

January 16, 2024

Sudbury Conservation Commission Department of Public Works Building 275 Old Lancaster Road Sudbury, MA 01776

Re: 38 Stubtoe Lane Sudbury, MA 01776 DEP File No. 301-1405

Commissioners;

On behalf of my clients, Yang Jin and Scott Tingley, I am submitting the revised plan for the above-mentioned site. The plan has been revised to reflect the following:

- The project incorporates rooftop infiltration for the proposed single-family addition/garage.
- An infiltration trench is proposed to infiltrate the driveway runoff.
- Eight native mitigation plantings are proposed along the edge of the lawn/tree line.

Enclosed is a copy of this letter, Stormwater Report and Site Plan dated 1-12-24, prepared by Cyprus Design, Inc. If you have any questions or concerns regarding the above information, please do not hesitate to call.

Sincerely,

Maureen Herald

Maureen Herald, PWS, CWS

Cc: MassDEP-NERO Yang Jin & Scott Tingley





6.) SEDIMENTATION AND EROSION CONTROL MEASURES SHALL CONFORM TO THE REQUIREMENTS OF THE SUDBURY CONSERVATION COMMISSION ORDER OF CONDITIONS. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES



MIRAFI FABRIC TO BE PLACED ON. EXISTING GRADE PRIOR TO HAYBALE INSTALLATION TO PREVENT EROSION FROM RUNOFF

DEWATERING DETAIL

NTS (IF APPLICABLE)

TEST PIT DATA

PERFORMED BY: MAUREEN HERALD NORSE ENVIRONMENTAL SERVICES, INC. DATE PERFORMED: 12-9-23

TEST PIT I

DEPTH (INCHES)	E.S.H.W.T. NOT ENCOUNTERED			
0-6	Ар	FSL	10YR 2/2	
6-16	Вw	LS	2.5Y 5/4	
16-64	CI	LS	10YR 4/4	

TEST PIT 2

DEPTH (INCHES)	E.S.H.W.T. NOT ENCOUNTERED			
0-6	Ap	FSL	10YR 2/2	
6-16	Βw	LS	10YR 4/4	
16-65	CI	LS	2.5Y 5/4	

IMPERVIOUS AREA INCREASE:

TOTAL EXISTING IMPERVIOUS AREA = 2,280 S.F. TOTAL PROPOSED IMPERVIOUS AREA = 2,950 S.F. TOTAL INCREASE IMPERVIOUS AREA = 670 S.F. (4) INFILTRATION CHAMBERS PROPOSED TO ACCEPT ALL OF PROPOSED ROOFTOP RUNOFF (842 S.F.) WITH NO OUTFLOW DURING 5" RAINFALL IN 24 HRS. AND 325 S.F. OF DRIVEWAY RUNOFF INTO CRUSHED STONE INFILTRATION TRENCH WITH NO OUTFLOW DURING 5" OF RAINFALL IN 24 HOURS SEE SITE PLAN, DETAILS & CALCULATIONS.

	90° ELBOW		SITE PLAN
: 2.41"/HR = 5.68' x 6.67' CRUSHED /SEC = RATORS FF	4"PVC SCH40 IN FROM SCH40 TEE INLET MANIFOLD DETAIL NOT TO SCALE	TIMOTLAN REVALUESE No. 41509	TO ACCOMPANY A STORMWATER MANAGEMENT APPLICATION 38 STUBTOE LANE SUDBURY, MA PREPARED BY CYPRUS DESIGN, INC. Tel. 978.640.1019 Fax: 978.640.1020 Web Page: CyprusDesignInc.com
	DATE / REVISION DESCRIPTION	DESIGN: KPF / REVIEW:TR	Email: Info@CyprusDesignInc.com SCALE: " = 20' DATE: I-12-24

3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT

CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

= 105 S.F. X 0.00005578 FT./SEC = 0.006 C.F.S. BOTTOM (STONE INFILTRATION TRENCH: = 60 S.F. X 0.00005578 FT., 0.003 C.F.S. BOTTOM STORMTECH SC-310 INFILT

FOR ROOFTOP RUNO

NOT TO SCALE

Stormwater Report 38 Stubtoe Lane Sudbury, MA

January 12, 2024

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- Project Narrative
- Stormwater Report:
 - Hydrology Calculations
 - Operations and Maintenance Manual & Pollution Prevention

Project Narrative

Project Narrative:

Cyprus Design, Inc. (Cyprus) is pleased to submit this drainage plan for new addition to a single-family home located at 38 Stubtoe Lane in Sudbury.

