

Phone: (978) 657-9714  
Fax: (978) 657-7915

May 8, 2020

Ms. Whitney McClees & Mr. Paul Foley  
Conservation Commission and Planning Board  
Town Hall  
40 Center Street  
Fairhaven, MA 02719

RE: Proposed Auto Dealership, Fairhaven, MA.  
Notice of Intent / Site Plan  
250 Bridge Street.

Dear Ms. McClees and Mr. Foley:

GCG Associates, Inc. has reviewed the following information for the 250 Bridge Street, proposed auto dealership site plan in Fairhaven, MA with respect to stormwater and stormwater related requirements under 310 CMR 10.00 Wetlands Protection Act Regulations.

Plan References: Proposed Auto Dealership, 250 Bridge Street, Fairhaven, MA prepared by Prime Engineering, Inc. dated April 27, 2015, last revised March 10, 2020.

Documents: Supplemental Drainage Calculations prepared by Prime Engineering, Inc. dated April 13, 2020

Cover letter with waiver requests dated prepared by Prime Engineering, Inc. dated March 17, 2020

Based upon our review of the above information, we offer the following general comments and comments with respect to compliance with Town Bylaws: Chapters 192 – Wetlands; 194 - Stormwater Management, Illicit Discharge, Soil Erosion, Sediment Control By-Law; 198-31.1 – Zoning - Stormwater Management and 310 CMR 10.00 Wetlands Protection. The numerical section of the regulations is referenced at the beginning of each comment unless it is a general comment. Prime Engineering, Inc. response shown in *Italic Arial*, 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 is a partially developed lot located at the northwest side of Bridge Street and Route 240 intersection, as identified as Assessor's Map 36 Lot 15. The parcel consists of 5.35+/- acres. The site was improved with an existing pavement driveway approximately 23'+/- wide by 350'+/- length connecting Bridge Street to Lot 15C, where an existing auto dealership uses.
2. The applicant has filed a Notice of Intent for a commercial site plan development for auto dealership uses, the project calls for a single storage building for automobile show room, office, vehicles maintenance uses, and associated pavement parking lot and utilities. The proposed work area is over 1 acre and requires filing an US EPA - NPDES permit and associated SWPPP. (NPDES NOI shall be filed 14 days prior to construction start.)
3. The proposed work limit also exceeds the Land Disturbance Permit (Chapter 194) threshold and requires filing a permit with the Fairhaven Board of Public Works.
4. The proposed Auto Sale and Services (Auto Dealership) is permitted by right in the Industrial Zone. This site development requires a Planning Board Special Permit approval per Chapter 198-29. Which requires site design in compliance with Chapter 198-31.1 Stormwater management standards. Hence, stormwater management design is being reviewed to meet 198-31.1 requirements.
5. The project is located within Zone X, Area of Minimal Flood Hazard, (FIRM 25005C0394G, effective 7/16/2014), four series (A, Y, Z, and HS) of wetland resource area were identified on the property and requires to file a Notice of Intent with the Fairhaven Conservation Commission and MassDEP.
6. There is no NHESP estimated habitats of rare wildlife or rare species identified in the site vicinity per MassGIS.

## PLAN SET

Drawing Sheet 1 - Title Sheet.

1. *Plan note #2. A variation is requested to Stormwater Management – Section 198-31.1. A(1)(a)[2], to allow the increase in volume of runoff due to the D soil and near surface ground water. This is a local regulation requirement only and is not regulated by MassDEP. 198-31.1.C(2)(k)[1], requires the volume control shall be by infiltration; [2] requires infiltration areas shall be located in areas with a Hydrologic Soil Group (HSG) of A, B, or C. The subject site is entirely located within HSG 'D' soil per NRCS soil survey. Therefore, infiltration is impractical and without the waiver, the site would be un-developable. No response necessary. **The latest calculations shown post-development runoff volume net increases of 0.274 AF (193%) and 0.329 AF (162%) for 2-year and 10-year storm events, respectively. A waiver has been requested due to the physical soil limitation on the site. The latest calculations shown post-development runoff volume net increase of 0.282 AF (194%) and 0.332 AF (163%) for 2-year and 10-year storm events, respectively. Waiver for 198-31.1.A(1)(a)[2] and C(1)(a), have been requested.***
2. *Plan note #3. A variation is requested to Stormwater Management – Section 198-31.1. B(2)(a)[h]&[i], to not provide soil logs since the infiltration is not proposed due to the D soil and near surface ground water. GCG recommends deep hole tests be performed at the proposed pocket wetland location to determine the seasonal high ground water (ESHGW) elevation and verify the available storage volume (above the ESHGW) and available water table to support the wetland vegetation. Soil deep hole test should also be performed at the rain garden #1 culvert outlet location to assure the pipe invert are*

