

32-5005-046A
September 19, 2025

Mark Warren, Supt.
Westford Water Department
60 Forge Village Road
Westford, MA 01886

**Re: Water System Impact Evaluation - Final
37 Powers Road Development**

Dear Mark:

Tighe & Bond has completed our evaluation of the Water System Impact for the proposed 37 Powers Road residential development that will be constructed by ZOM Living, LLC. The developer submitted an Application for Water System Impact Study to the Westford Water Department on March 12, 2025 which provided the water system demands for the project. As part of our agreement, Tighe & Bond completed a hydraulic analysis and water system capacity analysis to determine whether the Water Department will be able to provide adequate water service for this project. We also completed a review of the utility drawings included in the Permit Site Plan application.

A draft copy of this report was provided to the Water Department on July 1, 2025. We reviewed this report with the developer's site consultant (Hancock Associates) on August 18, 2025. *Updates from the draft report based on our meeting with Hancock Associates are shown in italics.* The results of our review and analysis of the impact of this development on the water distribution system are provided herein.

Project Description

The proposed project consists of a 530-unit multi-family development that will be constructed in five multi-story buildings located at 37 Powers Road. The proposed development will also include two clubhouses. The development will be constructed in multiple phases, with Building Nos. 1, 2, 3 and Clubhouse A included in the first phase, and the remaining two buildings and clubhouse to be constructed in the second phase. The estimated daily water consumption for the project is approximately 90,000 gallons per day (62 gallons per minute). There was no information provided on the fire flow requirements for the project. However, the minimum required static water pressure is 70 psi. The application also lists that an irrigation system will be installed throughout the development, although the application did not indicate if this will be connected to the water system or private well. Water service to the development will be provided via a connection to the Water Department's existing 12-inch ductile iron water main on Powers Road and will also connect to the existing 12-inch water main at the adjoining Bell Apartments.

Water System Hydraulic Analysis

Tighe & Bond utilized the Water Department's existing water system hydraulic model to evaluate water service at the proposed development. The hydraulic model includes scenarios for steady-state and extended period simulations. The model was modified to include proposed water mains and water demand at the development based on drawings provided by the developer. Water demand estimates listed in the Water System Impact Study Application were used for this analysis. These values are summarized in Table 1.



Table 1

Water Supply Requirements for 37 Powers Road Development

Static Pressure at Powers Road Connection	70 psi
Average Day Demand	90,000 gpd (62 gpm)
Maximum Day Demand	90,000 gpd (62 gpm)
Irrigation Demand	<i>On-site well will be used for irrigation</i>
Fire Flow Demand	<i>Not Provided</i>

No water demands for irrigation or outdoor water use were provided on the application and were assumed for our analysis to not be supplied by the water system connection. The application also did not provide the fire flow requirements for the development. *Hancock Associates confirmed that an irrigation system will utilize an on-site well and will not be connected to the public water system.*

The drawings provided by the developer show a combination of 12-inch and 6-inch water mains servicing the project. The proposed 12-inch main connects to the existing 12-inch ductile iron main in Powers Road and extends through the eastern portion of the development servicing Clubhouse A and Building Nos.2 and 3. The utility plans provided also show a connection to the existing 12-inch water main at the adjacent Bell Apartments. However, the plans do not indicate whether the 12-inch main extends through the project to the Powers Road connection. *Hancock Associates confirmed that a new 12-inch main will be installed from the Bell Apartments connection to the Powers Road connection.*

The proposed 6-inch water main loops around the western portion of the development servicing Clubhouse B and Building Nos. 1, 4 and 5. Hydrant connections, fire service connections, and domestic water service connections are shown on both the 6-inch and 12-inch mains. The plans do not indicate the size of the domestic and fire services to each building. *MassDEP Guidelines for Public Water Systems* states that “the minimum size of water main in the distribution system for providing fire protection and serving fire hydrants shall be 8-inch diameter.” We recommend increasing the 6-inch water main to 8-inch.

Hydraulic Model Evaluation

Existing water system hydraulics were evaluated using existing steady-state and 24-hour extended period scenarios for average day demand (ADD: 1.4 MGD) and maximum day demand (MDD: 3.1 MGD). The model contains diurnal demand curves developed based on system wide water use patterns during model development. These diurnal demand curves were applied to demands at the proposed development. However, water use patterns at the development may vary from those experienced system wide. The modeled peak hour peaking factor in the Westford water system model is four times the ADD.

