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		Transition Station #1		Checked By			
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# STORMWATER POND DESIGN CRITERIA (Env-Wq 1508.03)

Wet Extended Detention Basin

Enter the	type of stormwater pond (e.g., Wet Pond) and the node name in the drainage as	nalysis, if applicable
11.37 ac	A = Area draining to the practice	
0.32 ac	$A_{I}$ = Impervious area draining to the practice	
0.03 decimal	I = percent impervious area draining to the practice, in decimal form	
0.08 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.86 ac-in	WQV= 1" x Rv x A	
3,109 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
311 cf	10% x WQV (check calc for sediment forebay and micropool volume	)
1,555 cf	50% x WQV (check calc for extended detention volume)	
891 cf	$V_{SED}$ = sediment forebay volume	$\leftarrow \geq 10\% WQV$
7,749 cf	$V_{PP}$ = permanent pool volume (volume below the lowest invert of the	outlet structure)
NA cf	$V_{ED} = WQV - V_{PP} = extended detention volume$	$\leftarrow \leq X\%^1 WQV$
N/A	$E_{ED}$ = elevation of $V_{ED}$ (attach stage-storage table)	
- cfs	$2Q_{avg} = 2* V_{ED} / 24$ hrs * (1hr / 3600 sec) (used to check against $Q_{EDr}$	nax below)
0.15 cfs	$Q_{EDmax}$ = discharge at the $E_{ED}$ (attach stage-discharge table)	$\leftarrow < 2Q_{avg}$
- hours	$T_{ED}$ = drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	$\leftarrow \geq 24$ -hrs
3.00 :1	Pond side slopes	<b>←</b> <u>&gt;</u> 3:1
3.00 ft	Average permanent pool depth	← 3 - 6 ft
<u>3.75</u> ft	Maximum depth of permanent pool	<b>←</b> <u>≤</u> 8 ft
115.00 ft	Length of the flow path between the inlet and outlet at mid-depth	
37.00 ft	Average Width ([average of the top width + average bottom width]/2)	
3.11 :1	Length to Average Width ratio	$\leftarrow \ge 3:1$
Yes Yes/No	The perimeter should be curvilinear.	
Yes Yes/No	The inlet and outlet should be located as far apart as possible.	
Yes Yes/No	Is there a manually-controlled drain provided to dewater the pond over	er a 24hr period?
If no state why	:	
Inspection/Repair	_What mechanism is proposed to prevent the outlet structure from clogg	ing (applicable for
	orifices/weirs with a dimension of $\leq 6$ ")?	
1,160.77 ft	Peak elevation of the 50-year storm event	
1,162.60 ft	Berm elevation of the pond	
YES	50 peak elevation $\leq$ the berm elevation?	← yes
—	that developed the planting plan:	
Name, Profession:		

1. "X" varies depending on type of stormwater pond design. See NH Stormwater Manual, Vol.2, Ch.4-3, Section 1, for the design permanent pool volumes and extended detention volumes.

Designer's Notes:

Type/Node Name:

## **TREATMENT SWALE DESIGN CRITERIA (Env-Wq 1508.07)**

Node Name:	Drainline B/Swale F Treatment Swale	
	Enter the node name in the drainage analysis (e.g., reach TS 5), if applicable	
Yes Yes/No	Have you reviewed the restrictions on unlined swales outlined in Env-We	1508.07(b)?
No Yes/No	Is the system lined?	
11.30 ac	A = Area draining to the practice	
0.35 ac	$A_{I}$ = Impervious area draining to the practice	
22.7 minutes	$T_c = Time of Concentration$	
0.03 decimal	I = percent impervious area draining to the practice, in decimal form	
0.08 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.88 ac-in	WQV= 1" x Rv x A	
3,194 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
<u>1</u> inches	P = amount of rainfall. For WQF in NH, $P = 1$ ".	
0.08 inches	Q = water quality depth. Q = WQV/A	<b>95</b> +0+01
80 unitless	CN = unit peak discharge curve number. CN = $1000/(10+5P+10Q-10*[Q^2 + 10Q^2 + 10Q^2))$	.25*Q*P] ***)
2.56 inches	S = potential maximum retention. S = $(1000/CN) - 10$	
0.513  inches	Ia = initial abstraction. Ia = $0.2S$	1 4 777
	qu = unit peak discharge. Obtain this value from TR-55 exhibits 4-II a	
0.36 cfs	WQF = $q_u x$ WQV. Conversion: to convert "cfs/mi <sup>2</sup> /in * ac-in" to "cfs" multiplied	
88.00 feet	$L = swale length^{1}$	← ≥ 100'
10.00 feet	$w = bottom of the swale width^2$	$\leftarrow$ 0 - 8 feet <sup>2</sup>
feet	$E_{SHWT}$ = elevation of SHWT. If none found, use the lowest elev. of te	st pit
1,140.39 feet	$E_{BTM}$ = elevation of the bottom of the practice	$\leftarrow \geq E_{SHWT}$
3.0 :1	$SS_{RIGHT} = right Side slope$	<b>←</b> <u>&gt;</u> 3:1
3.0 :1	$SS_{LEFT} = left Side slope$	<b>←</b> <u>&gt;</u> 3:1
0.002 ft/ft	S = slope of swale in decimal form3	← 0.00505
2.6 inches	d = flow depth in swale at WQF (attach stage-discharge table) <sup>4</sup>	<b>←</b> <u>&lt;</u> 4"
0.15 unitless	d must be $< 4''$ , therefore Manning's n = 0.15	—
$2.32 \text{ ft}^2$	Cross-sectional area check (assume trapezoidal channel)	
11.38 feet	Check wetted perimeter	
0.36 cfs	$WQF_{check}$ . $\leftarrow WQF_{check} = WQF$	7
0%	Percent difference between WQF <sub>check</sub> and WQF <sup>5</sup>	← +/- 10%
10 minutes	HRT = hydraulic residence time during the WQF	$\epsilon \geq 10 \min$
1,141.19 ft	Peak elevation of the 10-year storm event	
1,143.90 ft	Elevation of the top of the swale	
YES Yes/No	10 peak elevation $\leq$ the top of swale	<b>←</b> yes

1. Any portion of the swale that is in a roadside ditch shall not count towards the swale length.

2. Widths up to 16' allowed if a dividing berm or structure is used such that neither width is more than 8'.

3. If > 0.02 (2%) then check dams are required. No additional detention time is credited for check dams.

4. If a detention structure is used immediately upstream of the swale, the flow depth in the swale shall be no greater than 4" during the peak of the 2-yr storm, 24-hour storm event.

