

HAMPDEN-WILBRAHAM REGIONAL SCHOOL DISTRICT
EXISTING CONDITIONS and FEASIBILITY STUDY
THORNTON W. BURGESS and WILBRAHAM MIDDLE SCHOOL

THORNTON W. BURGESS MIDDLE SCHOOL



SITE EVALUATION

Site Access, Parking and Fields

Existing Conditions

The existing building site is located on the west side of Wilbraham Road approximately one-half (1/2) mile north of the Town Center, and contains approximately 23 acres of mostly developed land, with an open gentle slope down from the road to the building and athletic fields beyond. The site is bounded on the west by heavily wooded land, to the north by property of the Hampden Country Club, and to the south by residential development. Wilbraham Road in Hampden is a light to moderately traveled two-way, twenty-four foot wide public road with safety signage for the school entry drive, and the sole north/south route Hampden-Wilbraham Regional School District Middle School Study ~ 2 September 2015

JLS Architects
7 Rice Drive
Wilbraham, MA 01095

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extending directly from the center of Hampden to the center of Wilbraham. The existing Middle School access drive is a lighted, two-way, twenty-four foot wide, 200 foot long asphalt drive for the exclusive use of school traffic during school hours. It is located directly across from the recently improved entrance to Hampden Country Club, and provides vehicular access to the buildings' main entrance and two asphalt parking areas for approximately 180 vehicles located in front and on the south side of the building, with a combination of vertical granite and asphalt curbing. There are no pedestrian sidewalks located on Wilbraham Road or along the existing access drive.



Deficiencies

The existing Middle School access drive and parking areas are original to the site and are in very poor condition, with significant areas of deteriorated, damaged and/or missing asphalt paving and curbs. Athletic and play fields behind the building are in good condition with minimal evidence of deterioration.



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Recommendations

Renovation: If the status of TWB is maintained as a single middle school serving the Town of Hampden, the existing asphalt access drive, parking lot and curbing, are deteriorated beyond repair and should be removed and replaced in their entirety as budgets allow. Existing playfields require minimal repair except for normal wear and tear.

Consolidation: If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum replacements be undertaken immediately:

- Removal and replacement of all existing asphalt paved areas and curbing, traffic circulation and parking, including increased parking capacity to serve increased student and staff population.
- See Part B – Building Evaluation and Part C - Mechanical System Evaluations of this Report for detailed evaluation and recommendations for existing building architectural systems.

Water and Sanitary Utilities

Existing Conditions

The existing building is served by an on-site domestic water well and septic system.

Deficiencies

The existing domestic water well and septic system are original to the building. As such, their subsurface location makes definitive determination of their current overall condition subject to interpretation, and their long term viability extremely doubtful.

Recommendations

Renovation: If the status of TWB is maintained as a single middle school serving the Town of Hampden, the existing domestic water well and septic system should be subject to a complete and comprehensive Title V inspection as budgets allow, to establish a baseline condition for future improvements or replacement.

Consolidation: If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum replacements be undertaken immediately:

- A complete and comprehensive inspection of the existing water well to establish a baseline condition for future improvements or replacement.
- Removal and replacement of the existing underground sanitary sewage disposal system with increased area to serve the increased student and staff population.
- Given available square foot area of the site and current code requirements, it should be anticipated that replacement of the existing septic system, when combined with other building improvements described elsewhere in this Report will significantly decrease the area available for athletic and playing fields.
- See Mechanical System Evaluations of this Report for detailed evaluation and recommendations for existing architectural and mechanical systems, including the existing septic system that will significantly influence any decision regarding selection of TWB as the site for a consolidated middle school.

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Electrical Utility

Existing Conditions

The existing building is served by 3-phase overhead utility power located in Wilbraham Road.

Deficiencies

The existing electrical utility serving the building, including utility poles, disconnects, risers, underground utility power feeder, pad mounted transformer and building infrastructure are original to the building, and currently loaded to capacity.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, the existing electrical utility serving the building, including utility poles, disconnects, risers, underground utility power feeder, pad mounted transformer, and building infrastructure should be subject to system component upgrades as budgets allow, to safely serve the increased electrical and technology requirements of a modern middle school.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum replacements be undertaken immediately:

- Removal and replacement in their entirety of the existing electrical utilities, including new utility poles, disconnects, risers, underground utility power feeder, and pad mounted transformer and building infrastructure, to provide safe consistent power necessary to support future building, life safety, and technology requirements.
- See Mechanical System Evaluations of this Report for detailed evaluation and recommendations for existing architectural and mechanical systems, including the electrical utility system that will significantly influence any decision regarding selection of TWB as the site for a consolidated middle school.

Traffic Evaluation

Existing Conditions

As described above, the alignment of Wilbraham Road at the intersection of the school drive is straight in both the north and south directions allowing for safe sight distances of more than 300 feet. The existing access drive safely provides sufficient width, alignment, capacity, and turning radii for safe and efficient vehicular and pedestrian traffic for current levels of student buses and parent drop off as noted below, despite the noticeable lack of designated bus and parent parking lanes for the respective traffic. Existing emergency services, including Hampden Fire and Police Departments are located approximately 2 miles from the site at the intersection of Main and North Streets.