**Auto Dealership Site Plan**  
**250 Bridge Street**  
 GCG Job#1988

not submerged below ESHGW. A hand dug test pit was dug on December 1, prior to any precipitation. There had been no significant antecedent precipitation for 5 days. The location of the test pit is shown on Sheet 4-Grading and Drainage Plan. The fine sandy silt at an 8-inch depth (elevation 43.0) was wet and indicative of the water table. The log is enclosed in Attachment A. We have determined that the constructed pocket wetland will be notched into the seasonally high-water table. There will be adequate storage above the seasonally high-water table because the elevation of the detention basin outlet culvert will assure that the water in the basin is always at the outlet invert elevation 43.0 except during significant surficial rainfall runoff events. The existing pipe invert elevation downgradient of the raingarden will assure that the pipe will not be submerged by the groundwater. **Resolved. This item is also for supporting waiver request item 1 above. This note has been removed from plan.**

3. *Plan note #4. A variation is requested to Stormwater Management – Section 198-31.1. C(2)(g)[6], to allow the side slopes to be 2:1 to minimize impacts to wetland. This requirement is regulated by the local regulation as well as the State regulations. The local regulation requires a 4:1 grade or approved by the Conservation Commission. The regulation also requires a 10' wide bench at 0% slope surround any permanent pool. The Massachusetts Stormwater Handbook (MSH) requires the sediment forebay side slope not steeper than 3:1. And requires a 15' wide maintenance path surrounding the constructed wetland. The proposed plan shown a 1:1 slope along the west side of sediment forebays and pocket wetland. GCG recommends providing a 3:1 minimum slope along the sediment forebays to meet MDEP requirements. Constructed wetland should maintain a minimum of 2:1 side slope with a 10' wide top bench for maintenance access. The proposed rain gardens could utilize the paved drive aisle for maintenance access. Granting a waiver for the State required access path width does not relief the developer to future actions imposed by MDEP. Alternative would be reducing the proposed pavement area to meet the local and MDEP requirements. Over the past 50 years of designing detention basins and fore bays, we have determined that the fore bays require regular cleaning prior to the ground being fully stabilized. Once the ground is stable, the main source of sediment is the occasional sand that is spread on the parking lot during winter icing events. That sand is swept on a regular basis. The small amount of sand that is not swept is captured in the deep sump catch basins. The volume of sediment that reaches the forebay from a .41-acre parking lot can be removed by a hand shovel into a 5-gallon bucket and carried out by foot. There is no need for other equipment access, nevertheless, a 4:1 slope has been provided to access both forebays. **Both State and Town regulations are for equipment and vehicle access. MSH also requires clean out sediment in basin/wetland system once every 10-year, which would be difficult without equipment. The two proposed forebays have 4:1 side slope on 1 side. GCG recommends widening the northern forebay 4:1 area to 10 feet wide and provide a 10' wide access, (6' width proposed). Pocket wetland #1 has side slopes of 2:1 and 1:1; Pocket wetland #2 has 2:1 side slope. A 10' wide access has been provided for pocket wetland #1. Waiver for 198-31.1. C(2)(g)[6] to allow detention basin side slope to be 2:1 rather than 4:1 has been requested. There is no minimum requirement for constructed wetland side slope by the MSH.***
4. *Plan note #5. A variation is requested to Stormwater Management – Section 198-31.1.C(3), to allow the low impact development (LID) design meet the bmp requirements, as requested by the conservation commission. This requirement is regulated by the local regulation. The proposed pocket wetland basin and rain gardens BMPs could meet the MSH stormwater management standards. See additional comments regarding the BMPs below. No*

response necessary. **See BMPs comment below.** This note has been removed from plan.

#### Drawing Sheet -2 – Existing Conditions Plan.

1. Wetland delineation line as shown requires Conservation Commission approval. *The Conservation Commission has approved the wetland delineation.* **Resolved.**
2. Plan shown depression contours (47) along four rip-rap patches on the west side of existing paved driveway, and a rip-rap weir east of wet flag A32. It appears existing driveway runoff was designed to drain into the depressions through rip-rap patches for retention and overflow through the westerly rip-rap weir onto the west wetland. The pre-development drainage calculations should include this ponding element or based on the previous calculations. *Attachment A presents the soil log.* **Resolved.**
3. There is an existing catch basin located at the south side of wet flag A30. The two connected catch basin rim, inverts and outlet should be identified on the plan. The proposed rain garden #1 outlet pipes are located within 10' of the catch basin and may cause interference with the catch basin's function. *The drainage structure information has been added to Sheets 2 and 4.* **The project engineer clarified that the site drains southward to the Bridge Street catch basin. The pair of 12" RCP connected to the Bridge Street catch basin inverts (North side) are lower than the two outlet inverts (South side), which would cause sediment built up inside these two catch basins. GCG recommends to add the on-site catch basin to the Operation and Maintenance plan. The existing on-site catch basin should be included in the O&P plan for inspection and maintenance.**

#### Drawing Sheet 3 – Erosion Control Plan.

1. **Catch basin silt sack should be installed at the two catch basin located west of the site driveway and catch basin at the intersection of Route 240 and Bridge Street.** These two offsite and one onsite existing catch basins silt sack installation should be called out on the plan.

