Stormwater Management Report Addendum

ROCKY MAPLE SOLAR

18 North Carver Road Wareham and Carver, Massachusetts

Prepared for: BE RE, LLC PO Box 974 Edwards, Colorado, 81632



Addendum Issued: March 11, 2021

Calculated by: Nathaniel Bautz, EIT

Checked by: Nick Santangelo, EIT

Approved by:



Eric J. Las, PE

320300RP001B-Addendum

Design Point 1 50-Year 100-Year 1-Year 2-Year 10-Year 25-Year Pre 13.07 29.88 91.59 148.71 205.68 276.94 Post 12.97 29.64 90.87 147.54 204.06 274.76

Table 1: Pre- & Post-development Peak Runoff Rate Comparison, units are in cubic feet per second (cfs).

Table 2: Pre- & Post-development Stormwater Volume Comparison, units are in acre-feet (af).

Design Point 1	1-Year	2-Year	10-Year	25-Year	50-Year	100-Year
Pre	1.69	2.85	7.10	11.06	15.06	20.11
Post	1.68	2.82	7.04	10.97	14.94	19.95



STANDARD 3: Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater management practices and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil types. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The Project proposes equipment pads with infiltration beds beneath such that runoff from these minor impervious areas will have the opportunity to infiltrate. The surrounding grassed and wooded areas provide for further infiltration. The proposed solar panels, while covering a large footprint, will allow water to sheet flow to the ground below where it can infiltrate similarly to existing conditions. Therefore, recharge of the groundwater will be maintained under the post-development conditions.





JOB NO./LOCATION:	
3203.00	
Carver & Wareham, MA	
CLIENT/PROJECT:	
BE RE, LLC	
Rocky Maple Solar	
SUBJECT/TITLE:	
Pre-Development Conditions Hydrology	
OBJECTIVE OF CALCULATION:	
• To determine the pre-development peak rates of runoff and stormwater volumes from the site for the	1, 2,
10, 25, 50, & 100-year storm events at the design points.	
CALCULATION METHOD(S):	
• Runoff curve numbers (CN), time-of-concentration (Tc), and runoff rates were calculated based on T methodology.	R-55
• AutoCAD 2019 computer program was utilized for digitizing ground cover areas.	
• Peak runoff rates and volumes were computed using HydroCAD version 10.00.	
ASSUMPTIONS:	
• The ground cover types were determined using aerial imagery. Hydrologic soil groups based on United S Department of Agriculture, NRCS Soil Survey map information.	States
• Stormwater runoff from offsite tributary areas was not included in the calculations.	
• Wetlands were excluded from this calculation.	
SOURCES OF DATA/EQUATIONS:	
 Pre-Development Conditions Hydrologic Areas Map prepared by Beals and Thomas, Inc. File 320300P004B-001. 	No.
 NRCS Soil Survey for Plymouth County, downloaded from Web Soil Survey on 06/03/2020. 	
• TR-55 urban Hydrology for Small Watersheds SCS 1986	

- TR-55 urban Hydrology for Small Watersheds, SCS, 1986.
- Massachusetts DEP Stormwater Management Handbook, February 2008.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	N. Bautz	12/15/2020	N. Santangelo	12/15/2020	E. Las	12/16/2020
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021

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CIVIL ENGINEERS | LANDSCAPE ARCHITECTS | LAND SURVEYORS | PLANNERS | ENVIRONMENTAL SPECIALISTS

CONCLUSIONS:

Peak Runoff Rates (CFS):

Storm Event	DP-1
1-Year	13.07
2-Year	29.88
10-Year	91.59
25-Year	148.71
50-Year	205.68
100-Year	276.94

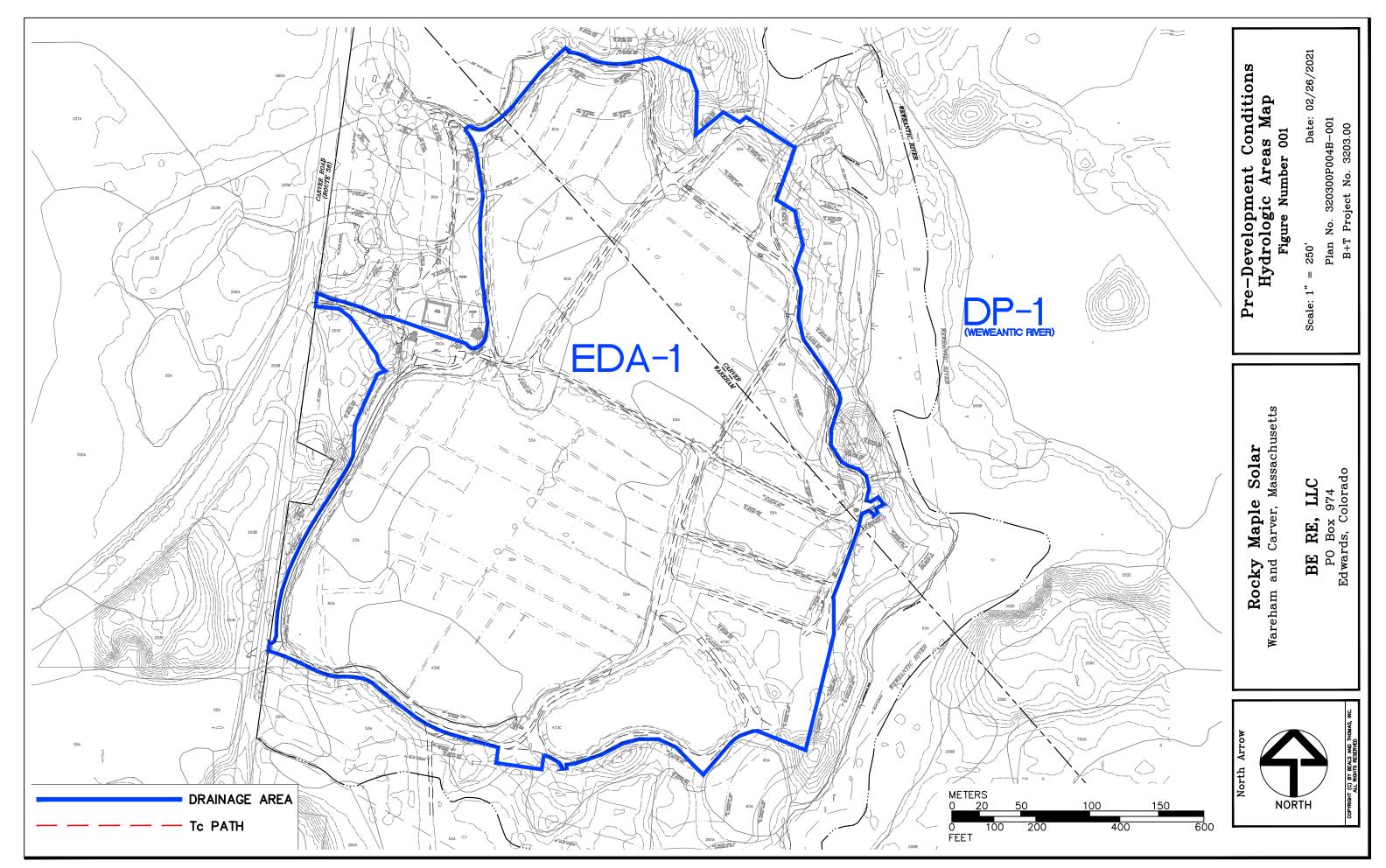
Total Runoff Volumes (AF):

Storm Event	DP-1
1-Year	1.69
2-Year	2.85
10-Year	7.10
25-Year	11.06
50-Year	15.06
100-Year	20.11

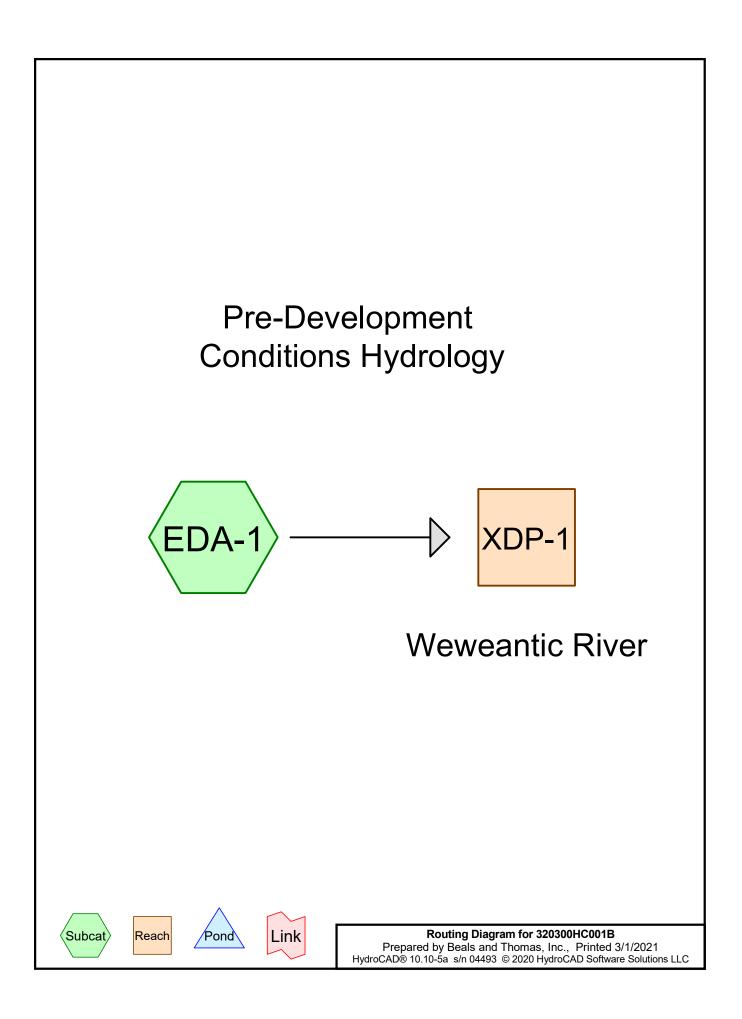
REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	N. Bautz	12/15/2020	N. Santangelo	12/15/2020	E. Las	12/16/2020
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021

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Area	CN	Description
(acres)		(subcatchment-numbers)
15.539	30	Brush, Good, HSG A (EDA-1)
38.227	73	Brush, Good, HSG D (EDA-1)
1.809	96	Existing Gravel Road, HSG A (EDA-1)
1.601	96	Existing Gravel Road, HSG D (EDA-1)
0.200	98	Existing Pavement, HSG A (EDA-1)
0.018	98	Existing Pavement, HSG D (EDA-1)
0.007	98	Existing Roofs, HSG A (EDA-1)
0.010	98	Existing Roofs, HSG D (EDA-1)
0.262	30	Woods, Good, HSG A (EDA-1)
0.025	77	Woods, Good, HSG D (EDA-1)
57.698	63	TOTAL AREA

Soil Listing (selected nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
17.817	HSG A	EDA-1
0.000	HSG B	
0.000	HSG C	
39.881	HSG D	EDA-1
0.000	Other	
57.698		TOTAL AREA

320300HC001BType III 24-hr Plymouth-001yr Rainfall=2.80"Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 4

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

Subcatchment EDA-1:

Runoff Area=57.698 ac 0.41% Impervious Runoff Depth>0.35" Tc=6.0 min CN=63 Runoff=13.07 cfs 1.691 af

Reach XDP-1: Weweantic River

Inflow=13.07 cfs 1.691 af Outflow=13.07 cfs 1.691 af

Total Runoff Area = 57.698 ac Runoff Volume = 1.691 af Average Runoff Depth = 0.35" 99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Runoff = 13.07 cfs @ 12.14 hrs, Volume= 1.691 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-001yr Rainfall=2.80"

_	Area	(ac)	CN	Desc	cription			
	0.	262	30	Woo	ds, Good,	HSG A		
	0.	025	77	Woo	ds, Good,	HSG D		
	15.	539	30	Brus	h, Good, F	ISG A		
	38.	227	73	Brus	h, Good, F	ISG D		
*	1.	809	96			l Road, HS		
*	1.	601	96	Exist	ting Grave	l Road, HS	G D	
*	0.	200	98	Exist	ting Paven	nent, HSG /	A	
*	0.	018	98			nent, HSG	D	
*	0.	007	98		ting Roofs,			
*	0.	010	98	Exist	ting Roofs,	HSG D		
	57.	698	63	Weig	ghted Aver	age		
	57.	463		99.5	9% Pervio	us Area		
	0.	235		0.41	% Impervi	ous Area		
	Tc	Leng	gth	Slope	Velocity	Capacity	Description	
_	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)		
	6.0						Direct Entry, Min Tc.	
	Summary for Reach XDP-1: Weweantic River							

Inflow Area =	57.698 ac,	0.41% Impervious, Inflow	/ Depth > 0.35"	for Plymouth-001yr event
Inflow =	13.07 cfs @	12.14 hrs, Volume=	1.691 af	
Outflow =	13.07 cfs @	12.14 hrs, Volume=	1.691 af, Att	en= 0%, Lag= 0.0 min

320300HC001BType III 24-hr Plymouth-002yr Rainfall=3.36"Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 6

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

Subcatchment EDA-1:

Runoff Area=57.698 ac 0.41% Impervious Runoff Depth>0.59" Tc=6.0 min CN=63 Runoff=29.88 cfs 2.845 af

Reach XDP-1: Weweantic River

Inflow=29.88 cfs 2.845 af Outflow=29.88 cfs 2.845 af

Total Runoff Area = 57.698 ac Runoff Volume = 2.845 af Average Runoff Depth = 0.59" 99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Runoff = 29.88 cfs @ 12.11 hrs, Volume= 2.845 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-002yr Rainfall=3.36"

_	Area	(ac)	CN	Desc	ription			
	0.	262	30	Woo	ds, Good,	HSG A		
	0.	025	77	Woo	ds, Good,	HSG D		
	15.	539	30	Brus	h, Good, H	ISG A		
	38.	227	73	Brus	h, Good, H	ISG D		
*	1.	809	96	Exist	ing Grave	I Road, HS	GA	
*	1.	601	96	Exist	ing Grave	I Road, HS	G D	
*	0.	200	98	Exist	ing Paven	nent, HSG /	A	
*	0.	018	98	Exist	ing Paven	nent, HSG l	D	
*	0.	007	98	Exist	ing Roofs	, HSG A		
*	0.	010	98	Exist	ing Roofs	, HSG D		
	57.	698	63	Weig	ghted Aver	age		
	57.	463		99.5	9% Pervio	us Area		
	0.	235		0.41	% Impervi	ous Area		
	Тс	Leng	gth	Slope	Velocity	Capacity	Description	
_	(min)	(fe	et)	(ft/ft)	(ft/sec)	(cfs)		
	6.0						Direct Entry, Min Tc.	
	Summary for Reach XDP-1: Weweantic River							

Inflow Area =	57.698 ac,	0.41% Impervious, Inflow D	epth > 0.59"	for Plymouth-002yr event
Inflow =	29.88 cfs @	12.11 hrs, Volume=	2.845 af	
Outflow =	29.88 cfs @	12.11 hrs, Volume=	2.845 af, Att	en= 0%, Lag= 0.0 min

320300HC001BType III 24-hr Plymouth-010yr Rainfall=4.95"Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 8

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

Subcatchment EDA-1:

Runoff Area=57.698 ac 0.41% Impervious Runoff Depth>1.48" Tc=6.0 min CN=63 Runoff=91.59 cfs 7.094 af

Reach XDP-1: Weweantic River

Inflow=91.59 cfs 7.094 af Outflow=91.59 cfs 7.094 af

Total Runoff Area = 57.698 ac Runoff Volume = 7.094 af Average Runoff Depth = 1.48" 99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Runoff = 91.59 cfs @ 12.10 hrs, Volume= 7.094 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-010yr Rainfall=4.95"

_	Area	(ac)	CN	Desc	ription					
	0.	262	30	Woo	/oods, Good, HSG A					
	0.	025	77	Woo	ds, Good,	HSG D				
	15.	539	30	Brus	h, Good, H	ISG A				
	38.	227	73	Brus	h, Good, H	ISG D				
*	1.	809	96	Exist	ing Grave	I Road, HS	GA			
*	1.	601	96	Exist	ing Grave	I Road, HS	G D			
*	0.	200	98	Exist	ing Paven	nent, HSG /	A			
*	0.	018	98	Exist	ing Paven	nent, HSG l	D			
*	0.	007	98	Exist	ing Roofs	HSG A				
*	0.	010	98	Exist	ing Roofs	HSG D				
	57.	698	63	Weig	hted Aver	age				
	57.	463		99.5	9% Pervio	us Area				
	0.	235		0.41	% Impervi	ous Area				
	Тс	Leng	gth 🖇	Slope	Velocity	Capacity	Description			
	(min)	(fe	et)	(ft/ft)	(ft/sec)	(cfs)				
	6.0						Direct Entry, Min Tc.			
	Summary for Reach XDP-1: Weweantic River									

