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Code

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NE Metro Regional Vocational Technical School Wakefield, Massachusetts



Existing Building Code Report

July 21, 2020

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Prepared By: Don E. Contois, P.E.

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Introduction

The existing high school building located in Wakefield, MA currently contains offices, classrooms, vocational classrooms, gymnasium, and cafeteria. This code summary is based on existing building drawings and information. Following is a list of applicable codes:

Code Type	Applicable Code (Model Code Basis)
Building	780 CMR: Massachusetts State Building Code, 9 th Edition • Amended 2015 International Building Code (IBC) • Amended 2015 International Existing Building Code (IEBC)
Fire Prevention	527 CMR: Massachusetts Fire Prevention Regulations (2015 NFPA 1) M.G.L. Chapter 148 Section 26G – Sprinkler Protection
Accessibility	521 CMR: Massachusetts Architectural Access Board Regulations
Electrical	527 CMR 12.00: Massachusetts Electrical Code • Amended 2020 National Electrical Code
Elevators	524 CMR: Massachusetts Elevator Code • Amended 2013 ASME A17.1
Mechanical	2015 International Mechanical Code (IMC)
Plumbing	248 CMR: Massachusetts Plumbing Code
Energy Conservation	2018 International Energy Conservation Code (IECC) ^A

A. Massachusetts has adopted the 2018 IECC and will become mandatory after November 7, 2020.

International Existing Building Code

The 2015 International Existing Building Code with Massachusetts amendments allows for 3 separate compliance methods, the Prescriptive Method (in general, altered areas must comply with the code for new construction), Work Area Method (level of compliance is based on the classification of work), and Performance Compliance Method (numerical method that allows tradeoffs for deficiencies). This report is based on the Work Area Method.

1. Work Area and Classification of Work:

The assumed work includes interior renovations that would be classified as a Level 3 alteration. This level includes the reconfiguration of spaces, the addition or elimination of doors and windows, the reconfiguration of spaces, the addition or elimination of doors and windows, the reconfiguration or extension of systems, and/or the installation of additional equipment in more than 50% of the aggregate area of the building. The work must comply with IEBC Chapters 7, 8, and 9 (IEBC 901.2). If the future work includes an addition, the project would also be subject to IEBC Chapter 11.

2. Occupancy Classification:

Non-Separated Mixed Uses:

- B (Offices)



- E (Educational)

As permitted by 780 CMR 303.1.3, the accessory assembly spaces such as the cafeteria, auditorium, and gymnasium have been considered to be part of the Use Group E occupancy based on our assumption that the spaces are typically used for school events only.

3. Construction Type:

It is our understanding that the existing building includes a mix of concrete and unprotected steel. Based on the unprotected steel within the building, the existing construction type is Type IIB construction. If the building does not undergo an addition, any new construction will need to maintain this construction type (noncombustible).

If the building undergoes an addition, the existing building and addition must comply with height and area limitations. Based on the size of the existing building, any addition will likely need to be separated by a firewall unless the structure of the existing building and addition are protected to meet a 2 hour fire resistance rating (Type IB construction).

4. Vertical Openings:

All existing vertical openings in the work area connecting two or more floors must be enclosed with 1 hour rated construction and approved opening protectives unless the openings meet one of the exceptions in IEBC 803.2.1. New vertical openings are required to comply with 780 CMR 712 & 713.

All the stairs in the building that connect multiple floors are enclosed except for Stairhall A and B. Stairhall B is permitted to be open since it only connects two floors per 780 CMR 1019.3(1).

5. Interior Finishes:

The existing interior finish of walls and ceilings in the work area and in all exits and corridors serving the work area must comply with the code requirements for new construction (IEBC 803.4 and 903.3). All newly installed wall and ceiling finishes, and interior trim materials must also comply with 780 CMR Table 803.11 (IEBC 702.1, 702.2, 702.3). The requirements are summarized in the following table:

Interior Finish (780 CMR Table 803.11 & Section 804.4.2)-Non-Sprinklered

Use Group:	B/ E
Exit Enclosures	Class A
Exit Access Corridors	Class B
Rooms & Enclosed Spaces	Class C
Floor Finish (in corridors)	Traditional Resilient or Class II Carpeting



The building generally consists of painted CMU or gypsum board walls that comply with the above interior finish requirements.