Arrival and Departure Traffic Counts

Note: The following evaluation of existing traffic conditions are based on site observations conducted during daily arrival and departure times

Date:	8 June 2015	9 June 2015
Time:	7:15 - 7:45	1:25 - 2:10
Vehicles:	Buses: 9	8 + 1
	Vans: 2	3
	Staff: 29	44
	Parents: 104	18

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Deficiencies

As detailed above during the 30-45 minute arrival and departure times at the existing site, nine (9) buses and an average of sixty-one (61) passenger vehicles visit the site daily.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, new vehicular traffic control markings, including designated bus and parent drop off/pick up lanes should be included in parking area upgrades recommended above, and as budgets allow.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting significant increase in student and staff population would require the following minimum replacements be undertaken immediately:

- Increased parking capacity to serve increased student and staff population, including separate designated bus and parent drop off/pick up lanes and staff and visitor parking areas, to maintain safe and secure traffic flow during critical arrival and departure times.
- See Building Evaluation and Mechanical System Evaluations of this Report for detailed evaluation and recommendations for existing architectural and mechanical systems, including the electrical utility system that will significantly influence any decision regarding selection of TWB as the site for a consolidated middle school.

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BUILDING EVALUATION

GENERAL DESCRIPTION

Thornton W. Burgess Middle School is a single story, steel framed structure with concrete block masonry infill and exterior brick veneer masonry constructed in 1967. The existing building encompasses an area of approximately 77,000 gross square feet. The building includes the centrally located Kitchen and Cafetorium, separated by a corridor, Gymnasium with associated locker and storage areas, Media Center, and miscellaneous educational and faculty work areas. Administration offices, Health Suite, General Classrooms, Music, Art, Science and Technology, Computer Labs, student toilets and Boiler Room are located around the exterior perimeter of the building. The existing building plan is moderately efficient, with two (2) central courtyards and double loaded corridors. The building is in overall good condition, with selected areas and materials showing some deterioration.

General Note: The following assessments of existing conditions are based upon visual inspection of exposed and readily accessible building systems and components. Comprehensive direct examination and confirmation of structural and mechanical systems is limited due to concealment by existing floor, wall, and ceiling construction.

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A. EXISTING CONDITIONS

1. BUILDING ENVELOPE

a. EXTERIOR WALLS

Existing Conditions

Exterior walls of the existing building are comprised of double wythe construction, with concrete block in-fill between structural steel framing with brick masonry walls above the concrete foundation water table. The existing masonry walls have no air cavity or insulation within the composite wythes of block and face brick, and the three (3) foot high exposed foundation walls are also constructed without insulation.



Deficiencies

Despite the inherently inefficient nature of the type of wall construction described above, the existing exterior masonry walls are in overall good condition. However, there exists a noteworthy lack of masonry control joints around the building perimeter which when combined with the lack of an internal wall cavity and internal flashing preventing entrapped moisture from being redirected to the exterior, several areas of spalling, cracking, and efflorescence on the exterior face are evident. Also, due to no wall insulation, during periods of cold outside temperatures the dew point is located at an undetermined point within the existing masonry, causing condensation to occur within the masonry wall. These are inherent systemic problems which will continue to occur and can result in long-term deterioration of the exterior masonry walls. In addition, though the thermal mass of the existing exterior walls acts to moderate outside air temperature extremes to a limited degree, the lack of exterior wall insulation does not comply with current building and energy code requirements.

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Recommendations

Renovation If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected areas of existing exterior masonry should be repaired or replaced to correct current ongoing and minimize future masonry deterioration as budgets allow.

Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting significant increase in student and staff population would require the following minimum replacements be undertaken immediately:

- All exterior walls be insulated at the interior face to maximize energy efficiency
- New masonry control joints be installed around the entire building perimeter in accordance with current accepted building standards.
- The existing masonry chimney be removed and replaced in its' entirety

2. WINDOW AND DOOR SYSTEMS

Existing Conditions

The main and secondary exterior entrances of the building are composed of the original hollow metal (steel) doors and frames. Exterior windows are the original fixed and awning type, single glazed non-thermally broken aluminum units with un-insulated aluminum infill panels and unit vent air intake louvers set within the original aluminum frames.



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Deficiencies

Exterior entrance doors are in overall fair condition with varying degrees of missing and/or damaged operating hardware. Exterior windows are in fair to poor condition with barely minimal insulating value, deteriorated weatherstripping and selected units with non-functioning operational and locking hardware. The large majority of existing exterior doors throughout the building are narrower than required to meet current handicapped code requirements.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected exterior doors could be removed and replaced in their entirety to provide new insulated hollow metal doors and operational hardware with increased energy efficiency, security and handicapped accessibility, as budgets allow.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum replacements be undertaken immediately:

- All exterior doors be removed and replaced in their entirety to provide new insulated hollow metal doors and operational hardware with maximized energy efficiency, security and handicapped accessibility
- New masonry control joints be installed around the entire building perimeter in accordance with current accepted building standards.
- The existing masonry chimney be removed and replaced in its' entirety

3. ROOF SYSTEM

Existing Conditions

The existing building utilizes two separate roof systems. Pitched to drain areas are covered with a single-ply, polyvinyl chloride (PVC) membrane, with copper counter and cap flashing at roof-to-wall and penetration locations, and aluminum fascia. Sloped roofs at the Cafetorium and Gymnasium are covered with single ply EPDM (rubber) membrane. Individual roof areas are drained via four (4) inch roof drains at selected locations.



