Town of Franklin

355 East Central Street
Franklin, Massachusetts 02038-1352

Phone: (508) 520-4949
www.franklinma.gov

Office of the Town Administrator

Memorandum

August 4, 2023

To: Davis-Thayer Building Reuse Advisory Committee
From: Jamie Hellen, Town Administrator
Amy Frigulietti, Deputy Town Administrator

Re: Davis- Thayer Existing Conditions Report – March 21, 2023

Please note that the attached Existing Conditions Report from Kaestle Boos is in DRAFT form. While the vast majority of the report is complete, Section 4 (Floor Plans) cannot be completed until the Davis-Thayer Building Reuse Advisory Committee has been able to provide Kaestle Boos with their suggestions for building reuse. A final version of the report is expected later this Fall after evaluating the ideas put forth by the committee.

KAESTLE BOOS
associates, inc

DAVIS THAYER ELEMENTARY SCHOOL

EXISTING CONDITIONS REPORT

March 21, 2023

TABLE OF CONTENTS

1 INTRODUCTION

2 CODE ANALYSIS

3 EXISTING CONDITIONS

Structural 13
Architectural 21
Heating Ventilation & Air Conditioning 29
Electrical 33
Plumbing 37
Fire Protection 45

4 APPENDIX

Floor Plans 47

1 INTRODUCTION

2 CODE ANALYSIS

APPLICABILITY

This analysis reviews the former Davis Thayer Elementary School ("Davis Thayer") in Franklin, MA, with regard to the Massachusetts State Building Codes ("Code") for new construction. The 9th Edition consists of Massachusetts Amendments to these codes:

- International Building Code (IBC, 2015)
- International Existing Building Code (IEBC, 2015)
- International Energy Conservation Code (IECC, 2015`)
- Massachusetts State Building Code Amendments (780 CMR 9th Edition)
- Architectural Access Board Rules and Regulations (521 CMR, 2006)
- Uniform State Plumbing Code (248 CMR, IBC 2015)

Mechanical systems, including electrical, plumbing, and fire protection systems and sitework are reviewed in separate sections of this study.

Chapter 34 Existing Buildings in 780 CMR is replaced by reference with the IEBC with Massachusetts Amendments. Renovations to existing structures must be reviewed for code compliance by one of three separate methods in the IEBC: the Prescriptive Method, the Performance Method, and the Work Area Method. Within these methods to review compliance, the modifications required for compliance vary dependent upon the extent of the renovation work; renovation work is classified as Repair, Alteration Level 1, Alteration Level 2, and Alteration Level 3. When the extent of the repair and alteration work exceeds 50% of the aggregate area of the building, this work is classified as Alteration Level 3 and, under this classification, compliance with requirements of Alteration Level 1 and Alteration Level 2 is also required. Alteration Level 2 requirements are enforced when the work involves reconfiguration of spaces or systems, but not more than 50% of the total building area. Alteration Level 1 requirements are enforced when the work is cosmetic or replacement of existing materials with similar materials, such as re-roofing projects. All analyses in this study are based on the Work Area Method and the renovation work is classified as Alteration Level 3 based on the worst case assumption that more than 50% of the building will require renovation.

Upgrades and corrections to existing structures undergoing renovations are limited to specific items under the IEBC. During renovations, not all existing safety issues and non-compliant conditions are required to be corrected; typically only items within each renovated area are required to be corrected. However, non-compliant conditions at stairs and egress elements, fire rating separations, accessibility, and fire protection (sprinklers) are required to be corrected or provided as required by the IBC. Because this building was constructed several decades ago, existing conditions which may be allowed to remain under the requirements of the IEBC may also be in conflict with current life safety codes and standards. Over time, since the original construction of the Davis Thayer School, life safety standards have been improved in reaction to tragic events. In order to provide life safety conditions in accordance with the most current intent for safety, the current IBC and Fire Safety codes and regulations are also used as a basis for judging compliance.

Correcting existing conditions to comply with current Accessibility and Fire Protection requirements is required by the IEBC only when the value of the work exceeds the cost or scope triggers stated in the AAB and the Fire Code.

Compliance with Chapter 148 Section 26G of the State Fire Code is required by the IEBC for all renovations classified as Alteration Level 3. The existing building is fully sprinklered and so complies with this requirement.

Accessibility in public buildings is regulated by 521 CMR, which is enforced by the Massachusetts Architectural Access Board (MA AAB) and the Building Inspector of the municipality. 521 CMR, as issued in 2006, is used for this review. MA AAB 5.1

Definitions states:

"Public Buildings: A building privately or publicly financed that is open to and used by the public, including but not limited to ….,commercial buildings, buildings having places of assembly, [etc.]…"

It is assumed that Davis Thayer Elementary School will change use from an educational use to be a public commercial building and is required to be accessible in accordance with 521 CMR.

Currently, the AAB regulates only areas and conditions accessed by the "public"; areas occupied solely by staff are not included in the regulation. Staff areas are included in the ADA Accessibility Guidelines as part of federal law, but these are not directly enforceable as part of the Building Code. However, as the areas limited to staff in a future renovation are unknown, all areas of the building will be reviewed for compliance with AAB.

Applicability of the AAB Regulations for renovations of existing buildings is based on the value of the renovations as a percentage of the current assessed value of the building (100% valuation). According to AAB 3.3, full compliance of the entire facility is required when the value of the renovations exceeds 30% of the assessed value of the building. Also, according to AAB 3.5, any work performed, even if under separate contracts or building permits, within a 3 year period must be included in the aggregate construction cost. This includes sitework and building renovations, whether done separately or together.

According to the Town of Franklin Assessors Department, the current assessed value for the building (structure only) is $2,760,800. The threshold value of the cost trigger for accessibility is 30% of this value less the cost of permitted work within the last 3 years. This threshold is shown below. As the building was taken out of service more than 2 years ago, the only costs attributed to the aggregate cost is the cost of the a proposed renovation. Based on the estimate of the conceptual design included in this study, the renovation/addition cost is presumed to exceed these thresholds and the entire site and building must be made to comply with current accessibility regulations.

COST THRESHOLDS FOR ACCESSIBILITY AND FIRE SUPPRESSION COMPLIANCE	
Assessed Value of Davis Thayer School (Structure Only)	$2,760,800
30% Cost Trigger for Accessibility Compliance	$ 828,240

Energy conservation, as required by the IECC for new construction, is not required for renovations to existing structures under the IEBC. However, any new elements or alterations to the exterior building envelope, such as new windows or new roofing, must comply to the greatest degree possible. As stated in the IEBC Alteration Level 3 Section 808 Energy Conservation "Essentially, the entire building is not require to meet the energy provisions, but only improvement in the energy performance of the building is intended to be achieved by making the new elements meet the IECC…". Overall upgrades of the exterior envelope of the building are not required for compliance with the Code, however, recommendations in this report are based on providing compliance with the Energy Code as best as possible.

BUILDING CODE COMPLIANCE ANALYSIS (IEBC / 780 CMR - IBC)

As this study evaluates the existing facility at the Davis Thayer Elementary School, the requirements of the IEBC are used to determine compliance. In the discussion below, references to specific code sections are noted before each paragraph with parentheses.

(IEBC 101.4.2) Applicability: Under this definition, as a building that has been previously occupied prior to the issuance of the Code, the Davis Thayer School is considered an existing building and regulated under the IEBC.

(IEBC 101.5.2) IEBC offers three methods for compliance analysis and four levels of work classification. For the purposes of this study, the Work Area Compliance method will be used and future renovations will be considered as an Alteration Level 3 work classification.

(IEBC 701.3) Compliance: All new elements must comply with IBC.

IBC CH. 6 – TYPES OF CONSTRUCTION

*The following discussions regarding Type of Construction, Use Group Classification, and Height and Area Limitations are provided to document the existing facility classification only. These characteristics are not regulated by the IEBC and existing buildings are not required to be modified to comply as a result of renovations. Additions to an existing building, however, must conform to limitations of allowable height and area and are regulated by the IBC. Determination of the allowable height and area of the existing structure provides guidance for the extent of any new additions that are planned.

(IBC Table 601) The building is constructed of masonry bearing wall and skeletal steel frame with concrete slab-on-grade/ concrete deck floors and with masonry veneer exterior skin. The structure does not appear to be protected with spray fireproofing or other rated construction. Interior steel stud and plaster partitions and masonry walls are non-load bearing and do not affect this classification. The existing construction system with non-fire rated structural members generally conforms to the requirements for Type II-B (non-combustible) construction in the current IBC.

Type II-B Construction Type Min. Fire Resistance Rating Requirements (780 CMR Table 601)	
Building Elements	**Required Fire Resistance Rating (Hrs)**
Structural Frame (including columns, girders, and trusses)	0
Exterior Bearing Walls	0
Interior Bearing Walls	0
Exterior Non-Bearing Walls and Partitions (See Table 602)	0
Interior Non-Bearing Walls and Partitions	0
Floor Construction (including support beams and joist)	0
Roof Construction (including support beams and joist)	0

Table 601 establishes the required minimum fire rating of construction elements and is related to the allowable height and area discussed in Table 503 below. Type II-B construction allows the building structural members to be unprotected (not fire rated). The tradeoff for not protecting the building structure is a reduction in the allowable height and area that can be built; essentially, the greater the fire protection of building structural elements, the larger the building height and area which is allowed.

(IBC CH. 3 – USE AND OCCUPANCY)

(IBC 305.1) Primary Use Group: Group B – Business, Commercial

(IBC 305.1) Mixed Use Areas: Group A-3 Assembly (Media Center, Gym, Cafeteria)

Group S-1 Storage (Mechanical Spaces, Storage)

(IBC CH. 5 – GENERAL BUILDING LIMITATIONS)

Height and area limitations for the existing building are presented below with the assumption that the existing fire protection (sprinkler) system is compliant and will be extended throughout any new school additions. These allowable floor area calculations take advantage of the height and area increases permitted when a fire protection system is provided and also incorporates area increases allowed for additional street frontage.

(Table 506.2) In this table, each building occupancy has 3 categories for allowable area: Non-Sprinklered, Sprinklered on One Floor, and Sprinklered on Multiple Floors. Based on the presumption that any renovation for this building will continue to include a sprinkler system, the allowable area will be based on the "Sprinklered Multiple Floor" category. Additionally, as the building perimeter is accessible for fire and rescue vehicles from the road or parking areas on 100% of the sides of the building, the maximum allowable area may be increased by an additional 75% for this accessible frontage.

