

Horsley Witten Group

Sustainable Environmental Solutions

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June 6, 2022

Ms. Jacki Byerley, Planner
Andover Planning Board
Town Office
36 Bartlett Street
Andover, MA 01810

Ref: Second Stormwater Peer Review
Phillips Academy Pan – New Music Center
25 Phillips Street, Andover, MA

Dear Ms. Byerley and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Andover Planning Board with this letter report summarizing our second peer review of the stormwater management for the proposed Music Center project at Phillips Academy at 25 Phillips Street, Andover, MA. The plans were prepared by Samiotes Consultants, Inc. for Phillips Academy (Applicant). The project consists of the construction of a new building with a 15,950 square foot (sf) footprint and associated parking lot as well as the reconfiguration of an adjacent parking lot.

Stormwater infrastructure improvements include deep sump catch basins, area drains, four water quality units, a rain garden, and two subsurface infiltration chamber systems. It does not appear that the proposed work is located within the buffer zone of a wetland resource area.

The following additional documents and plans were received by HW in response to our May 3, 2022 initial peer review letter:

- Peer Review Response Memorandum, prepared by Samiotes, dated June 3, 2022 (8 pages);
- Water Quality Calculations, Phillips Academy Music Building (16 pages);
- Stormwater Report, prepared for Phillips Academy, Andover, prepared by Samiotes Consultants, Inc., dated March 16, 2022, revised June 3, 2022 (170 pages);
- Storm Drain Computation Sheet, dated April 4, 2022 (1 page);
- NOAA Atlas 14 Precipitation Frequency Estimate Table (4 pages);
- Mounding analysis spreadsheet (1 page); and
- Site Plans for Phillips Academy Music Building, Andover, MA, prepared by Samiotes, Inc., dated June 3, 2022 – Peer Review, which includes:
 - Demo & Soil Erosion C-1.00
 - Grading Plan C-2.00
 - Stormwater Plan C-3.00
 - Site Utilities Plan C-4.00

- Civil Details C-5.00
 - Civil Details C-5.01
 - Civil Details C-5.02
 - Civil Details C-5.03
- Phillips Academy Music Building, 100% DD plan set, prepared by Architectural Resources Cambridge, Inc., dated April 26, 2022, which includes:
 - Tree preservation Plan L1.00
 - Overall Layout Plan L2.00
 - Terrace Layout and Grading Plan L2.10
 - Materials Plan L3.00
 - Soils Plan L-4.00
 - Planting Plan L-5.00
 - Planting Details L-5.10
 - Site Sections L6.00
 - Site Details L-7.00
 - Site Details L-7.10

Stormwater Review

HW has reviewed the documents listed above and has the following comments concerning the stormwater management design in accordance with the Massachusetts Stormwater Handbook (MSH) dated February 2008, and the Town of Andover Stormwater Management and Erosion Control Regulations amended May 11, 2021 (Stormwater Regulations).

In accordance with Section VI.B. of the Andover Stormwater Regulations the Stormwater Management Permit and Narrative provided by an Applicant shall contain sufficient information to verify compliance with the local Stormwater Bylaw and the MassDEP Stormwater Management Handbook (MSH). Below are comments relating to the standards as presented in the MSH. Where the more stringent requirements of the Andover Stormwater Regulations are applicable, those comments are included.

The following comments correlate to our initial peer review letter, dated May 3, 2022. Follow up comments are provided in bold font.

1. Standard 1 states that no new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.
 - a. The Applicant has evaluated two Points of Analysis (POA).
 - 1) POA-1 is west of the limit of work within the baseball athletic field, including area drains piping the runoff towards the west.
 - 2) POA-2 is north of the limit of work, towards Graves Hall and School Street.

It does not appear that the Applicant will cause erosion in wetlands and therefore complies with Standard 1. No further action required.

June 6, 2022: The Applicant complies with Standard 1.

2. *Standard 2 requires that post-development runoff does not exceed pre-development runoff off-site.*
- a. Section IX.E. of the Andover Stormwater Regulations includes a Table listing approved curve number (CN) values. HW recommends that the Applicant confirm it has utilized the correct CN values specifically for post construction open space.

June 6, 2022: The Applicant has noted that per discussions with the Town Engineer the proposed open space lawn area has been modeled as “good” because of the maintenance program ongoing at the school. HW has no further comment.