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Deficiencies

Both existing roof membranes are in poor condition with numerous areas of deteriorated seams, ponding water at various locations, missing or poorly installed roof-to-wall flashing, and evidence of water saturated insulation below the membranes. While adequate, existing roof drain locations serve greater than the currently recommended roof area. Copper gutters are deteriorated and leaking and have reached the end of their expected life span



*Recommendations
Renovation or
Consolidation*

Given the age and overall condition of the existing roof and its related accessories, and regardless of the future status of TWB, either as a single middle school serving the Town of Hampden, or as a consolidated middle school serving the Towns of Hampden and Wilbraham, the following minimum building system replacement must be undertaken immediately:

- The entire existing roof systems be removed and replaced in its entirety, including replacement of concealed steel roof deck found to be damaged upon roof system removal and installation of additional roof drains with overflow capability in accordance with current plumbing code requirements to maximize energy efficiency, eliminate moisture penetration into the building and improve air quality by elimination of water saturated roof insulation.

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2. BUILDING INTERIOR

A. WALLS

Existing Conditions

Interior walls throughout the existing building, with the exception of more recently installed gypsum drywall demising partitions at selected locations, consist of the original painted concrete block, structural glazed tile, brick veneer and wood paneling.



Deficiencies

Interior walls throughout the existing building are in overall good condition, with selected areas of visible damage to concrete block and structural glazed tile due to differential expansion between structural glazed tile and concrete block back-up, and limited masonry crack control joints and expansion joints. Also, due to the age of the existing building masonry walls are not designed to meet current building code seismic requirements.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected areas of visible damage to concrete block and structural glazed tile could be repaired or replaced, as budgets allow.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum replacements be undertaken immediately:

- Removal and replacement of interior masonry wall as required to best serve educational program
- Reinforcement and bracing of all new and existing interior masonry walls as required to meet current building code seismic requirements
- Installation of new masonry control joint in accordance with current accepted building standards.

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B. CEILINGS

Existing Conditions

Exposed ceilings throughout the building consist of a variety of materials, including exposed painted structural steel, painted cement plaster, and suspended metal grid with lay-in acoustical ceiling tile at varying heights.



Deficiencies

Existing ceilings located throughout the building are in overall fair to good condition with selected individual areas exhibiting damaged or missing components due to mechanical or water damage or normal wear-and-tear.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected areas of visibly damaged ceiling tile and plaster could be repaired or replaced, as budgets allow.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population and the attendant required mechanical system upgrades and replacement described elsewhere in this Report, would require the following minimum replacements be undertaken immediately:

- Complete removal and replacement of all existing ceiling systems

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C. FLOORS

Existing Conditions

Existing floor finishes consist of a variety of materials, including wood flooring at the Cafetorium Stage, composite sheet athletic flooring at the Gymnasium, vinyl composition tile (VCT), vinyl asbestos tile (VAT), carpet, ceramic tile, quarry tile, and poured-in-place cement terrazzo.



Deficiencies

Existing floor finishes throughout the existing building are in fair to good condition, exhibiting varying degrees of deterioration beyond what could be considered normal wear and tear.

Recommendations

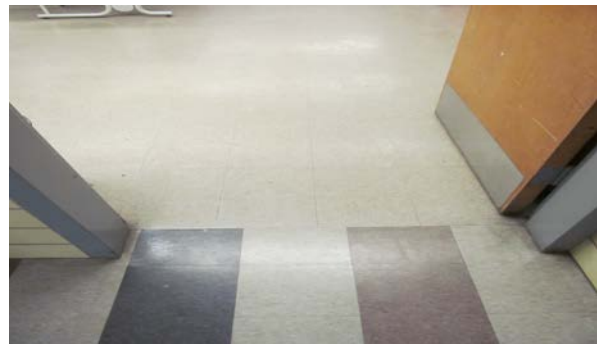
Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected areas of visibly damaged VAT and VCT flooring could be repaired or replaced, as budgets allow.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population and the attendant required building and mechanical system upgrades and replacements described elsewhere in this Report, would require the following minimum replacements be undertaken immediately:

- All existing floor finishes, either be protected-to-remain; or be removed and replaced in their entirety, or in the case of the poured-in-place terrazzo, protected-to-remain and refinished.



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D. DOORS

Existing Conditions

With limited exception, interior doors and operating hardware are original construction. Corridor doors are partially glazed with wire glass in all openings and sidelights where present. Interior doors at classrooms and offices are the original hollow metal (steel) frames with solid core wood doors with single glazed glass vision panels. Door hardware is a variety of original and replacement units, with no lever handles observed.



Deficiencies

All interior doors throughout the building are in fair to good condition, exhibiting varying degrees of functional and operational deficiencies, including damaged, missing, or obsolete hardware. The large majority of existing doors and selected door openings throughout the building are narrower than required to meet current handicapped code requirements.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected interior doors and operating hardware should be removed and replaced, as budgets allow, to better comply with current ADA, MAAB, and Building code requirements. .

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population and the attendant required architectural and mechanical building system upgrades and replacement described elsewhere in this Report, would require the following minimum replacements be undertaken immediately:

- Remove and replace all existing interior doors and operating hardware in their entirety, including selected wall removal, wall door openings relocated or enlarged with new frames, doors and hardware to comply with current ADA, MAAB, and Building code requirements.