6. Means of Egress:

The means of egress including the number of exits and egress capacity must be sufficient for the number of occupants on all floors (780 CMR 102.6.4).

Based on the numerous amount of exterior doors, the building is compliant with these egress requirements.

In addition, illuminated exit signs and means-of-egress lighting must be provided in accordance with the code for new construction (780 CMR 102.6.4). All means of egress lighting and exit signs must be provided with an emergency power supply to assure continued illumination for not less than 1.5 hours in case of primary power loss (780 CMR 1008.1 1008.3.4 & 1013.1).

The building is provided with emergency lighting and illuminated exit signs. In general, the existing systems will likely require upgrades to accommodate a future renovation.

7. Required Fire Protection Systems:

The following fire protection systems must be provided or maintained / updated to accommodate any renovations:

- Automatic sprinkler system (IEBC 804.2.2 & MGL c. 148 s. 26G) – *The building only has partial sprinkler protection in the carpentry classroom. A new sprinkler system would be required throughout the building.*
- Fire alarm notification and detection system with emergency voice/alarm communication (IEBC 904.2 & 780 CMR 903.4.2) – *The fire alarm system does not have a voice alarm. The system will need to be upgraded to accommodate any new floor layouts and address areas lacking coverage.*
- Standpipe system (780 CMR 905.3.4) – *As part of the new sprinkler system, standpipe protection should be provided for the stage in the auditorium.*
- Fire extinguishers (527 CMR 1 Section 13.6 & 780 CMR 906.1) – *Additional fire extinguishers will likely be required such that they are located throughout the building so that the maximum travel distance to an extinguisher is less than 75 feet.*

M.G.L. Chapter 148 Section 26G

Since the building is over 7,500 gross square feet in area, it is subject to the requirements of M.G.L. Chapter 148 Section 26G. These amendments require the entire building to be provided with sprinkler protection if the renovations are considered “major”.



Renovations are considered major depending on the type of work and the scope / cost of work. The following are general guidelines established by the board to be used to determine if the scope or the cost of the planned alterations are major:

1. Major alterations are reasonably considered major in scope when such work over a 5 year period affects **33% or more of the total gross square footage of the building** (measured from the outside walls, regardless of firewalls).
2. Major alterations are reasonably considered major in scope or expenditure, when the total cost of the work over a 5 year period, excluding costs relating to sprinkler installation, is equal to or greater than **33% of the assessed value of the building**, as of the date of permit application.

Major alterations would include work such as the demolition or reconstruction of existing ceilings, sub flooring, walls, stairways, doors, or the removal or relocation of a significant portion of the building's HVAC, plumbing, or electrical systems. Cosmetic work such as painting or installing / replacing carpeting would be considered minor and would not trigger compliance with this law.

Also, if the scope includes an addition, the addition and the existing building must be provided with an automatic sprinkler system throughout.

Since these are just general guidelines and not specific thresholds, it is up to the head of the fire department to determine if the renovation work triggers compliance with M.G.L. Chapter 148 Section 26G.

8. Energy Code Provisions for Existing Buildings

The building is subject to the 2018 International Energy Conservation Code (IECC) including the amendments contained in 780 CMR Chapter 13. Level 3 alterations to existing buildings are permitted without requiring the entire building to comply with the energy requirements of the International Energy Conservation Code (IECC). The alterations (new elements) shall conform to the energy requirements of the IECC as they relate to new construction only (IEBC 908.1).

9. Accessibility for Persons with Disabilities

Massachusetts Architectural Access Board Regulations

Alterations to the building must comply with the requirements of the Massachusetts Architectural Access Board Regulations (521 CMR). For existing building alterations the requirements of 521 CMR are based on the cost of the proposed work:

- A. If the cost of the proposed work is **less than \$100,000**, only the new work must comply.