- b. Section IX.E.6. states that, “The calculation of runoff volumes and peak rates shall be based on precipitation data provided in National Oceanic and Atmospheric Administration (NOAA) – National Weather Service “NOAA Atlas 14” unless otherwise authorized by the Planning Board.” HW recommends that the Applicant confirm that the precipitation depths utilized are based on the NOAA Atlas 14 data.

June 6, 2022: The Applicant has revised the precipitation depths utilized in the HydroCAD model as requested. HW has no further comment.

- c. The Applicant has proposed a subsurface infiltration system with chambers to mitigate the additional impervious area. The infiltration chamber field has been modeled in HydroCAD with 60 chambers however the design plans call out 90 chambers. HW recommends that the Applicant revise the plans or the model for consistency.

June 6, 2022: The Applicant has revised the plans and HydroCAD model to be consistent. The design includes two subsurface infiltration chamber systems, one has 84 StormTech DC-780 chambers, and the second system has 24 StormTech DC-780 chambers. HW has no further comment.

- d. The Stormwater Narrative describes a grass swale associated with catchment area P-WS-2. The plans do not appear to call out this grass swale. HW recommends that the Applicant clarify the location of the grass swale and how the grass swale is connected to POA-1.

June 6, 2022: The Applicant has clarified the grass swale located on the north side of the new parking area. HW has not further comment.

- e. There appears to be a short retaining wall to the north of the subsurface infiltration system. HW recommends that the Applicant provide a detail and additional clarification regarding the length, height, and proposed material of this wall.

June 6, 2022: The Applicant has clarified the size and height of the retaining wall located north of the new parking lot and south of the baseball backstop. HW has no further comment.

- f. The Applicant has provided a Proposed Watershed Plan (WS-PR). However, the stormwater infrastructure shown on WS-PR does not appear to match the stormwater infrastructure shown on the Stormwater Plan (C-3.0). HW recommends that the Applicant confirm the catchment areas are accurately represented on WS-PR.

June 6, 2022: The Applicant has revised the Proposed Watershed Plan to be consistent with the proposed Stormwater Plan. However, it appears that several of the watershed area labels on WS-PR are not listed accurately to correlate with the HydroCAD model. HW recommends that the Applicant confirm that the following labels should be revised on WS-PR:

- **PR-WS-4 should be labeled PR-WS-11**
- **PR-WS-5 should be labeled PR-WS-12**
- **PR-WS-7 should be labeled PR-WS-8**
- **PR-WS-8 should be labeled PR-WS-4**

- g. The Applicant has illustrated catchment areas to POA-1 and POA-2. The Applicant has combined these two points of analysis and compared the pre-development and post-development peak flows of the combined value. It is not clear from the information provided how POA-2 combines with POA-1. HW recommends that the Applicant clarify how these catchment areas are connected or provide a table illustrating the pre-development and post-development flows to the two separate points.

June 6, 2022: The Applicant has provided pre and post development tables comparing the two separate POAs and clarifying that the post-development peak stormwater runoff does not exceed the pre-development peak flow rate at either location. HW has no further comment.

- h. The HydroCAD routing diagram indicates that PR-WS-4 flows towards POA-2. It appears that portions of PR-WS-4 flows via the area drains to the proposed subsurface infiltration system and POA-1. It appears from the Existing and Proposed Watershed Plans, that PR-WS-7 is comparable to EX-WS-3. HW recommends that the Applicant clarify the HydroCAD routing diagram and watershed mapping as needed.

June 6, 2022: The Applicant has revised the proposed catchment areas. As noted above HW believes that several catchments have been mislabeled. However, the HydroCAD model appears accurate once the labels are corrected.

- i. The Applicant has noted in the narrative that P-WS-4 sheet flows towards Phillips Street. Under existing conditions, the project area does not appear to flow towards Phillips Street. If this is the intention of the proposed design, HW recommends that the Applicant clarify where the runoff entering Phillips Street will eventually discharge to.

June 6, 2022: The Applicant has clarified the flow towards Phillips Street. HW has no further comment.