Inflow Area	a =	57.698 ac, 0.41% Impervious, Inflow Depth > 1.48" for Plymouth-010yr even	nt
Inflow	=	91.59 cfs @ 12.10 hrs, Volume= 7.094 af	
Outflow	=	91.59 cfs @ 12.10 hrs, Volume= 7.094 af, Atten= 0%, Lag= 0.0 min	

320300HC001BType III 24-hr Plymouth-025yr Rainfall=6.18"Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 10

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

Subcatchment EDA-1:

Runoff Area=57.698 ac 0.41% Impervious Runoff Depth>2.30" Tc=6.0 min CN=63 Runoff=148.71 cfs 11.061 af

Reach XDP-1: Weweantic River

Inflow=148.71 cfs 11.061 af Outflow=148.71 cfs 11.061 af

Total Runoff Area = 57.698 ac Runoff Volume = 11.061 af Average Runoff Depth = 2.30" 99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Runoff = 148.71 cfs @ 12.10 hrs, Volume= 11.061 af, Depth> 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ad	c) CN	Des	cription		
	0.26	2 30) Woo	ods, Good,	HSG A	
	0.02	5 7	7 Woo	ods, Good,	HSG D	
	15.53	9 30) Brus	sh, Good, F	ISG A	
	38.22	7 7	3 Brus	sh, Good, F	ISG D	
*	1.80	9 96	6 Exis	ting Grave	Road, HS	SG A
*	1.60	1 96	6 Exis	ting Grave	Road, HS	SG D
*	0.20	0 98	3 Exis	ting Paven	nent, HSG /	A
*	0.01	8 98	3 Exis	ting Paven	nent, HSG l	D
*	0.00	7 98	3 Exis	ting Roofs,	HSG A	
*	0.01	0 98	3 Exis	ting Roofs,	HSG D	
	57.69	8 63	3 Wei	ghted Aver	age	
	57.46	3	99.5	9% Pervio	us Area	
	0.23	5	0.41	% Impervio	ous Area	
	Tc L	ength	Slope	Velocity	Capacity	Description
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	6.0					Direct Entry, Min Tc.
	Summers for Deach VDD 4. Moureantie Diver					

Summary for Reach XDP-1: Weweantic River

Inflow Are	a =	57.698 ac,	0.41% Impervious, Inflow [Depth > 2.30" for Plymouth-025yr event
Inflow	=	148.71 cfs @	12.10 hrs, Volume=	11.061 af
Outflow	=	148.71 cfs @	12.10 hrs, Volume=	11.061 af, Atten= 0%, Lag= 0.0 min

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

Subcatchment EDA-1:

Runoff Area=57.698 ac 0.41% Impervious Runoff Depth>3.13" Tc=6.0 min CN=63 Runoff=205.68 cfs 15.057 af

Reach XDP-1: Weweantic River

Inflow=205.68 cfs 15.057 af Outflow=205.68 cfs 15.057 af

Total Runoff Area = 57.698 ac Runoff Volume = 15.057 af Average Runoff Depth = 3.13" 99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Runoff = 205.68 cfs @ 12.10 hrs, Volume= 15.057 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area	(ac)	CN	Desc	cription					
	0.	262	30	Woo	Woods, Good, HSG A					
	0.	025	77	Woo	ds, Good,	HSG D				
	15.	539	30	Brus	h, Good, F	ISG A				
	38.	227	73		h, Good, H					
*	1.	809	96			Road, HS				
*	1.	601	96			Road, HS				
*		200	98		•	nent, HSG /				
*	0.	018	98		0	nent, HSG	i D			
*	0.	007	98		ting Roofs,					
*	0.	010	98	Exis	ting Roofs,	HSG D				
	57.	698	63	Weig	ghted Aver	age				
	57.	463		99.5	9% Pervio	us Area				
	0.	235		0.41	% Impervio	ous Area				
	Тс	Leng	gth	Slope	Velocity	Capacity	•			
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)				
	6.0						Direct Entry, Min Tc.			
	Summany for Reach XDP-1: Weweentic River									

Summary for Reach XDP-1: Weweantic River

Inflow Are	a =	57.698 ac,	0.41% Impervious, Inflow	Depth > 3.13"	for Plymouth-050yr event
Inflow	=	205.68 cfs @	12.10 hrs, Volume=	15.057 af	
Outflow	=	205.68 cfs @	12.10 hrs, Volume=	15.057 af, Att	en= 0%, Lag= 0.0 min

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

Subcatchment EDA-1:

Runoff Area=57.698 ac 0.41% Impervious Runoff Depth>4.18" Tc=6.0 min CN=63 Runoff=276.94 cfs 20.109 af

Reach XDP-1: Weweantic River

Inflow=276.94 cfs 20.109 af Outflow=276.94 cfs 20.109 af

Total Runoff Area = 57.698 ac Runoff Volume = 20.109 af Average Runoff Depth = 4.18" 99.59% Pervious = 57.463 ac 0.41% Impervious = 0.235 ac

Runoff = 276.94 cfs @ 12.09 hrs, Volume= 20.109 af, Depth> 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area	(ac)	CN	Desc	ription					
	0.	262	30	Woo	Voods, Good, HSG A					
	0.	025	77	Woo	ds, Good,	HSG D				
	15.	539	30	Brus	h, Good, H	ISG A				
	38.	227	73		h, Good, H					
*	1.	809	96		0	l Road, HS				
*	1.	601	96	Exist	ing Grave	l Road, HS	G D			
*	0.	200	98		0	hent, HSG /				
*	0.	018	98	Exist	ing Paven	nent, HSG I	D			
*	0.	007	98		ing Roofs					
*	0.	010	98	Exist	ing Roofs	, HSG D				
	57.	698	63	Weig	phted Aver	age				
	57.	463		99.5	9% Pervio	us Area				
	0.	235		0.41	% Impervi	ous Area				
	Tc	Leng	gth 🗄	Slope	Velocity	Capacity	Description			
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)				
	6.0						Direct Entry, Min Tc.			
				S	Summary	/ for Read	ch XDP-1: Weweantic River			

Inflow Are	a =	57.698 ac,	0.41% Impervious, Inflow	/ Depth > 4.18"	for Plymouth-100yr event
Inflow	=	276.94 cfs @	12.09 hrs, Volume=	20.109 af	
Outflow	=	276.94 cfs @	12.09 hrs, Volume=	20.109 af, Att	en= 0%, Lag= 0.0 min



JOB NO./LOCATION:	
3203	.00
Carver & Wa	reham, MA
CLIENT/PROJECT:	
BE RE.	LLC
Rocky Ma	ple Solar
SUBJECT/TITLE:	
Post-Development Co	nditions Hydrology
OBJECTIVE OF CALCULATION:	
• To determine the post-development peak rates of 10, 25, 50, & 100-year storm events at the design p	runoff and stormwater volumes from the site for the 1, 2, points.
CALCULATION METHOD(S):	
• Runoff curve numbers (CN), time-of-concentratio methodology.	n (Tc), and runoff rates were calculated based on TR-55
• AutoCAD 2019 computer program was utilized fo	r digitizing ground cover areas.
Peak runoff rates were computed using HydroCAI	
ASSUMPTIONS:	
• The ground cover types were determined using aeri Department of Agriculture, NRCS Soil Survey ma	al imagery. Hydrologic soil groups based on United States p information.
• Stormwater runoff from offsite tributary areas was	
• Wetlands were excluded from this calculation.	
SOURCES OF DATA/EQUATIONS:	
 Post-Development Conditions Hydrologic Areas N File No. 320300P004B-002. 	Iap prepared by Beals and Thomas, Inc.

- NRCS Soil Survey for Plymouth County, downloaded from Web Soil Survey on 06/03/2020.
- TR-55 urban Hydrology for Small Watersheds, SCS, 1986.
- Massachusetts DEP Stormwater Management Handbook, February 2008.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	N. Bautz	12/15/2020	N. Santangelo	12/15/2020	E. Las	12/16/2020
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021

320300CS002B



BEALS + THOMAS

CIVIL ENGINEERS | LANDSCAPE ARCHITECTS | LAND SURVEYORS | PLANNERS | ENVIRONMENTAL SPECIALISTS

CONCLUSIONS:

Peak Runoff Rates (CFS):

Storm Event	DP-1
1-Year	12.97
2-Year	29.64
10-Year	90.87
25-Year	147.54
50-Year	204.06
100-Year	274.76

Total Runoff Volumes (AF):

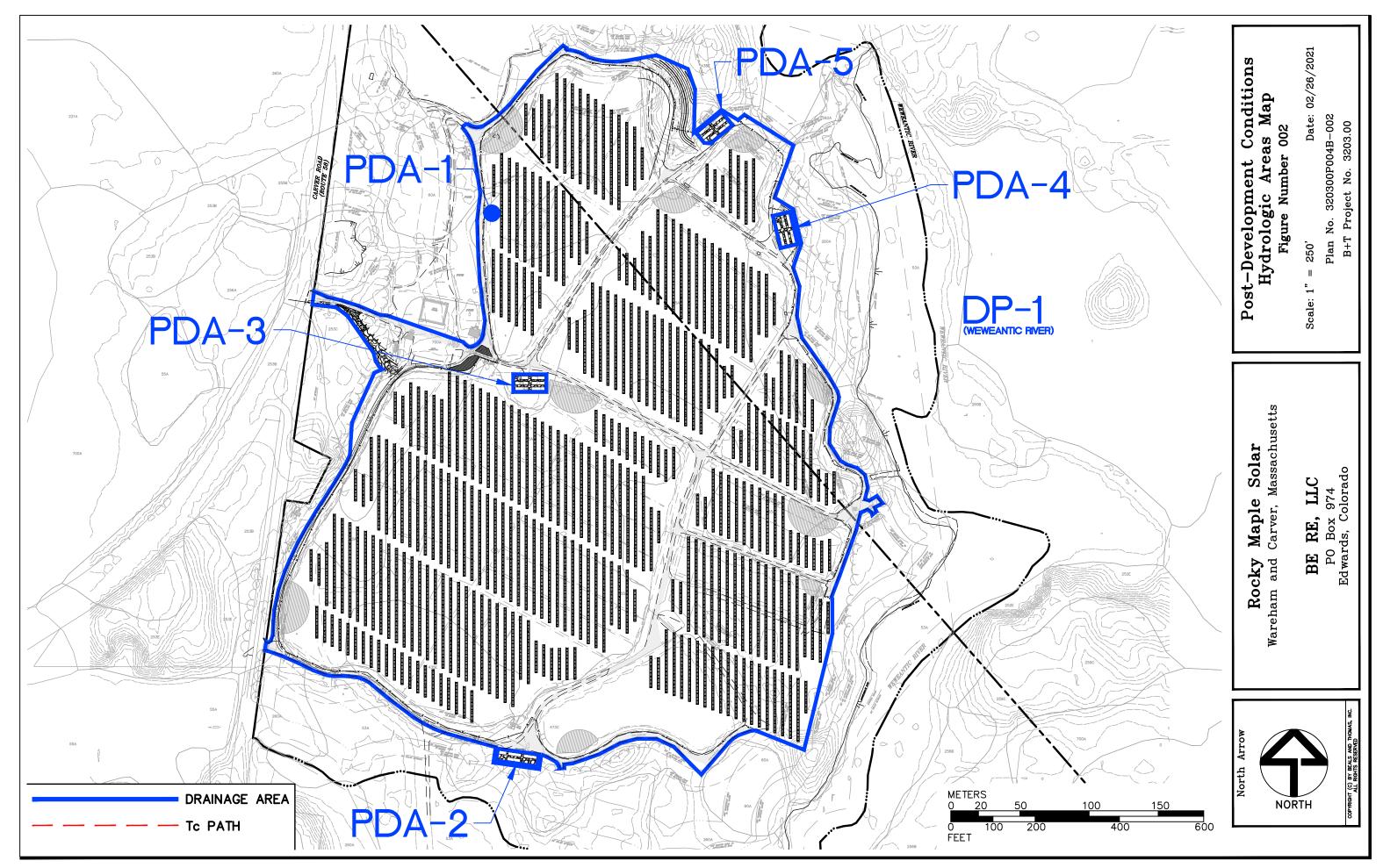
Storm Event	DP-1
1-Year	1.68
2-Year	2.82
10-Year	7.04
25-Year	10.97
50-Year	14.94
100-Year	19.95

Conclusion: Overall runoff rates and volumes from the project area will be less than existing conditions in accordance with Standard 2 of the MassDEP Stormwater Management Regulations and local bylaws.

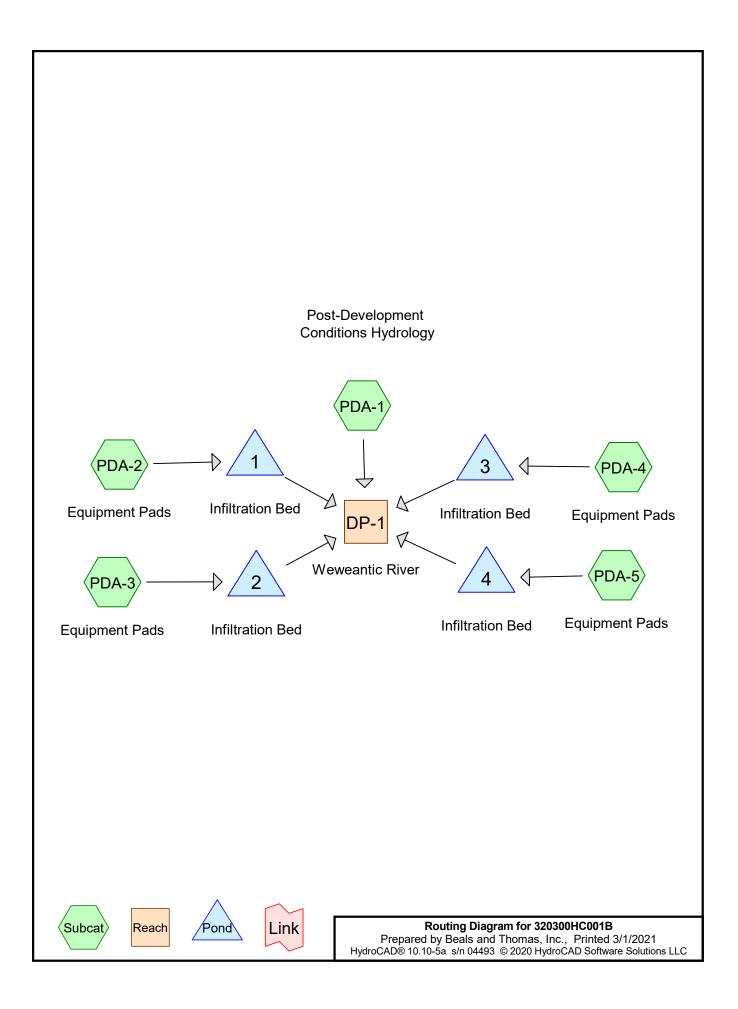
REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	N. Bautz	12/15/2020	N. Santangelo	12/15/2020	E. Las	12/16/2020
1	N. Bautz	02/26/2021	N. Santangelo	03/05/2021	E. Las	03/11/2021

320300CS002B





BEALS AND THOMAS, INC.