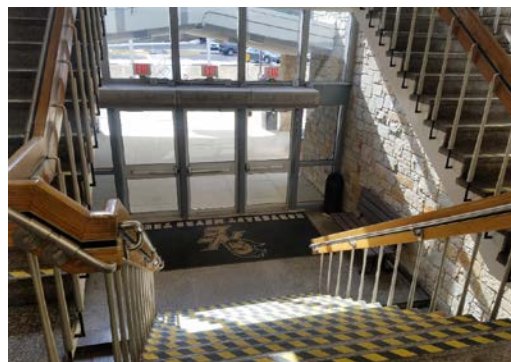
- B. If the cost of the proposed work is **greater than \$100,000** then all new work must comply and the existing building must include an accessible public entrance, toilet room, telephone and drinking fountain (if public phones and drinking fountains are provided) (521 CMR Section 3.3.1(b)). Exempt work when calculating the cost of work includes roof repair or replacement, window repair or replacement, and repointing and masonry repair work unless the exempt work exceeds \$500,000.
- C. If the cost of the proposed work is **greater than 30% of the full and fair cash value** of the existing building, the entire building is required to comply with 521 CMR (521 CMR Section 3.3.2). There is no exempt work, i.e. the entire project costs apply to determining the 30% criteria.

The cost of all work performed on a building in any 36 month period must be added together in determining the applicability of 521 CMR (521 CMR Section 3.5). The full and fair cash value of the existing building is determined by using the 100% equalized assessed value of the building on record with the city assessor's office. If no assessed value exists or if the assessment is more than 3 years old, an appraised value may be substituted. The certified appraised value must be submitted to the Massachusetts Architectural Access Board for approval.

If the renovation cost more than \$13,083,750 (triggering the 30% threshold of the \$43,612,500 assessed value) all portions of the building open to the general public (students, visitors, etc) must be upgraded to comply in full with the current requirements of 521 CMR. Any employee-only areas such as staff lounges, staff bathrooms, and staff work areas are not required to comply with 521 CMR, as long as student and public access is not permitted. Since the building is generally not provided with accessible features, the following upgrades will be required to meet full compliance with the provisions of 521 CMR:

- All public entrances must be accessible (521 CMR 25.1).

The main entrance as well as the majority of the exterior doors to the school are not assessible.



Entrance not accessible due to stairs.



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- Ramps shall comply with 521 CMR 24.00.

The ramp is not accessible. The cross slope is greater than 2%, the handrails do not comply with 521 CMR 24.5, and concrete is in disrepair on the ramp (521 CMR 24.6, 24.5, and 24.7).



Handrail are not compliant and the ramp has a cross slope larger than 2%.

The ramp that connects the lower half of the first floor to the higher half of the first floor is not compliant. The slope of the ramp is greater than 8.3%, the handrails are not circular and do not extend properly at the bottom of the ramp (521 CMR 24.2.1 and 24.5).



Steep ramp over 8.3% slope. The handrails are noncircular and do not extend.



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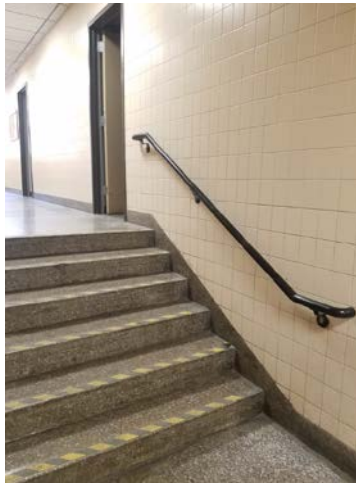
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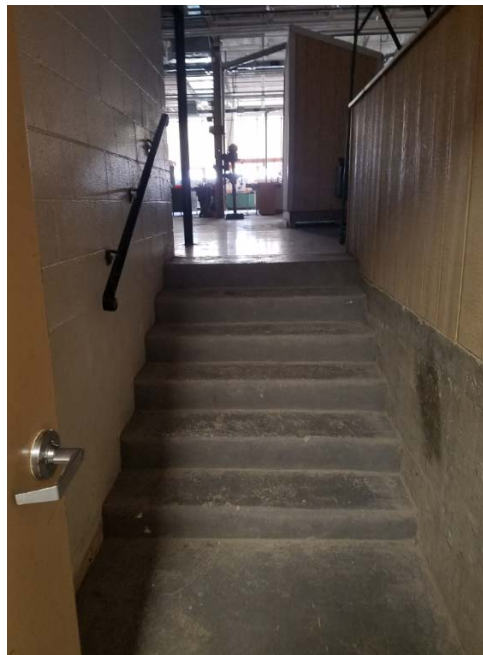
- All public and common use areas must be accessible and provided with an accessible route thereto (521 CMR Section 12.2.2 and 20.1).

