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Ms. Kathleen Colwell
Planning Division Director
City of Methuen – Community Development Board
41 Pleasant Street
Methuen, Massachusetts 01844

December 2, 2021

Re: Engineering Peer Review
23 Hampstead Street – Methuen, Massachusetts

Dear Ms. Colwell:

On behalf of the City of Methuen, TEC, Inc. (TEC) reviewed documents as part of the civil engineering peer review for the proposed definitive subdivision located on 23 Hampstead Street in Methuen, Massachusetts. JR Builders Inc. (the "Applicant") submitted the following documents which TEC reviewed for conformance with the City of Methuen Subdivision Rules and Regulations, Massachusetts Stormwater Handbook, and generally accepted industry standards:

- *Application for Approval of a Definitive Plan for 23 Hampstead Street in Methuen, MA;* prepared by JR Builders Inc.; Dated October 4, 2021
- *Definitive Subdivision Plan for 23 Hampstead Street in Methuen, MA;* prepared by Millennium Engineering, Inc; Dated October 5, 2021; Revised November 23, 2021
- *Stormwater Management Report for the Definitive Subdivision Plan at 23 Hampstead Street, Methuen, MA;* prepared by Millennium Engineering, Inc; Dated October 4, 2021; Revised November 23, 2021
- *Traffic Memorandum for the Definitive Subdivision Plan at 23 Hampstead Street, Methuen, MA*; prepared by Bayside Engineering; Dated September 3, 2021

For consistency, the original comment numbers have been retained from the most recent TEC Peer Review letter dated November 23, 2021. The Applicant's responses to the comments are shown as **bold**; TEC's responses are shown as *italic.*

Site Plan & Application – Definitive Subdivision Regulations

Comment 1: A discrepancy in the total lot area was noted in the Definitive Subdivision Application and Plans. The Application details a total lot area of 5.17 acres (as noted on the City of Methuen GIS), while the Definitive Subdivision Plans details a total site area of 4.87 acres.

MEI Response: **The correct area of the project is 4.87 acres.**

TEC Response: *Comment addressed.*

Comment 2: As stated in Section 3.2.2.5 of the City of Methuen Subdivision Rules and Regulations (abbreviated further as MSRR), the proposed street name should be added to the plans.

MEI Response: **A road name of "Geramat Way" has been added to the plan set.**

TEC Response: *Comment addressed.*

Comment 3: TEC acknowledges the waivers requests in the Application and on Sheet 1 of the Definitive Subdivision Plans. TEC concurs with the terms of agreement for the two waivers (Sections 4.2.2.8 & 5.7.1) stated in the letter by Stephen J. Gagnon dated October 19, 2021. TEC also concurs with the statements regarding denial of the remaining two waivers based around the proposed water main.

MEI Response: **Waivers A and B: We agree to the additional inch of pavement based on the approval of the waivers for pavement width and bituminous curb.**

Waiver C: There is currently no means of looping the proposed water main as no easements are in place. Furthermore, the cost associated with potentially looping the water main is significantly more than the cost to install the water main to serve the project and is cost prohibitive to the project.

Waiver D: This waiver has been removed and 8" water main is proposed.

Additional waivers have been added to the list.

TEC Response: *Regarding Waiver D: Comments Addressed. Regarding Waivers A-C & all additional waivers, TEC continues to defer to Stephen Gagnon and the City of Methuen on whether these waivers are acceptable.*

Comment 4: The proposed outlet invert is drawn higher than the inlet pipes within DMH 1. The inverts for this structure should be adjusted to be in accordance with Section 4.3.3.7 of the MSSR.

MEI Response: **The profile has been revised to correctly show the inverts of the drainage system.**

TEC Response: *TEC acknowledges the revision on the profile, however inverts for the DMH 1, CB 1, & CB 2 are no longer provided on the Definitive Plan Set. The applicant should revise the plans to detail all inverts for these structures.*

Comment 5: Per Sections 4.3.3.6 & 4.4.2.3 of the MSSR, drainage and sewer pipe designs respectfully have specific design velocity requirements. The applicant should provide pipe flow calculations for both systems to prove this design meets these requirements.

MEI Response: **Pipe flow calculations have been included in the Stormwater Report.**

TEC Response: *Regarding the drainage system & Section 4.3.3.6 of the MSSR, comment addressed. Per Section 4.4.2.3 of the MSSR, the applicant should provide sewer pipe design velocities for review.*

Comment 6: TEC recommends that the sewer service connections be drawn in the profile view on the plan & profile. It appears that the sewer service from Lot 4 may be too low to tie into the sewer main at the proposed location.

MEI Response: **The sewer services have been added to the profile view. Lot 4?**

TEC Response: *Comment addressed.*

Comment 7: The sewer service detail calls for a 6" service diameter, but the Plan & Profile call for a 4" service diameter.