- j. The subsurface infiltration system includes a primary outlet device of a 12-inch PVC pipe set at elevation 242.50, 12 inches below the top of the chambers which is reasonable. The two inlet pipes to the chamber system are set at elevation 240.35 and 242.00. It appears that stormwater will back up into the inlet pipes prior to overflowing at the catch basin grate of the outlet pipe set at elevation 242.0. HW recommends that the Applicant raise the inlets as high as feasible while providing adequate cover over the pipes.

June 6, 2022: The Applicant has revised the subsurface infiltration system design and most of the inlet inverts appear reasonable to avoid significant backing up into the inlet pipes during a 100-year storm event. HW recommends that the

Applicant revisit the outlet from catch basin DCB#2 and water quality unit WQU#3. It appears that there is adequate depth to raise these pipes higher than the peak flood elevation of 249.

- k. HW recommends that the Applicant review the constructability of the 12-inch PVC outlet and the outlet drywell with a rim of 242 and provide a detail. Furthermore, the Applicant may choose to provide scour protection around the outlet drywell and consider measures to keep the grate clear of debris, snow, and ice.

June 6, 2022: The Applicant has revised the outlets from the subsurface infiltration systems to include flared ends and scour protection. HW has no further comment.

- l. The Applicant is proposing 60 StormTech MC-3500 chambers for the subsurface infiltration system. HW recommends that the Applicant reach out to Stormtech for the proposed construction layout and potential need for manifolds.

June 6, 2022: The Applicant has provided manifolds as part of the proposed design for the StormTech infiltration systems. HW has no further comment.

- m. HW recommends that the Applicant revisit the design of the rain garden. As proposed the system appears to be four feet deep and have 2,700 sf of volume. The bottom elevation may be controlled by the inlet pipe elevations and adequate pipe coverage, however in accordance with the HydroCAD model the storage is not being utilized. A larger scaled detail illustrating the plants, outlet pipes, underdrain, stabilization at inlet pipes, potential walled edges, or berm as applicable would be beneficial.

June 6, 2022: The Applicant has provided the proposed landscape plants for the rain garden as requested. It appears that the Applicant has raised the bottom of the rain garden to 255, eliminating the bottom elevation of 254. HW recommends that the Applicant revise the callout on the Stormwater Plan.

- n. The proposed stormwater management design described by the Applicant includes a subsurface infiltration chamber system, several deep sump catch basins, a rain garden, and a proprietary water quality unit. However, the Stormwater Report provided to HW does not include the pipe sizing calculations, demonstrating that the existing and proposed pipes have adequate capacity for the proposed runoff flows and velocities. HW recommends that the Applicant provide the closed pipe sizing analysis to verify that all pipes are adequately sized.

June 6, 2022: The Applicant has provided the requested closed drainage pipe calculations. HW has no further comment.

- 3. *Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.*

- a. HW recommends that the Applicant provide the stormwater recharge calculations in accordance with the Town of Andover Stormwater Regulations as well as the MSH.

June 6, 2022: The Applicant has provided the requested calculations and appears to be providing adequate recharge volume. HW has no further comment.

- b. The Applicant has proposed to use subsurface infiltration chambers to capture and

infiltrate the proposed roof runoff and the proposed parking lot runoff. The Applicant has provided test pits with an aerial image indicating where the test pits were conducted, however it is difficult to transpose this information onto the plans. HW recommends that the Applicant clearly illustrate the test pit locations on the Existing Conditions Plan and on the Stormwater Plan.

June 6, 2022: The Applicant has clearly labeled the test pits on the Stormwater Plan. Soil testing was conducted within the footprints of the subsurface infiltration systems as well as within the rain garden. HW has no further comment.

- c. The Web Soil Survey for the project area indicates that the soils are hydrologic soil group (HSG) B. The test pits conducted indicate that gravelly sandy loam was encountered which is consistent with HSG B. The Applicant has used an exfiltration rate of 0.52 in/hr indicative of HSG C soils. HW has no objection to the lower exfiltration rate.

June 6, 2022: The Applicant has revised the HydroCAD model and is utilizing an exfiltration rate of 1.02 iph. HW has no objection to the infiltration rate utilized.

- d. In accordance with Standard 3, there should be at least a 2-foot separation between the bottom of the infiltration practice and the estimated seasonal high groundwater (ESHGW) elevation. It appears that the ESHGW elevation in Test Pit 1 was documented at 237 and the ESHGW elevation in Test Pit 2 was documented at 239.5. The bottom of the system is at elevation 239. HW recommends that the Applicant confirm that it has provided adequate separation.