Classroom C-113 and Classroom C-112 are not accessible due to stair in the corridor.



Stair causing a non-accessible route to the classrooms at the top of the stair.

The carpentry classroom does not have an accessible route into the classroom due to the stairs.



One of the stairs that is used to access this room.



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There is no accessible route to the stage.



Stairs are the only way to access the stage.

Portions of the courtyard are not accessible. There is a raised portion that cannot be accessed without stairs. Other parts of the courtyard have concrete missing causing it to not be accessible.



Stairs to the raised portion of the courtyard and concrete in disrepair.



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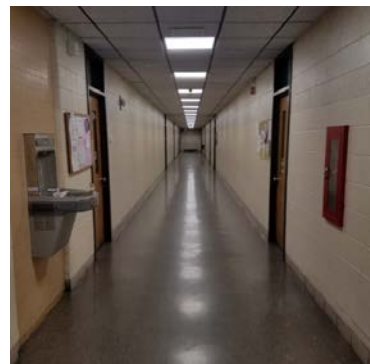
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Drinking fountains throughout the building protrude into the corridor more than 4 inches (521 CMR 20.6.1). The pictures below show some, but not all, of the examples of drinking fountains protruding into the corridor.



Protruding into the corridor more than 4 inches.



Protruding into the corridor more than 4 inches.



Protruding into the corridor more than 4 inches.



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- Vertical access to all floor levels (521 CMR 28.1)

The building does not have any elevators so there is no vertical access to the second floor or the basement level.

- Accessible toilet rooms must be provided where toilet rooms are provided to the public (521 CMR 30.1).

Toilet rooms throughout the building are generally not accessible. There are no accessible stalls that comply with 521 CMR 30.6. The size of the stalls are less than 60 inches wide and do not have grab bars complying with 521 CMR 30.8. The urinals do not comply with 521 CMR 30.10, the rim of the urinal is higher than 17 inches. The sinks do not comply with 521 CMR 30.9. The pictures below are some, but not all, of the examples of the noncompliant bathrooms.



Toilet stalls too small, urinals too high, and sinks not compliant.



Sinks not compliant.



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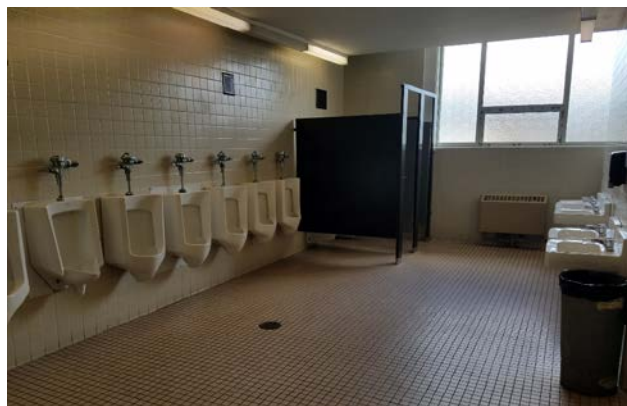
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Toilet stalls too small and grab bars noncompliant.



Stall too small and no grab bars.



Toilet stalls too small, urinals too high, and sinks not compliant.



