

November 5, 2021

Mr. Ross Povenmire
Office of the Conservation Commission
Town of Boxford
7A Spofford Road
Boxford, Massachusetts 01921

Re: **Response to engineering review comments
Harry Lee Cole School
Boxford, Massachusetts**

Dear Mr. Povenmire:

We are in receipt of technical review comments from third party reviewers for this project. These comments were provided pursuant to our application for a Stormwater Management Permit that is presently being considered by the conservation commission. To date, we have received the following:

- A stormwater engineering review letter from Roux Associates, Inc. to the Office of the Conservation Commission, dated June 16, 2021
- A memorandum to Scott Morrison, Superintendent of Tri Town by Chris Olbrot, PE, Superintendent of Public Works/Town Engineer titled Cole School Parking Lot Improvements (incorporated by reference in the letter from Roux above), dated February 15, 2021

Our submission materials have been revised as described below to address each review comment and are included with the submission of this letter. The review comments from the documents referenced above have been reproduced below, followed by our response to each comment.

Review comments from Roux Associates, June 16, 2021:

1. Although deep hooded catch basins are specified, no dedicated petroleum (including oil, grease, petroleum hydrocarbon) removal BMPs (e.g., oil water separators) are included in the design, which includes stormwater flows from paved areas. Recommend Designer provide justification for why dedicated petroleum removal is not warranted for the project or if petroleum removal is sufficiently provided in accordance with applicable standards for the proposed improvements.

Response: The hood component of the deep-sump hooded catch basins constitutes a petroleum capture BMP, performing a function similar to that of an oil baffle in an oil-grit separator. Under the MA Stormwater Handbook, there are a few points to consider on this topic:

- BMPs such as Oil-Grit Separators that provide extra petroleum removal capacity are generally required for sites considered land uses with higher potential pollutant load (LUHPPLs) under Standard 5 such as industrial sites, large shopping centers, fuel stations, etc. This site is not a LUHPPL.
- Under Standard 6, structural BMPs must be provided that will result in 44% TSS removal prior to discharge into an infiltration system using acceptable Pretreatment BMPs (Table CA 3, Volume 1, Chapter 1, Page 19) for sites that discharge within Zone Is and/or Zone IIs. This site discharges within a Zone II. The criteria gives no explicit requirement for added petroleum removal capacity, but as acceptable pretreatment strategies it lists deep sump hooded catch basins and proprietary separators, the latter of which is met by the proposed isolator row devices. These provide the required pretreatment for this critical area.
- As a redevelopment project, this project is only required to meet the requirements of the MA Stormwater Handbook “to the maximum extent practicable.” That being said, we believe that the

proposed design fully complies with the standards with only minor exceptions noted in response to arsenic levels in the soil.

In light of the considerations listed above, we do not believe that the installation of additional BMPs is required under the MA Stormwater Handbook.

2. Based on the information presented in the LSP Letter, the absence of detectable arsenic concentrations in groundwater monitoring wells MW-1 through MW-4 is a valuable line of evidence; however, we noted the following concerns:

- Based on the concentrations of arsenic present in soils shown on the plan in the LSP Letter, it is presumed that the arsenic is a natural background condition and therefore, may be ubiquitous and variable throughout the Site;
- The infiltration BMP is located almost directly hydraulically upgradient from the Site drinking water well based on the groundwater contour map provided in the LSP Letter;
- Infiltration BMPs may cause groundwater mounding and mobilization of arsenic; and
- Unlike the Spofford School, the LSP Letter does not indicate that Harry Lee Cole School currently provides pre-treatment for arsenic.

Recommend Designer engage in discussions with the Town of Boxford and the Town fully understands the rational and implications of installing an infiltration BMP at this Site.

Response: Weston & Sampson has engaged in lengthy discussions with town and school officials concerning the suitability, rationale and implications of installing an infiltration BMP as this site. Officials are fully aware of our recommendations and the reasoning behind them.

