FINAL REPORT

EVALUATION AND ASSESSMENT
TROY ELEMENTARY SCHOOL
44 SCHOOL STREET
TROY, NEW HAMPSHIRE

FOR

MONADNOCK SCHOOL DISTRICT

SAU #93, SWANZEY, NEW HAMPSHIRE

JUNE 30, 2017

The H.L. Turner Group Inc.

ARCHITECTS ▪ ENGINEERS ▪ BUILDING SCIENTISTS

Monadnock School District
Troy Elementary School
44 School Street
Troy, New Hampshire

Facility Assessment

June 30, 2017

On May 4, 2017, representatives from The H.L. Turner Group Inc. (TTG) of Concord, New Hampshire, Paul M. Becht, P.E. and Dan Hall, AIA, visited the Troy Elementary School for the purpose of performing an overall assessment of the building. During the assessment we were accompanied by the District's Facility Director, Mr. David LaPointe. The purpose of this assessment was to identify any existing deficiencies in the building, including life safety issues, that the Town should plan to address. Furthermore, the assessment is intended to assist the Town in deciding whether it is cost effective to continue to invest in the school or perhaps consider consolidation with another school in the District. The report gives an overview of the architectural features of the building including the exterior façade, roof, and interior finishes, as well as an overview of the major mechanical and electrical equipment. Also discussed are accessibility and the critical life safety issues at the school.

Accurate and concise condition assessment data is essential for proper planning for maintenance, improvements, and capital improvements. This condition assessment is intended for use by the Monadnock School District as a tool for budget planning for the allocation of resources on a priority basis. It is hoped that by determining the nature and extent of problems, and providing options for corrective action, items may be addressed before more serious damage or failure can occur. The purpose of this facility audit is to report conditions that are in need of repairs and upgrade, conditions that do not comply with current building and safety codes, and confirm that the facility operates as designed structurally, mechanically, and electrically.

Project Objectives

- To provide an accurate accounting of all items that may be classified as deferred maintenance or capital repair/improvements.

- To calculate opinions of cost for all identified maintenance and capital improvement items using an established method of construction and cost estimating data.

It is the intention that the results of this facility audit will ultimately be used to identify a prioritization of capital repair and replacement projects for the Troy Elementary School.

LIMITATIONS: The H.L. Turner Group Inc. (TTG) has prepared this report for the Monadnock School District based on visual observations only, and therefore it did not involve destructive demolition, scientific testing, or any other tests. The information/data in this report has been provided in general accordance with accepted engineering/architectural consulting practices, and TTG makes no warrantee, either expressed or implied on the conclusions or cost estimates/opinions of cost provided.

Introduction

The Troy Elementary School dates back to 1895 when it was constructed to educate approximately 200 students from the Town of Troy. The original building had six classrooms and accommodated grades 1 through 12. The original building is a three-level structure constructed of a granite masonry foundation, interior brick at the lower level with wood framed walls above, and a brick façade. A portion of the first level is partially below grade. We believe a three-level addition consisting of a partial basement and four classrooms was added on the north side in the 1930's or 1940's. This addition was constructed of similar materials as the original school, except that cast-in-place concrete was used in place of the granite blocks for the foundation. Then in the mid to late 1950's a gymnasium/cafeteria was added on the east side of the school. It was constructed of CMU (concrete masonry units) with a steel framed roof. Additional classrooms, administrative office space, and a small kitchen were added in the late 1970's. The latest addition is constructed of CMU interior block with a brick façade. The roof is a low sloped, steel framed roof. Currently the school has a gross square footage of 27,400 square feet and consists of 13 classrooms including a library, music/art room, a small kitchen and combination gym/cafeteria. The school's current enrollment is about 160 students from pre-kindergarten through grade 6.

Exterior

The original section of the school has a wood framed roof structure with several large wood trusses and full dimension roof rafters. The roof covering is slate, except for the flat section at the top which is covered in a rubber EPDM membrane. The timbers are in good condition with no sign of rot or distress. From inside the attic, we could observe several very small openings where the valley intersects the wall. These openings are excellent entry points for insects and bats and should be closed off.