Area Listing (selected nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
15.674	30	Brush, Good, HSG A (PDA-1)
37.989	73	Brush, Good, HSG D (PDA-1)
0.084	98	Equipment Pads, HSG A (PDA-2, PDA-5)
0.102	98	Equipment Pads, HSG D (PDA-3, PDA-4)
0.010	98	Exising Roofs, HSG D (PDA-1)
1.412	96	Existing Gravel Road, HSG A (PDA-1)
1.601	96	Existing Gravel Road, HSG D (PDA-1)
0.200	98	Existing Pavement, HSG A (PDA-1)
0.018	98	Existing Pavement, HSG D (PDA-1)
0.007	98	Existing Roofs, HSG A (PDA-1)
0.218	96	Proposed Gravel Road, HSG A (PDA-1)
0.006	96	Proposed Gravel Road, HSG D (PDA-1)
0.130	96	Proposed Gravel, HSG A (PDA-2, PDA-5)
0.140	96	Proposed Gravel, HSG D (PDA-2, PDA-3, PDA-4)
0.092	30	Woods, Good, HSG A (PDA-1)
0.015	77	Woods, Good, HSG D (PDA-1)
57.698	63	TOTAL AREA

Soil Listing (selected nodes)

Soil	Subcatchment
Group	Numbers
HSG A	PDA-1, PDA-2, PDA-5
HSG B	
HSG C	
HSG D	PDA-1, PDA-2, PDA-3, PDA-4
Other	
	TOTAL AREA
	Group HSG A HSG B HSG C HSG D

320300HC001B	Type III 24-hr	Plymouth-001yr Rainfall=2.80"
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1:	Runoff Area=57.242 ac 0.41% Impervious Runoff Depth>0.35" Tc=6.0 min CN=63 Runoff=12.97 cfs 1.678 af
Subcatchment PDA-2: Equipment Pads	Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>2.46" Tc=6.0 min CN=97 Runoff=0.26 cfs 0.021 af
Subcatchment PDA-3: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>2.46" Tc=6.0 min CN=97 Runoff=0.31 cfs 0.024 af
Subcatchment PDA-4: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>2.46" Tc=6.0 min CN=97 Runoff=0.31 cfs 0.024 af
Subcatchment PDA-5: Equipment Pads	Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>2.46" Tc=6.0 min CN=97 Runoff=0.30 cfs 0.024 af
Reach DP-1: Weweantic River	Inflow=12.97 cfs 1.678 af Outflow=12.97 cfs 1.678 af
Pond 1: Infiltration Bed	Peak Elev=62.01' Storage=0.000 af Inflow=0.26 cfs 0.021 af Outflow=0.25 cfs 0.021 af
Pond 2: Infiltration Bed	Peak Elev=63.51' Storage=0.001 af Inflow=0.31 cfs 0.024 af Outflow=0.29 cfs 0.024 af
Pond 3: Infiltration Bed	Peak Elev=65.01' Storage=0.001 af Inflow=0.31 cfs 0.024 af Outflow=0.29 cfs 0.024 af
Pond 4: Infiltration Bed	Peak Elev=65.01' Storage=0.001 af Inflow=0.30 cfs 0.024 af Outflow=0.28 cfs 0.024 af
Total Runoff Area = 57 698 a	c Runoff Volume = 1 771 af Average Runoff Depth = 0 37"

Total Runoff Area = 57.698 acRunoff Volume = 1.771 afAverage Runoff Depth = 0.37"99.27% Pervious = 57.277 ac0.73% Impervious = 0.421 ac

Runoff = 12.97 cfs @ 12.14 hrs, Volume= 1.678 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-001yr Rainfall=2.80"

_	Area	(ac)	CN	Desc	cription			
	0.	0.092 30 Woods, Good, HSG A						
	0.	015	77	Woo	ds, Good,	HSG D		
	15.	674	30	Brus	h, Good, F	ISG A		
	37.	989	73	Brus	h, Good, F	ISG D		
*	0.	218	96	Prop	osed Grav	el Road, H	SG A	
*	1.	412	96			Road, HS		
*	0.	006	96			el Road, H		
*	1.	601	96	Exis	ting Grave	Road, HS	6 D	
*	0.	200	98		0	nent, HSG		
*	0.	018	98		0	nent, HSG)	
*		007	98		ting Roofs,			
*	0.	010	98	Exis	ing Roofs,	HSG D		
	57.	242	63	Weig	ghted Aver	age		
	57.	007		99.5	9% Pervio	us Area		
	0.	0.235 0.41% Impervious Area				ous Area		
	-			<u>.</u>		.	_	
	ŢĊ	Leng	-	Slope	Velocity	Capacity	Description	
_	(min)	(fe	et)	(ft/ft)	(ft/sec)	(cfs)		
	6.0						Direct Entry, Min Tc.	

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.021 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area	(ac)	CN	Desc	cription		
*	0.	033	98	Equi	pment Pac	ls, HSG A	
*	0.	065	96	Prop	osed Grav	el, HSG A	
*	0.	004	96	Prop	osed Grav	el, HSG D	
	0.	102	97	Weig	ghted Aver	age	
	0.	069		67.6	5% Pervio	us Area	
	0.	033		32.3	5% Imperv	vious Area	
	Тс	Leng	th	Slope	Velocitv	Capacity	Description
	(min)	(fee		(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area	(ac)	CN	Desc	cription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	/el, HSG D	
	0.119 97 Weighted Average						
	0.	068		57.1	4% Pervio	us Area	
	0.051 42.86% Impervious Area				6% Imperv	ious Area/	
	_						
	Tc	Leng		Slope	Velocity	Capacity	Description
_	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry, Min Tc
							-

Summary for Subcatchment PDA-4: Equipment Pads

Runoff	=	0.31 cfs @	12.09 hrs,	Volume=	0.024 af, Depth>	2.46"
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area	(ac)	CN	Desc	ription		
*	0.	051	98	Equi	pment Pac	ls, HSG D	
*	0.	068	96	Prop	osed Grav	vel, HSG D	
	0.	119	97	Weig	phted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.	051		42.8	6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-001yr Rainfall=2.80"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

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Type III 24-hr Plymouth-001yr Rainfall=2.80" Printed 3/1/2021 HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLC Page 7

Capacity Tc Length Slope Velocity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 **Direct Entry, Min Tc** Summary for Reach DP-1: Weweantic River 0.73% Impervious, Inflow Depth > 0.35" for Plymouth-001vr event Inflow Area = 57.698 ac. Inflow 12.97 cfs @ 12.14 hrs, Volume= 1.678 af Outflow = 12.97 cfs @ 12.14 hrs, Volume= 1.678 af, Atten= 0%, Lag= 0.0 min Routing by Stor-Ind+Trans method. Time Span= 0.00-24.00 hrs. dt= 0.05 hrs Summary for Pond 1: Infiltration Bed Inflow Area = 0.102 ac, 32.35% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event 0.26 cfs @ 12.09 hrs, Volume= Inflow 0.021 af = Outflow = 0.25 cfs @ 12.12 hrs, Volume= 0.021 af, Atten= 5%, Lag= 2.0 min Discarded = 0.25 cfs @ 12.12 hrs, Volume= 0.021 af Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 62.01' @ 12.11 hrs Surf.Area= 0.102 ac Storage= 0.000 af Plug-Flow detention time= 1.2 min calculated for 0.021 af (100% of inflow) Center-of-Mass det. time= 1.1 min (770.1 - 769.1) Avail.Storage Storage Description Volume Invert 0.041 af 36.00'W x 123.00'L x 1.00'H Prismatoid #1 62.00' 0.102 af Overall x 40.0% Voids Device Routing Invert Outlet Devices 2.410 in/hr Exfiltration over Surface area #1 Discarded 62.00' **Discarded OutFlow** Max=0.25 cfs @ 12.12 hrs HW=62.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.25 cfs) Summary for Pond 2: Infiltration Bed Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event Inflow 0.31 cfs @ 12.09 hrs, Volume= 0.024 af = Outflow = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 6%, Lag= 2.2 min Discarded = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 63.51' @ 12.11 hrs Surf.Area= 0.118 ac Storage= 0.001 af

Plug-Flow detention time= 1.2 min calculated for 0.024 af (100% of inflow) Center-of-Mass det. time= 1.1 min (770.1 - 769.1)

320300HC001B Type III 24-hr Plymouth-001yr Rainfall=2.80"Prepared by Beals and Thomas, Inc.Printed 3/1/2021
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Volume Invert Avail.Storage Storage Description
#1 63.50' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid 0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices
#1 Discarded 63.50' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 12.12 hrs HW=63.51' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 3: Infiltration Bed
Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event Inflow = 0.31 cfs @ 12.09 hrs, Volume= 0.024 af Outflow = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 6%, Lag= 2.2 min Discarded = 0.29 cfs @ 12.12 hrs, Volume= 0.024 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.01' @ 12.11 hrs Surf.Area= 0.118 ac Storage= 0.001 af
Plug-Flow detention time= 1.2 min calculated for 0.024 af (100% of inflow) Center-of-Mass det. time= 1.1 min (770.1 - 769.1)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid 0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices
#1 Discarded 65.00' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 12.12 hrs HW=65.01' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 4: Infiltration Bed
Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 2.46" for Plymouth-001yr event Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 5%, Lag= 1.9 min Discarded = 0.28 cfs @ 12.12 hrs, Volume= 0.024 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.01' @ 12.11 hrs Surf.Area= 0.116 ac Storage= 0.001 af
Plug-Flow detention time= 1.2 min calculated for 0.024 af (100% of inflow) Center-of-Mass det. time= 1.1 min (770.1 - 769.1)
VolumeInvertAvail.StorageStorage Description#165.00'0.046 af51.00'W x 99.00'L x 1.00'H Prismatoid 0.116 af Overall x 40.0% Voids

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Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 12.12 hrs HW=65.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.28 cfs)

320300HC001B	Type III 24-hr	Plymouth-002yr Rainfall=3.36"
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1:	Runoff Area=57.242 ac 0.41% Impervious Runoff Depth>0.59" Tc=6.0 min CN=63 Runoff=29.64 cfs 2.823 af
Subcatchment PDA-2: Equipment Pads	Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>3.01" Tc=6.0 min CN=97 Runoff=0.32 cfs 0.026 af
Subcatchment PDA-3: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>3.01" Tc=6.0 min CN=97 Runoff=0.37 cfs 0.030 af
Subcatchment PDA-4: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>3.01" Tc=6.0 min CN=97 Runoff=0.37 cfs 0.030 af
Subcatchment PDA-5: Equipment Pads	Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>3.01" Tc=6.0 min CN=97 Runoff=0.36 cfs 0.029 af
Reach DP-1: Weweantic River	Inflow=29.64 cfs 2.823 af Outflow=29.64 cfs 2.823 af
Pond 1: Infiltration Bed	Peak Elev=62.02' Storage=0.001 af Inflow=0.32 cfs 0.026 af Outflow=0.25 cfs 0.026 af
Pond 2: Infiltration Bed	Peak Elev=63.52' Storage=0.001 af Inflow=0.37 cfs 0.030 af Outflow=0.29 cfs 0.030 af
Pond 3: Infiltration Bed	Peak Elev=65.02' Storage=0.001 af Inflow=0.37 cfs 0.030 af Outflow=0.29 cfs 0.030 af
Pond 4: Infiltration Bed	Peak Elev=65.02' Storage=0.001 af Inflow=0.36 cfs 0.029 af Outflow=0.28 cfs 0.029 af
Total Runoff Area = 57 698 a	c Runoff Volume = 2 937 af Average Runoff Denth = 0.61"

Total Runoff Area = 57.698 acRunoff Volume = 2.937 afAverage Runoff Depth = 0.61"99.27% Pervious = 57.277 ac0.73% Impervious = 0.421 ac

Runoff = 29.64 cfs @ 12.11 hrs, Volume= 2.823 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-002yr Rainfall=3.36"

_	Area ((ac)	CN	Des	cription				
	0.0	092	30	Woo	ods, Good,	HSG A			
	0.0	015	77	Woo	ods, Good,	HSG D			
	15.0	674	30	Brus	sh, Good, H	ISG A			
	37.9	989	73		sh, Good, H				
*	0.2	218	96	Prop	osed Gra	/el Road, H	SG A		
*	1.4	412	96			l Road, HS			
*	0.0	006	96	Prop	osed Grav	/el Road, H	SG D		
*	1.0	601	96	Exis	ting Grave	l Road, HS	G D		
*	0.2	200	98	Exis	ting Paven	nent, HSG	A		
*	0.0	018	98	Exis	ting Paven	nent, HSG	D		
*	0.0	007	98	Exis	ting Roofs	, HSG A			
*	0.0	010	98	Exis	ing Roofs,	HSG D			
	57.2	242	63	Wei	ghted Aver	age			
	57.0	007		99.5	9% Pervio	us Area			
	0.2	235		0.41	% Impervi	ous Area			
					•				
	Тс	Leng	jth	Slope	Velocity	Capacity	Description		
	(min)	(fe	et)	(ft/ft)	(ft/sec)	(cfs)			
	6.0						Direct Entry, M	lin Tc.	
							•		

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.026 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area	(ac)	CN	Desc	cription		
*	0.	033	98	Equi	pment Pac	ds, HSG A	
*	0.	065	96	Prop	osed Grav	el, HSG A	
*	0.	004	96	Prop	osed Grav	el, HSG D	
	0.	102	97	Weig	ghted Aver	age	
	0.	069		67.6	5% Pervio	us Area	
	0.	033		32.3	5% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-002yr Rainfall=3.36"

_	Area	(ac)	CN	Desc	cription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	/el, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.051			42.8	6% Imperv	ious Area/	
	Tc	Leng	th	Slope	Velocity	Capacity	Description
_	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry, Min Tc
							-

Summary for Subcatchment PDA-4: Equipment Pads

Runoff	=	0.37 cfs @	12.09 hrs,	Volume=	0.030 af,	Depth>	3.01"
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area	(ac)	CN	Desc	ription		
*	0.	051	98	Equi	pment Pac	ls, HSG D	
*	0.	068	96	Prop	osed Grav	vel, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.	051		42.8	6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-002yr Rainfall=3.36"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

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Type III 24-hr Plymouth-002yr Rainfall=3.36" Printed 3/1/2021 HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLC Page 13

Capacity Tc Length Slope Velocity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 **Direct Entry, Min Tc** Summary for Reach DP-1: Weweantic River 57.698 ac. 0.73% Impervious. Inflow Depth > 0.59"for Plymouth-002vr event Inflow Area = Inflow 29.64 cfs @ 12.11 hrs, Volume= 2.823 af Outflow = 29.64 cfs @ 12.11 hrs, Volume= 2.823 af, Atten= 0%, Lag= 0.0 min Routing by Stor-Ind+Trans method. Time Span= 0.00-24.00 hrs. dt= 0.05 hrs Summary for Pond 1: Infiltration Bed Inflow Area = 0.102 ac, 32.35% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event 0.32 cfs @ 12.09 hrs, Volume= Inflow 0.026 af = Outflow = 0.25 cfs @ 12.05 hrs, Volume= 0.026 af, Atten= 23%, Lag= 0.0 min Discarded = 0.25 cfs @ 12.05 hrs, Volume= 0.026 af Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 62.02' @ 12.15 hrs Surf.Area= 0.102 ac Storage= 0.001 af Plug-Flow detention time= 1.3 min calculated for 0.026 af (100% of inflow) Center-of-Mass det. time= 1.2 min (765.6 - 764.4) Avail.Storage Storage Description Volume Invert 0.041 af 36.00'W x 123.00'L x 1.00'H Prismatoid #1 62.00' 0.102 af Overall x 40.0% Voids Device Routing Invert Outlet Devices 2.410 in/hr Exfiltration over Surface area #1 Discarded 62.00' **Discarded OutFlow** Max=0.25 cfs @ 12.05 hrs HW=62.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.25 cfs) Summary for Pond 2: Infiltration Bed Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event Inflow 0.37 cfs @ 12.09 hrs, Volume= 0.030 af = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af, Atten= 23%, Lag= 0.0 min Outflow = Discarded = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 63.52' @ 12.15 hrs Surf.Area= 0.118 ac Storage= 0.001 af

Plug-Flow detention time= 1.3 min calculated for 0.030 af (100% of inflow) Center-of-Mass det. time= 1.2 min (765.6 - 764.4)

