



COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

Oct 5, 2021

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

**Re: Peer Review Services
38 Railroad Street
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 Industrial Site Development at 38 Railroad Street in Haverhill, MA. Our review focuses on design elements of the proposed project that pertain to the stormwater management design, based on the following information furnished to the Conservation Commission:

1. Notice of Intent Application, dated September 2, 2021, prepared by Huges Environmental Consulting;
2. Design Drawings entitled "Proposed Site Plan at 38 Railroad Street", revised date 8/25/21, prepared by Millennium Engineering Inc.;
3. Stormwater Management Report, dated 8/25/21, prepared by prepared by Millennium Engineering Inc.

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

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.

Deep sump catch basins, hydrodynamic separator (CDS) and subsurface infiltration systems are proposed to provide treatment.

See comments below regarding TSS removal.



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 precipitation frequencies used in the HydroCAD model are not consistent with the current NOAA14 Precipitation Frequency Estimates. The NOAA14 frequencies are recommended to reflect the current range storm events used to model peak runoff flows for pre and post-development conditions. The model should be revised with the NOAA14 precipitation frequencies for each storm event.
2. The total Pre-Development subcatchment area is greater than the Post-Development area in the HydroCAD model. The model should be revised with matching pre and post-subcatchment areas.

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

The Stormwater Report also indicates the soils on Site are mainly Hydrologic Soil Group A (HSG A). Soil test pit information provided on Sheet 11 supports the Site's soil characteristics. An infiltration rate of 2.41 in/hr is applied in HydroCAD to model the proposed infiltration systems.

4. Soil test pits were not completed within the two subsurface infiltration system areas. CEI recommends performing test pits to confirm the estimated Seasonal High Groundwater (ESHGW) elevation at each of the proposed locations.
5. The two nearest soil test pits (T.PIT#19-1 and #19-4) indicate ESHGW is approximately 75" to 82" below the existing grade. The ESHGW elevation in the proximity of the subsurface infiltration systems is 11.75' to 12.2'.

The proposed bottom of stone elevation for the subsurface infiltration systems (indicated on Sheet 9) is 13.0'. The stone elevation does not provide a minimum 2 foot of separation to ESHGW, as required by the Stormwater Handbook design guidelines for infiltration systems.

6. The Simple Dynamic Method was used to calculate the storage volume needed by the two subsurface infiltration systems to meet the recharge volume requirements. This method takes into account that exfiltration occurs while the storage chambers are filling during a storm event. As indicated in the Stormwater Handbook (Volume 3, Chapter 1, page 19), the Simple Dynamic Method can produce smaller storage requirements in sandy soils (HSG A), which is the case at this Site.



Calculations provided in the Stormwater report indicate the proposed infiltration systems provide sufficient recharge volume. However, concern for separation to groundwater may limit the infiltration capacity of the proposed systems and ability to achieve the design rate. CEI recommends using the Static Method (assumes no infiltration occurs until the system is filled to the required recharge volume elevation) to size the infiltration systems. This is a more conservative approach that will provide additional storage volume to increase stormwater attenuation.

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

TSS Removal Calculation Worksheets were provided with the Stormwater Report.

3. A TSS removal efficiency of 92% was included for the Contech CDS unit. A manufacturer TSS removal worksheet should be provided using the proposed water quality volume (WQV) flow rate through the unit.

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.

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.

The Applicant has indicated there are discharges to Critical Areas. The Limit of NHESP Estimated and Priority Habitat Areas is identified on the plans. The proposed stormwater management design includes BMPs to provide treatment and prevent impacts to the Critical Areas.

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

The proposed project is considered a redevelopment and meets the definition outlined by Standard 7.

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



4. The Applicant is required to submit 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.
5. CEI recommends the installation of temporary fencing around the proposed infiltration areas to provide an additional visual indicator to prevent encroachment of construction equipment into the area.
6. Due to the close proximity to the Merrimack River, CEI recommends installation of erosion control blankets in areas that are disturbed where invasive plant removal and other construction activities that will occur along the embankment.
7. Include silt sock perimeter controls around the proposed temporary stockpile location.
8. The silt sock installation detail should show overlapping ends with a minimum 2-foot requirement.
9. Catch basin inlet protection (e.g. silt sack) should be labelled for all proposed catch basins and any existing catch basins along Railroad Street that are adjacent to the Site.
 - a. Locations should be identified on the Open Space & Erosion Control Plan;
 - b. General Erosion Control Notes (Sheet 11) should include installation of silt sacks;
 - c. A detail of the inlet protection should be included on the plans.
10. General Erosion Control Notes should include installation of construction entrance.
11. CEI recommends including temporary construction fencing along the limit of work to contain construction wastes and prevent impacts to adjacent properties.
 - a. Installation of temporary construction fencing should be included in the Construction Sequence.



12. Include location for concrete cleanout and drum wash water.
 - a. A detail of a containment structure should be added to the plans.
13. Snow storage locations during the construction period should be included on the plans.

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

14. A standalone Long Term Pollution Prevention and Operation and Management Plan (O&M Plan) should be provided as a reference document for the facility owner(s) to review the property's stormwater management plan and BMP inspection and maintenance requirements.
 - a. Please refer to the Massachusetts Stormwater Handbook for information that should be included in the O&M Plan.
15. A Site plan should be included in the O&M Plan to identify the locations of stormwater BMPs. Snow storage areas should also be identified on the plan at locations where snow melt runoff will be directed to stormwater BMPs for proper treatment.
 - a. Proper snow storage requirements should be outlined in the O&M Plan.
16. Outfall riprap apron inspection and maintenance procedures should require removal of sediment and debris and repair of any erosion channels or vegetation loss.
17. Underground Detention System inspection and maintenance procedures should be included in the O&M Plan.
18. Procedures for embankment inspection and repair of eroded areas should be included in the in the O&M Plan.

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

19. Upon completion of the drain age system construction, the Applicant shall furnish documentation to the Conservation Commission, which states illicit discharge inspections were performed following the construction of the drainage system. Inspections are required prior to the discharge of any stormwater to post-construction BMPs.
20. Dumpster location should be included on the plans. The dumpster pad should include curbing to direct runoff to an adjacent catch basin for proper treatment.

General Comments



21. The Grading and Drainage Plan (Sheet 4) includes a Flood Storage table of the Project's compensatory flood storage. It's difficult to identify these locations on the plans and would be helpful to show them as shaded areas that correspond to the summary table.
22. The Infiltration Chamber Detail (Sheet 9) should include the size of crushed stone around the chambers. Washed crushed stone should be required for use in all infiltration BMPs.
23. Infiltration system inspection/cleanout port detail was provided. Cleanouts are needed for each row of chambers to provide proper maintenance access to remove sediment and debris.
24. Plans of the proposed infiltration systems should be added to the plans that show the configuration of the chambers and header pipes. Locations of risers, inspection ports and cleanouts should be indicated on the infiltration chamber plans.
25. Include outlet protection (e.g. riprap aprons) downstream of all outlet pipes along the embankment.
 - a. A detail of the outlet protection, with sizing requirements, should be added to the plans.

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