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E. KITCHEN

Existing Conditions

Existing food service equipment is industry standard, stainless steel, electric and low pressure natural gas fired, and in overall good condition with no reported malfunctioning equipment. The Kitchen prepares and serves lunch during four (4) servings. See the Mechanical Section of this Report for detailed evaluation of the kitchen exhaust hood, and related mechanical, plumbing and electrical systems.



Deficiencies

The existing food service equipment is in overall excellent condition, well maintained, and subject to ongoing repairs and replacement. See the Mechanical Section of this Report for detailed evaluation of the kitchen exhaust hood, and related mechanical, plumbing, electrical and life safety systems. See the Mechanical Section of this Report for detailed evaluation of the kitchen exhaust hood, and related mechanical, plumbing, electrical and life safety systems.

Recommendations

Renovation

If the status of TWB is maintained as a single middle school serving the Town of Hampden, the existing food service equipment and accessories require continued periodic modernization and replacement on an as-needed basis, or as budgets allow.

Consolidation

If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately:

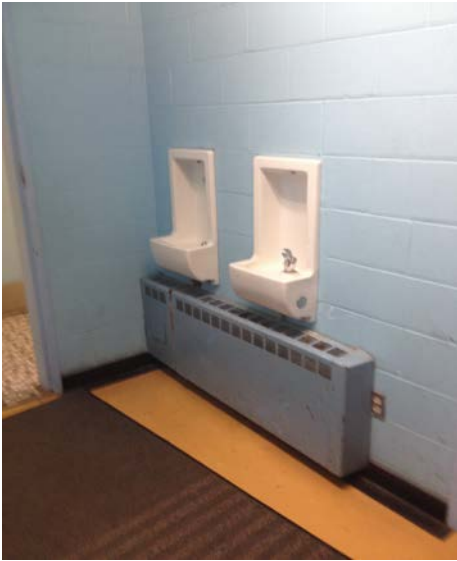
- Expansion of the existing kitchen, with requisite re-use of acceptable existing equipment
- Installation of new equipment to more efficiently prepare and serve larger population.

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F. HANDICAPPED ACCESSIBILITY

Existing Conditions

The existing building as originally designed and constructed, with limited exceptions described below, fails to comply with current ADA, MAAB, and Building Code accessibility requirements. See the Mechanical Section of this Report for detailed evaluation of related mechanical, plumbing, electrical and life safety systems.



Deficiencies

With the exception of one (1) pair of main entry doors and selected toilet rooms, there are numerous locations throughout the building that restrict handicapped accessibility, including all exterior and interior doors and hardware, Cafetorium Stage, drinking fountains, areaways, and toilet rooms that fail to comply with current ADA, MAAB, and Building Code requirements. See the Mechanical Section of this Report for detailed evaluation of related mechanical, plumbing, electrical and life safety systems.

Recommendations

Renovation If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected accessibility improvements could be implemented on a regular periodic basis as budgets allow.

Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately: the existing building would be required to be fully renovated to address

- Complete removal and replacement of all existing deficiencies as required to comply with current ADA, MAAB, and Building Code accessibility requirements; including
 - Wall and door removal and replacement or relocation
 - Plumbing fixture relocation or replacement
 - Vertical circulation (ramp or chairlift at Cafetorium Stage)

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G. MISCELLANEOUS EQUIPMENT

Existing Conditions

Though not easily categorized and not included in the evaluation of existing systems above, the building components listed below are original to the building and no less necessary as the 'bricks and mortar' described above for the effective operation of an efficient, modern and educationally sound middle school.

- Gymnasium equipment (not including recently installed bleachers and scoring system)
- Technology infrastructure
- Toilet room privacy partitions
- Student lockers



Deficiencies

While generally useable, existing miscellaneous equipment throughout the building is in fair to poor condition, exhibiting varying degrees of deterioration beyond what could be considered normal wear and tear; with selected locations failing to comply with current ADA, MAAB and Building Code requirements. Ironically, while the technology system serves the school well, the existing electrical system is at if not over, its original design capacity. See the Mechanical Section of this Report for detailed evaluation of related mechanical, plumbing, electrical and life safety systems.

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Recommendations

Renovation If the status of TWB is maintained as a single middle school serving the Town of Hampden, selected improvements to miscellaneous equipment could be implemented on a regular periodic basis as budgets allow.

Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately to ensure effective operation of an efficient, modern and educationally sound middle school:

- Complete removal and replacement of all existing miscellaneous equipment as an integral component of the complete renovation/addition described elsewhere in this Report, and required to increase the student and staff population nearly three-fold as part of any middle school consolidation
 - Replace student lockers
 - Add new student lockers
 - Add new student toilets
 - Add new staff toilets
 - New Gymnasium equipment
 - New locker rooms
 - Replace electrical system
 - Replace wood casework and millwork
 - Etc., etc., etc.

MECHANICAL/ELECTRICAL SYSTEMS EVALUATION

FIRE PROTECTION

Existing Conditions:

- The building is not currently served by an automatic sprinkler system.
- The existing kitchen hood is not fitted with a chemical extinguishing system.

