HANCOCK
ASSOCIATES

19774

June 29, 2016

Jonathan F.X. O'Brien, Esquire
Chairman
Sudbury Zoning Board of Appeals
Flynn Building
278 Old Sudbury Road
Sudbury, MA 01776

Re: Village at Sudbury Station
Peer Review – Stormwater Management Plan

Dear Chairman O'Brien and Members of the Board of Appeals:

As you know, Hancock Associates, ("HA"), was hired by the Zoning Board to conduct a peer review of the Stormwater Management Plan that was submitted to the Zoning Board for the Village at Sudbury Station project. As requested, HA have reviewed the following material: plans titled "Preliminary Site Plan for the Village at Sudbury Station (8 Sheets)" dated January 25, 2016, last revised June 10, 2016, and prepared by Sullivan, Connors and Associates ("SCA"); report titled "Hydrologic & Hydraulic Analysis for the Village at Sudbury Station" dated June 10, 2016 and prepared by SCA; plans (3) titled "Existing Drainage Areas for the Village at Sudbury Station", "Proposed Drainage Areas for the Village at Sudbury Station", and "Off-site Drainage Areas for the Village at Sudbury Station", all dated June 10, 2016 and prepared by SCA. In addition, HA have reviewed the submittal cover letter dated June 13, 2016 from William C. Hency, Esquire, to the Zoning Board that includes an attached copy of the negative MA DEP Superseding Determination of Applicability issued April 20, 2016. The HA review comments follow.

-1. General - Wetland Resource Area Delineation and Sewage Treatment

Comment 1.1: HA notes that the delineation of Wetland Resource Areas was performed by others and that a MA DEP negative Determination of Applicability was issued for this project.

Comment 1.2: HA notes that the proposed sewage treatment and subsurface disposal is shown in a general way on the plans. However, there is insufficient detail to describe those components, and the HA review offers no comments on sewage disposal.

-2. General - Rainfall Rates for Stormwater Management Design

Comment 2.1: HA notes that the applicant's engineer, SCA, has used Technical Paper 40 rates ("TP40") for design storms in compliance with the recent November 2015 MA DEP guidance memorandum included with the submission. HA agrees that use of TP40 for this project at this time is appropriate.

-3. General – Completeness of Plans – Proposed Grading

Comment 3.1: The plan set is not complete with respect to proposed surface elevations defining the finished grade. The proposed grades are shown as a mixture of proposed contour elevations, spot elevations, limited building floor elevations, and road centerline profiles. The proposed contours shown on the plan represent a fraction of the number needed to properly evaluate the proposal given the significant grade differences around the site. Generally, proposed contours are limited to ten foot intervals. Spot elevations are limited to most high/low points along Access Drives and at main entrances to buildings (but not secondary entrances). This makes it difficult to evaluate, among other things, the feasibility of the shoulders, retaining walls, and embankments along Peter's Way Extension, for example. Two foot contours should be added to the plans along with floor elevations at all building entrances.

-4. General – Completeness of Plans – Proposed Drain Piping

Comment 4.1: The plan set is not complete with respect to drain pipe elevations and sizes. Information on pipe sizes and invert elevations is limited to those pipes part of the underground detention system including outfall pipes to the property line. There is no information regarding pipe sizes/inverts for the upstream collection pipes on the plan views or the road profiles. There is no information on elevations of catch basin rims to demonstrate collection/ponding capabilities. In short, there is no demonstration on plans or calculations that the proposed flows can be collected and conveyed to underground detention without unintended overflows off the site. An analysis of pipe and catch basin capacities should be provided to eliminate potential for unintended overflows.

-5. Existing, Proposed, and Off-site Drainage Areas (3 Sheets)

Comment 5.1: HA has no issues with the delineation of drainage areas to points of reference.

-6. Preliminary Site Plan, Sheet 1 of 8, Overall Site Plan / Key Sheet

Comment 6.1: The "Parking Summary" lists a total of 14 surface accessible parking spaces. The plan itself shows 16 accessible parking surface spaces. In addition, there are no accessible spaces designated in the under-building garages; as an amenity, there must be equal treatment for garage parking under accessibility guidelines. HA mentions this under the stormwater review because a later correction might impact the grading (and resulting drainage) for this site; this is because the accessible parking comes with great constraints with regard to the maximum allowable slopes on the parking surfaces – addressing those constraints might cause the access drive elevations to change.
Comment 6.2: The accessible parking for Building #3 is on a slope of between 2 and 4%, more than the 2% allowed. The parking is across the street from Building #3; the route to Building #3 must be along a crosswalk in Access Drive #3 which has a cross-slope of about 3.5%, more than the 2% allowed. These would require grading changes to Access Drive #3.
Comment 6.3: The crosswalk shown in Access Drive #2, Station 0+35, is on a 4% grade, more than the 2% allowed. The Access Drive #2 must be regraded.
Comment 6.4: The crosswalk running with Access Drive #2 across the drive into the Building #2 garage is at 6.5%, more than the normal 5% maximum allowed; while it could be argued that this steeper grade is required due to topographical constraints, the hardship created would be self-inflicted since the grade could be cut back to 5% by increasing retaining wall heights to the west.
Comment 6.5: The more westerly pair of accessible parking spaces in front of Building #5 along Access Drive #1 are on a greater than 2% grade and should be adjusted.

