	0.00	0.01
4.50	0.00	0.00	0.00	31.00	0.01	0.00	0.01
5.00	0.00	0.00	0.00	31.50	0.01	0.00	0.01
5.50	0.00	0.00	0.00	32.00	0.01	0.00	0.01
6.00	0.00	0.00	0.00	32.50	0.00	0.00	0.00
6.50	0.00	0.00	0.00	33.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	33.50	0.00	0.00	0.00
7.50	0.00	0.00	0.00	34.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	34.50	0.00	0.00	0.00
8.50	0.00	0.00	0.00	35.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	35.50	0.00	0.00	0.00
9.50	0.00	0.00	0.00	36.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	36.50	0.00	0.00	0.00
10.50	0.00	0.00	0.00	37.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	37.50	0.00	0.00	0.00
11.50	0.00	0.00	0.00	38.00	0.00	0.00	0.00
12.00	0.05	0.00	0.05	38.50	0.00	0.00	0.00
12.50	3.36	0.00	3.36	39.00	0.00	0.00	0.00
13.00	3.34	0.00	3.34	39.50	0.00	0.00	0.00
13.50	2.65	0.00	2.65	40.00	0.00	0.00	0.00
14.00	2.31	0.00	2.31	40.50	0.00	0.00	0.00
14.50	2.20	0.00	2.20	41.00	0.00	0.00	0.00
15.00	1.94	0.00	1.94	41.50	0.00	0.00	0.00
15.50	0.83	0.00	0.83	42.00	0.00	0.00	0.00
16.00	0.76	0.00	0.76	42.50	0.00	0.00	0.00
16.50	0.72	0.00	0.72	43.00	0.00	0.00	0.00
17.00	0.69	0.00	0.69	43.50	0.00	0.00	0.00
17.50	0.66	0.00	0.66	44.00	0.00	0.00	0.00
18.00	0.62	0.00	0.62	44.50	0.00	0.00	0.00
18.50	0.59	0.00	0.59	45.00	0.00	0.00	0.00
19.00	0.55	0.00	0.55	45.50	0.00	0.00	0.00
19.50	0.51	0.00	0.51	46.00	0.00	0.00	0.00
20.00	0.47	0.00	0.47	46.50	0.00	0.00	0.00
20.50	0.44	0.00	0.44	47.00	0.00	0.00	0.00
21.00	0.40	0.00	0.40	47.50	0.00	0.00	0.00
21.50	0.36	0.00	0.36	48.00	0.00	0.00	0.00
22.00	0.32	0.00	0.32				
22.50	0.28	0.00	0.28				
23.00	0.24	0.00	0.24				
23.50	0.19	0.00	0.19				
24.00	0.15	0.00	0.15				
24.50	0.04	0.00	0.04				
25.00	0.03	0.00	0.03				
25.50	0.02	0.00	0.02				
26.00	0.02	0.00	0.02				

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 1S: NW	Runoff Area=12.206 ac 32.01% Impervious Runoff Depth=0.38" Tc=6.0 min CN=65 Runoff=6.44 cfs 0.387 af
Subcatchment 2S: NE	Runoff Area=14.192 ac 26.39% Impervious Runoff Depth=0.35" Tc=6.0 min CN=64 Runoff=6.50 cfs 0.412 af
Subcatchment 3S: NW	Runoff Area=14.232 ac 38.40% Impervious Runoff Depth=0.48" Tc=6.0 min CN=68 Runoff=10.71 cfs 0.573 af
Subcatchment 4S: S	Runoff Area=8.389 ac 38.46% Impervious Runoff Depth=0.41" Tc=6.0 min CN=66 Runoff=5.04 cfs 0.289 af
Subcatchment S2: SOUTH	Runoff Area=13.941 ac 39.85% Impervious Runoff Depth=0.68" Tc=6.0 min CN=73 Runoff=16.35 cfs 0.796 af
Pond 1P: NW Inf Pond	Peak Elev=962.54' Storage=5,060 cf Inflow=6.44 cfs 0.387 af Outflow=0.96 cfs 0.387 af
Pond 2P: NE Inf Pond	Peak Elev=960.24' Storage=3,919 cf Inflow=6.50 cfs 0.412 af Outflow=1.48 cfs 0.412 af
Pond 3P: MID Inf Pond	Peak Elev=961.58' Storage=8,253 cf Inflow=10.71 cfs 0.573 af Outflow=1.44 cfs 0.573 af
Pond 4P: S Bio Pond	Peak Elev=957.70' Storage=6,171 cf Inflow=5.04 cfs 0.289 af Primary=0.48 cfs 0.192 af Secondary=0.00 cfs 0.000 af Outflow=0.48 cfs 0.192 af
Link 1L: PROP Total	Inflow=4.28 cfs 1.563 af Primary=4.28 cfs 1.563 af

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Subcatchment 1S: NW

Runoff = 6.44 cfs @ 12.16 hrs, Volume= 0.387 af, Depth= 0.38"
 Routed to Pond 1P : NW Inf Pond

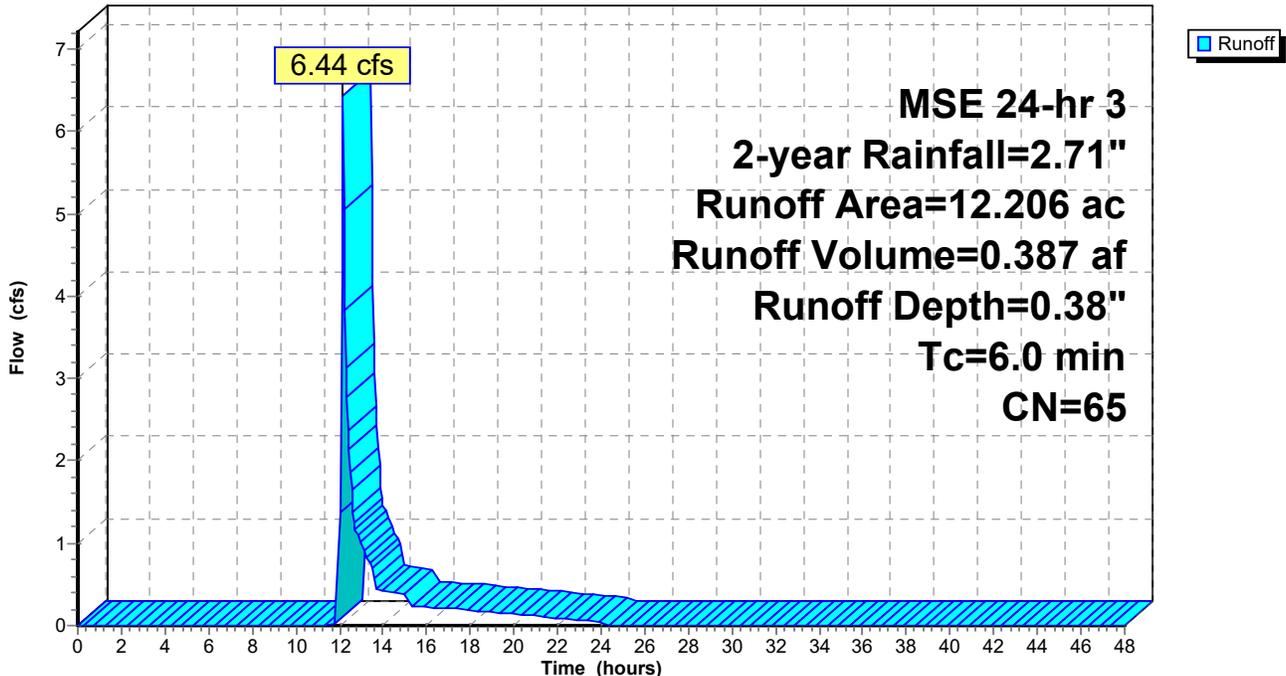
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-year Rainfall=2.71"

Area (ac)	CN	Description
0.675	98	Paved roads, HSG B
1.303	98	Roofs, HSG A
1.638	98	Paved parking, HSG A
* 0.291	98	Paved walks, HSG A
0.317	98	Water Surface, 0% imp, HSG A
3.899	39	>75% Grass cover, Good, HSG A
4.083	57	Woods/grass comb., Poor, HSG A
12.206	65	Weighted Average
8.299		67.99% Pervious Area
3.907		32.01% Impervious Area

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

Subcatchment 1S: NW

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Subcatchment 1S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.71	0.38	0.00
0.50	0.00	0.00	0.00	27.00	2.71	0.38	0.00
1.00	0.01	0.00	0.00	27.50	2.71	0.38	0.00
1.50	0.02	0.00	0.00	28.00	2.71	0.38	0.00
2.00	0.02	0.00	0.00	28.50	2.71	0.38	0.00
2.50	0.03	0.00	0.00	29.00	2.71	0.38	0.00
3.00	0.04	0.00	0.00	29.50	2.71	0.38	0.00
3.50	0.06	0.00	0.00	30.00	2.71	0.38	0.00
4.00	0.07	0.00	0.00	30.50	2.71	0.38	0.00
4.50	0.09	0.00	0.00	31.00	2.71	0.38	0.00
5.00	0.10	0.00	0.00	31.50	2.71	0.38	0.00
5.50	0.12	0.00	0.00	32.00	2.71	0.38	0.00
6.00	0.14	0.00	0.00	32.50	2.71	0.38	0.00
6.50	0.16	0.00	0.00	33.00	2.71	0.38	0.00
7.00	0.18	0.00	0.00	33.50	2.71	0.38	0.00
7.50	0.20	0.00	0.00	34.00	2.71	0.38	0.00
8.00	0.23	0.00	0.00	34.50	2.71	0.38	0.00
8.50	0.25	0.00	0.00	35.00	2.71	0.38	0.00
9.00	0.28	0.00	0.00	35.50	2.71	0.38	0.00
9.50	0.32	0.00	0.00	36.00	2.71	0.38	0.00
10.00	0.37	0.00	0.00	36.50	2.71	0.38	0.00
10.50	0.42	0.00	0.00	37.00	2.71	0.38	0.00
11.00	0.52	0.00	0.00	37.50	2.71	0.38	0.00
11.50	0.67	0.00	0.00	38.00	2.71	0.38	0.00
12.00	1.25	0.01	0.22	38.50	2.71	0.38	0.00
12.50	2.04	0.15	1.86	39.00	2.71	0.38	0.00
13.00	2.19	0.19	1.01	39.50	2.71	0.38	0.00
13.50	2.29	0.22	0.67	40.00	2.71	0.38	0.00
14.00	2.34	0.24	0.42	40.50	2.71	0.38	0.00
14.50	2.39	0.26	0.41	41.00	2.71	0.38	0.00
15.00	2.43	0.27	0.39	41.50	2.71	0.38	0.00
15.50	2.46	0.28	0.24	42.00	2.71	0.38	0.00
16.00	2.48	0.29	0.23	42.50	2.71	0.38	0.00
16.50	2.51	0.30	0.22	43.00	2.71	0.38	0.00
17.00	2.53	0.31	0.21	43.50	2.71	0.38	0.00
17.50	2.55	0.32	0.20	44.00	2.71	0.38	0.00
18.00	2.57	0.32	0.19	44.50	2.71	0.38	0.00
18.50	2.59	0.33	0.18	45.00	2.71	0.38	0.00
19.00	2.61	0.34	0.17	45.50	2.71	0.38	0.00
19.50	2.62	0.35	0.15	46.00	2.71	0.38	0.00
20.00	2.64	0.35	0.14	46.50	2.71	0.38	0.00
20.50	2.65	0.36	0.13	47.00	2.71	0.38	0.00
21.00	2.67	0.36	0.12	47.50	2.71	0.38	0.00
21.50	2.68	0.37	0.10	48.00	2.71	0.38	0.00
22.00	2.69	0.37	0.09				
22.50	2.69	0.37	0.08				
23.00	2.70	0.38	0.06				
23.50	2.71	0.38	0.05				
24.00	2.71	0.38	0.04				
24.50	2.71	0.38	0.00				
25.00	2.71	0.38	0.00				
25.50	2.71	0.38	0.00				
26.00	2.71	0.38	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Subcatchment 2S: NE

Runoff = 6.50 cfs @ 12.16 hrs, Volume= 0.412 af, Depth= 0.35"
 Routed to Pond 2P : NE Inf Pond

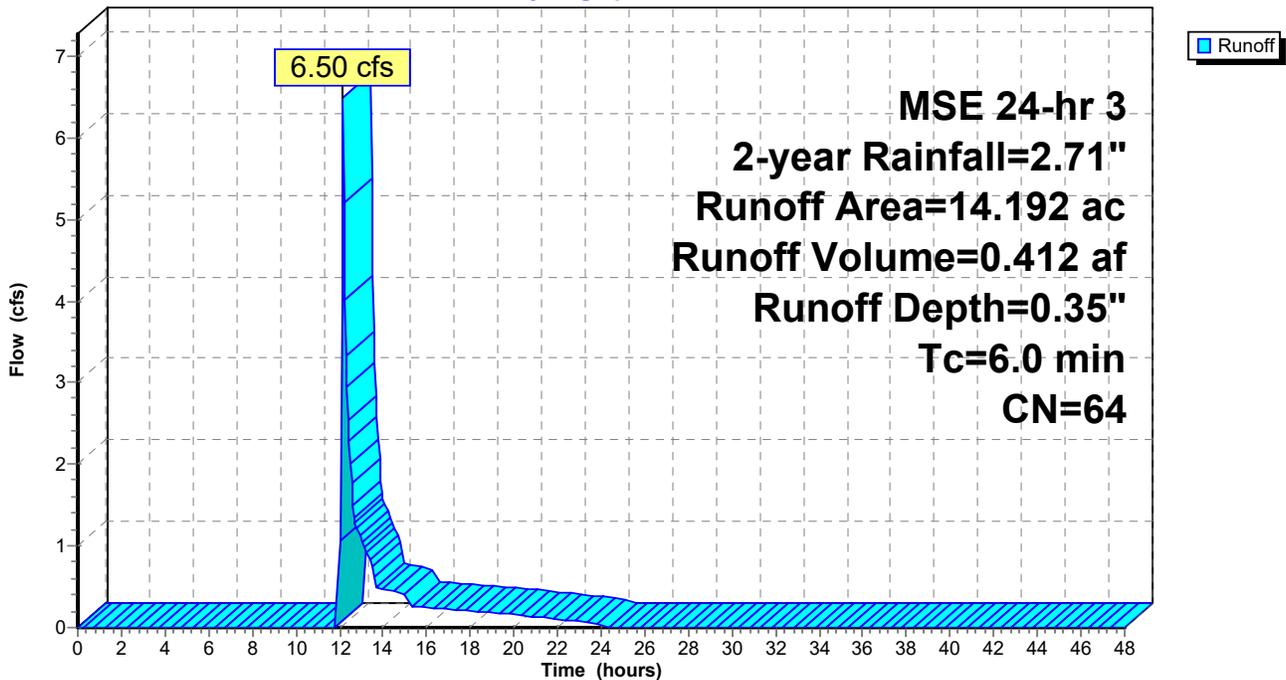
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-year Rainfall=2.71"

Area (ac)	CN	Description
* 0.299	98	Paved roads, HSG B
1.431	98	Roofs, HSG A
1.611	98	Paved parking, HSG A
* 0.404	98	Paved walks, HSG A
0.561	98	Water Surface, 0% imp, HSG A
4.036	39	>75% Grass cover, Good, HSG A
5.850	57	Woods/grass comb., Poor, HSG A
14.192	64	Weighted Average
10.447		73.61% Pervious Area
3.745		26.39% Impervious Area

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

Subcatchment 2S: NE

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Subcatchment 2S: NE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.71	0.35	0.00
0.50	0.00	0.00	0.00	27.00	2.71	0.35	0.00
1.00	0.01	0.00	0.00	27.50	2.71	0.35	0.00
1.50	0.02	0.00	0.00	28.00	2.71	0.35	0.00
2.00	0.02	0.00	0.00	28.50	2.71	0.35	0.00
2.50	0.03	0.00	0.00	29.00	2.71	0.35	0.00
3.00	0.04	0.00	0.00	29.50	2.71	0.35	0.00
3.50	0.06	0.00	0.00	30.00	2.71	0.35	0.00
4.00	0.07	0.00	0.00	30.50	2.71	0.35	0.00
4.50	0.09	0.00	0.00	31.00	2.71	0.35	0.00
5.00	0.10	0.00	0.00	31.50	2.71	0.35	0.00
5.50	0.12	0.00	0.00	32.00	2.71	0.35	0.00
6.00	0.14	0.00	0.00	32.50	2.71	0.35	0.00
6.50	0.16	0.00	0.00	33.00	2.71	0.35	0.00
7.00	0.18	0.00	0.00	33.50	2.71	0.35	0.00
7.50	0.20	0.00	0.00	34.00	2.71	0.35	0.00
8.00	0.23	0.00	0.00	34.50	2.71	0.35	0.00
8.50	0.25	0.00	0.00	35.00	2.71	0.35	0.00
9.00	0.28	0.00	0.00	35.50	2.71	0.35	0.00
9.50	0.32	0.00	0.00	36.00	2.71	0.35	0.00
10.00	0.37	0.00	0.00	36.50	2.71	0.35	0.00
10.50	0.42	0.00	0.00	37.00	2.71	0.35	0.00
11.00	0.52	0.00	0.00	37.50	2.71	0.35	0.00
11.50	0.67	0.00	0.00	38.00	2.71	0.35	0.00
12.00	1.25	0.00	0.09	38.50	2.71	0.35	0.00
12.50	2.04	0.13	2.00	39.00	2.71	0.35	0.00
13.00	2.19	0.17	1.10	39.50	2.71	0.35	0.00
13.50	2.29	0.20	0.73	40.00	2.71	0.35	0.00
14.00	2.34	0.22	0.46	40.50	2.71	0.35	0.00
14.50	2.39	0.23	0.45	41.00	2.71	0.35	0.00
15.00	2.43	0.25	0.43	41.50	2.71	0.35	0.00
15.50	2.46	0.26	0.26	42.00	2.71	0.35	0.00
16.00	2.48	0.26	0.25	42.50	2.71	0.35	0.00
16.50	2.51	0.27	0.24	43.00	2.71	0.35	0.00
17.00	2.53	0.28	0.23	43.50	2.71	0.35	0.00
17.50	2.55	0.29	0.22	44.00	2.71	0.35	0.00
18.00	2.57	0.30	0.21	44.50	2.71	0.35	0.00
18.50	2.59	0.30	0.20	45.00	2.71	0.35	0.00
19.00	2.61	0.31	0.18	45.50	2.71	0.35	0.00
19.50	2.62	0.32	0.17	46.00	2.71	0.35	0.00
20.00	2.64	0.32	0.16	46.50	2.71	0.35	0.00
20.50	2.65	0.33	0.14	47.00	2.71	0.35	0.00
21.00	2.67	0.33	0.13	47.50	2.71	0.35	0.00
21.50	2.68	0.34	0.11	48.00	2.71	0.35	0.00
22.00	2.69	0.34	0.10				
22.50	2.69	0.34	0.09				
23.00	2.70	0.34	0.07				
23.50	2.71	0.35	0.06				
24.00	2.71	0.35	0.04				
24.50	2.71	0.35	0.00				
25.00	2.71	0.35	0.00				
25.50	2.71	0.35	0.00				
26.00	2.71	0.35	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Subcatchment 3S: NW

Runoff = 10.71 cfs @ 12.15 hrs, Volume= 0.573 af, Depth= 0.48"
 Routed to Pond 3P : MID Inf Pond

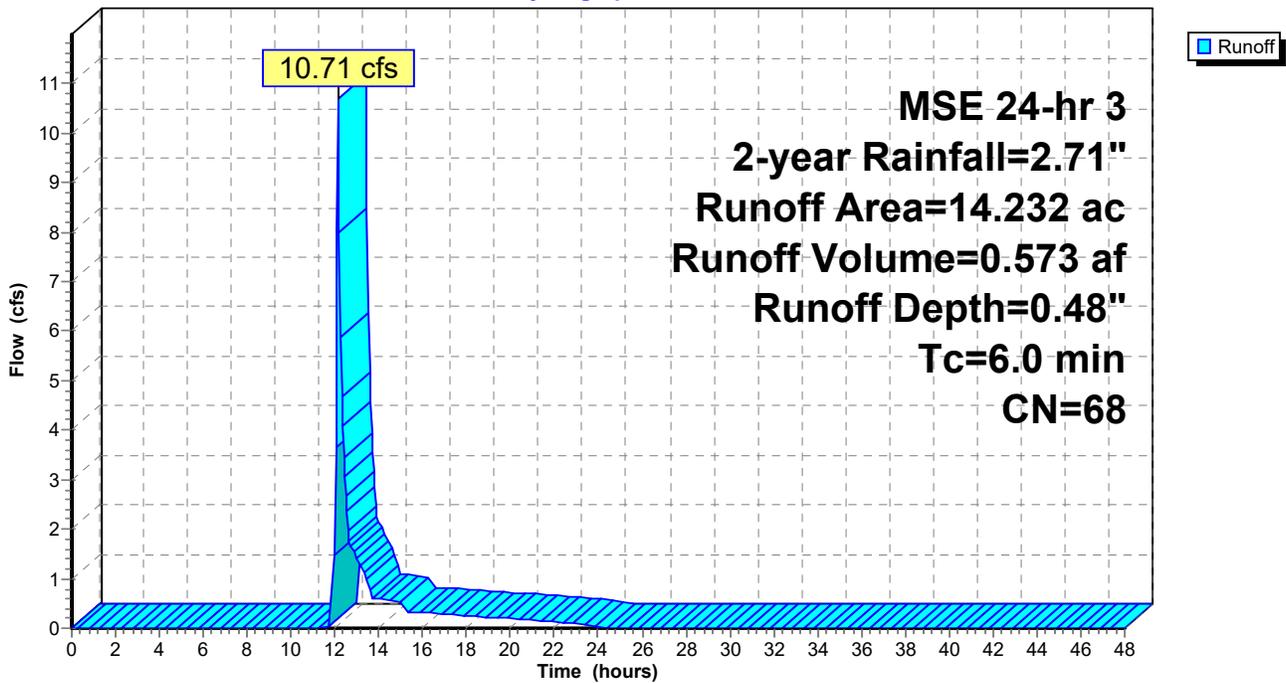
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-year Rainfall=2.71"

Area (ac)	CN	Description
2.033	98	Roofs, HSG A
2.731	98	Paved parking, HSG A
* 0.701	98	Paved walks, HSG A
0.466	98	Water Surface, 0% imp, HSG A
5.188	39	>75% Grass cover, Good, HSG A
3.113	57	Woods/grass comb., Poor, HSG A
14.232	68	Weighted Average
8.767		61.60% Pervious Area
5.465		38.40% Impervious Area

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

Subcatchment 3S: NW

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Subcatchment 3S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.71	0.48	0.00
0.50	0.00	0.00	0.00	27.00	2.71	0.48	0.00
1.00	0.01	0.00	0.00	27.50	2.71	0.48	0.00
1.50	0.02	0.00	0.00	28.00	2.71	0.48	0.00
2.00	0.02	0.00	0.00	28.50	2.71	0.48	0.00
2.50	0.03	0.00	0.00	29.00	2.71	0.48	0.00
3.00	0.04	0.00	0.00	29.50	2.71	0.48	0.00
3.50	0.06	0.00	0.00	30.00	2.71	0.48	0.00
4.00	0.07	0.00	0.00	30.50	2.71	0.48	0.00
4.50	0.09	0.00	0.00	31.00	2.71	0.48	0.00
5.00	0.10	0.00	0.00	31.50	2.71	0.48	0.00
5.50	0.12	0.00	0.00	32.00	2.71	0.48	0.00
6.00	0.14	0.00	0.00	32.50	2.71	0.48	0.00
6.50	0.16	0.00	0.00	33.00	2.71	0.48	0.00
7.00	0.18	0.00	0.00	33.50	2.71	0.48	0.00
7.50	0.20	0.00	0.00	34.00	2.71	0.48	0.00
8.00	0.23	0.00	0.00	34.50	2.71	0.48	0.00
8.50	0.25	0.00	0.00	35.00	2.71	0.48	0.00
9.00	0.28	0.00	0.00	35.50	2.71	0.48	0.00
9.50	0.32	0.00	0.00	36.00	2.71	0.48	0.00
10.00	0.37	0.00	0.00	36.50	2.71	0.48	0.00
10.50	0.42	0.00	0.00	37.00	2.71	0.48	0.00
11.00	0.52	0.00	0.00	37.50	2.71	0.48	0.00
11.50	0.67	0.00	0.00	38.00	2.71	0.48	0.00
12.00	1.25	0.02	1.47	38.50	2.71	0.48	0.00
12.50	2.04	0.21	2.67	39.00	2.71	0.48	0.00
13.00	2.19	0.26	1.42	39.50	2.71	0.48	0.00
13.50	2.29	0.30	0.92	40.00	2.71	0.48	0.00
14.00	2.34	0.32	0.58	40.50	2.71	0.48	0.00
14.50	2.39	0.34	0.56	41.00	2.71	0.48	0.00
15.00	2.43	0.36	0.53	41.50	2.71	0.48	0.00
15.50	2.46	0.37	0.32	42.00	2.71	0.48	0.00
16.00	2.48	0.38	0.31	42.50	2.71	0.48	0.00
16.50	2.51	0.39	0.30	43.00	2.71	0.48	0.00
17.00	2.53	0.40	0.28	43.50	2.71	0.48	0.00
17.50	2.55	0.41	0.27	44.00	2.71	0.48	0.00
18.00	2.57	0.42	0.25	44.50	2.71	0.48	0.00
18.50	2.59	0.43	0.24	45.00	2.71	0.48	0.00
19.00	2.61	0.44	0.22	45.50	2.71	0.48	0.00
19.50	2.62	0.44	0.21	46.00	2.71	0.48	0.00
20.00	2.64	0.45	0.19	46.50	2.71	0.48	0.00
20.50	2.65	0.46	0.17	47.00	2.71	0.48	0.00
21.00	2.67	0.46	0.16	47.50	2.71	0.48	0.00
21.50	2.68	0.47	0.14	48.00	2.71	0.48	0.00
22.00	2.69	0.47	0.12				
22.50	2.69	0.48	0.10				
23.00	2.70	0.48	0.09				
23.50	2.71	0.48	0.07				
24.00	2.71	0.48	0.05				
24.50	2.71	0.48	0.00				
25.00	2.71	0.48	0.00				
25.50	2.71	0.48	0.00				
26.00	2.71	0.48	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Subcatchment 4S: S

Runoff = 5.04 cfs @ 12.15 hrs, Volume= 0.289 af, Depth= 0.41"
 Routed to Pond 4P : S Bio Pond

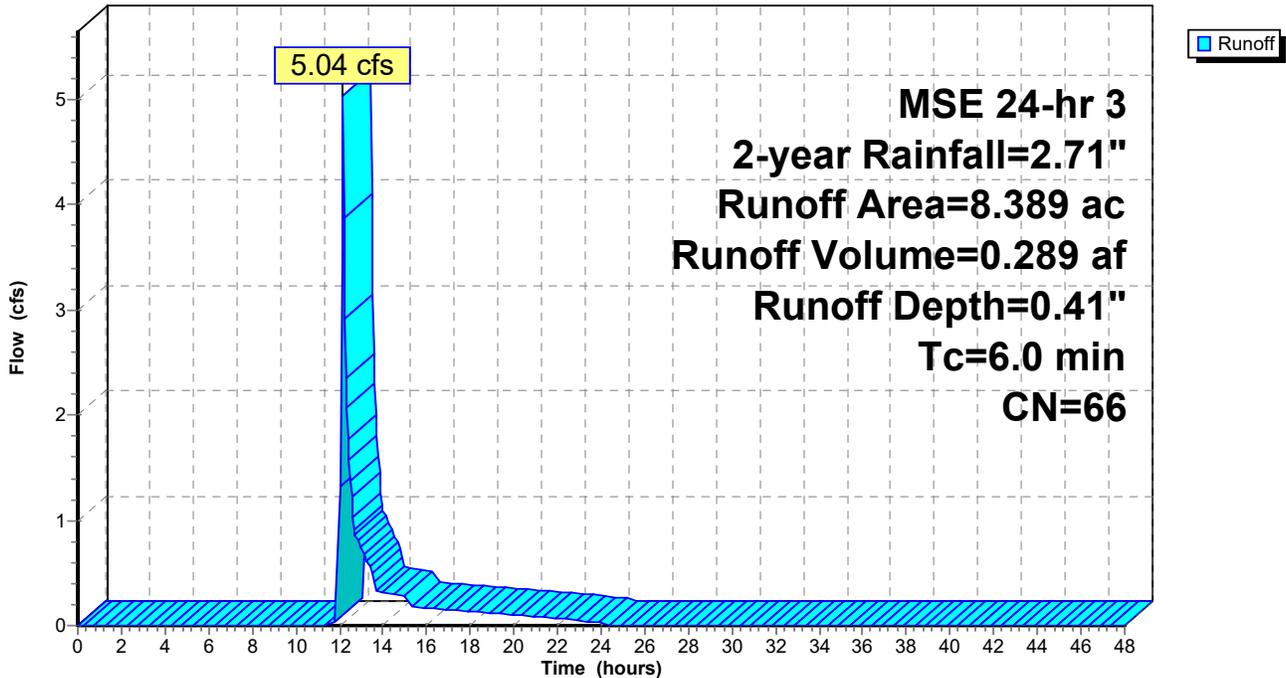
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-year Rainfall=2.71"

