

# SCHOOL FACILITIES ASSESSMENT

Watertown Public Schools, Watertown, Massachusetts

Watertown Public Schools District  
Dr. Jean M. Fitzgerald, Superintendent  
30 Common Street  
Watertown, MA 02472



## PRELIMINARY QUALITATIVE EVALUATION DOCUMENT

March 13, 2014

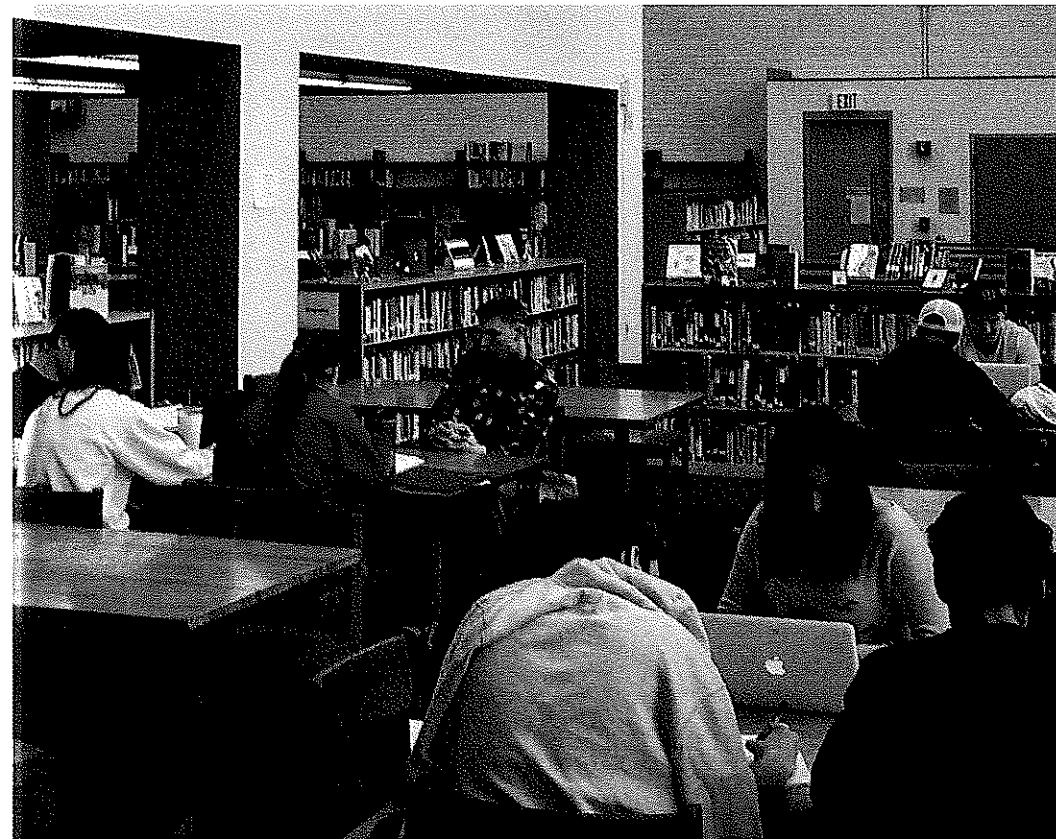
Prepared By:  
**Oudens Ello Architecture, LLC**  
46 Waltham Street, Suite 210  
Boston, MA 02118  
T. 617.422.0980

All information contained herein is the property of the Watertown Public Schools District, and may not be copied or re-used without the prior written permission of the District.

### PROJECT CONSULTANT TEAM

Architect and Lead Consultant  
Building Envelope Consultant  
MEP-FP Engineer  
Structural Engineer  
Code/Life Safety Consultant

Oudens Ello Architecture, Boston, MA  
Simpson Gumpertz & Heger, Waltham, MA  
TMP Consulting Engineers, Boston, MA  
RSE Associates Inc., Watertown, MA  
Cosentini Associates, Cambridge, MA



## TABLE OF CONTENTS

<b>1</b>	<b>Executive Summary and Findings</b>	<b>9</b>
1.1	Executive Summary	10
1.2	Findings	10
1.3	Findings Based on Rating System	14
1.4	Qualitative Scoring - Building Physical Condition	16
1.5	Qualitative Scoring - School-Specific Criteria	18
1.6	Age-of-Facility Benchmarking	20
1.7	Conclusions	20
<b>2</b>	<b>Project Overview</b>	<b>25</b>
2.1	Project Overview	26
<b>3</b>	<b>Individual School Analyses</b>	<b>29</b>
3.1	Cunniff School	30
3.2	Hosmer School	46
3.3	Lowell School	64
3.4	Middle school	80
3.5	High School	96
3.6	Administration Building	116
<b>4</b>	<b>Planning Scenarios</b>	<b>133</b>
4.1	Scenario Diagrams	134



March 13, 2014

Dr. Jean M. Fitzgerald, Superintendent  
Watertown Public Schools  
30 Common Street  
Watertown, MA 02472

RE: Preliminary qualitative evaluation of Watertown Public Schools

Dear Dr. Fitzgerald,

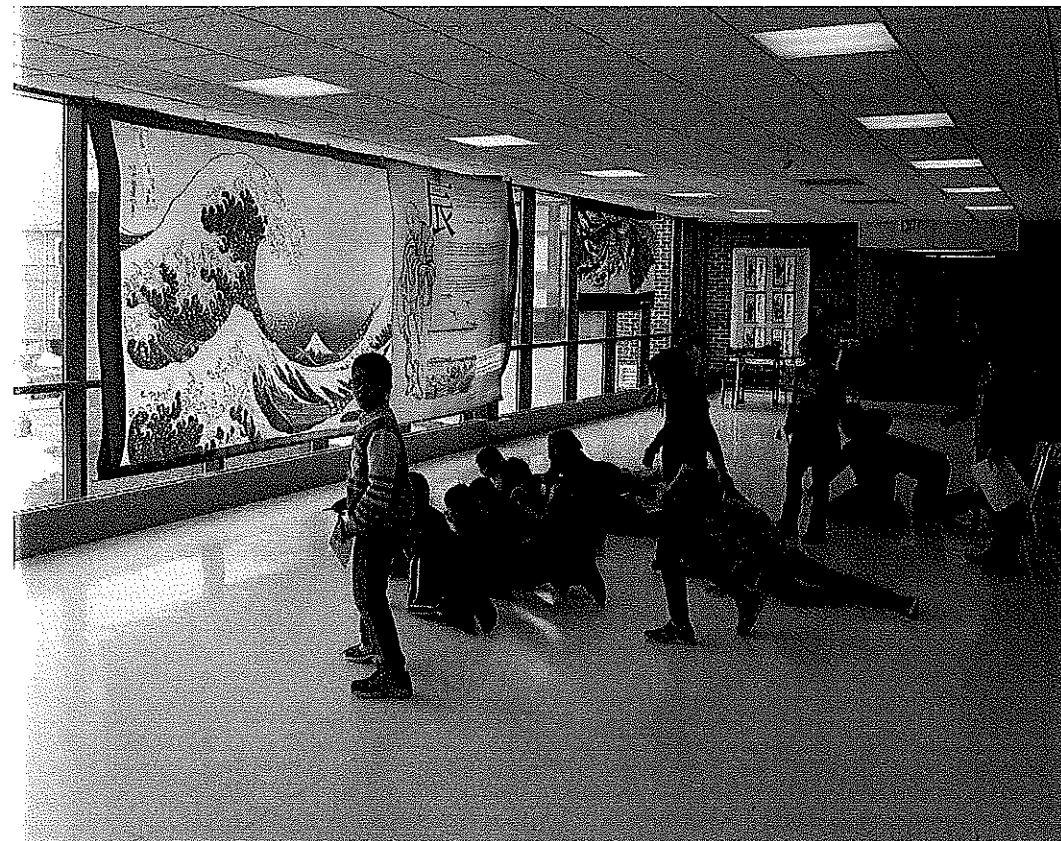
It is with great pleasure that Oudens Elio Architecture submits our qualitative assessment document for the Watertown Public Schools District. During the course of this study we have come to understand how cherished an institution the District is within Watertown, and we thus feel privileged to have been able to make this contribution; a contribution that we trust and hope will be informative in assisting you and school officials as you contemplate the future of the District.

In the weeks ahead, we would be happy to review our high-level findings with you in person. We also hope you will see our office as a resource going forward, so please feel free to contact us if/as questions arise down the road.

Thank you.

Yours Sincerely,

Conrad Elio, AIA, LEED AP Paul Schlapokersky, AIA, LEED AP Matthew Oudens, AIA, LEED AP



## **1 Executive Summary and Findings**

## 1.1 EXECUTIVE SUMMARY - 1.2 FINDINGS

### STUDY EXECUTIVE SUMMARY

This Facilities Conditions Assessment consists of a field survey, desktop study, and presentation of the findings of the study for the Watertown Public Schools District. The assessment was carried out by a consultant team led by Oudens Elio Architecture LLC (OEA). All five District Schools (Cunniff Elementary, Lowell Elementary, Hosmer Elementary, Watertown Middle School, and Watertown High School) as well as the Town's School Administration Building (Former Phillips School) were included in the study.

The District's brief for the study was that it be a "preliminary qualitative evaluation of the educational and operational adequacy of existing school facilities" (RFP Document).

During the three on-site evaluation and interview days informing the study, the consultant team came to understand that Watertown's public schools are cherished by the community, their imperfections notwithstanding, and occupy a special place within the daily life of Watertown. We observed that the District's leadership and staff are motivated individuals with an extremely positive view of their mission and the student body, as well as a sense of pride in the District. The breadth of cultures and communities within Watertown is easily recognizable in the all-inclusiveness of the schools' embrace of their education mission. It is against the highly positive backdrop of these overarching considerations that the consultant team respectfully offers our qualitative analysis of the District's schools and administration building.

At the outset of this report, prior to describing our Findings, we wish to additionally state that we fully understand the unique challenges confronted by the Watertown Public Schools District in terms of its goal to provide high quality education in high quality school buildings, while having a very limited tax base (due to the Town's low total number of occupants in relation to its neighbors) for raising funding for these goals, and additionally being constrained for open space for future development options, as an inner-ring suburb of Boston.

### FINDINGS

The study uses a grading scale of 1-5 (5: Excellent, 4: Good, 3: Fair, 2: Poor, 1: Bad) and assesses each facility using the following sets of evaluation criteria (explained in greater detail on subsequent pages):

**Building Physical Condition Criteria** – evaluates the physical condition of each facility.

**School-Specific Criteria** – evaluates each facility's ability to perform its mission as a contemporary school.

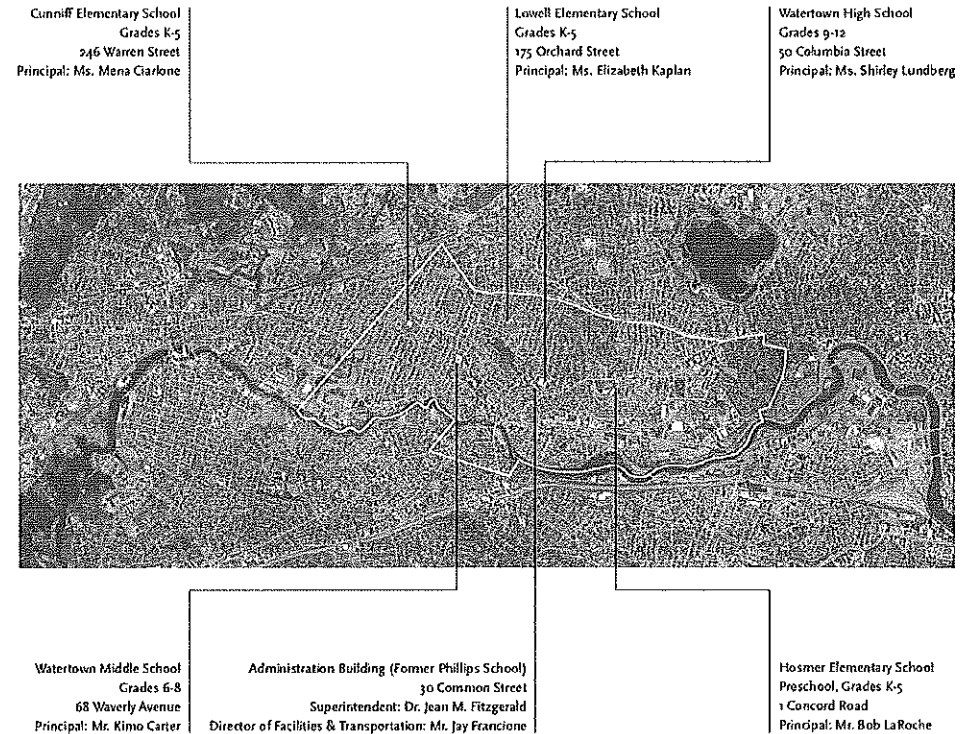
Based on Building Physical Condition Criteria, the highest-rated property in the study is the Cunniff Elementary, in large part due to its substantial 1990s era addition, as well as highly rated building systems. The lowest-rated property is Watertown High School, resulting from a number of complex factors explained further herein. It is worth noting that the majority of properties fall within a narrow band towards the lower end of the "Good" scale, which should be understood as buildings that are generally serviceable with myriad wear and tear deficiencies one might expect in aging buildings. In other words, the reader is cautioned to understand the low end of "Good" as being more or less representative of a building that is in serviceable, or adequate shape in its current state, as opposed to being "good" or "sound" with few problems.

Based on School-Specific Criteria (for contemporary education and community-related goals), the highest-rated properties in the study are the Lowell Elementary School and Administrative Building (tie). The lowest-rated is Watertown High School. Reasons for these ratings are described in further detail herein. All properties fit within the "Fair" scale, though it is worth noting that the High School and Hosmer both trend towards "Poor", which suggests significant deficiencies considering suitability to their mission at this time.

The reasons for these ratings relate to the following primary considerations:

- Age of the facilities.
- Capacity of facilities, including projections of potential growth of Watertown's population.
- Functionality of major building elements forming parts of facilities in relation to other parts, when constructed at different times (or, in the case of Hosmer Elementary, when constructed during the same era as separate facilities, but now joined as one).
- Suitability of the facilities to current education and related goals of the District.
- Good or best practices for school buildings in the current public education environment.

The age of all properties is a factor in the relatively low ratings obtained. The most recent significant additions within the District date to the mid- to late-1990s (excluding the 2002 addition of a Preschool to the Hosmer School, which



### 1.3 FINDINGS BASED ON RATING SYSTEM

#### STUDY DESCRIPTION

The overview table on the facing page presents the final score in two categories for each of the Watertown School District's properties. Spreadsheets on subsequent pages provide the detail that underlies these individual numbers. The two numbers derived for each school have not been reconciled into one single number as this would not create an accurate picture. We believe that the two numbers represent two different but complimentary criteria associated with each property, encompassing the two central questions:

- What is the physical condition of the building currently serving in its assigned role (as a school or administration building)?
- What is the suitability of this building for its assigned role within the context of contemporary education tenets, can it be adapted to conform to these tenets, and will it remain relevant into the future as the education mission evolves?

#### BUILDING PHYSICAL CONDITION STUDY BASIS

This study focuses exclusively on the physical condition of the asset, without specifically considering appropriateness of use as a school building or a school administration building.

#### SCHOOL-SPECIFIC CRITERIA STUDY BASIS & LIMITATIONS

This study focuses on school-specific physical aspects of the school buildings, as well as on some less tangible aspects. Certain items that are consistent across all properties and that are not easily remedied in any scenario of upgrading and improvement (eg. lack of surface space within the town for on-site staff/visitor parking), have been omitted from the ranking, because all properties would perform equally badly, with the result that the ranking would be pushed lower than it otherwise ought to be.

#### LIMITATIONS OF SCORE-BASED ANALYSIS

The methodology employed to derive the scores contained herein produces an accurate picture of the "state of being" of the property in question. The scores should not be read in isolation. Narrative-based information contained within this document is equally important to deriving a full picture of the challenges and opportunities confronted by a particular property.

#### FINDINGS

The following information describes the picture that emerges from the numbers on the page to the right:

#### Building Physical Condition Findings:

- All Watertown schools fall either into the lower end of the "Good" range, or, in the case of the High School, into the higher end of the "Fair" range. Despite these scores appearing to represent the lower or middle-lower end of the spectrum, the scores are in fact a testament to how well Watertown maintains the assets that it has, from ongoing maintenance of exterior walls and roofs, to care for mechanical and electrical equipment, the ages and other deficits of the facilities notwithstanding, particularly given the breadth of ages of the facilities and the fact that additions had to be integrated.
- Buildings falling into the "Good" range do so at the very low end of that range, rendering them for practical purposes as being "Fair" rather than firmly ensconced in "Good" (This is significant because the delineations between categories do not represent a drastic transition from one state to another, but rather a "hovering" around a particular general condition).
- Watertown High School is the lowest-performing facility in this category. Hosmer and Cunniff Schools are the highest rated, due in large part to the relative newness of their additions and well-maintained equipment.
- Low scores in this category are affected by building age, poor original construction (in some cases), as well as condition issues created by the complexities of adding to existing buildings, and work done to bring them into conformity with current requirements (eg. application of plywood over existing asbestos-containing flooring in Lowell Elementary created an ongoing flooring problem in that school that has a detrimental effect on day-to-day use and maintenance, as well as on physical appearance).

#### School-Specific Criteria Findings:

- The fact that these scores are in general lower than the Building Physical Condition scores is not surprising, given that these items are not generally affected by ongoing maintenance, but are instead a result of certain deeply-rooted conditions that are not easy to rectify (if these items were easy to attend to, the District would presumably have addressed them already).
- Low scores in this category derive from a general lack of suitability of key spaces or entire buildings to the contemporary education mission, inclusive of access to daylight, high-quality outdoor space, sub-divisible spaces, etc. This score is particularly significant because it contains a number of items that would be extremely difficult or expensive to address. If the Building Physical Condition finding pertains to a buildings "body", this score pertains directly to less easily quantifiable elements.
- Watertown High School is the lowest-performing facility in this category. Lowell Elementary, due to its large and well-functioning 1996 addition, scores highest.

## 1.1 EXECUTIVE SUMMARY - 1.2 FINDINGS

we see as being an outlier for the purposes of this study, as it is a self-contained unit), and there have been no completely new, purpose-built, synthesized, school buildings constructed in the District since the 1950 (Hosmer, Conniff). This creates an additional factor, such that all properties consist of older buildings with accretive additions that have in many cases been compromised by one or more of:

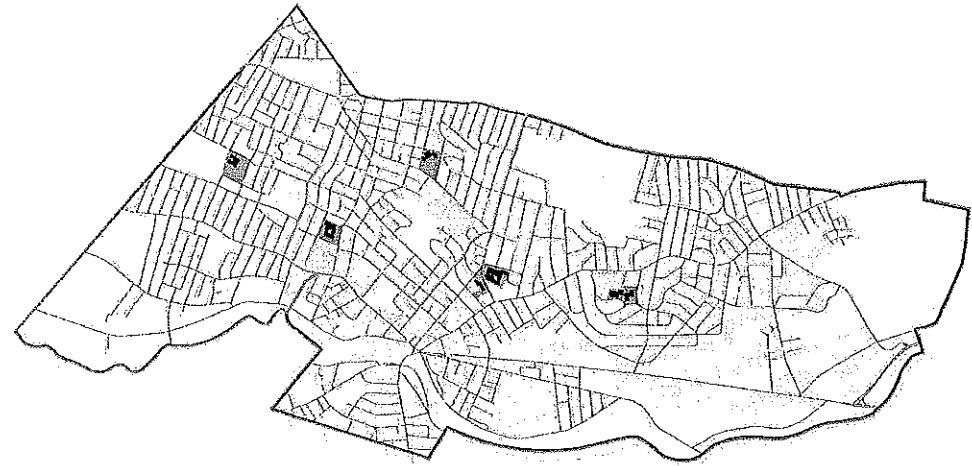
- Site Constraints
- Constraints or complexities created by the building being added to (misaligned floor levels, complex geometries)
- Unsuitability of internal space configurations of significantly older buildings to contemporary education principles and goals.

Key summary points relating to all District schools generally, are as follows:

- In terms of current best or good practices for education facilities design, Watertown school facilities – either in part or in whole – look and feel dated, tired and shopworn internally. We believe that this intangible essence becomes unintentionally embedded in the zeitgeist of the District in ways that are not apparent to all on a day-to-day basis. (We hasten to add that we do not automatically link the age of buildings to the above phenomenon; it is instead a combination of age, deferred maintenance, varying levels of design and construction quality, as well as wear and tear).
- Classroom sizes, while frequently adequate purely in terms of square feet, are insufficient for contemporary pedagogical needs and objectives (a variety of teacher-student seating configurations supporting teaching that is not based on lecture format).
- Laboratory space is similarly either under-provided or is provided in spaces too constrained dimensionally.
- Classrooms typically lack formal and informal capability for subdivision into smaller teaching spaces.
- Smaller teaching, evaluation and counseling spaces in proximity to, but separate from, classrooms are lacking.
- Teacher support spaces are lacking.
- Parking is substantially inadequate for requirements (exception: the Administration Building in its current use).

A vital consideration in determining the ongoing suitability of a school building for its mission is as follows: When the 1920s to 1950s era buildings were added to in the 1980s to 2000s to “bring them up to date”, the elements that were typically added (this applies nationally, not just in Watertown) were modern

cafeterias, gymnasiums, and other shared uses (libraries, lobbies, etc.). While this was at the time a positive step, it created for today's users a condition in which the primary educational mission of the schools – the classrooms, laboratories, counseling and teacher preparation spaces – were frozen in time at the date of the school building's original construction, because these elements were housed in the older part of the school. This is a condition that presents a serious challenge for the Watertown Public Schools District at this time. The cafeterias, auditorium and gymnasiums are generally acceptable or better, but the classrooms and laboratories are in serious need of upgrading. Due to the fact that the dimensions and proportions (length to width) of these spaces, as well as lack of provision for wiring for technology upgrades, are effectively encoded into the physical structures of these buildings, they are extremely difficult issues to address without replacement.



## 1.6 AGE-OF-FACILITY BENCHMARKING - 1.7 CONCLUSIONS

### STUDY DESCRIPTION

The diagram on the facing page has been established to allow for an overview understanding of the age of Watertown Public Schools facilities as relates to one another, and also as relates to the schools of four neighboring suburban towns/cities. Boston has not been included in the study due to the fact that Boston Schools are more representative of a large inner city district than inner-ring suburban towns, and would thus not provide information that is particularly useful for analysis when considering possible future trajectories of development for Watertown Schools.

### BENCHMARKING BASIS

All information contained in the diagram at right was sourced from the Massachusetts School Building Authority (MSBA) website. The information is, in some cases, not entirely up to date (for example, the Martin Luther King School in Cambridge is being built new from the ground up at this time), but it is the most authoritative source of information available. For neighboring towns, the bars representing the full life-span of a school do not include milestones that correspond with interim renovations and additions, either minor or major, as this information is not readily available from the MSBA.

OEA's starting position is that for buildings in general, age is not in itself a direct indicator of problems (it is well known that buildings built in certain epochs of the late 19th and early 20th centuries are extremely durable). In the case of school buildings, however, age has a larger than usual bearing, due to the continued evolution of educational tenets, as well as the evolution of technology. Both of these considerations - tenets and technology - can be extremely challenging to accommodate in older structures. There is also the additional factor of perception: people are happy if their town hall is a grand historic building, but usually prefer for their schools (and hospitals) to be up to date, reflecting the state of the art.

### BENCHMARKING FINDINGS

The diagram at right immediately establishes that neighboring towns have, in the past 15 years, begun to implement a program of major upgrades or total replacements, and in some cases now have schools that are entirely new or substantially upgraded. Watertown has conditions unique to the town's number of households, availability of land, etc., but if those issues are set aside, it becomes clear that age of school facilities in Watertown is an issue. This is borne out by empirical evidence at the properties, which in many cases feel shop-worn and showing signs of their age and use. Additional readings derived from the diagram are as follows:

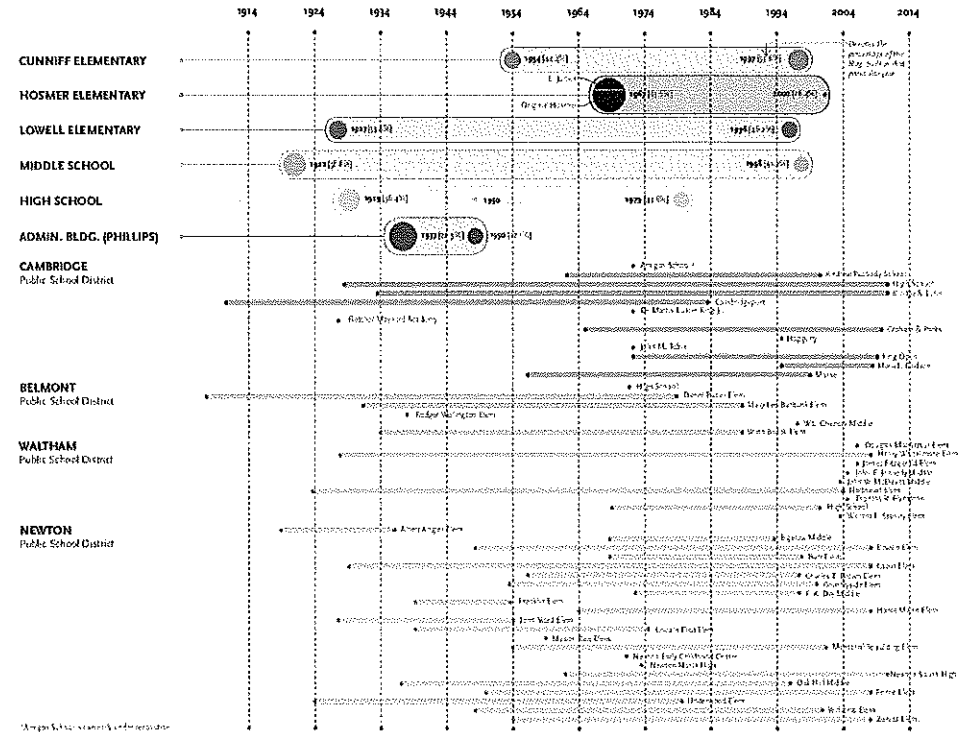
- Just over half of the space of the High School was built in 1929. While the 1979 addition is reasonably well integrated with the original building and was well constructed at the time, more than half of the High School's primary educational uses must be adapted to what is now an old and inflexible building.
- The Middle School is similarly comprised of old and newer in almost equal measure. Although this school generally feels more up to date than the High School, there are serious issues relating to intangible factors such as way-finding and overall school cohesion created by the complexities of relationship between the original building and the renovation. In this regard, the Middle School has some serious challenges.