#### Drawing Sheet 3 (New Sheet 4) – Site Layout Plan.

2. The easterly parking lot edge of pavement should have a curb/berm to direct surface runoff to the two catch basins and forebays for treatments. *The curbing is shown on Sheet 3.* **Cape cod berm needs an opening in front of Rain Garden 2 to collect runoff.** **Resolved.**
3. Access path openings should be provided for the constructed wetland and forebays maintenance. *The curbing is shown on Sheet 3.* **There are parking spaces assigned in front of the maintenance path accesses. Since this is an automobile dealership use, the owner should have full control of the parking arrangement. The operator should be responsible to clear the parking spaces during system maintenance.** *Guard rail should be shortened to clear maintenance access.*
4. Snow storage areas should be called out on the plan, snow should be stored outside the stormwater BMPs. *A snow storage has been added.* **The proposed snow storage area is located at the entrance of a one-way parking area, which will block the section of parking spaces. GCG does not see any suitable location for snow storage. We recommend the applicant to call out "Snow shall not be disposed within the Stormwater BMPs and excess snow to be removed off site by the owner with no**

Auto Dealership Site Plan  
250 Bridge Street  
GCG Job#1988

costs to the Town.” And specify on the Stormwater Operation and Maintenance (O&M) plan that snow shall not be stored within the stormwater BMPs. O&M plan shall be signed by the operator. [Note added to the site layout. Resolved](#)

#### Drawing Sheet 4 (New Sheet 5) – Grading and Drainage Plan

1. Plan should identify the portion of roof area drains to rain garden. Calculations shown only drop off vehicle roof area drains to rain garden. Roof drain pipe sizing calculations should be provided. *The entire building's roof slopes down from the front (south) end to the rear (north) end. For the 100-year storm  $Q = ciA = (.95) (8.4) (.29) = 2.32$  CFS. The proposed 12-inch HDPE roof drain can pass 5.0 CFS at a velocity of 6 FPS.* **Plan should identify the section of roof drains to rain garden through the eight-inch diameter ductile iron pipe, which does not have the capacity to handle the entire roof runoff. The divide is shown in the HydroCAD report and should also be identified on the plan for the contractor. The 8" DI roof drainpipe should be identified for the drive through overhang roof only.**
2. Curb or berm should be installed along the easterly edge of pavement to assure surface runoff be treated by the deep sump hooded catch basin and sediment forebay. *There is a cape cod berm. The curbing is shown on the Site Layout Plan.* **Resolved.**
3. Curb or berm should be installed along the Bridge Street access between the high point 47.20 to rain garden #1 crushed stone berm. *There is slope granite curb as shown on the Site Layout Plan.* **Resolved.**
4. Provide rip-rap protection at the rain garden #1 spillway and pipe outfalls. *A stone apron has been added.* **Resolved.**
5. The proposed three feet wide grass strip does not meet grass filter strip pretreatment requirements, filter strip length should be sizing per MSH Vol.2, Ch.2, Pg. 26. *The Stormwater Manual allows an 18-inch width of gravel followed by 3 feet of sod as shown on the detail on Sheet 4.* **The proposed 8 inches of gravel followed by 3 to 5 feet sod pre-treatment is based on the North Carolina Stormwater Manual (NCSM) as referenced by MSH. NCSM requires the bottom of the bioretention system to have two feet separation to seasonal high groundwater table and minimum media soil depth of 3 feet thickness and side slope not to excess 3h:1v. Therefore, the proposed pre-treatment filter strip does not meet the application. Another suitable pre-treatment should be provided. Rain garden deleted. Resolved.**
6. Please identify the circular object next to the southeast forebay. *The former silo has been deleted from the plan.* **Resolved.**
7. MSH requires side slopes of sediment forebay no steeper than 3:1 (MSH Vol.2, Ch.2, Pg. 15), and requires a minimum width of 15 feet access for maintenance. (MSH Vol.2, Ch.2 , Pg.45). *A waiver is being requested.* **The applicant has provided a 4:1 slope on one side and 1:1 and 2:1 on the remaining sides of both forebays. GCG recommends widening the 4:1 side slope on the north forebay to 10 feet width and provide a 10 feet wide access path on top of the earth berm (6' width proposed). GCG recommends the wavier be considered with these modifications. However, the recommended modified system still not meeting the MSH (MDEP) requirements. But it will provide a reasonable access for maintenance and repair if necessary. Granting this wavier should not relief the applicant for any further actions imposed by MDEP. Forebays 1 and 2 (Pocket wetland basin #1) have 4:1 side slope on 1 side and 2:1 and 1:1 on other 3 sides. Forebay 3 (Pocket wetland #2) has 2:1 slope on four sides. MSH requires sediment forebay side slope not to excess 3:1. One side of forebays 1 & 2 have 4:1 slope. Forebay 3 is relatively small and located next to**

