BUILDING CONDITIONS ASSESSMENT

for

Fitch Middle School
Town of Groton, Connecticut

Architect:

TLB Architecture, LLC
92 West Main Street, Chester, Connecticut 06412

February 27, 2015

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I. INTRODUCTION

TLB Architecture, LLC was retained by the Town of Groton to assess the physical condition of the former Fitch Middle School for possible reuse; and to determine the Code implications of a Change-in-Use from an Educational Occupancy to a mixed use Business and Assembly Occupancy. In addition to the Conditions Assessment and Code Analysis, TLBA will perform a town-wide space needs analysis and test-fit the needed space in the Fitch Middle School footprint. This document includes the conditions assessment. The Code analysis and space plan will be provided under separate cover.

The building is located at 61 Fort Hill Road (Route 1), directly behind the Town Hall on the Corner of Route 1 and Depot Road. It was constructed in four major phases between 1927 and 1977, and was also the subject of several modifications and upgrades over the years.

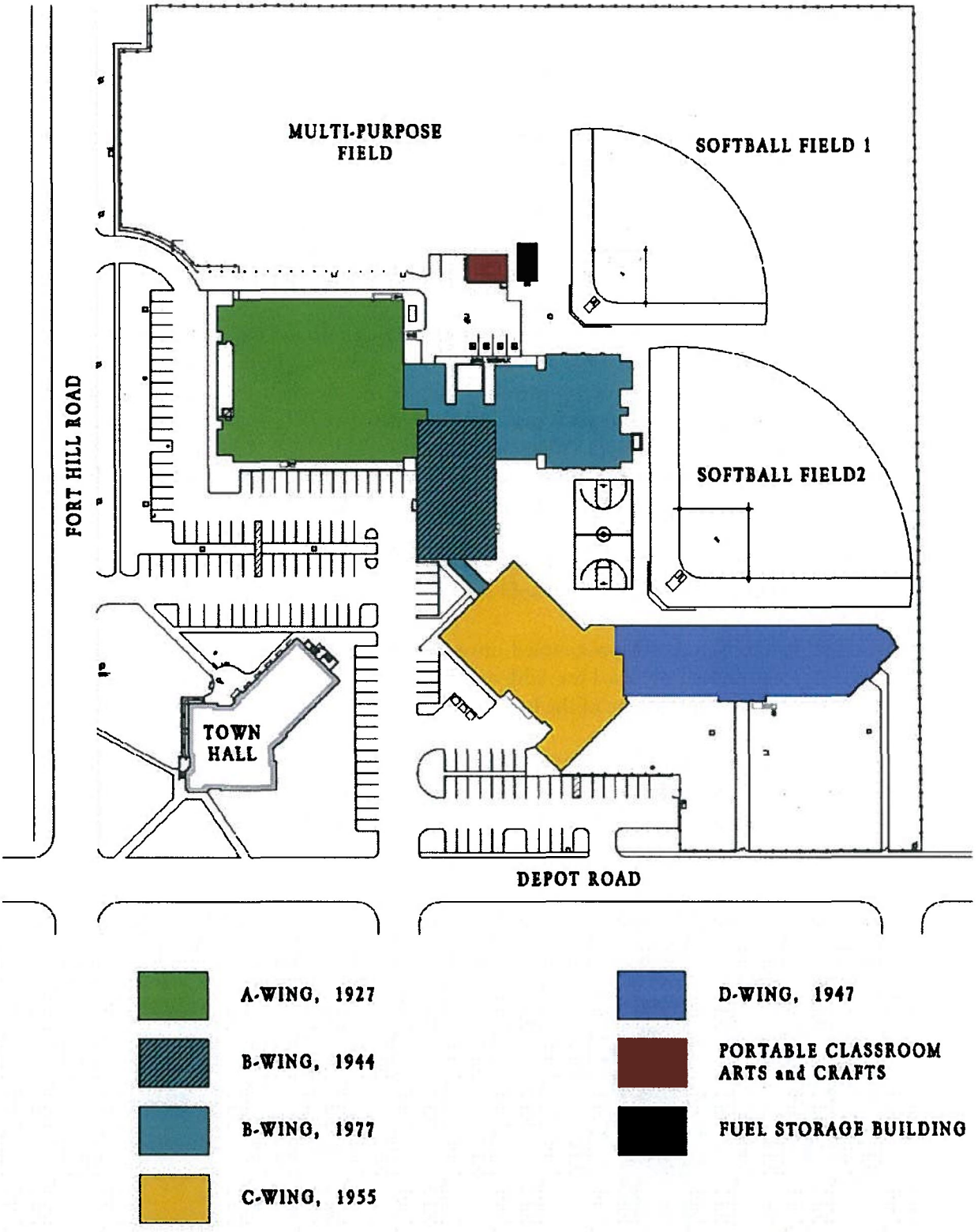
The building houses more than 85,000 square feet above grade and approximately 10,000 sf in the basement, for a total available area of 95,000 sf. It was originally two separate buildings with the high school occupying one building and the elementary school occupying the other. The original building (A-Wing) was constructed in 1927 as Fitch High School. The elementary school building, D-Wing, was constructed in 1947. Additions in 1944 (B-Wing), 1955 (C-Wing) and 1977 (B-Wing and the connector of C and D Wings) resulted in a single structure, which was most recently occupied as the Fitch Middle School.

In 2011, the Town decided that the graduating class of 2012 would be the last in this school, as the three middle schools in Town would consolidate to two.

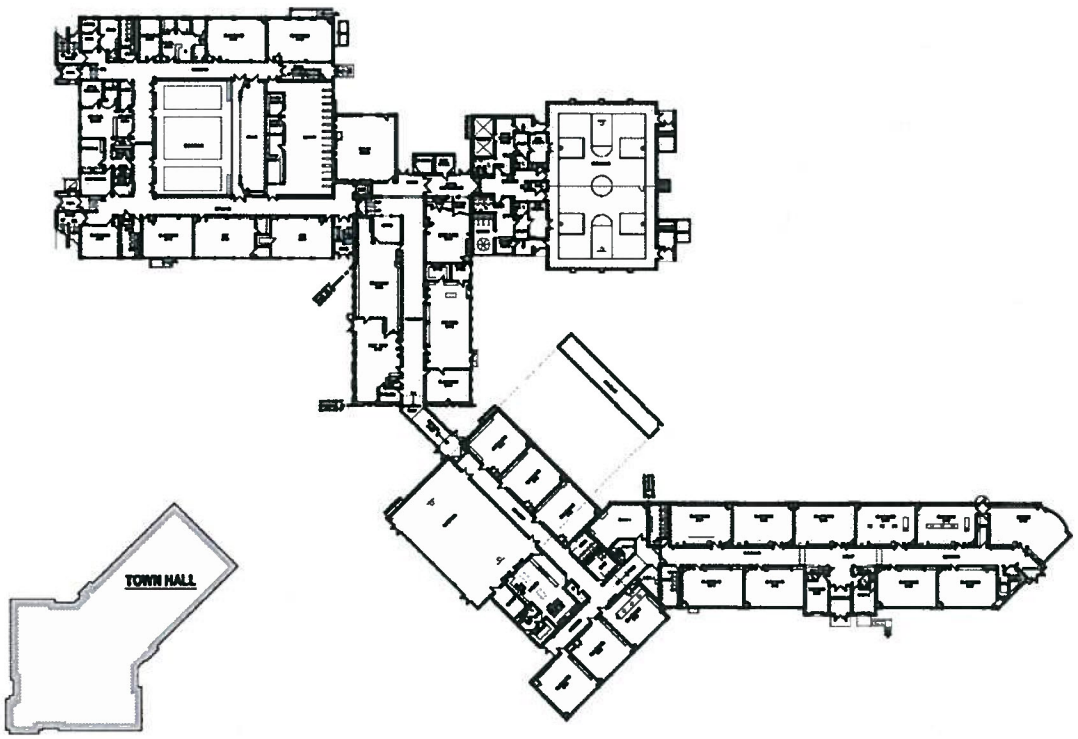
The building has been mostly unoccupied since its closing in 2012, however the gymnasium and locker rooms have been used for Athletics, Parks and Recreation functions, as have the exterior ball-fields. The balance of the building has been either vacant, or used for storage.

For purposes of this study, we have identified the four wings of the building based on current use and room numbers, not on chronology. The diagram on the following page identifies the building wings, as well as other major components of the site which are addressed in this study.

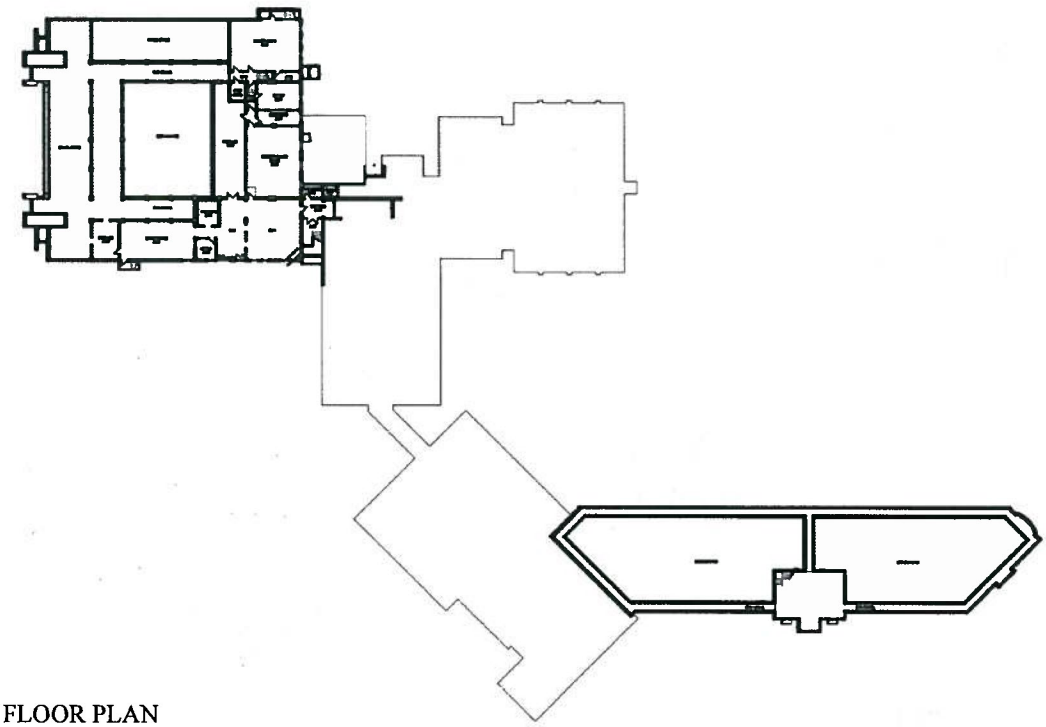
I. INTRODUCTION



I. INTRODUCTION

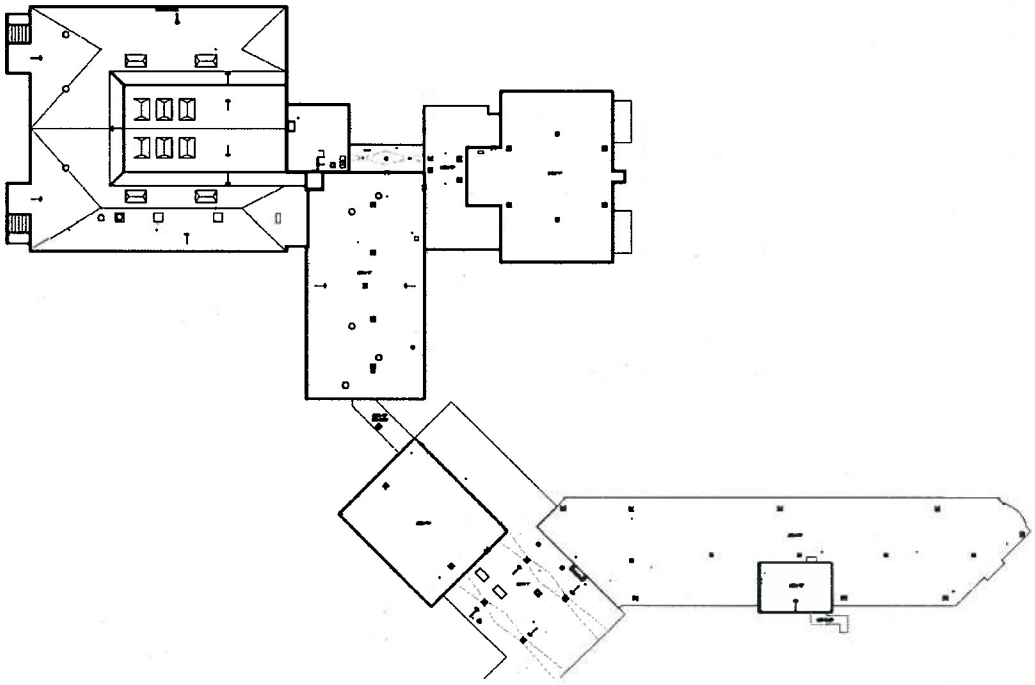


FIRST FLOOR PLAN

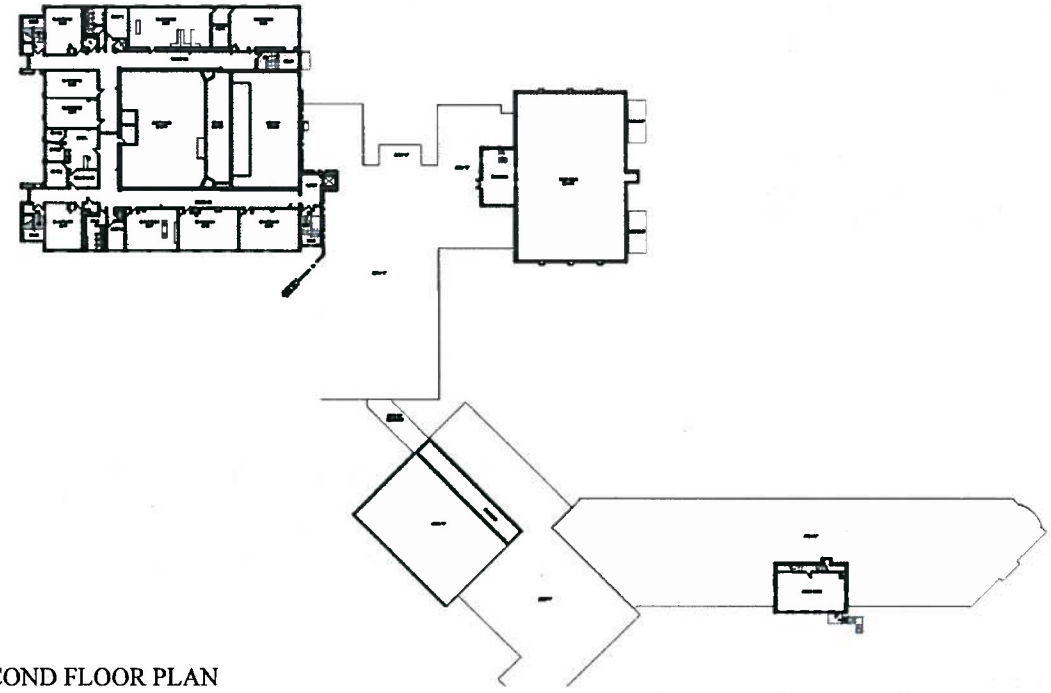


BASEMENT FLOOR PLAN

NOTE: Refer to Inserts for Full-Sized Plans



ROOF PLAN



SECOND FLOOR PLAN

NOTE: Refer to Inserts for Full-Sized Plans

I. INTRODUCTION

A-Wing–circa 1927:

The A-Wing is a two-story structure with a basement. The main level, which is approximately 4-feet above finish grade houses Classrooms, Administrative Offices, a 348-seat Auditorium and a Library. The Library was constructed in 1977 within the footprint of the former Gymnasium. Prior to 1977, the Library was on the second floor, in an area now occupied by Staff Offices.

The upper level includes classrooms and administrative offices. These spaces surround the double height auditorium and former gymnasium in a horseshoe arrangement to the north, east and west. The basement is primarily unoccupied and formerly housed locker rooms which served the gymnasium at the location of the current library. The locker rooms have been abandoned and the majority of the mechanical equipment was relocated to a grade-level in 1977.

