

## Karen Edwards

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**From:** Michael Behrendt  
**Sent:** Wednesday, March 10, 2021 9:20 AM  
**Subject:** Main Street #19 - questions from Robin Mower  
**Attachments:** Winter Maintenance and Stormwater system for 19 Main St. parking lot.pdf

To the Planning Board,  
Please see the attachment from Mike Sievert responding to a number of questions from Robin Mower (below) about the stormwater management system.

**Michael Behrendt**  
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**From:** Mike Sievert [mailto:mikesievert@mjs-engineering.com]  
**Sent:** Tuesday, March 09, 2021 10:10 PM  
**To:** Michael Behrendt  
**Cc:** Timothy Murphy; Pete Murphy (petermurphy6@comcast.net); Robbi Woodburn (robbi@woodburnandcompany.com)  
**Subject:** Re: Main Street #19 - questions from Robin Mower

Hi Michael,  
Please find attached a response to Robin's questions for the design.  
Mike

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**From:** RobinM [mailto:melodyofharpists@gmail.com]  
**Sent:** Thursday, February 11, 2021 9:46 AM  
**To:** Michael Behrendt  
**Cc:** Richard Reine; April Talon  
**Subject:** 19-21 Main Street | questions for engineer | impacts on College Brook

Greetings, Michael --

Would you please ask Mike Sievert to provide answers to the below questions regarding the proposed construction of a parking lot at 19-21 Main Street -- prior to the February 17th Planning Board meeting? Thank you.

Apologies to all if, as a lay person, I am misunderstanding or unintentionally misrepresenting anything, or if I have missed discussions addressing each of the below points.

### **Snow management -- deicing**

- 1) Mike noted that his clients would not be using \*salt\* on the parking lot; I take that to be \*sodium chloride.\* Exactly what material(s) would be used as an alternative, and what information can Mike provide the Planning Board/community about its impact on water quality in the chloride-impaired College Brook? (Whatever it is, it WILL travel through groundwater to the brook.)
- 2) Have the applicants committed to hiring only vendors who are certified through the NHDES GreenSnow Pro program? (This should be included as a note on the site plan as a Condition of Approval.)

### **Stormwater management -- Isolator row, filter media**

- 1) Do the plans include using the new, improved \*Isolator Row Plus\* (which I gather has a better flow rate, among other features)?
- 2) I seem to recall that Mike explained at a Technical Review meeting that he would be putting a soil mixture beneath the StormTech MC-4500 chamber that would allow for infiltration into the ground. In other words, he would replace the current soil with something else. Is that \*something else\* considered a \*filter media\*?
- 3) It is my understanding that in NH, sometimes underneath the Stormtech system a specific soil mix is used and that this is an accepted practice by AOT: AOT specifies the mix, project by project [notes from a conversation with a StormTech engineer], but...
- 4) Has Mike consulted with the UNH Stormwater Center about appropriate filter media? It would seem to be a terrific opportunity to benefit from their research. Please see below.

### **Stormwater management -- nutrient removal**

What is the efficacy of the proposed Stormtech system in removing pollutants and nutrients:

- (1) I understand that the isolator row would remove \*debris,\* total suspended solids, some of which would have \*trapped\* some of the pollutants, but, certainly others would \*leak through,\* so:
- (2) What are the pollutants/nutrients that the Stormtech system -- or filter media -- addresses? Could Mike provide the Board with third-party data on the efficacy of the system for each pollutant? For example, see the UNH Stormwater Center report dated 2010 (large file attached), or perhaps there is a more recent independent third-party review.

