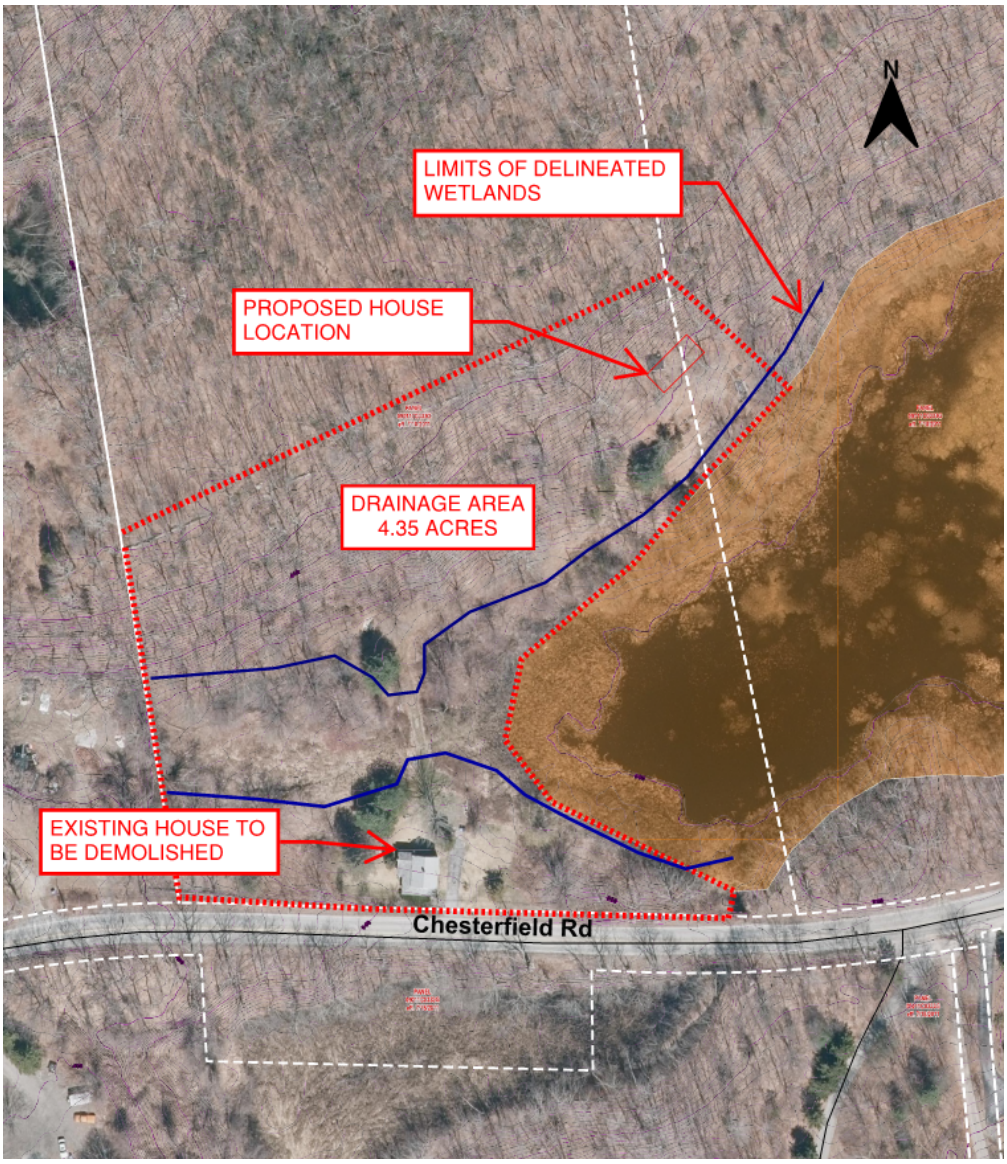
EROSION & SEDIMENT CONTROL:
All open cuts / earthwork locations will be protected via the installation of silt fencing as shown on the Site Development Plan. The existing asphalt driveway will serve as a construction entrance. Stockpile locations will be protected with silt fencing around the base of the pile. All final grading shall be seeded or stabilized within 7 days after grading.

