

# FINAL REPORT

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## EVALUATION AND ASSESSMENT CUTLER ELEMENTARY SCHOOL 31 S. WINCHESTER STREET SWANZEY, NEW HAMPSHIRE

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FOR  
MONADNOCK SCHOOL DISTRICT  
SAU #93, SWANZEY, NEW HAMPSHIRE  
JUNE 30, 2017

The H.L. Turner Group Inc.

Monadnock School District  
Cutler Elementary School  
31 South Winchester Street  
Swanzey, New Hampshire  
June 30, 2017

### **Facility Assessment**

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 Cutler Elementary School for the purpose of performing an overall assessment of the school 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 Cutler 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 warranty, either expressed or implied, on the conclusions or cost estimates/opinions of cost provided.

### **Introduction**

The Cutler Elementary School dates back to the late 1800's/early 1900's when it first opened as a two-story, wood framed schoolhouse. Facing east, it occupied a footprint of 2,400 square feet, approximately 68 feet long by 36 feet wide. A fire occurred in 1945 which damaged the hip roof and upper story. The roof and upper story were removed and a new wood framed roof was added. In that same year a one-story masonry addition with a steel frame was constructed to the rear, or west side of the original school, adding two classrooms to the school. An addition was completed in 1950 with the construction of a second story to the 1945 addition, resulting in a two-story brick structure behind the original hip roofed structure. Subsequent additions in 1970 and then in 1996 were completed. The 1970's addition was a one-story masonry classroom wing added to the south of the original building and the 1996 addition added over 12,000 square feet of space including classrooms, a gymnasium, a kitchen, and an art room. This brought the total usable space of the current school to 26,500 square feet. This figure does not include the two wood framed temporary classrooms that were originally situated on the west side of the school and then moved alongside and attached to the end of the west side of the 1996 addition. The school has around 260 students from pre-kindergarten through grade 6.

### **Exterior Notes**

The original section of the school, as well as the 1945 addition, have levels that are partially below grade. The main boiler room and incoming electric are located in the sub-grade section of the school as are a literary room/media center. The portions of the school added in 1970 and 1996 are constructed on a slab-on-grade.

The exterior of the school is in good condition. The original building is a wood framed structure that has been sided in vinyl. On the east facing side there are a few damaged strips of siding which should be replaced. The wood trim along the eaves is peeling and in



need of scraping and painting. At the northwest corner of the building there is a set of exterior wood stairs from the classroom to grade. The stair set is sheltered by a wood framed shed roof canopy. The entire stair set is in disrepair. The risers are too steep and the treads are not wide enough to be in compliance with current building codes. Furthermore, there are no handrails.

At the northeast corner there is a walk-up stair to grade from the basement literary room. The door at the top of the stairs is badly rusted at the base, presumably from splash back of rain on the asphalt. There is a visible gap in the corner of the foundation of the stairway and it appears water is able to enter into the foundation wall unimpeded at this spot. In addition, the door opens directly into a vehicular circulation path. In fact, there is a stop sign mounted to the side of the stair enclosure indicating how close it is to the vehicular pathway. At the north wall of this structure where it joins to the 1945 addition, runoff from the pitched roof of the original building sheds onto the face of the masonry wall. There is heavy staining and mortar joint deterioration of the brick at this point. A gutter and downspout, or additional crickets should be considered for this location. We observed some minor mildew growth evident on the vinyl siding at the north wall.

On the east facing wall of the 1970's addition near the main entry, we observed some staining, most likely from moisture, at the base of the wall from possible splash back from the asphalt. Also the north side of the 1970's addition has a roof overhang supported by a series of tapered wood beams that support the metal roof deck. Some of the outriggers have peeling paint and should be checked up close for decay or deterioration.

