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**DRAINAGE REPORT**

for

**RICE POND VILLAGE**  
**A PROPOSED RESIDENTIAL DEVELOPMENT**  
**AT 17 RICE ROAD, MILLBURY**

MARCH 26, 2021  
REVISED SEPTEMBER 3, 2021



*James I. Tetreault*  
9/3/2021

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AZIMUTH LAND DESIGN, LLC  
325 Donald Lynch Boulevard, Suite 100, Marlborough, MA 01572 (508) 485-0137

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## INTRODUCTION

The proposed Rice Pond Village development is a condominium development of 23 duplexes, 46 total units, at 17 Rice Road in Millbury. The site has an area of 15.6 acres and contains one single family home, a garage and pool area with a large lawn around it but is otherwise undeveloped and wooded.

The topography of the site is defined by a ridge in the middle of the site which separates areas sloping downward to the northeast to the abutting Providence & Worcester Railroad property from areas sloping downward to the southwesterly side of the property to an existing unnamed pond.

The pond receives overland runoff from this and also abutters to the south of this property, having frontage on Rice Road, and also runoff from some 58 acres of the residential areas south of South Main Street.

A copy of the Web Soil Survey by NRCS is included at the back of this Report and it shows that soils on site are almost all Merrimac series soils categorized as hydrologic soil group A soils. We have excavated some official deep observation holes on site and, at several of these, observed soils had a sandy loam texture inconsistent with that mapping. Nevertheless, this report makes the conservative assumption that that mapping is correct.

There is a small area of Scarboro & Walpole series soils categorized as hydrologic soil group D soils immediately south of the unnamed pond.

There is also a small area of Canton series soils categorized as hydrologic soil group B soils at the southwesterly corner of the property and the entirety of the above referenced offsite drainage area lies over hydrologic soil group B soils, mostly Canton series soils.

Because wooded cover is being converted to lawn and landscaped areas, paved driveways and roofs, the rate of stormwater runoff from the site would increase if no measures were taken to prevent it.

Except for the first 62 feet of the new private road, Hillcrest Circle, all of the runoff from the new road will be collected by the site's drainage system and directed through a CDS model 2025 stormwater filtration unit and then into an infiltration structure off the side of station 10+50 of Hillcrest Circle.

This infiltration structure will be located in an area where the observed soil texture was a sand and where there was greater than 9 foot depth to possible seasonal high groundwater. The structure will cover an area measuring 118 feet by 52 feet, and will be a total of 8.5 feet deep. Within double washed, crushed stone, we will install 1,216 Storm Tank 25 series modules measuring 3 feet long, 1.5 feet wide and 6 feet deep.

This structure will accept all the runoff collected from even the 100 year storm event without piped outflow.

In addition to this structure, 15 of the 23 proposed duplexes will send all or part of their roof runoff to individual infiltration structures the dimensions of which are shown on detail sheet D3 of the Site Plans.

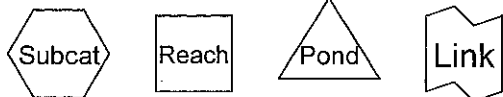
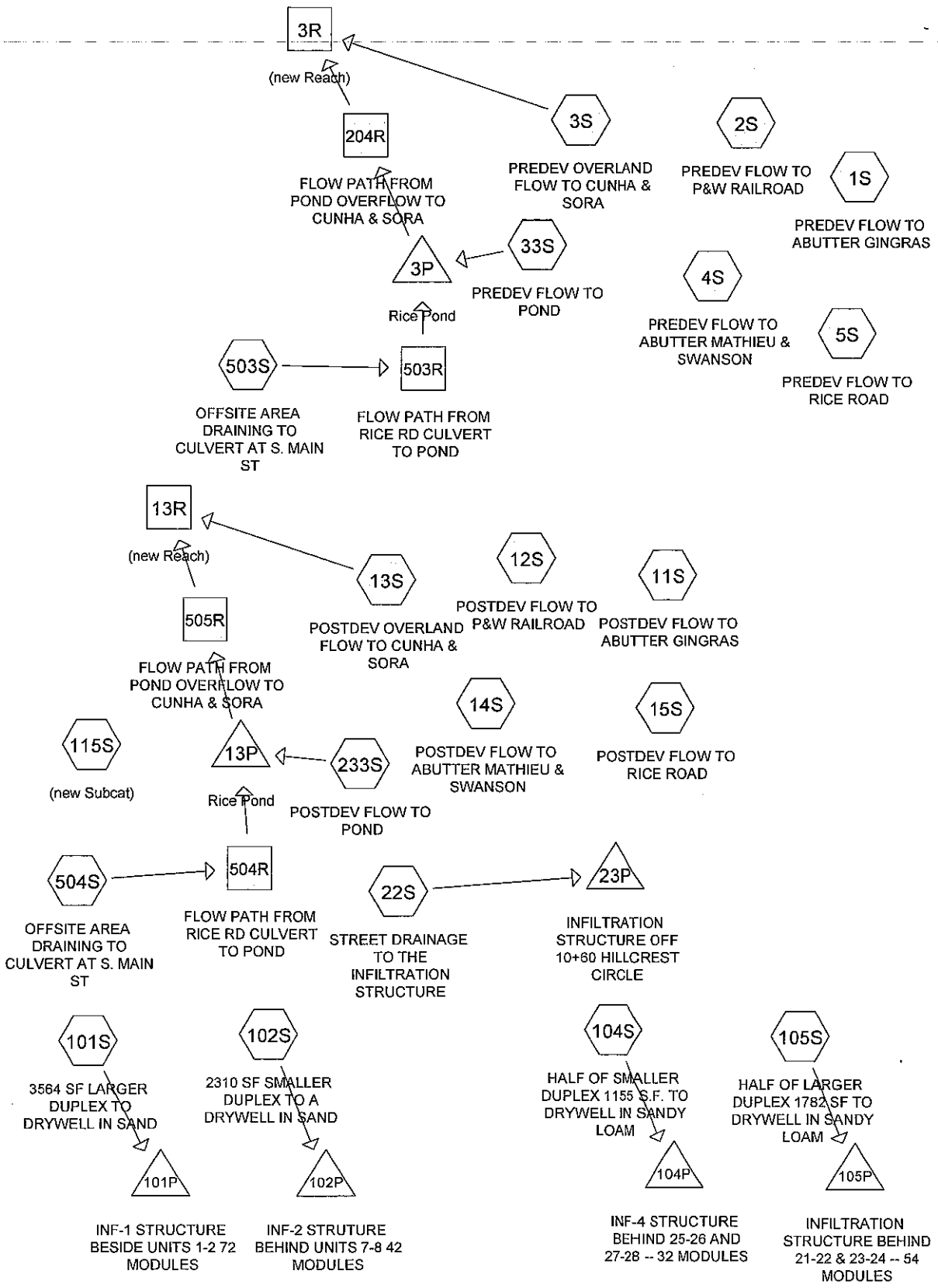
The body of this report contains the results of drainage calculations performed for the predevelopment and postdevelopment conditions during 2, 10, 25 and 100 year return frequency type III storm events. The 24 hour rainfalls associated with these storms are 3.15, 4.70, 5.90 and 8.35 inches respectively. Calculations were made using the HydroCAD stormwater modeling program. This program calculates hydrographs using a method very similar to that outlined in the Soil Conservation Service Technical Release Number 20 (TR-20). HydroCAD uses the TR-20 "curve number" evaluations of ground cover and the same times of concentration.

In calculating runoff, we have made certain assumptions. We assume that the maximum distance over which sheet flow will occur is 50 feet.

The following table compares the peak predevelopment and postdevelopment flows of stormwater at the design point:

#### DESIGN POINT

	PEAK FLOW RATE (in cfs)			
	2 yr storm	10 yr storm	25 yr storm	100 yr storm
Abutter Gingras property line				
Subcat #1 pre	0.00 pre	0.00 pre	0.02 pre	0.21 pre
Subcat #11 post	0.00	0.00	0.01	0.10
Providence & Worcester railroad property line				
Subcat #2 pre	0.00 pre	0.01	0.10 pre	1.63 pre
Subcat #12 post	0.00	0.01	0.06	0.80
Abutter Cunha & Sora property line				
Reach #3 pre	20.17 pre	57.61 pre	91.16 pre	166.14 pre
Reach #13 post	20.14	56.95	89.80	163.01
Abutter Mathieu & Swanson property line				
Subcat #4 pre	0.00 pre	0.00 pre	0.00 pre	0.08 pre
Subcat #14 post	0.00	0.00	0.03	0.35
Rice Road right of way line				
Subcat #5 pre	0.00 pre	0.06 pre	0.31 pre	1.61 pre
Subcat #15 post	0.00	0.05	0.20	0.97



**Routing Diagram for Rice Pond Village Millbury CURRENT**  
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2 YEAR STORM

**Summary for Subcatchment 1S: PREDEV FLOW TO ABUTTER GINGRAS**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
6,858	30	Woods, Good, HSG A
10,008	39	>75% Grass cover, Good, HSG A
16,866	35	Weighted Average
16,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.1000	0.19		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.9	100	0.1400	1.87		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
5.2	150	Total			

**Summary for Subcatchment 2S: PREDEV FLOW TO P&W RAILROAD**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
179,428	30	Woods, Good, HSG A
35,859	39	>75% Grass cover, Good, HSG A
3,896	98	Paved parking, HSG A
219,183	33	Weighted Average
215,287		98.22% Pervious Area
3,896		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.9	91	0.1200	1.73		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	197	0.1060	4.99	14.98	<b>Channel Flow,</b> Area= 3.0 sf Perim= 4.0' r= 0.75' n= 0.080 Earth, long dense weeds
11.0	338	Total			

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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**Summary for Subcatchment 3S: PREDEV OVERLAND FLOW TO CUNHA & SORA**

[73] Warning: Peak may fall outside time span

Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
148,793	30	Woods, Good, HSG A
30,807	98	Water Surface, HSG A
179,600	42	Weighted Average
148,793		82.85% Pervious Area
30,807		17.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			

**Summary for Subcatchment 4S: PREDEV FLOW TO ABUTTER MATHIEU & SWANSON**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
21,387	30	Woods, Good, HSG A
21,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1200	0.08		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.4	57	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
11.0	107	Total			

**Summary for Subcatchment 5S: PREDEV FLOW TO RICE ROAD**

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
22,350	30	Woods, Good, HSG A
30,632	39	>75% Grass cover, Good, HSG A
* 5,307	98	Existing roof and driveway
58,289	41	Weighted Average
52,982		90.90% Pervious Area
5,307		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.15"
3.7	212	0.0370	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.0	262	Total			

**Summary for Subcatchment 11S: POSTDEV FLOW TO ABUTTER GINGRAS**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
4,550	39	>75% Grass cover, Good, HSG A
6,450	30	Woods, Good, HSG A
11,000	34	Weighted Average
11,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1100	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	52	0.1600	2.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	102	Total			



**Summary for Subcatchment 12S: POSTDEV FLOW TO P&W RAILROAD**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
30,602	30	Woods, Good, HSG A
47,804	39	>75% Grass cover, Good, HSG A
78,406	35	Weighted Average
78,406		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	50	0.0600	0.06		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.15"
0.9	109	0.1500	1.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.8	159	Total			

**Summary for Subcatchment 13S: POSTDEV OVERLAND FLOW TO CUNHA & SORA**

[73] Warning: Peak may fall outside time span

Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.003 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
* 1,870	98	Back of units 17 & 18
30,807	98	Water Surface, HSG A
7,459	39	>75% Grass cover, Good, HSG A
137,688	30	Woods, Good, HSG A
177,824	43	Weighted Average
145,147		81.62% Pervious Area
32,677		18.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	Channel Flow, Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides

29.1 636 Total

**Summary for Subcatchment 14S: POSTDEV FLOW TO ABUTTER MATHIEU & SWANSON**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
10,950	30	Woods, Good, HSG A
16,798	39	>75% Grass cover, Good, HSG A
27,748	35	Weighted Average
27,748		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0600	0.23		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.15"
0.5	83	0.0400	3.00		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.4	44	0.1300	1.80		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
4.6	177	Total			

**Summary for Subcatchment 15S: POSTDEV FLOW TO RICE ROAD**

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
2,537	98	Paved parking, HSG A
6,015	30	Woods, Good, HSG A
24,458	39	>75% Grass cover, Good, HSG A
33,010	42	Weighted Average
30,473		92.31% Pervious Area
2,537		7.69% Impervious Area

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
1.9	119	0.0050	1.06		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
10.2	169	Total			

**Summary for Subcatchment 22S: STREET DRAINAGE TO THE INFILTRATION STRUCTURE**

Runoff = 4.20 cfs @ 12.16 hrs, Volume= 0.335 af, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
52,472	39	>75% Grass cover, Good, HSG A
* 101,970	98	Drive, driveways & roofs HSG A
154,442	78	Weighted Average
52,472		33.98% Pervious Area
101,970		66.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.2	20	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.1	21	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
11.2	91	Total			

**Summary for Subcatchment 33S: PREDEV FLOW TO POND**

Runoff = 1.65 cfs @ 12.33 hrs, Volume= 0.220 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
71,225	39	>75% Grass cover, Good, HSG A
49,927	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
313,497	61	Weighted Average
250,155		79.80% Pervious Area
63,342		20.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0900	0.07		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
3.9	242	0.0430	1.04		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.8	292	Total			