Prepared by Beals and Informas, Inc. Printed 371/2021 Prepared by Beals and Informas, Inc. Page 14 Volume Invert Avail.Storage Storage Description #1 63.50' 0.047 af \$2200 Wx 99.001_x 1.00*H Prismatoid 0.118 af Overall x 40.0% Voids Device Routing Invert Outlet Devices # Invert Outlet Devices #1 Discarded 63.50' 2.410 in/hr Exfiltration over Surface area Discarded OutFlow Max=0.29 cfs @ 12.05 hrs HW=63.51' (Free Discharge) —1=Exfiltration (Exfiltration Controls 0.29 cfs) Summary for Pond 3: Infiltration Bed Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 3.01" for Plymouth-002yr event Inflow = 0.37 cfs @ 12.05 hrs, Volume= 0.030 af Atten= 23%, Lag= 0.0 min Discarded = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af Atten= 23%, Lag= 0.0 min Discarded = 0.29 cfs @ 12.05 hrs, Volume= 0.030 af Center-of-Mass det. time= 1.2 min (765.6 - 764.4) Volume Invert Avail Storage Storage Description Externore of the storage <th>320300HC001B</th> <th>Type III 24-hr Plymouth-002yr Rainfall=3.36"</th>	320300HC001B	Type III 24-hr Plymouth-002yr Rainfall=3.36"
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Inflow=0.36 cfs @12.09 hrs, Volume=0.029 afOutflow=0.28 cfs @12.05 hrs, Volume=0.029 af, Atten= 23%, Lag= 0.0 minDiscarded=0.28 cfs @12.05 hrs, Volume=0.029 afRouting by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs0.029 afPeak Elev= 65.02' @12.15 hrsSurf.Area= 0.116 acStorage= 0.001 afPlug-Flow detention time= 1.3 min calculated for 0.029 af (100% of inflow)Center-of-Mass det. time= 1.2 min (765.6 - 764.4)VolumeInvertAvail.StorageStorage Description#165.00'0.046 af51.00'W x 99.00'L x 1.00'H Prismatoid	Summary	r for Pond 4: Infiltration Bed
Inflow=0.36 cfs @12.09 hrs, Volume=0.029 afOutflow=0.28 cfs @12.05 hrs, Volume=0.029 af, Atten= 23%, Lag= 0.0 minDiscarded=0.28 cfs @12.05 hrs, Volume=0.029 afRouting by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs0.029 afPeak Elev= 65.02' @12.15 hrsSurf.Area= 0.116 acStorage= 0.001 afPlug-Flow detention time= 1.3 min calculated for 0.029 af (100% of inflow)Center-of-Mass det. time= 1.2 min (765.6 - 764.4)VolumeInvertAvail.StorageStorage Description#165.00'0.046 af51.00'W x 99.00'L x 1.00'H Prismatoid	Inflow Area = 0 116 ac 43 97% Imr	pervious. Inflow Depth > 3.01" for Plymouth-002vr event
Discarded = $0.28 \text{ cfs} @ 12.05 \text{ hrs}$, Volume= 0.029 af Routing by Stor-Ind method, Time Span= $0.00-24.00 \text{ hrs}$, dt= 0.05 hrs Peak Elev= $65.02' @ 12.15 \text{ hrs}$ Surf.Area= 0.116 ac Storage= 0.001 af Plug-Flow detention time= 1.3 min calculated for 0.029 af (100% of inflow) Center-of-Mass det. time= 1.2 min ($765.6 - 764.4$) <u>Volume Invert Avail.Storage Storage Description</u> #1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid		
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.02' @ 12.15 hrsPlug-Flow detention time= 1.3 min calculated for 0.029 af (100% of inflow) Center-of-Mass det. time= 1.2 min (765.6 - 764.4)VolumeInvertAvail.StorageStorage Description#165.00'0.046 af51.00'W x 99.00'L x 1.00'H Prismatoid		
Peak Elev= 65.02' @ 12.15 hrsSurf.Area= 0.116 acStorage= 0.001 afPlug-Flow detention time= 1.3 min calculated for 0.029 af (100% of inflow) Center-of-Mass det. time= 1.2 min (765.6 - 764.4)VolumeInvertAvail.StorageStorage Description#165.00'0.046 af51.00'W x 99.00'L x 1.00'H Prismatoid	Discarded = $0.28 \text{ cfs} @ 12.05 \text{ hrs},$	Volume= 0.029 af
Volume Invert Avail.Storage Storage Description #1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid		
#1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid		
#1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid	Volume Invert Avail.Storage Sto	brage Description
	#1 65.00' 0.046 af 51	.00'W x 99.00'L x 1.00'H Prismatoid

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Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 12.05 hrs HW=65.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.28 cfs)

320300HC001B	Type III 24-hr	Plymouth-010yr Rainfall=4.95"
Prepared by Beals and Thomas, Inc.		Printed 3/1/2021
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1:	Runoff Area=57.242 ac 0.41% Impervious Runoff Depth>1.48" Tc=6.0 min CN=63 Runoff=90.87 cfs 7.038 af
Subcatchment PDA-2: Equipment Pads	Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>4.59" Tc=6.0 min CN=97 Runoff=0.48 cfs 0.039 af
Subcatchment PDA-3: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>4.59" Tc=6.0 min CN=97 Runoff=0.56 cfs 0.046 af
Subcatchment PDA-4: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>4.59" Tc=6.0 min CN=97 Runoff=0.56 cfs 0.046 af
Subcatchment PDA-5: Equipment Pads	Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>4.59" Tc=6.0 min CN=97 Runoff=0.54 cfs 0.044 af
Reach DP-1: Weweantic River	Inflow=90.87 cfs 7.038 af Outflow=90.87 cfs 7.038 af
Pond 1: Infiltration Bed	Peak Elev=62.07' Storage=0.003 af Inflow=0.48 cfs 0.039 af Outflow=0.25 cfs 0.039 af
Pond 2: Infiltration Bed	Peak Elev=63.57' Storage=0.004 af Inflow=0.56 cfs 0.046 af Outflow=0.29 cfs 0.046 af
Pond 3: Infiltration Bed	Peak Elev=65.07' Storage=0.004 af Inflow=0.56 cfs 0.046 af Outflow=0.29 cfs 0.046 af
Pond 4: Infiltration Bed	Peak Elev=65.07' Storage=0.003 af Inflow=0.54 cfs 0.044 af Outflow=0.28 cfs 0.044 af
Total Runoff Δrea = 57 698 a	c Runoff Volume = 7 213 af Average Runoff Depth = 1 50"

Total Runoff Area = 57.698 acRunoff Volume = 7.213 afAverage Runoff Depth = 1.50"99.27% Pervious = 57.277 ac0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 90.87 cfs @ 12.10 hrs, Volume= 7.038 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area	(ac)	CN	Desc	cription				
	0.	092	30	Woo	ds, Good,	HSG A			
	0.	015	77	Woo	ds, Good,	HSG D			
	15.	674	30	Brus	h, Good, H	ISG A			
	37.	989	73		h, Good, H				
*	0.	218	96	Prop	osed Grav	/el Road, H	SG A		
*	1.	412	96			l Road, HS			
*	0.	006	96	Prop	osed Grav	/el Road, H	SG D		
*	1.	601	96	Exis	ting Grave	l Road, HS	G D		
*	0.	200	98	Exis	Existing Pavement, HSG A				
*	0.	018	98	Exis	Existing Pavement, HSG D				
*	0.	007	98	Exis	Existing Roofs, HSG A				
*	0.	010	98	Exis	ing Roofs,	HSG D			
	57.	242	63	Weig	ghted Aver	age			
	57.	007		99.5	9% Pervio	us Area			
	0.	235		0.41	% Impervi	ous Area			
	_					- ··			
	Tc	Leng		Slope	Velocity	Capacity	Description		
	(min)	(fe	et)	(ft/ft)	(ft/sec)	(cfs)			
	6.0						Direct Entry, Mir	n Tc.	

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.039 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area ((ac)	CN	Desc	cription		
*	0.0	033	98	Equi	pment Pac	ds, HSG A	
*	0.0	065	96	Prop	osed Grav	el, HSG A	
*	0.0	004	96	Prop	osed Grav	vel, HSG D	
	0.	102	97	Weig	ghted Aver	age	
	0.0	069		67.6	5% Pervio	us Area	
	0.0	033		32.3	5% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-010yr Rainfall=4.95"

_	Area	(ac)	CN	Desc	cription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	el, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.	051		42.8	6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-4: Equipment Pads

Runoff	=	0.56 cfs @	12.09 hrs,	Volume=	0.046 af, Depth> 4.59"
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area	(ac)	CN	Desc	ription		
*	0.	051	98	Equi	pment Pac	ls, HSG D	
*	0.	068	96	Prop	osed Grav	vel, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.	051		42.8	6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0	•			\$ F	, <i>, , , , , , , , , , , , , , , , , , </i>	Direct Entry, Min Tc

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.044 af, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-010yr Rainfall=4.95"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

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Type III 24-hr Plymouth-010yr Rainfall=4.95" Printed 3/1/2021 HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLC Page 19

Capacity Tc Length Slope Velocity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 **Direct Entry, Min Tc** Summary for Reach DP-1: Weweantic River 0.73% Impervious. Inflow Depth > 1.46" for Plymouth-010vr event Inflow Area = 57.698 ac. Inflow 90.87 cfs @ 12.10 hrs, Volume= 7.038 af Outflow = 90.87 cfs @ 12.10 hrs, Volume= 7.038 af, Atten= 0%, Lag= 0.0 min Routing by Stor-Ind+Trans method. Time Span= 0.00-24.00 hrs. dt= 0.05 hrs Summary for Pond 1: Infiltration Bed Inflow Area = 0.102 ac, 32.35% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event 0.48 cfs @ 12.09 hrs, Volume= Inflow 0.039 af = Outflow = 0.25 cfs @ 12.00 hrs, Volume= 0.039 af, Atten= 48%, Lag= 0.0 min Discarded = 0.25 cfs @ 12.00 hrs, Volume= 0.039 af Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 62.07' @ 12.23 hrs Surf.Area= 0.102 ac Storage= 0.003 af Plug-Flow detention time= 2.6 min calculated for 0.039 af (100% of inflow) Center-of-Mass det. time= 2.5 min (758.0 - 755.5) Avail.Storage Storage Description Volume Invert 0.041 af 36.00'W x 123.00'L x 1.00'H Prismatoid #1 62.00' 0.102 af Overall x 40.0% Voids Device Routing Invert Outlet Devices 2.410 in/hr Exfiltration over Surface area #1 Discarded 62.00' **Discarded OutFlow** Max=0.25 cfs @ 12.00 hrs HW=62.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.25 cfs) Summary for Pond 2: Infiltration Bed Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event Inflow 0.56 cfs @ 12.09 hrs, Volume= 0.046 af = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af, Atten= 49%, Lag= 0.0 min Outflow = Discarded = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 63.57' @ 12.23 hrs Surf.Area= 0.118 ac Storage= 0.004 af

Plug-Flow detention time= 2.6 min calculated for 0.046 af (100% of inflow) Center-of-Mass det. time= 2.5 min (758.0 - 755.5)

320300HC001B Type III 24-hr Plymouth-010yr Rainfall=4.95"
Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 20
VolumeInvertAvail.StorageStorage Description#163.50'0.047 af52.00'W x 99.00'L x 1.00'H Prismatoid
0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices
#1 Discarded 63.50' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 12.00 hrs HW=63.51' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 3: Infiltration Bed
Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.046 af Outflow = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af, Atten= 49%, Lag= 0.0 min Discarded = 0.29 cfs @ 12.00 hrs, Volume= 0.046 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.07' @ 12.23 hrs Surf.Area= 0.118 ac Storage= 0.004 af
Plug-Flow detention time= 2.6 min calculated for 0.046 af (100% of inflow) Center-of-Mass det. time= 2.5 min(758.0 - 755.5)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid
0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices
#1 Discarded 65.00' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 12.00 hrs HW=65.01' (Free Discharge) [▲] -1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 4: Infiltration Bed
Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 4.59" for Plymouth-010yr event Inflow = 0.54 cfs @ 12.09 hrs, Volume= 0.044 af Outflow = 0.28 cfs @ 12.00 hrs, Volume= 0.044 af, Atten= 48%, Lag= 0.0 min Discarded = 0.28 cfs @ 12.00 hrs, Volume= 0.044 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.07' @ 12.23 hrs Surf.Area= 0.116 ac Storage= 0.003 af
Plug-Flow detention time= 2.6 min calculated for 0.044 af (100% of inflow) Center-of-Mass det. time= 2.4 min(758.0 - 755.5)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid 0.116 af Overall x 40.0% Voids

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DeviceRoutingInvertOutlet Devices#1Discarded65.00'2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 12.00 hrs HW=65.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.28 cfs)

320300HC001B	Type III 24-hr Plymouth-025yr Rainfall=6.18"
Prepared by Beals and Thomas, Inc.	Printed 3/1/2021
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1:	Runoff Area=57.242 ac 0.41% Impervious Runoff Depth>2.30" Tc=6.0 min CN=63 Runoff=147.54 cfs 10.974 af
Subcatchment PDA-2: Equipment Pads	Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>5.82" Tc=6.0 min CN=97 Runoff=0.60 cfs 0.049 af
Subcatchment PDA-3: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>5.82" Tc=6.0 min CN=97 Runoff=0.70 cfs 0.058 af
Subcatchment PDA-4: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>5.82" Tc=6.0 min CN=97 Runoff=0.70 cfs 0.058 af
Subcatchment PDA-5: Equipment Pads	Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>5.82" Tc=6.0 min CN=97 Runoff=0.68 cfs 0.056 af
Reach DP-1: Weweantic River	Inflow=147.54 cfs 10.974 af Outflow=147.54 cfs 10.974 af
Pond 1: Infiltration Bed	Peak Elev=62.13' Storage=0.005 af Inflow=0.60 cfs 0.049 af Outflow=0.25 cfs 0.049 af
Pond 2: Infiltration Bed	Peak Elev=63.63' Storage=0.006 af Inflow=0.70 cfs 0.058 af Outflow=0.29 cfs 0.058 af
Pond 3: Infiltration Bed	Peak Elev=65.13' Storage=0.006 af Inflow=0.70 cfs 0.058 af Outflow=0.29 cfs 0.058 af
Pond 4: Infiltration Bed	Peak Elev=65.13' Storage=0.006 af Inflow=0.68 cfs 0.056 af Outflow=0.28 cfs 0.056 af
Total Runoff Area = 57.698 ac	Runoff Volume = 11.195 af Average Runoff Depth = 2.33"

Total Runoff Area = 57.698 acRunoff Volume = 11.195 afAverage Runoff Depth = 2.33"99.27% Pervious = 57.277 ac0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 147.54 cfs @ 12.10 hrs, Volume= 10.974 af, Depth> 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-025yr Rainfall=6.18"

_	Area	(ac)	CN	Desc	cription			
	0.	092	30	Woo	Woods, Good, HSG A			
	0.	015	77	Woo	ds, Good,	HSG D		
	15.	674	30	Brus	h, Good, F	ISG A		
	37.	989	73	Brus	h, Good, F	ISG D		
*	0.	218	96	Prop	osed Grav	el Road, H	SG A	
*	1.4	412	96			l Road, HS		
*	0.	006	96			vel Road, H		
*	1.	601	96			l Road, HS		
*	0.	200	98	Exis	ting Paven	nent, HSG	Ą	
*	0.	018	98			nent, HSG	D	
*		007	98		ting Roofs,			
*	0.	010	98	Exis	ing Roofs,	HSG D		
	57.	242	63	Weig	ghted Aver	age		
	57.	007		99.5	9% Pervio	us Area		
	0.	235		0.41	% Impervi	ous Area		
	–					0	Description	
	Tc	Leng		Slope	Velocity	Capacity	Description	
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)		
	6.0						Direct Entry, Mi	n Tc.

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.60 cfs @ 12.09 hrs, Volume= 0.049 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area	(ac)	CN	Desc	cription		
*	0.	033	98	Equi	pment Pac	ds, HSG A	
*	0.	065	96	Prop	osed Grav	el, HSG A	
*	0.	004	96	Prop	osed Grav	vel, HSG D	
	0.	102	97	Weig	ghted Aver	age	
	0.	069		67.6	5% Pervio	us Area	
	0.	033		32.3	5% Imper\	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-025yr Rainfall=6.18"

_	Area	(ac)	CN	Desc	cription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	/el, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.051 42.86% Impervious Area			6% Imperv	ious Area/		
	–		а.	0	\/.l	0	Description
	ŢĊ	Leng		Slope	Velocity	Capacity	Description
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-4: Equipment Pads

Runoff	=	0.70 cfs @	12.09 hrs, \	Volume=	0.058 af,	Depth> 5.82"	
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area	(ac)	CN	Desc	ription		
*	0.	051	98	Equi	pment Pac	ls, HSG D	
*	0.	068	96	Prop	osed Grav	vel, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.	068		57.1	4% Pervio	us Area	
	0.	051		42.8	6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.68 cfs @ 12.09 hrs, Volume= 0.056 af, Depth> 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-025yr Rainfall=6.18"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

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Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs)					
6.0 Direct Entry, Min Tc					
Summary for Reach DP-1: Weweantic River					
Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 2.28" for Plymouth-025yr event Inflow = 147.54 cfs @ 12.10 hrs, Volume= 10.974 af Outflow = 147.54 cfs @ 12.10 hrs, Volume= 10.974 af, Atten= 0%, Lag= 0.0 min					
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs					
Summary for Pond 1: Infiltration Bed					
Inflow Area = 0.102 ac , 32.35% Impervious, Inflow Depth > $5.82"$ for Plymouth-025yr eventInflow = 0.60 cfs @ 12.09 hrs , Volume= 0.049 af Outflow = 0.25 cfs @ 11.95 hrs , Volume= 0.049 af , Atten= 59% , Lag= 0.0 min Discarded = 0.25 cfs @ 11.95 hrs , Volume= 0.049 af					
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 62.13' @ 12.30 hrs Surf.Area= 0.102 ac Storage= 0.005 af					
Plug-Flow detention time= 4.2 min calculated for 0.049 af (100% of inflow) Center-of-Mass det. time= 4.1 min (755.3 - 751.2)					
Volume Invert Avail.Storage Storage Description					
#1 62.00' 0.041 af 36.00'W x 123.00'L x 1.00'H Prismatoid 0.102 af Overall x 40.0% Voids					
Device Routing Invert Outlet Devices					
#1 Discarded 62.00' 2.410 in/hr Exfiltration over Surface area					
Discarded OutFlow Max=0.25 cfs @ 11.95 hrs HW=62.01' (Free Discharge) ←1=Exfiltration (Exfiltration Controls 0.25 cfs)					
Summary for Pond 2: Infiltration Bed					
Inflow Area = 0.119 ac , 42.86% Impervious, Inflow Depth > 5.82" for Plymouth-025yr eventInflow = 0.70 cfs @ 12.09 hrs , Volume= 0.058 af Outflow = 0.29 cfs @ 11.95 hrs , Volume= 0.058 af , Atten= 59%, Lag= 0.0 minDiscarded = 0.29 cfs @ 11.95 hrs , Volume= 0.058 af					
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs					