The model indicates the existing water system pressure at 37 Powers Road ranges between 73 psi and 77 psi, dependent on the water level in the Water Department’s storage tanks, water treatment plant flows, and overall water system demand. The modeled hydraulic grade line in this part of the system ranges between 388 ft and 401 ft. With the additional 62 gpm demand of the proposed development, the model predicts 72 psi to 77 psi at the supply connection. Based on this analysis, hydraulic modeling predicts that the existing water system will be capable of providing at least 70 psi at the proposed connection point in Powers Road.

Changes to modeled flow velocity in the water system are negligible in the majority of the water system. The existing 12-inch main in Concord Road (Route 225) can experience velocities as high as 2.0 ft/s during peak demand conditions. With the proposed development, the model predicts flow velocities could increase to 2.5 ft/s during peak demand conditions, if water use patterns at the development are similar to those experienced elsewhere in the



water system. While velocities of this magnitude are below thresholds associated with increased pipe stress, they may be capable of scouring accumulated sediment from water mains which can lead to discolored water occurrence. Discolored water can be managed through water main flushing, where high velocity flows are intentionally generated by opening hydrants to remove the accumulated material.

Available Fire Flow (AFF) is defined as the maximum flow rate that can be generated at a single point in the water system without any point dropping below a defined minimum pressure constraint, including the flowing point. Modeled available fire flow differs from available flow calculated from hydrant flow tests because it can evaluate pressure conditions system-wide and make specific assumptions about water system conditions during the flow event. We recommend performing hydrant flow tests near the proposed water system connection locations to confirm field conditions.

AFF modeling performed for this evaluation was during Maximum Day Demands (MDD), water storage tanks at the bottom of their normal operating range, and water treatment plants off-line in order to provide a conservative system condition. AFF is generally calculated assuming 20-psi minimum pressure, however, building sprinklers and fire pump stations can have greater upstream pressure requirements. In the absence of information on flow and static pressure requirements for the proposed development, AFF was modeled using two alternative pressure constraint criteria:

- Maximum flow available at 37 Powers Road with a 40-psi minimum pressure constraint at the water system connection and a 20-psi minimum pressure constraint elsewhere in the water system.
- Maximum flow available at 37 Powers Road with a 20-psi minimum pressure constraint at the water system connection and a 20-psi minimum pressure constraint elsewhere in the water system.

The results of the modeled Available Fire Flow are summarized in Table 2.

Table 2

Summary of Modeled Available Fire Flow¹

Pressure Constraint²	AFF at 37 Powers Road Connection³	Pressure Constraining Area
20-psi AFF	2,125 gpm	Technology Park Drive
40-psi AFF	1,725 gpm	Water system connection at 37 Powers Road

¹Modeled available fire flow assumed MDD conditions, water storage tanks at the lower end of their normal operating range, and water supply facilities off-line.

²Alternative pressure constraint criteria is for development connection to the water system only. A system-wide pressure constraint of 20-psi was used in both modeled AFF alternatives.

³AFF values shown are for the proposed water system connection at 37 Powers Road only and does not include connection at Bell Apartments.

Water System Capacity Analysis

As part of our evaluation of the impact on the water system by the proposed development, we completed an update of the Water Department’s water supply requirements which were previously developed by Tighe & Bond as part of the 2018 Water System Master Plan. The purpose was to confirm whether the Water Department will have sufficient capacity to service this project after evaluating both the existing and future demands of the water system. The Water Department’s water use over the past five years (2020 through 2024) was obtained



from Annual Statistical Reports (ASR) that are provided to MassDEP. These ASRs were reviewed to determine past water use trends. A summary of the Water Department’s annual demand for the past four years is presented in Table 3.

Table 3
Water System Historical Water Demand

Month	2020	2021	2022	2023	2024
Annual Pumpage (MG)	569	529	521	501	555
Average Day Demand (MGD)	1.559	1.449	1.428	1.373	1.521
Maximum Day Demand (MGD)	3.279	3.142	2.600	2.739	2.577
Total Water Services	5,574	5,607	5,598	5,624	5,653
MDD/ADD Ratio	2.1	2.2	1.8	2.0	1.7
Gallons/Unit/Day	280	259	255	244	269

Historical Average Day Demands (ADD) have been consistently below the Water Department’s current Water Management Act (WMA) permitted maximum daily withdrawal volume of 2.44 MGD. This withdrawal volume is averaged over the entire year. Historical Maximum Day Demands (MDD) has also not exceeded the Water Department’s maximum authorized withdrawal of 5.9 MGD which is a total of the maximum withdrawal volumes for each source. The Water Department’s highest recorded Maximum Day Demand was 4.85 MGD in 1996.

