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Sustainable Environmental Solutions

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August 30, 2024

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

Ref: Fifth Peer Review of the Stormwater Design
Eden Estates – Definitive Subdivision
9 Bancroft Road, 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 fifth peer review of the Stormwater Management for the proposed residential development for Eden Estates at 9 Bancroft Road in Andover, Massachusetts. We understand that Eden Lane LLC (Applicant) has applied for Approval of Definitive Plan for a three-lot subdivision on a 3.88-acre parcel. The Applicant is proposing to construct a 380-foot-long cul-de-sac, with sewer, water, and stormwater management to access three proposed house lots. To capture, treat, and manage the stormwater runoff from the proposed roadway, the Applicant is proposing to install a closed drainage system, a drainage swale, and a detention facility with a forebay. A subsurface drywell will be installed at each house to manage the proposed roof runoff. No wetlands are indicated on the Existing Conditions Plan.

The following additional documents and plans were received by HW in response to our third and fourth peer review letters, dated August 9, 2024 and reissued on August 23, 2024:

- Letter to Planning Board regarding Response to Peer Review, prepared by DK Engineering, LLC, dated August 28, 2024 (3 pages);
- Eden Estates Project Report on Drainage & Sedimentation Control & Project Stormwater Report; prepared by DK Engineering, LLC, revised August 28, 2024 (36 pages); and
- Illicit Discharge Compliance Statement, Eden Estates (1 page);
- Eden Estates – Offsite Photos (3 pages); and
- Definitive Subdivision Plan, Eden Estates, Andover, Massachusetts, prepared by DK Engineering, LLC, revised through August 28, 2024, which includes:
 - Title Sheet 1 of 8
 - Definitive Subdivision Plan 2 of 8
 - Existing Conditions Plan 3 of 8
 - Grading & Erosion Control Plan 4 of 8
 - Plan & Profile Sheet 5 of 8
 - Detail Sheet – Drainage & Erosion Control 6 of 8
 - Detail Sheet – Miscellaneous 7 of 8
 - Landscape Plan 8 of 8

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 the 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 with our third review letter dated August 9, 2024. Previously addressed comments have been eliminated for simplicity. Follow up comments are provided in ***bold italicized 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. Addressed July 24, 2024.
 - b. Addressed July 24, 2024.
 - c. Addressed July 24, 2024.
2. *Standard 2 requires that stormwater management system shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*
 - a. Addressed August 9, 2024.
 - b. Addressed July 24, 2024.
 - c. In accordance with Section IX.E.2 of the Stormwater Regulations, *the applicant shall account for all run-on and run-off (including off-site impacts) in both pre- and post-development conditions.* It is not clear if there is stormwater flowing onto the site from the southeast (Bancroft School). HW recommends that the Applicant include any off-site areas that may be flowing onto the property from the east.

July 24, 2024: The Applicant has noted that a storm drain was installed along the property line between Lots 59-29A and 59-30. HW was not able to locate this drain and recommends that the Applicant clarify if it is proposed or existing.

August 9, 2024: The Applicant has included a GIS figure that illustrates an 18" pipe on the Bancroft School property that runs parallel to the Eden Estates eastern property line. The figure calls out a drain manhole, DMH-567, and a catch basin, CB-1692. The figure does not clarify that the stormwater that flows to the east of the Eden Estates property is captured in this drainpipe. The existing contours suggest that a portion of the Bancroft School site flows west towards the project site. There appears to be a stone wall along the eastern property boundary. The stonewall may restrict runoff from flowing directly onto the Eden Estates parcel. HW recommends that the Applicant clarify how the runoff from the

Bancroft School property is prevented from flowing onto the Eden Estates property or size the stormwater system to manage the addition surface flow.

August 30, 2024: The Applicant has provided photographs of a swale that runs parallel to the stone wall. No further action requested.

- d. Addressed August 9, 2024.
- e. Addressed July 24, 2024.
- f. Addressed July 24, 2024.
- g. Addressed July 24, 2024.
- h. Addressed July 24, 2024.
- i. The Applicant is proposing to discharge the post-development stormwater runoff to the existing municipal drainage system in Bancroft Street. HW recommends that the Applicant call out the existing pipe size and material and confirm with the Town of Andover Department of Public Works that the municipal system can manage the proposed flow from the project site.