**Summary for Subcatchment 101S: 3564 SF LARGER DUPLEX TO DRYWELL IN SAND**

Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.019 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
3,564	98	Unconnected roofs, HSG A
3,564		100.00% Impervious Area
3,564		100.00% Unconnected

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

**Summary for Subcatchment 102S: 2310 SF SMALLER DUPLEX TO A DRYWELL IN SAND**

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.012 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

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Type III 24-hr 2 YR STORM Rainfall=3.15"

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Area (sf)	CN	Description
2,310	98	Roofs, HSG A
2,310		100.00% Impervious Area

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

**Summary for Subcatchment 104S: HALF OF SMALLER DUPLEX 1155 S.F. TO DRYWELL IN SANDY LOAM**

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
1,155	98	Unconnected roofs, HSG A
1,155		100.00% Impervious Area
1,155		100.00% Unconnected

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

**Summary for Subcatchment 105S: HALF OF LARGER DUPLEX 1782 SF TO DRYWELL IN SANDY LOAM**

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.009 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
1,782	98	Unconnected pavement, HSG A
1,782		100.00% Impervious Area
1,782		100.00% Unconnected

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

**Summary for Subcatchment 115S: (new Subcat)**

Runoff = 2.06 cfs @ 12.18 hrs, Volume= 0.225 af, Depth> 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Area (sf)	CN	Description
* 292,180	62	DIRECT INPUT
292,180		100.00% Pervious Area

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

**Summary for Subcatchment 233S: POSTDEV FLOW TO POND**

Runoff = 2.08 cfs @ 12.18 hrs, Volume= 0.225 af, Depth> 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
4,379	39	>75% Grass cover, Good, HSG A
24,995	39	>75% Grass cover, Good, HSG A
31,725	39	>75% Grass cover, Good, HSG A
38,736	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
292,180	62	Weighted Average
228,838		78.32% Pervious Area
63,342		21.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.15"
0.5	83	0.0400	3.00		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
3.8	212	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.3	345	Total			

**Summary for Subcatchment 503S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 23.92 cfs @ 12.63 hrs, Volume= 3.455 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		Lag/CN Method,

**Summary for Subcatchment 504S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 23.92 cfs @ 12.63 hrs, Volume= 3.455 af, Depth&gt; 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2 YR STORM Rainfall=3.15"

Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		Lag/CN Method,

**Summary for Reach 3R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.880 ac, 24.04% Impervious, Inflow Depth > 0.59" for 2 YR STORM event  
Inflow = 20.17 cfs @ 13.10 hrs, Volume= 3.420 af  
Outflow = 20.17 cfs @ 13.10 hrs, Volume= 3.420 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 13R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.350 ac, 24.29% Impervious, Inflow Depth > 0.59" for 2 YR STORM event  
Inflow = 20.14 cfs @ 13.10 hrs, Volume= 3.427 af  
Outflow = 20.14 cfs @ 13.10 hrs, Volume= 3.427 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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**Summary for Reach 204R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

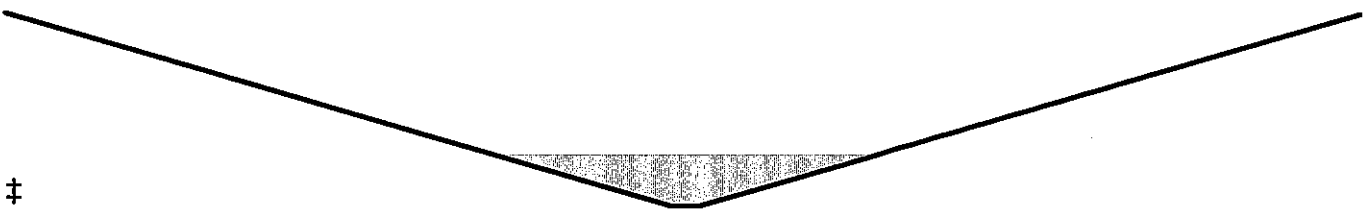
[79] Warning: Submerged Pond 3P Primary device # 1 by 0.41'

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 0.63" for 2 YR STORM event  
Inflow = 20.56 cfs @ 12.94 hrs, Volume= 3.454 af  
Outflow = 20.17 cfs @ 13.10 hrs, Volume= 3.419 af, Atten= 2%, Lag= 9.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Max. Velocity= 1.76 fps, Min. Travel Time= 5.2 min  
Avg. Velocity = 1.18 fps, Avg. Travel Time= 7.8 min

Peak Storage= 6,286 cf @ 13.01 hrs  
Average Depth at Peak Storage= 0.81' , Surface Width= 26.33'  
Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
Side Slope Z-value= 15.0 ' / ' Top Width= 92.00'  
Length= 547.0' Slope= 0.0068 ' / '  
Inlet Invert= 389.50', Outlet Invert= 385.80'



**Summary for Reach 503R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 0.71" for 2 YR STORM event  
Inflow = 23.92 cfs @ 12.63 hrs, Volume= 3.455 af  
Outflow = 23.72 cfs @ 12.72 hrs, Volume= 3.436 af, Atten= 1%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Max. Velocity= 3.36 fps, Min. Travel Time= 3.0 min  
Avg. Velocity = 2.02 fps, Avg. Travel Time= 5.0 min

Peak Storage= 4,300 cf @ 12.67 hrs  
Average Depth at Peak Storage= 0.76' , Surface Width= 16.51'  
Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
Side Slope Z-value= 14.0 5.0 ' / ' Top Width= 59.00'  
Length= 608.0' Slope= 0.0255 ' / '  
Inlet Invert= 405.50', Outlet Invert= 390.00'





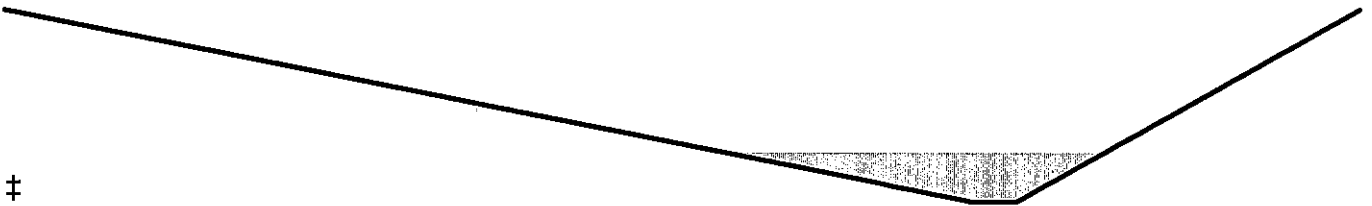
**Summary for Reach 504R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 0.71" for 2 YR STORM event  
 Inflow = 23.92 cfs @ 12.63 hrs, Volume= 3.455 af  
 Outflow = 23.72 cfs @ 12.72 hrs, Volume= 3.436 af, Atten= 1%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 3.36 fps, Min. Travel Time= 3.0 min  
 Avg. Velocity = 2.02 fps, Avg. Travel Time= 5.0 min

Peak Storage= 4,300 cf @ 12.67 hrs  
 Average Depth at Peak Storage= 0.76' , Surface Width= 16.51'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 ' / ' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 ' / '  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



**Summary for Reach 505R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

[79] Warning: Submerged Pond 13P Primary device # 1 by 0.41'

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 0.64" for 2 YR STORM event  
 Inflow = 20.52 cfs @ 12.94 hrs, Volume= 3.458 af  
 Outflow = 20.14 cfs @ 13.10 hrs, Volume= 3.424 af, Atten= 2%, Lag= 9.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 1.75 fps, Min. Travel Time= 5.2 min  
 Avg. Velocity = 1.17 fps, Avg. Travel Time= 7.8 min

Peak Storage= 6,279 cf @ 13.01 hrs  
 Average Depth at Peak Storage= 0.81' , Surface Width= 26.32'  
 Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

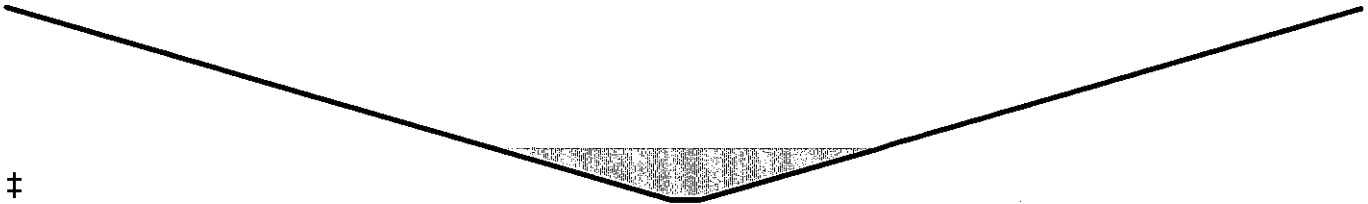
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2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 15.0 ' Top Width= 92.00'  
 Length= 547.0' Slope= 0.0068 '  
 Inlet Invert= 389.50', Outlet Invert= 385.80'



‡

**Summary for Pond 3P: Rice Pond**

[62] Hint: Exceeded Reach 503R OUTLET depth by 0.01' @ 13.28 hrs

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 0.67" for 2 YR STORM event  
 Inflow = 24.58 cfs @ 12.71 hrs, Volume= 3.656 af  
 Outflow = 20.56 cfs @ 12.94 hrs, Volume= 3.454 af, Atten= 16%, Lag= 13.7 min  
 Primary = 20.56 cfs @ 12.94 hrs, Volume= 3.454 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 390.64' @ 12.94 hrs Surf.Area= 40,277 sf Storage= 26,377 cf

Plug-Flow detention time= 38.7 min calculated for 3.454 af (94% of inflow)  
 Center-of-Mass det. time= 21.3 min ( 881.6 - 860.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)

Primary OutFlow Max=20.53 cfs @ 12.94 hrs HW=390.64' (Free Discharge)  
 ↑—1=Sharp-Crested Vee/Trap Weir (Weir Controls 20.53 cfs @ 2.21 fps)

**Summary for Pond 13P: Rice Pond**

[62] Hint: Exceeded Reach 504R OUTLET depth by 0.01' @ 13.28 hrs

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 0.67" for 2 YR STORM event  
 Inflow = 24.38 cfs @ 12.72 hrs, Volume= 3.661 af  
 Outflow = 20.52 cfs @ 12.94 hrs, Volume= 3.458 af, Atten= 16%, Lag= 13.3 min  
 Primary = 20.52 cfs @ 12.94 hrs, Volume= 3.458 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 390.64' @ 12.94 hrs Surf.Area= 40,266 sf Storage= 26,356 cf

Plug-Flow detention time= 38.6 min calculated for 3.451 af (94% of inflow)  
 Center-of-Mass det. time= 21.4 min ( 881.1 - 859.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	<b>171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir</b> Cv= 2.46 (C= 3.08)

**Primary OutFlow** Max=20.50 cfs @ 12.94 hrs HW=390.64' (Free Discharge)  
 ↳1=Sharp-Crested Vee/Trap Weir (Weir Controls 20.50 cfs @ 2.21 fps)

**Summary for Pond 23P: INFILTRATION STRUCTURE OFF 10+60 HILLCREST CIRCLE**

Inflow Area = 3.546 ac, 66.02% Impervious, Inflow Depth > 1.13" for 2 YR STORM event  
 Inflow = 4.20 cfs @ 12.16 hrs, Volume= 0.335 af  
 Outflow = 1.17 cfs @ 11.99 hrs, Volume= 0.335 af, Atten= 72%, Lag= 0.0 min  
 Discarded = 1.17 cfs @ 11.99 hrs, Volume= 0.335 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 375.43' @ 12.62 hrs Surf.Area= 6,136 sf Storage= 3,579 cf

Plug-Flow detention time= 20.1 min calculated for 0.335 af (100% of inflow)  
 Center-of-Mass det. time= 19.6 min ( 832.8 - 813.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	374.50'	7,730 cf	<b>118'X52' OUTSIDE OF STONE (Prismatic)</b> Listed below (Recalc) 52,156 cf Overall - 32,832 cf Embedded = 19,324 cf x 40.0% Voids
#2	375.00'	30,894 cf	<b>StormTank 25 Series 72"</b> x 1216 Inside #1 Inside= 18.0"W x 72.0"H => 8.73 sf x 3.00'L = 26.2 cf Outside= 18.0"W x 72.0"H => 9.00 sf x 3.00'L = 27.0 cf 1216 Chambers in 32 Rows 32,832 cf Overall x 97.0% Voids
		38,623 cf	Total Available Storage

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
374.50	6,136	0	0
383.00	6,136	52,156	52,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	374.50'	<b>8.270 in/hr Exfiltration over Surface area</b>

Discarded OutFlow Max=1.17 cfs @ 11.99 hrs HW=374.60' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 1.17 cfs)

**Summary for Pond 101P: INF-1 STRUCTURE BESIDE UNITS 1-2 72 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.082 ac, 100.00% Impervious, Inflow Depth > 2.73" for 2 YR STORM event  
 Inflow = 0.26 cfs @ 12.07 hrs, Volume= 0.019 af  
 Outflow = 0.08 cfs @ 11.84 hrs, Volume= 0.019 af, Atten= 70%, Lag= 0.0 min  
 Discarded = 0.08 cfs @ 11.84 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 395.66' @ 12.37 hrs Surf.Area= 406 sf Storage= 132 cf

