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:
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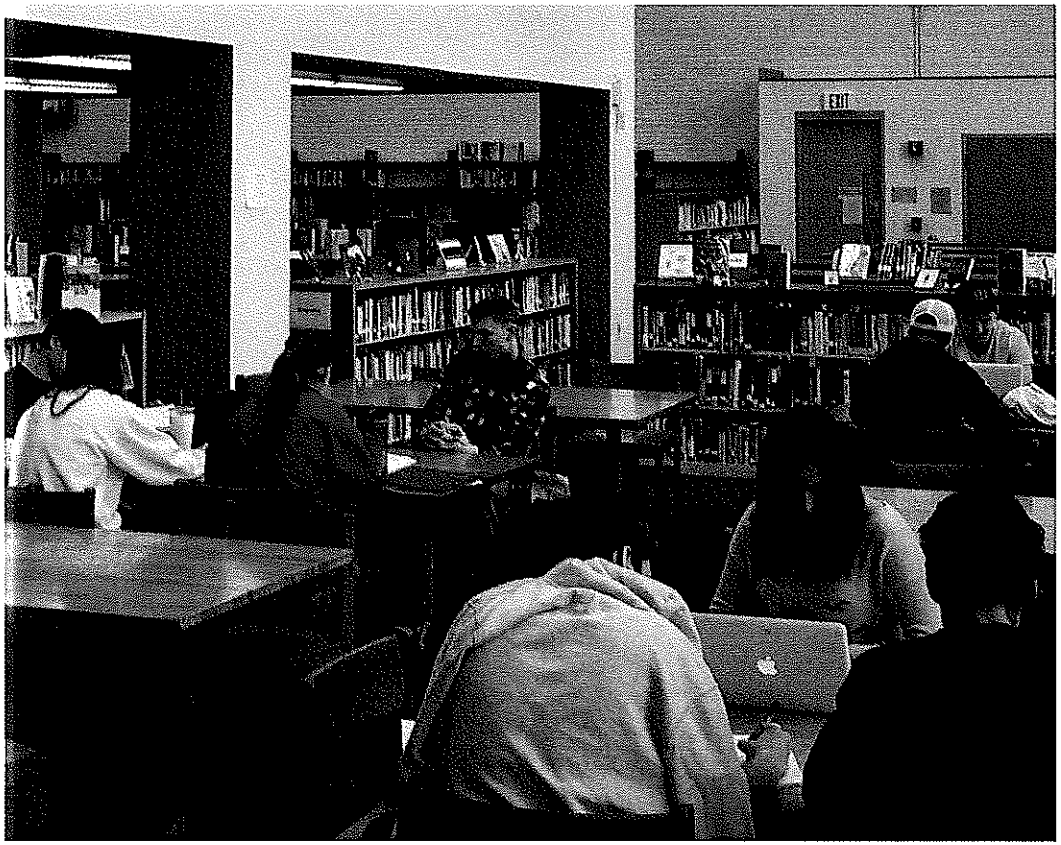
PROJECT CONSULTANT TEAM

Architect and Lead Consultant	Oudens Ello Architecture, Boston, MA
Building Envelope Consultant	Simpson Gumpertz & Heger, Waltham, MA
MEP-FP Engineer	TMP Consulting Engineers, Boston, MA
Structural Engineer	RSE Associates Inc., Watertown, MA
Code/Life Safety Consultant	Cosentini Associates, Cambridge, MA



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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,

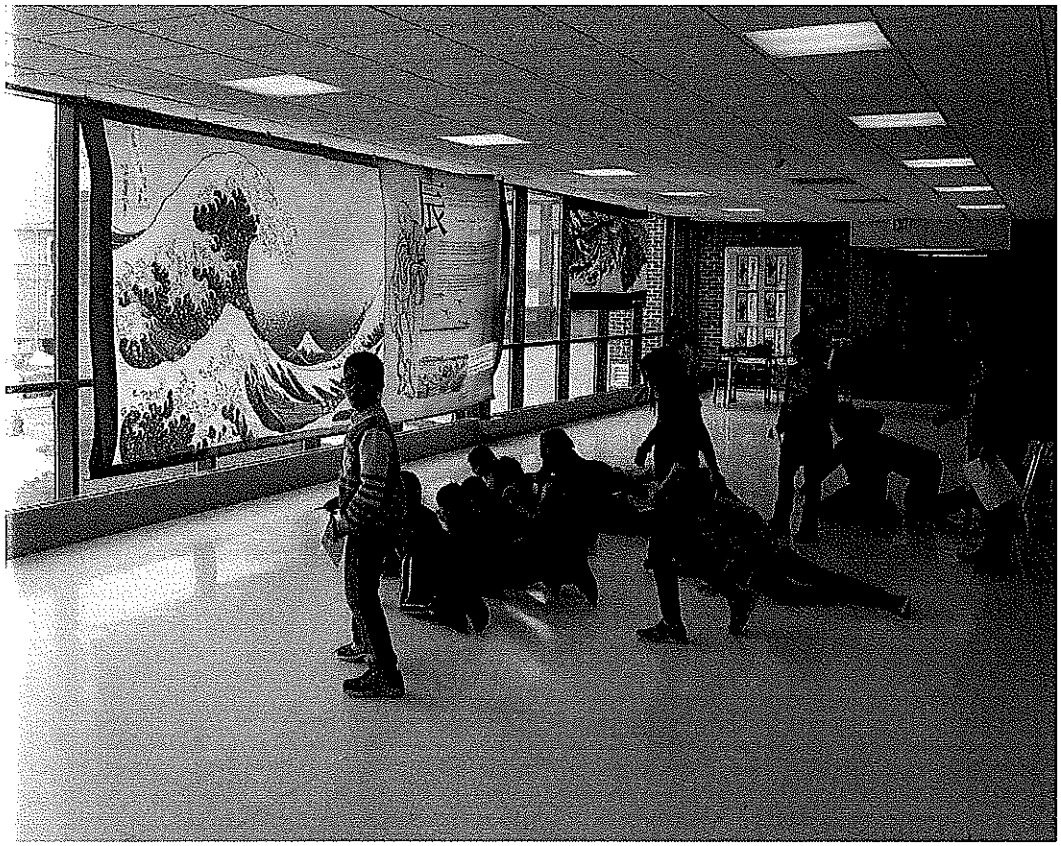
It is with great pleasure that Ouden Ello Architecture submits our qualitative assessment document for the Watertown Public Schools District. During the course of this study we have come to understand how cherished an institution the District is within Watertown, and we thus feel privileged to have been 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 Ello, AIA, LEED AP Paul Schlapobersky, 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 Ello 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 its 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:

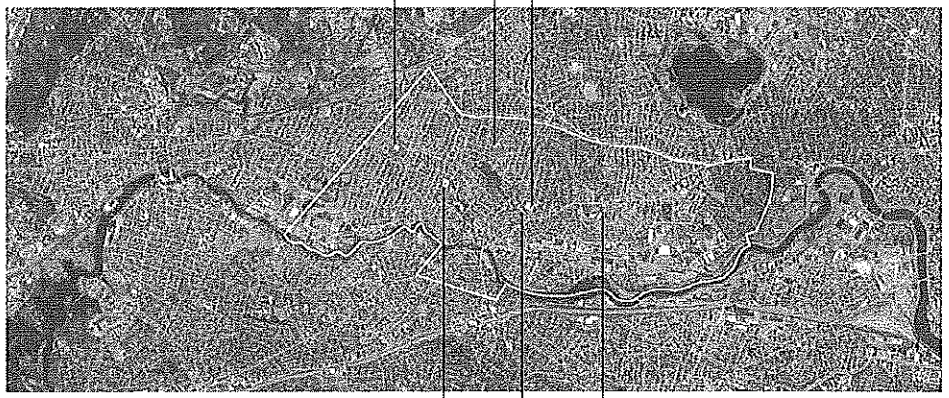
- Age of the facilities.
- Capacity of facilities, including projections of potential growth of Watertown's population.
- Functionality of major building elements forming parts of facilities in relation to other parts, when constructed at different times (or, in the case of Hosmer Elementary, when constructed 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

Cunniff Elementary School
Grades K-5
246 Warren Street
Principal: Ms. Mena Ciarlone

Lowell Elementary School
Grades K-5
175 Orchard Street
Principal: Ms. Elizabeth Kaplan

Watertown High School
Grades 9-12
50 Columbia Street
Principal: Ms. Shirley Lundberg



Watertown Middle School
Grades 6-8
68 Waverly Avenue
Principal: Mr. Kimo Carter

Administration Building (Former Phillips School)
30 Common Street
Superintendent: Dr. Jean M. Fitzgerald
Director of Facilities & Transportation: Mr. Jay Francione

Hosmer Elementary School
Preschool, Grades K-5
1 Concord Road
Principal: Mr. Bob LaRoche

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 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.

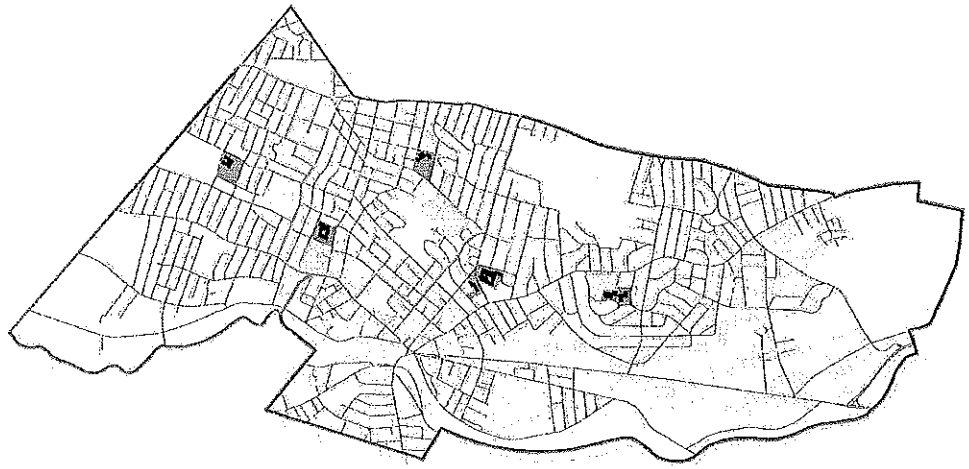
we see as being an outlier for the purposes of this study, as it is a self-contained unit), and there have been no completely new, purpose-built, synthesized, school buildings constructed in the District since the 1950 (Hosmer, Cunniff). This creates an additional factor, such that all properties consist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

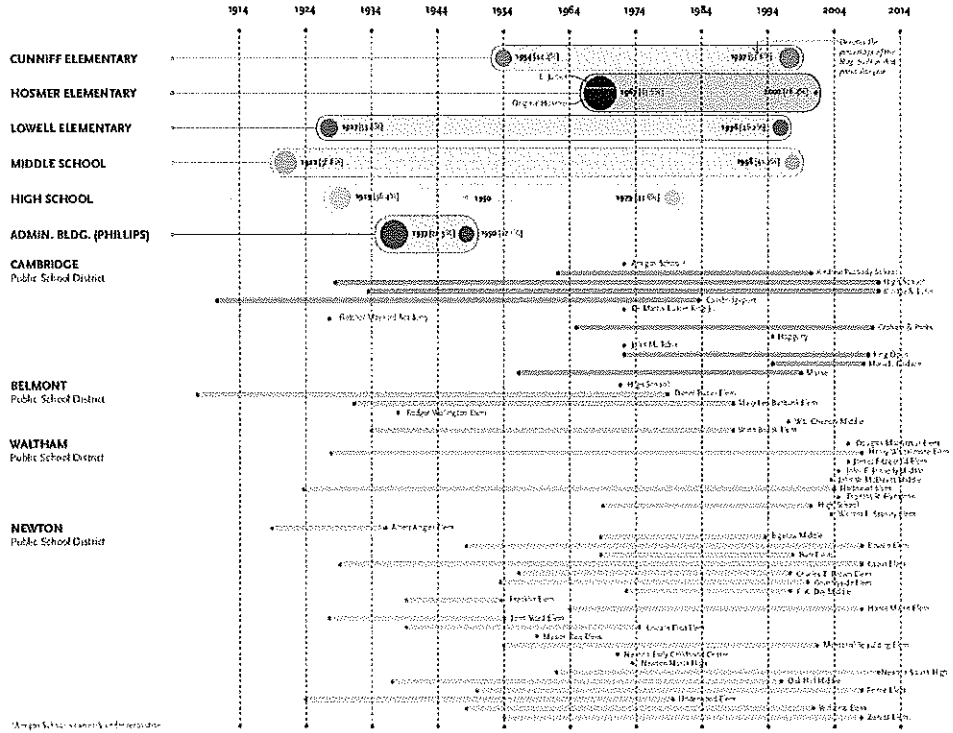
- Just over half of the space of the High School was built in 1929. While the 1979 addition is reasonably well integrated with the original building and was well constructed at the time, more than half of the High School's primary educational uses must be adapted to what is now an old and inflexible 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.

