

July 14, 2024

Andover Planning Board
Town Office
36 Bartlett Street
Andover, MA 01810

Attn: Ms. Jacki Byerley, Town Planner,

RE: Response to Initial Peer Review of the Stormwater Design
Eden Estates – Definitive Subdivision @ 9 Bancroft Road, Andover, MA

The Horsley Witten Group, Inc. performed a peer review of the stormwater design for Eden Estates and provided comments to the Board as outlined in their letter dated June 17, 2024. The following responses address each of the comments:

1. STANDARD 1

- a. *The Applicant has compared the pre-development and post-development peak flows and volumes along the western property boundary. Under pre-development conditions stormwater, from subcatchment SC-1, leaves the site at the northwestern corner of the property boundary at Bancroft Road and from subcatchment SC-2, at a low point on the western property boundary approximately 400 feet south of Bancroft Road.*

Response: The drainage areas have been reconfigured and the calculations modified. Please refer to the revised drainage report.

- b. *Under post-development conditions the discharge from the stormwater facility proposed for the project is on the northwestern corner of the parcel discharging towards Bancroft Road. The Applicant has proposed a swale along the western property boundary that directs the stormwater towards Bancroft Road. It is not clear why the Applicant has not evaluated the discharge point that pre-development SC-2 discharges to under proposed conditions. If the Applicant chooses to only discharge at Bancroft Road under proposed conditions the comparison should be between SC-1 and the Post-Dev Total rates. HW recommends that the Applicant separate pre-development SC-1 and SC-2 and evaluate the post-development discharge points at the same two locations on the western property boundary or justify the reasoning for the comparison presented.*

Response: Please see the response to 1.a above.

- c. *There does not appear to be any wetlands within 100 feet of the property boundaries. Therefore, the Applicant will not be causing erosion in a wetland.*

Response: No response necessary.

2. STANDARD 2

- a. *The Applicant has provided a HydroCAD model for the existing and proposed stormwater conditions to determine the peak rates and runoff volumes for the 2-year, 10-year, 25-year, and 100-year storm events. As noted above the Applicant has compared Pre-Dev Total Link 3 to Post-Dev Total Link 8. HW recommends that the Applicant compare the pre- and post-development flow rates and volumes at two separate locations along the western property boundary.*

Response: Please see the response to 1.a above.

- c. *The catchment area that includes the runoff from the existing house is delineated differently under pre-development conditions and post-development conditions. HW recommends that the Applicant clarify why the catchment area that includes the existing house is delineated differently when the surrounding topography has not changed.*

Response: Please see the response to 1.a above.

- d. *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.*

Response: The property to the east is the Bancroft School. A storm drain was installed along the property line between Lots 59-29A and 59-30 that collects the runoff. Additionally, a mound was created near the property line that slopes away from Lot 59-30.

- e. *Curve numbers (CN) per Table 1 for pre-development and post-development conditions should be used in accordance with Section IX.E.4 of the Stormwater Regulations. HW notes that the Applicant's CN values for woods and grass are not consistent with Table HW recommends that the Applicant revise the HydroCAD model accordingly*

Response: The HydroCAD model has been revised as recommended.

- f. *In accordance with Section IX.E.6 of the Stormwater Regulations, 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. The Applicant has utilized precipitation depths based on the Northeast Regional Climate Center (NRCC). The values are similar to Atlas NOAA 14 but are not identical. HW recommends that the Applicant revise the HydroCAD precipitation depths in accordance with the Stormwater Regulations.*

Response: The revised calculations utilize the NOAA Atlas 14 as required.

- g. *HW recommends that the Applicant clarify the time of concentration flow path for subcatchment area SC-5 that includes the roadway.*

Response: A Grass Channel [biofilter swale] has been added along the proposed road that will collect the entire flow from SC-5. The time of concentration has been adjusted accordingly.

- h. *The Applicant has modeled Pond 6: Basin with an exfiltration rate of 0.17 inches per hour (iph). HW has no objection to this rate. The Applicant has also modeled the outlet control structure with a 12-inch orifice at elevation 286.50 and a 15-inch orifice at elevation 287.00. HW recommends that the Applicant include a detail illustrating where the two orifices will be located on the outlet control structure. The discharge pipe from the outlet control structure is set at elevation 280.74, almost 6 feet below the 12-inch orifice. HW recommends that the Applicant adjust the detail to more proportionally illustrate the orifices, the discharge pipe, and the grate.*

Response: The outlet detail has been modified to proportionally illustrate the orifices as recommended.

- i. *The Applicant has included an overflow spillway. HW recommends that the Applicant add the width, elevation, and material proposed for the spillway.*

Response: The detail on sheet 6 has been updated and labeled “Infiltration Basin Overflow Outlet Detail”.

- k. *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.*

Response: The requested information has been added to the plans and the Andover DPW will be contacted to verify that the municipal system can manage the proposed flow from the site.

- l. *The Applicant is proposing a riprap swale. It is not clear how wide or how deep this swale is. HW recommends that the Applicant provide additional information on the detail and draw the swale to scale with spot grades on the grading plan.*

Response: The Typical Rip-Rap Swale Detail has been removed and replaced with the Grass Swale Detail on sheet 6 and the swale has been added to sheet 4.

- m. *The Applicant has included a detail on Sheet 6 for Infiltration Basin #2 Outlet Detail. HW recommends that the Applicant clarify where this outlet is located.*

Response: The detail on sheet 6 has been updated and labeled "Infiltration Basin Overflow Outlet Detail".

