From: David Marshall <dmarshall@cea-vt.com>
Sent: Friday, June 24, 2022 6:47 AM
To: mcypes@hinesburg.org; 'Benjamin Avery'; 'Michael J. Buscher'; 'Bryan Currier'
Cc: aweinhagen@hinesburg.org; Andres Torizzo
Subject: RE: Two-year-old stormwater question on Haystack
Attachments: Stormwater OVF Paths - 8.3.20.pdf; Haystack C2.0 - OVERALL - Drainage low Points and overflow directions..pdf; 17 - Post_Haystack_Q100_HC_Report.pdf; C3.2 - G&D Q100 Study Points Pond 17P.pdf; C3.3 - G&D Q100 Study Points Ponds 21P and 33P.pdf; C3.4 - G&D Q100 Study Points CB#1.pdf; C3.8 - G&D Q100 Study Points Pond 11P.pdf; C3.10 - G&D Q100 Study Points Pond 10P.pdf

Hi Mitch-

A couple of things to keep in mind.

The Plans depicting the overflow paths reflect where the water is proposed to be directed in extreme storm events. The HydroCAD modeling only addresses the Q100 storm event. The modeling shows that many of these areas have the capacity to convey the Q100 design flows, which is impressive in its own right, and some don't (more on that later).

The originally developed overflow paths were created specifically to address the Town's concerns of where flows were to be directed in support of the determination that the constructed buildings would not experience flooding. This is paramount for all extreme storm events. The other issue is compliance with the Q100 peak pre and post development flow requirements.

In addressing your observations from the email below we offer the following:

When a catch basin is modeled as a pond, it allows for a dynamic review of the performance of the pipe conveyance out of the catch basin under "inlet flow conditions".

"Inlet control" presumes that the water entering the catch basin and its associated momentum is totally stopped and it is only through the water "piling" up at the face of the outlet pipe, will cause the stormwater to move through the outlet pipe. The deeper the water is at the inlet end of the pipe, the more water can enter the pipe. We discussed earlier that it is common practice in some parts of the country to create a large diameter "gobbler" inlet and then to reduce the diameter a pipe length later since the inlet controlled flows revert to the occupancy of a smaller portion of the diameter of the inlet pipe.

The reason that there is no storage assigned for this "piling up" of the water inside the catch basin is that the volume is considered to be de minimis in comparison to what is flowing through the system. e.g. there is no storage that will alter the rate of inflow vs. outflow.

The way the modeling has been created, the locations where the pipe and catch basin capacity has been exceeded is readily identified. Without trying to model the standing water ponding capacity at a low point of a roadway where the water starts flowing out of the top of the catch basin, the model identifies the rate of flow leaving the piped network and flowing overland. Without the above ground

ponding included, this represents a conservative flow that then needs to be accommodated in the overland routing.

The previously prepared overland flow routing plan and its associated grading and finish floor assignments, by inspection, had plenty of capacity to pass the identified secondary flows.

We had previously developed a mark-up of Sheet C2.0 to depict the low points in the system and where overflows from those low points would be directed (Attached). These are shown in orange. Keep in mind that some of the street names have changed on this plan since its creation. We have modified this plan to include the locations of the eight (8) study points provided by the Town. Half of these have do not have overflow issues for the Q100 design flows directed to the supporting conveyance pipes [inlet control water height is above the pipe obvert but below the CB Rim, so no overflow] (shown in green) while the remaining 4 have some amount of bypass flows that exceed the pipe carrying capacity and outflows through the top of the structure (shown in red). From this, and using the C2.0 mark-up as a starting point, we noted that:

1. Pond 11P overflow needs to be Routed to Pond 33P to determine if the currently acceptable pipe carrying capacity at that point can handle the additional flows from 33P.
2. Of the study points reported by Staff, the eastern portions Shubael Street has capacity issues which causes the secondary overflows to be directed to Patrick Brook instead of the Main Gravel Wetland. Currently the model redirects the overflows from Pond 13P to Patrick Brook. The model needs to be revised further to direct the overflows from 14P and 17P to Patrick Brook to see if the Q100 post development peak remains within acceptable levels or the conveyance piping needs to be increased in size to convey these flows to the Main Gravel Wetland. On the attached C2.0 overall sheet and the supporting grading sheets we have identified the Q100 secondary flow rates at each overflow location to the previously created Q100 overland flow paths to see where there may be issues at the low point of the property.

Regarding the Towns inquiry on the ability of proposed open space Lot 20 to be further developed, this area had been utilized in the State Stormwater submittal as a disconnection area and conveyance path for those proposed homes on the west side of Jenna Drive. If the Town could identify what it would like to develop in this area, we can further review what the elimination of the disconnection areas will mean as it relates to compliance with the State reviewed system.

Best Regards

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From: mcypes@hinesburg.org [mailto:mcypes@hinesburg.org]
Sent: Thursday, June 23, 2022 11:16 AM
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Subject: Two-year-old stormwater question on Haystack

Hi Ben, David, Mike & Bryan,

I realized yesterday that I will be out of the office on Friday. I will need a sufficient response to the question I asked over two years ago by 9:00AM Friday, in order to schedule an opening discussion for Haystack Crossing on July 19th. Keep in mind that August 2nd, which is the next meeting is only 2-weeks after the 19th.

The attached uses the latest PDF of the HydroCAD, which I have available to me.

The more than two-year old question is where is the stormwater discharge that is above the obvert elevation of the pipe going to be conveyed, and is this discharge going to flood proposed residences or other structures, or overwhelm one of the smaller gravel wetlands?

Attached are marked up sheets from that HydroCAD. In the past I was told that the stormwater is stored in catchbasins and/or on the roadways. The HydroCAD does not show any volume area for catchbasins and/or the roadways. If these are the answers to the question, then you need to show that in the modeling. Usually, the stormwater discharge pipes are not shown as storage areas, but rather as the outflow to a catchbasin.

The other answer I was provided was a plan with overflow paths, some of which show stormwater discharging in a direction that is opposite the discharge flow shown in the subcatchment area plans. For now I am ignoring the overflow paths plan assuming it is inaccurate. If I were to consider that plan valid, then much of the modeling would be invalid.

I hope this is helpful. I really would like this concern satisfied. At the meeting on Tuesday, I did say I would accept a certification from an appropriately licensed engineer for the July 19th scheduling. Such a certification would have to be clear in how it answers this question. I would also be willing to schedule the application to start on July 19th with a partial update that clearly demonstrates how you fully plan to resolve this concern.

Mitch

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