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March 3, 2016

Town of South Hadley Planning Board
ATTN: Richard Harris
Town Hall
116 Main Street, Room 204
South Hadley, MA 01075

**RE: Peer Review of Stormwater Permit
Berkshire Hills Music Academy – Bernon Music Center
48 Woodbridge Street**

Dear Mr. Harris:

Doucet & Associates, Inc. (D&A) received a peer review letter from Fuss & O'Neill, dated February 26, 2016. We have responded to each comment below in **bold**:

Stormwater Management Report

1. It is difficult to determine the watershed outlines on the Proposed Conditions Drainage Exhibit. For clarification purposes please revise the plan to clearly show the watershed outlines.
The Existing and Proposed Conditions Drainage Exhibits have been revised to show the subcatchment outlines in red.
2. In review of the proposed and existing grading it appears the Tc maybe modeled incorrectly. The proposed HyrdoCAD model the sheet flow portion of the Tc was modeled with a constant slope of 0.04 ft/ft, however when reviewing the grading the slopes appear to differ from 0.01 ft/ft to about 0.06 ft/ft. Please review grading in the area and revise the Tc as required.
D&A cannot locate the 0.04 ft/ft slope in question.
3. Throughout the proposed HyrdoCAD model the Tc uses a ground cover of dense weeds to model the channel flow. The swales are proposed to be replanted as lawn and mowed as need and required by the MassDEP Stormwater Handbook. The HyrdoCAD should use the appropriate ground cover within the modeling of the Tc.
D&A has revised the HydroCAD model to reflect a “clean & straight” grassed channel with a corresponding Manning’s value of 0.022.

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4. In the proposed HydroCAD model Reach 1R models the outlet swale with a ground cover of dense weeds. The swales are proposed to be replanted as lawn and mowed as need and required by the MassDEP Stormwater Handbook. The HyrdoCAD should use the appropriate ground cover when modeling of the reach. **D&A has revised the HydroCAD model to reflect a “clean & straight” grassed channel with a corresponding Manning’s value of 0.022.**
5. A detail of the grass lined swale has not been provided. To ensure the swale has been modeled correctly within the drainage calculations, a detail should be provided. **A detail of the proposed grass channel has been added to Sheet C-11.**
6. Please clarify what type of structure will be used for the overflow devises in the proposed swales. The proposed HydroCAD model uses a 6” grate to model the outlet of the Northern Swale, however it is presumed that the overflow devices with be the 12” Nyloplast Area Drains shown on Sheet C-11 of the Site Plans. Please clarify. **This section of the grass channel has been revised; this comment is no longer applicable.**
7. It is unclear how the 4,641 square foot area was determined for the 268.9 elevation in the proposed HydroCAD model for the Northern Swale. Please clarify. **This section of the grass channel has been revised; this comment is no longer applicable.**
8. There is a discrepancy between the proposed HydroCAD Model and the proposed Site Plans. The 12” HDPE pipe outlet for Pond 3 has an invert of 254.9 on the Site Plans however it is modeled with an invert of 255.11 in the proposed HydroCAD model. Please review and revise as required. **The 12” HDPE pipe outlet for Pond 2 (formerly Pond 3) has been revised. The HydroCAD model is now consistent with the Site Plan invert of 254.90.**
9. To ensure the stormwater management system will continue to work properly, the swale overflow, area drains, and stormwater piping should be included in the Long-Term O&M Plan. **The Long-Term O&M Plan has been revised to include these system components, as well as a proposed rain garden.**
10. Please provide calculations showing how a water quality volume of 4,128 cf is provided within the proposed project. **A water quality volume of 1,012 cf is required for the proposed project based on the half-inch rule; see Appendix E of the Stormwater Management Report. The proposed rain garden provides 5,404 cf of storage at elevation 260.0.**
11. Per Standard 3 of the MassDEP Stormwater Handbook, drawdown calculations for each of the treatment BMPs should be provided. Calculations for the drawdown rate have been provided however it appears they are an overall drawdown rate for the site as a whole. Please provide drawdown rates for each of the proposed BMPs. **A draw-down rate for the entire rain garden volume (5,404 cf) has been provided in Appendix E of the Report (29.2 hours).**

12. Per Volume 3 Chapter 1 of the MassDEP Stormwater Handbook, if an infiltration BMPs are designed to meet water quality volume and attenuate peak flows in addition to infiltrating the required recharge volume, the storage volume of the structure must be used in place of the calculated required recharge volume. Please revise the calculations accordingly.