At the 1996 addition, the north-facing walls of the gym and kitchen show mildew and moisture staining. No efflorescence is evident, but there may be trapped moisture in the cavity that is not drying out. On the north wall of the 1996 classroom addition there is a split face CMU accent band in the brick veneer. At various locations it appears water drips over the gravel stop at the roof and hits the projected split face block. We observed moss growing on the split face block and staining above and below on the brick veneer. There was some slight efflorescence on the masonry veneer in these spots as well. Efflorescence is a crystalline deposit on the surface of the masonry. These are deposits of salts that originate in the mortar or block itself, and when combined with moisture, are driven by pressure differences through the porous masonry to the surface. As the water evaporates it leaves the salt deposits behind.

Water may be ponding on the roof and running over the top of the gravel stop. This should be further investigated to insure the roof drains are clear and that water is not ponding on



the roof. The brick window sills at the 1996 and 1945 additions had heavy mildew and water staining. This should be cleaned. Some of the mortar joints in the sills may need to be repointed.

There are two wood framed, modular style classrooms that were moved from a remote location on the school grounds to a position off the west side of the 1996 addition. The units are situated on a concrete perimeter frost wall with interior footings and piers. The area below the portable units is a crawlspace and there are some small vents on the sides of the units. But unless there is sufficient air movement, the floor framing of the portable is likely suffering from mold growth and possible wood decay. The exterior of the modular units are vinyl covered with a shingled roof. The roof is in poor condition and is in need of replacement. There is heavy mildew build-up on the north face of one of the units. The entrance to the modular units includes a wood ramp for handicap accessibility. Judging by the age and overall condition of the modular units, it is our opinion that they are past their useful life and should be replaced sooner than later with permanent classrooms.

### **Roofs**

The original wood framed section of the school has an asphalt shingle roof. As observed from the parking lot, this appears to be in good shape and has a substantial usable life remaining. There is a metal ice belt along the edge of the roof to protect against ice dams. While reviewing the interior framing of the roof (which is all full dimension 2x12's ) it should be noted that the cupola appears to have no support at the base, but rather is completely supported by the ridge board and rafters of the main roof. The main cupola support posts have been cut approximately 30" above the attic floor and left unsupported. There appears to be a substantial amount of weight hanging from the rafters with no additional reinforcement of the rafters. Further evaluation is warranted and steps may need to be taken to provide more substantial support for the cupola. The brick chimney which extends through the south side of this roof from the mechanical room in the basement shows heavy soot or creosote like staining at the cap. This should be cleaned in the near future.

We did not gain access to, or have views of, any of the flat roofs throughout the rest of the structure. These are either membrane type or built-up/ballasted type roof systems. There was some ceiling staining evident in the 1970's wing, which would indicate some possible roofing leaks in this area. Based on comments from the Facilities Director, the roofs over the 1950 and 1970's additions are due for new roofs.



There is a canopy over the walk-up stairs from the basement library. This is built of pressure treated lumber that hasn't been painted or stained. The post bases show signs of discoloration and much of the pressure treatment may have leached out. The posts should be continually monitored for deterioration and rot.

### **Interior**

The main stair set consists of steel and guards, as well as concrete pan treads with rubber covering. The stairway lacks proper handrails along guardrail (non-wall) side. The guardrail height does not appear to meet the 42" current code requirement and there is a lack of proper top and bottom handrail extensions on the wall mounted handrails.

Most of the ceilings are suspended, or drop ceilings, with acoustical tiles. The ceilings appear to be in good shape throughout the early 1970's and 1997 addition. There is some staining in the main corridor tiles of the 1970's building, possibly from roof leaks in this area. In the original building some of the foam backed acoustical ceiling tiles have rips and tears in the vinyl facing at several locations. The ceiling in these areas should be replaced. In this same area, the classrooms and some hallway areas have plaster ceilings. In some areas we observed staining and hair line cracking.

There is a shortage of ADA toilet compartments. Current codes require at least one accessible compartment in every toilet room where compartments are provided. Only two bathrooms in the 1997 addition comply. There are three toilets shown to be accessible on the 1997 addition drawings; however, they do not meet current accessibility guidelines.