Area (ac)	CN	Description
0.269	98	Paved roads, HSG B
1.067	98	Roofs, HSG A
1.430	98	Paved parking, HSG A
* 0.460	98	Paved walks, HSG A
0.300	98	Water Surface, 0% imp, HSG A
3.716	39	>75% Grass cover, Good, HSG A
1.147	57	Woods/grass comb., Poor, HSG A
8.389	66	Weighted Average
5.163		61.54% Pervious Area
3.226		38.46% Impervious Area

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

Subcatchment 4S: S

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Subcatchment 4S: S

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.71	0.41	0.00
0.50	0.00	0.00	0.00	27.00	2.71	0.41	0.00
1.00	0.01	0.00	0.00	27.50	2.71	0.41	0.00
1.50	0.02	0.00	0.00	28.00	2.71	0.41	0.00
2.00	0.02	0.00	0.00	28.50	2.71	0.41	0.00
2.50	0.03	0.00	0.00	29.00	2.71	0.41	0.00
3.00	0.04	0.00	0.00	29.50	2.71	0.41	0.00
3.50	0.06	0.00	0.00	30.00	2.71	0.41	0.00
4.00	0.07	0.00	0.00	30.50	2.71	0.41	0.00
4.50	0.09	0.00	0.00	31.00	2.71	0.41	0.00
5.00	0.10	0.00	0.00	31.50	2.71	0.41	0.00
5.50	0.12	0.00	0.00	32.00	2.71	0.41	0.00
6.00	0.14	0.00	0.00	32.50	2.71	0.41	0.00
6.50	0.16	0.00	0.00	33.00	2.71	0.41	0.00
7.00	0.18	0.00	0.00	33.50	2.71	0.41	0.00
7.50	0.20	0.00	0.00	34.00	2.71	0.41	0.00
8.00	0.23	0.00	0.00	34.50	2.71	0.41	0.00
8.50	0.25	0.00	0.00	35.00	2.71	0.41	0.00
9.00	0.28	0.00	0.00	35.50	2.71	0.41	0.00
9.50	0.32	0.00	0.00	36.00	2.71	0.41	0.00
10.00	0.37	0.00	0.00	36.50	2.71	0.41	0.00
10.50	0.42	0.00	0.00	37.00	2.71	0.41	0.00
11.00	0.52	0.00	0.00	37.50	2.71	0.41	0.00
11.50	0.67	0.00	0.00	38.00	2.71	0.41	0.00
12.00	1.25	0.01	0.33	38.50	2.71	0.41	0.00
12.50	2.04	0.16	1.37	39.00	2.71	0.41	0.00
13.00	2.19	0.21	0.74	39.50	2.71	0.41	0.00
13.50	2.29	0.25	0.49	40.00	2.71	0.41	0.00
14.00	2.34	0.26	0.31	40.50	2.71	0.41	0.00
14.50	2.39	0.28	0.30	41.00	2.71	0.41	0.00
15.00	2.43	0.30	0.28	41.50	2.71	0.41	0.00
15.50	2.46	0.31	0.17	42.00	2.71	0.41	0.00
16.00	2.48	0.32	0.17	42.50	2.71	0.41	0.00
16.50	2.51	0.33	0.16	43.00	2.71	0.41	0.00
17.00	2.53	0.34	0.15	43.50	2.71	0.41	0.00
17.50	2.55	0.35	0.14	44.00	2.71	0.41	0.00
18.00	2.57	0.36	0.14	44.50	2.71	0.41	0.00
18.50	2.59	0.36	0.13	45.00	2.71	0.41	0.00
19.00	2.61	0.37	0.12	45.50	2.71	0.41	0.00
19.50	2.62	0.38	0.11	46.00	2.71	0.41	0.00
20.00	2.64	0.38	0.10	46.50	2.71	0.41	0.00
20.50	2.65	0.39	0.09	47.00	2.71	0.41	0.00
21.00	2.67	0.39	0.08	47.50	2.71	0.41	0.00
21.50	2.68	0.40	0.07	48.00	2.71	0.41	0.00
22.00	2.69	0.40	0.07				
22.50	2.69	0.41	0.06				
23.00	2.70	0.41	0.05				
23.50	2.71	0.41	0.04				
24.00	2.71	0.41	0.03				
24.50	2.71	0.41	0.00				
25.00	2.71	0.41	0.00				
25.50	2.71	0.41	0.00				
26.00	2.71	0.41	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Subcatchment S2: SOUTH

Runoff = 16.35 cfs @ 12.14 hrs, Volume= 0.796 af, Depth= 0.68"
 Routed to nonexistent node 2L

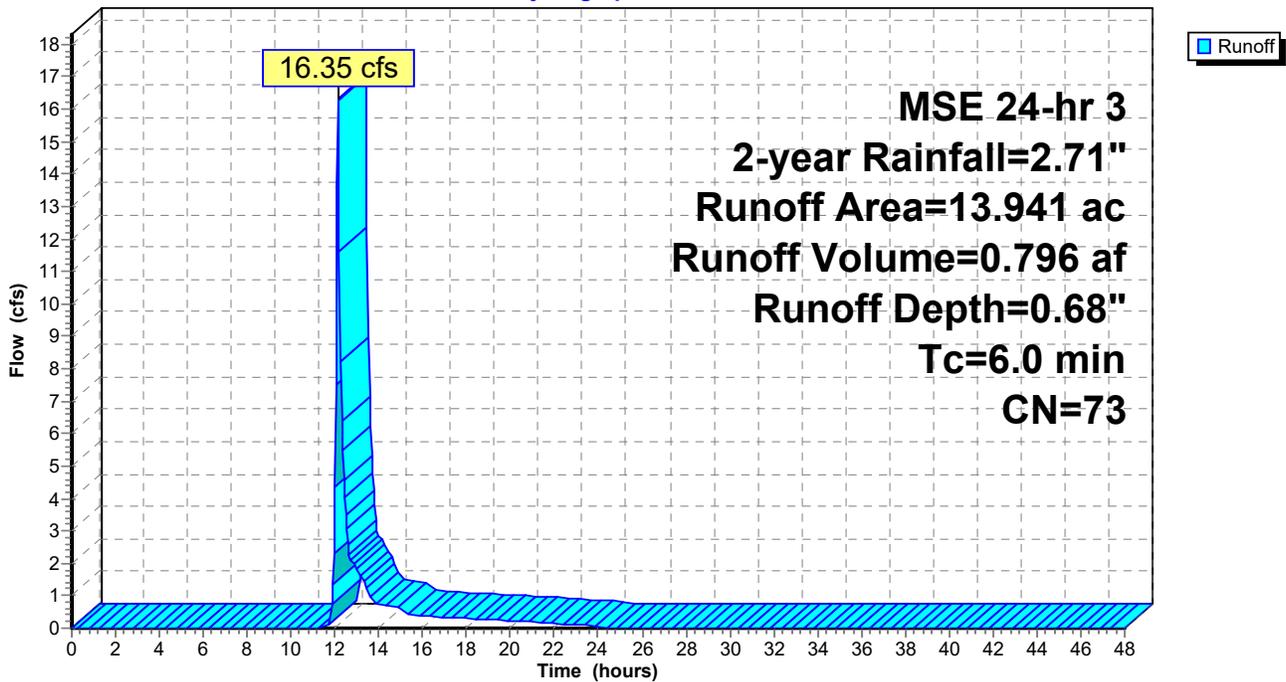
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-year Rainfall=2.71"

Area (ac)	CN	Description
* 0.269	98	Paved roads, HSG B
* 5.287	98	Gravel, HSG A
8.385	57	Woods/grass comb., Poor, HSG A
13.941	73	Weighted Average
8.385		60.15% Pervious Area
5.556		39.85% Impervious Area

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

Subcatchment S2: SOUTH

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Subcatchment S2: SOUTH

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	2.71	0.68	0.00
0.50	0.00	0.00	0.00	27.00	2.71	0.68	0.00
1.00	0.01	0.00	0.00	27.50	2.71	0.68	0.00
1.50	0.02	0.00	0.00	28.00	2.71	0.68	0.00
2.00	0.02	0.00	0.00	28.50	2.71	0.68	0.00
2.50	0.03	0.00	0.00	29.00	2.71	0.68	0.00
3.00	0.04	0.00	0.00	29.50	2.71	0.68	0.00
3.50	0.06	0.00	0.00	30.00	2.71	0.68	0.00
4.00	0.07	0.00	0.00	30.50	2.71	0.68	0.00
4.50	0.09	0.00	0.00	31.00	2.71	0.68	0.00
5.00	0.10	0.00	0.00	31.50	2.71	0.68	0.00
5.50	0.12	0.00	0.00	32.00	2.71	0.68	0.00
6.00	0.14	0.00	0.00	32.50	2.71	0.68	0.00
6.50	0.16	0.00	0.00	33.00	2.71	0.68	0.00
7.00	0.18	0.00	0.00	33.50	2.71	0.68	0.00
7.50	0.20	0.00	0.00	34.00	2.71	0.68	0.00
8.00	0.23	0.00	0.00	34.50	2.71	0.68	0.00
8.50	0.25	0.00	0.00	35.00	2.71	0.68	0.00
9.00	0.28	0.00	0.00	35.50	2.71	0.68	0.00
9.50	0.32	0.00	0.00	36.00	2.71	0.68	0.00
10.00	0.37	0.00	0.00	36.50	2.71	0.68	0.00
10.50	0.42	0.00	0.00	37.00	2.71	0.68	0.00
11.00	0.52	0.00	0.00	37.50	2.71	0.68	0.00
11.50	0.67	0.00	0.00	38.00	2.71	0.68	0.00
12.00	1.25	0.06	4.37	38.50	2.71	0.68	0.00
12.50	2.04	0.34	3.49	39.00	2.71	0.68	0.00
13.00	2.19	0.41	1.79	39.50	2.71	0.68	0.00
13.50	2.29	0.46	1.15	40.00	2.71	0.68	0.00
14.00	2.34	0.48	0.72	40.50	2.71	0.68	0.00
14.50	2.39	0.51	0.69	41.00	2.71	0.68	0.00
15.00	2.43	0.53	0.65	41.50	2.71	0.68	0.00
15.50	2.46	0.54	0.40	42.00	2.71	0.68	0.00
16.00	2.48	0.56	0.38	42.50	2.71	0.68	0.00
16.50	2.51	0.57	0.36	43.00	2.71	0.68	0.00
17.00	2.53	0.58	0.34	43.50	2.71	0.68	0.00
17.50	2.55	0.60	0.33	44.00	2.71	0.68	0.00
18.00	2.57	0.61	0.31	44.50	2.71	0.68	0.00
18.50	2.59	0.62	0.29	45.00	2.71	0.68	0.00
19.00	2.61	0.63	0.27	45.50	2.71	0.68	0.00
19.50	2.62	0.64	0.25	46.00	2.71	0.68	0.00
20.00	2.64	0.64	0.23	46.50	2.71	0.68	0.00
20.50	2.65	0.65	0.21	47.00	2.71	0.68	0.00
21.00	2.67	0.66	0.19	47.50	2.71	0.68	0.00
21.50	2.68	0.67	0.17	48.00	2.71	0.68	0.00
22.00	2.69	0.67	0.15				
22.50	2.69	0.68	0.13				
23.00	2.70	0.68	0.10				
23.50	2.71	0.68	0.08				
24.00	2.71	0.68	0.06				
24.50	2.71	0.68	0.00				
25.00	2.71	0.68	0.00				
25.50	2.71	0.68	0.00				
26.00	2.71	0.68	0.00				

Preliminary Hartland Apartments

MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Pond 1P: NW Inf Pond

Inflow Area = 12.206 ac, 32.01% Impervious, Inflow Depth = 0.38" for 2-year event
 Inflow = 6.44 cfs @ 12.16 hrs, Volume= 0.387 af
 Outflow = 0.96 cfs @ 13.08 hrs, Volume= 0.387 af, Atten= 85%, Lag= 55.6 min
 Primary = 0.96 cfs @ 13.08 hrs, Volume= 0.387 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 962.54' @ 13.08 hrs Surf.Area= 11,535 sf Storage= 5,060 cf

Plug-Flow detention time= 49.8 min calculated for 0.386 af (100% of inflow)
 Center-of-Mass det. time= 49.7 min (917.9 - 868.2)

Volume	Invert	Avail.Storage	Storage Description
#1	962.00'	70,699 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

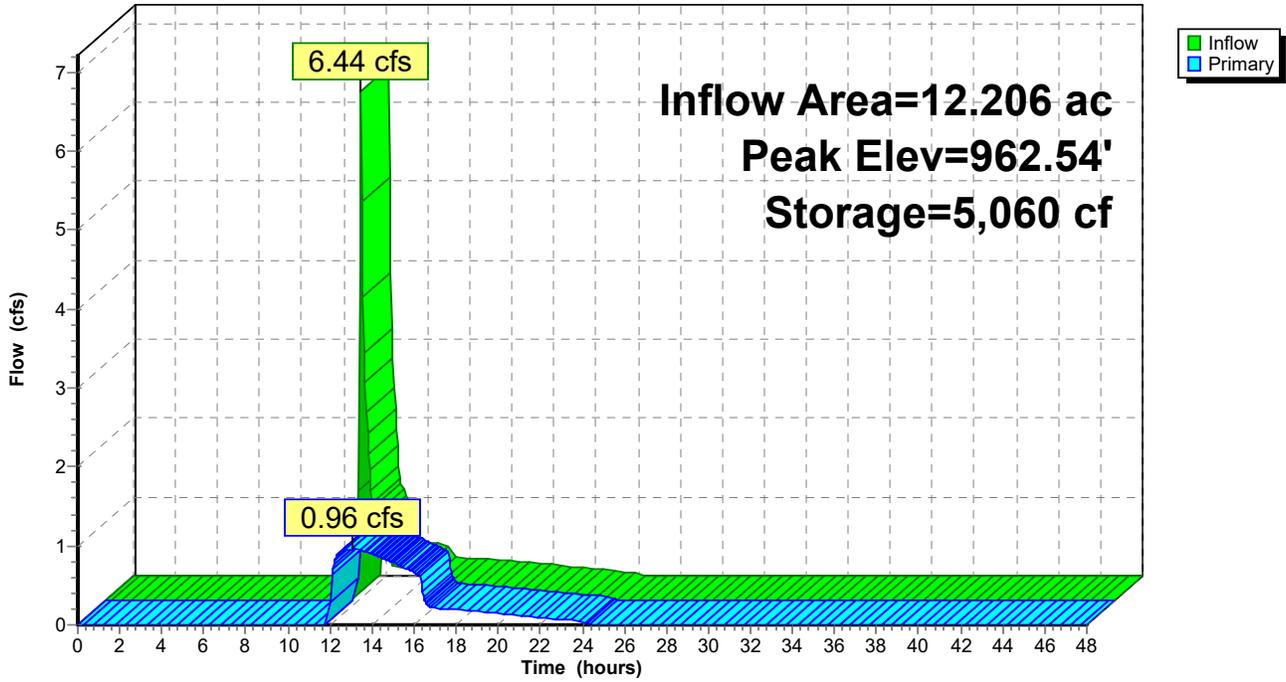
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
962.00	7,070	0	0
963.00	15,280	11,175	11,175
964.00	18,264	16,772	27,947
965.00	21,350	19,807	47,754
966.00	24,540	22,945	70,699

Device	Routing	Invert	Outlet Devices
#1	Primary	962.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=0.96 cfs @ 13.08 hrs HW=962.54' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.96 cfs)

Pond 1P: NW Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Pond 1P: NW Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	962.00	0.00
1.00	0.00	0	962.00	0.00
2.00	0.00	0	962.00	0.00
3.00	0.00	0	962.00	0.00
4.00	0.00	0	962.00	0.00
5.00	0.00	0	962.00	0.00
6.00	0.00	0	962.00	0.00
7.00	0.00	0	962.00	0.00
8.00	0.00	0	962.00	0.00
9.00	0.00	0	962.00	0.00
10.00	0.00	0	962.00	0.00
11.00	0.00	0	962.00	0.00
12.00	0.22	18	962.00	0.04
13.00	1.01	5,054	962.54	0.96
14.00	0.42	4,036	962.45	0.90
15.00	0.39	2,461	962.30	0.79
16.00	0.23	752	962.10	0.66
17.00	0.21	100	962.01	0.21
18.00	0.19	90	962.01	0.19
19.00	0.17	79	962.01	0.17
20.00	0.14	68	962.01	0.14
21.00	0.12	56	962.01	0.12
22.00	0.09	44	962.01	0.09
23.00	0.06	32	962.00	0.07
24.00	0.04	19	962.00	0.04
25.00	0.00	0	962.00	0.00
26.00	0.00	0	962.00	0.00
27.00	0.00	0	962.00	0.00
28.00	0.00	0	962.00	0.00
29.00	0.00	0	962.00	0.00
30.00	0.00	0	962.00	0.00
31.00	0.00	0	962.00	0.00
32.00	0.00	0	962.00	0.00
33.00	0.00	0	962.00	0.00
34.00	0.00	0	962.00	0.00
35.00	0.00	0	962.00	0.00
36.00	0.00	0	962.00	0.00
37.00	0.00	0	962.00	0.00
38.00	0.00	0	962.00	0.00
39.00	0.00	0	962.00	0.00
40.00	0.00	0	962.00	0.00
41.00	0.00	0	962.00	0.00
42.00	0.00	0	962.00	0.00
43.00	0.00	0	962.00	0.00
44.00	0.00	0	962.00	0.00
45.00	0.00	0	962.00	0.00
46.00	0.00	0	962.00	0.00
47.00	0.00	0	962.00	0.00
48.00	0.00	0	962.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Pond 2P: NE Inf Pond

Inflow Area = 14.192 ac, 26.39% Impervious, Inflow Depth = 0.35" for 2-year event
 Inflow = 6.50 cfs @ 12.16 hrs, Volume= 0.412 af
 Outflow = 1.48 cfs @ 12.61 hrs, Volume= 0.412 af, Atten= 77%, Lag= 27.2 min
 Primary = 1.48 cfs @ 12.61 hrs, Volume= 0.412 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 960.24' @ 12.61 hrs Surf.Area= 17,700 sf Storage= 3,919 cf

Plug-Flow detention time= 22.2 min calculated for 0.412 af (100% of inflow)
 Center-of-Mass det. time= 22.2 min (894.9 - 872.7)

Volume	Invert	Avail.Storage	Storage Description
#1	960.00'	111,091 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

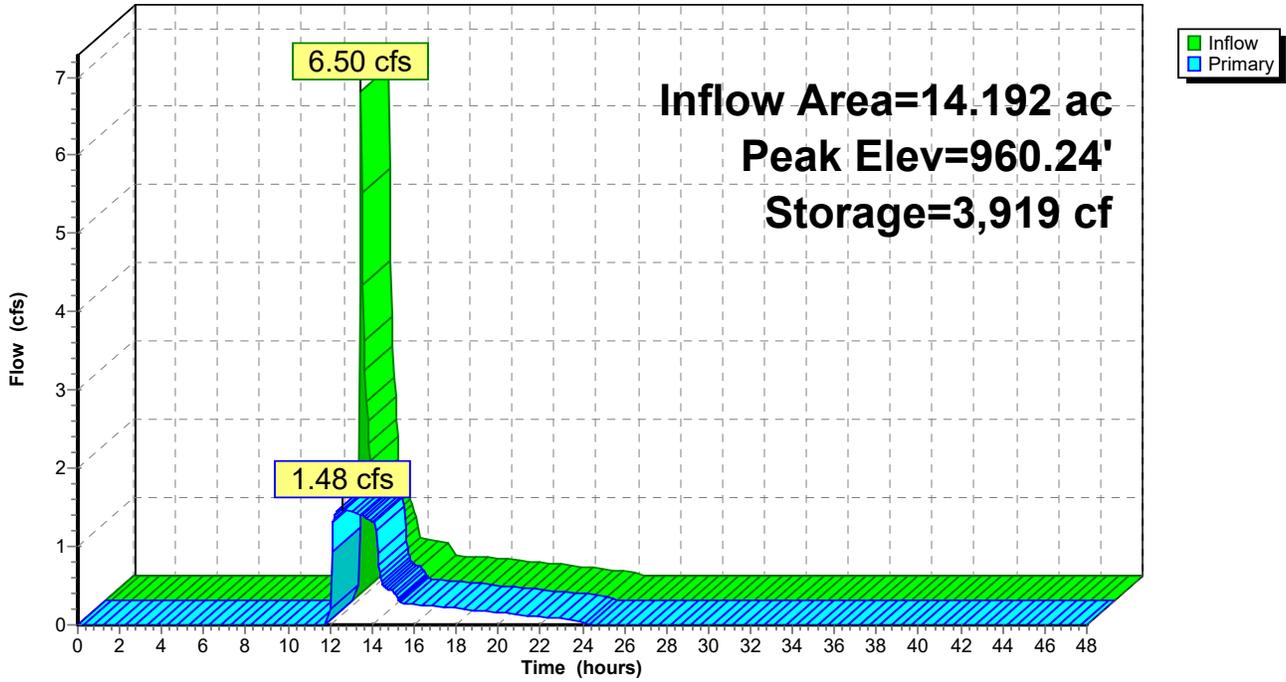
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
960.00	14,993	0	0
961.00	26,284	20,639	20,639
962.00	28,806	27,545	48,184
963.00	31,428	30,117	78,301
964.00	34,152	32,790	111,091

Device	Routing	Invert	Outlet Devices
#1	Primary	960.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=1.47 cfs @ 12.61 hrs HW=960.24' (Free Discharge)
 ↳1=Exfiltration (Exfiltration Controls 1.47 cfs)

Pond 2P: NE Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Pond 2P: NE Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	960.00	0.00
1.00	0.00	0	960.00	0.00
2.00	0.00	0	960.00	0.00
3.00	0.00	0	960.00	0.00
4.00	0.00	0	960.00	0.00
5.00	0.00	0	960.00	0.00
6.00	0.00	0	960.00	0.00
7.00	0.00	0	960.00	0.00
8.00	0.00	0	960.00	0.00
9.00	0.00	0	960.00	0.00
10.00	0.00	0	960.00	0.00
11.00	0.00	0	960.00	0.00
12.00	0.09	7	960.00	0.01
13.00	1.10	3,577	960.22	1.46
14.00	0.46	1,126	960.07	1.32
15.00	0.43	206	960.01	0.44
16.00	0.25	120	960.01	0.25
17.00	0.23	110	960.01	0.23
18.00	0.21	100	960.01	0.21
19.00	0.18	88	960.01	0.19
20.00	0.16	76	960.00	0.16
21.00	0.13	63	960.00	0.13
22.00	0.10	49	960.00	0.10
23.00	0.07	36	960.00	0.08
24.00	0.04	22	960.00	0.05
25.00	0.00	0	960.00	0.00
26.00	0.00	0	960.00	0.00
27.00	0.00	0	960.00	0.00
28.00	0.00	0	960.00	0.00
29.00	0.00	0	960.00	0.00
30.00	0.00	0	960.00	0.00
31.00	0.00	0	960.00	0.00
32.00	0.00	0	960.00	0.00
33.00	0.00	0	960.00	0.00
34.00	0.00	0	960.00	0.00
35.00	0.00	0	960.00	0.00
36.00	0.00	0	960.00	0.00
37.00	0.00	0	960.00	0.00
38.00	0.00	0	960.00	0.00
39.00	0.00	0	960.00	0.00
40.00	0.00	0	960.00	0.00
41.00	0.00	0	960.00	0.00
42.00	0.00	0	960.00	0.00
43.00	0.00	0	960.00	0.00
44.00	0.00	0	960.00	0.00
45.00	0.00	0	960.00	0.00
46.00	0.00	0	960.00	0.00
47.00	0.00	0	960.00	0.00
48.00	0.00	0	960.00	0.00

Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Pond 3P: MID Inf Pond

Inflow Area = 14.232 ac, 38.40% Impervious, Inflow Depth = 0.48" for 2-year event
Inflow = 10.71 cfs @ 12.15 hrs, Volume= 0.573 af
Outflow = 1.44 cfs @ 12.98 hrs, Volume= 0.573 af, Atten= 87%, Lag= 49.8 min
Primary = 1.44 cfs @ 12.98 hrs, Volume= 0.573 af
Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 961.58' @ 12.98 hrs Surf.Area= 17,226 sf Storage= 8,253 cf

Plug-Flow detention time= 54.5 min calculated for 0.573 af (100% of inflow)
Center-of-Mass det. time= 54.5 min (910.6 - 856.2)

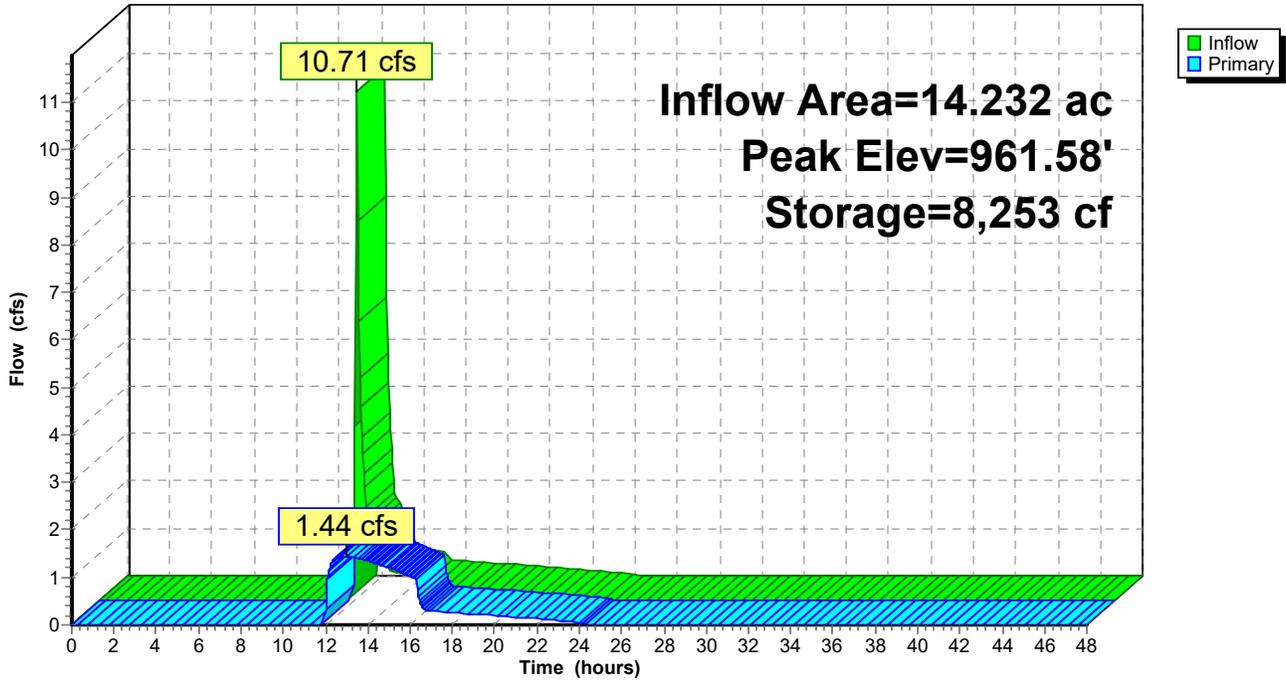
Volume	Invert	Avail.Storage	Storage Description
#1	961.00'	93,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
961.00	11,137	0	0
962.00	21,600	16,369	16,369
963.00	24,250	22,925	39,294
964.00	27,000	25,625	64,919
965.00	29,850	28,425	93,344

