

Strong School Building

Facility Assessment – October 2012



69 Grand Avenue – New Haven - Connecticut

Scope of Inspection

A visual inspection of the Strong School Building was performed on October 16, 2012. This property condition assessment addresses items of interest that were accessible and visible at the time of inspection.

Reasonable efforts were made to view all safely accessible areas of the Strong School Building. Concealed items cannot normally be inspected without using invasive procedures or testing equipment that is beyond the scope of this inspection. A property condition assessment will not address every problem with the property at this time. No warranty is made or implied.

This report is intended to address several key issues:

1. General condition of the roofing system
2. General condition of the mechanical systems
3. Suitability for use in "as is" condition
4. Estimated Maintenance and Operation Cost

The following were in attendance:

Samuel Cruz – Inspector

Lee Cruz – Chatham Square Neighborhood Association

Anthony Bialecki – Economic Development Administration, City of New Haven

Property Description

The Strong School Building, located at 69 Grand Avenue, is a Tudor style building constructed in 1915 with two floors and a partial basement, consisting of approximately 45,000 sq. ft. total. A recent addition includes a set of restrooms and two modern classrooms. The grounds are approximately one acre and consist of a playground with commercial playscape, paved parking and a raised terrace adjacent to Grand Avenue. The building was most recently used as an overflow school for the New Haven school district (see photos 1-8).

Foundation and Structure

The brick clad, reinforced concrete structure consists of two stories above a partial basement. The building is H shaped with two classroom wings, a central administrative and common area, and a gymnasium/auditorium. Architectural drawings were not available.

No deficiencies were evident in the foundation. Most structural elements were not visible, but the building exterior appears properly constructed and in good condition. Minor mortar failure was noted in the recent addition (see photo 10). Floors slabs appear to be in good condition. Exterior walls show no signs of settlement or cracks.

Roof

Roof access is through an interior stairwell exiting directly onto the roof. The structure capping this stairwell appears to be tin-clad and the step-flashing shows some signs of deterioration (see photos 23-24).

The fully adhered EPDM roofing membrane appears to have been installed over mechanically-fastened insulation board. It is not clear if the pre-existing built-up roofing system was removed. Parapet walls and coping are in good condition. Roof penetrations are properly flashed and in good condition. (See photos 17-22.)

The field of the roof appears to be water tight and in good condition. The roofing membrane did not show signs of deterioration or failure. All lap joints are fully sealed and in good condition. No significant ponding was noted. (See photos 13-16.)

The roof is pitched toward internal drains that are connected to the storm sewer system. Drains are clean and free of obstructions. Several drain covers are in poor condition and should be replaced.

The building has extensive signs of interior water leaks but no evidence indicates that these leaks are from current roofing failures. (See Photos 37-39, 41 and 46.)

The roof of the recent addition also appears to be in good condition. A small amount of ponding was observed near the roof drains, east of the roof-top HVAC (Heating, Ventilation and Air Conditioning) units (see photo 30). No leaks were evident in the classrooms or restrooms below, however. The hallway in the recent addition has light-framed continuous skylight roof systems (see photos 28 and 51) and the skylight has several broken panels (see photo 52).

An infrared moisture survey is recommended to detect any moisture that may be trapped under the roof membrane. Moisture trapped under the roof membrane dramatically reduces the effectiveness of the roof insulation and contributes to deterioration of the roof deck, insulation and membrane.

Building Exterior

The building's exterior walls are brick clad with masonry and terra cotta cornices, parapets, and similar details. Some minor mortar failures and evidence of water migration were noted (see photo 10). Overall, the brick cladding is in good condition.

Exterior windows consist of tinted insulated glazing in aluminum frames. Glazing assemblies are in good condition. Exterior sealant in some of the transition assemblies has begun to fail and may allow water and air infiltration (see photo 9).

Exterior doors are in operable condition but have been covered with plywood (see photo 11). The plywood is in poor condition and should be removed and replaced, or the doors restored to their

original state. A few of the exterior doors are in very poor condition and should be replaced (see photo 40).

The exterior of the recent addition is in good condition. Some mortar deterioration was noted on the West wall, below the window-well (see photo10).