MEI Response: **The plans have been revised to depict 6" sewer services.**

TEC Response: *Regarding the Plan & Profile sheet and sewer service detail, Comment Addressed. However, the Roadway Cross-Section detail shows a 6" PVC Sewer under the roadway while the Plan & Profile detail an 8" PVC Sewer. The applicant should revise this detail accordingly.*

Comment 8: Both CB 1 & 2 do not include the proposed use of gutter curb inlets. Per Section 5.3.8 of the MSSR, these catch basins should be revised to include gutter curb inlets.

MEI Response: **A waiver from this requirement has been requested.**

TEC Response: *See TEC response on Comment 3.*

Comment 9: Per Section 5.4.2.2 of the MSSR, all drainage pipes must be constructed of reinforced concrete. On Sheet 6 of the Definitive Subdivision Plan, the connection between CB 1, CB 2, and DMH 1 are detailed as 12" PVC. This should be revised to follow this Section.

MEI Response: **The drainage pipes have been revised to specify RCP.**

TEC Response: *TEC notes the change to RCP for the pipes between these structures. However, there is no information stating the pipe type, size, lengths, or inverts on the Definitive Site Plans. The applicant should revise the plans accordingly.*

Comment 10: The proposed rim to invert elevation for CB 1 is just under 3'. This invert should be revised to have at least 3' of separation per Section 5.4.3.4 of the MSSR.

MEI Response: **The rim to invert separation has been revised to provide at least a 3' separation.**

TEC Response: *Comment addressed.*

Site Plan – General

Comment 11: The typical section calls for sloped granite curbing on both sides of the roadway. The Applicant should confirm that curbing is proposed around the full extents of the roadway, and TEC recommends adding a leader to call out the proposed curbing on the Plan.

MEI Response: **A waiver has been requested to allow for bituminous curbs to be installed. Curbing is proposed along the full extents of the roadway. A label has been added to the Plan and Profile sheet calling out the curbing.**

TEC Response: *TEC recommends the use of sloped granite as originally shown on the typical section. Bituminous curbing will become a long term maintenance issue for the City.*

Comment 12: The maximum building coverage and open area requirements should be added to the zoning table on Sheet 3 of the Definitive Subdivision Plans.

MEI Response: **The maximum building coverage and open space requirements have been added to the table.**

TEC Response: *Comment addressed.*

Comment 13: TEC recommends that a building square footage should be added on each proposed building.

MEI Response: **The square footage of each footprint has been added to the plan set.**

TEC Response: *Comment addressed.*

Comment 14: There appears to be some existing vegetation at the rear corner of abutting lot 75-3. The plans should identify if this vegetation will be removed or a portion will remain. Location of individual trees may be required in this area in order to preserve the natural buffer.

MEI Response: **The existing vegetation will mostly be removed as the drainage line is proposed through the area of trees.**

TEC Response: *TEC recommends that the plan be revised to clearly identify that these trees will be removed.*

Comment 15: It appears that the proposed tree line does not appropriately tie into the existing tree line at the southwest property line of Lot 4.

MEI Response: **The tree line has been revised.**

TEC Response: *Comment addressed.*

Comment 16: TEC suggests the addition of proposed gas and electric connections to the proposed and existing dwelling(s) on Sheet 6 of the Definitive Subdivision Plans.

MEI Response: **Gas and underground electric have been added to the plan and profile sheet.**

TEC Response: *Regarding the proposed gas connections, comment addressed. The proposed underground electric only shows connections from the cul-de-sac center to the proposed buildings. The Plans should be revised to indicate if the underground electric will be extended to the street.*

Comment 17: On Sheet 6 of the Definitive Subdivision Plans a few issues were noted regarding the proposed utility profile:

a. Pipe lengths of sewer pipes are labeled in inches, not feet.

b. The inverts into DMH 1 should be specified for each CB they connect to.

c. The invert out of CB 1 is labeled as an invert in.

MEI Response: **The sewer pipe labels have been revised. The Inverts into DMH 1 have been specified. The label for CB 1 has been revised to show the invert out.**

TEC Response: *Regarding the sewer pipe labels, comment addressed. Regarding the labels for DMH 1 & CB 1, inverts and pipe sizes/materials should be added to the Plans.*

Comment 18: On Sheet 7 of the Definitive Subdivision Plans a few issues were noted as listed below:

a. Erosion control barriers are proposed in front of the existing driveways for the existing dwelling. A gap should be provided if this dwelling will be occupied during construction.

b. Multiple areas of proposed grading cross the proposed silt sock line across the proposed lots. The silt sock positioning should be adjusted to provide a gap (3' recommended) between the work zone and the protected areas.

c. The proposed silt sock crosses directly over the proposed rip rap for the outlet of Outlet Structure 1.

