

Ms. Kathleen Colwell
Planning Division Director
City of Methuen
41 Pleasant Street Suite 217
Methuen, Massachusetts 01844

May 7, 2025

Re: Stormwater Peer Review #2
47 Lowell Street – Methuen, MA

Dear Ms. Colwell:

On behalf of the City of Methuen, TEC, Inc. (TEC) reviewed documents as part of a stormwater peer review for the proposed duplex townhouse located at 47 Lowell Street in Methuen, Massachusetts. PJF and Associates (the "Applicant") submitted the following documents which TEC reviewed for conformance with the Town of Methuen Stormwater Bylaws, Massachusetts Stormwater Standards, and generally accepted industry standards:

- *Proposed Site Plan*; prepared by PJF and Associates; Dated December 31, 2024, revised April 29, 2025
- *Proposed Site Plan*; prepared by PJF and Associates; Dated February 3, 2025
- *Architect Summary of Changes*; prepared by LYF Architects; Dated February 4, 2025
- *Drainage Report*; prepared by Sullivan Engineering Group, LLC; Dated January 23, 2025, Revised April 29, 2025
- *Floor Plans*; prepared by LYF Architects; Dated June 5, 2024

For consistency, the original comment numbers have been retained from the most recent TEC Peer Review letter dated February 26, 2025. The Applicant's responses to the comments are shown as **bold**; TEC's responses are shown as *italic*.

Upon review of the documents and plans, TEC has compiled the following comments for the City's consideration:

Stormwater Management

- 1) Methuen Stormwater Regulations Section 9.G.4 state '*Watershed area for hydrologic analysis and BMP sizing calculations must include at a minimum the site area and all upgradient areas from which stormwater runoff flows onto the site.*' The Applicant should include the area flowing from off site to the site in their calculations to determine peak water elevations within the site.

Sullivan: The full watershed upgradient of the project site has been added to the plan for both the Existing Conditions and Proposed Site Condition.

TEC: Comment addressed.

- 2) The Drainage Report narrative states that there is no off-site runoff at this property and identifies the design point as internal to the site. Review of the surrounding topography indicates that stormwater in the existing condition has the potential to also pond within and flow through 50 Pelham Street towards the Pelham Street and Pelham Ave right-of-ways.

Sullivan: In reviewing the Town GIS contours it does appear there is potential stormwater to pond within the site at the internal low area during heavy rain events. There is the possibility that ponded water could carry onto 50 Pelham Street property, although with the A-soils onsite and the relative flat topography it is most likely water would be contained on the property and infiltrate into the ground. The potential for stormwater carryover to 50 Pelham Street has been eliminated in the proposed design.

TEC: Comment addressed.

- 3) The Applicant claims "de minimis" conditions for subcatchment 2S_P. The Applicant should provide the TSS weighted average calculation per Volume 3 Chapter 1 of the Massachusetts Stormwater Handbook.

Sullivan: Calculations have been provided for the small subcatchment area that drains to Lowell Street to confirm that the peak rate and volume of stormwater has been reduced in the 2, 10, 25, & 100 year storm event.

TEC: De minimis stormwater refers to Standard 4. The Applicant should achieve 80% TSS removal on an average weighted basis for the site as a whole using the weighted average method described in Volume 3 Chapter 1 Documenting Compliance. In saying this, the Applicant most likely does meet this weighted average, however the calculation was not provided.

- 4) Per Section 9.A.6 of the Methuen Stormwater Regulations: 'The Applicant must provide a Massachusetts Department of Environmental Protection Checklist for Stormwater Report completed, stamped and signed by a registered Professional Engineer (PE) licensed in the Commonwealth of Massachusetts to certify that the Stormwater Management Plan is in accordance with the criteria established in the Massachusetts Stormwater Management Standards, the Stormwater Ordinance, and these regulations.'

Sullivan: A completed Stormwater checklist is attached.

TEC: Comment addressed.