- n. *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.*

Response: Individual infiltrations systems have been added to the plans for the three dwellings, a detail has been added to sheet 7 and the calculations added to the drainage report.

- o. *The Applicant has included Summaries for Subcatchment 9 and Pond 11P in the HydroCAD model. It is not clear where this subcatchment or pond are located, and it does not appear that either were included in the routing diagram. HW recommends that the Applicant clarify the purpose of Subcatchment 9 and Pond 11P or delete them from the model.*

Response: These nodes were used in the intermediate calculations and should not have been included in the report.

3. STANDARD 3

- a. *The Applicant has provided recharge calculations in Section V of the Project Stormwater Report. It appears that the Applicant has provide the required volume of recharge in the proposed stormwater basin.*

Response: No response necessary.

- b. *The Applicant has provided a drawdown calculation. However, the K value used of 1.02 iph is not consistent with the exfiltration rate used in the HydroCAD model of 0.17 iph. Furthermore, the recharge volume included in the calculation should be the total volume available (1,590 cf) and not the recharge volume required (645 cf). HW recommends that the Applicant revise the calculation.*

Response: The soil has been identified as sandy loam at the level of infiltration. Per the 1982 Rawls Rates for infiltration, sandy loam has an infiltration rate of 1.02 inches/hour which has been used as the exfiltration rate in the HydroCAD model and in the drawdown calculations.

- 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.*

Response: The mounding analysis has been added to the stormwater report.

5. STANDARD 4

- 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.

Response: The treatment train has been reconfigured and the forebay in question has been removed. Additionally, the grass channel was added. The TSS worksheet and Stormwater Report have been updated and the detail on sheet 6 has been changed.

- 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.*

Response: The extended dry detention basin has been replaced with an infiltration basin and the HydroCAD model and TSS worksheet have been updated.

- c. *In accordance with IX.D.1. (2) of the Stormwater Regulations. A new development is required to retain 1.0 inch multiplied by the total post-construction impervious surface. HW recommends that the Applicant provide this calculation.*

Response: This calculation is presented in the revised stormwater report under the Water Quality Treatment Volume.

- d. *In accordance with IX.D.1. of the Stormwater Regulations the pollutant removal from a new site is required to be 90% of TSS and 60% of Total Phosphorus. HW recommends that the Applicant provide both calculations.*

Response: The average annual pollutant removal requirements for TSS and TP are met through retaining the volume of runoff equivalent to, or greater than (a) "For new developments, one (1.0) inch multiplied by the total post-construction impervious surface area on the new development site." Please see the response to 4.c above.

6. STANDARD 5

- a. *HW notes that a residential development is not considered a land use of higher potential pollutant load. Therefore, Standard 5 is not applicable.*

Response: No response necessary.

7. STANDARD 6

- a. *The site does not discharge to a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply. Therefore, Standard 6 is not applicable.*

Response: No response necessary.

8. STANDARD 7

- a. *The proposed development is considered new development. Therefore Standard 7 is not applicable.*

Response: No response necessary.

10. STANDARD 8

- a. *The Applicant has provided an Erosion Control Plan as part of the Grading Plan, Sheet 4 with details on Sheet 6, as well as a narrative in Section X of the Project Stormwater Report. The details include a Filtrexx Sediment Control barrier, catch basin protection, and a Construction Entrance. HW recommends that the Applicant increase the size of the erosion control barrier to a minimum of 12-inches.*

Response: The detail on sheet 6 has been revised to specify 12-inches as recommended.

- 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.*

Response: Please see the tree removal exhibit. The limit of disturbance will be marked in the field by a licensed surveyor if necessary.

- c. *HW recommends that the Applicant increase the length of the construction entrance to be a minimum of 50 feet and show the location on the grading plan.*

Response: The construction entrance detail on sheet 6 has been modified to shown a 50 foot length and the location has been added to sheet 4 as recommended.

- d. *The Applicant has indicated an erosion control line around the property boundaries. It is not clear if the limit of disturbance needs to extend to the boundaries or can be reduced to protect some of the trees. HW recommends that the Applicant revisit the erosion control barrier location.*

Response: The limits of construction have been added to the grading plan on sheet 4.

- 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.*

Response: No response necessary.

11. STANDARD 9

- 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.*

Response: The O&M Plan will be copied and submitted as a separate document and signed by the property owner.

- b. *HW recommends that the Applicant include a maintenance budget and a log for the long-term operation and maintenance of the stormwater practices within the O&M Plan.*

Response: The maintenance budget and the operation & maintenance log has been added.

- c. *HW recommends that the Applicant include a simple plan that is drawn to scale and shows the location of all stormwater practices to be inspected and maintained.*

Response: A BMP Location Plan has been added.

13. STANDARD 10

- 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.*

Response: No response necessary.

14. EARTH MOVEMENT PERMIT

- a. *The Applicant has provided documentation regarding the soil material and the cut and fill volumes for the earth movement anticipated for the proposed project. The Applicant has included an exhibit in the permit application "Earthwork Quantities Cut/Fill Map" that illustrates the cut and fill depths within the limit of work. HW notes that the proposed swales are not included in the figure, which also calls out the limit of clearing. HW recommends that the Applicant include the excavation required to install the swales on the Cut/Fill map and indicate the limit of clearing on the site plan set.*

Response: The earthwork quantities and the cut/fill map have been updated and presented in the Report to Accompany Application for Special Permit for Earth Movement.

Should you require any additional information or questions concerning the responses, please do not hesitate to contact me at your convenience.

Sincerely,



Daniel Koravos, P.E.

DK Engineering LLC