Auto Dealership Site Plan  
250 Bridge Street  
GCG Job#1988



the parking lot. The forebays are accessible for maintenance and constructed wetland forebay requires cleaning once per year.

8. 198-31.1(C)(2)(g)[6] – requires basins/ponds designed for stormwater runoff control shall have side slopes at a no steeper than a 4H to 1V grade. And a ten-foot wide bench surround any permanent pool. 1:1 and 2:1 side slopes proposed, Applicant is seeking a various, see Cover sheet comment #3. *A waiver is being requested.* **MSH does not specify a minimum side slope for constructed wetland. Since MSH only requires clean out sediment in basin/wetland systems once every ten years, steep side slopes could be ramped during the infrequency maintenance. GCG does not see any adverse impacts for granting this waiver. However, a minimum 10 feet wide access path should be provided, (MSH requires a minimum of 15' wide access). Nevertheless, the same waiver could not be apply to the rain garden/ bioretention area, MSH requires pre-treatment for rain garden BMP, a minimum vegetated filter strip length of 15' to 25' is required depends on using the Georgia Stormwater Manual or MSN chapter 2 - Vegetated Filter Strips calculations. MSN also requires bioretention area must not located on slopes greater than 20%. The intention of the mild slope is to slow the sheet flow velocity to allow vegetation pre-treatment. Waiver for 198-31.1. C(2)(g)[6] to allow detention basin side slope to be 2:1 rather than 4:1 has been requested.**
9. 198-31.1(C)(2)(k) - Forebays [1][b] requires forebays to be sized to contain 0.25 inches per impervious acre of contributing drainage and [d] requires forebay be four feet deep. Volume calculations per each forebay should be included in the report. *Attached are computations for forebay sizing (Attachment 8). A 2-foot deep forebay will be provided. A waiver is requested.* **The calculations were based on 0.1 inch of impervious surface area as required by MSH sediment forebay design. However, the proposed forebays are part of the constructed wetland and should be sized as such per MSH Table CSW.1, Vol.2, Ch.2,Pg.43. According to the MSH constructed wetland pollutant removal efficiencies rating, a constructed wetland would meet the Fairhaven's TSS, total Nitrogen and total Phosphorus removal standards. Therefore, granting a waiver for 198-31.1(C)(2)(k) should not have any adverse impacts if the constructed wetland meets all MSH requirements. Forebays 1 & 2 requires 0.25 inches volume. Forebay 3 volume calculation shown on sheet 9 does not match the depth shown on the plan (forebay 3, bottom 42 to stone dike elevation 43), height should be 1'. The volume per plan should have a volume of 82+/- C.F. or equals 1.6 inches of the impervious area volume. Waiver for 198-31.1.C(2)(k) has been required. (see waiver requests letter).**
10. 198-31.1(C)(4)(a)[2] – requires 48-hour detention time for the water quality (198-31.1(A)(1)(b) - First Flush = (1.25"), see 198-33 Definitions) storm. This regulation should be included in the variance seeking Section 198-31.1.C(3), see Cover Sheet comments #4. The regulation would require the pocket wetland to provide the 1.25" storage volume for treatments. *A constructed pocket wetland has been selected due to its better performance compared to extended detention basins (infiltration units were rejected due to the poor soils, high water table and their inherent propensity for failure). In accordance with the MassDEP Stormwater Manual, the following are projected removal rates:*
- | Removal Efficiency        | Nitrogen | Phosphorus | Total Suspended Solids |
|---------------------------|----------|------------|------------------------|
| Constructed Wetlands      | 20-55%   | 40-60%     | 80%                    |
| Extended Detention Basins | 10-30%   | 15-50%     | 50%                    |
- It is clear the proposed treatment system meets the performance standards of Fairhaven's Stormwater Management Regulations and the MassDEP Stormwater Standards.*  
**GCG concurs that a proper constructed wetland and raingarden/bioretention systems designed would meet the performance standards of Fairhaven's**

