



MEMORANDUM

To: Hinesburg Development Review Board

From: Paul O'Leary Jr, P.E.

Date: February 16, 2012

Re: Hannaford Hinesburg – Stormwater

Peter Erb asked for calculations regarding what impact Hannaford's stormwater would have on abutting properties during larger storm events. This firm did the calculations and determined the following.

Under current conditions stormwater from Lot 15 and other adjacent properties flows through swales on the Darkstar property then through a culvert under Commerce Street, into a stormwater pond located on the Mobil and Tailhook Towing properties. From time to time under Darkstar experiences backups of stormwater onto their property. The existing 15" culvert under Commerce Street is the limiting factor that causes these backups. The culvert is not large enough to accommodate even a 10-year storm under current conditions. It causes water to back up until it reaches a height of about 338' and then spills over the entrance of the adjacent shopping plaza where it flows into the swale along the front of the plaza.

To help address this pre-existing problem, Hannaford's stormwater system has been designed to completely separate Hannaford's discharge from the Darkstar property. Unlike current conditions in which stormwater from Lot 15 flows through the swales that cross the Darkstar property and add to the flows going through the 15" culvert under Commerce Street, Hannaford's proposed system will collect Hannaford's runoff and discharge it through an 18" pipe to a discharge point next to, but separate from, the 15" culvert under Commerce Street that drains the swale behind Darkstar.

During small and large storm events (up to a 25-year storm) which are more common than extreme storms (50 and 100 year storms), there will be no flows from the developed portion of the Hannaford site through the Darkstar swale. This separation will decrease flows through the Darkstar swale and decrease frequency, intensity and duration of backups.

In extreme storm events (which are much less frequent) Hannaford's system is designed to retain the majority of the excess stormwater within the curbed parking lot and gradually discharge it through Hannaford's separate 18" pipe. Nonetheless, during extreme storm events some stormwater may overflow the curbing in the vicinity of catch basin #13 located off the side of the entrance road. This water would flow into Darkstar's swale. To assess the impact of this overflow during occasional extreme storms O'Leary-Burke compared the rate of water overflowing CB #13 into Darkstar's swale to the current conditions of an undeveloped lot #15. The stormwater model shows that the overflow from the post development conditions is slightly less than pre-development conditions but it is so close that we consider them equal.

Here is a summary of the occasional extreme storm events for CB #13 which would overtop onto Darkstar:

During the 50-year storm CB #13 will back up to an elevation of 343.28' (rim elevation is 342.9'). There will be a peak discharge of 4.8 cfs flowing onto Darkstar. An undeveloped Lot #15 has a peak discharge of 6.1 cfs onto Darkstar.

During the 100-year storm CB #13 will back up to an elevation of 343.39'. There will be a peak discharge of 7.1 cfs onto Darkstar. An undeveloped Lot #15 has a peak discharge of 7.5 cfs onto Darkstar.

As described earlier, the existing 15" culvert under Commerce Street is the limiting factor. Once it rises to about elevation 338' and spills over the shopping plaza's entry drive into the swale along Commerce Street, it essentially becomes a free-flowing system and additional stormwater simply adds to the volume flowing across the plaza's driveway without causing further backups onto Darkstar's property. Thus during the occasional extreme storm event, by the time CB #13 overflows into the Darkstar swale the maximum backup will have already occurred and Hannaford's addition will not materially effect Darkstar's situation.

In summary, Hannaford's system will decrease Darkstar's problems during small and large storms. During occasional extreme storms it will add no more stormwater than goes there presently and even that will not add to the water backup because it will simply join the water flowing across the shopping plaza's driveway as it does under present circumstances.