5. The WQF<sub>check</sub> & WQF should be near equal (within 10%) to confirm that you have selected the correct depth off the stage-discharge table. If the depth is not accurate the HRT will be incorrect. Designer's Notes:

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#### Type/Node Name: Infiltration Basin

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

yes	Have you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allow	wed?
0.57 ac	A = Area draining to the practice	
0.01 ac	$A_{I}$ = Impervious area draining to the practice	
0.02 decimal	I = percent impervious area draining to the practice, in decimal form	
0.07 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.04 ac-in	WQV= 1" x Rv x A	
140 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
35 cf	25% x WQV (check calc for sediment forebay volume)	
pretreatment swale	Method of pretreatment? (not required for clean or roof runoff)	
cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
659 cf	$V = volume^{1}$ (attach a stage-storage table)	$\leftarrow \geq WQV$
664 sf	$A_{SA}$ = surface area of the bottom of the pond	
0.30 iph	$I_{DESIGN} = design infiltration rate2$	
39.7 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>&lt;</u> 72-hrs
1,303.00 feet	$E_{BTM}$ = elevation of the bottom of the practice	
feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	n of the test pit)
feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	on of the test pit)
1,303.00 feet	$D_{SHWT}$ = separation from SHWT <sup>3</sup>	$\leftarrow \geq *^3$
1,303.0 feet	$D_{ROCK}$ = separation from bedrock <sup>3</sup>	← <u>&gt;</u> * <sup>3</sup>
ft	$D_{T}$ = depth of trench, if trench proposed	← 4 - 10 ft
N/A Yes/No	If a trench or underground system is proposed, observation well provi	ided
	If a trench is proposed, material in trench	
Sand or Pea Gravel	If a basin is proposed, basin floor material	
yes Yes/No	If a basin is proposed, the perimeter should be curvilinear.	
3.0 :1	If a basin is proposed, pond side slopes	<b>←</b> <u>&gt;</u> 3:1
1,303.91 ft	Peak elevation of the 10-year storm event (infiltration can be used in	analysis)
1,303.98 ft	Peak elevation of the 50-year storm event (infiltration can be used in	analysis)
1,305.00 ft	Elevation of the top of the practice (if a basin, this is the elevation of	the berm)
YES	10 peak elevation $\leq$ Elevation of the top of the trench?	← yes
YES	If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.



5	Client Ev	rersource		Page	1	_of	1
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		Transition Station #3		Checked By			
		Impervious Area Summary		Preliminary		Final	

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#### Type/Node Name: Infiltration Basin

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

Yes	Have you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allow	ved?
0.94 ac	A = Area draining to the practice	
0.13 ac	$A_{I}$ = Impervious area draining to the practice	
0.14 decimal	I = percent impervious area draining to the practice, in decimal form	
0.17 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.16 ac-in	WQV= 1" x Rv x A	
595 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
149 cf	25% x WQV (check calc for sediment forebay volume)	
Sediment Forebay	Method of pretreatment? (not required for clean or roof runoff)	
317 cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
873 cf	$V = volume^1$ (attach a stage-storage table)	$\leftarrow \geq WQV$
1,247 sf	$A_{SA}$ = surface area of the bottom of the pond	
0.30 iph	$I_{DESIGN} = design infiltration rate2$	
28.0 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>≤</u> 72-hrs
1,801.50 feet	$E_{BTM}$ = elevation of the bottom of the practice	
feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	n of the test pit)
feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	—
1,801.50 feet	$D_{SHWT}$ = separation from SHWT <sup>3</sup>	$\leftarrow \geq *^3$
1,801.5 feet	$D_{ROCK}$ = separation from bedrock <sup>3</sup>	
ft	$D_{\rm T}$ = depth of trench, if trench proposed	← 4 - 10 ft
Yes/No	If a trench or underground system is proposed, observation well provi	ided
	If a trench is proposed, material in trench	
sand or pea gravel	If a basin is proposed, basin floor material	
Yes Yes/No	If a basin is proposed, the perimeter should be curvilinear.	
3.0 :1	If a basin is proposed, pond side slopes	<b>←</b> <u>&gt;</u> 3:1
ft	Peak elevation of the 10-year storm event (infiltration can be used in	analysis)
1,303.58 ft	Peak elevation of the 50-year storm event (infiltration can be used in	analysis)
1,305.00 ft	Elevation of the top of the practice (if a basin, this is the elevation of	
-	10 peak elevation $\leq$ Elevation of the top of the trench?	← yes
YES	If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm?	<b>←</b> yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