### WHAT THIS STUDY DOES NOT REVEAL

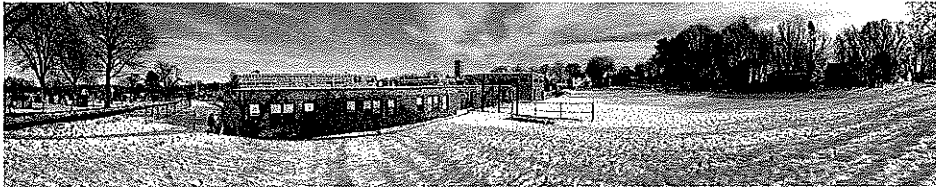
Age benchmarking gives a window into certain issues (such as classroom physical size, difficulty of wiring of older buildings, etc.) but it does not provide the full picture. For example, in the diagram at right, Hosmer Elementary appears to be a relatively new facility (due in large part to a relatively small addition in 2002 and the fact that the original buildings were constructed in the 60s rather than the 20s-30s). The true picture with Hosmer is, however, much more complex, and is described further elsewhere in this document.

### CONCLUSIONS

Using the ratings from both the Building Physical Condition Criteria and School-Specific Criteria assessments, the Watertown High School has yielded the lowest scores and is therefore the school facility we recommend receives immediate attention and detailed analysis. It is important to note that no Watertown school facility is free of problems, however, and all buildings face the serious challenge of reconciling a growing enrollment and increasing demands for special high needs students with the general lack of quality, flexible classrooms space and severe shortage of smaller spaces for specialized one-on-one and small group instruction. Consequently, a more focused study of the High School itself can only be a first step towards meaningful improvement in the Watertown Public Schools District. The best solutions to problems for any one of the facilities (including the High School) might depend on changes to another, or all others, so we encourage the Town and Watertown Public Schools to also undertake a comprehensive planning study that considers all school assets together to identify best opportunities for transformation and growth in the entire District. To that end, our proposed planning scenarios on the final pages of this study hint at possible pathways forward, though they are primarily intended to provoke discussion at this time and purely speculative without critical input from the town and school system's key stakeholders.







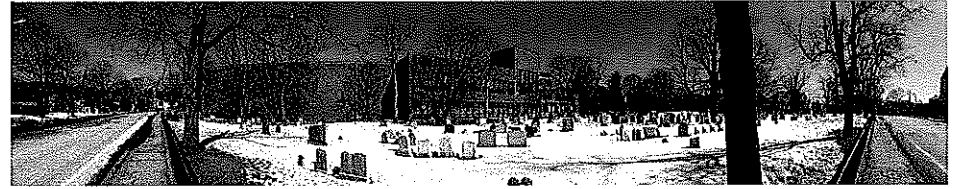
Canniff School



Middle School



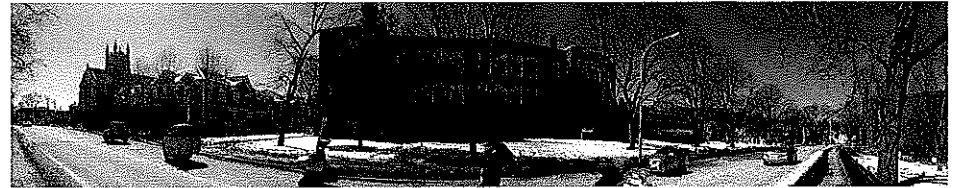
Hosrner School



High School



Lowell School



Administration Building — Phillips School



## 2 Project Overview

## 2.1 PROJECT OVERVIEW

### PROJECT TEAM

The primary consultant for this study is Oudens Ello Architecture, LLC, of Boston, MA (OEA). The OEA team is as follows:

- Oudens Ello Architecture (OEA), Boston, MA: Architectural & School Planning
- (SGH), Waltham, MA: Building Envelope (Exterior walls and windows, roof)
- RSE Associates (RSE), Watertown, MA: Structural Engineering
- Cosentini Associates (CA), Cambridge, MA: Code and Life Safety
- TMP Consulting Engineers (TMP), Boston, MA: Mechanical (HVAC), Electrical, Plumbing and Fire Protection

### METHODOLOGY

This Assessment consists of the following components:

- Field inspection of the properties, including comprehensive walk-throughs of the buildings over a period of three days (February 28 and March 4-5, 2014) by the consultant team accompanied by District officials. This portion of the study also included walking around all sides of the properties, externally, and visual inspection of the grounds.
- Non-destructive visual examination and photographic documentation of major building components and spaces, generally corresponding with the Construction Specifications Institute's Uniformat designations as follows:

- 1.1. Structure
- 1.2. Exterior
- 1.3. Roof
- 1.4. HVAC
- 1.5. Electrical
- 1.6. Plumbing & Fire Protection
- 1.7. Conveying
- 1.8. Interiors
- 1.9. Equipment

- A desktop study consisting of gathering of existing drawings relating to the facilities, from the archives of the District.
- Team interviews with Jay Francione, Director of Facilities and Transportation, Watertown Public Schools.
- OEA interviews with the principals of each of the five schools included in the study.

- OEA interview with Dr. Jean M. Fitzgerald, Superintendent of Watertown Public Schools, and Darlyn Donovan, Assistant Superintendent.

The study consisted of two primary qualitative assessment methods:

- The first was focused exclusively on the physical condition of the building(s) with general construction and use-wear criteria not specifically related to school building functionality.
- The second focused on qualitative criteria more finely adjusted to the particular needs of school buildings. The scoring of these two methods of inquiry is presented in the spreadsheets included herein. Additional items included in this portion of the study include the following:

- Space utilization
- Exterior spaces
- Schools-specific qualitative factors affecting staff and student wellbeing and student learning

Given the high-level nature of this Facilities Conditions Assessment, as well as the exclusion of either deferred maintenance or replacement costing from the scope of the study, we have not utilized a traditional Facilities Condition Index (FCI) that functions as a ratio of asset repair needs versus asset replacement value. We have instead utilized a simplified index that ranks assets and their components on a scale of 1 to 5, ranging from poor to excellent. This method is based on the US Government's Deferred Maintenance Parametric Estimating Guide, Version 2, 2003, as developed by NASA. This method, when conducted by experienced construction industry professionals, has been found to be at least as accurate as other methods, and usually substantially more accurate.

The above notwithstanding, our team's collective professional opinion is that if standard formulas assessing the cost of deferred maintenance against the cost of replacement were to be applied, findings would generally trend towards an indication that consideration of replacement was warranted in all cases with the possible exception of the Middle School (which has a sizeable addition from 1998).



Cunliff School



Middle School



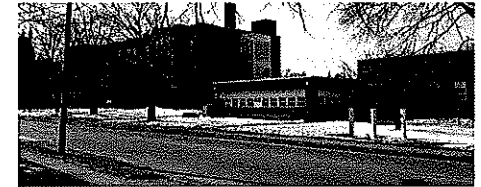
Hosmer School



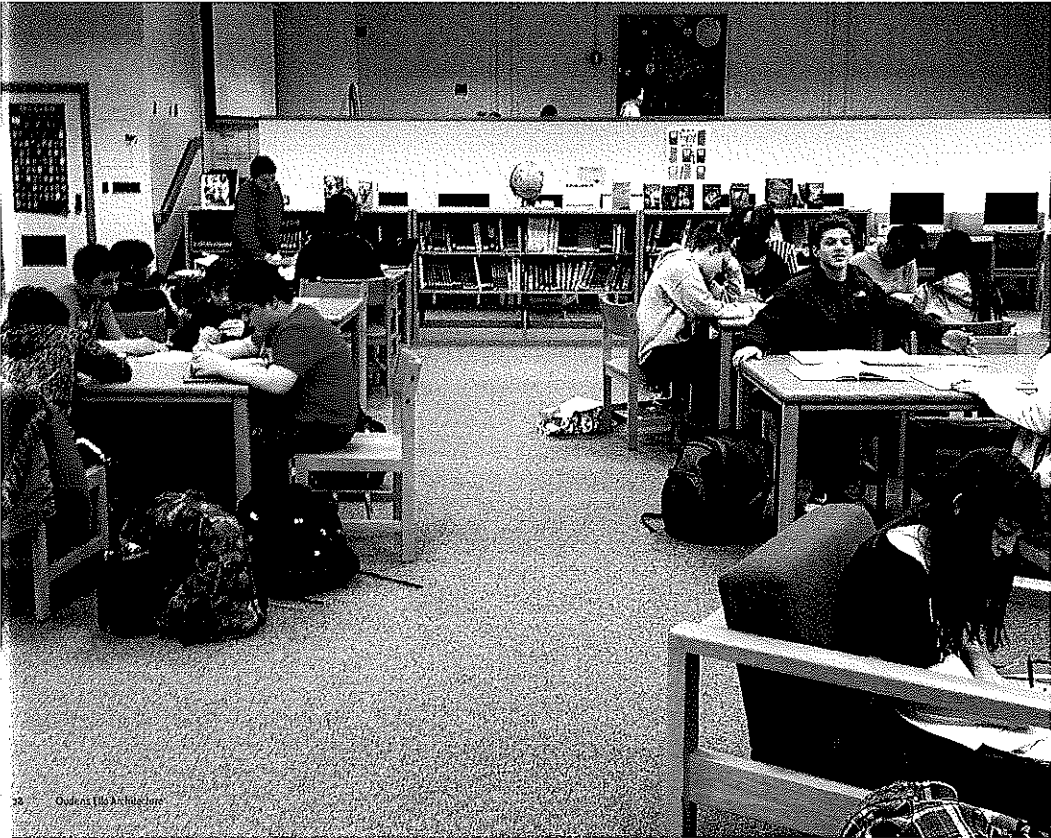
High School



Lowell School



Administration Building — Phillips School



### 3 Individual School Analyses

3.1 CUNNIFF SCHOOL

# CUNNIFF ELEMENTARY SCHOOL



Location	Building Components	Square Feet	Students
246 Warren St.	1954 Wing	23,077	315
	1997 Wing	28,898	
		51,975 total	165 sf/student

QUALITATIVE SCORING	Building Physical Condition	School - Specific Criteria
	3.18 Total Grade (Weighted by SF of Building Portions)	2.69 Total Grade

OVERVIEW

Cuniff Elementary is the smallest active school in the Watertown School District and serves the westernmost portions of the West End and Benis neighborhoods. The original, 3-story, 23,000 SF building was constructed in 1954. A major, 29,000 SF single-story building addition completed in 1997 effectively doubled the size of the school. Today the school accommodates approximately 315 students (Pre-K through Grade 5) and 75 full and part-time staff. As a working school facility, Cuniff is generally very sound (note: Cuniff Elementary achieved the highest score using Building Physical Condition Criteria). It is a cheerful place with ample daylighting, especially in the 1954 building. Cuniff also enjoys a safe and efficient main entrance with excellent visual control from the central office suite.

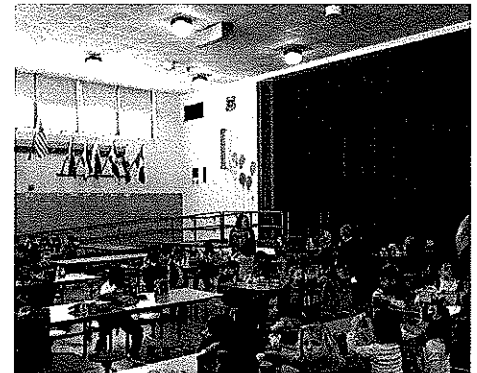
Despite its important attributes, Cuniff Elementary possesses one of the lowest square footage per student ratios in the School District (165 SF per student). The lack of space is ultimately Cuniff's primary deficiency. The typical classroom is too small to accommodate an average current class size of 23 students. Class sizes are trending upwards from here with projections for the next year or two closer to 24 or 25 students per classroom. As more classrooms become necessary to meet the demand, the only available option at Cuniff is to eliminate dedicated rooms for art and music. The loss of this type of dedicated program space directly compromises learning, as more will be required to be achieved using mobile carts going forward.

In addition to space demands on the classroom, Cuniff lacks small spaces necessary for specialized learning. An example of this is represented in the conversion of a former windowless conference room into a special education teaching space. Moreover, Cuniff's combined cafeteria-auditorium space is too small for all-school meetings. The school lacks dedicated science and computer rooms. It also lacks a men's restroom and a dedicated adult restroom on the upper level, which proves to be very difficult for teachers who need to request coverage for the time it takes to use a lower level restroom.

Another major issue for the school appears to be the relative isolation of Pre-K and K within the 1997 addition. Given the addition's long corridors and lack of interior glazing, these young children and their teachers feel completely cut off and remote from other school activities. The school library, which occupies a strategic location in the center of the building could have been designed to better integrate the two areas of the school to foster camaraderie and collegiality amongst students and teachers. Instead, the library serves as a barrier between the two areas.

SUMMARY OF FINDINGS

- Appears to be operating at or above full capacity. Classrooms are full and adding more classrooms would require the loss of the music room and/or art room.
- Shortage of support spaces (e.g., insufficient teaching and office space for special education, no men's room, no adult restroom on the upper level, no computer room/STEM lab, insufficient conference room space – current conference room only accommodates 10 people.)
- The 1997 addition is not well integrated with the original 1954 building, leading to it feeling internally like an addition rather than a fully integrated element. Despite its relative newness, its slab-on-grade construction appears to be only of moderate quality. Daylighting of public spaces in the 1997 addition is insufficient and the over-riding sense in the public areas is that they are nothing other than corridors.
- The 1954 Building is brighter and feels inherently less institutional, but has challenges related to its age, both from a condition point of view, and in terms of the size and relative lack of configurability of its classrooms.
- Public spaces (Cafetorium, Gymnasium) are well utilized but are insufficient for the variety of school and community uses required. All-school events cannot be accommodated.
- After-hours access to public spaces requires that the building be fully opened.
- The grounds are generally sufficient for the needs of the school (with the exception of parking).
- Parking is insufficient for the needs of the school and is laid out in a way that makes vehicle movement difficult (approximately 40 parking stalls).



CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS

BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY			
Watertown Public Schools Cuniff Elementary School		Date Constructed: 1954	Assessed By: JAT/ey
		Number of Floors: 1-2	Reviewed By: SAG/sky
		Approx. Sq. Ft.: 62,000	Assessment Date: 2/28/14
Additions, Renovations, and Major Maintenance:		1997 Addition: Gymnasium, library, and program space addition to the north and east of original building, plus new roofing throughout the addition and original 1954 Building.	
Wall System:		1954 Building: Clay brick mass masonry. 1997 Addition: Clay brick clad cavity wall with precast architectural elements.	
Window System:		1954 Building: Punched, aluminum framed, with fixed and project-in hopper windows and single-pane glass or metal panels typical. Aluminum framed storefront at stairwells. 1997 Addition: Aluminum framed punched windows and window/wall assemblies with project-out sliding operable vents, and IGUs.	
Door System:		All Building Areas: Entrances are aluminum framed storefront with IGUs reportedly installed in 1997.	
Roof System:		1954 Building: Fully-adhered EPDM at low-sloped areas, except for at cafeteria area which is ballasted EPDM. All roofing membranes were reportedly installed in 1997. 1997 Addition: Ballasted EPDM, except fully adhered EPDM at the entrance canopy and white thermoplastic (appears to be PVC or TPO) at cafeteria extension.	
General Building Performance			
Reports of Building Enclosure Leakage/Distress:		Ongoing water leakage from roofing since installation in 1997, especially at kitchen roof. Previous water leakage at skylights which have been covered with EPDM; leakage subsequently stopped. Localized peeling repairs at deteriorated locations.	
Overall Building Envelope Condition / Major Concerns:		Water management issues exist throughout the building such as at canopies and window sills concentrate flows of water which accelerates deterioration of the brick masonry locally below. Visible metal corrosion and spalling mortar joints indicates that the deterioration of the metal is severe enough to warrant repair in the near future; if left unrepaired will likely lead to rust jacking and additional mortar and brick spalls. Windows and entrances are sound, but perimeter seals are at the end of their useful life and require replacement. The EPDM roofing membrane is nearing the end of its useful life, and an increasing number of repairs can be expected until it is replaced.	
Component Condition (Rating 0 to 5)			
Component:	Rating	Comments:	
Walls:	3	1954 Building: Brick masonry is generally sound, except at isolated locations where we note efflorescence and mortar deterioration (Photos 1 – 3), a step crack emanating from a window corner (Photo 4), and isolated deterioration of brick units (Photo 5). The deteriorated brick units occur within the bottom 6 ft of wall and may be due to graffiti and graffiti cleaning efforts. Significant amounts of repointing have occurred especially along the north and west elevations (Photo 6). Lintels are corroded with some mortar spalling and deteriorated masonry above (Photo 7). Brick masonry appears to have been installed where a door was replaced at the east elevation (Photo 8). Mortar joints in precast concrete sills are deteriorated and missing at most locations (Photo 9).	
	5	1997 Addition: Bricks and mortar joints are typically, sound. Rowlock brick at window sills are stained with organic growth (Photo 10). Lintels are painted and no rust is evident. Sealant joint installed at brick masonry expansion joints have failed and require replacement (Photo 11). Weeps are installed at grade, but appear open (Photo 12).	
Penetrations:	3	All Building Areas: Windows generally appear to be in sound condition. Perimeter seals are typically cracked and have debonded at multiple locations (Photo 13).	
Doors:	3	All Building Areas: Entrances appear to be sound with plastic, in fact glazing. Some frames have been face-sealed, possible as a repair effort (Photo 14). The frames are also typically placed directly at grade with no visible seal to concrete pad (Photo 14).	
Roof:	2	All Building Areas: In the EPDM membrane roof areas, lap seals are cracked throughout the exposed roofing area indicating that the membrane is nearing the end of its useful life. Numerous patches and raised fastener heads exist, we identified one fastener head that had penetrated the roofing membrane and been previously sealed, but the sealant is failing (Photos 15 and 16). At one location the copper fabric flashing, which is typically retained in the wall assembly, is exposed (Photo 17). The edge metal along the inventory 1954 building south roof edge is displaced (Photo 18).  At canopies, there are no kickouts or gutters; therefore, water runs down the face of the brick causing deterioration (Photo 3). Metal panels at south entrance canopy south appear to be falling at light fixture (Photo 19).	

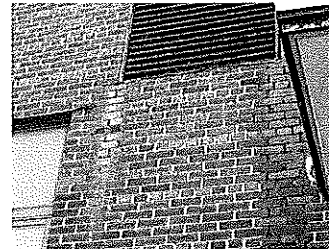
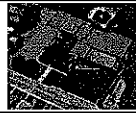


Photo 1  
Efflorescence and deteriorating mortar joints below lower at east elevation.

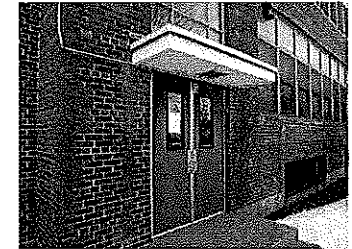


Photo 3  
Staining and deteriorated mortar joints at either side of entrance canopy.



Photo 2  
Efflorescence below window sill along north elevation.



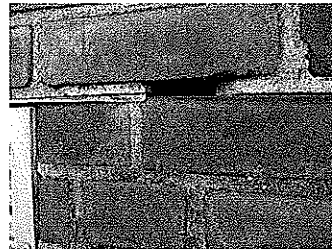
Photo 4  
Step crack in brick masonry west of main entrance.

L:\BOS\Projects\2014\140268-00-WATRRV\001\JAT\ey-1-Cuniff-140268-00-est.docx

CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS



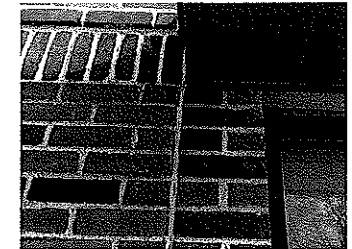
**Photo 5**  
Deterioration of several bricks along west elevation.



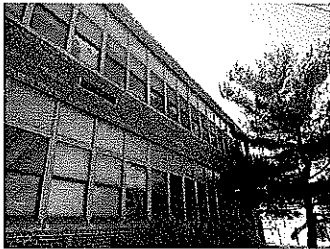
**Photo 7**  
Spalled and missing mortar with rusted lintel behind at louvers along north elevation of 1954 Building.



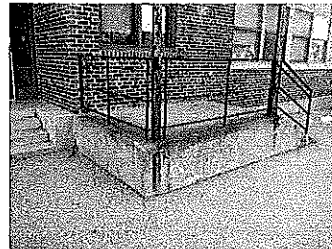
**Photo 9**  
Open joints in precast concrete sill at northeast building corner (yellow arrow). Open joints in window framing and crazing/debonded perimeter seals (red arrows).



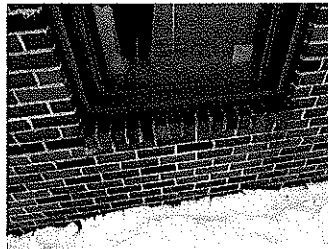
**Photo 11**  
Failed sealant joint at brick masonry expansion joint.



**Photo 6**  
Localized pointing repairs in 1954 Building exterior walls.



**Photo 8**  
Stairway to window, where apparently old door was replaced. Canopy supports have surface corrosion.



**Photo 10**  
Staining and organic growth at rowlock brick window sill in 1997 Addition.



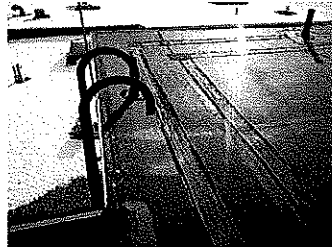
**Photo 12**  
Weeps at grade along south elevation.



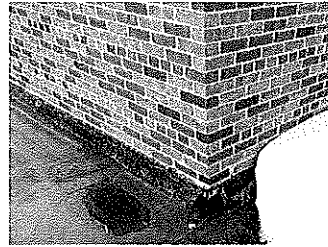
CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS



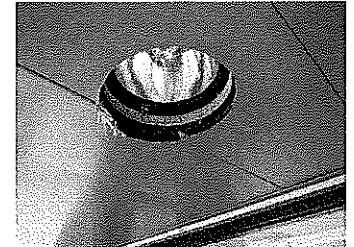
**Photo 13**  
Cracked and falling perimeter seal at window.



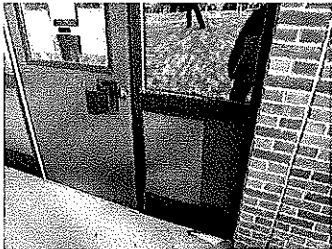
**Photo 15**  
Raised fastener heads under roofing membrane.



**Photo 17**  
Copper fabric flashing extending out from wall at adhered roof rising wall detail.



**Photo 19**  
Light installed at metal panel clad canopy. Support for the metal panels at soffit appears to be falling.



**Photo 14**  
South elevation auxiliary entrance. Frame is seated at several joints and placed directly at grade with no seal.



**Photo 16**  
Raised fastener penetrating the roofing membrane with failed sealant repair.



**Photo 18**  
Displaced edge metal at 1954 Building roof.



## CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS

### STRUCTURAL ANALYSIS — RSE ASSOCIATES

Structural information on the existing building was obtained from incomplete existing structural drawings and a visit to the site by RSE on March 4, 2014. The existing building was built in two phases. The two-story original piece was built in 1954, and the one-story addition was added in 1997.

#### A10 FOUNDATIONS

##### A1010 Standard Foundations

Existing foundation at both portions consists of spread footings. The older portion also includes concrete foundation walls.

The lowest floor slab is a concrete slab on grade.

#### B10 SUPERSTRUCTURE

The existing superstructure at the older building consists of concrete slabs and beams on concrete columns. The one story addition consists of steel tube columns, open web steel joists and metal roof deck.

Lateral resistance against wind and seismic loads is provided by CMU shear walls.

### EXISTING CONDITIONS

Some conditions were observed which will require repairs.

- Steel: Surface corrosion was observed at exposed, exterior round columns.
- CMU: At the addition, cracks were observed along corridor walls at the column locations.
- Concrete: The surface of the concrete slab on grade at the addition was uneven indicating possible settlement over time.

### CODE AND LIFE SAFETY — COSENTINI ASSOCIATES

#### A. EXECUTIVE SUMMARY

The two-story plus basement Elementary School is classified as a low-rise building in accordance with the MSBC. The building is 52,000GSF with a primary occupancy type of the building is Group E, Educational. The original 1954 structure along with 1997 addition results in a mixed construction type classification, where a MSBC designation of 3B necessitated given the wood framing.

The building is equipped with a fire alarm system with ADA compliant strobes in most public spaces. The fire alarm system reports directly to the local Fire Department via master box connection. The system is not monitored by a central station. Visual and audible appliances are provided in common corridors and large assembly areas. Smoke detection is provided throughout the building. The building is partially sprinklered in the 1997 addition.

The building is served by 2 exit stairways and exit doorways that discharge directly to grade. The Side A (main) entrance is accessible to the disabled. An elevator provides accessible routes to all main floor levels.

#### B. MEANS OF EGRESS

##### Components

The means of egress includes corridors of substantial construction that lead to exit stairway enclosures. The corridors are segregated by way of cross-corridor doors (wired glass; no UL label) that are equipped with self closers and no latch. The doors are not tied into the fire alarm system and therefore pegged open with wood-wedges. The 36-inches stair doors are 90-min FRR and are equipped with self closers and latch. Exit doors leading to street level from assembly spaces include panic hardware. The enclosed exit stairways have a slope (tread to riser ratio) and railing configuration that appears to comply with the current code.

### Egress Capacity, Number and Arrangement

All Floors are served by two exit stairways. The First Floor is served by doors directly to grade. The exits are remotely located and provide adequate capacity based on the occupant load served. All floor areas are served by a minimum of two means of egress.

