FINAL REPORT

EVALUATION AND ASSESSMENT

SAU #21

LITCHFIELD SCHOOL DISTRICT

LITCHFIELD, NEW HAMPSHIRE

SEPTEMBER 27, 2017

The H.L. Turner Group Inc.

ARCHITECTS ▪ ENGINEERS ▪ BUILDING SCIENTISTS

The H.L. Turner Group Inc.

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September 27, 2017

Mr. Cory Izbicki, Business Administrator
SAU 27 – Litchfield School District
1 Highlander Court
Litchfield, NH 03052

SUBJECT: Evaluation and Assessment
SAU #27 – Litchfield School District
Campbell High School
Litchfield Middle School
Griffin Memorial School
Litchfield, NH

Dear Mr. Izbicki:

Please find the attached final report for the three school buildings within SAU #27, Campbell High School, Litchfield Middle School and Griffin Memorial School.

We appreciate the opportunity to present this report, and look forward to further assisting SAU #27 implementing any of the work outlined in this report.

Sincerely,

THE H.L. TURNER GROUP INC.

William D. Hickey
Senior Vice President

On Friday November 18 and Tuesday November 22, 2016, The H.L. Turner Group Inc. (TTG) visited the Campbell High School at 1 Highlander Court in Litchfield, NH, to perform a site assessment of the property and identify any existing deficiencies the school district should address. This report provides a summary of those findings, our opinions regarding the remaining life expectancy of each condition, and an opinion of the associated costs to do so. For this report, the main entrance is on the south side of the building.

Prior to visiting the site, TTG reviewed the 2010 Moisture Problem Evaluation prepared by Stantec. This report was the result of a detailed investigation into the source(s) of water infiltration problems within the school and at the track infield. This report identified a number of possible sources but no conclusive reasons for the problems. During TTG's discussions with the facilities staff, they did not report any specific concerns or problems relative to site drainage. The soils across this site are well drained and the site design utilizes infiltration as a primary means of stormwater management so it is not surprising there are no site drainage issues.

Vehicle and Pedestrian Circulation

South Side

The primary parking lot is located on the south side of the school. There are 199 delineated parking spaces, four of which are reserved as accessible (there are additional spaces on the north side and will be discussed below). Two of these accessible spaces are not signed. The pavement is in fair condition with some cracking, indicative of normal aging and not due to a failure of base gravels. Along the south end of the lot, there is a bituminous curb in poor condition. The striping is faded and difficult to detect in some areas. At the southeast corner of the lot, where it intersects with an onsite driveway, there is a painted stop bar but no stop sign.

At the south side of this parking lot, between the pavement and an athletic field, there is a gravel-surfaced section sloping in a southerly direction for approximately 60-feet. It may be used as a supplemental parking lot or dedicated snow storage area, because there is very little grass cover to speak of.

There is a concrete sidewalk with integral curb along the north side of this lot, tying into the plaza leading to the main entrance. The concrete surfaces are in fair condition, with some cracking and deteriorated sections of concrete. Where the walk tips down to the crosswalk there is no detectable warning plate, which was not required at the time this building was constructed.

East Side

There are an additional 22 parking spaces along the east side of the school, none of which are reserved as accessible. It seems that at one time there were accessible spaces in this section based on the striping patterns and the presence of a curb tipdown. The tipdown is very steep and is not compliant with ADA. The condition of the pavement is similar to that on the south side, generally in fair condition with some visible cracks.

Along the east side of the driveway runoff flowing off the pavement is eroding the gravel surface at the edge of pavement, leading to some undermining and pavement failure. The vegetation is very sparse which exacerbates the problem with erosion.

At the east end of the site, across a driveway, are the softball field, the running track surrounding a soccer field, and at the northeast corner is the baseball diamond. A chain link fence runs the length of the property, separating the fields from the adjacent driveway and parking areas. With the exception of the gated access at the concession stand adjacent to the track, there are no accessible paths to the fields. The fence has a few v-shaped openings for spectators to enter the fields, but the openings do not comply with the Americans with Disabilities Act (ADA) regulations. Further, there is no defined, accessible path to these openings. Although there is an accessible entrance to the track at the concession stand, there is no path to the other fields from this location.

At door 26D there is visible erosion undermining the concrete door pad.

At door 25D there is a gap between the door pad and the asphalt sidewalk of 1-2 inches in width. This door pad has two significant patches of spalling and there is a large crack in the paved sidewalk angling away from the door pad.

At door 21D the paved sidewalk slopes away from this egress in excess of 5% but it does not have any handrails.

At door 22D there is a lateral crack running across the concrete door pad, and the concrete walk slopes at 8.8% down to a patio. There are no handrails at this sidewalk either. If either door 21D or 22D are part of an accessible route to or from the building, the sidewalks are not in compliance with ADA standards.

North Side

The pavement on this side of the school is also in fair condition, with some areas of cracking. The edges of pavement are in poor condition in many locations, due to runoff eroding the gravels adjacent to the pavement edge. There are 123 spaces in this lot, four of which are reserved as accessible (and another two could be made accessible, based on the position of the five-foot reserved aisles), though the only indication is the paint markings on the ground, as there are no signs marking these spaces. Most of the striping is faded in this lot also.

There is concrete spalling at multiple door pads.

At the northeast corner of the school there is a service driveway separated from the parking lot by three wooden sawhorses. Although they are easily maneuvered, they do not provide a secure barrier. A metal gate with a latch could serve the same purpose and may function better than the current system.

West Side

There is an exit driveway on this side of the property with 30 angled parking spaces, reserved for visitors and SAU personnel. This pavement is in similar (fair) condition with similar crack patterns evident. Where it meets the north side parking lot there is no painted stop bar or stop sign. There was a stop bar at one time but it has almost completely vanished due to fading and pavement cracking.

Since there are spaces reserved for visitors here the district should delineate a pedestrian walkway to the school's main entrance. Unless you are familiar with the school it is not clear which way to walk to enter the building.

This site has 374 parking spaces in total, eight of which are designated accessible, which complies with ADA standards. Two of those spaces also need to be van accessible and signed accordingly. This site only appears to have one van accessible space, in the large parking lot on the south side.

Summary of Recommendations, Vehicle and Pedestrian Circulation

- Fill pavement cracks across the entire site with a bituminous sealant and sealcoat the asphalt surfaces.
- Replace bituminous curbing.
- Restripe the parking lots.
- Install ADA compliant signage at all accessible parking spaces.
- Install stop sign @ southeast corner of parking lot on south side.
- Establish a second van accessible space.
- Repair cracks and spalls in concrete surfaces and curbs.
- Provide an ADA compliant accessible path to all of the athletic fields.
- Remove and replace the concrete door pad at door 26D.
- Install a swing gate across the service entrance driveway at the northeast corner of the building.
- Repair cracked and broken pavement along the edges of driveways and parking lots. Place compacted crushed gravel at the shoulders of all paved areas to prevent undermining and edge failure.
- Establish a delineated pedestrian route from the visitor parking spaces on the west side of the building to the main entrance.

Site Drainage

South Side

The parking lot on this side of the building slopes away from the building in a southerly direction. Bituminous curbing channels runoff toward two asphalt swales leading to precast concrete dry wells. The terrain on either side of these basins and swales is primarily bare earth, with some sparse weeds. Since the area slopes toward these inlets, they collect a lot of sediment, which can reduce the infiltration capacity of the dry wells. The easternmost structure had some standing water in it, which indicates the porous material beneath and surrounding it is partially clogged. The dry well at the west end of the site was dry but is at risk of becoming clogged because of the bare earth surrounding the inlet.

Along the west side of this parking lot is a vegetated swale that is becoming overgrown with trees and brush, and the culvert beneath the main driveway entrance is plugged with loamy material. This swale leads to a detention pond at the southwest corner of the property, with an overflow catch basin tied to the Town's municipal drainage system. The primary inlet to the structure is a vertical opening with no grating or other protection to prevent debris and animals from ending up in the structure. There are some small coniferous saplings starting to grow in this basin.

East Side

Along the emergency driveway between the school and the athletic fields, there is a vegetated drainage swale dry wells to infiltrate excess runoff. As water flows off the asphalt

driveway it is eroding the surface, causing undermining of the pavement and sending sediments down into the swale and dry wells.

The asphalt access to the track and the concession stand bisects the vegetated swale noted above and there are three plastic culverts connecting the two halves. These culverts are partially clogged with leaves and other debris. The dry well at the north end of this swale had water in the sump, indicating it may be clogged with fine sediments.

North Side

At the northeast corner of the school, there is a gravel area adjacent to the asphalt that slopes toward the baseball field. It presents a potential threat for sedimentation of the baseball outfield.

The parking lot slopes northward and where the runoff flows off the pavement it is eroding the ground, causing undermining and deterioration of the pavement edge.

There is a service entrance at the northwest corner of the school. This driveway slopes toward the school and relies on the driveway cross-slope to sheet runoff away from the pavement. There is a risk for ponding water to seep beneath both the overhead door and the man door at this location.

The rain gutter above door 10C leaks and drips water onto the pavement in front of these doors, creating a slip and fall risk during cold weather.

West Side

A vegetated drainage swale runs along the west side of the parking area, receiving runoff from building roof drains and the asphalt driveway/parking spaces. It has a lot of leaves and other debris in it that threaten to clog the drain outlets and reduce the ability of the swale to infiltrate and transmit rainfall and snowmelt.

<u>Summary of Recommendations, Site Drainage</u>

- Clean accumulated sediments and debris from drainage structures and culverts.
- Restore vegetation in swales and landscaped areas surrounding drainage inlets to reduce sedimentation and erosion.
- Install a grate or screen across the vertical orifice in the drainage structure at the detention basin located at the southwest corner of the site.
- Remove trees, shrubs, woody overgrowth and accumulated debris from all vegetated drainage swales and detention basins on the site.
- Install compacted crushed gravel at all pavement edges where runoff is eroding the existing soil material and undermining the pavement.
- Create a vegetated swale to prevent gravel from washing into the baseball outfield at the northwest corner of the school.
- Consider installing a drainage inlet at the service entrance at the northwest corner of the school to capture runoff so it cannot seep into the building beneath the existing doors.
- Repair leaks in the roof gutters to eliminate drips onto sidewalk in front of the doors and entrance 10C.
- Develop a Stormwater Inspection and Maintenance Plan, if one doesn't already exist, identifying the components of the stormwater management system that require regular

inspection and maintenance (vacuuming catch basin sumps, restoring eroded areas, maintaining vegetation in drainage swales and detention basins, removing debris….).

Landscaping

Across the entire site, there are several areas with sparse vegetation, especially where runoff tends to concentrate, at the edges of pavement and in the unshaded swales. In several locations, runoff from the driveway and parking areas has eroded the ground abutting the asphalt surface, resulting in an exposed pavement edge and increasing the risk of the pavement becoming undermined during rain events. Installing compacted gravel and ensuring it slopes away from the pavement can be effective, as can establishing dense grass cover, although this option is more difficult to maintain in the long term because of the tendency for vehicles to drive over it and impacts from sand and salt applied during winter months. Such efforts help ensure the integrity of the asphalt over time.

Summary of Recommendations, Landscaping

- Restore vegetation across the grass-covered areas of the site where needed.
- Protect edges of pavement with compacted crushed gravel and/or dense vegetation.

Septic System

Of the three schools, the system at the high school is the youngest. It consists of septic tanks and a pump station beneath the pavement on the east side of the school and paired leach fields constructed of plastic chambers, located beneath the athletic field at the track infield. The facilities staff reports have not experienced any problems with this system and it is maintained regularly (annual pump station inspection and septic tank pumping). Because the system is relatively young, the soils are well drained, and there are no reported problems, TTG decided not to excavate test pits in the effluent disposal area (leach fields) because it is an invasive and temporarily destructive process. Without an exact idea of where the distribution boxes and chambers are located, there was a risk of having to disturb a lot of sod material. Further, knowing the fields are irrigated, there is an additional risk that probing and excavating could puncture an irrigation line.

The design data from the record drawings on file with NHDES indicate the system was designed to manage 19,275 gallons of effluent per day, which accommodates 770 people at 25 gallons per day per person. With data indicating stable or declining enrollment numbers, the system is adequately sized for the 500+/- students projected for the coming years.

The pump station is located in the parking spaces on the east side of the school, flush with the pavement surface. The hatch cover frame is damaged, possibly from snow plowing operations and does not appear to be watertight. Rainfall and snowmelt entering the pump station can create additional strain on the pumps and leach fields, because it adds additional liquid volume beyond the effluent from the school. Additionally, there is no secondary fall protection on the inside of the pump station, nor is there a warning label on the inside of the hatch to inform people about the presence of a hazardous environment requiring a confined space permit to enter.

The inside of the pump station is in good condition, with the exception of the brackets securing the pump guide brackets to the sidewall. They are corroded and require replacement. The lifting chains and guide rails are galvanized (as per the design drawings) but the school should consider replacing them with stainless steel because it has greater longevity in the corrosive environment of a sewer pump station.

The pump station control panel is located inside the school and there is no line of sight between the panel and the station, which makes maintenance more complicated. The design drawings specified for the controls to be mounted to the exterior of the school but that obviously did not occur. During TTG's visit, the 'Seal Failure' alarm indicator light was illuminated and mentioned to CHS staff. There was no audible alarm sounding.

Summary of Recommendations, Septic System

- Replace pump station hatch rated for H20 loading. Install bollards, concrete barriers, or similar measures to prevent traffic damage to the hatch.
- Install secondary fall protection inside the pump station hatch and install warning labels compliant with State of New Hampshire regulations.
- Replace galvanized guiderails and lifting chains with stainless steel.
- Service pump 2 to determine the cause of the seal failure alarm indication. Replace if necessary.
- Review pump station control panel daily to ensure proper operation.
- Continue following regular service and inspection schedule for the septic system.

Miscellaneous

At the loading dock, the guardrails along its edge have been removed, creating a fall hazard.

The concrete at some locations of the loading dock, particularly at the stairs and beneath the corner of the northeast column supporting the canopy, has deteriorated.

The stair railings are rusting and showing corrosion where they meet the concrete treads.

There is an apparent low spot on the north side of the stairs.

The dumpsters are set on pavement or grass, rather than a concrete pad.

There is an athletic field at the north end of the site directly abutting the parking lot, but there is no fence or other barrier to prevent vehicles from driving onto the field.