4.0 Stormwater Narrative

The project site is in the southern quarter of two lots which shall be merged into one 55.01 acre parcel. The project includes the demolition of an existing residential structure and shed, the construction of a water crossing sufficient to support emergency vehicles, and the construction of a new residential structure further away from Chesterfield Road and overlooking a pond on the southern end of the property.

DRAINAGE AREA:



This project proposes to utilize a Cultec infiltration system and a stone diaphragm along the downgradient side of the proposed driveway to mitigate the slight increase in runoff due to the project. The runoff increase is the result of additional impervious area as shown in the table below:

IMPERVIOUS AREA COMPUTATIONS	PRE-DEVELOPMENT	POST-DEVELOPMENT
Existing Residence (Sq. Ft.)	850	0
Existing Driveway (Sq. Ft.)	584	0
Proposed Residence (Sq. Ft.)	0	1,800
Proposed Driveway (Sq. Ft.)	0	5,100
TOTAL	1,434	6,900
PERVIOUS AREA COMPUTATIONS		
Forest (Sq. Ft.)	187,306	182,406

PRE-DEVLOPMENT RUNOFF CALCULATIONS:
Pre-development runoff was calculated for the 10-yr and 25-yr storm events and are shown in the following figure. The 10-yr storm runoff is 0.28 cfs and the 25-year storm runoff is 0.34 cfs.

339 CHESTERFIELD RD PRE *CT-Montville 10-yr Duration=1,440 min, Inten=0.21 in/hr*
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Summary for Subcatchment DA-PRE: DA-PRE

Runoff = 0.28 cfs @ 0.09 hrs, Volume= 0.555 af, Depth> 1.53"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
CT-Montville 10-yr Duration=1,440 min, Inten=0.21 in/hr

Area (sf)	C	Description
850	0.90	EXISTING RESIDENCE
584	0.90	EXISTING DRIVEWAY
187,872	0.30	FOREST
189,306	0.30	Weighted Average
189,306		100.00% Pervious Area

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

339 CHESTERFIELD RD PRE *CT-Montville 25-yr Duration=1,440 min, Inten=0.26 in/hr*
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Summary for Subcatchment DA-PRE: DA-PRE

Runoff = 0.34 cfs @ 0.09 hrs, Volume= 0.668 af, Depth> 1.85"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
CT-Montville 25-yr Duration=1,440 min, Inten=0.26 in/hr

Area (sf)	C	Description
850	0.90	EXISTING RESIDENCE
584	0.90	EXISTING DRIVEWAY
187,872	0.30	FOREST
189,306	0.30	Weighted Average
189,306		100.00% Pervious Area

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

POST-DEVLOPMENT RUNOFF CALCULATIONS:
Post-development runoff was calculated for the 10-yr and 25-yr storm events and are shown in the following figure. The 10-yr storm runoff is 0.30 cfs and the 25-year storm runoff is 0.36 cfs.

339 CHESTERFIELD RD POST *CT-Montville 10-yr Duration=1,440 min, Inten=0.21 in/hr*
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Summary for Subcatchment DA-POST: DA-POST

Runoff = 0.30 cfs @ 0.09 hrs, Volume= 0.592 af, Depth> 1.64"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
CT-Montville 10-yr Duration=1,440 min, Inten=0.21 in/hr

Area (sf)	C	Description
1,800	0.90	PROPOSED RESIDENCE
5,100	0.90	PROPOSED DRIVEWAY
182,406	0.30	FOREST
189,306	0.32	Weighted Average
189,306		100.00% Pervious Area

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

339 CHESTERFIELD RD POST *CT-Montville 25-yr Duration=1,440 min, Inten=0.26 in/hr*
Prepared by RCL Thompson LLC Printed 3/30/2024
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Summary for Subcatchment DA-POST: DA-POST

Runoff = 0.36 cfs @ 0.09 hrs, Volume= 0.713 af, Depth> 1.97"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
CT-Montville 25-yr Duration=1,440 min, Inten=0.26 in/hr

Area (sf)	C	Description
1,800	0.90	PROPOSED RESIDENCE
5,100	0.90	PROPOSED DRIVEWAY
182,406	0.30	FOREST
189,306	0.32	Weighted Average
189,306		100.00% Pervious Area

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

The Cultec HD-180 system is chosen to mitigate the runoff on this property by collecting runoff from the roof of the proposed residence and infiltrating it into the soils. The use of the Cultec system reduces the runoff in the 10-year and 25-year storms by 0.01 cfs.