#### Travel Distance and Discharge from Exit

Travel distance limitation is 200 feet, while dead-end corridors are permitted up to 20 feet per the MSBC. The existing building configuration appears to satisfy these provisions.

#### Egress Lighting and Exit Signs

The corridors and common space are served by occasional battery powered lights. A lights out test was not conducted to determine the appropriateness of the lamination. Exit signs are placed in accordance with code and are similarly served by battery backup power.

#### Wheelchair Egress

The building is not fully sprinklered; therefore, areas of refuge are required and provided in the stairways. The configuration appears to meet the requirements for code at the time of construction, but would not satisfy today's standards (specifically associated with latches on stair doors and lack of communication system).

### MEP ANALYSIS — TMP CONSULTING ENGINEERS

#### BUILDING HEATING, VENTILATING AND AIR CONDITIONING

Building heating system consists of 2 Natural Gas Fired Boilers, hot water pumps with through the wall unit ventilators. The boilers are manufactured by H.B. Smith. The boilers are to be replaced in the summer of 2014. The hot water pumps have variable speed drives that were added recently.

The Cafeterium is served by 2 air handling units both with hot water, dx coils, and cleanstory fin tube radiation. The units are suspended above the stage area. The Kitchen area has a Hood protected by an Ansul Fire Suppression system.

The Library is served by an air handler with mechanical air conditioning and fin tube radiation.

#### Observation/Comments

Issues with the pneumatic ATC system which compromise many control systems are being addressed in the ESCO program scheduled to be completed in the summer of 2014. We are being told that all pneumatic actuation will be replaced and some new DDC controls will be added to replace the pneumatic control system.

#### BUILDING PLUMBING AND DOMESTIC HOT WATER

Water main is located in the Sprinkler Room adjacent to the Boiler Room. The domestic hot water heater consists of a Knight Boiler and associated storage tank which is approximately 3 years old and is operating properly. There is a gas booster located in the Boiler Room. The bathrooms fixtures are relatively old. The entire Boiler Room has flooded in the past. There is an existing sump pump (with a water sensor that was added recently) along with a back-up pump (that has to be manually started).

#### Observation/Comments

Consider replacing plumbing fixtures with new water conservation type plumbing fixtures.

CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS

FIRE PROTECTION

Building has an 8" sprinkler system and 4" distribution. Only the new addition is sprinkled, original building is not.

Observation/Comments

Consideration should be given to adding a sprinkler system through the original construction area of the building. In addition, it should be noted that any addition or substantial upgrade would require that a code compliant fire protection system be provided.

ELECTRICAL

The existing building is fed underground from a utility company pad mount transformer. This underground service feeds a 480/277 volt, 800 amp switchboard which was installed in 1999. This switchboard feeds panel boards and step down transformers located in electric closets throughout the building. The majority of this equipment was installed in 1997 and is good condition.

The majority of lighting fixtures consist of 2'x2' and 2'x4' recess acrylic lensed fixtures. The fixtures have all been upgraded recently with new lamps and ballasts and are in good condition.

The existing fire alarm system is the product of the Edwards Corporation and is an addressable system with no voice communication. Portions of the building do have sprinkler coverage and is supplemented with smoke detector coverage in corridors and stairs. Remaining portion of the building that does not have sprinkler coverage is provided with smoke detectors.

There is no emergency generator for this building.

Emergency egress lighting consists of a combination of battery packs and remote mounted battery operated lighting fixtures. Exit signs consist of self-contained battery operated units. All equipment appears to be in good condition.

Observation/Comments

Recommend installing occupancy sensors in classrooms, offices, restrooms and storage areas to help conserve energy.

MEP ANALYSIS — TMP CONSULTING ENGINEERS

Town of Watertown School Facility Assessment Survey  
 Building: Cuniff Elementary School Area: 61,975 sq. ft. Construction Date: 1954 Renovation Date: 1997  
 Facility Contact: Jay Frazzese  
 Plans Area: 30,000 sq. ft.  
 Survey Date: 3/5/14  
 TMP CONSULTING ENGINEERS, INC.

System	Equipment	Location	Age			Condition		Performance		Notes			
			Year	Month	Day	Good	Fair	Bad	Code	Energy	Water	Other	
1	Water	Water	19	09			X						
2	Panel Board	Control	2	20			X						
3	Panel Board	Control	17	21			X						
4	Control	Control	17	21			X						
5	Control	Control	17	21			X						
6	Control	Control	17	21			X						
7	Control	Control	17	21			X						
8	Control	Control	17	21			X						
9	Control	Control	17	21			X						
10	Control	Control	17	21			X						
11	Control	Control	17	21			X						
12	Control	Control	17	21			X						
13	Control	Control	17	21			X						
14	Control	Control	17	21			X						
15	Control	Control	17	21			X						
16	Control	Control	17	21			X						
17	Control	Control	17	21			X						
18	Control	Control	17	21			X						
19	Control	Control	17	21			X						
20	Control	Control	17	21			X						
21	Control	Control	17	21			X						
22	Control	Control	17	21			X						
23	Control	Control	17	21			X						
24	Control	Control	17	21			X						

(1) In the report that the system was replaced in 1991. The system is scheduled to be replaced in 2014.  
 (2) Lack of record for any work can be traced to the records of 2014.  
 (3)  
 (4)  
 (5)  
 (6)  
 (7)  
 (8)  
 (9)

CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS

Town of Watertown  
School Facility Assessment Survey

Building: Cuniff Elementary  
Systems: Fire/Alarm and Sprinkler Systems

Area: 51,915 sq ft  
Construction Date: 1954  
Renovated Dates: 1997

Facility Contact: Jay Francisco  
Phone: 617-253-1000  
Fax: 617-253-1000

Survey Date: 7/2/14

TMP CONSULTING ENGINEERS, INC.

Page 1 of 7

Item #	System	Type	Manufacturer	Efficacy	Condition				Remarks	Priority
					Good	Fair	Poor	Very Poor		
1	Electric fire alarm and sprinkler control	Control	Rockwell	J	20					
2	Exhaust	Control and exhaust	Thermo King	FD	50	X	X	X		
3	Sprinkler	Wet	Hemlock 1997 wet	FF	50	X				
4	Smoke Heat	Control	Rockwell	F	20					

- Notes:
- (1) The age of the piping throughout the school varies and will be replaced between 15 years old to over 60 years old.
  - (2) Low gas pressure throughout the school on very cold days, a condition triggering low pressure activation.
  - (3) A new parking lot is in the end.
  - (4) Construction should be planned to provide 100% sidewalk coverage for entire building.
  - (5) Most metal roofing done with granite, some are asphalt shingle, the bricks are done in repair on roads.
  - (6) It has been reported that there may be relative humidity issues in the mechanical rooms. A placement of relative humidity is not available in electric.
  - (7) Recommendations to be placed to assure gas leakage low pressure switch setting, if possible.
  - (8) If there is a need for replacement of the original piping, the work should be done prior to 1997.
  - (9)

Watertown Public School  
Building Condition Survey

Building: Cuniff Elementary  
Survey Date: 7/2/14

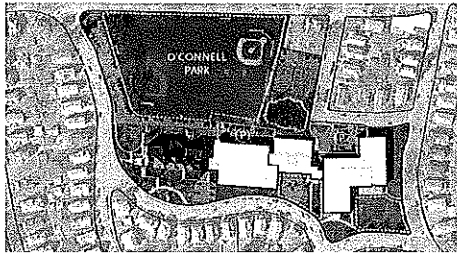
TMP Consulting Engineers, Inc.

Page 1 of 7

Item #	System	Type	Manufacturer	Efficacy	Condition				Remarks	Priority
					Good	Fair	Poor	Very Poor		
1	Electrical									
11	Wiring	Unorganized	Underground from pool room	FF	40					
12	Wiring	Steel conduit	Steel (Heater Room)	FF	40					
13	Wiring	NM-B 120 277V 3PH								
14	Lighting	Fluor. Lt.	Fluorescent	FF	40					
15	Lighting	LED	Fluor. Room	FF	40					
16	Lighting	LED	Fluorescent	FF	40					
17	Lighting	LED	Fluorescent	FF	40					
18	Lighting	LED	Fluorescent	FF	40					
19	Lighting	LED	Fluorescent	FF	40					
20	Lighting	LED	Fluorescent	FF	40					
21	Lighting	LED	Fluorescent	FF	40					
22	Lighting	LED	Fluorescent	FF	40					
23	Lighting	LED	Fluorescent	FF	40					
24	Lighting	LED	Fluorescent	FF	40					
25	Lighting	LED	Fluorescent	FF	40					
26	Lighting	LED	Fluorescent	FF	40					
27	Lighting	LED	Fluorescent	FF	40					
28	Lighting	LED	Fluorescent	FF	40					
29	Lighting	LED	Fluorescent	FF	40					
30	Lighting	LED	Fluorescent	FF	40					
31	Lighting	LED	Fluorescent	FF	40					
32	Lighting	LED	Fluorescent	FF	40					
33	Lighting	LED	Fluorescent	FF	40					
34	Lighting	LED	Fluorescent	FF	40					
35	Lighting	LED	Fluorescent	FF	40					
36	Lighting	LED	Fluorescent	FF	40					
37	Lighting	LED	Fluorescent	FF	40					
38	Lighting	LED	Fluorescent	FF	40					
39	Lighting	LED	Fluorescent	FF	40					
40	Lighting	LED	Fluorescent	FF	40					
41	Lighting	LED	Fluorescent	FF	40					
42	Lighting	LED	Fluorescent	FF	40					
43	Lighting	LED	Fluorescent	FF	40					
44	Lighting	LED	Fluorescent	FF	40					
45	Lighting	LED	Fluorescent	FF	40					
46	Lighting	LED	Fluorescent	FF	40					
47	Lighting	LED	Fluorescent	FF	40					
48	Lighting	LED	Fluorescent	FF	40					
49	Lighting	LED	Fluorescent	FF	40					
50	Lighting	LED	Fluorescent	FF	40					

3.2 HOSMER SCHOOL

# HOSMER ELEMENTARY SCHOOL



Location	Building Components	Square Feet	Students
1 Concord Lane	1967 Wing A	58,118	700
	1967 Wing B	27,724	
	2002 Link	16,840	
		102,682 total	147 sf/student

Qualitative Scoring	Building Physical Condition	School - Specific Criteria
	3.17 Total Grade (Weighted by SF of Building Portions)	2.19 Total Grade

OVERVIEW

Hosmer Elementary is the largest elementary school in the Watertown School District and serves the East Watertown, Brigham, Watertown Square and Coolidge Square neighborhoods. The school accommodates approximately 610 children in Pre-K through Grade 5, as well as 125 Pre-School children. In 2002, a large building addition facilitated the connection of the original 1967 Hosmer Elementary School with the 1967 portion of the former East Junior High School, thereby doubling Hosmer's size. The original 1967 Hosmer Elementary School currently functions as the classroom wing for Pre-K through Grade 5, while the 1967 portion of the former East Junior High School functions as the public space wing (e.g., houses the cafeteria, gymnasium, and auditorium). Between the wings, the 2002 addition accommodates the school's main entry as well as a self-contained, single-story Pre-School with an independent entrance.

What seems counterintuitive given severe demands for space, Hosmer suffers greatly from its large size and the joining of the original Hosmer with the 1967 portion of the former East Junior High School. In short, the combined facility lacks the types of spaces that it desperately needs (e.g., classroom space, special education teaching and office space) and has an abundance of space that isn't needed (e.g., an oversized auditorium that is rarely used, generous lobbies, ramps and corridors that serve that auditorium and two gymnasiums when only one would be sufficient). During the day, the classroom wing is overflowing with activity, while the former East Junior High School wing sits more or less desolate for long periods of time.

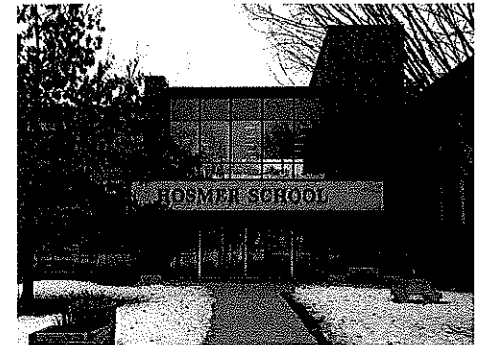
With almost twice the number of Pre-K through Grade 5 students than its peer schools, Hosmer also operates as a "super elementary school," within which it is difficult to deliver a nurturing, intimate experience for its young schoolchildren. Given the lack of classroom-type space available in the old East Junior High School wing, all Pre-K to Grade 5 schoolchildren are concentrated in the original building. Every available classroom there is operating well above capacity, which creates a kind of overwhelming, middle school-like intensity that is not conducive to lower grade instruction (in fact, some smaller classrooms sized to accommodate no more than 17 or 18 children currently house as many as 27 children). Space is so limited that grade levels cannot be organized in logical groupings. An example of this is a second grade class two doors down from a fifth grade class. Another is the two kindergarten classrooms relegated to partially below-grade space, far removed from the other kindergarten spaces one floor above. The lower level kindergarten spaces feel isolated. Worse yet, they are damp and musty and one of them is only handicap accessible by way of the other.

Another major deficiency is the lack of small spaces for one-on-one and small group instruction. Over 50% of Hosmer's students have special needs and/

or are low income or English Language Learners (ELL). With very few existing spaces to work with, ad hoc individual and small-group teaching spaces have, out of necessity, emerged in the most unlikely areas of the building. Examples of this include the reading desk in a fire stair, the makeshift classroom space fashioned out of a remote corner of the auditorium lobby, and the former (inaccessible) stage, recently cleaned out, which is being contemplated as a new special education teaching space.


SUMMARY OF FINDINGS

- Inefficient use of space – "Lacking space that is needed" combined with "a lot of space that isn't needed".
- Entire former East Junior High School wing is underutilized and incompatible with respect to the most pressing school needs. Gym and cafeteria are actively used, but the auditorium and vast expanse of circulation space surrounding it are rarely used.
- Classrooms operating at or above full capacity (up to 28 students in a classroom)
- Two gymnasiums when one would be sufficient
- Special Ed instruction & quiet learning occurs in lobby spaces, hallways, stair halls, etc.
- Lack of small spaces for intimate instruction and special needs (Hosmer has over 50% special needs, low income and English Language Learners (ELL) – higher than other schools).
- The school's main entry lacks visual supervision from central office location, which is up a set of stairs with no line-of-sight connection. A temporary desk has been set up as the primary control point.
- Partially below grade kindergarten classrooms are insufficient. Problems with moisture, musty smell. Dehumidifiers are required in the spring and summer. One lacks handicap accessibility.
- Shortage of support spaces (e.g., insufficient teaching and office space for special education, one-on-one and small group learning)
- Parking is insufficient for the needs of the school (used on a "first come, first serve" basis for teachers)
- Purpose-built (2002) Pre-School space is of poor quality. Lack of public space and poor daylighting creates a "clinical" feel to many of the interior spaces.
- Outdoor play area is shared by Pre-K through Grade 5 children. Teachers must manage interactions between little and big kids in a single space, which is difficult.
- Several areas of the building are inaccessible (e.g., mid-level girls restroom, lower level kindergarten classroom, stage, etc.).
- Lower level PA system doesn't work well.



## HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

### BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY			
<b>Watertown Public Schools Hosmer Elementary School</b>		Date Constructed: 1967	Assessed By: JAT/lay
		Number of Floors: 2 + Partial Basement	Reviewed By: BAG/sbby
		Approx. Sq. Ft.: 103,000	Assessment Date: 2/29/14
			
Address, Renovations, and Major Maintenance:	1967: Original Hosmer School and Old East Junior School Constructed 2002: Connector Building addition connecting the two schools (now combined school known solely as Hosmer School). Renovation work also included new PVC roof and fenestrations throughout all building areas.		
Wall System:	1967 Original Hosmer: Clay brick mass masonry with stucco panels at second-floor spandrel areas between windows. 1967 Old East Junior: Clay brick mass masonry with stucco panels at some second-floor window spandrels. Stone panels at north elevation. 2002 Connector Building: Clay brick veneer cavity wall (back-up construction unknown) typical with multi-story, glass-aluminum curtain wall at south elevation.		
Window System:	All Building Areas: Punched windows: Aluminum frames with fixed lites and project-in operable vents, green finish, and insulating glass units (IGUs). Multiple windows are muffed together with an aluminum spine. Well glazed from the exterior. Large Areas of Glazing: Aluminum and glass curtain wall construction, with fixed lites, spandrel panels, and project-in operable vents with IGUs. All glass is well-glazed. Rubber exterior glazing gaskets and butyl interior seals.		
Door System:	All Building Areas: Main entrances (north and south): Aluminum and glass storefront with green finish and IGUs. Auxiliary Entrances: Hollow metal typically with light tan painted finish.		
Roof System:	1967 Original Hosmer & 2002 Connector Building: Single PVC membrane typical at low-sloped areas and standing seam metal at steep sloped areas. 1967 Old East Junior: Single PVC membrane typical at low-sloped areas. Auditorium roof is a different, untested, white single-ply membrane that appears to be a reinforced thermoplastic. Two small roof areas above bathrooms and mechanical area at southwest building corner are EPDM and asphalt shingle. Watertown Public Schools (WPS) report that the shingle roof replaced a problematic EPDM roof in 2001.		
<b>General Building Performance</b>			
Reports of Building Envelope Leakage/Infiltration:	Multiple roof leaks, ongoing at the following locations: East side of the Connector Building elevators (between the elevators and original Hosmer School expansion joint) and below the EPDM roof at the southwest building corner. Water leakage also noted at walls of the ramp at the west end of the building at a unit vent/air in Room 156, a skylight in the Connector Building (reportedly under warranty, with repairs scheduled), and at the base of the Connector Building, south entrance canopy.		
Overall Building Envelope Condition/ Major Concerns	Brick masonry is generally sound with select locations of distress and efflorescence that should be addressed to avoid accelerated deterioration. Fenestrations are in sound condition, but perimeter seals have failed throughout the building, and require replacement. PVC roofing membrane and asphalt shingles are typically in sound condition. EPDM roofing is distressed and likely requires replacement. Flashing at rising walls are sound, but installed low-to-the-roof at locations related to interior leakage and should be investigated further.		
<b>Component Condition (Rating 0 to 5)</b>			
Component	Rating	Comments	
Walls	3	Original Hosmer: Brick masonry typically in sound condition. Mortar joints are slightly weathered with some exposed aggregate, but generally sound, except for below unsealed joints in porthouse gutter where leakage has severely deteriorated the joints (Photo 1). Stucco panels are cracked and spalled throughout the building with many existing patches (Photo 2). At south entrance site walls, efflorescence and vertical cracks exist in brick masonry (Photo 3). South-entrance field stone slabs are severely weathered, uneven, and in need of replacement (Photo 4).	
	4	Old East Junior: Brick masonry is typically sound, except at south elevation wing walls where efflorescence and spalling brick exists (Photo 5 and Photo 6). Mortar is weathered with some organic growth typically at the north elevation but generally sound with no visible cracking (Photo 7). Efflorescence exists where interior brick masonry is exposed at auditorium ramp (Photo 8). Cracks with efflorescence exist in the concrete canopy at auditorium/cafeteria north elevation (Photo 9). Previously connected structure apparently demolished at the east end; exposed steel is corroded and CMU masonry cracked/damaged at edge (Photo 10).	
	5	Connector Building: Brick masonry, mortar joints, and precast concrete elements are sound with no noted deterioration. Tin-zinc coated copper flashings appear sound; joints appear to be flat topped and no end dams are visible (Photo 11).	
Fenestrations	3	All Building Areas: Window and curtain wall frames and glazing are sound where visible. Perimeter seals are typically cracked or debonded and in need of replacement (Photo 12 and Photo 13). All buildings/additions similar. Broken screen at operable lites of Old East Junior School cafeteria (Photo 14).	
Doors	5	All Building Areas: Storefront entrance frames, IGUs, and glazing are sound. Isolated surface corrosion at hollow metal doors (Photo 15).	
Roof (PVC & Shingles/EPDM)	5	All Building Areas: Much of the roofs are covered with snow. Exposed PVC appears sound with few patches. Ponding water observed at multiple locations (Photo 16). Aluminum gutter at original Hosmer School appears sound, but seams are not sealed and water is leaking through deteriorating the wall below (Photo 1). Rooftop HVAC equipment appears sound, but flashings are rusted (Photo 17). Scupper with no downspout and low metal flashings (c.8 in. from roof surface) with failed EPDM repairs exist along east elevation of elevator overcan (Photo 18). EPDM roofing membrane at southwest building corner (Old East Junior) is unadhered and the substrate is buckling at several locations (Photo 19). Asphalt shingle roof (Old East Junior) appears in good condition.	

Building Envelope Condition Assessment Summary  
Hosmer Elementary School

SGH Project No. 140258  
1/8

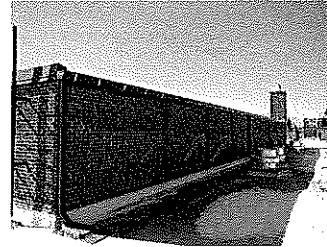


Photo 1

Deterioration of mortar joints below unsealed seams in porthouse gutter.

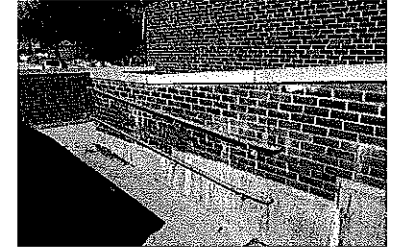


Photo 3

Efflorescence at south entrance site walls (Old Hosmer Building). Red arrow points to location of vertical crack in brick masonry.



Photo 2

Cracked and spalled stucco spandrel panel at Original Hosmer Building.

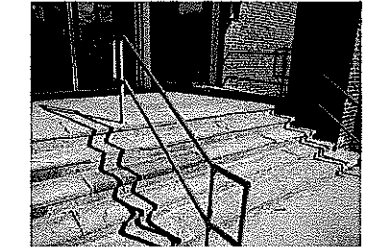


Photo 4

South entrance floor.

Building Envelope Condition Assessment Summary  
Hosmer Elementary School

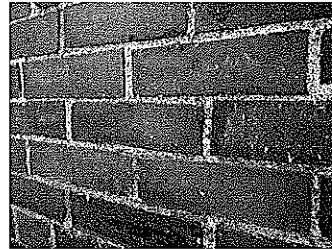
SGH Project No. 140258  
2/8

Watertown School Facilities Assessment

HOSMER SCHOOL - ENGINEERING CONSIDERATIONS



**Photo 5**  
Efflorescence and spalling brick at old East Junior School, south elevation, wing wall.



**Photo 7**  
Weathered mortar joint with apparent organic growth at old East Junior School.



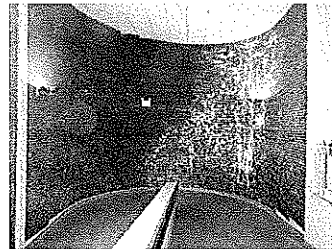
**Photo 9**  
Cracks and efflorescence in old East Junior School cafeteria/auditorium canopy.



**Photo 11**  
Typical condition at Connector Building. Metal flashing is flat-lapped. Masonry and mortar joints are in good condition.



**Photo 6**  
Close-up of spalling brick at old East Junior School, south elevation, wing wall.



**Photo 8**  
Efflorescence at exposed interior brick masonry at auditorium ramp (old East Junior School).



**Photo 10**  
Remaining extents at west end demolition.



**Photo 12**  
Failed window perimeter sealant.

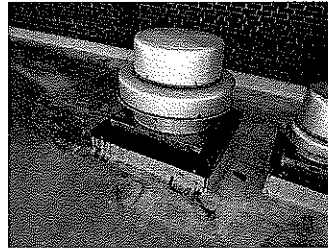
HOSMER SCHOOL - ENGINEERING CONSIDERATIONS



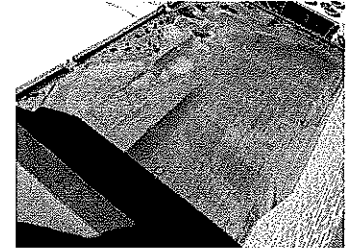
**Photo 13**  
Failed window perimeter sealant.



**Photo 15**  
Corrosion at hollow metal door frame.



**Photo 17**  
Rooftop exhaust fan with corroded fastening.



**Photo 19**  
EPDM roofed area at southwest building corner. Membrane is unanchored and substrate is buckling.



**Photo 14**  
Broken screen at old East Junior School Cafeteria.



**Photo 16**  
Ponding water at original Hosmer School Roof.



**Photo 18**  
Elevator overrun, east elevation. Low flashing and a scupper with no downspout.

## HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

### STRUCTURAL ANALYSIS — RSE ASSOCIATES

#### EXISTING STRUCTURE

Structural information on the existing building was obtained from incomplete existing structural drawings and a visit to the site by RSE on March 7, 2014. The existing building was built in two phases. Two separate buildings constructed in 1967 were connected by a two story addition in 2002. The two separate buildings had been an elementary school and a junior high school.

#### A10 FOUNDATIONS

##### A1010 Standard Foundations

Existing foundation at both portions consists of spread footings and concrete foundation walls.

The lowest floor slab is a concrete slab on grade.

#### B10 SUPERSTRUCTURE

The existing superstructure at the elementary school consists of concrete rib joist slab on concrete beams and columns. The construction of the former junior high school could not be verified, but steel columns and beams were visible at some locations. The connector addition is constructed of open web steel joists with a concrete topped formdeck at the second floor. There are expansion joints separating the three structures.

Lateral resistance against wind and seismic loads at the addition is provided by ordinary steel moment frames. The lateral system for the older buildings is unclear.

#### EXISTING CONDITIONS

Some conditions were observed which will require further investigation.

- At the former elementary school, cracking was observed in the finishes of the shorter exterior walls. In these locations, there was cracking and separation in the ceramic tile finish and between the wall finishes and the ceiling finishes. In one location, the finish was missing exposing

what appeared to be a CMU back up to the exterior brick veneer. It is recommended that finishes be removed in this area to ensure that the exterior walls are adequately tied into the floor and roof diaphragms.