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=1.44 cfs @ 12.98 hrs HW=961.58' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 1.44 cfs)

Pond 3P: MID Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Pond 3P: MID Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	961.00	0.00
1.00	0.00	0	961.00	0.00
2.00	0.00	0	961.00	0.00
3.00	0.00	0	961.00	0.00
4.00	0.00	0	961.00	0.00
5.00	0.00	0	961.00	0.00
6.00	0.00	0	961.00	0.00
7.00	0.00	0	961.00	0.00
8.00	0.00	0	961.00	0.00
9.00	0.00	0	961.00	0.00
10.00	0.00	0	961.00	0.00
11.00	0.00	0	961.00	0.00
12.00	1.47	161	961.01	0.34
13.00	1.42	8,254	961.58	1.44
14.00	0.58	6,494	961.48	1.34
15.00	0.53	3,934	961.31	1.20
16.00	0.31	1,178	961.10	1.02
17.00	0.28	137	961.01	0.29
18.00	0.25	122	961.01	0.26
19.00	0.22	107	961.01	0.23
20.00	0.19	92	961.01	0.19
21.00	0.16	76	961.01	0.16
22.00	0.12	59	961.01	0.13
23.00	0.09	43	961.00	0.09
24.00	0.05	26	961.00	0.06
25.00	0.00	0	961.00	0.00
26.00	0.00	0	961.00	0.00
27.00	0.00	0	961.00	0.00
28.00	0.00	0	961.00	0.00
29.00	0.00	0	961.00	0.00
30.00	0.00	0	961.00	0.00
31.00	0.00	0	961.00	0.00
32.00	0.00	0	961.00	0.00
33.00	0.00	0	961.00	0.00
34.00	0.00	0	961.00	0.00
35.00	0.00	0	961.00	0.00
36.00	0.00	0	961.00	0.00
37.00	0.00	0	961.00	0.00
38.00	0.00	0	961.00	0.00
39.00	0.00	0	961.00	0.00
40.00	0.00	0	961.00	0.00
41.00	0.00	0	961.00	0.00
42.00	0.00	0	961.00	0.00
43.00	0.00	0	961.00	0.00
44.00	0.00	0	961.00	0.00
45.00	0.00	0	961.00	0.00
46.00	0.00	0	961.00	0.00
47.00	0.00	0	961.00	0.00
48.00	0.00	0	961.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 2-year Rainfall=2.71"

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Summary for Pond 4P: S Bio Pond

Inflow Area = 8.389 ac, 38.46% Impervious, Inflow Depth = 0.41" for 2-year event
 Inflow = 5.04 cfs @ 12.15 hrs, Volume= 0.289 af
 Outflow = 0.48 cfs @ 13.50 hrs, Volume= 0.192 af, Atten= 90%, Lag= 80.9 min
 Primary = 0.48 cfs @ 13.50 hrs, Volume= 0.192 af
 Routed to Link 1L : PROP Total
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 957.70' @ 13.50 hrs Surf.Area= 12,900 sf Storage= 6,171 cf

Plug-Flow detention time= 276.6 min calculated for 0.192 af (66% of inflow)
 Center-of-Mass det. time= 172.5 min (1,036.4 - 863.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	956.25'	45,690 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
956.25	12,900	0.0	0	0
957.42	12,900	33.0	4,981	4,981
957.75	12,900	33.0	1,405	6,386
960.00	12,900	27.0	7,837	14,222
962.00	16,880	100.0	29,780	44,002
962.10	16,880	100.0	1,688	45,690

Device	Routing	Invert	Outlet Devices
#1	Primary	956.25'	15.0" Round Culvert L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 956.25' / 955.00' S= 0.0125 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	957.23'	8.0" Round Culvert L= 280.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 957.23' / 956.25' S= 0.0035 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 1	961.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	962.00'	20.0' long x 8.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.48 cfs @ 13.50 hrs HW=957.70' (Free Discharge)

- ↑ 1=Culvert (Passes 0.48 cfs of 6.65 cfs potential flow)
- ↑ 2=Culvert (Inlet Controls 0.48 cfs @ 1.84 fps)
- ↑ 3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=956.25' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Preliminary Hartland Apartments

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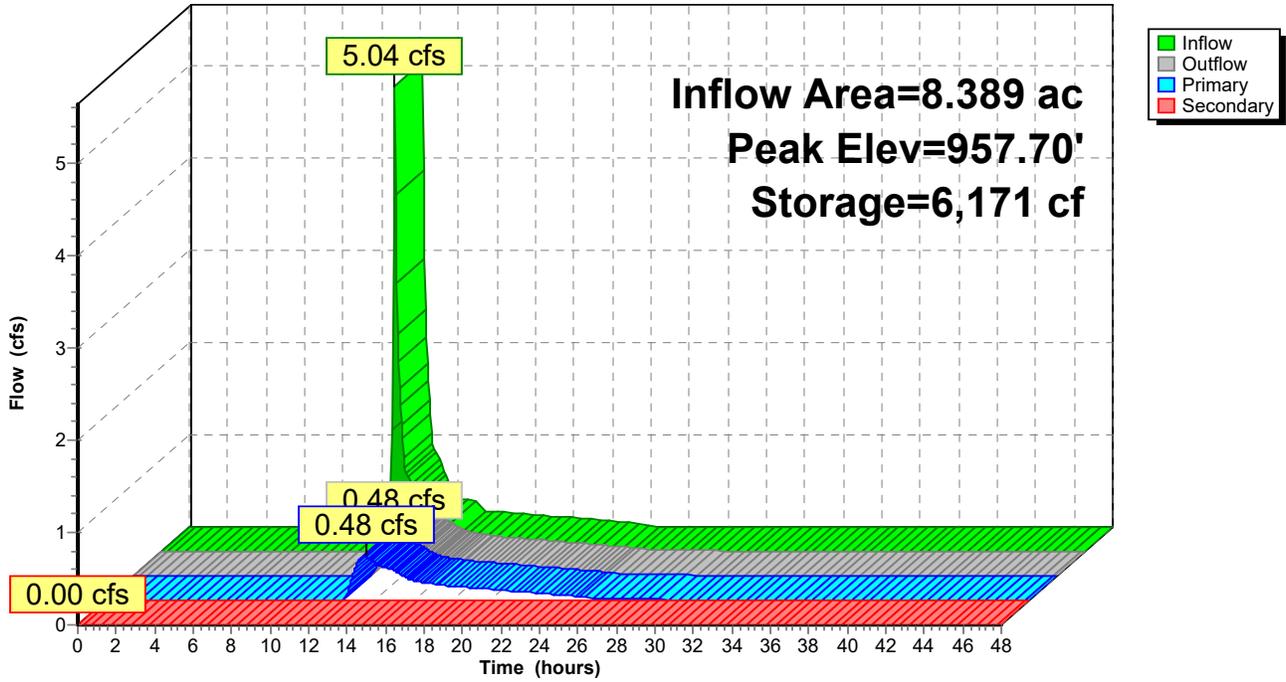
MSE 24-hr 3 2-year Rainfall=2.71"

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Pond 4P: S Bio Pond

Hydrograph



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Hydrograph for Pond 4P: S Bio Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	956.25	0.00	0.00	0.00
1.00	0.00	0	956.25	0.00	0.00	0.00
2.00	0.00	0	956.25	0.00	0.00	0.00
3.00	0.00	0	956.25	0.00	0.00	0.00
4.00	0.00	0	956.25	0.00	0.00	0.00
5.00	0.00	0	956.25	0.00	0.00	0.00
6.00	0.00	0	956.25	0.00	0.00	0.00
7.00	0.00	0	956.25	0.00	0.00	0.00
8.00	0.00	0	956.25	0.00	0.00	0.00
9.00	0.00	0	956.25	0.00	0.00	0.00
10.00	0.00	0	956.25	0.00	0.00	0.00
11.00	0.00	0	956.25	0.00	0.00	0.00
12.00	0.33	34	956.26	0.00	0.00	0.00
13.00	0.74	5,855	957.63	0.36	0.36	0.00
14.00	0.31	5,976	957.65	0.41	0.41	0.00
15.00	0.28	5,747	957.60	0.32	0.32	0.00
16.00	0.17	5,444	957.53	0.22	0.22	0.00
17.00	0.15	5,308	957.50	0.18	0.18	0.00
18.00	0.14	5,230	957.48	0.15	0.15	0.00
19.00	0.12	5,164	957.46	0.14	0.14	0.00
20.00	0.10	5,098	957.45	0.12	0.12	0.00
21.00	0.08	5,029	957.43	0.10	0.10	0.00
22.00	0.07	4,957	957.41	0.09	0.09	0.00
23.00	0.05	4,875	957.40	0.07	0.07	0.00
24.00	0.03	4,784	957.37	0.05	0.05	0.00
25.00	0.00	4,643	957.34	0.03	0.03	0.00
26.00	0.00	4,549	957.32	0.02	0.02	0.00
27.00	0.00	4,488	957.30	0.01	0.01	0.00
28.00	0.00	4,445	957.29	0.01	0.01	0.00
29.00	0.00	4,409	957.29	0.01	0.01	0.00
30.00	0.00	4,379	957.28	0.01	0.01	0.00
31.00	0.00	4,354	957.27	0.01	0.01	0.00
32.00	0.00	4,333	957.27	0.01	0.01	0.00
33.00	0.00	4,315	957.26	0.00	0.00	0.00
34.00	0.00	4,301	957.26	0.00	0.00	0.00
35.00	0.00	4,288	957.26	0.00	0.00	0.00
36.00	0.00	4,278	957.25	0.00	0.00	0.00
37.00	0.00	4,270	957.25	0.00	0.00	0.00
38.00	0.00	4,262	957.25	0.00	0.00	0.00
39.00	0.00	4,256	957.25	0.00	0.00	0.00
40.00	0.00	4,251	957.25	0.00	0.00	0.00
41.00	0.00	4,247	957.25	0.00	0.00	0.00
42.00	0.00	4,244	957.25	0.00	0.00	0.00
43.00	0.00	4,241	957.25	0.00	0.00	0.00
44.00	0.00	4,238	957.25	0.00	0.00	0.00
45.00	0.00	4,236	957.25	0.00	0.00	0.00
46.00	0.00	4,234	957.24	0.00	0.00	0.00
47.00	0.00	4,233	957.24	0.00	0.00	0.00
48.00	0.00	4,231	957.24	0.00	0.00	0.00

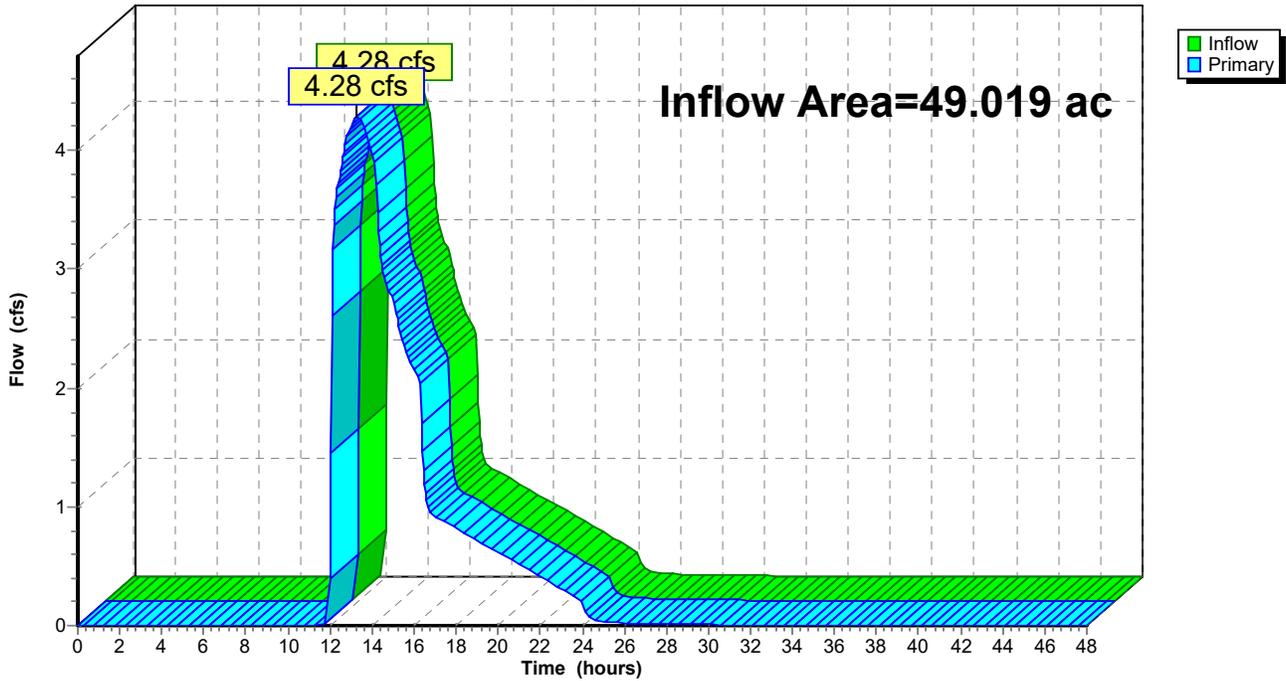
Summary for Link 1L: PROP Total

Inflow Area = 49.019 ac, 33.34% Impervious, Inflow Depth = 0.38" for 2-year event
Inflow = 4.28 cfs @ 13.29 hrs, Volume= 1.563 af
Primary = 4.28 cfs @ 13.29 hrs, Volume= 1.563 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: PROP Total

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 2-year Rainfall=2.71"

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Hydrograph for Link 1L: PROP Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	26.50	0.02	0.00	0.02
0.50	0.00	0.00	0.00	27.00	0.01	0.00	0.01
1.00	0.00	0.00	0.00	27.50	0.01	0.00	0.01
1.50	0.00	0.00	0.00	28.00	0.01	0.00	0.01
2.00	0.00	0.00	0.00	28.50	0.01	0.00	0.01
2.50	0.00	0.00	0.00	29.00	0.01	0.00	0.01
3.00	0.00	0.00	0.00	29.50	0.01	0.00	0.01
3.50	0.00	0.00	0.00	30.00	0.01	0.00	0.01
4.00	0.00	0.00	0.00	30.50	0.01	0.00	0.01
4.50	0.00	0.00	0.00	31.00	0.01	0.00	0.01
5.00	0.00	0.00	0.00	31.50	0.01	0.00	0.01
5.50	0.00	0.00	0.00	32.00	0.01	0.00	0.01
6.00	0.00	0.00	0.00	32.50	0.00	0.00	0.00
6.50	0.00	0.00	0.00	33.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	33.50	0.00	0.00	0.00
7.50	0.00	0.00	0.00	34.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	34.50	0.00	0.00	0.00
8.50	0.00	0.00	0.00	35.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	35.50	0.00	0.00	0.00
9.50	0.00	0.00	0.00	36.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	36.50	0.00	0.00	0.00
10.50	0.00	0.00	0.00	37.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	37.50	0.00	0.00	0.00
11.50	0.00	0.00	0.00	38.00	0.00	0.00	0.00
12.00	0.39	0.00	0.39	38.50	0.00	0.00	0.00
12.50	3.83	0.00	3.83	39.00	0.00	0.00	0.00
13.00	4.22	0.00	4.22	39.50	0.00	0.00	0.00
13.50	4.25	0.00	4.25	40.00	0.00	0.00	0.00
14.00	3.97	0.00	3.97	40.50	0.00	0.00	0.00
14.50	2.99	0.00	2.99	41.00	0.00	0.00	0.00
15.00	2.75	0.00	2.75	41.50	0.00	0.00	0.00
15.50	2.37	0.00	2.37	42.00	0.00	0.00	0.00
16.00	2.15	0.00	2.15	42.50	0.00	0.00	0.00
16.50	1.19	0.00	1.19	43.00	0.00	0.00	0.00
17.00	0.92	0.00	0.92	43.50	0.00	0.00	0.00
17.50	0.86	0.00	0.86	44.00	0.00	0.00	0.00
18.00	0.81	0.00	0.81	44.50	0.00	0.00	0.00
18.50	0.77	0.00	0.77	45.00	0.00	0.00	0.00
19.00	0.72	0.00	0.72	45.50	0.00	0.00	0.00
19.50	0.67	0.00	0.67	46.00	0.00	0.00	0.00
20.00	0.62	0.00	0.62	46.50	0.00	0.00	0.00
20.50	0.57	0.00	0.57	47.00	0.00	0.00	0.00
21.00	0.52	0.00	0.52	47.50	0.00	0.00	0.00
21.50	0.46	0.00	0.46	48.00	0.00	0.00	0.00
22.00	0.41	0.00	0.41				
22.50	0.36	0.00	0.36				
23.00	0.30	0.00	0.30				
23.50	0.25	0.00	0.25				
24.00	0.20	0.00	0.20				
24.50	0.05	0.00	0.05				
25.00	0.03	0.00	0.03				
25.50	0.03	0.00	0.03				
26.00	0.02	0.00	0.02				

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 1S: NW	Runoff Area=12.206 ac 32.01% Impervious Runoff Depth=0.93" Tc=6.0 min CN=65 Runoff=19.33 cfs 0.947 af
Subcatchment 2S: NE	Runoff Area=14.192 ac 26.39% Impervious Runoff Depth=0.88" Tc=6.0 min CN=64 Runoff=20.93 cfs 1.039 af
Subcatchment 3S: NW	Runoff Area=14.232 ac 38.40% Impervious Runoff Depth=1.10" Tc=6.0 min CN=68 Runoff=27.33 cfs 1.303 af
Subcatchment 4S: S	Runoff Area=8.389 ac 38.46% Impervious Runoff Depth=0.99" Tc=6.0 min CN=66 Runoff=14.21 cfs 0.689 af
Subcatchment S2: SOUTH	Runoff Area=13.941 ac 39.85% Impervious Runoff Depth=1.41" Tc=6.0 min CN=73 Runoff=35.07 cfs 1.634 af
Pond 1P: NW Inf Pond	Peak Elev=963.51' Storage=19,424 cf Inflow=19.33 cfs 0.947 af Outflow=1.40 cfs 0.947 af
Pond 2P: NE Inf Pond	Peak Elev=960.91' Storage=18,288 cf Inflow=20.93 cfs 1.039 af Outflow=2.10 cfs 1.039 af
Pond 3P: MID Inf Pond	Peak Elev=962.50' Storage=27,502 cf Inflow=27.33 cfs 1.303 af Outflow=1.91 cfs 1.303 af
Pond 4P: S Bio Pond	Peak Elev=959.77' Storage=13,411 cf Inflow=14.21 cfs 0.689 af Primary=1.44 cfs 0.592 af Secondary=0.00 cfs 0.000 af Outflow=1.44 cfs 0.592 af
Link 1L: PROP Total	Inflow=6.85 cfs 3.881 af Primary=6.85 cfs 3.881 af

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Subcatchment 1S: NW

Runoff = 19.33 cfs @ 12.14 hrs, Volume= 0.947 af, Depth= 0.93"
 Routed to Pond 1P : NW Inf Pond

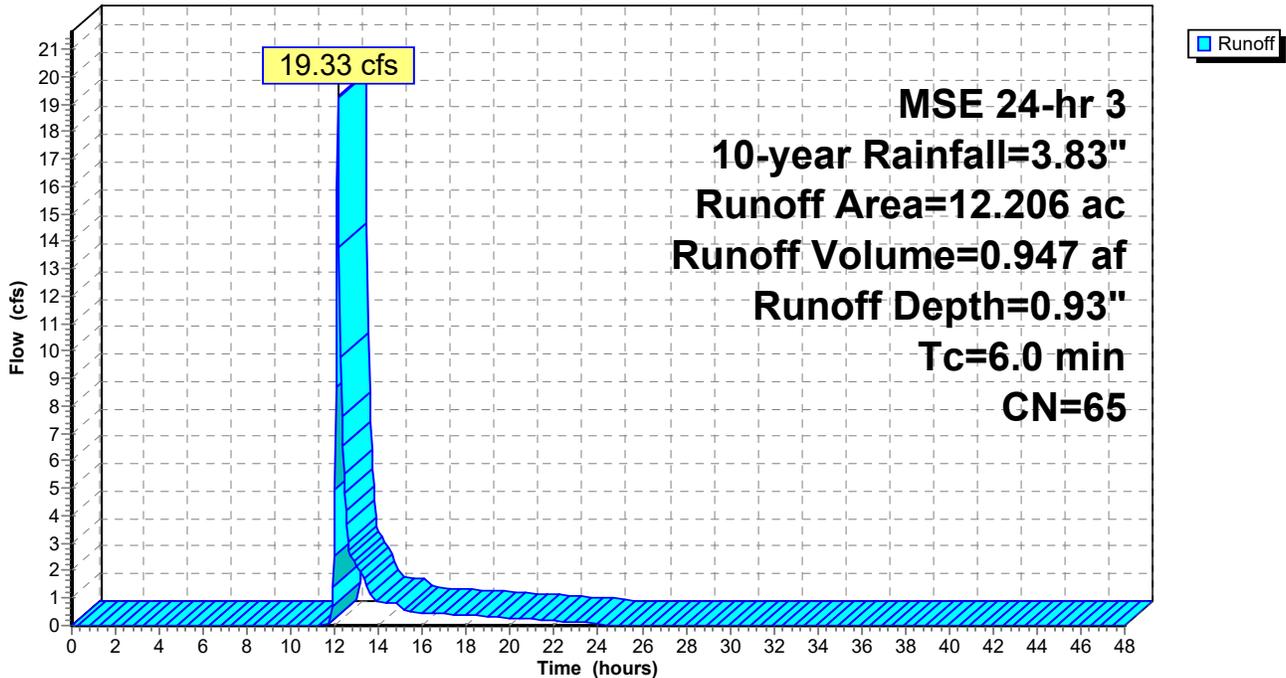
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-year Rainfall=3.83"

Area (ac)	CN	Description
0.675	98	Paved roads, HSG B
1.303	98	Roofs, HSG A
1.638	98	Paved parking, HSG A
* 0.291	98	Paved walks, HSG A
0.317	98	Water Surface, 0% imp, HSG A
3.899	39	>75% Grass cover, Good, HSG A
4.083	57	Woods/grass comb., Poor, HSG A
12.206	65	Weighted Average
8.299		67.99% Pervious Area
3.907		32.01% Impervious Area

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

Subcatchment 1S: NW

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Subcatchment 1S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.83	0.93	0.00
0.50	0.01	0.00	0.00	27.00	3.83	0.93	0.00
1.00	0.01	0.00	0.00	27.50	3.83	0.93	0.00
1.50	0.02	0.00	0.00	28.00	3.83	0.93	0.00
2.00	0.03	0.00	0.00	28.50	3.83	0.93	0.00
2.50	0.05	0.00	0.00	29.00	3.83	0.93	0.00
3.00	0.06	0.00	0.00	29.50	3.83	0.93	0.00
3.50	0.08	0.00	0.00	30.00	3.83	0.93	0.00
4.00	0.10	0.00	0.00	30.50	3.83	0.93	0.00
4.50	0.12	0.00	0.00	31.00	3.83	0.93	0.00
5.00	0.14	0.00	0.00	31.50	3.83	0.93	0.00
5.50	0.17	0.00	0.00	32.00	3.83	0.93	0.00
6.00	0.20	0.00	0.00	32.50	3.83	0.93	0.00
6.50	0.22	0.00	0.00	33.00	3.83	0.93	0.00
7.00	0.25	0.00	0.00	33.50	3.83	0.93	0.00
7.50	0.29	0.00	0.00	34.00	3.83	0.93	0.00
8.00	0.32	0.00	0.00	34.50	3.83	0.93	0.00
8.50	0.36	0.00	0.00	35.00	3.83	0.93	0.00
9.00	0.39	0.00	0.00	35.50	3.83	0.93	0.00
9.50	0.46	0.00	0.00	36.00	3.83	0.93	0.00
10.00	0.53	0.00	0.00	36.50	3.83	0.93	0.00
10.50	0.60	0.00	0.00	37.00	3.83	0.93	0.00
11.00	0.74	0.00	0.00	37.50	3.83	0.93	0.00
11.50	0.95	0.00	0.00	38.00	3.83	0.93	0.00
12.00	1.77	0.08	4.94	38.50	3.83	0.93	0.00
12.50	2.88	0.45	4.19	39.00	3.83	0.93	0.00
13.00	3.09	0.55	2.16	39.50	3.83	0.93	0.00
13.50	3.23	0.62	1.39	40.00	3.83	0.93	0.00
14.00	3.30	0.65	0.87	40.50	3.83	0.93	0.00
14.50	3.37	0.69	0.83	41.00	3.83	0.93	0.00
15.00	3.44	0.72	0.79	41.50	3.83	0.93	0.00
15.50	3.47	0.74	0.48	42.00	3.83	0.93	0.00
16.00	3.51	0.76	0.46	42.50	3.83	0.93	0.00
16.50	3.54	0.77	0.44	43.00	3.83	0.93	0.00
17.00	3.58	0.79	0.41	43.50	3.83	0.93	0.00
17.50	3.61	0.81	0.39	44.00	3.83	0.93	0.00
18.00	3.63	0.82	0.37	44.50	3.83	0.93	0.00
18.50	3.66	0.84	0.35	45.00	3.83	0.93	0.00
19.00	3.69	0.85	0.32	45.50	3.83	0.93	0.00
19.50	3.71	0.86	0.30	46.00	3.83	0.93	0.00
20.00	3.73	0.88	0.28	46.50	3.83	0.93	0.00
20.50	3.75	0.89	0.25	47.00	3.83	0.93	0.00
21.00	3.77	0.90	0.23	47.50	3.83	0.93	0.00
21.50	3.78	0.90	0.20	48.00	3.83	0.93	0.00
22.00	3.80	0.91	0.18				
22.50	3.81	0.92	0.15				
23.00	3.82	0.92	0.13				
23.50	3.82	0.93	0.10				
24.00	3.83	0.93	0.07				
24.50	3.83	0.93	0.00				
25.00	3.83	0.93	0.00				
25.50	3.83	0.93	0.00				
26.00	3.83	0.93	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Subcatchment 2S: NE

Runoff = 20.93 cfs @ 12.14 hrs, Volume= 1.039 af, Depth= 0.88"
 Routed to Pond 2P : NE Inf Pond

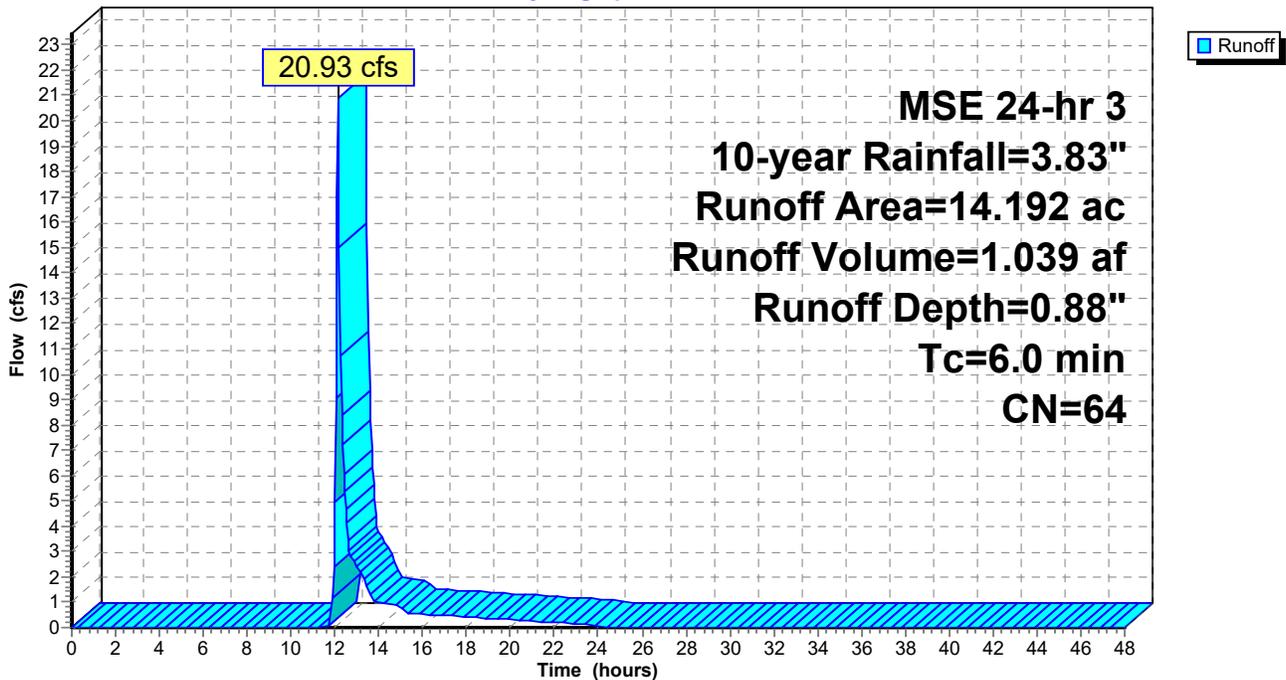
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-year Rainfall=3.83"

