

Horsley Witten Group

Sustainable Environmental Solutions

294 Washington Street • Suite 801 • Boston, MA 02108
857-263-8193 • horsleywitten.com



November 3, 2016

Ms. Beth Suedmeyer
Environmental Planner
Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, Massachusetts 01776

Re: Peer Review for Village Retail & Bridges by Epoch at Meadow Walk
526 & 528 Boston Post Road
Sudbury, Massachusetts

Dear Ms. Suedmeyer and Board Members:

The Horsley Witten Group (HW) is pleased to provide the Sudbury Planning Board with this letter report summarizing our initial review of the stormwater management design for the Village Retail & Bridges by Epoch at Meadow Walk (Retail & Bridges) proposed project. The plans and calculations were prepared for BPR Sudbury Development, LLC (Applicant) by VHB. This project is considered the third phase of the Meadow Walk redevelopment at the former Raytheon 50 acre campus. The proposed project consists of the construction of 35,000 square feet of retail space and a 48 unit assisted living facility with associated access roadway, parking, landscaping, utilities, and a stormwater management system. The proposed stormwater management system consists of subsurface infiltration trenches for recharge of clean roof runoff, and best management treatment trains consisting of deep sump catch basins and either proprietary water quality units, bioretention areas, and/or subsurface infiltration. The project is within the jurisdiction of the Sudbury Conservation Commission and is required to file a Notice of Intent.

The following documents and plans were reviewed by HW:

- Application for Stormwater Management Permit for Retail Buildings at Meadow Walk Sudbury
- Application for Stormwater Management Permit for Bridges by Epoch at Sudbury
- Preliminary Stormwater Management Master Plan, prepared by VHB, revised April 2016
- Village Retail & Bridges by Epoch at Meadow Walk, Stormwater Management Report, prepared by VHB, dated October 2016
- Site Plans entitled Village Retail & Bridges by Epoch at Meadow Walk Sudbury, 526-528 Boston Post Road, Sudbury, MA, prepared by VHB, dated October 14, 2016, including:
 - Cover Sheet
 - Legend and General Notes C-1
 - Overall Site Plan C-2

- Layout and Materials – Village Retail C-3.1
- Layout and Materials – Bridges by Epoch C-3.2
- Grading and Drainage Plan – Village Retail C-4.1
- Grading and Drainage Plan – Bridges by Epoch C-4.2
- Utility Plan – Village Retail C-5.1
- Utility Plan – Bridges by Epoch C-5.2
- Site Details C-6.1 - C-6.4
- Planting Plan – Village Retail L-1.1
- Planting Plan – Bridges by Epoch L-1.2
- Planting Notes and Details – Bridges by Epoch L-1.3

- Existing Conditions Plan of Land Sv-1 – Sv-6 (February 29, 2016)

Stormwater Review

HW has reviewed the proposed stormwater management design as per the standards listed in the Massachusetts Stormwater Handbook (MSH) dated February 2008 and the Town of Sudbury Stormwater Management Bylaw Regulations (Stormwater Bylaws), revised January 23, 2013.

In accordance with Section 8.0 of the Stormwater Bylaws, this project is required to comply with the performance standards of the MSH. Therefore, we have used the MSH as the basis for organizing our comments. However, in instances where the additional criteria established in Section 8.A.3 of the Stormwater Bylaws requires further recommendations; we have referenced these as well.

1. *Standard 1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

The Applicant has stated that all stormwater will be discharged to existing closed drainage systems and does not propose any new outfalls to wetlands. To verify that the Retail & Bridges redevelopment project is in compliance with Standard 1, HW recommends that the Applicant clarify which existing pipes will remain. It appears that the proposed development will be discharging into the large existing stormwater basin via two existing 12 inch reinforced concrete pipes (RCP) and one existing 18 inch RCP and will outlet via one existing 12 inch RCP and one existing 24 inch RCP. The existing drain pipes are discharging into recently refurbished forebays which should alleviate potential erosion into this wetland resource area.

HW recommends that the Applicant confirm that these are the only outfalls impacted by the proposed development and clarify which existing drain lines within the limit of work are to be maintained, a different line type may be useful for clarification. For instance it is not clear on Drawing C-4.2 if the 12 inch RCP with inlet at 144.70 will remain. This outlet is included in the HydroCAD calculations as Device 4.

2. *Standard 2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

The Preliminary Stormwater Management Plan revised in April 2016 provided the HydroCAD analysis which illustrated that the entire 50 acre redevelopment project is being designed so that post-development rates do not exceed pre-development peak discharge rates. However there are a number of inconsistencies between the plans and the HydroCAD modeling that are outlined below and should be clarified by the Applicant.

