

April 15, 2022

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

**Re: Building 1 & 1A**

*Response to Initial Peer Review*

SMMA No. 21141

Dear Ms. Byerley and Board Members:

On behalf of our client, Alexandria Real Estate (ARE), SMMA is pleased to submit this response to the Initial Stormwater Peer Review completed by The Horsley Witten Group, Inc. (HW), dated March 23, 2022. Please find below HW's comments *italicized* and SMMA's response **bold and blue**.

**Stormwater Review**

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 existing site discharges stormwater to three separate design points of analysis (DP):*
    - a. *DP-1: The stormwater from the developed site is piped towards a 48-inch outfall into the Merrimack River at the northern edge of the site.*
    - b. *DP-2: Onsite area that sheet flows offsite towards the west. The area associated with this design point is primarily undeveloped.*
    - c. *DP-3: Onsite area that sheet flows offsite towards the east. The area associated with this design point is primarily undeveloped.*

*Under proposed conditions the Applicant has provided stormwater practices to collect, manage, treat, and recharge the stormwater within the developed areas of the site. The peak flow rates that continue to discharge towards the design points have been reduced under proposed conditions. It appears that there are no new untreated discharges to critical areas as a result of the project.*

*The Applicant appears to comply with Standard 1.*

**R. Concur.**

2. *Standard 2 requires that post-development runoff does not exceed pre-development runoff off-site.*
- a. *The Applicant has provided a proposed Grading & Utilities Plan. It appears there are three existing structures that are not tied into the proposed drainage system along the west side of the northern parking area. These catch basins were previously tied into the existing drainage system in the outer access road. HW recommends that the Applicant provide additional information clarifying where these catch basins will be directed.*

**R. The plans have been revised to show the three catch basins demolished and not part of the future system. The grates and frames will be removed, and the structures will be demolished. The pipes will be capped and abandoned in place to limit tree disturbance. The C-111 Site Preparation Plan has been revised to reflect this intent, and the structures have been removed from the C-131 Grading & Utilities Plan.**

- b. *The Applicant has labeled the outlet elevations for each subsurface system on the Grading & Utilities Plan. HW recommends that the Applicant include the bottom of stone, bottom of chamber and top of stone for each subsurface system on the Subsurface Perforated Pipe System detail, found on Sheet C-502.*

**R. Additional inverts have been added for clarity to the schedule on detail F1, sheet C-502.**

- c. *The Applicant has proposed 0.6 acres of porous pavement and 0.3 acres of porous pavers. The details provided on Sheet C-503 indicate that 6-inches to 8-inches of reservoir stone will be provided beneath the porous surfaces. HW recommends that the Applicant model the reservoirs as ponds and utilize a curve number of 98 for the porous surfaces. If the stone reservoirs have adequate separation to groundwater the recharge volume provided can be included in the calculations required for compliance with Standard 3 and Standard 4.*

**R. Concur. The HydroCAD has been revised to model the porous pavement as requested. The recharge calculations have been revised to match. The HydroCAD models the combined depth of both the reservoir and filter course to ensure the flood elevation doesn't overtop the pavement surface; however, the recharge calcs conservatively only take credit for the storage in the reservoir course.**

**The HydroCAD models a 4" underdrain outlet for the porous pavement in the plaza area as well as the porous parking areas. Sheet C-131 and the details on sheet C-502 have been revised to clarify the design intent, including underdrain routing and minimum void space.**

d. *The Applicant has submitted the HydroCAD model for the proposed project, there appear to be a few inconsistencies between the model and the plan. HW has noted the following:*

i. *The HydroCAD model for System 1-3 (Detention) indicates an outlet control structure with a 3.0' long sharp-crested weir at elevation 69.10. HW was not able to confirm this information on the Grading & Utilities Plan or the Detail Sheets. HW recommends that the Applicant revisit the design and revise the plans or the calculations for consistency. Furthermore, it appears that the detail callout for OCS 2-1 on Sheet C-131 is referencing incorrectly.*

**R. The outlet control structure for System 1-3 is detailed at F5, on sheet C-502. The callout on C-131 has been revised to the correct reference. Per the detail, the outlet control structure has a 36" overflow weir in the baffle wall.**

ii. *The Subsurface Perforated Pipe System detail notes 6" stone bedding and 6" of stone cover. The HydroCAD for System 1-3 (Detention) indicates the stone bedding at elevation 66.00 and the chamber elevation at 66.00. The chamber elevation on the plan is noted at 67.00. HW recommends that the Applicant revisit the design and revise the plans or the calculations for consistency.*

