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May 31, 2023

Groton Zoning Board of Appeals
c/o Mr. Takashi Tada
Land Use Director/Town Planner
173 Main Street
Groton, MA 01450

RE: Nitsch Project #13346.25
Groton Farms
Stormwater Review
Groton, MA

Dear Zoning Board of Appeals Members:

Nitsch Engineering has received and reviewed the following documents:

1. The Comprehensive Permit Plans (the Plans) entitled "Proposed Comprehensive Permit Plan Set, 500 Main Street, Groton, MA" (11 sheets), dated February 9, 2023, and prepared by Dillis & Roy Civil Design Group;
2. The Pre-Developed Watershed Plan, 500 Main Street, Groton, Massachusetts, dated February 9, 2023, and prepared by Dillis & Roy Civil Design Group;
3. The Post-Developed Watershed Plan, 500 Main Street, Groton, Massachusetts, dated February 9, 2023, and prepared by Dillis & Roy Civil Design Group; and
4. The Stormwater Report for Groton Farms, 500 Main Street, Groton, Massachusetts (199 sheets), dated February 9, 2023, and prepared by Dillis & Roy Civil Design Group.

Nitsch Engineering has reviewed the Plans and 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 Engineering offers the following comments:

GROTON STORMWATER DESIGN CRITERIA AND THE MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS

1. Section 352-11.C.(5) states that to qualify as a treatment BMP, a recharge system must discharge to soils with infiltration rates less than or equal to 2.4 inches per hour when used as a treatment BMP.

   The Applicant is proposing to utilize recharge systems as treatment BMPs in soils with an infiltration rate greater than 2.4 inches per hour. The Applicant should revise the Plans to comply with this Section or request a waiver from the Zoning Board of Appeals. Nitsch Engineering would take no exceptions to this waiver request as the design currently meets the requirements of the Massachusetts Stormwater Management Standards.

2. Section 352-11.C.(7) states that at least 80% of the TSS must be removed prior to discharge to an infiltration structure used for recharge if the discharge is within an area with a rapid infiltration rate greater than 2.4 inches per hour.

The Applicant is proposing to utilize recharge systems in an area with a rapid infiltration rate greater than 2.4 inches per hour. Less than 80% TSS removal has been provided for runoff discharging to these recharge systems. The Applicant should revise the Plans to comply with this Section or request a waiver from the Zoning Board of Appeals. Nitsch Engineering would take no exceptions to this waiver request as the design currently meets the requirements of the Massachusetts Stormwater Management Standards.

3. Section 352-11.C.(14) states that 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 did not provide a mounding analysis for Infiltration Basins #1 and #2 which have less than four feet of separation to estimated seasonal high groundwater (ESHGW). A mounding analysis for these basins should be provided.

4. Section 352-13.G. states that 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). 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 352-24.D.(1) states that all drain pipes shall be at least 12 inches inside diameter and made of reinforced concrete conforming to Massachusetts Department of Transportation specifications for Class III pipe or such higher class as may be required by the depth of cover, which shall be not less than 36 inches where the pipe is subject to vehicular loads.

   The Plans indicate pipe material to be High Density Polyethylene (HDPE). The Applicant should revise the Plans to comply with this Section or request a waiver from the Zoning Board of Appeals. Nitsch Engineering would take no exceptions to this waiver request as HDPE is a common drain pipe material.

GENERAL COMMENTS

6. On the Stormwater Checklist, the Project Type should be Redevelopment.

7. On the Stormwater Checklist, Standard 3 indicates that runoff from all impervious areas at the site discharges to the infiltration BMPs. Based on the Plans and recharge calculations this box should be unchecked.

8. On the Stormwater Checklist, both boxes should be checked off under Standard 6.

9. A minimum of one foot of freeboard is recommended for all proposed basins. Infiltration Basin #1 and the Wet Basin have been provided with less than one foot of freeboard.

10. The Stormwater Report Checklist notes that the Stormwater Pollution Prevention Plan (SWPPP) will be submitted before land disturbance begins. Nitsch Engineering recommends this requirement be included as a condition of the Comprehensive Permit.

11. The Plans should be revised to include the complete grading design for all sediment forebays, including their overflow elevation into the adjacent infiltration basin, so the provided sediment forebay volumes can be confirmed.

12. Separate sizing calculations should be provided for each sediment forebay draining into Infiltration Basin #1.

13. A sizing calculation should be provided for the sediment forebay at the Wet Basin.

14. The surface areas for the Infiltration Basins, including the bottom surface areas, should be for the basins only and should not include the sediment forebays. The stormwater calculations should be updated to exclude the sediment forebay areas/volumes from the infiltration basin areas/volumes.

15. Some drain pipe slopes are less than 0.5%. To ensure proper constructability, we recommend all drain pipe slopes be a minimum of 0.5%.

16. Since the Wet Basin will have a permanent pool of water, the Applicant should consider providing a fence around the Wet Basin for safety reasons.

RECOMMENDATIONS

Nitsch Engineering recommends that the items noted above be addressed by the Applicant prior to the Zoning Board of Appeals granting approval of the Comprehensive Permit Plans.

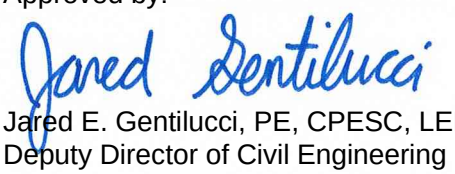
If the Zoning Board of Appeals has any questions, please let us know.

Very truly yours,

Nitsch Engineering, Inc.

Alexander Cruz
Project Designer

Approved by:



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

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