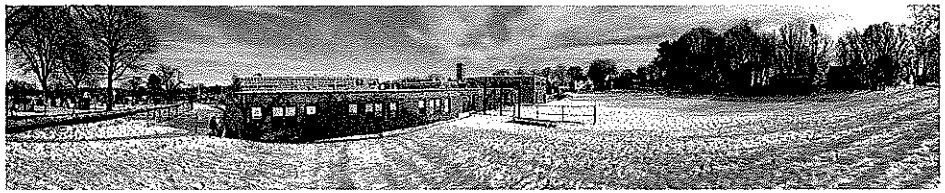
WHAT THIS STUDY DOES NOT REVEAL

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 a general lack of quality, flexible classroom 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.





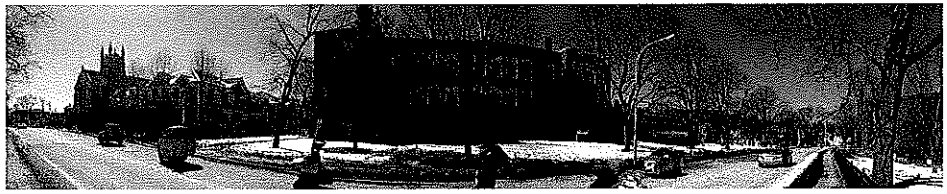
Cunniff School

Hosmer School

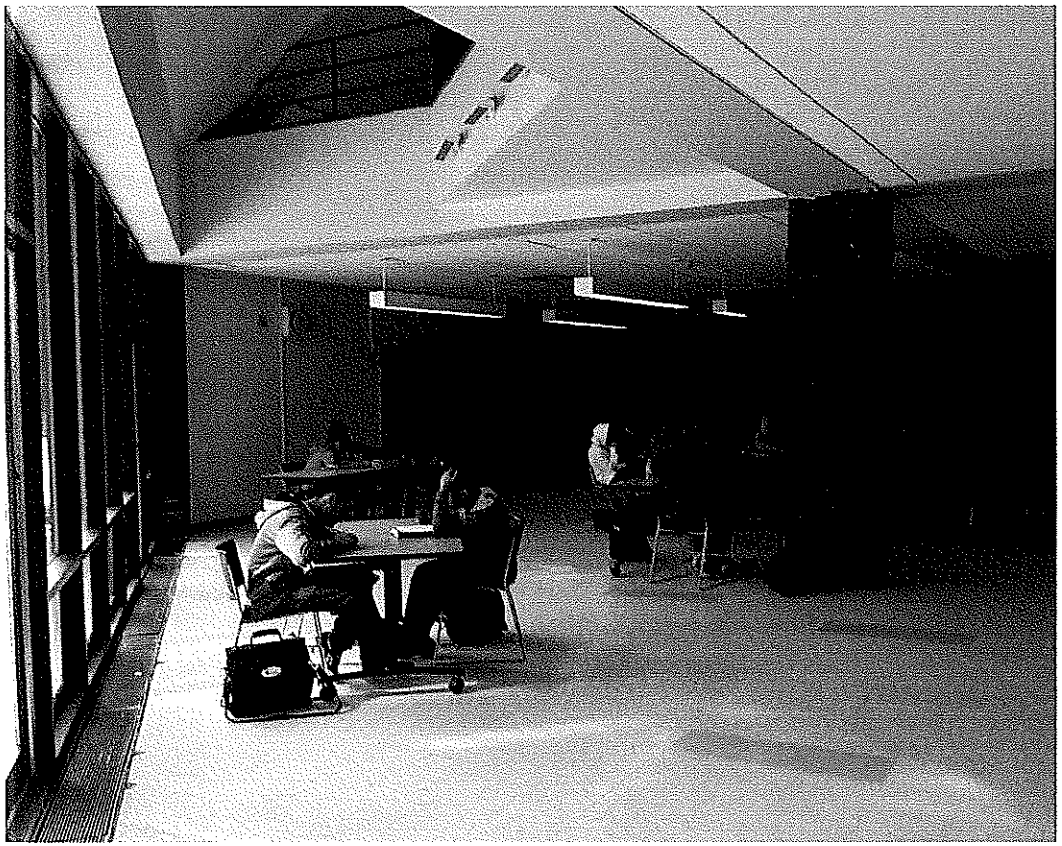
Lowell School

Middle School

High 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 Darilyn Donavan, Assistant Superintendent.

The study consisted of two primary qualitative assessment methods:

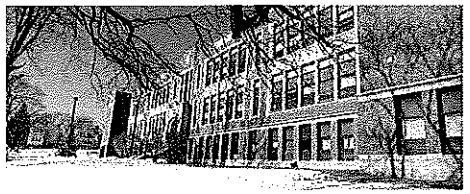
- The first was focused exclusively on the physical condition of the building(s) with general construction and use-wear criteria not specifically related to school building functionality.
- The second focused on qualitative criteria more finely adjusted to the particular needs of school buildings. The 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).

Cunniff School



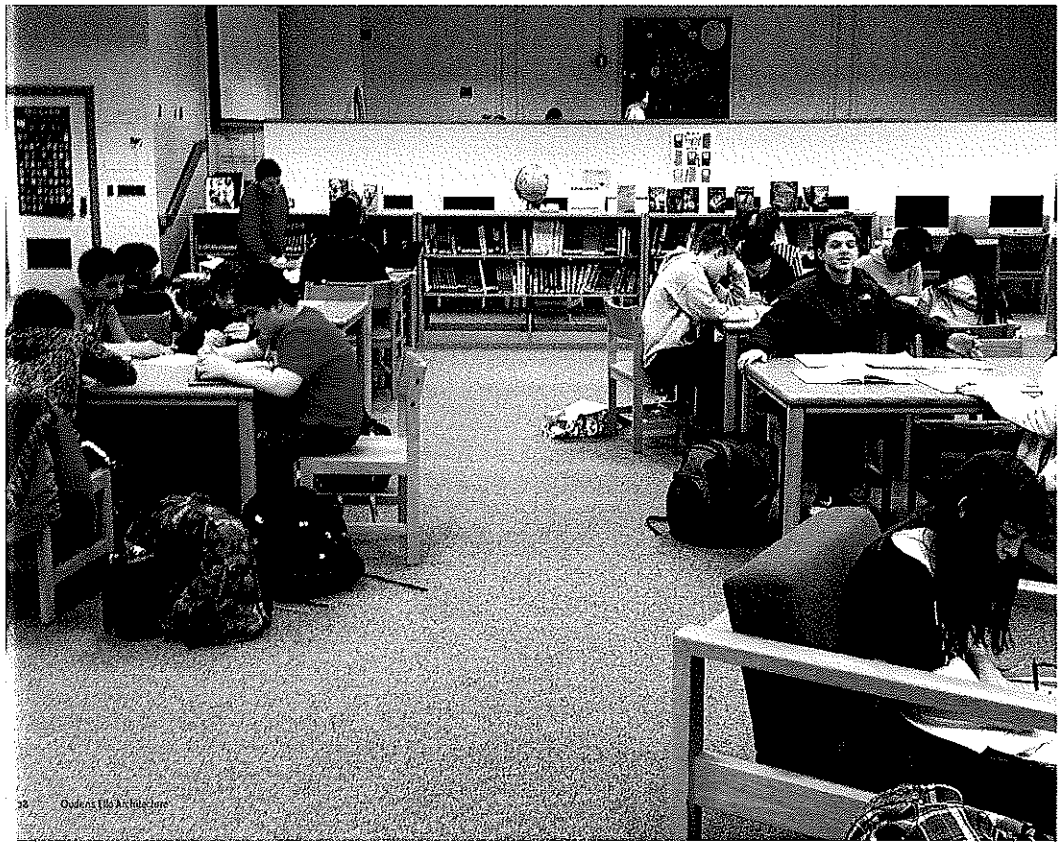
Middle School

Hosmer School

High School

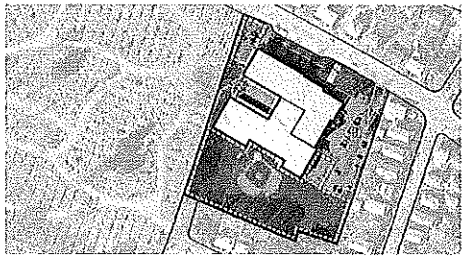
Lowell School

Administration Building — Phillips School



3 Individual School Analyses

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

Cunniff Elementary is the smallest active school in the Watertown School District and serves the westernmost portions of the West End and Bemis 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, Cunniff is generally very sound (note: Cunniff Elementary achieved the highest score using Building Physical Condition Criteria). It is a cheerful place with ample daylighting, especially in the 1954 building. Cunniff also enjoys a safe and efficient main entrance with excellent visual control from the central office suite.

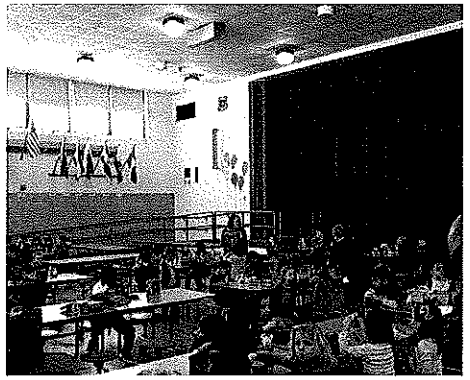
Despite its important attributes, Cunniff Elementary possesses one of the lowest square footage per student ratios in the School District (165 SF per student). The lack of space is ultimately Cunniff's primary deficiency. The typical classroom is too small to accommodate an average current class size 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 Cunniff 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, Cunniff 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, Cunniff'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 it's 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 Cunniff Elementary School	Date Constructed:	1954	Assessed By:	JATRey
	Number of Floors:	1-2	Reviewed By:	BAGabby
	Approx. Sq. Ft.:	52,000	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:	1964 Building: Clay brick mass masonry. 1997 Addition: Clay brick-clad cavity wall with precast architectural elements.
Window System:	1964 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 awning operable vents, and IGUs.
Door System:	All Building Areas: Entrances are aluminum framed storefront with IGUs reportedly installed in 1997.
Roof System:	1964 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 patching 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 listel corrosion and spalling mortar joints indicates that the deterioration of the lintels 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	1964 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 8 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).
Fenestrations:	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 pliable, in-tact 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 sealants 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 two-story 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 soffit appear to be failing at light fixture (Photo 19).

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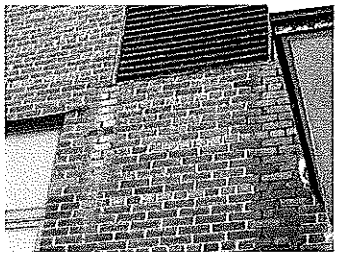

Photo 1

Efflorescence and deteriorating mortar joints below louver at east elevation.

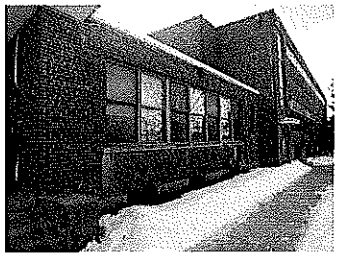

Photo 2

Efflorescence below window sill along north elevation.

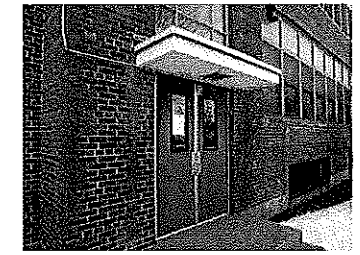

Photo 3

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

Photo 4

Step crack in brick masonry west of main entrance.

Photo 5

Deterioration of several bricks along west elevation.

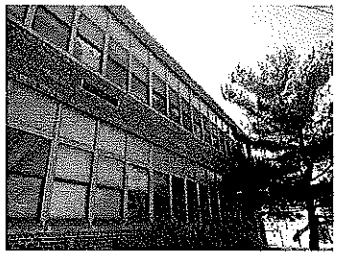

Photo 6

Localized pointing repairs in 1954 Building exterior walls.