The floors are primarily covered in vinyl composition tile (VCT) throughout corridors/classrooms in all areas and in the stairwell. Some cracking and possible moisture intrusion from the slab is being telegraphed through the tile in several areas where the 1996 addition meets the early 1970 wing. There is also a slab joint across the width of the corridor in the early 1970's wing that is evident in the tile. There is ceramic tile in the 1996 addition bathrooms and this is in good shape. The bathrooms in the original two phases have quarry tile on the first floor and VCT at the second floor. Both of these bathroom floors seem to be well maintained.

The walls of the original building are wood framed walls covered in plaster with wood framed plaster partition walls. Concrete masonry units form the exterior bearing walls and partition walls throughout the rest of the building. All interior walls appear to be well maintained with no immediate causes for concern. There is fiber reinforced plastic (FRP) wall covering to a wainscot height in the existing bathrooms which appears clean and in



good condition. The newer bathrooms and shower room have 2x2 ceramic wall tile and all areas are in good condition and well maintained. We observed that there were extensive areas of wall in the original building corridors covered with paper roll sheets displaying artwork. By code there are certain guidelines as to how much highly combustible decorative wall coverings are allowed in areas such as this. The local fire department may be consulted for guidance on this issue.

The windows in the original wood framed part of the building are replacement, vinyl, double-hung windows. They appear to be in good condition. The basement of the 1945 wing contains a mix of fixed picture transoms and gliding transom sized windows in various locations. These appear to be in decent shape; however, based on window age they are probably at or nearing the end of their life span. At the 1945 addition, the original double-hungs were replaced with a solid panel upper sash and gliding window lower sash. These windows appear to be nearing the end of their useful life. At the upper story addition to the 1945 building, the windows consist of 2/3 tall glass block upper panels, over 1/3 tall mulled hopper units. This entire assembly appears to be aging, and a full replacement unit would probably be a much tighter air seal than the glass blocks. The glass block panel joints are deteriorating, and the wood trim between block and masonry is badly peeling and needs immediate painting. The caulking in the joints between window frame and masonry throughout the entire 1945 and 1950 additions needs to be removed and resealed. Several windows on the west facing walls in this area had completely failed caulk joints.

In the 1970's addition, vinyl gliding units were installed. Believed to be original windows, they are close to needing replacement. The 1996 classroom addition contains gliding units with fixed transoms mulled to the glider. There are Kalwall panels up high on the north facing gym wall. These appear to be in good shape.

The main heating plant for the original building including the 1945/1950 addition is a Smith cast iron boiler. The boiler was built in 1996 so it's about 21 years old. A boiler of this type, if properly maintained, should typically last 30 years or more. That's just the base cast iron boiler. Other components such as the burner would be expected to be replaced more often. The fuel source is No. 2 heating oil. This type of boiler can also run on gas, but it requires a different burner. The capacity, based on the nameplate is 1.3 MBTU and the efficiency of this type of boiler is at best 80 percent. This is a hot water boiler designed to run hot, with a certain minimum return water temperature to prevent condensation, shock, or damage to the cast iron sections, and it cannot be run down into the condensing temperature range. However, it can be "reset" in various ways to vary its supply

temperature based on outdoor temperature. Typically oil boilers have more soot to clean than gas boilers, and lose some efficiency between cleanings.

This boiler is well suited to most existing systems which were designed for 180°F to 200°F peak supply temperatures. With this type of system, a modern high efficiency condensing boiler can be used and will be more efficient on some days, but on colder days when the new boiler has to run as hot as the old boiler, it will not be much more efficient than this existing one.

Some facilities with an existing boiler, that still has some life remaining, will leave it in place. A new condensing boiler will be installed in the boiler room and the old boiler will be used only on those coldest days.

For the newest section of the school, the classrooms rely on unit ventilators in each classroom.

There is a lack of ventilating air and cooling throughout the school. Some classrooms and offices rely on window mounted air conditioning units while others have freestanding air cooling units.

For lighting there are fluorescent tube lights throughout the entire building, both recessed, pendant and surface mounted. Many fixtures show poor fitting and discolored lense housings, most likely due to continual maintenance over the years. These should be replaced with LED fixtures as budget allows or if utility incentives can be realized.