The use of the stone diaphragm for 120' linear feet along the driveway immediately north of the wetland limits allows for some infiltration to occur and allows for the settlement of any pollutants coming off of the driveway. The reduction in runoff from the stone diaphragm in the 10-year and 25-year storms is 0.01 cfs.

The combined reduction between both mitigation measures is 0.02 cfs which brings the post-development runoff to the same level as the pre-development runoff. See detailed calculations on the following pages.

5.0 Cultec Calculations

Pond CT: CULTEC - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger® 180HD)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 2 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

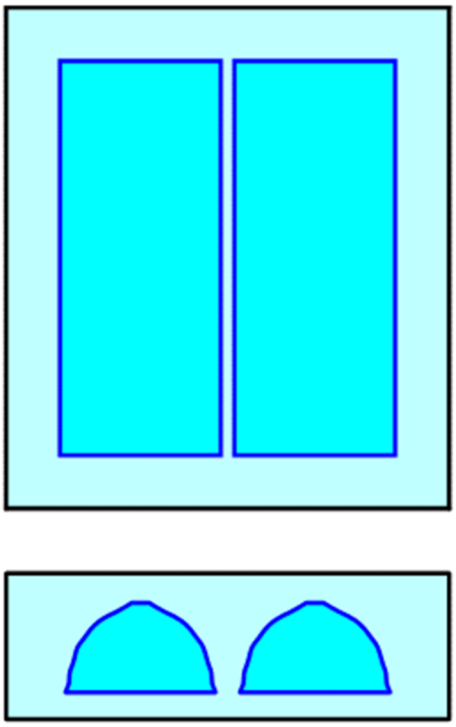
1 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 7.33' Row Length +12.0" End Stone x 2 = 9.33' Base Length
2 Rows x 36.0" Wide + 3.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.25' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

2 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 2 Rows = 50.4 cf Chamber Storage

208.5 cf Field - 50.4 cf Chambers = 158.0 cf Stone x 40.0% Voids = 63.2 cf Stone Storage

Chamber Storage + Stone Storage = 113.6 cf = 0.003 af
Overall Storage Efficiency = 54.5%
Overall System Size = 9.33' x 8.25' x 2.71'

2 Chambers
7.7 cy Field
5.9 cy Stone



Summary for Pond CT: CULTEC

Inflow Area = 0.041 ac, 0.00% Impervious, Inflow Depth = 4.61" for 10-yr event
Inflow = 0.01 cfs @ 0.09 hrs, Volume= 0.016 af
Outflow = 0.01 cfs @ 1.00 hrs, Volume= 0.016 af, Atten= 0%, Lag= 54.6 min
Primary = 0.01 cfs @ 1.00 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 394.02' @ 0.81 hrs Surf.Area= 0.002 ac Storage= 0.000 af

Plug-Flow detention time= 1.6 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (724.1 - 722.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	394.00'	0.001 af	**8.25'W x 9.33'L x 2.71'H Field A** 0.005 af Overall - 0.001 af Embedded = 0.004 af x 40.0% Voids
#2A	394.50'	0.001 af	**Cultec R-180** x 2 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 2 rows
		0.003 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	394.00'	**5.000 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.01 cfs @ 1.00 hrs HW=394.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Summary for Pond CT: CULTEC

Inflow Area = 0.041 ac, 0.00% Impervious, Inflow Depth = 5.54" for 25-yr event
Inflow = 0.01 cfs @ 0.09 hrs, Volume= 0.019 af
Outflow = 0.01 cfs @ 0.12 hrs, Volume= 0.019 af, Atten= 7%, Lag= 1.8 min
Primary = 0.01 cfs @ 0.12 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 395.38' @ 24.01 hrs Surf.Area= 0.002 ac Storage= 0.001 af

Plug-Flow detention time= 59.1 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 59.1 min (781.6 - 722.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	394.00'	0.001 af	**8.25'W x 9.33'L x 2.71'H Field A** 0.005 af Overall - 0.001 af Embedded = 0.004 af x 40.0% Voids
#2A	394.50'	0.001 af	**Cultec R-180** x 2 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 2 rows
		0.003 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	394.00'	**5.000 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.01 cfs @ 0.12 hrs HW=394.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