There is a sign along the north edge of the north parking lot lying on the ground, intended to notify people pets are prohibited from the athletic field.

Summary of Recommendations, Miscellaneous

- Install new guardrails at the edge of the loading dock.
- Repair deteriorated concrete where required site wide.
- Prime and repaint exterior handrails and guardrails.
- Regrade pavement at loading dock to eliminate low spot(s).
- Provide concrete pads and approach slabs for dumpsters. Install opaque enclosures to contain spilled debris.
- Install a fence or similar barrier to discourage vehicles from driving onto the athletic field at the north end of the site.
- Restore/ replace any signage that is improperly mounted.

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CAMPBELL HIGH SCHOOL - ARCHITECTURAL

General Information

The Campbell High School constructed in 2000 consists of a two story structure approximately 114,500 square feet. Under the current 2009 IBC and 2015 NFPA LSC-101 the building construction type is classified as 2B construction (noncombustible, unprotected). The building has a fire suppression system. The majority of the construction is structural steel, concrete masonry on the interior and exterior back-up walls with an economy brick veneer. There are some areas if exterior insulation stucco finish system. The entire school was constructed at one time and no additions have been built. Due to the recent construction of the building it is assumed that hazardous materials are not present.

Occupancy classifications within the building educational and an assembly use group for the gymnasium. Proper occupancy fire separations appear to have been provided based on the original construction documents. Occupant load egress meets current codes for size and travel distance. The two interior stairs are required to egress a portion of the calculated occupant load of the second floor, they egress to corridors on the first floor that serve as exit passageways, under the building code the observation and ticket windows into the lobby are not allowed.

Building Exterior

Masonry

The exterior masonry walls of the building are in good shape with some minor cracking showing at fenestrations and building corners. The split-face CMU on the east side of the building is showing a lot of cracking. The masonry control joints are due for resealing. Some the control joints on the building stop before they reach the ground, they should be full height, but it does not seem to have impacted anything. There are a small number of spot in the masonry around the building that require repointing. There is a large rust stain on the west side of the south wing from the sprinkler test discharge pipe. Staining is also present under some of the mechanical louvers on the north side.

Exterior Insulation System

Some of the EIFS areas are showing and staining possibly from roof drips or mold growth, a result of being on shady areas of the building. This will be a continuing maintenance item since the sun cannot dry out the areas. The EFIS window sills are chipping and should be replaced.

Doors

Some door frames should be resealed and all thresholds cleaned, there is a lot of salt and sand remaining on the thresholds that can lead to the bottom of the steel door frames rusting prematurely. Door frames should be repainted for added protection. A majority of the exterior doors are full glass doors that could be a security issue, a more resilient glazing should be considered if security is a concern to the district.

Windows

The windows are in good shape, broken insulation seals were not observed, but some of the operable sash gaskets are failing. Some windows require new perimeter sealant.

Gutters

The gymnasium exterior entrance gutter has two major leaks and is in need of immediate repair. There are also soffit lights that need to be reset. There is also a gutter at the loading dock that needs to be sealed.

Building Interior

Flooring

Flooring throughout the building consists of a majority vinyl composition tile (VCT), seamless flooring, and carpet in administration and library areas. Most of the carpeting shows signs of wear and there are areas where the carpeting has delaminated. With regard to the VCT, large gaps between tiles appeared in some rooms. There is no sign of structural issues near these separations, so this may have to do with the original installation, failing adhesive, or shrinkage of the floor tile.

There are other areas in the music areas and adjacent corridors where the tile is damaged due to the underlying concrete being uneven, spalling or cracking. The tech lab floor tile is suffering from moisture under the tile.

The seamless flooring in the restrooms and locker rooms has been waxed and will appear dirty all of the time unless stripped and cleaned. There are some areas where the pigment is discolored; this is the result of improper installation and not due to wear.

A phased approach should be established for replacing floor tile and carpet. The new carpet should be a higher grade then currently installed to prevent delamination. The use of carpet tiles would aid in future ease of replacement for more damaged areas.

The gymnasium floor is original and appears to be in good shape. Care should be taken to not apply too many coats of poly urethane to the floor without sanding or the floor will become slippery for athletes.

The kitchen flooring appears to be in good shape.

Ceilings

Most ceilings throughout the building are 2x4 acoustic ceiling tile mounted in a suspended grid system. Some staining of ceiling tiles was observed from dirty supply ducts and a few drip marks. Sagging ceiling tiles are prevalent throughout the building. This could be a result of humidity, but is probably due to the specified ceiling tiles are not rigid enough for a 2x4 ceiling grid, 2 x 2 ceiling grids can avoid this issue. Tiles are not in need of immediate replacement, but a long term replacement program should be planned.

Ceiling tiles that are water stained, dirty, or damaged should be replaced at the end of each school year. Since appearance is purely aesthetic, replacement is not mandatory.

Wall Materials and Finishes

Most walls are in good condition. Many of the walls are constructed of painted concrete masonry and are well suited for taking the abuse of a school, particularly a high school. There were a few small wall cracks found, they should be sealed and painted, but they are not a structural issue.

Interior Doors and Frames

Interior doors are serviceable and showing normal wear and tear. A program for repainting of door frames should be provided.

Interior Windows

The lobby observation and ticket windows do not meet current building code.

Restrooms

Most of the restrooms show signs of wear and tear; however; all appear to be in working order. Eventually the fixtures should be replaced to newer, more efficient fixtures. Accessibility has been provided. Consideration should be given to waterless urinals in order to conserve water usage. There are damaged toilet partitions on the second floor. Restrooms take a lot of wear and tear in high schools. We recommend that consideration be given to an upgrade of all restrooms over a long-term improvement project. A budget should be established to renovate a fixed number of spaces each year or every other year.

Equipment

There is a broken bleacher in the gymnasium. The locker room lockers are showing wear. The kitchen equipment is well maintained. The lockers are in serviceable condition.

Furniture

Furniture throughout the building is showing normal wear. The furniture in the teacher's room and conference room is old, and very stained and should be cleaned or replaced.

General Notes Regarding the Americans with Disabilities Act

The building meets present ADA standards. However there are drinking fountain that don't meet ADA corridor obstruction requirements, a guard should be added to meet requirements. Dual height drinking fountains should be provided through the building, it is not required for them to be provided in the same location.

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Mechanical Narrative – Campbell High School

Heating Plant

The primary heating source for the Campbell High School is provided by two HB Smith Model 28A-14 boilers. The two boilers were installed in 2000 when the school was initially constructed and are likely to have 10-15 years of useful life remaining. These boilers use propane as the fuel source. The combustion air intake has low and high openings as required by mechanical code. However, we observed that the damper for this combustion air does not open when the boilers are operating.

The hot water pumps are Taco Model FE 2508 base mounted systems with 7-1/2 horsepower motors. These pumps are constant speed, on/off type. Efficiency of operation for these pumps could be improved significantly by adding variable frequency drives (VFDs) to the motors to allow reduced speed operation during times when less heat is required in the building. Note: Adding VFDs will only allow reduced pump operation if classroom heating coils are re-piped with two-way valves, rather than the installed 3-way valves. We observed no filtration or main strainer for the heating hot water system, which allows debris in the system to constantly circulate and potentially foul sensitive components like control valves.

Domestic hot water is provided by two Lochinvar propane fired condensing water heaters. These water heaters each have a capacity of 90 gallons. These hot water heaters were installed in early 2016. We observed an issue with the exhaust of one of these units where it had been damaged due to ice falling off the roof. This combined exhaust/intake should be replaced.

Air Handling Systems

There are 10 rooftop units (RTU) providing ventilation, heat, and air conditioning. These units only provide cooled air, except for RTU-1, which provides heated and cooled air to the Gymnasium. RTU-6 and 7 distribute air through variable air volume (VAV) boxes. These boxes (with the exception of V7-8 and V7-9) have hot water heating coils and generally vary the air flow to control cooling and vary the hot water valve to control heating. The remaining RTUs (RTU-2, 3, 4, 5, 8, and 9) distribute air through heating coils at each space.

Many of the second floor classrooms are heated and ventilated by unit ventilators located above the ceilings. These units have individual outside air louvers at each room and a separate "gravity" exhaust, which operates by opening a damper to a roof hood when excess outside air is introduced. We understand that some, if not many, of these control dampers at the exhaust may not be operating properly.

Additional air handling systems include HV-1, a heating and ventilating unit serving the shop area in A155; HVAC-1, providing heating ventilation, and air conditioning to the Cafeteria space; and two blower coil units (BC-1 and BC-2) that transfer air from the Gymnasium to the locker rooms and provide additional heating.

Our observations indicate that the rooftop units tend to have some dirt inside the cabinets and also have delaminating interior insulation in some cases. The units have about 5-10 years of useful life remaining, so to maximize that life the units should be regularly cleaned and inspected for debris and degradation. The unit ventilators above the ceilings in the classrooms are difficult to access and also have not received regular maintenance. These units also have 5-10 years of useful life remaining and when these are replaced some thought should be given to relocating this equipment where it can be more easily maintained.

Heating Terminal Equipment

Most classroom spaces are heated primarily by radiant ceiling panels along the window walls. Entrance heating is accomplished by cabinet heaters (fan coil units) either floor mounted or ceiling mounted. Unit heaters suspended from the ceiling are used to provide heating in support spaces, like storage rooms and the Kitchen. We observed that some of these units do not appear to deliver significant heating when operating. This may be due to valve issues as indicated in the section below.

Automatic Temperature Controls

The temperature controls at Campbell High School are original to the school's construction in 2000. The system provides central control of the on/off function of systems and temperature settings for various spaces. Our observations indicate that this control system is nearly obsolete due to software changes over the past 15+ years. In addition, many spaces cannot maintain temperature control due to the failure of valves and actuators at the mechanical equipment. Many of the valves have been impacted by inadequate filtration of heating water, which prevents the valves from

either opening or closing fully. As a result, many of the classroom spaces were not being controlled to the temperature set at the thermostat or in the control system.

In some of the spaces (e.g., Classrooms 251 and 253, Staff Room) the thermostats are located above or next to heat generating equipment such as a computer, which provides false temperature feedback to the control system. Additional controls issues were noted with the operation of control dampers in second floor classrooms to gravity relief units on the roof.

Recommendations

Our short term recommendations are based on those items that should be addressed in the next five years. These items include:

- Replacement of automatic temperature controls system
- Repair of failing heating valves
- Installation of filtration system for heating water
- Installation of variable frequency drives for heating pumps (along with re-piping of hot water coil valves)
- Repair/replacement of automatic control dampers for gravity exhaust, combustion air
- Clean interiors of rooftop air handling units and replace damaged insulation
- Repair of domestic hot water venting
- Vent residential style range hoods to outside

Existing Conditions

The following is a summary of the existing electrical systems for the existing High School located at Highlander Court in Litchfield, NH.

Main Electrical Service

The building's electrical service originates from an NGRID utility pad-mounted transformer (300 KVA, 208 volt, 3-phase), located to the back of the school.

The service size is 1200 amps, 277/480 volt, 3-phase. The existing switchgear "MSB" was manufactured by General Electric Spectra Series, consists of a 1200 amp, 480 volt main circuit breaker and two distribution sections. The first section contains bolt on feeder circuit breakers.

The switchgear was manufactured in 1998 and was installed in 1999. The switchgear appears to be in excellent condition and has an additional 18-20 years of expected life remaining.

Standby/Emergency Generator Power

The building's standby electrical loads are connected via a portable 235 KVA diesel-fired generator.

The generator is approximately 5 years old, was manufactured by Magnum 235 is rated 235 KW, 250 KVA, 480 volts, 3 phase. The generator is mounted in a weatherproof enclosure, and is located on the building's exterior. The generator is connected to the building's electrical supply via an exterior manual disconnect.

The generator has minimal hours of run time, at the time of the site visit. The generator is maintained yearly and exercised on a weekly basis.

The disconnect switch is in good working condition. With continued exercising and maintenance, the generator and associated disconnect switch has an estimated 18-20 years of remaining life.

Electrical Distribution Equipment

The facility's electrical distribution equipment consists of originally installed (2000) 120/208 and 277/480 volt distribution panelboard and dry-type transformers. The panelboards were manufactured by General Electric, continue to be in good condition, are properly located in the electrical rooms or closets. The panelboards should work properly for an estimated 18-20 years more.

Fire Alarm System

The fire alarm system consists of an addressable Simplex 4020 Voice Evacuation Fire Alarm control panel located in the main lobby, a graphic annunciator on the exterior of the lobby, manual pull stations at all exit doors or exit staircases, smoke detectors in corridors, elevator-recall-smoke detectors, speaker/strobe devices in all public bathrooms, strobe-only devices in bathrooms and conference rooms.

The system is working adequately and there have been no reported issues. The system is 17 years old. The devices should be tested to check for proper functionality. The overall system has an approximate 6-8 years of remaining expected life.

Exit and Emergency Lighting

The exit signs and wall mounted emergency light fixtures serve as emergency lighting. Exit signs appear to be LED signs and seem to be in good working condition. There is adequate exit sign coverage throughout.

Lighting

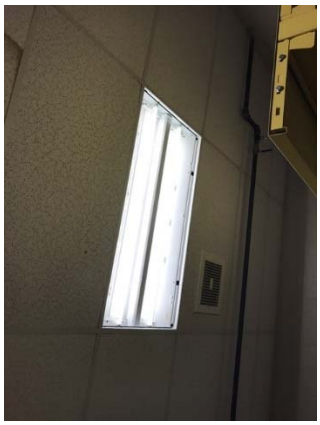
There are numerous types of lighting fixtures throughout the facility. The fixtures consist of numerous 2' x 4' recessed parabolic fixtures in office and classrooms, 2' x 2' recessed parabolic fixtures in corridors, 2-T8 industrial in mechanical rooms, 6-lamp fluorescent fixtures in gym. Lamps have been replaced over the years as needed. It was reported that fixture ballasts are starting to fail.

Speaker/Clock

Simplex System reported to be working adequately with the exception of a few speakers. The internal control cards have been replaced over the years.

Exterior Lighting

Exterior dual-shoe box metal halide, pole-mounted fixtures. One pole was missing both fixtures. A flagpole light has shorted out and should be replaced.



Electrical Recommendations

Main Electrical Service

The 1200 amp switchboard is adequately sized and in good working condition. With proper testing and yearly maintenance, the switchgear should function properly for another 18 years.