- The accessible street frontage combined with the allowable area increase for a sprinkler system will allow a total increase in area stated in Table 506/2. This total allowable area, for each use group, is shown in the last column of the table below.

(Table 506.2) The allowable height and area for Type IIB Construction is:

USE GROUP	Total Allowable Height with Additional Increase for Sprinkler System	Allowable Area **per Story**		
		Allowable Area (Table 503) Multiple Story with Sprinkler System	Accessible Perimeter +75%	Total Allowable Area per Floor with Allowable Increases
A-3	3 Stories	28,500 SF	+ 7,125 SF	+35,625 SF
B	4 Stories	69,000 SF	+ 17,250 SF	+86,250 SF
S-1	Accessory Use	Included in Business Use Throughout		

(202) The lowest level of the building housing the gymnasium is considered a basement and not a story above grade. A story is considered a basement when none of the following conditions apply:

- The floor of the story above is more than 6 feet above the average grade plane,
- The floor of the story above is more than 12 feet above the average grade plane at any point.

The Grade Plane is an imaginary line representing "the average of finished ground level adjoining the building at exterior walls".

- For this building, the grade plane is consistently about 1'-6" lower than the First Floor elevation (floor above the lowest level) on all sides, so the lowest level of the building is considered a Basement and not a Story above Grade.

(IBC 508.2.4 and Table 508.4) Buildings with multiple Use Groups are called mixed-use buildings. Buildings are further classified as a 'separated' mixed use or a 'non-separated' mixed use. If classified as a 'separated' mixed-use building, then the different use groups within the building must be separated by fire rated construction as required in Table 508.4. If classified as a 'non-separated' mixed-use building, then fire rated separations are not required if the most restrictive use group is used to calculate the allowable height and area. In Table 508.4, Assembly and Business use groups are required to be separated by 1 hour fire rated construction. This does not apply to Use Group S-1, as stated in 508.2.4, rooms used for storage may be considered as accessory to the primary Business Use Group provided the aggregate area of the storage rooms is less than 10% of each floor area and less than 10% of the area allowed by Table 506.2.

Even using the most restrictive Use Group A-3 as a basis for review, the allowable area per floor of 35,625 square feet indicated above far exceeds the actual area for each floor in the building. This will allow an Assembly use to be used as a primary use throughout the building and so not require fire rated separating construction between use groups.

EXISTING FACILITY FLOOR AREAS AND HEIGHT

FLOOR	ACTUAL FLOOR AREA	ALLOWABLE STORAGE AREA FOR ACCESSORY USE
Basement	8,089 square feet	809 square feet
1	10,226 square feet	1,023 square feet
2	13,437 square feet	1,084 square feet
3	10,832 square feet	1,083 square feet
TOTAL AREA	42,584 square feet	
ACTUAL HEIGHT	3 Stories above grade plane (with Basement)	

(IEBC 102.2.2.1 & IBC Chapter 10 - Means of Egress

Occupancy in the existing facility is determined by the occupancy rate and floor area for the uses on each floor of the building. As a worst case for future use, occupancies are assumed to be B (Business) and A-3 (Assembly). At this rate, the building may have an occupancy of 831 people.

PROPOSED BUILDING OCCUPANCY

FLOOR	OCCUPANCY AREA	OCCUPANCY RATE	OCCUPANTS PER AREA	TOTAL FOR FLOOR
Basement	3,264 SF	1p / 15 SF (A-3)	218 p	218 p
1	8,104 SF	1p / 100 SF (B)	81 p	223 p
	2,122 SF	1p / 15 SF (A-3)	142 p	
2	10,846 SF	1p / 100 SF (B)	108 p	281 p
	2,591 SF	1p / 15 SF (A-3)	173 p	
3	10,833 SF	1p / 100 SF (B)	109 p	109 p
Number of Occupants (B) :				298 p
Number of Occupants (A-3) :				533 p
TOTAL OCCUPANTS				831 p

The egress capacity (0.2"/per occupant) for each 60-inch wide stairway is approximately 300 occupants. The egress capacity (0.15"/per occupant for sprinklered buildings) for a typical single 36-inch wide egress doorway is approximately 220 occupants.

- There are 2 egress stairs evenly dispersed at each end of the building which can provide a combined egress capacity of 600 persons per floor.

- There are 2 egress door pairs at the front and at the rear of the school which can provide an egress capacity of 552 persons at each door. However, access to these exterior doors is limited by 2 smaller pairs of corridor doors at the front stairs of the school and 2 single interior doors at the rear of the school. These limit the access to the stairs on each floor to 373 persons; access to the exterior rear doors is limited to 220 persons.

- Although the existing egress elements are sufficient to provide egress from any location within the building for the projected occupancy per floor, the existing egress doors within corridors to stairways are not of compliant width. These doors must provide a minimum clear width of 32" but the actual clear width of these doors is less than 28".

IEBC 102.2.2.1 is an amendment by the State of Massachusetts and supersedes other less restrictive paragraphs in the IEBC. This amendment requires that all existing stairs comply with current requirements of the IBC with regard to the quantity of exit ways on each floor, the width of all exit ways, fire rating, handrails, continuity, etc., to "provide safe and adequate means of egress".

- Existing egress stairs in the building are not enclosed in required fire rated construction, do not have risers and treads of required dimensions, do not have railings and guards with required height and spacing, do not have required rail extensions, and do not have fire rated doors which comply. Storage and mechanical room also open directly into the stairs which is not allowed. All stair conditions must be corrected in accordance with current egress requirements.

(IEBC 703.2.1 Existing Vertical Openings)

All existing vertical openings connecting 2 or more floors must have an enclosure with a fire resistive rating of 1 hour minimum.

- Exception 6 under this requirement allows vertical openings up to 4 stories in Educational uses which have a fire protection system.

- As the existing sprinkler system is presumed to comply and to be extended for any new additional construction, a renovation will not require closing any existing openings between floors for distribution of ductwork or multistory rooms like the Gym and the Media Center.

(IEBC 703.5.1 Existing Guards)

Existing guards on stairway railings are not in compliance with current IBC must be modified or replaced.

- Guards at stair balcony rails are not 42 inches in height and exceed the maximum opening size requirement (for a 4 inch diameter ball). These guards must be modified or replaced to provide protection to the required height. The existing wall mounted handrails do comply and may remain. However, the interior guardrail does not have a continuous handrail as the existing rail terminates at newel posts at each landing. Handrails must be provided on the interior guardrails.

(IEBC 705.4 - Means of Egress)

IBC Table 1015.1 and IEBC 705.4.1.1 require 2 means of egress from Assembly occupancies when the occupant load exceeds 50 persons. The minimum distance between 2 means of egress from a room is required to be 1/3 of the diagonal room dimension if the building is sprinklered. Also, all exit doors must have compliant exit (push bar) door hardware.

(IBC Table 1016.1 Exit Access Travel Distance)

- The greatest travel distance to an exit enclosure occurs on the 3rd floor and is approximately 130 feet. This is far less than the allowable travel distance of 250 feet. Also, the maximum common path of travel distance, which is the distance one has to travel before having 2 separate means of egress to choose from, is 75 feet for any room or corridor. All rooms which require 2 means of egress are compliant and the longest common travel distance to a corridor is approximately 50 feet within one classroom on the 3rd floor.

(IEBC 705.6) In buildings with an Assembly occupancy, the allowable length of a dead end corridor is 35'.

- The existing egress component capacities and the length of exit access travel to the entrance of an exit meet all requirements of the current IBC. The existing school has 2 stair towers which are evenly spaced on the egress path with no dead end corridors. This provides egress capacity which far exceeds the current IBC requirements.

Minimum Number of Exits (780 CMR 1015.1)			
Area	**Occupant Load**	**Required Number of Exits**	**Number of Exits Provided**
Offices	< 50	1	1
Storage and Mechanical Rooms	< 50	1	1
Assembly – Media Center	≥50 < 500	2	2
Assembly – Gymnasium	≥50 < 500	2	2
Assembly – Cafeteria	≥50 < 500	2	2

(248 CMR 2.10 Plumbing Code: Fixtures) Based on an occupancy based on an assumed Business use throughout the building as a worst case, plumbing fixture requirements for this occupancy are stated below. All existing toilet rooms are assumed to require renovations to replace child toilets with adult toilet and new rooms created to meet the plumbing fixture requirements.

Use Group	**Rate for**	**Occupants**		**Minimum # of Fixtures Required**
B (Commercial, Business)	Male: 1/25 Female: 1/20	298 p	150 Male 150 Female	Male: 6 Fixtures Female: 8 Fixtures
A-3 (Assembly, Halls)	Male: 1/100 Female: 1/50	533 p	270 Male 270 Female	Male: 3 Fixtures Female: 6 Fixtures
Total # of Fixtures Required				Male: 9 Fixtures Female: 14 Fixtures

According to the table above, the plumbing code requires a minimum of:

- a total of 12 toilet fixtures for male occupants;
- a total of 11 toilet fixtures for female occupants;

In the existing facility, the toilet facilities are based on an educational occupancy and are not sized for adult use. Although the existing toilet fixture count exceeds the minimum requirement above for the assumed occupancies, none of the existing student or staff toilets comply with accessibility regulations. Modification of existing toilet rooms will result in loss of toilet fixtures.

ACCESSIBILITY CODE COMPLIANCE ANALYSIS (521 CMR AAB)

EVALUATION OF EXISTING CONDITIONS

This building was constructed in 1924, long before the Architectural Access Board issued accessibility regulations in 1968. Renovations in 1973 modified some conditions to comply with regulations at that time, however, these conditions are not compliant with current accessibility regulations. As a result, the building has impediments to accessibility throughout. Correction of some conditions to be compliant with current code requirements is simple with minimal effect on the existing building, such as adding accessible signage, while correction of other conditions is complex, such as relocating toilet rooms or adding an elevator, and will require extensive renovations. In summary, a general list of these issues follows:

- An accessible route is not provided to the Basement, Second Floor, and Third Floor levels or to many of the individual rooms throughout the building. Non-compliant conditions related to providing an accessible route which must be resolved are:
    - ◊ Access to and egress from the building at all required entrances,
    - ◊ Parking and loading zones,
    - ◊ Access to play areas,
    - ◊ Sidewalks and curb cuts,
    - ◊ Access to the Basement, Second, and Third Floors,
    - ◊ The underside of the stairs to the Basement is open under and protrudes more than 4 inches,
    - ◊ Clearance at classroom doors and door hardware,
    - ◊ Stair and corridor door widths,
    - ◊ Cafeteria and Library door widths,
    - ◊ Stair nosings, and
    - ◊ Stair railings and guards.
- Toilet rooms fixtures, accessories, and clearances are not compliant.
- Signage throughout the building is not compliant.
- Drinking fountains are not compliant.
- Casework and sinks within classroom spaces is not compliant.
- Places of assembly do not have assistive listening systems,
- Cafeteria services are not at accessible heights.