B-Wing–circa 1944 and 1977:

The B-Wing is comprised of two areas constructed at different times. The older portion, which expanded the 1927 high school, was constructed in 1944 and connected to the southwest corner of the building. It was constructed with finish floor near finish grade, approximately 4-feet below the main level of the original school. Access between the areas was by means of a stair located in the corridor. This addition provided Technical Education space to the High School, including Wood and Metal Shops and a Drafting Room. It also contained a Girl's Locker Room and toilet facilities for boys and girls.

The balance of B-Wing was constructed in 1977 and includes a Gymnasium with an 84-foot basketball court. Boys and Girls Locker Rooms were also constructed, as were coaches rooms for both Men and Women. The 1944 Girl's Locker Room was converted to a Music Room. A significant Mechanical Room was constructed and new boilers installed to service the entire school. The boiler room in the basement of A-Wing was, for the most part, abandoned at this time. A new elevator made accessible access between the split level school possible.

A connector with a sloped floor was constructed as part of the 1977 addition and connects the B-Wing to the C -Wing, with a finish floor approximately 2-feet lower.

C-Wing–circa 1955

In the mid1950's the C-Wing was constructed, and was designed as an addition to the D-Wing. This wing contains a Cafeteria that seats 242 students, a commercial Kitchen, Classrooms and Toilet Rooms.

D-Wing–circa 1947

The D-Wing was originally constructed as a stand-alone Middle School with its main entrance off of Depot Road. It is primarily a single story building, though there is a small second level above the entry which most recently housed a Staff Workroom. The wing has a double-loaded corridor with classrooms running the length of both sides, except for a teachers lounge at the north end and a Science Lab at the south end.

II. EXECUTIVE SUMMARY and RECOMMENDATIONS

The Fitch Middle School building provides an opportunity for adaptive reuse of over 85,500 square feet of space, with more than 72,000 square feet on the main level. When last occupied, the building was a mixed use occupancy containing both Educational 'E' and Assembly 'A' space. Without a reuse plan formulated, required upgrades cannot be fully defined, but it should be assumed that any reuse of the building would be considered a Change of Occupancy, which would require full compliance with the current Building and Fire Codes. While compliance with many requirements will be easily achievable due to the relatively strict requirements of the previous use, there will be challenges with regard to upgrades necessary for Energy Code and Seismic requirements.

The gymnasium, auditorium and cafeteria/kitchen provide opportunities for expanding Town-related programs, or provide large areas than can be redesigned to accommodate other uses, possibly including the installation of a second level in the double-height spaces.

Generally, the buildings are in good condition, though significant maintenance is required in addition to any programmatic renovations. Masonry at all wings can be repaired and re-pointed to remain serviceable, with the possible exception of the D-Wing brick veneer. This brick is severely weathered and its complete removal may be required. Given the architectural expression of that wing of the building, replacement with a façade system other than brick may provide greater energy efficiency at lower cost, while still being architecturally acceptable.

The roofing on B, C and D wings was installed in 2001 and is likely still under warranty. Maintenance is required on all of these roofs and options for long-term replacement should be evaluated in any re-use planning. The A-wing roof, installed in 1995 may also still be under warranty, but is in complete failure. It would be prudent to obtain Warranty information from the Board of Education to determine if replacement can be done under the warranty, even at a pro-rated basis.

All windows are in need of replacement, with the cafeteria store-front system being the most complicated.

Virtually all soft joints on the building are in need of replacement. Care should be taken to identify which joints should be sealant, compared to those that require mortar. Many mortar joints have been replaced with sealant, which may provide temporary water resistance, but is not a good long-term solution.

Building mechanical, electrical and plumbing systems are not efficient and any reuse plan should anticipate their replacement with more efficient and sustainable equipment and fixtures.

This summary includes the Work required to preserve the building while it is unoccupied mode. Once a reuse plan is formulated, necessary long-term renovations can be identified.

II. EXECUTIVE SUMMARY and RECOMMENDATIONS

Recommendations for Work Required to Maintain Building in Current Partially Unoccupied Mode:

A-Wing:

1. The entire A-Wing Roof needs to be replaced. Anticipating reuse, it would be prudent to install a roof that complies with the Energy Code, as opposed to a replacement in kind.
2. Cracks in the foundation should be repaired using epoxy injection.
3. The crack in the second level floor slab should be repaired with epoxy injection.
4. Sealant should be replaced around all windows, doors and openings.
5. Concrete at the top of the area-way walls on the east side should be repaired.
6. Remove through window air-conditioners and replace windows.
7. Remove soft joints at limestone lintels and sills and install masonry mortar.
8. Replace expansion joints with properly sized pre-manufactured joint system.
9. Remove rusting, abandoned steel embeds and patch masonry.
10. Patch exposed rebar at concrete stair slabs.

B-Wing:

1. At the 1977 masonry walls, clean out weep holes.
2. At pilaster copings at gymnasium, install flashing over the joint between coping and stone.
3. Replace steel lintels at recessed entries. Soldier courses of brick should be removed and rebuilt with proper flashing and weeping.
4. Reseal all control joints.
5. Remove soft joints at stone lintels, sills and accents and install masonry mortar.
6. Remove rusting window security screens and clean masonry. If screens are required, either prepare, paint and reinstall, or provide new aluminum screens.
7. The membrane roof requires seam and flashing maintenance.
8. Sealant should be replaced around all windows, doors and openings.

C-Wing

1. Remove rusting, abandoned steel embeds and patch masonry.
2. Remove soft joints at stone lintels, sills and accents and install masonry mortar.
3. Remove rusting window security screens and clean masonry. If screens are required, either prepare, paint and reinstall, or provide new aluminum screens.
4. The storefront façade at the cafeteria is in need of eventual replacement, but in the short-term it should be repaired to ensure it is weather tight, followed by cleaning and painting.
5. The membrane roof requires seam and flashing maintenance.
6. Sealant should be replaced around all windows, doors and openings.

II. EXECUTIVE SUMMARY and RECOMMENDATIONS

Recommendations for Work Required to Maintain Building in Unoccupied Mode:

D-Wing

1. Remove soft joints at stone lintels, sills and accents and install masonry mortar.
2. Remove rusting window security screens and clean masonry. If screens are required, either prepare, paint and reinstall, or provide new aluminum screens.
3. Prepare and paint fasciae and soffits.
4. The membrane roof requires seam and flashing maintenance.
5. Sealant should be replaced around all windows, doors and openings.
6. As long as the building remains unoccupied, we recommend that the wood egress stair be removed.
7. Remove through window air-conditioners and replace windows.
8. Replace roof drain domed top where missing.

Site:

1. Perform routine maintenance on pavement, such as crack sealing, curb repair and pot hole repair.
2. Replace all fencing and backstops associated with the ball fields.
3. Improve signage to provide better way-finding and ADA compliance.
4. Replace benches at ball fields.
5. Replace bollards at gas tank with concrete filled steel.
6. Remove plantings that are against the building.
7. Take measures to eliminate geese.
8. Smooth lips at infields.

Outbuildings:

1. Repair damaged skirt at Arts and Craft building.

General Work:

1. Allowance for general brick and concrete repairs. Assume 1% of total wall area.
2. Allowance for TVSS or pressure test of buried piping to assess condition for reuse.
3. Verify hazardous materials have been identified and remediated.
4. Replace existing lighting with new energy efficient lighting at gymnasium and locker rooms.
5. Replace exit signs and egress lighting with new Code compliant and energy efficient fixtures.
6. The fire wall between the gym/locker room and the B-Wing entry lobby needs work to be Code compliant. Wall penetrations and the configuration of the wall/roof assemblies need modification to complete the necessary separation.
7. At occupied areas of B-Wing, renovate as required for HCA, including hardware, plumbing fixtures, door clearances and thresholds.

	Item	Unit	Quantity	Unit Cost	Item Cost	Total Cost	
	A-Wing:						
1	Roof Replacement	S.F.	24,000	9	216000	$274,320.00	
2	Repair Foundation Cracks	L.F.	260	62	16120	$20,472.40	
3	Repair 2nd Floor Slab Crack	L.F.	30	70	2100	$2,667.00	
4	Replace Sealant at Window Perimeters	L.F.	2,576	3.5	9016	$11,450.32	
5	Repair Areaway Concrete	L.F.	228	12	2736	$3,474.72	
6	Remove Window A/C and Replace Windows	EACH	5	1250	6250	$7,937.50	
7	Repoint Sills and Lintels	L.F.	1,652	6	9912	$12,588.24	
8	Replace Expansion Joints	L.F.	100	4	400	$508.00	
9	Remove Embeds, Patch Masonry	Allowance	1	1850	1850	$2,349.50	
10	Patch Exposed Rebar at Stairs	Allowance	1	1250	1250	$1,587.50	
							$337,355.18
	B-Wing:						
1	Clean-out Weeps at 1977 Walls	EACH	96	25	2400	$3,048.00	
2	Reflash Pilasters at Gym	L.F.	15	250	3750	$4,762.50	
3	Replace Steel Lintels at Recessed Entries	EACH	5	5250	26250	$33,337.50	
4	Reseal Control Joints	L.F.	356	4	1424	$1,808.48	
5	Repoint Lintels, Sills and Accents	L.F.	299	6	1794	$2,278.38	
6	Remove Window Screens	EACH	10	55	550	$698.50	
6a	Prep, Paint and Reinstall Screens	S.F.	270	12	3240	$4,114.80	
7	Perform Roof Maintenance	L.F.	13,445	2.5	33613	$42,687.88	
8	Replace Sealant at Window Perimeters	L.F.	690	3.5	2415	$3,067.05	
							$95,803.09
	C-Wing:						
1	Remove Embeds, Patch Masonry	Allowance	1	1200	1200	$1,524.00	
2	Repoint Lintels, Sills and Accents	L.F.	176	6	1056	$1,341.12	
3	Remove Window Screens	EACH	34	55	1870	$2,374.90	
3a	Prep, Paint and Reinstall Screens	S.F.	510	12	6120	$7,772.40	
4	Repair and Paint Cafeteria Storefront	S.F.	1,547	15	23205	$29,470.35	
5	Perform Roof Maintenance	S.F.	7,364	2.5	18410	$23,380.70	
6	Replace Sealant at Window Perimeters	S.F.	580	3.5	2030	$2,578.10	
							$68,441.57
	D-Wing:						
1	Repoint Lintels, Sills and Accents	L.F.	321	6	1926	$2,446.02	
2	Remove Window Screens	EACH	42	55	2310	$2,933.70	
2a	Prep, Paint and Reinstall Screens	S.F.	630	12	7560	$9,601.20	
3	Prep and Paint Fascias and Soffits	L.F.	507	15	7605	$9,658.35	
4	Perform Roof Maintenance	S.F.	13,677	2.5	34193	$43,424.48	
5	Replace Sealant at Window Perimeters	L.F.	879	3.5	3076.5	$3,907.16	
6	Demo Wood Egress Stair	EACH	1	8500	8500	$10,795.00	
7	Remove Window A/C and Replace Windows	EACH	2	1250	2500	$3,175.00	
8	Replace Roof Drain Domed Tops	EACH	5	55	275	$349.25	
							$86,290.15

II. EXECUTIVE SUMMARY and RECOMMENDATIONS

	Item	Unit	Quantity	Cost	Cost	Cost	
	Site:						
1	Perform Pavement Maintenance	S.F.	35,830	0.5	17915	$22,752.05	
2	Replace Fencing and Backstops at Ballfields	EACH	2	5250	10500	$13,335.00	
3	Provide Improved Signage	Allowance	1	2500	2500	$3,175.00	
4	Replace Benches at Ballfields	EACH	4	1250	5000	$6,350.00	
5	Provide Bollards at Gas Tank	EACH	4	850	3400	$4,318.00	
6	Remove Plantings Against Building	Allowance	1	2500	2500	$3,175.00	
7	Omitted	Allowance	1		0	$0.00	
8	Smooth Lips at Infields	Allowance	1	5000	5000	$6,350.00	
							$59,455.05
	Outbuildings:						
1	Repair Skirt at Arts and Crafts Building	Allowance	1	1000	1000	$1,270.00	
							$1,270.00
	General Work:						
1	General Brick Repair (1%) of area	Allowance	1	25000	25000	$31,750.00	
2	Pressure Test (TVSS) Buried Piping	Allowance	1	7500	7500	$9,525.00	
3	Hazmat Abatement: (See Scope Note 1)				0	$0.00	
4	Replace Gym Rea Lighting (See Scope Note 2)	Allowance	1	32000	32000	$40,640.00	
5	Replace Exit Signs at Occupied Areas	EACH	10	125	1250	$1,587.50	
6	Modify Fire Walls at Gym / B-Wing Lobby	Allowance	1	17500	17500	$22,225.00	
7	HCA Improvements at Occupied Areas of b-Wing	Allowance	1	12500	12500	$15,875.00	

Scope Notes:

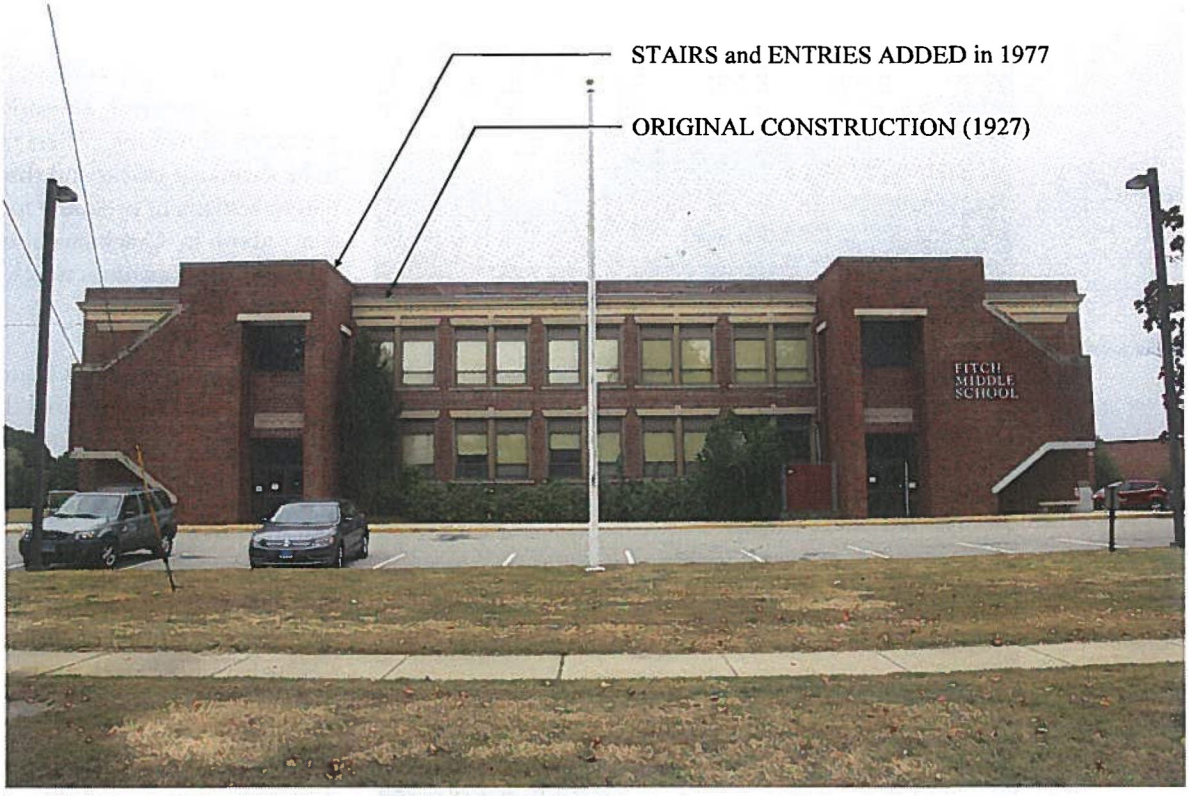
1. Costs assume there are no hazardous materials present. This must be verified with the Town and/or BOE.
2. Lighting upgrades may be eligible for utility rebates and incentives.