Building Interior – Auditorium / Cafeteria

The auditorium is a single-story portion of the building filling in the lower portion of the H layout; entrance is from Grand Avenue. The interior wall finishes are brick with masonry and terra cotta details. A suspended acoustical ceiling has been added in the main room. Entrance areas have their original plaster and tin ceilings. Flooring is wood in the main room and terrazzo in the entrance vestibules. (See photos 31-34.) A portion the main room and vestibule has been converted for use as a commercial kitchen, including a walk-in cooler (West side – Clinton Avenue – see photo 36).

The brick and masonry details are in good condition, as is the wood flooring in the main room (see photos 33-34). Terrazzo flooring in the vestibules has some cracking, but is otherwise in good condition (see photo 35). Interior doors and hardware are operable and in fair condition; some hardware may need to be replaced.

Numerous leaks are evident in the suspended acoustical ceiling, primarily along the South side of the main room (see photos 37-39). The roof in this portion of the building appears to be in good condition. The source of the leaks may be ventilation louvers located above the South-facing windows located above the suspended acoustical ceiling (see photo 12). Additionally, the exterior sealant in some of the window transition assemblies has failed (see photo 9). A building envelope assessment should be completed for this portion of the building and the balance of the building if funding allows.

Building Interior – Classrooms and Administrative Offices

The classrooms are primarily located in the East and West wings of the building (12) with additional classrooms in the central portion (2) and the recent addition (2). The East and West wings each contain two classrooms partially below-grade. Entrances from East (Perkins Street) and West (Clinton Avenue) to each wing supplement main entrances from the South-side (Grand Avenue) vestibules. Several classrooms in the center portion of the building appear to have been converted for use as administrative offices.

Interior walls are primarily plaster above grade, with brick walls in the below grade rooms. Suspended acoustical ceilings have been added in all of the classrooms. Flooring is primarily VCT. The recent addition finishes are drywall, suspended acoustical ceiling, and VCT flooring. (See photos 41-45.)

Brick, plaster and drywall are all in good condition with minor exceptions. Interior doors and hardware are operable and in fair condition; some hardware may need to be replaced. Acoustical ceiling stains indicate leaks, but it is unclear how recent. Leaks are primarily along the outside

walls, indicating possible water infiltration at parapet wall or building façade. The roof areas in these portions of the building appear to be in good condition. A building envelope assessment should be completed to determine the source of leaks.

Building Interior – Hallways and Stairways

Interior walls are brick (lower portion to about 7') and plaster above. Ceilings are original tin on the second level and plaster on first level. Floors are terrazzo. Below-grade hallways are full height brick with plaster ceiling and concrete floors. The hallway in the recent addition consists of drywall partitions and VCT flooring.

Brick and plaster are in good condition with minor exceptions. Interior doors and hardware are operable and in fair condition; some hardware may need to be replaced. Terrazzo floors are in good condition with some minor cracks. (See photos 46-50.)

Stains on the second-level tin ceiling indicate leaks, but it is unclear how recent. Leaks are primarily along the outside walls indicating possible water infiltration at parapet wall or building façade. The roof areas in these portions of the building appear to be in good condition.

Electrical Systems

nited Illuminating (UI) provides primary power via a single-phase 120/208 pole-mount step-down transformer located on the East side (Perkins Street) of the building. Primary switch is a 400 amp disconnect located at the East end of the central basement hallway. (See photos 59-64.)

Modifications have been made to the electrical system over the years, including the installation of numerous sub-panels throughout the building. Electrical systems appear to be fully operable and professionally installed. Infrared electrical inspection should be completed to identify maintenance and repair issues.

General lighting consists of T-8 florescent surface-mounted and recessed fixtures. The lighting appears to be adequate and fully operational. Some of the classrooms have been outfitted with additional surface-mount receptacles for personal computers and other equipment.

Category 5 (Cat 5) wiring, commonly used for computer networks, has been installed throughout the facility (see photos 46, and 71-72). Cable trays mounted in the hallways provide ready access to the wiring and rack-mounted switches are still in place in the administrative office.

Mechanical Systems

Two Smith Cast Iron Steam Boilers series 28A with Power Flame gas burners rated for 3100 MBH are located in a North side basement boiler room. These boilers are the primary heat source (see photos 53-54). A New Haven Building Inspection and Enforcement Bureau label indicates they were installed in September 2000. The original building does not have air-conditioning. Steam

pipng, traps, fittings, and convectors appear to be original but in working order (see photo 56). Some piping indicates asbestos insulation, but appears well encased in most areas (see photo 57).

