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March 14, 2024

Paul DiGiuseppe, CNU-A, MPA
Director of Planning & Economic Development
Town of Fairhaven
Town Hall
40 Center Street
Fairhaven, MA 02719

RE: Map 30 A Lots 87 and 87A, Bridge Street Site Plan

Dear Mr DiGiuseppe:

We are in receipt of the engineering review letter from GCG Associates (GCG), dated February 20, 2024. This letter is written to respond to each of the comments in that letter. Revised plans and drainage report reflecting all revisions have been attached. The GCG comments are presented below immediately followed by our response to the comment.

GENERAL PLAN AND DEVELOPMENT COMMENTS

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 Intent 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.*

   Response: We are aware of this requirement and have noted such on the cover sheet of the plans.

2. *The project's 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).*

   Response: No response necessary.

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.*

Response: Existing and proposed conditions of the drainage system have taken all features of the existing gas station into account.

PLAN SET

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.*

   Response: The forebay has been revised to provide the required volume (see comment 6). A detail has been added to the plan showing that all modified areas of the forebay and basin shall be lined to provide greater containment volume. The 31.65' contour has been added to the plan to display the bottom elevation of the basin.

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.*

   Response: The revised existing conditions shows and labels these features. The outlet is proposed to be modified by replacing the existing 4" orifice with a 6" orifice with the same spill isolation electric gate valve with activation control in the convenience store. A new upper outlet has been proposed (12" wide notch invert at 33.75'). Worst case scenario for a spill would be a full tanker which is, at most, 11,600 gallons (1,550 cubic-feet). As shown in the HydroCAD model the proposed basin provides over 3,700 cubic-feet of storage at elevation 33', therefore providing more than adequate spill control volume below the new outlet. A detail has been added for the new outlet.

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.*

   Response: Labels have been added to the plan for these features.

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).*

   Response: A waiver request has been added to the plan to allow 3:1 slopes.

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.*

   Response: The proposed modified forebay is designed similar to the existing, as a separate cell with impervious liner and rip-rap. The new forebay has been sized to accommodate the existing and proposed paved areas. A basin cross section detail has been added which shows the forebay construction method proposed.

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).*

   Response: The forebay has been revised to contain 0.25 inches per impervious acre of contributing area (see forebay sizing calculation within the revised drainage report).

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.*

   Response: The revised forebay measures approximately 9' from its center to the top of the outer berm.

8. *198-31.1.C.(2)(k)[1][d] –" Be four feet deep". Should be included in the design.*

   Response: A waiver request has been added to the plan to allow a 1.5' deep forebay. The existing forebay is 1' deep.

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.*

   Response: The proposed drainage system will be fully drained and ready for a 100-year return storm less than 72 hours after a 100-year storm event, therefore this requirement is easily met.

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.*

    Response: A waiver request has been added to the plan to allow 1.5' minimum cover over the proposed drain pipes. ADS N-12 HDPE pipe is proposed which requires only 1' of cover to meet H-20 loading requirements. This waiver also asks to allow drainage pipes smaller than 12" diameter. There are one 8" and two 10" pipe proposed. Pipe calculations show that these pipes are capable of conveying runoff from the 100-year storm event.

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.*

Response: The spillway has been relocated within the proposed basin expansion area.

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.*

    Response: The 31.65' contour has been added to the plan to display the basin's bottom elevation. The micropool does exist, but appears to be partially filled with sediment. A note has been added to the plan to clean out the micropool and the revised O&M plan has added language to maintain this feature going forward.

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.*

    Response: The purpose of additional soil test pits is to assure no exchange between the proposed basin and groundwater. Knowing the groundwater is high on the site we have proposed lining the basin where all new and altered grading is proposed rather than providing additional soil testing (see basin cross section detail).

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.*

    Response: A basin cross section detail has been added to the revised plans which specify an impervious core with material and construction specifications.

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.*

    Response: The existing outlet pipe and the berm within which it is imbedded are not proposed to be altered.

16. *The applicant may consider discharging the infiltration chambers system outlet to the detention basin directly (by-passing the sediment forebay).*

    Response: The outlet from the proposed chamber field has been revised to outlet directly to the basin.

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.*

    Response: The areas are shown on the Erosion Control Plan. The sequence note has been updated.

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.*

    Response: The catch basin hood note has been revised.

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.*

    Response: The NOAA Atlas 14 rainfall depths have been used in the revised HydroCAD calculations.

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).*

    Response: A water quality volume calculation has been added to the revised drainage report under Standard 4 which uses the 1.25" required depth.

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.*

    Response: The forebay has been revised as noted in this comment.

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.*

    Response: A note has been added to the revised HydroCAD routing diagram to clarify that this roof area was not included in the pre- or post-development sub-catchment areas.

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).*

   Response: The revised HydroCAD calculations include the basin area as impervious cover in pre- and post-development.

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.*

   Response: All sub-catchment areas were re-evaluated to assure accuracy.

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.*

   Response: The proposed contour areas of the basin have been revised in the HydroCAD calculations to accurately model the plan.

8. *Post-Development Pond 3P: Cultec Subsurface Infiltration – the outlet 12" Round Culvert length appeared to be 50'+/- with 0.011 ft/ft slope.*

   Response: The outlet from Pond 3P: Cultec Subsurface Infiltration has been revised to match the plan.

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.*

   Response: A drawdown calculation has been added to the revised drainage report under Standard 3. To make this calculation work the Cultec drainage field has been revised to use 150XL chambers rather than 330XL chambers. This change gives a larger footprint and smaller vertical storage area which resulted in a drawdown time of 65.8 hours.

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).*

    Response: A recharge calculation with capture area adjustment has been added to the revised drainage report under Standard 3.

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).*

Response: Running the mounding analysis resulted in a mound height of approximately 4'. We have revised the site design to accommodate a 4' separation between high groundwater and the bottom of the system stone (therefore, no mounding calculation is required). This, along with the revised field configuration noted in response #9 above, resulted in several minor alterations in the drainage layout which have all been accounted for in the revised drainage report.

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.*

    Response: This treatment requirement, as outlined in the regulation, can be met by retaining the volume of runoff equal to 1" multiplied by the proposed impervious area on the site. This is accomplished by the proposed chamber field (see calculation provided under Standard 4). Although it is not required, we would like to note the recharge volume within the chamber field is greater than 1" multiplied by the total impervious area on both lots.

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.*

    Response: The proposed project is not considered redevelopment (see previous response for new development standards).

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).*

    Response: A water quality volume calculation has been added to the revised drainage report under Standard 4 which uses the 1.25" required depth.

15. *Emergency spillway sizing calculations should be provided, sized should be based on brimful conditions without impinging upon the structural integrity of the basin.*

    Response: A new HydroCAD calculation has been provided which models the basin at brimful condition with the emergency spillway as the only outlet. A 100-year storm event under these conditions yields a peak elevation below the top of berm.

16. *Pipe Design Calculations:*
    a. *DCB-1 to DMH-1 - pipe slope should be 0.006 ft/ft.*
    b. *DMH-1to 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.

Response: Pipe calculations have been updated to reflect the revised plan.

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.*

   Response: The O&M Plan has been revised to say "An agreement must be made in the form on a legal document to use and maintain these shared components by current and future owners of the three parcels." The two owners for the parcels have been listed as responsible parties.

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.*

   Response: The O&M plan has been revised to include all concerns outlined in this comment.

We look forward to discussing this project with your Board at the upcoming hearing date. Please do not hesitate to contact our office if you have questions or concerns.

Sincerely,

ZENITH CONSULTING ENGINEERS, LLC

Jamie Bissonnette, P.E.
Manager