Recommendations:

Renovation The current Massachusetts State Building Code requires all buildings of Use Group E – Educations, to be equipped throughout with an automatic sprinkler. The National Fire Code requires all commercial cooking hoods to be protected by a chemical extinguishing system. This existing building does not meet current code requirements. Under Chapter 34 of the current Massachusetts State Building Code, existing buildings in Use "E" are not required to be retrofitted unless they are substantially renovated or undergo a change in use.

Unless the building is substantially renovated, the current codes do not require the building to be retrofitted with automatic sprinklers and/or stand pipes; however, because of the proven life saving benefits of these systems, this office would recommend retrofitting the entire building in the near future regardless of renovation plans.

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Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately to ensure effective operation of an efficient, modern and educationally sound middle school:

- A new 20,000 gallon water storage tank would have to be installed to store the needed water for an automatic sprinkler system to serve the new 40,000 square foot modular building. A makeup water line would have to be extended from the well to the water storage tank and would have to be refilled with tank fill controls. A new fire protection building or chamber would have to be constructed to house the required pressure tank compressor, alarm valve and controls. The new modular buildings would have to be filled with automatic sprinklers, and a new 4" underground sprinkler feed line extended from the new sprinkler storage/pressure tank to the modular buildings.

PLUMBING

Existing Conditions:

The existing plumbing systems currently serving this facility are 40-50 years old and are at the limit of their useful life. The building is currently served by a 1 1/2" well water supply line connected to a 7,500 gallon water storage tank located in the boiler room. The water service is equipped with a 1 1/2" water meter and a 1 1/2" main feed to the building.

The sewage disposal is a gravity type system which is connected to an on-site septic tank and leach field. The majority of the water piping is copper and most sanitary, waste, vent, and drain piping is cast iron and/or copper. The insulation on the water piping appears to be original and may be asbestos containing.

With the exception of few fixtures installed as part of a handicapped upgrade, the remaining fixtures in the building do not meet current ADA or water conservation regulations. The existing fixtures are china and/or enameled cast iron and were installed as part of the original construction.

Urinals are wall hung, flush valve, lavatories are wall hung vitreous china with two handle type faucets, and drinking fountains are wall mounted type. Janitor sinks are floor mounted and toilets are a combination of wall and floor mounted. Each classroom is fitted with a single bowl, stainless steel work sink and separate stainless steel drinking fountain.

The building's domestic hot water is provided by (2) A.O. Smith "Master fit" model BTR-3664 gas-fired water heaters installed in 2010. There is a 200 gallon indirect fired hot water generator that was installed as part the original construction that is now being used for storage only. There are two existing mixing valves in the Mechanical Room in the domestic hot water system.

There is 4" gas service entering the building in the Boiler Room with the gas meter located outside of the Mechanical Room. This gas main serves the boilers and hot water heaters, generator and kitchen. There are two grease traps located in the kitchen area with the top flush with the floor and connected to the dishwasher and (3) three bay sinks.

Storm drainage for the building consists of cast iron roof drains and cast iron piping. The storm drainage piping for the most part was concealed in walls and above ceilings.

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Deficiencies:

- In general, the Plumbing fixtures are original to the construction of 1966. The systems are well maintained and serviceable. However, due to their age they have exceeded their useful life.
- The fixtures do not meet current accessibility and water conservation standards.
- Drainage piping appears to be in good condition and main runs of piping where adequately sized could be reused in a major renovation.
- The water piping system due to its age contains lead based solder and should be totally replaced during a major renovation.
- In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require these fixtures be upgraded, but, where new fixtures are installed, as may be required by other codes or concerns, then the new fixtures need to be water conserving types of fixtures.
- The question of accessibility is somewhat more complex. The impact on the Plumbing is fairly simple but can be rather expensive.
- The Mass. Architectural Access Board Regulations are found at 521 CMR and as relates to Plumbing, provide as follows:
 - The level of Plumbing Compliance is determined by the value of total work being performed.
 - If the total work is less than \$100,000.00 and if this work were to include any Plumbing, then the Plumbing Work would need to comply.
 - If the total work is less than \$100,000 and less than 30% of the full and fair cash value of the building, then an accessible toilet and drinking fountain must be part of the work.
 - If the cost of the work exceeds 30%, then all of the existing and new Plumbing Facilities need to be accessible.

The existing kitchen grease waste system should be upgraded to meet current Massachusetts Plumbing Code and Title V. The domestic hot water mixing valves are in poor condition and must be replaced.

Recommendations

Renovations Due to the age and condition of the existing plumbing systems currently serving this building, it is recommended that as part of any major renovation process the plumbing system should be replaced in their entirety.

Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately to ensure effective operation of an efficient, modern and educationally sound middle school:

- A new domestic water storage tank will have to be installed to provide the additional water needed for the increase in occupancy
- The existing septic tank and leach field will have to be expanded to serve the increase in population
- The existing plumbing systems in the entire building will have to be renovated to meet the increase in occupancy of the building. Additional bathrooms will have to be added and existing kitchen plumbing expanded

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MECHANICAL

Existing Conditions:

The HVAC systems currently serving the Thornton Burgess Middle School were primarily installed as part of the original construction and are approximately 48 years old. The only notable system upgrades is the installation of the new Viessmann gas boiler. The building systems are described as follows:

Heat for the building is provided by two hot water boilers. One original Frank Prox boiler with a ray dual fuel burner rated for 3.8 million BTUH and one Viessmann boiler with a Weishaupt burner rated for 3.3 million BTUH installed in 2005. Each boiler operates. The collective boiler plant capacity provides approximately 66 BTU per square foot of building area. Oil for the boilers is stored in (2) 275 gallon above ground storage tanks.

