Nitsch Engineering

370 Main Street, Suite 850
Worcester, MA 01608
T: 508-365-1030

www.nitscheng.com

March 20, 2024

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

RE: Nitsch Project #13346.27
Heritage Landing
Stormwater Review
Groton, MA

Dear Zoning Board of Appeals Members:

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

1. The Comprehensive Permit Plans (the Plans) entitled "Comprehensive Permit Plan Set, Heritage Landing, Cow Pond Brook Road, Groton, MA" (5 sheets), dated April 25, 2023, revised January 30, 2024, and prepared by Meisner Brem Corporation; and
2. Heritage Landing Preliminary Stormwater Management Report (the Report), dated January 30, 2024, and prepared by Meisner Brem Corporation.

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, latest version.

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.(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.(5) states 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 an infiltration basin as a treatment BMP in soils with an infiltration rate greater than 2.4 inches per hour (8.27 inches per hour). The Applicant should revise the Plans to comply with this Section or request a waiver from the Zoning Board of Appeals.

3. Section 352-11.C.(7) states 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 an infiltration basin 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 the infiltration basin. The Applicant should revise the Plans to comply with this Section or request a waiver from the Zoning Board of Appeals.

4. Section 352-11.C.(13) states all units/devices shall be designed to drain within 72 hours from the end of the storm

   The Applicant should provide 72-hour drawdown calculations to confirm the infiltration basin will drain adequately.

5. 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 an infiltration basin 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 Infiltration Basin 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 should also verify soil texture at subgrade to determine if the proposed exfiltration rate is appropriate.

6. Section 352-11.C.(15) states recharge shall not be concentrated to one area. It shall be distributed to multiple areas throughout the site.

   Runoff for most of the site is directed to a single infiltration basin. The Applicant should revise the Plans to comply with this Section or request a waiver from the Zoning Board of Appeals.

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

   The Applicant should provide calculations to confirm pretreatment structures have been designed to provide a minimum of one year of sediment storage volume.

8. Section 352-13.D. states for each design storm, the Applicant shall account for all run-on and run-off (including off-site impacts) in both pre- and post-development conditions.

   Based on the existing topography, some off-site areas to the north drain into the site and will flow to the infiltration basin in the proposed condition. The hydrologic model should be updated to account for all areas draining to the infiltration basin.

9. 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 (refer to Note 3 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.

10. 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 12-18 inch 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.

GENERAL COMMENTS

11. The Applicant has indicated the Stormwater Pollution Prevention Plan (SWPPP), Operation and Maintenance Plan, Long-Term Pollution Prevention Plan, and the Illicit Discharge Statement will be submitted as part of the final Stormwater Management Report. Nitsch recommends this requirement be included as a condition of the Comprehensive Permit.

12. The Applicant should consider using NOAA Atlas 14 rainfall precipitation date for the hydrologic analysis.

13. A sizing calculation should be provided for the sediment forebay draining into the proposed Infiltration Basin. The Plans should also be revised to include the complete grading design for the sediment forebay to confirm the provided volume.

14. The water quality volume calculation for the infiltration basin should be updated to reflect the total impervious area within Subcatchments 100 and 150 (total of 86,684 sf).

15. Soil analysis information including soil maps and test pit data should be included as indicated in the Stormwater Checklist under Standard 3.

16. The Report notes that a majority of the site (Subcatchment 100) will drain to the infiltration basin via overland flow and swales to be constructed around the perimeter of the development. The Plans should be updated to include the design of these swales.

17. A closed drainage system analysis should be provided to confirm pipes are sized appropriately.

18. As noted in the Comprehensive Permit review letters, the Plans should be updated to identify the minimum provisions necessary for erosion and sediment controls during construction.

RECOMMENDATIONS

Nitsch is generally comfortable with the preliminary design of the stormwater management system for the project. Based on the preliminary design, the project appears to comply with the MassDEP Stormwater Management Standards. The preliminary design does not comply with several local regulations, and the Applicant will need to address these items through design revisions or waiver requests. We will provide a separate letter to the Zoning Board of Appeals with recommendations for conditions to be included in the final decision.

If the Zoning Board of Appeals 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

P:\10000-14999\13346.27 Heritage Landing\Civil\Project Data\Stormwater Review\13346.27-LT-RV-SW-2023-03-20.docx