

April 9, 2024

Cathy Melanson, Chair  
Planning Board  
Town of Fairhaven  
Town Hall  
40 Center Street  
Fairhaven, MA 02719

RE: Map 30A – Lots 87 and 87A, Bridge Street  
2<sup>nd</sup> Peer Review - Site Plan Stormwater

Dear Ms. Melanson:

GCG Associates, Inc. has reviewed the following information for the Site Plan for Map 30A – Lots 87 and 87A, Bridge Street in Fairhaven, MA with respect to Chapter 198 - Zoning, Chapter 194 - Stormwater Management, and Stormwater related requirements under 310 CMR 10.00 Wetlands Protection Act Regulations.

Plan References: “Site Plan, Map 30A Lots 87 & 87A, Bridge Street, Fairhaven, Massachusetts, prepared by Zenith Consulting Engineers, LLC. (ZCE), dated July 24, 2023, last revised March 14, 2024, consists of:

1. C – Cover Sheet
2. X – Existing Conditions Plan
3. L – Layout Plan
4. G – Grading and Drainage Plan
5. U – Utility Plan
6. V – Landscape Plan
7. E1 – Erosion Control Plan
8. E2 – Erosion Control Plan
9. D1 – Site Details
10. D2 – Site Details
11. D3 – Site Details

Documents: Stormwater Management Report, Commercial Development, Map 30A – Lots 87 and 87A Bridge Street, Fairhaven, Massachusetts, prepared by ZCE, dated July 24, 2023, last revised March 14, 2024.

Response Letter prepared by ZCE, dated March 14, 2024

Based upon our review of the above information, we offer the following general comments and comments with respect to compliance with Town Bylaws: 194 - Stormwater Management; 198-31.1 – Zoning - Stormwater Management and 310 CMR 10.00 Wetlands Protection required Stormwater Management standards per (Massachusetts Stormwater Handbook, MSH). The numerical section of the regulations is referenced at the beginning of each comment unless it is a general comment. GCG latest comments shown in 'Blue'.

## **GENERAL PLAN AND DEVELOPMENT COMMENTS**

The following are general comments with respect to the plans and development of the project.

1. This project's proposed work limit exceeded the one-acre threshold. Therefore, a NPDES (National Pollutant Discharge Elimination System), CGP (Construction General Permit) Notice of Intend should be filed with the US EPA at least 14 days prior to the start of construction, and with the associated SWPPP (Stormwater Pollution Prevention Plan) should be prepared and available on-site. [Statement](#).
2. The projects proposed land-disturbance exceeded the 40,000 square feet threshold and required a Soil Erosion and Sediment Control Permit under Chapter 194. However, this project with the Planning Board and/or the Conservation Commission approval, should qualify as an exempt project following the procedures under Chapter 194-4. A (3). [Statement](#).
3. Map 30A – Lot 86B (277 Bridge Street) is an existing commercial development consisting of a gas station/convenience store and associated parking lots, which share the existing common driveway on Lot 87A with a detention basin built on Lot 87. The gas station development was built in the year 2019. There is no work proposed on Lot 86B under this application. However, the existing detention basin would be expanded to accommodate this new development. [Resolved](#).

## **PLAN SET**

Drawing Sheet – 2 – X. Existing Conditions Plan.

1. Based on Google Maps' (May 2023) aerial image, the existing detention basin appears to have a riprap stone weir/check dam to form the sediment forebay cell, and the lower portion of the detention basin appeared to have a lower stage sump in front of the outlet control structure. In addition, according to the Lot 86B (277 Bridge Street) site plan approval, the existing forebay has a membrane liner on the base and extending up the sides to provide a containment volume of approximately 22,000 gallons, which should be maintained or modified as necessary to handle the additional new development flow. The HydroCAD pre-development calculations used an existing basin's storage volume at elevation 31.65 with surface area approximately 354 square feet, which should be shown on the plan. [Resolved](#).
2. The existing outlet structure's 4-inch orifice was designed with a spill isolation electric gate valve with activation control in the convenience store, which should be called detailed on the plan and identified to remain. The underground electrical wiring/conduit should be located on the plan and projected during construction. [Resolved](#)
3. The existing detention basin collects the stormwater surface runoff from Lot 86B – a gas station uses, which is classified as LUHPPL (Land Uses with Higher Potential Pollutant Loads) per MSH Standard 5. The water quality units with catch basin inlet grate,

forebay's membrane liner and electric outlet control gate valve are the critical components for the LUHPPL stormwater treatment system and should be called out on the plan. [Resolved](#).