- Heating Medium: Each boiler generates hot water and is distributed by three main circulation pumps and an over-head two pipe distribution system circulates throughout the buildings. All piping is schedule 40 black steel and appears to be insulated with asbestos. All piping is original to the building and approximately 40-50 years old; many sections of the boiler feed water piping has recently been replaced and sections of piping at several coils have recently been replaced. This indication is suggesting that the piping is reaching its maximum serviceable life due to perforation of the inner wall of the pipe causing the failure.
- Combustion Air: Combustion air is provided to the boiler room through a single wall mounted louver was installed as part of the 2005 boiler replacement. The louver is fitted with a motor operated dampers and the present condition is not code compliant.
- Breeching: Breeching from the original boiler is through a welded black steel ducting system which communicates overhead and terminates in a masonry chimney. We could not verify if a flue liner is installed, however, we did determine that the chimney is of adequate capacity and height for the combustion gases served. The breeching system was installed with a barometric damper and appears to operate satisfactorily. The cleanout doors in the breeching do indicate excessive surface contamination, and considering the age of the entire system, has reached its maximum serviceable life.
- Automatic Temperature Controls: With the exception of the boiler room controls, automatic temperature controls are of the pneumatic design and are provided with one individual air storage tanks each of which has a single air compressor and motor. This tank is undersized for the overall capacity of the automatic temperature control system. The system was not provided with an automatic temperature control board or a refrigerated air dryer. The entire system is extremely antiquated and more than likely is infiltrated with water and oil due to the lack of filtration and the entire system is in need of replacement.
- Kitchen Heating: Heating of the entire kitchen area is through an individual ceiling suspended horizontal unit heater which ties into the hot water distribution system. The bottom of the unit heater is hanging into the occupied area and does present a hazard to the occupants. The heaters are in excess of 50 years old, and although it does operate, it has reached its maximum serviceable life and is in need of replacement.
- Kitchen Cooking Exhaust Hood: The kitchen area is provided with a single wall island type exhaust hood located over the centrally located cooking area. The hood is provided with removable cartridge filters and two incandescent lights. The hood is not protected by a chemical extinguishing system as required by code. The hood is provided with lighting control. The exhaust hood is controlled by a

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manual switch which starts a roof mounted exhaust fan. Makeup air for the exhaust system is through operable doors located in the wall between the cafeteria and the kitchen. The kitchen hood is of the proper size and mounting height for the cooking area served and does operate. The exhaust fan was originally installed in 1968 and has exceeded its maximum serviceable life. There was no makeup air provided mechanically for the exhaust hood and it could not be determined if proper air flows are being achieved in the exhaust system. The interior sections of the hood were also noted to have excessive surface soiling and rusting on various components. The entire installation was noted to be poor and generally in need of replacement.

- Cafetorium: The Cafetorium area is served by a central station air handling unit located in a mezzanine mechanical room located above the entrance lobby. This unit is fitted with a fresh air intake and return duct, hot water heating coil with valve control, filters, supply fan, and return air. We could not determine if the outside ventilation dampers in this unit are operating correctly, however, considering their age and general state of disrepair, it does not appear that code required ventilation is adequately provided to the space. The entire volume of the air originally designed for the space as well as outside air is not adequate to achieve the space ventilation requirement. Located on opposite interior walls, adjacent to the stage, is a wall exhaust register which communicates to a roof mounted exhaust. This system is designed to provide code minimum ventilation air and should only operate when the exhaust hoods are not operating, however, we could not confirm if this operational sequence is in place. Located along the exterior wall of the cafetorium was finned tube radiation which was controlled by pneumatic control valve.
- Locker Rooms: The locker rooms are each served by dedicated air handling units located in the mezzanine space above the locker rooms. Each unit is fitted with a hot water coil, fresh air and return air dampers and filter section. Dedicated exhaust fans with ducted air distribution is also serving each room. These systems are original to construction and in poor condition.
- Gymnasium: The gymnasium is served by a central station air handling unit similar to the cafeteria unit. Due to the close proximity of the supply and return registers, a percentage of the total ventilation air provided to the space is ineffective. This unit was noted to be in poor condition and, generally, considering the age, have reached their maximum serviceable life. Each air handling system was provided with a roof mounted exhaust fan which draws exhaust air to the opposite corner of the gymnasium low at the floor and discharges through a roof mounted exhaust fan to maintain minimum code required ventilation air. This exhaust fan does not appear to operate, however, considering their age, have reached its maximum serviceable life.
- Classrooms: Each classroom is similar and is provided with wall mounted vertical discharge classroom unit ventilators located along the exterior wall. Each unit ventilator is provided with the intake louver for fresh air, hot water heating coil with valve control, filters and supply fan. All existing unit ventilators were installed as part of the original construction and were noted to be in poor condition. We could not determine if the outside ventilation dampers in each unit ventilator are operating correctly, however, considering their age and general state of disrepair, it does not appear that code required ventilation is adequately provided to the space. The entire volume of the air originally designed for the space as well as outside air does appear adequate to achieve the space ventilation requirements. Located on the same exterior walls are unit exhausters. It does appear that for the most part, the exhaust fans are running, however, could not determine if code required amounts of ventilation air are actually being exhausted. The systems appear adequate in overall design, however, are extremely antiquated and generally in need of replacement.

