

Ms. Kathleen Bradley-Colwell
Planning Division Director
Department of Economic and Community Development
City of Methuen
41 Pleasant Street
Methuen, MA 01844

September 3, 2024

Re: Brookview Heights Subdivision, Methuen, MA
Civil Engineering Peer Review

Dear Ms. Bradley-Colwell and Members of the Planning Board:

On behalf of the City of Methuen, TEC, Inc. (TEC) has reviewed documents as part of the civil engineering peer review for the proposed subdivision project located at Lots 53C, 66B, 66D, and 67E of Map 908 Block 78E. Greenman-Pedersen, Inc., ("Applicant") submitted the following supplemental documentation which were reviewed by TEC for conformance with the applicable sections of the City of Methuen Zoning Ordinance, Stormwater Management Rules and Regulations, and Subdivision Regulations. The submission was also reviewed for conformance with the Massachusetts DEP Stormwater Standards and generally accepted industry standards:

- *Brookview Heights Subdivision TEC Civil Engineering Peer Review Comment Response Letter*, prepared by Greenman-Pedersen, Inc., dated August 5, 2024
- *Brookview Heights Definitive Subdivision Review Comment Response Letter*, prepared by Greenman-Pedersen, Inc., dated August 5, 2024
- *Definitive Subdivision Plans*, prepared by Greenman-Pedersen, Inc., last revised August 2, 2024
- *Stormwater Management Report*, prepared by Greenman-Pedersen, Inc., last revised August 2, 2024
- *Operation & Maintenance Plan and Long Term Pollution Prevention Plan For Stormwater Management Systems*, prepared by Greenman-Pedersen, Inc., last revised August 2, 2024
- *Fire Truck Turn Exhibit*, prepared by Greenman-Pedersen, Inc., last revised March 6, 2024

For consistency, the original comment numbers have been retained from the previous TEC Peer Review Letter dated April 4, 2024. Comments that have been noted as addressed have been removed from the list. 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 Board's consideration:

Waiver Requests

1. **Section 4.2.3.2 Dead Ends – Streets greater than 500' (Washington Street 1,300', Edgewater Drive 1,500')** - TEC has provided recommendations within the Traffic Impact and Traffic Engineering Site Plan Review comments herein to address the proposed dead-end condition. See comment #33.
GPI 8/5/24: Our responses related to the dead-end street recommendations are within the Traffic Impact and Engineering Site Plan Review section.
TEC 9/3/24: Comment addressed.

2. **Section 5.3.1 Street and Roadways – General – 26' Pavement width required, 24' width proposed for Washington Street and 22' width proposed for Edgewater Drive** – The applicant has not provided justification for the decreased street width.
GPI 8/5/24: The 24' width proposed for Washington Street is consistent with the width of existing pavement within Washington Street south of Old Ferry Drive.

Regarding Edgewater Drive, any roadway that carries less than 400 vehicles per day (vpd) is classified as a low-volume roadway. AASHTO and other design guidance documents cite lane widths of 9 feet with a 2-foot shoulder as appropriate for rural low-volume roadways. The proposed paved width of 22 feet for Edgewater Drive exceeds AASHTO recommendations. The reduction in pavement width had environmental benefit by reducing stormwater runoff and reducing the need for processed and manufactured materials (base gravels, asphalt, etc.). A sidewalk will be constructed along one side of Edgewater Drive to provide separation between vehicles and pedestrians.

TEC 9/3/24: Although a waiver is technically required as this project was submitted under the prior Subdivision Rules and Regulations, TEC notes that under the updated Subdivision Rules and Regulations dated August 14, 2024 a waiver will no longer be required as this meets the newly adopted standards.

3. **Section 5.3.7 Curbs and Berms – Sloped granite curbing required, bituminous concrete curbing proposed** – TEC offers that bituminous concrete curbing may require additional maintenance for the municipality on public roads when compared to the required sloped granite curbing.
GPI 8/5/24: Comment acknowledged
TEC 9/3/24: Although a waiver is technically required as this project was submitted under the prior Subdivision Rules and Regulations, TEC notes that under the updated Subdivision Rules and Regulations dated August 14, 2024 a waiver will no longer be required as this meets the newly adopted standards.

