

March 18, 2024

Earth Removal Stormwater Advisory Committee
c/o Ms. Michelle Collette
Stormwater Inspector/ADA Coordinator
173 Main Street
Groton, MA 01450

RE: Nitsch Project #13346.29
797 Boston Road
Stormwater Review
Groton, MA

Dear Committee Members:

Nitsch Engineering (Nitsch) has received and reviewed the following documents:

1. The Stormwater Management Permit Application (7 sheets), dated March 7, 2024, and prepared by Farrel & Robbins, P.C.;
2. The Site Plan (the Plans) entitled "Site Plan for Proposed Age Restricted Housing Development, 797 Boston Road, Groton, MA" (18 Sheets), dated February 16, 2024, and prepared Howard Stein Hudson; and
3. The Supplemental Data Report (Stormwater Report) for the Proposed Age Restricted Housing Development, 797 Boston Road, Groton, Massachusetts (52 sheets), dated February 16, 2024, and prepared Howard Stein Hudson.

Nitsch has reviewed the Plans and Stormwater Report to determine conformance to the following:

1. "Earth Removal Stormwater Advisory Committee" Regulations, Chapter 352, Article II, Stormwater Design Criteria from the Code of the Town of Groton, latest version; and
2. The Massachusetts Stormwater Management Standards.

This letter is limited to the review of the stormwater management system only. Based on our review, Nitsch offers the following comments:

GROTON STORMWATER DESIGN CRITERIA AND THE MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS

1. Section 352-11.C.(3) states the compaction of soils in designated recharge areas must be minimized during and after construction.

Nitsch recommends the proposed Plans include a note or callout to minimize compaction in recharge areas during construction.

2. Section 352-11.C.(14) states a mounding analysis must be performed when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four feet and the recharge system is proposed to attenuate peak discharge from a ten-year or higher twenty-four-hour storm. The mounding analysis must demonstrate that the recharge volume is fully dewatered within 72 hours and that the groundwater mound that forms under the recharge system will not break out above the land or water surface of a wetland. The Hantush or other equivalent method may be used to conduct the mounding analysis.

The Applicant is proposing a Rain Garden as a recharge BMP that attenuates peak discharge from the ten-year and higher twenty-four-hour storms. The Applicant should conduct at least two test pit explorations within the footprint of the Rain Garden to determine the seasonal high groundwater elevation and verify the vertical separation from the bottom of the system to determine whether a mounding analysis is required. The Applicant can also verify soil texture at subgrade to determine if a higher exfiltration rate can be used.

At the proposed Detention Basin, vertical separation from the bottom of the system to seasonal high groundwater is less than four feet. A mounding analysis should be provided for the Detention Basin.

3. Section 352-12.B.(6) states pretreatment devices shall be sized to hold an annual sediment loading based on the provided calculation.

The Applicant should provide calculations to confirm the sediment forebay has been designed to provide a minimum of one year of sediment storage volume.

4. Section 352-13.G. states the Applicant shall use the curve number (CN) values as provided in Table 2 to calculate stormwater runoff rates for pre-/post-construction ground surface conditions.

The Applicant has used some CN values that are different from the values found in Table 2. The CN values used for grass cover assume a "good" condition while this Section requires CN values for grass cover assume a "poor" condition since the post-construction amount of grass cover cannot be predicted or guaranteed (refer to Note 2 under Table 2). Also, the proposed CN value used for woods assumes a "good" condition while this Section requires the proposed CN value for woods assumes a "fair" condition since the soils will be compacted due to the equipment used to remove trees. The Applicant should provide supporting documentation for these CN values and request a waiver from this Section or revise the hydrologic calculations to only utilize CN values from Table 2.

5. Section 352-26.A.(1)(b) states bioretention systems shall include a minimum three-inch thick transition layer of 3/8-inch pea gravel above the stone reservoir and below the soil media.

The Rain Garden should include a three-inch thick layer of 3/8-inch pea gravel between the stone reservoir and filter media.

6. Section 352-26.A.(2) states the soil media shall have a maximum fines content of 5% and shall consist of 20-30% topsoil, 20-30% organic materials (combination of wood chips/mulch and compost), and 50-55% sand.

The Applicant should update the filter media design to comply with this section.

GENERAL COMMENTS

7. A MassDEP stormwater checklist should be provided.
8. The Stormwater Pollution Prevention Plan (SWPPP) should be submitted before construction begins to address pollution prevention measures. Nitsch recommends this requirement be included as a condition of the stormwater management permit.
9. An erosion control barrier should be provided along the north edge of the site to control and manage stormwater runoff into the site from Forge Village Road.
10. The Applicant should consider using NOAA Atlas 14 rainfall precipitation data for the hydrologic analysis.

11. The Applicant should provide backup calculations for the time of concentration for subcatchment S201.
12. The time of concentration path for subcatchment S203 should end at the edge of the Detention Basin.
13. On the Post-Condition Drainage Plan, subcatchment labels S203 and S204 should be swapped. S203 drains to the Detention Basin and S204 drains to the Rain Garden.
14. The water quality volume calculations for the Rain Garden and Sediment Forebay should be updated to reflect the total impervious area within subcatchment S202 (8,062 sf). Provide stage storage tables for both BMPs so provided water quality volumes can be confirmed.
15. The Plans indicate runoff from impervious surfaces, including the north driveway and parking lot, drain via surface flow to the porous pavement system. Volume 1, Chapter 1 and Volume 2, Chapter 2 of the MassDEP Stormwater Handbook states that porous paving must not receive stormwater runoff from other drainage areas (run-on).
16. The porous pavement does not provide adequate water quality volume based on the contributing impervious area. A weighted water quality volume for the entire site is not allowed. Each BMP must provide the minimum water quality volume required based on its contributing impervious area.
17. The Plans should provide detailed grading information for the proposed swale which includes horizontal and vertical dimensions and slopes to confirm there is enough capacity to prevent overflow to the abutting properties during all storm events. Modeling of the swale in HydroCAD is recommended.
18. The Plans should include design information for the Yard Drains, including rim and invert elevations along with the size and material for the connecting pipes. The Plans show the drain pipes from the Yard Drains terminating at the parking lot curb. The Plans should be updated to show how the Yard Drain pipes connect to the site drainage system.
19. At least one test pit should be conducted within the footprint of the proposed Detention Basin to confirm the soil texture and estimated seasonal high groundwater elevation are consistent with nearby test pits TP-102 and TP-103.
20. A minimum of one foot of freeboard is recommended for the proposed Detention Basin.
21. The Plans should include spot grades at the north driveway to verify the delineation of subcatchment S202 and confirm runoff from Forge Village Road will not enter the site via the driveway.
22. The roof leader pipes terminate at the parking lot curb. The Plans should be updated to show how the roof leader pipes connect to the site drainage system. The Plans should also include sizes for the roof leader pipes.
23. The Plans should include sizing information for the stone apron at the outlet to the Detention Basin, including dimensions for the stone apron and the D50 stone size.
24. The Operation and Maintenance Plan should include the Detention Basin, Sediment Forebay, and swale
25. A closed drainage system analysis should be provided to confirm pipes are sized appropriately.

RECOMMENDATIONS

The Plans and supporting documents appear to conform to the Code, except as noted. The Applicant should revise and resubmit the applicable documents for review.

If the Earth Removal Stormwater Advisory Committee has any questions, please let us know.

Very truly yours,

Nitsch Engineering, Inc.



Rones Lubin
Project Designer

Approved by:



Jared E. Gentilucci, PE, CPESC, LEED AP BD+C
Deputy Director of Civil Engineering

RL/jeg