The recent addition has two 5-7 ton roof-top package units, which provide heating and air-conditioning (see photo 58). Units were not directly accessible but seem to be fully operational with the exception of some damage to thermostats in the classrooms served. Supplemental electric baseboard heat is installed in the hallway and restrooms.

Building temperature was being maintained at the time of the inspection. The boiler cycled several times. Heating control panels and thermostats throughout the building appear operational. Maintenance and service records were not available.

The building has cast iron waste and copper supply lines. Restroom fixtures and fittings are in poor condition. Some fitting and fixtures have been removed or are not in service. Water heater was not operational and some fixtures had been shut off at local valves. Plumbing will need to be carefully inspected and numerous repairs made before restrooms can be made fully operational.

Life Safety / Fire Protection

The building has a central fire alarm panel (Honeywell Notifier AFP-300) provided by FireTech Engineered Systems located in the administration office and an annunciator panel at the Southeast (Grand Avenue) entrance (see photo 66). Audible annunciators, strobe lights, and pull-stations appear in good condition. No testing or maintenance records were available.

The building has a security system but no information was available. A Sonitrol panel appeared to be in working order (see photo 69).

Emergency lighting is provided by individual wall-pack units. Emergency lighting and illuminated exit signs tested were operational (see photo 70). There are no back-up power facilities.

The building does not have a fire sprinkler system.

Site Conditions

The building site consists of two un-marked parking areas, a playground with a large commercial playscape, and two small lawn areas. The parking/paved areas are located on the North side of the building with room for approximately 25-30 parking spaces. The paved areas are not lined for parking spaces and are in poor condition. The playscape appears to be in good condition (see photo 7-8). Lawn areas are located in the Southwest and Southeast corners of the property.

Site topology is flat and drainage is accomplished by sheet flow to inlets on the site and surrounding streets (Clinton, Grand, and Perkins). Site drainage appears adequate and no ponding was observed.

Public sidewalks on Clinton Avenue and Grand Avenue are in good condition. Public sidewalk along Perkins Street appears to have been recently replaced. Curbs are in good condition and ADA compliant. (See photos 3, 4 and 6.)

No site lighting was observed, but surrounding streetlights may be sufficient to provide safe access.

Estimated Maintenance and Operation Cost

The *38th Annual Maintenance & Operations Cost Study for Schools (2009)* lists the maintenance and operating cost of similar facilities at \$4.42 per square foot including utilities. Based on the above study, the Strong School Building's maintenance and operating cost, with approximately 45,000 square feet, are estimated to be \$198,900 per year.

Total Payroll	\$2.07	
<i>Custodial</i>		\$1.35
<i>Maintenance</i>		\$0.57
<i>Grounds</i>		\$0.15
Outside Contract Labor		\$0.23
Total Energy/Utilities	\$1.43	
<i>Energy (gas, electricity, other fuels)</i>		\$1.19
<i>Utilities</i>		\$0.18
<i>Trash Collection/Disposal</i>		\$0.06
Total Equipment & Supplies	\$0.33	
<i>Custodial/Maint. Equip. & Supplies</i>		\$0.24
<i>Grounds Equip. & Supplies</i>		\$0.09
Other		\$0.36
Total M&O Budget*	\$4.42	

*Calculated from subtotals

Category descriptions

- **Total Payroll:** Salaries and benefits for individuals responsible for custodial, maintenance, and grounds.
- **Custodial:** Individuals responsible for building upkeep and cleaning.
- **Maintenance:** Individuals who perform skilled jobs, such as HVAC, electrical, and plumbing.
- **Grounds:** Individuals responsible for landscape upkeep and maintenance, including snow removal.
- **Outside Contract Labor:** Those hired for specialized jobs to maintain or repair building systems or equipment, such as HVAC repair.
- **Energy:** Includes gas, electricity, and other fuels used to operate facilities.
- **Utilities:** Includes water, telephone, etc.
- **Other:** Most often identified as clerical costs, equipment repair and rental, insurance, and travel.
- **Total Maintenance and Operations (M&O) expenditures:** Includes salaries, benefits, outside contracts, utilities, energy, trash collection/disposal, equipment and supplies, etc., for custodial, maintenance, and grounds.

Note: Since 1928, American School & University has been the information source for education

facilities and business professionals—serving the nation's K-12 and higher-education administrators responsible for the planning, design, construction, retrofit, operations, maintenance and management of education facilities.