4. **Section 5.7.1 Sidewalk Location – 5' wide sidewalks along both sides required, sidewalk on only one side proposed** – TEC understands that there are no sidewalks proposed on the extension of Washington Street. TEC has provided recommendations within the Traffic Impact and Traffic Engineering Site Plan Review comments herein to address this. See comments #31 and 32.
GPI 8/5/24: Our responses related to sidewalks within Washington Street are within the Traffic Impact and Engineering Site Plan Review section.
TEC 9/3/24: TEC continues to recommend the addition of a sidewalk on at least one side of Washington Street. TEC defers to the opinion of the board.

Subdivision Rules and Regulations

5. Pursuant to section 4.2.4.1 for maximum centerline slope, station 5+00 to 11+00 of Washington street exceeds the maximum allowable slope. The applicant has designed a portion of Washington Street at an 11.25% grade with driveways that will be very difficult to safely transition at Lots 1 through 4 and Lots 28 and 29. TEC recommends that the applicant review alternatives to comply with the requirement of the regulations.

GPI 8/5/24: Washington Street is currently a public way, and the proposed road grade matches the grade that is out there today. Compliance with the 8% maximum grade for new subdivision streets would require significant amounts of fill, large retaining walls within the public right-of-way down near Edgewater Drive to avoid impacting wetlands on both sides of the road, and would render the land on either side of Washington Street inaccessible.

TEC 9/3/24: TEC understands the concerns presented by the applicant, though we remain concerned about the proposed driveway connections and recommend that the applicant consider placement of the driveways such that they are situated in areas where the centerline remains in compliance with the regulations. An additional waiver request of section 4.2.4.1 is required if this regulation cannot be met.

6. Pursuant to section 4.7.1, the Community Development Board requires that trees be planted along all new streets at a specified interval. Applicant should update the submission in accordance with these requirements.

GPI 8/5/24: Street tree planting only applies to Edgewater Drive. On Sheet 2 we have added Construction Note 26 requiring the planting of trees along both sides of Edgewater Drive along in accordance with the requirements of section 4.7.1 and 4.7.2.

TEC 9/3/24: Comment addressed.

7. Pursuant to section 5.3.8, granite curb inlets shall be provided at all catch basin locations. Please verify if a waiver is being sought from this requirement.

GPI 8/5/24: A waiver is being sought to not provide granite curb inlets at all catch basin locations. This waiver has been added to the list on Sheet 2.

TEC 9/3/24: Comment addressed.

8. Pursuant to section 5.7, TEC recommends that the applicant provides a sidewalk cross section to verify compliance with sidewalk base, pavement, and accessibility requirements specified.

GPI 8/5/24: The Edgewater Drive Cross-Section detail on Sheet 26 has been revised to specify the sidewalk base material, pavement thickness, and a maximum 2% cross-slope to meet ADA requirements.

TEC 9/3/24: Comment addressed.

Site Plan Review

9. A fire truck turning plan should be provided to verify access is adequate for emergency vehicles. Approval of the fire truck turning plan should be provided by the Fire Department.

GPI 8/5/24: A fire truck turning exhibit has been prepared and forwarded to the Methuen Fire Department for their review and approval.

TEC 9/3/24: TEC defers to the Fire Department for approval.

10. TEC recommends that the applicant update the profile to identify crossing utilities and separation distances. The applicant should include protection requirements of the proposed sanitary line, if necessary.
GPI 8/5/24: We have revised the location of several utilities to provide a better layout and required horizontal separation. We are currently evaluating vertical separation distances and will provide that information on a subsequent update to the plans.
TEC 9/3/24: TEC will provide review of the utility layout on the subsequent plans.
11. On the Washington Street Plan and Profile Sheet 22 of 32 – revise the bar scale to match the noted scale.
GPI 8/5/24: The bar scale has been revised as requested.
TEC 9/3/24: Comment addressed.
12. There appears to be several areas where the proposed water line conflicts with other structures, including CB-9, CB-7, CB-5, and CB-3.
GPI 8/5/24: We are currently evaluating any water line conflicts with other utilities and will make any necessary adjustments on a subsequent update to the plans.
TEC 9/3/24: TEC will provide review of the utility layout on the subsequent plans.
13. There are two trench sections provided in the details, on sheet 27 and 28. Revise the plans to indicate which utility these are specific to.
GPI 8/5/24: The trench section on Sheet 27 has been revised to say Standard Sewer Trench Section and the trench section on Sheet 28 has been revised to say Drain Trench Section.
TEC 9/3/24: Comment addressed.
14. On the Pump Station Details Sheet 31 of 32 – The pump station detail is missing elevations for inverts, finish grade, and other structure elevations. Please provide this missing information. Additionally, the pipe routing shown on the detail does not appear to match the plan, please verify the intended routing and layout of the design.
GPI 8/5/24: The missing information on the pump station detail has been added to the plan and the pipe layout on the design plans revised to reflect what is intended.
TEC 9/3/24: Comment addressed.
15. The proposed pump station requires review and approval by the Department of Public Works.
GPI 8/5/24: The applicant intends to have the pump station remain private with maintenance being the responsibility of the homeowner's association.
TEC 9/3/24: The service connection and construction of the force main requires review and approval by the Department of Public Works.
16. The Washington Street and Edgewater Drive cross-sections show a 3' minimum cover on sewer lines. TEC recommends the minimum cover of sewer to be 5'.
GPI 8/5/24: Both cross-sections have been revised to specify a minimum cover of 5' for the sewer.
TEC 9/3/24: Comment addressed