**R. System 1-3 is designed to provide detention only, therefore the HydroCAD model does not take storage credit for the 6" of crushed stone below the pipes/chambers in this system (the outlet invert is at the same elevation as the pipes). The stone base for the detention system is below the impermeable layer and is included in the design for constructability purposes.**

**The HydroCAD has been revised to raise the entire system 1' to match the plans.**

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

a. *It does not appear that the Applicant has conducted stormwater test pits to adequately document soil types and depth to groundwater within the vicinity of the subsurface systems. HW recommends that the Applicant conduct test pits within the foot[print [sic] of each proposed subsurface system.*

**R. Test pits were not performed within the exact footprint of the proposed recharge basins because the systems are proposed in the existing active photovoltaic (PV) array. To limit electrical system disturbance and life-safety risk, test pit HA-TP-02 was performed just outside the extents of the field of PV panels.**

**It is respectfully requested that additional confirmatory test pits be performed within the footprint of each proposed surface system during construction after the PV panels have been decommissioned and removed.**

*b. The Applicant has provided recharge calculations stating that the design has adequate storage space below the outlet orifices. HW recommends providing the HydroCAD stage storage tables for each subsurface system to confirm the available storage provided.*

**R. Stage Storage tables have been printed for each of the subsurface systems and the porous pavement. They are provided as a separate HydroCAD report.**

*c. The Applicant has increased the impervious area of paved parking and roofs by approximately 1.9 acres. The Applicant has proposed 0.9 acres as porous pavement or porous pavers, for a total increase of 2.8 acres of impervious area. In accordance with Volume 3, Chapter 1, Page 15 of the MSH porous pavement is considered to be impervious for purposes of calculating the Required Recharge and Required Water Quality Volumes. HW recommends that the Applicant revise the calculations provided in Appendix 3.2 using the 2.8 acres of additional impervious area.*

**R. Recharge calculations have been revised to incorporate the porous pavement. The extent of porous walkways and porous pavement in the plaza area has been increased since the initial hydrology calcs, so the site now proposes 1.2 acres of porous pavement and 1.6 acres of standard paving and roofs. The combined total extent of “impervious” is still 2.8 acres.**

*d. The Applicant has stated due to high groundwater on the site, there are portions of the site where stormwater cannot be recharged. The Applicant states that based on geotechnical findings, the seasonal high groundwater onsite is 3-4 feet below the ground surface and therefore is providing recharge only to the maximum extent practicable. HW recommends providing the geotechnical information regarding the groundwater findings.*

**R. The available geotechnical information has been appended to this response letter.**

*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. The Applicant has provided water quality calculations for the water quality flow rate provided by each WQU. It appears that the area being treated by WQU 2-1 has a total area of 3.15 acres. This area is comprised of the adjacent loading areas and half of the existing roof runoff. It is noted that the roof runoff would be clean. However, the additional runoff from the roof increases the flow rate through the WQU. HW recommends reviewing all the WQU calculations to confirm they are consistent with the areas that are flowing to them to confirm*

*they can handle the pass-through flow while maintaining their efficiency. HW recommends revising WQU 2-1 calculations and any others as necessary.*

**R. SMMA has coordinated with Contech to incorporate the additional roof runoff in the sizing of water quality units 1-2 and 2-1. Revised water quality calcs have been provided. The detail on sheet C-502 has been revised to reflect the selected units.**

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*
  - a. *The Applicant has provided a Traffic Impact Assessment prepared by Vanasse and Associates. The proposed redevelopment will increase traffic on the site and based on the additional trips calculated in the traffic impact assessment it appears this project would be considered a LUHPPL as it exceeds 1,000 vehicle trips per day. Therefore, Standard 5 is applicable.*

*The Applicant has provided 80% TSS removal onsite including 44% pretreatment based on the treatment trains provided and water quality separators.*

*The Applicant appears to comply with Standard 5.*

**R. Concur.**

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 site does not discharge to a critical area, therefore Standard 6 is not applicable.*

