

July 26, 2021

Mr. Robert E. Moore, Jr.  
Environmental Health Technician  
City of Haverhill Conservation Department  
City Hall Room 300  
4 Summer Street  
Haverhill, MA 01830

**RE: PEER REVIEW SERVICES  
PROPOSED MULTIFAMILY DEVELOPMENT**

Dear Mr. Moore:

As requested by the City of Haverhill, CEI has completed a follow-up review of the materials and information listed below for the Proposed Multifamily/Mixed Use project located at Railroad Avenue in Haverhill, MA. Our review focuses on design elements of the proposed project that pertain to the stormwater management design and potential hydrologic impacts to resource areas, based on the following information furnished to the Conservation Commission:

1. A Notice of Intent entitled "Proposed Mixed Use Redevelopment – Railroad Avenue 0, 19, & 31-35 Railroad Avenue" dated July 1, 2021, prepared by Bohler Engineering.
2. Drawings entitled "Proposed Site Plan Documents for The Procopio Companies Proposed Multifamily Development" dated July 1, 2021, prepared by Bohler Engineering.
3. Drainage Report for The Procopio Companies Proposed Mixed-Use Redevelopment, dated July 1, 2021, prepared by Bohler Engineering.

The proposed work includes construction of a construction of a 290-unit residential development contained within two five-story buildings. The ground floor of the building will contain various amenities as well as approximately 6,500 sf of retail and restaurant space overlooking the proposed public park on the eastern edge of the site.

CEI offers the following follow-up comments relative to the proposed project:

**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. The Grading and Drainage Plan Sheet A does not indicate treatment devices or infiltration is being proposed in the proposed public park area. Runoff from this area will carry sediment and accumulate debris from walkways and park area into the drainage system, which should be collected with a treatment device. The design plans include a label for a water quality unit (WQU) but it's not clear where the unit is proposed. CEI recommends including a WQU, and other stormwater BMPs, upstream of the outlet pipe to trap sediment and debris before discharging to the Merrimack River.

The public park area offers a space where additional infiltration devices (e.g. rain gardens, tree boxes and infiltration trenches) could be installed to promote groundwater recharge and additional stormwater treatment. The park location provides a good opportunity to educate the community on Low Impact Development (LID) and stormwater BMPs.

2. The proposed dog park area includes an underdrain system to collect runoff, which is tied into an existing drain pipe that discharged to the Merrimack River. It's not clear how runoff collected by the underdrain will be treated for contaminants associated with dog waste (i.e. bacteria).
  - a. A detail of the proposed underdrain system should be included on the plans.

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

The HydroCAD model provided with the Drainage Report appears to accurately represent the existing and proposed conditions and properly routes stormwater through the drainage system. The proposed crushed stone infiltration system beneath the buildings provides significant storage volume to attenuate runoff generated from the impervious surfaces, primarily the roof top area. Additional, smaller infiltration systems are proposed to attenuate runoff from parking lot areas.

3. Peak stormwater discharge rates under proposed conditions do not exceed pre-development rates when evaluating the entire Site. However, peak rates from the existing 12" outlet pipe does increase under proposed conditions for all storm events. Peak rates from the existing 18" outlet pipe increase during the 25 and 100-year storm events.

The HydroCAD model only accounts for runoff from the proposed project Site and adjacent Railroad Avenue. It does not account for runoff from upstream drainage systems that are tied into the 12" and 18" outlet pipes.

The model shows the pipes have sufficient capacity to convey increased runoff from the Site and Railroad Avenue but may not be the case when considering the additional flow that would be generated from the upstream watershed area. CEI recommends additional investigation and modelling of the outlet pipes to account for upstream flows in order to confirm adequate capacity is available for increased flow under proposed development conditions.

4. Have the existing conditions of the two concrete spillways been evaluated to determine if they are adequate to accommodate proposed flows? The spillways may need additional material (i.e. riprap, level spreaders) to help mitigate outlet velocities and better stabilize the embankment.
5. The stormwater system design is dependent on the 24" crushed stone infiltration system beneath the buildings to provide storage and attenuate stormwater. The stone bed is designed to fully drain within 72 hours in order to accommodate the subsequent storm events.

Two water quality inlets in parking garage (beneath the building) and area drains at the central entrance (turnaround) are also tied into the crushed stone infiltration system. This raises a concern for sediment being washed into the stone beds and clogging the system.

The crushed stone bed does not include maintenance access to remove sediment and does not appear to provide a means to restore the stone bed through routine maintenance if it became clogged. As a result of clogging, the infiltration system may not allow the system to fully dewater as designed and the storage volume would therefore not be available to attenuate a future storm event.

6. CEI recommends only roof runoff discharge to the stone infiltration system beneath the buildings. An alternative infiltration system (e.g. storage chambers) should be considered to collect stormwater from the parking garage area and provide maintenance access for remove sediment.
7. CEI recommends an alternative design to collect runoff from the area drains located at the central entrance. Runoff from this area will require treatment for TSS removal.
8. Details and profiles of all proposed infiltration systems and associated drainage structures (e.g. outlet control structures, overflow connections) should be included on the design plans.

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

Recharge Volume and Drawdown calculations were provided to demonstrate the proposed stormwater management system provides sufficient volume to meet Standard 3 requirements.