Existing Conditions:

The subject property is currently developed with a single-family home, bit. Conc. Driveway and walkways and is bound by Stubtoe Lane to the south and residential properties to the north, east and west. Existing conditions detail and topography survey as shown on the site plan is based on a field survey performed by Cyprus in February 2023. The existing lot slopes from a high elevation of 184 at the easterly lot line for the property to a low elevation of 167 west of the existing home where vegetated wetlands exist. The dwelling is not located in a flood hazard zone according to Flood Insurance Rate Map (FIRM) for the Town of Sudbury Massachusetts

Proposed Conditions:

As shown on the attached site plan the proposed development will include the construction of a new 1 story addition, expanded driveway, along all associated drainage improvements, site preparation and site grading as shown on attached site plan. This project will increase impervious areas by 670 s.f.. to mitigate for this impervious increase (4) infiltration chambers are incorporated to accept all of proposed rooftop runoff (842 s.f.) with no outflow during 5" rainfall in 24 hrs. along with a 60 s.f. x 24" deep crushed stone infiltration trench to accept 325 s.f. of driveway runoff with no outflow during 5" of rainfall in 24 hours see site plan, details & calculations. Prior to the commencement of site work, a silt fence will be installed downgradient of the proposed site work to prevent the intrusion of sediment to abutting properties, Stubtoe Lane and vegetated wetlands. We do not anticipate a need for dewatering during excavation for construction of the addition, but if it is necessary, a dewatering pump will be installed, and the water will be discharged to mirafi fabric encompassed by a 20-foot by 20-foot area of hay bales to prevent erosion as shown in detail on attached site plan.

Soils:

Deep hole observation soil tests were performed on site by Maureen Herald of Norse Environmental on December 9, 2023 which resulted in a loamy sand (hydrologic group A) which is a soil that has high infiltration properties. The estimated seasonal high water table was not encountered so we have used the bottom of excavation of the two deep tests (64" & 65") and are shown on the attached site plan.

Drainage:

As shown on the attached site plan the proposed development will include all associated drainage improvements, site preparation and site grading as shown on attached site plan. This project will increase impervious areas by 670 s.f. to mitigate for this impervious increase (4) infiltration chambers are incorporated to accept all of proposed rooftop runoff (842 s.f.) with no outflow during 5" rainfall in 24 hrs. along with a 60 s.f. x 24" deep crushed stone infiltration trench to accept 325 s.f. of driveway runoff with no outflow during 5" of rainfall in 24 hours see site plan, details & calculations.

Erosion / Silt Controls

Prior to the commencement of site work, a silt fence will encompass down gradient of proposed site work to prevent the intrusion of sediment to the abutting properties. During construction of the 3 story addition, if dewatering of the excavation is necessary, a dewatering pump will be installed. The water will be discharged to mirafi fabric encompassed by a 15-foot by 15-foot area of hay bales to prevent erosion as shown in detail on attached site plan. we have also incorporated a note on the site plan requiring contractor to place temporary silt sack on all existing catch basins at intersection of Main street and Marshall street. the silt sack will prevent the intrusion of sediments into the drainage system and shall remain in-place until permanent vegetative cover is established or paving and/or construction is complete, and the transport of silt/sediment is no longer visibly apparent.

Site Grading

The existing grades will be maintained to the maximum extent feasible to minimize environmental disturbance and site costs related to excavation but is based on multiple control factors such as estimated seasonal high-water table / bottom of excavation on the test pits and existing grades. Proposed site elevations will maintain same flow patterns as existing conditions which slopes from a high elevation of 184 at the easterly lot line for the property to a low elevation of 167 west of the existing home where vegetated wetlands exist. See attached site plan for detailed existing site grades.