TOTAL PROBABLE CONSTRUCTION COST	$770,217.54
A/E Fees	$92,426.10

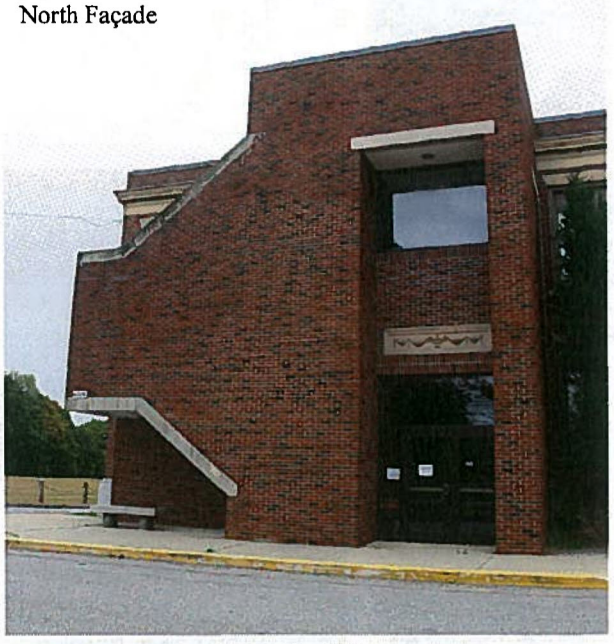
Notes:
1. Total Cost Column includes General Conditions (8%), General Contractor's Overhead and Profit (8%), and a Contingency of 10% in 2015 dollars.
2. Not included in this estimate: Fees, Water Well, Sewage Disposal System, Furnishings, Fixtures, or Moveable Equipment.

III. BUILDING CONDITIONS ASSESSMENT

1. A-Wing— Constructed in 1927 and Significantly Renovated in 1977



North Façade



Stair Tower, Constructed in 1977

Basic building assemblies are brick masonry with limestone cornices, lintels and sills. The masonry walls sit on a cast-in-place concrete foundation. Windows and doors have ben replaced with aluminum units.

The majority of the original construction and the 1977 additions are in good condition, with only routine maintenance required. Some of this maintenance has been deferred, and as such will require more careful attention in the short-term to ensure continued service life of the building systems and assemblies.

The roofing is a mechanically adhered EPDM, in very poor condition.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

The foundation wall exhibits cracking at fairly regular intervals at nearly the entire perimeter of A-Wing. These cracks appear to be shrinkage cracks and there is no apparent settlement or failure to support masonry above it. Cracks are also visible off the corners of openings which were cast into the concrete.

The cause of these cracks is unknown and they may have first appeared shortly after the building was constructed. Their random path is indicative of shrinkage cracks, which is often the result of rapid drying of the concrete while it is curing, lack of steel reinforcing or lack of control and/or expansion joints. In this case, it is likely a result of multiple causes. It appears a variety of repairs have been attempted over the years with limited success.

At the area-way at the southeast corner of the building, the top of the concrete wall is heavily decayed and puts both the integrity of the concrete and the stability of the railing in jeopardy.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

East Façade

The original brick surfaces are in need of miscellaneous repairs and a full re-pointing. While the brick is generally sound, the joints are deteriorated. There are also signs of water infiltration into the walls, as exhibited by the efflorescence and staining on the exterior surfaces.

Joints at limestone lintels and sills have deteriorated significantly and many have been repaired with sealant as opposed to mortar. Some mortar joints have been repaired with an unknown mortar mix that is not an acceptable match. Many joints are "lipsticked" over the face of brick, which accelerates deterioration.

Detail images on the following pages highlight these deficiencies.

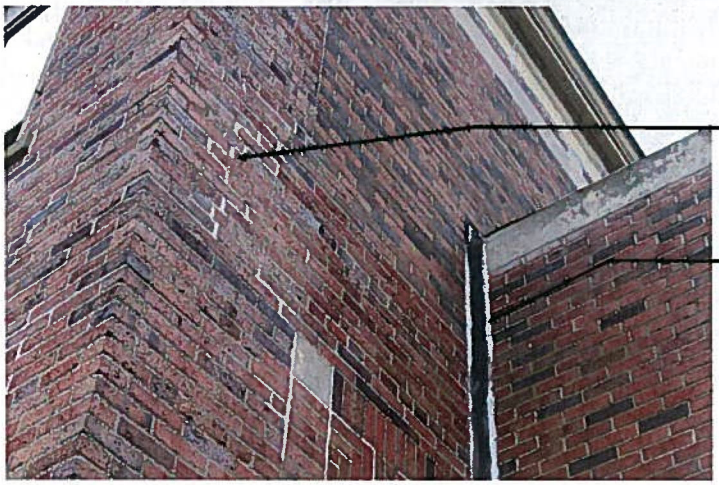
1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

Mortar Joint Replaced with Sealant at Concrete Lintels

Flashing and Weeping has been Interrupted by use of Sealants. The Staining Above the Lintel is Indicative of Trapped Water/ Moisture. Sealant Below Lintel is in Total Failure.

Sill Joints are Deteriorated and Allowing Water into Masonry Wall

Improperly Tooled ("lipsticked") Joints Allow Deterioration of Brick to Occur at a More Rapid Rate



Repaired Brick Joints

Deteriorated Expansion Joint at Stair Towers

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

South Facade

The south façade exhibits many of the same deferred maintenance issues as the north and east façade. Sealants used in lieu of mortar joints are further deteriorated due to southern exposure, leaving large open joints where water can enter the walls.

Embedded steel hanging devices are staining the brick and will accelerate deterioration of the joints. These embeds should be removed and the wall patched.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

West Facade

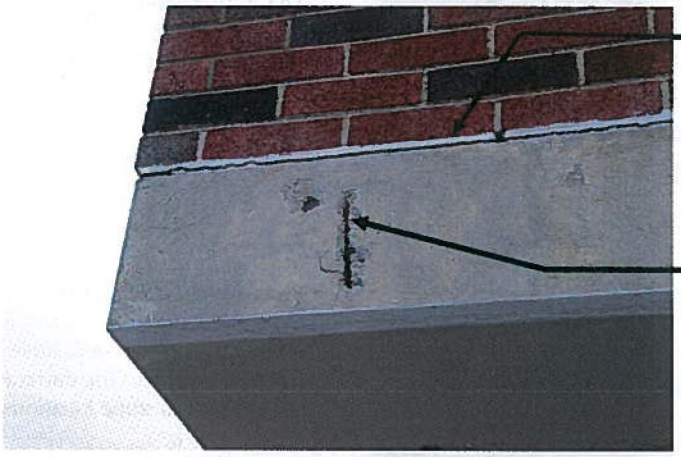
The west façade is similar to the east façade and exhibits similar conditions. Brick masonry needs to be repointed and the concrete bands, sills and lintels are in need of joint repair.

Similar cracking is found on the foundation walls.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

Weathered Aluminum Windows

Failed Joints at Perimeter of Windows



Failed Joint at Line of Flashing at 1977 Stair Tower

Exposed Steel Reinforcing at Cast-in-Place Stair (1977 construction)

Failed Joints at Sills

Improperly Repointed Brick

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

The A-Wing Roof appears to be a combination of mechanically and adhered EPDM membrane that is in generally very poor condition. In many locations it is in complete failure. Failed mechanical connections, abandoned penetrations, and damaged flashings and terminations are all contributing factors.

Invasive exploratory investigations were not performed, but it appears that the insulation layer below the membrane has failed in many areas.

The A-Wing roof is in need of complete replacement. Replacement should include the removal of abandoned penetrations.

Roofing runs up to the top of the parapet and has completely pulled away from the substrate. Multiple patches have been made over time and sandbags are currently used to ballast the roof in some locations.

Lack of mechanical adhesion allows ripples, sags and bellows to occur, reducing wind resistance, trapping water and preventing proper draining of the roof. Roof drains are infrequent and there is no emergency overflow protection.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

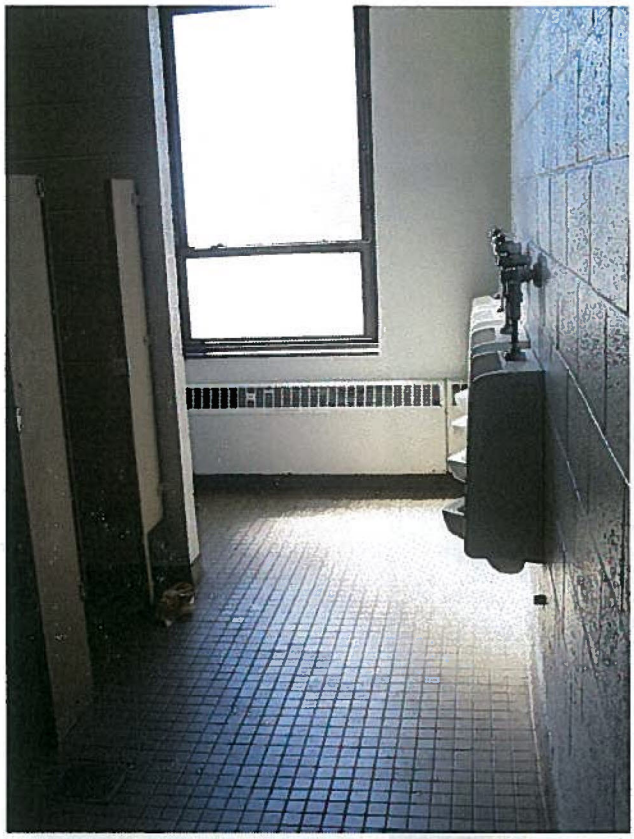
Interior materials and finishes at the entries at the north side are durable and in good condition. These entries provide no handicapped accessibility. Hand rails on the stairs are not compliant and would likely need replacement when the building is renovated.

Typical interior finishes in Corridors and most classrooms and offices include painted gypsum board walls, suspended acoustical tile ceilings and VCT flooring with coved vinyl base.

Most finishes are in fair to good condition, exhibiting the typical wear and tear found in school facilities.

Doors are primarily wood doors in hollow-metal frames. All hardware is knob-type and does not comply with accessibility requirements.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)



Toilet rooms are constructed with painted CMU partitions. Exterior walls are painted GWB, as are the ceilings. Floors and base are ceramic tile. While finishes are in good condition, the toilet rooms are not handicapped accessible and will require some renovation to achieve compliance.

Toilet partitions are solid plastic and in fairly good condition.

Toilet rooms have floor drains, simplifying cleaning and offering flood protection.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

The Library was constructed in 1977 in the space that was originally built as the gymnasium. As such, it has high ceilings with two large windows, facing south. Four large windows on the same façade were infilled to accommodate the construction of the Mechanical Room in 1977.

Walls are painted GWB and the ceiling is suspended acoustical tile. Flooring in the main stack area is carpet, while the work room to the north of the main area is VCT. It's unknown of the original gym floor is under the carpet.

The reuse of this space and the level of renovation required will be dependent on the reuse plan.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)

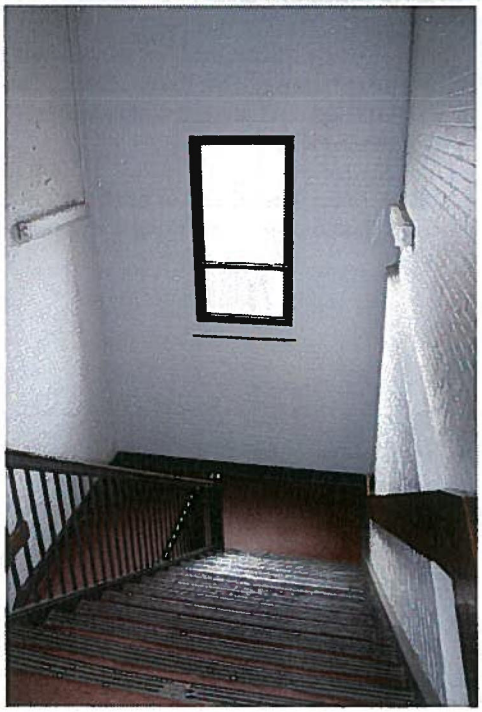
At the center of 'A'-Wing is a 348-seat auditorium with a full stage. The volume of the auditorium has surfaces that are designed and treated for acoustics.

The floor surfaces are painted concrete with carpet in the aisles. Walls are a painted GWB with a wood wainscot and acoustical panels. The ceiling is a suspended painted GWB ceiling with acoustical spray treatment.

The stage has an elevated wood floor, flush with the main corridor. The stage exceeds 1,000 sf and as such requires emergency ventilation and smoke control. A single smoke vent is located at the ceiling above the stage, though this does not provide adequate ventilation per current Codes. The opening height is less than 50-feet tall, limiting requirements for fire protection.

The auditorium and stage are in good condition and continued use is possible with renovations for handicapped accessibility and Building and Fire Code compliance.

1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)



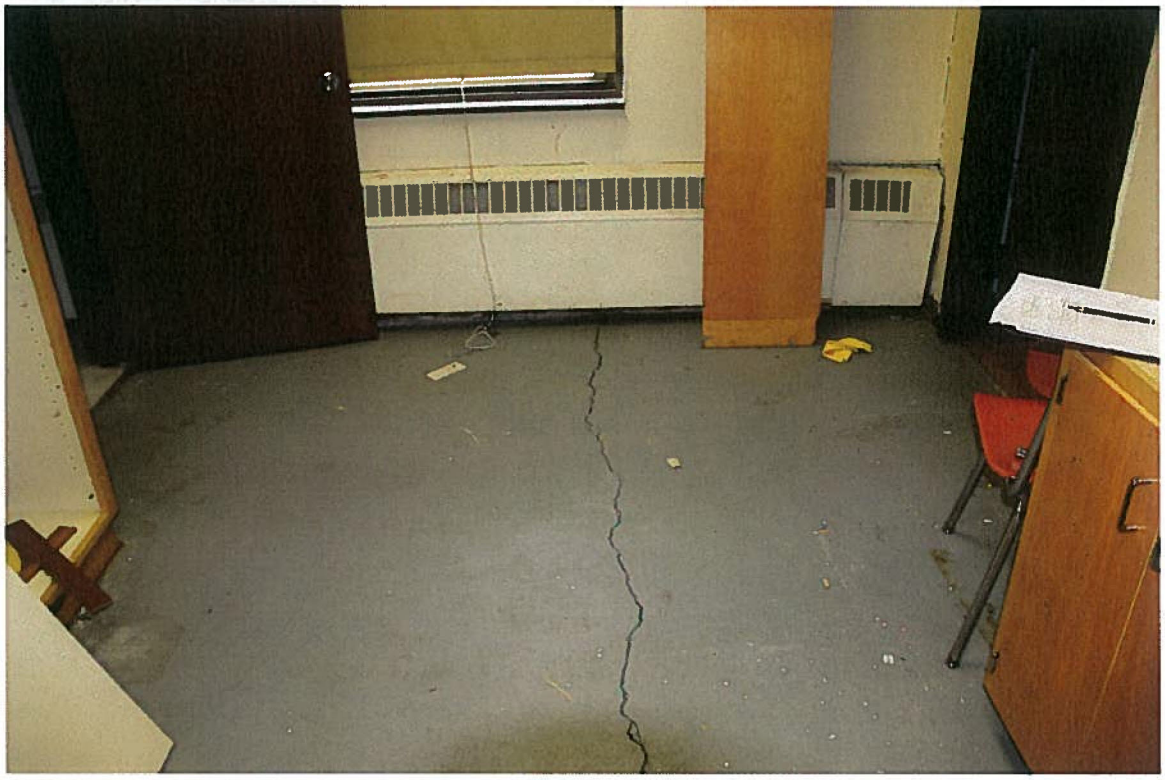
The corridor walls in A-Wing are painted GWB with painted metal lockers recessed into the walls. Flooring is VCT with coved vinyl base. Ceilings are suspended acoustical tile.

The original stairway at the southeast corner of A-Wing discharges to the exterior by means of an exterior flight of steps.

There are no HCA means-of-egress at the A-Wing and there are no Areas of Refuge. The only means of access or egress is by means of an elevator.

Stairway handrails and guard rails will require modification to be compliant in a redevelopment plan.

