

Nashua Fire Department Training Facility Relocation

Citizen-Prepared Engineering and Planning Analysis

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Independent research conducted by the residents of Teak Dr., Westgate Village, Windsor Pond and adjacent streets for informational purposes.

Not affiliated with the City of Nashua or Nashua Fire Department.

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CC:

- Mayor of Nashua
- Nashua Board of Aldermen
- Nashua Fire Department
- Nashua Conservation Commission
- Nashua Zoning Board of Adjustment
- Ernest A. Jette – Alderman Ward 5
- Paula Johnson & Justin Gerstenfield – Alderman Candidates Ward 5

1. Executive Summary

This report evaluates the suitability of the city-owned parcel at 37 Ridge Road as the preferred location for the Nashua Fire Department's new Training Facility.

The Fire Department's current training area is located within the city landfill property, where it has operated for approximately four decades under shared municipal use. As part of the Department of Public Works (DPW) expansion and long-term landfill improvement plan, the DPW has formally requested that the Fire Department vacate its current site to make room for upcoming public works infrastructure. This request requires identifying and developing a new, permanent training facility that meets the Department's operational, safety, and hydraulic requirements.

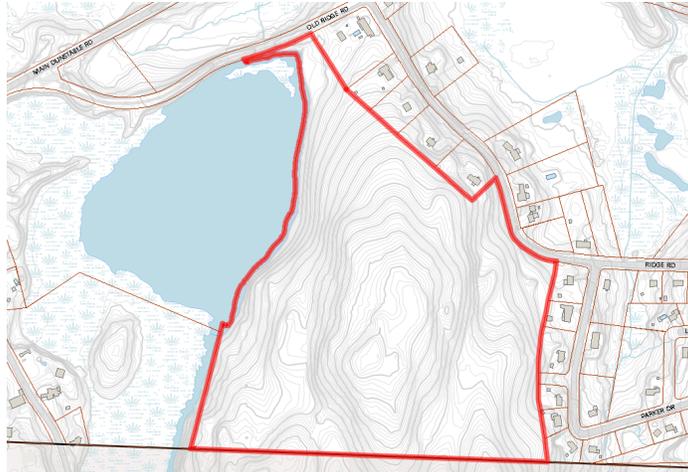
The existing landfill training site has faced ongoing issues with inadequate and inconsistent water pressure, which limit the reliability and safety of training operations. Despite close coordination with Pennichuck Water Works to stabilize pressure and flow, the system continues to struggle to maintain the sustained pressure necessary for pump testing, live evolutions, and multi-apparatus training. These limitations have restricted the Department's ability to conduct full-scale, realistic training scenarios.

Key Advantages:

1. The site provides steady municipal water pressure of approximately 86 pounds of pressure at 260 ft of elevation, meeting and exceeding operational requirements for pump testing and hydrant training without booster systems.
2. Its 42-acre size, stable terrain, and generous setbacks from residential properties make it ideally suited for current operations and future expansion.
3. The parcel is nearly five times larger than the previously proposed 9-acre landfill site, offering greater operational safety, capacity, and privacy.
4. Because the property is city-owned, there are no acquisition costs or title encumbrances. The Fire Department would maintain exclusive operational control of the developed training area while preserving a municipal buffer around the site.
5. The site presents no environmental constraints or known violations, and its upland conditions eliminate the need for wetland mitigation or special permitting.

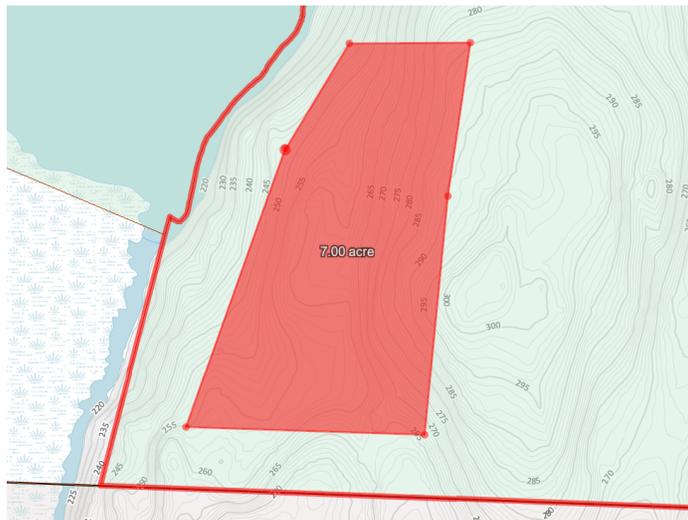
2. Ridge Road Site Description and Ownership

The property at 37 Ridge Road comprises approximately 42 acres of city-owned land located west of Ridge Road in Nashua, New Hampshire. The site is an undeveloped, overgrown parcel with moderate slopes ranging from 220 to 280 feet in elevation, offering stable topography and well-drained soils suitable for fire apparatus access and training infrastructure.