Plug-Flow detention time= 8.3 min calculated for 0.019 af (100% of inflow)  
 Center-of-Mass det. time= 8.1 min ( 746.0 - 737.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	395.00'	374 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 1,421 cf Overall - 486 cf Embedded = 935 cf x 40.0% Voids
#2	395.50'	445 cf	<b>StormTank 25 Series 18"</b> x 72 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 72 Chambers in 8 Rows 486 cf Overall x 96.0% Voids
		819 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
395.00	406	0	0
398.50	406	1,421	1,421

Device	Routing	Invert	Outlet Devices
#1	Discarded	395.00'	<b>8.270 in/hr Exfiltration over Surface area</b>

Discarded OutFlow Max=0.08 cfs @ 11.84 hrs HW=395.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.08 cfs)

**Summary for Pond 102P: INF-2 STRUTURE BEHIND UNITS 7-8 42 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.053 ac, 100.00% Impervious, Inflow Depth > 2.73" for 2 YR STORM event  
 Inflow = 0.17 cfs @ 12.07 hrs, Volume= 0.012 af  
 Outflow = 0.05 cfs @ 11.81 hrs, Volume= 0.012 af, Atten= 71%, Lag= 0.0 min  
 Discarded = 0.05 cfs @ 11.81 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 396.70' @ 12.38 hrs Surf.Area= 253 sf Storage= 90 cf

Plug-Flow detention time= 9.1 min calculated for 0.012 af (100% of inflow)  
 Center-of-Mass det. time= 8.9 min ( 746.8 - 737.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	241 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 886 cf Overall - 284 cf Embedded = 602 cf x 40.0% Voids
#2	396.50'	260 cf	<b>StormTank 25 Series 18"</b> x 42 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 42 Chambers in 6 Rows 284 cf Overall x 96.0% Voids
		500 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	253	0	0
399.50	253	886	886

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	<b>8.270 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.05 cfs @ 11.81 hrs HW=396.04' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

**Summary for Pond 104P: INF-4 STRUTURE BEHIND 25-26 AND 27-28 -- 32 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.027 ac, 100.00% Impervious, Inflow Depth > 2.73" for 2 YR STORM event  
 Inflow = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af  
 Outflow = 0.01 cfs @ 11.24 hrs, Volume= 0.006 af, Atten= 93%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 11.24 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 379.03' @ 13.12 hrs Surf.Area= 256 sf Storage= 109 cf

Plug-Flow detention time= 145.7 min calculated for 0.006 af (92% of inflow)  
 Center-of-Mass det. time= 117.8 min ( 855.7 - 737.9 )

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Volume	Invert	Avail.Storage	Storage Description
#1	378.00'	250 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 896 cf Overall - 270 cf Embedded = 626 cf x 40.0% Voids
#2	379.00'	247 cf	<b>StormTank 25 Series 18" x 40</b> Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 40 Chambers in 4 Rows 270 cf Overall x 96.0% Voids
		498 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
378.00	256	0	0
381.50	256	896	896

Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 11.24 hrs HW=378.04' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Summary for Pond 105P: INFILTRATION STRUCTURE BEHIND 21-22 & 23-24 -- 54 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.041 ac, 100.00% Impervious, Inflow Depth > 2.73" for 2 YR STORM event  
 Inflow = 0.13 cfs @ 12.07 hrs, Volume= 0.009 af  
 Outflow = 0.01 cfs @ 11.18 hrs, Volume= 0.008 af, Atten= 93%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 11.18 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 379.80' @ 13.19 hrs Surf.Area= 385 sf Storage= 170 cf

Plug-Flow detention time= 149.1 min calculated for 0.008 af (90% of inflow)  
 Center-of-Mass det. time= 116.2 min ( 854.1 - 737.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	379.00'	361 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 1,348 cf Overall - 446 cf Embedded = 902 cf x 40.0% Voids
#2	379.50'	408 cf	<b>StormTank 25 Series 18" x 66</b> Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 66 Chambers in 6 Rows 446 cf Overall x 96.0% Voids
		769 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.00	385	0	0
382.50	385	1,348	1,348

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 2 YR STORM Rainfall=3.15"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	379.00'	<b>1.020 in/hr Exfiltration over Surface area</b>

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**Discarded OutFlow** Max=0.01 cfs @ 11.18 hrs HW=379.04' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.01 cfs)

10 YEAR STORM



**Summary for Subcatchment 1S: PREDEV FLOW TO ABUTTER GINGRAS**

Runoff = 0.00 cfs @ 15.62 hrs, Volume= 0.001 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
6,858	30	Woods, Good, HSG A
10,008	39	>75% Grass cover, Good, HSG A
16,866	35	Weighted Average
16,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.1000	0.19		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.9	100	0.1400	1.87		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
5.2	150	Total			

**Summary for Subcatchment 2S: PREDEV FLOW TO P&W RAILROAD**

[73] Warning: Peak may fall outside time span

Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.004 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
179,428	30	Woods, Good, HSG A
35,859	39	>75% Grass cover, Good, HSG A
3,896	98	Paved parking, HSG A
219,183	33	Weighted Average
215,287		98.22% Pervious Area
3,896		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.9	91	0.1200	1.73		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	197	0.1060	4.99	14.98	<b>Channel Flow,</b> Area= 3.0 sf Perim= 4.0' r= 0.75' n= 0.080 Earth, long dense weeds
11.0	338	Total			

**Summary for Subcatchment 3S: PREDEV OVERLAND FLOW TO CUNHA & SORA**

Runoff = 0.19 cfs @ 12.82 hrs, Volume= 0.065 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
148,793	30	Woods, Good, HSG A
30,807	98	Water Surface, HSG A
179,600	42	Weighted Average
148,793		82.85% Pervious Area
30,807		17.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			

**Summary for Subcatchment 4S: PREDEV FLOW TO ABUTTER MATHIEU & SWANSON**

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
21,387	30	Woods, Good, HSG A
21,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1200	0.08		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.4	57	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
11.0	107	Total			

**Summary for Subcatchment 5S: PREDEV FLOW TO RICE ROAD**

Runoff = 0.06 cfs @ 12.50 hrs, Volume= 0.018 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
22,350	30	Woods, Good, HSG A
30,632	39	>75% Grass cover, Good, HSG A
* 5,307	98	Existing roof and driveway
58,289	41	Weighted Average
52,982		90.90% Pervious Area
5,307		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
3.7	212	0.0370	0.96		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.0	262	Total			

**Summary for Subcatchment 11S: POSTDEV FLOW TO ABUTTER GINGRAS**

Runoff = 0.00 cfs @ 17.14 hrs, Volume= 0.000 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
4,550	39	>75% Grass cover, Good, HSG A
6,450	30	Woods, Good, HSG A
11,000	34	Weighted Average
11,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1100	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	52	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.7	102	Total			

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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**Summary for Subcatchment 12S: POSTDEV FLOW TO P&W RAILROAD**

Runoff = 0.01 cfs @ 15.77 hrs, Volume= 0.005 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
30,602	30	Woods, Good, HSG A
47,804	39	>75% Grass cover, Good, HSG A
78,406	35	Weighted Average
78,406		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	50	0.0600	0.06		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.9	109	0.1500	1.94		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.8	159	Total			

**Summary for Subcatchment 13S: POSTDEV OVERLAND FLOW TO CUNHA & SORA**

Runoff = 0.25 cfs @ 12.76 hrs, Volume= 0.075 af, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
* 1,870	98	Back of units 17 & 18
30,807	98	Water Surface, HSG A
7,459	39	>75% Grass cover, Good, HSG A
137,688	30	Woods, Good, HSG A
177,824	43	Weighted Average
145,147		81.62% Pervious Area
32,677		18.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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**Summary for Subcatchment 14S: POSTDEV FLOW TO ABUTTER MATHIEU & SWANSON**

Runoff = 0.00 cfs @ 15.61 hrs, Volume= 0.002 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
10,950	30	Woods, Good, HSG A
16,798	39	>75% Grass cover, Good, HSG A
27,748	35	Weighted Average
27,748		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0600	0.23		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.15"
0.5	83	0.0400	3.00		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.4	44	0.1300	1.80		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
4.6	177	Total			

**Summary for Subcatchment 15S: POSTDEV FLOW TO RICE ROAD**

Runoff = 0.05 cfs @ 12.49 hrs, Volume= 0.012 af, Depth> 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
2,537	98	Paved parking, HSG A
6,015	30	Woods, Good, HSG A
24,458	39	>75% Grass cover, Good, HSG A
33,010	42	Weighted Average
30,473		92.31% Pervious Area
2,537		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
1.9	119	0.0050	1.06		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
10.2	169	Total			

**Summary for Subcatchment 22S: STREET DRAINAGE TO THE INFILTRATION STRUCTURE**

Runoff = 8.56 cfs @ 12.16 hrs, Volume= 0.675 af, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
52,472	39	>75% Grass cover, Good, HSG A
* 101,970	98	Drive, driveways & roofs HSG A
154,442	78	Weighted Average
52,472		33.98% Pervious Area
101,970		66.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.2	20	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.1	21	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
11.2	91	Total			

**Summary for Subcatchment 33S: PREDEV FLOW TO POND**

Runoff = 6.55 cfs @ 12.24 hrs, Volume= 0.642 af, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
71,225	39	>75% Grass cover, Good, HSG A
49,927	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
313,497	61	Weighted Average
250,155		79.80% Pervious Area
63,342		20.20% Impervious Area

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0900	0.07		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
3.9	242	0.0430	1.04		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.8	292	Total			

**Summary for Subcatchment 101S: 3564 SF LARGER DUPLEX TO DRYWELL IN SAND**

Runoff = 0.39 cfs @ 12.07 hrs, Volume= 0.028 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
3,564	98	Unconnected roofs, HSG A
3,564		100.00% Impervious Area
3,564		100.00% Unconnected

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

**Summary for Subcatchment 102S: 2310 SF SMALLER DUPLEX TO A DRYWELL IN SAND**

Runoff = 0.25 cfs @ 12.07 hrs, Volume= 0.018 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
2,310	98	Roofs, HSG A
2,310		100.00% Impervious Area

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

**Summary for Subcatchment 104S: HALF OF SMALLER DUPLEX 1155 S.F. TO DRYWELL IN SANDY LOA**

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.009 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Area (sf)	CN	Description
1,155	98	Unconnected roofs, HSG A
1,155		100.00% Impervious Area
1,155		100.00% Unconnected

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

**Summary for Subcatchment 105S: HALF OF LARGER DUPLEX 1782 SF TO DRYWELL IN SANDY LOAM**

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.014 af, Depth> 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
1,782	98	Unconnected pavement, HSG A
1,782		100.00% Impervious Area
1,782		100.00% Unconnected

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

**Summary for Subcatchment 115S: (new Subcat)**

Runoff = 7.83 cfs @ 12.15 hrs, Volume= 0.634 af, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (sf)	CN	Description
* 292,180	62	DIRECT INPUT
292,180		100.00% Pervious Area

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

**Summary for Subcatchment 233S: POSTDEV FLOW TO POND**

Runoff = 7.91 cfs @ 12.15 hrs, Volume= 0.634 af, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"



**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
4,379	39	>75% Grass cover, Good, HSG A
24,995	39	>75% Grass cover, Good, HSG A
31,725	39	>75% Grass cover, Good, HSG A
38,736	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
292,180	62	Weighted Average
228,838		78.32% Pervious Area
63,342		21.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0700	0.17		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.5	83	0.0400	3.00		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
3.8	212	0.0340	0.92		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	345	Total			

**Summary for Subcatchment 503S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 59.34 cfs @ 12.59 hrs, Volume= 8.027 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		<b>Lag/CN Method,</b>

**Summary for Subcatchment 504S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 59.34 cfs @ 12.59 hrs, Volume= 8.027 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10 YR STORM Rainfall=4.70"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		Lag/CN Method,

**Summary for Reach 3R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.880 ac, 24.04% Impervious, Inflow Depth > 1.44" for 10 YR STORM event  
 Inflow = 57.61 cfs @ 12.89 hrs, Volume= 8.391 af  
 Outflow = 57.61 cfs @ 12.89 hrs, Volume= 8.391 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 13R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.350 ac, 24.29% Impervious, Inflow Depth > 1.45" for 10 YR STORM event  
 Inflow = 56.95 cfs @ 12.90 hrs, Volume= 8.394 af  
 Outflow = 56.95 cfs @ 12.90 hrs, Volume= 8.394 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 204R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

[79] Warning: Submerged Pond 3P Primary device # 1 by 0.83'

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 1.53" for 10 YR STORM event  
 Inflow = 58.09 cfs @ 12.77 hrs, Volume= 8.380 af  
 Outflow = 57.42 cfs @ 12.89 hrs, Volume= 8.326 af, Atten= 1%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

Max. Velocity= 2.28 fps, Min. Travel Time= 4.0 min

Avg. Velocity = 1.38 fps, Avg. Travel Time= 6.6 min

Peak Storage= 13,771 cf @ 12.83 hrs

Average Depth at Peak Storage= 1.23', Surface Width= 38.92'