Most of the slate is in good condition although there is evidence of some slate tiles that have been replaced over the years along the roof edges and in the valleys. The areas previously replaced are those areas subjected to ice damage. Along the roof edge instead of replacing the slate, a metal ice band was added. Currently there are several slate tiles along the roof edges that will require replacement in the near future and the metal roof edging should be installed similar to what has already been done. The roof flashing at transitions and valleys appear to be in good condition and well maintained. The roofs of the 1930's addition as well as 1970's addition are covered with membrane type roofing. The former is an EPDM rubber roof in good condition, while the later appears to be a white TPO roof. The roof drains and drain sumps appear to be free of debris and the strainers were in good shape. Despite this fact, on the day of our observations, there were many ponding locations throughout the roof and the TPO was heavily stained. At the connector roof there were pavers placed over the membrane and there appeared to be an egress path from one of the second floor roofs to the connector roof. The gymnasium/cafeteria roof is pitched, with standing seam metal roofing on the south side and asphalt shingles on the north side. The standing seam roof, including the rows of snow guard, is in good condition, while the shingles on the north side are nearing the end of their useful life, and will require replacement in the next four to five years. The metal roof fascia at the flat roof over the classroom section is in good condition; however the wood beneath the metal is peeling in places and should be repainted.

Many sections of the wood cornice and soffit millwork on the original building have badly peeling paint and some wood rot. Other areas of the school have similar conditions along the soffit trim. All the millwork should be scraped, painted, and replaced as needed where rot has occurred.

The brickwork is in good condition and although some brick repointing has been done in the recent past there are a few additional areas that are exhibiting break down of mortar in the joints and of the masonry itself which should be addressed. In particular, the brick chimney cap on the original section of the school, although it is no longer used, does require some repointing. There are some wood-framed, shingled canopies supported by pressure treated posts at the entrances on the west side of the school. These are in poor condition and will require replacement in the next four to five years. There is a CMU canopy structure on the east side of the gymnasium that is starting to separate from the building. It appears the CMU was never properly attached to the building. This structure should be taken down and rebuilt.

There is underground water infiltration through the stone foundation wall along the south side of the original school building. This has been exhibited by leakage through the basement walls in the library. Since the above grade apron is intact and the drainage catch basins, etc. appear to be functioning, more extensive investigation is warranted to determine the source of the leakage.

We observed some moisture intrusion issues between the original 1895 building and the 1970's addition in the courtyard area facing the street, just outside the principal's office and one of the classrooms. The grade in this area between building sections has been built-up with earth to the point where it substantially covers the brick veneer. Other than water infiltrating into the ground, there is no definitive drainage path for water flowing off the roof. The area should be reworked with proper underground drainage added to alleviate future moisture intrusion issues through the buried brickwork. The painted CMU of the gymnasium appears to be generally in good condition with the exception of the lower few courses of block along the north side of the gym. These lower block courses exhibit mold growth from splash back of roof runoff from the pavement. This will eventually cause a breakdown of the CMU. Consideration should be given to a gutter system along the eave line to alleviate this problem.

The main entry to the school is through the connector section that joins the original building to the latest addition and it is on the north side of the building. There is no handicap accessibility at the main entrance. Since the grade is high on both sides of the connector building it is relatively easy for someone to get up onto the low roof. To remedy this, the District installed chain link fence across the roof edge of the connector on both the north and south sides of the school. The chain link fence is in disrepair and is unsightly. A more permanent barrier system should be designed, possibly lowering the grades in combination with barrier plantings or other landscape features.

There are two steel fire escape structures; one on the east side of the 1895 section and one on the north side of the 1930's section. The fire escapes are in fair to poor condition. New updated stairs or should be considered. Fire codes should be reviewed as part of a redesign of the stairs.

The original wood windows were replaced at one time with aluminum clad window units. The original sash was removed and the trim was covered with aluminum brake metal. The tall openings were in-filled with opaque metal panels over replacement windows that have a fixed upper section and a hopper style operable lower section. The windows are starting to reach the end of their useful life as evidenced by observation of condensation and

staining, indicating seal failures between the double-pane glass. The windows are at the end of their useful life and should be considered for replacement in the next two to three years.