## **TREATMENT SWALE DESIGN CRITERIA (Env-Wq 1508.07)**

Node Name:	Treatment Swale 5	<i>,</i>
	Enter the node name in the drainage analysis (e.g., reach TS 5), if applicable	
Yes Yes/No	Have you reviewed the restrictions on unlined swales outlined in Env-We	l 1508.07(b)?
No Yes/No	Is the system lined?	
<u>0.90</u> ac	A = Area draining to the practice	
0.11 ac	$A_{I}$ = Impervious area draining to the practice	
6.0 minutes	$T_c = Time of Concentration$	
0.12 decimal	I = percent impervious area draining to the practice, in decimal form	
0.16 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.14 ac-in	WQV= 1" x Rv x A	
519 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
<u>1</u> inches	P = amount of rainfall. For WQF in NH, $P = 1$ ".	
0.16 inches	Q = water quality depth. $Q = WQV/A$	0.5
84 unitless	CN = unit peak discharge curve number. CN = $1000/(10+5P+10Q-10*[Q^2 + 1Q^2 + 1Q^2))$	.25*Q*P] •••)
1.86 inches	S = potential maximum retention. S = $(1000/CN) - 10$	
0.371 inches	Ia = initial abstraction. $Ia = 0.2S$	
	qu = unit peak discharge. Obtain this value from TR-55 exhibits 4-II a	
0.19 cfs	WQF = $q_u x$ WQV. Conversion: to convert "cfs/mi <sup>2</sup> /in * ac-in" to "cfs" multiplied with the second secon	ply by 1mi <sup>2</sup> /640ac
107.00 feet	$L = swale length^{1}$	← <u>&gt;</u> 100'
<u>2.00</u> feet	$w = bottom of the swale width^2$	$\leftarrow 0 - 8 \text{ feet}^2$
feet	$E_{SHWT}$ = elevation of SHWT. If none found, use the lowest elev. of te	est pit
1,793.39 feet	$E_{BTM}$ = elevation of the bottom of the practice	$\leftarrow \geq E_{SHWT}$
333.0 :1	$SS_{RIGHT} = right Side slope$	<b>←</b> <u>≥</u> 3:1
45.0 :1	$SS_{LEFT} = left Side slope$	<b>←</b> <u>≥</u> 3:1
0.029 ft/ft	S = slope of swale in decimal form3	← 0.00505
0.8 inches	d = flow depth in swale at WQF (attach stage-discharge table)4	<b>←</b> <u>&lt;</u> 4"
0.15 unitless	d must be $< 4$ ", therefore Manning's n = 0.15	
$1.01  \text{ft}^2$	Cross-sectional area check (assume trapezoidal channel)	
27.67 feet	Check wetted perimeter	
0.19 cfs	$WQF_{check}^{5} \leftarrow WQF_{check} = WQF_{check}^{5}$	ז
0%	Percent difference between WQF <sub>check</sub> and WQF $^{5}$	← +/- 10%
10 minutes	HRT = hydraulic residence time during the WQF	← ≥ 10 min
1,793.43 ft	Peak elevation of the 10-year storm event	
1,793.99 ft	Elevation of the top of the swale	
YES Yes/No	10 peak elevation $\leq$ the top of swale	<b>←</b> yes

1. Any portion of the swale that is in a roadside ditch shall not count towards the swale length.

2. Widths up to 16' allowed if a dividing berm or structure is used such that neither width is more than 8'.

3. If > 0.02 (2%) then check dams are required. No additional detention time is credited for check dams.

4. If a detention structure is used immediately upstream of the swale, the flow depth in the swale shall be no greater than 4" during the peak of the 2-yr storm, 24-hour storm event.

5. The WQF<sub>check</sub> & WQF should be near equal (within 10%) to confirm that you have selected the correct depth off the stage-discharge table. If the depth is not accurate the HRT will be incorrect. Designer's Notes:

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## Type/Node Name:

**Underground Sand Filter- SF-1** 

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable

Yes	Have you reviewed the restrictions on unlined systems outlined in Env-We	q 1508.06(b)?
0.58 ac	A = Area draining to the practice1	
0.01 ac	$A_{I}$ = Impervious area draining to the practice	
0.02 decimal	I = percent impervious area draining to the practice, in decimal form	
0.07 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.04 ac-in	WQV= 1" x Rv x A	
141 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
35 cf	25% x WQV (check calc for sediment forebay volume)	
106 cf	75% x WQV (check calc for surface sand filter volume)	
^	r Method of Pretreatment? (not required for clean or roof runoff)	
<u>150</u> cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
<u>50</u> sf	$A_{SA}$ = surface area of the practice	
1.75 iph	$I_{DESIGN} = design infiltration rate2$	
Yes Yes/No	If $I_{DESIGN}$ is < 0.50 iph, has an underdrain been provided?	
19.4 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>&lt;</u> 72-hrs
1,727.45 feet	$E_{FC}$ = elevation of the bottom of the filter course material	
1,726.45 feet	$E_{UD}$ = invert elevation of the underdrain (UD), if applicable	
1,726.45 feet	$E_{BTM}$ = elevation of the bottom of the practice (i.e., bottom of the stone)	e reservoir).
1,724.00 feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	of the test pit)
1,724.00 feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	n of the test pit)
1.00 feet	$D_{FC to UD}$ = depth to UD from the bottom of the filter course <sup>3</sup>	<b>←</b> ≥ 1'
3.45 feet	$D_{FC \text{ to ROCK}} = \text{depth to bedrock from the bottom of the filter course}^3$	<b>←</b> ≥ 1'
3.45 feet	$D_{FC \text{ to SHWT}} = \text{depth to SHWT from the bottom of the filter course}^3$	<b>←</b> ≥ 1'
2.45 feet	$D_{BTM \text{ to SHWT}} = \text{depth to SHWT from the bottom of the practice}^3$	<b>←</b> ≥ 2'
1,731.55 ft	Peak elevation of the 10-year storm event (infiltration can be used in a	nalysis)
1,733.45 ft	Elevation of the top of the practice	
YES	10 peak elevation $\leq $ Elevation of the top of the practice	← yes
If a surface sand filte	er is proposed:	
YES ac	Drainage Area check.	<b>←</b> < 10 ac
cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	← ≥ 75%WQV
inches	$D_{FC}$ = filter course thickness	← 18"
Sheet	Note what sheet in the plan set contains the filter course specification	
Yes/No	Access grate provided?	← yes
	The filter shall not be covered in grass. What is covering the filter?	
If an underground sa	and filter is proposed:	
YES ac	Drainage Area check.	← < 10 ac
277 cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	← ≥75%WQV
24.0 inches	$D_{FC} = filter course thickness$	← 24''
Sheet C507	1 1	
Yes Yes/No	Access grate provided?	← yes

