

June 28, 2017

Mr. Glenn R. Clancy, P.E.
Director of Community Development
Town of Belmont
19 Moore Street
Belmont, Massachusetts 02478-0900

**RE: Peer Review – Stormwater Management and Erosion Control
Belmont Day School Barn and Entry Drive
Belmont, Massachusetts**

Dear Mr. Clancy:

BSC Group has completed its initial review of the stormwater management system design and erosion and sedimentation controls for the proposed Belmont Day School Barn and Entry Drive. This letter report summarizes our findings and presents comments and questions that we have formed as a result of the review. This review encompasses the Project's compliance with the Massachusetts Department of Environmental Protection's Massachusetts Stormwater Handbook (the Handbook), the Town of Belmont General Bylaws Chapter 60, Section 325 Stormwater Management and Erosion Control (the Bylaw), and the Town of Belmont's Stormwater Management and Erosion Control Rules and Regulations (the Rules and Regulations), as well as general engineering design standards.

Project Summary and Information Reviewed

The Project involves the construction of a new building (the Barn) at the existing Belmont Day School to provide field house space, additional classrooms, and work spaces. The proposed work will include clearing of existing wooded areas, a new one-way porous asphalt driveway from Concord Avenue, walkways, landscaping, additional stormwater management systems, and new utility services for the Barn.

To prepare this report, BSC Group reviewed the plan set "Belmont Day School Barn and Entry Drive, Site Plan Review" prepared by Stantec, dated February 27, 2017 and revised June 9, 2017, "Stormwater Management & Erosion Control Report, Belmont Day School, Belmont Massachusetts" prepared by Stantec, dated February 10, 2017 and revised June 9, 2017, and a letter from Mr. Frank Holmes of Stantec to the Belmont Planning Board dated June 6, 2017. In addition, Dominic Rinaldi and Janine White of BSC held a conference call with Mr. Frank Holmes and Ms. Hilde Karpawich of Stantec on June 22, 2017 to discuss our preliminary findings and gain additional clarity into the project. Based upon our review of these documents and discussion with Stantec, BSC Group offers the following comments and/or questions for the Town's consideration.

1. In general, we find the project's plans and stormwater report to be well prepared and in general conformance with the Handbook, the Bylaw, and the Rules and Regulations.
2. The existing conditions HydroCAD calculations (Appendix C of the Stormwater Report) are based on a total of 11.427 acres of land. The proposed conditions HydroCAD

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Custom Software
Developers
Landscape
Architects
Planners
Surveyors



calculations (Appendix D) are based on a total of 11.404 acres. The calculations should be revised based on matching areas to ensure that the reductions in peak flow rate and volume are due to the stormwater management systems and not a reduction in area.

3. Both the proposed underground infiltration system and porous asphalt pavement are designed, sized, and modeled in accordance with standard engineering design standards.
4. While appropriate erosion and sedimentation controls are shown on the project plans, we recommend that the symbol used for catch basin silt sack protection be revised to stand out more. The current symbol used blends into the background and is easily missed.
5. We recommend that the site preparation plan include notes requiring the contractor to maintain and remove all temporary controls during and at the conclusion of construction and that all strawbales used are guaranteed free of weed and invasive seeds.
6. As both the proposed underground infiltration system and porous asphalt pavement will be located close to existing and new trees, we recommend that a vertical root barrier be installed between the trees and the new systems to prevent root intrusion.
7. We recommend the use of a manifold system at the outlet of the underground infiltration system. A manifold system will allow for better flow out of the system and help prevent the system from backing up in larger storm events.
8. The project is proposing a 28-inch deep pavement structure (4-inches of porous asphalt pavement and a 24-inch reservoir course). During our June 22, 2017 conference call, BSC questioned why the applicant was only using a reservoir course section and not the section illustrated in the Handbook that includes a choker course, a filter course, and a reservoir course. Stantec explained that they have had discussions with both DEP and the UNH Stormwater Center (where the section from the Handbook was developed) about the Handbook section. Stantec has been informed by both DEP and UNH that the Handbook's section is based upon no separation from the bottom of the reservoir course to seasonal high groundwater. Therefore, this section requires the additional courses of differing soil types to provide the filtration and stormwater treatment. As the proposed driveway will have more than 2-feet of separation to seasonal high groundwater, the stormwater treatment and filtration will occur in the natural soils below the reservoir course. This treatment is similar to that of a septic system. We subsequently contacted Stantec requesting they provide any correspondence they may have from DEP and/or the UNH Stormwater Center on this matter for the record. Stantec stated this correspondence was verbal, and occurred approximately 8 years ago. BSC reviewed the most recent UNH Stormwater Center Design Specifications for Porous Asphalt Pavement and Infiltration Beds as well as other available porous asphalt designs. While UNH recommends these additional courses for better water quality treatment and in lieu of more detailed study of frost heave susceptibility, most other designs specify only a reservoir course below the asphalt, or a choker course to provide a more stable surface for paving. BSC finds the porous asphalt design acceptable and within standard industry practices.
9. The use of a liner check dam as shown on the Porous Asphalt Pavement detail (Sheet L5.01) is appropriate as the driveway does include areas steeper than 5% grade. However, we recommend that the detail be revised to include the dimensions for these check dams.
10. Because of the quality of the underlying soils (Hydrologic Soil Group B), water is not expected to sit in the reservoir course and will therefore minimize the concern for frost infiltration and frost heaving.



11. The Utility Plan (Sheet L3.02) calls for an “impermeable barrier” at the end of the porous asphalt driveway where it meets Concord Avenue. However, the Porous Asphalt Pavement detail (sheet L5.01) calls for a geotextile fabric at the end of the driveway. We recommend that a truly impermeable barrier similar to the proposed check dams be placed at the end of the driveway.
12. We recommend that signs be installed identifying the limits of the porous asphalt. These signs should include prohibitions against the use of sand and of snow storage on the porous asphalt.
13. As detailed in the Operations and Maintenance Plan, the porous asphalt will require regular maintenance with the use of a power washer and/or vacuum sweeper to remove sediment and prevent clogging. With proper maintenance, porous asphalt should have a similar life expectancy to that of regular asphalt pavement.
14. The Operations and Maintenance Plan should be updated to include a description and delineation of public safety features and an estimated operations and maintenance budget as required by Section III.D. of the Rules and Regulations.

BSC appreciates the opportunity to continue to provide our services in assistance to the Town of Belmont. Please feel free to contact me at (617) 896-4386 or drinaldi@bscgroup.com should you have any questions on the information in this report.

Sincerely,
BSC GROUP, INC.

A handwritten signature in black ink, appearing to read 'D. Rinaldi'.

Dominic Rinaldi, P.E., LEED AP BD+C
Senior Project Manager/Senior Associate

cc: J. White, BSC Group
T. Loughlin, BSC Group