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INCORPORATED

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April 7, 2026

Robert Moore, Conservation Agent  
Haverhill Conservation Commission  
4 Summer Street, City Hall Room 300  
Haverhill, MA 01830

**Re: Peer Review Services  
Northern Essex Community College  
Haverhill, MA**

Dear Mr. Moore:

As requested by the City of Haverhill, CEI has completed a technical review of the materials and information listed below for the proposed development project located at Northern Essex Community College in Haverhill, MA. Our review focuses on elements of the proposed project that pertain to the stormwater management design, based on the following information furnished to the Conservation Commission:

- a. Stormwater Management Report, dated February 26, 2026, prepared by prepared by Brennan Consulting;
- b. NOI Report, dated February 26, 2026, prepared by Brennan Consulting;
- c. Site Plans, dated February 26, 2026, prepared by prepared by Brennan Consulting

CEI offers the following comments based on our review of the design drawings and NOI information listed above.

**I. Compliance with Massachusetts Stormwater Management Standards**

**Standard 1:** No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

1. As not all impervious areas are being collected and directed towards the treatment system, the applicant should show that these areas are de minimis per Volume 3 Chapter 1 of the Massachusetts Stormwater Standards.
2. Riprap pads at pipe outlets should be shown on the plan sheets.

***Standard is not met.***

**Standard 2:** Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

1. The area of Hydrologic soil groups should remain consistent between pre- and post-developed conditions.
2. It does not appear that the newly proposed concrete sidewalk in the northern portion of PR3A will be directed to the infiltration drains in the ball field and instead will be intercepted by the

proposed WQU305 or AD304. This also appears to be the case for subcatchment PR1A. Please revise the post development watershed delineations and the HydroCAD model accordingly.

3. Time of concentration should be calculated to the edge of the subcatchment not to the outlet of the entire site. Please adjust calculations accordingly. Basin EX2 does not seem to have been calculated from the most hydrologically distant point.
4. The outlet for Pond 4P does not match the plans and the HydroCAD model. The HydroCAD model has two 12" culverts at 121.0 but the plans show one 18" culvert at 121.40. It appears that the infiltration systems for the fields did not account for the different outlet culverts for each system.

***Standard is not met.***

**Standard 3:** Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures.

1. The recharge calculations should be adjusted to accurately reflect the fact that all impervious surface is not being captured by the infiltration BMPs. A correction factor should be applied according to Volume 3 Chapter 1 of the Massachusetts Stormwater Standards.
2. The soil samples show redoximorphic features within 3 feet of the surface for all the test pits performed at the site. This can be indicative of a shallow Estimated Seasonal High groundwater (ESHGW) which could greatly influence the ability of the infiltration BMPs to drain. This combined with the soils being described as "moist" by the GeoEngineers during the dry season (July). The applicant should confirm the ESHGW at the site.
3. The infiltration systems in the fields currently overestimate the amount of infiltration that will occur. CEI is concerned that the underdrains will capture most of the runoff and redirect the water away before it has the chance to infiltrate. The infiltration utilized also does not account for the compacted subgrade, which can reduce the infiltration rate drastically.
4. The infiltration systems for the fields have outlet pipes below the available storage volume. The model should be revised to more accurately model the proposed systems.
5. The proposed recharge volumes for the baseball field and track do not match the volumes provided in the HydroCAD model.
6. One soil sample for every 5000 square feet of basin area is recommended, with a minimum of three samples for each infiltration basin. Samples should be taken at the actual location of the proposed infiltration basin so that any localized soil conditions are detected. The applicant is proposing 4 subsurface infiltration systems with each system being approximately 66,000 square feet with only 6 soil samples for the entirety of the site.
7. A minimum of 2 soil borings should be taken for each infiltration trench.
8. Infiltration basins should not be used at sites where soils have 30% or greater clay content, or 40% or greater silt clay content.
9. Subsurface systems are highly prone to clogging. Pretreatment is always required unless the runoff is strictly from residential rooftops.

***Standard is not met.***

**Standard 4:** Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).

1. Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of total suspended solids (TSS) related to the total postconstruction impervious area on the site and 60% of the average annual load of total phosphorus (TP) related to the total post-construction impervious surface area on the site. No phosphorous removal calculations were provided.
2. The minimum detention time for the Water Quality Volume in extended dry detention basins is 24 hours. The most traditional and easiest method for extended detention routing is the 24-hour brimful draw down. The applicant should provide calculations that show adequate detention time for the basin per Volume 2 Chapter 2.
3. The contributing drainage area to any deep sump catch basin should not exceed  $\frac{1}{4}$  acre of impervious cover.
4. The TSS removal calculations provided showed pollutant load removal for subcatchment for PR6 but the HydroCAD model shows the subcatchment is being directly discharged to the wetland.
5. Proprietary treatment devices should utilize pollutant removal rates that have been independently verified by a third party such as STEP, TARP, or NJDEP per Volume 2 Chapter 4 of the Massachusetts Stormwater Standards.
6. Sediment forebay calculations should be provided per Volume 2 Chapter 2 to show adequate storage is being provided. At a minimum, size the volume of the sediment forebay to hold 0.1-inch/impervious acre to pretreat the water quality volume.
7. Water quality volumes should be calculated for the impervious area being directed to each stormwater BMP and not calculated on a site wide basis.
8. The applicant has identified a stormwater BMP in subbasin PR4 as rain garden but identifies it in the existing condition plan as gravel, which would be more akin to an infiltration trench.
9. The infiltration trench shows 4" of loam and seed over the top of the trench. CEI is concerned that this will lead to siltation and recommends a pea gravel or sand filter layer along with a protective layer of filter fabric per Volume 2 Chapter 2. CEI also believes that the loam will not have the 50 in/hr infiltration rate that it was modelled with in HydroCAD.

