

**Date** January 20, 2016  
**To** Nathaniel Strosberg, Town Planner  
**From** Thomas C. Houston  
**Project** Rail Transit District Apartments Modification  
**Subject** Deficient Sudbury River Culvert

Professional Services Corporation, PC (PSC) previously identified an existing undersized culvert system that extends from the confluence of Chemical Brook and Trolley Brook northward beneath the MBTA tracks then northeastward beneath Cherry Street, between the police and fire stations, crossing beneath portions of Main Street, Front Street and Concord Street and into the Sudbury River (Sudbury River Culvert). Flooding issues associated with this system were identified for the previously approved Jefferson at Ashland Station JPI Apartment Development (JPI Project). The current plan does not address analysis of this system, particularly with respect to addressing the 100-year off-site flooding impacts from increased volumes from the Rail Transit District Apartments site.

The 36 inch/48 inch/4 ft. by 4 ft. Sudbury River Culvert has a tributary drainage area of at least 322 acres. The Sudbury River Culvert will be directly impacted by stormwater discharged from the Project Site. We have not reviewed the Allen and Major calculations for the JPI Project. For the Rail Transit District Apartments Project stormwater from the majority of the site flows to the Northerly Wetlands and thence via Chemical Brook to the Sudbury River Culvert.

As discussed at the public hearing, a simple screening test of relative impacts to the Sudbury River Culvert is to compare impervious cover for the approved JPI Project vs the current project. The Applicant has not yet submitted the quantitative comparison of impervious coverage on the approved JPI Project vs the current project. Nonetheless, we anticipate that there is less impervious materials coverage for the current Rail Transit District Apartments Project, in part because the JPI Project extended across the current property line.

It is known that the Sudbury River Culvert is deficient, even for existing flows, as evidenced by a 2001 overland flow which impacted the fire station. The submitted Rail Transit District Apartments



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stormwater calculations do not evaluate impacts on the east side of the MBTA Access Road, including impacts to the Sudbury River Culvert.

The Applicant has not agreed to contribute monies towards upgrading the Sudbury River Culvert.

The previously approved stormdrain system for the JPI project discharged runoff from much of the site to a stormwater basin near the northwest corner of the Nyaza Superfund Site east of the MBTA Access Road. That offsite basin discharged overland to the “Northerly Wetland,” thence to Chemical Brook, thence to the Sudbury River Culvert, and thence to the Sudbury River.

The currently proposed stormdrain system for the Rail Transit District Apartments discharges runoff from much of the site to a stormwater basin on the Project Site. A portion of runoff also flows to High Street which does not impact the Sudbury River Culvert and a portion flows to the “Easterly Wetland” but the volume of runoff to that design point slightly decreases. The discharge from the onsite basin flows through existing culverts across the MBTA Access Road. Thereafter the stormwater flows to the “Northerly Wetland,” thence to Chemical Brook, thence to the Sudbury River Culvert, and thence to the Sudbury River.

Once the stormwater discharge reaches the “Northerly Wetland,” stormwater from both projects follows the same route and impacts the Sudbury River Culvert. The stormwater system for the JPI Project has been described as a more centralized system. The primary difference is the location of the stormwater basin. The flowpath and impacts of the discharge are the same downgradient of the “Northerly Wetland.”

The proposed stormdrain system attenuates the increase in the peak rate of discharge for post development flows. However, the Northerly Wetland serves to detain flows. Therefore a volume increase will increase the volume of water within the Northerly Wetland. For the 100 year frequency storm event, the peak rate of runoff from the Proposed Project to the Northerly Wetland is 67.68 cfs (predeveloped) and 65.93 cfs (postdeveloped), a 3 percent decrease. For the 100 year frequency storm event, the volume of runoff from the Proposed Project to the Northerly Wetland is 309,987 cu.-ft. (predeveloped) and 487,646 cu.-ft. (postdeveloped), a 57 percent increase. Absent extending the drainage analysis to include the Sudbury River Culvert, we cannot quantify the extent to which the existing (predeveloped) peak rate of flow will be impacted by the Rail Transit District Apartments. However, we believe that the peak rate of flow (postdeveloped) for the Rail Transit District Apartments Project is likely to be less than the peak rate of flow (postdeveloped) for the previously approved JPI Project

PSC identified several additional deficiencies in the stormwater management calculations and design that should be adequately addressed prior to evaluating the Sudbury River Culvert flows. (Please refer to Comments #15, #19, #20, #21, #23 and #24) in our prior reports.