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 63.63' @ 12.30 hrs Surf.Area= 0.118 ac Storage= 0.006 af

Plug-Flow detention time= 4.3 min calculated for 0.058 af (100% of inflow) Center-of-Mass det. time= 4.1 min (755.3 - 751.2)

320300HC001B Type III 24-hr Plymouth-025yr Rainfall=6.18"				
Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 26				
Volume Invert Avail.Storage Storage Description				
#1 63.50' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid 0.118 af Overall x 40.0% Voids				
Device Routing Invert Outlet Devices				
#1 Discarded 63.50' 2.410 in/hr Exfiltration over Surface area				
Discarded OutFlow Max=0.29 cfs @ 11.95 hrs HW=63.51' (Free Discharge)				
Summary for Pond 3: Infiltration Bed				
-				
Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.058 af				
Outflow = $0.29 \text{ cfs} \oplus 11.95 \text{ hrs}$, Volume= 0.058 af , Atten= 59%, Lag= 0.0 min				
Discarded = 0.29 cfs @ 11.95 hrs, Volume= 0.058 af				
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.13' @ 12.30 hrs Surf.Area= 0.118 ac Storage= 0.006 af				
Plug-Flow detention time= 4.3 min calculated for 0.058 af (100% of inflow) Center-of-Mass det. time= 4.1 min (755.3 - 751.2)				
Volume Invert Avail.Storage Storage Description				
#1 65.00' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid				
0.118 af Overall x 40.0% Voids				
Device Routing Invert Outlet Devices				
#1 Discarded 65.00' 2.410 in/hr Exfiltration over Surface area				
Discarded OutFlow Max=0.29 cfs @ 11.95 hrs HW=65.01' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)				
Summary for Pond 4: Infiltration Bed				
Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 5.82" for Plymouth-025yr event				
Inflow = 0.68 cfs @ 12.09 hrs, Volume= 0.056 af				
Outflow = 0.28 cfs @ 11.95 hrs, Volume= 0.056 af, Atten= 59%, Lag= 0.0 min Discarded = 0.28 cfs @ 11.95 hrs, Volume= 0.056 af				
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.13' @ 12.29 hrs Surf.Area= 0.116 ac Storage= 0.006 af				
Plug-Flow detention time= 4.2 min calculated for 0.056 af (100% of inflow) Center-of-Mass det. time= 4.1 min (755.3 - 751.2)				
Volume Invert Avail.Storage Storage Description				
#1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid 0.116 af Overall x 40.0% Voids				

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Device	Routing	Invert	Outlet Devices	

#1 Discarded 65.00' 2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 11.95 hrs HW=65.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.28 cfs)

320300HC001B	Type III 24-hr Plymouth	-050yr Rainfall=7.31"
Prepared by Beals and Thomas, Inc.		Printed 3/1/2021
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1:	Runoff Area=57.242 ac 0.41% Impervious Runoff Depth>3.13" Tc=6.0 min CN=63 Runoff=204.06 cfs 14.938 af
Subcatchment PDA-2: Equipment Pads	Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>6.95" Tc=6.0 min CN=97 Runoff=0.71 cfs 0.059 af
Subcatchment PDA-3: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>6.95" Tc=6.0 min CN=97 Runoff=0.83 cfs 0.069 af
Subcatchment PDA-4: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>6.95" Tc=6.0 min CN=97 Runoff=0.83 cfs 0.069 af
Subcatchment PDA-5: Equipment Pads	Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>6.95" Tc=6.0 min CN=97 Runoff=0.81 cfs 0.067 af
Reach DP-1: Weweantic River	Inflow=204.06 cfs 14.938 af Outflow=204.06 cfs 14.938 af
Pond 1: Infiltration Bed	Peak Elev=62.19' Storage=0.008 af Inflow=0.71 cfs 0.059 af Outflow=0.25 cfs 0.059 af
Pond 2: Infiltration Bed	Peak Elev=63.70' Storage=0.009 af Inflow=0.83 cfs 0.069 af Outflow=0.29 cfs 0.069 af
Pond 3: Infiltration Bed	Peak Elev=65.20' Storage=0.009 af Inflow=0.83 cfs 0.069 af Outflow=0.29 cfs 0.069 af
Pond 4: Infiltration Bed	Peak Elev=65.19' Storage=0.009 af Inflow=0.81 cfs 0.067 af Outflow=0.28 cfs 0.067 af
Total Runoff Area = 57,698 ac	Runoff Volume = 15,202 af Average Runoff Depth = 3,16"

Total Runoff Area = 57.698 acRunoff Volume = 15.202 afAverage Runoff Depth = 3.16"99.27% Pervious = 57.277 ac0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 204.06 cfs @ 12.10 hrs, Volume= 14.938 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-050yr Rainfall=7.31"

_	Area	(ac)	CN	Desc	cription			
	0.	092	30	Woo	ds, Good,	HSG A		
	0.	015	77	Woo	ods, Good,	HSG D		
	15.	674	30	Brus	sh, Good, F	ISG A		
	37.	989	73		sh, Good, F			
*	0.	218	96	Prop	osed Grav	/el Road, H	ISG A	
*	1.	412	96			l Road, HS		
*	0.	006	96	Prop	osed Grav	/el Road, H	ISG D	
*	1.	601	96	Exis	ting Grave	l Road, HS	SG D	
*	0.	200	98		•	nent, HSG		
*	0.	018	98		•	nent, HSG	D	
*	0.	007	98		ting Roofs			
*	0.	010	98	Exis	ing Roofs,	HSG D		
	57.	242	63	Weig	ghted Aver	age		
	57.	007		99.5	9% Pervio	us Area		
	0.	235		0.41	% Impervi	ous Area		
	Тс	Leng		Slope	Velocity	Capacity	Description	
	(min)	(fe	et)	(ft/ft)	(ft/sec)	(cfs)		
	6.0						Direct Entry, Min Tc.	

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.71 cfs @ 12.09 hrs, Volume= 0.059 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area	(ac)	CN	Desc	cription		
*	0.	033	98	Equi	pment Pac	ls, HSG A	
*	0.	065	96	Prop	osed Grav	el, HSG A	
*	0.	004	96	Prop	osed Grav	vel, HSG D	
	0.	102	97	Weig	ghted Aver	age	
	0.069 67.65% Pervious Area			5% Pervio	us Area		
	0.	0.033 32.35% Impervious Area			5% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.069 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-050yr Rainfall=7.31"

_	Area	(ac)	CN	Desc	cription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	/el, HSG D	
	0.119 97 Weighted Average					age	
	0.068 57.14% Pervious Area					us Area	
	0.051 42.86% Impervious Area				6% Imperv	ious Area/	
	–		а.	0	\/.l	0	Description
	ŢĊ	Leng		Slope	Velocity	Capacity	Description
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-4: Equipment Pads

Runoff	=	0.83 cfs @	12.09 hrs,	Volume=	0.069 af, Depth> 6.9	5"
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area	(ac)	CN	Desc	ription		
*	0.	051	98	Equi	pment Pac	ls, HSG D	
*	0.	068	96	Prop	osed Grav	vel, HSG D	
	0.	119	97	Weig	ghted Aver	age	
	0.068 57.14% Pervious Area				4% Pervio	us Area	
	0.051 42.86% Impervious Area				6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.067 af, Depth> 6.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-050yr Rainfall=7.31"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

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Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs)									
6.0 Direct Entry, Min Tc									
Summary for Reach DP-1: Weweantic River									
Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 3.11" for Plymouth-050yr event Inflow = 204.06 cfs @ 12.10 hrs, Volume= 14.938 af Outflow = 204.06 cfs @ 12.10 hrs, Volume= 14.938 af, Atten= 0%, Lag= 0.0 min Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs									
Summary for Pond 1: Infiltration Bed									
Inflow Area = 0.102 ac, 32.35% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.059 af Outflow = 0.25 cfs @ 11.90 hrs, Volume= 0.059 af, Atten= 65%, Lag= 0.0 min Discarded = 0.25 cfs @ 11.90 hrs, Volume= 0.059 af									
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 62.19' @ 12.36 hrs Surf.Area= 0.102 ac Storage= 0.008 af									
Plug-Flow detention time= 6.2 min calculated for 0.059 af (100% of inflow) Center-of-Mass det. time= 6.1 min (754.3 - 748.2)									
Volume Invert Avail.Storage Storage Description									
#1 62.00' 0.041 af 36.00'W x 123.00'L x 1.00'H Prismatoid 0.102 af Overall x 40.0% Voids									
Device Routing Invert Outlet Devices									
#1 Discarded 62.00' 2.410 in/hr Exfiltration over Surface area									
Discarded OutFlow Max=0.25 cfs @ 11.90 hrs HW=62.01' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.25 cfs)									
Summary for Pond 2: Infiltration Bed									
Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.069 af Outflow = 0.29 cfs @ 11.90 hrs, Volume= 0.069 af, Atten= 65%, Lag= 0.0 min Discarded = 0.29 cfs @ 11.90 hrs, Volume= 0.069 af									
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 63.70' @ 12.36 hrs Surf.Area= 0.118 ac Storage= 0.009 af									

Plug-Flow detention time= 6.3 min calculated for 0.069 af (100% of inflow) Center-of-Mass det. time= 6.1 min (754.3 - 748.2)

320300HC001B Prepared by Beals and Thomas, Inc. Type III 24-hr Plymouth-050yr Rainfall=7.31" Printed 3/1/2021
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Volume Invert Avail.Storage Storage Description
#1 63.50' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid 0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices
#1 Discarded 63.50' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 11.90 hrs HW=63.51' (Free Discharge) ↑ 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 3: Infiltration Bed
Inflow Area = 0.119 ac , 42.86% Impervious, Inflow Depth > $6.95"$ for Plymouth-050yr eventInflow = 0.83 cfs @ 12.09 hrs , Volume= 0.069 af Outflow = 0.29 cfs @ 11.90 hrs , Volume= 0.069 af Discarded = 0.29 cfs @ 11.90 hrs , Volume= 0.069 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.20' @ 12.36 hrs Surf.Area= 0.118 ac Storage= 0.009 af
Plug-Flow detention time= 6.3 min calculated for 0.069 af (100% of inflow) Center-of-Mass det. time= 6.1 min (754.3 - 748.2)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid 0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices #1 Discarded 65.00' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 11.90 hrs HW=65.01' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 4: Infiltration Bed
Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 6.95" for Plymouth-050yr event Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.067 af Outflow = 0.28 cfs @ 11.90 hrs, Volume= 0.067 af, Atten= 65%, Lag= 0.0 min Discarded = 0.28 cfs @ 11.90 hrs, Volume= 0.067 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.19' @ 12.35 hrs Surf.Area= 0.116 ac Storage= 0.009 af
Plug-Flow detention time= 6.2 min calculated for 0.067 af (100% of inflow) Center-of-Mass det. time= 6.0 min (754.2 - 748.2)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid 0.116 af Overall x 40.0% Voids

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Device	Routing	Invert	Outlet Devices
#1	Discarded	65.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 11.90 hrs HW=65.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.28 cfs)

320300HC001B	Type III 24-hr Plymouth-100yr Rainfall=8.65"
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-1:	Runoff Area=57.242 ac 0.41% Impervious Runoff Depth>4.18" Tc=6.0 min CN=63 Runoff=274.76 cfs 19.950 af
Subcatchment PDA-2: Equipment Pads	Runoff Area=0.102 ac 32.35% Impervious Runoff Depth>8.28" Tc=6.0 min CN=97 Runoff=0.84 cfs 0.070 af
Subcatchment PDA-3: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>8.28" Tc=6.0 min CN=97 Runoff=0.98 cfs 0.082 af
Subcatchment PDA-4: Equipment Pads	Runoff Area=0.119 ac 42.86% Impervious Runoff Depth>8.28" Tc=6.0 min CN=97 Runoff=0.98 cfs 0.082 af
Subcatchment PDA-5: Equipment Pads	Runoff Area=0.116 ac 43.97% Impervious Runoff Depth>8.28" Tc=6.0 min CN=97 Runoff=0.96 cfs 0.080 af
Reach DP-1: Weweantic River	Inflow=274.76 cfs 19.950 af Outflow=274.76 cfs 19.950 af
Pond 1: Infiltration Bed	Peak Elev=62.28' Storage=0.012 af Inflow=0.84 cfs 0.070 af Outflow=0.25 cfs 0.070 af
Pond 2: Infiltration Bed	Peak Elev=63.78' Storage=0.013 af Inflow=0.98 cfs 0.082 af Outflow=0.29 cfs 0.082 af
Pond 3: Infiltration Bed	Peak Elev=65.28' Storage=0.013 af Inflow=0.98 cfs 0.082 af Outflow=0.29 cfs 0.082 af
Pond 4: Infiltration Bed	Peak Elev=65.28' Storage=0.013 af Inflow=0.96 cfs 0.080 af Outflow=0.28 cfs 0.080 af
Total Runoff Area = 57.698 ac	Runoff Volume = 20.265 af Average Runoff Depth = 4.21"

Total Runoff Area = 57.698 acRunoff Volume = 20.265 afAverage Runoff Depth = 4.21"99.27% Pervious = 57.277 ac0.73% Impervious = 0.421 ac

Summary for Subcatchment PDA-1:

Runoff = 274.76 cfs @ 12.09 hrs, Volume= 19.950 af, Depth> 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-100yr Rainfall=8.65"

0.092 30 Woods, Good, HSG A 0.015 77 Woods, Good, HSG D 15.674 30 Brush, Good, HSG A	
15.674 30 Brush, Good, HSG A	
37.989 73 Brush, Good, HSG D	
* 0.218 96 Proposed Gravel Road, HSG A	
* 1.412 96 Existing Gravel Road, HSG A	
* 0.006 96 Proposed Gravel Road, HSG D	
* 1.601 96 Existing Gravel Road, HSG D	
* 0.200 98 Existing Pavement, HSG A	
* 0.018 98 Existing Pavement, HSG D	
* 0.007 98 Existing Roofs, HSG A	
* 0.010 98 Exising Roofs, HSG D	
57.242 63 Weighted Average	
57.007 99.59% Pervious Area	
0.235 0.41% Impervious Area	
Tc Length Slope Velocity Capacity Description	
(min) (feet) (ft/ft) (ft/sec) (cfs)	
6.0 Direct Entry, Min Tc.	