17. There are several locations where the waterline is within the 10' separation requirement, specifically as a result of avoiding conflict with proposed catch basin structures.
GPI 8/5/24: The utility layout has been revised to provide the required 10' separation between water and sewer.
TEC 9/3/24: Comment addressed.
18. The profile does not include the proposed sewer force main. It is not clear if air/vacuum valves are required.
GPI 8/5/24: The locations for an air/vacuum valve manhole at the sewer force main high point and a cleanout manhole at the sewer force main low point have been added to the plan view on Sheet 21.
TEC 9/3/24: Comment addressed, although there is a utility conflict at approximate station 2+30 with the existing hydrant scheduled to remain, please revise.
19. Revise the locations of catch basins 14, 15, 16, 17 to be located at low point of road.
GPI 8/5/24: The locations of catch basins 14, 15, 16, and 17 have been corrected.
TEC 9/3/24: Comment addressed.
20. The plans appear to be missing rim and invert information for the following structures: YD-1, YD-2, YD-3, DMH-11, DMH-14, and DMH-15. Please provide this information.
GPI 8/5/24: The missing rim and invert information along with some missing pipe size, length, and slope data, has been added to the plans.
TEC 9/3/24: Comment addressed.
21. TEC recommends that the plans be updated to provide the following details: level spreader, pavement tie-in at sawcut locations, yard drains, guardrail, retaining wall, and overflow spillways.
GPI 8/5/24: These details have been added to the plans as requested.
TEC 9/3/24: Comment addressed. However, the yard drain detail specifies a frame and cover, whereas a frame and grate appear to be appropriate for the design.

Stormwater Management Review

22. Applicant identifies that a portion of the project is located within a flood hazard zone AE. Please include the FIRM panel identified in section 2 of the stormwater management report and include this boundary on the existing conditions plan.
GPI 8/5/24: The boundary of flood hazard zone AE as shown on the FIRM panel has been added to the existing conditions plan as requested. A copy of the FIRMette is included in the revised stormwater management report.
TEC 9/3/24: Comment addressed.
23. The above ground Infiltration Basin #1 (INF 1) 72-hour drawdown time calculation does not appear to be supported by test pits completed within the bounds of the basin. Please clarify.
GPI 8/5/24: Additional test pits were dug within the bounds of the Infiltration Basin #1 and identified loamy sand.
TEC 9/3/24: Comment addressed.