#### If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← yes
	cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	$\leftarrow \geq WQV$
	inches	$D_{FC} = $ filter course thickness	← 18''
Shee	t	Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	<b>←</b> <u>≥</u> 2:1
Shee	t	Note what sheet in the plan set contains the planting plans and surface	e cover
If porous	pavement	is proposed:	
		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	$A_{SA}$ = surface area of the pervious pavement	
-	:1	ratio of the contributing area to the pervious surface area	← 5:1
	inches	$D_{FC} = $ filter course thickness	← 12"

1. If the practice is a tree box filter, the drainage area shall be < 0.1 acre

2. Rate of the limiting layer (either the filter course or the underlying soil). See Vol. 2 of the NH Stormwater Manual, Ch. 2-4, for guidance on determining the infiltration rate.

Note what sheet in the plan set contains the filter course spec.

3. If not within a GPA or WSIPA: SHWT/Bedrock must be at least 1 foot below the filter course material (or an underdrain must drain the SHWT to at least one foot below the filter course material). If within a GPA or WSIPA: SHWT must be at least two feet below the bottom of the practice OR the filter course material must be at least twice as thick as required and the SHWT must be at least one foot below the filter course material.

4. Volume without depending on infiltration. The storage above the filter media shall not include the volume above the outlet structure, if any.

5. The volume includes the storage above the filter but below the invert of the outlet structure (if any), the filter media voids, and the pretreatment area.

Designer's Notes:

Sheet

1. Assumed the limiting layer is the sand layer which has a permeability rate (K) of 3.5 ft/day which equates to 1.75 inches/hour.

2. Concrete chamber will be lined on the outside with a waterproof coat which will act as an impermeable liner.

NHDES Alteration of Terrain Last Revised: August 2013

← 304.1 sand



	Client Ev	versource	 Page	1	of		
ELL.	Project	Northern Pass	Date	Made By			
		Franklin		Checked B	у		
		Impervious Area Summary		Preliminary		Final	

		ation Bas														
			rea draining				<u> 7 ac</u>									
	(Con	tributing	watersheds:	Post-Ar	ea 2A-	·2D)										
_									_							
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_		<u>1.97</u>	TOTAL Imp	perviou	s Area	Contr	ibutin	g to B	MP:	Infiltr	atio	n Bas	in 1			
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			rea draining													
	(Con	tributing	watersheds:	Post-Ar	ea 4A,	Post	Area 4	B, Pos	st Are	ea 4D	)					
		0.60	Asphalt Pa	vement												
		0.12	Gravel Roa	d												
		<u>0.72</u>	TOTAL Imp	perviou	s Area	Contr	ibutin	g to B	MP:	Infiltr	atio	n Bas	in 2			
													1 1			

Type/Node Name: Franklin Infiltration Basin 1

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

Yes	Have you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allow	ved?
19.77 ac	A = Area draining to the practice	
1.97 ac	$A_{I}$ = Impervious area draining to the practice	
0.10 decimal	I = percent impervious area draining to the practice, in decimal form	
0.14 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
2.76 ac-in	WQV= 1" x Rv x A	
10,024 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
2,506 cf	25% x WQV (check calc for sediment forebay volume)	
Forebay	Method of pretreatment? (not required for clean or roof runoff)	
2,713 cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
40,043 cf	$V = volume^{1}$ (attach a stage-storage table)	$\leftarrow \ge WQV$
17,812 sf	$A_{SA}$ = surface area of the bottom of the pond	
3.00 iph	$I_{DESIGN} = design infiltration rate^2$	
9.0 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>&lt;</u> 72-hrs
327.50 feet	$E_{BTM}$ = elevation of the bottom of the practice	
feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	of the test pit)
feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	-
327.50 feet	$D_{SHWT}$ = separation from SHWT <sup>3</sup>	$\leftarrow \geq *^3$
327.5 feet	$D_{ROCK}$ = separation from bedrock <sup>3</sup>	<b>←</b> ≥ * °
N/A ft	$D_{\rm T}$ = depth of trench, if trench proposed	← 4 - 10 ft
N/A Yes/No	If a trench or underground system is proposed, observation well provi	ded
N/A	If a trench is proposed, material in trench	
Sand/Gravel	If a basin is proposed, basin floor material	
Yes Yes/No	If a basin is proposed, the perimeter should be curvilinear.	
3.0 :1	If a basin is proposed, pond side slopes	<b>←</b> <u>&gt;</u> 3:1
<u>328.66</u> ft	Peak elevation of the 10-year storm event (infiltration can be used in a	•
330.39 ft	Peak elevation of the 50-year storm event (infiltration can be used in a	•
332.50 ft	Elevation of the top of the practice (if a basin, this is the elevation of t	
YES	10 peak elevation $\leq$ Elevation of the top of the trench?	← yes
YES	If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm?	<b>←</b> yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

Designer's Notes: Test pits not yet taken to determine elevation of SHWT and separation from bedrock.

