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To: Community Development
City of Methuen

From: Stephen J. Gagnon, PWM 
Engineering Department Administrator

Subject: 23 Hampstead Street
Definitive Subdivision Plan

As requested, I have reviewed the plan set, Stormwater Management Report, and response letter prepared by Millennium Engineering Inc. (MEI), dated November 23, 2021. My October 19, 2021, comment is in plain text, MEI's November 23, 2021, response is in italic text and my current comment is in bold text.

1. The intended final ownership of the subdivision should be identified, i.e., City or Homeowners Association.

MEI - The intention is for the Road to become a public road.

Comment addressed.

2. The cover sheet of the plan set requests the following waivers from the Subdivision Rules and Regulations:
 - a. Section 4.2.2.8 - Dead end streets.
 - b. Section 5.7.1 - Sidewalks.
 - c. Section 5.6.1 - Looped water main.
 - d. Section 5.6.1 - 8" diameter water main.

I suggest in exchange for waivers a. and b. the Developer provide an additional inch of pavement thickness to the roadway, to increase its longevity and ultimately reduce future costs to the residents.

I do not recommend waiver c. be granted. This waiver is contrary to the MassDEP Water Distribution regulations the city must follow. Annually,

MassDEP completes a detailed audit of the City's water distribution system. Each year our score is adversely impacted due to dead end water mains. The proposed water main could be easily looped to Applewood Ln. or Stoneybrook Rd., preventing the creation of a new dead-end water main and eliminating an existing dead end main.

Waiver d. cannot be granted, as DEP requires every water main which service a fire hydrant to be a minimum of 8" diameter.

MEI – 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.

The pavement detail should be revised to depict 2½" binder and 1½" finish course.

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.

Waivers A and B – Comment satisfactorily addressed.

Waiver C – I do not recommend granting this waiver. A looped water distribution system is critical for the proper operation of a domestic water system. Private wells should not be considered as adequate fire protection will not be provided. The nearest hydrant will be more than 500' from the dwelling on Lot 3.

I would like to take a moment to restate why a looped water system is important. As you may be aware the domestic water treatment process involves several steps, concluding with disinfection utilizing a form of chlorine. The finish water leaves the treatment plant with a specific amount of residual chlorine sufficient to prevent bacteria growth in the distribution system. Chlorine decomposes over time; the rate of decomposition depends on environmental conditions such as water temperature. Consequently, a residual chlorine level of 1.4 PPM at the treatment plant will become 0.3 or less at the farthest reaches of the distribution network.

In a dead-end water main, if water consumption is inadequate, the water may sit long enough for the chlorine to be completely depleted and allow bacteria to thrive. If the bacteria bloom is minor the situation may be resolved by flushing to expel the contaminated water and introduce new water with higher residual chlorine levels.

Flushing wastes large amounts of water and labor and therefore should be avoided.

In a looped water system, water with appropriate chlorine levels circulates through the system, maintaining sanitary conditions, preventing bacteria growth. Further, a looped water system is fed by two or more sources reducing the possibility of a service interruption or more importantly a loss of fire protection. This specific water loop will not only prevent a new dead end main, but it will also eliminate an existing dead end serving Stoneybrook Rd and Applewood Ln. According to the Water Distribution Superintendent the residents of Stoneybrook Rd and Applewood Ln. have had several service interruptions recently that could have been minor events had this water loop been in place.

In his response, the Project Engineer states in part that the water loop cannot be provided as there are no easements in place to access a water main. It is my expectation the Developer would negotiate an easement with an abutter. Typically, a utility easement would be located along a property line, within the Zoning setback, thereby having little impact on the value of the subject property. In years past the Community Development Board would not hesitate to require a developer to secure the easements necessary to provide a properly designed utility. In fact, a brief review of some prior developments in the Methuen reveals more than 30 examples where utility easements on abutting properties were required and ultimately secured by Developers. Clearly, an easement to provide a properly designed water system is not an unreasonable ask. One final thought, the decisions the Board makes regarding the technical aspects of a subdivision may seem trivial however they have the potential to adversely affect the DPW for years to come.

3. Section 4.2.2.4 of the Subdivision Rules and Regulations requires roadway centerline offsets to be a minimum of 125'. The proposed roadway is offset only 110' from the private way known as Old Hampstead Street.

MEI – A waiver has been requested for this section.

Comment addressed.

4. Section 4.2.4.3 of the Subdivision Rules and Regulations requires a minimum length of 75' to be substantially level approaching an intersection. Approximately 25' has been provided.

MEI – The grading of the roadway has been revised to provide an average grade of less than 25' FOR 75'.

Comment addressed.

5. An analysis of the sight distance, at the intersection of the proposed road and Hampstead Street, should be provided.

MEI – A Traffic Memo which includes a sight distance analysis has been provided.

Comment addressed. However, the vegetation maintenance recommendations outlined in the traffic memo should be incorporated into the plan set.