24. Pursuant to Massachusetts Stormwater Handbook Chapter 3 table 2.3.3, the infiltration rates used for the infiltration basins do not meet the requirements for a sandy loam as identified in the provided test pits for each location. Instead, the applicant uses the recommended Rawls Rate for loamy sand. Please update the model and stormwater report accordingly.
GPI 8/5/24: The sandy loam that is mentioned is just for the SCS soil classification. The actual test pits encountered loamy sand at each location.
TEC 9/3/24: Comment addressed.
25. Pursuant to Massachusetts Stormwater Handbook Chapter 3 regarding stormwater recharge and depth to the estimate seasonal high ground water table, it appears that Infiltration Basin #3 (INF-3) has a ESHWT within 4' of the bottom of the proposed infiltration basin, requiring a mounding analysis. Please provide a mounding analysis for INF-3.
GPI 8/5/24: A mounding analysis has been performed for INF-3 and is included in the revised stormwater management report.
TEC 9/3/24: TEC recommends that the applicant provide clear documentation to illustrate how all the variables were determined for the mounding analysis.
26. There is a discrepancy with the 12" orifice located at elevation 148.00' on the INF-1 outlet control device. The 12" orifice is modeled as a vertical orifice while the plans detail this orifice as a horizontal opening. Please clarify.
GPI 8/5/24: The 12" orifice has been updated to a horizontal orifice in the model.
TEC 9/3/24: Comment addressed.
27. The HydroCAD model shows the grassed depression to have a Broad-Crested Rectangular Weir. The weir appears to be missing from the plan set. Please update the plans to include this.
GPI 8/5/24: The plans have been revised to show the overflow elevation of 145.5 for the grassed depression.
TEC 9/3/24: Comment addressed.
28. The report identifies a first defense pre-treatment unit in treatment train A. It appears DMH-8 is intended to be a pretreatment device to align with the treatment train A. Please verify.
GPI 8/5/24: DMH-8 is intended to be a pretreatment unit (First Defense).
TEC 9/3/24: Comment addressed.
29. Ownership of required maintenance for stormwater features shall be coordinated with the City and the Operations & Maintenance.
GPI 8/5/24: We have confirmed with the city that the roadway drainage system along with the outfalls and stormwater basins associated with that system will be maintained by the city. All other drainage facilities shown on the plans will be maintained by the homeowner's association. The O&M plan has been updated to identify who is responsible for each drainage system.
TEC 9/3/24: It is still not clear what entity is responsible for each BMP proposed. The applicant provided a color-coded exhibit in Section 4 of the O&M manual, though, it appears that a color key would benefit this plan. There are also some discrepancies between the exhibits provided, please revise as required.
30. Massachusetts DEP Stormwater Standards

- a. It appears that this project fully meets standards 1, 4, 8, 9, and 10 of the MADEP Stormwater Standards.
- b. It appears that this project is not applicable to standards 5, 6, and 7, including requirements for land use with high potential pollutant loads, Critical Areas, and redevelopment projects.
- c. Standard 2 – This standard requires that the proposed project does not increase the stormwater peak runoff rates from the existing conditions. The project has minor stormwater calculation revisions that will be required to verify that the project fully complies with this standard.

TEC 9/3/24: In section 3 of the stormwater management report, the applicant explains that the project is in full compliance with Standard 2. The applicant continues to explain that the 2 year post-development peak flow exceeds the pre-development peak flow for Design Point 2, which makes the project not in compliance with Standard 2. There are discrepancies between that statement and Table 1 of the report. Based on the HydroCAD calculations, it appears that the project is in compliance, please verify and update the report as required.

- d. Standard 3 – This standard requires that a specific volume of groundwater recharge is attained by the proposed development. The project exhibits several infiltration basins that require revisions to the infiltration rates to verify that this standard is fully met by the development.

TEC 9/3/24: The applicant has provided additional test pits and verified infiltration rates to confirm that this project is in compliance with Standard 3.

Traffic Impact and Traffic Engineering Site Plan Review

Based on the review of the Site Development Overview Plan, the subdivision includes 29 single family homes. TEC reviewed the Institute of Transportation Engineers the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, Land Use Code (LUC) 220 – Single-Family Detached Housing. The proposed development is expected to generate 18 vehicle trips during weekday morning peak hour and 11 vehicle trips during weekday evening peak hour. This is an increase of one (1) vehicle every 2 minutes along Washington Street. Therefore, based on the minimal impact of the project, TEC concurs that a Transportation Impact Assessment (TIA) is not necessary as part of the project. However, TEC compiled the following traffic-related comments regarding the site plan:

- 31. Although Washington Street does not have sidewalks along either side of the roadway, the Applicant should provide a sidewalk on at least one side of Washington Street.

GPI 8/5/24: This has been discussed with City staff and while the plans include the grading necessary to install sidewalks, no sidewalks are proposed along Washington Street at this time.

TEC 9/3/24: TEC continues to recommend the addition of a sidewalk on at least one side of Washington Street because it is the main access point to the proposed 29 new lots. TEC defers to the opinion of the board and city staff.