5) The following comments are regarding the subsurface infiltration system:

a) Per Volume 2 Chapter 2 of the Massachusetts Stormwater Handbook, an Infiltration BMP distance from any building foundations shall be a minimum of 10 feet downslope or 100 feet upslope. The proposed duplex and existing neighboring foundations are within 100 feet downslope of the subsurface infiltration chambers

Sullivan: In reviewing the Massachusetts Stormwater Handbook ONLY a infiltration basin is required to be a minimum of 10 feet downslope or 100 feet upslope of a foundation. PLEASE SEE VOLUME 2, CHAPTER 2 FOR SUBSURFACE STRUCTURES...THERE IS NO REQUIREMENT FOR 100 FEET UPSLOPE OF A FOUNDATION.

TEC: MassDEP lists infiltration chambers as a “suitable alternative” to traditional infiltration basins. TEC maintains that subsurface infiltration chambers shall meet the setback requirements of infiltration basins. All infiltration BMPs within these setbacks carry the potential to interfere with the subsurface conditions of nearby structure foundations/basements. The Applicant does not show the location of the building at 52-54A Pelham Road which is downgradient of the system, however the bottom of the system is relatively close (2' separation) to seasonal high groundwater, and appears to be at least 70 feet away. TEC defers to the City for determination of this requirement.

b) The soils present at the site indicate rapid infiltration conditions. Per Volume 2 Chapter 2 of the Massachusetts Stormwater Handbook 44% TSS pretreatment should be provided prior to discharge to the infiltration structure. Additionally, the Applicant should provide the Soil Test Pit logs as part of the submission.

Sullivan: Soil Test Pit Logs are provided on Sheet 3 of 3. Soil testhole locations are shown on Sheet 1 & Sheet 2. A series of 3 deep sump catchbasins are provided PRIOR to discharge to the drain field which provide greater than 44% TSS removal as pretreatment (see TSS worksheet attached)

TEC: Comment partially addressed, the applicant has provided testpit logs. However, per the Stormwater Handbook: “deep sump catch basins receive credit for removing TSS only if they are used for pretreatment and designed as offline systems”, not in series. The current design does not provide 44% pretreatment, however the end location of the stormwater is the infiltration system. The Applicant’s Operations and Maintenance Plan specifies if the system gets clogged, it will need to be “cleaned and repaired or replaced as needed to maintain proper functioning.” TEC defers to the City for determination of this requirement.

c) The Applicant should provide required recharge calculations per Standard 3 of the Massachusetts Stormwater Handbook.

Sullivan:

Total impervious area: 9,222 s.f.

Total site volume required to be recharged; 9,222 s.f. x 1"/12 x 0.60 = 461 cf

Site volume recharge provided 3,528 c.f. (10 year storm) > 461 cf (meet standard)

TEC: Comment addressed.

5) The following comments are regarding the subsurface infiltration system(Continued)

- d) The subsurface infiltration system is required to fully infiltrate within 72 hours. The Applicant should provide a drawdown calculation per Volume 3 Chapter 1 of the Massachusetts Stormwater Handbook.

Sullivan:

Peak Elevation in chambers: 121.63

Bottom of chambers: 120.70

Difference: 0.93' or 11.16"

Drawdown: 8.27 in/hr so for 11.16" drop....1.35 hr < 72 hrs (meets standard)

TEC: The storage volume below the lowest outlet is typically used for this calculation, however the chambers are capable of infiltrating the entire storage volume within 72 hours. Comment addressed.

- e) According to the Massachusetts Stormwater Checklist, a mounding analysis is required when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four (4) feet and the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm.

Sullivan: A mounding analysis is attached

TEC: Comment addressed.

6) The following comments are regarding the HydroCAD model:

- a) Only the area of Lot 2 is modelled in HydroCAD. The stormwater model should include the entirety of the subcatchments in Lots 1 and 2, as shown in the Drainage Maps.

Sullivan: Both Lot 1 & Lot 2 are modeled in the HydroCAD analysis

TEC: Comment addressed.