Soil test pits performed across the Site were relatively consistent with fill material near the surface and underlying fine sand with some gravel. Soils on site are classified as hydrologic soils group B (HSG B), which are consistent with test pit logs and suitable to promote groundwater recharge.

Depth to seasonal high groundwater or mottling observed during soil test pits and borings varied but was generally between elevations 10.0' to 22.0'. It does not appear test pits were completed within the proposed smaller infiltration areas that are located in parking lots adjacent to the buildings.

9. Variability in seasonal high groundwater or mottling makes it difficult to determine if the proposed infiltration system beneath the buildings maintains a 2-foot separation from the bottom of stone. Test pit information indicates proper separation is maintained along the bottom of stone is at elevation 17.0' (side closest to the river) but may not be maintained along the side closest to Railroad Avenue. The proposed bottom of stone closest to the road is 19.0'. Test pits (TP-3 and TP-8) and boring log (B-4) indicate groundwater elevation is 20' to 22', which would place the crushed stone within the seasonal high groundwater.
10. CEI recommends completing additional test pits within the infiltration system areas that are located adjacent to the proposed buildings to confirm adequate separation to groundwater in those locations.

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

Water Quality Volume calculations were provided to demonstrate the proposed stormwater management system provides sufficient volume to meet Standard 4 requirements.

TSS Removal Calculation Worksheets were provided with removal efficiencies for the proposed stormwater BMPs.

11. Backup manufacturer's information should be provided to support the TSS removal efficiencies of the proposed Water Quality Units (WQU) and Water Quality Inlets (WQI).
12. Details of the proposed WQU and WQI should be added to the plans.

13. TSS removal for Subcatchments Areas PR01, PR04 and PR05 provide 45% removal efficiency. These areas include a walkway and vegetated embankment along the Merrimack River. These areas will not likely generate a significant amount of TSS, however the Applicant may want to consider including an infiltration trench along the walkway to collect runoff, provide sediment removal and reduce flow down the embankment.
14. TSS removal for Subcatchments Area PR10 (park area) provides 50% TSS removal using a WQU. As previously noted, the location of the WQU is not clearly indicated on the plans and CEI recommends additional BMPs to provide additional stormwater treatment and infiltration.

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

The proposed project does not meet thresholds or characteristics of a LUHPPL.

15. CEI recommends installing an emergency shut-off valve downstream of the proposed trench drain to isolate the drainage system in the event an accidental spill were to occur at the proposed facility.

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

There are no discharges to Critical Area from the proposed project.

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

16. The Applicant has acknowledged a SWPPP will be submitted as part of the NPDES Construction General Permit filing with EPA. The site owner and the contractor are each considered "operators" under that permit, and each will need to file an EPA Notice of Intent for coverage under that permit. Prior to filing a Notice of Intent, the applicant and its contractor must prepare a Stormwater Pollution Plan (SWPPP).
  - a. The Applicant shall provide the Conservation Commission with a copy of the SWPPP before land disturbance commences.
  - b. The Applicant shall provide the Commission with evidence that all "operators" (as defined in the NPDES Construction General Permit) have filed for coverage under the permit.

- c. The Applicant shall obtain authorization from the Conservation Commission or its agent prior to filing a Notice of Termination under the EPA permit.

17. CEI recommends temporary construction fencing along the proposed erosion/sediment controls to prevent encroachment into protected buffer zones and help contain trash and debris during the construction period.

**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 an Operation & Maintenance Plan Long-Term Pollution Prevention Plan that addresses measures to maintain the proposed stormwater BMPs and drainage management system.

18. The O&M Plan includes snow storage requirements but it doesn't appear there would be adequate space to maintain snow piles on Site.
19. Maintenance procedures for the vegetated buffer along the river embankment should be added to the O&M Plan.
20. Spill Prevention and Response Procedures should prohibit vehicle washing at the facility.
21. Contact information need to be updated on the Spill Prevention and Countermeasure Form.

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

The Applicant has furnish an Illicit Discharge Statement that will be submitted to the Conservation Commission upon completing construction of the drainage system. Any pipe connections or other discharges into the system should be noted and described at the time of the inspection, and any connection that cannot be accounted for should be further evaluated as a potential illicit connection.

### **General Comments**

22. A more detailed plan of the proposed bank restoration and stabilization should be included on the design plans. Landscape details for Erosion Control Blankets and Fiber Tube were included but the plans do not indicate where these slope stabilization treatments are located.

23. A note included on the Fiber Tube calls for tubes to be filled with flocculants. Additional information should be provided for the proposed Fiber Tubes with specifications for Manufacturer's flocculants.
24. A more detailed plan of the proposed walking path is needed to evaluate impacts to the embankment. It's not clear how the proposed walking path will be installed to gain access to the dock along the steep embankment. Will the path require retaining walls to provide proper grades for access and what material is proposed for the path surfaces? Proposed grading for the walking path and embankment are needed.
25. How will embankment stabilization be maintained during construction of the walking path? Additional detail for erosion and sediment controls are needed for this area of the Site.
26. Landscape details for Erosion Control Blankets and Fiber Tube were included but the plans do not indicate where these slope stabilization treatments are located.

If you have any questions or comments regarding this report please contact me at 508-281-5160.

Sincerely,

COMPREHENSIVE ENVIRONMENTAL INC



Curt Busto  
Project Engineer