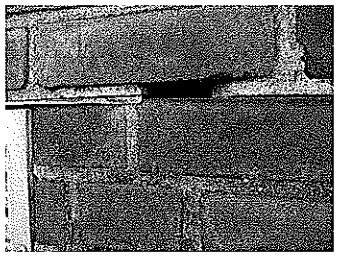

Photo 7

Spalled and missing mortar with rusted lintel behind at louver along north elevation of 1954 Building.

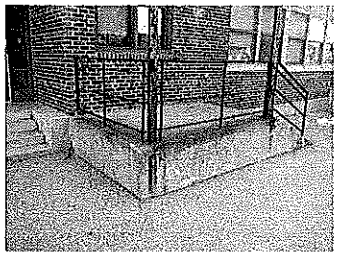

Photo 8

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

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).

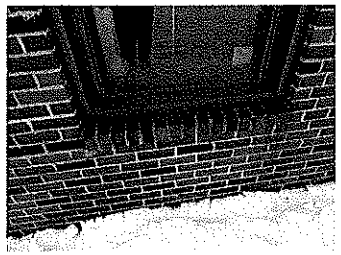

Photo 10

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

Photo 11

Failed sealant joint at brick masonry expansion joint.

Photo 12

Weeps at grade along south elevation.

CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS

Photo 13

Cracked and failing perimeter seal at window.

Photo 14

South elevation auxiliary entrance. Frame is face sealed at several joints and placed directly at grade with no seal.

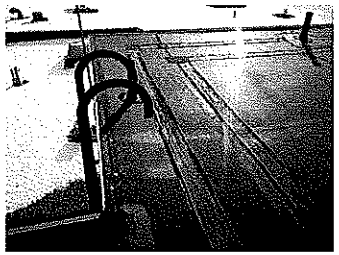

Photo 15

Raised fastener heads under roofing membrane.

Photo 16

Raised fastener penetrating the roofing membrane with failed sealant repair.

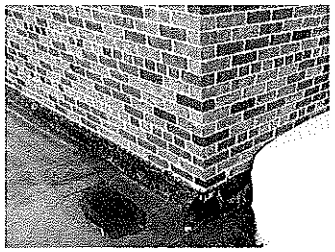

Photo 17

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

Photo 18

Displaced edge metal at 1954 Building roof.

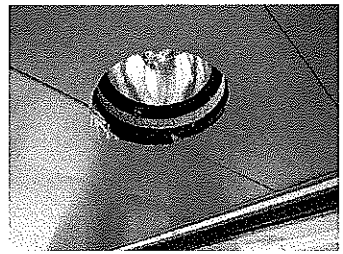

Photo 19

Light installed at metal panel clad canopy. Support for the metal panels at soffit appears to be failing.

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. 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 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 Cafetorium is served by 2 air handling units both with hot water, dx coils, and clearstory 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 ths 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 Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Cunniff Elementary School
System: HVAC

Area: 51,975 sq. ft

Construction Date: 1954
Renovation Date: 1997

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/6/14

Page 2 of 3

	system			life cycle		condition			deficiencies			recommendations: A - Immediate, B - Elective, C - Eventual				
item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
1	Boilers	Hot Water	Boiler Room	19	30			X							A	(1)
2																
3	Pumps (Base-Mounted)	Centrifugal	Boiler Room	2	25		X					X				
4																
5	Unit Ventilators	Console	Classrooms	17	25		X		X		Refer to Controls			A	C	(1)
6																
7	Controls	Pneumatic	Throughout Building	Varies	30			X	X		Overheating occurring due to ageing and deteriorating controls				A	Pneumatic controls being replaced under ESCO project
8																
9	Air Handling Units	Modular	Varies	Varies	30		X				(2)				B/C	
10																
11																
12																
13																
14																
15																
16																
17																
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23																
24																

Notes:

(1) It was reported that the boilers were replaced in 1994. The boilers are scheduled to be replaced summer of 2014 — (6)
(2) Lack of control for many units can be traced to the Controls deficiencies — (7)
(3) — (8)
(4) — (9)
(5) — (10)

CUNNIFF SCHOOL - ENGINEERING CONSIDERATIONS

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Cunniff Elementary
Systems: Plumbing and Sprinkler Systems

Area: 51,975 ft²

Construction Date: 1954
Renovation Date: 1997

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/5/14

Page 1 of 1

item #	system: component name	type	service/location	life cycle: estimated age	expected life	condition: new	good	aged	deficiencies: functional	code	deficiency	recommendation: A - Immediate, B - Elective, C - Eventual: no work	maintenance	repair	replace	remarks
1	Domestic hot water heater and storage tank	Gasfired	Boiler Room	3	20	X						X				
2																
3	Piping	Cast iron and copper	Throughout Building	(1)	50		X	X	X		(2)				C	(1);(6)(7);(8)
4																
5	Sprinklers	Wet	Throughout 1997 wing	17	50		X					X				(4)
6																
7	Ansul Hood	Pre-charged	Kitchen	7	20		x					X				(5)
8																
9																
10																
11																
12																
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14																
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Notes:

(1) The age of the piping throughout the school varies and can be anywhere between 15 years old to over 60 years old.

(2) Low gas pressure plagues the school on very cold days, sometimes tripping low pressure switches.

(3) A new gas booster is indicated.

(4) Consideration should be given to provide 100% sprinkler coverage for entire building.

(5) Minimal cooking done with grease, ovens are mainly used, the hoods are cleaned at regular intervals.

(6) It has been reported that there may be asbestos remaining in some of the mechanical systems' insulation. Abatement of asbestos that is non friable is elective.

(7) Consideration to be given to adjust gas booster low pressure switch setting, if possible

(8) Recommend eventual replacement of the original piping. No work required on the piping installed in 1997

(9)

Watertown Public Schools
Building Conditions Survey

TMP Consulting Engineers, Inc.

School: Cunniff Elementary

Construction Date: 1954/1997

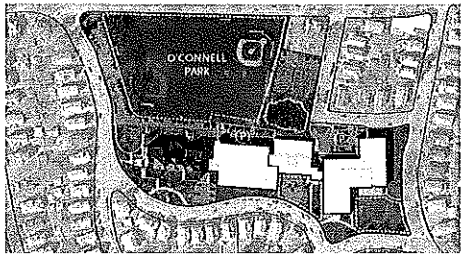
Survey Team: TMP

Survey Date: 3/5/14

Page 1 of 1

item #	system: component name	type	service/location	life cycle: estimated age	expected life	condition: new	good	aged	deficiencies: functional	code	deficiency	recommendations A - Immediate, B - Elective, C - Eventual: no work	maintenance	repair	replace	remarks
Electrical																
1	Service															
2	Wiring	Underground	Underground from pad trans.	17	40		x					x				
3	Equipment	Main Switchboard	Main Electric Room	17	40		x					x				
4	Rating	800A 480/277V 3PH														
5	Distribution															
6	Panels	Cir. Br.	Throughout	17	40		x					x				
7	Motor Controls	VFD's	Boiler Room	17	30		x					x				
8	Wiring	Conduit & wiring	Throughout	17	30		x					x				
9																
10	Life Safety															
11	Fire Alarm	City connected	Throughout	17	20	x						x				
12	Emer. Ltg.	On Battery Packs	Throughout	2	5		x		x						C	Replace with Generator
13	Fire Alarm Serv.	Underground	Underground from Master Box	12	40		x		x		None apparent	x				
14	Devices															
15	Receptacles	Duplex	Throughout	17	40		x		x			x				
16	Switches	Standard toggle	Throughout	17	40		x		x			x				
17	Lighting															
18	Classrooms	Recessed fluor.	Throughout	2	20	x						x				
19	Offices	Recessed fluor.	Throughout	2	20	x						x				
20	Corridors	Recessed fluor.	Throughout	2	20	x						x				
21	Toilets	Recessed fluor.	Throughout	2	20	x						x				
22	Mech Spc.	Recessed fluor.	Throughout	2	20	x						x				
23																
24																
25																

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.

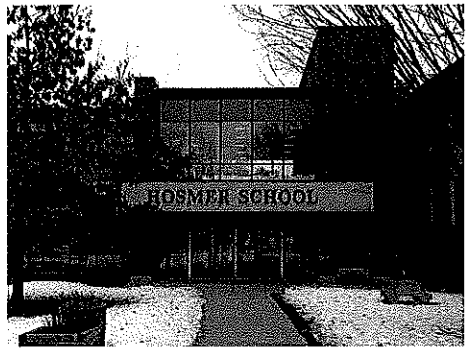
What seems counterintuitive given severe demands for space, Hosmer suffers greatly from its large size and the joining of the original Hosmer with the 1967 portion of the former East Junior High School. In short, the combined facility lacks the types of spaces that it desperately needs (e.g., classroom 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 gymnasia 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.

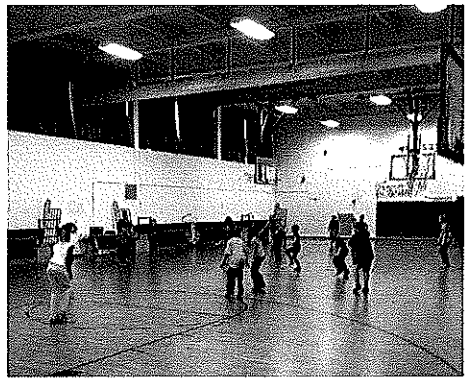
With almost twice the number of Pre-K through Grade 5 students than its peer schools, Hosmer also operates as a "super elementary school," within which it is difficult to deliver a nurturing, intimate experience for its young schoolchildren. Given the lack of classroom-type space available in the old 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

Watertown Public Schools Hosmer Elementary School	Date Constructed:	1967	Assessed By:	JATBay
	Number of Floors:	2 + Partial Basement	Reviewed By:	BAGabby
	Approx. Sq. Ft.:	103,000	Assessment Date:	2/20/14

Additions, Renovations, and Major Maintenance:	**1967:** Original Hosmer School and Old East Junior School Constructed **2002:** Connector Building addition connecting the two schools (new 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 mulled together with an aluminum spine. Wet 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 wet-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. **Ancillary Entrances:** Hollow metal typically with light tan painted finish.
Roof System:	**1967 Original Hosmer & 2002 Connector Building:** Sarnafil PVC membrane typical at low-sloped areas and standing seam metal at steep sloped areas. **1967 Old East Junior:** Sarnafil PVC membrane typical at low-sloped areas. Auditorium roof is a different, unmarked, 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 2004.
General Building Performance	
Reports of Building Enclosure Leakage/Distress:	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 ventilator in Room 158, 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.

Component Condition (Rating 0 to 5)

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 penthouse 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-lapped 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 lite 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	5 (PVC & Shingle) 2 (EPDM)	**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 (<6 in. from roof surface) with failed EPDM repairs exist along east elevation of elevator overrun (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.

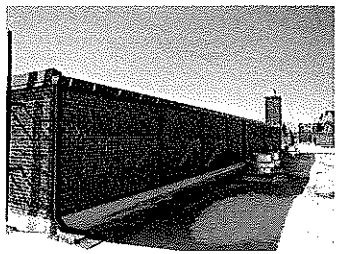


Photo 1

Deterioration of mortar joints below unsealed seams in penthouse gutter.

Photo 2

Cracked and spalled stucco spandrel panel at Original Hosmer Building.

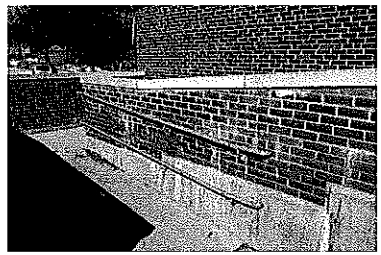


Photo 3

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

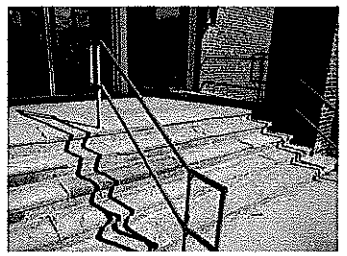


Photo 4

South entrance floor.

HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

Photo 5

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

Photo 6

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

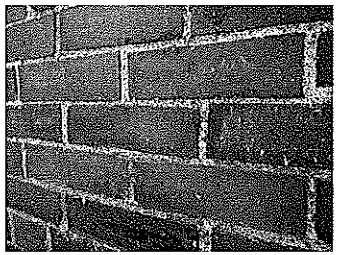


Photo 7

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

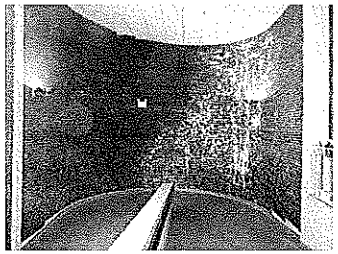


Photo 8

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

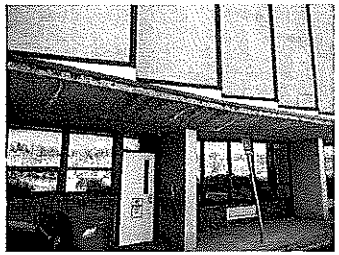


Photo 9

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

Photo 10

Remaining extents at west end demolition.