NHDES Alteration of Terrain Last Revised: August 2013

Type/Node Name: Franklin Infiltration Basin 2

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

Yes	Have you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allow	ved?
8.09 ac	A = Area draining to the practice	
0.72 ac	$A_{I}$ = Impervious area draining to the practice	
0.09 decimal	I = percent impervious area draining to the practice, in decimal form	
0.13 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
1.05 ac-in	WQV= 1" x Rv x A	
3,807 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
952 cf	25% x WQV (check calc for sediment forebay volume)	
Forebay	Method of pretreatment? (not required for clean or roof runoff)	
1,013 cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
7,675 cf	$V = volume^{1}$ (attach a stage-storage table)	$\leftarrow \geq WQV$
1,426 sf	$A_{SA}$ = surface area of the bottom of the pond	
3.00 iph	$I_{DESIGN} = design infiltration rate2$	
21.5 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>&lt;</u> 72-hrs
298.50 feet	$E_{BTM}$ = elevation of the bottom of the practice	
feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	of the test pit)
feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	n of the test pit)
298.50 feet	$D_{SHWT}$ = separation from SHWT <sup>3</sup>	$\leftarrow \geq *^3$
298.5 feet	$D_{ROCK}$ = separation from bedrock <sup>3</sup>	← ≥ * °
N/A ft	$D_{T}$ = depth of trench, if trench proposed	← 4 - 10 ft
N/A Yes/No	If a trench or underground system is proposed, observation well provi	ded
N/A	If a trench is proposed, material in trench	
Sand/Gravel	If a basin is proposed, basin floor material	
Yes Yes/No	If a basin is proposed, the perimeter should be curvilinear.	_
3.0 :1	If a basin is proposed, pond side slopes	<b>←</b> <u>&gt;</u> 3:1
298.84 ft	Peak elevation of the 10-year storm event (infiltration can be used in a	•
299.89 ft	Peak elevation of the 50-year storm event (infiltration can be used in a	•
302.00 ft	Elevation of the top of the practice (if a basin, this is the elevation of t	
YES	10 peak elevation $\leq$ Elevation of the top of the trench?	← yes
YES	If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm?	<b>←</b> yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

Designer's Notes: Test pits not yet taken to determine elevation of SHWT and separation from bedrock.

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BURNS	С	lient E	versource		Client Eversource Project Northern Pass Date Deerfield Impervious Area Summary										
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			Impervieu		nary										
	Canal E														
BMP: Surface			ining to the	e practice = <u>(</u>											
(Contri	buting	waters	heds: Post-	Area 1B, Pos	st-Area 1C)										
0.2	0 ac	Statio	on (roof top	os and concr	ete foundation)										
0.2	0 ac	TOTA	L Impervic	ous Area Con	tributing to BMP:	Surface Sand Filter									
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### **Surface Sand Filter SF-1**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable

Yes	Have you reviewed the restrictions on unlined systems outlined in Env-W	′q 1508.06(b)?
<u>3.98</u> ac	A = Area draining to the practice1	
0.20 ac	$A_{I}$ = Impervious area draining to the practice	
0.05 decimal	I = percent impervious area draining to the practice, in decimal form	
0.10 unitless	Rv = Runoff  coefficient = 0.05 + (0.9  x I)	
0.38 ac-in	WQV = 1" x Rv x A	
1,376 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
<u>344</u> cf	25% x WQV (check calc for sediment forebay volume)	
1,032 cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		
<u>364</u> cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
<u>906</u> sf	$A_{SA} = surface area of the practice$	
0.50 iph	$I_{\text{DESIGN}} = \text{design infiltration rate}^2$	
Yes Yes/No	If $I_{\text{DESIGN}}$ is < 0.50 iph, has an underdrain been provided?	
36.4 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>&lt;</u> 72-hrs
374.75 feet	$E_{FC}$ = elevation of the bottom of the filter course material	
373.00 feet	$E_{UD}$ = invert elevation of the underdrain (UD), if applicable	
372.90 feet	$E_{BTM}$ = elevation of the bottom of the practice (i.e., bottom of the stone)	e reservoir).
368.00 feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	of the test pit)
364.00 feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	n of the test pit)
1.75 feet	$D_{FC \text{ to } UD}$ = depth to UD from the bottom of the filter course <sup>3</sup>	<b>←</b> ≥ 1'
10.75 feet	$D_{FC \text{ to } ROCK}$ = depth to bedrock from the bottom of the filter course <sup>3</sup>	<b>←</b> ≥ 1'
6.75 feet	$D_{FC \text{ to SHWT}} = \text{depth to SHWT from the bottom of the filter course}^3$	<b>←</b> ≥ 1'
4.90 feet	$D_{BTM \text{ to } SHWT}$ = depth to SHWT from the bottom of the practice <sup>3</sup>	<b>←</b> ≥ 2'
378.42 ft	Peak elevation of the 10-year storm event (infiltration can be used in a	nalysis)
379.00 ft	Elevation of the top of the practice	
YES	10 peak elevation $\leq$ Elevation of the top of the practice	<b>←</b> yes
If a surface sand fi	ter is proposed:	
YES ac	Drainage Area check.	<b>←</b> < 10 ac
2,337 cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	← ≥75%WQV
24.0 inches	D <sub>FC</sub> = filter course thickness	← 18"
Sheet C50	9 Note what sheet in the plan set contains the filter course specification	
Yes Yes/No	Access grate provided?	← yes
Stone Fill	The filter shall not be covered in grass. What is covering the filter?	
	sand filter is proposed:	
YES ac	Drainage Area check.	← < 10 ac
cf	$V = volume of storage^{4, 5}$ (attach a stage-storage table)	$\leftarrow \geq 75\% WQV$
inches	$D_{FC} = filter$ course thickness	← 24''
Sheet	Note what sheet in the plan set contains the filter course specification	
Yes/No	Access grate provided?	← yes

### If a bioretention area is proposed:

3.0 inches

Sheet

YES ac	Drainage Area no larger than 5 ac?	← yes
cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	$\leftarrow \geq WQV$
inches	$D_{FC}$ = filter course thickness	← 18''
Sheet	Note what sheet in the plan set contains the filter course specification	n
:1	Pond side slopes	<b>←</b> <u>≥</u> 2:1
Sheet	Note what sheet in the plan set contains the planting plans and surfa	ce cover
lf porous pavemer	nt is proposed:	
	Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
acres	$A_{SA}$ = surface area of the pervious pavement	
- :1	ratio of the contributing area to the pervious surface area	← 5:1
3.0 inches	$D_{FC}$ = filter course thickness	← 12"

1. If the practice is a tree box filter, the drainage area shall be < 0.1 acre

 $D_{FC}$  = filter course thickness

2. Rate of the limiting layer (either the filter course or the underlying soil). See Vol. 2 of the NH Stormwater Manual, Ch. 2-4, for guidance on determining the infiltration rate.