As a result of evaluation of these issues, it is understood that corrective measures cannot be isolated to the specific areas of each condition. For example, providing access to toilet rooms will require increasing the size or, in some cases, relocating these rooms which will affect other rooms in the building. This domino effect has been considered in the evaluations and recommendations for correction of each condition to provide a solution that is the least intrusive on adjacent spaces.

ACCESSIBLE ROUTES:

Providing an accessible route to, from, and throughout the building requires correction of many conditions and will require extensive renovations.

Outside of the building, accessible routes must be provided from public parking areas, to play areas, and at public entrances and exits. All public entrances and required exits to the building must be accessible and be on an accessible route. In this building, all four entrances will require accessibility. The Main Entrance to the building does not provide an accessible route. Modification to the main entrance and required means of egress doorways to provide accessible routes is necessary.

Currently, only two non-compliant accessible parking spaces and no loading/drop off spaces are provided. Three accessible spaces and a loading area must be provided on an accessible route with curb cuts from street to sidewalk. Access to the play areas must be provided to accessible elements of the play structures and to the playground. For this, an accessible path must be composed of an approved synthetic paving material designed for exterior use.

Access to the Basement, Second, and Third Floors is not provided. As grade levels and specialty rooms, such as the gymnasium and media center, are distributed on floors other than the First floor, this does not allow for access by all children of all grade levels to classrooms and activities. A compliant elevator is required on an accessible route in all multistory buildings to provide access to all floor levels and activities. Extensive modifications to the building, including plumbing and fire protection service entrances at the basement foundation walls, are necessary to provide an elevator to access all floors of the building.

Accessible routes within the building generally comply with requirements for width, passing space, protruding objects, headroom, etc. Objects projecting from walls with their leading edges between 27 inches and 80 inches above the finished floor must not protrude more than 4 inches into walks, halls, corridors, passageways or aisle and must not have sharp edges. One area which is non-compliant, however, is the underside of the stairs in the corridor to the Gymnasium. This condition creates a non-compliant condition for a blind person as an obstruction above 12 inches above the floor. The underside of these stairs should be filled in with walls to remove this hazard.

DOORS:

Many doors within the building were modified during a previous renovation in 1973. Unfortunately, these renovations do not provide compliance with current code requirements. Classroom doors are constructed in recesses in the deep corridor walls and were set back about 15" from the face of the wall as part of the 1979 renovation. These doors do not provide the required pull side clearances beside the door strike edge (with the door handle). To provide this clearance, either the walls beside the door must be modified, the door must be moved to the corridor wall face, or an automatic operator (push button) must be added. The push button is not recommended as this electrified device requires ongoing maintenance and requires pulling force to open the door that may be difficult for young children. Moving the doors to their original position at the face of the corridor wall is also not recommended as these doors will then swing into the corridor obstructing egress and the passage of children through the corridor. Modification of the walls adjacent to these doors is the primary recommendation; however, the composition of these deep walls must be investigated at each location to be assured that concealed building elements, such as ductwork or piping, will not be affected. It is assumed that future renovations will demolish interior partitions and doors except at core locations such as stairs; all new doors and hardware must comply with accessibility requirements.

Door pairs at stairs and corridors have 32 inches wide leaves and do not provide the required exit width for compliance with accessibility requirements of the AAB or egress requirements of the Building Code. These doors should be replaced to provide door pairs with 36 inch wide leaves; in some cases, the doors must be moved and the walls will need to be rebuilt. Also, some rooms with door pairs are also too narrow, such as at the Library and the Cafeteria. These doors also should be rebuilt to provide door pairs with 36 inch wide leaves.

STAIRS:

Stair nosings are required to be angled or radiused so that these do not create an abrupt nosing on which a foot or crutch could be caught. All existing stair nosings have an abrupt protruding lip at each tread and all stair treads must to be modified to comply. Modification of the treads with vinyl tread covers is recommended to eliminate the abrupt nosing.

Stair handrails must be provided on both sides of the stair, must be continuous, and must have extensions at the top and bottom of the wall mounted rails. All stair railings need to be modified to comply with this handrail requirement. The wall mounted handrails do not have extensions at the top and bottom. Interior guardrails do not have handrails at all and guardrails are interrupted by newel posts so as not to provide a continuous rail.

TOILET ROOMS:

Existing toilet rooms do not comply with accessibility requirements and must be modified. Total fixture counts for these toilet rooms should comply with the requirements of the Plumbing Code discussed in the Existing Conditions portion of the Study and should be distributed to serve all occupancies in the building. All existing toilet rooms are assumed to require renovations to replace child toilets with adult toilet and new rooms created to meet the plumbing fixture requirements. In the existing facility, the toilet facilities are based on an educational occupancy and are not sized for adult use. Although the existing toilet fixture count exceeds the minimum requirement above for the assumed occupancies, none of the existing student or staff toilets comply with accessibility regulations. Modification of existing toilet rooms will result in loss of toilet fixtures.

Drinking fountains are provided within the building but are not accessible. These must be replaced with new fixtures with 2 level spouts.

SIGNAGE:

Room signage with braille must be provided at all 'permanent rooms and spaces' as well as code required egress signage. Compliant signage and Symbols of Accessibility are missing throughout building. Where exit signs indicate an accessible route, if all routes are not accessible, these exit signs shall include the symbol of accessibility. Also, illuminated signage identifying accessibility by the use of the international symbol contained within the "exit" sign must be provided at all egress doors in assembly occupancies with an occupancy load of over 150 people. Provide this signage for exits from the spaces currently used for the Gym, Cafeteria, and Library if these remain used for assembly purposes.

ASSISTIVE LISTENING SYSTEMS:

A permanently installed assistive listening system must be provided for all assembly occupancies of more than 50 persons. The minimum number of receivers that needs to be provided must be equal to 4% of the total number of seats, but no less than two receivers per room. These systems must be provided in all assembly spaces.

3 EXISTING CONDITIONS

STRUCTURAL

STRUCTURAL OBSERVATIONS

On February 24, 2023, in the company of Mr. Mike D'Angelo, the Facilities Director for the Franklin Public Schools, I visited the former Devis Thayer Elementary School at 137 West Central Street in Franklin, MA for the purpose of conducting a preliminary evaluation of the current physical condition of the building based solely on my visual observations. It is our understanding that the city is very interested in the historic preservation of this building and its potential reuse for some other type of occupancy rather than educational. The former school building has been vacant for some time, but well maintained, heated, and secured.

The following report is based upon our general impressions, and not on any detailed structural analysis, which could be performed, if necessary, under a later study. This report will outline any obvious structural deficiencies or limitations that would affect the continued use of the building.

The building was constructed in 1924, as can be seen on the buildings cast stone inscription. There are no original building plans available for this review which would indicate the framing sizes and direction of framing for the various building areas. However, the existing drawings for the renovations performed in 1972 are available for reference. The footprint of the present building appears to be identical to the original construction. The portable classrooms and rear fire escape were demolished some time ago.

GENERAL OBSERVATIONS

The building is rectangular in shape and measures approximately 146 feet x 100 feet and consists of three classroom levels above grade and a lower-level gymnasium about a half story below grade. The boiler room is accessed by an interior staircase and an exterior areaway stairwell and is a full story below grade. The lower-level floors consist of a concrete slab on grade which appeared to be in good condition. The framing layout of the upper floors is typical for school buildings of this period, with central corridors and classrooms on both sides. The floor framing consists of various construction methods including common-wood framing, reinforced cast-in-plate concrete tee construction, and more modern steel beams and joists at the gymnasium bleacher infill. I observed the floors to be relatively firm with respect to perceived bounce. There did not appear to be any cracking or sag in the plaster ceilings, and it appears the members are functioning properly.

Although most of the framing was concealed by plaster finishes and acoustical ceiling tiles, certain key areas were visible for review. In general, the condition of the structure appeared to be well built and sound without apparent defects, distress, or settlement, etc. It's estimated that the floor framing can support a loading similar to the original classroom loading of about 50 pounds per square foot and likely greater amounts over at the library area. Should any other occupancy be considered, which would require a heavier loading, or any other alteration work, such as a new elevator shaft, strengthening of the floor and reinforcing of certain key members would be necessary.

ATTIC / ROOF FRAMING

As viewed from the attic space above the classrooms, the roof and ceiling construction were framed primarily with conventional wood construction supported by steel beams and steel trusses (over the library) and in turn supported by steel columns and wood stud and brick bearing walls, presumably extending continuously down to the foundation. The roof decking consisted of tongue and groove wood planking spanning between the joists which depth varied based on the rafter span. Observations in the attic were limited due to poor lighting and unsure footing on the ceiling members. From the rooftop, I observed the roof was properly pitched to the roof drains with minimal ponding of water at the roof drains after the previous night's precipitation. There was no major rooftop equipment, just some small ventilation hoods. Although 100 years old, the roof construction appeared to be in excellent condition, with no sign of deterioration or dry rot visible. Any new renovations will require the joists and associated supports be fastened to the supporting steel beams and/or bearing walls with pre-manufactured tie-down anchors or other

approved methods to prevent against modern day uplift loadings. The loadings for and additional new roof top units would need to be investigated and the roof framing reinforced as necessary.

EXTERIOR BEARING WALLS

The exterior of the building appears to be in reasonably good condition for its age, with almost no distress or cracking evident. Some appendages, such as stoops and entry wells, are deteriorating, and would need to be re-built. Some rust-removal would be required at the lintels as occurring over the window openings, but overall, there does not appear to be any major structural work required other than minor repointing and repair to restore the exterior into good order..

STRUCTURAL LIMITATIONS

Floor Load Capacity: As desirably as it might be for the functioning of the renovated building, it will not be possible to upgrade the live load capacity of the floors without major reinforcing and likely seismic upgrades.