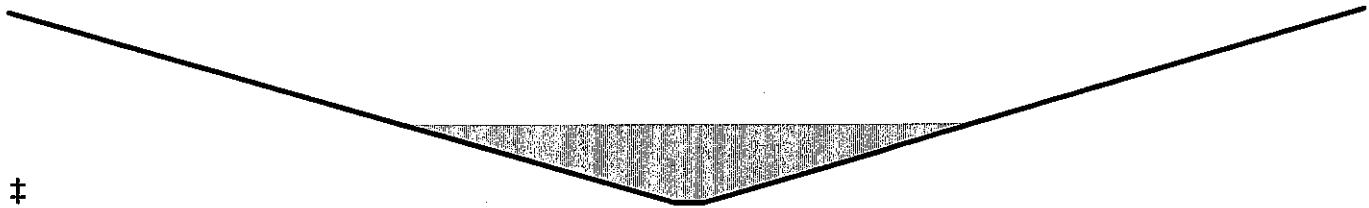
Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides

Side Slope Z-value= 15.0 '/' Top Width= 92.00'

Length= 547.0' Slope= 0.0068 '/'

Inlet Invert= 389.50', Outlet Invert= 385.80'



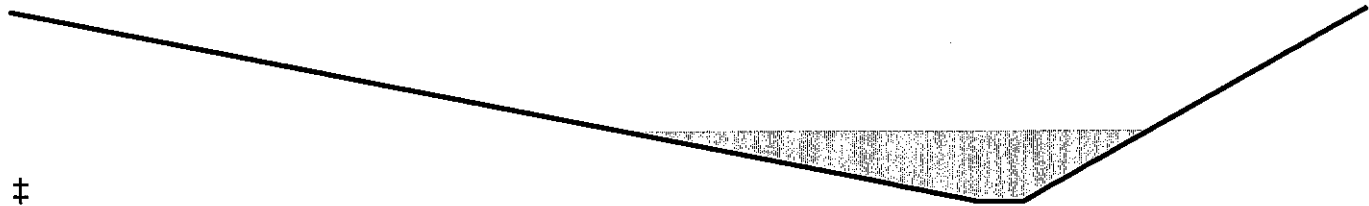
**Summary for Reach 503R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 1.64" for 10 YR STORM event  
 Inflow = 59.34 cfs @ 12.59 hrs, Volume= 8.027 af  
 Outflow = 59.08 cfs @ 12.66 hrs, Volume= 7.998 af, Atten= 0%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 4.22 fps, Min. Travel Time= 2.4 min  
 Avg. Velocity = 2.33 fps, Avg. Travel Time= 4.4 min

Peak Storage= 8,513 cf @ 12.62 hrs  
 Average Depth at Peak Storage= 1.11' , Surface Width= 23.15'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 ' / ' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 ' / '  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



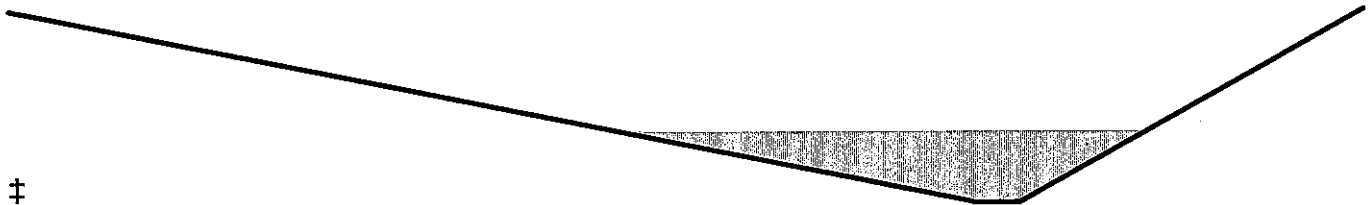
**Summary for Reach 504R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 1.64" for 10 YR STORM event  
 Inflow = 59.34 cfs @ 12.59 hrs, Volume= 8.027 af  
 Outflow = 59.08 cfs @ 12.66 hrs, Volume= 7.998 af, Atten= 0%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 4.22 fps, Min. Travel Time= 2.4 min  
 Avg. Velocity = 2.33 fps, Avg. Travel Time= 4.4 min

Peak Storage= 8,513 cf @ 12.62 hrs  
 Average Depth at Peak Storage= 1.11' , Surface Width= 23.15'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 ' / ' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 ' / '  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



**Summary for Reach 505R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

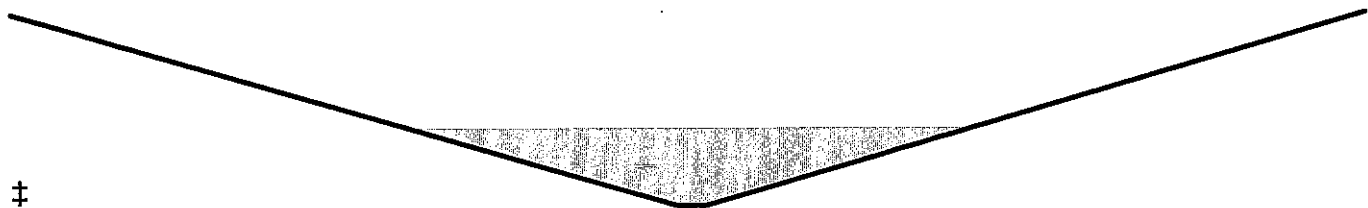
[79] Warning: Submerged Pond 13P Primary device # 1 by 0.82'

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 1.54" for 10 YR STORM event  
 Inflow = 57.36 cfs @ 12.78 hrs, Volume= 8.373 af  
 Outflow = 56.71 cfs @ 12.90 hrs, Volume= 8.319 af, Atten= 1%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 2.28 fps, Min. Travel Time= 4.0 min  
 Avg. Velocity = 1.38 fps, Avg. Travel Time= 6.6 min

Peak Storage= 13,643 cf @ 12.83 hrs  
 Average Depth at Peak Storage= 1.22', Surface Width= 38.73'  
 Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 15.0 ' ' Top Width= 92.00'  
 Length= 547.0' Slope= 0.0068 ' '  
 Inlet Invert= 389.50', Outlet Invert= 385.80'



**Summary for Pond 3P: Rice Pond**

[62] Hint: Exceeded Reach 503R OUTLET depth by 0.06' @ 13.10 hrs

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 1.58" for 10 YR STORM event  
 Inflow = 61.93 cfs @ 12.64 hrs, Volume= 8.640 af  
 Outflow = 58.09 cfs @ 12.77 hrs, Volume= 8.380 af, Atten= 6%, Lag= 7.9 min  
 Primary = 58.09 cfs @ 12.77 hrs, Volume= 8.380 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 391.06' @ 12.77 hrs Surf.Area= 49,622 sf Storage= 45,086 cf

Plug-Flow detention time= 24.8 min calculated for 8.380 af (97% of inflow)  
 Center-of-Mass det. time= 14.6 min ( 855.1 - 840.4 )

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	<b>171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir</b> Cv= 2.46 (C= 3.08)

Primary OutFlow Max=58.06 cfs @ 12.77 hrs HW=391.06' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 58.06 cfs @ 2.72 fps)

**Summary for Pond 13P: Rice Pond**

[62] Hint: Exceeded Reach 504R OUTLET depth by 0.06' @ 13.13 hrs

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 1.59" for 10 YR STORM event  
 Inflow = 60.97 cfs @ 12.65 hrs, Volume= 8.632 af  
 Outflow = 57.36 cfs @ 12.78 hrs, Volume= 8.373 af, Atten= 6%, Lag= 7.6 min  
 Primary = 57.36 cfs @ 12.78 hrs, Volume= 8.373 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 391.05' @ 12.78 hrs Surf.Area= 49,480 sf Storage= 44,775 cf

Plug-Flow detention time= 24.8 min calculated for 8.356 af (97% of inflow)  
 Center-of-Mass det. time= 14.7 min ( 854.6 - 839.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	<b>171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir</b> Cv= 2.46 (C= 3.08)

Primary OutFlow Max=57.30 cfs @ 12.78 hrs HW=391.05' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 57.30 cfs @ 2.71 fps)

**Rice Pond Village Millbury CURRENT**

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**Summary for Pond 23P: INFILTRATION STRUCTURE OFF 10+60 HILLCREST CIRCLE**

Inflow Area = 3.546 ac, 66.02% Impervious, Inflow Depth > 2.28" for 10 YR STORM event  
 Inflow = 8.56 cfs @ 12.16 hrs, Volume= 0.675 af  
 Outflow = 1.17 cfs @ 11.78 hrs, Volume= 0.674 af, Atten= 86%, Lag= 0.0 min  
 Discarded = 1.17 cfs @ 11.78 hrs, Volume= 0.674 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 376.80' @ 12.96 hrs Surf.Area= 6,136 sf Storage= 10,952 cf

Plug-Flow detention time= 79.6 min calculated for 0.674 af (100% of inflow)  
 Center-of-Mass det. time= 79.2 min ( 876.8 - 797.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	374.50'	7,730 cf	<b>118'X52' OUTSIDE OF STONE (Prismatic)</b> Listed below (Recalc) 52,156 cf Overall - 32,832 cf Embedded = 19,324 cf x 40.0% Voids
#2	375.00'	30,894 cf	<b>StormTank 25 Series 72"</b> x 1216 Inside #1 Inside= 18.0"W x 72.0"H => 8.73 sf x 3.00'L = 26.2 cf Outside= 18.0"W x 72.0"H => 9.00 sf x 3.00'L = 27.0 cf 1216 Chambers in 32 Rows 32,832 cf Overall x 97.0% Voids
		38,623 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
374.50	6,136	0	0
383.00	6,136	52,156	52,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	374.50'	<b>8.270 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=1.17 cfs @ 11.78 hrs HW=374.60' (Free Discharge)  
 ↳1=Exfiltration (Exfiltration Controls 1.17 cfs)

**Summary for Pond 101P: INF-1 STRUCTURE BESIDE UNITS 1-2 72 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.082 ac, 100.00% Impervious, Inflow Depth > 4.14" for 10 YR STORM event  
 Inflow = 0.39 cfs @ 12.07 hrs, Volume= 0.028 af  
 Outflow = 0.08 cfs @ 11.72 hrs, Volume= 0.028 af, Atten= 80%, Lag= 0.0 min  
 Discarded = 0.08 cfs @ 11.72 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 396.15' @ 12.48 hrs Surf.Area= 406 sf Storage= 294 cf

Plug-Flow detention time= 20.1 min calculated for 0.028 af (100% of inflow)  
 Center-of-Mass det. time= 19.9 min ( 754.6 - 734.7 )

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	395.00'	374 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 1,421 cf Overall - 486 cf Embedded = 935 cf x 40.0% Voids
#2	395.50'	445 cf	<b>StormTank 25 Series 18"</b> x 72 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 72 Chambers in 8 Rows 486 cf Overall x 96.0% Voids
		819 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
395.00	406	0	0
398.50	406	1,421	1,421

Device	Routing	Invert	Outlet Devices
#1	Discarded	395.00'	<b>8.270 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.08 cfs @ 11.72 hrs HW=395.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.08 cfs)

**Summary for Pond 102P: INF-2 STRUTURE BEHIND UNITS 7-8 42 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.053 ac, 100.00% Impervious, Inflow Depth > 4.14" for 10 YR STORM event  
 Inflow = 0.25 cfs @ 12.07 hrs, Volume= 0.018 af  
 Outflow = 0.05 cfs @ 11.69 hrs, Volume= 0.018 af, Atten= 81%, Lag= 0.0 min  
 Discarded = 0.05 cfs @ 11.69 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 397.23' @ 12.49 hrs Surf.Area= 253 sf Storage= 196 cf

Plug-Flow detention time= 21.9 min calculated for 0.018 af (100% of inflow)  
 Center-of-Mass det. time= 21.6 min ( 756.4 - 734.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	241 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 886 cf Overall - 284 cf Embedded = 602 cf x 40.0% Voids
#2	396.50'	260 cf	<b>StormTank 25 Series 18"</b> x 42 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 42 Chambers in 6 Rows 284 cf Overall x 96.0% Voids
		500 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	253	0	0
399.50	253	886	886

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.05 cfs @ 11.69 hrs HW=396.04' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

**Summary for Pond 104P: INF-4 STRUCTURE BEHIND 25-26 AND 27-28 -- 32 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.027 ac, 100.00% Impervious, Inflow Depth > 4.14" for 10 YR STORM event  
 Inflow = 0.13 cfs @ 12.07 hrs, Volume= 0.009 af  
 Outflow = 0.01 cfs @ 10.28 hrs, Volume= 0.006 af, Atten= 95%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 10.28 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 379.47' @ 14.15 hrs Surf.Area= 256 sf Storage= 195 cf

Plug-Flow detention time= 160.8 min calculated for 0.006 af (67% of inflow)  
 Center-of-Mass det. time= 89.3 min ( 824.1 - 734.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	378.00'	250 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 896 cf Overall - 270 cf Embedded = 626 cf x 40.0% Voids
#2	379.00'	247 cf	<b>StormTank 25 Series 18"</b> x 40 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 40 Chambers in 4 Rows 270 cf Overall x 96.0% Voids
		498 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
378.00	256	0	0
381.50	256	896	896

Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 10.28 hrs HW=378.04' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Summary for Pond 105P: INFILTRATION STRUCTURE BEHIND 21-22 & 23-24 -- 54 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.041 ac, 100.00% Impervious, Inflow Depth > 4.14" for 10 YR STORM event  
 Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.014 af  
 Outflow = 0.01 cfs @ 10.19 hrs, Volume= 0.009 af, Atten= 95%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 10.19 hrs, Volume= 0.009 af



**Rice Pond Village Millbury CURRENT**

Type III 24-hr 10 YR STORM Rainfall=4.70"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 380.24' @ 14.25 hrs Surf.Area= 385 sf Storage= 304 cf

Plug-Flow detention time= 161.3 min calculated for 0.009 af (66% of inflow)  
 Center-of-Mass det. time= 87.6 min ( 822.4 - 734.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	379.00'	361 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 1,348 cf Overall - 446 cf Embedded = 902 cf x 40.0% Voids
#2	379.50'	408 cf	<b>StormTank 25 Series 18"</b> x 66 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 66 Chambers in 6 Rows 446 cf Overall x 96.0% Voids
		769 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.00	385	0	0
382.50	385	1,348	1,348

Device	Routing	Invert	Outlet Devices
#1	Discarded	379.00'	<b>1.020 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.01 cfs @ 10.19 hrs HW=379.04' (Free Discharge)  
 ↑—1=Exfiltration (Exfiltration Controls 0.01 cfs)

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25 YEAR STORM

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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**Summary for Subcatchment 1S: PREDEV FLOW TO ABUTTER GINGRAS**

Runoff = 0.02 cfs @ 12.47 hrs, Volume= 0.006 af, Depth> 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
6,858	30	Woods, Good, HSG A
10,008	39	>75% Grass cover, Good, HSG A
16,866	35	Weighted Average
16,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.1000	0.19		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.9	100	0.1400	1.87		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
5.2	150	Total			

**Summary for Subcatchment 2S: PREDEV FLOW TO P&W RAILROAD**

Runoff = 0.10 cfs @ 14.71 hrs, Volume= 0.047 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
179,428	30	Woods, Good, HSG A
35,859	39	>75% Grass cover, Good, HSG A
3,896	98	Paved parking, HSG A
219,183	33	Weighted Average
215,287		98.22% Pervious Area
3,896		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.9	91	0.1200	1.73		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	197	0.1060	4.99	14.98	<b>Channel Flow,</b> Area= 3.0 sf Perim= 4.0' r= 0.75' n= 0.080 Earth, long dense weeds
11.0	338	Total			

**Summary for Subcatchment 3S: PREDEV OVERLAND FLOW TO CUNHA & SORA**

Runoff = 0.87 cfs @ 12.62 hrs, Volume= 0.168 af, Depth> 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
148,793	30	Woods, Good, HSG A
30,807	98	Water Surface, HSG A
179,600	42	Weighted Average
148,793		82.85% Pervious Area
30,807		17.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			

**Summary for Subcatchment 4S: PREDEV FLOW TO ABUTTER MATHIEU & SWANSON**

Runoff = 0.00 cfs @ 15.73 hrs, Volume= 0.002 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
21,387	30	Woods, Good, HSG A
21,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1200	0.08		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.4	57	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
11.0	107	Total			

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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**Summary for Subcatchment 5S: PREDEV FLOW TO RICE ROAD**

Runoff = 0.31 cfs @ 12.35 hrs, Volume= 0.049 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
22,350	30	Woods, Good, HSG A
30,632	39	>75% Grass cover, Good, HSG A
* 5,307	98	Existing roof and driveway
58,289	41	Weighted Average
52,982		90.90% Pervious Area
5,307		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
3.7	212	0.0370	0.96		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.0	262	Total			

**Summary for Subcatchment 11S: POSTDEV FLOW TO ABUTTER GINGRAS**

Runoff = 0.01 cfs @ 13.72 hrs, Volume= 0.003 af, Depth> 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
4,550	39	>75% Grass cover, Good, HSG A
6,450	30	Woods, Good, HSG A
11,000	34	Weighted Average
11,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1100	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	52	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.7	102	Total			

**Summary for Subcatchment 12S: POSTDEV FLOW TO P&W RAILROAD**

Runoff = 0.06 cfs @ 12.64 hrs, Volume= 0.027 af, Depth> 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
30,602	30	Woods, Good, HSG A
47,804	39	>75% Grass cover, Good, HSG A
78,406	35	Weighted Average
78,406		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	50	0.0600	0.06		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.9	109	0.1500	1.94		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.8	159	Total			

**Summary for Subcatchment 13S: POSTDEV OVERLAND FLOW TO CUNHA & SORA**

Runoff = 1.02 cfs @ 12.60 hrs, Volume= 0.184 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
* 1,870	98	Back of units 17 & 18
30,807	98	Water Surface, HSG A
7,459	39	>75% Grass cover, Good, HSG A
137,688	30	Woods, Good, HSG A
177,824	43	Weighted Average
145,147		81.62% Pervious Area
32,677		18.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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**Summary for Subcatchment 14S: POSTDEV FLOW TO ABUTTER MATHIEU & SWANSON**

Runoff = 0.03 cfs @ 12.46 hrs, Volume= 0.010 af, Depth> 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
10,950	30	Woods, Good, HSG A
16,798	39	>75% Grass cover, Good, HSG A
27,748	35	Weighted Average
27,748		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0600	0.23		Sheet Flow, Grass: Short n= 0.150 P2= 3.15"
0.5	83	0.0400	3.00		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.4	44	0.1300	1.80		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.6	177	Total			

**Summary for Subcatchment 15S: POSTDEV FLOW TO RICE ROAD**

Runoff = 0.20 cfs @ 12.34 hrs, Volume= 0.031 af, Depth> 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
2,537	98	Paved parking, HSG A
6,015	30	Woods, Good, HSG A
24,458	39	>75% Grass cover, Good, HSG A
33,010	42	Weighted Average
30,473		92.31% Pervious Area
2,537		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.15"
1.9	119	0.0050	1.06		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
10.2	169	Total			

**Summary for Subcatchment 22S: STREET DRAINAGE TO THE INFILTRATION STRUCTURE**

Runoff = 12.16 cfs @ 12.16 hrs, Volume= 0.962 af, Depth> 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
52,472	39	>75% Grass cover, Good, HSG A
* 101,970	98	Drive, driveways & roofs HSG A
154,442	78	Weighted Average
52,472		33.98% Pervious Area
101,970		66.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.2	20	0.0100	1.50		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.1	21	0.0150	2.49		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
11.2	91	Total			

**Summary for Subcatchment 33S: PREDEV FLOW TO POND**

Runoff = 11.42 cfs @ 12.23 hrs, Volume= 1.056 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
71,225	39	>75% Grass cover, Good, HSG A
49,927	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
313,497	61	Weighted Average
250,155		79.80% Pervious Area
63,342		20.20% Impervious Area



**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0900	0.07		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
3.9	242	0.0430	1.04		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.8	292	Total			

**Summary for Subcatchment 101S: 3564 SF LARGER DUPLEX TO DRYWELL IN SAND**

Runoff = 0.49 cfs @ 12.07 hrs, Volume= 0.036 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
3,564	98	Unconnected roofs, HSG A
3,564		100.00% Impervious Area
3,564		100.00% Unconnected

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

**Summary for Subcatchment 102S: 2310 SF SMALLER DUPLEX TO A DRYWELL IN SAND**

Runoff = 0.31 cfs @ 12.07 hrs, Volume= 0.023 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
2,310	98	Roofs, HSG A
2,310		100.00% Impervious Area

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

**Summary for Subcatchment 104S: HALF OF SMALLER DUPLEX 1155 S.F. TO DRYWELL IN SANDY LOA**

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 0.012 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Area (sf)	CN	Description
1,155	98	Unconnected roofs, HSG A
1,155		100.00% Impervious Area
1,155		100.00% Unconnected

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

**Summary for Subcatchment 105S: HALF OF LARGER DUPLEX 1782 SF TO DRYWELL IN SANDY LOAM**

Runoff = 0.24 cfs @ 12.07 hrs, Volume= 0.018 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
1,782	98	Unconnected pavement, HSG A
1,782		100.00% Impervious Area
1,782		100.00% Unconnected

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

**Summary for Subcatchment 115S: (new Subcat)**

Runoff = 13.38 cfs @ 12.14 hrs, Volume= 1.032 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (sf)	CN	Description
* 292,180	62	DIRECT INPUT
292,180		100.00% Pervious Area

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

**Summary for Subcatchment 233S: POSTDEV FLOW TO POND**

Runoff = 13.51 cfs @ 12.14 hrs, Volume= 1.032 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
4,379	39	>75% Grass cover, Good, HSG A
24,995	39	>75% Grass cover, Good, HSG A
31,725	39	>75% Grass cover, Good, HSG A
38,736	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
292,180	62	Weighted Average
228,838		78.32% Pervious Area
63,342		21.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0700	0.17		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.5	83	0.0400	3.00		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
3.8	212	0.0340	0.92		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	345	Total			

**Summary for Subcatchment 503S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 90.74 cfs @ 12.57 hrs, Volume= 12.149 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		<b>Lag/CN Method,</b>

**Summary for Subcatchment 504S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 90.74 cfs @ 12.57 hrs, Volume= 12.149 af, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25 YR STORM Rainfall=5.90"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		Lag/CN Method,

**Summary for Reach 3R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.880 ac, 24.04% Impervious, Inflow Depth > 2.23" for 25 YR STORM event  
 Inflow = 91.16 cfs @ 12.83 hrs, Volume= 12.973 af  
 Outflow = 91.16 cfs @ 12.83 hrs, Volume= 12.973 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 13R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.350 ac, 24.29% Impervious, Inflow Depth > 2.24" for 25 YR STORM event  
 Inflow = 89.80 cfs @ 12.84 hrs, Volume= 12.965 af  
 Outflow = 89.80 cfs @ 12.84 hrs, Volume= 12.965 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 204R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

[79] Warning: Submerged Pond 3P Primary device # 1 by 1.07'

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 2.35" for 25 YR STORM event  
 Inflow = 91.21 cfs @ 12.73 hrs, Volume= 12.873 af  
 Outflow = 90.44 cfs @ 12.83 hrs, Volume= 12.805 af, Atten= 1%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

Max. Velocity= 2.56 fps, Min. Travel Time= 3.6 min

Avg. Velocity = 1.47 fps, Avg. Travel Time= 6.2 min

Peak Storage= 19,350 cf @ 12.77 hrs

Average Depth at Peak Storage= 1.47', Surface Width= 46.11'

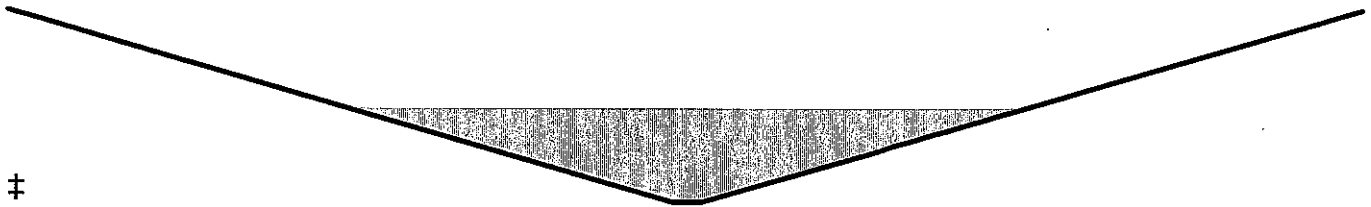
Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides

Side Slope Z-value= 15.0 ' Top Width= 92.00'

Length= 547.0' Slope= 0.0068 ' /'

Inlet Invert= 389.50', Outlet Invert= 385.80'



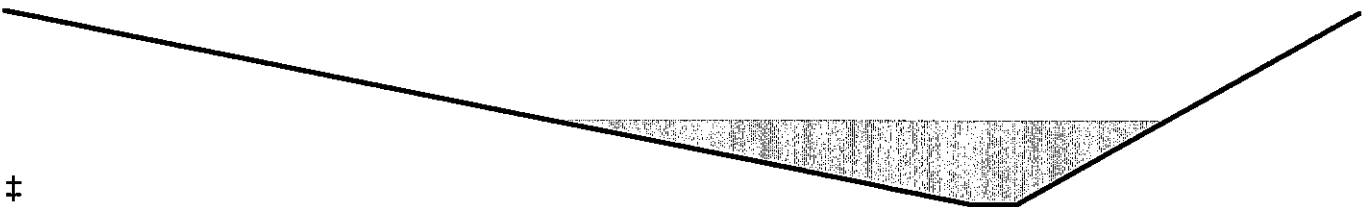
**Summary for Reach 503R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 2.49" for 25 YR STORM event  
 Inflow = 90.74 cfs @ 12.57 hrs, Volume= 12.149 af  
 Outflow = 90.45 cfs @ 12.64 hrs, Volume= 12.113 af, Atten= 0%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 4.70 fps, Min. Travel Time= 2.2 min  
 Avg. Velocity = 2.50 fps, Avg. Travel Time= 4.0 min