32. The Washington Street Cross-Section detail on Sheet 26 should include sufficient details to show a minimum 5' wide sidewalk, excluding any curbing, and a full sidewalk platform with on the opposite side, both of which should be graded at less than 2%. TEC recommends detailed 1.5% to allow for construction tolerances. The maximum driveway grades should be shown in addition to the typical side slope grades.

GPI 8/5/24: The Washington Street Cross-Section detail has been revised to depict a 5' wide sidewalk platform, exclusive of the curbing, on both sides of the street. The 2% slope shown is in accordance with Methuen's typical road section detail. Maximum driveway grades are not specified in the subdivision regulations.

TEC 9/3/24: Comment addressed.

33. The Applicant should install signage to notify motorists about the dead end roadway condition on Washington Street, just north of Edgewater Drive. The applicant's team should discuss the end treatment for Washington Street, including any potential gates or parking restrictions with City staff. TEC recommends that any fixed objects be buffered from the end of the paved portion of the roadway given the potential for sliding vehicles on the proposed steep roadway grade approaching the dead end during winter conditions.

GPI 8/5/24: We have revised the plans to include a "Pavement Ends" sign on Washington Street, just after the intersection with Edgewater Drive. We have also added a section of guardrail 8 feet beyond the end of pavement to prohibit vehicles from driving down the portion of Washington Street that will remain unimproved.

TEC 9/3/24: TEC recommends that the applicant add a "Dead End Ahead" sign on Washington Street approximately 30 feet northeast of the Old Ferry Road intersection to notify motorists of the dead end condition. The proposed end condition shall be approved by City staff.

34. Parking restrictions should be implemented on Washington Street north and south of Edgewater Drive, following the Manual on Uniform Traffic Control Device (MUTCD) guidelines, which state that no driver shall stand or park upon any street or highway within twenty (20) feet of an intersecting way, except alleys (Section 5-1 (i)). TEC recommends installation of "NO PARKING – ANY TIME" signs (MUTCD designation R7-1 with arrows).

GPI 8/5/24: As requested, we have added "NO PARKING – ANY TIME" signs on both sides of Washington Street, north and south of Edgewater Drive.

TEC 9/3/24: Comment addressed.

35. The Applicant should verify Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD) at the Edgewater Drive intersection with Washington Street, considering the *limited* potential for a future extension of Washington Street to the north for any municipal conservation access opportunities near Hawkes Brook. Sight triangle areas should be shown on the Site Plans, along with a note indicating: "Signs, landscaping, and other features located within sight triangle areas shall be designed, installed, and maintained so as not to exceed 2.5 feet in height. Snow windrows located within sight triangle areas that exceed 3.5 feet in height or that would otherwise inhibit sight lines shall be promptly removed. The proposed side slope grading and layout of the consideration easement on Lot 5 (southeast corner of Washington Street / Edgewater Drive) should consider the maintenance needs related to the sight lines.

GPI 8/5/24: The plans have been revised to include a stop sign and stop bar at the end of Edgewater Drive. Preliminary review of the grading at the northwest corner of Lot 5 suggests that adequate sightlines are provided. As part of a subsequent revision to these plans to address any remaining comments or conditions of approval, we will look at

opportunities for pulling the cut slope on Lot 5 back even further to account for snow in that area.

TEC 9/3/24: TEC continues to recommend showing sight triangles on the plans as indicated in the previous comment. TEC recommends using the posted speed limit plus five miles per hour to evaluate the sight lines.

36. A marked stop line should be provided for vehicles exiting the Edgewater Drive approach to Washington Street.

GPI 8/5/24: The plans have been revised to depict a painted stop bar on Edgewater Drive at the intersection with Washington Street.

TEC 9/3/24: Comment addressed.

37. The Applicant's team should verify the sight line characteristics for the stopped condition for motorists on Old Ferry Street westbound where it meets Washington Street and confirm that AASHTO criteria can be satisfied given the introduction of new through traffic associated with the proposed subdivision.

GPI 8/5/24: A stop sign and stop bar have been added at the end of Washington Street where it meets Old Ferry Drive. This section of Washington Street is not intended to be open to through traffic.

TEC 9/3/24: TEC continues to recommend that sight line characteristics are verified for the stopped condition for motorists on Old Ferry Street, particularly for northbound traffic on Washington Street. The applicant should review any features and vegetation that may impact sight lines and work with the city to remove them if necessary.

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"



Alexander Sellar, PE
Senior Project Manager