Stand-by Generator

The existing generator and manual transfer switch are approximately (5) years old and are in good working condition.

Electrical Distribution Equipment

The facility's distribution equipment and panels were manufactured by General Electric and are in good condition and shall be revised/retained.

Fire Alarm System

The existing addressable Simplex Fire Alarm control panel should be retained. The devices should be replaced with new addressable devices as needed, as they being to fail. Otherwise, the fire alarm is in good working condition. The entire system should be upgraded/replaced in 7 years.

Exit and Emergency Lighting

The existing exit signs appeared to be in good working condition, as did the emergency light fixtures. The exit sign coverage was adequate. Replace fixtures as needed.

Lighting

All lighting requires an upgrade to new, more energy-efficient LED fixtures. Occupancy sensors should be provided throughout, for better control, reduced energy costs, and to meet Chapter 13 Energy Conservation of the State Building Code.

Speaker/Clock System

The speakers, clocks and system cards should be replaced on an as needed basis, over the next 5 years. The entire system should be replaced in approximately 5 -7 years.

Exterior Lighting

The damaged pole light and flagpole light should be replaced immediately. The remaining pole light heads should be replaced with energy-efficient LED type heads.

Vehicle and Pedestrian Circulation

Concrete deterioration at main entrance; no detectable plate. Note faded striping.

Pavement cracking

Cracked, broken asphalt & curbing

Erosion & sparse vegetation at edge of pavement

Accessible spaces w/ no signage

Accessible spaces w/ no signage. Note faded striping.

Erosion beneath concrete pad at door 26D

Concrete corrosion at loading dock stairs.

Concrete spalling & asphalt cracking, door 25D

Concrete cracking

Sawhorses at service driveway

Erosion & undermining at edge of pavement. Note lack of fence separating vehicles from athletic field.

Nonaccessible entrance to fields (typical).

Install stop sign at intersection.

Steep egress sidewalk at door 25D.

Site Drainage

Asphalt sluice to dry well. Note poor vegetative cover on adjacent terrain.

Accumulated sediment on paved sluice to dry well.

Clogged dry well outlets.

Debris in culvert.

Obstructed culverts.

Obstructed culvert.

Erosion & sparse vegetation at drainage swale.

Unscreened opening to catch basin.

Overgrowth in drainage swale.

Install swale along fence line to prevent gravel from running onto baseball field.

Site of possible ponding/ infiltration at service entrance doors.

Gutter leak (one of two) & concrete deterioration at door 10C.

Landscaping

Bare gravel on south side of parking lot.

Sparse cover on driveway side slope & in swale.

Septic System

Damaged pump station hatch frame.

Corroded pump station components.

Pump seal failure indicator

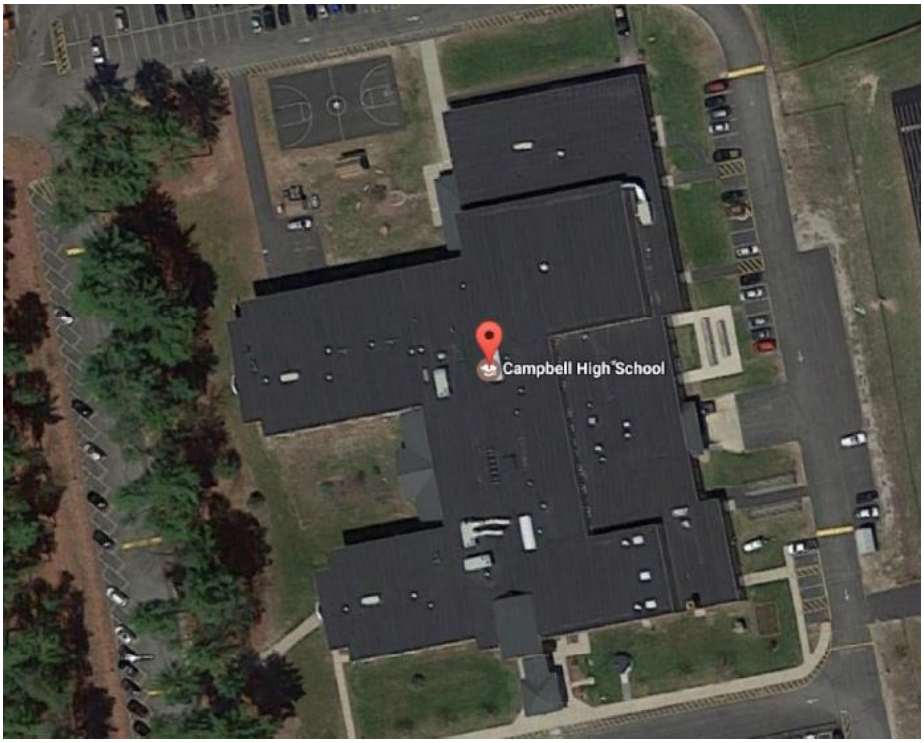
Miscellaneous

Install railing along loading dock.

Install guardrail at retaining wall.

Concrete deterioration at loading dock.

Remount sign.