Area (ac)	CN	Description
* 0.299	98	Paved roads, HSG B
1.431	98	Roofs, HSG A
1.611	98	Paved parking, HSG A
* 0.404	98	Paved walks, HSG A
0.561	98	Water Surface, 0% imp, HSG A
4.036	39	>75% Grass cover, Good, HSG A
5.850	57	Woods/grass comb., Poor, HSG A
14.192	64	Weighted Average
10.447		73.61% Pervious Area
3.745		26.39% Impervious Area

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

Subcatchment 2S: NE

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Subcatchment 2S: NE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.83	0.88	0.00
0.50	0.01	0.00	0.00	27.00	3.83	0.88	0.00
1.00	0.01	0.00	0.00	27.50	3.83	0.88	0.00
1.50	0.02	0.00	0.00	28.00	3.83	0.88	0.00
2.00	0.03	0.00	0.00	28.50	3.83	0.88	0.00
2.50	0.05	0.00	0.00	29.00	3.83	0.88	0.00
3.00	0.06	0.00	0.00	29.50	3.83	0.88	0.00
3.50	0.08	0.00	0.00	30.00	3.83	0.88	0.00
4.00	0.10	0.00	0.00	30.50	3.83	0.88	0.00
4.50	0.12	0.00	0.00	31.00	3.83	0.88	0.00
5.00	0.14	0.00	0.00	31.50	3.83	0.88	0.00
5.50	0.17	0.00	0.00	32.00	3.83	0.88	0.00
6.00	0.20	0.00	0.00	32.50	3.83	0.88	0.00
6.50	0.22	0.00	0.00	33.00	3.83	0.88	0.00
7.00	0.25	0.00	0.00	33.50	3.83	0.88	0.00
7.50	0.29	0.00	0.00	34.00	3.83	0.88	0.00
8.00	0.32	0.00	0.00	34.50	3.83	0.88	0.00
8.50	0.36	0.00	0.00	35.00	3.83	0.88	0.00
9.00	0.39	0.00	0.00	35.50	3.83	0.88	0.00
9.50	0.46	0.00	0.00	36.00	3.83	0.88	0.00
10.00	0.53	0.00	0.00	36.50	3.83	0.88	0.00
10.50	0.60	0.00	0.00	37.00	3.83	0.88	0.00
11.00	0.74	0.00	0.00	37.50	3.83	0.88	0.00
11.50	0.95	0.00	0.00	38.00	3.83	0.88	0.00
12.00	1.77	0.07	4.96	38.50	3.83	0.88	0.00
12.50	2.88	0.42	4.64	39.00	3.83	0.88	0.00
13.00	3.09	0.51	2.41	39.50	3.83	0.88	0.00
13.50	3.23	0.57	1.55	40.00	3.83	0.88	0.00
14.00	3.30	0.61	0.97	40.50	3.83	0.88	0.00
14.50	3.37	0.64	0.93	41.00	3.83	0.88	0.00
15.00	3.44	0.67	0.88	41.50	3.83	0.88	0.00
15.50	3.47	0.69	0.54	42.00	3.83	0.88	0.00
16.00	3.51	0.71	0.51	42.50	3.83	0.88	0.00
16.50	3.54	0.73	0.49	43.00	3.83	0.88	0.00
17.00	3.58	0.74	0.47	43.50	3.83	0.88	0.00
17.50	3.61	0.76	0.44	44.00	3.83	0.88	0.00
18.00	3.63	0.77	0.42	44.50	3.83	0.88	0.00
18.50	3.66	0.79	0.39	45.00	3.83	0.88	0.00
19.00	3.69	0.80	0.36	45.50	3.83	0.88	0.00
19.50	3.71	0.81	0.34	46.00	3.83	0.88	0.00
20.00	3.73	0.82	0.31	46.50	3.83	0.88	0.00
20.50	3.75	0.83	0.28	47.00	3.83	0.88	0.00
21.00	3.77	0.84	0.26	47.50	3.83	0.88	0.00
21.50	3.78	0.85	0.23	48.00	3.83	0.88	0.00
22.00	3.80	0.86	0.20				
22.50	3.81	0.87	0.17				
23.00	3.82	0.87	0.14				
23.50	3.82	0.88	0.11				
24.00	3.83	0.88	0.08				
24.50	3.83	0.88	0.00				
25.00	3.83	0.88	0.00				
25.50	3.83	0.88	0.00				
26.00	3.83	0.88	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Subcatchment 3S: NW

Runoff = 27.33 cfs @ 12.14 hrs, Volume= 1.303 af, Depth= 1.10"
 Routed to Pond 3P : MID Inf Pond

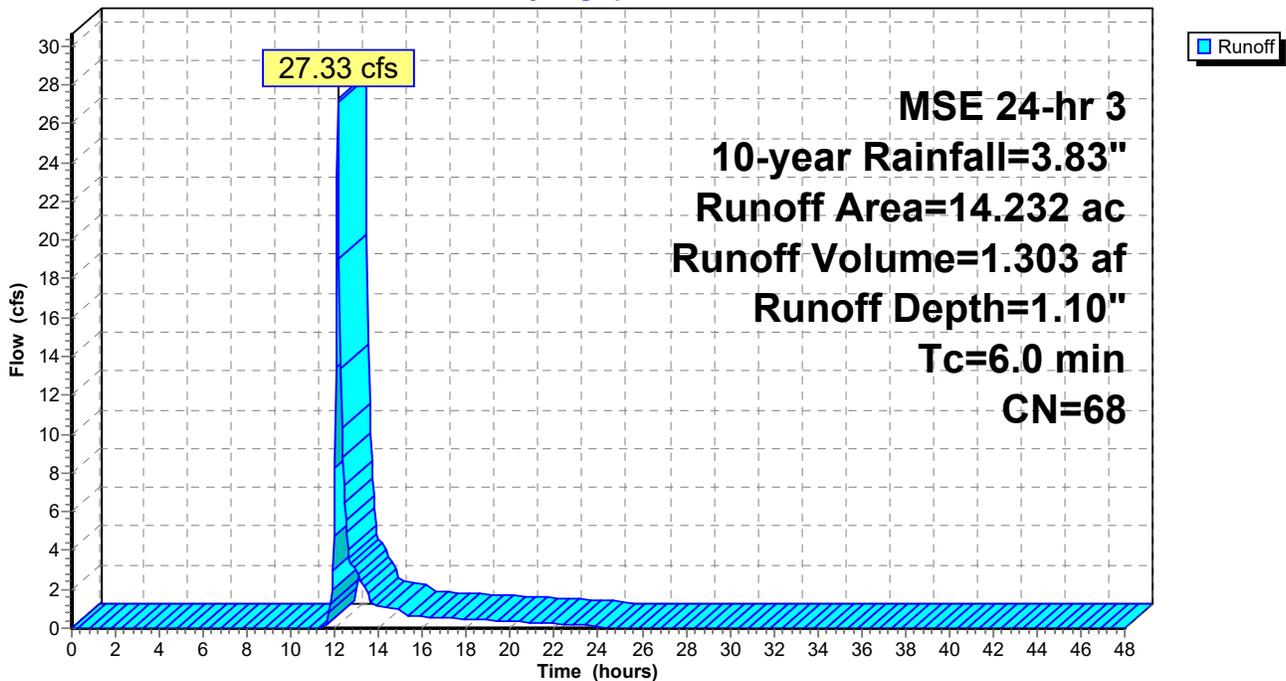
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-year Rainfall=3.83"

Area (ac)	CN	Description
2.033	98	Roofs, HSG A
2.731	98	Paved parking, HSG A
* 0.701	98	Paved walks, HSG A
0.466	98	Water Surface, 0% imp, HSG A
5.188	39	>75% Grass cover, Good, HSG A
3.113	57	Woods/grass comb., Poor, HSG A
14.232	68	Weighted Average
8.767		61.60% Pervious Area
5.465		38.40% Impervious Area

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

Subcatchment 3S: NW

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Subcatchment 3S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.83	1.10	0.00
0.50	0.01	0.00	0.00	27.00	3.83	1.10	0.00
1.00	0.01	0.00	0.00	27.50	3.83	1.10	0.00
1.50	0.02	0.00	0.00	28.00	3.83	1.10	0.00
2.00	0.03	0.00	0.00	28.50	3.83	1.10	0.00
2.50	0.05	0.00	0.00	29.00	3.83	1.10	0.00
3.00	0.06	0.00	0.00	29.50	3.83	1.10	0.00
3.50	0.08	0.00	0.00	30.00	3.83	1.10	0.00
4.00	0.10	0.00	0.00	30.50	3.83	1.10	0.00
4.50	0.12	0.00	0.00	31.00	3.83	1.10	0.00
5.00	0.14	0.00	0.00	31.50	3.83	1.10	0.00
5.50	0.17	0.00	0.00	32.00	3.83	1.10	0.00
6.00	0.20	0.00	0.00	32.50	3.83	1.10	0.00
6.50	0.22	0.00	0.00	33.00	3.83	1.10	0.00
7.00	0.25	0.00	0.00	33.50	3.83	1.10	0.00
7.50	0.29	0.00	0.00	34.00	3.83	1.10	0.00
8.00	0.32	0.00	0.00	34.50	3.83	1.10	0.00
8.50	0.36	0.00	0.00	35.00	3.83	1.10	0.00
9.00	0.39	0.00	0.00	35.50	3.83	1.10	0.00
9.50	0.46	0.00	0.00	36.00	3.83	1.10	0.00
10.00	0.53	0.00	0.00	36.50	3.83	1.10	0.00
10.50	0.60	0.00	0.00	37.00	3.83	1.10	0.00
11.00	0.74	0.00	0.00	37.50	3.83	1.10	0.00
11.50	0.95	0.00	0.00	38.00	3.83	1.10	0.00
12.00	1.77	0.12	8.24	38.50	3.83	1.10	0.00
12.50	2.88	0.57	5.57	39.00	3.83	1.10	0.00
13.00	3.09	0.67	2.84	39.50	3.83	1.10	0.00
13.50	3.23	0.75	1.81	40.00	3.83	1.10	0.00
14.00	3.30	0.79	1.13	40.50	3.83	1.10	0.00
14.50	3.37	0.83	1.08	41.00	3.83	1.10	0.00
15.00	3.44	0.86	1.02	41.50	3.83	1.10	0.00
15.50	3.47	0.89	0.62	42.00	3.83	1.10	0.00
16.00	3.51	0.91	0.59	42.50	3.83	1.10	0.00
16.50	3.54	0.93	0.56	43.00	3.83	1.10	0.00
17.00	3.58	0.95	0.53	43.50	3.83	1.10	0.00
17.50	3.61	0.96	0.51	44.00	3.83	1.10	0.00
18.00	3.63	0.98	0.48	44.50	3.83	1.10	0.00
18.50	3.66	1.00	0.45	45.00	3.83	1.10	0.00
19.00	3.69	1.01	0.42	45.50	3.83	1.10	0.00
19.50	3.71	1.03	0.38	46.00	3.83	1.10	0.00
20.00	3.73	1.04	0.35	46.50	3.83	1.10	0.00
20.50	3.75	1.05	0.32	47.00	3.83	1.10	0.00
21.00	3.77	1.06	0.29	47.50	3.83	1.10	0.00
21.50	3.78	1.07	0.26	48.00	3.83	1.10	0.00
22.00	3.80	1.08	0.22				
22.50	3.81	1.08	0.19				
23.00	3.82	1.09	0.16				
23.50	3.82	1.10	0.13				
24.00	3.83	1.10	0.09				
24.50	3.83	1.10	0.00				
25.00	3.83	1.10	0.00				
25.50	3.83	1.10	0.00				
26.00	3.83	1.10	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Subcatchment 4S: S

Runoff = 14.21 cfs @ 12.14 hrs, Volume= 0.689 af, Depth= 0.99"
 Routed to Pond 4P : S Bio Pond

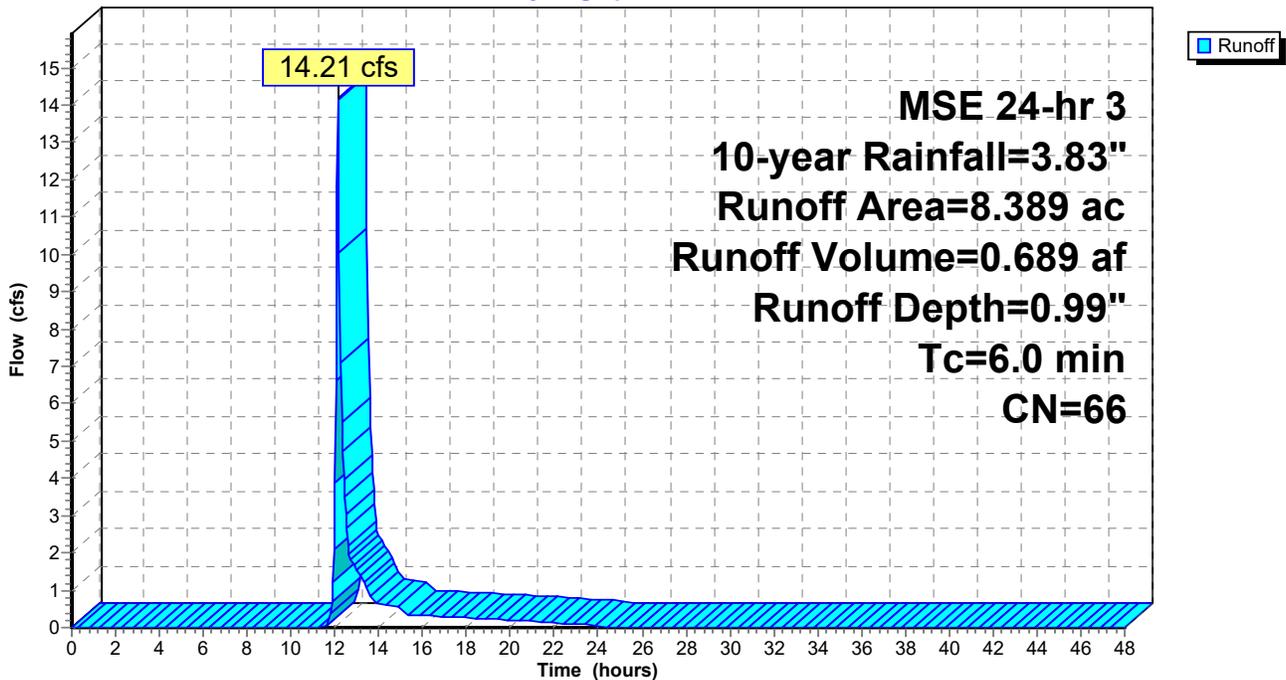
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-year Rainfall=3.83"

Area (ac)	CN	Description
0.269	98	Paved roads, HSG B
1.067	98	Roofs, HSG A
1.430	98	Paved parking, HSG A
* 0.460	98	Paved walks, HSG A
0.300	98	Water Surface, 0% imp, HSG A
3.716	39	>75% Grass cover, Good, HSG A
1.147	57	Woods/grass comb., Poor, HSG A
8.389	66	Weighted Average
5.163		61.54% Pervious Area
3.226		38.46% Impervious Area

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

Subcatchment 4S: S

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Subcatchment 4S: S

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.83	0.99	0.00
0.50	0.01	0.00	0.00	27.00	3.83	0.99	0.00
1.00	0.01	0.00	0.00	27.50	3.83	0.99	0.00
1.50	0.02	0.00	0.00	28.00	3.83	0.99	0.00
2.00	0.03	0.00	0.00	28.50	3.83	0.99	0.00
2.50	0.05	0.00	0.00	29.00	3.83	0.99	0.00
3.00	0.06	0.00	0.00	29.50	3.83	0.99	0.00
3.50	0.08	0.00	0.00	30.00	3.83	0.99	0.00
4.00	0.10	0.00	0.00	30.50	3.83	0.99	0.00
4.50	0.12	0.00	0.00	31.00	3.83	0.99	0.00
5.00	0.14	0.00	0.00	31.50	3.83	0.99	0.00
5.50	0.17	0.00	0.00	32.00	3.83	0.99	0.00
6.00	0.20	0.00	0.00	32.50	3.83	0.99	0.00
6.50	0.22	0.00	0.00	33.00	3.83	0.99	0.00
7.00	0.25	0.00	0.00	33.50	3.83	0.99	0.00
7.50	0.29	0.00	0.00	34.00	3.83	0.99	0.00
8.00	0.32	0.00	0.00	34.50	3.83	0.99	0.00
8.50	0.36	0.00	0.00	35.00	3.83	0.99	0.00
9.00	0.39	0.00	0.00	35.50	3.83	0.99	0.00
9.50	0.46	0.00	0.00	36.00	3.83	0.99	0.00
10.00	0.53	0.00	0.00	36.50	3.83	0.99	0.00
10.50	0.60	0.00	0.00	37.00	3.83	0.99	0.00
11.00	0.74	0.00	0.00	37.50	3.83	0.99	0.00
11.50	0.95	0.00	0.00	38.00	3.83	0.99	0.00
12.00	1.77	0.09	3.87	38.50	3.83	0.99	0.00
12.50	2.88	0.49	3.01	39.00	3.83	0.99	0.00
13.00	3.09	0.59	1.55	39.50	3.83	0.99	0.00
13.50	3.23	0.66	0.99	40.00	3.83	0.99	0.00
14.00	3.30	0.70	0.62	40.50	3.83	0.99	0.00
14.50	3.37	0.73	0.59	41.00	3.83	0.99	0.00
15.00	3.44	0.77	0.56	41.50	3.83	0.99	0.00
15.50	3.47	0.79	0.34	42.00	3.83	0.99	0.00
16.00	3.51	0.81	0.33	42.50	3.83	0.99	0.00
16.50	3.54	0.82	0.31	43.00	3.83	0.99	0.00
17.00	3.58	0.84	0.30	43.50	3.83	0.99	0.00
17.50	3.61	0.86	0.28	44.00	3.83	0.99	0.00
18.00	3.63	0.87	0.26	44.50	3.83	0.99	0.00
18.50	3.66	0.89	0.25	45.00	3.83	0.99	0.00
19.00	3.69	0.90	0.23	45.50	3.83	0.99	0.00
19.50	3.71	0.92	0.21	46.00	3.83	0.99	0.00
20.00	3.73	0.93	0.20	46.50	3.83	0.99	0.00
20.50	3.75	0.94	0.18	47.00	3.83	0.99	0.00
21.00	3.77	0.95	0.16	47.50	3.83	0.99	0.00
21.50	3.78	0.96	0.14	48.00	3.83	0.99	0.00
22.00	3.80	0.97	0.12				
22.50	3.81	0.97	0.11				
23.00	3.82	0.98	0.09				
23.50	3.82	0.98	0.07				
24.00	3.83	0.99	0.05				
24.50	3.83	0.99	0.00				
25.00	3.83	0.99	0.00				
25.50	3.83	0.99	0.00				
26.00	3.83	0.99	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Subcatchment S2: SOUTH

Runoff = 35.07 cfs @ 12.14 hrs, Volume= 1.634 af, Depth= 1.41"
Routed to nonexistent node 2L

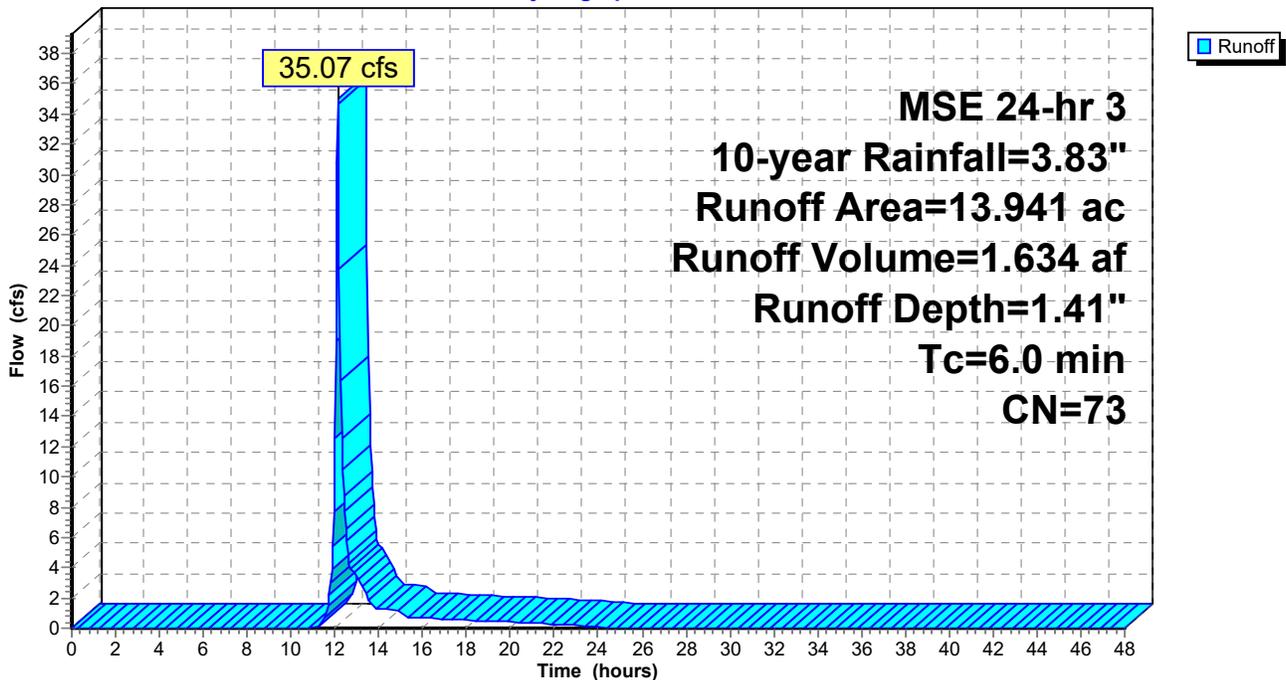
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-year Rainfall=3.83"

Area (ac)	CN	Description
* 0.269	98	Paved roads, HSG B
* 5.287	98	Gravel, HSG A
8.385	57	Woods/grass comb., Poor, HSG A
13.941	73	Weighted Average
8.385		60.15% Pervious Area
5.556		39.85% Impervious Area

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

Subcatchment S2: SOUTH

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Subcatchment S2: SOUTH

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	3.83	1.41	0.00
0.50	0.01	0.00	0.00	27.00	3.83	1.41	0.00
1.00	0.01	0.00	0.00	27.50	3.83	1.41	0.00
1.50	0.02	0.00	0.00	28.00	3.83	1.41	0.00
2.00	0.03	0.00	0.00	28.50	3.83	1.41	0.00
2.50	0.05	0.00	0.00	29.00	3.83	1.41	0.00
3.00	0.06	0.00	0.00	29.50	3.83	1.41	0.00
3.50	0.08	0.00	0.00	30.00	3.83	1.41	0.00
4.00	0.10	0.00	0.00	30.50	3.83	1.41	0.00
4.50	0.12	0.00	0.00	31.00	3.83	1.41	0.00
5.00	0.14	0.00	0.00	31.50	3.83	1.41	0.00
5.50	0.17	0.00	0.00	32.00	3.83	1.41	0.00
6.00	0.20	0.00	0.00	32.50	3.83	1.41	0.00
6.50	0.22	0.00	0.00	33.00	3.83	1.41	0.00
7.00	0.25	0.00	0.00	33.50	3.83	1.41	0.00
7.50	0.29	0.00	0.00	34.00	3.83	1.41	0.00
8.00	0.32	0.00	0.00	34.50	3.83	1.41	0.00
8.50	0.36	0.00	0.00	35.00	3.83	1.41	0.00
9.00	0.39	0.00	0.00	35.50	3.83	1.41	0.00
9.50	0.46	0.00	0.00	36.00	3.83	1.41	0.00
10.00	0.53	0.00	0.00	36.50	3.83	1.41	0.00
10.50	0.60	0.00	0.00	37.00	3.83	1.41	0.00
11.00	0.74	0.00	0.00	37.50	3.83	1.41	0.00
11.50	0.95	0.01	0.56	38.00	3.83	1.41	0.00
12.00	1.77	0.23	12.51	38.50	3.83	1.41	0.00
12.50	2.88	0.78	6.59	39.00	3.83	1.41	0.00
13.00	3.09	0.91	3.30	39.50	3.83	1.41	0.00
13.50	3.23	1.00	2.09	40.00	3.83	1.41	0.00
14.00	3.30	1.05	1.30	40.50	3.83	1.41	0.00
14.50	3.37	1.09	1.23	41.00	3.83	1.41	0.00
15.00	3.44	1.14	1.16	41.50	3.83	1.41	0.00
15.50	3.47	1.16	0.70	42.00	3.83	1.41	0.00
16.00	3.51	1.19	0.67	42.50	3.83	1.41	0.00
16.50	3.54	1.21	0.64	43.00	3.83	1.41	0.00
17.00	3.58	1.23	0.60	43.50	3.83	1.41	0.00
17.50	3.61	1.25	0.57	44.00	3.83	1.41	0.00
18.00	3.63	1.27	0.54	44.50	3.83	1.41	0.00
18.50	3.66	1.29	0.50	45.00	3.83	1.41	0.00
19.00	3.69	1.31	0.47	45.50	3.83	1.41	0.00
19.50	3.71	1.32	0.43	46.00	3.83	1.41	0.00
20.00	3.73	1.34	0.40	46.50	3.83	1.41	0.00
20.50	3.75	1.35	0.36	47.00	3.83	1.41	0.00
21.00	3.77	1.36	0.33	47.50	3.83	1.41	0.00
21.50	3.78	1.37	0.29	48.00	3.83	1.41	0.00
22.00	3.80	1.38	0.25				
22.50	3.81	1.39	0.22				
23.00	3.82	1.40	0.18				
23.50	3.82	1.40	0.14				
24.00	3.83	1.41	0.10				
24.50	3.83	1.41	0.00				
25.00	3.83	1.41	0.00				
25.50	3.83	1.41	0.00				
26.00	3.83	1.41	0.00				

Preliminary Hartland Apartments

MSE 24-hr 3 10-year Rainfall=3.83"

Prepared by Payne & Dolan

Printed 5/30/2023

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Summary for Pond 1P: NW Inf Pond

Inflow Area = 12.206 ac, 32.01% Impervious, Inflow Depth = 0.93" for 10-year event
 Inflow = 19.33 cfs @ 12.14 hrs, Volume= 0.947 af
 Outflow = 1.40 cfs @ 13.49 hrs, Volume= 0.947 af, Atten= 93%, Lag= 80.9 min
 Primary = 1.40 cfs @ 13.49 hrs, Volume= 0.947 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 963.51' @ 13.49 hrs Surf.Area= 16,814 sf Storage= 19,424 cf

Plug-Flow detention time= 147.1 min calculated for 0.946 af (100% of inflow)
 Center-of-Mass det. time= 146.9 min (988.4 - 841.5)

Volume	Invert	Avail.Storage	Storage Description
#1	962.00'	70,699 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