June 6, 2022: The Applicant has revised the design to propose two separate subsurface infiltration systems. The design includes a minimum separation of 2 feet between the bottom of the systems and ESHGW. HW has no further comment.

- e. HW recommends that the Applicant verify if a mounding analysis is required and if needed provide one in accordance with Volume 3, Chapter 1, page 28 of the MSH.

June 6, 2022: The Applicant has provided a mounding analysis for subsurface infiltration system 2. HW has no further comment.

The Applicant complies with Standard 3.

4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 0.5-inch of volume from the impervious area for water quality.*

- a. The Applicant is proposing catch basins in the proposed parking lot that discharge directly into the subsurface infiltration system. HW recommends that the Applicant consider additional water quality measures either an isolator row or water quality device to provide treatment prior to entering the open chambers to extend the life of the subsurface system.

June 6, 2022: The Applicant has proposed water quality units prior to the subsurface infiltration systems. HW has no further comment.

- b. The Applicant has noted that the infiltration system provides 80% TSS removal. However according to the TSS Removal Efficiencies Table in Volume 1, Chapter 1, Page 11 of the MSH an infiltration basin provides 80% TSS if it is combined with

adequate pretreatment. HW recommends that the Applicant revisit the TSS removal calculations.

June 6, 2022: The Applicant has provided additional measures for TSS removal and revised the calculations provided in the Stormwater Report. The Applicant is providing greater than 90% TSS removal. HW has no further comment.

- c. HW recommends that the Applicant provide water quality flow calculations for the proprietary water quality unit in accordance with the MADEP *Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices*.

June 6, 2022: The Applicant has provided the requested calculations for sizing the water quality units. HW has no further comment.

- d. HW recommends that the Applicant document how it is complying with Section IX.D of the Andover Stormwater Regulations. Including retaining the volume of runoff for 1.0 inch over the proposed impervious area, providing 90% TSS removal and providing 60% Total Phosphorus Removal.

June 6, 2022: The Applicant has provided the requested calculations in the Stormwater Report. HW has no further comment.

- e. HW recommends that the Applicant verify that it is meeting the Pretreatment requirements under Section IX.C of the Town of Andover Stormwater Regulations. Pretreatment structures shall be sized to hold an annual sediment loading as detailed in Section IX.C.2.f., HW recommends that the Applicant provide the calculations verifying that the structures are sized adequately.

June 6, 2022: The Applicant has provided the requested calculations in the Stormwater Report. HW has no further comment.

The Applicant complies with Standard 4.

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

- a. The proposed use is not considered a LUHPPL, therefore Standard 5 is not applicable to this site.

June 6, 2022: Standard 5 is not applicable.

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.*

- a. The project site is not located within a critical area, therefore Standard 6 is not applicable.

June 6, 2022: Standard 6 is not applicable.

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

- a. The proposed project is considered a mix of new development and redevelopment. The Applicant is increasing the impervious area and intends to meet the requirements of the stormwater standards.

June 6, 2022: Standard 7 is not applicable.

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

- a. The erosion and sediment control measures are not clearly defined on C-1.00 Demo & Soil Erosion Plan. An item for Erosion Control is listed in the legend however this line type is not evident on the plan. HW recommends that the Applicant clearly define the location of the straw wattles with silt fence, the catch basin filters, and the construction entrance with key dimensions shown on Sheet C-1.00.

June 6, 2022: The Applicant has clarified the location of the erosion control barrier on Sheet C-1.00. HW has no further comment.

- b. The Operation and Maintenance Plan, provided in Appendix 4 of the Stormwater Report, notes that the construction entrance will be installed at Phillips Street at the onset of the project, however this is not shown on the Demo & Soil Erosion Plan.

June 6, 2022: The Applicant has clarified the location of the construction entrance on Sheet C-1.00. HW has no further comment.

- c. The Site Plan Review narrative describes the use of Jute Mesh. HW recommends that the Applicant include a note on the plans describing where the jute mesh will be utilized.

June 6, 2022: The Applicant has clarified the location of the jute mesh on Sheet C-1.00. HW has no further comment.