- b) The Applicant should include all the water this system will see, including offsite upgradient areas per Methuen Stormwater Regulations Section 9.G.4.

Sullivan: All upgradient land areas that drain to the site are modeled.

TEC: Comment addressed.

6) The following comments are regarding the HydroCAD model: (Continued)

- c) The Applicant should provide analysis of the ponding condition created in the back yard for the events where the infiltration chambers overflow via the primary outlet, to determine peak water elevation does not overtop the proposed wall on the northeast property line and/or flood the basement of the duplex.

Sullivan: There is no overflow for the drainage field for the 2,10. and 25 year storm event. In the 100 year storm event water will exit the catchbasin grate and pond to elevation 123.96' (this is 1 foot below the slab elevation of the proposed duplex and below the height of the retaining wall along the easterly side)...therefore no flooding issues affecting abutters or the proposed duplex are anticipated.

TEC: Comment addressed.

7) The following comments address the site grading:

- a) The site grading and landscape wall design as proposed will create a ponding condition north of the proposed duplex, and should be properly modeled.

Sullivan: To eliminate the ponding condition north of the proposed duplex a deep sump catchbasin has been added to the design and has been modeled.

TEC: Comment addressed.

- b) The driveway low point at Elevation 125 as proposed will create ponding across the width of the driveway. To prevent this, the pavement should be pitched north towards the proposed catch basin.

Sullivan: Spot grades have been added on the driveway to show the driveway is pitched to the catchbasin.

TEC: Comment addressed.

8) The following comments pertain to the proposed stormwater management design:

- a) TEC recommends a drainage structure or cleanout at the connection of the roof drain and 12" HDPE drain.

Sullivan: A cleanout was added at the connection point of the roof drain and the 12" HPDE drain.

TEC: Comment addressed.

8) The following comments pertain to the proposed stormwater management design: (Continued)

b) Methuen Stormwater Regulations Section 9.C.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 post-construction 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.*' The Applicant should provide TSS and TP removal BMPs and calculations for the proposed duplex that meet new development standards.

Sullivan: TSS and TP calculations have been provided (attached)

TEC: Per the Stormwater Handbook: "deep sump catch basins receive credit for removing TSS only if they are used for pretreatment and designed as offline systems". The catch basin used as chamber overflow will not provide treatment. The current design provides a TSS removal rate of 85% for impervious entering the infiltration chambers in contrast to the required 90%. TEC defers to the City for a determination of this requirement.

The chambers are designed to retain and infiltrate the 1" water quality storm event, meeting the required Total Phosphorus removal within the new development area per Methuen Stormwater Regulations.

c) Methuen Stormwater Regulations Section 9.C.1: '*Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual postconstruction load of Total Suspended Solids (TSS) related to the total postconstruction impervious area on the site and 50% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site.*' The Applicant should provide TSS and TP removal BMPs and calculations for the historic house renovation that meet redevelopment standards.

Sullivan: TSS and TP calculations have been provided (attached)

TEC: The redevelopment area appears to align with subcatchment 2S. See comment 3 regarding TSS removal requirements at Subcatchment 2S_P. The stormwater management system does not propose phosphorus removal within this small redevelopment area, however the site as a whole meets this requirement. TEC defers to the City for a determination of this requirement.

9) The Applicant should provide an erosion and sedimentation control plan meeting all requirements of Standard 8 of the Massachusetts Stormwater Standards and Section 10 of the Methuen Stormwater Regulations.

Sullivan: Erosion control is shown on Sheet 2 of 3. For this site since fill is required no soil stockpiling is proposed. Additionally, there already exists a paved driveway that will serve as a construction entrance.

TEC: A stone construction entrance should be added to the plans to prevent sediment tracked onto Lowell Street. Details of the silt sock and construction entrance should be added to the site plans.

Please do not hesitate to contact me directly if you have any questions concerning our comments at 978-794-1792. Thank you for your consideration.

Sincerely,
TEC, Inc.
“*The Engineering Corporation*”



David Nader, PE
Project Manager