### CODE AND LIFE SAFETY — COSENTINI ASSOCIATES

#### A. EXECUTIVE SUMMARY

The three-story Elementary School is classified as a low-rise building in accordance with the Massachusetts State Building Code (MSBC). The building is 102,500 GSF with a primary occupancy type of the building is Group E, Educational. The day care facility provides service for children no younger than 2-years and 9-months (Group E). The original 1967 structure along with 2002 addition results in a mixed construction type classification, where a MSBC designation of 2B necessitated given the unprotected steel roof framing.

The building is equipped with a fire alarm system with ADA compliant strobes in most public spaces. The fire alarm system reports directly to the local Fire Department via master box connection. The system is not monitored by a central station. Visual and audible appliances are provided in common corridors and large assembly areas. Smoke detection is provided throughout the building. The building is partially sprinklered in the 1979 addition.

The building is served by as many as 5 exit stairways, an exit ramp and exit doorways that discharge directly to grade. The Side C (main) and Side D (auditorium) entrances are accessible to the disabled. An elevator provides an accessible route to all main floor levels.

#### B. MEANS OF EGRESS

##### Components

The means of egress includes corridors of substantial construction that lead to exit stairway enclosures. The corridors are segregated by way of cross-corridor doors (wired glass; no UL label) that are equipped with self closers and no latch. The doors are not tied into the fire alarm system and therefore pegged open with wood-wedges. The 36-inches stair doors are 90-min FRR and are equipped with self closers and latch. Exit doors leading to street level from assembly spaces include panic hardware.

The enclosed exit stairways have a slope (tread to riser ratio) and railing configuration that appears to comply with the current code.

##### Egress Capacity, Number and Arrangement

The Second Floor is served by five exit stairways and an exit ramp. The First Floor is served by three exit stairways and doors to grade. The Ground Floor is served by exit doors directly to grade. The exits are remotely located and provide adequate capacity based on the occupant load served. All floor areas are served by a minimum of two means of egress.

##### Travel Distance and Discharge from Exits

Travel distance limitation is 200 feet, while dead-end corridors are permitted up to 20 feet per the MSBC. The existing building configuration appears to satisfy these provisions.

##### Egress Lighting and Exit Signs

The corridors and common space are served by occasional battery powered lights. A lights out test was not conducted to determine the appropriateness of the lamination. Exit signs are placed in accordance with code and are similarly served by battery backup power.

##### Wheelchair Egress

The building is not fully sprinklered; therefore, areas of refuge are required and provided in the stairways. The configuration appears to meet the requirements for code at the time of construction, but would not satisfy today's standards (specifically associated with latches on stair doors and lack of communication system).

### MEP ANALYSIS — TMP CONSULTING ENGINEERS

#### HEATING, VENTILATING AND AIR CONDITIONING

Building heating systems consist of two natural gas fired hot water boilers with primary and secondary hot water pumps. Classrooms are heated and ventilated with through-wall unit ventilators. Fin-tube radiation is used in some areas for heating. The preschool area added in 2002 is served by roof top units for the office areas and through-wall unit ventilators in the classrooms. The preschool area is fully air conditioned. All controls presently have pneumatic actuators with the compressor located in the Boiler Room.

In 2002 when the building underwent a renovation and the construction of the new preschool facility the boilers were replaced. Boilers are manufactured by H.B. Smith approximately (2) 3,500 MBH input each. Additional hot water pumps were added under the 2002 renovation. The four pumps added serve the preschool area, gymnasium and cafeteria. Three hot water pumps serve the existing 1967 portion of the school. The four pumps added during the renovation have variable speed drives. The heating system utilizes a pair of secondary pumps and zone control valves to supply to each zone in the building. It was noted that the zone control valves are not functioning and are set to 100% open all of the time.

The Cafeteria has through-wall unit ventilators with fin-tube radiation. The Kitchen area is heated by two cabinet unit heaters. The kitchen hood and Ansul fire suppression system was in good condition and had recently been upgraded. The Cafeteria has had issues with overheating and the unit vents are often turned off. The thermostat location in the Cafeteria was on farthest interior wall from the unit ventilators.

The Small Gymnasium is served by console unit ventilators with exposed pipe tunnels. The Large Gymnasium is served by a McQuay air handling unit with fresh air intake and a hot water coil.

The Auditorium is served by an air handling unit located in a raised room that is difficult to access above the stage. It was noted that the air handler has an AC coil, but has never functioned. It is impossible to occupy the Auditorium in cooling season due to the lack of cooling in the space.



## HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

### Observations/Comments

Replace Auditorium HVAC system with a system that is accessible and includes mechanical cooling.

Replace the (3) three existing hot water pumps due to age.

Issues with the pneumatic ATC system which compromise many control systems are being addressed in the ESCO program scheduled to be completed in the summer of 2014. We are being told that all pneumatic actuation will be replaced and some new DDC controls will be added to replace the pneumatic control system.

Original unit ventilators should be replaced due to equipment age.

The console unit ventilators in the Small Gym encroach upon the playing surface.

The Cafeteria thermostat should be relocated within +/- 10'-0" of exterior wall to address thermal gradient within space.

### ELECTRICAL

The existing building is fed underground from a utility company pad mount transformer. This underground service feeds a 208/120 volt, 2000 amp switchboard which was installed in the year 2002. This new switchboard then re-feeds the original building switchboard and associated distribution equipment located throughout the building. It was observed that a number of panelboards along with a motor control center appear to be original to the building.

The majority of lighting fixtures consist of recessed 2'x2' and 2'x4' acrylic lensed fixtures. These fixtures have all been upgraded recently with new lamps and ballast's and are in good condition.

The existing fire alarm system is the product of the Edwards Corporation and is an addressable system with one-way voice communication. Full smoke detector coverage is provided in the portion of the building that does not have sprinkler coverage. The system was installed in 2002 and appears to be regularly maintained.

There is a natural gas fired 85 KW emergency generator located in the building. This generator is original to the building and no longer operates.

As the generator no longer functions, battery operated ballast's have been installed in selected fixtures throughout the building in addition to battery packs. Exit signs consist of self-contained battery operated units. All equipment appears to be in good condition.

The existing clock, intercom and security systems have been installed within the past 10 years and appear to be regularly maintained and in good condition.

### Observations/comments

Consideration should be given to replacement of existing panelboards that are original to the building as replacement parts for this equipment are no longer available.

Replace existing generator with new to provide for emergency lighting and building freeze protection.

Remove existing Motor Control Center in boiler room and replace starters with VFD's wherever possible.

Replace plug-in CO detectors located in the Pre-school with hard wired devices connected to building fire alarm system.

Replace existing exterior incandescent light fixtures at loading dock that are no longer functional with new energy efficient fixtures.

Replace existing incandescent fixtures located in stairwell adjacent to auditorium with new energy efficient fixtures. Fixtures did not function at time of visit.

Consideration to be given to replacement of existing auditorium dimming system and theatrical lighting as this equipment appears original to the building and no longer fully functional.

Overall building electrical systems appear to be regularly maintained and in good condition for the age of the equipment.

Recommend installing occupancy sensors in all classrooms, offices, storage areas, restrooms, etc... to assist in conserving energy.

### PLUMBING AND DOMESTIC HOT WATER

The water service entrance is located in the Boiler Room. The building has 4" domestic water service with backflow preventer. The 800,000 Btu Lochinvar Knight Boiler and associated storage tank is two years old and functioning properly.

Water closets have flush valves.

### Observations/comments

No recommendations.

### FIRE PROTECTION

Building has 8" sprinkler main with a 4" wet distribution. Sprinkler service is located in the Boiler Room. The new addition of the building has sprinklers, but the original construction does not.

### Observations/comments

Consideration should be given to adding a sprinkler system throughout the original construction area of the building. In addition, it should be noted that any addition or substantial upgrade would require that a code compliant fire protection system be provided.

# HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

## MEP ANALYSIS --- TMP CONSULTING ENGINEERS

Town of Watertown  
School Facility Assessment Survey  
System: 11/19/02

Area: 102,692 sq. ft.  
Construction Date: 1967  
Renovation Date: 2002

Facility Contact: Jay Francisco  
Phone Available: NO  
(If in parenthesis refer to notes below)

Survey Date: 3/5/14  
Page 1 of 7

TMP CONSULTING ENGINEERS, INC.

Room #	System	Room Name	Room Number	Equipment			Substances			Notes
				Age	Condition	Material	Material	Material		
1	Water	Hot Water	Boiler Room	11	30	X				
2	Water	Boiler Room	Boiler Room	(1)	25	X	X			
3	Water	Boiler Room	Boiler Room	(2)	25	X				
4	Water	Boiler Room	Boiler Room	(3)	25	X				
5	Water	Boiler Room	Boiler Room	(4)	25	X				
6	Water	Boiler Room	Boiler Room	(5)	25	X				
7	Water	Boiler Room	Boiler Room	(6)	25	X				
8	Water	Boiler Room	Boiler Room	(7)	25	X				
9	Water	Boiler Room	Boiler Room	(8)	25	X				
10	Water	Boiler Room	Boiler Room	(9)	25	X				
11	Water	Boiler Room	Boiler Room	(10)	25	X				
12	Water	Boiler Room	Boiler Room	(11)	25	X				
13	Water	Boiler Room	Boiler Room	(12)	25	X				
14	Water	Boiler Room	Boiler Room	(13)	25	X				
15	Water	Boiler Room	Boiler Room	(14)	25	X				
16	Water	Boiler Room	Boiler Room	(15)	25	X				
17	Water	Boiler Room	Boiler Room	(16)	25	X				
18	Water	Boiler Room	Boiler Room	(17)	25	X				
19	Water	Boiler Room	Boiler Room	(18)	25	X				
20	Water	Boiler Room	Boiler Room	(19)	25	X				
21	Water	Boiler Room	Boiler Room	(20)	25	X				
22	Water	Boiler Room	Boiler Room	(21)	25	X				
23	Water	Boiler Room	Boiler Room	(22)	25	X				
24	Water	Boiler Room	Boiler Room	(23)	25	X				

- Notes:
- (1) Three pumps are original equipment (45 years) and two pumps were installed in 2002 (12 years)
  - (2) There are several valves for these pumps, storage age is 41-45 years
  - (3) Lack of control for many units was the cause of the problem
  - (4) The age of these units would suggest that they reached the normal end-of-service life
  - (5) It has been reported that asbestos may be in the boiler building.

- (6)
- (7)
- (8)
- (9)
- (10)

Town of Watertown  
School Facility Assessment Survey  
System: Plumbing & Fire Protection

Area: 102,692 sq. ft.  
Construction Date: 1967  
Renovation Date: 2002

Facility Contact: Jay Francisco  
Phone Available: NO  
(If in parenthesis refer to notes below)

Survey Date: 3/5/14  
Page 1 of 7

TMP CONSULTING ENGINEERS, INC.

Room #	System	Room Name	Room Number	Equipment			Substances			Notes
				Age	Condition	Material	Material	Material		
1	Plumbing	Hot Water	Boiler Room	2	20	X				
2	Plumbing	Hot Water	Boiler Room	(1)	20	X				
3	Plumbing	Hot Water	Boiler Room	(2)	20	X				
4	Plumbing	Hot Water	Boiler Room	(3)	20	X				
5	Plumbing	Hot Water	Boiler Room	(4)	20	X				
6	Plumbing	Hot Water	Boiler Room	(5)	20	X				
7	Plumbing	Hot Water	Boiler Room	(6)	20	X				
8	Plumbing	Hot Water	Boiler Room	(7)	20	X				
9	Plumbing	Hot Water	Boiler Room	(8)	20	X				
10	Plumbing	Hot Water	Boiler Room	(9)	20	X				
11	Plumbing	Hot Water	Boiler Room	(10)	20	X				
12	Plumbing	Hot Water	Boiler Room	(11)	20	X				
13	Plumbing	Hot Water	Boiler Room	(12)	20	X				
14	Plumbing	Hot Water	Boiler Room	(13)	20	X				
15	Plumbing	Hot Water	Boiler Room	(14)	20	X				
16	Plumbing	Hot Water	Boiler Room	(15)	20	X				
17	Plumbing	Hot Water	Boiler Room	(16)	20	X				
18	Plumbing	Hot Water	Boiler Room	(17)	20	X				
19	Plumbing	Hot Water	Boiler Room	(18)	20	X				
20	Plumbing	Hot Water	Boiler Room	(19)	20	X				
21	Plumbing	Hot Water	Boiler Room	(20)	20	X				
22	Plumbing	Hot Water	Boiler Room	(21)	20	X				
23	Plumbing	Hot Water	Boiler Room	(22)	20	X				
24	Plumbing	Hot Water	Boiler Room	(23)	20	X				

- Notes:
- (1) Mechanical ceiling area with grease, even as easily read. The hood is cleaned at regular intervals by fire Dept.
  - (2) Not all of the piping is original to building with the exception of the 2002 addition which was installed in 2002.
  - (3) Consideration should be given to extend existing coverage to the entire building complex.
  - (4) No fire pump installed.

- (5) It has been reported that there may be asbestos remaining in some of the mechanical system's insulation, asbestos of which is not detectable in debris.
- (6) Replacement replacement of original piping. No work required with the piping installed in 2002.

# HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

Watertown Public Schools  
Building Condition Survey

TMP Consulting Engineers, Inc.

School: Hosmer Elementary

Construction Date: 1963/2002

Survey Firm: TMP

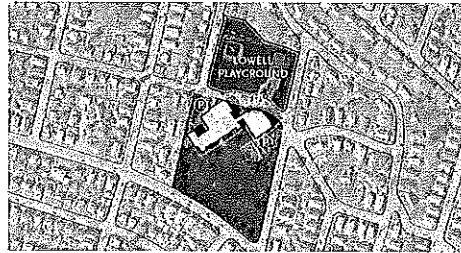
Survey Date: 3/9/14

Page 1 of 11

System	Equipment Model	Type	Service Location	Life Cycle			Use Status		Mechanical		Recommendation: A - Immediate, B - Elective, C - Verbal								
				Estimated Age	Expected Life	Notes	Operational	Standby	Code	Category	Work	Replace	Repair	Remarks					
1 Electrical																			
1.1 Service																			
1.1.1 Wiring	Code book		Developed from past years	22	40														
1.1.2 Equipment	Man. Switches &		Main Electric Room	12	10														
1.1.3 Busbar	1000L 200/150 WPI																		
1.2 Distribution																			
1.2.1 Panels	One 1hr		Throughout	47	40														
1.2.2 Panel Controls	Oil Filled Switch		Rec. Room	1	10														
1.2.3 Busbar	Conduit & wiring		Throughout	47	20														
1.2.4 Single Branching	Branching Boxes		Rec. Room	47	40														
1.3 Life Safety																			
1.3.1 Fire Alarm	City owned		Throughout	14	10														
1.3.2 Smoke Alar	Photo eye smoke		Throughout	7	5														
1.3.3 Fire Alarm Sw.	Chargeman		Developed from Master Bus	14	40														
1.4 Heating																			
1.4.1 Boilers																			
1.4.2 Radiators	Single		Throughout	17	40														
1.4.3 Radiators	Standard type		Throughout	17	40														
1.5 Lighting																			
1.5.1 Classroom	Recessed		Throughout	7	10														
1.5.2 Office	Recessed		Throughout	7	10														
1.5.3 Corridor	Recessed		Throughout	7	10														
1.5.4 Hall	Recessed		Throughout	7	10														
1.5.5 Restroom	Recessed		Throughout	47	10														
1.5.6 Restroom	Recessed		Throughout	47	10														
1.6																			
1.7																			
1.8																			

3.3 LOWELL SCHOOL

# LOWELL ELEMENTARY SCHOOL



### OVERVIEW

Lowell Elementary is located in Watertown's West End neighborhood. The 3-story, 45,500 SF building was originally constructed in 1927. The historic building, with its symmetrical façade, central cupola and generous front lawn, figures prominently in town atop a hill overlooking Orchard Street. A 3-story classroom wing and gymnasium were constructed in 1997, almost doubling the size of the school. The current school accommodates approximately 415 students (Pre-K through Grade 5) and 60 full and part time staff. The building sees heavy use after hours for extended day programs, Community Education and PTO functions.

Similar to Cunrieff, Lowell Elementary is generally a cheerful school with light-filled spaces and an efficient main entry with excellent visual supervision from the central office suite. Lowell also possesses a highly efficient and flexible classroom wing (i.e., the 1997 addition) with big spaces that are easy to subdivide. It's presence on the hill and ample outdoor spaces are also key virtues. The school has recently had great success implementing an outdoor learning garden and aspires to use outdoor program elements more regularly as teaching tools to promote "green" technologies and practices.

Lowell suffers, however, from increased enrollment and the lack of adequate teaching and support spaces. Every year the enrollment goes up and options are limited for expandability. Adding classroom space is not possible without compromising other program elements (the most plausible option for adding another classroom, for example, would be to displace an existing faculty lounge and a special education classroom). Moreover, with learning for roughly twenty percent of Lowell's student body structured by an Individualized Education Program (IEP) plan, the need to create individualized spaces for intimate learning wherever possible has burdened the entire building. The loss of the school's only conference room, which is now acting as a teaching space, is one example of the school's compromised functionality directly tied to increased enrollment and the demands of special education needs.

An additional deficiency at Lowell is its lack of an all-school meeting space. The cafeteria and gymnasium both often serve to accommodate large groups, but functions are uncomfortable and, in some instances, unsafe. There is no auditorium at Lowell and many large-occupancy functions have to be held off-site (the school has often booked the Watertown Middle School for large events). There is also the general disrepair and inflexibility of the original 1927 building. Old windows are, in many instances, inoperable or dangerously dysfunctional (one teacher recently had fingers crushed by a loose window

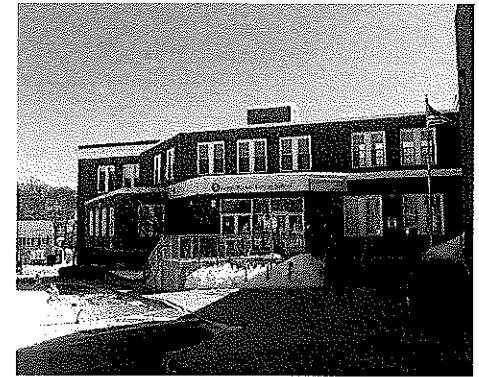
sash). Asbestos tile remains encapsulated below new floor finishes. Permanent wall locations make spaces difficult to reconfigure to meet current demands. Spaces are hard to retrofit with new technologies.

### SUMMARY OF FINDINGS

- Appears to be operating at or above full capacity. Classrooms are full and adding more classrooms would require the loss of a staff lounge and special education classroom.
- Shortage of support spaces (e.g., insufficient teaching and office space for special education, no conference room / meeting space).
- No auditorium. All-school events cannot be accommodated effectively and safely in the existing cafeteria and gymnasium.
- Limited parking (approximately 50 parking stalls distributed across three separate areas)
- Original 1927 building is in need of renovation. Windows are inoperable and/or unsafe. Room finishes are shopworn.

Location	Building Components	Square Feet	Students
175 Orchard St	1927 Wing	45,515	415
	1996 Wing & Gymnasium	39,085	
		84,600 total	204 sf/student

Qualitative Scoring	Building Physical Condition	School - Specific Criteria
	3.03 Total Grade (Weighted by SF of Building Portions)	2.97 Total Grade



LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY		
Waterlow Public Schools Lowell Elementary School		Date Constructed: 1927 Number of Floors: 3 Approx. Sq Ft: 85,000
Assessed By: JAT/ey		Reviewed By: BAG/abty
Assessment Date: 2/28/14		
Reservations and Major Maintenance:	1996 Addition: Gymnasium and program space addition to the north and east of original building, plus new windows and roofing throughout the addition and original 1927 Building.	
Wall System:	1927 Building: Clay brick mass masonry with decorative painted wood elements. 1996 Addition: Clay brick-clad cavity wall with decorative painted metal elements that mimic original building, and copper flash through-roof flashing.	
Window System:	All Building Areas: Punched, aluminum framed, hung windows with insulating glass units (IGUs) typical, except at large bay window at east side of the building that is custom w/ft, all reportedly installed in 1996.	
Door System:	All Building Areas: Entrances are aluminum framed steel/wood with IGUs reportedly installed in 1996.	
Roof System:	1927 Building: Fully-adhered EPDM at low-sloped areas installed in 1996. Slate over wood plank at steep sloped areas, which is reportedly original. 1996 Addition: Ballasted EPDM. Approximately 1,600 sq ft at library replaced in 2011.	
<b>Overall Building Performance</b>		
Reports of Bidding Enclosure Leakage/Distress:	Numerous leaks seemingly related to the roofing, which have been ongoing since its installation in 1996. Worst leakage occurs at the connection between the 1927 Building and 1996 Addition, as well as below a roof drain over the cafeteria.	
Overall Building Envelope Condition/ Major Concerns	A precast concrete band course element above a first-floor window, adjacent to a site stair is cracked longitudinally, and may be unstable; immediate hands-on investigation is necessary to determine if the element is unstable and re-secure as necessary. Exterior walls of the 1927 Building are in need of repointing throughout, but the 1996 Addition appears in sound. Wood elements require repainting, with some replacement necessary at the cupola. Windows are sound, but perimeter seals should be replaced in the near to mid-term to avoid water leakage and more significant deterioration. EPDM roofing membrane is in poor condition, and appears to be nearing the end of its useful life. Degrading and increased need for repair should be expected until it is replaced. Slate is deteriorated and damaged, but still seems to generally be performing except at isolated locations. The need for continued patching and isolated replacement is expected until the slate is replaced.	
<b>Component Condition (Rating 0 to 5)</b>		
Component	Rating	Comments
Walls	1	1927 Building: Mortar is severely weathered throughout with organic growth (Photo 1); localized repairs (repointing) exist at isolated areas throughout the building. Brick at the northwest corner near a parking lot is damaged (Photo 2). Corrosion is visible at lintels, and perovite mortar joint repairs exist above lintels at locations in areas that typically crack or deteriorate due to rust jacking (Photo 2). A precast concrete band course element above a first floor window, adjacent to a site stair is cracked longitudinally, and may be unstable (Photo 3); immediate hands-on investigation is necessary to determine if the element is unstable and re-secure as necessary. Brick below windows has grey staining, especially along south elevation (Photo 4). Brick and mortar joints are deteriorated below two missing downspouts along the south elevation (Photo 5). Transverse joints in exposed concrete band course elements are typically open and missing the mortar (Photo 6). Painted is peeling at decorative wood elements (Photo 7), and portions of the cupola are deteriorated (Photo 8). Efflorescence also exists at a site wall near the main entrance (Photo 9); no flashing exist between the brick masonry and cupola at site walls.
	5*	1996 Addition: Brick masonry and mortar joints are typically in good condition with minimal weathering (Photo 10). Lintels are galvanized steel, and there is no evidence of corrosion or deterioration at the lintels (Photo 10). Some of the metal cornice elements appear displaced (Photo 11). *Additional investigation is necessary to determine reason for metal cornice element displacement.
Penetrations	3	All Building Areas: Window and certain wall frames and glazing appears to be sound with only typical maintenance required. Perimeter seals are cracking and delaminated at many locations.
Doors	5	All Building Areas: Entrances generally appears to be in good condition with only typical maintenance required.
Roof	2 (EPDM) 2 (Slate)	All Building Areas: Adhered and Ballasted EPDM Roofs: Much of roof was covered with snow. Exposed EPDM appears to be in poor condition, unadhered near drains, with multiple patches and failed sealed joints (Photo 12 and Photo 13). Watertown Public Schools reported that leakage occurred at one drain location over the cafeteria (1927 Building), and they subsequently installed drain inserts at that location (Photo 12) plus other drains over the cafeteria and gymnasium (1996 Addition) roofs. Water leakage is reportedly ongoing. Membrane terminates at rising walls with an exposed metal termination bar and sealant (Photo 14). An attempted repair exists at one location, where an EPDM patch was adhered over the original roof termination, and higher up onto the brick masonry wall (Photo 14). EPDM installed above the 1927 Building wood cornice elements is counterflashed by copper flashing that is split and appears to be fastened through the roofing membrane (Photo 15); one such location is directly above a noted exterior leak. A drain strainer is damaged in the ballasted roof area (Photo 16) and roof ladders are badly rusted (Photo 17). Slate roof: Slate is weathered, and multiple slates are damaged or have been replaced throughout the roof area (Photo 18 and Photo 19). Wood planks generally appear in good condition with isolated locations of apparent water staining and one visible pin-hole of daylight through the system.

Building Envelope Condition Assessment Summary  
Lowell Elementary School

SGH Project No. 140268  
1/6

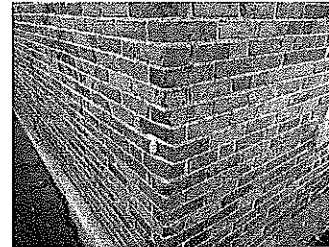


Photo 1  
Northeast corner of 1927 Building showing typical mortar condition and damaged brick.



Photo 2  
Corrosion of lintel and localized mortar joint repairs at 1927 Building.

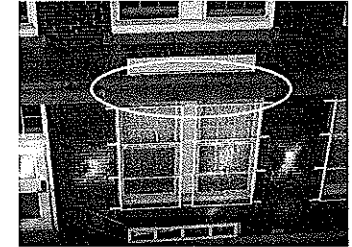


Photo 3  
Cracked and potentially unstable precast-concrete element above site stair of 1927 Building.

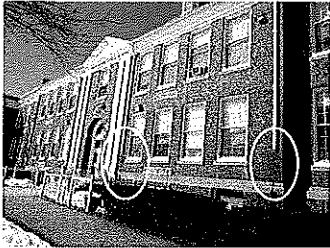


Photo 4  
Grey staining below windows at south elevation of 1927 Building.

Building Envelope Condition Assessment Summary  
Lowell Elementary School

SGH Project No. 140268  
2/6

LOWELL SCHOOL - ENGINEERING CONSIDERATIONS



**Photo 5**  
Missing / broken downspouts at south elevation and deteriorated masonry below.



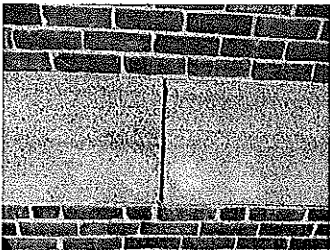
**Photo 7**  
Peeling paint at decorative wood elements of 1927 Building.