- d. HW recommends that the Applicant add a note to the detail on Sheet C-4.00, stating that inlet protection shall be provided in any existing catch basin within 100 feet of the construction entrance.

June 6, 2022: The Applicant has added the requested note to Sheet C-1.00. HW has no further comment.

- e. HW recommends that the Applicant provide tree protection for any existing trees that are to remain within 10 feet of the limit of work and provide a detail on the site plans.

June 6, 2022: The Applicant has provided a Tree Preservation Plan (L1.00) with the Landscape Drawings. HW has no further comment.

- f. HW recommends that the Applicant provide more detail about the types of trees and other landscaping that is proposed to verify that native species are being used per the Andover Stormwater Regulations. Furthermore, HW recommends that the Applicant note in the construction period Operation & Maintenance (O&M) Plan when permanent seeding can occur per the Regulations.

June 6, 2022: The Applicant has provided a Planting Plan (L-5.00) that illustrates the various plant materials to be installed. HW has no further comment.

- g. HW recommends that the Applicant indicate the proposed locations for soil stockpiles and note that these should be surrounded by erosion control measures or covered.

June 6, 2022: The Applicant has added stockpile locations on Sheet C-1.00. HW has no further comment.

- h. HW recommends that the Applicant provide direction to the contractor regarding the protection of soils at the location of the subsurface infiltration chambers and the rain garden, to avoid compaction from construction vehicles. HW further recommends that orange construction fencing be provided along the limit of work to clearly identify the project limits.

June 6, 2022: The Applicant has added the suggested direction to Sheet C-1.00. HW has no further comment.

- i. The project will exceed an acre of land disturbance and, therefore, will require a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the USEPA NPDES Construction General Permit. Prior to construction a SWPPP should be completed for the contractor's use and provided to the Town for its records.

June 6, 2022: The Applicant has stated that the SWPPP will be provided to the Town a minimum of 14 days prior to land disturbance. The Planning Board may choose to include receipt of the SWPPP as a condition of approval.

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

- a. Section VI.C. of the Andover Stormwater Regulations lists the various requirements that must be included as part of the O&M Plan. HW recommends that the Applicant confirm the various components have been provided, including the owner's signature and a simple sketch indicating where the stormwater practices being maintained are located. HW further recommends that the O&M Plan be a stand-alone document that can be easily provided to the responsible party.

June 6, 2022: The Applicant has provided an O&M Plan that includes a simple sketch. The Planning Board may choose to require receipt of a signed O&M Plan as a condition of approval.

- b. HW recommends that the Applicant provide documentation from the manufacturer detailing the O&M of the proposed proprietary water quality unit.

June 6, 2022: The Applicant has provided the requested documentation. HW has no further comment.

- c. HW recommends that the Applicant include the locations of the inspection ports/cleanouts on the subsurface infiltration chamber system.

June 6, 2022: The Applicant has provided the inspection ports on the Stormwater Plan. HW has no further comment.

- d. HW recommends that the Applicant provide specific locations where snow and deicing materials will be stored and managed on-site per the snow removal policy in Volume 2 of the MSH. Snow may not be stockpiled in stormwater management practices.

June 6, 2022: The Applicant has stated where snow will be stockpiled within the parking lot. However, HW did not see this area noted on a plan that can be provided to a plowing contractor. The Applicant may choose to include signage to notify any plows where snow can be placed.

- e. HW recommends that the O&M Plan include mention of the Annual Report Submittal requirement as noted in Section VI.C.3. of the Andover Stormwater Regulations.

June 6, 2022: The Applicant has included language in the O&M Plan regarding the annual reporting. The Planning Board may choose to include receipt of the annual reporting as a condition of approval.

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

- a. The Applicant has stated that no illicit discharges are anticipated, however, to be in compliance with Standard 10 an illicit discharge statement signed by the property owner must be provided to the prior to land disturbance

June 6, 2022: The Applicant has provided a signed Illicit Discharge Compliance Statement.

The Applicant complies with Standard 10.

Conclusions

HW recommends that the Planning Board require that the Applicant address the few minor outstanding 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 Andover Codes and By-Laws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Bernardo at 857-263-8193 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.



Janet Carter Bernardo, P.E.
Associate Principal