The building is fully covered by a sprinkler system. There are heat and smoke detectors throughout the building, as well as horns and strobes. However there is a lack of horns and strobes in some of the bathrooms. Also the fire alarm panel is outdated and should be upgraded.

The gymnasium and kitchen are part of the 1996 addition. Both are in good condition. The gym has a seamless vinyl/rubber sheet product which is in good condition. However, the lines on the floor are badly worn and require repainting. Another item requiring attention includes the double doors; they are lacking astragal seal strips to cover the space between door halves. There is also some corrosion at the bottom of the door frames and the doors will have to be replaced in the next five to six years. The gym heating and ventilation is provided by two large ceiling mounted units. The units are over 20 years old and may need replacement in the next five to six years. Having the units suspended from the ceiling presents some difficulties in terms of ease of access for maintenance purposes.



The kitchen is of sufficient size to serve the student population and most of the equipment is in good condition. There is quarry tile in the kitchen food prep areas and it too is in good condition. The floor appears to be well maintained.

### **Egress and Accessibility**

Accessibility – There is a stair mounted chair lift from the main entry at the 1970’s building to the first floor and basement of the 1945 addition. There is no accessibility to the second floor (1950 addition) classrooms, or any of the original wood structure classrooms. The original wood structure is down several risers from the floor of the 1945 wing. The 1970’s and 1996 additions are fully accessible with on-grade entrances and a ramp into the modular classrooms, both from the interior floor level change and parking lot outside. There are accessibility issues with the bathrooms as previously mentioned.

Egress from all portions of the structure appear to be adequate in number and arrangement. The main stair at the connection between the original wood structure and the 1945/1950 additions is properly enclosed. It does not however exit directly to the outside, but rather there is a double door leading to the exterior directly adjacent to the first floor landing, which is allowed by code for a certain number of building exits.

There are exits from the rear of the 1945/1950 additions via a door onto a steel framed platform with a set of steel framed stairs. These are used only in the event of an emergency. At some point in the near future, the stairs will require close inspection for corrosion and weld cracks, and will require a new coating of paint.

There are no vestibules in the building. This is now a requirement in the energy conservation code at main entries unless certain exceptions are met. A vestibule can also act as an added security measure. This should be considered in future planning as the budget allows.

## Recommendations

### Short-Term

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

- Rebuild the stairs on the northwest corner of the building such that it is in compliance with current codes. (\$12,000)
- Repair the gap in the foundation at the stairway exit from the literary room. Replace the door. (\$5,000)
- Install speed bumps in the roadway approaching the door from either direction or investigate if the dumpster is moved is there is room to re-stripe the driveway to shift the traffic pattern. (\$1,500)
- Replace the modular classroom with an addition onto the school. (\$500,000 to \$600,000)
- Investigate the cupola support and provide a more substantial support system (\$6,000)
- Replace the roofs over the 1950's and 1970's additions. Approximately 9,400 square feet of roofing. (\$100,000 to \$115,000)
- Replace the foam backed acoustical ceiling tiles in the original section of the building (\$10,000)
- Replace the caulking/sealants around the windows in the 1945/50 additions (about 30 windows - \$15,000)
- Scrape and repaint the wood trim between the glass block and the brick (\$4,000)
- Update the HVAC system to provide more ventilation and better cooling throughout the school (26,500SF @ \$12.00/SF to \$14.00/SF = \$318,000 to \$371,000)
- Update the fire alarm panel (\$75,000)
- Re-paint the lines on the gymnasium floor (\$3,000)
- Clean soot/creosote from chimney (\$1,500)

The expenditure required to address the above list is estimated to be between \$1,051,000 and \$1,219,000.