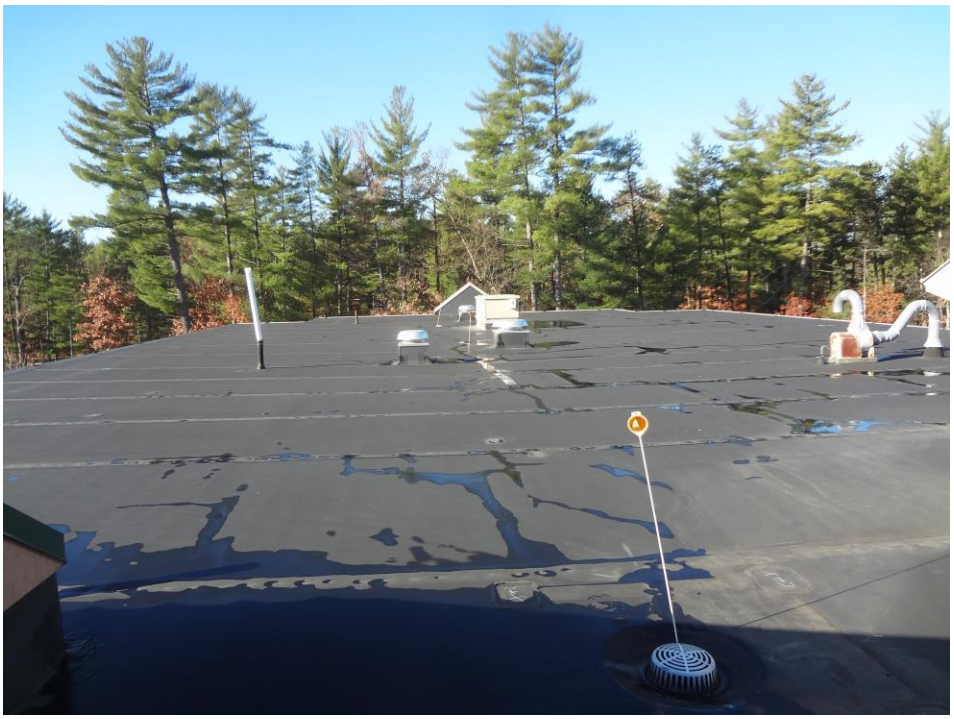


Campbell High School Aerial Photo

Metal Roof at Main Entry

North Side of Main Entry Roof

North Wing EPDM



South Wing EPDM

EPDM Roof Seam

EPDM Roof Seam

EPDM Roof Seam

Skylight Frame

Metal Roof at West Side

North Classroom Wing

East Side Low Roof EDPM Membrane

Crack in Concrete Chimney Cap

East Side Low Roof EDPM Membrane

East Side Low Roof EDPM Membrane

East Side Low Roof EDPM Membrane

Ponding at HVAC Unit Adjacent to the Gymnasium

Metal Edging at East Side of Gymnasium Roof

North Side Low Roof EDPM Membrane

EIFS at Window Sill on North Side of Gymnasium

Sealant in EIFS

Wood Sleepers at HVAC Unit

Sealant at Window

Metal Roof at Main Entry

Rusted Door Frame at Main Entry

High to Low Transition

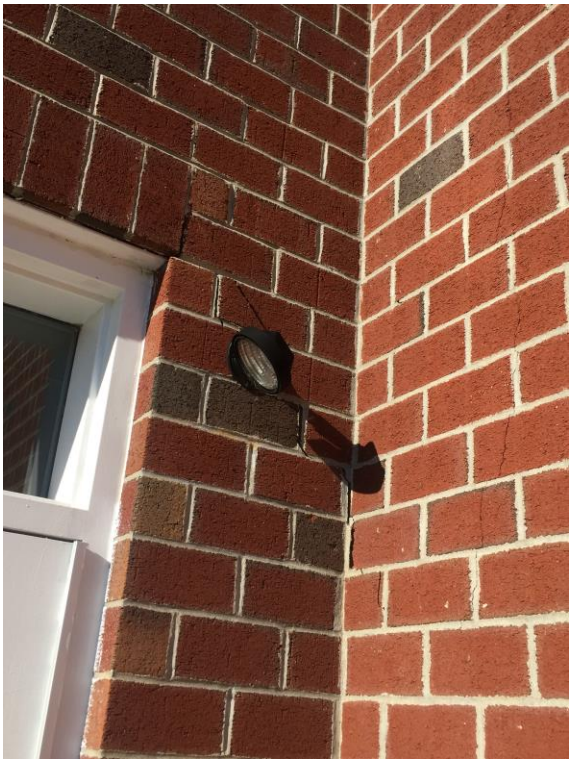
Crack in Mortar Joint

Crack in Brick

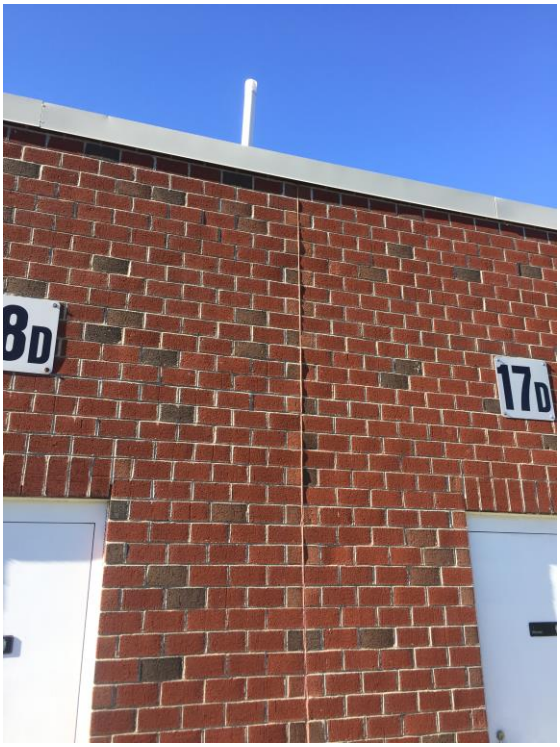
Railing and Foundation at Loading Dock

Crack in Brick at Door Head

Crack in Brick at Window Head



Crack in Brick at Door Head



Sealant in Brick Wall

Deteriorated Mortar at Roof Drip Zone

Roof Runoff on the Brick

Window Weather Stripping

Window & Door Sealant

Sprinkler Stain

Leaking Gutter

Drinking fountain without guard

Waxed seamless flooring

Waxed seamless flooring

Damaged Floor tile

Stained ceiling tiles

Example of sagging ceiling tiles

Photo #1 Typical Rooftop Air Handling Unit

Photo #2 Delaminating Insulation Inside Rooftop Unit

Photo #3 Main Heating Hot Water Pumps

Photo #4 Damaged Domestic Hot Water Intake/Exhaust

Photo #5 Range Hoods in FACS Space

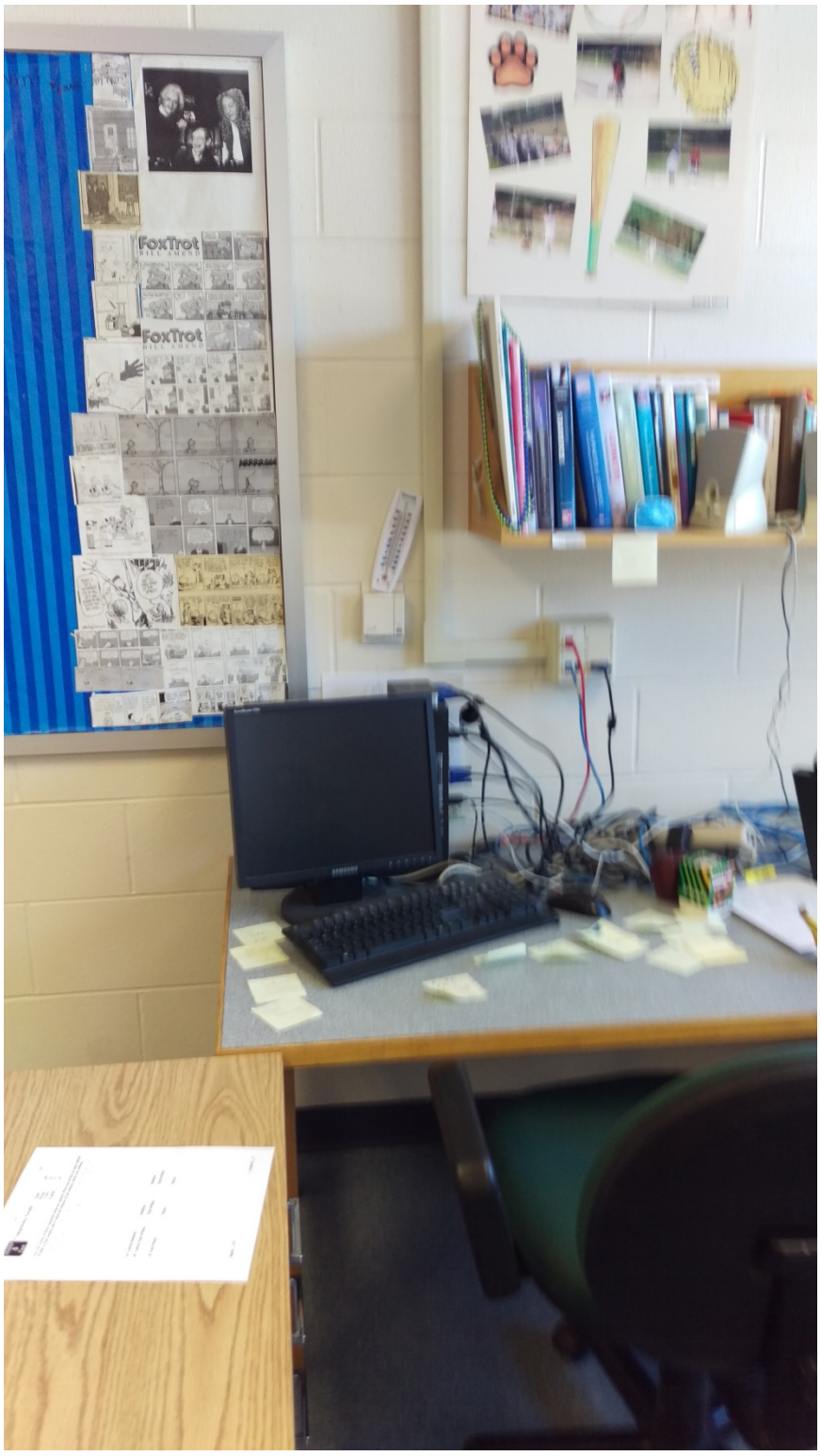


Photo #6 Temperature Control Thermostat Above Computer

SITE/CIVIL							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
VEHICLE & PEDESTRIAN CIRCULATION							
Pavement cracks	Pavement is holding up well across the majority of the site; most cracks can be cleaned and filled to prolong pavement life. Sealcoating the pavement on a regular schedule will help prolong pavement life also.	Clean and fill cracks in asphalt driveways and sidewalks. Sealcoat all asphalt surfaces.	3	1999 (unsure if there have been any overlays)	2-5 years	20	$20,000
Bituminous curbing	At the south side of the parking lot on the south side of the school the bituminous curb is in poor condition.	Remove existing bituminous curb and replace.	3	1999 (unsure if there have been any overlays)	<2 years	10-15	$3,000
Pavement markings	Most striping and other pavement markings are faded.	Repaint pavement markings.	3	1999	<2 years	5	$12,000
Accessible parking space signage	Every space requires signage complying with Americans with Disabilities Act (ADA) standards.	Install proper signage at each space reserved for accessible parking. Ensure a second van accessible space is signed.	2	1999	<2 years	20 years	$7,000
Driveway intersection with parking lot- south side of school.	The parking lot aisle for eastbound traffic (toward the track) meets a driveway and although there is a stop bar there is no stop sign.	Install a stop sign, complying with Manual on Uniform Traffic Control Devices (MUTCD).	3	1999	<2 years	20 years	$700
Concrete sidewalks, door pads, curbs, stairs, loading dock.	Overall concrete is in good shape but there are some isolated areas with cracks and spalling.	Repair concrete cracks and spalls. Replace the door pad at door 26D; Repair eroded concrete at loading dock stairs and the corner under the canopy column.	3	1999	<2 years	20-30	$10,500
Access to athletic fields.	With the exception of the approach to the track at the concession stand, there are no accessible paths to the athletic fields that comply with ADA.	Construct ADA compliant sidewalks to all athletic fields, including modifying fence openings.	2	1999	2-5 years		$15,000
Service entrance driveway at the northwest corner of the school.	Vehicular access control is currently accomplished with wooden sawhorses.	Install a latching swing gate across the service driveway entrance.	3	1999	2-5 years		$3,000
Broken asphalt and erosion at pavement edges	In multiple locations runoff has caused erosion and undermining at the edge of pavement, causing the pavement to crack and break up.	Replace cracked and broken pavement where runoff has undermined the edges of pavement. Place compacted crushed gravel at pavement edges to reinforce and support the asphalt.	3	1999	<2 years	20 years	$10,000

	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Visitor parking spaces on west side of school.	There is no sidewalk, delineation, or other indication where pedestrians should proceed to enter the school.	Paint a delineated walkway at the edge of pavement and include appropriate signage to direct pedestrians to the school entrance.	3	1999	<2 years	20 years	$2,500
SITE DRAINAGE							
Culverts and drainage structures (catch basins/ dry wells). The vegetated drainage swales have debris in them (leaves, sediment…)	Most culverts were noted to have a lot of accumulated sediment in them and some of the dry wells are holding water in them.	Clean out sediment from drainage culverts, catch basin sumps. Remove debris from vegetated swales and trim vegetative overgrowth (trees, shrubs).	3	1999	<2 years	20-30 years	$5,000
Service entrance at northwest corner of school.	The driveway appears to slope toward the school and the door openings, which could lead to water infiltration.	Install a trench drain in front of the doors at the northwest corner of the school to collect runoff and route it away from the building to a drywell or to daylight.	3	1999	2-5 years	20 years	$7,000
Roof gutters at Door 10C.	Two joints in roof gutters are leaking onto the asphalt in front of the doors at 10C.	Repair the leaking seams.	3	1999	<2 years	15-20 years	$500
Maintenance and inspection of drainage measures	Regular inspection and maintenance (pavement sweeping, swale maintenance, catch basin cleaning….) can help prevent flooding and other drainage problems.	Develop a storm water inspection and maintenance plan, specifying specific inspection tasks and items to review, frequency, and preventive/corrective measures (if the District does not already have one)	3		<2 years		$2,000
LANDSCAPING							
Grass covered surfaces	In many locations the vegetative cover is sparse.	Reseed those areas of the site that should be grass-covered and display poor coverage. Obtain soil assessments first to identify any deficiencies and to customize a fertilizer specification.	3		2-5 years		$5,000
SEPTIC SYSTEM							
Pump station hatch	The frame appears damaged, likely from snow plows. Water likely leaks in around the edge. It does not have secondary fall protection, nor does it have a warning label on its underside.	Replace the hatch cover with one that can be secured, is watertight, and has secondary fall protection. Include a warning label re. the presence of a hazardous environment.	3	1999	2-5 years	30 years	$10,000
Galvanized guide rails and lifting chains in the pump chamber.	The galvanized components are showing corrosion- the brackets supporting the guide rails are severely corroded.	Replace the guide rails and lifting chains with stainless steel components.	3	1999	2-5 years	30 years	$10,000

	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Pump 2- Seal failure	During TTG's visit, the alarm light indicating a seal failure at pump 2 was lit.	Repair/ replace pump 2.	3	1999	<2 years	10 years	$1,750
Loading dock- guardrails	At one time the loading dock had guardrails, as evidenced by the plugged holes at the edge of the concrete pad.	The loading dock presents a fall hazard. Install new guardrails along the edge of the loading dock, that can be opened or temporarily removed to receive deliveries.	3	1999	<2 years	20 years	$3,000
Metal handrails and guardrails.	Exposed metal elements show minor corrosion.	Sand, prime, and paint exterior metal railings.	3	1999	2-5 years	20 years	$2,500
Loading dock drainage	There is an apparent low spot next to the stairs at the loading dock.	Install a drain to prevent water from accumulating in the loading dock area, which can create a slip hazard and cause pavement deterioration.	3	1999	>5 years	20-30 years	$10,000
Dumpsters	Dumpsters at the site are set on asphalt or grassed surfaces. The approaches to the dumpsters are asphalt.	Install concrete pads on which to set the dumpsters and include concrete approach slabs. Consider installing an opaque enclosure to provide visual screening and containment for debris.	3		>5 years		$12,000
Athletic field at north end of site.	This field abuts a parking lot and there are no physical barriers to prevent vehicles from driving onto the field.	Install bollards, guardrails, fencing, or similar measures to discourage vehicles from driving across the field.	3	1999	2-5 years		$8,000
Signage	One sign (other than what has been previously mentioned) was lying on the ground during this visit.	Inspect all site signage and ensure it is properly mounted and in the correct locations.	3	1999	<2 years	20 years	$1,200
SUB-TOTAL							**$161,650**

ARCHITECTURAL							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Roofing	Existing EPDM roofing is in good overall condition.						
	Some of the EPDM roof seams have come up.	Reseaming the roof is recommended	3	2000	1	25	$10,000
	Mechanical unit sleepers are rotted	Replace sleepers	3	2000	1	15	$750
Skylights	Existing skylights are in good overall condition.		3	2000	13	30	
Windows							
	Existing windows are in good overall condition.	Sealant around the windows should be replaced every 10-15 years	3	2000	4 to 6	10	
Doors							
	Existing doors are in good overall condition.	Some door frames have started to rust. Scrap and paint the door frames.	3	2000	1	10	$4,500
Brick Veneer							
	Some minor cracking in the brick veneer was noted.	Apply sealants in all cracks to prevent moisture intrusion.	3	2000	1	10	$8,000
	Vertical joint sealants in good condition.	Sealants at vertical joints should be replaced every 10-15 years	3		4 to 6	10	$15,000

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Exterior Insulation Finishing System (EIFS)	EIFS coating of upper walls is shown signs of deterioration at horizontal surfaces.	Recoat EIFS	3	2000	1	10	$22,400
Chimney	Precast concrete cap on the chimney is cracked	Remove and replace concrete cap	3	2000	1	40	$2,500
Water Fountain							
	Water fountain does not meet current ADA requirements	Install dual height water fountain to meet the ADA requirements	2		1		$6,500
	Water fountain does not meet current ADA requirements	Install guard on existing water fountain	2	2000	1		$500
Roof Gutter	Gutters are leaking	Replace or reseal existing gutters	3	2000	1		$1,000
Carpet	Administration, Music & Library	Recommend Replacement	3	2000	1	12	$16,000
VCT	Music Areas damaged VCT	Demo, Grind & Replace VCT	3	2000	4	35	$4,000
Gym	Bleacher broken	Repair broken bleacher	3	2000	1	35	$2,000
Drinking Fountains	Missing ADA Guards	Install Guards	3	2000	1	35	$1,000
Stage Doors	Damaged doors & hardware	Repair doors & hardware	3	2000	1	20	$1,800
Toilet Partitions	Damaged Toilet Partitions	Replace	3	2000	1	30	$6,000
SUB-TOTAL							**$101,950**

MECHANICAL & PLUMBING							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Automatic Temperature Controls	Control system is now obsolete. Many functions not currently operating. Excess energy expended and poor comfort conditions due to lack of temperature control.	Replace controls system including central controller computer and programming. Evaluate connections to equipment to determine extent of wiring and devices that can remain.	3	2000	0	15	$300,000.00
Heating Valves	Many of the valves throughout system have failed due to contaminants in heating water	Replace heating valves that do not operate correctly on reheat coils, VAV boxes, cabinet heaters, unit heaters	3	2000	0	25	$50,000
Heating Water Filtration	No equipment was installed to filter out particulate contaminants from heating water system. This affects operation of components and efficiency of heat exchange surfaces.	Install equipment to adequately filter out particulate contaminants.	3	-	-	30	$10,000
Heating Pumps	Single speed, on/off pump control causes significant inefficiency during all but the coldest weather	Install variable frequency drives for the two main heating pumps. Convert hot water coils to 2-way valves at reheat coils.	3	2000	-	-	$50,000
Automatic Control Dampers	Some exhaust dampers for classrooms and combustion air damper for Boiler Room do not function as intended.	Repair or replace dampers that do not operate correctly.	2,3	2000	-	-	$20,000
Rooftop Air Handling Units	Interior dirt observed. Some interior insulation delaminating	Clean units and repair damaged insulation	3	2000	-	-	$20,000
Domestic Hot Water Venting	One of the intake/exhaust vents for the domestic hot water system has been damaged from falling ice.	Repair the damaged vent	3	2000	-	-	$1,000

Range Hoods	Residential style range hoods in FACS do not vent to the outside as required by code.	Duct hood exhaust to the outside of building	2	2000	-	-	$5,000
SUB-TOTAL							**$456,000**

CAMPBELL HIGH SCHOOL - ELECTRICAL								
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	**1-LifeSafety 2-BldgCode 3-Maint**	**YEAR INSTALLED**	**REMAINING USEFUL LIFE (Years)**	**TYPICAL USEFUL LIFE (Years)**	**OPINION OF COST FOR REPLACEMENT**	
Service Equipment	General Electric 1200 amp 480 volt Switchgear in good condition.	Provide yearly maintenance torqueing lugs and circuit breakers.	3	1999	18	35	$1,000	*per year*
		Provide hi-potential testing every 5 years.					$5,000	*per year*
		Replace in 18 years.					$75,000	
Panelboards	General Electric , good condition.	Replace in 18 years.	3	1999	18	35	$27,000	
Dry-Type Transformers	General Electric, good condition	Replace in 18 years.	3	1999	18	35	$10,000	
Exterior Lighting	One pole missing both fixture heads, one hit by plow, flagpole light short circuited, metal halide lamps.	Replace all exterior lights with new LED energy-efficient fixtures.	3	1999	2	20	$17,500	
	Site lighting at night does not provide proper coverage	While upgrading lights to LED fixtures, conduct a lighting study including foot candle throughout the site						
Speaker/Clock System	Simplex System clocks are reportedly working adequately; speakers are not working properly in some instances. Cards for the system have required replacement already.	Upgrade the cards and speakers on an as-needed basis for the next few years. Replace in its entirety in 5 years.	3	1999	5	22	$155,000	
Emergency Lighting	Self-contained dual heads, wall-mounted; tested yearly, in good working condition.	Continue to test the units and replace as needed.	1,3	1999	1-3	20	$250	*each*
Fire Alarm System	Simplex System 4020 Voice Evacuation, addressable, coverage meets NFPA, ADA; system reportedly working properly.	System should be replaced in 7 years.	1,2	1999	7	25	$104,000	
Interior Lighting	2'x4' fluorescent parabolics in office, track lighting, retrofitted with LED heads, 2'x2' parabolics in hallway, fluorescent downlights in hallways, 6-lamp T8 gym fixtures, 2'x4' acrylic lensed fixtures in weight room and classrooms.	Replace fixtures with new LED energy efficient fixtures. Ballasts will need to be replaced within next year or two. Lamps have already been replaced.	2,3	1999	7	25	$284,000	

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Generator	Existing generator is not exercised on a regular basis	Exercise the generator on a regular basis					
SUB-TOTAL							**$597,750**

On Friday November 18, Tuesday November 22, and Friday December 2, 2016, The H.L. Turner Group Inc. (TTG) visited the Griffin Memorial School at 229 Charles Bancroft Highway (NH Route 3A) in Litchfield, NH, to perform a site assessment of the property and identify any existing deficiencies the school district should address. This report provides a summary of those findings, our opinions regarding the remaining life expectancy of each condition, and an opinion of the associated costs to do so. For this report, Route 3A is on the south side of the building.