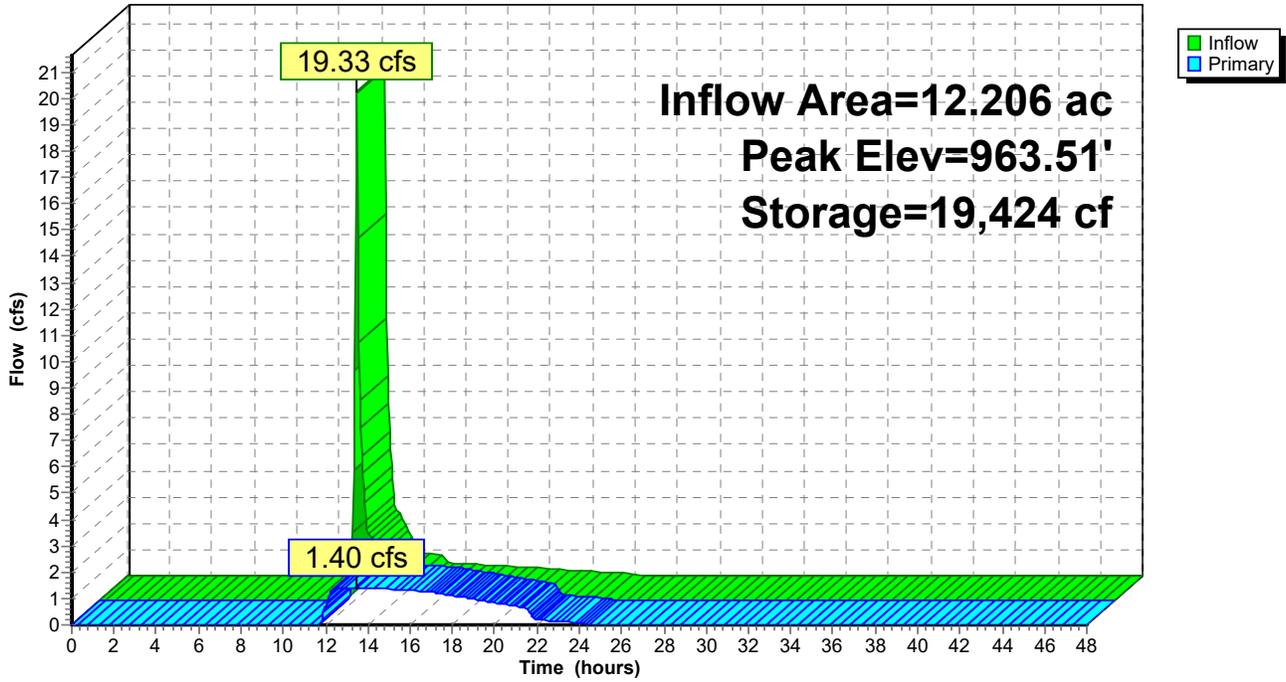
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
962.00	7,070	0	0
963.00	15,280	11,175	11,175
964.00	18,264	16,772	27,947
965.00	21,350	19,807	47,754
966.00	24,540	22,945	70,699

Device	Routing	Invert	Outlet Devices
#1	Primary	962.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=1.40 cfs @ 13.49 hrs HW=963.51' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.40 cfs)

Pond 1P: NW Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Pond 1P: NW Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	962.00	0.00
1.00	0.00	0	962.00	0.00
2.00	0.00	0	962.00	0.00
3.00	0.00	0	962.00	0.00
4.00	0.00	0	962.00	0.00
5.00	0.00	0	962.00	0.00
6.00	0.00	0	962.00	0.00
7.00	0.00	0	962.00	0.00
8.00	0.00	0	962.00	0.00
9.00	0.00	0	962.00	0.00
10.00	0.00	0	962.00	0.00
11.00	0.00	0	962.00	0.00
12.00	4.94	1,039	962.14	0.68
13.00	2.16	18,718	963.47	1.39
14.00	0.87	18,662	963.47	1.39
15.00	0.79	16,703	963.35	1.36
16.00	0.46	13,706	963.16	1.31
17.00	0.41	10,645	962.96	1.25
18.00	0.37	7,811	962.76	1.11
19.00	0.32	5,305	962.56	0.98
20.00	0.28	3,122	962.36	0.84
21.00	0.23	1,258	962.16	0.70
22.00	0.18	95	962.01	0.20
23.00	0.13	62	962.01	0.13
24.00	0.07	37	962.01	0.08
25.00	0.00	0	962.00	0.00
26.00	0.00	0	962.00	0.00
27.00	0.00	0	962.00	0.00
28.00	0.00	0	962.00	0.00
29.00	0.00	0	962.00	0.00
30.00	0.00	0	962.00	0.00
31.00	0.00	0	962.00	0.00
32.00	0.00	0	962.00	0.00
33.00	0.00	0	962.00	0.00
34.00	0.00	0	962.00	0.00
35.00	0.00	0	962.00	0.00
36.00	0.00	0	962.00	0.00
37.00	0.00	0	962.00	0.00
38.00	0.00	0	962.00	0.00
39.00	0.00	0	962.00	0.00
40.00	0.00	0	962.00	0.00
41.00	0.00	0	962.00	0.00
42.00	0.00	0	962.00	0.00
43.00	0.00	0	962.00	0.00
44.00	0.00	0	962.00	0.00
45.00	0.00	0	962.00	0.00
46.00	0.00	0	962.00	0.00
47.00	0.00	0	962.00	0.00
48.00	0.00	0	962.00	0.00

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Pond 2P: NE Inf Pond

Inflow Area = 14.192 ac, 26.39% Impervious, Inflow Depth = 0.88" for 10-year event
 Inflow = 20.93 cfs @ 12.14 hrs, Volume= 1.039 af
 Outflow = 2.10 cfs @ 13.19 hrs, Volume= 1.039 af, Atten= 90%, Lag= 62.7 min
 Primary = 2.10 cfs @ 13.19 hrs, Volume= 1.039 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 960.91' @ 13.19 hrs Surf.Area= 25,254 sf Storage= 18,288 cf

Plug-Flow detention time= 87.4 min calculated for 1.038 af (100% of inflow)
 Center-of-Mass det. time= 87.4 min (931.6 - 844.2)

Volume	Invert	Avail.Storage	Storage Description
#1	960.00'	111,091 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

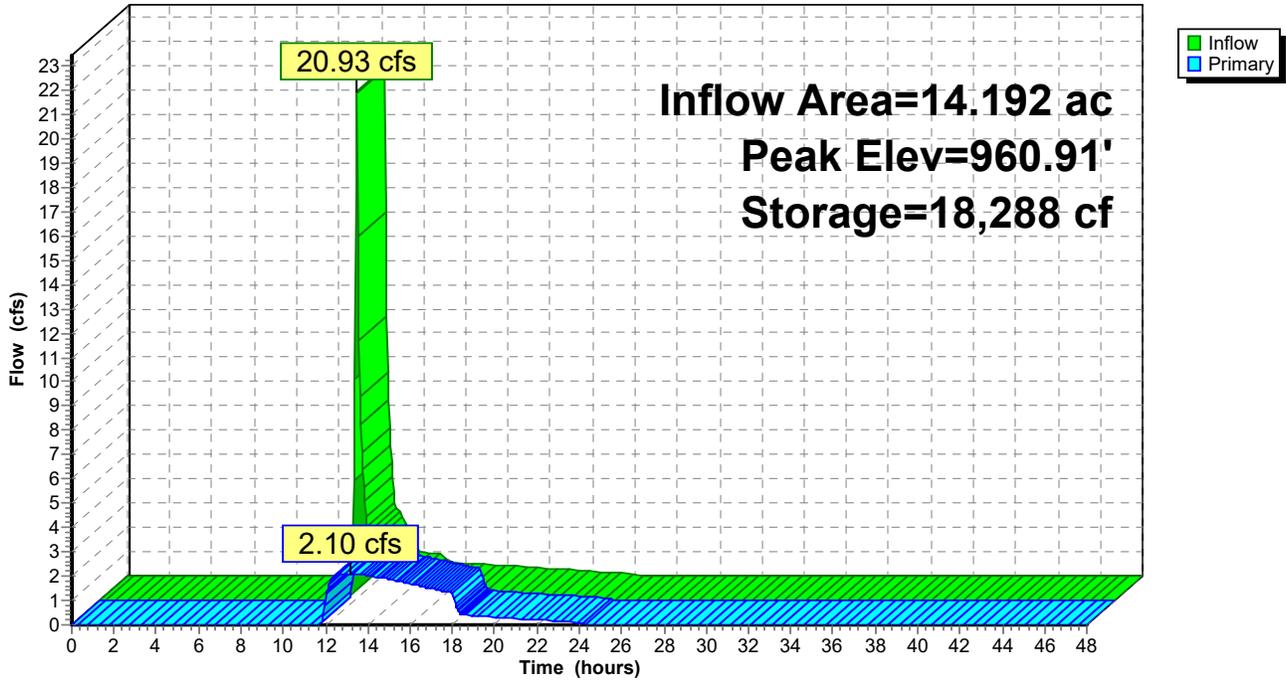
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
960.00	14,993	0	0
961.00	26,284	20,639	20,639
962.00	28,806	27,545	48,184
963.00	31,428	30,117	78,301
964.00	34,152	32,790	111,091

Device	Routing	Invert	Outlet Devices
#1	Primary	960.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=2.10 cfs @ 13.19 hrs HW=960.91' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.10 cfs)

Pond 2P: NE Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Pond 2P: NE Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	960.00	0.00
1.00	0.00	0	960.00	0.00
2.00	0.00	0	960.00	0.00
3.00	0.00	0	960.00	0.00
4.00	0.00	0	960.00	0.00
5.00	0.00	0	960.00	0.00
6.00	0.00	0	960.00	0.00
7.00	0.00	0	960.00	0.00
8.00	0.00	0	960.00	0.00
9.00	0.00	0	960.00	0.00
10.00	0.00	0	960.00	0.00
11.00	0.00	0	960.00	0.00
12.00	4.96	860	960.06	1.30
13.00	2.41	18,183	960.90	2.10
14.00	0.97	16,239	960.83	2.03
15.00	0.88	12,556	960.67	1.88
16.00	0.51	8,173	960.46	1.69
17.00	0.47	4,221	960.26	1.49
18.00	0.42	793	960.05	1.30
19.00	0.36	176	960.01	0.37
20.00	0.31	150	960.01	0.32
21.00	0.26	124	960.01	0.26
22.00	0.20	97	960.01	0.21
23.00	0.14	70	960.00	0.15
24.00	0.08	43	960.00	0.09
25.00	0.00	0	960.00	0.00
26.00	0.00	0	960.00	0.00
27.00	0.00	0	960.00	0.00
28.00	0.00	0	960.00	0.00
29.00	0.00	0	960.00	0.00
30.00	0.00	0	960.00	0.00
31.00	0.00	0	960.00	0.00
32.00	0.00	0	960.00	0.00
33.00	0.00	0	960.00	0.00
34.00	0.00	0	960.00	0.00
35.00	0.00	0	960.00	0.00
36.00	0.00	0	960.00	0.00
37.00	0.00	0	960.00	0.00
38.00	0.00	0	960.00	0.00
39.00	0.00	0	960.00	0.00
40.00	0.00	0	960.00	0.00
41.00	0.00	0	960.00	0.00
42.00	0.00	0	960.00	0.00
43.00	0.00	0	960.00	0.00
44.00	0.00	0	960.00	0.00
45.00	0.00	0	960.00	0.00
46.00	0.00	0	960.00	0.00
47.00	0.00	0	960.00	0.00
48.00	0.00	0	960.00	0.00

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Pond 3P: MID Inf Pond

Inflow Area = 14.232 ac, 38.40% Impervious, Inflow Depth = 1.10" for 10-year event
 Inflow = 27.33 cfs @ 12.14 hrs, Volume= 1.303 af
 Outflow = 1.91 cfs @ 13.46 hrs, Volume= 1.303 af, Atten= 93%, Lag= 79.0 min
 Primary = 1.91 cfs @ 13.46 hrs, Volume= 1.303 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 962.50' @ 13.46 hrs Surf.Area= 22,925 sf Storage= 27,502 cf

Plug-Flow detention time= 148.5 min calculated for 1.302 af (100% of inflow)
 Center-of-Mass det. time= 148.4 min (982.3 - 833.9)

Volume	Invert	Avail.Storage	Storage Description
#1	961.00'	93,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

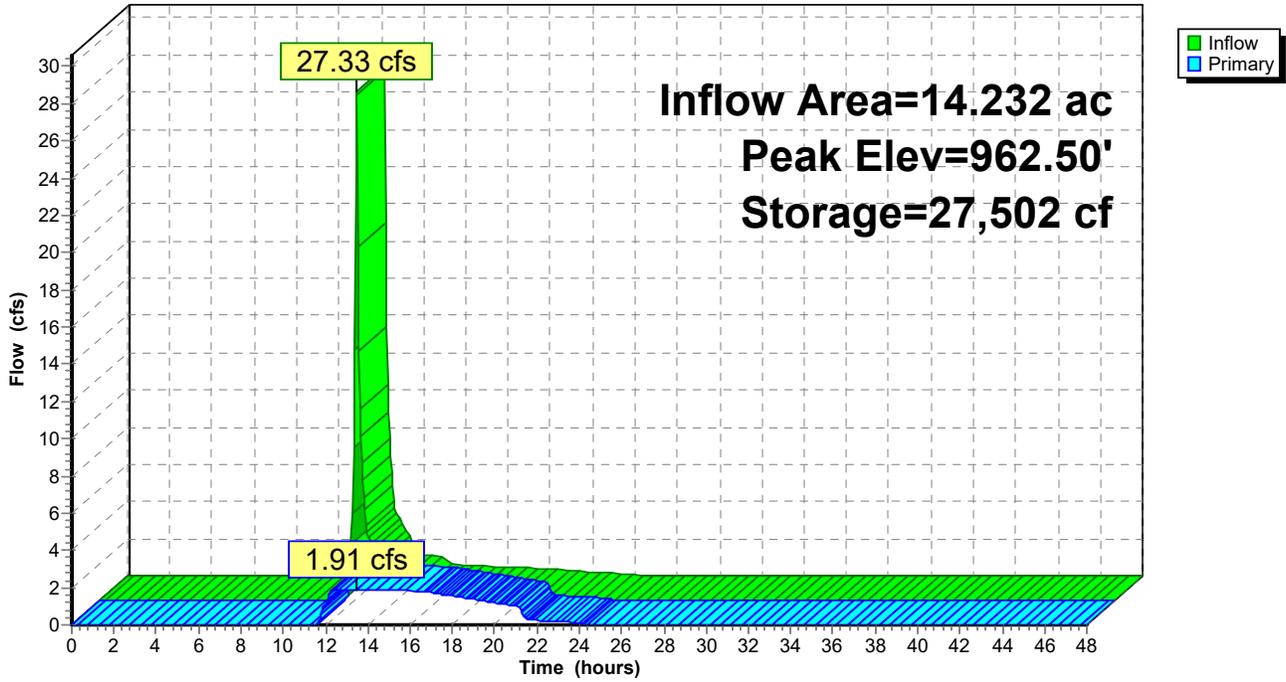
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
961.00	11,137	0	0
962.00	21,600	16,369	16,369
963.00	24,250	22,925	39,294
964.00	27,000	25,625	64,919
965.00	29,850	28,425	93,344

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=1.91 cfs @ 13.46 hrs HW=962.50' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 1.91 cfs)

Pond 3P: MID Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Pond 3P: MID Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	961.00	0.00
1.00	0.00	0	961.00	0.00
2.00	0.00	0	961.00	0.00
3.00	0.00	0	961.00	0.00
4.00	0.00	0	961.00	0.00
5.00	0.00	0	961.00	0.00
6.00	0.00	0	961.00	0.00
7.00	0.00	0	961.00	0.00
8.00	0.00	0	961.00	0.00
9.00	0.00	0	961.00	0.00
10.00	0.00	0	961.00	0.00
11.00	0.00	0	961.00	0.00
12.00	8.24	2,181	961.18	1.09
13.00	2.84	26,714	962.47	1.90
14.00	1.13	26,347	962.45	1.90
15.00	1.02	23,441	962.32	1.87
16.00	0.59	19,132	962.13	1.83
17.00	0.53	14,698	961.92	1.73
18.00	0.48	10,614	961.71	1.55
19.00	0.42	6,969	961.51	1.37
20.00	0.35	3,757	961.30	1.19
21.00	0.29	979	961.08	1.00
22.00	0.22	111	961.01	0.24
23.00	0.16	79	961.01	0.17
24.00	0.09	48	961.00	0.10
25.00	0.00	0	961.00	0.00
26.00	0.00	0	961.00	0.00
27.00	0.00	0	961.00	0.00
28.00	0.00	0	961.00	0.00
29.00	0.00	0	961.00	0.00
30.00	0.00	0	961.00	0.00
31.00	0.00	0	961.00	0.00
32.00	0.00	0	961.00	0.00
33.00	0.00	0	961.00	0.00
34.00	0.00	0	961.00	0.00
35.00	0.00	0	961.00	0.00
36.00	0.00	0	961.00	0.00
37.00	0.00	0	961.00	0.00
38.00	0.00	0	961.00	0.00
39.00	0.00	0	961.00	0.00
40.00	0.00	0	961.00	0.00
41.00	0.00	0	961.00	0.00
42.00	0.00	0	961.00	0.00
43.00	0.00	0	961.00	0.00
44.00	0.00	0	961.00	0.00
45.00	0.00	0	961.00	0.00
46.00	0.00	0	961.00	0.00
47.00	0.00	0	961.00	0.00
48.00	0.00	0	961.00	0.00

Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Summary for Pond 4P: S Bio Pond

Inflow Area = 8.389 ac, 38.46% Impervious, Inflow Depth = 0.99" for 10-year event
 Inflow = 14.21 cfs @ 12.14 hrs, Volume= 0.689 af
 Outflow = 1.44 cfs @ 13.11 hrs, Volume= 0.592 af, Atten= 90%, Lag= 57.9 min
 Primary = 1.44 cfs @ 13.11 hrs, Volume= 0.592 af
 Routed to Link 1L : PROP Total
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 959.77' @ 13.11 hrs Surf.Area= 12,900 sf Storage= 13,411 cf

Plug-Flow detention time= 169.4 min calculated for 0.592 af (86% of inflow)
 Center-of-Mass det. time= 111.4 min (950.3 - 838.9)

Volume	Invert	Avail.Storage	Storage Description	
#1	956.25'	45,690 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
956.25	12,900	0.0	0	0
957.42	12,900	33.0	4,981	4,981
957.75	12,900	33.0	1,405	6,386
960.00	12,900	27.0	7,837	14,222
962.00	16,880	100.0	29,780	44,002
962.10	16,880	100.0	1,688	45,690

Device	Routing	Invert	Outlet Devices
#1	Primary	956.25'	15.0" Round Culvert L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 956.25' / 955.00' S= 0.0125 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	957.23'	8.0" Round Culvert L= 280.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 957.23' / 956.25' S= 0.0035 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 1	961.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	962.00'	20.0' long x 8.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.44 cfs @ 13.11 hrs HW=959.77' (Free Discharge)

↑ **1=Culvert** (Passes 1.44 cfs of 9.83 cfs potential flow)

↑ **2=Culvert** (Barrel Controls 1.44 cfs @ 4.12 fps)

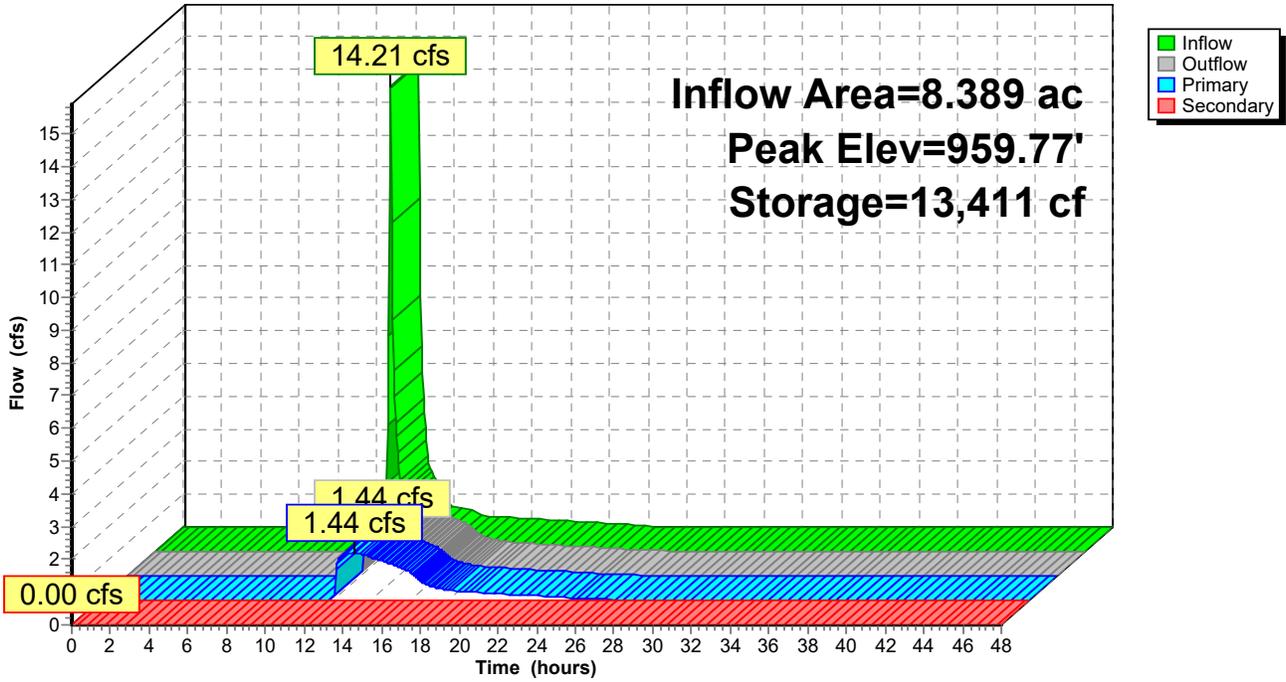
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=956.25' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: S Bio Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Pond 4P: S Bio Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	956.25	0.00	0.00	0.00
1.00	0.00	0	956.25	0.00	0.00	0.00
2.00	0.00	0	956.25	0.00	0.00	0.00
3.00	0.00	0	956.25	0.00	0.00	0.00
4.00	0.00	0	956.25	0.00	0.00	0.00
5.00	0.00	0	956.25	0.00	0.00	0.00
6.00	0.00	0	956.25	0.00	0.00	0.00
7.00	0.00	0	956.25	0.00	0.00	0.00
8.00	0.00	0	956.25	0.00	0.00	0.00
9.00	0.00	0	956.25	0.00	0.00	0.00
10.00	0.00	0	956.25	0.00	0.00	0.00
11.00	0.00	0	956.25	0.00	0.00	0.00
12.00	3.87	1,178	956.53	0.00	0.00	0.00
13.00	1.55	13,388	959.76	1.44	1.44	0.00
14.00	0.62	11,898	959.33	1.32	1.32	0.00
15.00	0.56	9,619	958.68	1.13	1.13	0.00
16.00	0.33	7,271	958.00	0.88	0.88	0.00
17.00	0.30	6,099	957.68	0.46	0.46	0.00
18.00	0.26	5,745	957.60	0.32	0.32	0.00
19.00	0.23	5,583	957.56	0.27	0.27	0.00
20.00	0.20	5,466	957.53	0.23	0.23	0.00
21.00	0.16	5,355	957.51	0.19	0.19	0.00
22.00	0.12	5,239	957.48	0.16	0.16	0.00
23.00	0.09	5,115	957.45	0.13	0.13	0.00
24.00	0.05	4,979	957.42	0.09	0.09	0.00
25.00	0.00	4,751	957.37	0.05	0.05	0.00
26.00	0.00	4,618	957.33	0.03	0.03	0.00
27.00	0.00	4,532	957.31	0.02	0.02	0.00
28.00	0.00	4,477	957.30	0.01	0.01	0.00
29.00	0.00	4,436	957.29	0.01	0.01	0.00
30.00	0.00	4,402	957.28	0.01	0.01	0.00
31.00	0.00	4,373	957.28	0.01	0.01	0.00
32.00	0.00	4,349	957.27	0.01	0.01	0.00
33.00	0.00	4,329	957.27	0.01	0.01	0.00
34.00	0.00	4,312	957.26	0.00	0.00	0.00
35.00	0.00	4,298	957.26	0.00	0.00	0.00
36.00	0.00	4,286	957.26	0.00	0.00	0.00
37.00	0.00	4,276	957.25	0.00	0.00	0.00
38.00	0.00	4,268	957.25	0.00	0.00	0.00
39.00	0.00	4,261	957.25	0.00	0.00	0.00
40.00	0.00	4,255	957.25	0.00	0.00	0.00
41.00	0.00	4,250	957.25	0.00	0.00	0.00
42.00	0.00	4,246	957.25	0.00	0.00	0.00
43.00	0.00	4,243	957.25	0.00	0.00	0.00
44.00	0.00	4,240	957.25	0.00	0.00	0.00
45.00	0.00	4,238	957.25	0.00	0.00	0.00
46.00	0.00	4,236	957.24	0.00	0.00	0.00
47.00	0.00	4,234	957.24	0.00	0.00	0.00
48.00	0.00	4,233	957.24	0.00	0.00	0.00

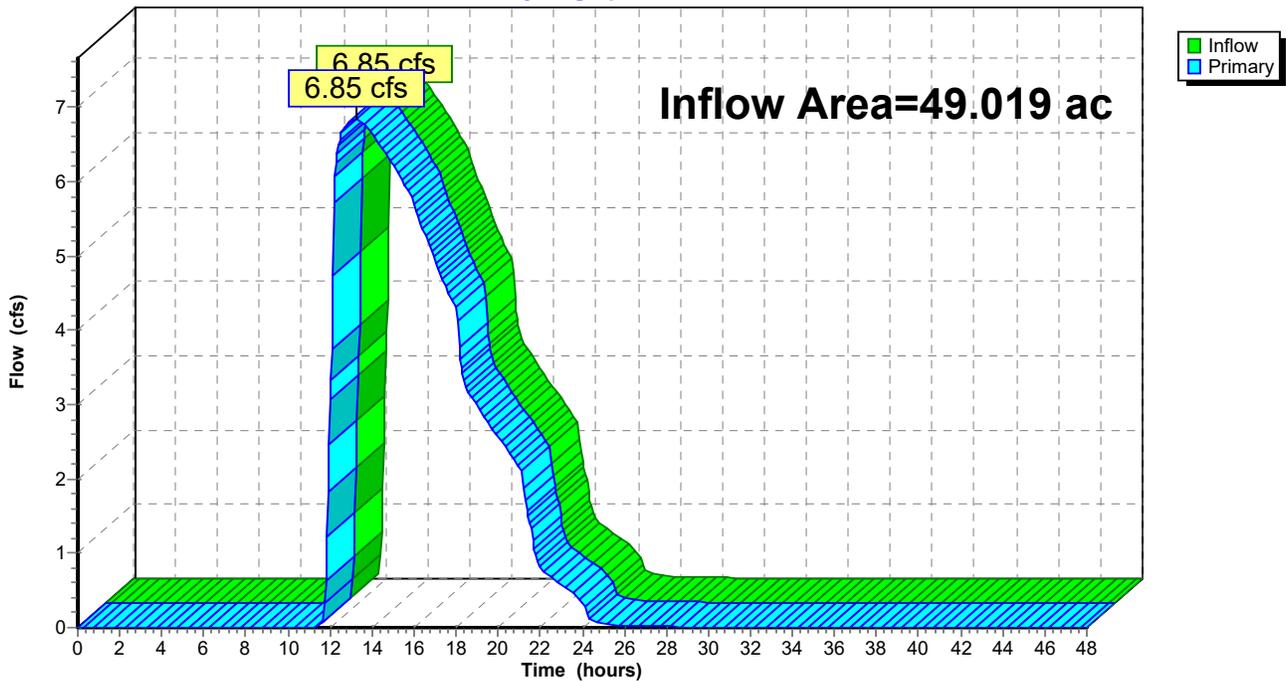
Summary for Link 1L: PROP Total

Inflow Area = 49.019 ac, 33.34% Impervious, Inflow Depth = 0.95" for 10-year event
Inflow = 6.85 cfs @ 13.23 hrs, Volume= 3.881 af
Primary = 6.85 cfs @ 13.23 hrs, Volume= 3.881 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: PROP Total

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 10-year Rainfall=3.83"