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- Administration Area: The administration area is heated by a series of hot water fin tube radiation located along the exterior wall which is controlled by individual wall mounted thermostats. All radiation ties into the central hot water distribution system and was installed during the original 1968 construction. All radiation was noted to have slight surface soiling and a slight damage, however, does operate and maintain adequate space temperature control. There was no mechanical ventilation systems installed and it appears that all ventilation was intended to be through the use of operable windows. Although this condition does meet minimum code requirements for the exterior spaces, there were internal areas that are not provided with adequate ventilation. This condition is not code compliant and should be improved upon. Throughout the entire administration area window mounted air-conditioning units are installed. These units are sized adequately for the spaces that they serve, however, are noisy when they operate.
- Communicating Corridors: The communicating corridors which circulate throughout the entire building were provided with a limited amount of exhaust air. This entire condition is considered not code compliant and should be improved upon. The corridors were provided with a limited amount of convection heat of which is controlled by wall-mounted pneumatic thermostats. All convectors were noted to have slight surface soiling and slight damage and do appear adequate in maintaining reasonable space temperature control. Based purely on age, the entire system should be upgraded.
- Entrances & Vestibules: The main entrance vestibule located adjacent to the administration area was not provided with any heat. This condition will allow for the infiltration of cold air during frequent use of the area. The entrance lobby was provided with a single cabinet heater of which is undersized for the area served particularly during frequent use of the exterior doors. This condition should be improved upon.
- Public Toilet Areas: The common public toilet areas are provided with a series of wall mounted exhaust registers located generally adjacent to the plumbing fixtures. All wall exhaust registers were noted to be extremely antiquated; many of which were damaged. We did note that there was no makeup air provided for the exhaust systems. The exhaust registers communicate to roof mounted exhaust fans through a galvanized sheet metal exhaust system, all of which is original to the building and in excess of 40 years old. Heating of the spaces is through various wall mounted convectors which tie into the low-pressure steam distribution system which are controlled by wall mounted thermostats. All heaters were noted to be antiquated, had slight surface soiling, however, do operate and maintain reasonable space temperature control.

Deficiencies:

In general, with the exception of the boilers, the existing HVAC systems currently serving this building are over 45 years old and must be replaced. All of the unit ventilators and air handling units are original equipment and have exceeded their life expectancy.

Other than the boiler and associated circulating pumps and controls, which are replacements of the original units, all of the remaining boiler room equipment is original and in poor condition. Approximately 60% of the piping insulation within the boiler room is missing or damaged. The combustion air dampers appear to be undersized based on the firing rate of the boilers. Additionally, the gas-fired water heater does not have a dedicated combustion air system.

All of the existing heating hot water piping is original and in poor condition. There are numerous locations throughout the building where the piping insulation is missing or damaged. The entire piping system should be replaced at the time of building renovation.

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All of the building's toilet and general exhaust systems are original and in fair condition. It is assumed that the systems are not operating at design capacity.

There are numerous code violations at the kitchen grease exhaust hood/system, including a lack of the required fire suppression system, lack of manual pull stations, hood does not cover all of the grease producing cooking equipment and there is no make-up air during hood operation. Based on the current cooking equipment layout the existing hood should be replaced with a larger hood that is equipped with the appropriate fire suppression and make-up air systems.

The window air conditioning units are typical residential type with unit mounted controls. Units that were visible for inspection were in good condition. The computer room ductless split system air conditioning unit was also in good condition.

Temperature control systems are original to the building and have failed with age. The system is not capable of meeting the demands of current energy codes or modern HVAC systems and equipment.

Recommendations:

Renovations Due to the age and deteriorating condition of the existing HVAC systems this office recommends a complete replacement of all systems and equipment with the exception of the boilers as part of any planned renovation project. Since one of the boilers is in good condition it could possibly be re-used if the building were to be renovated.

Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately to ensure effective operation of an efficient, modern and educationally sound middle school:

- Due to the age and condition, the existing HVAC systems in the entire building would have to be replaced and/or renovated to support the additional classrooms, auditorium and support the increase occupancy in the building.
- The new modular building would require a new dedicated gas service. The existing gas service is not large enough to support the new load.

ELECTRICAL AND TECHNOLOGY

Existing Conditions:

Power Distribution:

The existing main service disconnect switch is a 1600A circuit breaker with current transformer cabinet for utility metering for a 208/120V, 3 phase, 4 wire service. The main electric service is located in a garage which also houses the telephone service demarcation, the fire alarm control panel and the buildings central data rack. The main electric service distribution serves panel boards located in the garage, in corridors, in the kitchen, in the cafeteria and by the main office. The main service equipment and feeders appear to be original to the building. Being in operation for fifty years, the panel boards and associated feeders are at the end of their useful and dependable life. The original panel boards and associated circuit breakers are no longer available and are not supported by the manufacturer. The existing service and distribution is still in working order and appears to have sufficient capacity for the existing facility but may be inadequate for moderate expansion or load increase. The location of the existing main service distribution and panel boards are inaccessible due to the storage practices at

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the facility. The distribution equipment requires a minimum of 3 feet of unobstructed clearance and shall be readily accessible.