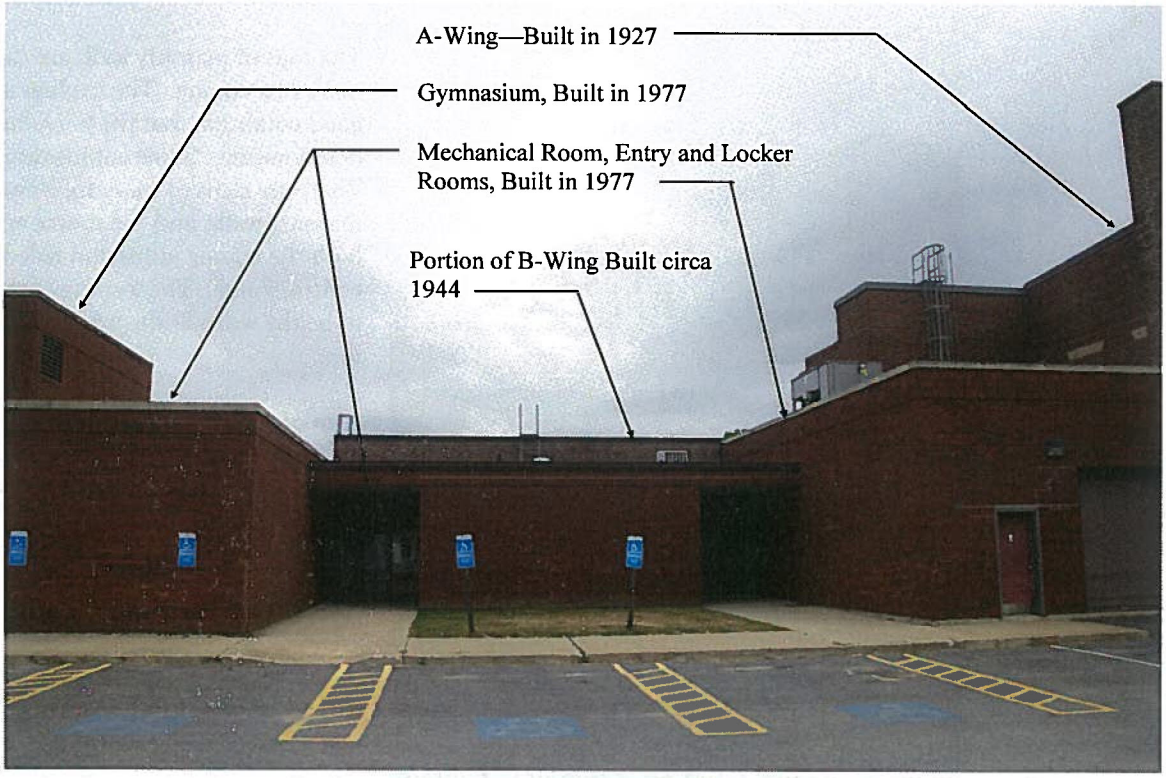
1. A-Wing– Constructed in 1927 and Significantly Renovated in 1977 (continued)



There is a significant crack in the concrete floor slab on the second level, within Room 203B. This crack runs the full length of the room and branches in multiple directions at the ends.

There is no misalignment or settlement of the slab. This crack should be repaired using a structural epoxy.

2. B-Wing– Constructed in circa 1944 and 1977



Partial East Facade

Partial East Façade — Gymnasium

The 1944 portion of B-Wing is a brick masonry structure that appears to be solid brick walls, likely triple-wythe.

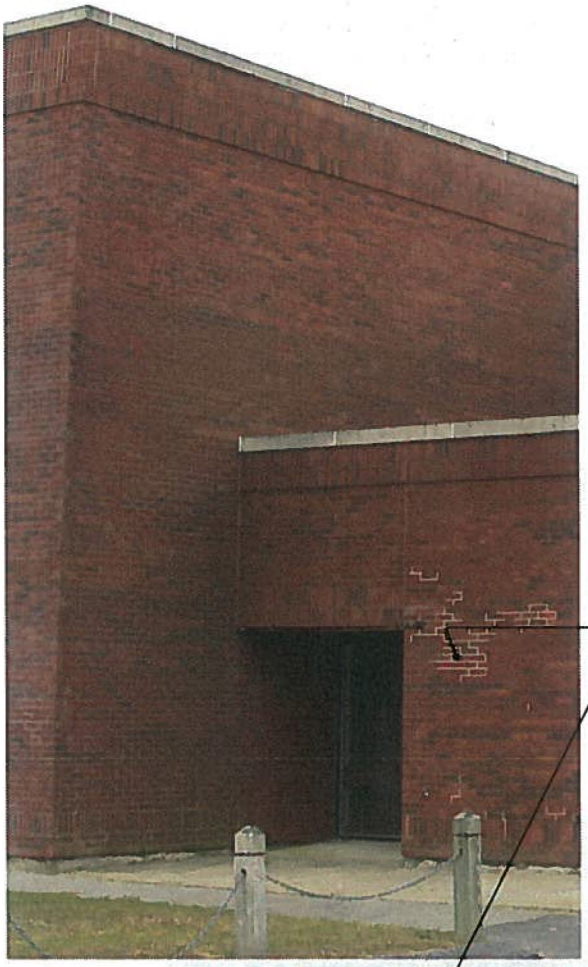
The 1977 additions are of masonry cavity wall construction and have a concrete masonry back-up with a brick veneer. Cast-stone parapet caps terminate the walls. The roof structure is steel framing with metal deck.

The high-volume gym space has a series of pilasters that provide additional bracing for the masonry walls.

2. B-Wing– Constructed in circa 1944 and 1977

The tops of masonry walls are capped with a cast-stone coping. The copings are generally in good condition, but the joints have signs of deterioration. Some copings are mis-aligned. There are signs of water infiltration into the masonry walls, and the source appears to be both the coping joints and failed sealants at the control joints. The wetting of the wall appears to be the worst at the north wall of the gymnasium.

Also of concern is an apparent lack of flashing and weeping at interruptions and plane changes in the masonry. The steel lintels over the recessed entries are in complete failure. Damage to brick at door heads are also a result of a lack of weeping.



Damaged brick and failed steel lintels due to missing or insufficient flashing and weeping.

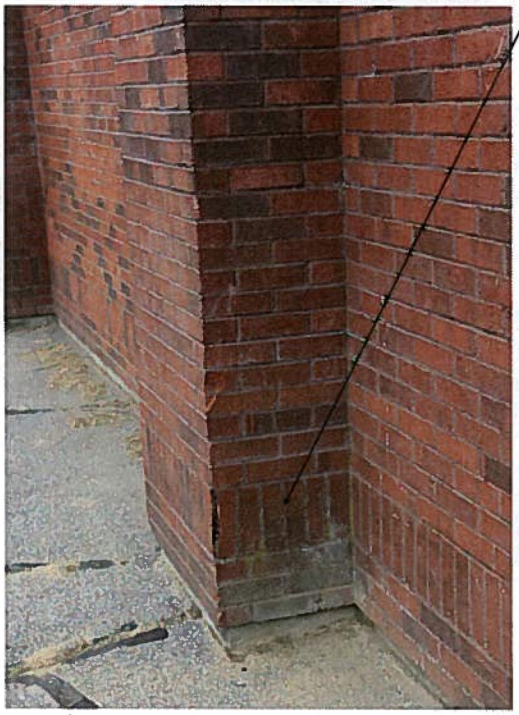
2. B-Wing– Constructed in circa 1944 and 1977

Water appears to be infiltrating the pilasters, likely through the cap flashing and control joints, which align with the edge of the pilaster.

Moss growing in the joints is an indication of sustained moisture, as is the discoloration and efflorescence.

Efflorescence

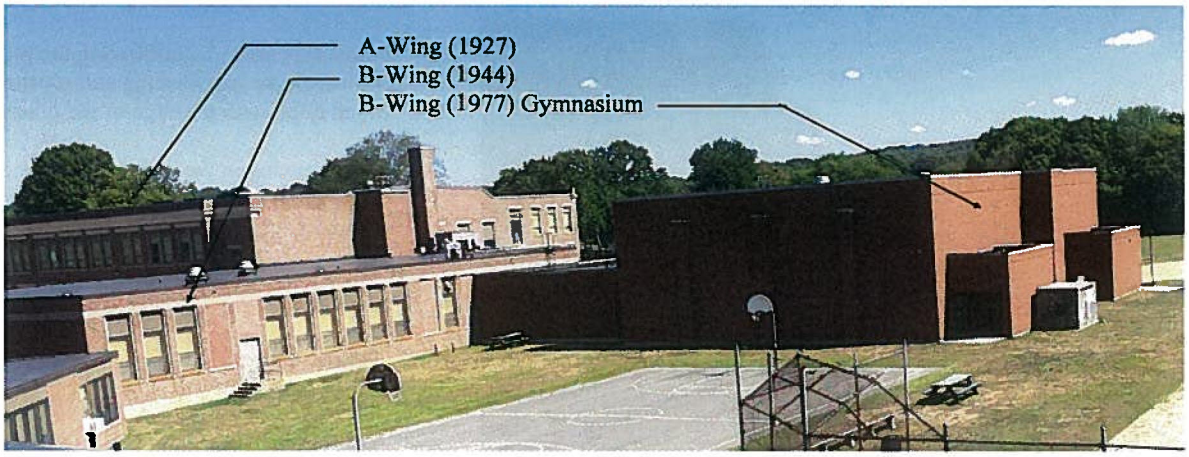
Moss Growing in Joints



Damaged Masonry at base of Pilaster with no Apparent Weeping

Control Joint with Failed Sealant

2. B-Wing– Constructed in circa 1944 and 1977



East Façade of 1944 Construction & South and East Façade of 1977 Construction

East Façade of 1944 Construction

2. B-Wing– Constructed in circa 1944 and 1977

1977 Construction (Typical Conditions):

Cast-stone coping showing signs of damage.

No visible signs of flashing / weeping below coping or below soldier joint as detailed on original drawings.

Failed control joint sealant.

1944 Construction (Typical Conditions):

Masonry joints are deteriorated and in need of repointing throughout the wing.

There are broken bricks in some locations, but this is not widespread.

Open joints in lintels allow water infiltration.

Aluminum windows are weathered.

Metal screens are rusting and staining masonry, which accelerates damage.

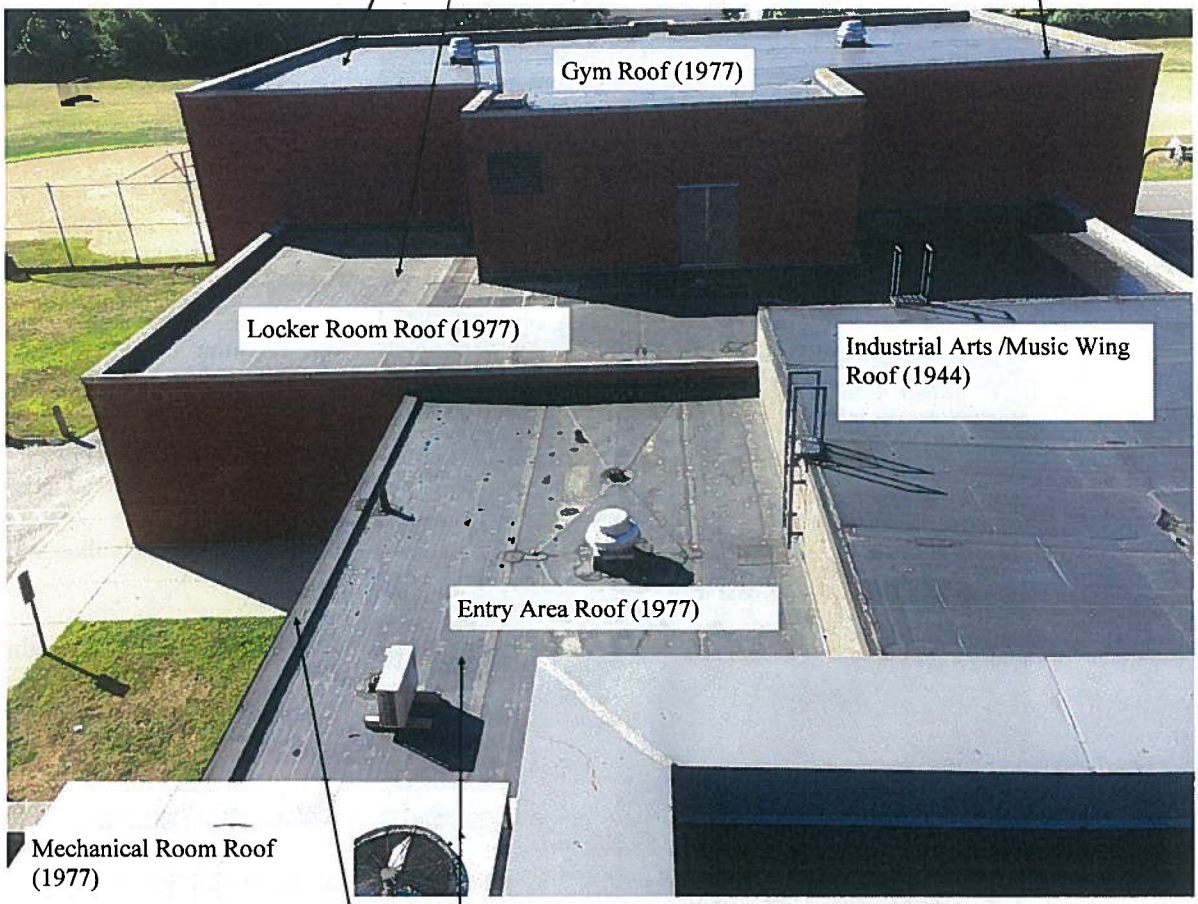
2. *B-Wing– Constructed in circa 1944 and 1977*

The B-Wing roof is comprised of five distinct roof areas. As follows:

1. Gymnasium (1977)
2. Locker Rooms (1977)
3. Entry (1977)
4. Mechanical Room (1977)
5. Industrial Arts/Music (1944)

Gym and Locker Room Roof: Mechanically fastened and ribbon-adhered EPDM is in generally good condition and requires routine seam and flashing maintenance.

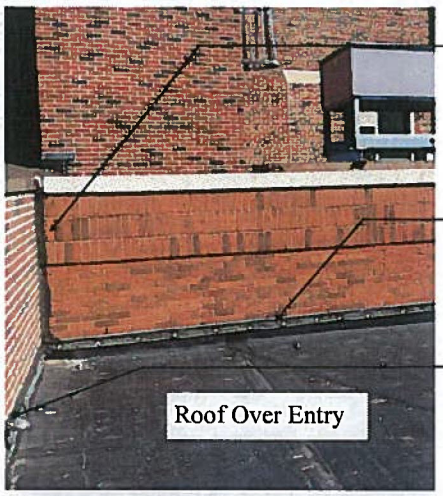
Cast-stone copings should be further evaluated to confirm flashing, All joints needs to be repointed and several coping stones need to be reset.



Roof Over Entry Area: Mechanically fastened and ribbon-adhered EPDM is in generally good condition and requires routine seam and flashing maintenance. Particular attention is required at flashing that transitions into wall of 1944 wing.

Roof edge is a metal gravel stop in good condition.

2. B-Wing– Constructed in circa 1944 and 1977



Building expansion joint should have a pre-manufactured joint system to maintain a water-tight joint.

Retainer bar and sealant at transition at north wall requires just routine maintenance.

Retainer bar and sealant at west wall appears to have failed and is coated with mastic. Bar should be reset and sealed properly.

Maintenance required on roof-edge metal and roofing seams.