Water Demand Projections

Understanding the historical and future average and maximum day demands is necessary for evaluating a water system and determining what the system may need in the future to sustain demand. MassDEP performance standards set a residential per capita demand goal of 65 residential gallons per capita per day (RGPCD). The calculated RGPCD for the water use of the Water Department’s customers as documented in the ASRs over the past five years is approximately 61 RGPCD, which is below the standard. However, to account for potential fluctuations in demand due to annual changes in weather and rainfall, the MassDEP per capita goal of 65 RGPCD was utilized in the demand projections. Additionally, over the past five years, approximately 72% of the Town’s population was supplied by the Water Department. We used this percentage for the projected population for a conservative estimate of the future residential demand projection. Our overall projected average day and maximum demands for the Water Department for the next ten years is presented in Table 4.

Table 4
Projected Water Demands (MGD)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Total Demand	582.4	589.6	596.9	604.1	611.4	618.7	626.6	634.5	642.5	650.4
Average Day Demand	1.60	1.62	1.64	1.66	1.68	1.70	1.72	1.74	1.76	1.78
Maximum Day Demand	3.12	3.16	3.20	3.24	3.28	3.32	3.36	3.40	3.44	3.53

The Water Department’s total annual water demand in 2034 is estimated to be approximately 650 MGY which represents an increase of approximately 17% from 2024. The Average Day Demand is estimated to increase to 1.78 MGD in 2034. The projected maximum day demand was estimated using an average peaking factor ratio of 1.96 which was based on the average MDD/ADD ratio over the past five years.



The proposed 530-unit multi-family development at 37 Powers Road is estimated to increase the Water Department's Average Day Demand by approximately 0.09 MGD once the development is fully occupied. Using a peaking factor of 1.96, the maximum day is estimated to be 0.18 MGD.

Based on our analysis and estimated future water demands including the demands of the 37 Powers Road Development, it is our opinion that the Water Department should have sufficient capacity with their available water supply sources and their current permitted thresholds to supply the estimated daily water demands for this development.

Recommendations

Based on our evaluation of the impact on the water system by the proposed 37 Powers Road Development, it is our opinion that the Westford Water Department can provide adequate water service that meets the domestic water demand requirements for this project. However, the fire flow requirements for the project need to be provided by the developer in order to confirm whether the Water Department's existing distribution system can meet those demands, or if an alternative fire protection system will need to be provided.

The following is a summary of our recommendations based on our evaluation of the water system impact and our review of the utility plans included in the Permit Site Plan drawings dated February 14, 2025 as prepared by Hancock Associates:

1. The general location and layout of the proposed water mains and hydrant locations within the development are acceptable. We recommend that the developer consider adding an additional hydrant on the 12-inch water main at the Powers Road entrance to the project. Final locations of all hydrants should be approved by the Fire Department. All watermain materials must conform to Water Department standard specifications. *It is our understanding that the Fire Department has reviewed the hydrant locations with Hancock Associates.*
2. The plans indicate connections to the existing 12-inch water main on Powers Road and the adjacent Bell Apartments. However, the plans were not clear whether the new 12-inch water main will be installed through the development between the two connection points. *Based on our meeting on August 18th, 2025, Hancock Associates confirmed that the entire length of this water main will be 12-inches.*
3. The plans indicate that a new 6-inch water main will be installed to service Clubhouse B and Building Nos.1, 4, and 5. We recommend that this water main be increased to 8-inches. *Hancock Associates confirmed this change will be made.*
4. The permit drawings do not indicate any valves on the 6-inch and 12-inch water mains. We recommend that a 3-way valve cluster be installed on the intersection of the two mains near the Powers Road entrance, and a two-way valve cluster be installed at the intersection of the water mains near Building No.3. *Hancock Associates confirmed that the final construction drawings will include this change.*
5. The permit drawings do not indicate how the connections will be made at the two locations (i.e. tapping sleeve and valve, connection to stub, etc.) to the existing water system on Powers Road and Bell Apartments. *Hancock Associates will provide more detail on these proposed connections on the final construction drawings for the project and will review with the Water Department.*
6. The size of the domestic and fire service connections are not shown on the drawings. The utility drawings should indicate these service connection sizes. *The final construction drawings will include proposed service sizes.*