Stormwater Report



Summary for Subcatchment Driveway: Driveway Runoff

Runoff = 0.04 cfs @ 12.07 hrs, Volume= 123 cf, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs Type III 24-hr Custom Rainfall=5.00"



Summary for Subcatchment Rooftop: Rooftop

Runoff = 0.10 cfs @ 12.07 hrs, Volume= 319 cf, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs Type III 24-hr Custom Rainfall=5.00"



Summary for Pond Crushed Stone: Crushed Stone

Inflow Area	a =	325 sf,	100.00%	Impervious,	Inflow Dep	th > 4.54"	for Custom	n event
Inflow	=	0.04 cfs @	12.07 hr	s, Volume=		123 cf		
Outflow	=	0.00 cfs @	11.21 hr	s, Volume=		123 cf, Atter	n= 92%, Lag	g= 0.0 min
Primary	=	0.00 cfs @	11.21 hr	s, Volume=		123 cf		
Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs Peak Elev= 179.92' @ 13.00 hrs Surf.Area= 60 sf Storage= 46 cf Plug-Flow detention time= 113.8 min calculated for 123 cf (100% of inflow) Center-of-Mass det. time= 113.4 min (833.1 - 719.7)								
Volume	Invei	rt Avail.S	torage	Storage Des	cription			
#1	178.00)'	48 cf	Custom Sta 120 cf Overa	ge Data (Pr Ill x 40.0%	rismatic) List Voids	ed below (R	ecalc)
Elevation	S	Surf.Area	Inc.	Store (Cum.Store			
		(34-11)		-1001 (cubic-leet)			

0

120

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	0.00 cfs Exfiltration at all elevations

0

120

60

60

178.00

180.00

Primary OutFlow Max=0.00 cfs @ 11.21 hrs HW=178.02' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)



Pond Crushed Stone: Crushed Stone

Summary for Pond Stormtech Chambers: Stormtech chambers

Inflow Area	a =	842 sf,100.00% Impervious, Inflow Depth > 4.54" for Custom event	
Inflow	=	.10 cfs @ 12.07 hrs, Volume= 319 cf	
Outflow	=	0.01 cfs @ 10.72 hrs, Volume= 264 cf, Atten= 94%, Lag= 0.0 m	in
Primary	=	0.01 cfs @ 10.72 hrs, Volume= 264 cf	

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs Peak Elev= 177.92' @ 13.55 hrs Surf.Area= 105 sf Storage= 133 cf

Plug-Flow detention time= 147.7 min calculated for 264 cf (83% of inflow) Center-of-Mass det. time= 95.6 min (815.3 - 719.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	175.60'	73 cf	6.67'W x 15.68'L x 2.33'H Field A
			244 cf Overall - 61 cf Embedded = 183 cf x 40.0% Voids
#2A	176.10'	61 cf	ADS_StormTech SC-310 x 4 Inside #1
			Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
			Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
			Row Length Adjustment= +0.44' x 2.07 sf x 2 rows
		134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices	
#1	Primary	175.60'	0.01 cfs Exfiltration at all elevations	

Primary OutFlow Max=0.01 cfs @ 10.72 hrs HW=175.62' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.01 cfs)



Pond Stormtech Chambers: Stormtech chambers

Stormwater BMP Operation/Maintenance Manual & Pollution Prevention

For

38 Stubtoe Lane

Located in

Sudbury, MA

Prepared by:

Cyprus Design, Inc. 978-640-1019

January 12, 2024

PROJECT DESCRIPTION:

Existing Conditions:

The subject property is currently developed with a single-family home, bit. Conc. Driveway and walkways and is bound by Stubtoe Lane to the south and residential properties to the north, east and west. Existing conditions detail and topography survey as shown on the site plan is based on a field survey performed by Cyprus in February 2023. The existing lot slopes from a high elevation of 184 at the easterly lot line for the property to a low elevation of 167 west of the existing home where vegetated wetlands exist. The dwelling is not located in a flood hazard zone according to Flood Insurance Rate Map (FIRM) for the Town of Sudbury Massachusetts

Proposed Conditions:

As shown on the attached site plan the proposed development will include the construction of a new 1 story addition, expanded driveway, along all associated drainage improvements, site preparation and site grading as shown on attached site plan. This project will increase impervious areas by 670 s.f.. to mitigate for this impervious increase (4) infiltration chambers are incorporated to accept all of proposed rooftop runoff (842 s.f.) with no outflow during 5" rainfall in 24 hrs. along with a 60 s.f. x 24" deep crushed stone infiltration trench to accept 325 s.f. of driveway runoff with no outflow during 5" of rainfall in 24 hours see site plan, details & calculations. Prior to the commencement of site work, a silt fence will be installed downgradient of the proposed site work to prevent the intrusion of sediment to abutting properties, Stubtoe Lane and vegetated wetlands. We do not anticipate a need for dewatering during excavation for construction of the addition, but if it is necessary, a dewatering pump will be installed, and the water will be discharged to mirafi fabric encompassed by a 20-foot by 20-foot area of hay bales to prevent erosion as shown in detail on attached site plan.

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Erosion / Silt Controls

Prior to the commencement of site work, a silt fence will encompass down gradient of proposed site work to prevent the intrusion of sediment to the abutting properties. During construction of the 3 story addition, if dewatering of the excavation is necessary, a

dewatering pump will be installed. The water will be discharged to mirafi fabric encompassed by a 15-foot by 15-foot area of hay bales to prevent erosion as shown in detail on attached site plan. we have also incorporated a note on the site plan requiring contractor to place temporary silt sack on all existing catch basins at intersection of Main street and Marshall street. the silt sack will prevent the intrusion of sediments into the drainage system and shall remain in-place until permanent vegetative cover is established or paving and/or construction is complete, and the transport of silt/sediment is no longer visibly apparent.

Site Grading

The existing grades will be maintained to the maximum extent feasible to minimize environmental disturbance and site costs related to excavation but is based on multiple control factors such as estimated seasonal high-water table / bottom of excavation on the test pits and existing grades. Proposed site elevations will maintain same flow patterns as existing conditions which slopes from a high elevation of 184 at the easterly lot line for the property to a low elevation of 167 west of the existing home where vegetated wetlands exist. See attached site plan for detailed existing site grades.

If applicable, temporary storm inlet protection filter fabric will be placed around all catch basin inlets to prevent the intrusion of sediments into the drainage system and shall remain in-place until permanent vegetative cover is established or paving and/or construction are complete, and the transport of silt/sediment is no longer visibly apparent. The surface of all disturbed areas shall be stabilized during and after construction. Temporary measures shall be taken during construction to prevent erosion and siltation. All disturbed slopes will be stabilized with a permanent vegetative cover. Some or all the following measures will be utilized on this project as conditions may warrant.

- a. Temporary Seeding
- b. Temporary Mulching
- c. Permanent Seeding
- d. Placement of Sod
- e. Hydroseeding
- f. Placement of Hay
- g. Placement of Jute Netting

Operation and Maintenance

This Operation and Maintenance Manual has been prepared to conform to the Department of Environmental Protection's Stormwater Management guidelines and more specifically follows the format of Stormwater Management Standards Operation and Maintenance Plans (Standard 9).

Estimated yearly operating costs: The yearly cost for maintenance and upkeep of stormwater management systems is estimated to be between \$100 and \$300.

1. Stormwater Management System(s) Owner(s)

The stormwater management plan includes the use of (4) infiltration chambers to accept all of proposed rooftop runoff (842 s.f.) and a 60 s.f. x 24" deep crushed stone infiltration trench to accept 325 s.f. of driveway runoff. Maintenance responsibilities of the porous pavement and rain garden will be the record owner of the property which is recorded at the Middlesex South Registry of Deeds.

2. The Party or Parties Responsible for Operation and Maintenance

Once constructed, approved, and accepted by the Town of Sudbury, the three stormwater management areas located on the subject parcel will be maintained by the record owner of the property which is recorded at the Middlesex South Registry of Deeds.