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Hydrograph for Link 1L: PROP Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	26.50	0.02	0.00	0.02
0.50	0.00	0.00	0.00	27.00	0.02	0.00	0.02
1.00	0.00	0.00	0.00	27.50	0.02	0.00	0.02
1.50	0.00	0.00	0.00	28.00	0.01	0.00	0.01
2.00	0.00	0.00	0.00	28.50	0.01	0.00	0.01
2.50	0.00	0.00	0.00	29.00	0.01	0.00	0.01
3.00	0.00	0.00	0.00	29.50	0.01	0.00	0.01
3.50	0.00	0.00	0.00	30.00	0.01	0.00	0.01
4.00	0.00	0.00	0.00	30.50	0.01	0.00	0.01
4.50	0.00	0.00	0.00	31.00	0.01	0.00	0.01
5.00	0.00	0.00	0.00	31.50	0.01	0.00	0.01
5.50	0.00	0.00	0.00	32.00	0.01	0.00	0.01
6.00	0.00	0.00	0.00	32.50	0.01	0.00	0.01
6.50	0.00	0.00	0.00	33.00	0.01	0.00	0.01
7.00	0.00	0.00	0.00	33.50	0.00	0.00	0.00
7.50	0.00	0.00	0.00	34.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	34.50	0.00	0.00	0.00
8.50	0.00	0.00	0.00	35.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	35.50	0.00	0.00	0.00
9.50	0.00	0.00	0.00	36.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	36.50	0.00	0.00	0.00
10.50	0.00	0.00	0.00	37.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	37.50	0.00	0.00	0.00
11.50	0.00	0.00	0.00	38.00	0.00	0.00	0.00
12.00	3.07	0.00	3.07	38.50	0.00	0.00	0.00
12.50	6.63	0.00	6.63	39.00	0.00	0.00	0.00
13.00	6.83	0.00	6.83	39.50	0.00	0.00	0.00
13.50	6.82	0.00	6.82	40.00	0.00	0.00	0.00
14.00	6.64	0.00	6.64	40.50	0.00	0.00	0.00
14.50	6.44	0.00	6.44	41.00	0.00	0.00	0.00
15.00	6.24	0.00	6.24	41.50	0.00	0.00	0.00
15.50	5.98	0.00	5.98	42.00	0.00	0.00	0.00
16.00	5.71	0.00	5.71	42.50	0.00	0.00	0.00
16.50	5.30	0.00	5.30	43.00	0.00	0.00	0.00
17.00	4.93	0.00	4.93	43.50	0.00	0.00	0.00
17.50	4.59	0.00	4.59	44.00	0.00	0.00	0.00
18.00	4.28	0.00	4.28	44.50	0.00	0.00	0.00
18.50	3.22	0.00	3.22	45.00	0.00	0.00	0.00
19.00	2.98	0.00	2.98	45.50	0.00	0.00	0.00
19.50	2.78	0.00	2.78	46.00	0.00	0.00	0.00
20.00	2.57	0.00	2.57	46.50	0.00	0.00	0.00
20.50	2.36	0.00	2.36	47.00	0.00	0.00	0.00
21.00	2.16	0.00	2.16	47.50	0.00	0.00	0.00
21.50	1.38	0.00	1.38	48.00	0.00	0.00	0.00
22.00	0.80	0.00	0.80				
22.50	0.68	0.00	0.68				
23.00	0.57	0.00	0.57				
23.50	0.47	0.00	0.47				
24.00	0.36	0.00	0.36				
24.50	0.08	0.00	0.08				
25.00	0.05	0.00	0.05				
25.50	0.04	0.00	0.04				
26.00	0.03	0.00	0.03				

Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 1S: NW	Runoff Area=12.206 ac 32.01% Impervious Runoff Depth=2.54" Tc=6.0 min CN=65 Runoff=55.71 cfs 2.586 af
Subcatchment 2S: NE	Runoff Area=14.192 ac 26.39% Impervious Runoff Depth=2.45" Tc=6.0 min CN=64 Runoff=62.37 cfs 2.898 af
Subcatchment 3S: NW	Runoff Area=14.232 ac 38.40% Impervious Runoff Depth=2.82" Tc=6.0 min CN=68 Runoff=72.18 cfs 3.347 af
Subcatchment 4S: S	Runoff Area=8.389 ac 38.46% Impervious Runoff Depth=2.63" Tc=6.0 min CN=66 Runoff=39.71 cfs 1.842 af
Subcatchment S2: SOUTH	Runoff Area=13.941 ac 39.85% Impervious Runoff Depth=3.31" Tc=6.0 min CN=73 Runoff=82.38 cfs 3.840 af
Pond 1P: NW Inf Pond	Peak Elev=965.92' Storage=68,735 cf Inflow=55.71 cfs 2.586 af Outflow=2.02 cfs 2.586 af
Pond 2P: NE Inf Pond	Peak Elev=962.85' Storage=73,583 cf Inflow=62.37 cfs 2.898 af Outflow=2.59 cfs 2.898 af
Pond 3P: MID Inf Pond	Peak Elev=964.90' Storage=90,289 cf Inflow=72.18 cfs 3.347 af Outflow=2.46 cfs 3.347 af
Pond 4P: S Bio Pond	Peak Elev=961.70' Storage=38,958 cf Inflow=39.71 cfs 1.842 af Primary=5.01 cfs 1.745 af Secondary=0.00 cfs 0.000 af Outflow=5.01 cfs 1.745 af
Link 1L: PROP Total	Inflow=11.84 cfs 10.575 af Primary=11.84 cfs 10.575 af

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MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Subcatchment 1S: NW

Runoff = 55.71 cfs @ 12.14 hrs, Volume= 2.586 af, Depth= 2.54"
 Routed to Pond 1P : NW Inf Pond

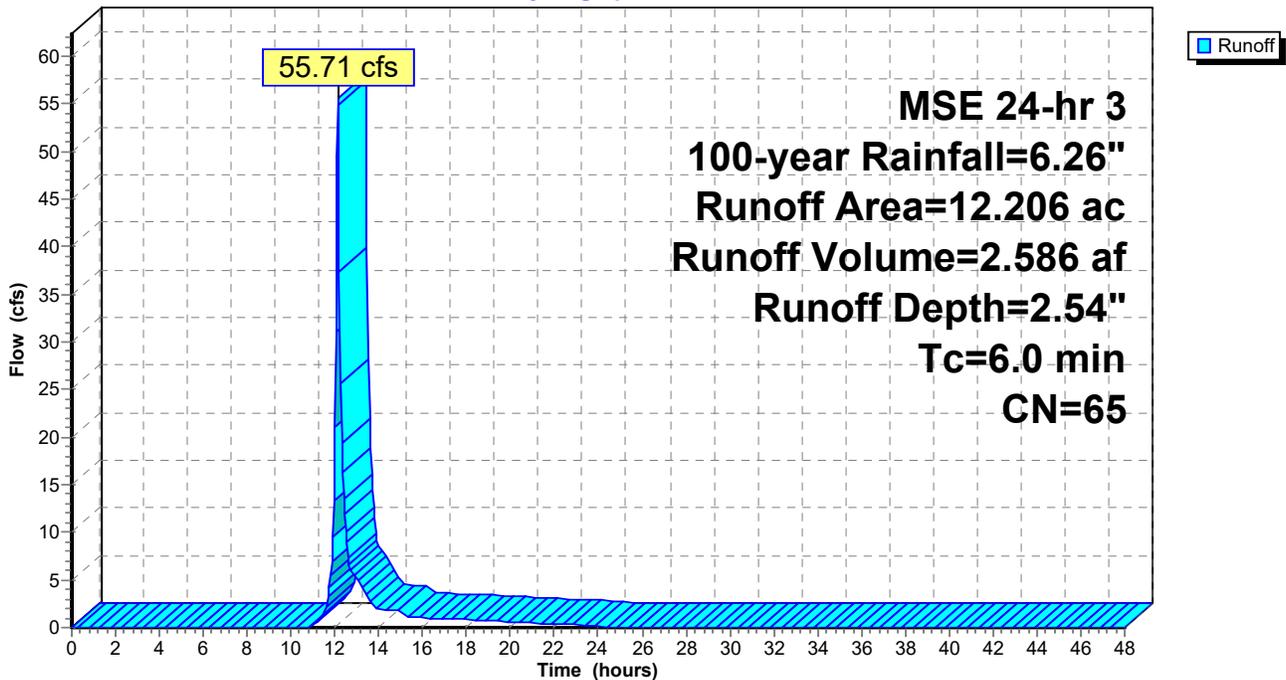
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-year Rainfall=6.26"

Area (ac)	CN	Description
0.675	98	Paved roads, HSG B
1.303	98	Roofs, HSG A
1.638	98	Paved parking, HSG A
* 0.291	98	Paved walks, HSG A
0.317	98	Water Surface, 0% imp, HSG A
3.899	39	>75% Grass cover, Good, HSG A
4.083	57	Woods/grass comb., Poor, HSG A
12.206	65	Weighted Average
8.299		67.99% Pervious Area
3.907		32.01% Impervious Area

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

Subcatchment 1S: NW

Hydrograph



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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Subcatchment 1S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	6.26	2.54	0.00
0.50	0.01	0.00	0.00	27.00	6.26	2.54	0.00
1.00	0.02	0.00	0.00	27.50	6.26	2.54	0.00
1.50	0.04	0.00	0.00	28.00	6.26	2.54	0.00
2.00	0.06	0.00	0.00	28.50	6.26	2.54	0.00
2.50	0.08	0.00	0.00	29.00	6.26	2.54	0.00
3.00	0.10	0.00	0.00	29.50	6.26	2.54	0.00
3.50	0.13	0.00	0.00	30.00	6.26	2.54	0.00
4.00	0.16	0.00	0.00	30.50	6.26	2.54	0.00
4.50	0.20	0.00	0.00	31.00	6.26	2.54	0.00
5.00	0.23	0.00	0.00	31.50	6.26	2.54	0.00
5.50	0.28	0.00	0.00	32.00	6.26	2.54	0.00
6.00	0.32	0.00	0.00	32.50	6.26	2.54	0.00
6.50	0.37	0.00	0.00	33.00	6.26	2.54	0.00
7.00	0.42	0.00	0.00	33.50	6.26	2.54	0.00
7.50	0.47	0.00	0.00	34.00	6.26	2.54	0.00
8.00	0.52	0.00	0.00	34.50	6.26	2.54	0.00
8.50	0.58	0.00	0.00	35.00	6.26	2.54	0.00
9.00	0.65	0.00	0.00	35.50	6.26	2.54	0.00
9.50	0.75	0.00	0.00	36.00	6.26	2.54	0.00
10.00	0.86	0.00	0.00	36.50	6.26	2.54	0.00
10.50	0.98	0.00	0.00	37.00	6.26	2.54	0.00
11.00	1.21	0.00	0.19	37.50	6.26	2.54	0.00
11.50	1.55	0.04	1.27	38.00	6.26	2.54	0.00
12.00	2.90	0.46	20.96	38.50	6.26	2.54	0.00
12.50	4.71	1.46	10.15	39.00	6.26	2.54	0.00
13.00	5.05	1.69	5.04	39.50	6.26	2.54	0.00
13.50	5.28	1.84	3.18	40.00	6.26	2.54	0.00
14.00	5.40	1.92	1.98	40.50	6.26	2.54	0.00
14.50	5.51	2.00	1.87	41.00	6.26	2.54	0.00
15.00	5.61	2.08	1.76	41.50	6.26	2.54	0.00
15.50	5.68	2.12	1.06	42.00	6.26	2.54	0.00
16.00	5.74	2.16	1.02	42.50	6.26	2.54	0.00
16.50	5.79	2.20	0.97	43.00	6.26	2.54	0.00
17.00	5.84	2.24	0.91	43.50	6.26	2.54	0.00
17.50	5.89	2.27	0.87	44.00	6.26	2.54	0.00
18.00	5.94	2.31	0.81	44.50	6.26	2.54	0.00
18.50	5.98	2.34	0.76	45.00	6.26	2.54	0.00
19.00	6.03	2.37	0.71	45.50	6.26	2.54	0.00
19.50	6.06	2.40	0.65	46.00	6.26	2.54	0.00
20.00	6.10	2.42	0.60	46.50	6.26	2.54	0.00
20.50	6.13	2.44	0.55	47.00	6.26	2.54	0.00
21.00	6.16	2.47	0.49	47.50	6.26	2.54	0.00
21.50	6.18	2.48	0.44	48.00	6.26	2.54	0.00
22.00	6.20	2.50	0.38				
22.50	6.22	2.51	0.33				
23.00	6.24	2.53	0.27				
23.50	6.25	2.54	0.22				
24.00	6.26	2.54	0.16				
24.50	6.26	2.54	0.00				
25.00	6.26	2.54	0.00				
25.50	6.26	2.54	0.00				
26.00	6.26	2.54	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Subcatchment 2S: NE

Runoff = 62.37 cfs @ 12.14 hrs, Volume= 2.898 af, Depth= 2.45"
 Routed to Pond 2P : NE Inf Pond

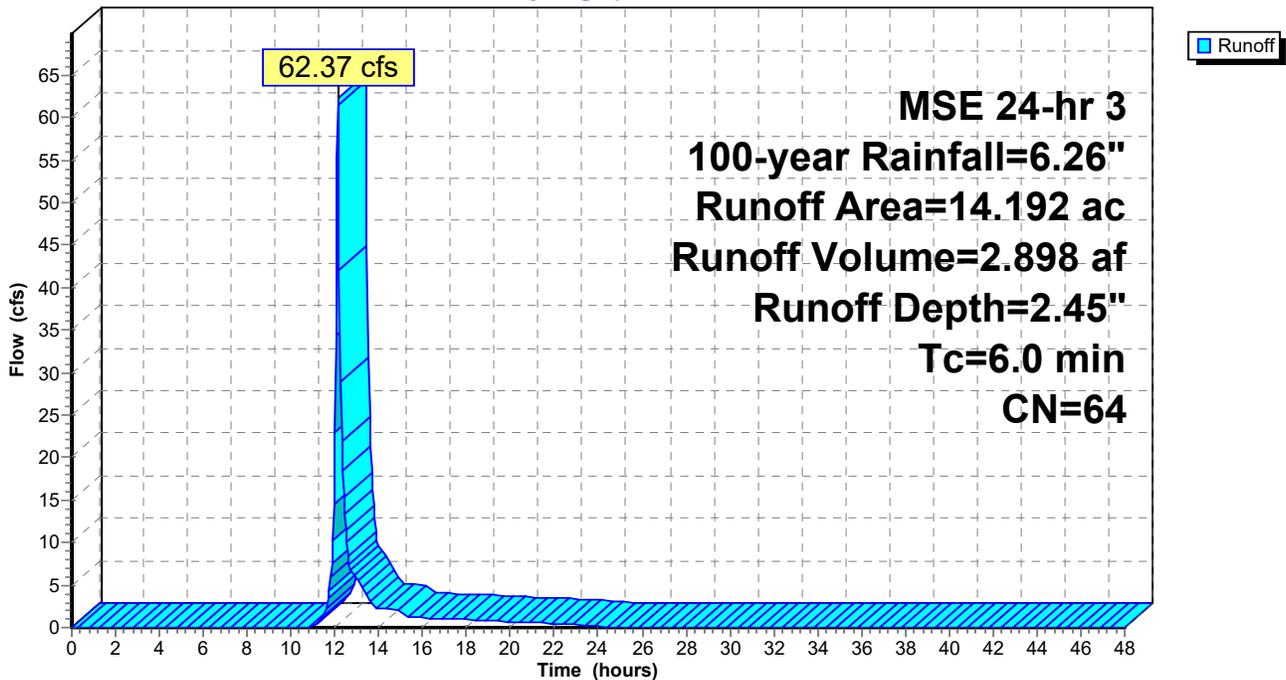
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-year Rainfall=6.26"

Area (ac)	CN	Description
* 0.299	98	Paved roads, HSG B
1.431	98	Roofs, HSG A
1.611	98	Paved parking, HSG A
* 0.404	98	Paved walks, HSG A
0.561	98	Water Surface, 0% imp, HSG A
4.036	39	>75% Grass cover, Good, HSG A
5.850	57	Woods/grass comb., Poor, HSG A
14.192	64	Weighted Average
10.447		73.61% Pervious Area
3.745		26.39% Impervious Area

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

Subcatchment 2S: NE

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Subcatchment 2S: NE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	6.26	2.45	0.00
0.50	0.01	0.00	0.00	27.00	6.26	2.45	0.00
1.00	0.02	0.00	0.00	27.50	6.26	2.45	0.00
1.50	0.04	0.00	0.00	28.00	6.26	2.45	0.00
2.00	0.06	0.00	0.00	28.50	6.26	2.45	0.00
2.50	0.08	0.00	0.00	29.00	6.26	2.45	0.00
3.00	0.10	0.00	0.00	29.50	6.26	2.45	0.00
3.50	0.13	0.00	0.00	30.00	6.26	2.45	0.00
4.00	0.16	0.00	0.00	30.50	6.26	2.45	0.00
4.50	0.20	0.00	0.00	31.00	6.26	2.45	0.00
5.00	0.23	0.00	0.00	31.50	6.26	2.45	0.00
5.50	0.28	0.00	0.00	32.00	6.26	2.45	0.00
6.00	0.32	0.00	0.00	32.50	6.26	2.45	0.00
6.50	0.37	0.00	0.00	33.00	6.26	2.45	0.00
7.00	0.42	0.00	0.00	33.50	6.26	2.45	0.00
7.50	0.47	0.00	0.00	34.00	6.26	2.45	0.00
8.00	0.52	0.00	0.00	34.50	6.26	2.45	0.00
8.50	0.58	0.00	0.00	35.00	6.26	2.45	0.00
9.00	0.65	0.00	0.00	35.50	6.26	2.45	0.00
9.50	0.75	0.00	0.00	36.00	6.26	2.45	0.00
10.00	0.86	0.00	0.00	36.50	6.26	2.45	0.00
10.50	0.98	0.00	0.00	37.00	6.26	2.45	0.00
11.00	1.21	0.00	0.09	37.50	6.26	2.45	0.00
11.50	1.55	0.03	1.27	38.00	6.26	2.45	0.00
12.00	2.90	0.42	23.03	38.50	6.26	2.45	0.00
12.50	4.71	1.39	11.49	39.00	6.26	2.45	0.00
13.00	5.05	1.62	5.72	39.50	6.26	2.45	0.00
13.50	5.28	1.77	3.62	40.00	6.26	2.45	0.00
14.00	5.40	1.85	2.25	40.50	6.26	2.45	0.00
14.50	5.51	1.92	2.13	41.00	6.26	2.45	0.00
15.00	5.61	1.99	2.01	41.50	6.26	2.45	0.00
15.50	5.68	2.04	1.21	42.00	6.26	2.45	0.00
16.00	5.74	2.08	1.16	42.50	6.26	2.45	0.00
16.50	5.79	2.12	1.10	43.00	6.26	2.45	0.00
17.00	5.84	2.15	1.04	43.50	6.26	2.45	0.00
17.50	5.89	2.19	0.99	44.00	6.26	2.45	0.00
18.00	5.94	2.22	0.93	44.50	6.26	2.45	0.00
18.50	5.98	2.25	0.87	45.00	6.26	2.45	0.00
19.00	6.03	2.28	0.81	45.50	6.26	2.45	0.00
19.50	6.06	2.31	0.74	46.00	6.26	2.45	0.00
20.00	6.10	2.33	0.68	46.50	6.26	2.45	0.00
20.50	6.13	2.36	0.62	47.00	6.26	2.45	0.00
21.00	6.16	2.38	0.56	47.50	6.26	2.45	0.00
21.50	6.18	2.39	0.50	48.00	6.26	2.45	0.00
22.00	6.20	2.41	0.43				
22.50	6.22	2.42	0.37				
23.00	6.24	2.43	0.31				
23.50	6.25	2.44	0.25				
24.00	6.26	2.45	0.18				
24.50	6.26	2.45	0.00				
25.00	6.26	2.45	0.00				
25.50	6.26	2.45	0.00				
26.00	6.26	2.45	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Subcatchment 3S: NW

Runoff = 72.18 cfs @ 12.14 hrs, Volume= 3.347 af, Depth= 2.82"
 Routed to Pond 3P : MID Inf Pond

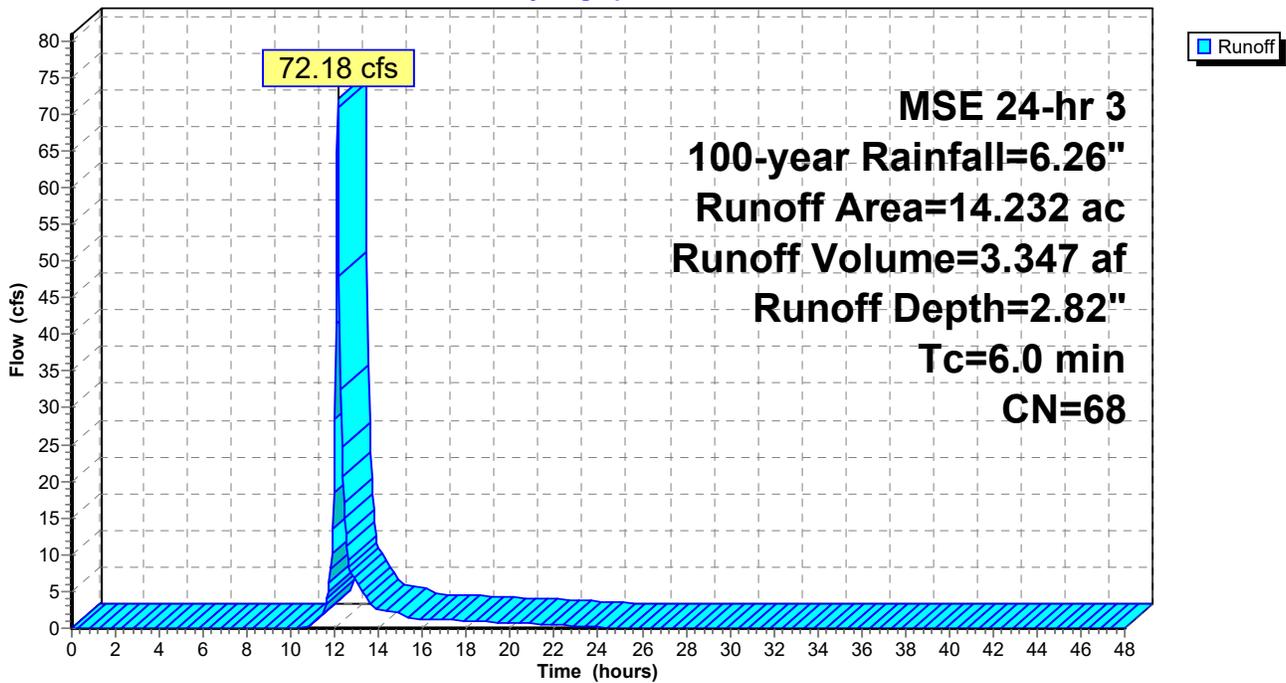
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-year Rainfall=6.26"

Area (ac)	CN	Description
2.033	98	Roofs, HSG A
2.731	98	Paved parking, HSG A
* 0.701	98	Paved walks, HSG A
0.466	98	Water Surface, 0% imp, HSG A
5.188	39	>75% Grass cover, Good, HSG A
3.113	57	Woods/grass comb., Poor, HSG A
14.232	68	Weighted Average
8.767		61.60% Pervious Area
5.465		38.40% Impervious Area

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

Subcatchment 3S: NW

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Subcatchment 3S: NW

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	6.26	2.82	0.00
0.50	0.01	0.00	0.00	27.00	6.26	2.82	0.00
1.00	0.02	0.00	0.00	27.50	6.26	2.82	0.00
1.50	0.04	0.00	0.00	28.00	6.26	2.82	0.00
2.00	0.06	0.00	0.00	28.50	6.26	2.82	0.00
2.50	0.08	0.00	0.00	29.00	6.26	2.82	0.00
3.00	0.10	0.00	0.00	29.50	6.26	2.82	0.00
3.50	0.13	0.00	0.00	30.00	6.26	2.82	0.00
4.00	0.16	0.00	0.00	30.50	6.26	2.82	0.00
4.50	0.20	0.00	0.00	31.00	6.26	2.82	0.00
5.00	0.23	0.00	0.00	31.50	6.26	2.82	0.00
5.50	0.28	0.00	0.00	32.00	6.26	2.82	0.00
6.00	0.32	0.00	0.00	32.50	6.26	2.82	0.00
6.50	0.37	0.00	0.00	33.00	6.26	2.82	0.00
7.00	0.42	0.00	0.00	33.50	6.26	2.82	0.00
7.50	0.47	0.00	0.00	34.00	6.26	2.82	0.00
8.00	0.52	0.00	0.00	34.50	6.26	2.82	0.00
8.50	0.58	0.00	0.00	35.00	6.26	2.82	0.00
9.00	0.65	0.00	0.00	35.50	6.26	2.82	0.00
9.50	0.75	0.00	0.00	36.00	6.26	2.82	0.00
10.00	0.86	0.00	0.00	36.50	6.26	2.82	0.00
10.50	0.98	0.00	0.02	37.00	6.26	2.82	0.00
11.00	1.21	0.01	0.65	37.50	6.26	2.82	0.00
11.50	1.55	0.07	2.15	38.00	6.26	2.82	0.00
12.00	2.90	0.57	28.54	38.50	6.26	2.82	0.00
12.50	4.71	1.67	12.75	39.00	6.26	2.82	0.00
13.00	5.05	1.92	6.29	39.50	6.26	2.82	0.00
13.50	5.28	2.08	3.96	40.00	6.26	2.82	0.00
14.00	5.40	2.17	2.45	40.50	6.26	2.82	0.00
14.50	5.51	2.25	2.32	41.00	6.26	2.82	0.00
15.00	5.61	2.33	2.18	41.50	6.26	2.82	0.00
15.50	5.68	2.38	1.31	42.00	6.26	2.82	0.00
16.00	5.74	2.42	1.26	42.50	6.26	2.82	0.00
16.50	5.79	2.46	1.20	43.00	6.26	2.82	0.00
17.00	5.84	2.50	1.13	43.50	6.26	2.82	0.00
17.50	5.89	2.54	1.07	44.00	6.26	2.82	0.00
18.00	5.94	2.58	1.00	44.50	6.26	2.82	0.00
18.50	5.98	2.61	0.94	45.00	6.26	2.82	0.00
19.00	6.03	2.64	0.87	45.50	6.26	2.82	0.00
19.50	6.06	2.67	0.80	46.00	6.26	2.82	0.00
20.00	6.10	2.70	0.74	46.50	6.26	2.82	0.00
20.50	6.13	2.72	0.67	47.00	6.26	2.82	0.00
21.00	6.16	2.74	0.60	47.50	6.26	2.82	0.00
21.50	6.18	2.76	0.54	48.00	6.26	2.82	0.00
22.00	6.20	2.78	0.47				
22.50	6.22	2.79	0.40				
23.00	6.24	2.80	0.33				
23.50	6.25	2.81	0.26				
24.00	6.26	2.82	0.19				
24.50	6.26	2.82	0.00				
25.00	6.26	2.82	0.00				
25.50	6.26	2.82	0.00				
26.00	6.26	2.82	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Subcatchment 4S: S

Runoff = 39.71 cfs @ 12.14 hrs, Volume= 1.842 af, Depth= 2.63"
 Routed to Pond 4P : S Bio Pond