Photo 11

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

Photo 12

Failed window perimeter sealant.

Photo 13

Failed window perimeter sealant.

Photo 15

Corrosion at hollow metal door frame.

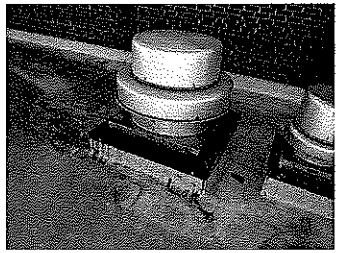


Photo 17

Rooftop exhaust fan with corroded flashing.

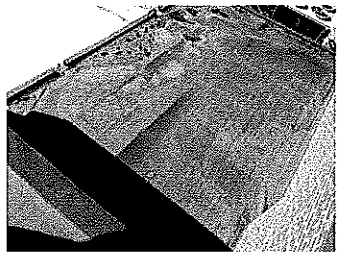


Photo 19

EPDM roofed area at southwest bedding corner. Membrane is unadhered and substrate is buckling.

Photo 14

Broken screen at old East Junior School Cafeteria.

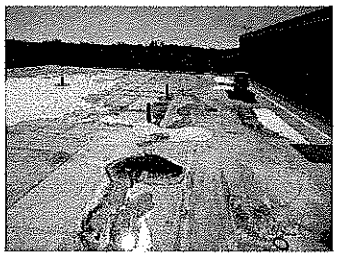


Photo 16

Ponding water at original Hosmer School Roof.

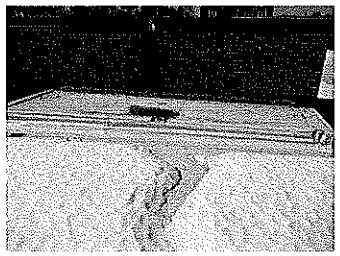


Photo 18

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 steels joists with a concrete topped formdeck at the second floor. There are expansion joints separating the three sturctures.

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 102,500GSF 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 exitstairways and a exit ramp. The First Floor is served by three exit stairways and doors to grade. The Ground Floor is served by two exit stairs and doors directly to grade. The pre-school 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. 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

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 Btuh 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 Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Hosmer
Systems: HVAC

Area: 102,602 sq. ft.

Construction Date: 1967
Renovation Date: 2002

Facility Contact: Jay Franclone
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/5/14

Page 1 of 1

item #	system: component name	type	service/location	life cycle: estimated age	life cycle: expected life	condition: new	condition: good	condition: aged	deficiencies: functional	deficiencies: code	deficiencies: deficiency	recommendation (A - Immediate, B - Elective, C - Eventual): no work	maintenance	repair	replace	remarks
1	Boilers	Hot Water	Boiler Room	11	30		X					X				(5)
2																
3	Pumps (Base-Mounted)	Centrifugal	Boiler Room	(1)	25		X	X				X			B	Replace 47 year old pumps
4																
5	Pumps (Inline)	Centrifugal	Boiler Room	(2)	25		X					X				
6																
7	Unit Ventilators	Console	Classrooms	Mixed	25		X	X	X		Control Related			A	C	(3)
8																
9	Controls	Pneumatic	Throughout Building	45	30			X	X		Overheating occurring due to aging and deteriorating controls				A	Pneumatic controls being replaced under ESCO project
10																
11	Rooftop Units	HVAC	2002 Roof	12	25		X					X				
12																
13	Air Handling Units	Modular	Varies	45	30			X			(3)				B/C	(4)
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																

Notes:

(1) Three pumps are original equipment (45 years) and four pumps were installed in 2002 (12 years)

(2) There are several vintages for these pumps, average age is +/- 15 years

(3) Lack of control for many units can be traced to the Controls deficiencies

(4) The age of these units would support that they exceeded the normal estimated service life

(5) It has been reported that Asbestos may be in the boiler breeching.

(6)

(7)

(8)

(9)

(10)

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Hosmer
Systems: Plumbing & Fire Protection

Area: 102,692 sq. ft.

Construction Date: 1967
Renovation Date: 2002

Facility Contact: Jay Franclone
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/5/14

Page 1 of 1

item #	system: component name	type	service/location	life cycle: estimated age	life cycle: expected life	condition: new	condition: good	condition: aged	deficiencies: functional	deficiencies: code	deficiencies: deficiency	recommendation (A - Immediate, B - Elective, C - Eventual): no work	maintenance	repair	replace	remarks
1	Domestic Hot Water Heater & Storage Tank	Split System	Boiler Room	2	20	X						X				
2																
3	Piping	Cast Iron & Copper	Throughout	(2)	30		X	X				X			C	(2)(5)
4																
5	Sprinklers	Wet System	New Addition	12	30		X					X				(3)(4)
6																
7	Ansul Hood	Pre-charged	Kitchen	7	20		X									(1)
8																
9																
10																
11																
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Notes:

(1) Minimal cooking done with grease, ovens are mainly used. The hoods are cleaned at regular intervals dictated by Fire Dept.

(2) Most of the piping is original to building with (the exception of the 2002 addition) minor modifications

(3) Consideration should be given to extend sprinkler coverage into the entire building complex.

(4) No fire pump required.

(5) It has been reported that there may be asbestos remaining in some of the mechanical system's insulation. Abatement of asbestos that is non-friable is elective.

(5) Recommend replacement of original piping. No work required with the piping installed in 2002

HOSMER SCHOOL - ENGINEERING CONSIDERATIONS

Watertown Public Schools
Building Conditions Survey

TMP Consulting Engineers, Inc.

School: Hosmer Elementary

Construction Date: 1967/2002

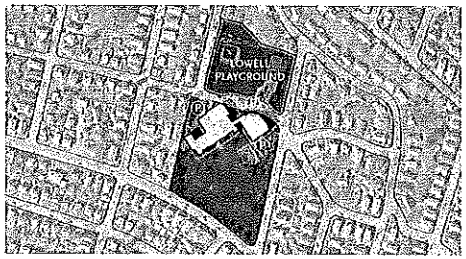
Survey Team: TMP

Survey Date: 3/5/14

Page 1 of 1

system				life cycle		condition			deficiencies			recommendation: A - Immediate, B - Elective, C - Eventual				
item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
Electrical																
1	Service															
2	Wiring	Underground	Underground from pad trans.	12	40		x					x				
3	Equipment	Main Switchboard	Main Electric Room	12	40	x						x				
4	Rating	2000A 208/120 3PH														
5	Distribution															
6	Panels	Circ. Bkr	Throughout	47	40	x								C	C	See Report
7	Motor Controls	Old technology	Boiler Room	4	30	x									C	
8	Wiring	Conduit & wiring	Throughout	47	30			x							C	See Report
9	Stage Dimming	Dimming System	Auditorium	47	40			x							C	See Report
10	Life Safety															
11	Fire Alarm	City connected	Throughout	14	30		x		x			x				
12	Emerg. Ltg	Via battery packs	Throughout	2	5				x		Generator not functioning				A	Replace Generator - See Report
13	Fire Alarm Serv	Underground	Underground from Master Box	14	40		x		x		None apparent	x				
14	Devices															
15	Receptacles	Duplex	Throughout	12	40		x		x			x				
16	Switches	Standard toggle	Throughout	12	40		x		x			x				
17	Lighting															
18	Classrooms	Recessed fluor.	Throughout	2	20	x						x				
19	Offices	Recessed fluor.	Throughout	2	20	x						x				
20	Corridors	Recessed fluor.	Throughout	2	20	x						x				
21	Toilets	Recessed fluor.	Throughout	2	20	x						x				
22	Stairwells	Incandescent	Throughout	47	20			x	x		Non Energy Efficient				B	
23	Exterior	Incandescent		47	20			x	x		Non Energy Efficient				B	
24																
25																

LOWELL ELEMENTARY SCHOOL



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

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.

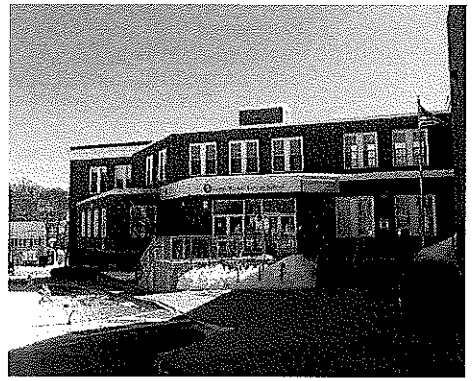
Similar to Cunniff, Lowell Elementary is generally a cheerful school with light-filled spaces and an efficient main entry with excellent visual supervision from the central office suite. Lowell also possesses a highly efficient and flexible classroom wing (i.e., the 1997 addition) with big spaces that 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.



LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY

Watertown Public Schools Lowell Elementary School	Date Constructed:	1927	Assessed By:	JATilley
	Number of Floors:	3	Reviewed By:	BAGabby
	Approx. Sq Ft:	85,000	Assessment Date:	2/28/14

Additions, Renovations, 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 fabric through-wall flashings.
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 curtain wall, all reportedly installed in 1996.
Door System:	All Building Areas: Entrances are aluminum framed storefront 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.
General Building Performance	
Reports of Building 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. Ongoing and increased need for repairs 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.

Component Condition (Rating 0 to 5)		
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 1). Corrosion is visible at lintels, and previous 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 coping 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.
Fenestrations	3	All Building Areas: Window and curtain wall frames and glazing appears to be sound with only typical maintenance required. Perimeter seals are crazing and debonded 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 sealant repairs (Photo 12 and Photo 13). Watertown Public Schools reported that leakage occurred at one drain locations 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 interior 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 slate 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.

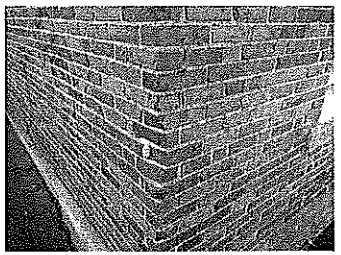


Photo 1

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.

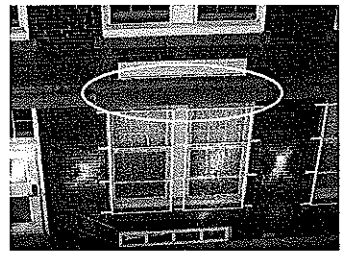


Photo 3

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.

LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

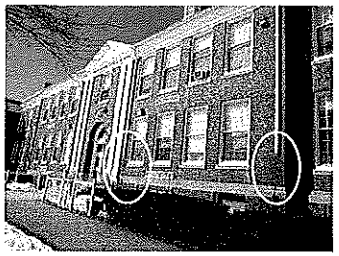


Photo 5

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

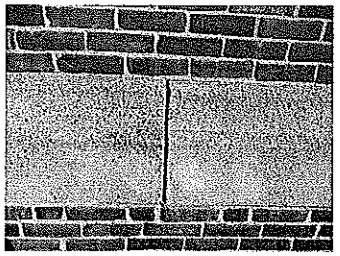


Photo 6

Open transverse joint in concrete band element of 1927 Building.

Photo 7

Peeling paint at decorative wood elements of 1927 Building.

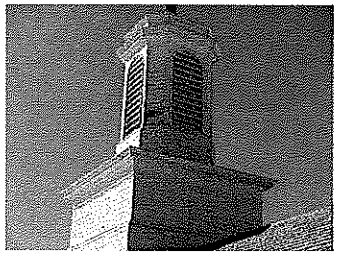


Photo 8

Damage at cupola.

Photo 9

Efflorescence at site wall.

Photo 10

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

Photo 11

Metal cornice elements appear displaced at 1996 Addition.

Photo 12

Adhered EPDM roof with drain insert and multiple patches.

LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

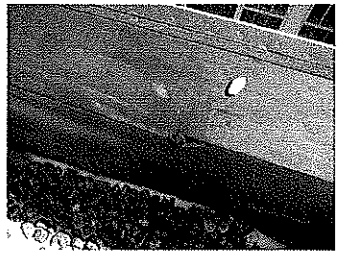


Photo 13

Failed sealant repair at parapet.