Note what sheet in the plan set contains the filter course spec.

3. If not within a GPA or WSIPA: SHWT/Bedrock must be at least 1 foot below the filter course material (or an underdrain must drain the SHWT to at least one foot below the filter course material). If within a GPA or WSIPA: SHWT must be at least two feet below the bottom of the practice OR the filter course material must be at least twice as thick as required and the SHWT must be at least one foot below the filter course material.

4. Volume without depending on infiltration. The storage above the filter media shall not include the volume above the outlet structure, if any.

5. The volume includes the storage above the filter but below the invert of the outlet structure (if any), the filter media voids, and the pretreatment area.

**Designer's Notes:** 

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← 304.1 sand



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 Type/Node Name:
 Infiltration Basin (IF-1)

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

yesHave you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allowed?2.43acA = Area draining to the practice0.20acA <sub>1</sub> = Impervious area draining to the practice0.20acA <sub>1</sub> = Impervious area draining to the practice0.08decimalI = percent impervious area draining to the practice, in decimal form0.12unitlessRv = Runoff coefficient = 0.05 + (0.9 x I)0.30ac-inWQV = 1" x Rv x A1.095cfWQV conversion (ac-in x 43,560 sf/ac x 1ft/12")274cf25% x WQV (check calc for sediment forebay volume)ForebayMethod of pretreatment? (not required for clean or roof runoff)889cfV sED = sediment forebay volume, if used for pretreatment $\phi \ge 25\%WQV$ 3,485cfV = volume <sup>1</sup> (attach a stage-storage table) $\phi \ge WQV$ 1,969sfA <sub>SA</sub> = surface area of the bottom of the pond0.50iphIDESIGN = design infiltration rate <sup>2</sup> $t_{2.5}$ hours $t_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$ $\phi \le 72$ -hrs354.00feet $s_{SHWT} =$ elevation of bedrock (if none found, enter the lowest elevation of the test pit)350.00feet $E_{ROCK} =$ elevation of bedrock (if none found, enter the lowest elevation of the test pit)4.00feetD <sub>ROCK</sub> = separation from SHWT <sup>3</sup> $\phi \ge *^3$ 2.00ftDredepth of trench, if trench proposed $\phi \ge *^3$
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$\frac{2.00}{\text{ft}} \text{ ft} \qquad D_{\text{T}} = \text{depth of trench, if trench proposed} \qquad \qquad \boldsymbol{\leftarrow} 4 - 10 \text{ ft}$
$D_1 = depth of definition proposed$
N/A Yes/No If a trench or underground system is proposed, observation well provided
If a trench is proposed, material in trench
If a basin is proposed, basin floor material
yes Yes/No If a basin is proposed, the perimeter should be curvilinear.
$3.0:1$ If a basin is proposed, pond side slopes $\leftarrow \geq 3:1$
356.18 ft Peak elevation of the 10-year storm event (infiltration can be used in analysis)
357.26ftPeak elevation of the 50-year storm event (infiltration can be used in analysis)
359.00 ft Elevation of the top of the practice (if a basin, this is the elevation of the berm)
YES10 peak elevation $\leq$ Elevation of the top of the trench? $\leftarrow$ yes
YES If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm? $\leftarrow$ yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

# Groundwater Recharge Volume (GRV) Calculation

-	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.20	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
-	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = weighted groundwater recharge depth	
0.05	ac-in	GRV = AI * Rd	
182	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

### Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):



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		Transition Station #5	-	Checked By			
		Impervious Area Summary		Preliminary		Final	
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Type/Node Name:
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## **Underground Sand Filter SF-1**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable

Yes	Have you reviewed the restrictions on unlined systems outlined in Env-We	q 1508.06(b)?
0.68 ac	A = Area draining to the practice1	
0.05 ac	$A_{I}$ = Impervious area draining to the practice	
0.07 decimal		
0.12 unitless		
0.08 ac-in	WQV= 1" x Rv x A	
287 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
72  cf	25% x WQV (check calc for sediment forebay volume)	
215 cf	75% x WQV (check calc for surface sand filter volume)	
262 cf	asir Method of Pretreatment? (not required for clean or roof runoff) $V_{i}$ = addiment for above volume, if used for pretreatment	$\epsilon \geq 25\%$ WQV
	$V_{SED}$ = sediment forebay volume, if used for pretreatment	<u>2370wQv</u>
<u>85</u> sf	$A_{SA}$ = surface area of the practice	
1.75 iph	$I_{DESIGN} = design infiltration rate2$	
Yes Yes/No		
23.3 hours	$T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$	<b>←</b> <u>&lt;</u> 72-hrs
1,087.65 feet	$E_{FC}$ = elevation of the bottom of the filter course material	
1,086.65 feet	$E_{UD}$ = invert elevation of the underdrain (UD), if applicable	
1,086.65 feet	$E_{BTM}$ = elevation of the bottom of the practice (i.e., bottom of the stone)	e reservoir).
1,082.80 feet	$E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation	of the test pit)
1,080.80 feet	$E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation	n of the test pit)
1.00 feet	$D_{FC \text{ to UD}} = \text{depth to UD from the bottom of the filter course}^3$	<b>←</b> ≥ 1'
6.85 feet	$D_{FC \text{ to ROCK}} = \text{depth to bedrock from the bottom of the filter course}^3$	<b>←</b> ≥ 1'
4.85 feet	$D_{FC to SHWT}$ = depth to SHWT from the bottom of the filter course <sup>3</sup>	<b>←</b> ≥ 1'
3.85 feet	$D_{BTM \text{ to SHWT}} = \text{depth to SHWT from the bottom of the practice}^3$	<b>←</b> ≥ 2'
1,091.75 ft	Peak elevation of the 10-year storm event (infiltration can be used in a	nalysis)
1,093.65 ft	Elevation of the top of the practice	
YES	10 peak elevation $\leq$ Elevation of the top of the practice	← yes
If a surface sand f		
YES ac	Drainage Area check.	<b>←</b> < 10 ac
cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	$\leftarrow \geq 75\%$ WQV
inches	$D_{FC}$ = filter course thickness	← 18"
Sheet	Note what sheet in the plan set contains the filter course specification	_
Yes/No	e i	<b>←</b> yes
	The filter shall not be covered in grass. What is covering the filter?	
	sand filter is proposed:	10
YES ac	Drainage Area check.	← < 10 ac
<u>477</u> cf	V = volume of storage <sup>4, 5</sup> (attach a stage-storage table)	$\leftarrow \geq 75\% WQV$
24.0 inches	$D_{FC} = $ filter course thickness	← 24''
Yes Yes/No	Note what sheet in the plan set contains the filter course specification	← yes
Yes Yes/No	Access grate provided?	x yts