GIS view of 37 Ridge Rd.

The proposed training facility would occupy the western portion of the 42-acre parcel, while the remaining land would serve as a natural buffer to provide privacy, noise separation, and space for future expansion. The Fire Department would have full operational control of the entire property, ensuring that the site is used exclusively for public safety training and support functions, without shared access or interference from other municipal operations. The location's elevation and terrain make it ideal for access road construction, paved training surfaces, and supporting infrastructure, all while maintaining a natural visual screen from surrounding properties.

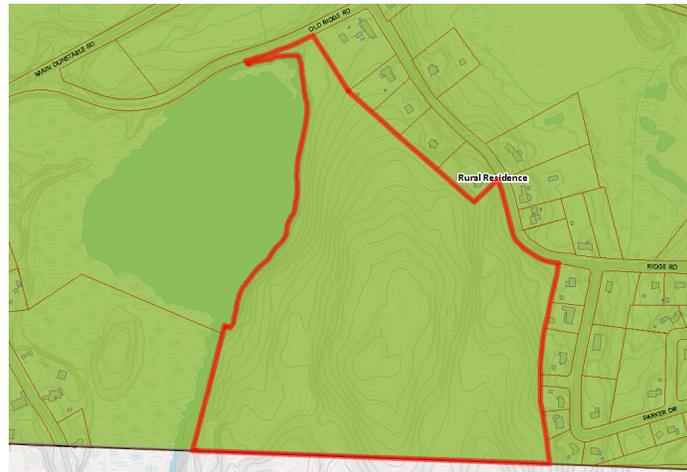


Proposed 7 acre training pad

3. Zoning and Regulatory Compliance

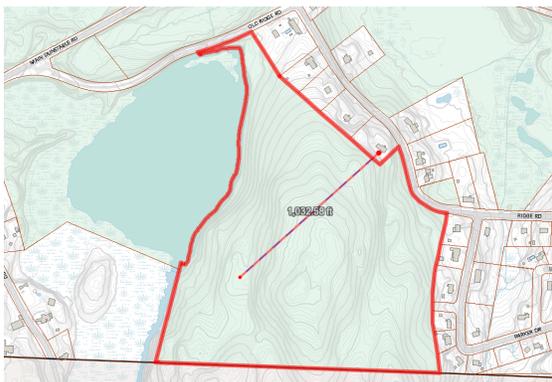
The property lies within the R-40 zoning district, which primarily supports large-lot residential uses. However, municipal uses such as public safety facilities are recognized under the city's zoning ordinance as allowable by Special Exception or Zoning Board of Adjustment (ZBA) approval when serving a critical community function.

Accordingly, while the 37 Ridge Road site is city-owned and perfectly suited for the Fire Department's operational needs, the project will require a ZBA exception to permit development of a fire training facility within the R-40 zone.

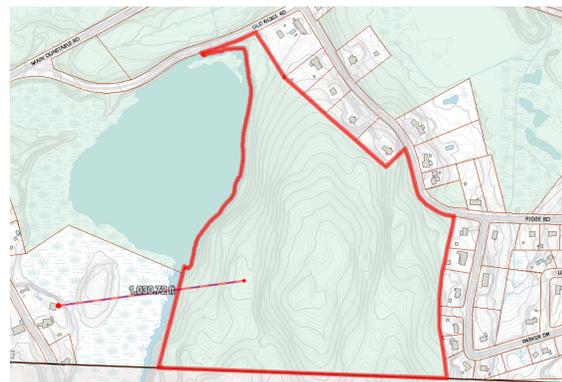


R-40 – Rural Residence

All dimensional standards—including front, side, and rear setbacks—are comfortably exceeded. The center of the proposed 7-acre training pad which can be increased, would be located over 1,000 ft from the nearest residences, while obeying the minimum setback requirements of the district.



Closest abutter east 1,032 ft.