3. A Checklist for Stormwater Report was not included. Recommend Designer include the Checklist for Stormwater Report

Response: The stormwater report has been revised to include the MA DEP "Checklist for Stormwater Report" form.

4. It appears that sufficient TSS removal is incorporated into the design; however, individual TSS removal calculation sheets were not provided for all flow trains which discharge to the Main Street storm sewer. Recommend Designer provide TSS removal calculation worksheets (including contributory TSS removal by deep-hooded catch basins) for at least the following trains:

- A1 → A;
- A2 → DS-1 → A;
- A3 → BR-1 → IS-1 → A;
- A4 → IS-1 → A;
- A5 → A (if appropriate); and
- A8 → A (if appropriate).

Response: The stormwater report has been revised to include the requested TSS removal worksheets.

5. The north arrows in Fig-1 and Fig-2 are reversed in Attachment D. Recommend Designer revise the figures.

Response: The figures have been revised to correct the orientation of the north arrows.

6. There are no details for ICS-1, ICS-2, and ICS-3 (assumed inlet control structures) for the Stormtech systems. Recommend Designer provide details for the inlet control structures.

Response: The ICS structures have no internal baffles, orifice plates, etc that require detailing. Detail 1 on sheet C501 (typical precast concrete manhole detail) covers the ICS construction and the invert elevations are called out on the plan.

7. Based on groundwater elevation included with the LSP Letter, the groundwater elevation in the vicinity of the MC-3500 infiltration chambers is approximate Elev. 90-92 and, based on the information in Civil Drawings Sheet No. C134, the bottom of the MC-3500 system is Elev. 92.5. Two feet of separation should be provided between infiltration BMPs and the seasonal high groundwater table. Recommend Designer indicate whether the groundwater elevations depicted in the LSP Letter reflect seasonal high conditions and provide justification for the applicability of an infiltration BMP in this location.

Response: Test pits TP-3 and TP-4 were excavated for stormwater design evaluation purposes. TP-3 indicated no groundwater and no redoxomorphic features indicating seasonal high groundwater down to a depth of 90.5 feet, at which elevation excavation ceased. If seasonal high groundwater is assumed to occur just below 90.5 then at least two feet of separation has been provided since the bottom of the system is at 92.5. We have conferred with our LSP, and the letter shows "approximate" groundwater elevations and contours based on a limited number of data points. The LSP agrees that the data from the test pits cited above should be used given that it was done within the location of the infiltration system.

8. Based on information in the Civil Drawings detail sheets (No. C507) and the inverts shown in the drainage plan (No. C134), it is uncertain if there is sufficient vertical space is provided for the installation of the MC-3500 (IS-1) infiltration system to meet the minimum cover requirements listed in the detail sheet. Recommend Designer include elevations on the detail sheets for IS-1 (also for DS-1).

Response: The details reference above have been edited to clarify minimum finish grade elevation requirements. Additional detail has also been added to the grading plans at these locations.

9. The details included with the Civil Drawings (Sheet No. C505) for the "Bioretention Area" (BR-1) are inconsistent with the rain garden treatment BMP requirements in the MA SW Handbook:
 - There does not appear to be pretreatment which is necessary to achieve the 90% TSS removal credits for sheet flows to bioretention areas (per the MA SW Handbook);

Response: The detail referenced above has been revised to provide pretreatment measures consisting of a "grass and gravel combination" as specified in the stormwater handbook.

- It is uncertain if filtering is occurring because no impermeable liner with an underdrain was shown on the details, nor, in the case of an infiltration BMP, was exfiltration included with the HydroCAD reports; and

Response: The bioretention area is intended to function as an infiltrating bioretention area, which is consistent with what is shown in the plans and details (i.e. no underdrain or liner shown). Exfiltration was not modeled in the HydroCAD reports which is a conservative approach as it means that peak discharges from the site will potentially be less than what has been modeled if the exfiltration from the bioretention area were taken into account.

- The soil layer is less than 2 feet in thickness and trees and bushes are shown to be planted within BR-1 (L101).