Plaster Removal: Care should be taken while removing plaster from some interior walls and ceilings. The plaster may provide lateral bracing for the tops of walls and may cause the walls to become unstable.

Shear walls: There is no reason to believe that there is any vertical reinforcing in the masonry, as it was not the custom to have such reinforcing for relatively simple bearing construction. Numerous buildings of this vintage were built using exactly the same technique, with no distress, other than occasional shrinkage cracking.

Wall Anchorage: The connections of the floor and roof diaphragms to the masonry walls are incapable of providing adequate support as masonry shear walls for out of plane demands.

Diaphragm: The building does not have a clearly defined lateral force resisting floor system other than de facto structural elements consisting of minimally reinforced concrete floors and wood floor planking.

Seismic Loading: Due to the age of the original building construction, mainly because of the unreinforced masonry bearing walls, this structure is not qualified to be upgraded to Risk Category III or IV buildings, i.e., police station or emergency facilities. The existing building must be strengthened to meet the requirements of the current IBC for new buildings, which in our opinion, is unjustifiable.

CONCLUSION

In our professional opinion, it appears that there is every reason to believe, from a structural standpoint, that this present vacant building could be transformed into one which could conceivably serve any number of beneficial purposes so as long as the Occupancy category is the same or less than the present construction. However, we defer to the Architectural narrative for the level of work to be performed, as well as any change of occupancy proposed, along with project compliance with the International Existing Building Code (IEBC)

I trust that this narrative sufficiently explains the circumstances of the existing structure. Should there be any questions in connection with this report, please do not hesitate to contact us.

BUILDING PHOTOS

Figure 1 – Original Building Constructed in 1924

Figure 2 – Wood Framing Below Second Floor Classrooms

Figure 3 – Reinforced concrete rib-slab construction above kitchen and lower-level storage.

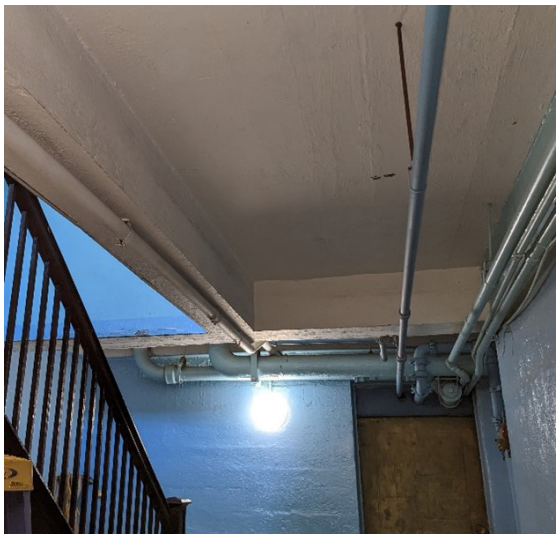


Figure 4 – Reinforced concrete beams and slab construction in stairwells.

Figure 5 – Boiler room one full story below grade.

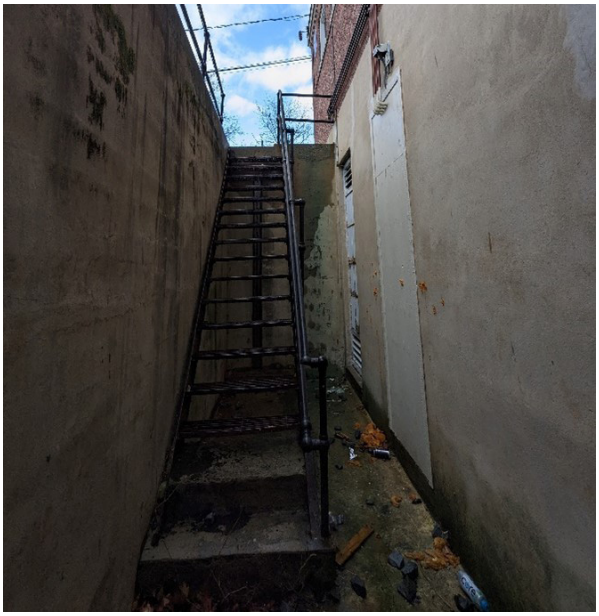


Figure 8 – Two-story library structure

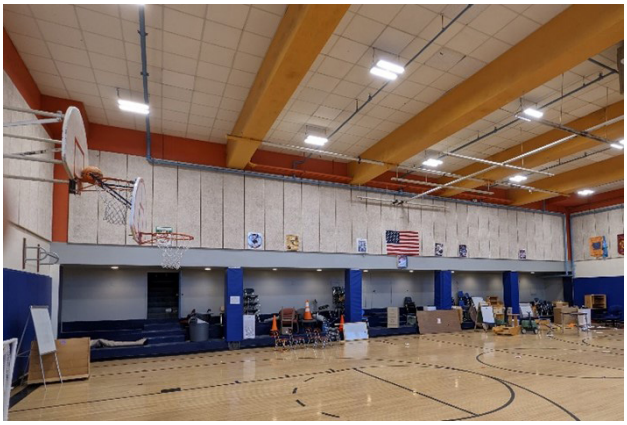


Figure 7 – Existing gymnasium one-half story below exterior grade.

Figure 8 – Two-story library structure

Figure 9 – Attic photos showing steel beam, column, and wood roof framing

Figure 10 – Steel truss roof framing over library area, and cripple walls providing pitched roof construction.

Figure 11 – Photo showing roof properly pitched to roof drains, and limited roof top equipment.

Figure 12 – GO BOBCATS !

ARCHITECTURAL

OVERVIEW

The Davis Thayer Elementary School was originally constructed in 1924 as a high school for the Town of Franklin. The building was taken out of service a few years ago but has remained tempered and maintained by the School District. Major spaces in the existing school building consist of a gymnasium located on the basement level, the kitchen/cafeteria located on the first floor, and the media center / library on the second floor. The media center space and gymnasium space are both 2 stories in height. Remaining spaces on the three floors above grade were previously used as classroom spaces with various support spaces for storage, mechanical systems, and toilet rooms. A renovation in 1973 created classroom spaces, expanded the size of the cafeteria, replaced doors and hardware, installed a new roof, and installed ramps for accessibility. Four modular classrooms were added to the building later were removed when the building was taken out of service.

Egress is provided by two stair towers at each of the main entrances on the front (south side) of the building which extend from the First to the Third Floor. Single stairs provide egress from the Basement gymnasium to the exit doors at each side at the rear (north side) of the building. There is not emergency access by elevator provided in the building.

The original building is listed in the Town Assessor Property Data at 42,018 gross square feet. The gymnsasium and boiler room in the basement, at approximately 8,418 square feet, is not included in the building area on the property data card.

EXTERIOR ENVELOPE

VENEER

The exterior of the building is sheathed with brick veneer, assumed over structural CMU backup walls, with cast stone cornices and door casings. The existing brick veneer is in generally good condition and is reviewed in detail in the Structual section of this report.

There are louvered openings below windows in all classrooms of the existing building for unit ventilator mechanical equipment. Some of these openings have been covered by metal plates. In any future renovation, removal of the unit ventilation system is recommended and so these openings will be infilled with brick and backup CMU to match the existing construction.

On the north side of the building, the 1973 renovation modified a row of windows to become doors leading to a fire escape. The fire escape was demolished at least 10 years ago but the doors remain and are a life safety hazard. These doors should be removed and infilled with with brick and backup CMU to match the existing construction with new windows.

WINDOWS AND DOORS

The single hung windows are a residential/light commercial type aluminum replacement window with the original wood frames left in place. These were replaced recently and appear to be in good condition. However, the two original circular windows in the stairwells above the entrances have not been replaced or protected and consequently the wood has deteriorated to a point where wind driven rain infiltrates through the window. Exit doors at the main entrances are in fair condition with functional exit devices.

At exterior windows, there is evidence of water infiltration. For example, the plastic laminate interior window sills at the Media Center space on the north side of the building is peeling from the substrate presumably from water damage. All windows should be resealed with caulking.

ROOFING

The Davis Thayer School roof was built in 1924 and based on the 1973 renovation drawings, the roofing at that time was built up tar and gravel; the current roof consists of a fully adhered EPDM membrane on a wood deck and it is unknown if the original roof was removed when the EPDM roof was installed. The EPDM membrane roof is more than 20 years old and is beyond the end of its expected use. Energy code requirements for roofs have increased since this roof was replaced and any roof replacement should include upgrades to roof insulation thicknesses. Replacement of roofing membrane, insulation, and flashing is recommended.

INTERIOR BUILDING ELEMENTS

INTERIOR FINISHES

Interior finishes are original plaster walls with paint, acoustical tile ceilings, and vinyl floor tile or carpet.

Flooring is mostly vinyl tile on the First floor and carpet throughout on the Second and Third Floors. Previous renovation documents indicate that corridors and stairways originally were finished with terrazzo. Much of the flooring is original to the building except where replaced in the 1973 renovation and most of the carpeted areas are installed over the original floor finishes.

Much of the surface of the interior plaster shows extensive cracking is present in the plaster walls. This may be indicative of the condition of other areas of the building. The interior surface of the exterior walls is finished with one inch of insulation with plaster finish; there is no insulation in the minimal masonry cavity of the exterior walls. Original plaster ceilings are concealed by suspended acoustical tile ceilings in classrooms or adhered acoustical tile in other rooms. The suspended acoustical tiles are in poor condition and are sagging and curling within the suspended ceiling grid.

On the lower (basement) level of the building, the wood floor in the gymnasium has been patched in several areas. This floor is past its useful life.

INTERIOR DOORS AND FRAMES

Interior doors are painted steel or stained wood in metal frames. A few doors have been installed with residential grade painted wood frames and casings. Most of the doors are presumed to have been part of the original construction and show wear, dents, and other damage. Classroom doors are set in deep recesses in the corridor walls. During the 1973 renovation, most of the classroom doors were moved from the corridor face to the classroom side of these recesses creating non-compliant and non-handicapped accessible entrances to these rooms.

Doors pairs at stairwells, in corridors, and at the Media Center are not wide enough to comply with egress requirements of the Code. Throughout the building, doors do not provide required clearances, hardware, and width for handicapped accessibility. Old style crashbars are still in place on egress doors and are not compliant with current Code.