Prior to visiting the site, TTG reviewed the 2006 Facility Study prepared by Harriman Associates. This report identified a number of site-related deficiencies and concerns, and included recommendations to correct these deficiencies. Although some items have been addressed, most have not. The following issues remain: Shortage of parking, overflow parking extending onto Route 3A, leach fields dating back to 1972 and 1978, insufficient site lighting, overgrown drainage channels, and excessive moisture in the school. This assessment discusses these items again, in less detail than the original report. The following items dating back to the 2006 report have been corrected: Additional accessible parking spaces are delineated, an accessible route to the school has been created, some of the entrances to the school have been modified to be handicapped accessible (to comply with Americans with Disabilities Act [ADA] regulations), roof drains are piped away from the school building and daylight in a drainage swale, and an underdrain has been installed along one wing of the school, as had been recommended in that initial report.

During TTG's discussions with the facilities staff, they did not report any specific concerns or problems relative to site issues, other than the excess of moisture inside the school, which is likely due in part to a high ground water table.

Vehicle and Pedestrian Circulation

West Side

The primary parking lot is located on the west side of the school. There are 99 delineated parking spaces, four of which are reserved as accessible (there are additional spaces on the south side and will be discussed below). In 2006 there were only 74 total spaces and the Harriman report identified a need for 111. At that time, the report noted the paved playground area was used for parking, but this was not the case on the dates TTG visited. Although the lots were full and there were vehicles parked along the shoulder of Route 3A, there were no cars in the playground. The pavement of the vehicle surfaces, the sidewalks, and the bituminous curbing is in poor condition. The paved playground surface is in good condition, as is the paved area adjacent to the portable classroom, likely because there are minimal traffic loads on these surfaces. The playground is separated from the driveway and parking lots by a sidewalk and a chain link fence, except for a spot in its southwest corner where there is an opening large enough for vehicles. The school does need to maintain access through here for trucks to service the pump stations and septic tanks, but TTG recommends the installation of a latching gate to discourage unauthorized vehicular access. The paved area adjacent to the portable classroom is a remnant of past portable classrooms that have been removed. The district may consider removing the pavement to create additional pervious surface if it is unlikely to utilize additional portable classrooms in the future.

Although accessible parking spaces have been delineated, they do not comply with ADA standards because they slope in excess of 2% in several directions. This situation is impossible to correct without performing a pavement removal and regrading project. Additionally, the signage at these spaces is mounted too low and the van accessible space is not signed (although there is a paint mark on the pavement indicating which is the van space). A delineated route from these spaces to the school is indicated.

At the western extent of the parking areas is a remote parking lot with pavement in very poor condition.

The concrete at the main entrance to the building is in fair condition, with some minor cracking and areas of deterioration present.

North Side

The concrete door pad at the northwest corner of the school is not flush with the asphalt sidewalk, and it has a large chip in its corner.

East Side

Near the wood deck overlooking the drainage swale, a corner of the overhanging roof drips onto the asphalt below, which likely causes a maintenance issue during freeze/thaw seasons. The school has a flat roof with roof drains in the section so it is not clear why it spills over here.

South Side

There is a small parking lot with space for five cars between the school and Route 3A (although additional vehicles park off the edge of the pavement) bringing the total number of spaces onsite to 104. One of these spaces had an accessible symbol painted on the asphalt surface, however there is no signage, nor is there the required access aisle adjacent to it so it can't rightly be considered in the count of accessible spaces. With 104 total spaces, ADA requires five of them to be accessible (and one of those must be van accessible). This site has four accessible spaces. This small lot is another dead end lot, requiring cars to back out almost to Route 3A if they drive in and no spaces are available.

There is a parent drop off loop in front of the original school building with space for maybe 8-10 cars to queue. The loop intersects Route 3A at its entrance and exit and it is likely undersized for the number of parents that come to pick up and drop off. This traffic will also block access to the loading area during morning drop off and afternoon pick up. There is a pothole at the intersection of this loop's entrance and Route 3A, but it is likely a NH Department of Transportation concern because it appears to be in the State right-of-way.

The pavement in the delivery area is in very poor condition, with numerous cracks, sections of broken pavement, and uneven settlement. The angles of the building adjacent to the loading area create a tight, confined area difficult for delivery vehicles to maneuver.

<u>Summary of Recommendations, Vehicle and Pedestrian Circulation</u>

- Fill pavement cracks with a bituminous sealant and sealcoat the asphalt surfaces.
- Remove asphalt and base gravels in those areas across the site identified in poor condition, including sidewalks and bituminous curb (delivery area, parent vehicle loop, parking lots on the south and west sides). Rebuild pavement bases and repave.
- During pavement reconstruction, regrade accessible parking spaces to comply with ADA regulations. Identify locations around the parking lot perimeter where additional

parking spaces can be created. Replace the signage at accessible spaces with signs in compliance with ADA standards.

- Establish a fifth accessible parking space.
- Remove section of pavement on south side of portable classroom. Loam and seed.
- Eliminate dead ends at parking lots. Paint diagonal stripes in the parking spaces abutting the end of the lot to provide a means for vehicles to turn around.
- Install a latching gate at the southwest entrance to the paved playground to control traffic.
- Repair cracks and chips in concrete door pads.
- Capture roof runoff on the east side of the school where it spills onto the sidewalk.
- During pavement reconstruction, the district should consider redesigning the entire traffic layout to provide adequate space for all required parking, bus traffic, and parent pick up/drop off loops. A schematic layout proposed in the 2006 Harriman Associates report represents one possible solution.

Site Drainage

The entire site is very flat and reportedly has an elevated ground water table. Collected runoff exits the site through culverts beneath NH Route 3A at the southeast and southwest corners. The closed drainage throughout the site is minimal. There are swales along the east end of the property and along the west side of the parking lots and playground west of the school building.

West Side

The large primary parking lot drains to the grassed island at its center. There are catch basins to collect runoff and channel it away. With a high groundwater table, this area likely remains wet for much of the time and would benefit from the installation of drainage infrastructure. A catch basin could collect ponded water and route it through a culvert to the swale at the west end of the lot.

Near the service entrance there is a shallow catch basin constructed with masonry blocks. It was full of water some of the blocks appear displaced. The paved sluice leading to it was in poor condition with accumulations of sediment along its length.

Between the vehicle exit driveway and the remote parking lot is a vegetated drainage swale leading to a culvert running beneath Route 3A. It appeared to have been recently regraded because a new outlet pipe from a catch basin was installed, and the swale had not yet been revegetated. A second culvert that collects runoff from the paved playground daylights into this swale and the outlet is deeply scoured, leaving the end of the pipe elevated above the floor of the swale. The swale has a lot of accumulated sediment along its entire length.

East Side

The vegetated swale along the east side of the parcel is overgrown with shrubs and other woody vegetation. Additionally there is a lot of leaf litter and other debris accumulating on its floor. These conditions both contribute to a reduction in swale capacity and creates a less efficient flow path.

South Side

A catch basin near the high side of the delivery area driveway is surrounded by a concrete collar with multiple deep cracks. To ensure this structure has adequate support to resist vehicle traffic and to avoid water infiltrating along the outside walls of the structure the concrete should be replaced.

At the low point of the delivery area area there is a catch basin with very shallow cover. The plastic culvert exiting the pipe was cut along the top portion to allow it to fit beneath the frame and grate, and it has heaved, causing a hump in the delivery area asphalt. There is only one place for this culvert to outlet so there are limitations to how deep this structure can be set and still allow it to drain via gravity. It likely cannot be placed any deeper, yet an inlet is necessary here because there are multiple roof drains that discharge directly to the ground in this area of the building and all of the runoff collects at this low point. A stormwater pump chamber is likely the best solution to resolve this problem.

General Observation

In several locations, parts of the school roof drain outlets are oriented to discharge directly to the ground adjacent to the building. Where this occurs the roof runoff has typically scoured a hole into the soil. A hardened outlet would protect the ground beneath and help reduce the velocity of the runoff by the time it reaches natural ground.

<u>Summary of Recommendations, Site Drainage</u>

- Extend the closed drainage system to help manage runoff that accumulates in the grassed island in the middle of the parking lot on the west side of the school. It can likely be designed to discharge to the existing swale at the west end of this lot.
- Replace the masonry block catch basin near the west side service entrance with a precast concrete structure. With a high water table it is better to prevent groundwater from entering into drainage structures, which is likely happening through the joints between the blocks at the current structure.
- Place loam, seed, and erosion control matting in the drainage swale west of the large parking lot. Install NHDOT Class C stone at the outlets of the two drainage culverts to prevent scour from occurring at these locations. Remove accumulated sediments from the bottom of the swale and remove all trees, shrubs, and other woody vegetation on a regular basis.
- Remove trees, shrubs, and accumulated debris from the drainage swale on the east end of the property, and perform regular maintenance to prevent this growth from recurring.
- Replace the concrete collar surrounding the catch basin inlet at the delivery area on the south side of the school.
- Replace the existing shallow catch basin at the delivery area low point on the south side of the school and install a deeper basin, connected to a stormwater pump station, to mechanically remove water that accumulates in this area.
- Place concrete pavers, 4” and larger stone, or similar armoring measures at the discharge points of roof leaders.
- Develop a Stormwater Inspection and Maintenance Plan, if one doesn’t already exist, identifying the components of the stormwater management system that require regular

inspection and maintenance (vacuuming catch basin sumps, restoring eroded areas, maintaining vegetation in drainage swales and detention basins, removing debris….).

Landscaping

Across the entire site, there are several areas with sparse vegetation, especially at the leach fields and at the ballfield at the north end of the site. Dense grass cover will help minimize erosion and other runoff impacts. The test pits excavated at the leach fields during this assessment reveal there is adequate depths of loam across the fields to support vegetation. Aeration and reseeding will help restore adequate cover and facilitate aerobic activity in the effluent treatment zones. The western leach fields in particular can benefit from such attention, because they have up to 18" of dense soil material above the stone and pipe, which limits the amount of oxygen entering the system (refer to the 'Septic System' section of this report for additional information). Prior to seeding, obtaining samples of the soil can provide a specific analysis of any nutrient deficiencies so a fertilization plan can be customized to this site, yielding better results than a generic approach to applying fertilizer.

In several locations runoff from the driveway and parking areas has eroded the ground abutting the asphalt surface, resulting in an exposed pavement edge and increasing the risk of the pavement becoming undermined during rain events. Installing compacted gravel and ensuring it slopes away from the pavement can be effective, as can establishing dense grass cover, although this option is more difficult to maintain in the long term because of the tendency for vehicles to drive over it and impacts from sand and salt applied during winter months. Such efforts help ensure the integrity of the asphalt over time.

Summary of Recommendations, Landscaping

- Restore vegetation across the grass-covered areas of the site.
- Protect edges of pavement with compacted crushed gravel and/or dense vegetation.

Septic System

The design data from the record drawings on file with NHDES indicate the system was designed around unknown parameters because that information is not available. The system has been modified and expanded multiple times, as the building has been enlarged. The site has two independent systems. The oldest was constructed in 1972 and consists of a 12,000 gallon precast septic tank (replaced in the mid 2000's), a duplex pump station, and a stone and pipe trench system for an effluent disposal area. The design drawings specified two beds consisting of four lateral trenches, 2-feet wide by 1-foot deep by 30-feet long, spaced 7-feet on center. This provided 480 square feet of surface area for effluent disposal. TTG's onsite explorations indicate there is only a single field, which would provide 240 square feet of disposal area. The 1978 system has two identical beds, consisting of thirteen 105-foot long perforated pipes, spaced five feet on center, located within a bed of 12-inches of septic stone. The two beds provide 13,650 square feet of disposal area, so the two systems together provide 13,890 square feet for the entire school. Documents reveal the original system reported a 1-minute per inch percolation rate. Assuming a 10-minute per inch rate, and an occupancy of 400 staff and students, the 6,000 gallons per day would require an effluent disposal area of 11,100 square feet, therefore the system is properly sized. Using these same assumptions, TTG estimates this system could manage up to 500 staff and students.

Building maintenance staff reports to TTG that the system is maintained yearly, including septic tank pumping and pump station assessments. This is good practice and should continue, to help ensure the system longevity.

The 1972 trench field receives effluent from only a portion of the school, likely the oldest section. Within the school's boiler room, there is a septic system wet well with duplex grinder pumps. The basin is vented to the outside and it has a gasketed, bolted cover to prevent odors and harmful gases from entering the occupied space. This space is mechanically ventilated as well. The controls are not modern and these pumps do not have alarms to monitor for problems, so the school maintenance staff should be reviewing the operation of this system on a daily basis. Adjacent to the wet well is a separate concrete valve structure. On the date of TTG's visit, it was partially full of water because of an elevated groundwater level. There is no drain or dedicated sump pump so it requires manual pumping. This system pumps collected effluent to the septic tank that feeds the 1972 trench system.

The gravity line between the school and the septic tank for the 1972 system has two clay tile risers that function as clean outs. They sit beneath cast iron manhole covers and the frames have settled into the surrounding soil because the underside of the manhole cover rests directly on the top of the clean out; in fact the clean out closest to the school has cracked and broken because of the weight of the cover on top of it. The septic tank is in good condition. The only comment about the structure is that it has two access covers with 'Drain' written on them rather than 'Sewer'.

The pump station is a precast concrete structure and the access hatches are within a locked, wood framed pump station. Although the station has a locking door, it is not very secure because it can be easily picked with a screwdriver or similar flat tool. Inside the pump station is the control panel for the pumps and three access hatches to the wet well. The hatches are not secure: They consist of flat steel plates that lie loosely over the access openings. There is no secondary fall protection, nor are there any warning labels, as recommended by State regulations. The pumps do not have guide rails or lifting chains, so to service them the station must be pumped dry and physically entered. A wet well is a confined space that requires a permit to enter. The pump station itself meets the definition of a confined space, though not one that requires a permit to enter. In the absence of mechanical ventilation, district personnel need to be certain the pump station door remains open whenever the pumps and controls are receiving service or inspection.