Summary for Subcatchment PDA-2: Equipment Pads

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.070 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area	(ac)	CN	Desc	cription		
*	0.	033	98	Equi	pment Pa	ds, HSG A	
*	0.	065	96	Prop	osed Grav	/el, HSG A	
*	0.	004	96	Prop	osed Grav	/el, HSG D	
	0.102 97 Weighted Average				ghted Aver	age	
	0.069 67.65% Pervious Area				5% Pervio	us Area	
	0.033 32.35% Impervious Area			5% Imperv	ious Area/		
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-3: Equipment Pads

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-100yr Rainfall=8.65"

_	Area	(ac)	CN	Desc	cription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	el, HSG D	
	0.119 97 Weighted Average					age	
	0.068 57.14% Pervious Area					us Area	
	0.051 42.86% Impervious Area					vious Area	
			а.	0	\/.l	0	Description
	ŢĊ	Leng		Slope	Velocity	Capacity	Description
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-4: Equipment Pads

Runoff	=	0.98 cfs @	12.09 hrs,	Volume=	0.082 af, Depth> 8.28"
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Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area	(ac)	CN	Desc	ription		
*	0.	051	98	Equi	pment Pac	ds, HSG D	
*	0.	068	96	Prop	osed Grav	vel, HSG D	
	0.119 97 Weighted Average				ghted Aver	age	
	0.068 57.14% Pervious Area				4% Pervio	us Area	
	0.051 42.86% Impervious Area				6% Imperv	vious Area	
	Tc (min)	Leng (fee		Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	6.0						Direct Entry, Min Tc

Summary for Subcatchment PDA-5: Equipment Pads

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.080 af, Depth> 8.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Type III 24-hr Plymouth-100yr Rainfall=8.65"

	Area (ac)	CN	Description
*	0.051	98	Equipment Pads, HSG A
*	0.065	96	Proposed Gravel, HSG A
	0.116	97	Weighted Average
	0.065		56.03% Pervious Area
	0.051		43.97% Impervious Area

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Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs)								
6.0 Direct Entry, Min Tc								
Summary for Reach DP-1: Weweantic River								
Inflow Area = 57.698 ac, 0.73% Impervious, Inflow Depth > 4.15" for Plymouth-100yr event Inflow = 274.76 cfs @ 12.09 hrs, Volume= 19.950 af Outflow = 274.76 cfs @ 12.09 hrs, Volume= 19.950 af, Atten= 0%, Lag= 0.0 min								
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs								
Summary for Pond 1: Infiltration Bed								
Inflow Area = 0.102 ac, 32.35% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.070 af Outflow = 0.25 cfs @ 11.80 hrs, Volume= 0.070 af, Atten= 71%, Lag= 0.0 min Discarded = 0.25 cfs @ 11.80 hrs, Volume= 0.070 af								
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 62.28' @ 12.41 hrs Surf.Area= 0.102 ac Storage= 0.012 af								
Plug-Flow detention time= 9.1 min calculated for 0.070 af (100% of inflow) Center-of-Mass det. time= 9.0 min(754.5 - 745.5)								
Volume Invert Avail.Storage Storage Description								
#1 62.00' 0.041 af 36.00'W x 123.00'L x 1.00'H Prismatoid 0.102 af Overall x 40.0% Voids								
Device Routing Invert Outlet Devices								
#1 Discarded 62.00' 2.410 in/hr Exfiltration over Surface area								
Discarded OutFlow Max=0.25 cfs @ 11.80 hrs HW=62.01' (Free Discharge) -1=Exfiltration (Exfiltration Controls 0.25 cfs)								
Summary for Pond 2: Infiltration Bed								
Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event Inflow = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af Outflow = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af, Atten= 71%, Lag= 0.0 min Discarded = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af								
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 63.78' @ 12.41 hrs Surf.Area= 0.118 ac Storage= 0.013 af								

Plug-Flow detention time= 9.2 min calculated for 0.082 af (100% of inflow) Center-of-Mass det. time= 9.1 min (754.6 - 745.5)

320300HC001B Type III 24-hr Plymouth-100yr Rainfall=8.65"
Prepared by Beals and Thomas, Inc.Printed 3/1/2021HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLCPage 38
VolumeInvertAvail.StorageStorage Description#163.50'0.047 af52.00'W x 99.00'L x 1.00'H Prismatoid
0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices
#1 Discarded 63.50' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 11.80 hrs HW=63.51' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 3: Infiltration Bed
Inflow Area = 0.119 ac, 42.86% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.98 cfs @ 12.09 hrs, Volume= 0.082 af
Outflow = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af, Atten= 71%, Lag= 0.0 min Discarded = 0.29 cfs @ 11.80 hrs, Volume= 0.082 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.28' @ 12.41 hrs Surf.Area= 0.118 ac Storage= 0.013 af
Plug-Flow detention time= 9.2 min calculated for 0.082 af (100% of inflow) Center-of-Mass det. time= 9.1 min(754.6-745.5)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.047 af 52.00'W x 99.00'L x 1.00'H Prismatoid
0.118 af Overall x 40.0% Voids
Device Routing Invert Outlet Devices #1 Discarded 65.00' 2.410 in/hr Exfiltration over Surface area
Discarded OutFlow Max=0.29 cfs @ 11.80 hrs HW=65.01' (Free Discharge) 1=Exfiltration (Exfiltration Controls 0.29 cfs)
Summary for Pond 4: Infiltration Bed
Inflow Area = 0.116 ac, 43.97% Impervious, Inflow Depth > 8.28" for Plymouth-100yr event
Inflow = 0.96 cfs @ 12.09 hrs, Volume= 0.080 af
Outflow = 0.28 cfs @ 11.80 hrs, Volume= 0.080 af, Atten= 71%, Lag= 0.0 min Discarded = 0.28 cfs @ 11.80 hrs, Volume= 0.080 af
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs Peak Elev= 65.28' @ 12.41 hrs Surf.Area= 0.116 ac Storage= 0.013 af
Plug-Flow detention time= 9.1 min calculated for 0.080 af (100% of inflow) Center-of-Mass det. time= 9.0 min(754.4-745.5)
Volume Invert Avail.Storage Storage Description
#1 65.00' 0.046 af 51.00'W x 99.00'L x 1.00'H Prismatoid 0.116 af Overall x 40.0% Voids

Prepared by Beals and Thomas, Inc. HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLC

DeviceRoutingInvertOutlet Devices#1Discarded65.00'2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.28 cfs @ 11.80 hrs HW=65.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.28 cfs)



JO	B NO./LOCATION:		2202.00				
	3203.00 Correr & Warshow MA						
	Carver & Wareham, MA						
CL	IENT/PROJECT:						
			BE RE, LI				
			Rocky Maple	Solar			
CU							
30.	BJECT/TITLE:	Groundwate	er Mounding Calculat	ions for Infiltrati	on Bed 1		
OB	JECTIVE OF CALCU	JLATION:					
	• To determine th	e maximum gro	undwater mounding h	eight beneath In	filtration Bed 1.		
CA	LCULATION METHO	OD(S):					
	• Estimated maxi	mum groundwat	er mounding height c	alculated using I	Hantush equation.		
AS	SUMPTIONS:						
	= 2.41 in/hr $= 4$.82 ft/day.		, -	infiltration rate of the		
		aulic conductivit) is 200 ft/day ba	ased on data provided	in USGS Report	
				GSWS Paper 160	62-D for Medium San	d	
					rved seasonal high g		
			ing subsurface explor	rations.			
			tion) [x] = 61.5 ft				
		basin (in y direct					
	Infiltration Basi	in-1 takes approx	kimately 2.001 hours	(t=0.083 days) to	dewater.		
50	URCES OF DATA/EQ	OUATIONS:					
50			ublished by the USGS				
					Water from Stratified	d-Drift Aquifers.	
			setts: Executive Sum		, and great angles		
				•	Specific Yields for Va	rious Materials,	
	1967.						
	Massachusetts	Stormwater Hand	dbook, 2008				
CO	NCLUSIONS:						
	ę ;		0	11	proximately <u>0.867-fee</u>		
			cluded that the rise in	groundwater ele	evation will not prohib	oit the basin from	
dev	vatering within 72 ho	urs.					
REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE	
0	NBB	02/26/2021	NPS	03/05/2021	EJL	03/11/2021	
				1	1		

320300CS004A



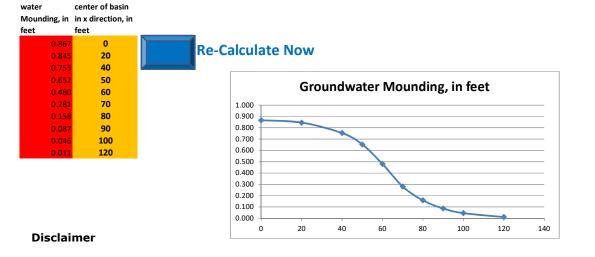
This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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		use consistent units (e.g. feet & days or inches & hours)	Conversion Table	
Input Values			inch/hour feet/	day
4.8200	R	Recharge (infiltration) rate (feet/day)	0.67	1.33
0.260	Sy	Specific yield, Sy (dimensionless, between 0 and 1)		
200.00	к	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00 In the report accompanying this spreadsheet
61.500	x	1/2 length of basin (x direction, in feet)		(USGS SIR 2010-5102), vertical soil permeability
18.000	У	1/2 width of basin (y direction, in feet)	hours days	
0.083	t	duration of infiltration period (days)	36	1.50 hydraulic conductivity (ft/d).
10.000	hi(0)	initial thickness of saturated zone (feet)		

maximum thickness of saturated zone (beneath center of basin at end of infiltration period) maximum groundwater mounding (beneath center of basin at end of infiltration period)



h(max)

∆h(max)

Distance from

10.867

Ground-

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.



JO	JOB NO./LOCATION: 3203.00 Carver & Wareham, MA							
CL	CLIENT/PROJECT: BE RE, LLC Rocky Maple Solar							
SU.	SUBJECT/TITLE: Groundwater Mounding Calculations for Infiltration Bed 2							
OB	 OBJECTIVE OF CALCULATION: To determine the maximum groundwater mounding height beneath Infiltration Bed 2. 							
CA	<i>LCULATION METH</i>Estimated maxi		er mounding height c	alculated using H	Hantush equation.			
AS	 ASSUMPTIONS: Vertical hydraulic conductivity [R] (unsaturated zone) is equal to the infiltration rate of the proposed basin = 2.41 in/hr = 4.82 ft/day. Horizontal hydraulic conductivity [K] (saturated zone) is 200 ft/day based on data provided in USGS Report 86-4053A for mixed sand and gravel. Specific yield [Sy] is 0.26 based on data provided in GSWS Paper 1662-D for Medium Sand Estimated saturated thickness [hi(0)] is 10.00 ft based upon observed seasonal high groundwater and additional field observations during subsurface explorations. ¹/₂ the length of basin (in x direction) [x] = 49.5 ft ¹/₂ the width of basin (in y direction) [y] = 26 ft Infiltration Basin-1 takes approximately 1.983 hours (t=0.083 days) to dewater. 							
SO	 SOURCES OF DATA/EQUATIONS: Hantush equation spreadsheet published by the USGS. Page 2 of USGS Report 86-4053A, Yield and Quality of Ground Water from Stratified-Drift Aquifers, Taunton River Basin, Massachusetts: Executive Summary, 1989. Page D1 of GWSWS Paper 1662-D, Specific Yield – Compilation of Specific Yields for Various Materials, 1967. Massachusetts Stormwater Handbook, 2008 							
The req	<i>CONCLUSIONS:</i> The mounding analysis indicates that the groundwater elevation would rise approximately <u>1.049-feet</u> to infiltrate the required volume. Therefore, it can be concluded that the rise in groundwater elevation will not prohibit the basin from dewatering within 72 hours.							
REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE		
0	NBB	02/26/2021	NPS	03/05/2021	EJL	03/11/2021		

320300CS005A



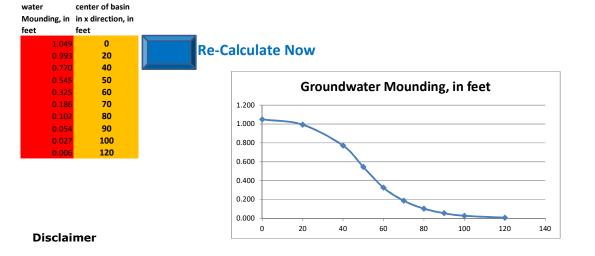
This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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		use consistent units (e.g. feet & days or inches & hours)	Conversion Ta	ble	
Input Values			inch/hour	feet/day	
4.8200	R	Recharge (infiltration) rate (feet/day)	0.67	1.	33
0.260	Sy	Specific yield, Sy (dimensionless, between 0 and 1)			
200.00	К	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.	00 In the report accompanying this spreadsheet
49.500	x	1/2 length of basin (x direction, in feet)			(USGS SIR 2010-5102), vertical soil permeability
26.000	У	1/2 width of basin (y direction, in feet)	hours	days	(ft/d) is assumed to be one-tenth horizontal
0.083	t	duration of infiltration period (days)	36	1.	50 hydraulic conductivity (ft/d).
10.000	hi(0)	initial thickness of saturated zone (feet)			

maximum thickness of saturated zone (beneath center of basin at end of infiltration period) maximum groundwater mounding (beneath center of basin at end of infiltration period)



h(max)

∆h(max)

Distance from

11.049

Ground-

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.



JO.	JOB NO./LOCATION:							
	3203.00 Carver & Wareham, MA							
CL	IENT/PROJECT:		BE RE, LI	C				
			Rocky Maple					
SU	BJECT/TITLE:	Groundwate	er Mounding Calculat	ions for Infiltrati	on Bed 3			
OB	 OBJECTIVE OF CALCULATION: To determine the maximum groundwater mounding height beneath Infiltration Bed 3. 							
CA	LCULATION METHO	OD(S):						
	• Estimated maxi	mum groundwat	er mounding height c	alculated using H	Hantush equation.			
	 Estimated maximum groundwater mounding height calculated using Hantush equation. ASSUMPTIONS: Vertical hydraulic conductivity [R] (unsaturated zone) is equal to the infiltration rate of the proposed basin = 2.41 in/hr = 4.82 ft/day. Horizontal hydraulic conductivity [K] (saturated zone) is 200 ft/day based on data provided in USGS Report 86-4053A for mixed sand and gravel. Specific yield [Sy] is 0.26 based on data provided in GSWS Paper 1662-D for Medium Sand Estimated saturated thickness [hi(0)] is 10.00 ft based upon observed seasonal high groundwater and additional field observations during subsurface explorations. ½ the length of basin (in x direction) [x] = 49.5 ft ½ the width of basin (in y direction) [y] = 26 ft Infiltration Basin-1 takes approximately 1.983 hours (t=0.083 days) to dewater. SOURCES OF DATA/EQUATIONS: Hantush equation spreadsheet published by the USGS. Page 2 of USGS Report 86-4053A, Yield and Quality of Ground Water from Stratified-Drift Aquifers, Taunton River Basin, Massachusetts: Executive Summary, 1989. Page D1 of GWSWS Paper 1662-D, Specific Yield – Compilation of Specific Yields for Various Materials, 1967. 							
The req	Massachusetts Stormwater Handbook, 2008 CONCLUSIONS: The mounding analysis indicates that the groundwater elevation would rise approximately <u>1.049-feet</u> to infiltrate the required volume. Therefore, it can be concluded that the rise in groundwater elevation will not prohibit the basin from dewatering within 72 hours.							
$\frac{\text{REV}}{0}$	CALC. BY NBB	DATE 02/26/2021	CHECKED BY NPS	DATE 03/05/2021	APPROVED BY EJL	DATE 03/11/2021		
U		02/20/2021	111.5	03/03/2021		05/11/2021		

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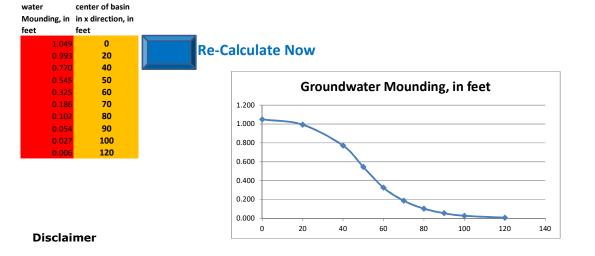
This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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			use consistent units (e.g. feet & days or inches & hours)	Conversion Ta	ble	
	Input Values			inch/hour f	eet/day	
	4.8200	R	Recharge (infiltration) rate (feet/day)	0.67	1.3	3
	0.260	Sy	Specific yield, Sy (dimensionless, between 0 and 1)			
	200.00	К	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.0	0 In the report accompanying this spreadsheet
	49.500	x	1/2 length of basin (x direction, in feet)			(USGS SIR 2010-5102), vertical soil permeability
	26.000	У	1/2 width of basin (y direction, in feet)	hours o	days	(ft/d) is assumed to be one-tenth horizontal
	0.083	t	duration of infiltration period (days)	36	1.5	0 hydraulic conductivity (ft/d).
	10.000	hi(0)	initial thickness of saturated zone (feet)			

maximum thickness of saturated zone (beneath center of basin at end of infiltration period) maximum groundwater mounding (beneath center of basin at end of infiltration period)



h(max)

∆h(max)

Distance from

11.049

Ground-

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.