A draw-down rate for the entire rain garden volume (5,404 cf) has been provided in Appendix E of the Report (29.2 hours).

13. Per Standard 4 of the MassDEP Stormwater Handbook, 80% TSS removal must be obtained. The applicant has stated this is a redevelopment project and TSS removal is met to the maximum extent practicable with 70% TSS removal. It appears the TSS removal will be provided by the proposed water quality swales. The swales as currently proposed appear to be grass lined swales, which do not provide TSS removal as outlined in the Handbook. To ensure the swales are designed as water quality swales a detail should be provided. In addition the swales must be provided with pretreatment to be able to obtain TSS removal.

The stormwater management system has been revised. It now consists of one grassed channel that provides pretreatment and conveys stormwater to a rain garden in the northeast corner of the site. Per the MassDEP Stormwater Handbook, a rain garden provides 90% TSS removal with adequate pretreatment. Pretreatment for this project includes the grassed channel and a sod strip (8 inches of gravel followed by 3 to 5 feet of sod) at the edge of the rain garden, adjacent to the access drive. Calculations for the maximum velocity and Hydraulic Residence Time in the grassed channel are provided in Appendix E.

14. Per Volume 2 Chapter 1 of the MassDEP Stormwater Handbook, an infiltration BMP must have a minimum 2 feet of separation from bedrock. In review of the provided test pits and borings, it appears the northern swale is located in the area of TP101. TP101 indicates bedrock is 2.5 feet down with an estimated elevation of 267, making the bedrock at an elevation of 264.5. The bottom of the northern swale is proposed at 266.25, this does not provide the minimum separation distance required from bedrock. Please review and revise as required.

The swale has been revised to be a grassed channel with no infiltration credit. The bottom of the proposed rain garden is at elevation 257.50. The rain garden contains 30" of additional soil media, down to elevation 255.00. TP102 indicates bedrock at 252.00.

Stormwater Management Bylaw

15. Per Section 16-5 1(m), mapping of habitats within 500 feet of the project area should be provided. This does not appear to have been provided in the review material provided to Fuss & O'Neill.

An exhibit showing NHESP Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, and Certified Vernal Pools has been included with D&A's revised Criteria for Review of Stormwater Permit Letter, dated March 3, 2016. Rare Species and Rare Wildlife Habitats do exist on portions of the 48.80 Acre site, but not within 250 feet of proposed disturbance.

16. Per Section 16.5 1(q)(iv), structural details for all components of the proposed drainage system shall be provided. A detail for the swales has not been provided.

A detail of the proposed grassed channel and rain garden are now shown on Sheet C-11.

17. Per Section 16-6 2(D), BMPs must shall be designed with an emergency overflow system, the Applicant has indicated that the swales have been designed with overflow structures that outlet to concrete flared ends with stone protection. These overflow structure is the primary outlet for the swales and not an emergency overflow. An example of an emergency overflow would be a weir outlet. The swales should be designed with an emergency overflow system.

An emergency outlet weir with riprap protection has been provided for the proposed rain garden.

18. Per Section 16-6 (H), runoff from parking lots shall be treated by oil and water separators or other controls to remove oil and sediment. Please provide documentation showing the provide BMPs will met this criteria.

This requirement was discussed with the Planning Board at the hearing on February 29, 2016. Because the proposed stormwater management system does not discharge directly to a wetland resource area and is not a LUHPPL, the Board considers the proposed grassed channel and sod strip pretreatment BMP's to be "other controls to remove oil and sediment" per Section 16-6(H).

19. Per Section 16-8 1(A)(2)(e), the signatures of the owner(s) shall be provided on the operation, maintenance and inspection agreement. The owner(s) signature(s) has not been provided on the Long-Term O&M Plan provided by the Applicant.

The Long-Term O&M Plan will be signed by the owner prior to the next Planning Board hearing.

Site Plans

20. Sheet C-4 indicates about 30 parking spaces to be set aside for future use. Will these spaces be paved spaces or grassed spaces?

The future spaces will be lawn parking.

21. Sheet C-5, please provide pipe type and minimum slope for the roof drainage located around the proposed building.

Sheet C-5 has been revised accordingly.

We anticipate that the enclosed information will assist Fuss & O'Neill with its review. Please let us know if you require any further information or clarification.

Sincerely,



Chris Tait, P.E.
Senior Project Engineer
Doucet & Associates, Inc.