Auto Dealership Site Plan  
250 Bridge Street  
GCG Job#1988

**Stormwater Management Regulations and the MassDEP Stormwater Standards. However, both systems need to meet all standards required by MSH. GCG recommends granting the waiver be considered subject to all other requirements meeting MSH standards. [Waiver for 198-31.1C \(3\)\(d\) – Approval of constructed pocket wetlands and Stormceptor as water quality BMPs has been requested.](#)**

11. 198-31.1(C)(4)(a)[1 & 6] – requires establishment of, and the methodology with which to maintain, wetland vegetation on the bottom of the basin. GCG recommends soil testing to determine the ESHGW, see Cover Sheet comment #2. *The regulations focus on the establishment of a methodology with which to maintain wetland vegetation on the bottom of the basin because extended detention basins are almost always inundated and, therefore, establishing vegetation in an extended detention basin is difficult, if not impossible. This results from the fact that on average it rains every three days (approximately 120 times per year) and the local soils are slow to infiltrate and tend to clog by the fine particles that settle in extended detention basins. The proposed constructed wetlands, on the other hand, will typically empty within hours of the end of the runoff events. The plants for each level of the marsh (high marsh, low marsh and semi-wet marsh) have been selected for those specific water depths. The Constructed Pocket Wetland Plan (Sheet 9) presents the planting schedule and Section 4 of the submitted Stormwater Report presents maintenance procedures.* **There was no soil testing on the proposed rain garden area, based on the same 10" below surface ESHGW assumption as indicated in TP-1, the rain garden would be in the ESHGW. Therefore, the two rain gardens would not meet the 2' to 4' depth soil media for pollutant removal requirements. MSH requires 30" minimum media depth for total nitrogen removal. GCG recommends considering constructed wetland BMP design or lining the rain garden to provide the required media soil depth treatment. [Two constructed pocket wetlands have been proposed. Resolved.](#)**
12. MSH Vol.2, Ch.2, Pg. 45 - requires constructed stormwater wetland to have an emergency spillway capable of bypassing runoff from large storms without damage to the impounding structure. Emergency spillway sizing calculations should be provided based on the brimful conditions. *The constructed wetland has been designed to contain the entire 100-year storm. The emergency spillway can pass 26 CFS. This can readily accommodate the 8.03 CFS 100-year peak flow into the basin (Refer to Attachment E).* **Resolved.**
13. MSH Vol.2, Ch.2, Pg. 45 – requires an access for maintenance. *A 4: 1 slope to the basin has been provided.* **MSH requires an access for maintenance, with a minimum width of 15' and maximum slope of 15%. A 6 feet wide top of berm width was proposed. GCG recommends a minimum of 10 feet wide access be provided. [A 10' wide access earth berm proposed.](#)**
14. Pipe(s) length and slope should be labeled. *The pipe lengths have been labeled.* **Please verify the Rain Garden #1, 4" HDPE outfall pipe invert on sheet 5 plan view. Rain Garden #1 10" HDPE pipe should length and slope should be labeled. The calculations used a 26' pipe with slope at 0.0385 ft/ft. The plan scaled pipe length 20'+/-. The earth berm elevation on top of the 10" HDPE should be labeled. The calculations shown a peak ponding elevation at 46.48 during the 100-year storm event rip-rap berm protection should be provided. GCG recommends to re-direct the two outlet pipes toward to the open field. [Rain Garden removed.](#)**
15. Provide pre-treatment in front of rain gardens per SMH Vol. 2, Ch.2, Pg. 25. *A one-foot width of stone, followed by a three-foot width of grass is shown in the cross section on Sheet 5.* **The pre-treatment strip was based on North Carolina Stormwater Manual (NCSM) design, which requires 3' minimum soil media with 2' separation to the ESHGW. MSH referenced two other pre-treatment vegetated grass strip designs based on MSH Chapter 2 and Georgia Stormwater Manual. Both manuals have similar requirement of 15' to 25' minimum grass strip length. In addition, the ESHGW**

(based on the assumption of similar depth shown on TP-1), the bottom of the two rain gardens are at or below seasonal high ground water. See additional soil media comments below. Please note, filter strips are restricted to the outer 50 feet of the buffer zone. (MSH Vol. 2, Ch.2, Pg.20.) [Rain Garden removed.](#)