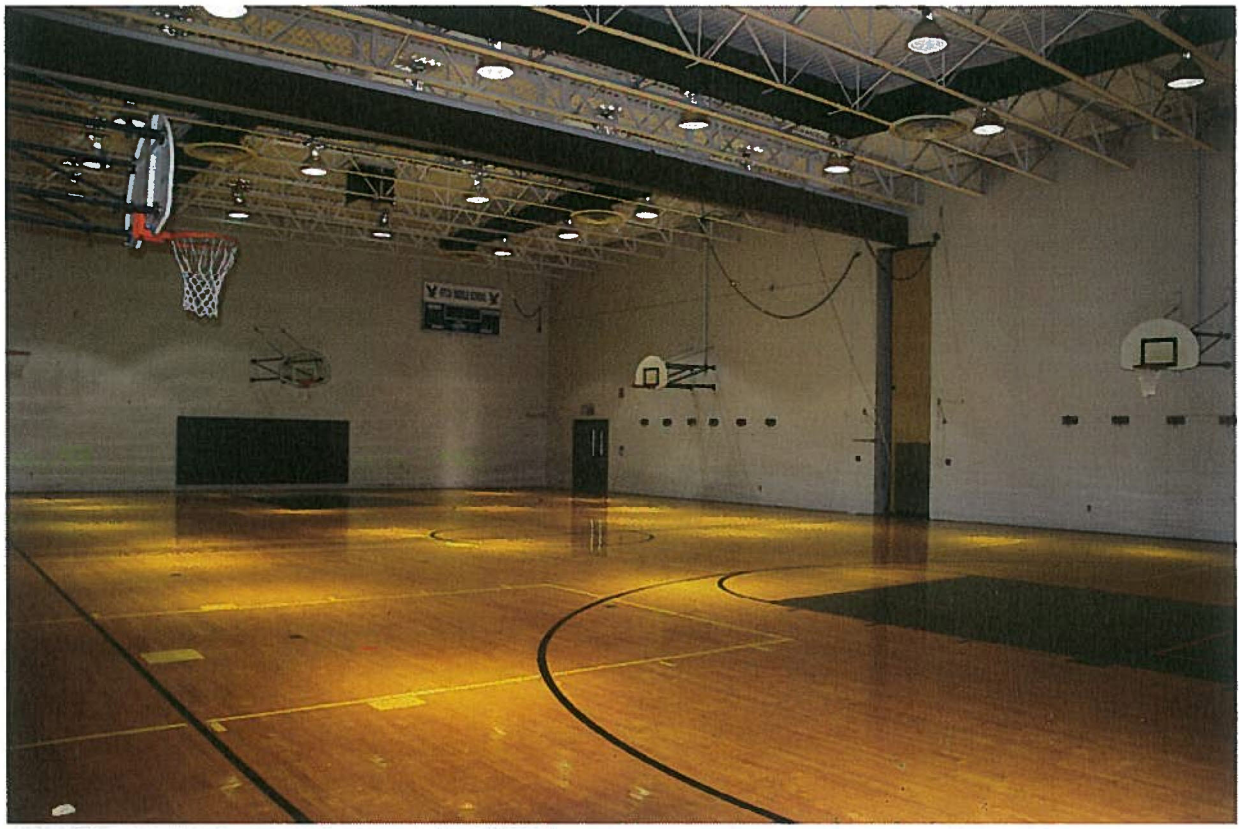
Mastic at top of retainer bar should be removed and retainer bar and sealant reinstalled.

Copings should be properly flashed and joints repointed.

Roof is adhered using ribbon adhesive as opposed to full adhesion. Wind uplift requirements may not be achievable as installed (120 MPH).

Seam maintenance is required throughout the EPDM roof. It appears that joints in the rigid insulation below the membrane are not tight and the joints are telegraphing through the roofing, reducing the energy efficiency of the roof system.

2. B-Wing– Constructed in circa 1944 and 1977

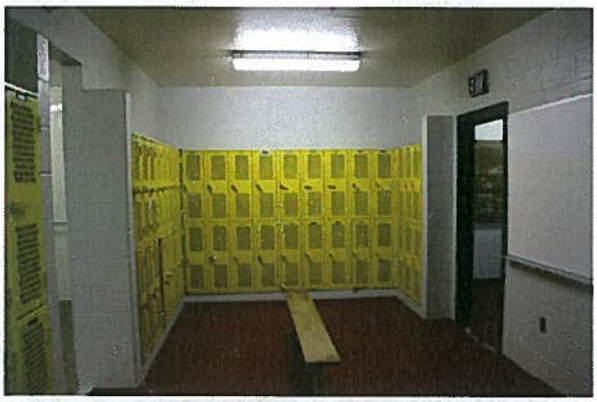


The gymnasium is the largest volume within the B-Wing and consists of an 84-foot basketball court with a hardwood floor. The floor is in generally good condition, though there is some damage from water or moisture at the east end.

There is evidence of water or moisture migration at the masonry walls. Damage is evident primarily high on the wall, and is likely a result of moisture migration through the cast-stone wall coping. The original construction drawings show through wall flashing, but without weeps at the termination of the flashing. It is also possible that the flashing was damaged in the re-roof in 2001, or that penetrations of stone dowels are not properly sealed.

In any renovation plans, copings, flashing and weeping of walls must be addressed prior to preparing and re-painting wall and deck.

2. B-Wing– Constructed in circa 1944 and 1977



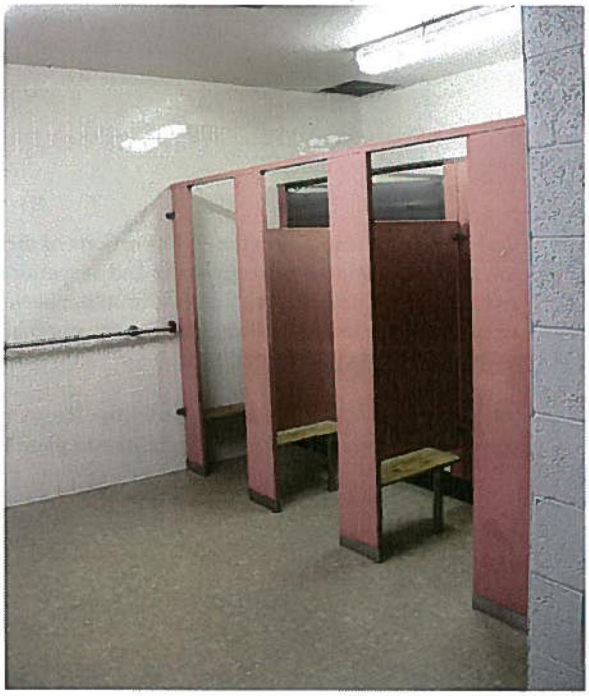
The locker rooms serving the gymnasium are constructed durably. In the locker area the walls are painted CMU walls and are painted concrete floors. In the toilet and lavatory area, walls are painted CMU and floors are ceramic tile. Showers have ceramic tile on the walls and the floor. Painted GWB ceilings are provided throughout.

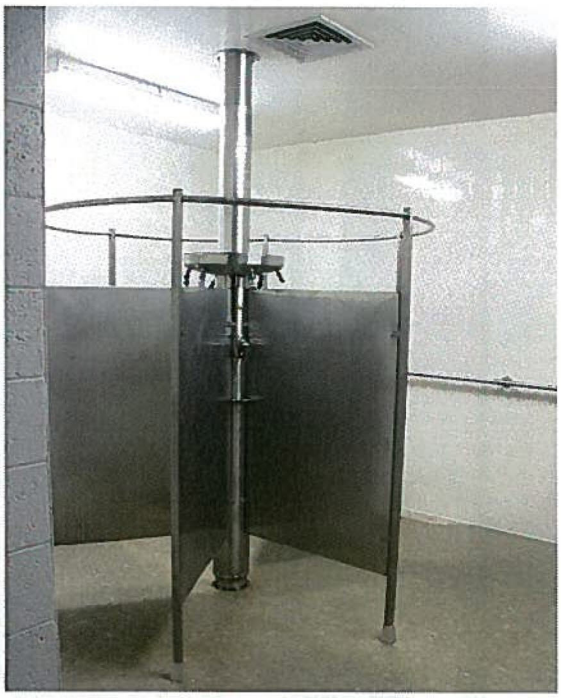
The locker rooms are currently being used and are well maintained. However they lack handicapped accessibility and would need some renovation to comply with current Codes.

Lockers are ventilated painted metal, four high cubicle type. They are in good condition. If they are to remain in a reuse plan, sloped tops are recommended to make maintenance simpler.

Coaches' offices and toilet/shower rooms are located within the locker rooms. These are similarly constructed and in good condition, but again lack accessibility.

Equipment storage rooms are located between the coaches' offices and the gymnasiums. In a reuse plan, the general arrangement of spaces may be reconsidered due to the potential privacy issues.





2. B-Wing– Constructed in circa 1944 and 1977

The common areas within the 1977 portions of the B-Wing are primarily painted masonry walls and suspended acoustical tile ceilings. The corridors that exit from the back of the locker rooms to the exterior, at each end of the north side of the gym have painted GWB ceilings.

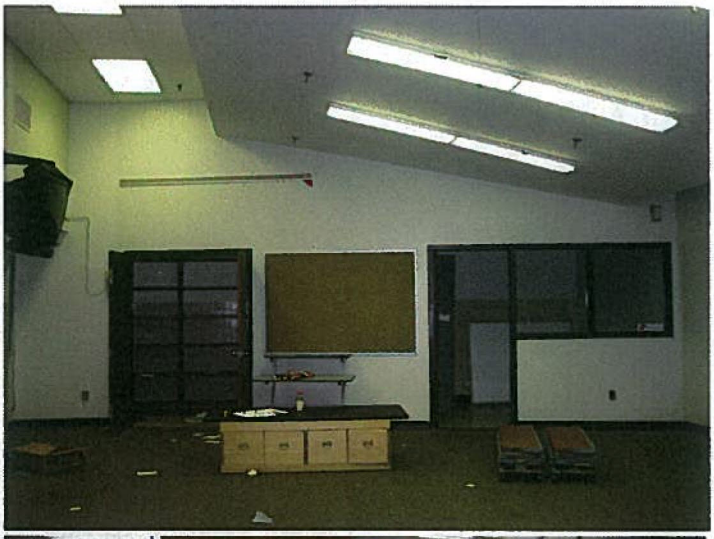
All floors are VCT and vary in condition. Heavy use areas are worn, in some places to the point of complete failure.

2. B-Wing– Constructed in circa 1944 and 1977

The transition of the 1977 addition into the 1944 wing occurs at the base of the A-Wing stair. Walls in the 1944 wing are glazed CMU up to a height of about 5-feet, with painted CMU above. Ceilings are suspended acoustical tile.

Handrails at the stair are not Code compliant

2. B-Wing– Constructed in circa 1944 and 1977



Spaces within the 1944 portion of the B-Wing are for very specific uses of wood shop, art room, print shop and a music room.

The music room has painted GWB walls. Ceilings are suspended GWB and acoustical tile. The floor is carpet which is worn and requires replacement.

The wood shop has painted GWB walls and a hardwood floor. There is no ceiling and all utilities are exposed.

The print shop retains portions of former toilet room walls which have glazed and painted CMU. Ceilings are suspended acoustical tile. The floor is a combination of painted concrete and carpet.

2. B-Wing– Constructed in circa 1944 and 1977

The 1977 construction documents indicate that the gymnasium and locker rooms are separated with a Fire Wall at the north wall of the showers. The Fire Wall is designed to continue to the exterior to the east and shares a common wall with the Music Room to the west.

The doors through the Fire Wall are on hold opens tied to the fire alarm system. When activated, the doors will close, to maintain the integrity of the fire barrier.

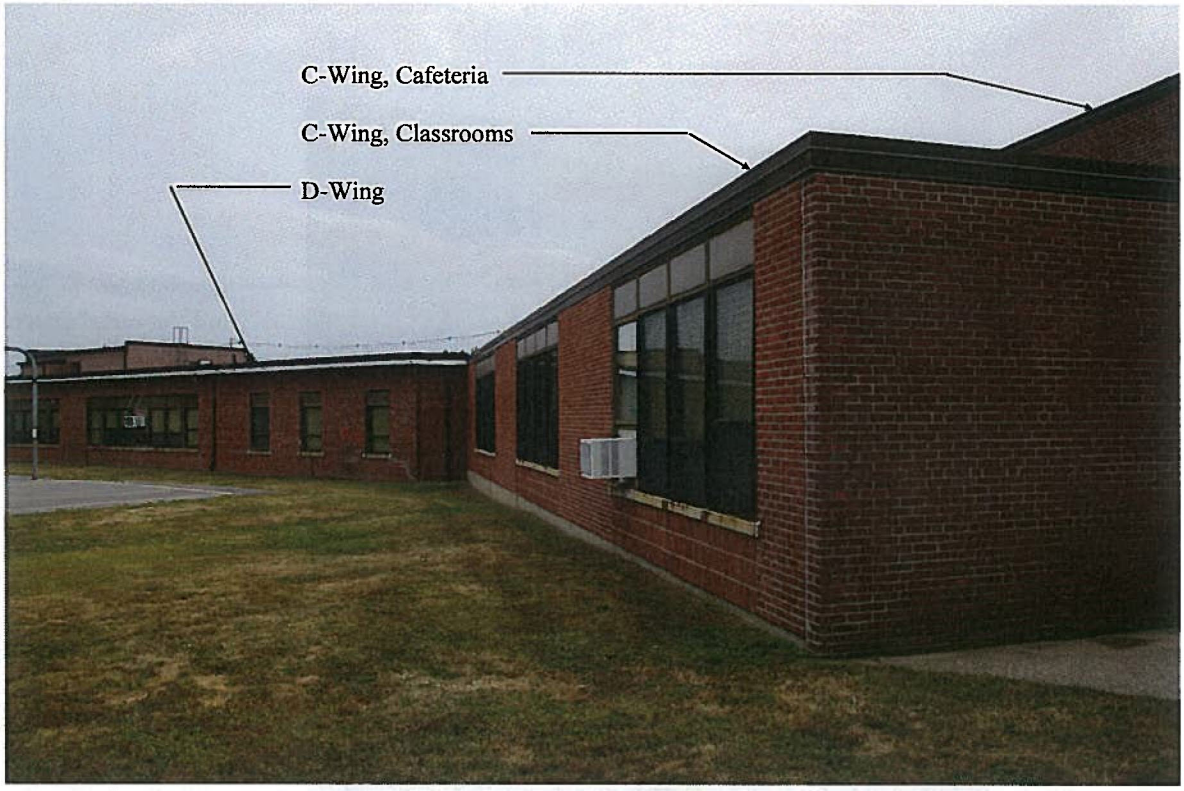
The configuration of the wall and the penetrations through the wall are non-compliant and will require properly designed and UL listed through-wall penetrations for compliance.

Metal deck with polyiso insulation do not provide the required fire resistance rating at the roof level.

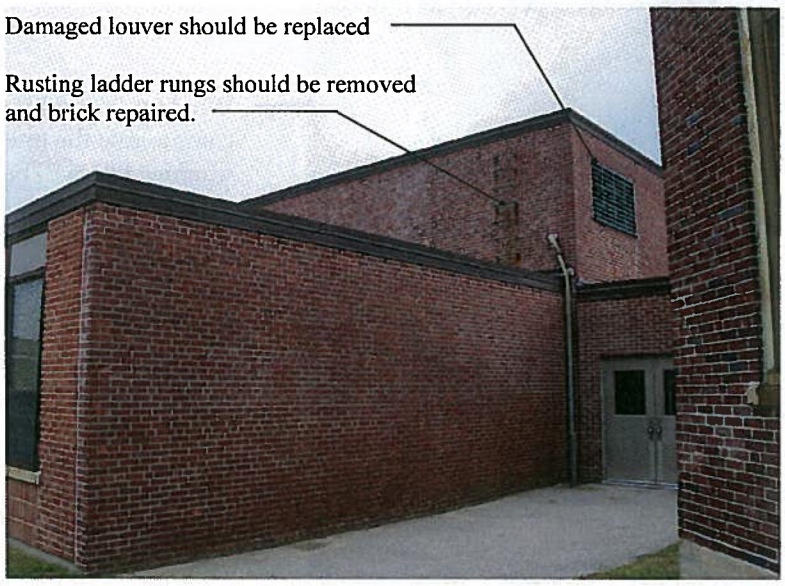
Non-compliant through wall penetrations.

Southwest corner of Music Room that forms the completion of the Fire Wall. The wall assembly needs to be evaluated as the brick portion may not provide the required fire-resistance rating.

3. C-Wing– Constructed circa 1955



East Facade



C-Wing at Intersection of Classrooms, Cafeteria and Connector

In 1955, the C-Wing was constructed adjacent to the D-Wing. This addition contains a cafeteria and kitchen, as well as six classrooms. The addition shares a wall with D-Wing, but is separated from B-Wing by a one-story connector. The cafeteria portion of the wing is a double-height space, while the kitchen and classrooms are single story.

Masonry is in generally good condition, needing maintenance such as re-pointing and repair.

3. C-Wing– Constructed circa 1955

Windows are heavily weathered and the metal screens are rusting, resulting in staining and deterioration of cast-stone sills and brick.

Weeping at the base of wall is inconsistent and the wall cavities are apparently not vented.

Window air-conditioning units compromise the integrity of the window system. The removal of the security screen renders all screens ineffective by creating an easy point of access.

3. C-Wing– Constructed circa 1955

West Façade of Cafeteria

The west façade of the Cafeteria is a metal storefront system. It is heavily weathered, thermally inefficient and unattractive. As it is a prominent façade in the backdrop of the historic Town Hall, it would be prudent to make improvements to wall assembly.

West Façade of Kitchen and C-Wing Classrooms

The Kitchen is served by bottled propane, which sits on a platform outside the west wall. In a renovation scheme, this should either be eliminated or better protected.