Peak Storage= 11,707 cf @ 12.60 hrs  
 Average Depth at Peak Storage= 1.32' , Surface Width= 27.12'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 ' / ' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 ' / '  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



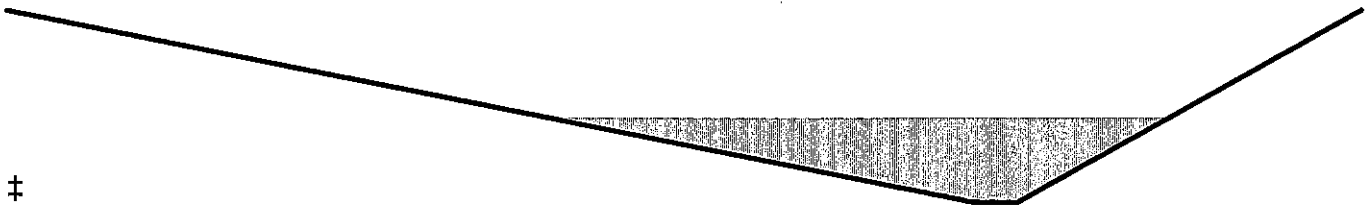
**Summary for Reach 504R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 2.49" for 25 YR STORM event  
 Inflow = 90.74 cfs @ 12.57 hrs, Volume= 12.149 af  
 Outflow = 90.45 cfs @ 12.64 hrs, Volume= 12.113 af, Atten= 0%, Lag= 3.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 4.70 fps, Min. Travel Time= 2.2 min  
 Avg. Velocity = 2.50 fps, Avg. Travel Time= 4.0 min

Peak Storage= 11,707 cf @ 12.60 hrs  
 Average Depth at Peak Storage= 1.32' , Surface Width= 27.12'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 ' / ' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 ' / '  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



‡

**Summary for Reach 505R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

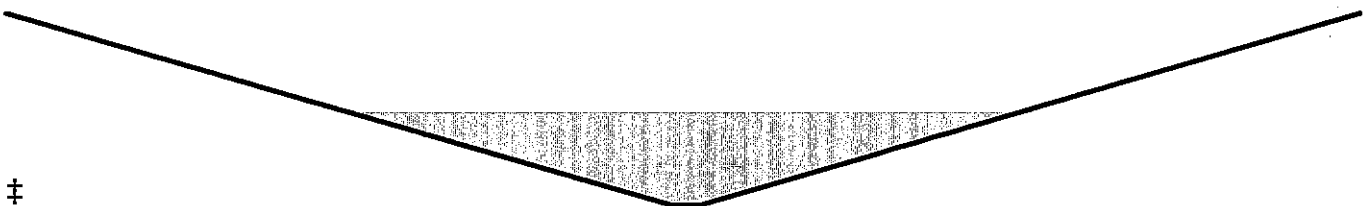
[79] Warning: Submerged Pond 13P Primary device # 1 by 1.06'

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 2.36" for 25 YR STORM event  
 Inflow = 89.73 cfs @ 12.73 hrs, Volume= 12.849 af  
 Outflow = 88.99 cfs @ 12.84 hrs, Volume= 12.782 af, Atten= 1%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 2.55 fps, Min. Travel Time= 3.6 min  
 Avg. Velocity = 1.47 fps, Avg. Travel Time= 6.2 min

Peak Storage= 19,115 cf @ 12.78 hrs  
 Average Depth at Peak Storage= 1.46', Surface Width= 45.83'  
 Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 15.0 ' / ' Top Width= 92.00'  
 Length= 547.0' Slope= 0.0068 ' / '  
 Inlet Invert= 389.50', Outlet Invert= 385.80'



‡

**Summary for Pond 3P: Rice Pond**

[62] Hint: Exceeded Reach 503R OUTLET depth by 0.09' @ 13.04 hrs

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 2.40" for 25 YR STORM event  
 Inflow = 95.30 cfs @ 12.62 hrs, Volume= 13.169 af  
 Outflow = 91.21 cfs @ 12.73 hrs, Volume= 12.873 af, Atten= 4%, Lag= 6.5 min  
 Primary = 91.21 cfs @ 12.73 hrs, Volume= 12.873 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 391.30' @ 12.73 hrs Surf.Area= 55,061 sf Storage= 57,768 cf

Plug-Flow detention time= 20.6 min calculated for 12.873 af (98% of inflow)  
 Center-of-Mass det. time= 12.7 min ( 843.7 - 831.0 )

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)

Primary OutFlow Max=91.11 cfs @ 12.73 hrs HW=391.30' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 91.11 cfs @ 2.98 fps)

**Summary for Pond 13P: Rice Pond**

[62] Hint: Exceeded Reach 504R OUTLET depth by 0.08' @ 13.04 hrs

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 2.42" for 25 YR STORM event  
 Inflow = 93.55 cfs @ 12.62 hrs, Volume= 13.145 af  
 Outflow = 89.73 cfs @ 12.73 hrs, Volume= 12.849 af, Atten= 4%, Lag= 6.5 min  
 Primary = 89.73 cfs @ 12.73 hrs, Volume= 12.849 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 391.29' @ 12.73 hrs Surf.Area= 54,844 sf Storage= 57,237 cf

Plug-Flow detention time= 20.6 min calculated for 12.849 af (98% of inflow)  
 Center-of-Mass det. time= 12.8 min ( 843.2 - 830.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir Cv= 2.46 (C= 3.08)

Primary OutFlow Max=89.64 cfs @ 12.73 hrs HW=391.29' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 89.64 cfs @ 2.97 fps)

**Summary for Pond 23P: INFILTRATION STRUCTURE OFF 10+60 HILLCREST CIRCLE**

Inflow Area = 3.546 ac, 66.02% Impervious, Inflow Depth > 3.26" for 25 YR STORM event  
 Inflow = 12.16 cfs @ 12.16 hrs, Volume= 0.962 af  
 Outflow = 1.17 cfs @ 11.63 hrs, Volume= 0.910 af, Atten= 90%, Lag= 0.0 min  
 Discarded = 1.17 cfs @ 11.63 hrs, Volume= 0.910 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 378.10' @ 13.41 hrs Surf.Area= 6,136 sf Storage= 18,027 cf

Plug-Flow detention time= 146.4 min calculated for 0.910 af (95% of inflow)  
 Center-of-Mass det. time= 126.9 min ( 916.3 - 789.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	374.50'	7,730 cf	<b>118'X52' OUTSIDE OF STONE (Prismatic)</b> Listed below (Recalc) 52,156 cf Overall - 32,832 cf Embedded = 19,324 cf x 40.0% Voids
#2	375.00'	30,894 cf	<b>StormTank 25 Series 72"</b> x 1216 Inside #1 Inside= 18.0"W x 72.0"H => 8.73 sf x 3.00'L = 26.2 cf Outside= 18.0"W x 72.0"H => 9.00 sf x 3.00'L = 27.0 cf 1216 Chambers in 32 Rows 32,832 cf Overall x 97.0% Voids
		38,623 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
374.50	6,136	0	0
383.00	6,136	52,156	52,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	374.50'	<b>8.270 in/hr Exfiltration over Surface area</b>

Discarded OutFlow Max=1.17 cfs @ 11.63 hrs HW=374.59' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 1.17 cfs)

**Summary for Pond 101P: INF-1 STRUCTURE BESIDE UNITS 1-2 72 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.082 ac, 100.00% Impervious, Inflow Depth > 5.24" for 25 YR STORM event  
 Inflow = 0.49 cfs @ 12.07 hrs, Volume= 0.036 af  
 Outflow = 0.08 cfs @ 11.66 hrs, Volume= 0.036 af, Atten= 84%, Lag= 0.0 min  
 Discarded = 0.08 cfs @ 11.66 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 396.56' @ 12.53 hrs Surf.Area= 406 sf Storage= 431 cf

Plug-Flow detention time= 32.0 min calculated for 0.036 af (100% of inflow)  
 Center-of-Mass det. time= 31.7 min ( 765.2 - 733.5 )



**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Volume	Invert	Avail.Storage	Storage Description
#1	395.00'	374 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 1,421 cf Overall - 486 cf Embedded = 935 cf x 40.0% Voids
#2	395.50'	445 cf	
			<b>StormTank 25 Series 18" x 72</b> Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 72 Chambers in 8 Rows 486 cf Overall x 96.0% Voids
819 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
395.00	406	0	0
398.50	406	1,421	1,421

Device	Routing	Invert	Outlet Devices
#1	Discarded	395.00'	<b>8.270 in/hr Exfiltration over Surface area</b>

Discarded OutFlow Max=0.08 cfs @ 11.66 hrs HW=395.04' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.08 cfs)

**Summary for Pond 102P: INF-2 STRUTURE BEHIND UNITS 7-8 42 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.053 ac, 100.00% Impervious, Inflow Depth > 5.24" for 25 YR STORM event  
 Inflow = 0.31 cfs @ 12.07 hrs, Volume= 0.023 af  
 Outflow = 0.05 cfs @ 11.66 hrs, Volume= 0.023 af, Atten= 85%, Lag= 0.0 min  
 Discarded = 0.05 cfs @ 11.66 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 397.68' @ 12.54 hrs Surf.Area= 253 sf Storage= 286 cf

Plug-Flow detention time= 34.5 min calculated for 0.023 af (100% of inflow)  
 Center-of-Mass det. time= 34.3 min ( 767.8 - 733.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	241 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 886 cf Overall - 284 cf Embedded = 602 cf x 40.0% Voids
#2	396.50'	260 cf	
			<b>StormTank 25 Series 18" x 42</b> Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 42 Chambers in 6 Rows 284 cf Overall x 96.0% Voids
500 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	253	0	0
399.50	253	886	886

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	<b>8.270 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.05 cfs @ 11.66 hrs HW=396.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

**Summary for Pond 104P: INF-4 STRUCTURE BEHIND 25-26 AND 27-28 -- 32 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.027 ac, 100.00% Impervious, Inflow Depth > 5.24" for 25 YR STORM event  
 Inflow = 0.16 cfs @ 12.07 hrs, Volume= 0.012 af  
 Outflow = 0.01 cfs @ 9.44 hrs, Volume= 0.006 af, Atten= 96%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 9.44 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 379.87' @ 15.00 hrs Surf.Area= 256 sf Storage= 272 cf

Plug-Flow detention time= 160.0 min calculated for 0.006 af (56% of inflow)  
 Center-of-Mass det. time= 73.5 min ( 807.0 - 733.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	378.00'	250 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 896 cf Overall - 270 cf Embedded = 626 cf x 40.0% Voids
#2	379.00'	247 cf	<b>StormTank 25 Series 18"</b> x 40 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 40 Chambers in 4 Rows 270 cf Overall x 96.0% Voids
		498 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
378.00	256	0	0
381.50	256	896	896

Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	<b>1.020 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.01 cfs @ 9.44 hrs HW=378.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Summary for Pond 105P: INFILTRATION STRUCTURE BEHIND 21-22 & 23-24 -- 54 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.041 ac, 100.00% Impervious, Inflow Depth > 5.24" for 25 YR STORM event  
 Inflow = 0.24 cfs @ 12.07 hrs, Volume= 0.018 af  
 Outflow = 0.01 cfs @ 9.38 hrs, Volume= 0.010 af, Atten= 96%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 9.38 hrs, Volume= 0.010 af

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 25 YR STORM Rainfall=5.90"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 380.63' @ 15.09 hrs Surf.Area= 385 sf Storage= 425 cf

Plug-Flow detention time= 160.8 min calculated for 0.010 af (55% of inflow)  
 Center-of-Mass det. time= 71.9 min ( 805.4 - 733.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	379.00'	361 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 1,348 cf Overall - 446 cf Embedded = 902 cf x 40.0% Voids
#2	379.50'	408 cf	<b>StormTank 25 Series 18"</b> x 66 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 66 Chambers in 6 Rows 446 cf Overall x 96.0% Voids
		769 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.00	385	0	0
382.50	385	1,348	1,348

Device	Routing	Invert	Outlet Devices
#1	Discarded	379.00'	<b>1.020 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.01 cfs @ 9.38 hrs HW=379.04' (Free Discharge)  
 ↳1=Exfiltration (Exfiltration Controls 0.01 cfs)

100 YEAR STORM

**Summary for Subcatchment 1S: PREDEV FLOW TO ABUTTER GINGRAS**

Runoff = 0.21 cfs @ 12.13 hrs, Volume= 0.026 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
6,858	30	Woods, Good, HSG A
10,008	39	>75% Grass cover, Good, HSG A
16,866	35	Weighted Average
16,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.1000	0.19		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.9	100	0.1400	1.87		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
5.2	150	Total			

**Summary for Subcatchment 2S: PREDEV FLOW TO P&W RAILROAD**

Runoff = 1.63 cfs @ 12.38 hrs, Volume= 0.265 af, Depth> 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
179,428	30	Woods, Good, HSG A
35,859	39	>75% Grass cover, Good, HSG A
3,896	98	Paved parking, HSG A
219,183	33	Weighted Average
215,287		98.22% Pervious Area
3,896		1.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0400	0.09		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.9	91	0.1200	1.73		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	197	0.1060	4.99	14.98	<b>Channel Flow,</b> Area= 3.0 sf Perim= 4.0' r= 0.75' n= 0.080 Earth, long dense weeds
11.0	338	Total			