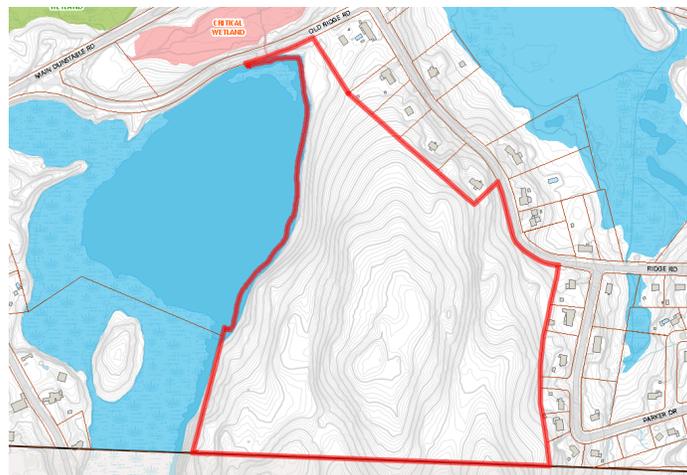
Closest abutter west 1,030 ft.

4. Environmental and Wetland Assessment

Review of city GIS data, topographic mapping, and state wetland inventories confirms no jurisdictional wetlands, hydric soils, or surface waters within or immediately adjacent to the development footprint.

The upland soils and elevation characteristics minimize runoff and flooding potential, eliminating the need for NHDES Wetlands Bureau permitting or mitigation measures. Erosion and sediment control during construction will follow city and EPA best management practices, including silt fence barriers, stabilized construction entrances, and vegetative restoration of disturbed areas.

The absence of impacted wetlands and environmental constraints within this parcel makes it low risk and highly developable.



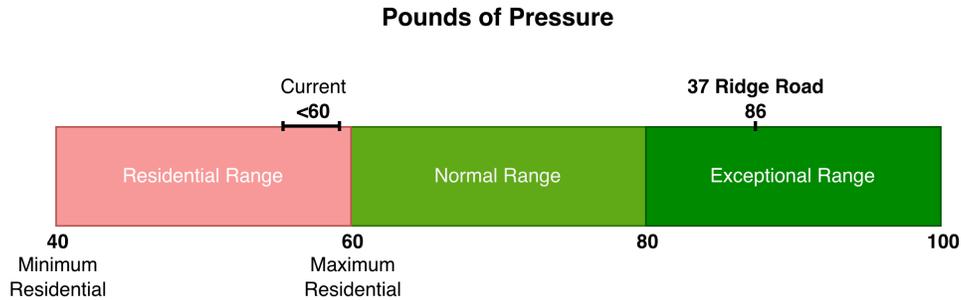
Surrounding wetlands

5. Topography, Infrastructure, and Water Supply

The parcel's gentle grade rises from approximately 220 ft along Ridge Road to 300 ft at its western high point, creating a natural knoll that provides both elevation and seclusion.

The backside of this knoll (250–280 ft elevation) is the optimal location for the training pad and drill yard. This area is visually screened from Ridge Road and adjacent homes, creating operational privacy without additional berms or barriers.

The current landfill training facility has experienced chronic low-pressure conditions. Sustained hydrant pressures have frequently fallen below minimum NFPA requirements, even after extensive work with Pennichuck Water Works. These challenges have required ongoing adjustments, portable pump setups, and scheduling limitations, compromising training realism and efficiency.



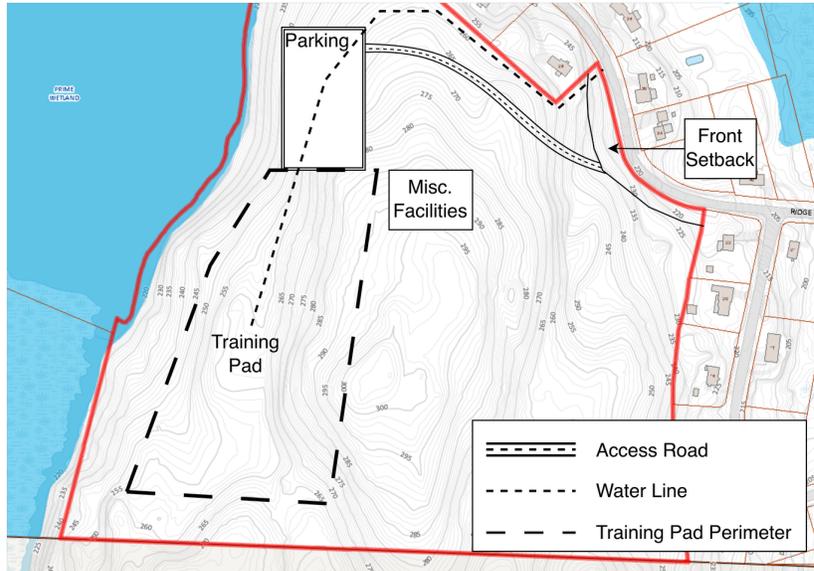
Water pressure standards

At the 37 Ridge Road site, the municipal water grid provides steady 86 pounds of pressure, which fully supports simultaneous multi-apparatus training and hydrant flow testing. This improvement ensures compliance with NFPA 291 standards for fire hydrant performance and removes the need for costly pressure-boosting systems.

