



August 31, 2022

Patrick Reffett, Director
Planning and Inspectional Services
Town of Hamilton
577 Bay Road
Hamilton, MA 01936

**RE: STORMWATER / SEPTIC SYSTEM PEER REVIEW
Asbury Commons
421 Asbury Street
Hamilton, MA**

Headquarters
115 GLASTONBURY BLVD
GLASTONBURY CT 06033
860.659.1416

10 CABOT ROAD
SUITE 101B
MEDFORD MA 02155
617.776.3350

6 CHESTNUT ST
SUITE 110
AMESBURY MA 01913
978.388.2157

197 LOUDON RD
SUITE 310
CONCORD NH 03301
603.856.7854

200 MAIN ST
PAWTUCKET RI 02860
401.726.4084

Dear Mr. Reffett:

GM2 Associates, Inc. (GM2), is pleased to provide this preliminary stormwater and septic system peer review of the submitted site plan documents associated with the proposed 45-Unit Multi-Family Residential use property located at 421 Asbury Street, Hamilton, MA. The project has been submitted to the Town of Hamilton for consideration of a 40B Comprehensive Permit.

The following documents, specific to stormwater and septic design, have been reviewed:

1. Summary Letter to the Planning Commission, dated August 30, 2021, prepared by ASB Design Group.
2. "Stormwater Management Report," dated February 18, 2022, prepared by Hancock Associates.
3. "Preliminary Site Plan," dated February 22, 2022, prepared by Hancock Associates.

This review is comprehensive in terms of material submitted. The proposed stormwater management has been reviewed relative to the Massachusetts Stormwater Handbook (the Handbook) and the Town of Hamilton Stormwater Management Permit Rules & Regulations, dated November 9, 2021. The proposed septic design has been reviewed relative to 310CMR 15.00 (Title 5).

PART 1 - STORMWATER MANAGEMENT REVIEW

MASSACHUSETTS STORMWATER HANDBOOK

The project is assumed to be a new development and is subject to full compliance with the standards defined in the MassDEP Stormwater Handbook ("The Handbook")

General Review comments

Although the drainage design is preliminary, we do not see issue with overall design approach with the drainage system able to function by gravity with no surcharging or flooding over catch basin rim elevations during the most extreme 100-year storm event.

The design far exceeds the groundwater recharge requirements which is beneficial where the project is located within a groundwater protection area.

Standard 1 – No Untreated Discharges or Erosion

"No new untreated conveyances or direct discharge to wetlands are proposed; all points of discharge mirror existing discharge patterns. See computations completed in Standards 4 & 6 that demonstrate proper treatment of suspended solids and required water quality volume."

The Applicant has submitted a Plan and a Stormwater Management Report that illustrate how site-generated stormwater is collected and treated prior to being discharged onsite, maintaining existing discharge patterns.

Standard 2 – Peak Rate Attenuation

"As detailed in the Stormwater Methodology and Introduction and summarized in the preceding table, there will be no increase in peak runoff rate for the 2, 10, or 100-year frequency events as compared to existing conditions. HydroCAD worksheets are attached herewith."

The calculations document the provided design exceeds this requirement, also reducing the volume of stormwater flow of the site which is not a requirement of Standard 2.

Pre-development Subcatchment Plan

The flow path for subcatchment 20s appears to run uphill at the end of its path. Applicant should revise flow path and t_c calculation.

The proposed infiltration basin (Pond 200P) is modeled using a 2.41in/hr infiltration rate. While this rate is consistent with Rawl Rates for Loamy Sand, the provided percolation test result for TP-8/P-8 is 49 minutes per inch. Percolation tests are not allowed for use in designing stormwater infiltration BMPs, but the results indicate that the actual infiltration capacity in that location may be less than 2.41in/hr. GM2 recommends the Engineer revises their model of Pond 200P using a more conservative infiltration rate. We do not foresee the change in exfiltration rate impacting the rate in flow that would increase the flow to design point 200R to a point where it would not meet Standard 2.

Post-development Subcatchment Plan

Flow paths are not shown on the Post-development Subcatchment Plan.

HydroCAD Report

The proposed infiltration basin (Pond 200P) is modeled using a 2.41in/hr infiltration rate. While this rate is consistent with Rawls Rates for Loamy Sand, the provided percolation test result for TP-8/P-8 is 49 minutes per inch. Percolation tests are not allowed for use in designing stormwater infiltration BMPs, but the results indicate that the actual infiltration capacity in that location may be less than 2.41in/hr. GM2 recommends the Engineer revises their model of Pond 200P using a more conservative infiltration rate. We do not foresee the change in exfiltration rate impacting the rate in flow that would increase the flow to design point 200R to a point where it would not meet Standard 2.

