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June 17, 2024

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

Ref: Initial 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 initial 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. No wetlands are indicated on the Existing Conditions Plan.

The following documents and plans were received by HW:

- Application for Approval of Definitive Plan, dated May 28, 2024 (2 pages);
- Application for Special Permit for Earth Movement, dated May 26, 2024 (27 pages);
- Eden Estates Project Report on Drainage & Sedimentation Control & Project Stormwater Report; prepared by DK Engineering, LLC, dated May 26, 2024 (111 pages); and
- Definitive Subdivision Plan, Eden Estates, Andover, Massachusetts, prepared by DK Engineering, LLC, dated April 2, 2024, which includes:
    - Title Sheet 1 of 7
    - Definitive Subdivision Plan 2 of 7
    - Existing Conditions Plan 3 of 7
    - Grading & Erosion Control Plan 4 of 7
    - Plan & Profile Sheet 5 of 7
    - Detail Sheet – Drainage & Erosion Control 6 of 7
    - Detail Sheet – Miscellaneous 7 of 7

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.

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 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.

    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.

    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.

2. *Standard 2 requires that stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

    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.

b. 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.

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.

d. 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 1. HW recommends that the Applicant revise the HydroCAD model accordingly

e. 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.

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

g. 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.

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

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.

j. 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.

k. 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.

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.

m. 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.

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

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.

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.

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.

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.

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.

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.

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.

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

   a. HW notes that a residential development is not considered a land use of higher potential pollutant load. Therefore, 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 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.

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

   a. The proposed development is considered new development. Therefore 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 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.

   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.

   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.

   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.

   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.

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.

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.

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.

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.

11. 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.

Conclusions

HW recommends that the Planning Board require that the Applicant provide a written response to address these comments as part of the review 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.
Principal