6. Proposed Development Concept

The conceptual layout is for illustration purposes only and includes the following primary components:

1. Fire Apparatus Access Road: Approximately 700 ft long, beginning at Ridge Road (220 ft elevation) and climbing to the training pad at ~275 ft. The alignment maintains a 9–10% sustained grade with a gentle 6–8% entry transition for smooth apparatus ingress and egress.
2. Roadway and Clearance: 20–26 ft wide paved travel way with a 35–40 ft total cleared width, providing compliant turning radii and overhead clearance per NFPA 1 and NFPA 1144.
3. Training Pad and Facilities: A 100 ft diameter paved training pad suitable for apparatus staging, pump evolutions, live-burn props, and hose deployment. The pad area encompasses approximately 7 acres on the rear terrace between elevations 250–280 ft.
4. Turnaround or Loop Configuration: Space for a 100 ft diameter turnaround or 45–50 ft radius loop to allow continuous forward movement of engines and aerials.
5. Drainage and Stormwater Control: Incorporation of broad-based dips, shallow swales, and culverts at grade breaks to manage surface flow, maintaining compliance with city stormwater standards.
6. Proposed 1,584-foot water line alignment maintains elevation below 260 feet to maximize system pressure.



Illustrative 37 Ridge Rd. site plan

7. Fire Apparatus Access and Design Standards

Design will conform to applicable fire apparatus and roadway standards:

<i>Design Element</i>	<i>Specification</i>	<i>Reference</i>
<i>Travel Way Width</i>	20 ft (26 ft preferred)	NFPA 1 §18.2.3
<i>Max Sustained Grade</i>	10%	NFPA 1144 §5.2.4
<i>Max Short Grade</i>	12%	NFPA 1 §18.2.3.2.2
<i>Inside Turning Radius</i>	≥ 28 ft	AASHTO Fire Apparatus Template
<i>Outside Turning Radius</i>	≥ 48–50 ft	NFPA 1901
<i>Vertical Clearance</i>	≥ 13.5 ft	NFPA 1 §18.2.3.4.1
<i>Load Rating</i>	75,000 lb GVW	NFPA 1901 (Aerial/Ladder Truck)

These standards ensure accessibility for all front-line apparatus, including ladder, tanker, and pump units.

8. Neighborhood Compatibility and Setback Analysis

The training area will be over 1,000 ft from the nearest residential structure, with no direct line of sight due to topography and vegetative cover.

This distance exceeds standard municipal separation thresholds and provides natural sound attenuation. Live burns, pump evolutions, and night training can occur without perceptible noise or glare impacts.

The site design maintains all city noise, lighting, and environmental compliance standards while providing a secure, private environment for critical training.

9. Comparative Evaluation

<i>Evaluation Criteria</i>	<i>Proposed Landfill (9 acres)</i>	<i>37 Ridge Road (42 acres)</i>
<i>Ownership</i>	City	City
<i>Total Area</i>	9 acres	42 acres (5× larger)
<i>Environmental Conditions</i>	Adjacent to landfill, odor, dust, methane	No wetlands, stable uplands
<i>Accessibility</i>	Limited via landfill route	Private access via Ridge Road
<i>Water Pressure</i>	Unstable, <60 pounds	Consistent 86 pounds
<i>Privacy</i>	Minimal, exposed	1,000 ft buffer, no line of sight
<i>Expansion Potential</i>	None	35-acre municipal buffer for future needs

The Ridge Road parcel provides clear and measurable advantages in every technical and operational category.

10. Conclusions and Recommendations

Based on engineering, operational, and environmental review, the 37 Ridge Road site is the most advantageous location for the Fire Department’s training facility relocation.

Key Findings:

1. City-owned 42-acre parcel—no acquisition costs or title constraints.
2. Zoned R-40; will require a Zoning Board of Adjustment Special Exception to permit municipal training use.
3. Fully compatible with zoning intent due to the parcel’s isolation, minimal residential impact, and critical public safety function.
4. No wetlands or environmental encumbrances.
5. Consistent 86 pounds of water pressure, resolving longstanding supply issues at the landfill site.
6. 1,000 ft setback from nearest residence with full visual screening.
7. Site is nearly five times larger than the current 9-acre alternative.
8. Topography, soils, and access fully support heavy apparatus operations.