Response: Acknowledged. The stormwater handbook indicates “if trees and shrubs are to be planted the soil media should be at least 3-feet.” The detail has been revised to provide for this depth of soil media.

Recommend Designer provide additional details regarding the construction of the proposed rain garden (BR-1) and, if necessary, review and revise TSS Removal calculations for flows which are treated by the proposed rain garden.

10. The following items were identified with respect to the Operations and Maintenance Plan (Attachment H).
 - o Item 4.2 states, “The site is considered a land use with a higher potential pollutant load, therefore if catch basins are found to be filled to capacity with sediment during a cleaning, the frequency of cleaning shall be increased.” Recommend Designer address this statement which is inconsistent with the Standard 5 statement in the Stormwater Report (“This site is not considered a LUHPPL, as such, Standard 5 does not apply”).

Response: The Operations and Maintenance Plan has been revised to delete the reference to the site being a LUHPPL.

- o Operations and Maintenance plan does not include considerations for pre-treatment BMPs for the bioretention areas (beyond catch basin cleaning).

Response: The Operations and Maintenance Plan has been revised to provide maintenance language related to the bioretention area pretreatment BMPs.

- o The inspection for the bioretention basin (Item 4.7) states, “Basin inspection should include checking for rilling and other signs of erosion.” Recommend Designer add “and gullyng” to the inspection criteria.

Response: The inspection criteria referenced above has been revised to add “gullyng”.

- o The inspection for the bioretention basin (Item 4.7) states, “Care must be taken to maintain the plants in the basin. Salt use must be restricted where runoff flows to the bioretention areas to maintain the plantings.” At the same time, however, the Long Term Pollution Prevention Plan (Attachment F) states, “The operation will utilize salt and sand to treat the paved surfaces of the site during snow and ice events.” Recommend Designer address this conflict.

Response: The LTPPP has been revised to indicate that salt use must be restricted within areas where stormwater drains to the bioretention area.

- o Item 5 states, “The onsite stormwater basins will be shielded from public access by fencing.” However, no fencing was observed around bioretention areas in the Civil Drawings.

Response: This is a reference that we often use relative to deep detention or infiltration basins. In this case we are creating a shallow bioretention area, so the O&M plan has been revised to eliminate this reference.

- o The Operations and Maintenance Plan does not include a plan showing the location of all stormwater BMPs.

Response: A BMP location plan has been added to the O&M plan.

Recommend Designer address these items.

11. The Illicit Discharge Compliance Statement (Attachment I) included with the Stormwater Report does not make a statement that no illicit discharges exist nor document efforts to investigate illicit discharges. Recommend Designer provide a signed statement which states there are no illicit discharges that meets the requirements outlined in the MA SW Handbook.

Response: The illicit discharge compliance statement contains a statement that prohibits the discharge of “any materials” that are other than stormwater (with certain specific exceptions as allowed by the standards as listed). This implies that if illicit discharges, if such were to exist, would also be prohibited. Based upon information to date we are not aware of any existing illicit discharges into the onsite stormwater system. We have revised the illicit discharge compliance statement to clarify that, to the best of the project proponent’s knowledge and belief, no illicit discharges currently exist at the site.

To be clear, Weston & Sampson will not be issuing a statement signed by our company that makes the certification referenced above. Weston & Sampson is a third-party consultant and exercises no operational control over the subject property. Certification by a third-party consultant is not required by the referenced standard. The standard requires that this verification should be issued by the project proponent, which in this case is the Tri-Town School Union.

12. By reference, Roux includes recommendations presented in the Town Letter.

Response: Comments from the referenced letter are reproduced below, followed by our responses. It should be noted that the town letter was based upon a review of a prior version of the plans, and the version of the plans that Roux Associates reviewed had already substantially addressed the comments in the letter.