6.0 Stone Diaphragm Calculations

Summary for Pond SD: STONE DIAPHRAGM

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.034 ac, 0.00% Impervious, Inflow Depth = 4.61" for 10-yr event
Inflow = 0.01 cfs @ 0.09 hrs, Volume= 0.013 af
Outflow = 0.01 cfs @ 0.10 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.6 min
Primary = 0.01 cfs @ 0.10 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 381.00' @ 0.09 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 0.0 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (722.5 - 722.5)

Volume	Invert	Avail.Storage	Storage Description
#1	381.00'	0.002 af	**1.00'W x 120.00'L x 2.00'H Prismatoid** 0.006 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	381.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	232.90'	**60.0' long (Profile 7) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.99 3.41 3.62

Primary OutFlow Max=391,464.54 cfs @ 0.10 hrs HW=381.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 391,464.52 cfs @ 44.05 fps)

Summary for Pond SD: STONE DIAPHRAGM

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.034 ac, 0.00% Impervious, Inflow Depth = 5.54" for 25-yr event
Inflow = 0.01 cfs @ 0.09 hrs, Volume= 0.016 af
Outflow = 0.01 cfs @ 0.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.6 min
Primary = 0.01 cfs @ 0.10 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 381.00' @ 0.09 hrs Surf.Area= 0.003 ac Storage= 0.000 af

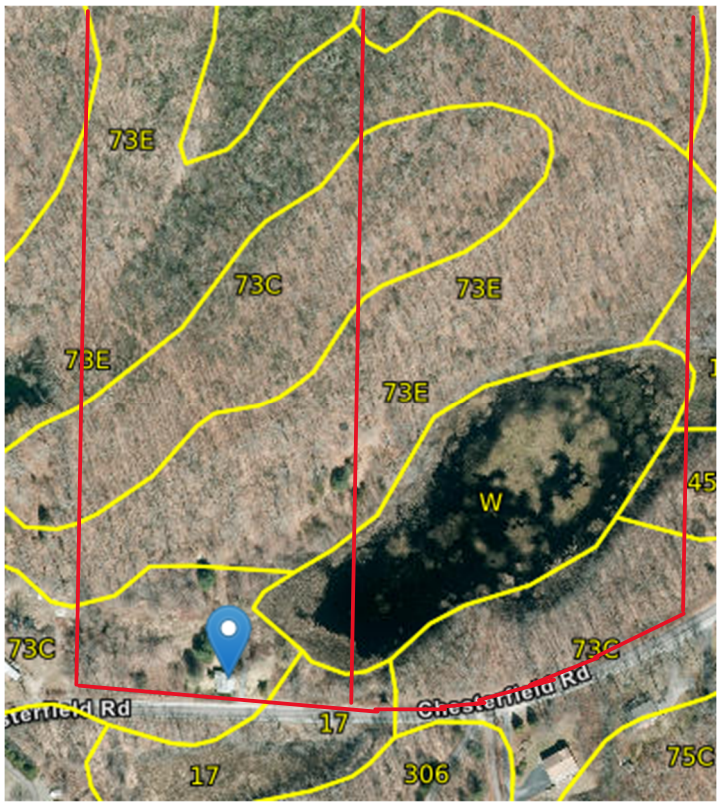
Plug-Flow detention time= 0.0 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (722.5 - 722.5)

Volume	Invert	Avail.Storage	Storage Description
#1	381.00'	0.002 af	**1.00'W x 120.00'L x 2.00'H Prismatoid** 0.006 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	381.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	232.90'	**60.0' long (Profile 7) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.99 3.41 3.62

Primary OutFlow Max=391,464.54 cfs @ 0.10 hrs HW=381.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 391,464.52 cfs @ 44.05 fps)

7.0 Soils Map



Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky (73C)

Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky (73E)

▲ **Map Unit Composition**

45% - ***Charlton***
Geomorphic Position: *hills*

30% - ***Chatfield***
Geomorphic Position: *ridges*
hills

10% - ***Rock outcrop***

5% - ***Leicester***
Geomorphic Position: *drainageways*
depressions

5% - ***Sutton***
Geomorphic Position: *drainageways*
depressions

3% - ***Hollis***
Geomorphic Position: *ridges*
hills

1% - ***Unnamed***
Horizon data n/a

1% - ***Unnamed***
Horizon data n/a