- a. Table 1 has been provided within the Stormwater Management Report to verify that the proposed impervious areas are consistent with what was previously approved under the proposed Master Plan for the entire site. It appears that there is a discrepancy with some of the proposed values specifically S1-A and S1-B, which should be explained by the Applicant. It also appears that the area listed for S-1E is different than what was previously approved for the Grocery Store and that the total area of currently proposed impervious area is miscalculated and is actually greater than the approved Master Plan. HW recommends that the Applicant revisit Table 1 and confirm the values listed. For any Drainage Area where the proposed impervious area exceeds the Master Plan value an explanation should be provided.
- b. HW recommends that the proposed conditions HydroCAD map illustrate all subcatchments. For example, subcatchment S-1B should be broken into subcatchments S-1B-1A through S-1B-1E. Currently S-1B-1A, S-1B-1B, S-1B-1C, S-1B-1D, and S-1B-1E all indicate that the impervious cover consists of 'roofs & parking' however it appears that the entire roof of the Bridges Building is captured within S-1B-1A. It would be useful to provide these subcatchment areas on Figure #4.
- c. HW recommends that the Applicant also illustrate the various subcatchments within S-1G.
- d. For any subcatchment area that has a time of concentration (T_c) greater than 5.0 minutes, HW recommends that the Applicant provide T_c paths for verification. For instance S-1A-2 and S-1B-1C indicate 50 feet of sheet flow over grass, however it does not appear that there is 50 feet of grassway available.
- e. HW recommends that the Applicant define "LD" and show it on a detail. Both Bioretention Pond B-3 and B-4 indicate an LD of 24 inches.
- f. HW recommends that the Applicant verify that WQU-502 will function properly during the 25-year storm event if the existing pond elevation backs up into it.

- g. Subsurface infiltration system #2 has an outlet pipe diameter of 16-inches; however the HydroCAD modeling indicates a 15-inch pipe. HW recommends that the Applicant confirm the correct diameter and revise the plans or calculations as needed.
 - h. HW recommends that the Applicant verify the elevation of the manifold in subsurface infiltration systems #2 and #3. It appears lower than necessary and the chamber storage may not be fully utilized.
3. *Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.*

The Applicant has noted that the impervious area of the entire site will be reduced under the proposed layout and therefore the recharge criteria are met. To provide additional recharge the Applicant is proposing infiltration trenches around the perimeter of each building to infiltrate the roof runoff, three subsurface infiltration systems, and two bioretention areas to infiltrate portions of the access drive, walkways, and driveways. These methods of infiltrating are considered acceptable best management practices (BMPs) per the MSH. It appears that the Applicant is in compliance with Standard 3.

4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1.0-inch of volume from the impervious area for water quality.*
- a. HW recommends that the Applicant confirm the detail for the gravel filter strip to verify that the pretreatment meets the criteria listed in the MSH and ensure that the bioretention areas will provide 90% TSS removal.
 - b. The following inconsistencies are noted between the Water Quality (WQ) modeling and the Proposed HydroCAD modeling
 - Pond 1P (Building 4&5 Subsurface Infiltration System) – Device #4 is modeled as two 10-inch vertical orifice under the WQ calculations, but one 8-inch vertical orifice in the overall HydroCAD calculations. Appears that the primary device (#2) is also different.
 - Pond 2P (Bldg 2) – the WQ volume calculations use an exfiltration rate of 8.27 in/hr vs. the HydroCAD calculations which use 2.41 in/hr. The length/slope of the outlet pipe is also different.
 - Pond P-Roof 2 – the Primary devices are different (broad-crested vs. sharp-crested weir) and sizes are different.
 - In the WQf calculations, WQU 502 is not listed in the table (impervious area = 0.39 ac)

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*

The project is not considered a LUHPPL, therefore no further comment is needed.

6. *Standard 6 is related to projects with stormwater discharging into a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply.*

The project site is located within a Zone II Interim Wellhead Protection Area. The site has been designed to treat the one inch Water Quality Volume and has proposed stormwater practices such as deep sump catch basins, water quality units, bioretention basins, and subsurface infiltration, which are all appropriate BMPs for a Zone II Interim Wellhead Protection Area per the MSH. Additionally, the Applicant has identified proposed source controls and pollution prevention measures in the submission. The Applicant appears to be in compliance with Standard 6.

7. *Standard 7 is related to projects considered Redevelopment.*

The proposed project is considered a redevelopment and the Applicant has stated that the Project will be designed to be substantially compliant with the MSH for new development. It appears that the design will improve the quantity and quality of stormwater discharging from the site by reducing impervious surfaces, proposing stormwater pretreatment, providing recharge, and providing a long term Operation and Maintenance Plan. The Applicant appears to be in compliance with Standard 7.