Review comments from Chris Olbrot, February 15, 2021:

Site/Plan Review and General Comments:

1. A comprehensive investigation and verification of the existing subsurface utilities that are to remain in place in post construction conditions (Post) shall be completed. It appears that much of storm sewer lines (ST) and sewer (S) lines are to remain under the reconstructed areas. The integrity of these pipes and structures should be verified by video inspection to confirm their integrity and capacity. Failure of any of these pipes and numerous structures compromises the longevity of this significant reconstruction investment. Additionally, any pipes that are to be abandoned shall be removed or cut and capped so as not to cause settlement issues in the future. This shall be clearly labeled on the *Site Preparation and Erosion Control Plan (C110)*.

Response: Weston & Sampson has undertaken a limited investigation of underground pipes within the facility, primarily focusing on stormwater infrastructure. The investigation consisted of inserting a specialized camera into manhole and catch basin structures and capturing video imaging of pipes. The

camera is capable of providing imagery of pipe interiors for a distance of approximately 50-feet. We also discussed history of storm drain backups and failures with the director of facilities as a means of evaluating potential problem areas. Based upon this collective information we believe that the storm drain pipes that we intend to re-use are in serviceable condition.

2. The *Site Preparation and Erosion Control Plan (C110)* shall include the following at a minimum:
 - a. Stockpile areas
 - b. Protection of subsurface drainage areas
 - c. Describe how the trees are to be protected on the SW side of the building. These appear to be surrounded by significant grade changes.
 - d. Construction entrance details shall be placed on multiple entrance and egress as they will most likely be utilized during the project.
 - e. Describe what to do with each casting (ie, remove and reset, remove and replace)
 - f. Describe what to do with bollards
 - g. Construction Sequence

The edits above have been incorporated into the plans. Project sequencing requirements will be stipulated in the project specifications prior to construction.

3. The *Overall Materials & Layout Plan (C120)* shall include the following at a minimum:
 - a. The plan shall have a detailed curb tie schedule.
 - b. Note 3 is too vague and problematic. Granite curb shall be inspected and either directed to remove & reset or furnish & install with clear locations and quantities.
4. The *Overall Grading & Drainage Plan (C130)* shall include the following at a minimum:
 - a. All accessible ramps and sidewalks/walkways shall show spot grades. Additionally, walkways (i.e. BSW, TOC/BOC) shots shall be shown at no less than 25' intervals to ensure proper construction and compliance.

Plans have been revised to add additional spot elevations.

- b. Grading of the lots shall have slopes lines from relative high points to low points or drainage areas.

Plans have been revised to add grade breaks, high points, and low points.

- c. The northern entrance shall be evaluated to ensure the steep grade change is accommodating for buses.

This has been evaluated.

5. The *Grading & Drainage Enlargement Plan I & II (C131 & C132)* shall include the following at a minimum:
 - a. Storm Water Rain Garden shall be re-evaluated. Grade lines appear to cross over each other. Grade lines as well as top and bottom of rain garden shall be shown for clarity and ease in construction.

Grading has been adjusted and refined since this comment was made.

- b. The ramp grades shall be evaluated on the SW side of the building. As currently designed it appears to steep to construct to maintain ADA compliance.

Grading has been adjusted and refined since this comment was made.

- c. The pipes and structures to remain shall be verified with respect to their integrity. Many structures and pipes appear to remain part of the final drainage design. To maintain these structures without the benefit of a thorough evaluation, puts undue burden on the town to make a decision with respect to the design. More information is necessary to approve the design.

See response to comment 1 from Chris Olbrot, above.

- d. All accessible ramps and sidewalks/walkways shall show spot grades. Additionally, walkways (i.e. BSW, TOC/BOC) shots shall be shown at no more than 25' intervals to ensure proper construction and ADA compliance. Details of the ramps shall be provided at this scale should the previous scale not be beneficial.

Plans have been revised to add additional spot elevations.

- e. All high points, changes in grade, and slopes from these points shall be shown on the plans to ensure proper drainage and grading to the CBs.

Plans have been revised to add grade breaks, high points, and low points.

- f. A plan view detail shall be provided for the underground detention area.

Construction details of the subsurface chamber systems have been expanded on sheet C506 through sheet C508.