Most of the exterior doors are in good condition and no further action is required at this time.

Interior

Many of the ceiling finishes are in fair condition. The ceilings are acoustic ceiling tile (ACT) throughout, most likely suspended below existing plaster ceilings in the original school building. Some tiles appeared to be sagging slightly. This could be a sign of excessive humidity at certain times of the year. We did not observe any staining of the tiles. The original tin ceilings in the basement bathrooms need some minor repairs such as edge molding coming off the walls in some locations. Any work on the ceilings may require abatement of the space above the existing ceiling due to the possible presence of hazardous materials. The walls on the upper levels are basically drywall with plaster and paint. On the lower levels, the walls are painted masonry with 4 x 4 porcelain tile on the walls of the bathrooms of the 1930's building. In general, the wall finishes are in fair to poor condition throughout.

The gymnasium has a spline type, concealed grid, interlocking tile ceiling. Many of the tiles are poorly fitted, most likely from the difficulty of replacing a tile or tiles once removed. The ceiling may need to be replaced in the near future.

The school is served by a kitchen adjacent to the gymnasium/cafeteria, but it is severely undersized for the current food service that takes place at the school and much of the equipment requires updating.

The wood flooring in the original building at the first and second floors shows severe wear in central common areas between classrooms and at stair landings. Extensive maintenance/repair is required in these areas. Removing the flooring may expose some bad floor joists and other structural issues which would have to be addressed as part of the floor replacement. The remainder of the building is a combination of painted concrete floors or vinyl composition tile (VCT). These floors are generally in good condition. Quarry tile in boys/girls bathrooms in the original building appears to be in good shape with some staining of tiles and grout.

At the original three-story section of the school, the stairs have several major issues. The door at the top of the stairway, designed to act as a fire door, actually swings over the stairs and is coped around the chair lift. This in itself compromises fire/smoke sealing ability and it is questionable whether a student could open the door just based on its size and weight. The top landing should be reconfigured/rebuilt to allow for proper fire door installation, handrail extensions, and chair lift termination. The stairs were originally designed as open stairwells to each of the floors. Modifications have been made to close off the stairs from the top and bottom levels; however, location of stair enclosure doors/walls do not allow for modern code clearances typically associated with stairs, landings and handrails.

Most of the lighting throughout the building appears adequate; however, upgrades to LED lighting and occupancy sensors will save the District in electricity costs. Much of the work to change over the lighting may be able to be funded by utility rebates and other incentives. The electrical system including the incoming switchboard and distribution panels appear to be in good condition. It appears there have been some upgrades completed several years ago.

The building is heated by a pair of Weil McLain boilers that have been recently converted from oil to propane. The old in-ground oil tanks have been removed and replaced with a pair of underground propane tanks located at the northwest corner of the building. The boilers appear to be in good condition. The boilers are vented through an exhaust duct that exits the building through a louver on the south side of the original building just above the level of the concrete drip apron. The exhaust is located directly below a bank of windows. Although the location of the exhaust has reportedly not posed a problem with exhaust gases getting into the building, it is not the most ideal location for an exhaust. Hot water from the boiler is distributed by a circulating pump to unit heaters and fin tube radiators throughout the building. Ventilation and minimal cooling is provided by two air handling units and a chiller on the roof top.

There is an area beneath the stage that originally served as locker rooms and actors prep rooms, that is currently used for a staff break room and special instruction area for individual students or small groups. There is no handicap accessibility to these spaces beneath the stage. Egress is another concern. There are access panels in the walls with fixed steps leading through the foundation wall to the exterior to provide the needed egress. Although not ideal, it does meet the criteria.

Accessibility and Egress

There are several issues at the Troy Elementary School relating to access and egress. The main accessible entry is located off the south (School Street) side of the building at the classroom wing near the gym. Once inside the building, access to the original school building is gained by two separate ramps to reach the first floor elevation of the original wing of the building. There are "at grade" exits from the basement of the original building, but they function as exits only. They are not properly designed to allow entry from the outside.