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 100YR STORM Rainfall=8.35"

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**Summary for Subcatchment 3S: PREDEV OVERLAND FLOW TO CUNHA & SORA**

Runoff = 3.59 cfs @ 12.50 hrs, Volume= 0.486 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
148,793	30	Woods, Good, HSG A
30,807	98	Water Surface, HSG A
179,600	42	Weighted Average
148,793		82.85% Pervious Area
30,807		17.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			

**Summary for Subcatchment 4S: PREDEV FLOW TO ABUTTER MATHIEU & SWANSON**

Runoff = 0.08 cfs @ 12.47 hrs, Volume= 0.017 af, Depth> 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
21,387	30	Woods, Good, HSG A
21,387		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	50	0.1200	0.08		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.4	57	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
11.0	107	Total			

**Summary for Subcatchment 5S: PREDEV FLOW TO RICE ROAD**

Runoff = 1.61 cfs @ 12.15 hrs, Volume= 0.149 af, Depth> 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
22,350	30	Woods, Good, HSG A
30,632	39	>75% Grass cover, Good, HSG A
* 5,307	98	Existing roof and driveway
58,289	41	Weighted Average
52,982		90.90% Pervious Area
5,307		9.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0600	0.16		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
3.7	212	0.0370	0.96		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.0	262	Total			

**Summary for Subcatchment 11S: POSTDEV FLOW TO ABUTTER GINGRAS**

Runoff = 0.10 cfs @ 12.28 hrs, Volume= 0.015 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
4,550	39	>75% Grass cover, Good, HSG A
6,450	30	Woods, Good, HSG A
11,000	34	Weighted Average
11,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	50	0.1100	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.15"
0.4	52	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
6.7	102	Total			

**Summary for Subcatchment 12S: POSTDEV FLOW TO P&W RAILROAD**

Runoff = 0.80 cfs @ 12.38 hrs, Volume= 0.119 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
30,602	30	Woods, Good, HSG A
47,804	39	>75% Grass cover, Good, HSG A
78,406	35	Weighted Average
78,406		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	50	0.0600	0.06		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
0.9	109	0.1500	1.94		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.8	159	Total			

**Summary for Subcatchment 13S: POSTDEV OVERLAND FLOW TO CUNHA & SORA**

Runoff = 3.88 cfs @ 12.49 hrs, Volume= 0.514 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
* 1,870	98	Back of units 17 & 18
30,807	98	Water Surface, HSG A
7,459	39	>75% Grass cover, Good, HSG A
137,688	30	Woods, Good, HSG A
177,824	43	Weighted Average
145,147		81.62% Pervious Area
32,677		18.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	50	0.0140	0.03		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
2.3	186	0.0710	1.33		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.8	400	0.0090	3.75	59.94	<b>Channel Flow,</b> Area= 16.0 sf Perim= 14.6' r= 1.10' n= 0.040 Earth, cobble bottom, clean sides
29.1	636	Total			



**Rice Pond Village Millbury CURRENT**

Type III 24-hr 100YR STORM Rainfall=8.35"

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**Summary for Subcatchment 14S: POSTDEV FLOW TO ABUTTER MATHIEU & SWANSON**

Runoff = 0.35 cfs @ 12.12 hrs, Volume= 0.042 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
10,950	30	Woods, Good, HSG A
16,798	39	>75% Grass cover, Good, HSG A
27,748	35	Weighted Average
27,748		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0600	0.23		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.15"
0.5	83	0.0400	3.00		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.4	44	0.1300	1.80		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
4.6	177	Total			

**Summary for Subcatchment 15S: POSTDEV FLOW TO RICE ROAD**

Runoff = 0.97 cfs @ 12.17 hrs, Volume= 0.090 af, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
2,537	98	Paved parking, HSG A
6,015	30	Woods, Good, HSG A
24,458	39	>75% Grass cover, Good, HSG A
33,010	42	Weighted Average
30,473		92.31% Pervious Area
2,537		7.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0200	0.10		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
1.9	119	0.0050	1.06		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
10.2	169	Total			

**Summary for Subcatchment 22S: STREET DRAINAGE TO THE INFILTRATION STRUCTURE**

Runoff = 19.75 cfs @ 12.15 hrs, Volume= 1.586 af, Depth> 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
52,472	39	>75% Grass cover, Good, HSG A
* 101,970	98	Drive, driveways & roofs HSG A
154,442	78	Weighted Average
52,472		33.98% Pervious Area
101,970		66.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.15"
0.2	20	0.0100	1.50		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.1	21	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
11.2	91	Total			

**Summary for Subcatchment 33S: PREDEV FLOW TO POND**

Runoff = 22.89 cfs @ 12.22 hrs, Volume= 2.050 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
71,225	39	>75% Grass cover, Good, HSG A
49,927	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
313,497	61	Weighted Average
250,155		79.80% Pervious Area
63,342		20.20% Impervious Area

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 100YR STORM Rainfall=8.35"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0900	0.07		<b>Sheet Flow,</b> Woods: Dense underbrush n= 0.800 P2= 3.15"
3.9	242	0.0430	1.04		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
15.8	292	Total			

**Summary for Subcatchment 101S: 3564 SF LARGER DUPLEX TO DRYWELL IN SAND**

Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.051 af, Depth> 7.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
3,564	98	Unconnected roofs, HSG A
3,564		100.00% Impervious Area
3,564		100.00% Unconnected

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

**Summary for Subcatchment 102S: 2310 SF SMALLER DUPLEX TO A DRYWELL IN SAND**

Runoff = 0.45 cfs @ 12.07 hrs, Volume= 0.033 af, Depth> 7.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
2,310	98	Roofs, HSG A
2,310		100.00% Impervious Area

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

**Summary for Subcatchment 104S: HALF OF SMALLER DUPLEX 1155 S.F. TO DRYWELL IN SANDY LOA**

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.016 af, Depth> 7.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 100YR STORM Rainfall=8.35"

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Area (sf)	CN	Description
1,155	98	Unconnected roofs, HSG A
1,155		100.00% Impervious Area
1,155		100.00% Unconnected

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

**Summary for Subcatchment 105S: HALF OF LARGER DUPLEX 1782 SF TO DRYWELL IN SANDY LOAM**

Runoff = 0.34 cfs @ 12.07 hrs, Volume= 0.025 af, Depth> 7.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
1,782	98	Unconnected pavement, HSG A
1,782		100.00% Impervious Area
1,782		100.00% Unconnected

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

**Summary for Subcatchment 115S: (new Subcat)**

Runoff = 26.34 cfs @ 12.14 hrs, Volume= 1.978 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (sf)	CN	Description
* 292,180	62	DIRECT INPUT
292,180		100.00% Pervious Area

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

**Summary for Subcatchment 233S: POSTDEV FLOW TO POND**

Runoff = 26.58 cfs @ 12.14 hrs, Volume= 1.978 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 100YR STORM Rainfall=8.35"

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Area (sf)	CN	Description
30,502	98	Water Surface, HSG A
* 13,200	98	Roofs & Driveways, HSG A
4,379	39	>75% Grass cover, Good, HSG A
24,995	39	>75% Grass cover, Good, HSG A
31,725	39	>75% Grass cover, Good, HSG A
38,736	30	Woods, Good, HSG A
14,588	30	Woods, Good, HSG A
* 10,940	98	Roofs & Driveways, HSG B
26,999	61	>75% Grass cover, Good, HSG B
20,859	55	Woods, Good, HSG B
* 8,700	98	Roofs & Driveways, HSG D
42,423	80	>75% Grass cover, Good, HSG D
24,134	77	Woods, Good, HSG D
292,180	62	Weighted Average
228,838		78.32% Pervious Area
63,342		21.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0700	0.17		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.15"
0.5	83	0.0400	3.00		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
3.8	212	0.0340	0.92		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
9.3	345	Total			

**Summary for Subcatchment 503S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 160.17 cfs @ 12.55 hrs, Volume= 21.459 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		<b>Lag/CN Method,</b>

**Summary for Subcatchment 504S: OFFSITE AREA DRAINING TO CULVERT AT S. MAIN ST**

Runoff = 160.17 cfs @ 12.55 hrs, Volume= 21.459 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100YR STORM Rainfall=8.35"

**Rice Pond Village Millbury CURRENT**

Type III 24-hr 100YR STORM Rainfall=8.35"

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Area (ac)	CN	Description
58.560	70	1/2 acre lots, 25% imp, HSG B
43.920		75.00% Pervious Area
14.640		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	3,090	0.0670	1.27		Lag/CN Method,

**Summary for Reach 3R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.880 ac, 24.04% Impervious, Inflow Depth > 4.03" for 100YR STORM event  
 Inflow = 166.14 cfs @ 12.77 hrs, Volume= 23.492 af  
 Outflow = 166.14 cfs @ 12.77 hrs, Volume= 23.492 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 13R: (new Reach)**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 69.350 ac, 24.29% Impervious, Inflow Depth > 4.06" for 100YR STORM event  
 Inflow = 163.01 cfs @ 12.77 hrs, Volume= 23.449 af  
 Outflow = 163.01 cfs @ 12.77 hrs, Volume= 23.449 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

**Summary for Reach 204R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

[79] Warning: Submerged Pond 3P Primary device # 1 by 1.45'

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 4.22" for 100YR STORM event  
 Inflow = 164.67 cfs @ 12.68 hrs, Volume= 23.099 af  
 Outflow = 163.52 cfs @ 12.77 hrs, Volume= 23.006 af, Atten= 1%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs

Max. Velocity= 2.97 fps, Min. Travel Time= 3.1 min  
 Avg. Velocity = 1.62 fps, Avg. Travel Time= 5.6 min

Peak Storage= 30,181 cf @ 12.72 hrs

Average Depth at Peak Storage= 1.85', Surface Width= 57.57'

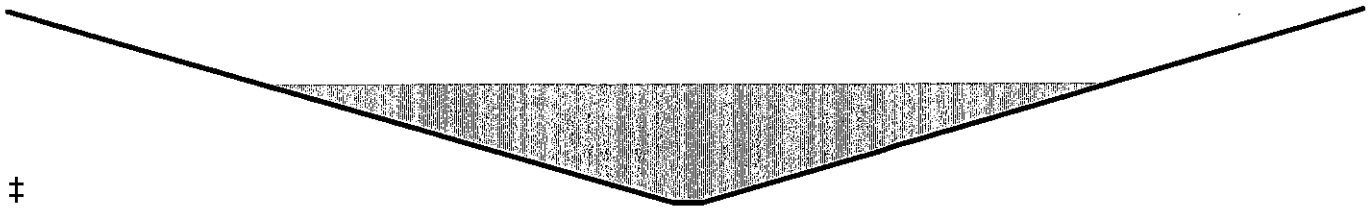
Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides

Side Slope Z-value= 15.0 ' / ' Top Width= 92.00'

Length= 547.0' Slope= 0.0068 ' / '

Inlet Invert= 389.50', Outlet Invert= 385.80'



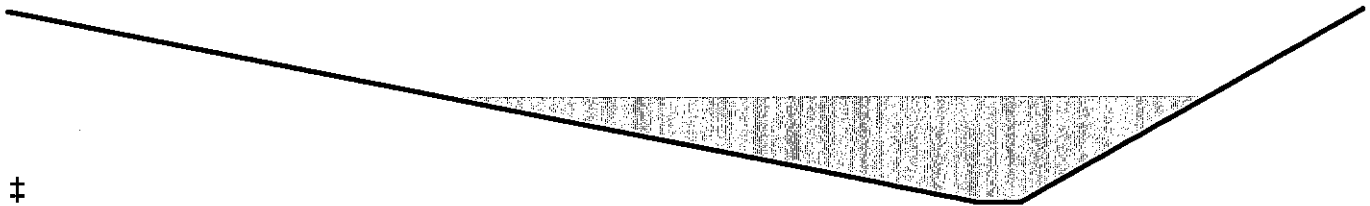
**Summary for Reach 503R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 4.40" for 100YR STORM event  
 Inflow = 160.17 cfs @ 12.55 hrs, Volume= 21.459 af  
 Outflow = 159.78 cfs @ 12.61 hrs, Volume= 21.408 af, Atten= 0%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 5.42 fps, Min. Travel Time= 1.9 min  
 Avg. Velocity = 2.76 fps, Avg. Travel Time= 3.7 min

Peak Storage= 17,925 cf @ 12.58 hrs  
 Average Depth at Peak Storage= 1.66' , Surface Width= 33.53'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 '/' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 '/'  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



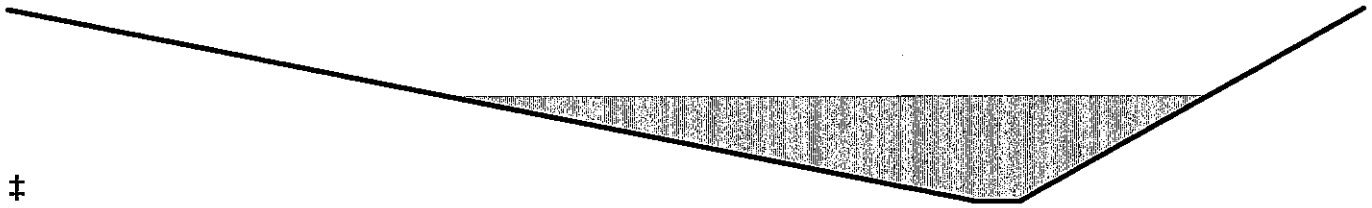
**Summary for Reach 504R: FLOW PATH FROM RICE RD CULVERT TO POND**