Recommendations for the Fire Department’s Special Exception application to the ZBA:

Advance the 37 Ridge Road Training Facility into the design phase, including boundary and topographic survey, geotechnical testing, and civil site plan preparation for planning and utility coordination. Parallel to design advancement, the Fire Department should prepare and submit a Zoning Board of Adjustment application for Special Exception citing the essential municipal and public safety purpose of the project, its minimal impact, and its alignment with the city’s master plan for emergency service infrastructure.

This parcel provides the Fire Department with a safe, sustainable, and hydraulically superior site that meets both present and future training requirements, ensuring uninterrupted service continuity as the DPW expansion proceeds.

11. References

1. **City of Nashua Zoning Ordinance** (Rev. 2021).
City of Nashua, New Hampshire.
Available at: <https://www.nashuanh.gov/DocumentCenter/View/3832>
2. **City-Owned Parcels – Map and Inventory** (Revised March 2021).
City of Nashua GIS Division, Department of Information Technology.
Available at: <https://www.nashuanh.gov/DocumentCenter/View/3833/City-Owned-Parcels-PDF>
3. **Nashua Geographic Information System (GIS) Portal**.
City of Nashua, New Hampshire – Department of Information Technology.
Available at: <https://www.nashuanh.gov/155/GIS>
4. **NFPA 1 – Fire Code**, 2021 Edition.
National Fire Protection Association, Quincy, MA.
5. **NFPA 1144 – Standard for Reducing Structure Ignition Hazards from Wildland Fire**, 2022 Edition.
National Fire Protection Association, Quincy, MA.
6. **NFPA 1901 – Standard for Automotive Fire Apparatus**, 2016 Edition.
National Fire Protection Association, Quincy, MA.
7. **NFPA 291 – Recommended Practice for Fire Flow Testing and Marking of Hydrants**, 2019 Edition.
National Fire Protection Association, Quincy, MA.
8. **AASHTO LRFD Bridge Design Specifications**, 9th Edition (2020).
American Association of State Highway and Transportation Officials, Washington, D.C.
9. **AWWA C150/C151 – Ductile Iron Pipe Design and Installation Standards**.
American Water Works Association, Denver, CO.
10. **AWWA C900 – PVC Pressure Pipe for Water Transmission and Distribution**.
American Water Works Association, Denver, CO.
11. **ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications**.
ASTM International, West Conshohocken, PA.
12. **ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping**.
ASTM International, West Conshohocken, PA.
13. **New Hampshire Office of Strategic Initiatives (OSI) – Zoning and Land Use Regulations Database**.
Statewide repository of municipal zoning ordinances and land-use regulations for all New Hampshire communities.
Available at: <https://www.nh.gov/osi/planning/resources/zoning.htm>
14. **New Hampshire Municipal Association – Land Use Law Resources**.
Legal and procedural guidance for municipal boards and land-use decisions in New Hampshire.
Available at: <https://www.nhmunicipal.org/land-use-law>
15. **NH GRANIT – New Hampshire Statewide GIS Clearinghouse**.
State-maintained GIS platform providing parcel, zoning, elevation, and wetland data for all NH municipalities.
Available at: <https://www.granit.unh.edu/>

16. **New Hampshire Department of Environmental Services (NHDES) – Public Water Systems Program.**
Information on municipal and regional public water systems, source water protection, and infrastructure mapping.
Available at: <https://www.des.nh.gov/>
17. **NHDES Wetlands Bureau – Wetlands and Shoreland Protection Program.**
Regulatory and mapping resources for wetland identification, permitting, and conservation under RSA 482-A.
Available at: <https://www.des.nh.gov/water/wetlands>
18. **NH Department of Business and Economic Affairs – Bureau of Planning and Zoning.**
Provides planning guidance, regional development maps, and zoning coordination for local governments.
Available at: <https://www.nheconomy.com/office-of-planning-and-development>
19. **NH Department of Transportation (NHDOT) – GIS and Mapping Portal.**
Provides statewide transportation and topographic mapping for infrastructure design and planning.
Available at: <https://www.nh.gov/dot/org/projectdevelopment/planning/gis-data.htm>
20. **NH Geological Survey – Surficial and Bedrock Mapping Program.**
Includes detailed soil and subsurface data useful for site grading and development feasibility studies.
Available at: <https://www.des.nh.gov/nhrivers/geologic-survey>
21. **NH Department of Safety – Division of Fire Standards and Training & Emergency Medical Services.**
Provides fire training standards, facility guidelines, and apparatus operation requirements statewide.
Available at: <https://www.des.nh.gov/water/geologic-survey>