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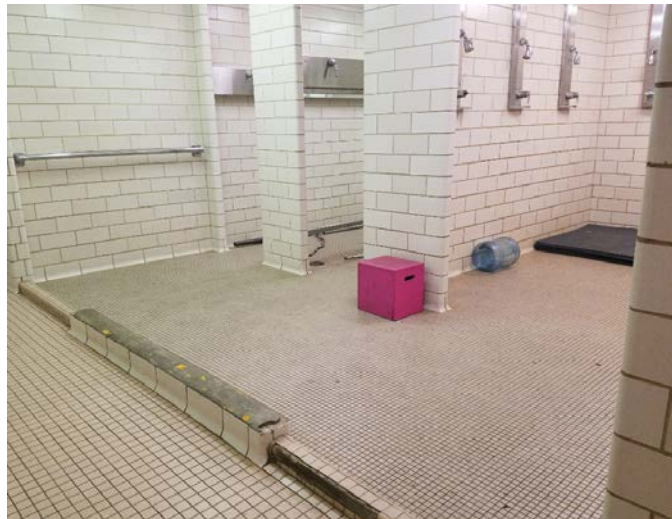
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- Bathing rooms shall comply with 521 CMR 31.00.

The men's bathing room shower is noncompliant. The fixtures are not accessible, and the shower has a 6" high barrier.



Noncompliant fixtures and barrier in shower.

The woman's bathing room is generally noncompliant. The showers and changing rooms are not compliant.



Shower is too small and has a barrier.

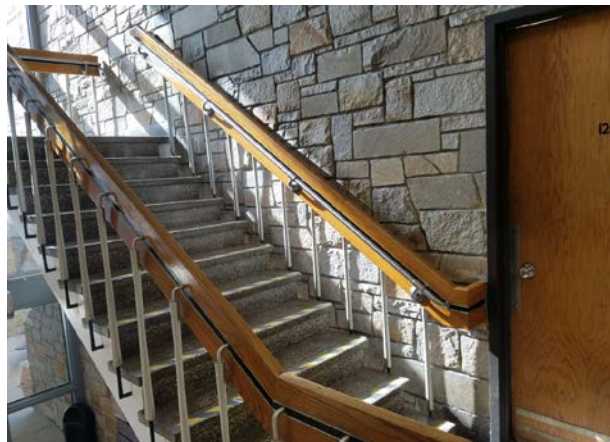


Changing area is noncompliant.

- Stairs shall comply with 521 CMR 27.00.

In general, most of the stairs are not compliant. In general stairs have one or more of the following issues (521 CMR 27.3, 27.4.4, 27.4.5, 27.4.3, 27.4.1, and 27.4.8). The pictures below are some, but not all, of the examples of the noncompliant stairs.

1. Abrupt nosings
2. Noncircular handrails
3. Handrails do not extend properly at the top or bottom of the stairs
4. Handrails are missing on one or both sides of the stairs.
5. Are not continuous on the inside due to post.



Stair handrails do not extend at the top and the bottom of the stair.

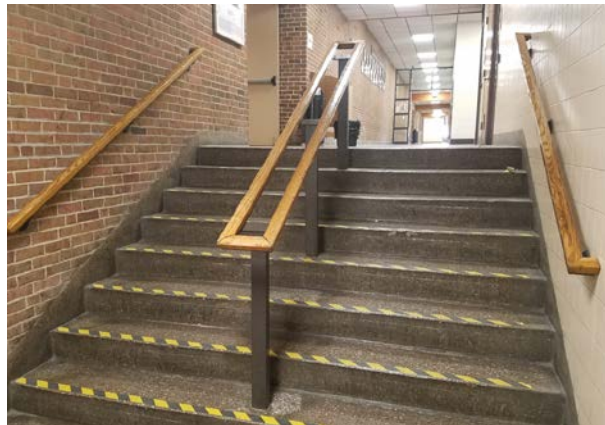


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Abrupt nosing on stair.



Handrails are noncircular and do not extend at the top and bottom of the stair.



Stair is missing a handrail.



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Bleachers are missing handrails in the aisle.



Stair is missing a handrail.



Stair is missing handrails on the sides.