Standard 3 – Recharge

(The report does not provide a recharge narrative but includes calculations illustrating how the standard is met.)

The calculations demonstrate and document that the recharge volume provided far exceeds the required recharge volume.

The proposed underground infiltration system (Pond 300P) is reported to be sited 2 feet above estimated seasonal high groundwater, however, there are no test pits shown within the limit of the system. The Handbook requires soil evaluations to be performed at the “specific location where recharge is proposed.” Considering the minimum groundwater separation is being held, additional test pits may be appropriate to verify the system meets the 2-foot groundwater separation requirement. Also, where the design is held at the 2-foot required separation we recommend a groundwater mounding analysis be provided.

Standard 4 – Water Quality

(The report does not include a water quality narrative but includes calculations illustrating how the standard is met.)

The calculations demonstrate that the water quality requirements have been met. The Engineer attributes the Contech VortSentry Unit with providing 80% TSS removal. Supporting documentation should be submitted to support this claim. The efficiency of third-party water quality units often varies based on the reporting sources. Since the dissolution of the MassSTEP program, which provided independent testing of third-party water quality units, application reviewers and approving authorities must often rely solely on data from the manufacturers themselves. This data is often anecdotal and may not reflect the removal rate that will be provided by being used in this project.

However, the required pretreatment TSS removal rate, prior to infiltration, is 44% and is achieved using deep sump and hooded catch basins (25% TSS Removal) and crediting the Contech VortSentry Unit with as little as 25%. Combined with infiltration of the required water quality volume, the treatment train for each of the two BMPs provides 88.8% TSS removal. This exceeds the 80% TSS removal rate required by Standard 4.

Standard 5 – Land Uses with Higher Potential Pollutant Loads

“The proposed development does not qualify as a Land Use with Higher Potential Pollutant Loads (LUHPPL). The proposed development meets this standard.”

GM2 agrees that this development is not a Land Use with Higher Potential Pollutant Loads.

Standard 6 – Critical Areas

“The project does discharge to or near a critical area, source Controls and pollution prevention measures for the construction period are highlighted and discussed in Standard 8 of this report. Long-term Pollution prevention methods are discussed in Standard 9 portion of this report.”

The project discharges stormwater to a Zone II Wellhead Protection Area. For clarity, the Engineer should specify the critical area to which the project discharges and state the requirements related to that critical area.

Discharging to a Zone II requires 44% pretreatment prior to discharging to the infiltration BMP and requires 1-inch of runoff from impervious areas be used in calculating the Water Quality Volume (Standard 4). Both of these requirements are met in the design.

Standard 7 – Redevelopments Subject to the Standards only to the Maximum Extent Practicable

“The proposed project is not a redevelopment and shall comply with all other requirements of the Stormwater Management Standards to the maximum extent practicable.”

Non-redevelopment projects are fully subject to all standards, not to the extent practicable. The Engineer should re-write their response for clarity.

Standard 8: Construction Period Pollution Prevention and Erosion & Sedimentation Controls

The Engineer has submitted an Erosion & Sediment Controls plan that is consistent with the Handbook. A more thorough NPDES Stormwater Pollution Prevention Plan is required prior to construction.

Standard 9: Operation & Maintenance Plan

The cleaning schedule provided for the StormTech MC-4500 Chambers references the Isolator Row sediment depths. The Isolator Row is a different StormTech product that provides pre-treatment; therefore, it is expected to see sediment build up in that product. The MC-4500 Chambers should be receiving pre-treated water for the purpose of exfiltrating it back into the groundwater table. StormTech does not provide a threshold for sediment depths in infiltration chambers at which cleaning is recommended because the chambers are designed to be used with the Isolator Row. The Engineer should incorporate inspection ports into the underground infiltration system design and provide a threshold for which cleaning is recommended as well as direction on how the system should be cleaned.

Standard 10: Illicit Discharges to Drainage System

“Measures to prevent illicit discharges are included in Standard 4 & 8 of this report. It is the responsibility of the owner post construction to uphold this standard. A no illicit discharges statement has not been attached but will be submitted by the owner prior to discharge of stormwater to post construction BMPs.”

As noted, the Owner shall submit a “no illicit discharges statement” prior discharge of stormwater to post construction BMPs.

TOWN OF HAMILTON STORMWATER MANAGEMENT PERMIT RULES & REGULATIONS

The submitted documents do not address the local regulations. While it does appear that the local, more stringent regulations are met, the Engineer should address each standard and document compliance.