### **Mid-Term**

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

- Install horns and strobes in the bathrooms to meet code (\$15,000)
- Provide access to the second floor of the 1950's addition by extending the stair mounted chair lift or by providing an elevator. (\$25,000 to \$300,000)
- Modify the main stairway handrail to meet the code requirements for guiderail height, handrail extensions and a wall mounted handrail. (\$20,000)
- Inspect the steel fire escape stairways and platforms and re-paint (\$12,000)
- Replace the doors and frames in the Gymnasium (\$5,000)
- Upgrade the bathrooms to include proper ADA compartments (\$75,000)
- Window replacement in the 1945, 1950's and 1970's sections of the building (\$250,000 to \$300,000)

The expenditure required to address the above list is estimated to be between \$402,000 and \$727,000.

### **Long-Term**

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

- Get rid of the existing oil tanks and replace the existing boiler with multiple gas-fired condensing boilers for efficiency and redundancy. Get rid of the old oil tanks. (\$175,000)
- Replace all light fixtures with new LED energy efficient fixtures and sensor switches. (\$150,000)
- Add a vestibule enclosure for security reasons and for energy conservation (\$100,000)
- Replace vinyl tile in the corridor that transitions between the 1970's wing and the 1996 wing. (\$40,000)

The expenditure required to address the above list is estimated to be approximately \$465,000

## **Summary**

The Cutler 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, and 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.



The original Cutler School with an east facing entrance.



Looking west, just south of the original school is the main entrance, built as part of the 1970's addition.



Exit from the basement level of the original school. Note rusted door and hole in foundation.



Non-compliant stair set providing exit from a classroom on the main floor of the original building.



Missing sealant between window frame and brick at 1950's addition.



Wood framed canopy over basement exit. Also steel fire exit stairs from first and second floors.



Paved courtyard between the 1945/1950 and 1970 additions.  
Note overhanging wood roof support beams.



North façade of 1990's wing. Note staining on precast accent piece and individual AC unit.





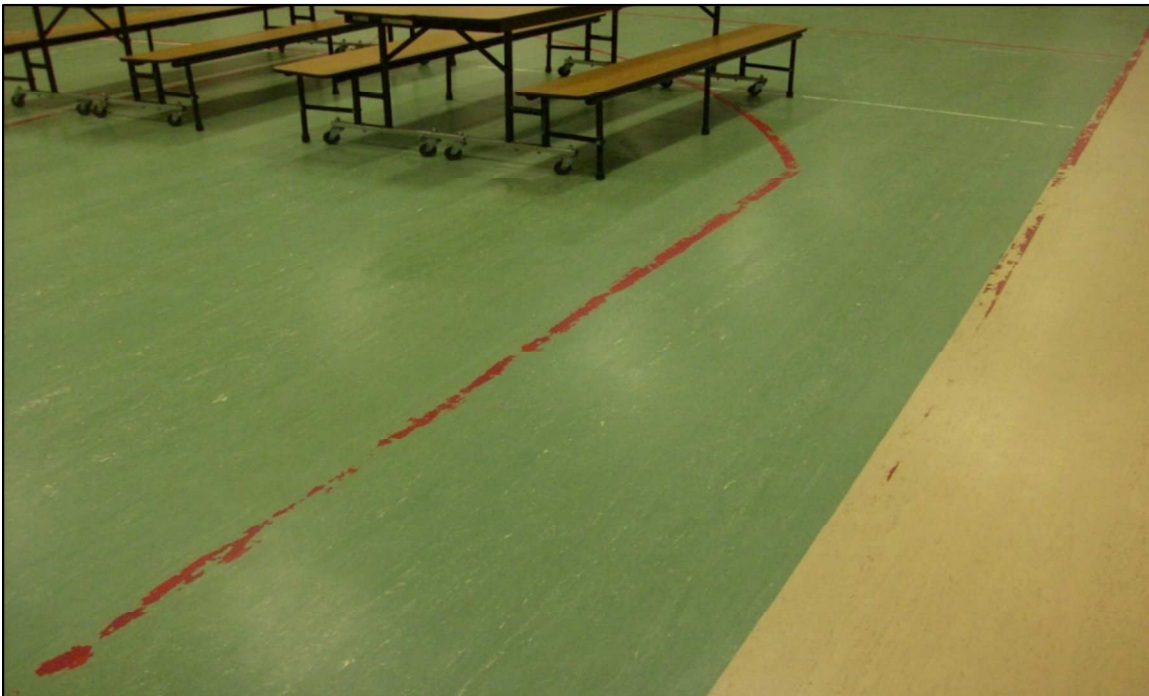
Accessible ramp to rear entrance at portable classroom units.