16. Rain garden soil layer should be Engineered Soil Mix for Bioretention Systems Designed to Exfiltrate, MSH Vol.2, Ch.2, Pg.26. *The engineered soil has been revised.* **MSH stated that most of the pollutant removal occurs within the first 2 feet of soil, and where nitrogen removal is required should have a soil media with a depth of at least 30 inches. The proposed soil media depth of 1.5' and 1.2' for rain gardens #1 and #2, respectively, are within the ESHGW and not suitable for pollutant removal. GCG recommends lining the bottom of the soil media to allow a minimum of 30" depth soil media for treatment.** [Rain Garden removed.](#)
17. Pocket wetland area component (percentage calculations based on MSH Vol. 2., Ch.2, Pg.43) should be provided and shown on the plan. *The pocket wetland components have been presented on Sheet 9.* **See comment Sheet 9 below.** [Resolved.](#)
18. Site erosion control plan should be included, at a minimum, silt sack and silt fence/wattle/haybale should be installed during construction, existing pavement could be utilized for construction exit with inspection and sweeping operation. *An erosion control plan has been added.* **Catch basin silt sack should be installed at the two catch basin located west of the site driveway and catch basin at the intersection of Route 240 and Bridge Street.** [Silt sack should be shown on the Bridge Street catch basins.](#)
19. [Verify CB 3 Frame and Grate elevation. It should be 48.00 instead of 47.00.](#)
20. [Pocket wetland 12" outfall headwall invert should 42.63 instead of 42.75.](#)
21. [Cross Section A-A should show cape cod berm to assure surface runoff flows to deep sump catch basins for pre-treatment.](#)

#### Drawing Sheet 5 (**New Sheet 6**) –Utilities Plan

1. Subject to Planning Board review and approval.

#### Drawing Sheet 6 (**New Sheet 7**) – Lighting Plan

1. Subject to Planning Board review and approval.

#### Drawing Sheet 7 (**New Sheet 8**) – Landscape Plan

1. Constructed Pocket Wetland planting should be specified on this plan. *A blow up of the pocket wetlands with plantings has been added to sheet 9.* **See comment for Sheet 9 below. Resolved.**

#### Drawing Sheet 9 – Construction Wetland Plan

1. Please clarify the 38,147SF impervious area used to calculate the WQV. The Water Quality Volumes shown in the report called out 33,000 SF (non-roof) impervious area and the proposed building roof is scaled approximately 13,500+/- SF. (GCG was unable to verify the impervious area on the HydroCAD sub-catchment 1A, which included the forebays and constructed wetland surface areas.) MSH-Vol. 1, Ch.1, Pg.9 specified WQV should be based on the total impervious area, which should be based on approximately 46,500+/- SF. The % volume design criteria



should match with the MSH Table CSW.1 Pocket Wetland requirements. The proposed wetland volume should meet SCW.1 requirement. [Resolved.](#)

2. [Verify Forebay 3 volume calculations, height should be 1'.](#)
3. [Construction pocket wetland schematic cross-section calls for see Crushed Stone Infiltration Berm detail. Detail drawing not provided.](#)

#### Drawing Sheet 8 (New Sheet 10) – Site Details

1. Please verify the 18" HDPE outlet pipe shown on the Headwall with orifice plate detail. *The 18-inch HOPE has been changed to 12-inch RCP. **Resolved.***
2. Erosion control device, silt sack, wattle etc. should be included in the details sheet. *A separate Erosion Control Plan has been added with details. **See comment for new Sheet 3 above. Provide silk sack detail.***

#### Drawing Sheet 9 (New Sheet 11) – Vehicle Movement Plan

1. Is there a function of the two-way driveway located north of the dumpster? The Vehicle movement plan shown no use of this driveway. Can it be eliminated for lawn area or snow storage? *The drive north of the building is to allow vehicle circulation around the building in the event that the property to the north is in separate ownership. **In the event of separating ownership, access and utilities cross easements would be generated for emergency vehicles access, dumpster pickup access, and sewer service. Reducing impervious area would improve the post-development runoff volume.***

#### STORMWATER REPORT COMMENTS

1. MSH Vol.2, Ch.3, Pg. 1 Checklist for Redevelopment projects – Only the existing paved driveway is considered re-development, and all other new impervious area needs to meet all MSH standards. *Previously developed is not limited to impervious areas. The area east of the existing drive has been maintained as lawn for many years. **All new impervious area would consider new development and required to meet MSH standards to the full extent.***
2. The existing paved driveway appears to be treated with rip-rap swales/pads and retention (depression at contours 47) BMPs along the west side of the pavement. Previous calculations or existing retention/ponding conditions should be included in the pre-development flow calculations. *The shallow swales west of the existing drive only have the capacity to hold the initial 1,800 cubic feet of runoff. Hydrocad software does not allow the addition of this initial abstraction to the computations. On Attachment C, we have shown the initial abstraction on the hydrograph in red. This initial abstraction does not impact the peak rate of runoff. In order to be conservative, we did not model these 1,800 square feet of standing water as impervious with a runoff curve of 98 since this would lead to a higher rate of runoff and a higher peak runoff under existing conditions. **The 1,800 cubic feet volume appears to fit mitigation volume for the existing 7,900 s.f. paved driveway. GCG recommends modelling the pre-development conditions with the existing 7,900 SF paved driveway as Meadow, non-grazed, HSG D (CN=78) to represent the original pre-development flow (prior to the existing driveway installation). And control the post-development flow to equal or below the original pre-development conditions. The surrounding abutters are fully developed, any increased in post-development runoff would affect the downstream properties. [The Existing Conditions Drainage Plan clearly shows drainage mitigation treatments \(several riprap check-dams and](#)***