July 24, 2024: The Applicant is proposing to discharge stormwater from the basin via a 12-inch pipe set at a slope of 9.5%. HW recommends that the Applicant reduce the slope if feasible to avoid a 10-foot trench excavation. HW further recommends that prior to approval confirmation from the Department of Public Works is obtained, confirming that the municipal pipe can manage the flow.

August 9, 2024: The proposed invert from the Outlet Control Structure, OS-1 is elevation 280.74. The Rim elevation of the drain manhole in Bancroft Street is 285.0 with an outlet elevation of 275.65. The Applicant is proposing to core into the manhole at elevation 276.05. If the Applicant reduces the slope of the proposed pipe to 1.0% instead of 9.5% the invert at the drain manhole would be elevation 280.22 which would require a 5 foot deep trench excavation instead of a 10 foot deep excavation. HW's previous comment stands.

August 30, 2024: The Applicant has adjusted the slope of the pipe between the Outlet Control Structure and the Drain Manhole in Bancroft Street to reduce the depth of excavation required. No further action requested.

- j. Addressed August 9, 2024.
- k. Addressed July 24, 2024.
- l. HW recommends that the Applicant consider adding individual stormwater systems to manage the roof runoff from each of the proposed houses. The systems could be subsurface chambers or surface rain gardens to reduce the proposed flow to the detention system.

July 24, 2024: The Applicant has provided individual drywells to manage the roof runoff. The drywells consist of crushed stone and are 22 feet long, 15 feet wide, and 3.5 feet deep. A 12-inch perforated pipe is proposed down the center of the crushed stone. HW recommends that the Applicant include two 12-inch pipes set 5 feet on center, instead of one set 7.5 feet on center to more evenly distribute the

roof runoff.

August 9, 2024: The Applicant has adjusted the Typical Roof Infiltration System as suggested. HW notes that the drain line for Lot #1 has been extended beyond the house. HW recommends that the Applicant correct the drafting error.

August 30, 2024: The Applicant has made the suggested plan edit. HW has no further comment.

m. Addressed July 24, 2024.

n. Addressed August 9, 2024.

o. **August 9, 2024: The Applicant has included a GIS figure that illustrates the stormwater infrastructure and the wetland resources in the vicinity of the project site. The figure appears to indicate wetland margins across the Eden Estates parcel. HW recommends that the Applicant clarify whether a wetland scientist has evaluated the site and confirmed the limits of the resource areas.**



August 30, 2024: The Applicant has stated that a wetland scientist has conducted a site visit and found no evidence of wetlands and that Bob Douglas from the Conservation Commission has agreed that no additional filings are required. No further action requested.

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

a. Addressed August 9, 2024.

b. Addressed August 9, 2024.

c. It appears that the proposed stormwater basin with a bottom elevation of 286, has less than 4 feet of separation from the estimated seasonal high ground water of 282.43. HW recommends that the Applicant provide a mounding analysis as required per Volume 2, Chapter 1, page 28 of the MSH.

July 24, 2024: The Applicant has provided a mounding analysis as requested. HW recommends that the Applicant provide documentation clarifying how each of the input values was determined.

August 9, 2024: The Applicant has updated the mounding analysis. As calculated the groundwater within 50 feet from the center of the basin will mound up approximately 2.0 feet. Within 100 feet from the center of the basin groundwater will rise approximately 1 foot. HW recommends that the Applicant confirm the distance of the abutting residential house and determine whether the proposed infiltration basin will impact the groundwater beneath the house.

August 30, 2024: The Applicant has raised the bottom of the basin to elevation 287, four feet above the ESHGW. Considering that the downgradient property is approximately 25 feet from the infiltration basin, an impermeable barrier along the western edge of the basin may be beneficial to eliminate any potential breakout.

- d. **August 9, 2024: The Applicant has added an area drain on the east side of the infiltration basin. It is not obvious what the purpose of this area drain is. The catchment area above the area drain (SC-6) has been included in the HydroCAD model as directly entering the infiltration basin. The installation of 94 feet of 8-inch HDPE pipe may harm the roots of the 20-inch Maple tree located in this area. HW recommends that the Applicant clarify the need for the area drain and drainage pipe and eliminate it if possible.**

August 30, 2024: The Applicant has clarified the purpose of the area drain. The Applicant may want to consider other design options, including adjusting the grades to avoid the low point and the need for the area drain or consider installing a tree well to protect the 20-inch Maple.