- g. A detail and cross section should be shown of the Bio-Retention Area(s).

Construction details for the bioretention area are shown on sheet C505.

- 6. The *Details Plans* (C500-506) shall include the following at a minimum:
 - a. Sidewalk Scupper Detail calls for porous pavement. This appears to be an error.
 - b. The detectable warning panels shall be cast iron and not composite plastic.
 - c. The outlet control structure detail shall be accurate to the current design with appropriate invert elevations and pipe sizes, etc.
 - d. The rain gardens and infiltration areas details shall have a plan view and cross section view detail clearly showing design intent with elevations of all system components. Also, the plan detail shall show spacing and layout of systems and units. The Detail on Sheet C504 and C505 call for an underdrain but is not shown on the plans.
 - e. The outlet control structure detail on sheet C506 shall be labeled with intended design elevations etc.
 - f. Detail 3 on sheet C506 shall be revised with the intended sump depth.

The edits above have been incorporated into the plans.

- 7. A *Construction Sequence Plan* or narrative should be incorporated into the plan set.

Construction sequencing remains to be discussed with school officials and may vary depending on the timing of when they intend to start the construction project. The desired construction schedule has not been determined yet. Once this has been determined, this information will be furnished as part of the construction set.

Drainage Report Review and Comments:

8. Due to the large number of inconsistencies between the plan set and drainage report, the stormwater mitigation calculations need to be revised and resubmitted for review. Upon closer QA/QC, WSE will find that pipe inverts and slopes, rim elevations, constructability, etc. is not consistent across the plans with respect to the stormwater design report and model. These inconsistencies in design will need to be rectified for the stormwater calculations to be accepted and ensure no negative down-stream impacts.

The calculations and plans have been reviewed and edited for consistency.

9. The drainage report shall be revised to ensure that all downstream modeling is vetted and analyzed. This is particularly the case when modeling the OCS and infiltration system outlets. The culvert pipe outlet is limited to the immediate downstream pipe in both systems. This is not a free discharge culvert and the downstream pipes should be evaluated as well to ensure proper stormwater mitigation and no negative downstream impacts. Please revise and submit for review and approval.

This has been reviewed and the calculations have been updated as needed.

10. The drainage system appears to be overly crowded in several areas. This complicates construction and increases costs. The drainage system should use a design which removes unnecessary pipes and inverts and provides adequate separation from existing pipes and structures. Examples of this can be found near CB-4 and CB-7.

The design has been re-evaluated and edits incorporated into the plans.

11. Rational method pipe sizing calculations should be completed to ensure the system can mitigate the flow as intended.

A pipe network analysis has been completed using Hydraflow Storm Sewers analysis software to determine the capacity of the proposed and existing piping. This information has been included with the revised stormwater report.

12. The calculations for the Diversion Weir shall be provided for review to ensure it is designed as described in the Technical Memorandum attached, dated 03/05/2010.

HydroCAD analysis of the required bypass manifold elevation has been included in the stormwater report.

13. WSE shall provide adequate documentation describing how item number 4 of the letter dated July 29, 2016 signed by Mr. Mark Bergeron, PE is being achieved with respect to pre-treatment prior to an infiltrative BMP. This item describes how the isolator row does **not** provide adequate pre-treatment of hydrocarbons from the parking lot area. Documentation of what acceptable device or practice is being proposed to meet the 44% pre-treatment as necessary to meet Standard 4, for rapid infiltrative soils.

Deep sump hooded catch basins are proposed and will provide removal of hydrocarbons from the stormwater prior to entering the subsurface chamber systems. In combination with the isolator row, this provides more than the required 44% TSS removal prior to entering the infiltration system.

14. The LTOMP shall be revised to omit the Boxford DPW from item 6 as being the Owner/Responsible Party to maintain any of the stormwater BMPs other than Deep Sump CB annual cleaning. DPW does not have the resources or funding to absorb the requirements of the LTOMP.

This has been edited.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.

James I. Pearson
Technical Specialist