The main bathrooms for boys and girls are located on the lowest level of the original building, accessible from the main level by a half flight of stairs, or a wheelchair lift attached to the stair handrail. The girl's bathroom entrance at the lower level conflicts with the bottom stair landing. The last riser is past the edge of the opening into the bathroom. The privacy screening half walls at the bathroom entrances conflict with proper ADA wheelchair maneuvering clearances. The girl's bathroom has a fully accessible stall while the boy's bathroom lacks a wheelchair accessible compartment. Original trough style lavatories in both bathrooms need to be checked for compliance with ADA accessibility guidelines. Other bathrooms throughout the school do not meet all the guidelines for fully compliant ADA accessible bathrooms.

Handicap accessibility between levels is provided by a rail mounted, electric powered stair lift system. The system is cumbersome and impacts the use of the main stair handrails on one side of the stairwell. If budget allows, a more permanent means of access such as a (Limited Use/Limited Application) or an elevator should be added.

From the original school building, egress is provided through the two main open stairways, and an exterior steel framed exit stair/fire escape from the third floor on the north side of the building. There are additional exits from a fire escape stairway on the east side of the second level of the original building and from the east side of the first level onto the roof of the connector.

Portions of the two main stairways themselves are not separated in enough distance from one another to meet code remoteness and exit requirements. The use of the exterior egress stairs (fire escapes) helps to alleviate this problem, although the classrooms on the south side of the second floor are not served by the exterior exit stairway. In the original section of the school, a fire door was added to a wall that divides the common space and separates the two stairs. It appears that this fire door and wall set-up would inhibit passage

of smoke and flame, but it does not appear to connect to or create a rated enclosure or area separation of any kind. The two main stairs do not qualify as fire stairs since they are not adequately separated from the floors they serve. The west side stairway does offer direct exit to the outside, and the east stairway empties into the connector hall to an exterior entrance at the base of the ramp leading to the newer section of the school. It is also worthy of note that the entire building is covered by a sprinkler system.

Recommendations

Short-Term

Repairs, renovations, and upgrades that should be completed within the next two to three years:

- Repair the slate roof over the original section of the building and add metal edging along all slate roof edges. ($25,000)
- Replace the roofing on the north side of the gymnasium. ($40,000)
- Replace rotted section of wood cornice, soffit millwork, and repaint all wood trim. ($35,000)
- Repoint brickwork at the chimney and other areas where needed. ($20,000)
- Address water infiltration on the south side of the building near the library, as well as at the connector section outside the administrative offices. ($50,000)
- Replace the windows.($225,000-$300,000)
- Upgrades to the HVAC to provide additional ventilation and cooling. ($300,000-$350,000)
- Replace worn out wood flooring in the original section of the building. ($100,000)

The expenditure required to address the above list is estimated to be between $795,000 and $920,000.

Mid-Term

Repairs, renovations, and upgrades that should be completed within the next five to six years:

- Rebuild the canopies over the entry doors. ($30,000)

- Reconfigure and reconstruct a more aesthetic means for preventing access to the school roof at the connector between the original building and the 1970's wing. ($25,000)
- Replace the steel platforms and stairs on the exterior. ($50,000)
- Recoat the exterior of the gymnasium. ($30,000)
- Install a new ceiling system in the gymnasium. ($50,000-$60,000)
- Address the heavy fire doors at the stairwells of the original section of the school. Investigate ways to reconfigure the space for better egress and fire separation. ($35,000-$60,000)
- Renovate the bathrooms by upgrading fixtures and finishes, and bring bathrooms into full compliance with ADA guidelines. ($125,000-$175,000)

The expenditure required to address the above list is estimated to be between $345,000 and $430,000.

Long-Term

Repairs, renovations, and upgrades that should be completed within the next 10 to 12 years:

- Upgrade and expand the Kitchen.($200,000-$250,000)
- Install an elevator or Limited Use/Limited Application (LU/LA) to replace the existing stair lift device. ($125,000-$175,000)
- Upgrade lighting throughout the building by switching to LED's and occupancy sensors. ($200,000-$225,000)
- Re-roofing the low-sloped 1970's classroom wing. ($65,000)
- Consider an addition to replace the classroom space in the original section of the school as well as the space below the stage. The original section could be redesigned for use as computer rooms, administrative and guidance office, and space for Special Needs. ($3.5M-$4.5M)

The expenditure required to address the above list is estimated to be between $4,090,000 and $5,215,000.