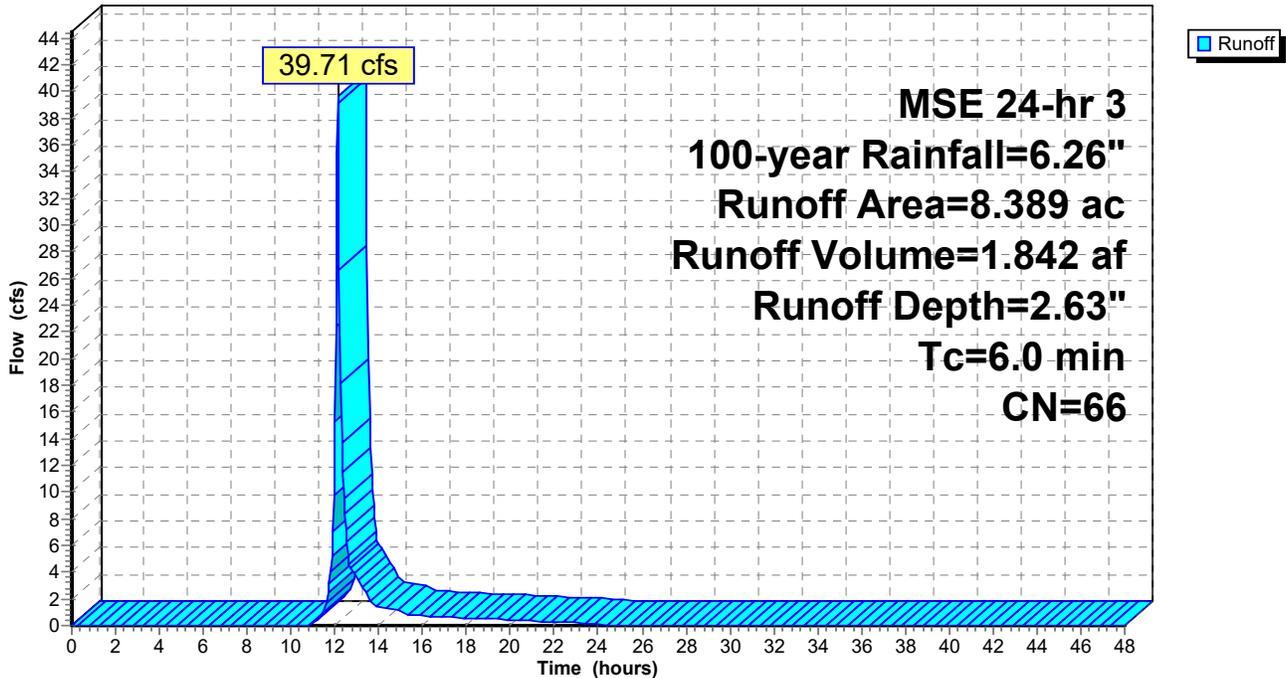
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-year Rainfall=6.26"

Area (ac)	CN	Description
0.269	98	Paved roads, HSG B
1.067	98	Roofs, HSG A
1.430	98	Paved parking, HSG A
* 0.460	98	Paved walks, HSG A
0.300	98	Water Surface, 0% imp, HSG A
3.716	39	>75% Grass cover, Good, HSG A
1.147	57	Woods/grass comb., Poor, HSG A
8.389	66	Weighted Average
5.163		61.54% Pervious Area
3.226		38.46% Impervious Area

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

Subcatchment 4S: S

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Subcatchment 4S: S

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	6.26	2.63	0.00
0.50	0.01	0.00	0.00	27.00	6.26	2.63	0.00
1.00	0.02	0.00	0.00	27.50	6.26	2.63	0.00
1.50	0.04	0.00	0.00	28.00	6.26	2.63	0.00
2.00	0.06	0.00	0.00	28.50	6.26	2.63	0.00
2.50	0.08	0.00	0.00	29.00	6.26	2.63	0.00
3.00	0.10	0.00	0.00	29.50	6.26	2.63	0.00
3.50	0.13	0.00	0.00	30.00	6.26	2.63	0.00
4.00	0.16	0.00	0.00	30.50	6.26	2.63	0.00
4.50	0.20	0.00	0.00	31.00	6.26	2.63	0.00
5.00	0.23	0.00	0.00	31.50	6.26	2.63	0.00
5.50	0.28	0.00	0.00	32.00	6.26	2.63	0.00
6.00	0.32	0.00	0.00	32.50	6.26	2.63	0.00
6.50	0.37	0.00	0.00	33.00	6.26	2.63	0.00
7.00	0.42	0.00	0.00	33.50	6.26	2.63	0.00
7.50	0.47	0.00	0.00	34.00	6.26	2.63	0.00
8.00	0.52	0.00	0.00	34.50	6.26	2.63	0.00
8.50	0.58	0.00	0.00	35.00	6.26	2.63	0.00
9.00	0.65	0.00	0.00	35.50	6.26	2.63	0.00
9.50	0.75	0.00	0.00	36.00	6.26	2.63	0.00
10.00	0.86	0.00	0.00	36.50	6.26	2.63	0.00
10.50	0.98	0.00	0.00	37.00	6.26	2.63	0.00
11.00	1.21	0.01	0.21	37.50	6.26	2.63	0.00
11.50	1.55	0.05	1.00	38.00	6.26	2.63	0.00
12.00	2.90	0.50	15.20	38.50	6.26	2.63	0.00
12.50	4.71	1.53	7.16	39.00	6.26	2.63	0.00
13.00	5.05	1.76	3.55	39.50	6.26	2.63	0.00
13.50	5.28	1.92	2.24	40.00	6.26	2.63	0.00
14.00	5.40	2.01	1.39	40.50	6.26	2.63	0.00
14.50	5.51	2.08	1.31	41.00	6.26	2.63	0.00
15.00	5.61	2.16	1.24	41.50	6.26	2.63	0.00
15.50	5.68	2.20	0.75	42.00	6.26	2.63	0.00
16.00	5.74	2.25	0.71	42.50	6.26	2.63	0.00
16.50	5.79	2.29	0.68	43.00	6.26	2.63	0.00
17.00	5.84	2.33	0.64	43.50	6.26	2.63	0.00
17.50	5.89	2.36	0.61	44.00	6.26	2.63	0.00
18.00	5.94	2.40	0.57	44.50	6.26	2.63	0.00
18.50	5.98	2.43	0.53	45.00	6.26	2.63	0.00
19.00	6.03	2.46	0.50	45.50	6.26	2.63	0.00
19.50	6.06	2.49	0.46	46.00	6.26	2.63	0.00
20.00	6.10	2.51	0.42	46.50	6.26	2.63	0.00
20.50	6.13	2.54	0.38	47.00	6.26	2.63	0.00
21.00	6.16	2.56	0.34	47.50	6.26	2.63	0.00
21.50	6.18	2.58	0.30	48.00	6.26	2.63	0.00
22.00	6.20	2.59	0.27				
22.50	6.22	2.61	0.23				
23.00	6.24	2.62	0.19				
23.50	6.25	2.63	0.15				
24.00	6.26	2.63	0.11				
24.50	6.26	2.63	0.00				
25.00	6.26	2.63	0.00				
25.50	6.26	2.63	0.00				
26.00	6.26	2.63	0.00				

Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Subcatchment S2: SOUTH

Runoff = 82.38 cfs @ 12.13 hrs, Volume= 3.840 af, Depth= 3.31"
 Routed to nonexistent node 2L

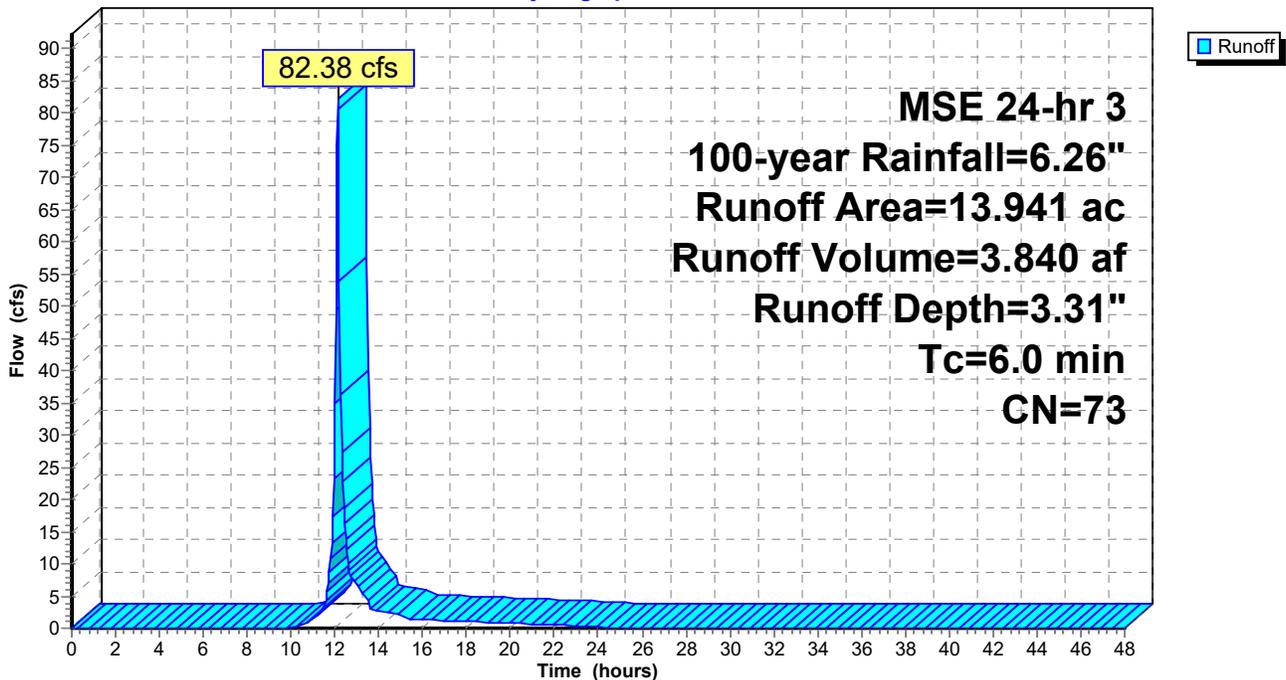
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-year Rainfall=6.26"

Area (ac)	CN	Description
* 0.269	98	Paved roads, HSG B
* 5.287	98	Gravel, HSG A
8.385	57	Woods/grass comb., Poor, HSG A
13.941	73	Weighted Average
8.385		60.15% Pervious Area
5.556		39.85% Impervious Area

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

Subcatchment S2: SOUTH

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Subcatchment S2: SOUTH

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	6.26	3.31	0.00
0.50	0.01	0.00	0.00	27.00	6.26	3.31	0.00
1.00	0.02	0.00	0.00	27.50	6.26	3.31	0.00
1.50	0.04	0.00	0.00	28.00	6.26	3.31	0.00
2.00	0.06	0.00	0.00	28.50	6.26	3.31	0.00
2.50	0.08	0.00	0.00	29.00	6.26	3.31	0.00
3.00	0.10	0.00	0.00	29.50	6.26	3.31	0.00
3.50	0.13	0.00	0.00	30.00	6.26	3.31	0.00
4.00	0.16	0.00	0.00	30.50	6.26	3.31	0.00
4.50	0.20	0.00	0.00	31.00	6.26	3.31	0.00
5.00	0.23	0.00	0.00	31.50	6.26	3.31	0.00
5.50	0.28	0.00	0.00	32.00	6.26	3.31	0.00
6.00	0.32	0.00	0.00	32.50	6.26	3.31	0.00
6.50	0.37	0.00	0.00	33.00	6.26	3.31	0.00
7.00	0.42	0.00	0.00	33.50	6.26	3.31	0.00
7.50	0.47	0.00	0.00	34.00	6.26	3.31	0.00
8.00	0.52	0.00	0.00	34.50	6.26	3.31	0.00
8.50	0.58	0.00	0.00	35.00	6.26	3.31	0.00
9.00	0.65	0.00	0.00	35.50	6.26	3.31	0.00
9.50	0.75	0.00	0.00	36.00	6.26	3.31	0.00
10.00	0.86	0.00	0.17	36.50	6.26	3.31	0.00
10.50	0.98	0.01	0.37	37.00	6.26	3.31	0.00
11.00	1.21	0.05	1.44	37.50	6.26	3.31	0.00
11.50	1.55	0.15	3.31	38.00	6.26	3.31	0.00
12.00	2.90	0.80	34.88	38.50	6.26	3.31	0.00
12.50	4.71	2.05	13.90	39.00	6.26	3.31	0.00
13.00	5.05	2.32	6.79	39.50	6.26	3.31	0.00
13.50	5.28	2.50	4.25	40.00	6.26	3.31	0.00
14.00	5.40	2.60	2.62	40.50	6.26	3.31	0.00
14.50	5.51	2.69	2.48	41.00	6.26	3.31	0.00
15.00	5.61	2.77	2.32	41.50	6.26	3.31	0.00
15.50	5.68	2.82	1.40	42.00	6.26	3.31	0.00
16.00	5.74	2.87	1.34	42.50	6.26	3.31	0.00
16.50	5.79	2.92	1.27	43.00	6.26	3.31	0.00
17.00	5.84	2.96	1.20	43.50	6.26	3.31	0.00
17.50	5.89	3.00	1.13	44.00	6.26	3.31	0.00
18.00	5.94	3.04	1.06	44.50	6.26	3.31	0.00
18.50	5.98	3.08	0.99	45.00	6.26	3.31	0.00
19.00	6.03	3.11	0.92	45.50	6.26	3.31	0.00
19.50	6.06	3.14	0.85	46.00	6.26	3.31	0.00
20.00	6.10	3.17	0.78	46.50	6.26	3.31	0.00
20.50	6.13	3.20	0.71	47.00	6.26	3.31	0.00
21.00	6.16	3.22	0.64	47.50	6.26	3.31	0.00
21.50	6.18	3.24	0.56	48.00	6.26	3.31	0.00
22.00	6.20	3.26	0.49				
22.50	6.22	3.27	0.42				
23.00	6.24	3.29	0.35				
23.50	6.25	3.30	0.28				
24.00	6.26	3.31	0.20				
24.50	6.26	3.31	0.00				
25.00	6.26	3.31	0.00				
25.50	6.26	3.31	0.00				
26.00	6.26	3.31	0.00				

Preliminary Hartland Apartments

MSE 24-hr 3 100-year Rainfall=6.26"

Prepared by Payne & Dolan

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Summary for Pond 1P: NW Inf Pond

Inflow Area = 12.206 ac, 32.01% Impervious, Inflow Depth = 2.54" for 100-year event
 Inflow = 55.71 cfs @ 12.14 hrs, Volume= 2.586 af
 Outflow = 2.02 cfs @ 13.78 hrs, Volume= 2.586 af, Atten= 96%, Lag= 98.5 min
 Primary = 2.02 cfs @ 13.78 hrs, Volume= 2.586 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 965.92' @ 13.78 hrs Surf.Area= 24,283 sf Storage= 68,735 cf

Plug-Flow detention time= 394.5 min calculated for 2.583 af (100% of inflow)
 Center-of-Mass det. time= 394.5 min (1,212.5 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	962.00'	70,699 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

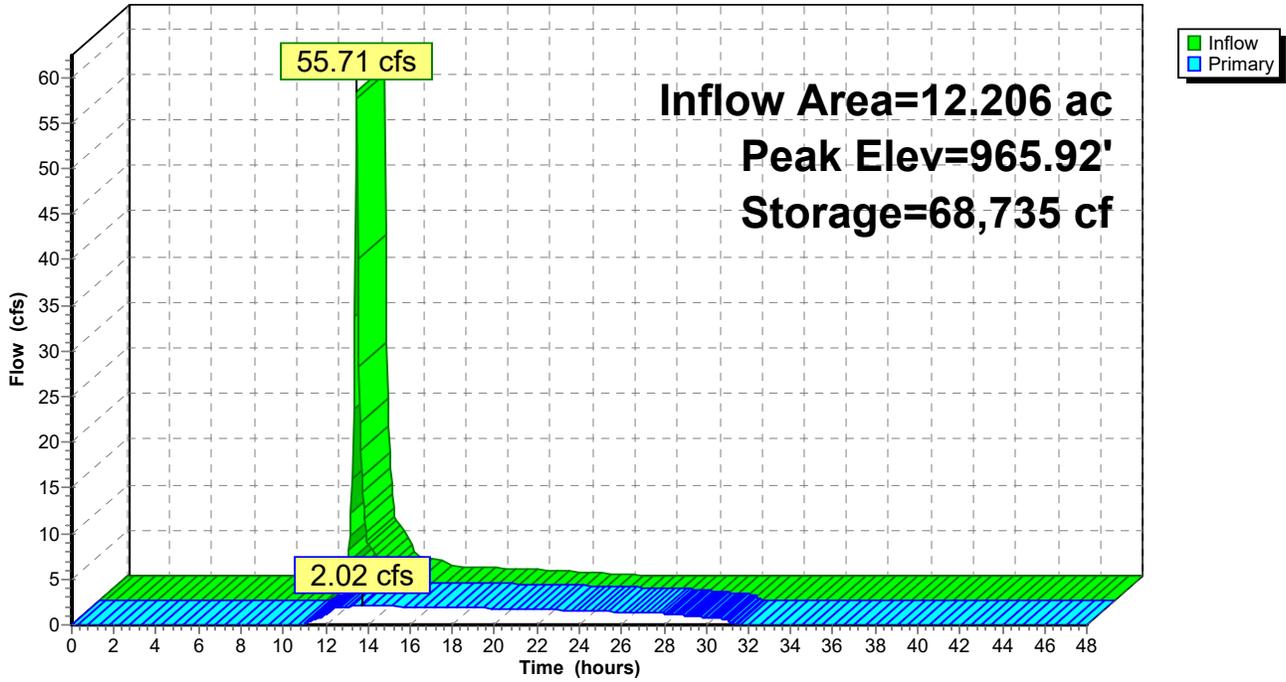
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
962.00	7,070	0	0
963.00	15,280	11,175	11,175
964.00	18,264	16,772	27,947
965.00	21,350	19,807	47,754
966.00	24,540	22,945	70,699

Device	Routing	Invert	Outlet Devices
#1	Primary	962.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=2.02 cfs @ 13.78 hrs HW=965.92' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.02 cfs)

Pond 1P: NW Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Pond 1P: NW Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	962.00	0.00
1.00	0.00	0	962.00	0.00
2.00	0.00	0	962.00	0.00
3.00	0.00	0	962.00	0.00
4.00	0.00	0	962.00	0.00
5.00	0.00	0	962.00	0.00
6.00	0.00	0	962.00	0.00
7.00	0.00	0	962.00	0.00
8.00	0.00	0	962.00	0.00
9.00	0.00	0	962.00	0.00
10.00	0.00	0	962.00	0.00
11.00	0.19	38	962.01	0.08
12.00	20.96	9,845	962.91	1.21
13.00	5.04	64,516	965.74	1.98
14.00	1.98	68,716	965.92	2.02
15.00	1.76	68,178	965.90	2.02
16.00	1.02	65,025	965.77	1.98
17.00	0.91	61,440	965.61	1.94
18.00	0.81	57,641	965.45	1.90
19.00	0.71	53,630	965.27	1.85
20.00	0.60	49,413	965.08	1.80
21.00	0.49	44,996	964.87	1.75
22.00	0.38	40,384	964.65	1.69
23.00	0.27	35,588	964.40	1.63
24.00	0.16	30,621	964.14	1.56
25.00	0.00	25,195	963.85	1.48
26.00	0.00	19,987	963.55	1.41
27.00	0.00	15,047	963.25	1.33
28.00	0.00	10,383	962.95	1.24
29.00	0.00	6,298	962.65	1.03
30.00	0.00	2,952	962.35	0.83
31.00	0.00	345	962.05	0.62
32.00	0.00	0	962.00	0.00
33.00	0.00	0	962.00	0.00
34.00	0.00	0	962.00	0.00
35.00	0.00	0	962.00	0.00
36.00	0.00	0	962.00	0.00
37.00	0.00	0	962.00	0.00
38.00	0.00	0	962.00	0.00
39.00	0.00	0	962.00	0.00
40.00	0.00	0	962.00	0.00
41.00	0.00	0	962.00	0.00
42.00	0.00	0	962.00	0.00
43.00	0.00	0	962.00	0.00
44.00	0.00	0	962.00	0.00
45.00	0.00	0	962.00	0.00
46.00	0.00	0	962.00	0.00
47.00	0.00	0	962.00	0.00
48.00	0.00	0	962.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Pond 2P: NE Inf Pond

Inflow Area = 14.192 ac, 26.39% Impervious, Inflow Depth = 2.45" for 100-year event
 Inflow = 62.37 cfs @ 12.14 hrs, Volume= 2.898 af
 Outflow = 2.59 cfs @ 13.63 hrs, Volume= 2.898 af, Atten= 96%, Lag= 89.5 min
 Primary = 2.59 cfs @ 13.63 hrs, Volume= 2.898 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 962.85' @ 13.63 hrs Surf.Area= 31,032 sf Storage= 73,583 cf

Plug-Flow detention time= 308.3 min calculated for 2.898 af (100% of inflow)
 Center-of-Mass det. time= 308.2 min (1,127.9 - 819.7)

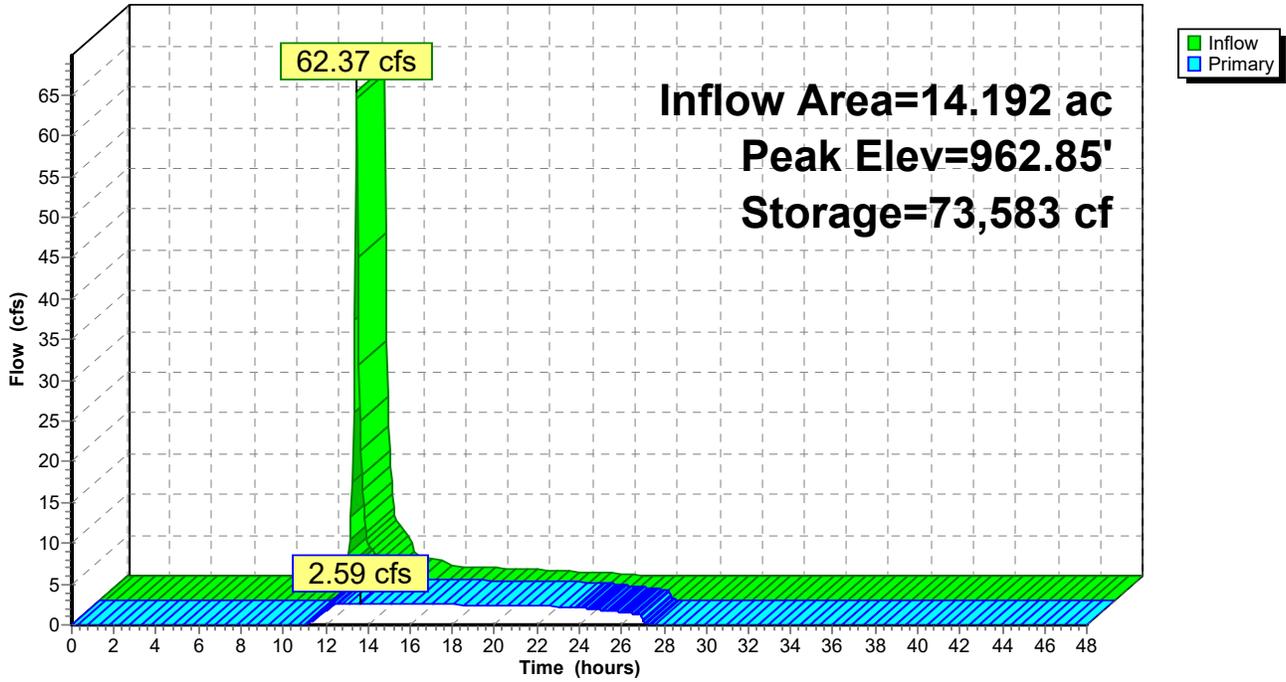
Volume	Invert	Avail.Storage	Storage Description
#1	960.00'	111,091 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
960.00	14,993	0	0
961.00	26,284	20,639	20,639
962.00	28,806	27,545	48,184
963.00	31,428	30,117	78,301
964.00	34,152	32,790	111,091

Device	Routing	Invert	Outlet Devices
#1	Primary	960.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=2.59 cfs @ 13.63 hrs HW=962.85' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.59 cfs)

Pond 2P: NE Inf Pond

Hydrograph



Preliminary Hartland Apartments

MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Pond 2P: NE Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	960.00	0.00
1.00	0.00	0	960.00	0.00
2.00	0.00	0	960.00	0.00
3.00	0.00	0	960.00	0.00
4.00	0.00	0	960.00	0.00
5.00	0.00	0	960.00	0.00
6.00	0.00	0	960.00	0.00
7.00	0.00	0	960.00	0.00
8.00	0.00	0	960.00	0.00
9.00	0.00	0	960.00	0.00
10.00	0.00	0	960.00	0.00
11.00	0.09	11	960.00	0.02
12.00	23.03	9,569	960.53	1.75
13.00	5.72	69,507	962.72	2.56
14.00	2.25	73,223	962.84	2.58
15.00	2.01	71,607	962.79	2.57
16.00	1.16	67,016	962.64	2.54
17.00	1.04	61,906	962.47	2.50
18.00	0.93	56,517	962.29	2.46
19.00	0.81	50,848	962.09	2.42
20.00	0.68	44,898	961.89	2.38
21.00	0.56	38,668	961.66	2.33
22.00	0.43	32,158	961.43	2.28
23.00	0.31	25,378	961.18	2.23
24.00	0.18	18,372	960.91	2.11
25.00	0.00	11,345	960.61	1.83
26.00	0.00	5,274	960.31	1.55
27.00	0.00	321	960.02	0.68
28.00	0.00	0	960.00	0.00
29.00	0.00	0	960.00	0.00
30.00	0.00	0	960.00	0.00
31.00	0.00	0	960.00	0.00
32.00	0.00	0	960.00	0.00
33.00	0.00	0	960.00	0.00
34.00	0.00	0	960.00	0.00
35.00	0.00	0	960.00	0.00
36.00	0.00	0	960.00	0.00
37.00	0.00	0	960.00	0.00
38.00	0.00	0	960.00	0.00
39.00	0.00	0	960.00	0.00
40.00	0.00	0	960.00	0.00
41.00	0.00	0	960.00	0.00
42.00	0.00	0	960.00	0.00
43.00	0.00	0	960.00	0.00
44.00	0.00	0	960.00	0.00
45.00	0.00	0	960.00	0.00
46.00	0.00	0	960.00	0.00
47.00	0.00	0	960.00	0.00
48.00	0.00	0	960.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Pond 3P: MID Inf Pond

Inflow Area = 14.232 ac, 38.40% Impervious, Inflow Depth = 2.82" for 100-year event
 Inflow = 72.18 cfs @ 12.14 hrs, Volume= 3.347 af
 Outflow = 2.46 cfs @ 13.96 hrs, Volume= 3.347 af, Atten= 97%, Lag= 109.2 min
 Primary = 2.46 cfs @ 13.96 hrs, Volume= 3.347 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 964.90' @ 13.96 hrs Surf.Area= 29,557 sf Storage= 90,289 cf

Plug-Flow detention time= 409.2 min calculated for 3.343 af (100% of inflow)
 Center-of-Mass det. time= 409.2 min (1,222.1 - 812.9)

Volume	Invert	Avail.Storage	Storage Description
#1	961.00'	93,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

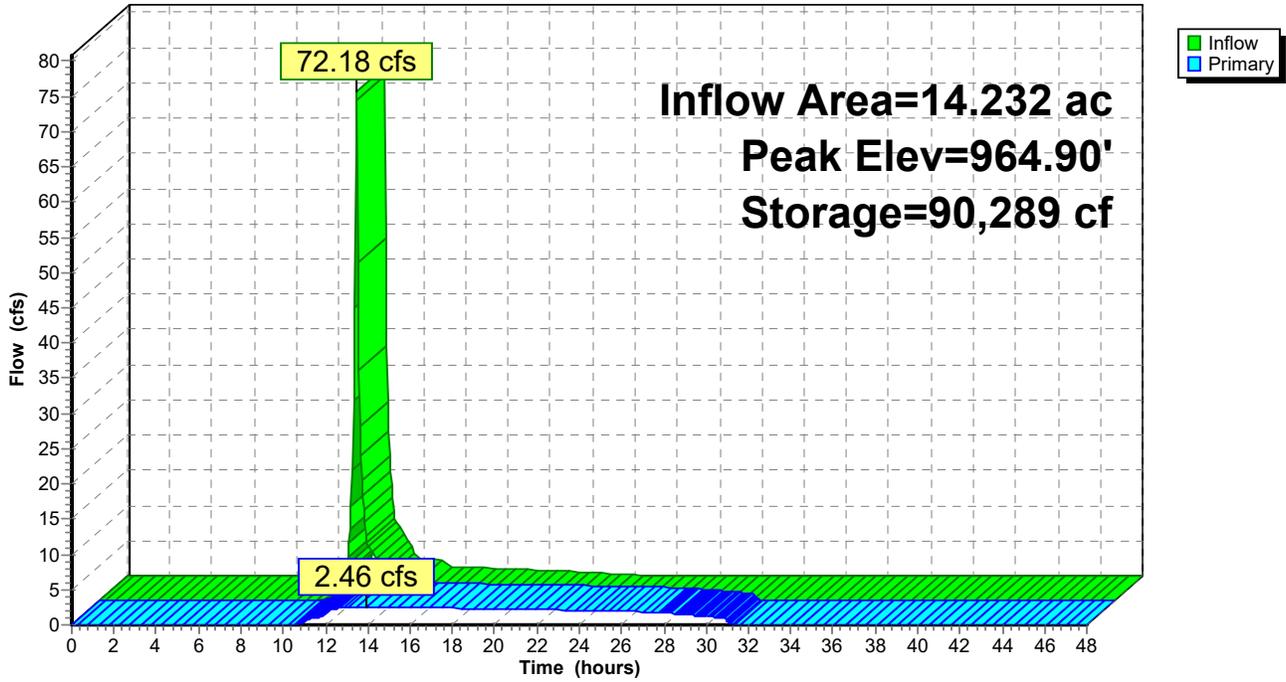
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
961.00	11,137	0	0
962.00	21,600	16,369	16,369
963.00	24,250	22,925	39,294
964.00	27,000	25,625	64,919
965.00	29,850	28,425	93,344