Summary

Overall, the building appears to be in fair to good condition, but additional evaluation should be considered as outlined in the recommendations below.

Building envelope assessment can be instrumental in understanding the sources of current leaks and developing a short-term and longer-term plan to remediate. If the current leaks are façade-related, mold and mildew may develop in wall cavities and above acoustical ceilings. The additional benefit would be the potential energy saving from reducing air infiltration.

Infrared survey of the electrical system can detect problems with the electrical system before failure, helping to reduce down time and repair costs. The electrical load information can also be very helpful for longer term planning.

Infrared moisture survey of the roof can detect moisture that has become trapped under the roof membrane. Moisture trapped under the roof membrane dramatically reduces the effectiveness of the roof insulation and contributes to deterioration of the roof deck, insulation and membrane.

The facility boiler room and mechanical areas should be cleaned out to facilitate servicing of mechanical equipment and reduce fire risk. A preventative maintenance program should be put in place for HVAC (Heating, Ventilation and Air Conditioning) equipment to reduce operating and repair costs. A survey of the existing building controls system should be completed to ensure proper operation and increase energy efficiency.

Although generally suitable for use in as-is condition, short-term and longer-term maintenance and capital improvements will be needed. Some are out-lined below and others should be determined after completing additional evaluations, testing and assessment.

Recommendations – Additional Inspections and Assessments

Building Envelope Assessment – minimally exterior walls

[Wiss, Janney, Elstner Associates, Inc - New Haven, Connecticut (203) 944-9424]

Infrared Survey of the electrical system

[High Voltage Maintenance Corporation – Wallingford, Connecticut (203) 949-2646]

Infrared Moisture Survey of the Roof

[Roofing Consulting Services, Inc - Boston, Massachusetts (617) 345-0550]

Recommendations – Short Term

1. Fire and security alarm systems should be tested and repaired as needed
2. Redo exterior sealant at all doors and windows to help determine source of leaks
3. Complete a survey of all plumbing fixtures to determine repairs needed before water is restored to all fixtures
4. Survey and make repairs as needed to HVAC and building controls
5. Test and put into operation the gas-fired water heater (not currently in operation)
6. Re-point brick as needed, primarily on North side of building
7. Clean white roof to reduce summer time temperatures and extend the roof life
8. Redo step-flashing on roof access structure
9. Replace roof drain covers as needed
10. Clean out boiler room and mechanical areas
11. Remove and replace plywood on exterior doors
12. Repair or replace hardware on exterior doors as needed
13. Missing, broken or stained ceiling tiles should be replaced to facilitate leak detection (after sealant replacement on exterior walls completed)
14. Stained ceilings should also be repainted to facilitate leak detection (after sealant replacement on exterior walls completed)



Photo # 1

South and West
sides of building
looking Northeast
(Grand Avenue and
Clinton Avenue).



Photo # 2

South side of
building looking
North (Grand
Avenue).



Photo # 3

East side of building looking North (Perkins Street).



Photo # 4

West side of building looking South (Clinton Avenue).



Photo # 5

Recent addition
West and North
sides looking
Southeast.



Photo # 6

Recent addition
East side looking
North (Perkins
Street).



Photo # 7

North side looking
South.



Photo # 8

Playground and
parking area
looking North.



Photo # 9

South side windows - transition assemblies have begun to fail and may allow water and air infiltration.



Photo # 10

West side recent addition - mortar deterioration.



Photo # 11

Exterior doors –
plywood covered.



Photo # 12

South side (Grand
Avenue) windows
and ventilation
louvers.



Photo # 13

Field of main roof
looking East.



Photo # 14

Field of main roof
looking Northeast.



Photo # 15

Field of main roof
looking West.



Photo # 16

Field of main roof
looking West.



Photo # 17

Parapet wall and
vent pipe
penetration detail
(typical).



Photo # 18

Parapet wall
(typical).



Photo # 19

Exhaust fan curb detail (typical).



Photo # 20

Parapet wall and ventilation shafts.



Photo # 21

Parapet wall.



Photo # 22

Parapet wall and
ventilation shafts.
Sealed access
panels.



Photo # 23

Roof access structure.



Photo # 24

Roof access structure — step flashing in poor condition.



Photo # 25

Roof of auditorium
looking South.



Photo # 26

Roof of auditorium
looking Southwest.



