

September 17, 2024

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

RE: Nitsch Project #13346.33
Gratuity Brook Farm Estates
Stormwater Review
Groton, MA

Dear Committee Members:

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

1. Stormwater Management Permit Application (8 pages), dated August 15, 2024, and prepared by Farrel & Robbins, P.C.;
2. Definitive Subdivision Plans (the Plans) entitled "Gratuity Brook Farm Estates, Definitive Subdivision, 63 Gratuity Road, Groton, MA" (31 sheets), dated August 12, 2024, and prepared by LandTech Consultants;
3. Stormwater Management Report for the Gratuity Brook Farm Estates Definitive Subdivision at 63 Gratuity Road, Groton, MA (194 pages), dated July 3, 2024, and prepared by LandTech Consultants;
4. Supplemental Data & Environmental Impact Report (43 pages), dated August 1, 2024, and prepared by LandTech Consultants; and
5. Operation & Maintenance Manual and Long-Term Pollution Prevention Plan (13 pages), dated August 12, 2024, and prepared by LandTech Consultants.

Nitsch has reviewed the Plans and supporting documents 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.(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 infiltration basins as treatment BMPs in soils with an infiltration rate of 8.27 inches per hour. The Applicant should revise the Plans to comply with this Section.

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 infiltration basins 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 basins. The Applicant should revise the Plans to comply with this Section.

4. 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 infiltration basins as recharge BMPs that attenuate peak discharge from the ten-year and higher twenty-four-hour storms and have less than four feet of separation to estimated seasonal high groundwater (ESHW). The Applicant should provide a mounding analysis for all infiltration basins.

Infiltration Basins #1 and #5 do not have at least two feet of separation to ESHGW as required by Stormwater Management Standard #3. The Applicant should revise the Plans to comply with this Standard.

5. Section 352-12.B.(6) states pretreatment devices shall be sized to hold an annual sediment loading. The annual sediment load shall be calculated using a sand application rate of 500 pounds/acre for sanding of roadways, parking areas and access drives within the subcatchment area, a sand density of 90 pounds per cubic foot and assuming a minimum frequency of 10 sandings per year.

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

6. 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 revise the hydrologic calculations to only utilize CN values from Table 2.

GENERAL COMMENTS

7. 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.
8. The Applicant should sign and date the illicit discharge statement.
9. Since the Applicant is using NOAA Atlas 14 rainfall depths, their hydrologic model should use the NOAA 24-hour Storm Type and Storm Curve D.

10. The time of concentration flow paths are the same for subcatchments EX-1A and PR-1A as shown on the pre- and post-development maps. However, the time of concentration value is higher in the post-development condition due to differences in the length and slope values for each segment. The time of concentration calculations should be updated so they match. This condition also applies to subcatchments EX-1B and PR-1B.
11. ESHGW is shallow throughout the site. The Applicant should consider providing waterproofing and footing drains around the building foundations if they intend to provide basements.
12. One test pit was conducted at five of the proposed infiltration basins and no test pit was conducted within Infiltration Basin #2. Nitsch recommends at least two test pits be conducted at all infiltration basins to confirm soil texture and ESHGW elevations.
13. Based on the HydroCAD report, a drip edge is proposed around each building to capture and infiltrate roof runoff. The Plans should be updated to show the drip edges, and a detail should be provided.
14. At each infiltration basin, the overflow weir elevation should correspond to the bottom of the stone layer at the spillway (top of berm under stone). Otherwise, water will overflow 16 inches below the intended and modeled outlet elevation.
15. Infiltration Basin #4 is modeled with an overflow weir, but it is not shown on the Plans. The Plans should be updated to include this overflow weir.
16. Sediment Forebay #6 needs to be adjusted to provide the minimum required pretreatment volume.

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