-7. Preliminary Site Plan, Sheet 2 of 8, Site Plan

Comment 7.1: Numerous floor elevations at doors are missing. All resident doors of a multi-family building must be accessible; this plan does not show how that is to be done. Due to the significant grades on the site, it may be necessary to change either the road grades or to add accessible handrail ramps in order to provide the required accessible access. In making such a change, the grades and drainage piping may be significantly changed.
Comment 7.2: There are no provisions shown for roof drainage. If gutters and downspouts are to be used, then there is a likelihood of the following: creation of low spots in front of some buildings between buildings and sidewalks; and, erosion down steep embankments from from to rear of buildings. The usual treatment is to install small area drains to prevent these types of drainage problems. Methods for avoiding these problems should be added to the plan.
Comment 7.3: In front of Building #2, there are two parking lot islands that are broken to allow for drainage along gutter to the catch basins downstream. In a residential setting, HA disagrees with this due to potential for blockage during winter and fall especially at the low end of the site where overflows might occur. The row of parking can be regraded to allow for a pavement gutter at the front end of parking row.

Comment 7.4: The rear of Buildings #12 and #13 is susceptible to ponding of water running off from the cemetery and probably the roofs; this area at the rear of buildings is narrow and cannot be effectively drained by swales conveying runoff to Access Drive #1. Area drains and piping should be located at the rear that can also receive the roof downspouts and convey this flow to the drain in Access Drive #1.

-8. Preliminary Site Plan, Sheet 3 of 8, Site Plan

Comment 8.1: At the intersection of Access Drive #1 and Hudson Road, a temporary grading easement is shown across an existing garage on property of Gilmartin to allow for construction of Access Drive #1. An explanation of the arrangement should be added to the plan.

-9. Preliminary Site Plan, Sheet 4 of 8, Plan/Profile

Comment 9.1: Proposed drain pipes, first floor building doors (in background), and accessible parking locations should be added to the plan to show feasibility of design.

-10. Preliminary Site Plan, Sheet 5 of 8, Plan/Profile

Comment 10.1: Proposed drain pipes, first floor building doors (in background), and accessible parking locations should be added to the plan to show feasibility of design.

-11. Preliminary Site Plan, Sheet 6 of 8, Plan/Profile

Comment 11.1: Proposed drain pipes should be added to the plan to show feasibility of design.
Comment 11.2: Typical sections should be added to demonstrate feasibility of sidewalk, guardrail, and embankment grading.

-12. Preliminary Site Plan, Sheet 7 of 8, Drainage Details

Comment 12.1: In the plan view of Detention Systems A and B, a water main crossing is shown over the 60 inch diameter System B pipe outfall. Given the lack of grades on the plan, HA questions its feasibility with respect to proposed depth of cover (the 60 inch is an obstacle to it). More information should be provided describing this pipe crossing.
Comment 12.2: In the plan view of Detention System A and B, the System A field is described as having a minimum cover elevation of 201; this seems to conflict with the Sheet 2 of 8 plan view which calls for an elevation less than 200 – again, the lack of grades makes this aspect impossible to evaluate properly. More information on grades should be provided.
Comment 12.3: Both Detention Systems A and B incorporate a small 4 inch diameter opening in a vertical wall as the lowest and primary outlet for the large underground storage areas. These small 4 inch diameter openings will discharge the vast majority (more than 90%) of total runoff from the site over the system's lifetime. The 4 inch

openings will be susceptible to clogging since the only filtering of sediment, leaves and trash is from the deep sump catch basins. HA suggests the following three additions to the system to prevent chronic maintenance problems. First, provide an upstream screening system to prevent larger objects from entering the storage chambers; these must be inspected and cleaned frequently; HA suggests monthly cleaning. Second, provide a monthly inspection of the 4 inch outlet; as it will be often submerged, provide a manually operated device that can be used by property management from the surface – this device could be an aluminum pole that could be swung from the surface to dislodge stuck objects and silt from the 4 inch opening. Third, provide an emergency and maintenance valve at each outlet that can be opened to allow discharge of unwanted ponded water due to a plugged outlet; this outlet (12 inch recommended) could lower water during non-precipitation days to allow for cleaning of the 4 inch opening; the Agri Drain Corporation (agridrain.com) manufactures a valve ("Valterra Valve" up to 12 inch size) with an extension pipe that can be operated from the surface; their product line may suit the depths and pressures involved in this case.

-13. Preliminary Site Plan, Sheet 8 of 8, Snow Storage Plan

Comment 13.1: Please refer to Comment 7.2. There is no provision for local area drains in landscaped areas contained by building and sidewalks; it is likely these will be needed for roof drainage and snow melt in certain areas such as in front of Buildings 2, 4, 5, and between town house groupings.

-14. Hydrologic and Hydraulic Analysis

Comment 14.1: In Section 2.10 of the narrative, correct typographical error: revise, "…at approximately elevation 193.5." to "…at approximately elevation 173.5."
Comment 14.2: In Section 2.10 of the narrative, provide the correct conversion factors using the 0.25 and 0.35 inches to achieve the required 7,893 cubic feet of recharge.

Summary

Based on the lack of sufficient preliminary information, HA cannot determine that the stormwater management system is technically feasible to construct in a manner that would meet the MassDEP requirements and serve to protect the residents on site and abutting properties. HA recommends that the Board require the additional information noted above in order to facilitate a proper review prior to rendering a decision.

If you have any questions or comments, please contact me at 508-460-1111 or email me at rchrusciel@hancockassociates.com.

Sincerely,

HANCOCK ASSOCIATES

Robert A. Chrusciel, P.E.
Senior Project Manager

RAC/rac
cc: Vito Colonna, PE, Connorstone Engineering, Inc.; Joe Peznola, PE, Hancock Associates.