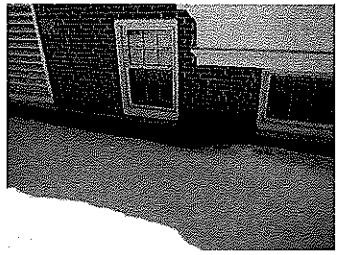


Photo 14

EPDM membrane termination at rising wall.

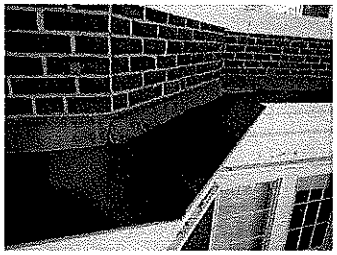


Photo 15

EPDM installed over wood cornice elements of 1927 Building.

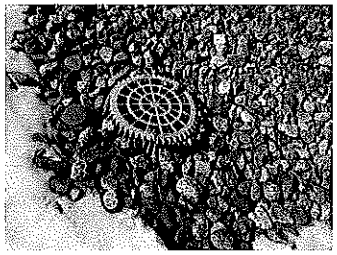


Photo 16

Damaged drain strainer at ballasted roof area.

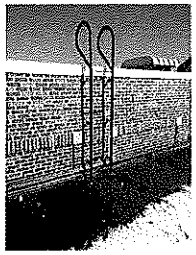


Photo 17

Rusted roof ladder.

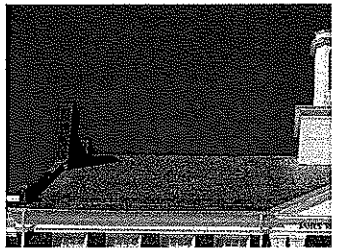


Photo 18

Patched areas in slate roof.

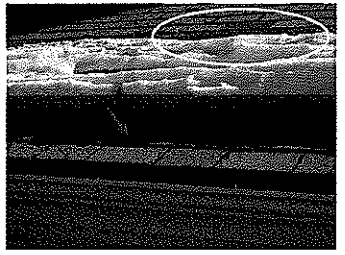


Photo 19

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

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 sounds 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 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. With the installation of a retrofit sprinkler system, the pre-existing cross corridors have been appropriately decommissioned. The 36-inches 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 the 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 Ansul 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.

<u>Observation/Comments</u>

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 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 — TMP CONSULTING ENGINEERS

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Lowell Elementary School
System: HVAC

Area: 84,600 sq. ft

Construction Date: 1927
Renovation Date: 1996

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/5/14

Page 1 of 1

	system			life cycle		condition			deficiencies			recommendation: A - Immediate, B - Elective, C - Eventual				
item #	component name	type	service/location	estimated age	expected life	new	good	aged	insufficient	code	deficiency	no work	maintenance	repair	replace	remarks
1	Boilers	Hot Water	Boiler Room	44	30			X							A	(1)
2																
3	Pumps (Base-Mounted)	Centrifugal	Boiler Room	3	25		X					X				
4																
5	Piping	Steel and copper	Throughout building	Varies	30			X			(3)				B	
6																
7	Unit Ventilators	Console	Classrooms	17	25		X		X		Controls related			A	C	(2)
8																
9	Controls	Pneumatic	Throughout Building	Varies	30			X	X		Overheating occurring due to ageing and deteriorating controls				A	Pneumatic controls being replaced under ESCO project
10																
11	Air Handling Units	Modular	Throughout Building	Varies	30			X			(2)				B/C	
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																

Notes:

(1) It was reported that the burners replaced in 1996, boilers are original to building. The boilers are scheduled to be replaced summer of 2014

(2) Lack of control for many units can be traced to the Controls deficiencies

(3) It has been noted that some of the piping and/or boiler breeching insulation may be asbestos

abatement of non-friable asbestos is elective.

LOWELL SCHOOL - ENGINEERING CONSIDERATIONS

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Lowell Elementary School
Systems: Plumbing & Fire Protection

Area: 84,600 sq. ft

Construction Date: 1927
Renovation Date: 1996

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/5/14

Page 1 of 1

item #	system: component name	type	service/location	life cycle: estimated age	life cycle: expected life	condition: new	condition: good	condition: aged	deficiencies: functional	deficiencies: code	deficiency	recommendation: no work	maintenance	repair	replace	remarks
1	Domestic Hot Water Heater & Storage Tank	Split System	Boiler Room	7	20	X						X				
2																
3	Piping	Cast Iron & Copper	Throughout	(2)	50		X	X				X			C	(2),(4)(5)(6)
4																
5	Sprinklers	Wet System	Throughout	13	50		X					X				(3)
6																
7	Sprinklers	Dry System	Attic	37	10			X							C	System to be inspected & tested to verify integrity of system
8																
9	Ansul Hood	Pre-charged	Kitchen	7	20		X									(1)
10																
11																
12																
13																
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Notes:
(1) Minimal cooking done with grease, ovens are mainly used. The hoods are cleaned at regular intervals dictated by Fire Dept.

(2) Most of the piping is original to building with the exception of the 1996 addition plus minor modifications

(3) No fire pump required.

(4) It has been reported that there may be asbestos remaining in some of the mechanical system's insulation. Abatement of asbestos that is accessible is elective

(5) It was reported that the building has low gas pressure. Installing a gas booster pump would alleviate this condition

(6) Recommend eventual replacement of original piping. No work required on piping installed in 1996

(7)

(8)

Watertown Public Schools
Building Conditions Survey

TMP Consulting Engineers, Inc.

School: Lowell Elementary

Construction Date: 1927/1996

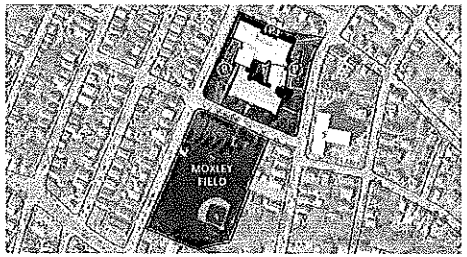
Survey Team: TMP

Survey Date: 3/5/14

Page 1 of 1

item #	system: component name	type	location	life cycle: estimated age	life cycle: expected life	condition: new	condition: good	condition: aged	deficiencies: functional	deficiencies: code	deficiency	recommendation: no work	maintenance	repair	replace	remedy/comments
Electrical																
1	Service															
2	Wiring	Underground	Underground from pad trans	15	40		x					x				
3	Equipment	Main Switchboard	Main Electric Room	15	40		x					x				
4	Rating	500A 480/277V 3PH														
5	Distribution															
6	Panels	Circ. Bkr	Throughout	15	40			x				x				
7	Motor Controls	VFD's	Boiler Room	15	30			x				x				
8	Wiring	Conduit & wiring	Throughout	15	30			x				x				
9	Surge Dampening	None														
10	Life Safety															
11	Fire Alarm	City connected	Throughout	7	30	x				x	NFPA violations			C		See Report
12	Emer Ltg	W/ Battery Packs	Throughout	7	5		x		x		Gym See Report				B	Replace with Generator
13	Fire Alarm Serv	Underground	Underground from Master Box	15	40		x		x		None apparent	x				
14	Devices															
15	Receptacles	Duplex	Throughout	15	40		x		x			x				
16	Switches	Standard toggle	Throughout	15	40		x		x			x				
17	Lighting															
18	Classrooms	Recessed fluor.	Throughout	2	20	x						x				
19	Offices	Recessed fluor.	Throughout	2	20	x						x				
20	Corridors	Recessed fluor.	Throughout	2	20	x						x				
21	Toilets	Recessed fluor.	Throughout	2	20	x						x				
22	Mech Stor.	Recessed fluor.	Throughout	2	20	x						x				
23																
24																
25																

WATERTOWN MIDDLE SCHOOL



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

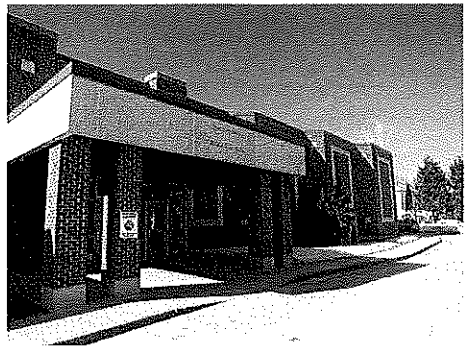
OVERVIEW

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 5th grade classrooms from Hosmer, Lowell and Cunniff 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.



MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY				
Watertown Public Schools Watertown Middle School	Date Constructed:	1922	Assessed By:	JATBay
	Number of Floors:	2-3	Reviewed By:	BAGabby
	Approx. Sq. Ft.:	134,000	Assessment Date:	2/28/14

Additions, Renovations, and Major Maintenance:	**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. **2010-11:** Repointed brick masonry along the west, south, and east elevations of the 1922 Building.
Wall System:	**1922 Building:** Clay brick mass masonry **1998 Addition:** Clay brick-clad cavity wall with cast stone accent elements. No through-wall flashing is visible (i.e. it does not day light).
Window System:	**1922 Building:** Punched, aluminum framed, with fixed and project-in hopper windows and single-pane glass or metal panels typical. Aluminum framed storefront at stairwells. **1998 Addition:** Aluminum framed punched windows and window-wall assemblies with project-out awning operable vents, and insulating glass units (IGUs).
Door System:	**All Building Areas:** Entrances are aluminum framed storefront with IGUs reportedly installed in 1998.
Roof System:	**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. **1998 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 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 sloped grade (parking lot previously at this location reportedly used to flood). Ventilators are installed and run continuously below bleachers along this wall to remove moisture.
Overall Building Envelope Condition / Major Concerns:	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 lintels at 1998 Addition indicate they are starting to deteriorate, and will likely require repairs in the next 5-10 yrs. Windows and doors installed in 1998 are generally in good condition, but windows in the 1992 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.

Component Condition (Rating 0 to 5)		
Component	**Rating**	**Comments**
Walls:	3	**1922 Building:** Face 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 transverse 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).
	4	**1998 Addition:** Brick masonry and mortar are generally sound. Rusting of lintels is evident at isolated locations throughout (Photo 7).
Fenestrations:	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).
	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).
Doors:	5	**All Building Areas:** Doors are sound good condition. We observed a broken and missing sweep at one door (Photo 11).
Roof:	3	**All Building Areas:** Exposed roof areas appear to be in fair condition, with minimal patches and localized unadhered 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 counter 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.

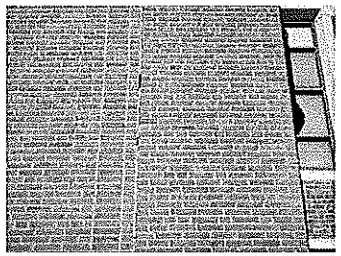


Photo 2

Cracked and missing mortar in repointed masonry area.

Photo 3

Spalled and deteriorating cast stone water table.

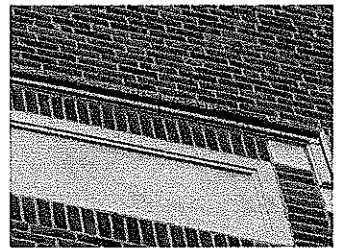


Photo 4

Repaired spall in cast stone element.

MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

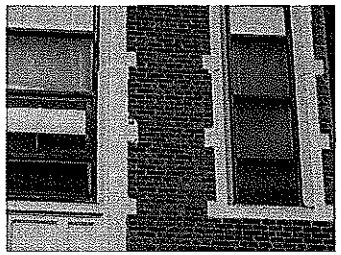


Photo 5

Sealant installed at cast stone joists at window surround.

Photo 6

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

Photo 7

Isolated rusting of Intel in 1998 Addition.

Photo 8

Failed glazing at window spandrel panel in 1922 Building.

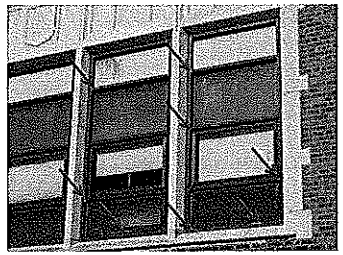


Photo 9

Face seal repairs at window frames of 1922 Building.

Photo 10

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

Photo 11

Broken and missing sweep at entrance door.

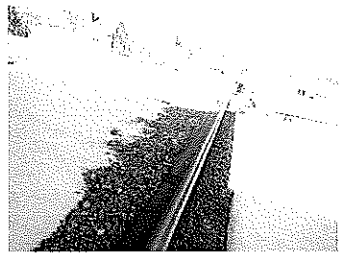


Photo 12

Bridging EPDM at expansion joint along gymnasium roof extents (near location of known leakage).

MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

Photo 13

HVAC unit above known leakage in Gymnasium.

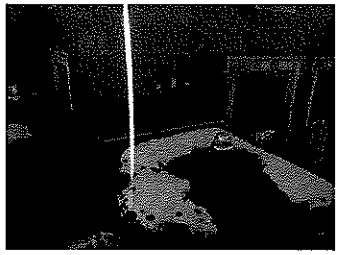


Photo 14

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 constriction 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-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

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. 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 2 Natural Gas Fired Boilers, hot water pumps with through the wall unit ventilators. The boilers are manufactured by Weil McLein. 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 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 10 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

TMP CONSULTING ENGINEERS, INC.

Building: Middle School | **Area: 133,410 sq. ft** | **Construction Date: 1922** | **Facility Contact: Jay Francione** | **Survey Date: 3/5/14**
System: HVAC | **Renovation Date: 1998** | **Plans Available: NO**

(# in parenthesis refer to notes below) — *Page 1 of 1*

item #	system: component item	type	service/location	life cycle: estimated age	expected life	condition: new	good	aged	deficiencies: functional	code	deficiency	recommendation (A - Immediate, B - Elective, C - Eventual): no work	maintenance	repair	replace	remarks
1	Boiler	Hot Water	Boiler Room	18	30		X					X				(1)
2																
3	Pumps (Base-Mounted)	Centrifugal	Boiler Room	2	25		X					X				
4																
5	Piping	Steel and copper	Throughout Building	16	50		X									
6																
7	Unit Ventilators	Console	Classrooms	20	25		X		X		Controls related			A	C	(2)
8																
9	Controls	Pneumatic	Throughout Building	Varies	30			X	X		Overheating occurring due to ageing and deteriorating controls				A	Pneumatic controls being replaced under ESCO project
10																
11	Roof Top Units	HVAC	1995 Roof	16	15		X								B,C	(3)
12																
13	Air Handling Units	Modular	Various	16	30		X				(2)				B,C	
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																

Notes:

(1) It was reported that the boilers were replaced in 1995.

(2) Lack of control for many units can be traced to the Controls deficiencies

(3) It was reported that the Large Gym is served by RTU scheduled to be replaced summer of 2014

(6)

(7)

(8)

(9)

(10)

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Middle School | **Area: 133,410 sq. ft** | **Construction Date: 1922** | **Facility Contact: Jay Francione** | **Survey Date: 3/5/14**
System: Plumbing & Fire Protection | **Renovation Date: 1998** | **Plans Available: NO**

(# in parenthesis refer to notes below) — *Page 1 of 1*

item #	system: component item	type	service/location	life cycle: estimated age	expected life	condition: new	good	aged	deficiencies: functional	code	deficiency	recommendation (A - Immediate, B - Elective, C - Eventual): no work	maintenance	repair	replace	remarks
1	Domestic Hot Water Heater & Storage Tank	Split System	Boiler Room	1	20	X						X				
2																
3	Piping	Cast Iron & Copper	Throughout	(2)	50		X	X				X			C	(2)(4)(5)(7)
4																
5	Sprinkler	Wet System	Partial	16	30		X					X				(3)(6)
6																
7	Ansul Hood	Pre-charged	Kitchen	1	20		X									(1)
8																
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Notes:

(1) Minimal cooking done with grease, ovens are mainly used. The hoods are cleaned at regular intervals dictated by Fire Dept.

(2) Most of the piping is original to building with the exception of the 1998 addition/minor modifications

(3) No fire pump required

(4) It has been reported that there may be asbestos remaining in some of the mechanical system's insulation. Abatement of asbestos that is non-friable is also [illegible]

(5) It was reported that the building has low gas pressure. Installing a gas booster pump could alleviate this condition.

(6) Consideration should be given to extend sprinkler coverage into the entire building.

(7) Recommend eventual replacement of original piping. No work required on the piping installed in 1998

MIDDLE SCHOOL - ENGINEERING CONSIDERATIONS

Watertown Public Schools
Building Condition Survey

TMP Consulting Engineers, Inc.

School: Watertown Middle School

Construction Date: 1922/1998

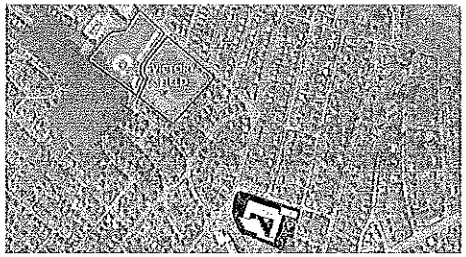
Survey Team: TMP

Survey Date: 3/3/14

Page 1 of 1

system				life cycle		condition			deficiencies			recommendation: A - Immediate, B - Elective, C - Eventual				
item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
Electrical																
1	Service															
2	Wiring	Underground	Underground from pad trans.	16	40		x					x				
3	Equipment	Main Switchboard	Main Electric Room	16	40		x					x				
4	Rating	1600A 480/277V 3PH														
5	Distribution															
6	Panels	Circ. Bkr	Throughout	16	40		x		x						A	See Report
7	Motor Controls	VFD's	Boiler Room	16	30		x		x			x				
8	Wiring	Conduit & wiring	Throughout	16	30		x		x			x				
9																
10	Life Safety															
11	Fire Alarm	City connected	Throughout	12	20		x		x	x	NFPA Violations			A		See Report
12	Emer Ltg	Use Battery Packs	Throughout	7	5		x		x		Constant Maintenance Req'd				B	Replace with Generator
13	Fire Alarm Serv	Underground	Underground from Master Box	12	40		x		x		None apparent	x				
14	Devices															
15	Receptacles	Duplex	Throughout	16	40		x		x			x				
16	Switches	Standard toggle	Throughout	16	40		x		x			x				
17	Lighting															
18	Classrooms	Recessed fluor.	Throughout	2	20	x						x				
19	Offices	Recessed fluor.	Throughout	2	20	x						x				
20	Corridors	Recessed fluor.	Throughout	2	20	x						x				
21	Toilets	Recessed fluor.	Throughout	2	20	x						x				
22	Mech Spc	Recessed fluor.	Throughout	2	20	x						x				
23																
24																
25																

WATERTOWN HIGH SCHOOL



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 Portions)	2.18 Total Grade

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.

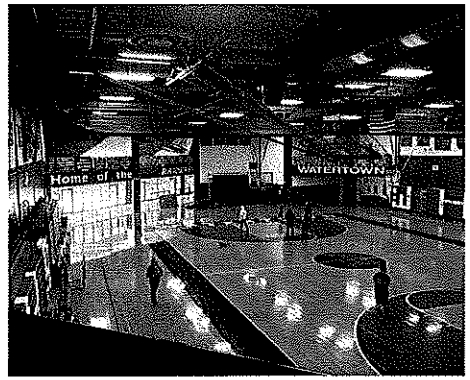
Among its primary attributes, the original 1929 building is solidly built and of historical significance. The main entrance façade on Columbia Street, main entrance lobby and auditorium are the building's most distinguishable features. The school's largest building addition in 1979 is also well built 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 ELL, 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.



HIGH SCHOOL - ENGINEERING CONSIDERATIONS

BUILDING ENVELOPE ANALYSIS — SIMPSON GUMPERTZ & HEGER

BUILDING ENVELOPE CONDITION ASSESSMENT SUMMARY					
Watertown Public Schools Watertown High School	Date Constructed:	1929	Assessed By:	JATilley	
	Number of Floors:	3	Reviewed By:	BAGabby	
	Approx. Sq Ft:	166,000	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. **1979:** 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:** Sarnafil PVC membrane typical at low-sloped areas and standing seam metal at steep sloped areas.				
General Building Performance					
Reports of Building Enclosure Leakage/Distress:	Localized areas of interior peeling paint, generally associated with failing mortar joints on the exterior and most severe along the parking lot (east) elevation; Watertown Public Schools (WPS) reportedly repoints failing joints on an ongoing basis to address leakage. Water leakage reportedly occurs at louvers 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 failing seals and replacement or significant short-term repairs (e.g. wet-sealing) should be anticipated in the next several years. Roofing membrane and sleep sloped metal roofing generally appear to be in good condition with only typical maintenance necessary.				
Component Condition (Rating 0 to 5)					
Component	**Rating**	**Comments**			
Walls:	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 failing again, exist throughout the building, typically below windows (Photo 6). Concrete stair/landing 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 failing, 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 step 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). Step 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 crazed (Photo 18).			
Fenestrations:	2	**All Building Areas:** Perimeter sleats are starting to fail at isolated locations (Photo 19). Window glazing is failing (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 1979 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 debonded at localized areas typically around the perimeter (Photo 26). Skylight acrylic glazing typically has micro-cracking throughout (Photo 27).			

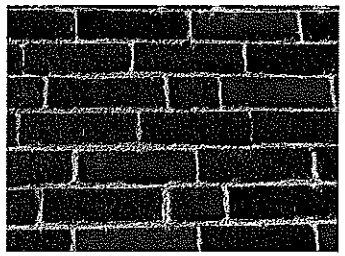


Photo 1

Typical brick masonry condition at original 1930 building.

Photo 2

Efflorescence along outside of parapet at 1930 Building.

Photo 3

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

Photo 4

Corroded lintel with displaced precast band course above.

Building Envelope Condition Assessment Summary
Watertown High School

HIGH SCHOOL - ENGINEERING CONSIDERATIONS

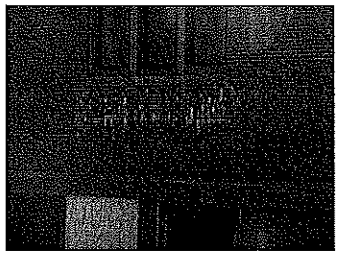


Photo 5

Efflorescence at window sill of 1930s Building.

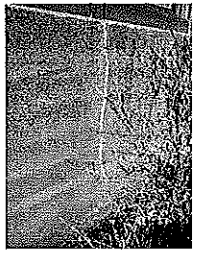


Photo 6

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

Photo 7

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

Photo 8

Staining at water table elements.

Photo 9

Coated and falling terra-cotta pieces at entrance.

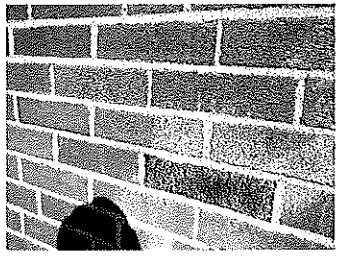


Photo 10

Typical brick masonry condition at 1950s addition.

Photo 11

Mortar spall at bearing end of lintel.

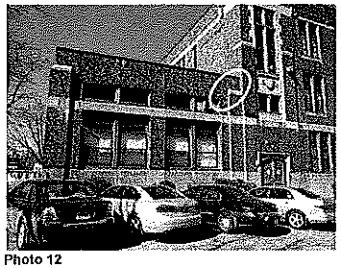


Photo 12

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

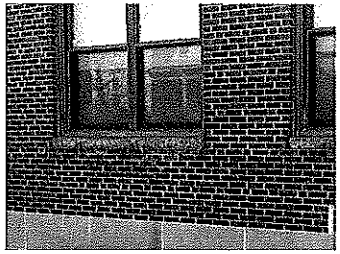


Photo 13

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

Photo 14

Step crack emanative from upper right window corner of one-story 1950s addition.

Photo 15

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

Photo 16

Cracked and variable-colored brick typical at 1979 Addition.

Photo 17

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

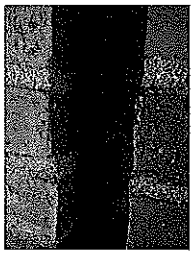


Photo 18

Crazing sealant at brick expansion joint in 1979 Addition.

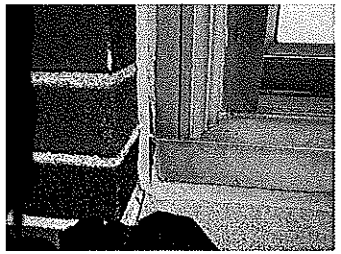


Photo 19

Debonding of perimeter seal at window of 1950s addition.

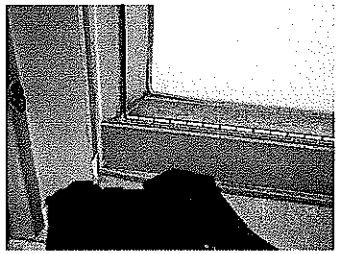


Photo 20

Failing window glazing.