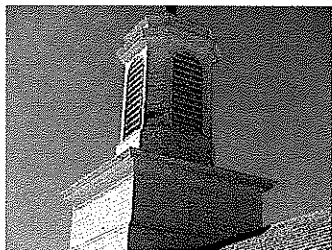
**Photo 9**  
Efflorescence at site wall.



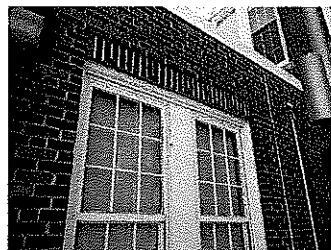
**Photo 11**  
Metal cornice elements appear displaced at 1996 Addition.



**Photo 6**  
Open transverse joint in concrete band element of 1927 Building.



**Photo 8**  
Damage at cupola.

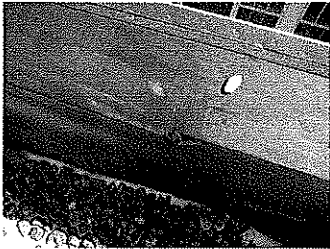


**Photo 10**  
1996 Addition window head condition. Lintel is galvanized steel and appears in good condition.



**Photo 12**  
Adhered EPDM roof with drain insert and multiple patches.

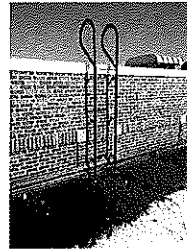
LOWELL SCHOOL - ENGINEERING CONSIDERATIONS



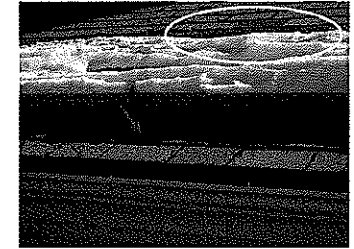
**Photo 13**  
Failed sealant repair at parapet.



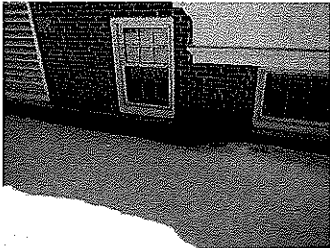
**Photo 15**  
EPDM installed over wood cornice elements of 1927 Building.



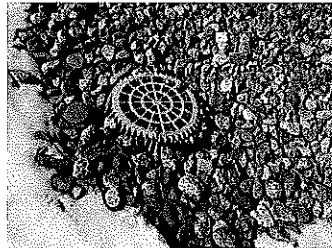
**Photo 17**  
Rusted roof ladder.



**Photo 19**  
Close-up of damaged slate (red arrow) and replaced slate (yellow circle).



**Photo 14**  
EPDM membrane termination at rising wall.



**Photo 16**  
Damaged drain strainer at ballasted roof area.



**Photo 18**  
Patched areas in slate roof.

## LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

### STRUCTURAL ANALYSIS — RSE ASSOCIATES

#### EXISTING STRUCTURE

Structural information on the existing building was obtained from incomplete existing structural drawings and a visit to the site by RSE on March 4, 2014. The existing building was built in two phases. The two-story original piece was constructed in 1927, and the two-story addition was added in 1996.

#### A10 FOUNDATIONS

##### A1010 Standard Foundations

Existing foundation at both portions consists of spread footings and concrete foundation walls.

The lowest floor slab is a concrete slab on grade.

#### B10 SUPERSTRUCTURE

The existing superstructure at the older building consists of multiple construction types. The first floor is supported by concrete encased steel columns and is a concrete beam supported slab. The second floor is constructed of steel beams with wood joist infill. There are slabs at the bathrooms and the exterior wall is load bearing masonry. Lateral resistance against wind and seismic loads is provided by masonry shear walls.

The addition is a steel framed building with concrete slab on metal deck floors. Lateral resistance against wind and seismic loads is provided by CMU shear walls.

#### EXISTING CONDITIONS

Existing structural conditions were sound with no items flagged for repair or further investigation.

### CODE AND LIFE SAFETY — COSENTINI ASSOCIATES

#### A. EXECUTIVE SUMMARY

The two-story plus basement Elementary School is classified as a low-rise building in accordance with the MSBC. The building is 84,600 GSF with a primary occupancy type of the building is Group E, Educational. The original 1927 structure along with 1996 addition results in a mixed construction type classification, where a MSBC designation of 2B necessitated given the unprotected steel framing.

The building is equipped with a fire alarm system with ADA compliant strobes in most public spaces. The fire alarm system reports directly to the local Fire Department via master box connection. The system is not monitored by a central station. Visual and audible appliances are provided in common corridors and large assembly areas. Smoke detection is provided in the corridors. The building is fully sprinklered, including a pre-action system in the attic.

The building is served by as many as 3 exit stairways and exit doorways that discharge directly to grade. The Slide B (main) entrance is accessible to the disabled. An elevator provides accessible routes to all main floor levels.

#### B. MEANS OF EGRESS

##### Components

The means of egress includes corridors of substantial construction that lead to exit stairway enclosures. With the installation of a retrofit sprinkler system, the pre-existing cross corridors have been appropriately decommissioned. The 36-inch stair doors are 60-min FRR and are equipped with self closers and latch. Exit doors leading to street level from assembly spaces include panic hardware. The enclosed exit stairways have a slope (tread to riser ratio) and railing configuration that appears to comply with the current code.

##### Egress Capacity, Number and Arrangement

All Floors are served by three exit stairways. The First Floor is served by doors directly to grade. The exits are remotely located and provide

adequate capacity based on the occupant load served. All floor areas are served by a minimum of two means of egress.

##### Travel Distance and Discharge from Exits

Travel distance limitation is 250 feet, while dead-end corridors are permitted up to 50 feet per the MSBC. The existing building configuration appears to satisfy these provisions.

##### Egress Lighting and Exit Signs

The corridors and common space are served by occasional battery powered lights. A lights out test was not conducted to determine the appropriateness of the lamination. Exits signs are placed in accordance with code and are similarly served by battery backup power.

##### Wheelchair Egress

The building is fully sprinklered; therefore, exit stairway landings can serve as accessible means of egress.

### MEP ANALYSIS — TMP CONSULTING ENGINEERS

#### BUILDING HEATING, VENTILATING AND AIR CONDITIONING

Building heating system consists of 2 Natural Gas Fired Boilers, hot water pumps with through the wall unit ventilators. The burners were replaced in 1996, and the boilers appear to be original to the building. The boilers are Weil McLein 2,320 MBH Input and are scheduled to be replaced this summer. Variable speed drives were recently added to the hot water pumps.

The Library has unit ventilators that have cooling with condensers located remotely on the roof.

The Cafeteria has an interior air handling unit located within an adjacent space, no cooling provided. The Kitchen is served by a horizontal unit ventilator mounted in the space. The kitchen hood and Anslul system was recently updated and in good condition.

The Gymnasium consists of an air handling unit mounted high in the space and two roof mounted exhaust fans.

The unit ventilators were replaced in the classrooms in 1996 when the addition was built. The classrooms have exhaust and are ducted to roof mounted exhaust fans.

#### Observation/Comments

Issues with the pneumatic ATC system which compromise many control systems are being addressed in the ESCO program scheduled to be completed in the summer of 2014. We are being told that all pneumatic actuation will be replaced and some new DDC controls will be added to replace the pneumatic control system.

The variable speed drives operating the hot water pumps can be reprogrammed to allow for energy efficiency.

Replace all unit ventilators over the age of 20 years.



**LOWELL SCHOOL - ENGINEERING CONSIDERATIONS**

**BUILDING PLUMBING AND DOMESTIC HOT WATER**

Water main is located in the Boiler Room. The domestic hot water heater consists of a Knight Boiler and an associated storage tank, which is approximately 3 years old and is operating properly. The building has low gas pressure. Building has two 2" domestic water distributions. Hot water is distributed via high-low mixing valve. The bathroom faucet fixtures are metering type. A grease separator exists in the Kitchen.

**Observation/Comments**

Install a gas booster to alleviate low gas pressure and if it affects system performance.

Replace plumbing fixtures

**FIRE PROTECTION**

Building has a sprinkler system with two alarm valves, one for the old section and one for the new section. Fire department hose connections are provided in the stairs. Service is located in the water service room off the Boiler Room. The Attic space has a dry sprinkler system.

**Observation/Comments**

Based on the age of the dry sprinkler system, the integrity of that system should be verified.

**ELECTRICAL**

The existing service is fed underground from a utility company pad mount transformer. This underground service feeds a 480/277 volt, 800 amp switchboard which was installed in 1996. This switchboard feeds panelboards and stepdown transformers located in electric closets throughout the building. The majority of this equipment was installed in 1996 and is in good condition.

The majority of lighting fixtures consist of 2'x2' and 2'x4' recess acrylic lensed fixtures. The fixtures have all recently been upgraded with new lamps and ballasts and are in good condition.

The existing fire alarm system is the product of Edwards Corporation and is an addressable system with no voice communication. The fire alarm control panel was installed in 2012 appears to be maintained regularly and in good condition.

There is no emergency generator for this building.

Emergency egress lighting consists of a combination of battery packs and remote mounted battery operated lighting fixtures.

**Observation/Comments**

Repair or replace all emergency lighting heads in gym, typical for six locations.

Provide occupancy sensors in all classrooms, restrooms, offices, etc..

Classrooms currently contain a fire alarm audio unit only. Recommend replacing with combination audio/visual units to be ADA compliant.

**MEP ANALYSIS — TWP CONSULTING ENGINEERS**

Town of Watertown School Facility Assessment Survey  
 Building: Lowell Elementary School  
 System: HVAC  
 Area: 24,600 sq. ft.  
 Construction Date: 1977  
 Renovation Date: 1996  
 Facility Controls by Brand/Date: Please Attach to CD or to permit set for the same building  
 Survey Date: 3/5/14  
 TWP CONSULTING ENGINEERS, INC.  
 Page 1 of 1

System	Equipment	Location	Quantity	Condition			Performance			Controls					
				Good	Fair	Poor	Compliance	Efficiency	Reliability	Brand	Year	Notes			
1	Boiler	Boiler Room	01	X											
2	Water Main	Boiler Room	1	X											
3	Water Main	Boiler Room	1	X											
4	Water Main	Boiler Room	1	X											
5	Water Main	Boiler Room	1	X											
6	Water Main	Boiler Room	1	X											
7	Water Main	Boiler Room	1	X											
8	Water Main	Boiler Room	1	X											
9	Water Main	Boiler Room	1	X											
10	Water Main	Boiler Room	1	X											
11	Water Main	Boiler Room	1	X											
12	Water Main	Boiler Room	1	X											
13	Water Main	Boiler Room	1	X											
14	Water Main	Boiler Room	1	X											
15	Water Main	Boiler Room	1	X											
16	Water Main	Boiler Room	1	X											
17	Water Main	Boiler Room	1	X											
18	Water Main	Boiler Room	1	X											
19	Water Main	Boiler Room	1	X											
20	Water Main	Boiler Room	1	X											
21	Water Main	Boiler Room	1	X											
22	Water Main	Boiler Room	1	X											
23	Water Main	Boiler Room	1	X											
24	Water Main	Boiler Room	1	X											
25	Water Main	Boiler Room	1	X											
26	Water Main	Boiler Room	1	X											
27	Water Main	Boiler Room	1	X											
28	Water Main	Boiler Room	1	X											
29	Water Main	Boiler Room	1	X											
30	Water Main	Boiler Room	1	X											
31	Water Main	Boiler Room	1	X											
32	Water Main	Boiler Room	1	X											
33	Water Main	Boiler Room	1	X											
34	Water Main	Boiler Room	1	X											
35	Water Main	Boiler Room	1	X											
36	Water Main	Boiler Room	1	X											
37	Water Main	Boiler Room	1	X											
38	Water Main	Boiler Room	1	X											
39	Water Main	Boiler Room	1	X											
40	Water Main	Boiler Room	1	X											
41	Water Main	Boiler Room	1	X											
42	Water Main	Boiler Room	1	X											
43	Water Main	Boiler Room	1	X											
44	Water Main	Boiler Room	1	X											
45	Water Main	Boiler Room	1	X											
46	Water Main	Boiler Room	1	X											
47	Water Main	Boiler Room	1	X											
48	Water Main	Boiler Room	1	X											
49	Water Main	Boiler Room	1	X											
50	Water Main	Boiler Room	1	X											

Notes:  
 (1) It was reported that the boiler replaced in 1996, however original to building. The boiler was scheduled to be replaced sometime in 2011.  
 (2) Each of several dry emergency exits can be found in the Classroom/Boiler Room.  
 (3) It has been noted that some of the piping and/or boiler room piping locations may be in violation of some state, national or other codes.

LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

Town of Waterville  
School Facility Assessment Survey

Building: Lowell Elementary School  
System: Plumbing & Fire Protection

Area: 84,600 sq. ft. Construction Date: 1927  
Renovation Date: 1996

Facility Contact: Jay Francisco  
Phone: 603/852-1600  
E-mail: jayfranc@townofwaterville.com

Survey Date: 3/5/14

TME CONSULTING ENGINEERS, INC. Page 1 of 1

Item #	System	Type	Location	Life cycle replacement percentage	Condition			Sub-System	Remarks	Priority
					Good	Fair	Poor			
1	Overhead Air Handler & Motor Room	Split System	Boiler Room	2	20		X			
2	Boiler	Cast Iron & Copper	Boiler Room	10	50		X	X		
3	Boiler	Hot Water	Boiler Room	12	55		X			
4	Boiler	Hot Water	Boiler Room	17	10		X			
5	Boiler	Hot Water	Boiler Room	7	20		X			

Notes:  
 (1) All metal roofing done with galvne, even on eave metal. The boots are drawn up the flange & secured by 2x4  
 Deck.  
 (2) Most of the piping is original to building with the exception of the 1996 4" hot water main replacement  
 (3) No fire pump required

(1) It has been reported that due to a leak in the boiler room, the boiler room is in need of a new boiler. The boiler room is in need of a new boiler. The boiler room is in need of a new boiler.  
 (2) It was reported that the building has low gas pressure. Installing a gas booster pump would be a good idea.  
 (3) It was reported that the building has low gas pressure. Installing a gas booster pump would be a good idea.  
 (4) It was reported that the building has low gas pressure. Installing a gas booster pump would be a good idea.  
 (5) It was reported that the building has low gas pressure. Installing a gas booster pump would be a good idea.  
 (6) It was reported that the building has low gas pressure. Installing a gas booster pump would be a good idea.  
 (7)  
 (8)

Waterville Public Schools  
Building Condition Survey

School: Lowell Elementary

Survey Issue: TME

Construction Date: 1927/1996

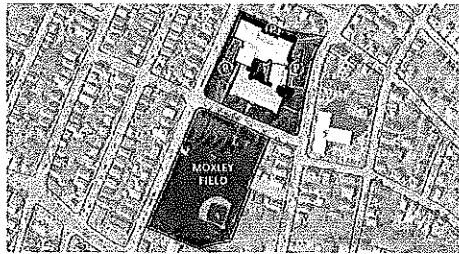
Survey Date: 3/5/14

TME Consulting Engineers, Inc. Page 1 of 1

Item #	System	Type	Location	Life cycle replacement percentage	Condition			Sub-System	Remarks	Priority
					Good	Fair	Poor			
1	Service									
2	Service	Underground	Underground from old main	15	40		X			
3	Service	Underground	Main from down	15	40		X			
4	Service	Underground	Main from down	15	40		X			
5	Service	Underground	Main from down	15	40		X			
6	Service	Underground	Main from down	15	40		X			
7	Service	Underground	Main from down	15	40		X			
8	Service	Underground	Main from down	15	40		X			
9	Service	Underground	Main from down	15	40		X			
10	Service	Underground	Main from down	15	40		X			
11	Service	Underground	Main from down	15	40		X			
12	Service	Underground	Main from down	15	40		X			
13	Service	Underground	Main from down	15	40		X			
14	Service	Underground	Main from down	15	40		X			
15	Service	Underground	Main from down	15	40		X			
16	Service	Underground	Main from down	15	40		X			
17	Service	Underground	Main from down	15	40		X			
18	Service	Underground	Main from down	15	40		X			
19	Service	Underground	Main from down	15	40		X			
20	Service	Underground	Main from down	15	40		X			
21	Service	Underground	Main from down	15	40		X			
22	Service	Underground	Main from down	15	40		X			
23	Service	Underground	Main from down	15	40		X			
24	Service	Underground	Main from down	15	40		X			
25	Service	Underground	Main from down	15	40		X			

3.4 MIDDLE SCHOOL

# WATERTOWN MIDDLE SCHOOL



OVERVIEW

Watertown Middle School is located in the West End neighborhood on Waverley Avenue. The building currently accommodates 575 students in grades 6-8 and approximately 60 full and part-time teachers and staff. The original three-story, 78,000 square-foot building was constructed on Bemis Street in 1922 and stands as the oldest of all facilities still in operation in the School District. A three-story classroom wing was added in the 1950s and a two-story classroom wing with a cafeteria added in the 1960s. A large renovation/expansion in 1998 brought the total size of the building to 132,000 square feet and included a new auditorium and gymnasium. The 1998 project also relocated the main entrance to Waverley Street and established an outdoor courtyard in the middle of the school building. Of all of Watertown's active schools, the Middle School is the only one currently operating below full capacity (note: the school has the potential to hold as many as 100 additional students, which raises an important town-wide question as to whether or not it makes sense to decouple the 5<sup>th</sup> grade classrooms from Hosmer, Lowell and Cumrill elementary schools and combine them with Grades 6-8 at the Middle School).

The elongated, double-height entrance lobby hints at some of the School's most serious challenges, which include its inability to graciously receive students and visitors to the school, its fundamental failing as a poorly navigable school and its lack of a true "center" or point of arrival. There are few visual cues in the lobby to guide students and visitors to a given destination. What's more, the main entrance cannot be visually monitored from a central office suite and as a result the School has resorted to adding a small security desk in the lobby. Multiple building additions over the years have created a series of awkward level changes that make access and wayfinding between spaces and wings of the building very difficult. In fact, level changes in the Middle School are so difficult to navigate, that it is not unusual for Sixth Graders to get lost in their new building a month or two into the school year.

SUMMARY OF FINDINGS

- Poor sense of arrival and visual supervision at entrance lobby.
- Level change / access between classroom wings is problematic. Wayfinding between spaces is challenging.
- Limited parking
- Lacks small spaces for specialized one-on-one and small group instruction.
- Insufficient laboratory space
- Original 1922 building possesses historical details worthy of preservation.
- Old windows and replacement linoleum flooring are examples of major ongoing maintenance concerns in the 1922 wing that are costing more and more money each year. Linoleum floor tiles are in very poor condition and are constantly peeling/delaminating from the plywood substrate.
- Former auditorium in 1922 wing is now the library. Former stage is now a reading space that is inaccessible to handicapped patrons. A suspended acoustic tile ceiling in the library conceals an overly generous plenum space that could be converted to upper floor space.
- Underutilization of the outdoor courtyard is directly attributable to acoustics. Children in courtyard have been found to be too noisy during class time.
- Significant water infiltration issues in cafeteria and gymnasium.
- The school's auditorium is one of the more successful spaces in the school district.



Location	Building Components	Square Feet	Students
68 Waverley Ave	1922 Wing	78,445	575
	1950 Addition		
	1960 Addition		
	1998 Wing	54,965	

133,410 total      232 sf/student

Qualitative Scoring	Building Physical Condition	School - Specific Criteria
	3.08 Total Grade (Weighted by SF of Building Portions)	2.73 Total Grade

## MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

### BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY										
<table border="1"> <tr> <td>Watertown Public Schools Watertown Middle School</td> <td>Date Constructed: 1922</td> <td>Assessed By: JAT/ey</td> </tr> <tr> <td></td> <td>Number of Floors: 2-3</td> <td>Reviewed By: BAGabby</td> </tr> <tr> <td></td> <td>Approx. Sq. Ft.: 134,000</td> <td>Assessment Date: 7/28/14</td> </tr> </table>		Watertown Public Schools Watertown Middle School	Date Constructed: 1922	Assessed By: JAT/ey		Number of Floors: 2-3	Reviewed By: BAGabby		Approx. Sq. Ft.: 134,000	Assessment Date: 7/28/14
Watertown Public Schools Watertown Middle School	Date Constructed: 1922	Assessed By: JAT/ey								
	Number of Floors: 2-3	Reviewed By: BAGabby								
	Approx. Sq. Ft.: 134,000	Assessment Date: 7/28/14								
<p><b>Address, Renovations, and Major Maintenance:</b></p>	<p>1998 Addition: Gymnasium, auditorium, and program space addition to the north and east of original building, plus new roofing throughout the addition and original 1922 Building.</p> <p>2010-11: Repointed brick masonry along the west, south, and east elevations of the 1922 Building.</p>									
<b>Wall System:</b>	<p>1922 Building: Clay brick mass masonry</p> <p>1998 Addition: Clay brick and cavity wall with cast stone accent elements. No through-wall flashing is visible (i.e. it does not dry right).</p>									
<b>Window System:</b>	<p>1922 Building: Punched, aluminum framed, with fixed and project-in hopper windows and single pane glass or metal panels typical. Aluminum framed storefront at stairs/decks.</p> <p>1998 Addition: Aluminum framed punched windows and window-wall assemblies with project-out awning operable vents, and insulating glass units (IGUs).</p>									
<b>Door System:</b>	All Building Areas: Entrances are aluminum framed storefront with IGUs reportedly installed in 1998.									
<b>Roof System:</b>	<p>1922 Building: Fully adhered EPDM at low-sloped areas, except for at cafeteria area which is ballasted EPDM. All roofing membranes were reportedly installed in 1998.</p> <p>1998 Addition: Ballasted EPDM, except fully adhered EPDM at the entrance canopy and white thermoplastic (appears to be PVC or TPO) at cafeteria extension.</p>									
<b>General Building Performance</b>										
<b>Reports of Building Envelope Leakage/Distress:</b>	Ongoing water leakage into gymnasium from roof, typically at mechanical equipment and parapets (school currently has issued a statement of interest to replace roof). Water leakage reported at connections between new and old building. Water infiltration issues along north gym elevation due to steep grade (grading lot previously at this location reportedly used to flood). Ventilators are installed and run continuously below bleachers along this wall to remove moisture.									
<b>Overall Building Envelope Condition / Major Concerns:</b>	Spalling brick masonry and significant deterioration of cast stone elements is indicative of severe weathering, a source of potential water infiltration. Metal flashing should be considered in the near term to improve water management at 1922 Building and mitigate future damage. Rusting at joints at 1998 Addition indicate they are starting to deteriorate, and likely require repairs in the next 5-10 yrs. Windows and doors installed in 1998 are generally in good condition, but windows in the 1922 building are at the end of their useful life and should be replaced in the next 5 yrs. Perimeter seals around windows are in need of replacement. Roof is generally in fair condition, although is beginning to show signs of aging. Repairs are needed at areas of currently known leakage, but otherwise we expect this roof will continue to function for another 5-10 yrs with typical maintenance and minor repairs.									
<b>Component Condition (Rating 0 to 5)</b>										
<b>Comments</b>	<b>Rating</b>									
<b>Walls:</b>	<p>3 1922 Building: Free spalling of brick, most notably along north elevation (Photo 1). Mortar is typically sound where repointed, except for a few isolated locations where we observed spalling and cracking mortar (Photo 2). Cast stone band course and cornice elements are typically stained and the finish is deteriorated exposing aggregate, especially at exposed protrusions, sky-facing areas, and horizontal joints (Photo 3). Multiple spalls exist in the cast stone elements throughout the building, where some have been repaired and others haven't (Photo 3 and Photo 4). Transverse joints are severely deteriorated or missing. Sealant is installed at joints in the cast stone at the window perimeters (Photo 5). Concrete below grated windows at the ground floor level are rust-stained and spalling (Photo 6).</p> <p>4 1998 Addition: Brick masonry and mortar are generally sound. Rusting of lintels is evident at isolated locations throughout (Photo 7).</p>									
<b>Windows:</b>	<p>2 1922 Building: Windows appear to be at the end of their useful life. Window frames are worn, and glazing is failing (Photo 8). Liquid sealants applied over frame joints are consistent with previously attempted repairs (Photo 9).</p> <p>4 1998 Addition: Windows are sound with only typical maintenance required. Perimeter seals are crazed, and debonded at isolated locations indicating they are nearing the end of their useful life (Photo 10).</p>									
<b>Doors:</b>	5 All Building Areas: Doors are sound good condition. We observed a broken and missing sweep at one door (Photo 11).									
<b>Roof:</b>	3 All Building Areas: Exposed roof areas appear to be in fair condition, with minimal patches and localized unshaded areas. Membrane is bridging at edge of gymnasium roof (Photo 12). HVAC units above ongoing leakage in gymnasium are old and rusted (Photo 13). Base flashing at HVAC units is corroded (flashed by a metal flashing that is face-fastened (Photo 13). Typical termination detail at 1922 rising walls is a face-fastened and sealed termination bar (Photo 14) compared to through-wall flashing at the 1998 Addition (Photo 13).									



Photo 1  
Face-spalled brick at 1922 Building.

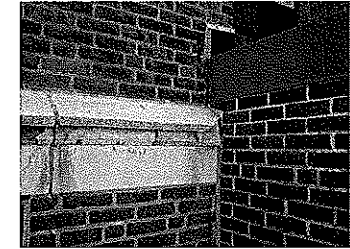


Photo 3  
Spalled and deteriorating cast stone water table.

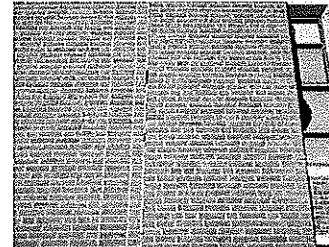


Photo 2  
Cracked and missing mortar in repointed masonry area.

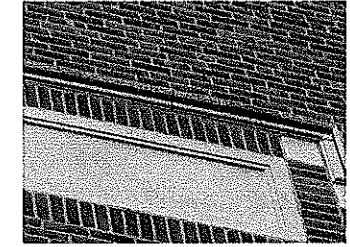
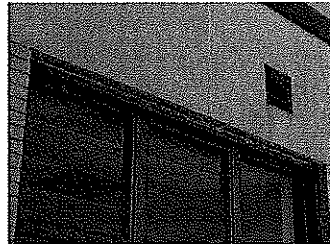


Photo 4  
Repaired spall in cast stone element.

MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS



**Photo 5**  
Sealant installed at cast stone joints at window surround.



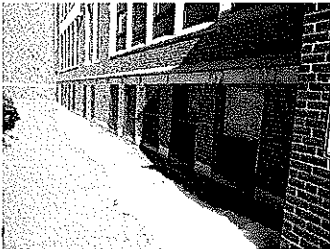
**Photo 7**  
Isolated rusting of Encl in 1990 Addition.



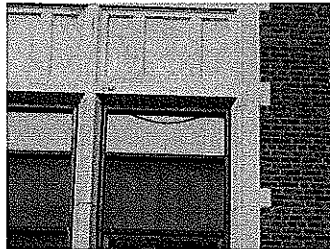
**Photo 9**  
Face seal repairs at window frames of 1922 Building.



**Photo 11**  
Broken and missing sweep at entrance door.



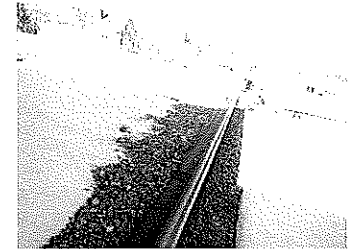
**Photo 6**  
Rust staining and deterioration of concrete elements below grated windows at ground floor.



**Photo 8**  
Failed glazing at window spandrel panel in 1922 Building.



**Photo 10**  
Close-up of perimeter sealant crazing and debonding at corner.

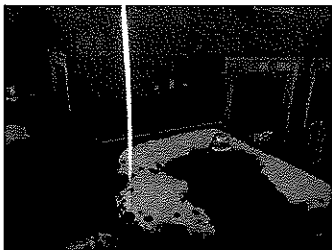


**Photo 12**  
Bridging EPDM at expansion joint along gymnasium roof eaves (near location of known leakage).

## MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS



**Photo 13**  
HVAC unit above known leakage in Gymnasium.



**Photo 14**  
Face-fastened and sealed termination bar detail at rising wall.

### STRUCTURAL ANALYSIS — RSE ASSOCIATES

#### EXISTING STRUCTURE

Structural information on the existing building was obtained from incomplete existing structural drawings and a visit to the site by RSE on March 4, 2014. The existing building was built in multiple phases.

#### A10 FOUNDATIONS

##### A1010 Standard Foundations

Existing foundations throughout appear to consist of spread footings and concrete foundation walls.

The lowest floor slab is a concrete slab on grade.

#### B10 SUPERSTRUCTURE

The existing superstructure varies. In the oldest portion dating from 1922, it appears to be wood planks on steel beams with masonry load bearing walls. Newer construction includes steel framing with concrete slab on deck. CMU shear walls and moment frames provide lateral resistance in some portions. Roofs over open areas such as the gymnasium are open web steel joists.

#### EXISTING CONDITIONS

Some conditions were observed which may require remediation.

- Vinyl floor tiles in the oldest portion of the school are not compatible with the flexible nature of the wood floors and tend to loosen or crack over time.

### CODE AND LIFE SAFETY — COSENTINI ASSOCIATES

#### A. EXECUTIVE SUMMARY

The three-story Middle School is classified as a low-rise building in accordance with the MSBC. The building is 133,000GSF with a primary occupancy type of the building is Group E, Educational. The original 1922 structure along with 1998 addition results in a mixed construction type classification, where a MSBC designation of 3B necessitated given the wood framing.

The building is equipped with a fire alarm system with ADA compliant strobes in most public spaces. The fire alarm system reports directly to the local Fire Department via master box connection. The system is not monitored by a central station. Visual and audible appliances are provided in common corridors and large assembly areas. Smoke detection is provided throughout the building. The building is generally sprinklered, however only two sprinkler heads are provided in each classroom of the 1922 structure.

The building is served by as many as 6 exit stairways and exit doorways that discharge directly to grade. The Side A (main) entrance is accessible to the disabled. Two (2) elevators provide accessible routes to all main floor levels. That said, there are some challenging floor level changes that occur given the interconnection between original construction and new addition that results in a confusing experience for the disabled.

#### B. MEANS OF EGRESS

##### Components

The means of egress includes corridors of substantial construction that lead to exit stairway enclosures. The corridors are segregated by way of cross-corridor doors (wired glass; no UL label) that are equipped with self closers and no latch. The 36-inch stair doors are 90-min FRR and are equipped with self closers and latch. Exit doors leading to street level from assembly spaces include panic hardware. The enclosed exit stairways have a slope (tread to riser ratio) and railing configuration that appears to comply with the current code.

##### Egress Capacity, Number and Arrangement

## MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

The Second Floor is served by four exit stairways. The First Floor is served by six exit stairways. The Ground Floor is served by two exit stairs and doors directly to grade. The exits are remotely located and provide adequate capacity based on the occupant load served. All floor areas are served by a minimum of two means of egress.

### Travel Distance and Discharge from Exits

Travel distance limitation is 200 feet, while dead-end corridors are permitted up to 20 feet per the MSBC. The existing building configuration appears to satisfy these provisions.

### Egress Lighting and Exit Signs

The corridors and common space are served by occasional battery powered lights. A lights out test was not conducted to determine the appropriateness of the lamination. Exit signs are placed in accordance with code and are similarly served by battery backup power.

### Wheelchair Egress

The building is not fully sprinklered; therefore, areas of refuge are required and provided in the stairways. The configuration appears to meet the requirements for code at the time of construction, but would not satisfy today's standards (specifically associated with latches on stair doors and lack of communication system).

## MEP ANALYSIS — TMP CONSULTING ENGINEERS

### BUILDING HEATING, VENTILATING AND AIR CONDITIONING

Building heating system consists of 2 Natural Gas Fired Boilers, hot water pumps with through the wall unit ventilators. The boilers are manufactured by Weil McLain. The main office area, library and auditorium are cooled with roof top units.

The Cafeteria is served by an interior air handling unit. The units have electric actuators. The kitchen hood and Ansul system was recently updated and in good condition.

The Small Gymnasium is served from an air handling unit with a hot water coil mounted high in the space. The Large Gymnasium is served by Rooftop units which are scheduled to be replaced next summer for new units with cooling.

The Auditorium is served by a rooftop unit that has cooling and appears to be functioning adequately.

The unit ventilators throughout the building had a jockey pump added to the system reportedly to prevent the coils from freezing. Prior to the installation of the jockey pumps this was a widespread problem. The exhaust air in each classroom is ducted to roof mounted exhaust fans.

### Observation/Comments

Issues with the pneumatic ATC system which compromise many control systems are being addressed in the ESCO program scheduled to be completed in the summer of 2014. We are being told that all pneumatic actuation will be replaced and some new DDC controls will be added to replace the pneumatic control system.

Although the pump added to the unit ventilators seemingly prevents freezestats from tripping, the sequence of operation for this freeze protection is unknown and should be investigated further for energy efficiency.

### BUILDING PLUMBING AND DOMESTIC HOT WATER

The 4" water main is located in the Boiler Room. The domestic hot water consists of a Knight Boiler and associated storage tank which is approximately

3 years old and is operating properly. Hot water is distributed via a high-low mixing valve. Bathroom fixture faucets are mostly metering type. A grease separator exists in the Kitchen.

### Observation/Comments

Recommend replacing plumbing fixtures with new water conservation type plumbing fixtures.

A low gas pressure situation seems to require a gas booster, similar to other Watertown Schools.

### FIRE PROTECTION

The new building is fully sprinkled and the old building is partially sprinkled. The building has a 6" sprinkler system and 4" distribution.

### Observation/Comments

Consideration should be given to adding a sprinkler system throughout the original construction area of the building. In addition, it should be noted that any addition or substantial upgrade would require that a code complaint fire protection system be provided.

### ELECTRICAL

The existing building is fed underground from a utility company pad mount transformer. This underground service feeds a 480/277 volt, 1600 amp switchboard which was installed in 1999. This switchboard feeds panelboards and step down transformers located throughout the building. The majority of this equipment was also installed in 1999 and is in good condition.

The majority of lighting fixtures consist of 2'x2' and 2'x4' acrylic lensed fixtures. The fixtures have all been upgraded recently with new lamps and ballast's and are in good condition.

The existing fire alarm system is the product of the Edwards Corporation and is an addressable system with no voice communication. Portions of the building have sprinkler coverage and is supplemented with smoke detector coverage in corridors and stairs. Remaining portion of the building that does not have

sprinkler coverage is provided smoke detectors. Smoke detector coverage in non-sprinkled areas does not appear to provide adequate coverage. It was noted during our walk through that at least one classroom had no sprinklers or smoke detectors. The system in general was installed in 2002 and appears to be regularly maintained.

There is no emergency generator for this building.

Emergency lighting consist of a combination of battery packs and remote mounted heads. Exit signs consist of self-contained battery operated units. All equipment appears to be in good condition.

The existing clock, intercom and security system have been installed in the past to years and appear to be regularly maintained and in good condition.

### Observation/Comments

Install at a minimum smoke or heat detectors in all classrooms or other spaces that do not have sprinkler coverage.

Special reference is made to replacing panels in the boiler room that are original to the building. In general consideration should be given to replacing any remaining existing panels that are original to the building as replacement parts for this equipment is no longer available.

Recommend installing occupancy sensors in classrooms, offices, restrooms and storage areas to supplement the corridor sensors.

Existing exterior lighting is controlled by a panel which has the capability to be connected to the building automation system. This panel has not been connected to this system, recommend when automation system is installed that this panel be connected to allow for control of the exterior lighting from this system.

MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

MEP ANALYSIS — TMP CONSULTING ENGINEERS

Town of Watertown  
School Facility Assessment Surveys  
Building: Middle School  
System: HVAC

Area: 137,410 sq. ft.  
Construction Dates: 1972  
Renovation Dates: 1998

Facility Contacts: Jay Francisco  
Plans Available: NO  
(If in parentheses refer to notes below)

Survey Date: 3/5/14  
Page 7 of 11

TMP CONSULTING ENGINEERS, INC.

System	Equipment	Description	Size (sq ft)	Year	Condition	Notes	Code Compliance													
							International Mechanical Code (IMC)	International Fire Code (IFC)	International Building Code (IBC)	International Energy Conservation Code (IECC)										
1	Boiler	Hot Water	38	80	X		X													
2	Pump (Boiler-Driven)	Chilled Water	7	23	X		X													
3	Chiller	Chilled Water	18	80	X															
4	Chilled Water	Chiller	20	23	X	X	Control wires			A, C, D										
5	Controls	Boiler/Chiller	100	30	X	X	Chilled water			A										
6	Control Unit	Boiler	10	23	X					A, C, D										
7	Hot Water Unit	Boiler	10	80	X					A, C										

- Notes:
- (1) It was reported that the boilers were replaced in 1998.
  - (2) Lack of control for many units can be traced to the Control deficiencies.
  - (3) It was reported that the Large Open is served by RTU's made obsolete to be replaced sometime in 2018.

- (4)
- (5)
- (6)
- (7)
- (8)
- (9)
- (10)
- (11)
- (12)
- (13)
- (14)
- (15)
- (16)
- (17)
- (18)
- (19)

Town of Watertown  
School Facility Assessment Surveys  
Building: Middle School  
System: Plumbing & Fire Protection

Area: 137,410 sq. ft.  
Construction Dates: 1972  
Renovation Dates: 1998

Facility Contacts: Jay Francisco  
Plans Available: NO  
(If in parentheses refer to notes below)

Survey Date: 3/5/14  
Page 8 of 11

TMP CONSULTING ENGINEERS, INC.

System	Equipment	Description	Size (sq ft)	Year	Condition	Notes	Code Compliance													
							International Mechanical Code (IMC)	International Fire Code (IFC)	International Building Code (IBC)	International Energy Conservation Code (IECC)										
1	Water Meter	Water Meter	2	20	X															
2	Water Meter	Water Meter	10	20	X															
3	Water Meter	Water Meter	10	20	X															
4	Water Meter	Water Meter	10	20	X															
5	Water Meter	Water Meter	10	20	X															

- Notes:
- (1) Metered cooling down with green, cover an empty tank. The boiler was checked at by the tenants directly by fire Dept.
  - (2) Allow for the piping to extend to building with the exception of the 1998 addition to the east facade.
  - (3) No fire pump required.

- (4) It was reported that there may be an issue regarding a case of the mechanical system's condition. Absence of a case that is not able to check.
- (5) It was reported that the building has low gas pressure. Installing a gas booster pump could solve the problem.
- (6) Check drawings about the plan to extend the piping to the main building.
- (7) Recommended several types of pipe to be used in the piping system in 1998.



MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

Watertown Public Schools  
 Building Condition Survey  
 School: Watertown Middle School  
 Survey Year: 2016

TMP Consulting Engineers, Inc.

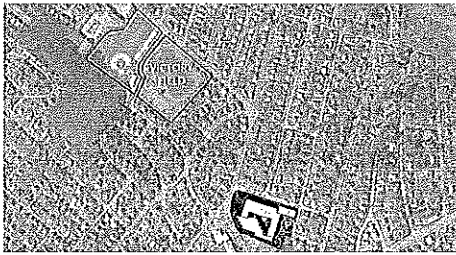
Construction Date: 1920/1998  
 Survey Date: 3/5/16

Page 1 of 1

System	Item #	Component Name	Type	Description	Life Cycle		Condition		Deficiencies		Recommendation: A - Immediate, B - Elective, C - Essential									
					Estimated Age	Reported Age	Obs	Code	Structural	Functional	Operational	Code	Priority	Remarks						
Electrical	11	Electric																		
	11.1	Wiring	Unorganized	Unorganized, Run past doors	18	20														
	11.2	Electric	Utility Substation	Lean Electric Room	18	49														
	11.3	Wiring	1001 & 1023/11-11/11																	
	11.4	Disconnection	Car. Air	Missing box	18	49														
	11.5	Electric Controls	11/11	Electric Room		18	29													
	11.6	Wiring	Overhead wiring	Missing box	18	39														
	11.7	Wiring		Missing box	18	39														
	11.8	Lighting	Lighting	Missing box	18	39														
	11.9	Wiring	Lighting	Missing box	18	39														
Mechanical	12	Plumbing																		
	12.1	Plumbing	Plumbing	Plumbing	18	49														
	12.2	Plumbing	Plumbing	Plumbing	18	49														
	12.3	Plumbing	Plumbing	Plumbing	18	49														
	12.4	Plumbing	Plumbing	Plumbing	18	49														
	12.5	Plumbing	Plumbing	Plumbing	18	49														
	12.6	Plumbing	Plumbing	Plumbing	18	49														
	12.7	Plumbing	Plumbing	Plumbing	18	49														
	12.8	Plumbing	Plumbing	Plumbing	18	49														
	12.9	Plumbing	Plumbing	Plumbing	18	49														
HVAC	13	HVAC																		
	13.1	HVAC	HVAC	HVAC	18	49														
	13.2	HVAC	HVAC	HVAC	18	49														
	13.3	HVAC	HVAC	HVAC	18	49														
	13.4	HVAC	HVAC	HVAC	18	49														
	13.5	HVAC	HVAC	HVAC	18	49														
	13.6	HVAC	HVAC	HVAC	18	49														
	13.7	HVAC	HVAC	HVAC	18	49														
	13.8	HVAC	HVAC	HVAC	18	49														
	13.9	HVAC	HVAC	HVAC	18	49														

3.5 HIGH SCHOOL

# WATERTOWN HIGH SCHOOL



OVERVIEW

Watertown High School is the largest facility in the School District. The building serves approximately 750 students (Grades 9-12) and between 75-100 full and part-time teachers and staff. The original three-story, 93,000 square-foot building was constructed in 1929. Building additions constructed in 1950, 1979 and 2004 established the School's outdoor courtyard and current size of 165,000 square feet. Bound by Columbia Street, Barnard Street, Common Street and the Common Street Cemetery, the High School property offers very limited parking and outdoor pedestrian/green space. The School's primary open space, Victory Field, is located approximately one third of a mile away off of Orchard Street.

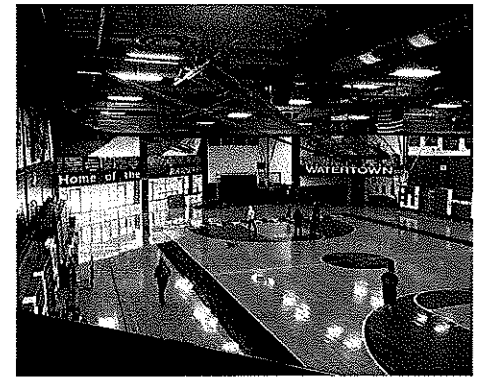
Among its primary attributes, the original 1929 building is solidly built and of historical significance. The main entrance façade on Columbia Street, main entrance lobby and auditorium are the building's most distinguishable features. The school's largest building addition in 1979 is also well built and its most notable feature is a spacious and highly functional gymnasium. The facility is heavily used by the school and (after hours) by the town throughout the year. In short, the High School has a strong sense of place and it is said to be beloved by countless alumni.

Incongruous with its attributes, the High School's aging and outmoded facilities severely compromise its teaching mission. Most existing spaces are shopworn, or of poor construction quality, inflexible and in many cases too small to handle increased enrollment (e.g., English and History classrooms that typically accommodate 20-21 students now handle between 28 and 29 students; a classroom with tiered seating is inaccessible to handicapped students). A single elevator serves the entire High School building. There are no conference spaces. There are very few small spaces for one-on-one / small group instruction, a critical shortcoming given the high percentage of high needs learners (i.e., 48% of the student body are ELI, Special Education and/or low income learners).

Unfortunately, the school property's tight boundaries prohibit building expansion of any kind, which suggests that space deficiencies as described herein are difficult if not impossible to overcome. Moreover, the remote location of Victory Field further compromises the overall functionality of the High School. The lack of open green space adjacent to the school building limits the types of physical and social outdoor activities and experiences that can often be among the most enriching and memorable for students of their school days. The remote location of Victory Field was raised by many to be the single greatest deficiency at the High School.

SUMMARY OF FINDINGS

- The original 1929 building is of historical significance. The main entrance façade, lobby and auditorium are elements of distinction.
- Lack of open space contiguous to school (playing fields are located at a distance from the school)
- Site constraints prohibit building expansion
- Insufficient and inflexible classroom sizes
- Several spaces are inadequate to serve current functions (e.g., inaccessible tiered seating in classrooms)
- No conference space; no small spaces for specialized, one-on-one and small group instruction
- 2004 renovation work is of poor construction quality
- Insufficient café space (alleviated by "Senior Privilege", which allows seniors to leave campus during lunch)
- Deficient security system – the current system needs full replacement, although lack of funding keeps this on the backburner for the moment. Three incidents in the past twelve months have raised major concerns. Senior Privilege makes security and control that much harder (students prop open doors when headed off campus for lunch)
- No unisex restroom. The school is beginning to have trouble accommodating transgender individuals.
- Only one elevator serves the entire high school
- Windows are drafty
- Library has poor sightlines, limited technology and inadequate office space
- Chorus room is "woefully small"
- Special Ed is in the basement – there is no pride of place.
- In after-hours and summer scenarios, there is no way to close off areas of the building that are not in use. This limitation creates operational and security problems.




Location	Building Components	Square Feet	Students
50 Columbia St.	1929 Wing	93,060	750
	1950s & 1970 Addition	71,940	

165,000 total  
220 sf/student

Qualitative Scoring	Building Physical Condition	School - Specific Criteria
	2.82 Total Grade (Weighted by SF of Building Portion)	2.18 Total Grade

## HIGH SCHOOL - ENGINEERING CONSIDERATIONS

### BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY			
Watertown Public Schools Watertown High School		Date Constructed: 1929 Number of Floors: 3 Approx. Sq Ft: 195,000	Assessed By: JAT/BJ Reviewed By: SAC/BJ Assessment Date: 2/28/14
			
Additions, Renovations, and Major Maintenance:	1950s: Two-story program space addition to the northeast building corner plus one story addition at southeast corner. 1978: Program space addition at the south elevation (enclose the courtyard) plus auto shop at the northeast corner. 2004: Cafeteria addition and entire building low-sloped roof replacement.		
Wall System:	All Building Areas: Clay brick mass masonry throughout with decorative precast concrete, cast stone, and coated terra-cotta accents at original 1929 structure only.		
Window System:	All Building Areas: Punched windows are aluminum framed, hung windows with single-pane glass. 1979 Addition features aluminum curtain wall frames with insulating glass units (IGUs).		
Door System:	All Building Areas: Main door at the 1979 Addition is set into the curtain wall system. Other doors are hollow or insulated metal.		
Roof System:	All Building Areas: Smooth PVC membrane typical at low-sloped areas and standing seam metal at steep sloped areas.		
<b>General Building Performance</b>			
Reports of Building Envelope Leakage/Distress:	Localized areas of interior peeling paint, generally associated with falling mortar joints on the exterior and most severe along the parking lot (east) elevation; Watertown Public Schools (WPS) reportedly reports falling joints on an ongoing basis to address leakage. Water leakage reportedly occurs at corners and is dependent on wind direction during the storm. No reported leakage associated with the roofing system since its installation in 2004.		
Overall Building Envelope Condition / Major Concerns:	Exterior walls are in fair condition with notable areas of distress (efflorescence, cracking, mortar spalls at lintel ends) that should be repaired in the near to mid-term to avoid more significant deterioration. Windows are significantly worn with falling seals and replacement or significant short-term repairs (e.g. wet-sealing) should be anticipated in the next several years. Roofing membrane and steep sloped metal roofing generally appear to be in good condition with only typical maintenance necessary.		
<b>Component Condition (Rating 6 to 5)</b>			
Walls:	Rating	Comments:	
	3	1929 Building: Brick masonry and joints are typically in fair condition and appear sound but weathered (Photo 1). Efflorescence exists along the outside of the parapet and appears to emanate from below the coping (Photo 2), at an entrance canopy (Photo 3), and below many of the windows (Photo 5). Lintels appear painted, with isolated locations of corrosion visible; we observed one location where a precast element above a lintel is displaced, possibly from rust jacking (Photo 4). Vertical cracks in the concrete foundation wall that have been previously sealed are falling again, exist throughout the building, typically below windows (Photo 6). Concrete stabilizing at an east auxiliary entrance has settled and fallen away from the building (Photo 7). Water table elements below the parapet have significant staining and open mortar joints (Photo 8). A coating has been applied over terra cotta at part of the main entrance; the coating appears to be falling, and several terra cotta pieces within the coated area have spalled (Photo 9).	
	4	1950s Addition: Brick masonry and mortar joints are typically sound with minimal weathering (Photo 10). Lintels are painted with localized corrosion visible and spalled mortar at the bearing ends (Photo 11); no evidence of rust jacking is visible. Localized efflorescence exists at one pilaster and one location of the parapet of the one-story addition (Photo 12), as well as below most of the north elevation windows (Photo 13). A stop crack also exists emanating from the window of the one-story addition towards the 1929 building (Photo 14), and an area at the northeast corner of the two-story addition appears to have been previously repaired.	
	4	1979 Addition: Brick masonry units are cracked throughout the building, which appears to be material or manufacturing related – not structural (Photo 16). Stop cracking exists at end of auto shop garage door (Photo 17). Lintels are galvanized steel and appear to be sound with no observed corrosion or evidence of rust jacking. Urethane sealant at brick expansion joints is cracked (Photo 18).	
Fenestrations:	2	All Building Areas: Perimeter seals are starting to fail at isolated locations (Photo 19). Window glazing is falling (Photo 20). Finish on the frames is faded, worn, and beginning to corrode at some locations (Photo 21). Exterior gaskets in the curtain wall framing system of the 1978 addition are embrittled, cracked, and short at corners (Photo 22). Several IGUs along the east elevation have failed and have condensation on the interior (Photo 23).	
Doors:	5	All Building Areas: Curtain wall and hollow metal doors appear to generally be sound, with localized areas of rust and paint wear.	
Roof:	4	All Building Areas: Much of roof covered with snow. Exposed PVC appears in good condition with few patches. Ponding water observed at a few locations (Photo 24). Rooftop HVAC equipment generally appears in good condition, but flashings and several pieces of equipment are rusted (Photo 25). The green-colored roofing membrane at cafeteria roof appears delaminated at localized areas typically around the perimeter (Photo 26). Skylight acrylic glazing typically has micro-cracking throughout (Photo 27).	

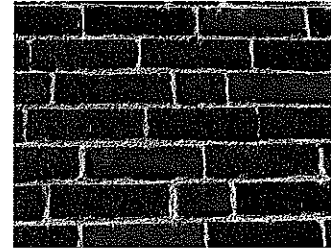


Photo 1  
Typical brick masonry condition at original 1930 building.



Photo 3  
Staining, efflorescence, and organic growth on brick masonry below canopy.

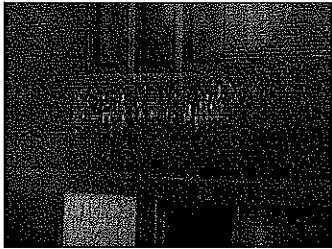


Photo 2  
Efflorescence along outside of parapet at 1930 building.

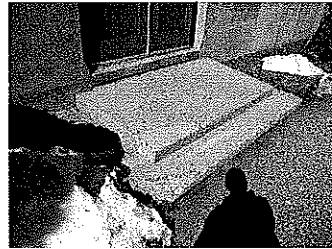


Photo 4  
Corroded lintel with displaced precast band course above.

HIGH SCHOOL - ENGINEERING CONSIDERATIONS



**Photo 5**  
Efflorescence at window sill of 1930s Building.



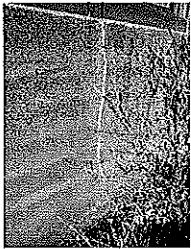
**Photo 7**  
Concrete stair at east auxiliary entrance has settled and fallen away from the building.



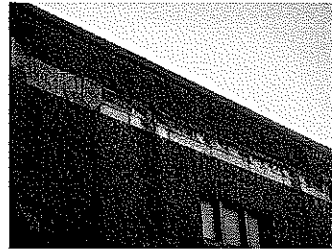
**Photo 9**  
Dented and falling terra-cotta pieces at entrance.