As noted above, the stone and pipe trench system consists of four laterals consisting of stone surrounding perforated pipes. Effluent is dispersed to each trench through a precast concrete distribution box. This structure is in good condition and appears to be functioning properly; there is no evidence of regular ponding and the water elevation is flowing equally to each outlet. There are a lot of roots growing through the gaps in the access cover and present a potential clogging threat in the box. TTG excavated two test pits within the effluent disposal area to assess the condition of the trenches. There is 3-6 inches of loam across this area, with 12-16 inches of sand between that and the stone filled trenches. In both cases, the bottom of the holes were dry, the stone was clean, there was minimal odor, and there was slight discoloration (graying) of the sand to approximately 1-inch above the top of the perforated pipes. These characteristics indicate a system that is functioning well and displays few, if any, signs of deterioration. Despite its age, this system is functioning well. The only issue to speak of is the sparse grass coverage across the field and the dense shrubs, brambles, and other woody vegetation growing along the side slopes of the field. It is better for the system to remove this

growth and establish healthy grass cover on the side slopes, to prevent excessive root growth into the effluent disposal area.

The 1978 system receives the effluent from the remainder of the school and consists of a gravity line that flows into a concrete septic tank (assumed to be 12,000 gallons based on design drawings dating to 1977, however the tank an pump station were installed in a different location than shown on the plan), then into a concrete pump station with submersible pumps, then into a two-bed stone and pipe leach field.

It is assumed the kitchen waste drains into this system because although the school has a grease interceptor, this septic tank had a dense layer of grease and solids at the water surface, and the outlet baffle was coated in a thick mat of grease, to the extent that there is little open space remaining for air to escape or for liquid to flow to the pump station. The school should perform more frequent inspections of the grease interceptor to assess if it needs more frequent cleaning. Based on the grease seen in this tank, the interceptor is not capturing all that it should. Any grease that is pumped to the leach field presents a threat to its longevity and ability to function correctly.

The pump station for this system is not within a pump house, and provides two access points: A locking aluminum hatch over the pumps and an access-way to the wet well beneath a cast iron manhole cover. The hatch does not provide secondary fall protection, nor does it have a warning label noting the hazardous environment within. It does not appear to be watertight either, which can allow rainfall and snowmelt to enter the structure and place excess stress on the pumps and the leach field. The pumps have stainless steel lifting chains in good condition, but the guide rails show signs of corrosion, particularly where they mount to the sidewall. They will need to be replaced with stainless steel components. The horizontal portions of the brackets have sediment piled on them, as does the frame at the bottom of the hatch support, providing evidence the hatch is neither soil tight or watertight. The control panel for this pump station is located within a classroom in the school and does not provide a clear line of sight between the controls and the pumps.

The 1977 design plans indicate the pump station pumps to a primary concrete distribution box centered between the exterior edge of the two leach field beds, which in turn directs the effluent to one of two secondary concrete distribution boxes (one for each bed). The secondary distribution boxes disperse the flow into the stone and pipe leach fields, located west of the older trench system. TTG could not locate the primary distribution box, and the box serving the east leaching bed was secured shut with mastic and could not be opened, but the distribution box for the west leaching bed was located and opened. It was in good condition and seemed to be functioning properly, with no evidence of ponding or unbalanced flows to the lateral pipes.

TTG hand excavated two test pits, one in each leaching bed, to assess the condition of the fields. The stone bed is overlain by approximately 18-inches of dense, silty fill that has cobbles, pieces of pavement, and other debris strewn throughout. The 1977 plans directed the contractor to use excavation spoils from when an addition was being put on the school and soil is consistent with such a material. The depth and dense consistency of this soil limit the amount of oxygen available in the effluent treatment zone. The west leach bed has a vent pipe at one corner, but the east bed no longer has a vent. Despite these concerns, based on what was visible at our test pits the system is in good condition. TTG dug to the bottom of the stone beds and in both instances, the holes were dry, with minimal odor, and the stones were clean and

slightly damp. There was no evidence of regular ponding in the bed. The only issues at this field are the absence of one vent pipe and the poor vegetative cover over the leaching area.

As noted in the 'Landscaping' section of this assessment, TTG recommends aerating and reseeding both effluent disposal areas to restore the grass cover. This will also increase the amount of oxygen able to penetrate the soil cover and reach the effluent layer (particularly at the 1978 field), which is essential for proper treatment.

Summary of Recommendations, Septic System

- Replace manhole covers that read 'Drain' with covers reading 'Sewer'.
- Reset manhole covers at two clean outs so there is space between the underside of the manhole cover and the clean out. Repair the broken clean out riser section.
- Install secure hatch covers for the enclosed pump station and provide a more secure door into the station. Provide secondary fall protection and warning labels compliant with State of New Hampshire regulations.
- Install stainless steel guide rails and stainless steel lifting chains for each submersible pump at the enclosed pump station to allow them to be removed and serviced without entering the wet well. Replace the corroded guide rails at the uncovered pump station.
- Replace the hatch at the exposed pump station with one that is watertight and soil tight. Install secondary fall protection and warning labels compliant with State of New Hampshire regulations.
- Remove the roots from inside the distribution box at the 1972 field. Place geotextile separation fabric over the top of the box to prevent future growth.
- Install an alarm in the grinder pump valve pit to alert personnel to high groundwater levels.
- Install a new second vent pipe at the stone and pipe leach field.
- Pump the grease out of the grease interceptor and the septic tank servicing the 1978 leach fields. Clean the collected grease and solids off the outlet pipe and baffle. Review interior condition of both structures on a regular basis (every two months +/-) to watch for grease accumulations. These tanks may require more frequent pumping to prevent grease from flowing into the leach fields.
- Aerate and reseed the leach fields. Analyze the soil to determine a customized fertilizer application. Remove the dense shrubs and woody vegetation from the side slopes of the trench system effluent disposal area.

Miscellaneous

There is no audible overfill alarm in close proximity to the underground oil storage tank.

The concrete footers supporting the accessible ramps at the portable classroom building are deteriorating.

The wood railing on the east side of the school has some exposed nail heads and loose, warped boards.

The dumpsters are set on either grass or asphalt, with no concrete approach apron.

The site lighting, noted as deficient in the Harriman Facility Study report dated 2006, has not been expanded or modified.

Summary of Recommendations, Miscellaneous

- Install an audible oil tank overfill alarm, mounted to the exterior of the school within sight of the oil storage tank fill valve.
- Replace the deteriorated concrete footers supporting the accessible ramps at the portable classrooms.
- Countersink exposed nail heads and replace checked, warped, and splintered wood planks at the wood railings on the east side of the school.
- Install concrete dumpster pads and approach aprons for each dumpster. Provide perimeter enclosures around the pads for visual screening and debris containment.
- Replace/ expand the site lighting in accordance with the Harriman Associate's recommendations dated 2006.

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GRIFFIN MEMORIAL ELEMENTARY SCHOOL - ARCHITECTURAL

General Information

The Griffin Memorial Elementary School consists of one story of approximately 58,000 square feet. The building appears to be the result of six building projects from 1930 to 1983. The original 1930's school was a two story, four classroom room school house. There is also a structure holding two portable classrooms on site. Under the current 2009 IBC and 2015 NFPA LSC-101 the building construction type is classified as 3B construction (noncombustible, unprotected) due to some portions of the roof structure being wood framed. The building does not have a fire suppression system. According to table 503 of the IBC the present building is approximately two times the allowable building area. If a fire suppression system were to be installed the building become code compliant.

The majority of the construction is concrete masonry on the interior and exterior back-up walls with a brick or concrete masonry veneer. There are some fascia of vinyl siding and framed soffits. There is a wooden mezzanine adjacent to the stage which would not be allowed under the construction type classification.

Occupancy classifications within the building educational and assembly use groups for the auditorium and gymnasium. Proper occupancy fire separations appear to have been provided. Occupant load egress meets current codes for size and travel distance. Without a sprinkler system all corridor walls are required to be 1 hour rated and the door openings in the corridor wall are required to be 20 minute rated. Some doors indicate that they are 45 minute rated and other doors do not indicate a rating or are difficult to determine due to painted over or missing labels. We found documentation stating that some of the firewalls don't extend to the roof deck. All corridor walls should extend to the roof deck and any penetrations should be fire sealed.

Building Exterior

Masonry

The exterior masonry walls of the building are in good shape. The masonry control joints are due for resealing. There are single wythe CMU exterior walls present that are uninsulated. Step cracking is present in the concrete masonry veneer. The steel window lintels in the original wing appear to be expanding due to rust and have been sealed, which traps moisture behind the wall at the window head.

Soffits
The soffits on the east side of the building are showing a lot of mold and mildew. The soffits should be cleans and painted. Any moisture damaged panels should be replaced.
Doors
A few exterior doors have been replaced with new leaves. Some door frames should be resealed and all thresholds cleaned, there is a lot of salt and sand remaining on the thresholds that can lead to the bottom of the steel door frames rusting prematurely. Some door frame bottoms have already rusted. Door frames should be repainted for added protection.

Some exterior doors are full glass doors that could be a security issue, a more resilient glazing should be considered if security is a concern to the district.

Windows
The windows consist of a combination of insulated pane, single pane and single pane storefront. Some aluminum window sills are oxidizing and causing staining on the masonry at the sides of the sills. A window replacement program should be scheduled.

Building Interior:

Flooring
Flooring throughout the building consists of a majority vinyl composition tile (VCT), ceramic tile, quarry tile and carpet in corridors, administration and library areas. The Administration and Library carpeting shows signs of wear and there are areas where the carpeting has delaminated. The corridor carpet is more recent and maintainable. The new carpet should be a higher grade then currently installed to prevent delamination similar to the corridor carpet.

The Cafeteria quarry time is original and being maintained well. Ceramic tile in the restrooms adjacent to the main entrance should be replaced or seamless flooring provided. The ceramic floor tile in the remaining bathroom should be deep cleaned

The cafeteria and classrooms 19 through 25 have received new VCT floor tile. There is a maintenance program in place to replace the tile in the remaining areas, including corridors. This program should be continued until tile replacement is completed.

Ceilings
Most ceilings throughout the building are 2x4 acoustic ceiling tile mounted in a suspended grid system. Some staining of ceiling tiles was observed from dirty supply ducts and a few drip marks. Sagging ceiling tiles are prevalent throughout the building. This could be a result of humidity, but is probably due to the specified ceiling tiles are

not rigid enough for a 2x4 ceiling grid, 2 x 2 ceiling grids can avoid this issue. The ceiling tiles in classrooms and corridor of the northeast corridor have been replaced. Remaining areas of the building should be replaced. Ceilings would need to be replaced if a sprinkler installation is undertaken.

There are some 12" x 12" acoustical ceilings on the south end of the building that should be replaced.
Ceiling tiles that are water stained, dirty, or damaged should be replaced at the end of each school year. Since appearance is purely aesthetic, replacement is not mandatory.

Wall Materials and Finishes
Most walls are in fair condition. Many of the walls are constructed of painted concrete masonry and are well suited for taking the abuse of a school. Some corridor walls have a tile wainscot which is maintainable, but dated. Some masonry cracks are present; they should be sealed and painted.

Interior Doors and Frames
Interior doors are a combination of some wood doors, but a majority of hollow metal doors. The doors are serviceable and showing age. It appears some doors and frames have been repainted and the program should be continued. Accessible lever lockset hardware should be provided on all doors. A budget for rated doors has been included, however further investigation should be performed to determine present ratings.

Interior Windows
No issues found.

Restrooms
The restrooms adjacent to the front entrance are not accessible. Most of the restrooms show signs of wear and tear; however; all appear to be in working order. Eventually the fixtures should be replaced to newer, more efficient fixtures. Consideration should be given to waterless urinals in order to conserve water usage. We recommend that consideration be given to an upgrade of all restrooms over a long-term improvement project. A budget should be established to renovate a fixed number of spaces each year or every other year.

Equipment
Some casework is older and in need of replacement.

Furniture
Furniture throughout the building is showing normal wear.

General Notes Regarding the Americans with Disabilities Act

The restrooms adjacent to the front entrance are not accessible. Dual height drinking fountains should be provided through the building, it is not required for both heights to be provided in the same location. Accessible door lever hardware should be provided in all locations, some incidental doors and doors between classrooms still have door knobs. The ramp handrails should be exchanged for accessible handrails.

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Mechanical Narrative – Griffin Memorial School

Heating Plant

There are two Boiler Rooms in the Griffin Memorial School. The first Boiler Room we observed contained two boilers – a Weil McLain Model 488 oil-fired unit that was installed in 1989, and a Buderus GE315/9 oil-fired boiler that was installed in 2009. The combustion air for this room is ducted from the roof down to the floor and does not have a high opening as required by code. When the hot water temperature falls below the setpoint, we observed that both boilers operate together, rather than staging to meet the load.

The hot water pumps in the first Boiler Room are Armstrong 4030 3x2x3 base mounted systems with 5 horsepower motors. These pumps are constant speed, on/off type. Efficiency of operation for these pumps could be improved significantly by adding variable frequency drives (VFDs) to the motors to allow reduced speed operation during times when less heat is required in the building. Note: Adding VFDs will only allow reduced pump operation if coils are re-piped with two-way valves, rather than the installed 3-way valves. The boilers also each have a Grundfos cartridge circulator injecting boiler water into the main heating loop. We observed no filtration or main strainer for the heating hot water system, which allows debris in the system to constantly circulate and potentially foul sensitive components like control valves.

Domestic hot water is provided by a Triangle Tube Phase III indirect water heater, plus an oil-fired Bock Model 71E, which is likely to be used for summer hot water needs while the boilers are off. These water heaters each have a capacity of 90 gallons. These hot water heaters appear to be in reasonably good condition.

The second Boiler Room has a single Weil McLain Model 688 oil-fired boiler that was installed in 2003. There are five hot water circulators in this space, each serving a different portion of the building. In addition, there is a Taco cartridge circulator that injects the boiler water into the main hot water loop.

Air Handling Systems

Rooftop units serving the Elementary School include a Venmar energy recovery unit with added cooling at the Office area, a Trane Penthouse Climate Changer heating and ventilating unit located next to the Gymnasium (serving Classrooms 17, 28, 29, and 30), and two Magic Aire heating and ventilating units serving Classrooms 1-15. Indoor air handling equipment include a unit suspended on the Stage area that provides heat and ventilation to the Gymnasium, a unit suspended from the ceiling in the main Boiler Room that provides heat and ventilation to the Cafeteria and a suspended unit behind the Stage that provides heat and ventilation to the Teacher's Room and Nurse's office.