A gas fired 75kw emergency generator is located in a dedicated room off the boiler room accessible from outside the building. The generator is over 45 years old and in poor to fair condition. As originally designed, the generator is connected to emergency and stand by power feeds and no longer meets current life safety codes.

Lighting:

The lighting systems throughout the school are primarily T8 fluorescent lamps in either open louver pendant fixtures or surface wraparound lensed fixtures in the corridors, office and classrooms. The gymnasium and cafetorium, being high ceiling rooms, utilize metal halide light fixtures which appear to be newer and in good condition. The classroom toilet rooms and utility spaces utilize incandescent lamps. The main entrance has exterior incandescent light fixtures. The remaining exits do not have exterior light fixtures.

The lighting control in classrooms and offices have been modified since the original construction to provide occupancy sensor control of the room lights.

The dimmer control of the stage lights in the cafetorium appears to be original to the building and is at the end of its useful life.

Emergency Lighting:

Emergency lighting consists of dedicated light fixtures connected to the emergency generator. Many of the systems appear to be original to the building. Emergency lighting was observed in the corridors and the large spaces such as the gymnasium and cafetorium. The quantity and locations of emergency lights appear to be inadequate to provide the minimum 1 foot candle light levels required by code. The exterior side of the egress doors do not have emergency lighting as required by current code.

Fire Alarm:

The fire alarm system is not original to the building. The fire alarm system consists of manual pull stations located at the corridor egress doors and egress doors from the gymnasium and cafetorium, smoke detectors, horn and/or strobe units in most occupiable spaces, heat detectors in high heat spaces such as the boiler room, an annunciator in the main front entrance vestibule and control panel in the garage. The fire alarm system is a Gamewell system.

Although the fire alarm system is fairly new, the spacing and locations of strobes do not meet current code. The exit doors to the exterior in the classrooms do not have manual pull stations at the doors even though there are signs that read fire exit.

The kitchen hood does not have a fire suppression system that is monitored by the fire alarms system.

Special Systems:

The security system control panel is located in the garage. The security system has card key access at the building entrance with surveillance cameras.

Each classroom has a cable television outlet located above the classroom telephone.

The clock system is not original to the building. The original clock system was retrofitted with a newer clock system by Simplex Time and Signal Corporation. The new control panel was secured to the existing system.

The sound system is by Bogen. The age of the system is indeterminate based on visual inspection. The speakers are surface mounted at the corner between the wall and ceiling and display the Bogen manufacturer brand label.

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Technology:

The telephone system service entrance is located in the garage with 110 punch down blocks. The incoming phone lines run from the garage to the main office for the PBX and intercom systems.

Telephones are all mounted in each classroom adjacent to the door.

The data rack is located in the garage with horizontal distribution to each classroom, office and similar space. Each classroom has three data back box locations with two data jacks per back box.

The school staff indicated that the system does not function properly during heavy rains. One of the three outside lines rings without calls being received. One of the other lines has sound clarity issues including a static related sound.

Recommendations

Renovation Recommendations for the Electrical systems are based on code compliance and the age and condition of the systems.

Replace main service distribution, panelboards, dimmer panel and associated feeders.

Replace existing fluorescent light fixtures with energy efficient type containing T5 lamp technology and electronic ballasts of LED. The proposed light fixtures will result in a reduction of energy consumption by between 12% and 20%.

Replace existing incandescent light fixtures with fluorescent light fixtures. The proposed light fixtures will result in a reduction of energy consumption by approximately 80%.

The exit signs should be replaced with new battery back-up exit signs meeting current code for letter stencil dimensions and direction chevrons. The proposed exit signs should be LED type which would reduce the energy consumption of each exit sign by approximately 90%.

The original emergency light system utilizing battery units in the storage and utility rooms with recessed remote heads should be removed. The self-contained emergency lights should have the batteries replaced if they are more than two years old. Self-contained emergency lights with batteries that are no more than two years old should be tested and failed batteries should be replaced. Additional emergency lights should be added to ensure that any point along each egress path does not have less than 1 footcandle of illumination when normal power is lost.

Normal and emergency lighting should be provided at the exterior side of each required exit as required by current code. The need for additional receptacles should be reviewed with the school to ensure that current and future needs will be satisfied.

Add a fire suppression system to the kitchen hood and reconfigure the power to all equipment under the hood with shunt trip function to shut down power upon hood suppression system activation. Monitor the fire suppression system with the fire alarm system.

Relocate and add fire alarm horn/strobe units in the corridors to meet current code.

Add manual pull stations at each fire exit that does not currently have manual pull stations including the fire exits from the classrooms. Test incoming phone lines and replace lines that do not meet signal test requirements.

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Need and function of the clock system, security system, CATV system, and the sound system should be reviewed with the school board for operational requirements and modifications.

Consolidation If TWB were to be selected as the location of a consolidated middle school serving the Towns of Hampden and Wilbraham, the resulting increase in student and staff population would require the following minimum work be undertaken immediately to ensure effective operation of an efficient, modern and educationally sound middle school:

- Due to the age and condition of the existing electrical power, lighting and special systems, complete replacement of the electrical systems is required.
- The existing electrical service would have to be replaced and a new 600 amp 3 pole distribution panel added to support the new 40,000 square foot modular addition needed to support the increased occupancy.