INTERIOR COMMON SPACES

The building has three large common spaces: the Gym in the Basement, Cafeteria on the First Floor, and the Media Center on the Second Floor. The Gym and Media Center are 2 story spaces. The Gym and Cafeteria, adjacent to the upper portion of the Gym on the First Floor, were both modified as part of the 1973 renovation. Cast in place concrete bleachers in the Gym were covered when the floor slab of the Cafeteria was extended to increase its size. Only a few rows of bleachers are accessible from the basement level with the remaining rows blocked by a drywall partition and limited by headroom clearance. Residual space under this floor slab on the bleachers is currently used as makeshift storage space for gymnasium equipment. If desired for a future use, these bleachers may be opened to the first floor again by removing the floor slab installed in 1973.

The Gym is undersized and does not provide a full size basketball court. There is minimal space beyond the sidelines of the court and no space beyond the endlines to the masonry walls and this presents a hazard to players on the court. Wall pads are provided on the endwalls but not the sidewalls or the bleachers. Storage space for gym equipment is not available and a gym teacher's office is not provided. There is a cast iron roof drain leader mounted on the sidewall which exits through the wall at about 5feet above the floor; this is a severe hazard for students and players using the court.

The Cafeteria is small but functional for groups of limited size. It was expanded in 1973 and the kitchen equipment appears to be well maintained and in good condition. This kitchen could be maintained for small group functions in a future use. If the floor slab over the bleachers is removed to expose access to the gym space in the basement, this will decrease the usable space in this room. Also, a rail should be provided as protection from a fall hazard at the top of the bleachers.

The Media Center is identified by a plaque as originally being an auditorium; the space is 2 stories in height and is not a comfortable space for quiet group study. The original plaster walls and ceiling moulding, which is in poor condition, cracked, and in need of repair, is very poor acoustically for this use.

INTERIOR SERVICE SPACES

Toilet rooms sized for elementary school students were provided on the First, Second and Third Floors and three single user toilet rooms for adult staff are located on the First and Third Floors. None of these toilet rooms are handicapped accessible and the toilet rooms on the Second Floor have a 3" floor transition between the corridor and toilet room floor elevations. Toilet rooms do not provide accessible configurations for water closet stalls or sink for students in Grades K-6.

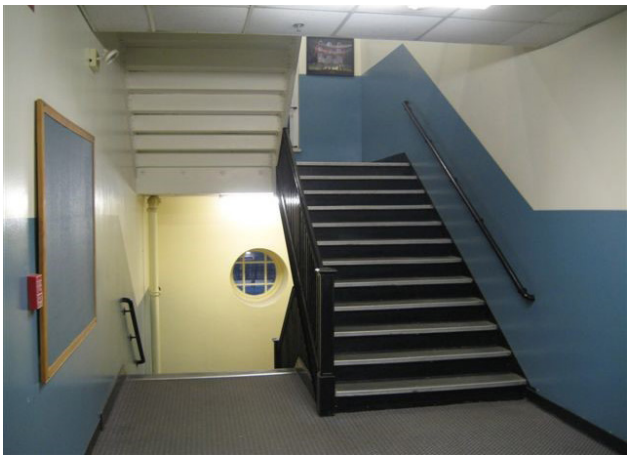
Storage rooms were provided in the Cafeteria and Media Center but not the Gym. Storage rooms for general classroom use are provide in the corridors because the classrooms are undersized and cannot accommodate the storage needs.

Custodial closets and storage spaces were provided in the original locker room spaces; in one space the original tiled shower space with shower fixtures remain in place with material stored in the shower. Custodial spaces were provided on each floor for equipment and supplies as no elevator exists to transport equipment between floors.

VERTICAL CIRCULATION

There are two interior stairwells on the front of the school at each end of the main circulation corridor providing egress from the Second and Third Floors to grade. The Basement has 2 stairs providing egress from the Gym to grade at the rear of the school. Stairs are steel framed with concrete filled pans and terrazzo finish. The guardrails are not of compliant height and the interior stair railing is set between newel posts. Stair treads and risers are typically 7" high and 10" deep; these cannot be modified without rebuilding the entire stairwell. Only one exit door provides accessible egress with a ramp at the rear of the building.

No elevator is provided to access the Basement, Second, or Third floors.



RECOMMENDATIONS:

- The existing EPDM roof is at the end of its useful expected life and should be replaced. All stainless steel copings should be removed and replaced with copper or copper colored aluminum sheet metal with properly sealed seams. In the process of removing and replacing the stainless steel copings attention should be given to inspect the EPDM membrane to make sure that it extends over the top of the parapets to completely seal and protect the masonry walls.

- At a minimum, all wall surfaces should be patched to repair cracking plaster and repainted. It is recommended that all existing plaster surfaces on exterior walls be removed with electrical wiring and mechanical systems piping and replaced with a minimum 3" thick spray foam insulation to provide insulating value and a vapor barrier on all exterior walls. Metal stud framing, offset from the spray foam insulation, will provide space for wiring and mechanical system infrastructure.

- The doorways previously leading to the new demolished fire escape on the north side of the building should be infilled with masonry to match existing or infilled with new windows. The existing 'doors to nowhere' are a life safety hazard.

- The existing openings in exterior walls for unit ventilation unit grilles should be infilled with masonry to match existing. Existing unit ventilators are inefficient and are past their useful life; these systems should be removed and replaced with new mechanical systems for future uses.

- The two circular windows should be removed and new aluminum framed double pane windows be installed.

- Rails on the inside of the stairwells should be modified to provide a 42" high guardrail and a continuous handrail for compliance with Code and accessibility guidelines. Handrails on the wall side of the stairwells should be replaced with a railing with a code compliant profile. This handrail should be mounted at the required height and have extensions at the top and bottom of each flight.

- An elevator should be provided for compliant access to all floors.

- If retained in a future use, interior door pairs at stairs and common rooms should be replaced with compliant doors of required width, rating and hardware.

- If retained in a future use, doors to classrooms should be demolished and replaced with new doors on the corridor face or be replaced with new doors swinging into the classroom to provide accessible clearances and hardware. Where this cannot be provided, automatic door operators should be installed.

- All other doors serving common areas and storage rooms should be replace with new doors and hardware to provide accessible entrances.

- Toilet rooms should be reconstructed or relocated to provide compliant clearances and fixtures. Based on the age groups served in a future use, multiple toilet rooms with fixture heights and clearances must be provided. Additional adult toilet rooms must be provided to supplement the three locations currently provided in the building. The quantity is dependent on the future use of the building and is based on the fixture rate required in the MA Plumbing Code.

- All interior flooring finishes should be replaced. Most of the flooring should be removed and replaced as part of an abatement plan and new finishes should be provided.

- Terrazzo floor finishes in corridors and stairwells should be ground and polished to restore the finish.

- The Gym floor has visible patches in the wood floor and has been repaired in the past for water damage. The wood floor is original to the building and is assumed, based on the time of installation, to not have a vapor barrier. A topical vapor barrier should be installed over the existing slab, the slab recess filled with cementitious underlayment, and a synthetic poured floor provided if use as a gym or activity space is to be continued in the future.

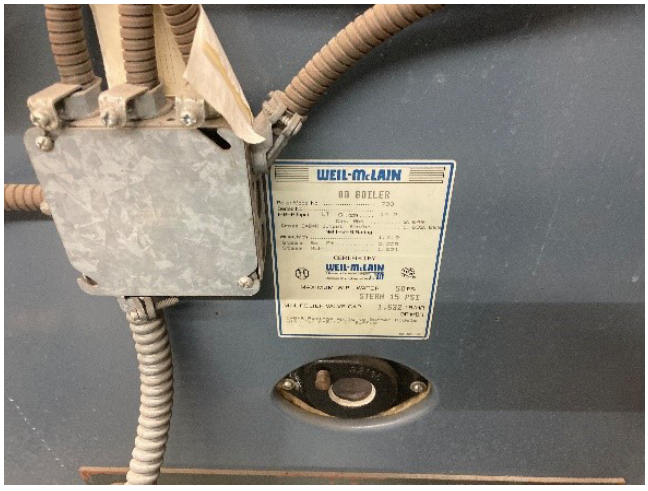
- All acoustical ceilings should be replaced as part of any renovation project. A building renovation will require extensive work above the ceiling for systems replacement or upgrade and the ceilings will be further damaged.

HEATING VENTILATION & AIR CONDITIONING

BOILER PLANT

The building is served by a central gas fired gravity vented boiler plant located in the basement mechanical room. Two 2,049 MBH input Weil McLain Model 88 cast iron hot water boilers with gas fired burners were installed in 1996. The boilers feed hot water via a central pumping supply and return piping system to all unit ventilators, cabinet heaters, unit heaters, air handlers and perimeter radiation.

Boiler, Front View

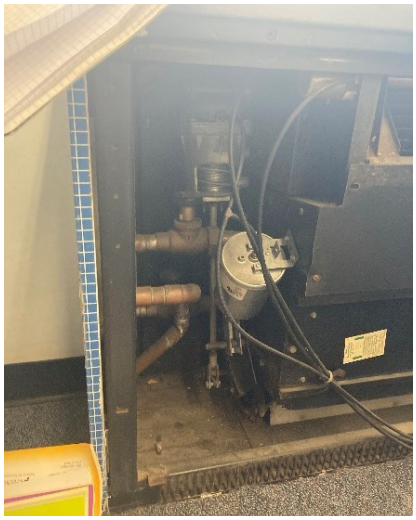


Boiler Nameplate

AIR SIDE EQUIPMENT

AIR HANDLERS

Air handlers, AH-1 and 3, located in the mechanical rooms provide heating and ventilation air to the Library Media Center and Cafeteria. A dedicated free blow air handling unit AH-2 is located in the gymnasium. The classrooms, perimeter support spaces and perimeter offices are served by unit ventilators. Typically each classroom is equipped with a heating unit ventilator providing heating, and outdoor air ventilation, paired with an exhaust unit ventilator that increases outdoor airflow for free cooling when conditions permit. The unit ventilators have hydronic coils and face-and-bypass dampers for temperature control and freeze protection. Some perimeter rooms have hydronic supplemental fin tube radiation. Cabinet heaters with hydronic coils are installed at entrances, corridors and stairs.