Photo # 27

Roof of auditorium
- parapet wall
(typical).



Photo # 28

Recent addition –
light-framed
continuous skylight
roof system.



Photo # 29

Recent addition –
field of roof.



Photo # 30

Recent addition –
field of roof. Some
ponding noted.



Photo # 31

Auditorium interior
looking West.



Photo # 32

Auditorium interior
and stage looking
North.



Photo # 33

Auditorium wood
floor looking West.



Photo # 34

Vestibule
Southeast entrance
from Grand
Avenue.



Photo # 35

Vestibule floor.



Photo # 36

Auditorium –
commercial kitchen
West side of main
room.



Photo # 37

Auditorium –
building envelope
leaks. Note water
marks on brick
wall.



Photo # 38

Auditorium –
building envelope
leaks.



Photo # 39

Auditorium South side – building envelope leaks. Ventilation louver directly above windows pictured here.



Photo # 40

Some exterior doors in poor condition and missing hardware.



Photo # 41

Classroom -
typical.



Photo # 42

Classroom -
typical.



Photo # 43

Classroom below
grade - typical.



Photo # 44

Classroom -
typical.



Photo # 45

Classroom -
typical.



Photo # 46

Hallway -typical.



Photo # 47

Hallway -typical.



Photo # 48

Hallway -typical.



Photo # 49

Hallway below
grade - typical.



Photo # 50

Hallway below
grade - typical.



Photo # 51

Recent addition -
hallway.



Photo # 52

Recent addition -
hallway. Broken
lights.

Comment [A1]: Windows?



Photo # 53

Boiler room
looking Southeast.



Photo # 54

Boiler room
looking Northeast



Photo # 55

JCI /Honeywell
controls - typical



Photo # 56

Steam convectors,
fittings and traps -
typical.



Photo # 57

Asbestos warning -
typical. Most areas
are well encased.



Photo # 58

Recent addition –
Roof Top Unit
(RTU's) – 5-7 ton.



Photo # 59

400 Amp single-phase electrical service.



Photo # 60

120/208v pole-mounted step-down transformer.



Photo # 61

400 Amp single-phase electrical main switch.



Photo # 62

Sub-panels in boiler room.



Photo # 64

Sub-panel in
basement hallway.



Photo # 66

Central fire alarm
panel.



Photo # 67

Annunciator panel
at Grand Avenue
entrance.



Photo # 68

Fire alarm pull-
station -- typical.



Photo # 69

Security system panel.



Photo # 70

Emergency lighting wall packs and illuminated exits signs – typical.

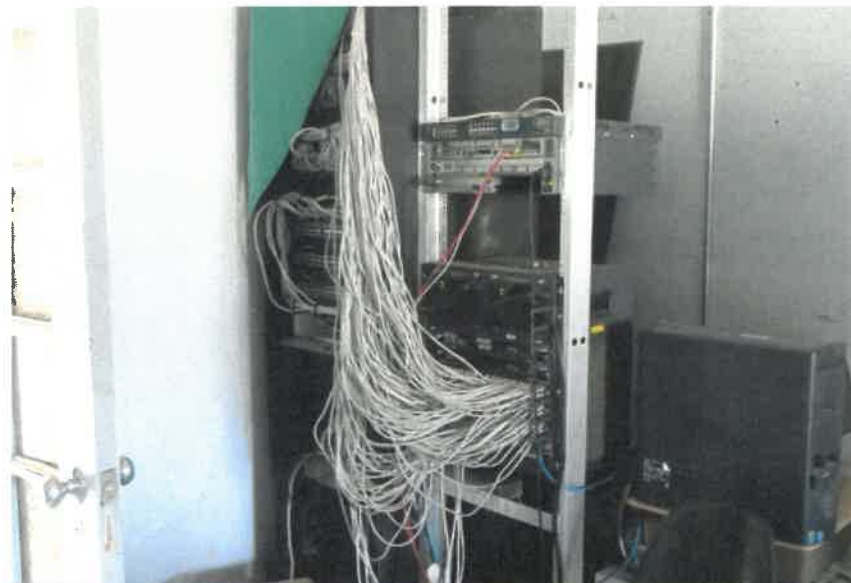


Photo # 71

CAT 5 wiring and
server racks in
administrative
office.



Photo # 72

Cat 5 wiring in
cable tray installed
along hallways.