Shingle roof of portable units nearing end of life.



Doors at gym. Note lack of astragal between doors and corrosion at door frame.



Lines on gym floor need repainting.



View of corridor in the 1990's wing.



Fire alarm panel needs upgrade to new modern addressable panel.



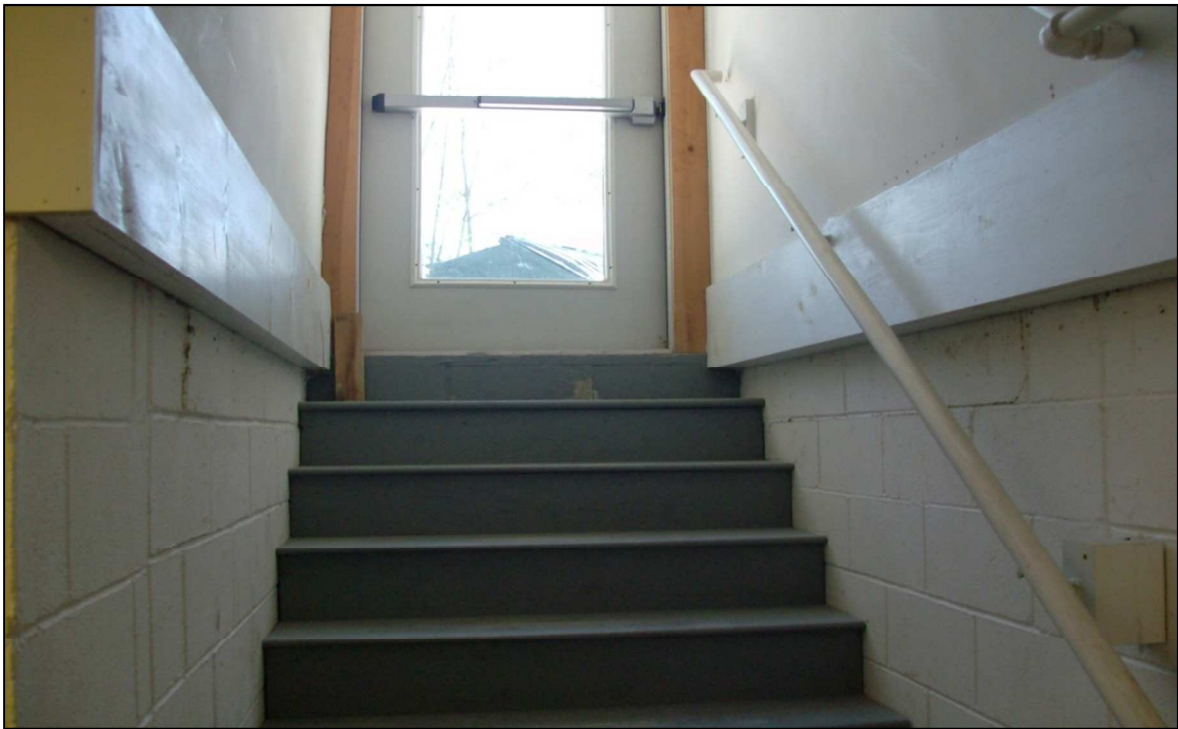
Staining on ceiling of stairwell between 1945/1950 and 1970's additions.



Typical classroom in original section of school.



Damage to vinyl coated acoustical ceiling tile in the original section of the school.



Exit stairway from literary room in the basement of original school.



Office in literary room in basement of original school.



Stairway to library in basement of original section of school.  
Note chair lift from basement to first landing. It does not extend above that level.



Typical bathroom in 1945/1950 addition. There is a lack of fully accessible stall.