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	3.600 in/hr Exfiltration over Surface area

Primary OutFlow Max=2.46 cfs @ 13.96 hrs HW=964.90' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.46 cfs)

Pond 3P: MID Inf Pond

Hydrograph



Preliminary Hartland Apartments

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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Pond 3P: MID Inf Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	961.00	0.00
1.00	0.00	0	961.00	0.00
2.00	0.00	0	961.00	0.00
3.00	0.00	0	961.00	0.00
4.00	0.00	0	961.00	0.00
5.00	0.00	0	961.00	0.00
6.00	0.00	0	961.00	0.00
7.00	0.00	0	961.00	0.00
8.00	0.00	0	961.00	0.00
9.00	0.00	0	961.00	0.00
10.00	0.00	0	961.00	0.00
11.00	0.65	206	961.02	0.44
12.00	28.54	14,455	961.91	1.72
13.00	6.29	84,883	964.71	2.42
14.00	2.45	90,289	964.90	2.46
15.00	2.18	89,773	964.88	2.46
16.00	1.26	85,980	964.75	2.43
17.00	1.13	81,598	964.60	2.39
18.00	1.00	76,895	964.43	2.35
19.00	0.87	71,873	964.25	2.31
20.00	0.74	66,535	964.06	2.26
21.00	0.60	60,888	963.85	2.22
22.00	0.47	54,933	963.62	2.16
23.00	0.33	48,681	963.38	2.11
24.00	0.19	42,144	963.12	2.05
25.00	0.00	34,957	962.82	1.98
26.00	0.00	27,945	962.52	1.91
27.00	0.00	21,171	962.22	1.85
28.00	0.00	14,661	961.92	1.73
29.00	0.00	8,905	961.62	1.47
30.00	0.00	4,091	961.32	1.21
31.00	0.00	272	961.02	0.58
32.00	0.00	0	961.00	0.00
33.00	0.00	0	961.00	0.00
34.00	0.00	0	961.00	0.00
35.00	0.00	0	961.00	0.00
36.00	0.00	0	961.00	0.00
37.00	0.00	0	961.00	0.00
38.00	0.00	0	961.00	0.00
39.00	0.00	0	961.00	0.00
40.00	0.00	0	961.00	0.00
41.00	0.00	0	961.00	0.00
42.00	0.00	0	961.00	0.00
43.00	0.00	0	961.00	0.00
44.00	0.00	0	961.00	0.00
45.00	0.00	0	961.00	0.00
46.00	0.00	0	961.00	0.00
47.00	0.00	0	961.00	0.00
48.00	0.00	0	961.00	0.00

Preliminary Hartland Apartments

MSE 24-hr 3 100-year Rainfall=6.26"

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Summary for Pond 4P: S Bio Pond

Inflow Area = 8.389 ac, 38.46% Impervious, Inflow Depth = 2.63" for 100-year event
 Inflow = 39.71 cfs @ 12.14 hrs, Volume= 1.842 af
 Outflow = 5.01 cfs @ 12.62 hrs, Volume= 1.745 af, Atten= 87%, Lag= 28.9 min
 Primary = 5.01 cfs @ 12.62 hrs, Volume= 1.745 af
 Routed to Link 1L : PROP Total
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : PROP Total

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 961.70' @ 12.62 hrs Surf.Area= 16,275 sf Storage= 38,958 cf

Plug-Flow detention time= 174.0 min calculated for 1.745 af (95% of inflow)
 Center-of-Mass det. time= 147.5 min (963.8 - 816.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	956.25'	45,690 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
956.25	12,900	0.0	0	0
957.42	12,900	33.0	4,981	4,981
957.75	12,900	33.0	1,405	6,386
960.00	12,900	27.0	7,837	14,222
962.00	16,880	100.0	29,780	44,002
962.10	16,880	100.0	1,688	45,690

Device	Routing	Invert	Outlet Devices
#1	Primary	956.25'	15.0" Round Culvert L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 956.25' / 955.00' S= 0.0125 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.23 sf
#2	Device 1	957.23'	8.0" Round Culvert L= 280.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 957.23' / 956.25' S= 0.0035 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#3	Device 1	961.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	962.00'	20.0' long x 8.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=5.01 cfs @ 12.62 hrs HW=961.69' (Free Discharge)

- ↑ 1=Culvert (Passes 5.01 cfs of 12.23 cfs potential flow)
- ↑ 2=Culvert (Barrel Controls 1.86 cfs @ 5.33 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 3.15 cfs @ 4.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=956.25' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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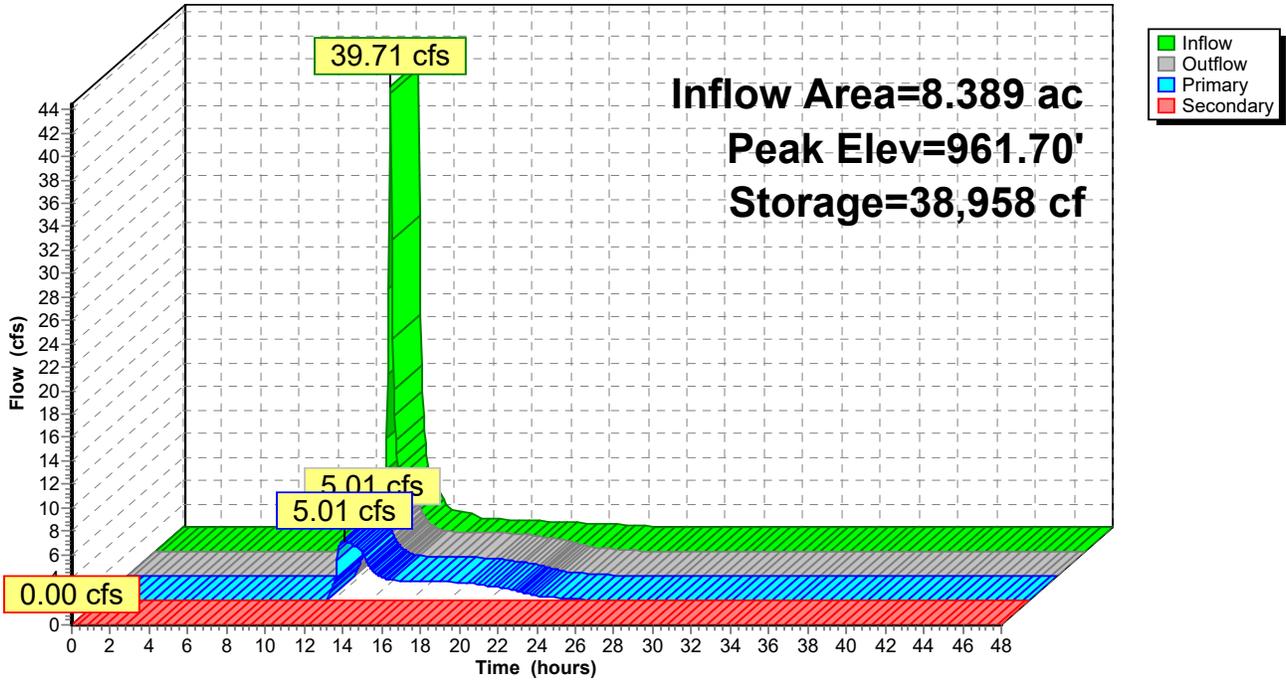
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Pond 4P: S Bio Pond

Hydrograph



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MSE 24-hr 3 100-year Rainfall=6.26"

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Hydrograph for Pond 4P: S Bio Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	956.25	0.00	0.00	0.00
1.00	0.00	0	956.25	0.00	0.00	0.00
2.00	0.00	0	956.25	0.00	0.00	0.00
3.00	0.00	0	956.25	0.00	0.00	0.00
4.00	0.00	0	956.25	0.00	0.00	0.00
5.00	0.00	0	956.25	0.00	0.00	0.00
6.00	0.00	0	956.25	0.00	0.00	0.00
7.00	0.00	0	956.25	0.00	0.00	0.00
8.00	0.00	0	956.25	0.00	0.00	0.00
9.00	0.00	0	956.25	0.00	0.00	0.00
10.00	0.00	0	956.25	0.00	0.00	0.00
11.00	0.21	95	956.27	0.00	0.00	0.00
12.00	15.20	8,846	958.46	1.06	1.06	0.00
13.00	3.55	37,761	961.62	4.83	4.83	0.00
14.00	1.39	31,212	961.20	2.72	2.72	0.00
15.00	1.24	28,401	961.02	1.77	1.77	0.00
16.00	0.71	25,107	960.79	1.68	1.68	0.00
17.00	0.64	21,609	960.55	1.62	1.62	0.00
18.00	0.57	18,055	960.29	1.56	1.56	0.00
19.00	0.50	14,459	960.02	1.50	1.50	0.00
20.00	0.42	11,121	959.11	1.26	1.26	0.00
21.00	0.34	8,407	958.33	1.01	1.01	0.00
22.00	0.27	6,456	957.77	0.60	0.60	0.00
23.00	0.19	5,722	957.59	0.31	0.31	0.00
24.00	0.11	5,363	957.51	0.20	0.20	0.00
25.00	0.00	4,931	957.41	0.08	0.08	0.00
26.00	0.00	4,719	957.36	0.04	0.04	0.00
27.00	0.00	4,597	957.33	0.03	0.03	0.00
28.00	0.00	4,519	957.31	0.02	0.02	0.00
29.00	0.00	4,468	957.30	0.01	0.01	0.00
30.00	0.00	4,429	957.29	0.01	0.01	0.00
31.00	0.00	4,396	957.28	0.01	0.01	0.00
32.00	0.00	4,368	957.28	0.01	0.01	0.00
33.00	0.00	4,344	957.27	0.01	0.01	0.00
34.00	0.00	4,325	957.27	0.00	0.00	0.00
35.00	0.00	4,309	957.26	0.00	0.00	0.00
36.00	0.00	4,295	957.26	0.00	0.00	0.00
37.00	0.00	4,284	957.26	0.00	0.00	0.00
38.00	0.00	4,274	957.25	0.00	0.00	0.00
39.00	0.00	4,266	957.25	0.00	0.00	0.00
40.00	0.00	4,260	957.25	0.00	0.00	0.00
41.00	0.00	4,254	957.25	0.00	0.00	0.00
42.00	0.00	4,249	957.25	0.00	0.00	0.00
43.00	0.00	4,245	957.25	0.00	0.00	0.00
44.00	0.00	4,242	957.25	0.00	0.00	0.00
45.00	0.00	4,239	957.25	0.00	0.00	0.00
46.00	0.00	4,237	957.25	0.00	0.00	0.00
47.00	0.00	4,235	957.24	0.00	0.00	0.00
48.00	0.00	4,234	957.24	0.00	0.00	0.00

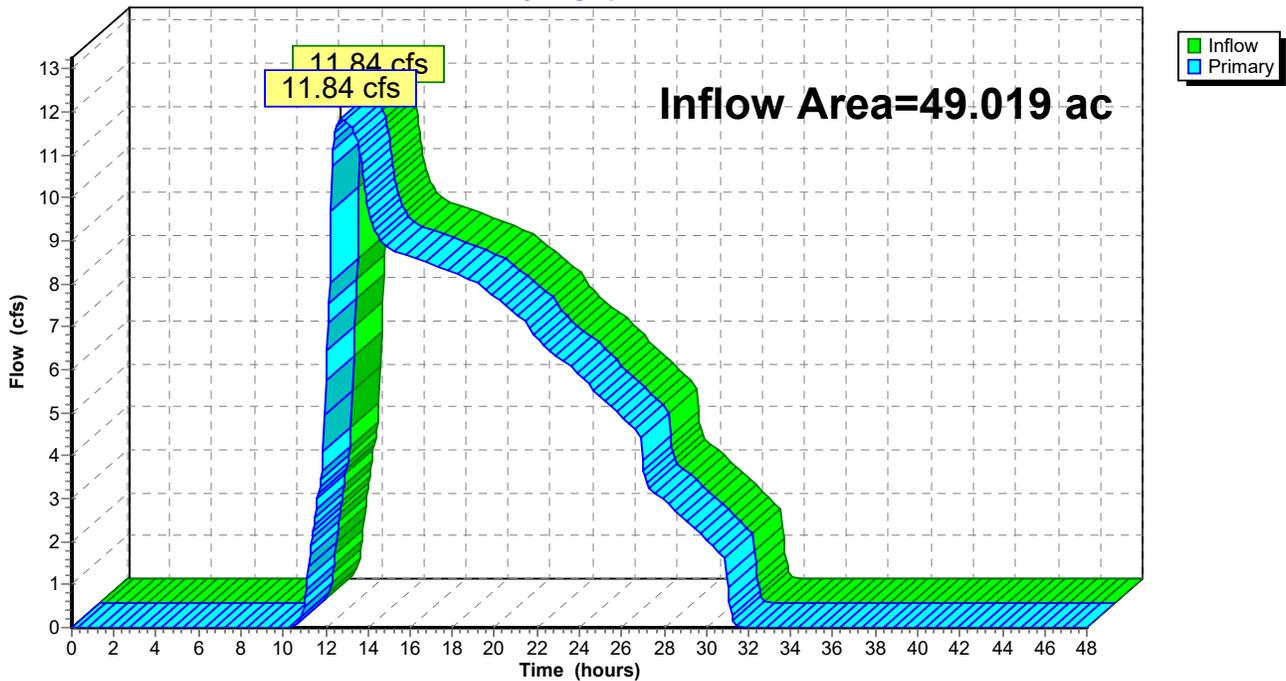
Summary for Link 1L: PROP Total

Inflow Area = 49.019 ac, 33.34% Impervious, Inflow Depth = 2.59" for 100-year event
Inflow = 11.84 cfs @ 12.74 hrs, Volume= 10.575 af
Primary = 11.84 cfs @ 12.74 hrs, Volume= 10.575 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: PROP Total

Hydrograph



Preliminary Hartland Apartments

Prepared by Payne & Dolan

HydroCAD® 10.20-2g s/n 08699 © 2022 HydroCAD Software Solutions LLC

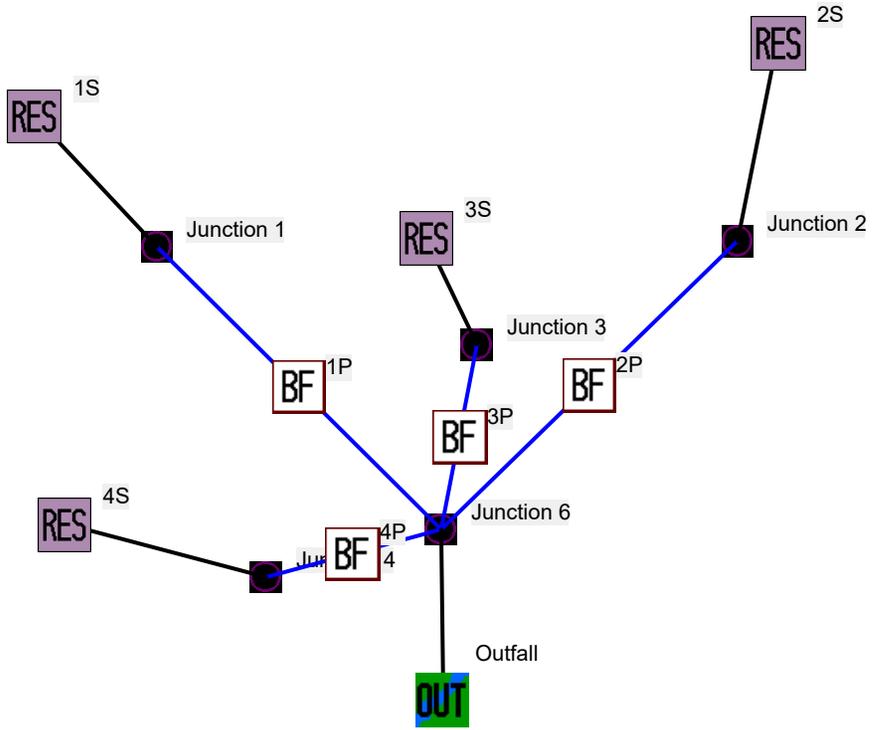
MSE 24-hr 3 100-year Rainfall=6.26"

Printed 5/30/2023

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Hydrograph for Link 1L: PROP Total

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	26.50	4.69	0.00	4.69
0.50	0.00	0.00	0.00	27.00	3.89	0.00	3.89
1.00	0.00	0.00	0.00	27.50	3.15	0.00	3.15
1.50	0.00	0.00	0.00	28.00	2.98	0.00	2.98
2.00	0.00	0.00	0.00	28.50	2.75	0.00	2.75
2.50	0.00	0.00	0.00	29.00	2.51	0.00	2.51
3.00	0.00	0.00	0.00	29.50	2.28	0.00	2.28
3.50	0.00	0.00	0.00	30.00	2.04	0.00	2.04
4.00	0.00	0.00	0.00	30.50	1.81	0.00	1.81
4.50	0.00	0.00	0.00	31.00	1.21	0.00	1.21
5.00	0.00	0.00	0.00	31.50	0.04	0.00	0.04
5.50	0.00	0.00	0.00	32.00	0.01	0.00	0.01
6.00	0.00	0.00	0.00	32.50	0.01	0.00	0.01
6.50	0.00	0.00	0.00	33.00	0.01	0.00	0.01
7.00	0.00	0.00	0.00	33.50	0.01	0.00	0.01
7.50	0.00	0.00	0.00	34.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	34.50	0.00	0.00	0.00
8.50	0.00	0.00	0.00	35.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	35.50	0.00	0.00	0.00
9.50	0.00	0.00	0.00	36.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	36.50	0.00	0.00	0.00
10.50	0.01	0.00	0.01	37.00	0.00	0.00	0.00
11.00	0.54	0.00	0.54	37.50	0.00	0.00	0.00
11.50	2.55	0.00	2.55	38.00	0.00	0.00	0.00
12.00	5.74	0.00	5.74	38.50	0.00	0.00	0.00
12.50	11.66	0.00	11.66	39.00	0.00	0.00	0.00
13.00	11.78	0.00	11.78	39.50	0.00	0.00	0.00
13.50	11.36	0.00	11.36	40.00	0.00	0.00	0.00
14.00	9.79	0.00	9.79	40.50	0.00	0.00	0.00
14.50	9.09	0.00	9.09	41.00	0.00	0.00	0.00
15.00	8.81	0.00	8.81	41.50	0.00	0.00	0.00
15.50	8.71	0.00	8.71	42.00	0.00	0.00	0.00
16.00	8.63	0.00	8.63	42.50	0.00	0.00	0.00
16.50	8.54	0.00	8.54	43.00	0.00	0.00	0.00
17.00	8.46	0.00	8.46	43.50	0.00	0.00	0.00
17.50	8.37	0.00	8.37	44.00	0.00	0.00	0.00
18.00	8.28	0.00	8.28	44.50	0.00	0.00	0.00
18.50	8.18	0.00	8.18	45.00	0.00	0.00	0.00
19.00	8.08	0.00	8.08	45.50	0.00	0.00	0.00
19.50	7.90	0.00	7.90	46.00	0.00	0.00	0.00
20.00	7.70	0.00	7.70	46.50	0.00	0.00	0.00
20.50	7.50	0.00	7.50	47.00	0.00	0.00	0.00
21.00	7.30	0.00	7.30	47.50	0.00	0.00	0.00
21.50	7.09	0.00	7.09	48.00	0.00	0.00	0.00
22.00	6.73	0.00	6.73				
22.50	6.47	0.00	6.47				
23.00	6.28	0.00	6.28				
23.50	6.12	0.00	6.12				
24.00	5.91	0.00	5.91				
24.50	5.63	0.00	5.63				
25.00	5.37	0.00	5.37				
25.50	5.14	0.00	5.14				
26.00	4.91	0.00	4.91				



Data file name: S:\Design & Construction Services\Mandel\490686 Hartland\Stormwater\WinSLAMM\Preliminary Hartland Apartments.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee Five Year Rainfall.ran
Particulate Solids Concentration file name: C:\WinSLAMM Files\w10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/02/66 Study period ending date: 12/29/70
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 05-30-2023 Time: 14:26:18
Site information: Preliminary Hartland Apartments Site

LU# 1 - Residential: 1S Total area (ac): 12.206

1 - Roofs 1: 1.303 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.638 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.291 ac. Disconnected Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.675 ac. Intermediate Street Length = 0.1989 mi Street Width = 27.99774 ft Street Edges = 2
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 3.899 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 4.083 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.317 ac. PSD File: Source Area PSD File:

LU# 2 - Residential: 2S Total area (ac): 14.192

1 - Roofs 1: 1.431 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.611 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.404 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.299 ac. Intermediate Street Length = 0.0771 mi Street Width = 31.99416 ft Street Edges = 1
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 4.036 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 5.850 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.561 ac. PSD File: Source Area PSD File:

LU# 3 - Residential: 3S Total area (ac): 14.232

1 - Roofs 1: 2.033 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 2.731 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.701 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 5.188 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 3.113 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.466 ac. PSD File: Source Area PSD File:

LU# 4 - Residential: 4S Total area (ac): 8.389

1 - Roofs 1: 1.067 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.430 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.460 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.269 ac. Intermediate Street Length = 0.0854 mi Street Width = 25.98653 ft Street Edges = 1
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 3.716 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 1.147 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.300 ac. PSD File: Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - 1P

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 66.78

2. Weir crest width (ft): 10

3. Height from datum to bottom of weir opening: 5.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0166	0.00	0.00
2	1.00	0.0232	0.00	0.00
3	2.00	0.0306	0.00	0.00
4	3.00	0.0387	0.00	0.00
5	4.00	0.0477	0.00	0.00
6	5.00	0.1043	0.00	0.00
7	6.00	0.3508	0.00	0.00
8	7.00	0.4193	0.00	0.00
9	8.00	0.4902	0.00	0.00
10	9.00	0.5634	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - 2P

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 90.73

2. Weir crest width (ft): 10

3. Height from datum to bottom of weir opening: 5.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0179	0.00	0.00
2	1.00	0.0311	0.00	0.00
3	2.00	0.0450	0.00	0.00
4	3.00	0.0597	0.00	0.00
5	4.00	0.0752	0.00	0.00
6	5.00	0.1620	0.00	0.00
7	6.00	0.6034	0.00	0.00
8	7.00	0.6613	0.00	0.00
9	8.00	0.7215	0.00	0.00
10	9.00	0.7840	0.00	0.00

Control Practice 3: Wet Detention Pond CP# 3 (DS) - 3P

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 46.62

2. Weir crest width (ft): 10

3. Height from datum to bottom of weir opening: 5.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0548	0.00	0.00
2	1.00	0.0641	0.00	0.00
3	2.00	0.0740	0.00	0.00
4	3.00	0.0846	0.00	0.00
5	4.00	0.0956	0.00	0.00
6	5.00	0.1597	0.00	0.00
7	5.50	0.4958	0.00	0.00
8	6.00	0.5567	0.00	0.00
9	7.00	0.6198	0.00	0.00
10	8.00	0.6852	0.00	0.00

Data file name: S:\Design & Construction Services\Mandel\490686 Hartland\Stormwater\WinSLAMM\Preliminary Hartland Apartments.mdb
WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee Five Year Rainfall.ran

Particulate Solids Concentration file name: C:\WinSLAMM Files\10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdX
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/02/66 Study period ending date: 12/29/70
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 05-30-2023 Time: 14:27:39
Site information: Preliminary Hartland Apartments Site

LU# 1 - Residential: 1S Total area (ac): 12.206

1 - Roofs 1: 1.303 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.638 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.291 ac. Disconnected Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.675 ac. Intermediate Street Length = 0.1989 mi Street Width = 27.99774 ft Street Edges = 2
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 3.899 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 4.083 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.317 ac. PSD File: Source Area PSD File:

LU# 2 - Residential: 2S Total area (ac): 14.192

1 - Roofs 1: 1.431 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.611 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.404 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.299 ac. Intermediate Street Length = 0.0771 mi Street Width = 31.99416 ft Street Edges = 1
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 4.036 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 5.850 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.561 ac. PSD File: Source Area PSD File:

LU# 3 - Residential: 3S Total area (ac): 14.232

1 - Roofs 1: 2.033 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 2.731 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.701 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 5.188 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 3.113 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.466 ac. PSD File: Source Area PSD File:

LU# 4 - Residential: 4S Total area (ac): 8.389

1 - Roofs 1: 1.067 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.430 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.460 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.269 ac. Intermediate Street Length = 0.0854 mi Street Width = 25.98653 ft Street Edges = 1
Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 3.716 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
57 - Undeveloped Areas 1: 1.147 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.300 ac. PSD File: Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - 1P

Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 5
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 66.78
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 5.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0166	0.00	0.00
2	1.00	0.0232	0.00	0.00
3	2.00	0.0306	0.00	0.00
4	3.00	0.0387	0.00	0.00
5	4.00	0.0477	0.00	0.00
6	5.00	0.1043	0.00	0.00
7	6.00	0.3508	0.00	0.00
8	7.00	0.4193	0.00	0.00
9	8.00	0.4902	0.00	0.00
10	9.00	0.5634	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - 2P

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 90.73
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 5.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0179	0.00	0.00
2	1.00	0.0311	0.00	0.00
3	2.00	0.0450	0.00	0.00
4	3.00	0.0597	0.00	0.00
5	4.00	0.0752	0.00	0.00
6	5.00	0.1620	0.00	0.00
7	6.00	0.6034	0.00	0.00
8	7.00	0.6613	0.00	0.00
9	8.00	0.7215	0.00	0.00
10	9.00	0.7840	0.00	0.00

Control Practice 3: Wet Detention Pond CP# 3 (DS) - 3P

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 46.62
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 5.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0548	0.00	0.00
2	1.00	0.0641	0.00	0.00
3	2.00	0.0740	0.00	0.00
4	3.00	0.0846	0.00	0.00
5	4.00	0.0956	0.00	0.00
6	5.00	0.1597	0.00	0.00
7	5.50	0.4958	0.00	0.00
8	6.00	0.5567	0.00	0.00
9	7.00	0.6198	0.00	0.00
10	8.00	0.6852	0.00	0.00

Data file name: S:\Design & Construction Services\Mandel\490686 Hartland\Stormwater\WinSLAMM\Preliminary Hartland Apartments.mdb
WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee Five Year Rainfall.ran

Particulate Solids Concentration file name: C:\WinSLAMM Files\w10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/02/66 Study period ending date: 12/29/70

Start of Winter Season: 12/02 End of Winter Season: 03/12

Model Run Start Date: 01/02/66 Model Run End Date: 12/29/70

Date of run: 05-30-2023 Time of run: 14:08:06

Total Area Modeled (acres): 49.019

Years in Model Run: 4.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	6.589E+06	-	89.70	36894	-
Outfall Total with Controls:	6.552E+06	0.56%	22.37	9149	75.20%
Annualized Total After Outfall Controls:	1.313E+06			1833	

Pollutant	Conc. No Controls	Conc. With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units	Percent Reduction
Particulate Solids	89.70	22.37	mg/L	36894	9149	lbs	75.20 %
Total Phosphorus	0.3198	0.1451	mg/L	131.6	59.35	lbs	54.90 %

Biofilter # 1 is expected to clog in 21.91 years.. Percent Solids Reduction due to Engineered Media = 80