Unit ventilators provide heat and ventilation to the Media Center and Classrooms 16, 18, 19, 20, 21, 22, 23, and 24. These unit ventilators are Nesbitt floor mounted models. These rooms also have gravity exhaust vents. No significant air flow was noted at many of the exhaust vents throughout the school.

Our observations indicate that the rooftop and indoor air handling units tend to have some dirt inside the cabinets and also have delaminating interior insulation in some cases. The units appear to have served their useful life.

Heating Terminal Equipment

Most classroom spaces are heated primarily by fin tube radiators along the window walls. Entrance heating is accomplished by cabinet heaters (fan coil units) either floor mounted or ceiling mounted. Unit heaters suspended from the ceiling are used to provide heating in support spaces, like storage rooms and the Kitchen.

Automatic Temperature Controls

The temperature controls at Griffin Memorial School are of several vintages. The system does not appear to centrally control the systems, but rather is comprised of smaller networks that control individual units or the boiler plant. Our observations indicate that this control system is nearly obsolete due to software changes over the past 15+ years. Many of the systems and individual units were not operating during our site visit.

Recommendations

Our short term recommendations are based on those items that should be addressed in the next five years. These items include:

- Replacement of automatic temperature controls system
- Replacement of air handling systems
- Installation of filtration system for heating water
- Installation of variable frequency drives for heating pumps (along with re-piping of hot water coil valves)
- Replacement of one boiler and combustion air systems
- Replacement of exhaust fans throughout building

Existing Conditions

The following is a summary of the existing electrical systems for the existing Elementary School located at 229 Charles Bancroft Highway in Litchfield, NH.

Main Electrical Service

The building's electrical service originates from an NGRID utility pad-mounted transformer (300 KVA, 480 volt, 3-phase), located to the back of the school.

The service size is 1600 amps, 277/480 volt, 3-phase. The existing switchgear "MSB" was manufactured by Square D, consists of a 1600 amp, 480 volt bolted pressure switch and two distribution sections. Each section contains bolt on feeder circuit breakers.

The switchgear was manufactured in 1978 and was installed in 1978. The switchgear has surpassed its expected life and should be replaced immediately.

Electrical Distribution Equipment

The facility's electrical distribution equipment consists of originally installed (1978) 120/208 and 277/480 volt distribution panelboard and dry-type transformers. The panelboards were manufactured by Square D, have surpassed their expected life and should be replaced.

Fire Alarm System

The fire alarm system consists of an addressable Simplex 4100U Fire Alarm control panel located in the main lobby, a graphic annunciator also in the lobby, manual pull stations at all exit doors or exit staircases, smoke detectors in corridors, elevator-recall-smoke detectors, speaker/strobe devices in all public bathrooms, strobe-only devices in bathrooms and conference rooms.

The system is working adequately and there have been no reported issues. The system is 12 years old. The devices should be tested to check for proper functionality. The overall system has an approximate 13 years of remaining expected life.

Exit and Emergency Lighting

The exit signs and wall mounted emergency light fixtures serve as emergency lighting. Exit signs appear to be LED signs and seem to be in good working condition. There is adequate exit sign coverage throughout.

Lighting

There are numerous types of lighting fixtures throughout the facility. The fixtures consist of numerous 2' x 4' recessed acrylic lensed fixtures in office and classrooms, 2' x 2' recessed acrylic lensed fixtures in corridors, 2-T8 industrial in mechanical rooms, 6-lamp fluorescent fixtures in gym. Lamps have been replaced over the years as needed. It was reported that fixture ballasts are starting to fail.

Speaker/Clock

Simplex System 2400 reported to be working adequately.

<u>Electrical Recommendations</u>

Main Electrical Service

The 1600 amp switchboard has surpassed its expected life and should be replaced immediately.

Electrical Distribution Equipment

The facility's distribution equipment and panels were manufactured by Square D and have surpassed their useful life and should be replaced.

Fire Alarm System

The existing addressable Simplex 4100U Fire Alarm control panel should be retained. The devices should be replaced with new addressable devices as needed, as they being to fail. Otherwise, the fire alarm is in good working condition. The entire system should be upgraded/replaced in 13 years.

Exit and Emergency Lighting

The existing exit signs appeared to be in good working condition, as did the emergency light fixtures. The exit sign coverage was adequate. Replace fixtures as needed.

Lighting

All lighting requires an upgrade to new, more energy-efficient LED fixtures. Occupancy sensors should be provided throughout, for better control, reduced energy costs, and to meet Chapter 13 Energy Conservation of the State Building Code.

Speaker/Clock System

The speakers and clocks are in good working condition. The entire system should be replaced in approximately 20 years.

Vehicle and Pedestrian Circulation

Pavement deterioration at driveway,curb, & sidewalk.

Pavement deterioration at driveway, curb, & sidewalk.

Cracked, broken pavement, indicating base gravel failure.

Failing pavement & cracked concrete at catch basin. Note dumpster placed on asphalt & no concrete approach apron.

Non-compliant accessible spaces. Note poor condition of asphalt & signage.

Parking spaces at dead end lot on south side. Note accessible parking logo painted on the surface of space 5.

Dead end parking lot on south side of school.

Pothole at intersection of Route 3A & parent drop-off loop.

Vehicle opening to playground- install latching gate to control access.

Example of crack in concrete pad requiring attention.

Roof runoff spilling onto sidewalk.

Parent drop off loop- capacity for small number of vehicles..

Site Drainage

Loose-laid masonry blocks forming catch basin sidewall. Structurally insecure and allows for groundwater infiltration.

Accumulated sediment that flushes to catch basin.

Drainage swale at west end of parking lot. Note lack of vegetation and elevated culvert outlet.

Eroded swale capturing playground runoff.

Sediment in drainage swale at west end of parking lot. Tall grass should be maintained at 4-6” length.

Overgrowth in drainage swale at east end of site.

Shallow culvert at loading area. Note loose-laid bricks & non-watertight seal around culvert.

Crack leading from catch basin grate indicates displacement of plastic culvert beneath.

Soil displacement at roof leader outlet.

Landscaping

Sparse grass cover- typical example.

Excess pavement that could be restored to a grass-covered area.

Sparse grass cover at ballfield.

Overgrowth at drainage swale.

Septic System

Septic tank cover reading'DRAIN' (typ. For 2).

Broken cleanout cover support.

Elevated cleanout cover- prevents larger cover from setting securely in frame.

Pump station interior (trench field system). Note loose-laid covers over access holes.

Wet well interior- no guide rails or lifting chains.

Access hatch (rectangle beyond) to pump station wet well (stone & pipe system).

Corroded guide rails & brackets, stone & pipe system pump station.

Roots at distribution box interior, trench field system.

Grinder pump controls & wet well, inside mechanical room.

Grinder pump valve pit. Note presence of groundwater.

Grease accumulation at inlet of septic tank adjacent to stone & pipe pump station.

Grease accumulation at outlet pipe of septic tank adjacent to stone & pipe pump station.

Sparse vegetation at trench system leach field. Note dense woody vegetation around the perimeter on the side slopes.

Sparse vegetation at stone and pipe system leach field.

Distribution box at stone and pipe field that is sealed shut.

Miscellaneous

Underground oil storage tank. Mount audible overfill alarm to masonry wall. Note dumpster set on grass surface in background.

Deteriorating ramp footing at portable classroom.

Wood railing on east side of school- note exposed nail heads & displaced/ warped wood members.

Typical site lighting- replace with high-efficiency luminaires & add additional fixtures for greater illumination.