#### If a bioretention area is proposed:

II a bioi etention	
YES ac	Drainage Area no larger than 5 ac? $\leftarrow$ yes
cf	V = volume of storage <sup>4,5</sup> (attach a stage-storage table) $\leftarrow \geq WQV$
inche	s $D_{FC}$ = filter course thickness $\leftarrow$ 18"
Sheet	Note what sheet in the plan set contains the filter course specification
:1	Pond side slopes $\leftarrow \ge 2:1$
Sheet	Note what sheet in the plan set contains the planting plans and surface cover
lf porous pavem	ent is proposed:
	Type of pavement proposed (concrete? Asphalt? Pavers? Etc)
acres	$A_{SA}$ = surface area of the pervious pavement
- :1	ratio of the contributing area to the pervious surface area $\leftarrow 5:1$
3.0 inches	s $D_{FC}$ = filter course thickness $\leftarrow$ 12"
Sheet	Note what sheet in the plan set contains the filter course spec. $\leftarrow$ 304.1 sand

1. If the practice is a tree box filter, the drainage area shall be < 0.1 acre

2. Rate of the limiting layer (either the filter course or the underlying soil). See Vol. 2 of the NH Stormwater Manual, Ch. 2-4, for guidance on determining the infiltration rate.

3. If not within a GPA or WSIPA: SHWT/Bedrock must be at least 1 foot below the filter course material (or an underdrain must drain the SHWT to at least one foot below the filter course material). If within a GPA or WSIPA: SHWT must be at least two feet below the bottom of the practice OR the filter course material must be at least twice as thick as required and the SHWT must be at least one foot below the filter course material.

4. Volume without depending on infiltration. The storage above the filter media shall not include the volume above the outlet structure, if any.

5. The volume includes the storage above the filter but below the invert of the outlet structure (if any), the filter media voids, and the pretreatment area.

Designer's Notes:

1. Assumed the limiting layer is the sand layer which has a permeability rate (K) of 3.5 ft/day (1.75 in/hr).

2. A waterproof coating will be applied to the exterior walls of the concrete chamber.

NHDES Alteration of Terrain Last Revised: August 2013

<b>N</b> BURNS	Client E	versource		Page	1	of	1
	Project	Northern Pass	Date	Made By			
		Transition Station #6	_	Checked B	y		
		Impervious Area Summary		Preliminary		Final	

BN	ИP:	Nor	rth	Infi	ltrati	on E	Basi	<u>n</u>																						
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Type/Node Name: North Infiltration Basin

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

YesHave you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allowed? $2.09$ acA = Area draining to the practice $0.25$ acA <sub>I</sub> = Impervious area draining to the practice $0.12$ decimalI = percent impervious area draining to the practice, in decimal form $0.16$ unitlessRv = Runoff coefficient = $0.05 + (0.9 \text{ x I})$ $0.33$ ac-inWQV= 1" x Rv x A	
$0.25$ ac $A_I$ = Impervious area draining to the practice $0.12$ decimalI = percent impervious area draining to the practice, in decimal form $0.16$ unitlessRv = Runoff coefficient = $0.05 + (0.9 \text{ x I})$	
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0.16  unitless  Rv = Runoff coefficient = 0.05 + (0.9  x I)	
0.33 ac-in WOV=1" x Ry x A	
1,195 cf WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
299 cf 25% x WQV (check calc for sediment forebay volume)	
Sediment Forebay Method of pretreatment? (not required for clean or roof runoff)	
532 cf $V_{SED}$ = sediment forebay volume, if used for pretreatment $\leftarrow \ge 25\%$	%WQV
2,916 cf $V = volume^1$ (attach a stage-storage table) $\leftarrow \ge WO$	γv
418 sf $A_{SA}$ = surface area of the bottom of the pond	
5.00 iph $I_{\text{DESIGN}} = \text{design infiltration rate}^2$	
16.7 hours $T_{DRAIN} = \text{drain time} = V / (A_{SA} * I_{DESIGN})$ $\leftarrow \le 72-1$	ırs
483.00 feet $E_{BTM}$ = elevation of the bottom of the practice	
feet $E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation of the tes	t pit)
feet $E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation of the te	st pit)
483.00 feet $D_{SHWT} = separation from SHWT^3$ $\bigstar \geq *^3$	
483.0 feet $D_{ROCK} = \text{separation from bedrock}^3$ $\bigstar \geq *^3$	
ft $D_{\rm T}$ = depth of trench, if trench proposed $\leftarrow$ 4 - 10	ft
No Yes/No If a trench or underground system is proposed, observation well provided	
N/A If a trench is proposed, material in trench	
6" Coarse Sand If a basin is proposed, basin floor material	
Yes Yes/No If a basin is proposed, the perimeter should be curvilinear.	
3.0 :1 If a basin is proposed, pond side slopes $\leftarrow \geq 3:1$	
484.98 ft Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
486.50 ft Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
488.00 ft Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES10 peak elevation $\leq$ Elevation of the top of the trench? $\leftarrow$ yes	
YES If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm? $\leftarrow$ yes	

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.