6. The proposed roadway will bisect the existing sidewalk on Hampstead Street. ADA/ABB compliant wheelchair ramps must be provided at each side of the proposed roadway.

MEI – ADA compliant ramps have been added to each side of the proposed roadway.

Comment addressed.

7. Subdrains should be provided along the roadway where the cut profile exceeds one foot.

MEI – A note has been added requiring the installation of a subdrain as required in the field.

The note regarding subdrains, on sheet 6 of the plan set, states in part “where the site contractor deems necessary.” The comment should be revised to state “subdrains shall be provided where cut exceeds one foot.”

8. It is not clear if the existing water mains in Hampstead Street are labeled correctly on the plan set. Regardless of the representation, the water connection for the subdivision must be made to the 12” diameter water main.

MEI – The approximate location of the existing 12” main has been added to the plans. The connection of the proposed water main has been revised to connect to the existing 12” main.

Comment addressed.

9. The plan should be revised to depict three gates at each connection to a water main.

MEI – Three gate valves have been shown at the connection of the proposed water main.

Comment addressed.

10. The proposed sewer service connections are depicted as 4" diameter on sheet 6 of the plan set. The plan should be revised to depict 6" diameter sewer service connections.

MEI – The sewer service connections have been revised to 6" services.

Comment addressed.

11. The plan set depicts approximately 125' of the roadway draining uncontrolled onto Hampstead Street. Catch basins should be provided to collect the stormwater before it reaches Hampstead Street.

MEI – Catch basins have been added at the entrance of the proposed roadway.

Comment addressed.

12. The proposed route maintenance vehicles are to access the infiltration basin should be identified on the plan set.

MEI - The maintenance route has been added to the plan set.

Comment addressed.

13. An underdrain should be provided in the infiltration basin so it can be dewatered for maintenance.

MEI – An underdrain has been provided in the infiltration basin.

Comment partly addressed – An underdrain is now depicted on the plan, but no information has been provided regarding pipe diameter, elevation, material etc. A complete construction detail should be provided.

14. The plan depicts the infiltration chamber outlet pipe discharging directly to Hampstead St. This is not acceptable as it will cause icing of the roadway and sidewalk in cold weather.

MEI – The outlet from the subsurface infiltration area has been removed from the design.

Comment addressed.

15. In the profile view, the pipes entering DMH-1 from CB-1 & CB-2 are lower than the pipe exiting DMH-1. The plan should be revised accordingly.

MEI – The profile has been revised to accurately depict the inverts of the drainage system.

Comment not addressed. Some drainage structures do not have invert elevations.

16. The elevation of the flared end section on the infiltration pond outlet pipe does not agree in the plan set and the Stormwater Management Report.

MEI – The elevation of the flared end has been revised.

Comment addressed.

17. The Stormwater Management Report indicates Subcatchment P1B will flow overland before discharging directly into the infiltration chambers. The plan should be revised to provide pretreatment for the overland flow.

MEI – The drainage design has been revised and no overland flow enters into the subsurface infiltration area.

Comment addressed.

18. The plan depicts an existing 12” CMP entering the subject property from a catch basin on Hampstead Street. This pipe should be investigated, and its source determined.

MEI – Additional detail was provided regarding the drainage system in Hampstead Street. No information was found regarding the pipe exiting the site.

Comment addressed.

19. The soil logs provided in the Stormwater Management Report should be revised to provide an elevation for ESHGW and refusal.

MEI - The soil logs have been added to the plan set and the elevations of the ESHGW have been added.

Comment addressed.

20. The Operation and Maintenance Plan provided exceeds the ability of the Methuen DPW, should the Applicant wish the subdivision to be accepted by the city.

MEI – No response required.

This issue will be further discussed during the Conservation Commission review.

21. Under the heading of Infiltration Chambers, the Operation and Maintenance Plan states the Condo Association is the responsible party. Is this correct or a typographical error?

MEI - The O & M has been revised to require the homeowner to be responsible for the maintenance of the subsurface infiltration area.

Comment addressed.

22. The Applicant should consider installing a landscaped island in the cul-de-sac to reduce pavement costs and reduce impervious area and stormwater runoff.

MEI – A landscape island has been added to the cul-de-sac.

Comment addressed.

23. The plan depicts proposed grading adjacent to the east property line of Lot 4. A detail of this grading should be provided.

MEI – A detail of the grading has been provided.

Comment addressed.

NEW ISSUES

1. Note 13 on page 4 of the plan set should be replaced with “6” thick concrete encasement extending 10’ either side of the crossing.”
2. Note 14 on page 4 of the plan set should be removed.
3. Sheet 5 has a note that states “Prop reconstructed sidewalk along project frontage (see detail). I was unable to locate a corresponding detail. It should be noted the Construction Standard for curbing and sidewalk on a primary roadway is vertical granite curbing and cement concrete sidewalk.
4. The hydrant detail should be revised to specify Mueller Centurion open left.

The Project Engineer should address these issues in writing.