Regards,

-- Robin

Robin Mower  
Durham, NH

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**UNH Stormwater Center Triennial Report 2017-2019** (published December 2020) <[https://www.unh.edu/unhsc/sites/default/files/media/unhsc\\_2020\\_report\\_final\\_online.pdf](https://www.unh.edu/unhsc/sites/default/files/media/unhsc_2020_report_final_online.pdf)>

#### **Page 4 \*Not all filter media is created equal (but we have recipe tips)\***

##### EXCERPT

“Green” sounds eco-friendly, but not if it’s the color of surface waters in your town! Excess nutrients like nitrogen and phosphorus in runoff are a major source of nonpoint source pollution and the harmful algal blooms plaguing waterways around the country. UNH Stormwater Center research has found that the right filter media is key to meeting nutrient removal targets for the bioretention systems commonly found in urban and suburban settings.

Filter media is typically a mix of sand, loam, wood chips, and other amendments. Together, these ingredients help manage peak stormwater flows, nurture vegetative cover, and filter pollutants. Because filter media is the most hydraulically restrictive component of a bioretention system, it also dictates the filtration footprint and sizing. In a series of laboratory studies, we looked at the capacity of different filter media textures and amendments to remove phosphorus. We found when it comes to phosphorus management, not all filter media is created equal.

#### **27 columns, four takeaways**

UNHSC field work is supported by laboratory studies. We conducted 27 column studies that examined the performance of different soil textures, depths, and amendments when subjected to simulated urban stormwater runoff with typical phosphorus concentrations. The studies looked at the performance of the UNHSC filter media mix (sand, loam, and wood chips); other mixes containing different percentages of sand and loam; and five soil amendments: water treatment residuals (WTR), iron filings (Fe<sub>2</sub>), basic oxygen furnace slag (BOF), pulverized limestone (LS), and zerovalent iron (ZVI).

1. Loamy versus sandy? For phosphorus removal, finer textured, loamy soil mixes outperformed coarser sandy soils when no other amendments were added. However, the low permeability rate of finer soils does not allow for commonly specified drain times. Engineered

media often needs bulking

Takeaway: Filter media soil characteristics are an important component of design—they must

\* \* \*

<UNHSC\_Stormtech PER\_9\_9\_10-Final.pdf>

**Winter Maintenance of the parking lot.**

My clients are going to maintain their parking lot the same way everyone else maintains their parking lots. In addition, the same way the Town of Durham, and other towns maintain their roads and parking lot.

In the beginning, my clients were proposing to use a larger mobile melting machine to melt the snow by loading it into the hopper and allowing the water from the melted snow to flow into the stormwater treatment system. Upon further investigation into these machines, they have decided to forgo that plan for now and hire a local snow removal company to maintain the parking lot. They plan to use only contractors who have been certified by the GreenSnow Pro program. They will continue to work with this company to improve winter maintenance as technologies improve.

Snow plowing and removal will be conducted in the following manner. There are enough snow storage areas on the site to handle the storage of upto one 8" storm. Once these onsite snow storage areas are filled to capacity, then the snow will be stockpiled and removed from the site.

**Stormwater Management:**

The stormwater management system includes the Stormtech MC-4500 chambers with the isolator row plus. It means that there is an isolator row, plus an access manhole, inspection ports and geotextile fabric for this row.

We are not technically replacing the soil under the stormtech system, but we are placing the stormtech system on engineered soil fill, hence the height of the parking lot. The fill under the system will be specifically engineered to infiltrate and filter the stormwater to the greatest capacity possible but not to overwhelm the existing soil capacity under the fill. We are in the process of designing this fill material now and it will be part of the final design.

We always design all of our stormwater systems based on the published data and research from the UNH Stormwater Center. On some designs we do work directly with the Stormwater Center, usually with Professor Ballestero, but we have not consulted directly with them on this system to date. If we see the need for doing so as we work through the design of the fill material them we will obviously reach out.

The isolator row removes TSS, P, TPH and Z. The efficiency of the system is 80%, 49% 90% and 53% respectively based on UNH testing. We believe this system will achieve these results and better due to the infiltration design and additional treatment through the soil filter built into the fill. In addition, the discharge point is located at the beginning of a 100'+ wooded buffer for additional filtering qualities prior to discharge to the surface water and the College Brook.