**Photo 11**  
Mortar spall at bearing end of inlet.



**Photo 6**  
Crack in foundation wall below window along east elevation of 1930 Building. Typical below all windows.



**Photo 8**  
Staining at water table elements.

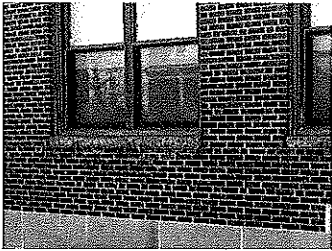


**Photo 10**  
Typical brick masonry condition at 1950s addition.

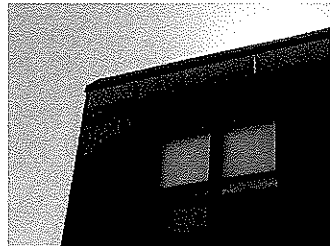


**Photo 12**  
Efflorescence in brick masonry at one-story 1950s addition (red arrows). Yellow arrow points to location of step cracking in brick masonry; see Photo 14 for close-up.

HIGH SCHOOL - ENGINEERING CONSIDERATIONS



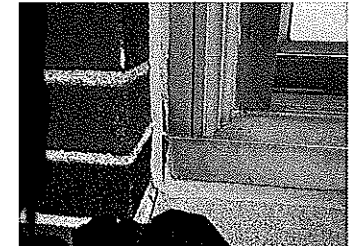
**Photo 13**  
Light efflorescence below north elevation windows of the 1950s building.



**Photo 15**  
Apparent repair at northeast corner of two-story 1950s addition.



**Photo 17**  
Step cracking in brick masonry at end of auto shop garage door.



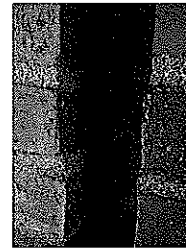
**Photo 19**  
Debonding of perimeter seal at window of 1950s addition.



**Photo 14**  
Slap crack emanating from upper right window corner of one-story 1950s addition.



**Photo 16**  
Cracked and variable-colored brick typical at 1979 Addition.

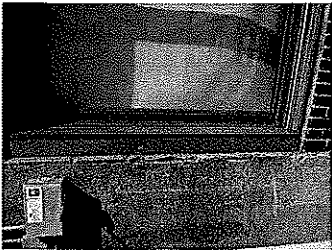


**Photo 18**  
Cracking parallel at brick expansion joint in 1979 Addition.



**Photo 20**  
Falling window glazing.

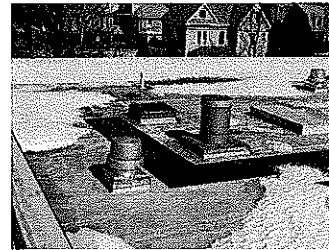
## HIGH SCHOOL - ENGINEERING CONSIDERATIONS



**Photo 21**  
Punched window frame with light corrosion.



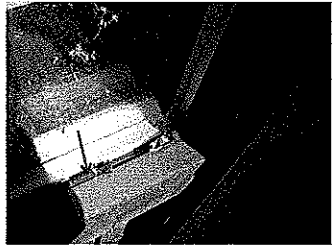
**Photo 23**  
Faded IGU along east elevation curtain wall.



**Photo 25**  
Rusted flashings and roof hatch.



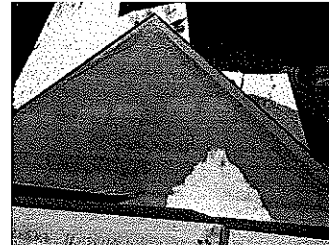
**Photo 27**  
Micro-cracking of skylight acrylic glazing.



**Photo 22**  
Embrittled and cracked glazing gasket in curtain wall system. Gasket is short at the corner.



**Photo 24**  
Ponding water on roofing membrane.



**Photo 26**  
Green-colored cafeteria roof, with localized areas of deformed membrane, typically around the perimeter.

## HIGH SCHOOL - ENGINEERING CONSIDERATIONS

### STRUCTURAL ANALYSIS — RSE ASSOCIATES

#### EXISTING STRUCTURE

Structural information on the existing building was obtained from incomplete existing structural drawings and a visit to the site by RSE on March 4, 2014. The existing building was built in multiple phases with the oldest portion constructed in 1929, and new additions in the 1950s and in 1979.

#### A10 FOUNDATIONS

##### A1010 Standard Foundations

Existing foundations throughout appear to consist of spread footings and concrete foundation walls.

The lowest floor slab is a concrete slab on grade.

#### B10 SUPERSTRUCTURE

The existing superstructure varies. Ongoing repairs exposed construction at some of the oldest portion from 1929 where wood floor planks and joists were observed supported by steel beams and load bearing masonry walls. The 1979 addition is steel framed. Structure in other areas could not be observed and no documents were found.

#### EXISTING CONDITIONS

Some conditions were observed which may require remediation.

- Steel lintels: Surface rust was observed over window and door openings on the rear side of the building. This should be cleaned and painted to avoid further deterioration.
- Concrete Foundation Walls: Cracks in the foundation were observed below several of the same openings at the rear of the building.

### CODE AND LIFE SAFETY — COSENTINI ASSOCIATES

#### A. EXECUTIVE SUMMARY

The three-story plus partial basement High School is classified as a low-rise building in accordance with the Massachusetts State Building Code (MSBC). The building is 165,000GSF with a primary occupancy type of the building is Group E, Educational. The original 1929 structure along with 1979 addition results in a mixed construction type classification, where a MSBC designation of 3B necessitated given the wood floor framing.

The building is equipped with a fire alarm system with ADA compliant strobes in most public spaces. The fire alarm system reports directly to the local Fire Department via master box connection. The system is not monitored by a central station. Visual and audible appliances are provided in common corridors and large assembly areas. Smoke detection is provided throughout the building. The building is partially sprinklered in the 1979 addition.

The building is served by as many as 6 exit stairways and exit doorways that discharge directly to grade. The Side A (main) and Side D entrances are accessible to the disabled. An elevator provides an accessible route to all main floor levels. A lift provides an accessible route to the stage.

The main lobby is served by a 3-story, unenclosed monumental stairway. Though this likely was permitted at the time of construction, any renovations that occur in close proximity to this feature may necessitate partial enclosure, as to limit the designation as an atrium.

#### B. MEANS OF EGRESS

##### Components

The means of egress includes corridors of substantial construction that lead to exit stairway enclosures. The corridors are segregated by way of 90-minute fire resistance rated (FRR) cross-corridor doors that are equipped with self closers but no latch. The stair doors are 2-hour FRR, range from 36-48-inches, and are equipped with self closers with no latch. Exit doors leading to street level from assembly spaces include panic hardware. The enclosed exit stairways have a slope (tread to riser ratio) and railing configuration that was acceptable at the time of construction; these

handrails would not however comply with the current code.

##### Egress Capacity, Number and Arrangement

The Third Floor is served by six exit stairways. The Second Floor is served by five exit stairways and doors to grade. The First Floor is served by doors directly to grade. The Basements are served by two exit stairs. The exits are remotely located and provide adequate capacity based on the occupant load served. All floor areas are served by a minimum of two means of egress.

##### Travel Distance and Discharge from Exits

Travel distance limitation is 200 feet, while dead-end corridors are permitted up to 20 feet per the MSBC. The existing building configuration appears to satisfy these provisions.

##### Egress Lighting and Exit Signs

The corridors and common space are served by occasional battery powered lights. A lights out test was not conducted to determine the appropriateness of the lamination. Exits signs are placed in accordance with code and are similarly served by battery backup power.

##### Wheelchair Egress

The building is not fully sprinklered; therefore, areas of refuge are required and provided in the stairways. The configuration appears to meet the requirements for code at the time of construction, but would not satisfy today's standards (specifically associated with latches on stair doors and lack of communication system).

### MEP ANALYSIS — TMP CONSULTING ENGINEERS

#### BUILDING HEATING, VENTILATING AND AIR CONDITIONING

Building heating system consists of 3 cast iron Natural Gas fired Weil McLein steam boilers with steam radiation and through wall unit ventilators. The boilers were replaced in 2001, 2 boilers are currently operational and the third boiler is down for repairs. The high school is listed as a shelter, but none of the HVAC systems are on stand-by power. The Generator set has a 1,000 gallon

buried tank that has not been filled in 10 years. In fact, the tank cannot be filled due to physical limitations.

The Auditorium is served by a rooftop unit that has recently been repaired. The Stage has no HVAC.

The Cafeteria has fin tube radiation at the exterior wall. The Cafeteria has an issue with overheating during times of high occupancy. It is unclear whether this is solely due to the aging and mislaid control system. There is a full Ansul fire protection system for the Kitchen hood system.

The Gym is served by 2 air handling units, of which also have a tendency to overheat. This could also be attributed to the deteriorating controls system. The Fitness Center located under the gym has no air conditioning, but does have heat recovery. There is an issue with odor in the Wrestling Room. The Small Lecture Hall also appears to have an odor issue.

The Paint Spray Booth and Auto shop area are not used. The HVAC systems status associated with these rooms are unknown due to lack of use.

#### Observation/Comments

Issues with the pneumatic ATC system which compromise many control systems are being addressed in the ESCO program scheduled to be completed in the summer of 2014. We are being told that all pneumatic actuation will be replaced and some new DDC controls will be added to replace the pneumatic control system.

If a shelter is required for this building, stand by power to some of the HVAC equipment is required depending on which parts of the building are to be designated as such.

Generator fuel issues should be addressed.

Wrestling room should be investigated and charcoal filtering to control odors in the Fitness Center is indicated.

Aging unit ventilators should be replaced.

## HIGH SCHOOL - ENGINEERING CONSIDERATIONS

### BUILDING PLUMBING AND DOMESTIC HOT WATER

The domestic hot water heater consists of 2 PVI 800 MBH input heaters, approximately 13 years old.

#### Observation/Comments

The domestic hot water heaters and all associated components are approaching the end of their service life and replacement is recommended within 3-5 years.

### FIRE PROTECTION

The Wood Shop & Science Labs have sprinklers. The rest of the building does not. There is a deluge system serving the courtyard windows on the exterior of the building.

#### Observation/Comments

Consideration should be given to adding a sprinkler system throughout the original construction area of the building. In addition, it should be noted that any addition or substantial upgrade would require that a code compliant fire protection system be provided.

### ELECTRICAL

The existing building is fed underground from a utility company pad mount transformer. This underground service feeds a 208/120 volt, 3000 amp switchboard which was installed in 1979. This newer switchboard then re-feeds the original building switchboard and associated distribution equipment. It was observed that the majority of existing panelboards are original to the building and in need of replacement.

The majority of lighting fixtures consist of 2'x2' and 2'x4' recess acrylic lensed fixtures. These fixtures have all been upgraded recently with new lamps and ballasts and are in good condition.

The existing fire alarm system is the product of the Edwards Corporation and is an addressable system with no voice communication. The building contains a sprinkler system and is supplemented with smoke detector coverage. The system is approximately 10 years old and appears to be regularly maintained

and in good condition.

A diesel fueled emergency generator is located in the building penthouse and provides for emergency lighting, heating and power for the kitchen refrigeration walk-in units. The size and age of the generator could not be determined but appears to be at least 30 years old.

The existing clock, intercom and security systems are the product of Signet Corporation and appear to be regularly maintained and are functional.

#### Observation/Comments

Existing panel in boiler room has exposed electrical bus bars and is a safety issue. This panel should be repaired or replaced.

The lighting in the gym is not connected to the emergency generator. As this area was noted as being a shelter area this lighting should be connected to emergency system.

It was noted that due to the age of the existing diesel underground fuel tank for the generator local fuel suppliers will not fill the tank. Recommend the tank be tested and all vent lines inspected. Due to the age of the generator and fuel tank consideration should be given to replacement of the entire system. The current emergency distribution system does meet code requirements for separation of life safety and optional standby systems.

The existing distribution equipment that is original to the building or in excess of 40 years old should be replaced with new.

It was observed that there are existing smoke detectors in the boiler room that are covered with plastic that should be removed. If the plastic covering was installed to address false alarms then consideration should be given to replacing the smokes with heat detectors.

Recommend installing occupancy sensors in classrooms, offices, restrooms and storage areas to help conserve energy.

Recommend installing a daylight harvesting system in the cafeteria.

## MEP ANALYSIS — TMP CONSULTING ENGINEERS

Town of Watertown  
School Facility Assessment Survey  
Watertown High School  
System: HVAC

Area: 165,000 ft<sup>2</sup>

Construction Date: 1970  
Renovation: 2001

Facility Contact: Jay Franciose  
Phone: 617-253-1100  
(If the person is not available, please contact the building manager)

Survey Date: 3/4/14  
Page 7 of 7

TMP CONSULTING ENGINEERS, INC.

Room #	Room Name	System	Description	Age		Condition		Notes		Priority	
				Year	Month	Good	Bad	1	2	3	4
1	Boiler	Hot Water Heating System	Boiler Room	12	00	3	1	(1)		B	High
2	Condensate Receiver Pump	Flow reversed	Cable room and boiler room	11	00	1	1			C	
3	Condenser Unit	Unit	Roof of 11th addition	10	21	3	1			D	
4	ACU/PA	Unit	Boiler Room	10	00	1	1			D	
5	Chiller/Generator	Generator	Boiler Room	10	21	1	1	(2)		B	
6	Panel	Steel and copper	Boiler Room	10	00	1	1			C	
7	Controls	Domestic and climate	Boiler Room	10	00	1	1	(3)		D	

#### Notes

(1) Check the boiler to determine if repairs are required to last the building's span.

(2) Check the generator to determine if repairs are required to last the building's span.

(3) Check the generator to determine if repairs are required to last the building's span.

(4) The piping in the building is several inches and it may be up to 40 years old in some parts of building.

(5) The pressure controls are scheduled to be replaced in the summer of 2014, exact scope unknown.

(6) The existing system is not acceptable.

(7) It is noted here that the system is being installed and this is not acceptable.

(8)

(9)

(10)

(11)



# HIGH SCHOOL - ENGINEERING CONSIDERATIONS

Town of Watertown  
School Facility Assessment Surveys  
Deering High School  
Systems Plumbing and Fire Protection

Area: 165,000 ft<sup>2</sup>  
Construction Dates: 1970  
Renovation Dates: 2003

Facility Details: 1st Floor done  
2nd Floor (to be done before)

Survey Date: 3/1/14  
Page 1 of 1

Item #	System	Component Name	Location	Year		Material	Notes	Priority	Status
				Install	Replace				
1	Hot Water/Heating	Water Tank Condensate	Ashe Room	13	20	X			
2	Steam Boilers	Steamer	Ashe Room	14	23	X			
3	Water Pipes	Submain/Service Line	Ashe Room	14	23	X			
4	Sanitary Sewer	Stm	Washroom and Storage Room	18	30	X			
5		Drain	Courtyard Walkway - exterior surface	7	20	X	Observability		
6		Architectural Drain	Archives	7	20	X			

- Notes:
- (1)
  - (2)
  - (3)
  - (4)
  - (5)
  - (6)
  - (7)
  - (8)
  - (9)
  - (10)
  - (11)

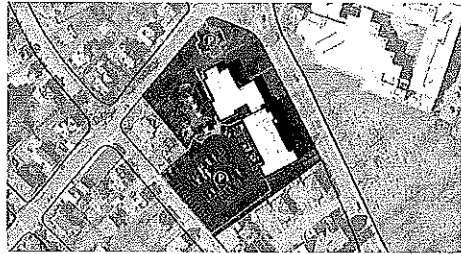
Watertown Public Schools  
Building Condition Survey  
School: Watertown High School  
Survey Team: TMP

Construction Date: 1916/1979  
Survey Date: 3/1/14  
Page 1 of 1

Item #	System	Component Name	Type	Termination	Year		Material	Notes	Priority	Status
					Install	Replace				
<b>Electrical</b>										
1	Hardware									
2	Wiring	Underground	Underground Area and Room			33	20			
3	Equipment	Utility Switchboard	Utility Electric Room			23	20			
4	Wiring	1000V 120V 277V								
5	Installation									
6	Panel	Clear Air	Throughout			13	20			
7	Motor Control	HP/2P	Boiler Room			33	20			C: Some equipment orig. in 1979
8	Wiring	Control wiring	Throughout			23	20			C: Some equipment orig. in 1979
9	Signal Wiring	Fire Alarm	Ashe Room			33	20			C: Some equipment orig. in 1979
10	Electricity									
11	Fire Alarm	City connected	Throughout			19	19			A: See Report
12	Generator	Stand by	Generator			33	20			A: 2000 Generator Report
13	Fire Alarm Siren	Underground	Underground Electric Room			23	20			A: Replace with new
14	Devices									
15	Receptacles	Drop	Throughout			23	20			
16	Switches	Standard type	Throughout			19	20			
17	Lighting									
18	Chandeliers	Recessed	Throughout			2	20			
19	Office	Recessed	Throughout			2	20			
20	Corridors	Recessed	Throughout			2	20			
21	Class	Recessed	Throughout			2	20			
22	Health Rm	Recessed	Throughout			2	20			
23										
24										
25										

3.6 ADMINISTRATION BUILDING

# ADMINISTRATION BUILDING - PHILLIPS SCHOOL



OVERVIEW

The School Administration Building is a former elementary school that currently accommodates a variety of public services serving the Watertown Community. Formerly known as the Phillips Elementary School, the building was constructed in 1937 as a three-story, 25,000 SF facility to replace an earlier, 19<sup>th</sup>-century school building. In 1950, a 9,000 SF gymnasium wing was added. By the 1980s, school consolidation in Watertown left Phillips an un-programmed building, which set the stage for its current uses. The third floor currently houses the administrative offices for Watertown Public Schools. The second floor houses the EDCO Collaborative, a State-run program offering high quality student programs and educator training for at-risk students and adults to school communities in the Greater Boston area. The first floor accommodates Watertown Family Network (WFN, an education resource for families, run by Watertown Public Schools), Growing Spaces (a privately-run preschool) and school facilities personnel. The gymnasium is shared by the preschool, WFN and the Watertown Council on Aging / Senior Center, which is located in a separate facility with direct access to the gymnasium. Renovations to the third floor and a new elevator tower serving all floors were completed in 2002.

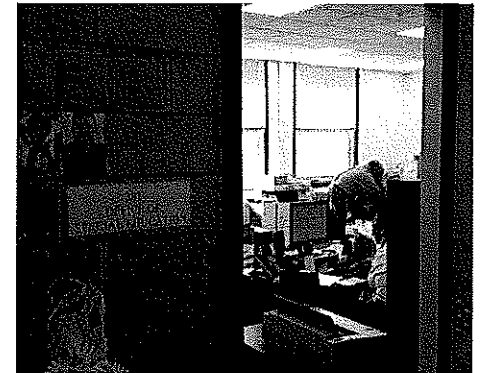
The School Administrative Building's enclosure, structure and finishes are all aging, but generally sound. The facility benefits from its ample main parking lot (approximately 90 parking stalls, highest among school facilities in town). The building has proven serviceable with respect to housing its current programs. However, there is a lack of clear wayfinding to the various public services and also what appears to be a general underutilization of space throughout. This underutilization is related to the adaptation of a purpose-built school building's spaces to accommodate current uses.

Location	Building Components	Square Feet
30 Common St.	1937 Wing	24,786
	1950 Addition & 2002 Elevator	9,214
		34,000 total

Qualitative Scoring	Building Physical Condition	School - Specific Criteria
		3.02 Total Grade (Weighted by 5% of Building Portion)

SUMMARY OF FINDINGS

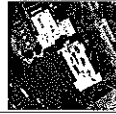
- Inefficient use of former school building space. The building's spaces were not created with current programs in mind.
- Insufficient signage/wayfinding throughout the building. Poor sense of arrival to each of the various programs housed within the building.
- Ventilation system, intercom system and clock system are all inoperable.
- Ample parking (at approximately 90 parking stalls, the lot is the largest of all of the school facilities in town).
- Facility has great potential to operate in the future as a "relief valve" for the Watertown School District. Could be re-purposed to accommodate increased enrollment and/or future renovations (e.g. temporary "swing space" for school programs and/or classrooms during renovations; a new Pre-School, or school for all Pre-K students, etc.)



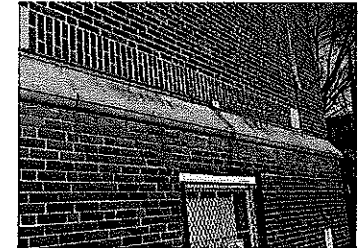
## ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

### BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

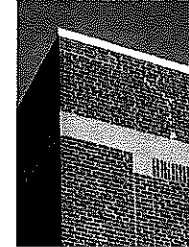
BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY			
Watertown Public Schools Phillips School (Central Administration Building)		Date Constructed: 1937	Assessed By: JAT/ley
		Number of Floors: 3	Reviewed By: BAG/abby
		Approx. Sq Ft: 35,000	Assessment Date: 2/28/14
Additions, Renovations, and Major Maintenance:	1950s: One-story addition to north end of the building currently housing the gym and daycare center. 2001: Renovation of second and third floors to reconfigure for administration use, and addition of an elevator. 2010-2011: Repointing at various locations to mitigate water leakage.		
Wall System:	1937 Building: Clay brick mass masonry 1950s Addition: Clay brick-clad cavity wall		
Window System:	All Building Areas: Punched aluminum framed, hung windows with insulating glass units (IGUs). IGU spacers are dated 2000, and Watertown Public Schools (WPS) stated they were repurposed from another school when it was decommissioned in 2009. Aluminum curtain wall (shear block construction) with fixed IGUs at the north stair tower of the original building.		
Door System:	All Building Areas: Entrances are aluminum framed storefront with IGUs.		
Roof System:	All Building Areas: PVC Roofing system reportedly installed in 2001 at all building areas.		
General Building Performance			
Reports of Building Enclosure Leakage/Distress:	Some wall leakage. Repointing work has minimized the leakage but occasionally leakage still occurs typically at window heads. No water leakage associated with roofing since new roof installed in 2001.		
Overall Building Envelope Condition / Major Concerns	Brick masonry walls are generally sound with isolated areas of deterioration and cracking. Lintels are beginning to rust and require repairs in the near to mid-term to avoid more significant rust/pitting issues. Windows and entrance site sound, but perimeter seals are failing and require replacement. PVC roofing membrane is sound, but large areas of ponding water exist that will accelerate deterioration.		
Component Condition (Rating 0 to 5)			
Component	Rating	Comments	
Walls	3	1937 Building: Brick masonry is sound, especially along the west elevations. East elevation mortar joints are weathered, with significant deterioration noted along the parapet; some locations have apparently been repaired (Photo 1). We observed a step crack at the west elevation parapet near a corner that appears to have been repaired with mortar (Photo 2). Joints in precast band course elements are weathered and missing at some locations (Photo 3); brick masonry below has grey staining and is weathered. Window gables are typically rusted and some are damaged (Photo 4). Cast-in-place concrete below windows is typically rusted and cracked (verify) at many locations (Photo 5). Lintels above windows are rusted with a slight downward deflection noted at some locations (Photo 6). Mortar at the chimney is in poor condition, and multiple attempted repairs have failed (Photo 7).	
	3	1950s Addition: Brick masonry is sound along the south and west elevations. Along the north and east, where they are used to cover the walls (WPS reportedly began removing the bay this past year, Photo 8), the brick masonry is slightly eroded at the face, and the joints are more weathered than other locations (Photo 9). Lintels above the windows are typically rusted, and some precast band course elements have cracked (Photo 10 and Photo 11). A vertical leaded joint above a window jamb on the south elevation has apparently been repaired (Photo 12), and a sill stone below the window is spalled at the joint (Photo 13); it is unclear whether the spall is related to an impact or exposure to weather. Brick masonry at site walls is contains efflorescence (Photo 14); no finishing is visible below coping on site walls.	
Fenestrations	3	All Building Areas: Windows and curtain wall system generally appear to be sound. Bulkhead seals are typically cracked and have debonded at multiple locations (Photo 15).	
Doors	3	All Building Areas: Entrances appear to be sound. Perimeter seals are typically cracked and have debonded at multiple locations.	
Roof	4	All Building Areas: Snow covered much of the 1950s roof. The exposed PVC roofing membrane appears to generally be sound with minimal patched. Large areas of ponding water are present on the original building roof (Photo 16). Two large vents have steep sloped roofs; one is covered with a standing seam metal roof that is badly worn and has holes (Photo 17). The other is covered with an asphalt shingle roof that appears relatively new and in sound condition (Photo 18).	



**Photo 1**  
Cast stone elements above east entrance. Patches are circled in yellow. Efflorescence and surface staining typical at joints. Mortar repair at parapet (red arrow).



**Photo 3**  
Rusted staining and deteriorated mortar joints at precast band course. Brick masonry below is stained.



**Photo 2**  
Step crack at west parapet of Original building.



**Photo 4**  
Rusted and broken window grates.

ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS



**Photo 5**  
Cracked concrete foundation below ground floor window.



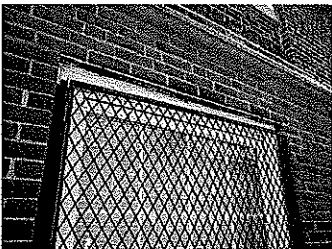
**Photo 7**  
Failed mortar repairs at chimney.



**Photo 9**  
Condition of brick masonry at 1950s building where ivy has been removed.



**Photo 11**  
Cracks in band course elements above rusted lintel.



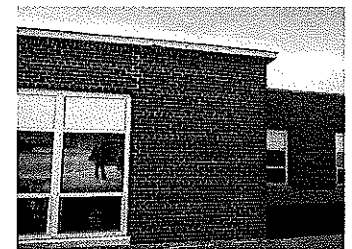
**Photo 6**  
Rusted lintel at original building.



**Photo 8**  
IVY remnants at 1950s addition.



**Photo 10**  
Rust at lintel of 1950s addition.



**Photo 12**  
Repair at crack in single story brick masonry addition.

ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

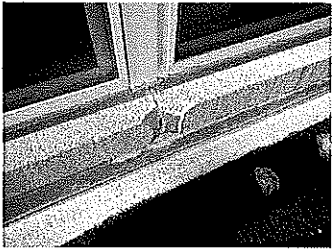


Photo 13  
Damaged limestone sill at 1950s addition.