MEI Response: **a. The existing dwelling is vacant and will ultimately access via the proposed roadway.**

b. We did not find any areas where the proposed grading crosses the erosion control barrier. The erosion control barrier has been revised to provide a 3' gap between the limit of work and the protected area.

c. The erosion control barrier has been revised to avoid crossing the rip-rap.

TEC Response: *Comment addressed.*

Comment 19: A detail should be provided for the inlet structure placed on top of the proposed subsurface infiltration system.

MEI Response: **This structure is no longer part of the stormwater design.**

TEC Response: *Comment addressed.*

Comment 20: On Sheet 9 of the Definitive Subdivision Plans, multiple details reference HDPE pipes, but none are referenced on the other sheets.

MEI Response: **All references to HDPE pipe have been revised to specify RCP pipe.**

TEC Response: *Comment addressed.*

Stormwater Report

Comment 21: Upon adjustment of the proposed catch basin locations (as suggested in the letter by Stephen J. Gagnon dated October 19, 2021), the water quality calculations should be adjusted to include the additional impervious area leading to these catch basins.

MEI Response: **The water quality calculations that were provided accounted for all the roadway areas.**

TEC Response: *Comment addressed.*

Comment 22: TEC suggests the Water quality calculations and TSS removal calculations include information for the proposed subsurface infiltration system.

MEI Response: **The design has been revised and the proposed subsurface infiltration area only takes flow directly form the roof of the dwelling on Lot 4. No TSS or water quality calculations are required.**

TEC Response: *Comment addressed.*

Comment 23: The contribution to TSS Removal from deep sump hooded catch basins should be added to the TSS removal calculations.

MEI Response: **The TSS removal calculations have been revised to include the catch basins and sediment forebay as pretreatment prior to the infiltration basin.**

TEC Response: *Comment addressed.*

Comment 24: The estimated seasonal high-water table near the proposed infiltration basin within proposed Lot 2 is less than 2' below the bottom of the proposed basin based on the provided Test Pit 21-9. A revision in design of the basin is required to meet the 2' minimum separation between the estimated seasonal high-water table and the bottom of basin per Volume 2 Chapter 2 of the Massachusetts Stormwater Handbook. The ESHWT value on the Infiltration Basin Cross-Section on Sheet 9 of the Definitive Subdivision Plans should also be revised accordingly.

MEI Response: **The infiltration basin has been revised to provide a 2' separation to ESHGW.**

TEC Response: *Based on the revised design on Sheets 7 & 9, the proposed infiltration basin still does not provide the 2' minimum separation between the estimated seasonal high-water table and the bottom of basin. The ESHWT value reported for TP 21-8 is 176.6 based on the information on Sheet 10. However, the ESHWT shown on the infiltration basin cross-section is labeled at 175.5 which is not detailed on any test pits. The applicant should revise accordingly.*

Additional Comments – Stormwater

Comment 25: Below are new comments related to the dry well (SC-740 chambers):

a. Sheet 5 labels the chambers as a roof drywell. Sheet 10 shows a detail labeled subsurface infiltration area. These labels should be revised to be consistent for clarity.
b. The subsurface area elevations are not consistent with the dimensions of the detail. (Bottom of Chambers = 183.00 + 30" chamber height = 185.50, not 186.50)
c. The "Subsurface Infiltration Area Detail" shows what appears to be an outlet pipe and manifold system labeled with a dimension "0.5'". This is not shown on the Site Plan Sheet 5.

Additional Comments – Traffic Memo

Comment 26: Traditionally, the sight distance calculations are based upon the design speed of the roadway which was not identified by the Applicant. It would generally be assumed that the design speed would be slightly above ethe posted speed, say 35 mph. The Applicant has provided sight distance calculations for 40 mph as well which depicts the conservative calculation for sight distance at the subdivision road.

Comment 27: The Sight Distance Assessment memorandum denotes that the required minimum sight distance due to grade is 188-feet at 30 mph and 285-feet at 40 mph for both directions in terms of stopping sight distance. This would suggest that the downgrade is the same in both directions from the sub-division road. Based on field observation it appears that the grades are not the same and that the calculated SSD should be higher than 200-feet for the downgrades on each approach.

Comment 28: TEC agrees that the sight distance measurements will exceed AASHTO minimum recommendations. It is anticipated that the changes based on the comment above will not alter this conclusion. Although the minimum sight distance is met, the desired sight distance at 30 mph is not for intersection sight distance (ISD) looking north and at 40 mph for ISD looking south. TEC agrees that the Applicant should maintain cut-back vegetation on the site frontage to provide the maximum sight lines possible.

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.
*"**T**he **E**ngineering **C**orporation"*

Peter F. Ellison, PE
Director of Strategic Land Planning