Summary

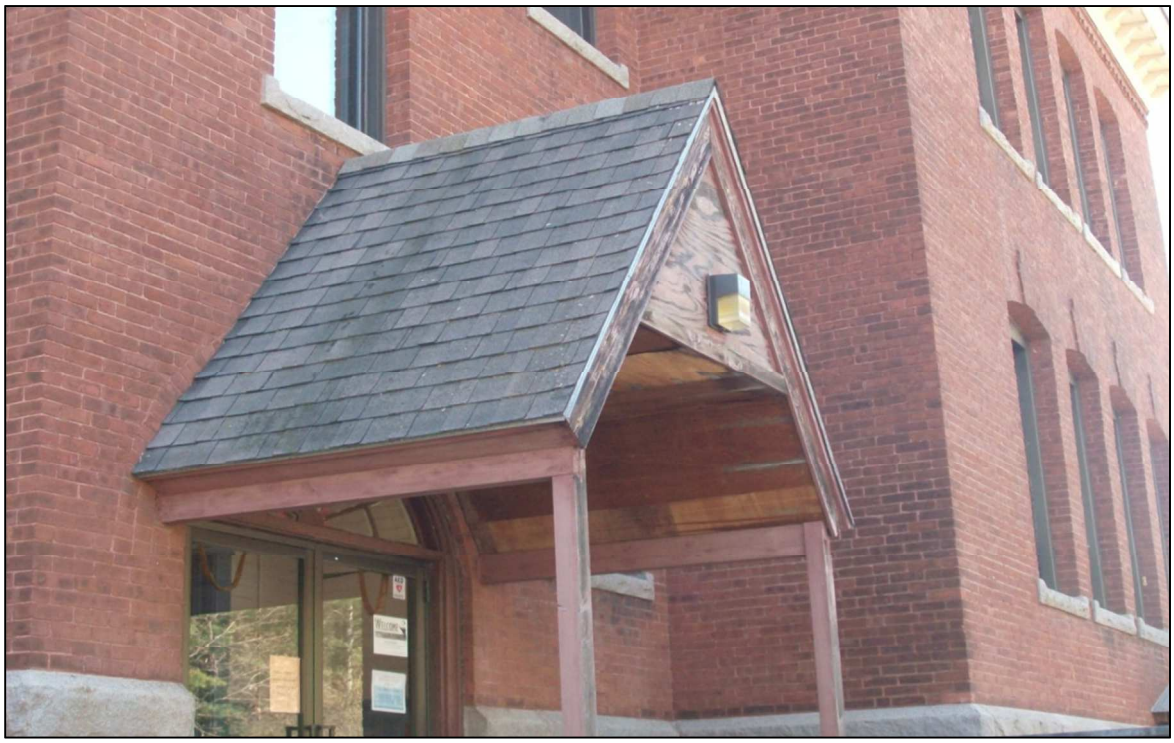
The Troy Elementary School has served the community well and should continue to serve the children of Troy into the future. The District should be commended for maintaining the building over the years, completing upgrades as needed to meet the needs of staff and students. We have tried to point out some major areas of concern to give the District an idea of where best to spend their money in the near term and long term. And even though attempts are constantly being made to repair and renovate the school as needed, the fact is some portions of the building and its equipment are getting old and worn out and well beyond a serviceable life.

With regards to overall functionality of the school when compared to modern educational facility design, the arrangement of the building, with a mix of old and newer sections presents challenges for classroom layout and efficient circulation through the building. We felt a sense of overcrowding and a general lack of space for administrative offices and other support spaces such as guidance, library, media and kitchen. In particular the 1895 wing, with a small footprint spread over three levels presents challenges with the location of classrooms and ease of access to the library and restrooms.