Typ. Heating UV, note piping and pneumatics

Typ. Exhaust unit ventilator

AHU-1 in basement, note pneumatic actuator

AHU-2 at gym ceiling & horiz. UV beyond

Typ. Finned-Tube radiation

Typical Cabinet Unit Heater

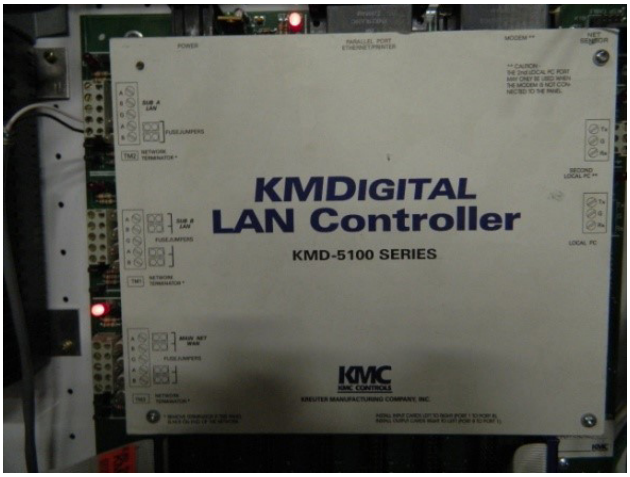
EXHAUST FANS

The building has multiple exhaust fan systems serving toilets, dishwasher, kitchen hood, offices, classrooms, storage, and mechanical spaces. These fans are typically located in the attic and high roof.

Roof, note exhaust fans

CONTROLS

The HVAC controls are a pneumatic system. A controls system for the boiler plant and mechanical air handling equipment was installed in a recent upgrade and is via the control panel located in the basement mechanical room. The remaining HVAC equipment including unit ventilators are controlled locally via space thermostats.



OVERALL CONDITION

HVAC systems in the building wing are primarily original to the construction or installed in or prior to the 1972 renovation. The 1996 boiler renovation is the only major equipment upgrade that has been made. The equipment is in good condition for its age but is past the expected service life. All equipment is recommended for replacement with more efficient models that use less energy and provide better control. Existing ductwork is in good condition and portions could potentially be reused for a renovation project depending on the layout and subject to cleaning.

RECOMMENDATIONS

GENERAL:

NV5 understands that the future use of this building is undetermined. The recommendations below are for an HVAC system aimed at maintaining the current elementary school occupancy. This system type can also be adapted to education for older students, community center, higher education, or office space use when sized accordingly. They would not be suitable for a multi-unit residential re-use of the building.

BOILER PLANT:

NV5 recommends full replacement of the existing gas fired boilers with new high efficiency condensing sealed combustion gas fired boilers. Size of existing boiler plant would be calculated to serve building use, occupancy, and associated thermal and outdoor air requirement. A minimum two boiler installation is recommended for redundancy. NV5 recommends new variable speed controlled pumping equipment to replace the existing system hot water pumps to integrate with new modulating two-way hot water control valves at all heating applications. A differential bypass control valve will allow for system minimum flow rates to be achieved and control system operating pressure. Modifications to distribution piping system will be designed to suit indoor floorplan changes and HVAC equipment arrangement.

AIR SIDE EQUIPMENT SYSTEMS:

NV5 recommends airside equipment including unit ventilators and air handlers be replaced with roof mounted packaged energy recovery type heating and cooling units to provide required building exhaust rates with recovery air energy transfer from the exhaust to the fresh air for the building. Classrooms, corridors and support spaces will be provided with conditioned air from the energy recovery units and be provided with series fan powered variable-air-volume (VAV) terminals with hot water coils and distribution ductwork. Systems will have a full enthalpy controlled economizer cycle. Exhaust will be captured from all existing renovated building areas and be ducted to the energy recovery units. New duct chases will be required to be added to the existing building to accommodate the new air systems and distribution ductwork. Fan powered VAV terminals will incorporate both space temperature control and demand-controlled ventilation (DCV) sequences for high occupant density spaces. Low

occupant density spaces will be equipped with space temperature control sequences only.

The new Cafeteria and Servery spaces will be provided with a packaged roofop DX cooling and hot water heating system with distribution ductwork. A dedicated kitchen exhaust system of hood, exhaust fan and heated makeup air system will be provided for the servery. Additional makeup air will be supplied to the kitchen from the cafeteria system. The system will include demand ventilation and full enthalpy controlled economizer cycle.

NV5 recommends a new replacement dedicated heating and ventilating unit will be provided for the existing gymnasium.

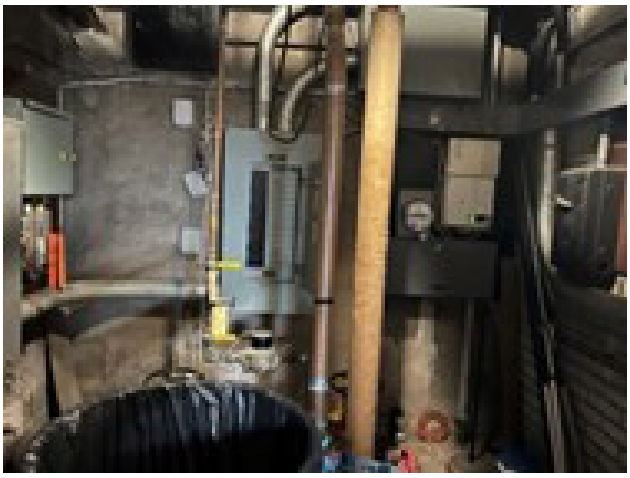
CONTROLS SYSTEMS:

NV5 recommends a new replacement BMS controlled DDC electronic controls be installed to replace the existing pneumatic controls system.

ELECTRICAL

DISTRIBUTION SYSTEM:

The building is fed via overhead electrical service from pole mounted utility company transformer to a 400 Amp, 208V/120V, 3-phase, 4-wire service entrance disconnect switch manufactured by Bulldog and main distribution board located in the basement electric room. Secondary utility metering is provided. Access to the main distribution board is obstructed by the water service entrance assembly equipment. Branch panel boards manufactured by Westinghouse, Kelek and Square D appear to be in fair condition with minimal spare/space for future capacity.



Power is distributed to branch panelboards located in electric closets at the 2nd and 3rd floor. Flush mounted panels are located in the 1st floor cafeteria. There is no spare/space for future expansion. In addition, it was noted that the dedicated workspace clearance has not been provided in the 3rd floor electric room as required by NEC Article 110.26.

EMERGENCY POWER

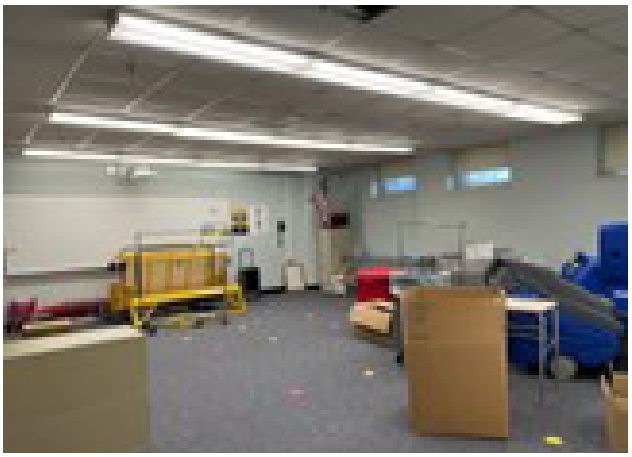
The building does not contain a standby emergency generator.

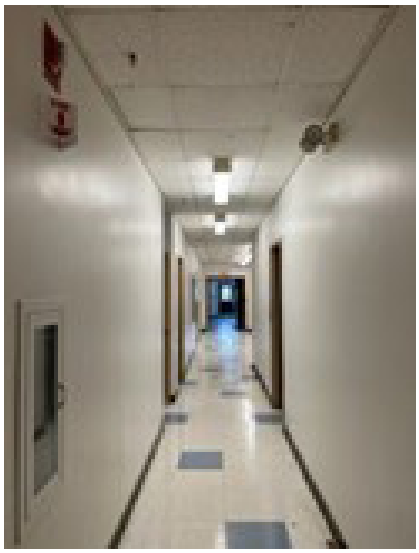
LIGHTING AND CONTROLS

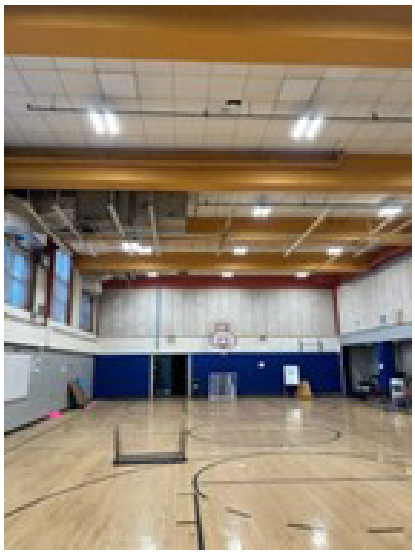
The lighting system consists of surface mounted acrylic lens fluorescent fixtures with T8 lamps and local switching. No automated controls have been provided to meet current energy code requirements. The gymnasium lighting has been upgraded to LED high bay fixtures with integral occupancy sensors.

EMERGENCY LIGHTING

Emergency battery unit with remote heads have been provided along egress paths. It was noted that egress lighting has not been provided in restrooms. The battery units are in fair condition.







FIRE ALARM SYSTEM

The fire alarm system control panel is located in the Nurse's Office at the main level. The fire alarm control panel is manufactured by Firelite/Honeywell and appears to be relatively new. Notification appliances (horn/strobes) have been provided along egress paths. Minimal coverage has been provided in the library and cafeteria. No coverage has been provided in the restrooms. Devices appear to be in good condition and meet current ADA requirements. The initiating devices (smoke detectors, pullstations, etc) appear to be a combination of new and original. It was noted that 100% smoke detector coverage has been provided in the corridors to supplement the sprinkler system.

CLOCK AND SPEAKER SYSTEM

The existing PA system was provided as part of a building upgrade prior to the 1972 project. Many of the clock/speaker assemblies are not operational and have been modified with independent speakers and wall clocks.

SECURITY

The security system consists of dome mounted cameras in the corridors with video monitors in the main office. Details and condition of the security system(s) are unknown.

TELECOMMUNICATIONS

Telephone service appears to enter the building overhead from a pole located on Union Street.

Additional details of the telephone equipment are not known. A new system is recommended.

Wireless access points have been provided in faculty rooms and classrooms.

Category 5 cabling has been installed throughout the building.

RECOMMENDATIONS

ELECTRIC SERVICE

The existing electric service shall be replaced and upgraded to meet the requirements of the proposed mechanical equipment upgrades, accessibility requirements (elevators) and the building use. A pad-mounted utility company transformer is anticipated. A new electric room will be required at the basement level to house the service entrance main distribution board.