Inflow Area = 58.560 ac, 25.00% Impervious, Inflow Depth > 4.40" for 100YR STORM event  
 Inflow = 160.17 cfs @ 12.55 hrs, Volume= 21.459 af  
 Outflow = 159.78 cfs @ 12.61 hrs, Volume= 21.408 af, Atten= 0%, Lag= 3.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 5.42 fps, Min. Travel Time= 1.9 min  
 Avg. Velocity = 2.76 fps, Avg. Travel Time= 3.7 min

Peak Storage= 17,925 cf @ 12.58 hrs  
 Average Depth at Peak Storage= 1.66' , Surface Width= 33.53'  
 Bank-Full Depth= 3.00' Flow Area= 91.5 sf, Capacity= 723.88 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 14.0 5.0 '/' Top Width= 59.00'  
 Length= 608.0' Slope= 0.0255 '/'  
 Inlet Invert= 405.50', Outlet Invert= 390.00'



**Summary for Reach 505R: FLOW PATH FROM POND OVERFLOW TO CUNHA & SORA**

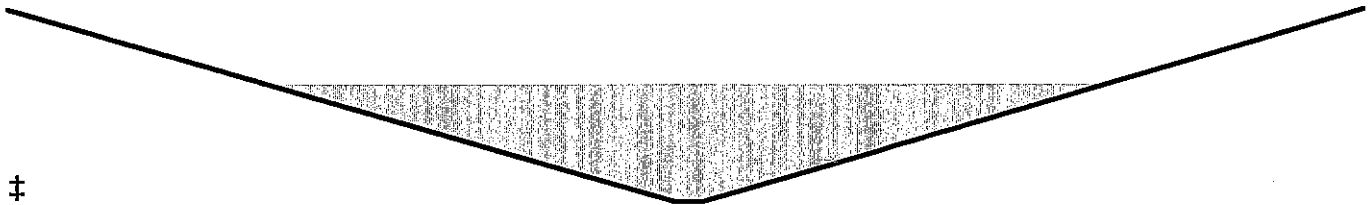
[79] Warning: Submerged Pond 13P Primary device # 1 by 1.44'

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 4.23" for 100YR STORM event  
 Inflow = 161.34 cfs @ 12.69 hrs, Volume= 23.028 af  
 Outflow = 160.27 cfs @ 12.78 hrs, Volume= 22.935 af, Atten= 1%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Max. Velocity= 2.95 fps, Min. Travel Time= 3.1 min  
 Avg. Velocity = 1.62 fps, Avg. Travel Time= 5.6 min

Peak Storage= 29,727 cf @ 12.73 hrs  
 Average Depth at Peak Storage= 1.84', Surface Width= 57.14'  
 Bank-Full Depth= 3.00' Flow Area= 141.0 sf, Capacity= 571.84 cfs

2.00' x 3.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides  
 Side Slope Z-value= 15.0 ' / ' Top Width= 92.00'  
 Length= 547.0' Slope= 0.0068 ' / '  
 Inlet Invert= 389.50', Outlet Invert= 385.80'



**Summary for Pond 3P: Rice Pond**

[62] Hint: Exceeded Reach 503R OUTLET depth by 0.13' @ 12.95 hrs

Inflow Area = 65.757 ac, 24.48% Impervious, Inflow Depth > 4.28" for 100YR STORM event  
 Inflow = 169.53 cfs @ 12.59 hrs, Volume= 23.459 af  
 Outflow = 164.67 cfs @ 12.68 hrs, Volume= 23.099 af, Atten= 3%, Lag= 5.3 min  
 Primary = 164.67 cfs @ 12.68 hrs, Volume= 23.099 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 391.69' @ 12.68 hrs Surf.Area= 63,855 sf Storage= 81,060 cf

Plug-Flow detention time= 16.2 min calculated for 23.053 af (98% of inflow)  
 Center-of-Mass det. time= 10.6 min ( 828.6 - 817.9 )



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Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	<b>171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir</b> Cv= 2.46 (C= 3.08)

**Primary OutFlow** Max=164.61 cfs @ 12.68 hrs HW=391.69' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 164.61 cfs @ 3.36 fps)

**Summary for Pond 13P: Rice Pond**

[62] Hint: Exceeded Reach 504R OUTLET depth by 0.13' @ 12.98 hrs

Inflow Area = 65.268 ac, 24.66% Impervious, Inflow Depth > 4.30" for 100YR STORM event  
 Inflow = 165.94 cfs @ 12.59 hrs, Volume= 23.386 af  
 Outflow = 161.34 cfs @ 12.69 hrs, Volume= 23.028 af, Atten= 3%, Lag= 5.4 min  
 Primary = 161.34 cfs @ 12.69 hrs, Volume= 23.028 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 391.68' @ 12.69 hrs Surf.Area= 63,514 sf Storage= 80,092 cf

Plug-Flow detention time= 16.2 min calculated for 22.982 af (98% of inflow)  
 Center-of-Mass det. time= 10.7 min ( 828.1 - 817.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	389.80'	285,060 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
389.80	25,072	0	0
390.00	25,815	5,089	5,089
392.00	70,715	96,530	101,619
394.00	112,726	183,441	285,060

Device	Routing	Invert	Outlet Devices
#1	Primary	389.90'	<b>171.9 deg x 2.0' long Sharp-Crested Vee/Trap Weir</b> Cv= 2.46 (C= 3.08)

**Primary OutFlow** Max=161.23 cfs @ 12.69 hrs HW=391.68' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 161.23 cfs @ 3.34 fps)

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**Summary for Pond 23P: INFILTRATION STRUCTURE OFF 10+60 HILLCREST CIRCLE**

Inflow Area = 3.546 ac, 66.02% Impervious, Inflow Depth > 5.37" for 100YR STORM event  
 Inflow = 19.75 cfs @ 12.15 hrs, Volume= 1.586 af  
 Outflow = 1.17 cfs @ 11.12 hrs, Volume= 1.011 af, Atten= 94%, Lag= 0.0 min  
 Discarded = 1.17 cfs @ 11.12 hrs, Volume= 1.011 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 381.81' @ 14.66 hrs Surf.Area= 6,136 sf Storage= 35,714 cf

Plug-Flow detention time= 177.6 min calculated for 1.011 af (64% of inflow)  
 Center-of-Mass det. time= 106.1 min ( 883.9 - 777.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	374.50'	7,730 cf	<b>118'X52' OUTSIDE OF STONE (Prismatic)</b> Listed below (Recalc) 52,156 cf Overall - 32,832 cf Embedded = 19,324 cf x 40.0% Voids
#2	375.00'	30,894 cf	<b>StormTank 25 Series 72"</b> x 1216 Inside #1 Inside= 18.0"W x 72.0"H => 8.73 sf x 3.00'L = 26.2 cf Outside= 18.0"W x 72.0"H => 9.00 sf x 3.00'L = 27.0 cf 1216 Chambers in 32 Rows 32,832 cf Overall x 97.0% Voids
		38,623 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
374.50	6,136	0	0
383.00	6,136	52,156	52,156

Device	Routing	Invert	Outlet Devices
#1	Discarded	374.50'	<b>8.270 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=1.17 cfs @ 11.12 hrs HW=374.59' (Free Discharge)  
 ↑1=Exfiltration (Exfiltration Controls 1.17 cfs)

**Summary for Pond 101P: INF-1 STRUCTURE BESIDE UNITS 1-2 72 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.082 ac, 100.00% Impervious, Inflow Depth > 7.46" for 100YR STORM event  
 Inflow = 0.69 cfs @ 12.07 hrs, Volume= 0.051 af  
 Outflow = 0.08 cfs @ 11.54 hrs, Volume= 0.051 af, Atten= 89%, Lag= 0.0 min  
 Discarded = 0.08 cfs @ 11.54 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 397.93' @ 12.66 hrs Surf.Area= 406 sf Storage= 726 cf

Plug-Flow detention time= 61.8 min calculated for 0.051 af (100% of inflow)  
 Center-of-Mass det. time= 61.5 min ( 793.7 - 732.2 )

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Volume	Invert	Avail.Storage	Storage Description
#1	395.00'	374 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 1,421 cf Overall - 486 cf Embedded = 935 cf x 40.0% Voids
#2	395.50'	445 cf	<b>StormTank 25 Series 18"</b> x 72 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 72 Chambers in 8 Rows 486 cf Overall x 96.0% Voids
		819 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
395.00	406	0	0
398.50	406	1,421	1,421

Device	Routing	Invert	Outlet Devices
#1	Discarded	395.00'	<b>8.270 in/hr Exfiltration over Surface area</b>

Discarded OutFlow Max=0.08 cfs @ 11.54 hrs HW=395.04' (Free Discharge)  
 ↑ 1=Exfiltration (Exfiltration Controls 0.08 cfs)

**Summary for Pond 102P: INF-2 STRUTURE BEHIND UNITS 7-8 42 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.053 ac, 100.00% Impervious, Inflow Depth > 7.46" for 100YR STORM event  
 Inflow = 0.45 cfs @ 12.07 hrs, Volume= 0.033 af  
 Outflow = 0.05 cfs @ 11.51 hrs, Volume= 0.033 af, Atten= 89%, Lag= 0.0 min  
 Discarded = 0.05 cfs @ 11.51 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 399.28' @ 12.69 hrs Surf.Area= 253 sf Storage= 478 cf

Plug-Flow detention time= 66.4 min calculated for 0.033 af (100% of inflow)  
 Center-of-Mass det. time= 66.1 min ( 798.3 - 732.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	241 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) 886 cf Overall - 284 cf Embedded = 602 cf x 40.0% Voids
#2	396.50'	260 cf	<b>StormTank 25 Series 18"</b> x 42 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 42 Chambers in 6 Rows 284 cf Overall x 96.0% Voids
		500 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	253	0	0
399.50	253	886	886

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Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	8.270 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.05 cfs @ 11.51 hrs HW=396.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

**Summary for Pond 104P: INF-4 STRUCTURE BEHIND 25-26 AND 27-28 -- 32 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.027 ac, 100.00% Impervious, Inflow Depth > 7.46" for 100YR STORM event  
 Inflow = 0.22 cfs @ 12.07 hrs, Volume= 0.016 af  
 Outflow = 0.01 cfs @ 8.42 hrs, Volume= 0.007 af, Atten= 97%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 8.42 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 381.01' @ 15.98 hrs Surf.Area= 256 sf Storage= 447 cf

Plug-Flow detention time= 165.1 min calculated for 0.007 af (42% of inflow)  
 Center-of-Mass det. time= 51.4 min ( 783.6 - 732.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	378.00'	250 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 896 cf Overall - 270 cf Embedded = 626 cf x 40.0% Voids
#2	379.00'	247 cf	<b>StormTank 25 Series 18"</b> x 40 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 40 Chambers in 4 Rows 270 cf Overall x 96.0% Voids
		498 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
378.00	256	0	0
381.50	256	896	896

Device	Routing	Invert	Outlet Devices
#1	Discarded	378.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 8.42 hrs HW=378.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Summary for Pond 105P: INFILTRATION STRUCTURE BEHIND 21-22 & 23-24 -- 54 MODULES**

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.041 ac, 100.00% Impervious, Inflow Depth > 7.46" for 100YR STORM event  
 Inflow = 0.34 cfs @ 12.07 hrs, Volume= 0.025 af  
 Outflow = 0.01 cfs @ 8.36 hrs, Volume= 0.010 af, Atten= 97%, Lag= 0.0 min  
 Discarded = 0.01 cfs @ 8.36 hrs, Volume= 0.010 af

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Type III 24-hr 100YR STORM Rainfall=8.35"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.03 hrs  
 Peak Elev= 382.03' @ 16.04 hrs Surf.Area= 385 sf Storage= 696 cf

Plug-Flow detention time= 166.5 min calculated for 0.010 af (41% of inflow)

Center-of-Mass det. time= 49.9 min ( 782.1 - 732.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	379.00'	361 cf	<b>Custom Stage Data (Prismatic)</b> Listed below 1,348 cf Overall - 446 cf Embedded = 902 cf x 40.0% Voids
#2	379.50'	408 cf	<b>StormTank 25 Series 18"</b> x 66 Inside #1 Inside= 18.0"W x 18.0"H => 2.15 sf x 3.00'L = 6.4 cf Outside= 18.0"W x 18.0"H => 2.25 sf x 3.00'L = 6.8 cf 66 Chambers in 6 Rows 446 cf Overall x 96.0% Voids
		769 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
379.00	385	0	0
382.50	385	1,348	1,348

Device	Routing	Invert	Outlet Devices
#1	Discarded	379.00'	<b>1.020 in/hr Exfiltration over Surface area</b>

**Discarded OutFlow** Max=0.01 cfs @ 8.36 hrs HW=379.04' (Free Discharge)

↳ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)