***Standard is not met.***

**Standard 5:** For Land Uses with Higher Potential Pollutant Loads (LUHPPL), source control and pollution prevention shall be implemented.

The project is not a land use with higher potential pollutant loads.

***Standard is not applicable.***

**Standard 6:** Stormwater discharges near or to any critical area require the use of specific source control and pollution prevention measures and the specific structural stormwater best management practices.

1. The western half of the Site is part of the Kenzo Lake Watershed. This is a public drinking water supply watershed, which is classified as an Outstanding Resource Water per 314 CMR 4.00. The south-western portion of the site is also designated as a Zone A per Mass Mapper. Zone A is defined as the land area between the surface water source and the upper boundary of the bank and the land area within a 400-foot lateral distance from the upper boundary of the bank of a Class A surface water source as defined in the Surface Water Quality

Standards, 314 CMR 4.05(3). Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of the public water supply.

***Standard is not met.***

**Standard 7:** Redevelopments projects are required to meet the Massachusetts Stormwater Management Standards only to the maximum extent practicable.

The project is considered new development.

***Standard is met.***

**Standard 8:** A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities.

The applicant has provided an Erosion and Soil Control Plan.

1. Construction sequence and phasing should be specified to reduce the amount of disturbed area at any one time.
2. The minimum length of the gravel pad for the construction entrance should be 50 feet. Longer entrances will provide better cleaning action. The pad should extend the full width of the construction access road or 10 feet whichever is greater. The aggregate should be placed at least six inches thick.
3. A concrete washout area should be specified in the erosion control plan.
4. A narrative of the construction sequence/phasing of the project, including both operation and maintenance for structural and non-structural measures, interim grading, and material stockpiling areas must be provided.
5. Include a note that construction-phase runoff shall not enter the infiltration basins, as this could negatively affect the infiltration rate.
6. The applicant should clarify if construction runoff will be directed towards the post-construction stormwater BMPs.

***Standard is not met.***

**Standard 9:** A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

The Applicant has provided a Long-Term Operation and Maintenance Plan for the Site.

1. The Operation and Maintenance plan must specify where on-site snow will be stored.
2. The applicant did not provide any maintenance plan for the infiltration systems located within the field. Subsurface infiltration systems require rigorous maintenance as they are installed underground and can fail quickly without being noticed.
3. The Long-Term Operation and Maintenance Plan shall at a minimum include:
  - a. Stormwater management system(s) owners; and
  - b. The party or parties responsible for operation and maintenance, including how future property owners will be notified of the presence of the stormwater management system and the requirement for proper operation and maintenance.
4. To ensure compliance with Standard 9, the Order of Conditions should include the continuing conditions set forth below.

- a. All stormwater BMPs shall be operated and maintained in accordance with the design plans and the Operation and Maintenance Plan approved by the issuing authority.
- b. The responsible party shall:
  - i. maintain an operation and maintenance log for the last three years, including inspections, repairs, replacement and disposal (for disposal, the log shall indicate the type of material and the disposal location);
  - ii. make this log available to MassDEP and the Conservation Commission upon request; and
  - iii. allow members and agents of the MassDEP and the Conservation Commission to enter and inspect the premises to evaluate and ensure that the responsibility party complies with the Operation and Maintenance Plan requirements for each BMP.

*Standard is not met.*

**Standard 10:** All illicit discharges to the stormwater management system are prohibited.

The Applicant has provided an Illicit Discharge Compliance Statement in compliance with Standard 10.

*Standard is met.*

## II. Other Comments

1. The proposed courts are within the 25' no-disturbance zone and the 50' no-build zone.
2. Per Volume 2 Chapter 2, extended dry detention basins should use low flow underdrains connected to the principal outlet structure or other downstream discharge point to promote thorough drying of the channel and the basin bottom.
3. The Applicant has proposed the use of an extended dry detention basin on the development, however no details of this practice has been provided. CEI recommends the Applicant include cross section and plan view details of the above noted stormwater management practices on their Construction Detail Sheet.
4. CEI recommends cleanouts in the sub drains for the fields to allow for maintenance.
5. The landscaping plans and civil plans do not match in multiple locations, and the civil plans do not match the pipe calculations provided in the stormwater management report.
6. The plans are unclear about what existing drainage infrastructure will remain and what will be removed. An existing conditions plan should be included in the civil set.

We appreciate the opportunity to provide the City with peer review services. If you have any questions or comments regarding this report, please contact me at 774-843-2007 or [cosullivan@ceiengineers.com](mailto:cosullivan@ceiengineers.com).

Sincerely,

COMPREHENSIVE ENVIRONMENTAL, INC.



Conor O'Sullivan  
Project Review Engineer



Matthew Lundsted, P.E.  
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