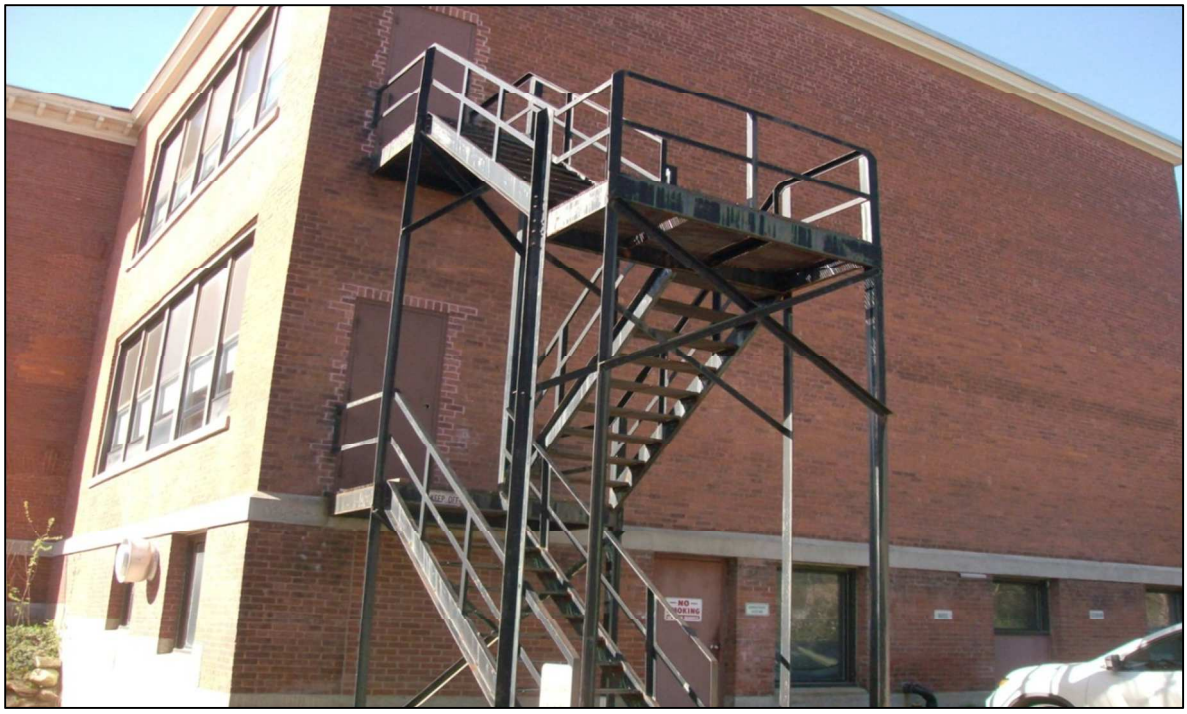
South side of original building. Furnace louver vent behind flagpole.

Section of rotted wood millwork at eave of original building.

Peeling paint on wood trim at 70's addition.