**R. Concur.**

7. *Standard 7 is related to projects considered Redevelopment. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*
  - a. *The proposed project is considered a mix of new and redevelopment, therefore Standard 7 is applicable for a large portion of the site. HW recommends that the Applicant clearly document how it is improving existing conditions. Furthermore, HW suggests that the Applicant document where the existing solar panels will be relocated to. The Applicant may consider relocating the panels to the new roof or as canopies in the new parking lot.*

**R. As stated in the Stormwater Narrative, the existing stormwater collection system has virtually zero treatment, detention, or infiltration prior to discharge. The proposed project includes Low-Impact Development (LID) BMPs – such as porous pavements and pavers – as well as treatment and recharge BMPs designed in accordance with local and state regulations. Stormwater for a 1” design storm will be treated to remove a minimum of 80% total suspended solids and 50% phosphorus prior to discharge and approximately 10,000 cf of recharge is provided in the project. This stormwater BMPs will result in a significant improvement over existing conditions to the stormwater discharge from the site into the Merrimack River.**

**The existing PV panels will not be reused on this project site. The Applicant is planning PV-ready roofs throughout the campus however the ground-mounted style cannot be reused as rooftop equipment or as carport canopies (due to structural considerations). The Applicant is actively seeking a location to which the salvaged panels can be delivered.**

8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation, or other pollutant sources.*
- a. *Item 1 of the Stormwater Management Notes on Sheet C-111, states that the contractor shall, protect the existing storm drains as necessary for discharge of stormwater runoff prior to completion of new trunk line in Essex Street. HW recommends that this sequencing extends into post construction and permanent stabilization.*

**R. The note has been revised as stated.**

- b. *Under the General Erosion Control Notes on Sheet C-111*

- i. *Item 3 refers to erosion control measures to stay in place until groundcover is established, HW recommends using the term permanent stabilization, instead of until groundcover is established.*

**R. The note has been revised as stated.**

- ii. *Item 5 refers to Lexington Conservation Commission, replace with Andover.*

**R. The note has been revised as stated.**

- iii. *Item 7 states to stabilize stockpiles and exposed soil in areas where construction activities will cease for 21 days. HW recommends changing this to 14 days per the Andover Stormwater Regulations.*

**R. The note has been revised as stated.**

- iv. *Item 9 notes that detention basins and forebays may be used as temporary sedimentation basins throughout construction and shall be*

*periodically cleaned during construction. HW recommends more detail is provided on the means of periodical cleaning of these structures, to ensure proper long-term functionality, as well as the sequencing of temporary to permanent status of the detention basins and forebays as it relates to the construction phase.*

**R. There are no surface basins or forebays in the proposed stormwater management plan, therefore Note 9 has been revised to delete these references. The note is revised to specify a method (sediment vacuum) and visual limit (halfway up the outlet device) for sediment removal.**

*c. HW recommends that key dimensions of the temporary construction entrances be shown on the Site Preparation Plan.*

**R. Dimensions have been added as requested.**

*d. HW recommends proposed stockpiling areas with stabilization measures on the Site Preparation Plan.*

**R. A potential stockpiling location has been added as requested. Per General Erosion Control Note 6, stockpiles must be surrounded on their perimeters with staked haybales and silt fences.**

*e. HW recommends that the Applicant include details for each stormwater practice noted in the narrative, such as temporary swales and sedimentation basins, vegetative slope stabilization, and straw bales.*

**R. Details for temporary swales and sedimentation basin outlets have been added to Sheet C-501, Details I. Slope stabilization measures will be described in the specifications and Stormwater Pollution Prevention Plan to facilitate season-specific applications (e.g. temporary seeding vs. erosion control fabric) and allow contractor flexibility.**

*f. HW recommends that the locations of critical areas for erosion potential are delineated on the Site Preparation Plan as required in the Andover Stormwater Regulations.*

**R. Areas of critical erosion potential have been delineated on sheet C-111, Site Preparation Plan.**

*g. HW recommends that the location of temporary and permanent seeding, vegetative controls, and other temporary and final stabilization measures are delineated on the Site Preparation Plan or clarify where this information has been provided.*

**R. As noted in Comment 8.e. above, temporary slope stabilization will be described in specifications to facilitate season-specific applications and allow contractor flexibility.**

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

*The Applicant has provided a Stormwater Operation and Maintenance (O&M) Plan, which includes instructions for maintenance of stormwater control measures, an O&M budget, and an O&M checklist. HW has the following comments regarding the O&M Plan:*