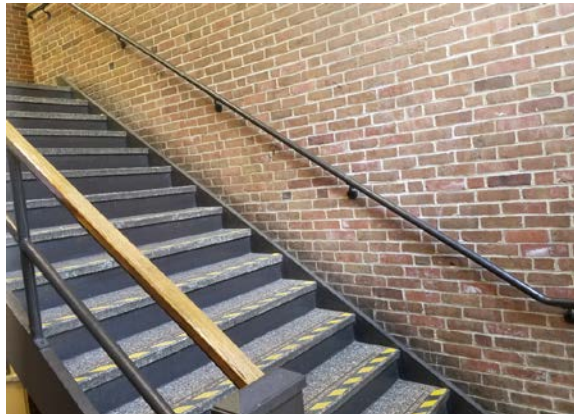


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Handrail is noncircular and does not extend at the top or the bottom.



Handrail is noncircular and is interrupted by post. Stair has abrupt nosings.



Handrails are noncircular, do not extend at the top and bottom and are interrupted by post. Stair has abrupt nosings.



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- Doors shall comply with 521 CMR 26.00.

Throughout the building the doors have doorknobs on them which is not compliant hardware since it requires a person to twist their wrist (521 CMR 26.11.1). Also, a lot of the doors do not meet the door clearance due to the alcoves being deeper than 6" in the classrooms (521 CMR 26.6.2, 26.6.3, and 26.6.4). The pictures below are some, but not all, of the examples of the noncompliant doors.



*Door does not meet clearances
and has doorknob.*



*Door does not meet clearances
and has doorknob.*

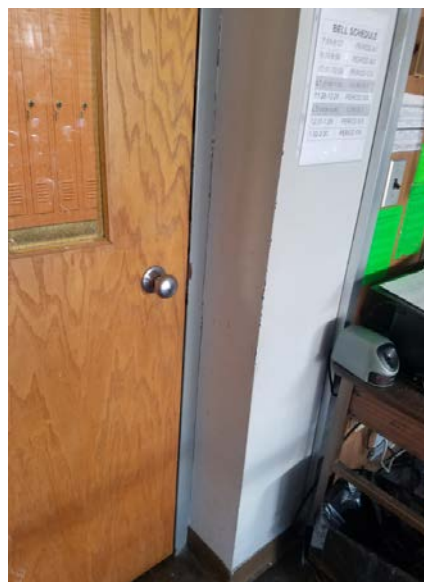


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Door does not meet clearances.



*Door does not meet clearances
and has doorknob.*



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Door has doorknob.



*Door does not meet clearances
and has doorknob.*



- Where tables, sinks, study carrels, computer workstations or fixed seating is provided at least 5% with a minimum of one of each item must be accessible (521 CMR Section 12.2.2).

In general, the classrooms are accessible. The shops and the labs are not accessible. Some shops have non-accessible levels. The shops and the labs also have non-accessible sinks. The labs have non-accessible workstations. The pictures below are some, but not all, of the examples for non-accessible items in shops and labs.



No accessible route to the upper level.



*No accessible route to the upper level
and non-accessible sink.*



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No accessible route to the upper level.



Non-accessible sink and counter space.



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- Drinking fountains shall comply with 521 CMR 36.00.

The drinking fountain is not compliant due to the controls, spout, height, and lack of kneespace.



Non-accessible drinking fountain.



Non-accessible drinking fountain.



- Signage must comply with 521 CMR 41.00

Throughout the building the signs do not comply. They are placed on the doors and do not have braille or raised lettering. Also, there are no signs that designate an accessible exit (521 CMR 41.2, 41.5, 41.6, and 41.1.3). The pictures below are some, but not all, the examples of non-accessible signs.



Noncompliant sign.



Noncompliant sign.

Americans with Disabilities Act Guidelines

The ADA Guidelines are not enforced by the Commonwealth of Massachusetts, they can only be enforced through a civil lawsuit or complaint filed with the U.S. Department of Justice. Compliance with the ADA Guidelines is triggered by renovations to the existing building. All renovations to the building must be made to ensure that, to the maximum extent feasible, the altered portions of the facility are readily accessible to and usable by individuals with disabilities (28 CFR Part 36 Section 36.402(a)). Alterations made to provide an accessible path of travel to altered areas and accessible facilities (i.e. provide accessible toilet facilities) are not required if the cost exceeds 20%



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of the total cost of the alteration (28 CFR Part 36 Section 36.403(f)). However, if the cost to meet these accessibility requirements does exceed 20%, alterations are still required to the maximum extent that the area can be made accessible without exceeding the 20% criteria (28 CFR Part 36 Section 36.403(g)). The ADA also contains less stringent dimensional requirements for some building elements in an existing building where it is infeasible to meet the requirements for new construction.