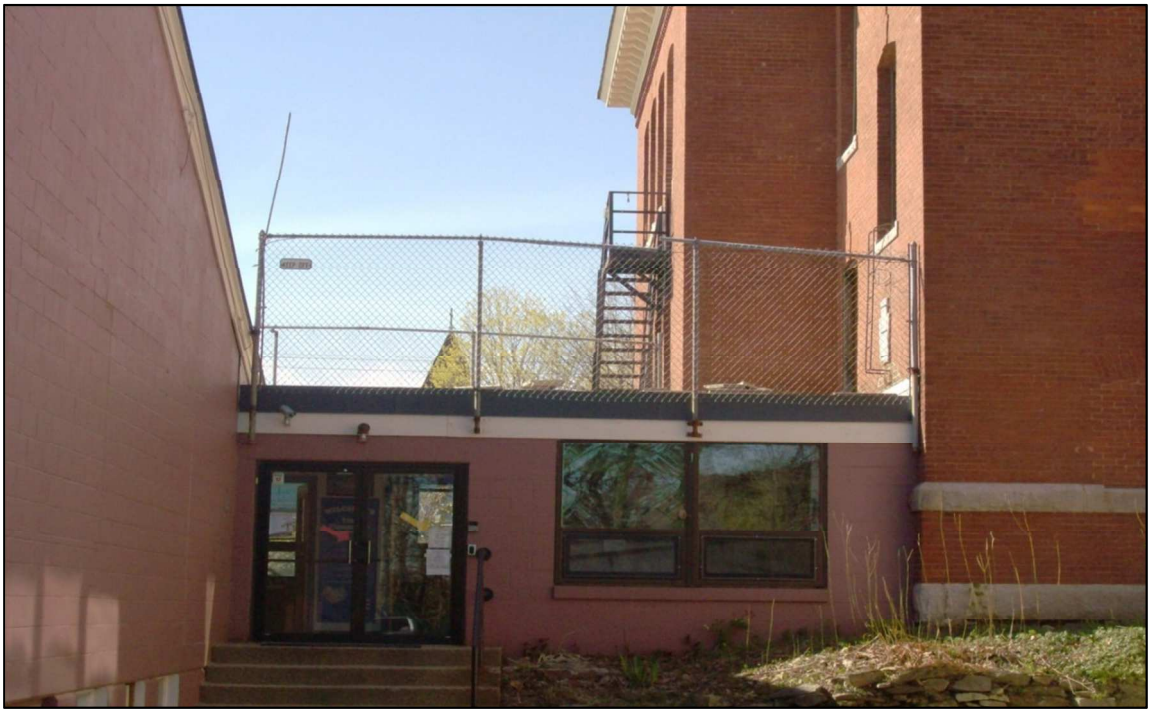
Wood framed canopy at entrance on west side.



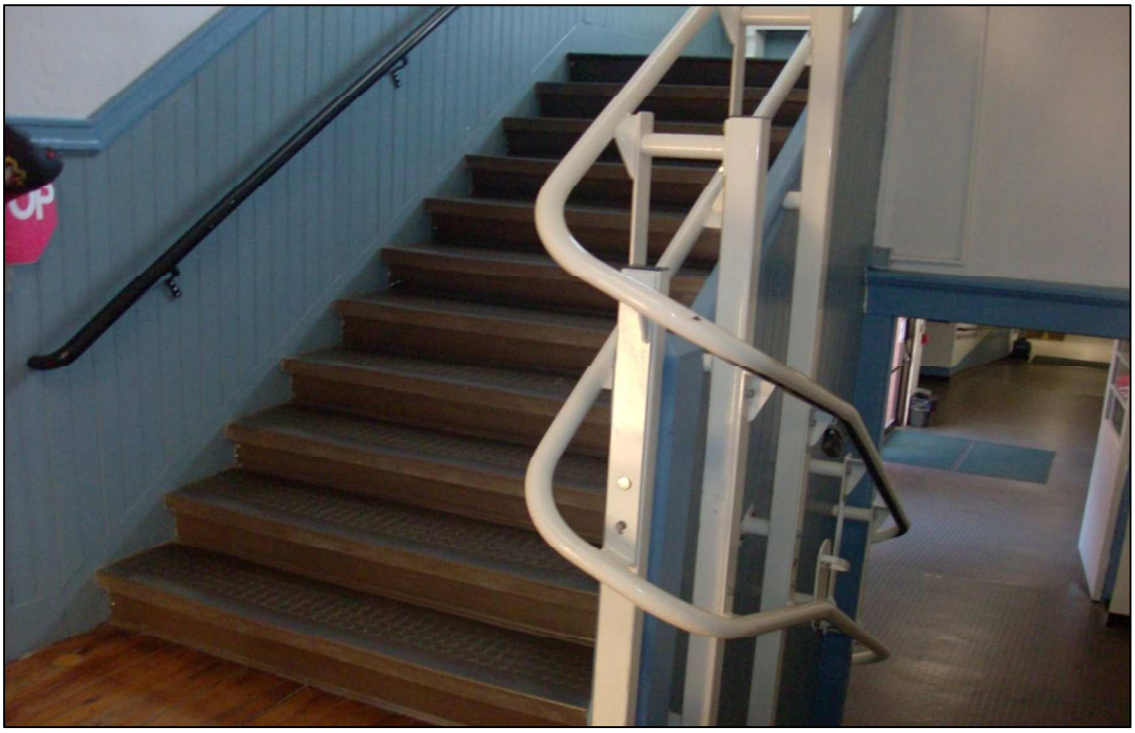
Steel framed stairs on north side of original building.