JO	JOB NO./LOCATION: 3203.00 Carver & Wareham, MA							
CL	IENT/PROJECT:		BE RE, LI Rocky Maple					
SU.	BJECT/TITLE:	Groundwate	r Mounding Calculat	ions for Infiltrati	on Bed 4			
OB	<i>JECTIVE OF CALCU</i>To determine the		undwater mounding h	eight beneath In	filtration Bed 4.			
CA	• Estimated maxi		er mounding height c	alculated using H	Hantush equation.			
AS	 ASSUMPTIONS: Vertical hydraulic conductivity [R] (unsaturated zone) is equal to the infiltration rate of the proposed basin = 2.41 in/hr = 4.82 ft/day. Horizontal hydraulic conductivity [K] (saturated zone) is 200 ft/day based on data provided in USGS Report 86-4053A for mixed sand and gravel. Specific yield [Sy] is 0.26 based on data provided in GSWS Paper 1662-D for Medium Sand Estimated saturated thickness [hi(0)] is 10.00 ft based upon observed seasonal high groundwater and additional field observations during subsurface explorations. ½ the length of basin (in x direction) [x] = 49.5 ft ½ the width of basin (in y direction) [y] = 25.5 ft Infiltration Basin-1 takes approximately 1.975 hours (t=0.082 days) to dewater. 							
SO	 SOURCES OF DATA/EQUATIONS: Hantush equation spreadsheet published by the USGS. Page 2 of USGS Report 86-4053A, Yield and Quality of Ground Water from Stratified-Drift Aquifers, Taunton River Basin, Massachusetts: Executive Summary, 1989. Page D1 of GWSWS Paper 1662-D, Specific Yield – Compilation of Specific Yields for Various Materials, 1967. Massachusetts Stormwater Handbook, 2008 							
The req	<i>CONCLUSIONS:</i> The mounding analysis indicates that the groundwater elevation would rise approximately <u>1.030-feet</u> to infiltrate the required volume. Therefore, it can be concluded that the rise in groundwater elevation will not prohibit the basin from dewatering within 72 hours.							
REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE		
0	NBB	02/26/2021	NPS	03/05/2021	EJL	03/11/2021		

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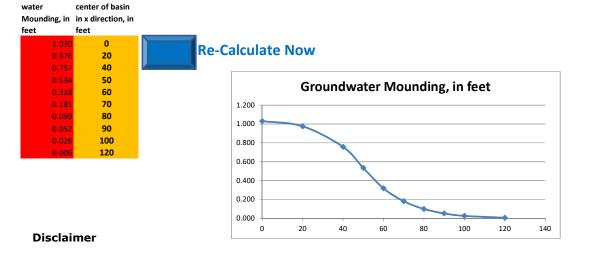
This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

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		use consistent units (e.g. feet & days or inches & hours)	Conversion Table	
Input Values			inch/hour fee	t/day
4.8200	R	Recharge (infiltration) rate (feet/day)	0.67	1.33
0.260	Sy	Specific yield, Sy (dimensionless, between 0 and 1)		
200.00	к	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00 In the report accompanying this spreadsheet
49.500	x	1/2 length of basin (x direction, in feet)		(USGS SIR 2010-5102), vertical soil permeability
25.500	У	1/2 width of basin (y direction, in feet)	hours day	
0.082	t	duration of infiltration period (days)	36	1.50 hydraulic conductivity (ft/d).
10.000	hi(0)	initial thickness of saturated zone (feet)		

maximum thickness of saturated zone (beneath center of basin at end of infiltration period) maximum groundwater mounding (beneath center of basin at end of infiltration period)



h(max)

∆h(max)

Distance from

1.030

Ground-

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YIELD AND QUALITY OF GROUND WATER FROM STRATIFIED-DRIFT AQUIFERS, TAUNTON RIVER BASIN, MASSACHUSETTS: EXECUTIVE SUMMARY

By Wayne W. Lapham and Julio C. Olimpio

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 86-4053A

Prepared in cooperation with

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL MANAGEMENT DIVISION OF WATER RESOURCES



Boston, Massachusetts 1989

PHYSICAL SETTING AND HYDROGEOLOGY OF THE BASIN

The Taunton River basin covers 530 mi² (square miles) of Bristol, Norfolk, and Plymouth Counties in southeastern Massachusetts. All or parts of the cities of Attleboro, Brockton, Fall River, New Bedford, and Taunton, and 36 towns are in the basin (fig. 1). The basin is drained by the Matfield, Town, and Taunton Rivers.

Tributary streams include the Canoe, Nemasket, Wading, Threemile, and Winnetuxet Rivers. Surface-water drainage is generally southward toward Mount Hope Bay, a part of Narragansett Bay at Fall River.

Stratified-drift deposits cover about 62 percent of the basin. These deposits are primarily ice-contact, outwash, and lake-bottom sediments, which were deposited in preglacial bedrock valleys and in water-filled depressions in the till and bedrock surface during retreat of the last glacier. The sediments are composed of sand, gravel, cobbles, silt, and clay. The drift ranges in thickness from zero to about 200 ft (feet) in some of the deep preglacial bedrock vallevs. The thickest deposits are lake-bottom deposits composed of fine sand interbedded with silt and clay. Stratified-drift deposits are more abundant in the central and southern parts of the basin than in the northern part of the basin. In the northern onethird of the basin, stratified drift fills narrow, northsouth trending valleys, which are bordered by till and bedrock uplands.

Yields of wells in the fine-grained stratifieddrift deposits are usually no more than a few gallons per minute (gal/min) whereas yields of wells in the coarse-grained stratified drift may exceed 300 gal/min. The coarse-grained parts of the stratifieddrift deposits form the major aquifers in the basin. In the northern part of the basin, these aquifers are long, narrow, and thin, and have saturated thicknesses that range from about 20 ft to somewhat more than 100 ft. The widths of the stratified-drift aquifers generally range from 0.1 to 1.5 mi (miles), and their lengths generally range from 1 to 5 mi.

Twenty-six stratified-drift aquifers in the northern half of the basin were studied in detail (fig. 2). These aquifers were selected because current and projected 1990 water-supply deficits are greatest in the northern half of the basin, affecting 14 of 19 municipalities. In contrast, only one of nine municipalities in the southern half of the basin is projected to have a deficit (Richard Thibedeau, Massachusetts Division of Water Resources, written commun.,1984). The 26 aquifers also were selected because the use of ground water as the sole source of supply is greatest in the northern half of the basin. Fifteen of 19 municipalities in the northern half of the basin use ground water as compared to 4 of 9 municipalities in the southern half of the basin.

The 26 stratified-drift aguifers were identified as areas of stratified drift that have a transmissivity equal to or greater than 1,337 ft²/d (square feet per day), which is equivalent to 10,000 gallons per day per foot. The aquifers underlie or are near major rivers or tributaries. The aquifers are composed mostly of layers of sand and gravel but include some interbedded layers of silt and clay. John R. Williams (U.S. Geological Survey, written commun., 1982) determined that the hydraulic conductivity of fineto-coarse gravel ranges from about 150 to 500 ft/d (feet per day), mixed sand and gravel averages about 200 ft/d, and fine-to-coarse sand ranges from about 25 to 150 ft/d. The transmissivity of the stratified drift is equal to the product of its hydraulic conductivity and saturated thickness. Therefore, equal transmissivities at different locations in an aquifer may be the result of thin deposits of high-conductivity drift or thick deposits of low-conductivity drift. Transmissivity exceeds 4,000 ft²/d in small areas in nearly all 26 aguifers. In a few areas, where the stratified drift is thick or has a high hydraulic conductivity, transmissivity exceeds 10,000 ft^2/d .

AQUIFER YIELDS

Estimates from Model Simulations

During severe drought, ground-water discharge from aquifers to streams is reduced or ceases, streamflow is at a minimum, and only small amounts of surface water are stored in wetlands and ponds. Consequently, water pumped from most aquifers in New England during severe drought is derived largely from storage in the aquifers. During normal climatic conditions, water pumped from an aquifer is derived from storage, intercepted ground-water discharge, and induced infiltration of surface water. To account for drought and normal conditions, two sets of aquifer-vield estimates were made for each of the 26 stratified-drift aquifers using simple groundwater flow models. "Short-term" aquifer yields during drought conditions were determined by considering only water from storage and are expressed as single values for several selected pumping periods. "Long-term" aquifer yields during normal

Specific Yield---

Compilation of Specific

Yields for Various



GEOLOGICAL SURVEY WATER SUPPLY PAPER 1662-D

<u>"Prepered in</u> cooperation with the California Department of Water Resources



HYDROLOGIC PROPERTIES OF EARTH MATERIALS

SPECIFIC YIELD—COMPILATION OF SPECIFIC YIFLDS FOR VARIOUS MATERIALS

By A. I. JOHNSON

ABSTRACT

Specific yield is defined as the ratio of (1) the volume of water that a strutated rock or soil will yield by gravity to (2) the total volume of the rock or soil. Specific yield is usually expressed as a percentage. The value is not definitive, because the quantity of water that will drain by gravity depends on variables such as duration of drainage, temperature, mineral composition of the water, and various physical characteristics of the rock or soil under consideration. Values of specific yield, nevertheless, offer a convenient means by which hydrologists can estimate the water-yielding capacities of earth materials and, as such, are very useful in hydrologic studies.

The present report consists mostly of direct or modified quotations from many selected reports that present and evaluate methods for determining specific yield, limitations of those methods, and results of the determinations made on a wide variety of rock and soil materials. Although no particular values are recommended in this report, a table summarizes values of specific yield, and their averages, determined for 10 rock textures. The following is an abstract of the table:

	-	-		
	Number of		Specific yield	
Material	determinations	Maximum	Minimum	Average
Clay	15	5	0	2
Silt	16	19	3	8
Sandy clay	12	12	3	7
Fine sand	17	28	10	21
Medium sand	17	32	15	26
Coarse sand	17	35	20	27
Gravelly sand	15	35	20	25
Fine gravel	17	35	21	25
Medium gravel	14	26	13	23
Coarse gravel	14	26	12	22

Specific yields, in percent, of various materials

[Rounded to nearest whole percent]

INTRODUCTION

PURPOSE AND SCOPE

The purpose of this report is to assist hydrologists in estimating the quantity of water in storage in ground-water reservoirs by providing



wdown Time = <u>Rv</u> (K) (Bottom	Area) where:	Rv = Storage Volume Below Outlet [Ac-ft] K= Infiltration Rate [in/hr] Bottom Area= Bottom Area of Recharge System [Ac]
Infiltration Bed 1		
Rv =	0.041 Ac-ft	
К =	2.410 in/hr	
Bottom Area =	0.102 Acres	
Drawdown Time =	2.001 Hours	< 72 Hours, Design is in compliance with the standard.
Infiltration Bed 2		
Rv =	0.047 Ac-ft	
К =	2.410 in/hr	
Bottom Area =	0.118 Acres	
Drawdown Time =	1.983 Hours	< 72 Hours, Design is in compliance with the standard
Infiltration Bed 3 Rv = K = Bottom Area = Drawdown Time =	0.047 Ac-ft 2.410 in/hr 0.118 Acres 1.983 Hours	< 72 Hours, Design is in compliance with the standard.
Infiltration Bed 4		
initiation bed 4		
Rv =	0.046 Ac-ft	
	0.046 Ac-ft 2.410 in/hr	
Rv =		

Note:

1. The infiltration BMPs have been designed to fully drain within 72 hours, therefore the proposed stormwater management design is in compliance with Standard 3.

2. Infiltration Rate based on Volume 3, Chapter 1, Table 2.3.3 *Rawls Rates* from the 2008 MA DEP Stormwater Management Handbook.

JOB NO. <u>3203.00</u>	COMPUTED BY: NBB	CHECKED BY:	NPS	
JOB: Rocky Maple Solar	DATE: 02/26/21	DATE:	3/5/2021	_

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Stage-Area-Storage for Pond 1: Infiltration Bed

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Stage-Area-Storage for Pond 2: Infiltration Bed

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Elevation	Surface	Storage	Elevation	Surface	Storage
(feet)	(acres)	(acre-feet)	(feet)	(acres)	(acre-feet)
63.50	0.118	0.000	64.02	0.118	0.025
63.51	0.118	0.000	64.03	0.118	0.025
63.52	0.118	0.001	64.04	0.118	0.026
63.53	0.118	0.001	64.05	0.118	0.026
63.54	0.118	0.002	64.06	0.118	0.026
63.55	0.118	0.002	64.07	0.118	0.027
63.56	0.118	0.003	64.08	0.118	0.027
63.57	0.118	0.003	64.09	0.118	0.028
63.58	0.118	0.004	64.10	0.118	0.028
63.59	0.118	0.004	64.11	0.118	0.029
63.60	0.118	0.005	64.12	0.118	0.029
63.61	0.118	0.005	64.13	0.118	0.030
63.62	0.118	0.006	64.14	0.118	0.030
63.63	0.118	0.006	64.15	0.118	0.031
63.64	0.118	0.007	64.16	0.118	0.031
63.65	0.118	0.007	64.17	0.118	0.032
63.66	0.118	0.008	64.18	0.118	0.032
63.67	0.118	0.008	64.19	0.118	0.033
63.68	0.118	0.009	64.20	0.118	0.033
63.69	0.118	0.009	64.21	0.118	0.034
63.70	0.118	0.009	64.22	0.118	0.034
63.71	0.118	0.010	64.23	0.118	0.035
63.72	0.118	0.010	64.24	0.118	0.035
63.73	0.118	0.011	64.25	0.118	0.035
63.74	0.118	0.011	64.26	0.118	0.036
63.75	0.118	0.012	64.27	0.118	0.036
63.76	0.118	0.012	64.28	0.118	0.037
63.77	0.118	0.013	64.29	0.118	0.037
63.78	0.118	0.013	64.30	0.118	0.038
63.79	0.118	0.014	64.31	0.118	0.038
63.80	0.118	0.014	64.32	0.118	0.039
63.81	0.118	0.015	64.33	0.118	0.039
63.82	0.118	0.015	64.34	0.118	0.040
63.83	0.118	0.016	64.35	0.118	0.040
63.84	0.118	0.016	64.36	0.118	0.041
63.85	0.118	0.017	64.37	0.118	0.041
63.86	0.118	0.017	64.38	0.118	0.042
63.87	0.118	0.017	64.39	0.118	0.042
63.88	0.118	0.018	64.40	0.118	0.043
63.89	0.118	0.018	64.41	0.118	0.043
63.90	0.118	0.019	64.42	0.118	0.043
63.91	0.118	0.019	64.43	0.118	0.044
63.92	0.118	0.020	64.44	0.118	0.044
63.93 63.94	0.118	0.020	64.45	0.118	0.045
	0.118	0.021	64.46	0.118	0.045
63.95 63.06	0.118	0.021	64.47	0.118	0.046
63.96 63.07	0.118	0.022	64.48	0.118	0.046
63.97 63.98	0.118	0.022	64.49	0.118	0.047
	0.118	0.023	64.50	0.118	0.047
63.99 64.00	0.118	0.023			
64.00 64.01	0.118 0.118	0.024 0.024			
04.01	0.110	0.024			
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Stage-Area-Storage for Pond 3: Infiltration Bed