Schedule for Maintenance and Inspection

During Construction

During construction, erosion control measures shall be implemented in accordance with the design plan approved by the Town of Sudbury to eliminate silt intrusion to drainage systems prior to paving and the stabilization of vegetated cover in landscaped areas. During this period, it shall be the responsibility of the owner's representatives (contractor) to maintain erosion control measures. These measures include ensuring silt sock is in-place, filter fabric or silt sack is present on catch basin grates and that these are effectively preventing silt and/or sediment from entering the catch basins. The owner or owner's representative shall be responsible for inspecting the silt sack / sock on a weekly basis. If silt sock or filter fabric needs to be replaced, the owner or owner's representative shall replace the silt sock / filter fabric as soon as is practical or no later than the next workday.

Upon Completion of Development and Town of Sudbury Approval

Once the construction is complete to the satisfaction of the Town of Sudbury, inspection and maintenance of the three stormwater management systems and subject parcel structures will be the responsibility of the record owner of the property which is recorded at the Middlesex South Registry of Deeds.

Stormtech Infiltrator Chambers Maintenance:

During the first two years of operation, the owner shall inspect infiltration units through the observation port after the first 20 storm events and after each heavy rainfall event thereafter. In addition, the infiltrators shall be inspected at least once a year outside of the storm events during the first two years. After the first two years, the owner shall inspect the infiltrators after an unusually heavy storm and once each year. The owner shall be responsible for inspection of the drainage system every spring and maintenance as needed to ensure proper operation and to prevent a significant accumulation of sand, silt and/or debris from entering the chambers. Screens must be placed on all building gutters throughout the project to eliminate debris and leaves from entering the roof leaders, which are connected to the infiltrator chamber systems. The owner shall also be responsible for clearing any accumulated leaves, and tree debris such as branches, acorns, seedlings from roof gutter system. Any debris collected from gutters must be handled and disposed in accordance with all DEP regulations, policies, and guidance. Maintenance of structures shall coincide with the previously identified inspection schedule at a minimum. If accumulated water inside the infiltration chambers is observed (as visible from an observation well) 24 hours or several days after a storm event, it may indicate that the bottom of the trench has been fouled. In this case, stormwater entering the system may reach the overflow level and exit surcharge pipe as shown on detail on attached site plans. If this occurs, a Professional Civil Engineering Consultant shall be contracted by the owner to determine if maintenance and/or replacement of some or all of the units will be required. If water accumulates in the units (as observed in the well), the contracted Professional Civil Engineering consulting firm will determine the extent of system repair and/or replacement. Once approved, the owner will be responsible for implementation of the remedy.

Crushed Stone Infiltration Trench Maintenance:

During the first two years of operation, the owner shall inspect infiltration area after the first 20 storm events and after each heavy rainfall event thereafter. In addition, the infiltration trench shall be inspected at least once a year outside of the storm events during the first two years. After the first two years, the owner shall inspect the trench after an unusually heavy storm and once each year. The owner shall be responsible for inspection of the drainage system every spring and maintenance as needed to ensure proper operation and to prevent a significant accumulation of sand, silt and/or debris from entering the drainage system. The owner shall also be responsible for clearing accumulated sediment from infiltration areas, vegetated areas, landscaping, and removal of grass clippings, leaves, trash, and shall remove unwanted tree seedlings from the infiltration area (if applicable). Maintenance of structures shall coincide with the previously identified inspection schedule at a minimum. Trash may collect in the drainage areas, potentially causing clogging of the facilities. All debris and litter shall be removed when necessary, and after each storm event. Structure cleanings, and Debris collected from infiltration areas and chambers are considered solid waste by DEP, and must be handled and disposed in accordance with all DEP regulations, policies, and guidance. In the absence of written approval from the DEP, the cleanings and debris removal must be taken to a facility permitted by the DEP to accept solid waste. If accumulated water at the infiltration area is observed 24 hours or several days after a storm event, it may indicate that the trench has been fouled with silt, leaves, or other debris. In this case, stormwater entering the system may reach the overflow level and continue overland flow to the neighboring properties. If this occurs, the owner or their representative shall immediately remove these items. If this procedure does not remedy the fouled infiltration area then a Professional Civil Engineering consulting firm shall be contracted by the owner to determine the extent of system repair and/or replacement. Once approved, the owner will be responsible for implementation of the remedy.