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APPENDIX A: Assessed Value

HOME

SEARCH

SUMMARY

INTERIOR

EXTERIOR

SALES

[Printable Record Card](#) | [Previous Assessment](#) | [Condo](#)

[Info](#) | [Sales](#) | [Zoning](#) | [Comments](#) |

WebPro

Card 1 of 3

[Next Card](#)

[Last Card](#)

Location 100 HEMLOCK RD	Property Account Number 81761	Parcel ID 40A-000-0RS
-------------------------	-------------------------------	-----------------------

Old Parcel ID 5 --

Current Property Mailing Address

Owner	NORTHEAST METRO, REG VOC SCHL	City WAKEFIELD
		State MA
Address 100 HEMLOCK ROAD		Zip 01880
		Zoning MD

Current Property Sales Information

Sale Date 12/31/1965	Legal Reference 11020-232
Sale Price 0	Grantor(Seller)

Current Property Assessment

	<u>Card 1 Value</u>	<u>Total Parcel Value</u>
Year 2020	Building Value 42,504,800	Building Value 43,612,500
	Xtra Features Value 65,300	Xtra Features Value 258,200
Land Area 60.000 acres	Land Value 2,487,100	Land Value 2,487,100
	Total Value 45,057,200	Total Value 46,357,800

Narrative Description

This property contains 60.000 acres of land mainly classified as MUNICPL with a(n) N/A st

HOME

SEARCH

SUMMARY

INTERIOR

EXTERIOR

SALES

[Printable Record Card](#) | [Previous Assessment](#) | [Condo Info](#) | [Sales](#) | [Zoning](#) | [Comments](#) | **WebPro**

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Location 100 HEMLOCK RD	Property Account Number 81761	Parcel ID 40A-000-0RS
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Old Parcel ID 5 --(

Current Property Mailing Address

Owner	NORTHEAST METRO, REG VOC SCHL	City WAKEFIELD
		State MA
Address 100 HEMLOCK ROAD		Zip 01880
		Zoning MD

Current Property Sales Information

Sale Date 12/31/1965	Legal Reference 11020-232
Sale Price 0	Grantor(Seller)

Current Property Assessment

	<u>Card 2 Value</u>	<u>Total Parcel Value</u>
Year 2020	Building Value 23,700	Building Value 43,612,500
	Xtra Features Value 192,200	Xtra Features Value 258,200
Land Area 0.000 acres	Land Value 0	Land Value 2,487,100
	Total Value 215,900	Total Value 46,357,800

Narrative Description

HOME	SEARCH	SUMMARY	INTERIOR	EXTERIOR	SALES
Printable Record Card Previous Assessment Condo Info Sales Zoning Comments					WebPro

[First Card](#) [Previous Card](#) Card 3 of 3

Location 100 HEMLOCK RD	Property Account Number 81761	Parcel ID 40A-000-0RS
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Old Parcel ID 5 --(

Current Property Mailing Address

Owner	NORTHEAST METRO, REG VOC SCHL	City WAKEFIELD
Address	100 HEMLOCK ROAD	State MA Zip 01880 Zoning MD

Current Property Sales Information

Sale Date 12/31/1965	Legal Reference 11020-232
Sale Price 0	Grantor(Seller)

Current Property Assessment

	<u>Card 3 Value</u>	<u>Total Parcel Value</u>
Year 2020	Building Value 1,084,000	Building Value 43,612,500
	Xtra Features Value 700	Xtra Features Value 258,200
Land Area 0.000 acres	Land Value 0	Land Value 2,487,100
	Total Value 1,084,700	Total Value 46,357,800

Narrative Description