HIGH SCHOOL - ENGINEERING CONSIDERATIONS

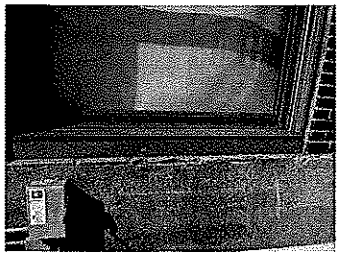


Photo 21

Punched window frame with light corrosion.

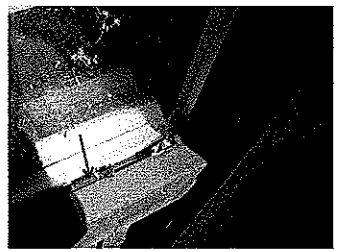


Photo 22

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

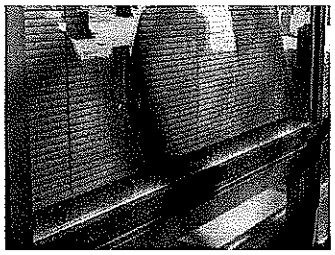


Photo 23

Failed IGU along east elevation curtain wall.

Photo 24

Ponding water on roofing membrane.

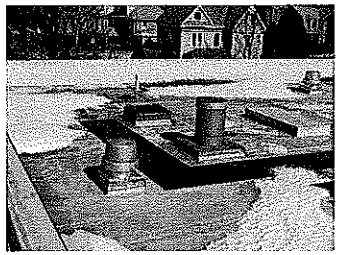


Photo 25

Rusted flashings and roof hatch.

Photo 26

Green-colored cafeteria roof, with localized areas of debonad membrane, typically around the perimeter.

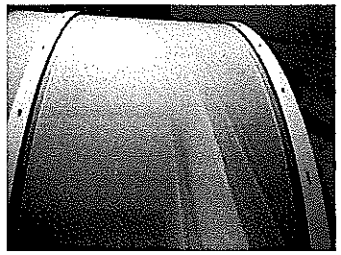


Photo 27

Micro-cracking of skylight acrylic glazing.

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 1930s 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 maligned 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.

<u>Observation/Comments</u>

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 Surveys

TMP CONSULTING ENGINEERS, INC.

Building: High School
Systems: HVAC

Area: 165,000 ft²

Construction Date: 1930
Renovation: 2003

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/4/14

Page 1 of 1

item #	system: component name	type	service/location	life cycle: estimated age	expected life	condition: new	good	aged	deficiencies: functional	code	deficiency	recommendation (A - Immediate, B - Elective, C - Eventual): no work	maintenance	repair	replace	remarks
1	Boilers	Cast Iron Sectional Steam	Boiler Room	11	30		x		x		(1)			B		Gas-Fired
2																
3	Condensate Receiver Pump	Floor mounted	Boiler room and mechanical room	13	20			x							C	
4																
5	Rooftop Units	Modular	Roof of 1995 addition	10	25		x									(2)
6																
7	AHU's	Modular	Throughout Building	15	40		x									(7)
8																
9	Unit ventilators	Ceramic Steam	Throughout Building	18	25			x	x		(3)				B	
10																
11	Piping	Steel and copper	Throughout Building	(4)								x				(6)
12																
13	Controls	Pneumatic and electric	Throughout Building	Varies	30			x	x		(3)				(5)	
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																

Notes:

(1) One of the boilers is down for repairs, not required to heat the building (spare).

(2) Cafeteria gets warm, A/C is ineffective when full.

(3) Most control issues are based on an obsolete pneumatic ATC system, of which is being replaced.

(4) The piping in the building is several vintages and it may be upwards of 60 years old in some parts of building.

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

(6) The steam traps are an ongoing maintenance issue.

(7) It is noted here that the science labs are being renovated and fans are not acceptable.

(8)

(9)

(10)

HIGH SCHOOL - ENGINEERING CONSIDERATIONS

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: High School
Systems: Plumbing and Fire Protection

Area: 165,000 ft²

Construction Date: 1930
Renovation Date: 2003

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/4/14

Page 1 of 1

	system			life cycle		condition			deficiencies			recommendations: A - Immediate, B - Elective, C - Eventual				
item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
1	Hot Water Heaters	Heater/Tank Combination	Boiler Room	13	20		X								C	
2																
3	Sewer Ejector	Automatic	Boiler Room	16	25			X							C	
4																
5	Sump Pump	Automatic [illegible]	Boiler Room	16	25			X							C	
6																
7	Sprinkler Systems	Wet	Woodshop and Science Rooms	33	50		X					X				
8																
9		Deluge	Courtyard Windows - exterior surface	7	20			X			Questionable [illegible]				C	Dry system
10																
11		Kitchen hood [illegible] System	Kitchen	7	20							X				
12																
13																
14																
15																
16																
17																
18																
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Notes:

(1)
(2)
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(6)
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(9)
(10)

Watertown Public Schools
Building Conditions Survey

TMP Consulting Engineers, Inc.

School: Watertown High School

Construction Date: 1919/1979

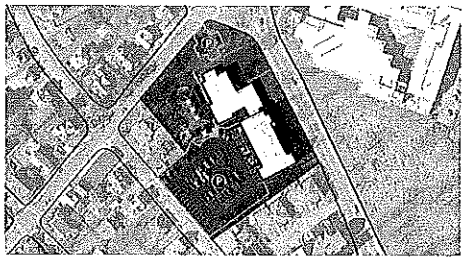
Survey Team: TMP

Survey Date: 3/4/14

Page 1 of 1

system				life cycle		condition			deficiencies			recommendations: A - Immediate, B - Elective, C - Eventual				
item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
Electrical																
1	Service															
2	Wiring	Underground	Underground from pad trans	35	40		x								C	
3	Equipment	Main Switchboard	Main Electric Room	35	40			x							C	Some equipment orig. to bldg
4	Rating	3000A 208/120 3PH														
5	Distribution															
6	Panels	Circ. Br.	Throughout	35	40			x							C	Some equipment orig. to bldg
7	Motor Controls	VFD's	Boiler Room	35	30			x							C	Some equipment orig. to bldg
8	Wiring	Conduit & wiring	Throughout	35	30			x							C	Some equipment orig. to bldg
9	Stage Dimming	Dimming System	Auditorium	35	40			x							C	Some equipment orig. to bldg
10	Life Safety															
11	Fire Alarm	City connected	Throughout	10	30	x				x	NFPA violations			A		See Report
12	Generator	Diesel indoor	Penthouse	35	30			x	x	x	2 Hour Separation Req'd				A	Replace with new
13	Fire Alarm Serv.	Underground	Underground from Master Box	25	40			x	x		None apparent	x				
14	Devices															
15	Receptacles	Duplex	Throughout	35	40			x	x			x				
16	Switches	Standard toggle	Throughout	35	40			x	x			x				
17	Lighting															
18	Classrooms	Recessed fluor.	Throughout	2	20	x						x				
19	Offices	Recessed fluor.	Throughout	2	20	x						x				
20	Corridors	Recessed fluor.	Throughout	2	20	x						x				
21	Toilets	Recessed fluor.	Throughout	2	20	x						x				
22	Mech Stor.	Recessed fluor.	Throughout	2	20	x						x				
23																
24																
25																

ADMINISTRATION BUILDING - PHILLIPS SCHOOL



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 SF of Building Portions)	2.97 Total Grade

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, 19th-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 accomodate current uses.

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:	JATilley
	Number of Floors:	3	Reviewed By:	BAGabby
	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. 2010-2016: 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 jacking issues. Windows and entrances are 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 plates are typically rusted and some are damaged (Photo 4). Cast-in-place concrete below windows is typically rusted and cracked (vertically) 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 ivy used to cover the walls (WPS reportedly began removing the ivy 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 leached 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 flashing is visible below copings on site walls.
Fenestrations	3	All Building Areas: Windows and curtain wall system generally appear to be sound. Perimeter 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).

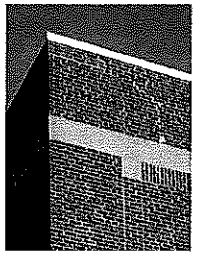


Photo 2
Step crack at west parapet of original building.

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

Photo 4
Rusted and broken window grate.

ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

Photo 5

Cracked concrete foundation below ground floor window.

Photo 6

Rusted lintel at original building.

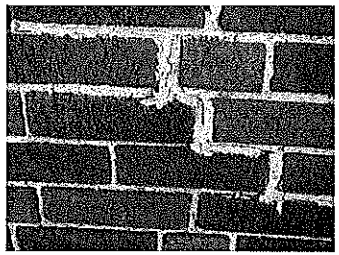


Photo 7

Failed mortar repairs at chimney.

Photo 8

IVY remnants at 1950s addition.

Photo 9

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

Photo 10

Rust at lintel of 1950s addition.

Photo 11

Cracks in band course elements above rusted lintel.

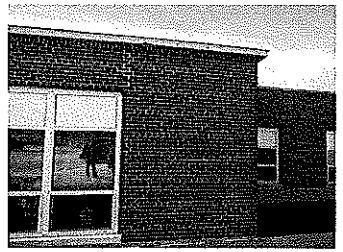


Photo 12

Repair at crack in single story brick masonry addition.

ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

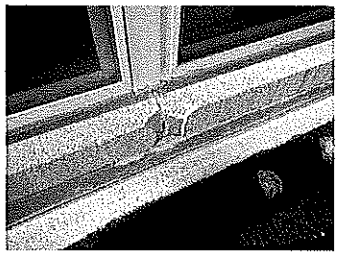


Photo 13

Damaged limestone sill at 1950s addition.

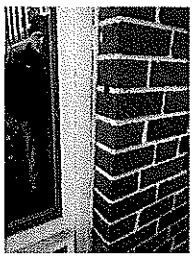


Photo 15

Crazing and cracked perimeter sealant.

Photo 17

Standing seam metal roof at vent.

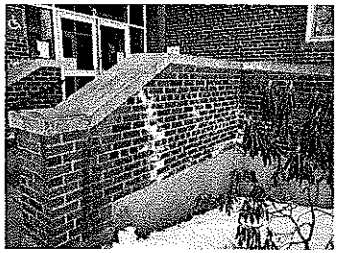


Photo 14

Efflorescence at site walls.

Photo 16

Ponding water at roof.

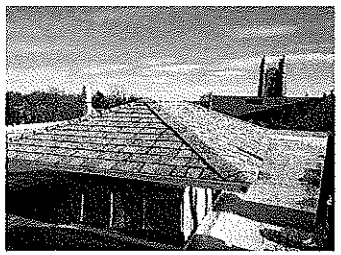


Photo 18

Asphalt shingle roof at vent.

Building Envelope Condition Assessment Summary
Phillips School (Central Administration Building)

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 sounds 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 ENIGINEERS

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 breeching 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 DDC 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.

Exsiting 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 clocks.

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 Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Phillips School
Systems: HVAC

Area: 34,000 ft²

Construction Date: 1937/1959
Renovation Date: 2001

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/4/14

Page 1 of 1

	system			life cycle		condition			deficiencies			recommendation: A - Immediate, B - Elective, C - Eventual				
item #	equipment name	type	service/location	estimated age	expected life	new	good	poor	functional	code	deficiency	no work	maintenance	repair	replace	remarks
1	Boilers	Cast Iron Sectional Gas Fired Steam	Boiler Room	64	40			X							A	(1) (2)
2																
3	Condensate Tank Pump Unit	Floor mounted	Boiler Room	3	25		X								C	
4																
5	Unit Ventilators	Console	Throughout Building	Varies	20			X	X		Controls				A	(3)
6																
7	Air Conditioning	Mini-split	Server Room	2	20	X						X				
8																
9	Air Conditioning	Wall residential Units	Throughout Building	Varies	Varies			X							C	
10																
11	Air Handling Units	Modular	Boiler Room and Gym	30+	40			X	X		Controls				C	
12																
13	Piping	Steel and Copper	Throughout Building	60+	50			X		X	(4)			B		(4)
14																
15	Radiators	Cast Iron	Throughout Building	65	50			X	X		(5)				B	
16																
17	Controls	Pneumatic	Throughout Building	Varies	30				X		Lack of Temperature Control in Rooms				A	(6)
18																
19																
20																
21																
22																
23																
24																

Notes:

(1) There are two boilers, one was converted 6 years ago, the other is scheduled to be replaced the summer of 2014
(2) Burners are 15 years old.
(3) With the unit ventilators inactive, ventilation is not being introduced mechanically but by virtue of operable windows.
(4) Some piping insulation is missing from the boiler room piping systems.
(5) The cast iron radiators do not have protective covers making them potential (burn) hazards.
(6) It has been reported that the ATC system is being replaced with a new DDC system.
(7)
(8)
(9)
(10)

ADMINISTRATION BUILDING - ENGINEERING CONSIDERATIONS

Town of Watertown
School Facility Assessment Surveys

TMP CONSULTING ENGINEERS, INC.

