

# Horsley Witten Group

*Sustainable Environmental Solutions*

112 Water Street • 6<sup>th</sup> Floor • Boston, MA 02109  
857-263-8193 • horsleywitten.com



May 3, 2022

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

Ref: Initial 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 initial 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, a water quality unit, dry wells, a rain garden, and a subsurface infiltration chamber system. It does not appear that the proposed work is located within the buffer zone of a wetland resource area.

The following documents and plans were reviewed by HW:

- Site Plan Review Narrative, prepared for Phillips Academy, Andover, prepared by Samiotes Consultants, Inc., dated March 16, 2022 (11 pages);
- Stormwater Report, prepared for Phillips Academy, Andover, prepared by Samiotes Consultants, Inc., dated March 16, 2022 (105 pages);
- Phillips Academy Music Center, 25 Phillips Street, Andover, MA, Existing Conditions Plan of Land, prepared by Samiotes Consultants, Inc., dated March 10, 2022 (1 Sheet);
- Site Plans for Phillips Academy Music Building, Andover, MA, prepared by Samiotes, Inc., dated March 16, 2022, 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-4.00
  - Civil Details C-4.01
  - Civil Details C-4.02

- Phillips Academy Music Building, Permit Set, prepared by Architectural Resources Cambridge, Inc., dated March 16, 2022, which includes:
  - Materials & Layout Plan L-1.00
  - Planting Plan L-2.00
- Phillips Academy Music Building, Site Plan Special Permit Submission, prepared by Architectural Resources Cambridge, Inc., dated March 16, 2022, which includes:
  - Exterior Elevations A-2.00
  - Exterior Elevations A-2.01

### **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.

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.
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.
  - 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.

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

- 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.
  - 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.
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.
  - 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.
  - 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.
  - 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.
  - 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.
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.

- 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.
  - 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*.
  - 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.
  - 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.
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.
  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.
  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.
  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.
    - 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.

- 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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.
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.
  - b. HW recommends that the Applicant provide documentation from the manufacturer detailing the O&M of the proposed proprietary water quality unit.
  - c. HW recommends that the Applicant include the locations of the inspection ports/cleanouts on the subsurface infiltration chamber system.
  - 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.
  - 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.

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

**Conclusions**

HW recommends that the 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 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](mailto:jbernardo@horsleywitten.com) if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.



Janet Carter Bernardo, P.E.  
Associate Principal