#### Drawing Sheet – 4 – C. Grading and Drainage Plan.

4. 198-31.1.C.(2)(g)[6] – All basins/ponds designed for stormwater runoff control should have side slopes at a no steeper than a four horizontal to one vertical grade (4H:1V) unless otherwise allowed by the Fairhaven Conservation Commission. The proposed side slopes (forebay and basin) are at three horizontal to one vertical slope (3H:1V). [Waiver has been requested, the proposed 3H:1V side slope meets the MSH requirements and should not cause any adverse impact to the basin.](#)
5. 198-31.1.C.(2)(k)[1][a] – Sediment Forebay (Forebay) should consist of a separate cell. The existing forebay riprap weir/berm with the membrane liner should remain or be modified to handle the additional flow from this new development. [Resolved](#).
6. 198-31.1.C.(2)(k)[1][b] – Forebay should be sized to contain 0.25 inches per impervious acre of contributing drainage. The proposed forebay reduction was sized based on 0.1 inches (MSH) requirements. (See additional Stormwater Report comments below). [Forebay sized to handle the 0.25" volume, resolved.](#)
7. 198-31.1.C.(2)(k)[1][c] – “ Be less than twelve-foot distance from the bank to the center of the forebay”. Should be included in the design. [Resolved](#).
8. 198-31.1.C.(2)(k)[1][d] – “ Be four feet deep”. Should be included in the design. [Waiver requested. The proposed 1.5 feet forebay depth should not cause any adverse impact to the pretreatment function with the associated long-term operation and maintenance plan.](#)
9. 198-31.1.C.(2)(m) - All water quality stormwater systems shall be designed to accept a return storm of 0.5 inches off the impervious area 11 days after the water quality storm. An additional 0.5 inches storage volume should be provided. [Resolved](#).
10. The proposed drain material should be specified in the plan. Sections of the drain have approximately 1.5' to 1.7' pipe cover at the catch basin locations. GCG recommends increasing the pipe cover to 2 feet. [The applicant has requested a waiver with Section 198-31.1-C.2.N.6. - Drain must be a minimum of 12" diameter and have a minimum of 2' cover. The proposed HDPE/ADS pipe is allowed under C.2.N.6. The project pipe calculations also indicated the proposed 8" and 10" diameter HDPE pipes have the capacity to handle the 100-year storm event flow. The HDPE/ADS manufacturer also recommended the minimum pipe cover be 12" plus the thickness of the pavement. Therefore, the proposed 1.5' minimum cover meets the manufacturer standards. The applicant should be responsible for the backfill material and compaction requirements meeting the manufacturer's standards.](#)
11. GCG recommends relocating the emergency spill way to the far side of the detention basin to avoid short circuit situations and allow forebay outflow overspill onto the detention basin and controlled by the spill isolation gate valve. [Resolved](#).
12. The bottom of the existing basin's elevation is 31.65 with surface area approximately 354 square feet (as shown on the HydroCAD report). This should be shown on the plan. The plan also shows the 4-inch outlet vertical orifice's invert at the same elevation at 31.65. The detention basin outlet should be equipped with a lower stage sump as part of the extended dry detention basin lower stage design per MSH, Vol.2, Ch.2, Pg.50. Based on the 2017 approved site plan. There should be a low stage sump in front of the 4" orifice. GCG suspected the sump may be filled with sediments. The new design should address the operation and maintenance issues. [Resolved](#).

13. Additional soil test pits should be required within the proposed detention basin expansion area to verify the (estimated seasonal high ground water) ESHGW elevation to assure a minimum of two feet separation between the bottom of basin to the ESHGW provided. This expanded detention basin collects the combined inflow from Lot 86B - gas station, a LUHPPL use and the additional runoff from the new development (non-LUHPPL). Hence, the LUHPPL requirements control and should be designed as such. A higher separation between the ESHGW to the basin bottom is desirable. Impervious liner has been proposed to line the detention basin with various methods. GCG recommends requiring the project engineer to review and approve the final lining method (and shop drawings by contractor) prior to the basin construction and provide inspection services during the liner installation and certification, as part of the approval conditions.
14. The proposed new earth berm would be constructed in fill. Earth berm materials should be specified. An impervious core should be installed and extended at least two feet into the existing ground. Resolved.
15. The existing basin outlet pipe should be equipped with an anti-seep collar, which should be verified during construction and tie in with the impervious core, existing anti-seep collar if disturbed should be replaced. Resolved.
16. The applicant may consider discharging the infiltration chambers system outlet to the detention basin directly (by-passing the sediment forebay). Resolved.
- 16.a The applicant has requested a waiver of section 198-31.1-C.3.B – “No underground infiltration practice, such as leaching catch basins, shall be allowed.” Underground infiltration systems have been approved for clean water/roof drain recharge only, (as installed behind the existing gas station/convenience store), which requires no treatments. The proposed underground chambers infiltration system with deep sump hooded catch basin pretreatment would require a waiver from the Board.
- 16b DMH-2 rim elevation should be 42.0+/-, subsurface infiltration system’s all pipe invert elevation should be 37.5.