Elevation Surface Storage (acre-feet) Elevation Surface Storage (acre-feet) 65:00 0.118 0.000 65:52 0.118 0.025 65:01 0.118 0.001 65:53 0.118 0.025 65:03 0.118 0.001 65:55 0.118 0.026 65:04 0.118 0.002 65:55 0.118 0.027 65:05 0.118 0.003 65:58 0.118 0.027 65:06 0.118 0.003 65:59 0.118 0.028 65:09 0.118 0.004 65:61 0.118 0.029 65:10 0.118 0.005 65:62 0.118 0.029 65:11 0.118 0.006 65:65 0.118 0.031 65:12 0.118 0.007 65:66 0.118 0.032 65:17 0.118 0.007 65:66 0.118 0.032 65:17 0.118 0.008 65:67 0.118 </th <th></th> <th>_</th> <th></th> <th></th> <th>_</th> <th></th>		_			_	
65.00 0.118 0.000 65.52 0.118 0.025 65.02 0.118 0.001 65.53 0.118 0.025 65.03 0.118 0.001 65.55 0.118 0.026 65.04 0.118 0.002 65.57 0.118 0.027 65.05 0.118 0.002 65.57 0.118 0.027 65.06 0.118 0.003 65.59 0.118 0.027 65.07 0.118 0.003 65.59 0.118 0.028 65.08 0.118 0.004 65.61 0.118 0.028 65.10 0.118 0.004 65.62 0.118 0.029 65.11 0.118 0.005 65.62 0.118 0.029 65.13 0.118 0.006 65.65 0.118 0.031 65.14 0.118 0.006 65.66 0.118 0.031 65.15 0.118 0.007 65.66 0.118 0.032 65.17 0.118 0.009 65.71 0.118 0.032 65.19 0.118 0.009 65.77 0.118 0.033 65.19 0.118 0.009 65.77 0.118 0.033 65.20 0.118 0.010 65.73 0.118 0.035 65.21 0.118 0.010 65.77 0.118 0.035 65.22 0.118 0.011 65.79 0.118 0.035 65.24 0.118 0						
65.01 0.118 0.001 65.53 0.118 0.026 65.03 0.118 0.001 65.54 0.118 0.026 65.04 0.118 0.002 65.56 0.118 0.026 65.05 0.118 0.002 65.57 0.118 0.027 65.06 0.118 0.003 65.58 0.118 0.027 65.07 0.118 0.003 65.59 0.118 0.028 65.08 0.118 0.004 65.61 0.118 0.028 65.09 0.118 0.004 65.61 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.030 65.12 0.118 0.006 65.64 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.032 65.16 0.118 0.009 65.71 0.118 0.032 65.16 0.118 0.009 65.72 0.118 0.033 65.19 0.118 0.009 65.77 0.118 0.033 65.21 0.118 0.009 65.77 0.118 0.035 65.21 0.118 0.010 65.77 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.011 65.77 0.118 0.035 65.24 0.118 0			i			
65.02 0.118 0.001 65.54 0.118 0.026 65.04 0.118 0.002 65.56 0.118 0.026 65.05 0.118 0.002 65.57 0.118 0.027 65.06 0.118 0.003 65.58 0.118 0.027 65.06 0.118 0.003 65.59 0.118 0.028 65.09 0.118 0.004 65.60 0.118 0.028 65.09 0.118 0.004 65.61 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.030 65.12 0.118 0.006 65.66 0.118 0.030 65.13 0.118 0.007 65.66 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.032 65.16 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.033 65.20 0.118 0.009 65.74 0.118 0.035 65.21 0.118 0.010 65.78 0.118 0.035 65.22 0.118 0.010 65.77 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.037 65.24 0.118 0						
65.03 0.118 0.002 65.55 0.118 0.026 65.05 0.118 0.002 65.56 0.118 0.027 65.06 0.118 0.003 65.58 0.118 0.027 65.07 0.118 0.003 65.59 0.118 0.028 65.08 0.118 0.004 65.61 0.118 0.028 65.09 0.118 0.004 65.61 0.118 0.029 65.11 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.030 65.13 0.118 0.006 65.64 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.031 65.15 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.033 65.18 0.118 0.009 65.72 0.118 0.033 65.20 0.118 0.009 65.77 0.118 0.035 65.22 0.118 0.010 65.77 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.037 65.27 0.118 0.011 65.76 0.118 0.037 65.26 0.118 0.013 65.80 0.118 0.037 65.27 0.118 0						
65.04 0.118 0.002 65.56 0.118 0.026 65.05 0.118 0.003 65.58 0.118 0.027 65.06 0.118 0.003 65.59 0.118 0.028 65.08 0.118 0.004 65.60 0.118 0.028 65.09 0.118 0.004 65.61 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.62 0.118 0.030 65.12 0.118 0.006 65.64 0.118 0.030 65.13 0.118 0.006 65.66 0.118 0.031 65.14 0.118 0.007 65.67 0.118 0.032 65.15 0.118 0.007 65.67 0.118 0.033 65.16 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.72 0.118 0.033 65.21 0.118 0.009 65.73 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.037 65.25 0.118 0	65.02					0.026
65.05 0.118 0.002 65.57 0.118 0.027 65.06 0.118 0.003 65.58 0.118 0.028 65.09 0.118 0.004 65.60 0.118 0.028 65.09 0.118 0.004 65.61 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.006 65.64 0.118 0.030 65.12 0.118 0.006 65.66 0.118 0.031 65.13 0.118 0.007 65.66 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.032 65.16 0.118 0.009 65.71 0.118 0.032 65.16 0.118 0.009 65.71 0.118 0.033 65.18 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.033 65.22 0.118 0.010 65.74 0.118 0.035 65.24 0.118 0.010 65.79 0.118 0.035 65.24 0.118 0.011 65.79 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.036 65.26 0.118 0.014 65.81 0.118 0.036 65.26 0.118 0	65.03	0.118	0.001	65.55	0.118	0.026
65.06 0.118 0.003 65.58 0.118 0.027 65.07 0.118 0.003 65.59 0.118 0.028 65.09 0.118 0.004 65.61 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.62 0.118 0.030 65.12 0.118 0.006 65.64 0.118 0.030 65.12 0.118 0.006 65.65 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.032 65.15 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.033 65.18 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.72 0.118 0.033 65.20 0.118 0.009 65.772 0.118 0.033 65.21 0.118 0.010 65.74 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.037 65.24 0.118 0.011 65.76 0.118 0.037 65.26 0.118 0.011 65.77 0.118 0.037 65.26 0.118 0.011 65.77 0.118 0.037 65.26 0.118 0.014 65.81 0.118 0.037 65.26 0.118	65.04	0.118	0.002	65.56	0.118	0.026
65.07 0.118 0.004 65.59 0.118 0.028 65.09 0.118 0.004 65.60 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.031 65.12 0.118 0.006 65.64 0.118 0.031 65.13 0.118 0.007 65.66 0.118 0.032 65.16 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.77 0.118 0.035 65.22 0.118 0.011 65.75 0.118 0.035 65.24 0.118 0.011 65.77 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.037 65.26 0.118 0.013 65.79 0.118 0.037 65.27 0.118 0.013 65.79 0.118 0.038 65.26 0.118 0.014 65.81 0.118 0.038 65.27 0.118 0	65.05	0.118	0.002	65.57	0.118	0.027
65.07 0.118 0.004 65.59 0.118 0.028 65.09 0.118 0.004 65.60 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.031 65.12 0.118 0.006 65.64 0.118 0.031 65.13 0.118 0.007 65.66 0.118 0.032 65.16 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.77 0.118 0.035 65.22 0.118 0.011 65.75 0.118 0.035 65.24 0.118 0.011 65.77 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.037 65.26 0.118 0.013 65.79 0.118 0.037 65.27 0.118 0.013 65.79 0.118 0.038 65.26 0.118 0.014 65.81 0.118 0.038 65.27 0.118 0	65.06	0.118	0.003	65.58	0.118	0.027
65.09 0.118 0.004 65.61 0.118 0.029 65.10 0.118 0.005 65.62 0.118 0.030 65.12 0.118 0.006 65.64 0.118 0.030 65.13 0.118 0.006 65.65 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.031 65.15 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.008 65.69 0.118 0.033 65.18 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.72 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.011 65.77 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.037 65.26 0.118 0.012 65.79 0.118 0.036 65.26 0.118 0.014 65.80 0.118 0.038 65.26 0.118 0.014 65.84 0.118 0.038 65.27 0.118 0.014 65.86 0.118 0.039 65.37 0.118 0	65.07		0.003	65.59	0.118	0.028
65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.030 65.12 0.118 0.006 65.64 0.118 0.031 65.13 0.118 0.007 65.66 0.118 0.031 65.14 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.033 65.17 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.74 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.036 65.25 0.118 0.012 65.78 0.118 0.037 65.26 0.118 0.013 65.79 0.118 0.037 65.27 0.118 0.013 65.79 0.118 0.038 65.30 0.118 0.014 65.81 0.118 0.039 65.31 0.118 0.014 65.86 0.118 0.044 65.36 0.118 0.017 65.86 0.118 0.042 65.37 0.118 0	65.08	0.118	0.004	65.60	0.118	0.028
65.10 0.118 0.005 65.62 0.118 0.029 65.11 0.118 0.005 65.63 0.118 0.030 65.12 0.118 0.006 65.64 0.118 0.031 65.13 0.118 0.007 65.66 0.118 0.031 65.14 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.009 65.70 0.118 0.033 65.17 0.118 0.009 65.71 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.74 0.118 0.035 65.22 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.036 65.25 0.118 0.012 65.78 0.118 0.037 65.26 0.118 0.013 65.79 0.118 0.037 65.27 0.118 0.013 65.79 0.118 0.038 65.30 0.118 0.014 65.81 0.118 0.039 65.31 0.118 0.014 65.86 0.118 0.044 65.36 0.118 0.017 65.86 0.118 0.042 65.37 0.118 0	65.09	0.118	0.004	65.61	0.118	0.029
65.12 0.118 0.006 65.64 0.118 0.030 65.13 0.118 0.007 65.66 0.118 0.031 65.14 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.008 65.69 0.118 0.032 65.17 0.118 0.008 65.69 0.118 0.033 65.18 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.72 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.010 65.76 0.118 0.035 65.23 0.118 0.011 65.76 0.118 0.036 65.26 0.118 0.012 65.77 0.118 0.037 65.26 0.118 0.013 65.80 0.118 0.038 65.29 0.118 0.013 65.81 0.118 0.038 65.30 0.118 0.014 65.81 0.118 0.039 65.31 0.118 0.015 65.84 0.118 0.042 65.33 0.118 0.017 65.86 0.118 0.042 65.34 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0	65.10		0.005	65.62	0.118	0.029
65.13 0.118 0.006 65.65 0.118 0.031 65.14 0.118 0.007 65.66 0.118 0.032 65.16 0.118 0.008 65.68 0.118 0.032 65.17 0.118 0.008 65.69 0.118 0.033 65.19 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.010 65.75 0.118 0.035 65.24 0.118 0.011 65.76 0.118 0.035 65.25 0.118 0.012 65.76 0.118 0.036 65.26 0.118 0.012 65.77 0.118 0.037 65.27 0.118 0.012 65.78 0.118 0.037 65.26 0.118 0.013 65.80 0.118 0.038 65.30 0.118 0.014 65.81 0.118 0.038 65.30 0.118 0.014 65.85 0.118 0.039 65.31 0.118 0.016 65.86 0.118 0.042 65.36 0.118 0.017 65.87 0.118 0.042 65.39 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0	65.11	0.118	0.005	65.63	0.118	0.030
65.14 0.118 0.007 65.66 0.118 0.031 65.15 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.008 65.68 0.118 0.032 65.17 0.118 0.009 65.70 0.118 0.033 65.18 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.010 65.74 0.118 0.035 65.23 0.118 0.011 65.75 0.118 0.036 65.24 0.118 0.011 65.76 0.118 0.036 65.26 0.118 0.012 65.77 0.118 0.037 65.27 0.118 0.013 65.79 0.118 0.037 65.26 0.118 0.013 65.80 0.118 0.038 65.29 0.118 0.014 65.81 0.118 0.038 65.30 0.118 0.015 65.84 0.118 0.039 65.31 0.118 0.017 65.86 0.118 0.041 65.36 0.118 0.017 65.89 0.118 0.042 65.37 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0	65.12	0.118	0.006	65.64	0.118	0.030
65.15 0.118 0.007 65.67 0.118 0.032 65.16 0.118 0.008 65.68 0.118 0.033 65.18 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.72 0.118 0.034 65.20 0.118 0.010 65.73 0.118 0.035 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.011 65.75 0.118 0.035 65.23 0.118 0.011 65.76 0.118 0.036 65.26 0.118 0.012 65.77 0.118 0.036 65.26 0.118 0.012 65.79 0.118 0.037 65.27 0.118 0.013 65.80 0.118 0.038 65.29 0.118 0.014 65.81 0.118 0.039 65.30 0.118 0.014 65.84 0.118 0.039 65.32 0.118 0.015 65.84 0.118 0.040 65.33 0.118 0.017 65.87 0.118 0.042 65.36 0.118 0.017 65.88 0.118 0.042 65.37 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0.017 65.89 0.118 0.043 65.41 0.118 0	65.13	0.118	0.006	65.65	0.118	0.031
65.16 0.118 0.008 65.68 0.118 0.032 65.17 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.70 0.118 0.034 65.20 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.010 65.74 0.118 0.035 65.23 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.012 65.77 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.037 65.26 0.118 0.012 65.79 0.118 0.037 65.27 0.118 0.013 65.80 0.118 0.038 65.29 0.118 0.014 65.81 0.118 0.039 65.31 0.118 0.014 65.84 0.118 0.039 65.32 0.118 0.016 65.86 0.118 0.044 65.34 0.118 0.017 65.89 0.118 0.042 65.37 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0.017 65.89 0.118 0.043 65.41 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0	65.14	0.118	0.007	65.66	0.118	0.031
65.16 0.118 0.008 65.68 0.118 0.032 65.17 0.118 0.009 65.70 0.118 0.033 65.19 0.118 0.009 65.70 0.118 0.034 65.20 0.118 0.009 65.71 0.118 0.034 65.20 0.118 0.009 65.72 0.118 0.034 65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.010 65.74 0.118 0.035 65.23 0.118 0.011 65.76 0.118 0.035 65.24 0.118 0.012 65.77 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.037 65.26 0.118 0.012 65.79 0.118 0.037 65.27 0.118 0.013 65.80 0.118 0.038 65.29 0.118 0.014 65.81 0.118 0.039 65.31 0.118 0.014 65.84 0.118 0.039 65.32 0.118 0.016 65.86 0.118 0.044 65.34 0.118 0.017 65.89 0.118 0.042 65.37 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0.017 65.89 0.118 0.043 65.41 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0						
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	65.17	0.118	0.008	65.69	0.118	0.033
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65.21 0.118 0.010 65.73 0.118 0.035 65.22 0.118 0.011 65.74 0.118 0.035 65.23 0.118 0.011 65.76 0.118 0.036 65.24 0.118 0.012 65.77 0.118 0.036 65.25 0.118 0.012 65.77 0.118 0.036 65.26 0.118 0.012 65.78 0.118 0.037 65.26 0.118 0.013 65.79 0.118 0.037 65.28 0.118 0.014 65.81 0.118 0.038 65.29 0.118 0.014 65.81 0.118 0.039 65.30 0.118 0.014 65.82 0.118 0.039 65.31 0.118 0.015 65.83 0.118 0.039 65.32 0.118 0.015 65.84 0.118 0.041 65.35 0.118 0.017 65.86 0.118 0.041 65.36 0.118 0.017 65.88 0.118 0.042 65.37 0.118 0.017 65.89 0.118 0.043 65.40 0.118 0.019 65.91 0.118 0.043 65.41 0.118 0.019 65.93 0.118 0.043 65.44 0.118 0.021 65.96 0.118 0.044 65.44 0.118 0.021 65.97 0.118 0.044 65.44 0.118 0	65.20	0.118	0.009	65.72	0.118	0.034
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	65.23		0.011		0.118	0.035
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	65.25	0.118	0.012	65.77	0.118	0.036
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	65.27	0.118	0.013	65.79	0.118	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	65.28	0.118	0.013	65.80	0.118	0.038
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	65.29	0.118	0.014	65.81	0.118	0.038
	65.30		0.014	65.82		0.039
	65.31	0.118	0.015	65.83	0.118	0.039
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$						0.040
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	65.34	0.118		65.86	0.118	0.041
	65.35					
	65.36	0.118	0.017	65.88	0.118	0.042
	65.37	0.118	0.017	65.89	0.118	0.042
	65.38	0.118	0.018	65.90	0.118	0.043
65.410.1180.01965.930.1180.04465.420.1180.02065.940.1180.04465.430.1180.02065.950.1180.04565.440.1180.02165.960.1180.04565.450.1180.02165.970.1180.04665.460.1180.02265.980.1180.04665.470.1180.02265.990.1180.04765.480.1180.02366.000.1180.04765.490.1180.02365.000.1180.047	65.39	0.118	0.018	65.91	0.118	0.043
65.420.1180.02065.940.1180.04465.430.1180.02065.950.1180.04565.440.1180.02165.960.1180.04565.450.1180.02165.970.1180.04665.460.1180.02265.980.1180.04665.470.1180.02265.990.1180.04765.480.1180.02366.000.1180.04765.490.1180.02365.000.1180.047	65.40	0.118	0.019	65.92	0.118	0.043
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65.440.1180.02165.960.1180.04565.450.1180.02165.970.1180.04665.460.1180.02265.980.1180.04665.470.1180.02265.990.1180.04765.480.1180.02366.000.1180.04765.490.1180.02365.000.1180.04765.500.1180.0240.0240.0240.047	65.42	0.118	0.020	65.94	0.118	0.044
65.450.1180.02165.970.1180.04665.460.1180.02265.980.1180.04665.470.1180.02265.990.1180.04765.480.1180.02366.000.1180.04765.490.1180.02365.000.1180.04765.500.1180.0240.0240.0240.047	65.43	0.118	0.020	65.95	0.118	0.045
65.460.1180.02265.980.1180.04665.470.1180.02265.990.1180.04765.480.1180.02366.000.1180.04765.490.1180.02366.000.1180.04765.500.1180.0240.0240.0240.0047	65.44	0.118	0.021	65.96	0.118	0.045
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65.480.1180.02366.000.1180.04765.490.1180.02365.500.1180.024						
65.490.1180.02365.500.1180.024				65.99	0.118	0.047
65.50 0.118 0.024				<mark>66.00</mark>	0.118	0.047
65.51 0.118 0.024						
I	65.51	0.118	0.024			

Prepared by Beals and Thomas, Inc. HydroCAD® 10.10-5a s/n 04493 © 2020 HydroCAD Software Solutions LLC

Stage-Area-Storage for Pond 4: Infiltration Bed

ElevationSurfaceStorage (acre-feet)ElevationSurfaceStorage (acre-feet) 65.00 0.1160.000 65.52 0.1160.024 65.01 0.1160.001 65.53 0.1160.025 65.03 0.1160.001 65.55 0.1160.025 65.04 0.1160.002 65.55 0.1160.026 65.05 0.1160.002 65.55 0.1160.027 65.06 0.1160.003 65.58 0.1160.027 65.07 0.1160.003 65.58 0.1160.028 65.09 0.1160.004 65.61 0.1160.028 65.10 0.1160.005 65.62 0.1160.029 65.11 0.1160.005 65.62 0.1160.029 65.12 0.1160.006 65.65 0.1160.031 65.14 0.1160.007 65.67 0.1160.032 65.17 0.1160.007 65.67 0.1160.032 65.17 0.1160.008 65.72 0.1160.032 65.19 0.1160.009 65.77 0.1160.033 65.20 0.1160.009 65.77 0.1160.033 65.21 0.1160.009 65.77 0.1160.033 65.22 0.1160.012 65.77 0.1160.035 65.25 0.1160.013 65.84 0.1160.035 65.26 0.1160.013			~	I		_
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