The existing branch panelboards shall be replaced with new and upgraded to meet the requirements of the proposed renovations with ample spare capacity for future loads. The new panels shall be mounted in the existing electric closets at the 2nd and 3rd floors. New electric closets will be required at the 1st floor.

EMERGENCY POWER

A new standby emergency distribution system shall be provided if required to meet the building use.

LIGHTING AND CONTROLS

The existing lighting throughout the facility shall be upgraded to LED fixtures to meet current energy code requirements. Automated controls shall be provided to include daylight harvesting and dimming throughout.

EMERGENCY LIGHTING

Egress lighting shall be provided along paths of egress. Fixtures equipped with emergency battery drivers could be considered to replace the existing individual battery units.

FIRE ALARM SYSTEM

The fire alarm system shall be upgraded to meet the requirements of proposed renovations.

SECURITY:

The security system shall be upgraded to meet the requirements of the proposed renovations.

TELECOMMUNICATIONS

The telecom system shall be upgraded to meet the requirements of the proposed renovations.

PLUMBING

NATURAL GAS

A three inch (3") natural gas main enters the basement mechanical room adjacent to the entrance stair from the exterior location of the gas service, utility meter and regulator. The line runs horizontally along the mechanical room ceiling and drops to the gas fired boilers and domestic hot water boiler. The gas main is fed from the gas service main located in Union Street. The natural gas distribution piping appears to be in very good condition. The existing gas service will need to be coordinated with the gas utility provider to determine if the existing main and pressure is adequate to supply the proposed new gas requirements of the school fit out plans.

WATER SERVICE ROOM

The domestic water service main (3") enters the shared Electric / Water (This is a potential code violation if any modifications or upgrades are required in the future buildout) service room 147 thru the concrete wall and transitions above the floor to a tee (this tee valve looks original and dated) and horizontal piping serving three discipline.

First discipline is for the HVAC make-up water supply. A 2" cold water connection from the tee valve line flows thru a control valve, then thru a 3" double check valve assembly and thru another vertical control valve. These valves serving the HVAC supply system seems to be in newer and good conditions. There is a existing 3" aged copper HVAC makeup water riser line to serve the HVAC requirements. The flange connection from the makeup water after the last vertical control valve seems to be rough aged shape with modified added sealant at the face of the flange.

Second discipline is assumed to be for the site irrigation system, this water service application is not fully confirmed. There is a 1-1/2" NPCW connection at the base of the HVAC make up water riser. Which flows thru ball valve, to a small water meter, thru another ball valve, this supply piping was not tracked down at this time to verify the piping feed to discipline.

Third discipline is for the building Domestic Cold Water supply. After the tee connection there is a reducer (this reducer valve looks original but in decent condition), a control valve (new looking and recently installed control valve), a compound type water meter (in good condition) and thru another control valve (new looking and recently installed control valve) on the downstream side of the meter.

The domestic water piping is fully insulated from the outlet flange of the shut off valve downstream of the water meter. The fiberglass all service jacket insulation appears to be in fair to good condition. There is a damaged insulated elbow at the base of the riser that appears to be the original insulation that has been damaged. There is a powdery material on the floor below the damage that should be tested for asbestos content. There are labels at the distribution tunnels below the school indicating asbestos materials beyond.

DOMESTIC HOT WATER

Domestic hot water is generated via a Burnham 50,000 btuh gas fired gravity flue type boiler (This boiler system looked aged) located in the basement Mechanical Room 144.

There is a new looking A.O. Smith, model TJV120M, 119 gallon storage tank installed recently and existing hot water circulation system located in the basement Mechanical Room 144.

KITCHEN

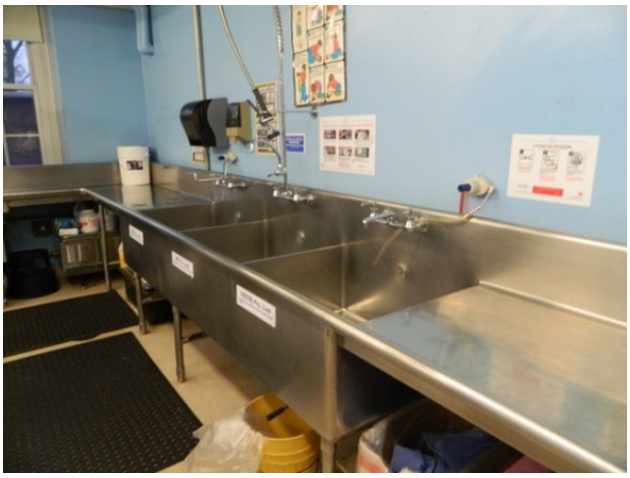
The existing kitchen equipment layout consists of steam ovens, soup kettle, four burner top stove/oven, 130" length x 48" width grease hood, pyro-chem ansul hood fire protection system, a three compartment pot sink (each compartment approx. 30" length x 27" width x 13" deep) and one semi-buried surface mounted grease interceptor (this existing grease interceptor unit looks to be undersized and aged in poor condition), a pre-rinse sink, food disposer, dish washer with an electric hot water booster unit located on the floor, after and to the right side of the dish washer. Two hand wash sinks, refrigerator(s), floor drain(s), and floor cleanouts.

Only the three pot sink is piped to the recessed grease interceptor. Current MA State plumbing code requires all grease generating waste with the exception of the garbage disposer to be piped to a grease interceptor, including any applicable floor drains. The floor drain does not appear to have a trap primer connection.

The domestic hot water supply appears to be at a single temperature supply main.

The gas supply main to feed the kitchen gas fired equipment is located on the right side under the kitchen exhaust hood with the gas supply entering thru the base of the wall adjacent to the hood. There is a manual master gas shut off valve, serving two gas regulators down stream and gas piping to the kitchen equipment(s). The current gas loads and pressure serving these kitchen equipment is not known presently.

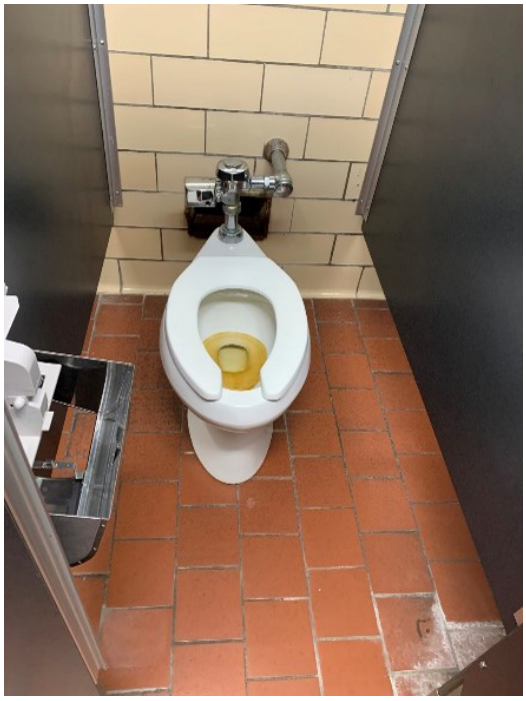
The gas supply master shut off looks to be in poor / rough shape. There does not seem to be any installed operational solenoid operated shut off valve with a manual reset that is controlled via a carbon monoxide sensor.




SYLVANIA

TOILET ROOMS

The toilet room fixtures are aged, stained and not all fully functional and most likely non code compliant. Full ADA accessibility will be determined by the architect. The urinals and water closets incorporate both manual and electronical sensor operated flush valves while the lavatories use 4"centerset conventional manual handle controlled faucets. There are some locations where the lav faucets have been updated with newer electronic sensor faucets as well. Some of the lavatories have been replaced with wheelchair type lavatories, but lack proper mounting height, clearance and insulation kits to be considered ADA or Massachusetts Architectural Access Barriers Board accessible compliant fixtures. All fixtures are in poor to good condition. There are water closets with wide stalls that have manual flush valves mounted on the wrong side, lacking proper clearance and grab bars to be considered accessible. There have been numerous fixture and fitting replacements over the years for upkeep and maintenance. The existing floor drains within the toilet rooms require replacement grids or trap primer connections to be code compliant and it is not clear at this time if they were the originally installed drains or replacements.



STORM DRAINAGE

The main building flat roofs are drained via single primary roof drains and internal rain water leaders. There are no parapets on the flat roof and no secondary roof drainage currently installed or required by code base upon existing conditions. The existing roof drains and dome strainers appear to be in good condition.

RECOMMENDATIONS

NATURAL GAS:

To verify the existing natural gas service entrance is not in the path of the new proposed building modifications and foundation system. NV5 Engineers recommends that the new proposed gas service be coordinated with gas utility provider and modified as accordingly to handle the proposed new gas load for the new addition to serve new packaged gas fired rooftop HVAC equipment, Kitchen Make-up air unit and proposed new kitchen server cooking appliances. New gas distribution piping would be run through the new building addition to serve the new gas fired equipment. Existing gas distribution piping would be evaluated for use in serving the proposed new boiler plant and new domestic hot water heating equipment. Provide new master gas shut-off valving, regulators and equipment as required to meet NFPA 54.

WATER SERVICE:

To verify the existing water service entrance location would not be in the way of the proposed new construction foundation systems. NV5 Engineers recommends relocation of the existing water service entrance adjacent to the existing fire service entrance and main riser in room 143. This relocation of the water service will allow the electrical panels to remain and thus not being a code issue of a current shared room of services. Reconnection to the existing domestic water system would be required for the phased construction. New domestic cold water piping would be run out to the new addition to serve all new plumbing requiring cold water at the new administrative and nursing support area, cafeteria and kitchen servery. Selective demolition and addition of new domestic cold water branch piping would be included in the phased design to rework the existing systems in the renovated areas as required for new plumbing work and fixture replacement. Installation of new domestic water piping is recommended throughout to prevent leaching of lead in the existing distribution piping.

DOMESTIC HOT WATER:

NV5 Engineers recommends replacement of the existing standard efficiency boiler/ storage tank domestic hot water system with a new high efficiency sealed combustion condensing type gas fired storage heater. The system would be located at the opposite end of the mechanical room from its current location to make room for the new electric rooms at the exterior wall. The system would be reconnected to the existing system to facilitate the construction phasing and a new domestic hot water circulating system would be run out to the new addition to serve all new plumbing requiring hot water at the new administrative and nursing support area, cafeteria and kitchen servery. Multiple temperature point of use mixing would be required at the various fixture and equipment connections. Selective demolition and addition of new recirculating domestic hot water branch piping would be included in the phased design to rework the existing systems in the renovated areas as required for new plumbing work and fixture replacement. Installation of new domestic hot water piping is recommended throughout to prevent leaching of lead in the existing distribution piping.