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 included the TSS worksheet as required per the MSH. However, the Applicant has included the sediment forebay before the water quality swale when it should be included after the swale. Furthermore, the proposed swale appears to be more of a drainage channel than a water quality swale. HW recommends that the Applicant provide additional details and design criteria for the swale or eliminate it from the TSS worksheet.

July 24, 2024: The Applicant has adjusted the TSS worksheet and provided a detail for the drainage swale. HW notes that the detail appears to be for a stormwater conveyance and not for a water quality swale. Additional information is needed, potential check dams and plantings to contain the stormwater with the intention to slow down the runoff and provide treatment.

August 9, 2024: The Applicant has provided calculations to illustrate that the Grassed Channel has been designed in accordance with the MSH. HW recommends that the Applicant include a pretreatment practice to receive the 50% TSS removal credit.

August 30, 2024: The Applicant has added a pea gravel diaphragm to provide pretreatment for the grassed channel. No further action requested.

- b. The Applicant has included an extended dry detention basin in the TSS worksheet. It is HW's opinion that the proposed basin is designed as an infiltration basin. HW

recommends that the Applicant clarify the intention of the proposed basin and revised the TSS worksheet accordingly.

July 24, 2024: The Applicant has adjusted the TSS worksheet as suggested. HW now questions the ability of the proposed basin to provide infiltration if the groundwater is higher than the bottom of the basin. HW recommends that the Applicant reconsider the design.

August 9, 2024: HW concurs with the TSS worksheet provided once the Applicant adds pretreatment to the Grassed Channel.

August 30, 2024: The Applicant has added the pretreatment as suggested. No further action requested.

- c. Addressed August 9, 2024.
- d. Addressed August 9, 2024.
- 5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*
 - a. 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. Standard 6 is not applicable.
- 7. *Standard 7 is related to projects considered Redevelopment.*
 - a. Standard 7 is not applicable.
- 8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.*
 - a. Addressed July 24, 2024.
 - b. The Applicant has not noted if any trees will be removed or if tree protection is proposed. HW recommends that the Applicant provide this information.

July 24, 2024: The Applicant has included a Tree Removal Exhibit in the Stormwater Report. It is not clear how many trees will be removed though there is a 10-inch Apple tree within the right of way and a second Apple tree along the path of the drainpipe. HW defers to the Planning Board if additional clarification for the total number of trees being removed is required.

- c. Addressed July 24, 2024.
- d. Addressed August 9, 2024.
- e. The proposed project requires land disturbance of greater than 1 acre. Therefore, a Stormwater Pollution Prevention Plan (SWPPP) per the EPA NPDES Construction General Permit will be required. HW recommends that the Applicant provide a copy of the SWPPP to the Town a minimum of 14 days prior to land disturbance. The Planning Board may choose to require receipt of the SWPPP as a condition of approval.

July 24, 2024: As stated previously, the Planning Board may choose to require

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. The Applicant has included a narrative regarding long term maintenance in Section IX of the Project Stormwater Report. HW recommends that the O&M Plan be submitted as a separate standalone document that is signed by the property owner/responsible party.

July 24, 2024: The Planning Board may choose to require receipt of the signed O&M Plan or the Homeowners Association documents as a condition of approval.

- b. Addressed July 24, 2024.
- c. Addressed July 24, 2024.

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

- a. HW recommends that the Applicant submit an Illicit Discharge Compliance Statement signed by the property owner. The Planning Board may choose to require receipt of an Illicit Discharge statement signed by the property owner prior to land disturbance as a condition of approval.

July 24, 2024: The Planning Board may choose to require receipt of the signed Illicit Discharge Compliance Statement as a condition of approval.

11. *Earth Movement Permit*

- a. Addressed August 9, 2024.

Conclusions

HW is satisfied that the Applicant has addressed our comments. We do suggest that additional measures to avoid breakout on the western edge of the infiltration basin as well as measures to protect the 20-inch Maple tree be considered. 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.
Principal