#### Drawing Sheet – 5 – E – Erosion Control Plan

17. The plan “Expanded Detention Basin Grading Sequence” notes reference Area 1, Area 2, and Area 3 as shown on sheet G. There were no Areas 1, 2, and 3 shown on plan sheet G. Resolved.

#### Drawing Sheet – 7 – D – Site Details

18. The Precast Concrete Catch Basin should be specified to be 5-foot diameter to fit the proposed double catch basins. Remove the New Bedford Department of Public Works Catch Basin Hood label and replace it with “Snout” or “The Eliminator” hood or approved equal. Resolved.

#### Drawing Sheet – 10 – D2 – Site Details

19. The Outlet Control Structure Manhole (DMH-3) should have the bottom of concrete flat top elevation called out on the detail. The outlet weir calculation was based on the 4’ wide weir invert elevation at 39.20 with 0.6’ rise, which make the bottom of the concrete flat top elevation at 39.8 and creates a clearance issue with the proposed rim elevation at 40.7, with the 8” concrete flat top thickness, there is only 2.76 inches height for the frame and cover, which should be addressed.

## STORMWATER REPORT COMMENTS

1. Section 194-9 under Annual Town Meeting (ATM), June 14, 2021, Article 59 Amendment. Item 7.b. "The plan shall utilize the 24-hour rainfall data taken from the NOAA Atlas 14 (or most current data from NOAA) and Type III storm. The Drainage Summary stated: 2 YR STORM (3.2 in.); 10 YR STORM (4.8 in.); 25 YR STORM (5.6 in.), and 100 YR STORM (7.0 in.). However, the HydroCAD calculations were using 3.4 in., 4.8 in., 5.6 in., and 7.0 in. respectively. GCG recommends adjusting the calculations based on the NOAA Atlas 14 rainfall data with 3.40 in., 5.02 in., 6.03 in., and 7.60 in., respectively. [Resolved.](#)
2. Section 198-31.1. A. (1). (b) – Water Quality. The first flush of stormwater runoff is required to be treated. Based on 198-33 Definitions & Word Use – First Flush should be the first 1.25 inches of stormwater runoff of the site impervious area (see Sect. 198-33 for calculation formula. [Resolved.](#)
3. 198-31.1. C.(2)(k)[1][b] - Forebay sizing calculations should be based on 0.25 inches per impervious acre of contributing drainage. The existing forebay should be re-sized to accommodate the additional new development impervious area. impervious membrane liner should be extended accordingly. [Resolved.](#)
4. The HydroCAD pre-development conditions should clarify that the existing gas station /convenience store roof area (90' x 50' = 4,500 s.f.) was not included in the sub-catchment 1S. The roof runoff was connected to the sub-surface drainage chambers for exfiltration. The subsurface chambers system has the capacity to handle up to the 100-year storm event. [Resolved.](#)
5. 198-31.1. C.(2)(j)[4] (Zoning Bylaw was stated subsection (k), which should be corrected to (j) - HydroCAD Post-development report's sub-catchment 3S should model the surface of the detention basin to be impervious, (as water surface with CN value = 98) [Resolved.](#)
6. The post-development sub-catchment 3S Paved parking area, should be the sum of the existing pavement 42,000 s.f. (from pre-development sub-catchment 1S, also see comment #4) and the new pavement runoff in front of the southwest new building corner and the paved intersection connecting to the existing driveway. (Which GCG scaled over 5,000 s.f. of new pavement area.) Therefore, the proposed paved area should be approximately 47,000+ plus square feet. [Resolved.](#)
7. Post-development Pond 2P (Expanded Detention Basin) – the applicant should verify the pond stage surface area shown on the calculations. GCG scaled approximately 10% to 18% less surface area than from the surface areas shown. [Resolved.](#)
8. Post-Development Pond 3P: Cultec Subsurface Infiltration – the outlet 12" Round Culvert length appeared to be 50'+/- with 0.011 ft/ft slope. [Resolved.](#)
9. The subsurface Infiltration system drawdown calculations should be provided, based on the 0.270 in/hr. exfiltration rate used in the HydroCAD calculations. The system would not meet the drawdown within 72 hours requirements. (MSH, Vol.3, Ch.1, Pg.25). The system's surface area should be increased to allow drawdown within 72 hours. [Resolved.](#)
10. Since the proposed infiltration (subsurface chambers) system does not collect the entire impervious surface runoff. Standard 3 capture area adjustment calculations should be provided. (65% rule, MSH, Vol.3, Ch.1, Pg.27). [Resolved.](#)
11. Since the infiltration system bottom does not meet the 4-foot vertical separation to ESHGW, and the recharge system was used to attenuate the peak discharge from a 10-year or higher 24-hour storm. Mounding analysis should be provided. (MSH, Vol.3, Ch.1, Pg.28). [Resolved.](#)