Auto Dealership Site Plan  
250 Bridge Street  
GCG Job#1988

depressions) for the existing driveway. GCG recommend applicant to perform the calculations to analyze the development based on the original landform, (without the existing paved driveway), as required by MSH Standards #2.

3. The proposed layout/use appears to equip with vehicle maintenance and repair bays, and possible storage of petroleum product and may considered as fleet storage area. (applicant should verify our assumptions). Therefore, it is considered Land Uses with Higher Potential Pollutant Loads (LUHPPL). MSH Vol.1, Ch.1, Pg.14. Therefore, the vegetated filter strip, MSH Vol.1, Ch.1, Pg.14. and constructed wetland, Vol.2, Ch.2, Pg.36 and rain gardens, V Vol.2, Ch.2, Pg.23 should be lined and sealed for LUHPPL uses. *All vehicle maintenance will be indoors with mass standard oil and water separator discharging to the municipal sewer. The small volume of fuel and oil storage will be indoors and properly labelled. There is extremely little jeopardy for the proposed BMPs. There is no intention to line or seal the BMPs. A waiver is being requested.* **“Land Uses with Higher Potential Pollutant Loads (LUHPPL)” is based on uses classified by the EPA. Automobile repair services would involve impaired vehicles parked outdoor queuing for service/repair, which could cause higher potential for pollutant. GCG recommends BMPs to comply with MSH’s LUHPPL standards. In addition, the proposed rain gardens are in the ESHGW and would require lining to allow soil media treatment prior to contact with ground water. 310 CMR 22.20C.2(i) motor vehicle repair operations, are defined as LUHPPL. However, the proposed BMPs are suitable for LUHPPL uses.**
4. Forebays [1][b] requires forebays be sized to contain 0.25 inches per impervious acre of contributing drainage, please provide calculations. There were some calculations included in the page after the Drainage Summary table. However, the copy was very light and not readable. Please provide a clean copy. *The forebay computations are enclosed as Attachment B. The computations were based on (0.1” times impervious area) dry forebay sizing per MSH standard and does not meet the 0.25 inches required by this local regulation. However, these two forebays are part of the constructed wetland component and the required surface area and volume shown are specified in MSH Table CSW.1. A constructed wetland meeting all MSH requirements is rated with the pollutant removal rate meets or exceeds the Fairhaven’s performance standards and design specifications. Therefore, it should be considered as other water quality BMPs under 198-31.1(C)(3)(d). GCG recommends the applicant to request a waiver for the forebay sizing requirements. Waiver for 198-31.1.C(2)(k) has been requested.*  
198-31.1(A)(1)(b) - requires treatment of the Water quality (First Flush = (1.25” of entire impervious area on site), see First Flush definition for calculation formula (198-33). This regulation could be complied with the 1.25” volume storage within the wetland basin. *The first flush runoff will pass through the constructed pocket wetlands which has been verified as removing 80% of the suspended solids. A waiver is being requested to allow a .5-inch depth be the water quality volume. A review of many years of local rainfall reveals that 77% of all storms are less than .5 inches of total rainfall. The goal of treating the water quality volume is to treat the runoff from the day to day storms and worry less about the 23% of storms that have over ½ inch of rainfall. Although the first flush of those larger storms will also have their first flush treated.* **MSH rated constructed wetland and rain garden BMPs are suitable for LUHPPL uses and appears to meet Fairhaven’s performance standards and design specifications and should qualify as other water quality BMPs under 198-31.1(C)(3)(d). However, the BMPs design should be in full compliance with the MSH standards. Waiver for 198-31.1C (3)(d) – Approval of constructed pocket wetlands and Stormceptor as water quality BMPs has been requested.**