- a. The O&M Plan does not list name(s) and address(es) of responsible parties but notes that the applicant/owner shall designate a supervisor who shall assume responsibility after a CoC has been issued. The Plan also states that the applicant/owner is financially responsible for operation and maintenance, however no name/address is provided.*

**R. The O&M Plan has been revised to clarify that the Applicant/Owner is “ARE – MA Region 93 Holding, LLC, 26 North Euclid Avenue, Pasadena, CA” and that this is the party financially responsible for implementing the O&M Plan.**

- b. HW recommends including an estimated O&M budget within the O&M Plan.*

**R. An estimated budget has been added to the O&M Plan.**

- c. Per Andover Stormwater Regulations Section VI.C.1.b.7, HW recommends including a simple sketch indicating where the stormwater practices to be maintained are located for the entire complex.*

**R. A figure indicating BMPs associated with the project site has been appended and will be retained with the Operation and Maintenance Plan for the Building. The figure will be expanded as the stormwater management systems for the rest of the campus are upgraded.**

- d. HW recommends that the sample log provided reflect the requirements of the Andover Stormwater Regulations, and the submittal is in the form of an annual report to the Planning Board to be issued by September 1, including:*

- i. Descriptions of the condition of the stormwater practices,*
- ii. Descriptions of maintenance performed,*
- iii. Signature of the responsible party,*
- iv. Signature of the Professional Engineer, where applicable and,*
- v. Receipts showing payment for maintenance performed.*

**R. The requirements for the Site Maintenance Log have been revised as noted.**

- e. The Andover Stormwater Regulations require scheduling and construction sequences be included in the Stormwater Narrative. HW recommends that the*

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*Applicant provide more details including a narrative of the construction sequence/phasing of the project, including both operation and maintenance for structural and non-structural measures, interim grading, and material stockpiling areas.*

**R. Notes providing more detail on construction sequencing, operation and maintenance of erosion and sedimentation control BMPs, and stockpiling requirements have been added to sheet C-111, Site Preparation Plan.**

10. *Standard 10 requires an Illicit Discharge Compliance Statement to be provided.*
- a. The Applicant has stated there are no known illicit discharges onsite. HW recommends that the Applicant provide a signed Illicit Discharge Compliance Statement as part of the Report.*

**R. An Illicit Discharge Compliance Statement has been forwarded to the client for signature.**

*Additional Comments per Andover Stormwater Regulations:*

11. *Section IX (Andover Stormwater Regulations - Design Criteria)*
- a. C - Pretreatment: The Applicant must size all pretreatment practices (deep sump catch basins) to accommodate one-years' worth of sediment and debris using the calculation provided in Andover's regulations. HW recommends that the Applicant provide the required calculation.*

**R. The capacity of proposed and existing catch basins to accommodate one-years' worth of sediment has been verified and the calculations are appended.**

12. *Other Comments:*
- a. Pipe calculations – HW recommends that the Applicant providing pipe sizing calculations to confirm that the sizing of the closed drainage pipe system proposed can manage a 25-year storm event.*

**R. Pipe sizing calculations have been completed and appended to this letter. As requested, the pipe system is sized to manage a 25-year storm event, based on data obtained from NOAA Precipitation Frequency Data Server.**

- b. HW recommends that the Applicant address any additional comments provided by the Planning Board or Department of Public works in relation to the project in addition to this letter.*

**R. Statement, no response required.**

Enclosed with this letter is the following documentation:

- Plan Set – issued as “Response to Comments” and dated 04/12/2022
- Hydrology, Hydraulics, and Water Quality Calculations

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- Revised HydroCAD report with porous pavement modeled and stage-storage tables included
- Revised recharge calculations with porous pavement counted as impervious
- Revised water quality unit sizing calculations
- Pipe sizing calculations
- Pretreatment unit sediment loading calculations
- Available geotechnical information, including Soils Suitability Assessments, test boring reports, and test pit logs
- Revised O&M Plan
- Illicit Discharge Compliance Statement

We appreciate your review of this project. If you have any questions, please feel free to contact me at 617-520-9224 or blawlor@smma.com.

Very truly yours,

**SMMA**



Brian Lawlor  
Principal

cc: Mark Johnson  
Ricki Golden, Dante Angelucci, Ivan Kousidis – ARE  
William Park, Daniel Clasby - SMMA

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