8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.*

- a. The Applicant has provided a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the EPA National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Additional inlet protection may be necessary on the proposed catch basins once they have been set to finish grade.
- b. HW recommends that the Applicant flush the entire drainage system at the completion of construction.
- c. Sheet L-1.2 indicates existing trees to remain. The tree protection should be called out on ESC Plan (Sheets 4.1 and 4.2). The notes state that temporary construction fence should be placed as tree protection; however, there is no temporary construction fence detail:
- d. Applicant should verify that all catch basins have inlet protection and verify that the limit of work is accurate for this Phase.

9. *Standard 9 requires a Long Term Operation and Maintenance (O & M) Plan to be provided.*

The Applicant has included a Long Term Operation and Maintenance (O&M) Plan in the submission that includes checklists for maintenance. It appears that the Retail & Bridges portion of the Meadow Walk development will be included with the overall maintenance of the entire site.

HW has the following recommendations for the O&M plan provided:

- a. The gravel filter to bioretention areas should be included in the O&M plan.
- b. As currently designed, there is no pretreatment for the courtyard area. If overland flow to the LD is assumed, HW recommends a note in the O&M Plan to inspect the LDs and clear any accumulated sediment and debris.
- c. Section D.3.3 discusses Vegetated Drainage Systems, specifically Retention Basin and a Modified Treatment Swale; it is not clear where these features are proposed or existing on the site.
- d. Table E.3a in the O&M Plan discusses Construction Practices, which are also covered in the SWPPP, it is not necessary to include them in the O&M Plan.
- e. CBs 502 and 503 should be included on Figure A-1 of the O&M Plan.

10. *Standard 10 requires an Illicit Discharge Compliance Statement be provided.*

The Applicant has stated that the stormwater components included in the design plans submitted for this portion of the Master redevelopment project are in full compliance with current standards. HW recommends that as stated in Volume 1, Chapter 1, page 25 of the Massachusetts Stormwater Handbook, a Certificate of Compliance should not be issued by the Sudbury Conservation Commission until it has been determined that the Illicit Discharge Compliance Statement has been submitted for the Avalon Sudbury development and that it has been verified that there are no illicit discharges occurring on this portion of the 50 acre site.

11. *Plan Details*

- a. HW recommends that a detail for the bioretention basins be provided including the inlets, forebays, berms, materials, and planting plan.

- b. HW recommends that the following details be provided:
- Cleanouts
 - Gravel filter strip
 - Details for DMH-208 and DMH-205A
 - LD
- c. Rim elevations of manholes near Buildings 4 and 5 do not appear to be correct, specifically DMH-208 and DMH-211.
- d. The landscaping call out note for 'detention area plantings' should read 'bioretention area plantings'.
- e. There does not appear to be a detail for the modification of the existing orifice at the outfall (note states the ex 36" x 18" orifice will be modified to 24"x18" rectangular orifice).
- f. HW recommends that the erosion controls be provided on a separate plan such as a Site Preparation or Erosion Control Plan for clarity. HW further recommends that a plan be provided that clearly illustrates which existing drain pipes shall be removed and which will be maintained.

12. *Drainage Calculations*

The Applicant has provided storm drain calculations for the 25-year design storm. HW offers the following comments:

- a. The Applicant has proposed two 36-inch pipes combining into one 36-inch pipe near Building 3. Review of the capacity calculations indicates that the pipe is undersized between DMH-206 and DMH-207. It appears that the 36-inch upstream of DMH-206 (up to DMH-209) may also be undersized.
- b. There is only one catch basin proposed within the access drive to the assisted living facility which has an 18-inch diameter outlet pipe. A catch basin flow analysis should be conducted to determine if two catch basins are required at the low spot to prevent ponding.
- c. There appears to be a missing connection and LD on sheet C-5.1.
- d. HW recommends that the Applicant clarify where CB Shallow Cover vs. CB and DMH vs. DMH with Oil Debris/Traps are located to get proper TSS removal credit.
- e. HW recommends that the Applicant clarify the OUT diameters, because it is difficult to

follow the information as presented, for example at DMH-208A.

- f. Pipe materials are not called out. It does not appear that the 'perforated pipes' are labeled as mentioned in the Stormwater Management Report.

Conclusions

HW recommends that the Sudbury Planning Board require that the Applicant address these comments as part of the permitting process. The Applicant is advised that provision of these comments does not relieve him/her of the responsibility to comply with all Town of Sudbury Codes and Bylaws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Carter Bernardo at jbernardo@horsleywitten.com or at 857-263-8193 if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.



Janet Carter Bernardo, P.E.
Senior Project Manager