Type/Node Name: South Infiltration Basin

Enter the type of infiltration practice (e.g., trench) and the node name in the drainage analysis, if applicable

YesHave you reviewed Env-Wq 1508.05(a) to ensure that infiltration is allowed?2.10acA = Area draining to the practice0.12acA_1 = Impervious area draining to the practice0.06decimalI = percent impervious area draining to the practice, in decimal form0.10unitlessRv = Ruoff coefficient = 0.05 + (0.9 x I)0.21ac-inWQV = 1" x Rv x A772ofWQV conversion (ac-in x 43,560 sf/ac x 1ft/12")193cf25% x WQV (check calc for sediment forebay volume)Sediment ForebayMethod of pretreatment? (not required for clean or roof runoff)229cfV sED = sediment forebay volume, if used for pretreatment $\notin \geq 25\%$ WQV827cfV = volume <sup>1</sup> (attach a stage-storage table) $\notin \geq WQV$ 90sfA <sub>SA</sub> = surface area of the bottom of the pond5.00iphIpEsIGN = design infiltration rate <sup>2</sup> 22.1hoursTpEARN = drain time = V / (A <sub>SA</sub> * IpEsIGN)feetE <sub>BTM</sub> = elevation of the bottom of the practicefeetE <sub>SHWT</sub> = elevation of bedrock (if none found, enter the lowest elevation of the test pit)feetD <sub>SHWT</sub> = separation from SHWT <sup>3</sup> $\notin \geq *^3$ 480.65fetN/AIf a trench or underground system is proposed, observation well providedN/AIf a trench is proposed, material in trenchN/AIf a trench is proposed, pasi floor materialYesYes/NoIf a basin is proposed, pasi floor materialYesYes/NoIf a basin is proposed,			
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90sfA_{SA} = surface area of the bottom of the pond5.00iphI <sub>DESIGN</sub> = design infiltration rate <sup>2</sup> 22.1hoursT <sub>DRAIN</sub> = drain time = V / (A <sub>SA</sub> * I <sub>DESIGN</sub> )€ ≤ 72-hrs480.65feet $E_{BTM}$ = elevation of the bottom of the practicefeet $E_{SHWT}$ = elevation of SHWT (if none found, enter the lowest elevation of the test pit)feet $E_{ROCK}$ = elevation of bedrock (if none found, enter the lowest elevation of the test pit)480.65feet $D_{SHWT}$ = separation from SHWT <sup>3</sup> € ≥ * <sup>3</sup> 480.7feet $D_{SHWT}$ = separation from bedrock <sup>3</sup> € ≥ * <sup>3</sup> 480.7feet $D_{CCK}$ = separation from bedrock <sup>3</sup> € ≥ * <sup>3</sup> ft $D_T$ = depth of trench, if trench proposed€ 4 - 10 ftNoYes/NoIf a trench or underground system is proposed, observation well providedN/AIf a basin is proposed, material in trench6" Coarse SandIf a basin is proposed, basin floor materialYesYes/NoIf a basin is proposed, pond side slopes480.73ft9eak elevation of the 10-year storm event (infiltration can be used in analysis)481.69ftPeak elevation of the 50-year storm event (infiltration can be used in analysis)481.69ftPeak elevation of the top of the practice (if a basin, this is the elevation of the berm)YES10 peak elevation ≤ Elevation of the top of the trench? <b>44</b>	229 cf	$V_{SED}$ = sediment forebay volume, if used for pretreatment	$\leftarrow \geq 25\% WQV$
5.00iph $I_{DESIGN} = design infiltration rate^2$ 22.1hours $T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$ $\bigstar \le 72$ -hrs480.65feet $E_{BTM} = elevation of the bottom of the practicefeetE_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)feetE_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)480.65feetD_{SHWT} = separation from SHWT^3480.77feetD_{ROCK} = separation from bedrock^3ftD_T = depth of trench, if trench proposedftD_T = depth of trench, if trench proposed, observation well providedN/AIf a trench or underground system is proposed, observation well providedN/AIf a basin is proposed, basin floor materialYesYes/NoIf a basin is proposed, pond side slopes3.0:1If a basin is proposed, pond side slopes480.73 ftPeak elevation of the 10-year storm event (infiltration can be used in analysis)481.69 ftElevation of the 50-year storm event (infiltration can be used in analysis)481.69 ftIf elevation of the top of the practice (if a basin, this is the elevation of the berm)10 peak elevation \le Elevation of the top of the trench?\checkmark yes$	827 cf	$V = volume^{1}$ (attach a stage-storage table)	$\leftarrow \geq WQV$
22.1 hours $T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})$ $\bigstar \le 72$ -hrs480.65feet $E_{BTM} = elevation of the bottom of the practicefeetE_{BTM} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)feetE_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)480.65feetD_{SHWT} = separation from SHWT^3480.7feetD_{ROCK} = separation from bedrock^3ftD_T = depth of trench, if trench proposedftD_T = depth of trench, if trench proposed, observation well providedN/AIf a trench or underground system is proposed, observation well providedN/AIf a basin is proposed, material in trenchg'Yes/NoIf a basin is proposed, pond side slopesftPeak elevation of the 10-year storm event (infiltration can be used in analysis)481.69ftPeak elevation of the 50-year storm event (infiltration can be used in analysis)484.15ftElevation of the top of the practice (if a basin, this is the elevation of the berm)YES10 peak elevation \le Elevation of the top of the trench?YES\checkmark yes$	90 sf	$A_{SA}$ = surface area of the bottom of the pond	
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			the berm)
YES If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm? $\leftarrow$ yes			•
	YES	If a basin is proposed, 50-year peak elevation $\leq$ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume

2. See NH Stormwater Manual, Vol.2, Ch.2-4, for guidance on determining the infiltration rate

3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.