3. C-Wing– Constructed circa 1955

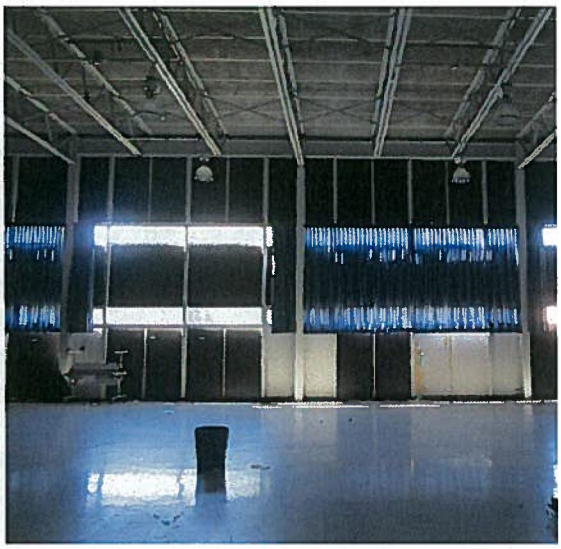
Detail—West Façade of Cafeteria, Near Top

Detail—West Façade of Cafeteria, Near Bottom

The storefront façade is a combination of original (1955) glass and insulated panels, as well as glass panels installed in 1977. All are in poor condition and have outlived their useful life.

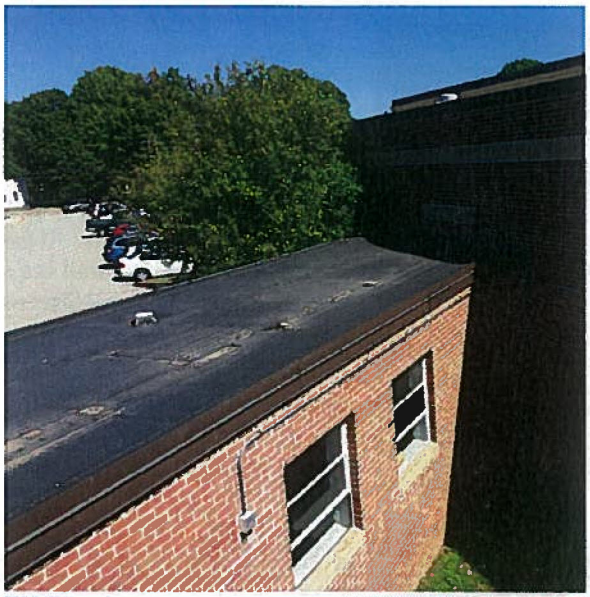
The western exposure makes this type of system hard to control, resulting in glare and excessive heat gain in the cafeteria.

Curtains have been installed on the interior to mitigate the effects of the sun, which would be particularly difficult in late afternoon.

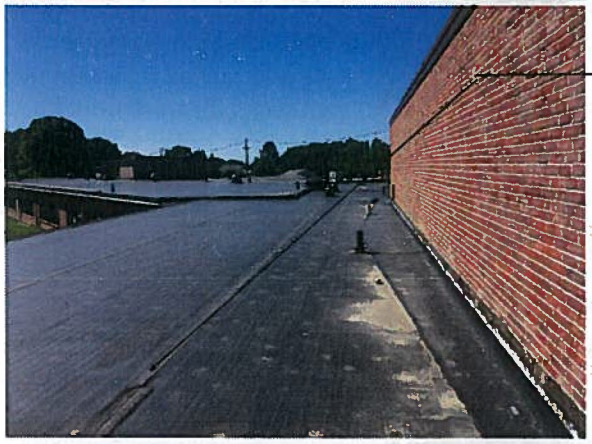


Interior of West Façade of Cafeteria

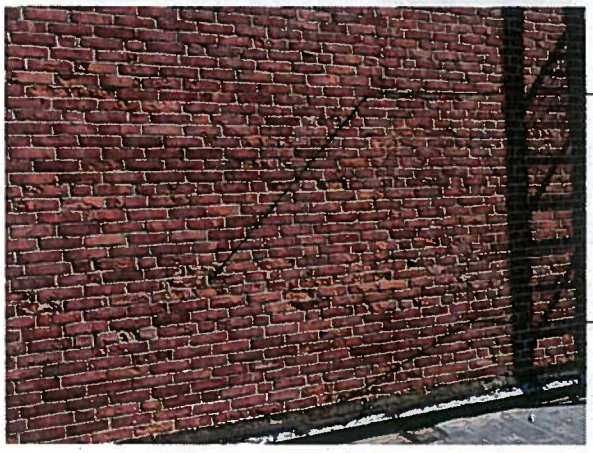
3. C-Wing– Constructed circa 1955



The roof over the connector is a mechanically adhered EPDM roof in generally good condition. It requires regular maintenance of seams and flashings. The connector was constructed in 1977.



The roof over the classrooms and kitchen is a ribbon adhered EPDM roof on rigid insulation. There are several misaligned boards and many seams that are in poor condition. The roof is in need of significant maintenance.



The brick at the cafeteria wall is severely weathered and in need of maintenance and repair. It appears that any weeping at the base of the wall has been covered by mastic and as such the wall cannot properly dry out.

Flashing to the cafeteria wall is failing and in need of replacement.

3. C-Wing– Constructed circa 1955

The cafeteria is a double-height space that is functional, but worn and in need of a finishes upgrade. The west wall is a storefront system that is in need of replacement. The flooring is VCT. There is no ceiling and the underside of the Tectum Acoustical deck is exposed above a steel structure.

The Kitchen is a fully functional commercial kitchen with gas appliances. Walls are glazed CMU. Flooring is quarry tile. Ceilings are concealed spline acoustical tiles. Minimal architecturally work would likely be required to continue use as a kitchen.

The hood and fire protection systems require verification, testing and certification before being put back in use.

Academic spaces within the C-Wing include one Science Classroom and five general Classrooms. Classrooms have painted GWB walls, VCT floors and suspended acoustical tile ceilings.

4. D-Wing– Constructed circa 1947

East Facade

Southeast Facade

D-Wing was constructed as a stand-alone building in 1947. Wall construction is generally 8" clay or terra-cotta tile with a brick veneer on the exterior and plaster on the interior. The walls are solid masonry bearing walls with no cavity to vent or weep moisture.

The foundation is cast-in-place concrete. There is a pipe tunnel at the perimeter of the foundation and a basement under a small two-story area near the middle of the west side.

The roof structure is steel bar joists with a 2" concrete plank deck.

4. D-Wing– Constructed circa 1947

Southwest Facade

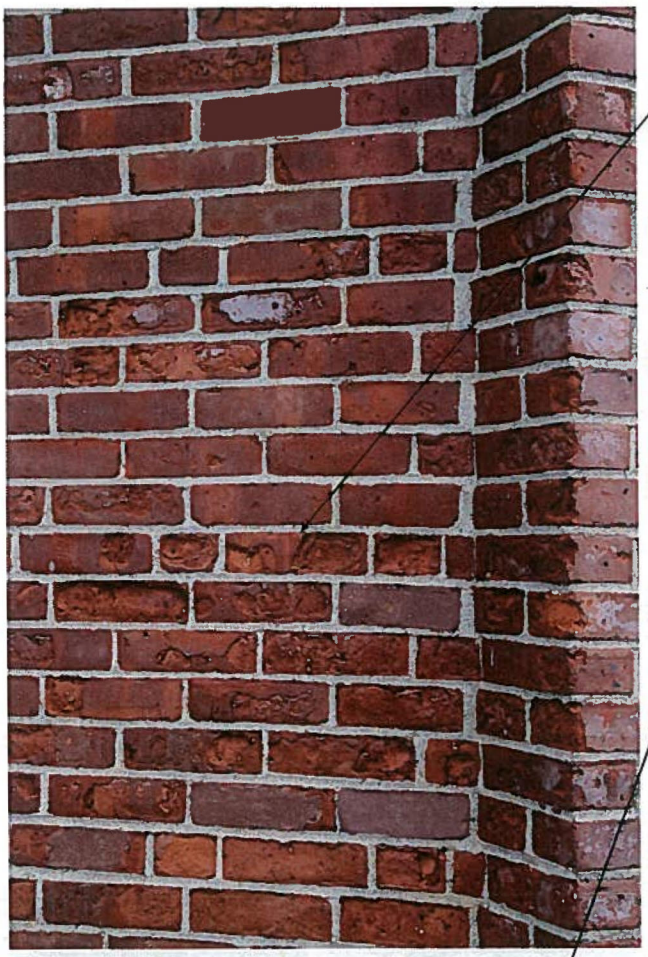
Partial West Facade

The roof overhangs the walls and is finished with a painted wood fascia and soffit. Roof edge metal terminates the membrane roof and laps onto the fascia. The wood components appear to be in reasonably good condition, but are in need of repair and repainting.

Originally, window openings were filled with 7-courses of glass block above a fixed-over-hopper steel window. The windows have been replaced with the current aluminum window system, which are worn and in need of full perimeter sealant, at a minimum, and likely full replacement if the wing is renovated.

The brick masonry veneer on the entire wing is heavily distressed and weathered. It appears that a coating or sealer was installed at some point to control moisture migration. This sealer may not be a breathable type of sealer and as a result may be trapping moisture and accelerating deterioration of the brick.

4. D-Wing– Constructed circa 1947



Heavily weathered brick, typical throughout all of D-Wing, most prominently on the east and south facades.

Rusted lintels and moisture migration have caused damage to brick at openings.

Cantilevered concrete canopy over doors are nearly flat and lack roofing or flashing. A bituminous coating has been added to control water penetration.

4. D-Wing– Constructed circa 1947

A wood exterior fire escape was constructed to provide a second means of egress from the second level of D-Wing. This stair is in generally poor condition and is not compatible with the architecture of the building. If continued use of the second floor is planned with a use that requires two means of egress, then this stair should be replaced with a new fire stair.

Heavily weathered brick and cracks that have been repaired are common on the D-Wing.

Failed joints at sills and at window perimeter allows water penetration into building and wall assemblies.

4. D-Wing— Constructed circa 1942

The D-Wing roof is a 2" concrete plank deck with rigid insulation above it. Roofing is an adhered EPDM membrane. The roofing was installed in 2001 and is in need of maintenance to maintain watertightness. Many of the substrate boards are misaligned and loose. In addition to causing eventual damage to the roof, there are thermal bridges in the insulated layer which significantly reduces the efficiency of the insulation. There are no walkway pads installed to protect the surface. Roof drainage is accomplished by means of roof drains spaced evenly at the overhang along the perimeter of the roof. A tapered edge pitches to the drains, which discharge through rainwater leaders installed through the soffits.

Flashing at the transition from C-Wing to D-Wing is designed to have an expansion joint. This joint does not continue at the raised parapets at the former entry locations, which is causing stress at these locations.

4. D-Wing– Constructed circa 1947

Flashing at the transition to the two story area is in need of complete replacement.

Typical roof drain at building perimeter

Brick veneer is exhibiting the same severe weathering noted at the lower level.

Flashings are in need of complete replacement.

4. D-Wing– Constructed circa 1947

Typical finishes in D-Wing classrooms include painted plaster and GWB on walls, suspended acoustical tile ceilings and VCT floors. Most of the wing is slab on grade, though there is a pipe tunnel around the perimeter of the wing and a basement area under the two story portion.

There is evidence of moisture or water migration at the exterior walls, as finishes are damaged.

Several D-Wing classrooms are science labs, with laboratory casework. Some casework has been removed, leaving utilities stubbed up through the floor.

Windows treatments are in poor condition.

Casework is a combination of metal and wood and countertops vary from wood and plastic laminate to epoxy resin.

4. D-Wing– Constructed circa 1947

The corridors in D-Wing have painted plaster above glazed CMU on one side, and semi-recessed painted metal lockers on the other side. The ceilings are suspended acoustical tile. Floors are VCT.

Doors into each room are wood with hardware that is not HCA.

Toilet rooms have painted CMU walls in some locations and painted plaster above glazed CMU on exterior and corridor walls. Floors are ceramic tile.

The rooms are in generally good condition, but there is no handicapped accessibility.

Access to the upper and lower level of the two-story portion of the wing is by means of stairs. There is no elevator access. The second means of egress from the upper level is through a door in the exterior wall, onto the wood exit stair. The door is in poor condition , as is the wooden exterior stair.

5. Site

Driveways, sidewalks and parking areas are in varying conditions, but all are in need of basic maintenance, such as crack sealing, pot hole repair and repair of sunken areas.

Much of the building has pavement right up to the foundation walls. Pavement should be removed from the building, as it promotes damp-rise, which stains and damages the concrete and brick. Grade should be held down several inches below the bottom of brick. Ramped access has been installed to many of the door openings, but most are not HCA and many create a tripping hazard. They are also not constructed with a level landing as required.

At the entrance to the D-Wing on the west side, a concrete sloped concrete walk was placed over the top of the existing landing. A bituminous paved area connecting this walk to the entrances to the portable classrooms is in poor condition and should be removed once the classrooms are removed.

5. Site

The bollards protecting the buried gas tank should be replaced with more substantial bollards as the wood posts would not be capable of stopping a vehicle.

Drain grates with large openings should be replaced with covers that will not create a tripping hazard. Covers in pavement should be HCA.

Site fencing and signs are in generally poor condition. Much of the signage is not ADA compliant.

5. Site

Plantings against the building should be cut back to allow damp areas to dry out and to prevent screening from the street.

The apple tree planted near the connector should be removed. This type of tree is not appropriate for a foundation planting, as the roots can cause damage to the foundation.

5. Site

Backstops and fencing are rusting and the bases of the chain-link is in poor condition. All fencing should be replaced to provide proper protection to players and spectators.

Rusted fencing, sharp edges, lose boards and uneven turf present hazards to players.

5. Site

Ball fields are playable but depending on the desired level of quality, can benefit from a turf management plan and irrigation. Lips at the transition from infields to outfields should be leveled to avoid trips and bad hops.

Ball field and site accessories, including benches, bike racks, soccer goals, field hockey goals and lacrosse goals, trash bins, picnic tables, etc. are in need of repair or replacement.

Geese create a nuisance and a potential health hazard from the droppings.

CT DEEP offers some guidance on dealing with geese, but it remains a significant challenge. Guidance can be found at the DEEP website.

IV. BUILDING CONDITIONS ASSESSMENT

6. Outbuildings

An elevated masonry fuel storage building is in good condition and its continued use is likely in any reuse plan.

The Arts and Crafts building is a portable classroom-type building. It is serving its purpose and is in reasonably good condition. In the short-term, the building should continue to be serviceable. In the long-term, if the programs need to be continued, it should be moved into the main building, as the building has a limited anticipated life and is incompatible with the architecture on-site. The skirt at the foundation is damaged and should be repaired to prevent unauthorized access below the building.

INNOVATIVE ENGINEERING
SERVICES, LLC

AN INTEGRATED ENGINEERING + DESIGN FIRM

Fitch Elementary School MEP Conditions Report

for

TLB Architecture LLC

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Prepared by:

Innovative Engineering Services, LLC

September 11, 2014

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INTRODUCTION

Innovative Engineering Services, LLC was retained by TLB Architecture to provide information regarding the condition and recommendations for the mechanical, electrical, plumbing and fire protection systems for the Fitch Elementary School located at 61 Fort Hill Road in Groton CT.

Our site survey was limited to readily accessible and visible elements only. No destructive testing was performed. IES did not perform an environmental survey of the facility and shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to hazardous materials in any form at the building site, including but not limited to, asbestos products, polychlorinated biphenyl (PCB), or other toxic substances.

All corrective work recommended herein shall be done in accordance with the latest codes for the State of Connecticut in addition to local regulations. Additional code references are noted as required by the scope of the project. Such work shall be performed by qualified others.