7. Pressure at the proposed connection to the Water Department's distribution system on Powers Road is predicted to range between 72 psi and 77 psi during normal operating conditions. The water demand estimates for the development that is summarized in Table 1 are expected to have a minimal impact on the existing water system pressure in this area of the distribution system.
8. The model predicts that flow velocity may increase from 2.0 ft/s to 2.5 ft/s in the 12-inch water main in Concord Road during peak demand periods with the estimated development demand. The higher flow velocity could mobilize accumulated sediment in this section of main, increasing the risk of discolored water occurrence during peak demand periods. Discolored water can be managed by routine water system flushing, especially before higher-demand summer months. No other high velocity areas were identified in the model as a result of the new development.
9. The model predicts 1,725 gpm Available Fire Flow at 40-psi residual pressure and 2,125 gpm Available Fire Flow at 20-psi residual pressure at the development. The developer should confirm with their Fire Protection consultant whether this is adequate for the project. We also recommend that the developer perform hydrant flow tests on the existing 12-inch water mains near 37 Powers Road and Bell Apartments to confirm field conditions at the proposed connection locations to the water distribution system. *Hancock Associates will provide the Water Department with hydrant flow test information to confirm the available fire flow will meet the requirements of the development.*

We trust this correspondence meets the Water Department's requirements for this proposed development. If you have any questions or require any additional information, please contact me at (978) 846-0675.

Very truly yours,

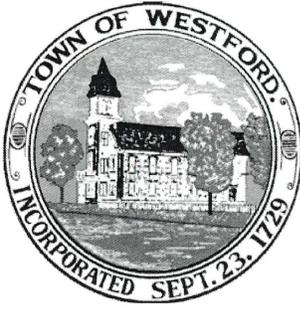
Tighe & Bond, Inc.



Thomas J. Mahanna, PE
Vice President
tjmahanna@tighebond.com

Enclosure: Application for Water System Impact Study – 37 Powers Road

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Westford Water Department

Mark Warren, Superintendent
Board of Water Commissioners:
Hugh C. Maguire
Chauncy Chu
Titus Palmer
Tim Hall, Alternate

APPLICATION FOR WATER SYSTEM IMPACT STUDY

I. Project Overview

1. Project Identification:

A. Project Name: **37 Powers Road**

B. Project Proponent: **ZOM Living, LLC.**

7900 Westpark Drive, Suite T605

McClean, Virginia, 22102

2. Project Description:

A. Location: **37 Powers Road, Westford, MA**

3. Project Summary:

A. Describe project and give general description of expected daily water needs and attach USGS map showing project location.

This project consists of a 530-unit multi-family development including 53 affordable units available to households earning at or below 80% of the area median income across five buildings (the "Project"). The Project will also provide approximately 812 on-site, surface parking spaces. The Project Site will be accessed by two driveways off Powers Road. Additional amenities will include landscaped open space for residents of the development and a stormwater management system.

II. Impact on Water Supply System

1. State the number of units and/or square feet anticipated for the project site. If project is to be built in phases, provide schedule. Attach two (2) copies of site plans and utility plan.

This project proposes 5 apartment buildings and 2 clubhouse buildings. The apartment buildings shall contain 530 units. The project shall be constructed in 2-phases, the first phase will include Buildings 1, 2, and 3 as well as clubhouse 1. Phase 2 will include buildings 4 and 5, and clubhouse 2.

2. Estimate consumption of water:
 - A. Estimated average daily consumption **89,771 gallons**
 - B. Estimated maximum daily consumption **89,771 gallons**
 - C. Are lawn sprinklers and/or lawn irrigation proposed on site? **Yes**
3. Estimated fire flows required for the project site (attach letter of correspondence from insurance company if available).
 - A. Does the project require a fire suppression system? **Yes**
4. Required minimum static pressure for the proposed project site? **70 psi**
5. List alternatives to connection to the water system.
(i.e., Fire ponds, on-site wells, fire booster stations)
6. List any conservation methods being proposed.
(i.e., recycling, etc.)

Zero-scaping and water reducing fixtures shall be used to help limit the water demand of this site.

III. Certification


Signature of Project Proponent

3/12/25
Date

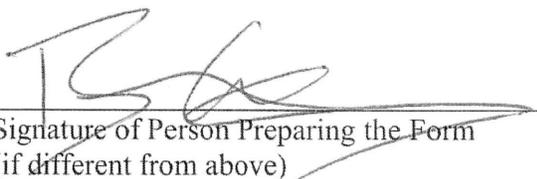
James R. Dunlop
Type or Print Name

ZOM Living
Company Name

2001 Summit Park Drive
Street Address

Orlando, FL 32810
City/Town, State/Zip Code

917-822-1031
Phone Number


Signature of Person Preparing the Form
(if different from above)

3/11/2025
Date

Brian Geaudreau
Type or Print Name

Hancock Associates
Company Name

34 Chelmsford St, 2nd Fl
Street Address

Chelmsford, MA, 01824
City/Town, State/Zip Code

978 244-0110
Phone Number

For Water Department Use Only

Estimated Cost: _____