5. 198-31.1(A)(1)(a)[2] - No increase will be allowed in the volume of runoff off of the site up to the ten-year, twenty-four-hour design storm. The proposed drainage calculations shown increase of runoff volume during 2-year and 10-year storm events. The pre-development and post-development 10-year storm runoff volumes (combined DP-1 and DP-2) were 0.525 a.f. and 0.854 a.f., respectively. The applicant has requested a waiver, see Cover Sheet comment #1. *A waiver has been requested. The latest calculations shown post-development runoff volume net increases of 0.874 AF (193%) and 0.329 AF (162%) for 2-year and 10-year storm events, respectively. GCG recommends modifying the pre-development HydroCAD model to reflect the original pre-development conditions (prior to existing paved driveway development). The runoff volume could be controlled by reducing proposed new impervious area. Waiver for 198-31.1.A(1)(a)[2] and C(1)(a), have been requested.*
6. 198-31.1(C)(2)(n)[1-7] – storm drainage system capacity should be calculated based on 25-year storm event. Catch basin inlet and drain pipe capacity calculations should be provided. *Inlet and drain pipe computations are presented in Attachment D. Resolved.*
7. Both proposed Rain Gardens requires pre-treatment to qualify for 90% TSS removal. *The vegetated filter strips will provide pre-treatment. The proposed vegetated filter strip is not compatible with this design, the design as presented require 3' depth soil media and additional 2 feet separation to ESHGW. Resolved.*
8. 198-31.1(C)(4)(a)[2] - provide water quality volume (First Flush) 24 hour detention volume. *There is no requirement to detain the first flush for 24 hours. The constructed pocket wetlands have been confirmed to effectively treat the first flush. The applicant needs to request a waiver by proposed other water quality BMPs under 198-31.1(C)(3)(d). Waiver for 198-31.1C (3)(d) – Approval of constructed pocket wetlands and Stormceptor as water quality BMPs has been requested.*
9. The post-development HydroCAD report did not include the 25-year and 100-year events and GCG was unable to verify the capacity of the drainage design. Freeboard and emergency spillway sizing calculations should also be provided. *The 25- and 100-year drain computations are enclosed. They were inadvertently omitted. Resolved.*
10. MSH standard 3 requires 0.1" groundwater recharge volume over proposed HSG 'D' impervious area. The site is entirely in HGS 'D' soil and recharge is impossible and non-suitable in HSG 'D' soil. MSH calls for "maximum extent practicable" for ground water recharge in this situation. Therefore, the proposed without recharge volume is acceptable for this site. *No response is necessary.*

#### **OPERATIONAL AND MAINTENANCE (O&M) PROGRAM COMMENTS** (O&M plan dated February 18, 2020.)

1. Temporary Erosion Control should include catch basin silt sack erosion silt fence/wattle type of control. **Silt sacks should be added. Off-site catch basin silt sack should be shown.**
2. Snow storage area should be identified on the plan, since both sides of the development are bounded by BMPs. Snow storage areas should not be in the BMPs. **GCG recommends specifying no snow storage within the stormwater BMPs area. Excess snow should be removed off-site by the property owner.**
3. Long term O&M plan catch basin should be inspected and cleaned 4 times per year. Stormceptor is not part of the BMPs proposed. Grass/vegetated filter strip, rain garden, sediment forebays and constructed (pocket) wetland should be included in the O&M plan. **GCG recommends adding clean catch basin including existing on-site catch basin four times per year as required by MSH. Forebay clean out could be reduced**

Auto Dealership Site Plan  
250 Bridge Street  
GCG Job#1988

to once a year, these forebays are part of the pocket wetland system with ponding water and require less maintenance; Rain gardens requires inspect and remove trash monthly, mow 2 to 12 times per year, mulch, fertilize, remove dead vegetation and prune annually; Pocket wetland requires clean out sediment in basin/wetland once every 10 years; Specify disposal of removed sediment and debris off site according to the Federal, State, and local regulations. Remove rain garden from O&M plan.

4. O&M plan should provide a signature block for responsible party/operator signature. **Resolved.**
5. O&M plan should include estimated annual operation budget and long-term O&M (sample) log. **Resolved.**
6. Update O&M plan to include Stormceptor unit.

Summary:

1. The proposed layout has maximized the site and unable to provide the required drainage mitigation with the required side slopes and maintenance access. **GCG believes the site has been maximized to the limit that suitable location for snow storage was unavailable and requires excess snow to be removed offsite. Furthermore, the recommended stormwater maintenance access and pre-treatment for rain garden system would require additional lot area and may affect the development layout.** The proposed pocket wetlands are suitable BMPs for this high seasonal water site. This development would require a few waivers as stated in their waiver requests letter. Without the waivers, the site would have to reduce the proposed impervious coverage to satisfy the regulations. The forebay side slope and maintenance path width are required by MSH. The proposed BMPs with the 10 feet wide path are reasonable for maintenance access.

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

Respectfully Submitted,  
GCG Associates

*Anthony Ma*

Anthony C. Ma, P.E.  
Senior Project Engineer

**Auto Dealership Site Plan  
250 Bridge Street  
GCG Job#1988**