ADDITIONAL STORMWATER COMMENTS

Siting of infiltration basin limits development potential on abutting property, as the Handbook states that a private well should be 100ft from an infiltration basin. Additionally, the overflow for the infiltration basin is designed to discharge to the abutting property to the west. GM2 recommends that the overflow be redirected away from the abutting property.

PART 2 – SEPTIC SYSTEM DESIGN

The applicant has yet to provide a detailed design for the septic system at the time of this review. The review is based upon the provided preliminary site plan and submitted documents. Upon completion of test pits and submission of the septic system design a detailed review can be provided at that time.

General Comments:

The system design will need to accommodate 90 bedrooms with a design flow of 9,990 gallons per day as based upon 110 gallons per bedroom per day as dictated in 310 CMR 15.203. Given this is a large system, two tanks in series are required in accordance with 310 CMR 15.223. The primary system will tank will need a volume of 200% of the daily flow or a 20,000-gallon tank and a 10,000-gallon secondary tank. The system will require a pump chamber to pressure dose the soil absorption system (leaching field). The sizing of this tank will be determined in the detailed design but will require a minimum of 24-hour emergency storage if no back up power is provided. This tank will most likely be between 15,000 and 18,000 gallons. The soil absorption system will need to be pressure dosed and sized according to 310 CMR 15.242. There are no test pits completed within the perimeter of the primary or reserve areas. Currently the field is sized based upon a Class I sand material with the highest effluent lasting rate of 0.74 gpd/sq.ft.

Plan Review Comments:

- The Primary Septic Tank scales to be 10 ft. long by 5 ft. wide. A 20,000-gallon tank is approximately 40 ft long by 11 ft wide, much larger than shown on the plan. It should be noted there is ample area to accommodate this large tank.
- The Secondary Tank Scales to be 10 ft. long by 5 ft. wide. A 10,000-gallon tank is approximately 17 ft. long by 10 ft wide, much larger than shown on the plan. It should be noted there is ample area to accommodate this large tank.
- The Pump Chamber also scales 10 ft.by 5 ft. A 15,000-gallon tank is approximately 30 ft. long by 11 ft wide, much larger than shown on the plan. It should be noted there is ample area to accommodate this large tank.
- The leaching field provided is 13,500 sf (75 ft by 180 ft) with a reserve area of the same size. This is sized to accommodate a flow of 9,990 gallons per day. Per 310 CMR 15.252 the maximum flow for each leach field is 5,000 gallon per day. This would require two separate leach fields for the primary and reserve soil absorption systems. 310 CMR 15.252 (2) (f) also requires ten feet of separation between all adjacent leach beds. Providing the required separation between primary and reserve leaching beds will add 10 feet to the length and width of the overall area shown on the plan. The additional area may require the proposed property line shown around the soil absorption system to be changed. Additionally, the system is designed based upon a loading rate of 0.74 gpd which will require a percolation rate of less than 5 minutes per inch and a Class I soil. There are three test pits within 30 feet from the proposed system. While the material in test pit TP-2 indicated sand material consistent with a percolation rate of less than 5 minutes per inch the soil material in test pits T-4 and T-12 indicated loamy sand material which could render a slower percolation rate that would increase the size of the leaching field. We recommend the applicant complete test pits required for the system design prior to finalizing the restricted land area provided for the soil absorption system.

Watershed Protection Zone II Design Considerations:

The site is in a Zone II aquifer protection zone with the septic system design regulated by 310 CMR 15.215 Designation of Nitrogen Sensitive Areas. As such the maximum daily flow is limited by the land area, with a daily flow limited to 440 gallons per day per acre. There are options for increasing the allowable flow in the zone that include providing a system design with enhanced nitrogen removal per 310 CMR 15.217 limiting the nitrogen in the effluent distributed to the leaching field to 110 ppm which would then be subject to 314 CMR 5.00 Ground Water Discharge Permit Program.

The other option, and this project approach, is to set aside adjacent land with a deed restriction limiting any future development requiring installation of septic systems and certain land uses. The applicant is currently working with the Hamilton Health Department on this approach. The total project site including the proposed extension of lot for the soil absorption system is 4.89 Acres. This would require 17.61 acres of adjacent land to be set aside in the restricted easement area. Based upon Exhibit F & G the "Grant of Title V Nitrogen Loading and Easement on Nitrogen Credit Land," 19 Acres of land is provided satisfying the aggregate nitrogen loading requirements.

Letter P. Reffett, 08/31/2022

This concludes our review of the stormwater and septic-related materials submitted to date for this project. If you should have any questions regarding the review, please feel free to contact me at 617-776-3350.

Sincerely,

GM2 ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read "Eric D. Carlson". The signature is stylized and fluid, with a large initial "E" and "C".

Eric D. Carlson, PE
Chief Engineer, MA