Building: Phillips School
Systems: Plumbing and Fire Protection

Area: 34,000 ft²

Construction Date: 1937/1950
Renovation Date: 2002

Facility Contact: Jay Francione
Plans Available: NO
(# in parenthesis refer to notes below)

Survey Date: 3/4/14

Page 1 of 1

item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
1	Hot water Heater	Spla system boiler and tank with heat exchanger	Boiler Room	2	20	x						x				
2																
3	Piping	Cast Iron and Copper	Throughout building	(1)	35		x	x							C	
4																
5																
6																
7																
8																
9																
10																
11																
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13																
14																
15																
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(1) Most of the piping is original to the building or installed in the 1950 installation

Watertown Public Schools
Building Condition Survey

TMP Consulting Engineers, Inc.

School: Phillips School - Admin Building

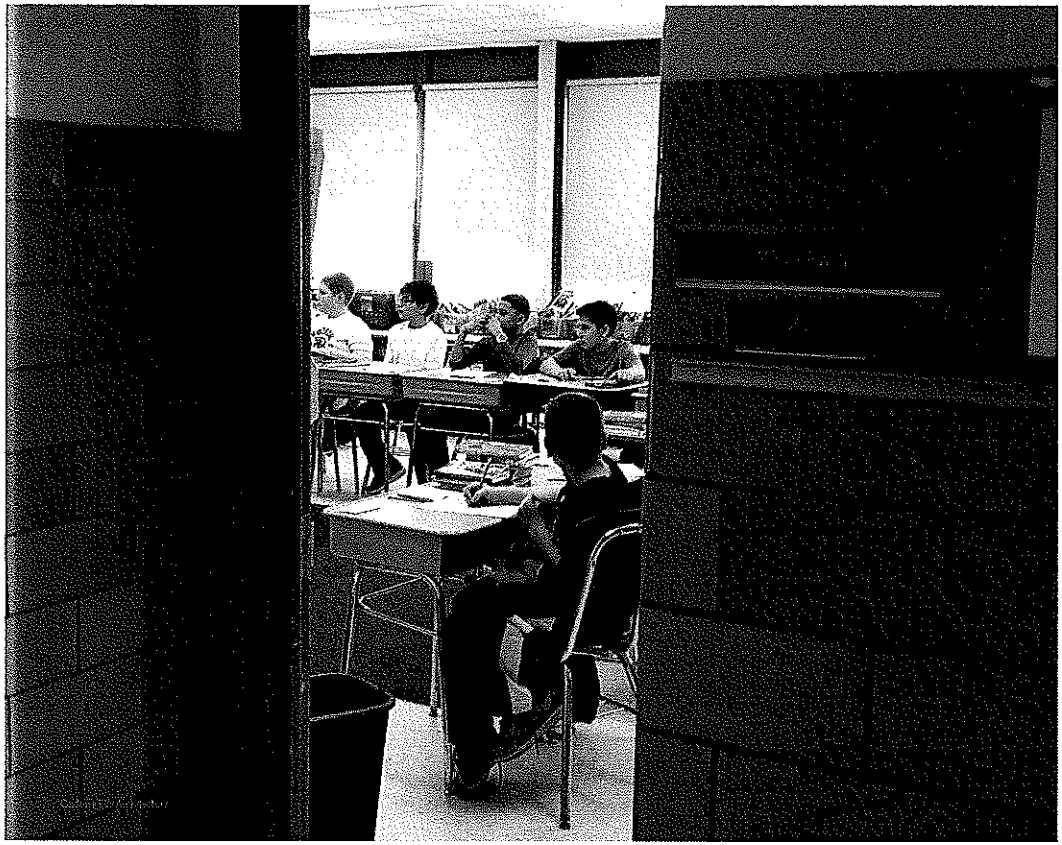
Construction Date: 1937/1950

Survey Team: TMP

Survey Date: 3/4/14

Page 1 of 1

item #	component name	type	service/location	estimated age	expected life	new	good	aged	functional	code	deficiency	no work	maintenance	repair	replace	remarks
Electrical																
1	Service															
2	Wiring	Underground	Underground from pad trans	13	40		x					x				
3	Equipment	Main Switchboard	Main Electric Room	13	40	x						x				
4	Rating	[illegible] 208/120 3PH														
5	Distribution															
6	Panels	Circ. Bkr	Throughout	13	40	x					Non ADA Compliant			A	A	See Report
7	Motor Controls	VFD's	Boiler Room	4	30	x						x				
8	Wiring	Conduit & wiring	Throughout	32	30		x					x				
9	Stage Dimming	Dimming System	Auditorium	50	40			x							C	
10	Life Safety															
11	Fire Alarm	City connected	Throughout	1	30	x				x	NFPA violations			C		See Report
12	Emerg. Ltg	Via battery packs	Throughout	7	5				x		Needs constant maintenance				C	Replace with generator
13	Fire Alarm Serv	Underground	Undergrd from Master Box	32	40				x		None apparent	x				
14	Devices															
15	Receptacles	Duplex	Throughout	13	40		x		x			x				
16	Switches	Standard toggle	Throughout	13	40		x		x			x				
17	Lighting															
18	Classrooms	Recessed fluor.	Throughout	2	20	x						x				
19	Offices	Recessed fluor	Throughout	7	20	x						x				
20	Corridors	Recessed fluor	Throughout	2	20	x						x				
21	Toilets	Recessed fluor.	Throughout	2	20	x						x				
22	Mech Sur.	Incandescent	Throughout	40	20			x							C	
23																
24																
25																



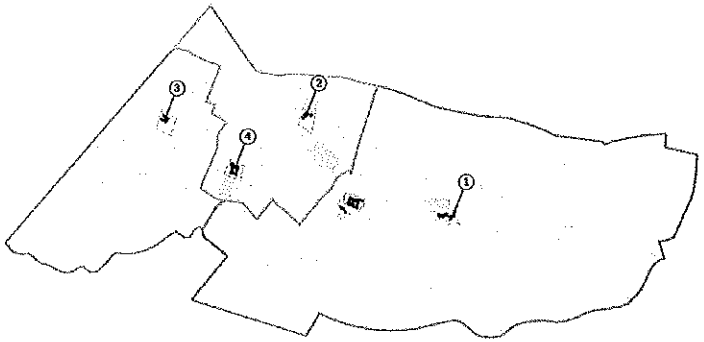
4 Planning Scenarios

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 Cunniff 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 Cunniff Elementary
4. Middle School space utilized

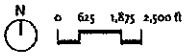


Fig. 1.0 Move 5th grade students from Hosmer Elementary to the Middle School

Fig. 1.1 Create new classrooms in Hosmer Elementary gym

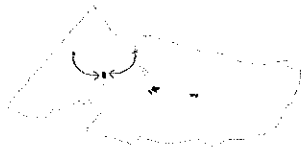


Fig. 1.2 Move some students from Cunniff Elementary and Lowell Elementary to the Middle School

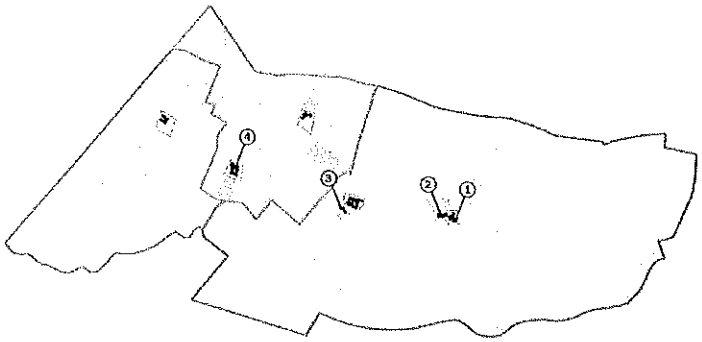
4.1 SCENARIO DIAGRAMS

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

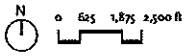


Fig. 1.0 Move 5th grade students from Hosmer Elementary to the Middle School

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

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

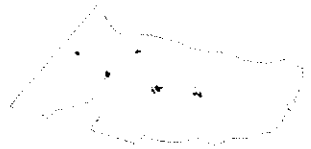


Fig. 1.3 Create new classrooms in Hosmer Elementary gym

Fig. 1.4 Rebuild East Junior as Hosmer West Elementary

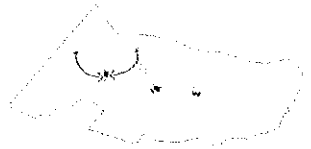


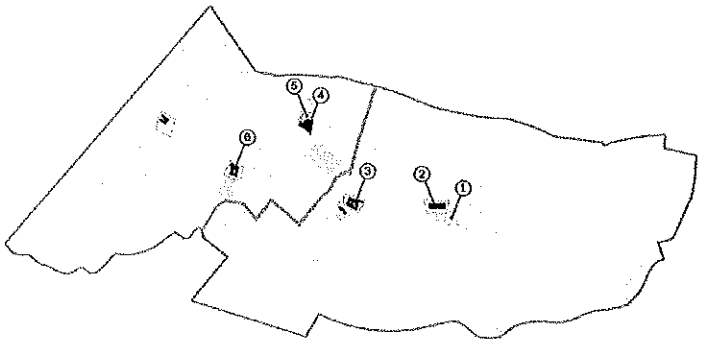
Fig. 1.5 Move some students from Cunniff Elementary and Lowell Elementary to the Middle School

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

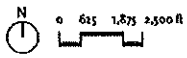


Fig. 1.0 Build new High School on Lowell Elementary parcel

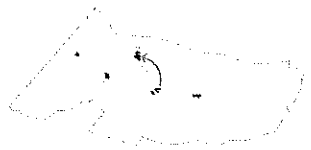


Fig. 1.1 Move students from High School to new building and refurbish existing High School

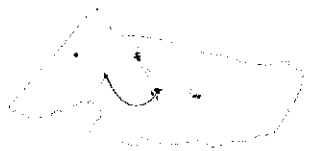


Fig. 1.2 Move students from Middle School to High School and refurbish existing Middle School

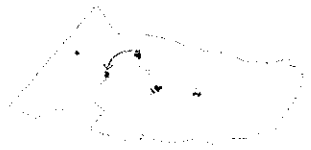


Fig. 1.3 Move students from Lowell Elementary to new Middle School. Demolish Lowell Elementary or incorporate into new High School

Fig. 1.4 Move students from Cunniff Elementary to new Middle School

Fig. 1.5 Move students from Preschool on Hosmer to Cunniff Elementary

Fig. 1.6 Re-build Hosmer Elementary on the adjacent property

Fig. 1.7 Move students from Hosmer Elementary to the new Elementary School on the adjacent property

Fig. 1.8 Demolish the old Hosmer Elementary

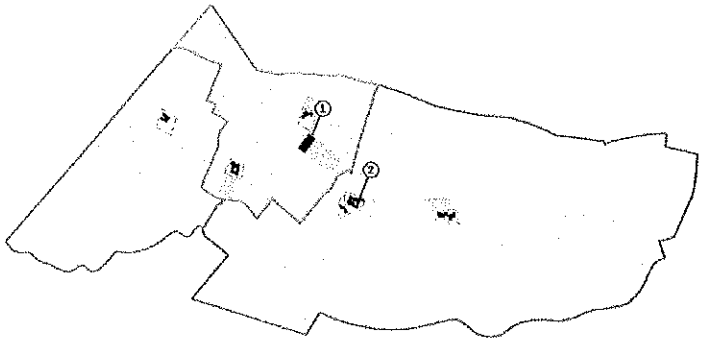
4.1 SCENARIO DIAGRAMS

SCENARIO B1

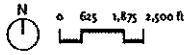
HIGH SCHOOL AS SWING BLDG.

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 time line



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



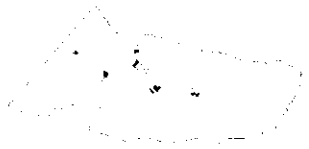


Fig. 1.0 Build new High School adjacent to High School playing fields

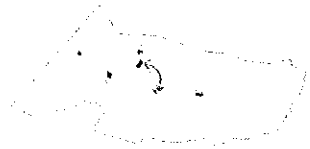


Fig. 1.1 Move students from High School to new building and refurbish existing High School

Fig. 1.2 Existing High School acts as a swing building for all other buildings and then repurposed for alternative town use(s) thereafter