Fire Protection Systems

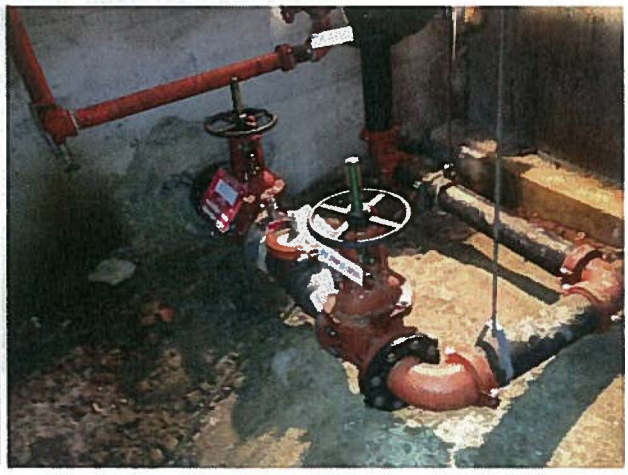
Applicable Codes and Standards:

The fire protection system was reviewed for conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

- 2005 Connecticut State Building Code with 2009 supplements.
- 2005 Connecticut State Fire Safety Code with 2009 supplements.
- 2003 International Building Code (IBC)
- NFPA 13 (2002 Edition)

Fire Protection

1. Existing Fire Protection Service: The existing building is currently served by a 6-inch fire protection service. The service is provided with a post indicator valve located on the side of the parking lot closest to Fort Hill Road. The service enters the building on the north side and into a crawl space below the first floor. This 6-inch main reduces to a 4-inch line at the foundation wall. All fire service equipment is 4-inch. Fire service equipment consists of an "Ames" 2000SJ double check valve, isolation valves with tamper switches, alarm check valve, water motor gong, test/drain connections and fire department connections.



2. Pressure gauge readings on the street side are 95 psig static and 120 psig on the system side.

3. There are two fire department connections provided on the west side of the building. These fire department connections are building mounted 2 1/2x2 1/2x4 inch Siamese type connections.

4. All areas of Building 'A' including the auditorium, administration area, classrooms, library and most of the basement and crawl space are provided with sprinkler protection. Only portions of Building 'B' are provided with sprinkler protection (technical education shop areas). All other areas of the building are not provided with sprinkler protection.

5. Sprinkler piping is black steel with threaded and grooved end joints. Sprinkler heads are fusible link type upright and chrome pendent style. Some locations are provided with glass bulb type pendent sprinklers.

Recommendations

We recommend the following regarding the fire protection system:

1. Provide the building with full sprinkler coverage. The existing 6-inch fire protection service can be utilized for full sprinkler coverage. An extension of the existing fire protection system with three zones would be required if the building is renovated for new use. Due to its location in the crawl space; the existing fire service equipment should be relocated to a more accessible location for annual servicing and testing or the current location of the service equipment should be made more accessible.

Plumbing Systems

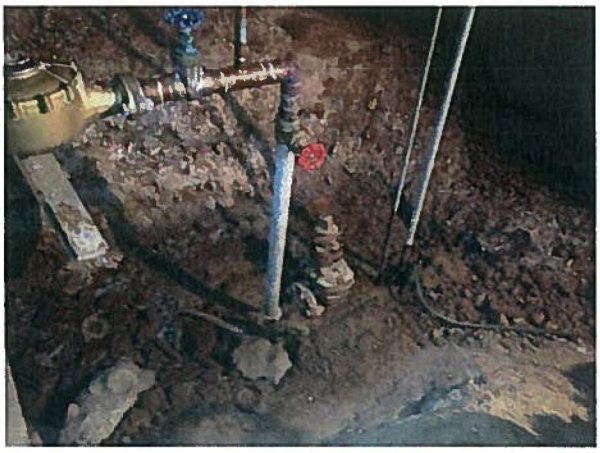
Applicable Codes and Standards:

The plumbing systems have been reviewed for conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2005 and 2009 supplements.
2. 2005 Connecticut State Fire Safety Code with 2005 and 2009 supplements.
3. 2003 International Building Code (IBC) with 2005 and 2009 supplements.
4. 2003 International Plumbing Code (IPC) with 2005 and 2009 supplements.
5. 2003 International Mechanical Code (IMC)
6. 2006 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1

Existing Plumbing Utilities

1. Domestic Water Service: The existing building is currently served by two 4-inch domestic water services. The first service enters the building on the north side from Fort Hill Road into the basement/crawl space. This service incorporates a 2-inch water meter, 1-inch bypass, pressure gauges, strainer and isolation valves. The second service enters the building on the west side from Depot Road into the basement. This second service incorporates a 2 ½-inch water meter, 1 ½-inch bypass, pressure gauges, strainer and isolations valves. Both services incorporate a reduced pressure backflow preventer on both the main service line and the bypass. These two water services currently serve all of the buildings domestic water needs.



2. Propane Gas: There is currently a buried propane tank located on the east side of the building. The tank size is unknown. The gas line enters the building on the east side and incorporates a pressure regulating valve located on the building exterior. The age of the tank is unknown.

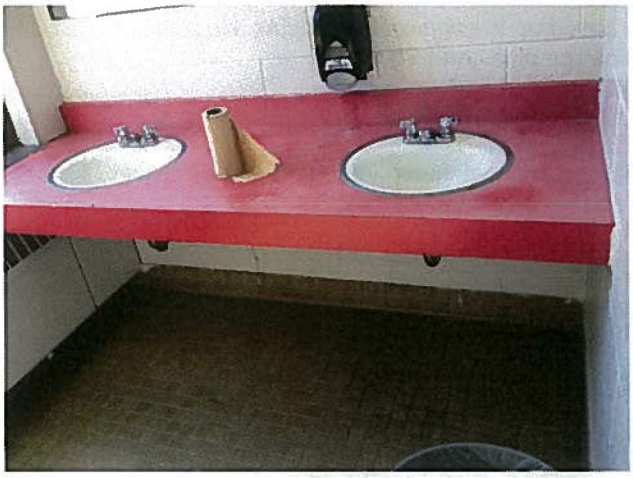
3. Sanitary Service: The School is provided with multiple sanitary sewer laterals that exit the building to the site and terminate at the municipal waste water system. The piping material is cast iron and the condition is assumed to be in fair based on the age of the building. No pressure test or camera scoping work was done to determine the pipe condition.
4. Storm Service: The School is provided with multiple storm laterals that exit the building to the site and terminate at the storm water system on the School property. The piping material is cast iron, the condition is assumed to be in fair based on the age of the building. No pressure test or camera scoping work was done to determine the pipe condition.

Existing Plumbing Fixtures

1. Water closets are vitreous china, floor mounted and wall hung with manual flush valves. Flush valves are not water saving type. None are ADA compliant.

2. Urinals are vitreous chine, wall hung with manual flush valves. Flush valves are not water saving type. None are ADA compliant.

3. Lavatories are vitreous china wall hung and countertop mounted. Faucets are both two lever type and single lever type. Faucets are not water saving type. None are ADA compliant.



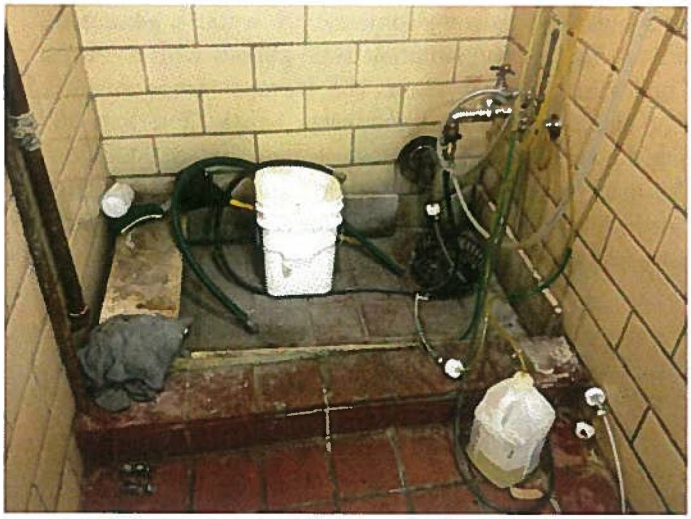
4. Drinking fountains are wall hung stainless steel, some are semi-recessed. There are only a few ADA compliant drinking fountains located throughout the building.

5. Classroom sinks are enamel coated cast iron with two-lever faucets, none are ADA compliant. Some classroom sinks are stainless steel countertop type with two lever handle faucet and gooseneck spout. All are provided with hot and cold water supply.

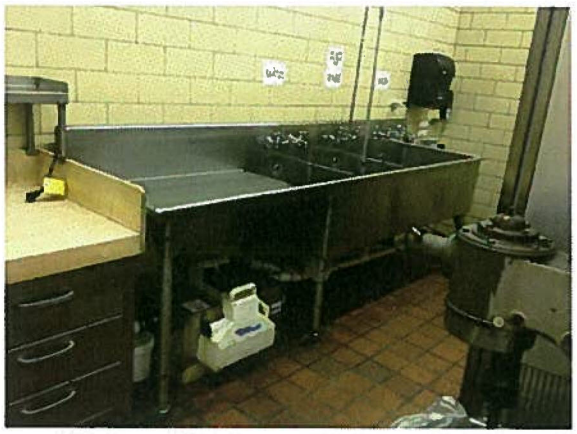
6. The gymnasium Locker Room is provided with gang showers that may not be compliant with the Health Code relative to the pitch of the floor and available drains. Gang showers are stainless steel pedestal type with drain at the base of the pedestal. The girl's locker room is provided with some shower stalls. The toilet fixtures and drinking fountain in this area are all non-ADA compliant. The coach's toilet rooms are provided with a toilet, lavatory and shower. Shower is a single 36"x36" terrazzo base with tiled walls. Shower valve and head are as manufactured by Symmons.

7. Science Classrooms. Emergency Eyewash stations at existing Science Classrooms are single plastic bowl type mounted at the end of the student work tables. Science classroom sinks are acid resistant solid surface integral to the countertop. Faucets are single lever type, gooseneck with integral vacuum breakers and have only a cold water supply. Some locations are provided with stainless steel countertop type sinks. None are ADA compliant. There is no acid neutralization system present for these fixtures. Three of the science classrooms located in Building D are provided with gas turrets piped to a master gas valve located in a recessed cabinet. Gas pipe in cabinet has been cut and gas pipe to turrets is not active.

8. Mop Basins: The kitchen mop basin is floor mounted constructed of tile with a two lever service sink faucet with vacuum breaker. All other mop basins are 36"x36" terrazzo type with same faucet.



9. Kitchen Fixtures: There is currently a three bay scullery stainless steel pot and pan sink with an automatic grease recovery unit located below the sink. Waste pipe is hard piped. A commercial grade single rack dishwasher is provided and incorporates a pre-rinse bay with hose spray and electric booster heater. Discharge waste pipe is not provided with an air gap. Gas fired appliances are provided with a propane gas supply. Pipe material is corrugated stainless steel and is piped to an outside above ground propane tank. Hook up for propane tank is in place, but propane tank has been removed.



Domestic Hot Water

1. Existing Domestic Hot Water System: The building's existing domestic hot water is generated by a single horizontal storage tank estimated to be approximately 1600 gallons with a P-tube internal heat exchanger fed from the boiler hot water system. The storage temperature is unknown. This system also incorporates a single vertical tankless water heater "Everhart 20-LONG and is assumed to be utilized during the summer months. Both storage tank and tankless heater are over 30 years old. System also incorporates a hot water circulating loop and water recirculating pump located under the horizontal tank to ensure hot water is available in a timely manner to all plumbing fixtures that require hot water.

Other Plumbing Items:

1. Cold water make-up: Cold water make up from the potable water system to the boiler water system is provided. Make-up line is provided with a backflow prevention device, Watts 9D.

2. Roof Drains: Roof drain are provided at all locations of the building provided with a flat roof. Drains are cast iron body with plastic dome cover. Some locations are provided with cast iron dome. All roof drains are part of the primary roof drainage system. There is currently no secondary drains or scuppers for areas of the building provided with parapets.

3. Gang bathrooms: Are provided with chrome hose outlets with vacuum breakers connected to the domestic cold water system for general cleaning of the toilet room.

4. Electric water heater: An electric water heater is provided and is located in a kitchen storage room adjacent to the kitchen and is assumed to be utilized for the hot water supply to the kitchen plumbing fixtures.

5. Domestic water System: Domestic water distribution to the building including cold water, hot water and hot water return piping is copper pipe with copper fittings and soldered joints. Not all areas are provided with pipe insulation. Due to the age of the piping system, it is likely that some locations may have joints that utilize a lead based solder.

6. Waste and vent system: Waste and vent piping is cast iron with push on joints. Some locations are renovated areas are provided with PVC piping with PVC fittings.

Recommendations

We recommend the following regarding the Domestic Water/Waste system:

1. Remove the buried propane tank and provide as required for any new gas fired equipment.
2. Have all buried sanitary waste and storm piping pressure tested and scoped to determine the condition of the piping for reuse.
3. Remove all vitreous china plumbing fixtures and install new water saving low flow fixtures. Provide ADA accessible fixtures in locations requiring these types of fixtures.
4. Remove the domestic hot water storage tank, heat exchanger and tankless water heater and provide new high efficiency gas fired water heater. Size to be determined based on the renovation work and the requirements for domestic hot water.

Electrical System

Applicable Codes and Standards:

The Electrical systems were reviewed for conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

- 2005 Connecticut State Building Code with 2009 supplements.
- 2005 Connecticut State Fire Safety Code with 2009 supplements.
- 2003 International Building Code (IBC)
- National Electrical Code 2011 (NEC)

Switchgear

1. The facility's existing main electrical service is located within the basement level of building "A" and consist of a fused Westinghouse POW-R-LINE switchgear rated at 1600 Amps, 208Y/120 Volt, 3-Phase, 4-Wire. The electrical switchgear is fed from a pad mounted utility transformer located on the exterior within the parking lot directly adjacent to the electrical room.
2. The switchgear is made up of 5 cabinet sections, "a wire-trough" "combination 1600amp main fused switch and metering section" and "3 sections of fused distribution". At the time of the site visit the facility's maintenance personnel stated that the electrical service was upgraded approximately 5 years ago, although the electrical switchgear appears to be in good operating condition the nameplate states it was manufactured in 1977.
3. The facility is estimated at 95,000 square feet which converts to the electrical service providing approximately 6.1 watts per square foot, if future plans for the facility includes providing a new centralized air conditioning system, then the existing electrical service will be undersized and will require an upgrade.

Distribution

1. The existing distribution system consist of multiple surface and recessed local panelboards located throughout the facility's main corridors and closets. The existing panelboards are rated at 208Y/120Volts, 3-Phase, 4-Wire and support the lighting and receptacle outlets for classrooms and office within the corridor the panelboards are located.
2. The existing panel boards appeared to be in poor condition and since the installation of some of the panelboards do not meet the recent codes and are almost inaccessible, all of the panelboards should be replaced with new 208Y/120V 3-Phase 4-wire panel boards


Generator

1. The facility is equipment with an emergency generator which feeds a 100amp panelboard, the emergency panelboards supports the egress emergency lighting and exit signs. The generator and emergency panelboard is located within the basement of building "A" the generator system is rated at 15Kw/18Kva, 208Y/120Volt, 3-Phase, 4-Wire.
2. At the time of the site visit no information was made available pertaining to the date or installation of the existing generator. The installation of the generator and existing emergency panelboard do need not meet the proper working clearance and produces a risk to personnel servicing the generator and/or panelboard located on the wall adjacent to the generator. The NEC2011 code requires a minimum working clearance of 36" between equipment, the existing installation has 24" clearance between the existing generator and panelboard.
3. Since the installation of the existing generator and panelboard do not meet code plus the generator appears to be undersized for the new emergency system, it is recommended that the existing generator system be replaced with a new larger generator to support the entire facility's emergency lighting requirements. An alternate emergency system can be installed if a new generator system is cost prohibited, new light fixtures with integral emergency batteries can be installed in lieu of a new generator system.

