

June 3, 2021

Lisa DeMeo, P.E.  
Director of Public Works  
The Town of Salisbury  
DPW Building, 39 Lafayette Road  
Salisbury, MA 01952

Re: **Meadowview at Salisbury Developer Review**

Dear Ms. DeMeo:

As requested, Weston & Sampson Engineers, Inc. (W&S) has completed the agreed scope of services for the water system evaluation of the proposed 64-unit (138-bedroom) townhouse residential community located off Forest Road, near the intersection with School House Lane. The proposed water services will be obtained from a new 8-inch cement lined ductile iron (CLDI) water main that is proposed to be tapped off the existing 6-inch asbestos cement (transite) water main in Forest Road. The purpose of this evaluation was to determine if the proposed townhouses would receive adequate water service (pressure and flows), and if they would have an adverse impact on the Town's water distribution system. The Town's computer based hydraulic model was used to evaluate the capabilities of the water distribution system in the area of the proposed development.

The analysis of the proposed townhouses was performed using the existing hydraulic model of Salisbury's water distribution system as it is currently configured.

#### REGULATIONS & EVALUATION CRITERIA

Massachusetts Department of Environmental Protection (DEP) regulations were used as the basis for our determination. DEP Guidelines and Policies for Public Water Systems and Massachusetts law (310 CMR 22.04) require that any public water system must provide 35 pounds per square inch (psi) pressure to all residences, under all normal conditions of flow. Normal conditions include peak hour demands, usually the most severe demand condition that occurs during the hottest summer days.

DEP Guidelines and Policies for Public Water Systems and Massachusetts law (310 CMR 22.19) require that any public water system shall provide 20-psi pressure under fire flow situations. System adequacy is evaluated under a fire flow situation occurring during a maximum day domestic demand condition.

A minimum fire flow demand of 1,000 gpm is the requirement for this development, per information provided by Millennium Engineering Inc.

#### SERVICE AREA and MODEL DEVELOPMENT

We used the software package WaterCAD CONNECT Edition Update 2.0 to model the impact of the proposed townhouses on the Town's water distribution system. We previously received a hydraulic model of Salisbury's distribution system, making it possible to add the proposed development and model it's effects on the water system.

A plan of the proposed Meadowview at Salisbury development was provided showing the location of the proposed townhouses. The development consists of 64 individual units (54 units with 2-bedrooms and 10 units with 3-bedrooms) that will receive water service from a new 8-inch CLDI water main located in the proposed Meadowview Lane. This new 8-inch CLDI water main, approximately 2,400 feet in length, will be tapped off of the existing 6-inch transite water main in Forest Road. The development was added to the current hydraulic model of the distribution system by combining the 64 services and inputting the combined information on 2 junction nodes at

the intersection with the existing 6-inch transite water main and at the end of the 8-inch CLDI water main. The elevation of the development was modeled between 25 and 18 feet (USGS), per information provided on the developer plans.

Maximum day water demands for the proposed houses were determined using design flows for residential homes from Title 5 Design Standards. The development will consist of 138 bedrooms. The Title 5 Design Requirements assess a demand of 110 gallons per day (gpd) for each bedroom. For the 64 townhouses, the maximum day demand was calculated to be 15,180 gpd. In addition to maximum day demand calculations, we calculated a peak hour demand to assess all normal conditions of flow. We have assumed a peaking factor of 1.5 for the ratio of maximum day demand to peak hour demand. The peak hour demand for the eight proposed houses is therefore estimated at 22,770 gpd.

## MODELING RESULTS

The model was run under two worst-case demand conditions:

- Peak hour demand. The Town's water system is required to maintain a minimum working pressure of 35 psi under this demand condition.
- Fire flow demand: The available fire flow in the development at maximum day demand and 20 psi.

**Peak Hour Demand.** The hydraulic analysis indicates that when the additional 64 townhouses are present, and at peak hour system demands, the system pressure does not drop below 35 psi. The model indicates that the pressure at the site will be between 55- and 65-psi during peak hour demands. This pressure meets DEP regulations.

**Fire Flow Demand.** The hydraulic analysis indicates that when the 64 townhouses are present, and at maximum day demands, the water system is capable of providing a 1,000 gpm fire flow at residual pressures greater than 20 psi to all points in the proposed development.

## CONCLUSIONS

The results of the hydraulic evaluation indicate that construction of the 64 townhouses off Forest Road will not significantly impact surrounding customer's water pressure in the Salisbury water distribution system during domestic peak hour demands. Additionally, based on the hydraulic model results, a fire flow of 1,000 gpm can be furnished to the proposed development while maintaining greater than 20 psi residual pressure.

Very truly yours,

WESTON & SAMPSON ENGINEERS, INC.



Jeffrey C. Provost, P.E.  
Senior Project Manager

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