KITCHEN

NV5 recommends a fully re-designed code compliant kitchen plumbing system with full separation of sanitary and grease waste systems with a dedicated grease waste exit to an exterior grease interceptor with connection to the sanitary main in Union Street. Kitchen to include three well pot sink, prep sink, hand sinks, mop sink, dishwasher, disposer and rinse sink, floor drains, floor sinks and local recessed grease traps in accordance with the Massachusetts State Plumbing Code, Franklin Board of Health and the Sewer Authority.

TOILET ROOMS

NV5 recommends a fully re-design or modification of all toilet rooms to bring the existing fixtures up to present code compliance. Being of low flow fixtures, non lead fixtures, proper handicap requirements / accessibility and quantities as required for the new modification to this facility. Quantities and locations of plumbing fixtures with low flow consumptions will be dependent upon the decided future building usage as per the MASS Plumbing Code requirements. At which time proper fixture mounting heights, clearances and access will be addressed to be code compliant with the Massachusetts Architectural Access Barriers Board requirements.

STORM DRAINAGE

NV5 recommends a fully re-designed code compliant interior storm drainage system serving any new modified roof area and connected to the proposed new site drainage system connecting to site recharge or Union Street. The existing roof drainage system would be reworked to facilitate new roof reinforcement and replacement with existing leaders to remain. New primary and secondary drainage bodies and system insulation would be provided under the phased renovation area work.

FIRE PROTECTION

FIRE SERVICE SYSTEM:

Located within the basement general storage room 143 is a single 8" fire protection service main entrance. The fire protection service main enters the room through the foundation wall and transitions through an 8" elbow with a 6" reducing flange, drops and horizontally offsets above the floor to a floor mounted double check valve assembly and main system wet alarm riser valve. The system serves the school's combined standpipe riser, standpipe riser, wet fire protection system and remote located dry alarm riser valve located on the third floor. The dry alarm system riser assembly is located in the Teacher Toilet Room 321. The dry system feeds the attic and library dry sprinkler system. The existing old fire protection service located off of the existing domestic water service located in Water/Electric Room 147 at the basement, is still connected with a double check valve assembly. The system is currently valved off. The new system was installed in 2007 and appears to be in good working condition.

DRY SYSTEM SERVING ATTIC AND LIBRARY SPACES

The Attic and Library areas is protected with a dry sprinkler system throughout and is protected with a combination of exposed piping with upright heads. There is a suspended acoustical ceiling tile plenum located below the original third floor ceiling in the corridors and classrooms. The Media Center 304 has the original ornamental wood trimmed ceiling with dry sprinkler system.

CLASSROOMS, CORRIDORS AND SUPPORT SPACES:

A full coverage wet sprinkler system is installed that covers the three floors of the building. Recessed pendant heads are installed in the suspended acoustical ceiling tiles with concealed piping located above the ceiling. The original plaster ceilings are located in their original condition above the suspended acoustical ceiling and protect the wood framed construction.

Sprinkler coverage was noted as providing full coverage for this building.

STANDPIPES

Class 1 combined standpipe with hose valves and floor control valves is located in the main stair 279 and a Class 1 standpipe with hose valves is located in other stair near the administrative offices. Egress stairs are compliant and the standpipe system and combined standpipe will be utilized to serve the defined sprinkler zones identified in the overall building study with the existing floor control assemblies.

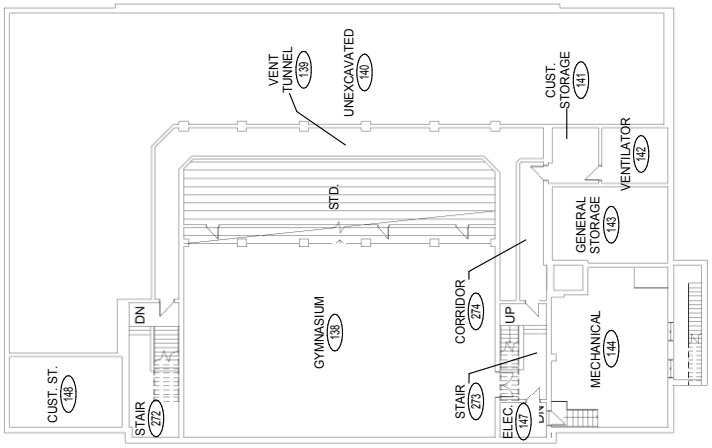
RECOMMENDATIONS

SUMMARY OF PRELIMINARY WALKTHROUGH

It appears that the existing fire service entrance and current equipment is sufficient to feed the entire building with a fully functioning sprinkled building system designed for the future building modifications. Upgrades, modifications and integration with the building existing sprinkler coverage, fire alarm system for zone and supervisory control will become a part of the overall building design.

4 APPENDIX

FLOOR PLANS

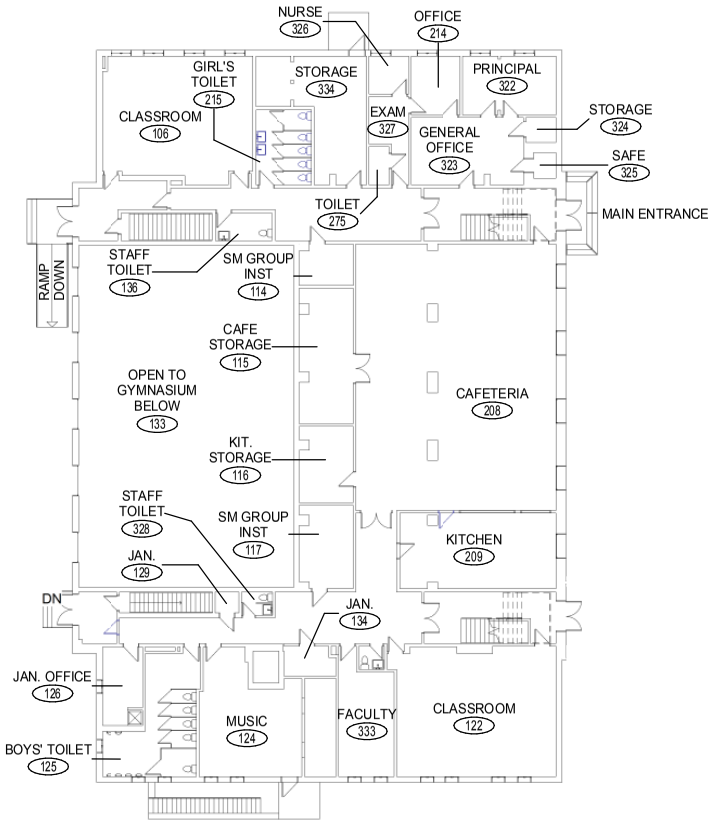


KAESTLE BOOS associates, inc

BASEMENT - EXISTING

Davis Thayer Elementary School

137 West Central Street Franklin, MA 02038

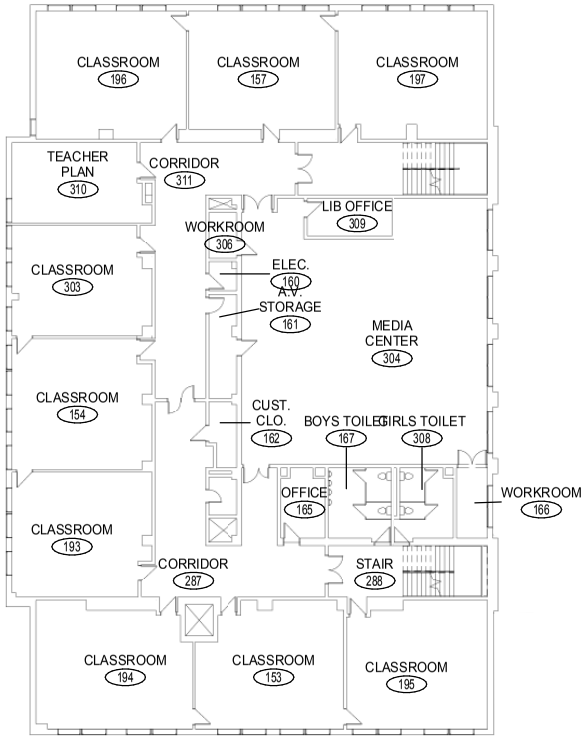


LEVEL 1 - EXISTING

Davis Thayer Elementary School

137 West Central Street Franklin, MA 02038

KAESTLE BOOS associates, inc

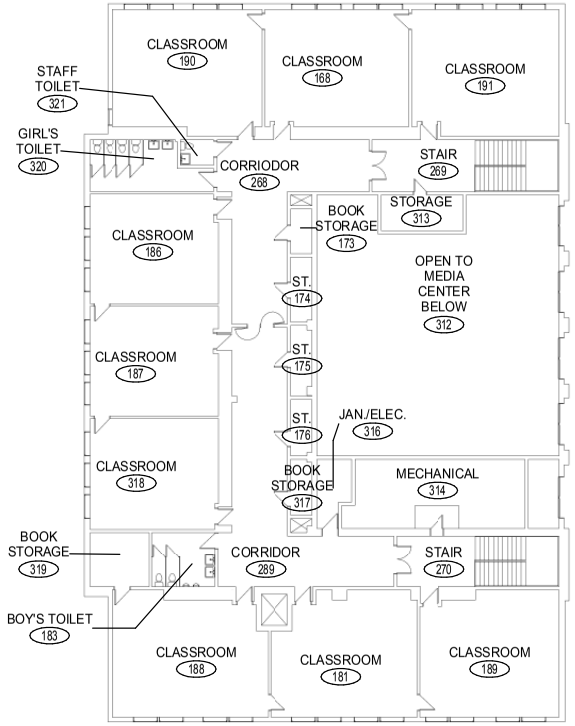


LEVEL 2 - EXISTING

Davis Thayer Elementary School

137 West Central Street Franklin, MA 02038

KAESTLE BOOS
associates, inc



LEVEL 3 - EXISTING

Davis Thayer Elementary School

137 West Central Street Franklin, MA 02038

KAESTLE BOOS associates, inc