Only accessible entrance on south side of 70's addition.

Mold/mildew growth on north side of gymnasium from roof runoff splash back.



Main entry to school on north side. Chain link fencing is deterrent to easy roof access.



Track for stair lift in original section of school.

Outdated fixtures and finishes in lower level boy's bathroom.

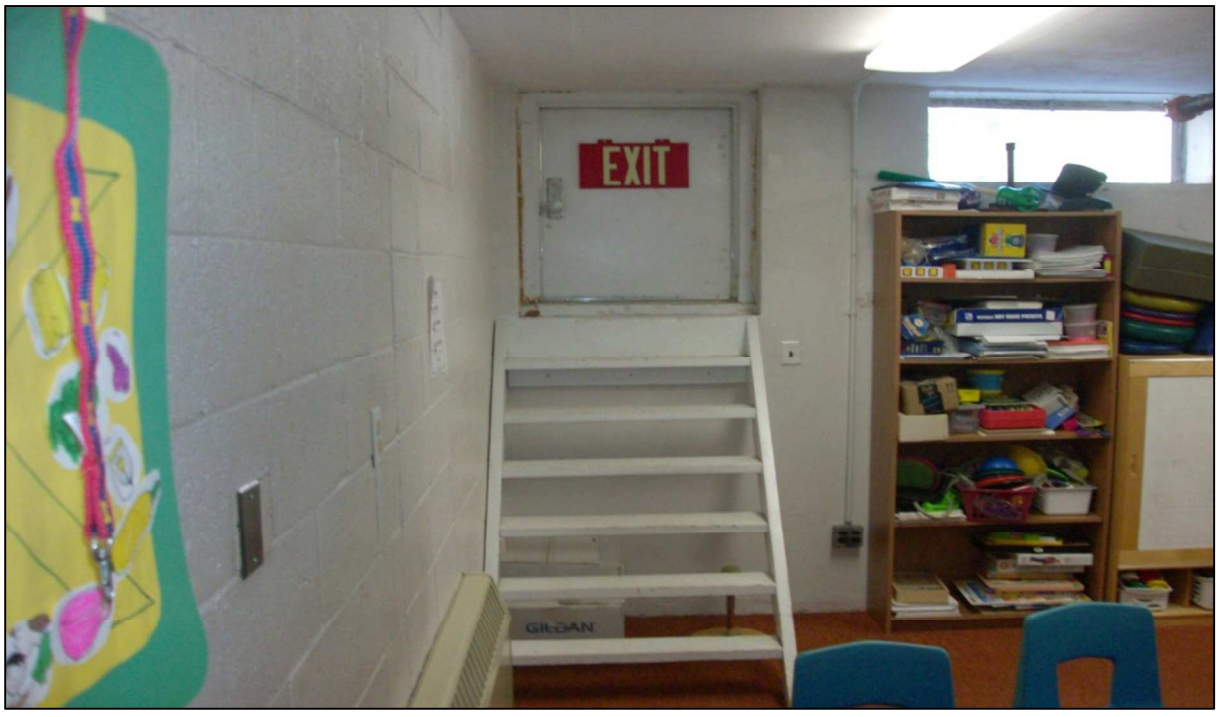
ADA accessible stall in girl's bathroom at lower level.

Typical classroom with ACT drop ceiling and outdated lighting.

Large heavy fire door at top of stairwell in original section of building.

Ramp in connector between original building and 1970's addition. Main entry is on the left.

Overview of Gymnasium/Cafeteria from the stage.



Emergency exit from lower level below the stage.

Typical wood framing in the attic. Wood staining may indicate past leakage.

Slat roof over original building. Note replacement slate along the valley.

Looking east from original building toward the 1970's addition. Note metal edging along slate roof, water ponding on 1970's TPO roof, and metal roofing with snow guards on gym to the left.