Photo 15  
Cracking and cracked perimeter sealant.



Photo 17  
Standing seam metal roof at vent.

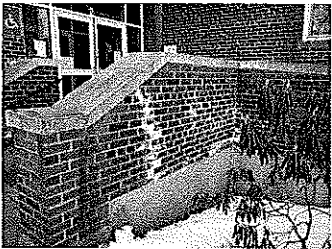


Photo 14  
Efflorescence at site walls.



Photo 16  
Ponding water at roof.



Photo 18  
Asphalt shingle roof at vent.

## ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

### STRUCTURAL ANALYSIS — RSE ASSOCIATES

#### EXISTING STRUCTURE

Structural information on the existing building was obtained from incomplete existing structural drawings and a visit to the site by RSE on March 4, 2014. The existing building was built in multiple phases with the original portion constructed in 1937, and new additions in 1950 and in 2001.

#### A10 FOUNDATIONS

##### A1010 Standard Foundations

Existing foundations throughout appear to consist of spread footings and concrete foundation walls.

The lowest floor slab is a concrete slab on grade.

#### B10 SUPERSTRUCTURE

The existing superstructure at the original portion appears to be a concrete waffle slab on concrete beams supported by steel columns. The structure was visible only in the basement. The structure at the 1950 addition was not visible and drawings for this area were not found. The addition in 2001 is an elevator tower that appears to be constructed of steel columns and concrete slab on deck.

#### EXISTING CONDITIONS

Existing structural conditions were sound with no items flagged for repair or further investigation.

### CODE AND LIFE SAFETY — COSENTINI ASSOCIATES

#### A. EXECUTIVE SUMMARY

The three-story Administration Building is classified as a low-rise building in accordance with the MSBC. The building is 52,000GSF with a primary occupancy types of the building is Group E, Educational (1st Floor pre-school and 2nd Floor Ed-Co) and Group B, Business (3rd Floor). The original 1937 structure along with 1950 addition results in a mixed construction type classification, where a MSBC designation of 3B necessitated given the wood framing.

The building is equipped with a fire alarm system with ADA compliant strobes in most public spaces. The fire alarm system reports directly to the local Fire Department via master box connection. The system is not monitored by a central station. Visual and audible appliances are provided in common corridors and large assembly areas. Smoke detection is provided in the corridors and heat detection in the classrooms/office areas. The building is not sprinklered.

The building is served by 2 exit stairways and exit doorways that discharge directly to grade. The Side B (main) entrance is accessible to the disabled. An elevator provides accessible routes to all main floor levels.

#### B. MEANS OF EGRESS

##### Components

The means of egress includes corridors of substantial construction that lead to exit stairway enclosures. The corridors are segregated by way of cross-corridor doors (wired glass; no UL label) that are equipped with self closers and no latch. The doors are tied into the fire alarm system. The 36-inches stair doors are 90-min FRR and are equipped with self closers, but no latch. Exit doors leading to street level from assembly spaces include panic hardware. The enclosed exit stairways have a slope (tread to riser ratio) and railing configuration that appears to comply with the current code.

##### Egress Capacity, Number and Arrangement

All Floors are served by two exit stairways. The First Floor is served by doors directly to grade. The exits are remotely located and provide

adequate capacity based on the occupant load served. All floor areas are served by a minimum of two means of egress.

##### Travel Distance and Discharge from Exits

Travel distance limitation is 200 feet, while dead-end corridors are permitted up to 20 feet per the MSBC. The existing building configuration appears to satisfy these provisions.

##### Egress Lighting and Exit Signs

The corridors and common space are served by occasional battery powered lights. A lights out test was not conducted to determine the appropriateness of the lamination. Exits signs are placed in accordance with code and are similarly served by battery backup power.

##### Wheelchair Egress

The building is not fully sprinklered; therefore, areas of refuge are required and provided in the stairways. The configuration appears to meet the requirements for code at the time of construction, but would not satisfy today's standards (specifically associated with latches on stair doors and lack of communication system).

### MEP ANALYSIS — TMP CONSULTING ENGINEERS

#### BUILDING HEATING, VENTILATING AND AIR CONDITIONING

Building system consists of 2 Natural Gas Fired steam boilers. One boiler was replaced 6 years ago and the other boiler is being replaced this coming summer. The unit ventilators are old and not in working condition. There is an asbestos issue with the boiler breaching in most schools. There is some pipe insulation missing in the Boiler Room. There is sporadic placement of residential wall through air conditioning units. The unit ventilators are not operating.

The Gymnasium is served by 2 systems, an older interior Heating and Ventilating system and a rooftop system. The school does not operate the rooftop units, this is controlled by the Senior Center.

##### Observation/Comments

Issues with the pneumatic ATC system which compromise many control systems are being addressed in the ESCO program scheduled to be completed in the summer of 2014. We are being told that all pneumatic actuation will be replaced and some new EDC controls will be added to replace the pneumatic control system.

Replace the unit ventilators

All of the HVAC equipment has exceeded its estimated service life with the exception of the newer boiler.

#### BUILDING PLUMBING AND DOMESTIC HOT WATER

The old domestic hot water heater has been abandoned in place in the Boiler Room due to asbestos. The current domestic hot water heater consists of a Knight Boiler and associated storage tank which was recently installed.

##### Observation/Comments

## ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

Consider replacing plumbing fixtures with new water conservation type plumbing fixtures.

### FIRE PROTECTION

There building does not have a fire suppression system.

#### Observation/Comments

Consideration should be given to provide a fire suppression system as required per current code. In addition, it should be noted that any addition or substantial upgrade would require that a code compliant fire protection system be provided.

### ELECTRICAL

The existing service is fed underground from a utility company pad mount transformer. This underground service feeds a 208/120 volt, 800 amp switchboard which was installed in 2000. This switchboard feeds panelboards located throughout the building. The entire existing distribution system was also replaced with new in 2000. The entire service including the distribution equipment is in good condition.

The majority of lighting fixtures consists of 2'x2' and 2'x4' acrylic lensed fixtures. The fixtures have all been upgraded recently with new and are in good condition.

The existing fire alarm system is the product of the Gamewell Corporation and is an addressable system with no voice communication. A combination of heat and smoke detectors are provided throughout the building as the building does not have a sprinkler system. The existing fire alarm system was installed in 2013 and appears to be well maintained and in good condition.

There is no emergency generator for this building.

Emergency egress lighting is provided by a combination of battery packs and remote mounted battery operated lighting heads. Exit signs consist of a combination of self-contained battery operated units. All equipment appears to be regularly maintained and in good condition.

Existing clock system is old and does not operate properly. It was noted that the existing system is being phased out with the installation of battery operated docks.

There was no existing intercom system.

The existing security system consisted of a card access system and motion sensors. The system appeared to be maintained regularly and in good condition.

#### Observation/Comments

Consideration should be given to relocating or enclosing existing panels in corridors as they protrude more 6" from the wall and do not conform to ADA requirements.

Recommend installing emergency generator for this building.

Replace existing stage lighting dimming system as this equipment appears original to the building.

Recommend replacing existing miscellaneous incandescent lighting fixtures with new energy efficient fixtures.

Egress doors in the basement level boiler room do not have required exit signage.

Smoke detection coverage does not appear to be adequate for this building as there were a number of offices which had no sprinkler coverage and no smoke or heat detectors.

Recommend installing occupancy sensors in classrooms, offices, storage rooms, restrooms, etc. to assist in conserving energy.

## MEP ANALYSIS — TMP CONSULTING ENGINEERS

Town of Watertown  
School Facility Assessment Survey

TMP CONSULTING ENGINEERS, INC.

Building: Phillips School  
System: HVAC

Area: 24,600 sq

Construction Dates: 1979/1990  
Renovated Date: 2001

Facility Contact: Jay Frazee  
Phone Available: N/A  
E-mail Available: jay.frazee@watertownschools.org

Survey Date: 3/4/14  
Page 1 of 1

Item #	Item Description	Location	Type		Condition		Notes		Priority	
			Material	Age	Good	Poor	Code	Energy	Health	Other
1	Under	Under the School Bus	Under Bus	64	90					A (1) (2)
2	Condenser Unit Pump Unit	Plum Room	Plum Room	8	23		X			C
3	Stage Dimmers	Stage	Theatre of Building	1979	20		X	X	General	A (1)
4	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
5	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
6	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
7	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
8	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
9	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
10	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
11	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
12	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
13	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
14	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
15	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
16	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
17	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
18	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
19	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
20	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
21	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
22	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
23	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
24	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
25	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
26	AC Condenser	Boiler Room	Boiler Room	2	29		X			X
27	AC Condenser	Boiler Room	Theatre of Building	1979	20		X			C
28	AC Condenser	Boiler Room	Boiler Room	2	29		X			X

#### Notes

- (1) This was a boiler, one was removed 6 years ago, the other is scheduled to be replaced the summer of 2014
- (2) Boilers are 15 years old
- (3) With the work under way, ventilation is not being introduced and safety has by virtue of operable windows
- (4) Some lighting fixtures are being fixed to boiler room piping system
- (5) The code book references are being reviewed to determine potential code book work

- (6) It has been reported that the AUC system is being replaced with a new DDC system
- (7)
- (8)
- (9)
- (10)
- (11)

ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

Town of Watertown  
School Facility Assessment Survey

Building: F2001 School System Planning and Fire Protection

Area: 21,690 sq ft

Construction Date: 03/1950  
Renovations: 1971

Facility Contact: Jay Francisco  
Phone: 603-688-1000

Survey Date: 3/4/14

TMP CONSULTING ENGINEERS, INC.

Facility Name: F2001 School System Planning and Fire Protection

Room #	Room Name	Room Description	Fire Cycle		Fire Risk		Fire Protection		Fire Hazard		Fire Alarm		Fire Extinguishers		Fire Evacuation		Fire Exit	
			Year	Life	High	Low	Smoke	Alarm	Extinguishers	Evacuation	Exit	Extinguishers	Evacuation	Exit	Extinguishers	Evacuation	Exit	
1	Director's Office	350 sqm floor and 1st locker room	2	20	X													
2	Office	First floor and 1st locker room	10	20	X	X												

(X) None of the piping is original to the building or installed in the 1970s or earlier.

Watertown Public Schools  
Building Condition Survey

School: F2001 School - Admin Building

Survey Title: TME

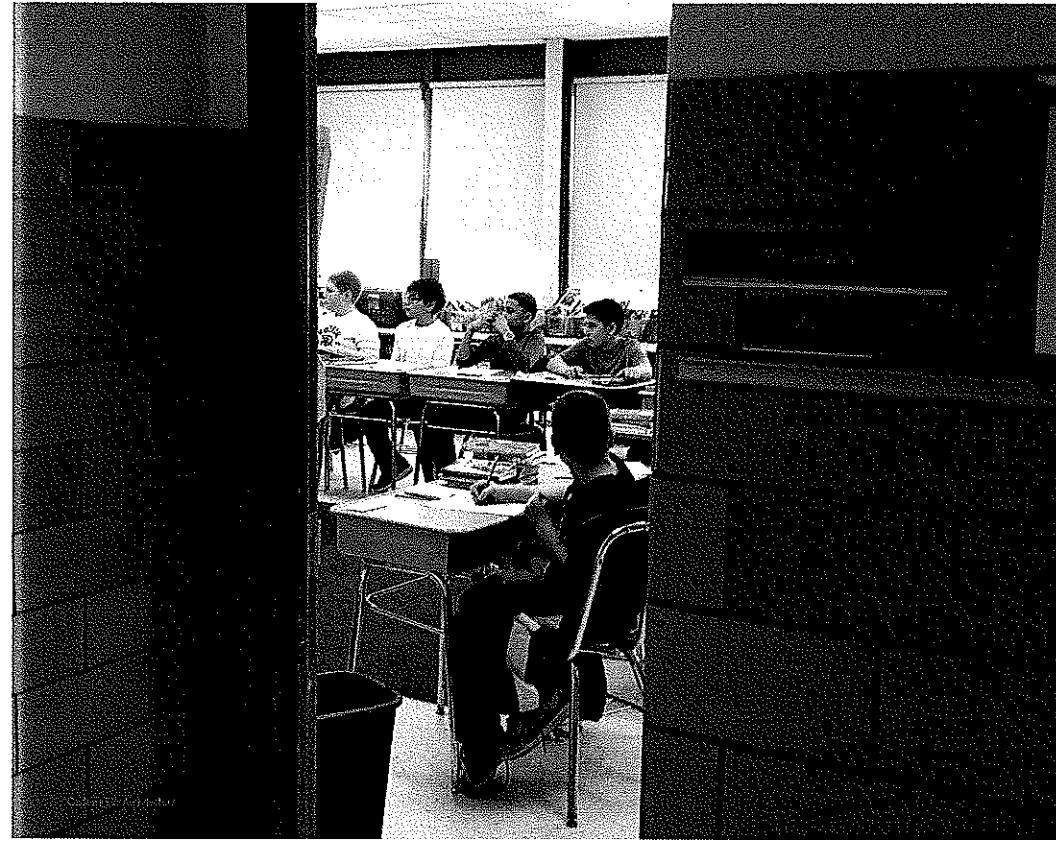
Construction Date: 1970/1998

Survey Date: 3/14/14

TMP Consulting Engineers, Inc.

Room #	Room Name	Room Description	Fire Cycle		Fire Risk		Fire Protection		Fire Hazard		Fire Alarm		Fire Extinguishers		Fire Evacuation		Fire Exit	
			Year	Life	High	Low	Smoke	Alarm	Extinguishers	Evacuation	Exit	Extinguishers	Evacuation	Exit	Extinguishers	Evacuation	Exit	
1	Service																	
2	Library	Underground	73	49														
3	Classroom	Underground	15	49	X													
4	Restroom	Underground																
5	Distribution	Underground	13	49	X													
6	Storage	Underground	13	49	X													
7	Office	Underground	13	49	X													
8	Storage	Underground	13	49	X													
9	Storage	Underground	13	49	X													
10	Storage	Underground	13	49	X													
11	Storage	Underground	13	49	X													
12	Storage	Underground	13	49	X													
13	Storage	Underground	13	49	X													
14	Storage	Underground	13	49	X													
15	Storage	Underground	13	49	X													
16	Storage	Underground	13	49	X													
17	Storage	Underground	13	49	X													
18	Storage	Underground	13	49	X													
19	Storage	Underground	13	49	X													
20	Storage	Underground	13	49	X													
21	Storage	Underground	13	49	X													
22	Storage	Underground	13	49	X													
23	Storage	Underground	13	49	X													
24	Storage	Underground	13	49	X													
25	Storage	Underground	13	49	X													
26	Storage	Underground	13	49	X													
27	Storage	Underground	13	49	X													
28	Storage	Underground	13	49	X													
29	Storage	Underground	13	49	X													
30	Storage	Underground	13	49	X													
31	Storage	Underground	13	49	X													
32	Storage	Underground	13	49	X													
33	Storage	Underground	13	49	X													
34	Storage	Underground	13	49	X													
35	Storage	Underground	13	49	X													
36	Storage	Underground	13	49	X													
37	Storage	Underground	13	49	X													
38	Storage	Underground	13	49	X													
39	Storage	Underground	13	49	X													
40	Storage	Underground	13	49	X													
41	Storage	Underground	13	49	X													
42	Storage	Underground	13	49	X													
43	Storage	Underground	13	49	X													
44	Storage	Underground	13	49	X													
45	Storage	Underground	13	49	X													
46	Storage	Underground	13	49	X													
47	Storage	Underground	13	49	X													
48	Storage	Underground	13	49	X													
49	Storage	Underground	13	49	X													
50	Storage	Underground	13	49	X													





## 4 Planning Scenarios

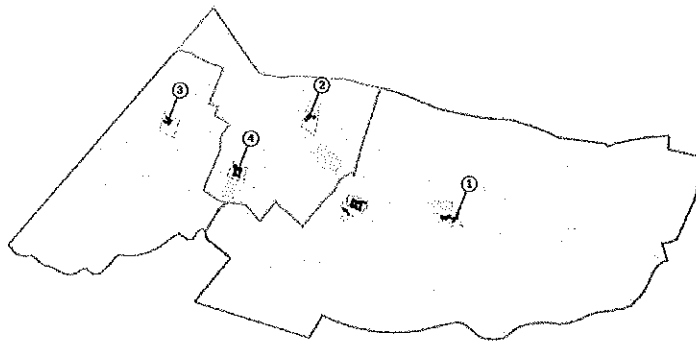
## 4.1 SCENARIO DIAGRAMS

### SCENARIO A

#### MINIMAL RENOVATIONS

The planning scenarios described on pages 134-141 are speculative and are offered as part of this study solely to raise questions and provoke discussion about possible scenarios for future improvement and growth in the School District. The four scenarios are incremental with respect to capital improvement investment and each scenario contains elements that could be interchanged with other scenarios. Scenario A, represented at right, is an example of a low-cost strategy that addresses overburdened classrooms in Hosmer, Lowell and Cuniff elementary schools. Scenario A includes a renovation project in Hosmer which replaces one of two gymnasium spaces with classroom and/or special education space. Scenario A does not address critical needs at Watertown High School.

- Does not identify a swing building
- Insufficient use of the administration building
- Does not address the needs of the High School



1. New classrooms in Hosmer Elementary gym
2. Space available in Lowell Elementary
3. Space available in Cuniff Elementary
4. Middle School space utilized

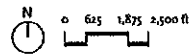


Fig. 1.0 Move 5th grade students from Hosmer Elementary to the Middle School



Fig. 1.1 Create new classrooms in Hosmer Elementary gym



Fig. 1.2 Move some students from Cuniff Elementary and Lowell Elementary to the Middle School

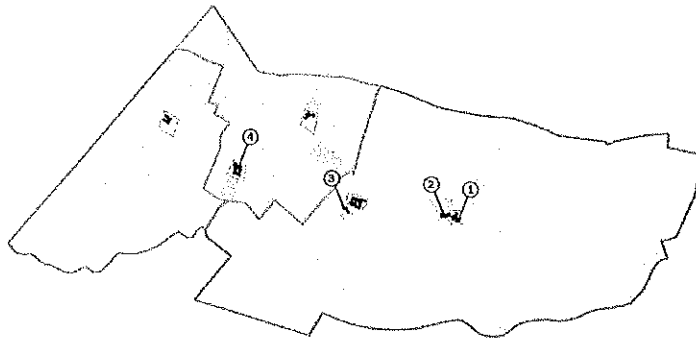
4.1 SCENARIO DIAGRAMS

**SCENARIO A1**

**ADMIN. AS SWING BLDG.**

Scenario A1, represented at right, is a second example of a low-cost strategy that addresses overburdened classrooms in Hosmer, Lowell and Cunniff elementary schools. Scenario A1 includes renovations to both the School Administration Building and Hosmer. The School Administration Building is shown as the new home of the preschool, which potentially allows for greater transformation of the Hosmer Elementary School. Scenario A1 does not address critical needs at the Watertown High School.

- Administration becomes a swing building
- Does not address the needs of the High School



1. Prefabricated addition to Hosmer Elementary
2. E. Junior of Hosmer Elementary rebuilt
3. Preschool students in Administration building
4. Middle school space utilized

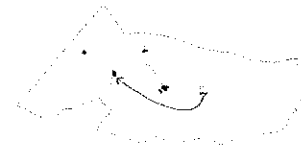
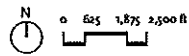


Fig. 1.0 Move 5th grade students from Hosmer Elementary to the Middle School

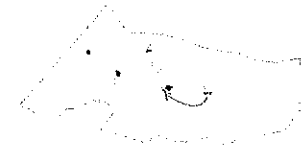


Fig. 1.1 Move preschool students from Hosmer Elementary to Administration building

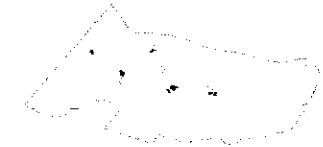


Fig. 1.2 Add prefabricated building to Hosmer Elementary for additional classrooms

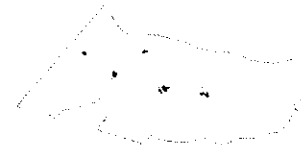


Fig. 1.3 Create new classrooms in Hosmer Elementary



Fig. 1.4 Rebuild East Junior in Hosmer West Elementary



Fig. 1.5 Move some students from Cunniff Elementary and Lowell Elementary to the Middle School

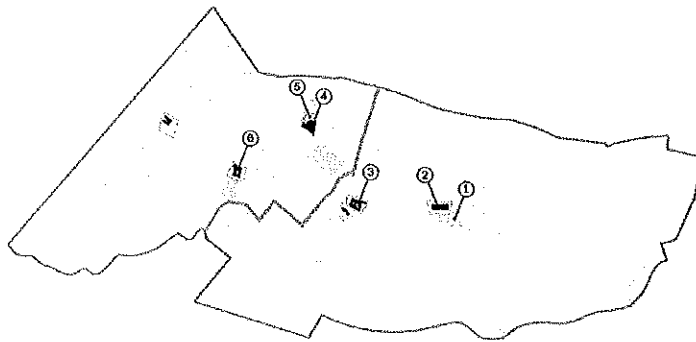
4.1 SCENARIO DIAGRAMS

**SCENARIO B**

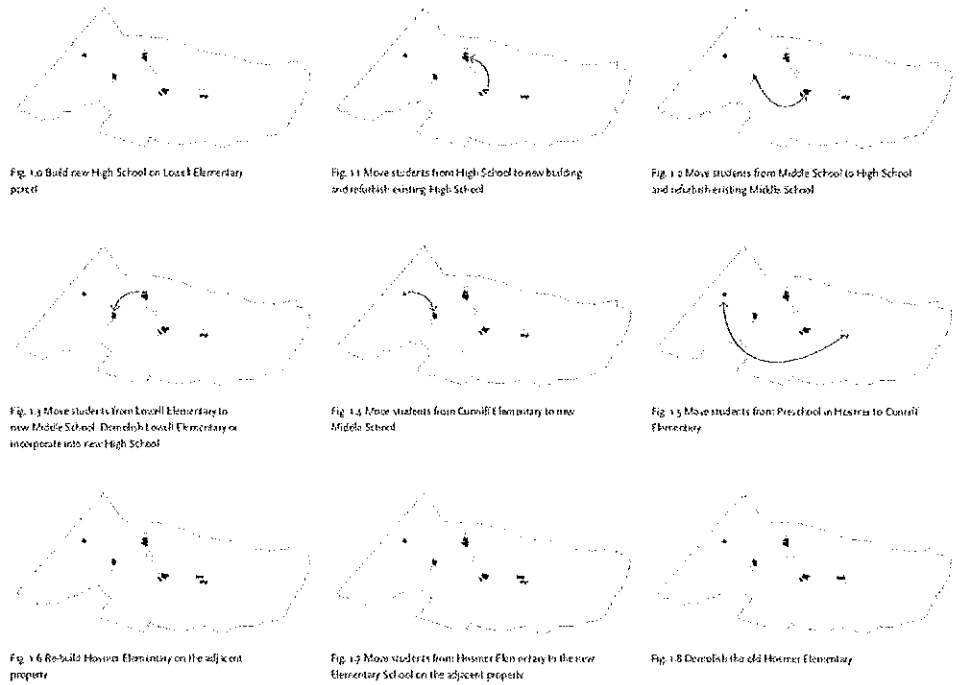
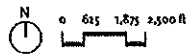
**HIGH SCHOOL AS SWING BLDG.**

Scenario B, represented at right, is an example of a high-cost strategy that addresses critical deficiencies in all schools. It assumes a phased approach and implementation over the course of many years. Scenario B includes the construction of a new high school building first, followed by renovations to all other school properties. The new high school establishes a "swing building" approach subsequent renovation projects, allowing for the movement of students from one building to another and enabling renovations to occur in the vacated building. Construction of a new high school is also intended to improve the relationship between the high school and its outdoor spaces. In this case, the new high school is proposed on Lowell Elementary School's large front lawn, in close proximity to Victory Field.

- New High School
- Twice as large Hosmer Elementary School



1. Hosmer Elementary parcel becomes open field
2. New Hosmer Elementary
3. High School acts as swing building
4. New High School
5. Existing Lowell Elementary building TBD
6. Refurbished Middle School



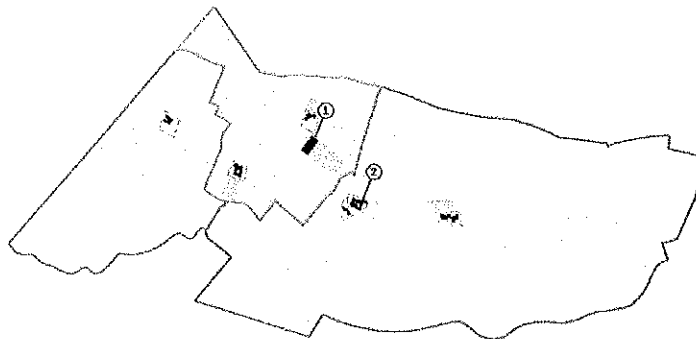
4.1 SCENARIO DIAGRAMS

**SCENARIO B1**

**HIGH SCHOOL AS SWING BLDG.**

Scenario B1, represented at right, is an example of a high-cost strategy that addresses critical deficiencies in all schools. It assumes a phased approach and implementation over the course of many years. Scenario B1 includes the construction of a new high school building first, followed by renovations to all other school properties. The construction of a new high school allows the old high school to serve as a "swing building" for a period of years after which it can be repurposed for alternative town use(s). In Scenario B1, the new high school is proposed on the site of the current public works facility, which establishes the ideal relationship between the high school and Victory Field. Possible options for the required relocation of the public works facility have not been considered.

- New High School
- New High School is located in close proximity to playing fields
- No set back line



- 1 New High School
- 2 Existing High School acts as swing building

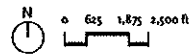


Fig. 1.1 Build new High School adjacent to High School playing fields

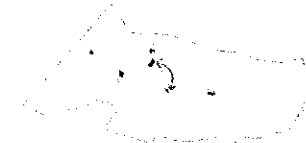


Fig. 1.2 Move students from High School to new building and repurpose existing High School



Fig. 1.3 Existing High School acts as a swing building for all other buildings and then repurposed for alternative town uses thereafter