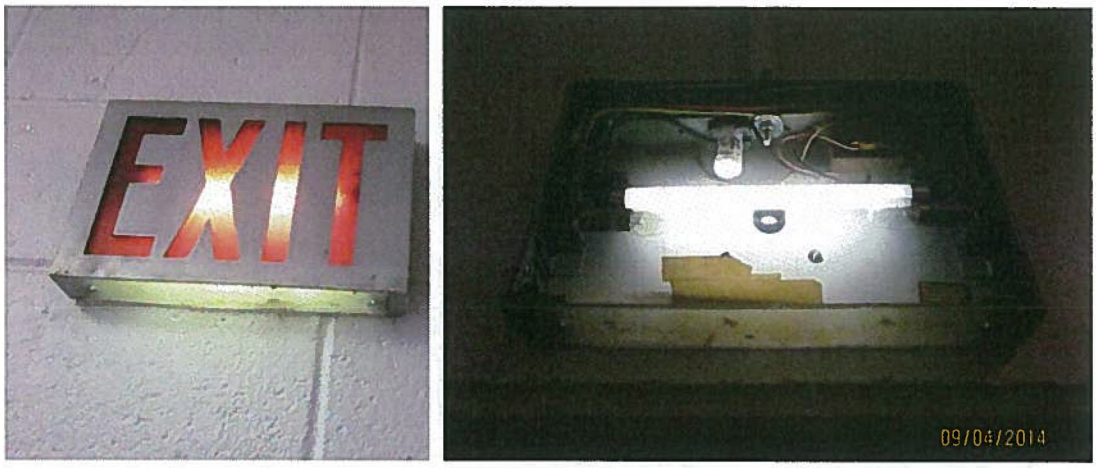

Lighting

1. The lighting within the basement consists of a mixture of incandescent and utility fluorescent strips. The 1st and 2nd floor's light fixtures consist of recessed and surface mounted fluorescent light fixtures, the light fixtures within the classrooms and corridor appeared to be older T12 type fluorescent light fixtures which have been retrofitted with T8 lamps and electronic ballast, the gym area is equipped with round pendant mount high-bay HID light fixtures. Depending on the projected use of the facility significant lighting upgrades will be required. The retrofit of the existing T12 fixtures is beneficial however, all of the light fixtures are well past their expected life span and it is recommended that new energy efficient light fixtures be installed.



2. The light switches throughout the facility consist older twist turn type, toggle switch and key type switches, the facility had very minimal occupancy sensors installed. All of the light controls will need to be evaluated for compliance with current energy codes for whatever the projected new use of the building will be. Implementation of occupancy sensors and lighting reduction controls will be required at a minimum and daylight harvesting is recommended to dim the light fixtures closest to the windows.

3. The exit signs are incandescent type with a separate integral emergency luminaire connected to the generator circuit. At the time of the site visit there were numerous exit sign which were not operational and had blown bulbs, other exit signs were flashing and had faceplate covers missing. All of the existing exit signs do not meet current energy codes and are past their expected life span and will need to be replaced with new LED type with integral emergency battery pack.



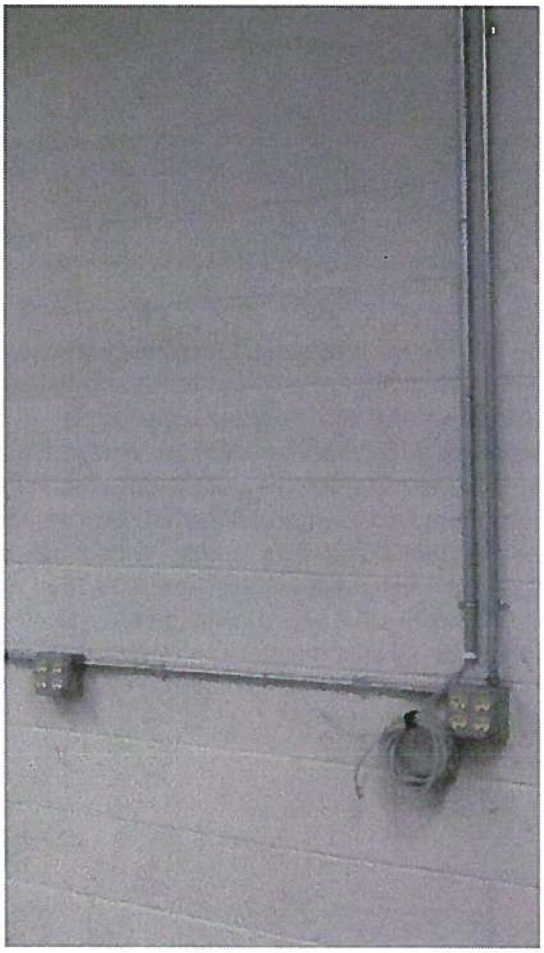
4. The emergency lighting consist of dedicated wall and ceiling mounted light fixtures, the light fixtures are not illuminated until the loss of power, once the generator senses the loss of power the emergency light fixtures will illuminate. There are no test switches for any of the emergency lights which requires a manual test of the generator and transfer switch to verify operation of the fixtures designated as emergency. The emergency light fixtures are installed within the ceiling and corridor walls between 35'-0" to 50'-0" on center, all of the existing emergency light fixtures appeared to be installed beyond the allowed coverage and some are passed their expected life span. In order to meet current life safety codes the existing emergency lighting system in its entirety must be replaced with a new emergency lighting system, either via integral

emergency batteries within new light fixtures or new light fixtures connected to a new emergency generator distribution system.

5. The egress door to the exterior did not have a code required 2 lamp emergency light fixture on the exterior above the door illuminating the exterior of the egress path, new energy efficient emergency light fixtures with integral photocell should be installed and interconnected with new time clock.

Devices

1. The existing receptacles within the facility consist of multiple manufacturer and most were recessed within the wall with some additional receptacles surface mounted, some classrooms and labs had surface mounted raceway and power poles throughout. Most of the receptacles were of the 3 prong ground type and appeared in good working order, however some outlet locations had broken cover plates, did not have GFI protection where required by code and some devices were painted over. Although the devices appeared in fair condition; due to the age of the devices and the probability of damage or breakage during rewiring for future needs we recommend any retrofit include new devices wired from new panelboards.



2. The existing Main telecommunication system is located within one of the mechanical rooms on level 1 of building "A" adjacent to the administration area. It appears that a makeshift closet was created around the telephone equipment utilizing the HVAC equipment and a door. The receptacle outlets for the telephone equipment are located outside of the said closet and power cords are run through the door jambs. The Tel/Com and speaker/clock system appeared to be mostly removed with occasional left over remnants of the system throughout the classrooms. The telephone and data outlets within the classrooms was very minimal and data racks appeared abandoned within some of the classrooms. It is recommend that the entire telecommunication system should be removed and replaced with new upgraded infrastructure within a designated telephone room to meet today's telecommunication needs.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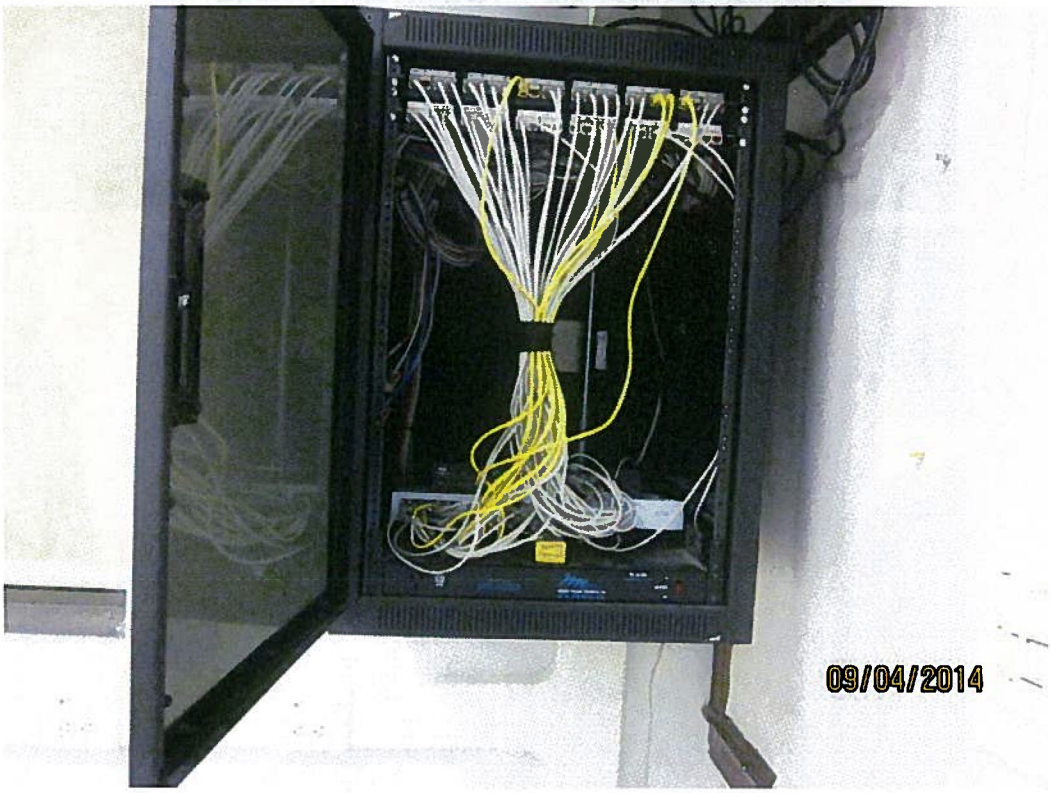


Fire Alarm System

1. The existing fire alarm system consist of a 20 zone Silent Knight fire alarm control panel "FACP" located within the main office area of level 1. At the time of the site visit the fire alarm system was in the trouble mode and was continuously beeping.
2. The fire alarm devices consist of a mixture of manufacturers and the installation of most of the horn/strobe do not meet proper required coverage, also none of the strobe meet the ADA

requirements. None of the single stall toilet rooms were equipped with fire alarm strobes nor had a call for aid pull cord.

3. The majority of the classrooms did not have fire alarm notification devices and smoke detector coverage was at a minimal. Due to the quantity and types of additional devices required to address code compliance it is recommended that the entire fire alarm system including FACP, notification devices and annunciation devices be replaced with a new digital addressable fire alarm system.

Mechanical System

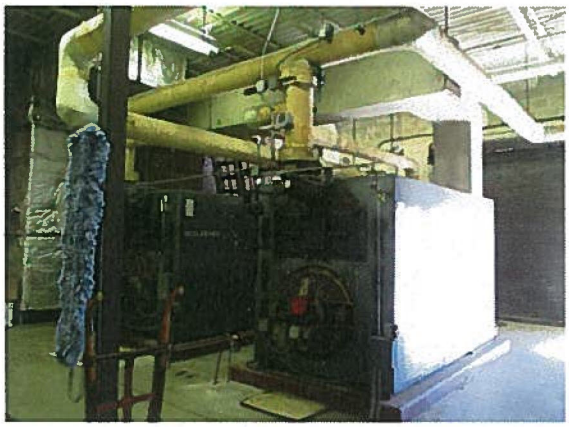
Applicable Codes and Standards:

The Mechanical system was reviewed for conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

- 2005 Connecticut State Building Code with 2009 supplements.
- 2005 Connecticut State Fire Safety Code with 2009 supplements.
- 2003 International Building Code (IBC)
- 2003 International Mechanical Code (MIC)
- 2009 International Energy Conservation Code (IECC)
- 2003 International Existing Building Code
- NFPA, All Latest Adopted Versions
- ASHRAE 90.1

Heating System

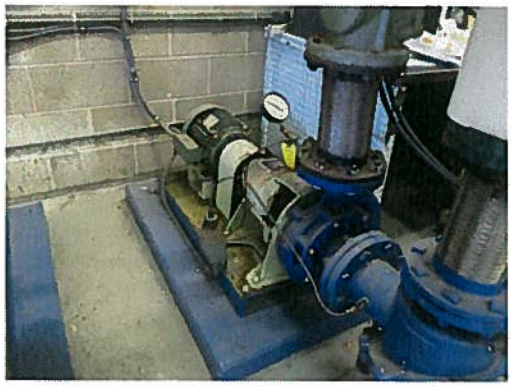
5. The existing building's heating system is served by oil fired (2) boilers, "Weil McLain," Model AH-1994-W-F, 4,060 MBH of heating capacity, located in the Basement (Part A). The two boilers are piped such that domestic water heater could provide hot water to the building. The heating boilers currently modulate as required to maintain a constant discharge water temperature. The heating boilers are working and in fair condition, but approaching the end of their useful life.



6. The heating circulation piping system is composed of steel and copper piping. The piping system served fin tube radiation in Classrooms, Offices, Exam room, Shops (Part A, Part B, Part C, Part D) as well as unit ventilators located in wood shop, metal shop, AHUs, serving Auditorium, Front Offices, Library, Music room, Gymnasium, Cafeteria and CUH, located on second floor (Part B).


7. The distribution piping system apppears to be in good condition however when the building is renovated significant modications to the piping will be required.

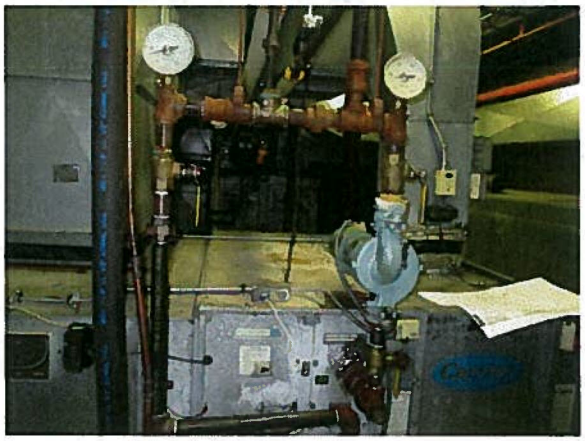
The heating water is circulated throughout the building by two (2) primary and two (2) secondary base-mounted pumps. The pumps are in good condition, however, when the building is renovated, replacement of the pumps will be required.




The abandoned boilers and condensate pump located in basement (Part A and Part D) should be removed.

Air Conditioning System

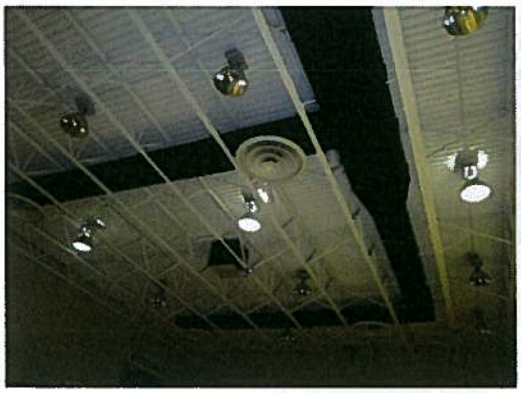
1. The AHUs serving the Front Offices, Auditorium, Library, Music room, Gymnasium and Cafeteria are not in good condition and are approaching the end of their useful life.



2. Window AC units are serving some offices and classrooms throughout the building.


3. The existing air distribution systems to the auditorium and gymnasium are in good condition.





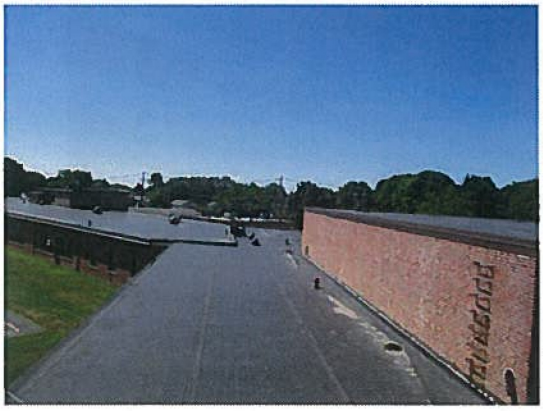

4. The existing AC and CU serving computer room are in good condition.


5. The existing dust collector and exhaust ducts, located in the wood shop, are in bad condition and approaching the end of their useful life.


6. All existing systems are controlled by "Alerton" DDC. The system appears to be in good condition and viable for reuse for future renovations.

Exhaust System

1. The exhaust distribution ductwork from spaces and corridors and exhaust fans, located on roof throughout the bulding, are in fair condition and approaching the end of their useful life and will need replacement.




Recommendations

Heating System:

1. Remove the (2) existing boilers, accessories and provide new (2) high efficiency hot water boilers. Size of new boilers to be determined based on the renovation work, building heating load and ventilation air requirements for news systems.
2. The existing fin tube radiation should be reused to provide heat to new spaces. The piping connections should be reused and modified, if required.
3. The main portion of existing heating water piping can be reused.
4. The capacity of existing heating pumps should be evaluated and replace, if required.

Air Conditioning System:

1. Remove the existing AHU, serving Front Offices, Auditorium, Library, Music Room, Gymnasium and Cafeteria and provide new AHU's with outside air capacity to meet MIC2003 requirements.
2. The Change of Use renovation spaces will require new AHU with hot water coils and outside air connections.
3. All window AC units should be removed.
4. The existing air distribution systems (Auditorium and Gymnasium) will be reused.
5. Remove the existing dust collector and associated ductwork.

Exhaust system:

1. Remove the existing exhaust ductwork, located in Corridors and roof mounted fans.
2. Provide new exhaust system and roof mounted fans, serving new spaces.

End