12. Section 198-31.1 Stormwater Management Amendments under ATM June 2021, Article 37. – 198-31.1.(1)B(1)(a) - New development project should provide removal of 90% of the average annual (not per storm) load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site and 60% of the average annual (not per storm) load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. The applicant should provide calculations to support compliance with the 90% TSS and 60% TP removal from the new development. [Resolved.](#)
13. 198-31.1.(1)B(1)(b) - Redevelopment project should provide removal of 80% of the average annual (not per storm) load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site and 50% of the average annual (not per storm) load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. Since there is no work proposed within Lot 86B (277 Bridge, Gas Station), GCG did not consider any re-development on Lot 86B and 198-31.1. (1)B(1)(b) compliance is not being reviewed, unless otherwise directed by the Board or Conservation Commission. [Resolved.](#)
14. 198-31.1. A. (1). (b) - Water quality volume (WQV) standard 4 should be based on 1.25 inch of runoff (Fairhaven First Flush treatment requirements.) [Resolved.](#)
15. Emergency spillway sizing calculations should be provided, sized should be based on brimful conditions without impinging upon the structural integrity of the basin. [Resolved.](#)
16. Pipe Design Calculations:
  - a) DCB-1 to DMH-1 - pipe slope should be 0.006 ft/ft.
  - b) DMH-1 to DMH-2 - pipe slope should be 0.010 ft/ft.
  - c) DCB-2 to DMH-2 - pipe slope should be 0.030 ft/ft.
  - d) DCB-3 to DMH-3 - pipe length should be 90', pipe slope should be 0.006 ft/ft.
  - e) DMH-3 to Infil. - pipe length should be 10', pipe slope should be 0.010 ft/ft.Consider adjusting the pipe slope to gain additional pipe cover at the catch basin locations. [Resolved.](#)

## **OPERATION AND MAINTENANCE (O&M) PLAN COMMENTS**

1. The O&M plan should be assigned to a joint responsible party created by Map 30A Lots 86B, 87 and 87A. The stormwater runoff from all three parcels discharges onto the same WQU inlet, sediment forebay, and detention basin. There should be a single entity responsible for operating and maintaining the drainage system shared by the two commercial uses. [Resolved.](#)
2. Long term O&M plan should include all the requirements from the gas station/convenience store and the WQU units, (which also collects runoff from Lot 87). Provide necessary drainage easements for all three parcels, if under separate owners. The O&M plan should include the testing of the spill isolation electric gate valve twice per year. Training of the convenience store/gas station employees. Spill prevention and emergency spill action plan (and any other O&M requirements from the 277 Bridge Street site) should be included in the new O&M. Street/parking lot/pavement sweeping at minimum of twice per year (late spring and early fall) should be mandatory on all three parcels. Mowing the bottom and side slope of the detention basin, cleaning of the sediment forebay, inspection of the membrane liner, and outlet control structures should all be included in the O&M plan. [Resolved.](#)



3. GCG recommends changing the Detention Basin's remove sediment requirement to at least once every 5 years as required by MSH – Vol.2, Ch.2, Pg. 50.

If you have any questions regarding this matter, please contact our office.

Please call with any questions.

Respectfully Submitted,  
GCG ASSOCIATES, INC.

*Michael J. Carter*

Michael J. Carter, P.E.  
Project Manager

