COMPREHENSIVE
ENVIRONMENTAL
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April 8, 2026

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

Re: Peer Review Services
890 North Broadway
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 890 North Broadway 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 Civil Design Consultants Inc.;
b. NOI Report, dated February 26, 2026, prepared by Civil Design Consultants Inc.;
c. Site Plans, dated February 26, 2026, prepared by Civil Design Consultants Inc.;
d. Stormwater Management Report, dated November 12, 2009, prepared by Civil Design Consultants Inc.;
e. Watershed Plans, dated May 10, 2009, prepared by Civil Design Consultants Inc.;
f. Site Plans, dated October 14, 2009, prepared by Civil Design Consultants Inc.;
g. Fuel Pad Tank Sketch, dated February 26, 2026, prepared by Civil Design Consultants Inc.

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.

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 applicant is comparing the post-development discharge of the proposed clubhouse area to the post-development discharge of the previously approved 2009 design, as the clubhouse drainage area was originally part of a larger system of stormwater BMPs with a design point at the outlet of the downstream irrigation pond.
    a. The post-development discharge rate from the 2009 design appears to have been taken as the discharge from the subcatchment tributary to the previously proposed wet swale, rather than the discharge from the wet swale itself. As the wet swale provided additional attenuation in the originally approved design, using the upstream subcatchment discharge does not represent the correct allowable discharge rate. Please revise the allowable release rate to reflect the wet swale outlet discharge from the 2009 TP-40 based analysis.
    b. The previously approved discharge rate for the clubhouse area was based on TP-40 rainfall depths. While it may be appropriate to maintain consistency with the originally approved stormwater system sizing using TP-40 rainfall assumptions, the applicant should also demonstrate how the proposed conditions would perform using NOAA Atlas 14 rainfall depths.
    c. CEI also recommends that the applicant consider the effects on the downstream irrigation pond.
2. It appears that there was also a proposed wet pond at the 18th green in the 2009 approved plan that doesn't seem to be accounted for in the new calculations or appear to have been constructed.

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 only show that recharge is being provided for the proposed buildings but not for the 1.62 acres of paved parking. This area does not appear to have been accounted for in the recharge calculations in the 2009 report either as only 1.98 acres of impervious area were provided recharge while about 6.1 acres of impervious area was proposed.
2. Exfiltration within HydroCAD should be modeled as exfiltration over surface area, not wetted area, as Volume 3 Chapter 1 of the Massachusetts Stormwater Standards states that exfiltration should be limited to only the bottom surface.

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.

2. The contributing drainage area to any deep sump catch basin should not exceed ¼ acre of impervious cover.
3. CEI recommends adding curbing around the cart building to ensure pretreatment of any runoff before it enters the stormwater BMPs.

Standard is not met.

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

1. The applicant should clarify the proposed use of the cart barn. If the uses include vehicle and/or equipment maintenance and service areas, it would be considered a LUHPPL.

Standard is not met.

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.

The project site is not located within any critical areas.

Standard is 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. A concrete washout should be specified in the erosion control plan.

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 proposed wet swales are designed with permanent standing water. Stormwater BMPs that maintain standing water may create conditions conducive to mosquito breeding if not properly designed and maintained. In accordance with Volume 2, Chapter 5 of the Massachusetts Stormwater Handbook, the applicant should provide documentation describing how mosquito breeding potential will be minimized through design measures and long-term maintenance practices.
3. 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 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 not provided an Illicit Discharge Compliance Statement in compliance with Standard 10.

Standard is not met.

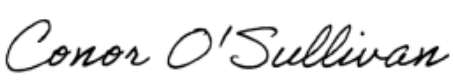
II. Other Comments

1. An inlet capacity analysis should be performed as the catch basins are placed more than 300 feet apart and runoff may pond above the curb with the proposed design.
2. Stormwater drainage pipes should not decrease in size in the downstream direction. At Manhole PDMH-2, a 15" pipe and a 12" pipe enter the structure, but the outlet pipe is 12" in diameter. The outlet pipe must be increased to a minimum of 15" in diameter to match the largest incoming pipe size.
3. The Applicant has proposed the use of a wet swale and an infiltration basin on the development, however no details of these practices of 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 would like to confirm if the catch basins on the east side of Front Drive are existing or proposed. The catch basins are not shown consistently between sheets and the catch basins are not seen in any aerial images.
5. There appears to be substantial encroachment in the 25' no-disturb zone with the proposed wet swale that could be avoided by moving the wet swale slightly to the west.

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.

Sincerely,

COMPREHENSIVE ENVIRONMENTAL, INC.



Conor O'Sullivan
Project Review Engineer

Matthew Lundsted, P.E.
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