Griffin School Aerial Photo

PVC Roof Membrane

PVC Roof Membrane

EPDM Roof Membrane

PVC Roof Membrane at Gymnasium

EPDM to PVC Membrane Transition

PVC Roof Membrane

Roof Hatch & Access to Gymnasium Roof

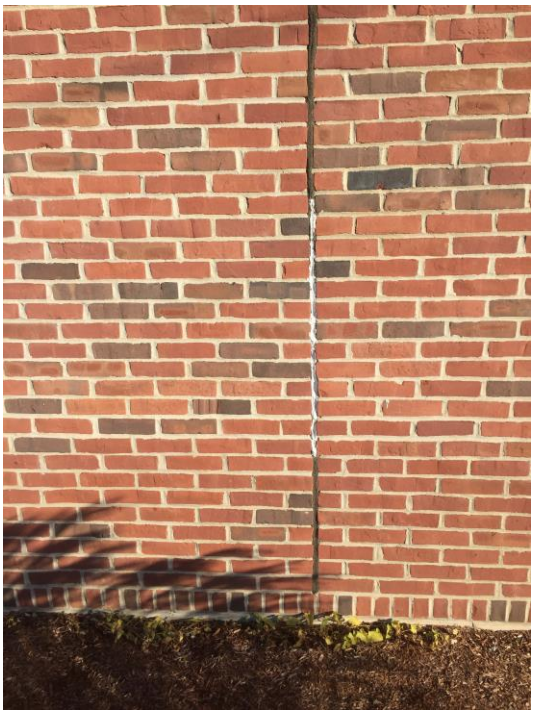
PVC Roof Membrane

Roof Transition

Patches at PVC Membrane

Interior Courtyard

Sealant Joint at Brick Veneer



Sealant Joint at Brick Veneer

Window Wall at Main Entry

Window Wall at Main Entry

Roof Downspout

Roof Drain Outlet

Sealant Joint at Brick Veneer

Unit Ventilator Louver

CMU Exterior Wall

CMU Exterior Wall

East Exterior Wall

Roof Overhang at East Exterior Wall

East Wall Brick Staining from Roof Runoff

East Exterior Wall

Opening in Sill of Window Frame

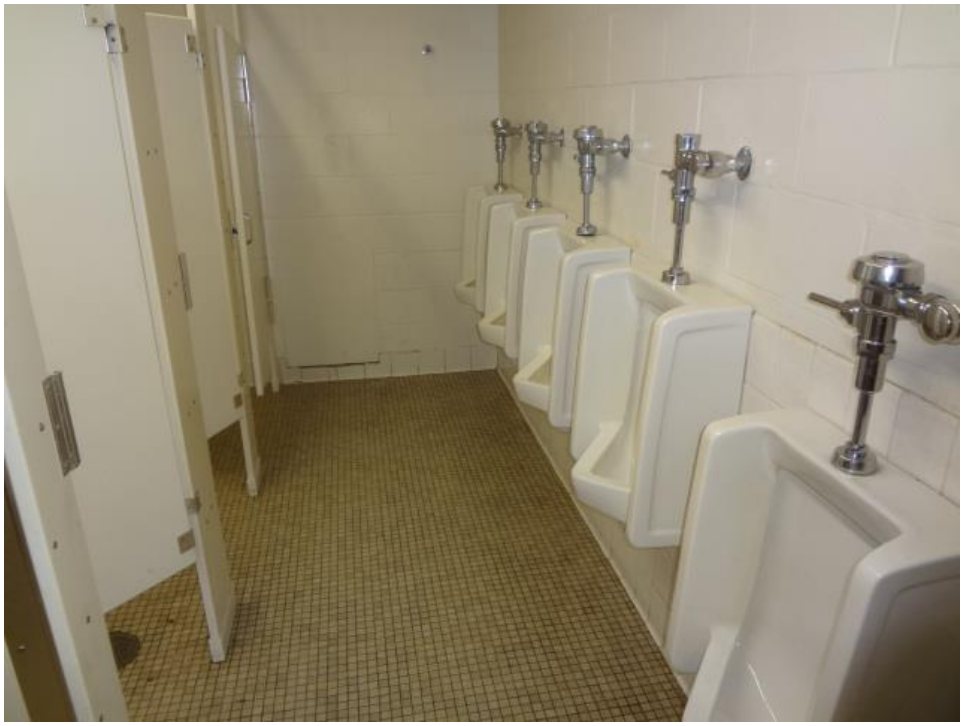
Sealant at Window Frames

South Exterior Wall

Original Building South Wall

Original Building North Wall

Inaccessible toilet stall



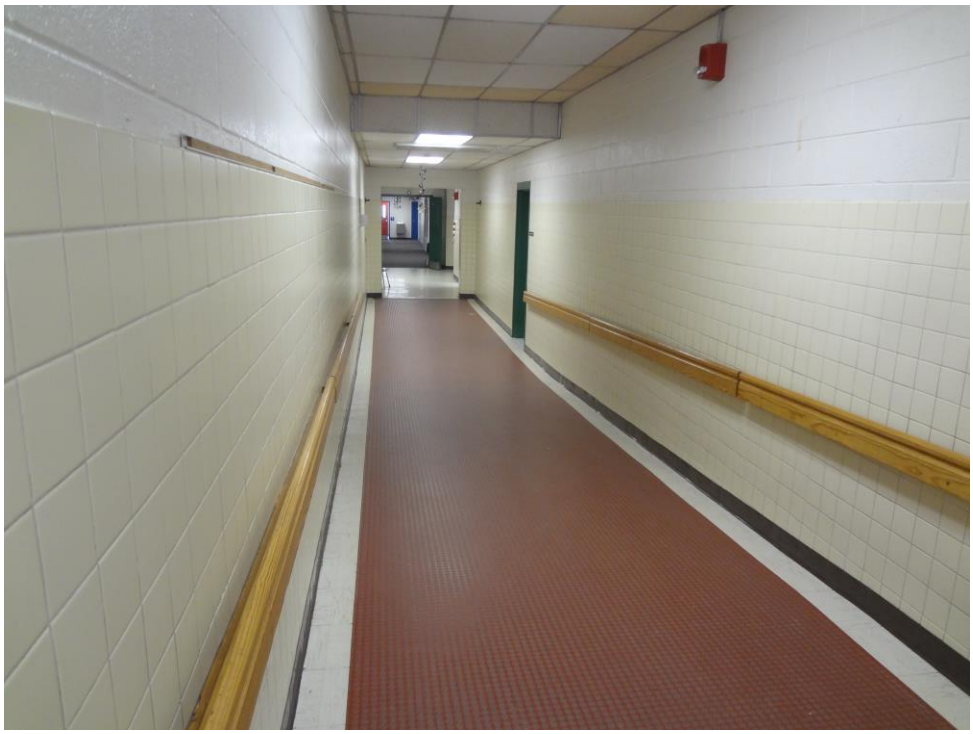
Restroom floor in need of replacement

Wooden Storage Mezzanine

Carpet in need of replacement

Original 12” x 12” ceiling

Non-structural cracking



Corridor Ramp Handrails

Photo #1 Office Rooftop Energy Recovery Unit

Photo #2 Interior Insulation in Trane Rooftop Unit

Photo #3 Weil McLain (1989) and Buderus (2009) Boilers

Photo #4 Main Heating Hot Water Pumps

Photo #5 Pumps in Secondary Boiler Room

Photo #6 Partially Sealed Floor Drain in Nurse's Office

SITE/CIVIL							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
VEHICLE & PEDESTRIAN CIRCULATION							
Pavement cracks	Pavement is in poor condition overall. The district will need to plan on reconstructing paved surfaces on this site.	Clean and fill cracks in asphalt driveways and sidewalks. Sealcoat all asphalt surfaces. Some areas of pavement are too deteriorated to repair and this measure is a temporary solution to help prolong pavement life before it can be reconstructed.	3	(?)	<2 years	20	$8,000
Pavement and base gravels	As noted above, the asphalt surfaces on this site are in poor condition.	Remove pavement and base gravels. Place new gravels and asphalt. A project of this scope will present an opportunity to construct sidewalks and ramps that comply with ADA standards	3	(?)	2-5 years	20	$175,000
Accessible parking space signage and layout	Existing spaces do not comply with ADA regulations: They are too steep, an additional space is needed, and signage is incorrect.	Install proper signage. Create an additional space and sign it appropriately [short term measures]. During pavement reconstruction, regrade the accessible spaces so they are in full compliance with ADA [long term}	2	(?)	<2 years		$4,000
Excess pavement adjacent to portable classroom	On the south side of the portable classroom is a stretch of pavement that once supported additional portables.	If there is no intention or need to use additional portable classrooms, remove this pavement and establish additional landscaped areas	3		>5 years		$10,000
Vehicle entrance to playground	There is no barrier to prevent traffic from driving onto the asphalt playground	Install a latching gate to control traffic access	3		<2 years		$3,000
Concrete door pads	Multiple door pads show chips and cracks in the concrete	Repair all blemishes in concrete surfaces.	3		<2 years		$2,500
Roof runoff falling on asphalt sidewalk on east side of school	This condition may create an icy hazard in cold weather	Capture roof runoff in a gutter and pipe it away from pedestrian pathways	3		2-5 years		$1,000
Traffic patterns across the site	The site needs additional parking and better accommodations for busses, parents dropping off/ picking up.	A schematic design was done in 2006, detailing one possibility. Before reconstructing paved surfaces the district should consider developing a new site design/layout to address these issues (cost is for design only, not construction).	3		>5 years		$10,000

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
SITE DRAINAGE							
Grass island in the middle of the parking lot on the west side	Parking lot is sloped to direct a majority of the runoff to the island but there is no drainage inlet or other means of removing water.	Extend the closed drainage system to collect any runoff that ponds in this area.	3		>5 years		$11,500
Catch basin adjacent to west side service entrance	The structure is constructed of loose laid cmu blocks. With a high water table they allow groundwater to seep into the structure, placing strain on the closed system downstream.	Replace structure with a precast concrete catch basin. Ensure joints and connection to outlet pipe are watertight.	3		2-5 years		
Vegetated swale on the west side of westernmost parking lot	There is a lot of bare earth and accumulated sediment in this swale. The outlet of the culvert coming from the playground is elevated and a large scour hole has formed.	Remove accumulated sediment from the swale. Place NHDOT Class C stone and geotextile separation fabric at the elevated outlet to reduce/ eliminate future scour. Loam and seed areas of the swale meant to be vegetated and place erosion control matting to protect the seed. Remove overgrown trees, shrubs, and woody vegetation.	3		<2 years		$4,250
Vegetated swale along the east property line	Swale is overgrown with trees, shrubs and woody vegetation.	Remove overgrowth and any debris and/or accumulated sediment. Maintain regularly.	3		<2 years		$1,250
Concrete collar surrounding catch basin grate at delivery area	Concrete is significantly cracked.	Replace concrete collar.	3		<2 years		$2,500
Shallow catch basin at low point of delivery area on south side	The outlet pipe is very shallow because the system ties into the NHDOT drainage on Rte. 3A and there is no flexibility to lower this pipe. It is causing damage to the pavement and likely freezes in winter.	Install a new structure with a deeper sump. The structure should drain to a stormwater pump station so the school can continue to drain this area and provide proper cover over drainage piping.	3		>5 years		$50,000
Roof leaders	Several roof leaders discharge direct to the ground. In locations where there is a landscaped surface beneath the outlet, the ground is scoured and eroded.	Install a concrete paver or similar hardscaped material to prevent further erosion from roof runoff discharge through the roof leaders.	3		2-5 years		$200
Maintenance and inspection of drainage measures	Regular inspection and maintenance (pavement sweeping, swale maintenance, catch basin cleaning….) can help prevent flooding and other drainage problems.	Develop a stormwater inspection and maintenance plan, specifying specific inspection tasks and items to review, frequency, and preventive/corrective measures (if the District does not already have one).	3		<2 years		$2,000

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
LANDSCAPING							
Grass covered surfaces	In many locations the vegetative cover is sparse, especially at the leach fields and the baseball outfield.	Aerate and reseed those areas of the site that should be grass-covered and display poor coverage. Obtain soil assessments first to identify any deficiencies and to customize a fertilizer specification.	3		<2 years		$7,500
Erosion at edges of pavement	In multiple locations where runoff flows off the edge of pavement to abutting gravels, the ground is eroded and the pavement is undermined.	Place compacted crushed gravel at pavement edges across the site where erosion is a problem.	3		<2 years		$2,500
SEPTIC SYSTEM							
Septic tank access covers that say 'DRAIN'	The septic system is part of the sewer system, not the drainage system.	Replace the two covers that say 'DRAIN' with covers that say 'SEWER'.	3	2005	2-5 years	50 years	$1,750
Manhole covers over sewer line cleanout covers.	The frames have settled into the sand and the underside of the covers rest on top of the cleanout covers beneath. One of the cleanout riser pipes has broken in multiple pieces.	Replace broken riser pipe. Reset frames and covers to the proper elevation and place a concrete collar or similar bearing surface beneath them to prevent them from settling into the sand again.	3	2005	2-5 years	50 years	$3,500
Enclosed pump station- access to wet well	The hatch covers to the wet well are not lockable. There is no secondary fall protection nor is there a warning label alerting people to the presence of a hazardous environment in the wet well	Install lockable access hatches. The opening are small so secondary fall protection may not be available. As an alternative to locking hatches, an H20 rated frame and cover, secured to the slab, is acceptable because of the effort required to open such a cover.	2	2005 (?)	2-5 years	30 years	$10,500
Enclosed pump station- guide rails and lifting chains	The pumps cannot be removed for inspection or maintenance without entering the wet well.	Install stainless steel guide rails and lifting chains at each pump so service can occur from outside of the wet well.	3	2005 (?)	2-5 years	30 years	$10,000
Enclosed pump station- man door	The door to the pump station is not secure. Although it has a lock, it can be bypassed with a screwdriver.	Replace the residential-style door with a more sturdy, locking, industrial-style door.	3	2005 (?)	<2 years	20 years	$2,000
Exposed pump station- access hatch	The hatch does not appear to be watertight. There is no secondary fall protection nor is there a warning label to alert people to the presence of a hazardous environment.	Replace the hatch with one that is watertight. Provide secondary fall protection and proper warning notices.	3	2005 (?)	2-5 years	30 years	$10,000
Distribution box- 1972 leach field (trench system)	There are numerous roots growing through the gaps in the cover on the box and will eventually clog the piping.	Remove the roots from inside the distribution box and install nonwoven geotextile separation fabric over the top of the box, wrapping around the sides a minimum of 6-inches.	3	1972	<2 years	30 years	$500

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Grinder pump valve pit	This open-bottomed structure is sometimes infiltrated with groundwater. There is no alarm alerting staff to this condition, nor is there an interior sump pump.	Install a high water alarm so school staff are alerted to high water conditions in the valve pit, without having to open the hatch.	3	1972(?)	2-5 years	20-30 years	$6,500
Vent pipe at 1978 leach field (stone and pipe beds)	These two beds were designed with vent pipes at the end of the field opposite the distribution boxes. The pipe has been removed from one of the two fields.	Replace the vent pipe. These leach fields have a deep layer of dense backfill material above the effluent receiving area. Leach fields are designed to function in the presence of air. Without a vent pipe, the amount of air entering the system is reduced.	3	1978	<2 years	30 years	$1,750
Septic tank upstream of the exposed pump station	There is a lot of grease floating on top of the effluent in this tank. The inlet and especially the outlet pipe are caked in a thick layer of grease, reducing the hydraulic capacity.	Pump out this tank and clean the grease off of the inlet and outlet pipes. Inspect this tank and the grease interceptor with greater frequency because it appears these tanks require pumping multiple times per year.	3	1978 (?)	<2 years	30 years	$1,000
MISCELLANEOUS							
Underground oil storage tank	No audible overfill alarm was observed.	Install an audible overfill alarm, in close proximity to the tank.	3	(?)	2-5 years	30 =50 years	
Concrete footers at ramp to portable classrooms	The concrete at many of the footers is deteriorating, likely due to winter salt application efforts.	Replace the concrete footers.	3	(?)	<2 years	10-20 years	$3,000
Wood deck on east side of school	There are exposed nail heads and warped, checked wood components.	Countersink exposed nails and replace those wood planks that have deformed over time.	3	(?)	<2 years		$500
Dumpsters	Dumpsters at the site are set on asphalt or grassed surfaces. The approaches to the dumpsters are asphalt.	Install concrete pads on which to set the dumpsters and include concrete approach slabs. Consider installing an opaque enclosure to provide visual screening and containment for spilled debris.	3	(?)	>5 years	20 years	$12,000
Site lighting	A 2006 site assessment identified an inadequate number of site luminaires, and those that are there are inefficient. Site lighting hasn't been modified or enhanced.	Replace existing site lighting with high efficiency LED lighting. Have a site lighting design completed to determine what additional luminaires are required.	3	(?)	2-5 years	20-30 years	$60,000
SUB-TOTAL							**$296,950**

GRIFFIN MEMORIAL SCHOOL - FACILITY ASSESSMENT

ARCHITECTURAL							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Roofing							
	Existing PVC roofing is in good overall condition.		3		8	30	
Windows							
	Existing windows are in fair overall condition.	Windows at the east and north buildings should be replaced	3		5	20	$42,000
Doors							
	Existing doors are in good overall condition.	Some door frames have started to rust. Scrap and paint the door frames.	3		1	10	$4,500
Brick Veneer							
	Vertical joint sealants in good condition.	Sealants at vertical joints should be replaced every 10-15 years	3		4 to 6	10	$15,000
Sprinkler System	Building too big not to have sprinkler	Install sprinkler system and ceilings	1,2			25	$500,000
Corridor Doors	Fire rating in question, doors required to be 20 minute rated w/o sprinkler system	Replace with rated doors & hardware	1,2	Unknown	1	25	$40,000
North Restrooms	Not ADA Compliannt, need renovation	Renovate restrooms	3	1973	2	25	$150,000
Drinking Fountains	Not ADA Compliannt,need dual height	install one higher drinking fountain	3	Unknown	na	25	

SUB-TOTAL							$751,500

MECHANICAL & PLUMBING							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Automatic Temperature Controls	Temperature controls are aging and appear to consist of many individual smaller systems rather than a comprehensive central control system.	Replace control system throughout the school	3	Varies	0	15	$340,000
Air Handling Systems	The central air handling units, as well as the unit ventilator systems have exceeded their useful life.	Replace air handling systems with modern equipment that is accessible for maintenance.	3	Varies	0	15-20	$400,000
Heating Water System	No evidence of water filtration system. Main pumps are single speed, on/off.	Install heating water filtration system. Add variable frequency drives to main heating pumps and re-pipe 3 way valves	3	-	-	-	$60,000
Boilers	Two of the three boilers have 15 years or less of service. Remaining boiler has served its useful life. Combustion air systems do not meet code requirements.	Replace 1989 Weil McLain boiler. Rework combustion air systems to meet code	2,3	1989	2	30	$70,000
Exhaust Fans	Rooftop exhaust fans have exceeded their useful life. Many were not operating during our site work.	Replace aging exhaust fans	3	-	-	-	$84,000
Nurse's Office Odor	Sewer odor noted during site investigation in Nurse's Office.	Completely seal floor drains in former shower area (now storage) in rear of Nurse's space.	3	-	-	-	$5,000
SUB-TOTAL							**$959,000**

ELECTRICAL							
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	**1-LifeSafety 2-BldgCode 3-Maint**	**YEAR INSTALLED**	**REMAINING USEFUL LIFE (Years)**	**TYPICAL USEFUL LIFE (Years)**	**OPINION OF COST FOR REPLACEMENT**
Service Equipment	1600 Amp 480 Volt Square D bolted pressure switch and distribution section. NEC working clearance is not adequate. There are missing inserts exposing live bussing.	Replace switchgear as soon as possible. Provide missing inserts immediately.	1,2	1978	0	35	$75,000
Panelboards	Square D panels and load centers provided during the original building construction. Panels have surpassed their expected life.	Replace panels in the next 1-2 years.	1,3	1978	0	35	$25,000
Dry-Type Transformers	Square D transformers appear to be in decent working condition, but have surpassed their expected life.	Replace transformers in the next 1-2 years.	3	1978	0	35	$10,000
Speaker/Clock System	The speaker control system is located in the main office and is reported to be in good working condition. The system is a Simplex 2400 and was installed in 2015.	No work or maintenance needed at this time. Replace in approximately 20 years.	3	2015	20	22	$114,000
Emergency Lighting	Self-contained dual heads, wall mounted, tested yearly, in good working condition, but approaching end of life.	Continue to test the units and replace as needed.	1,3	1983	1-2	20	$250 each
Fire Alarm System	Simplex 4100 U, Voice Evacuation Addressable, Coverage meets NFPA, ADA, system reportedly working properly.	System devices such as smoke detectors should be replaced. Replace entire system in 10-12 years.	1,2	2005	13	25	$77,000
Interior Lighting	Fixtures are from the original construction (1978). Fluorescent fixtures include 2'x4' lensed troffers, 4' and 8' industrials, surface arcylic wraparounds, 4-lamp T-5 gym fixtures.	Replace fixtures with LED energy-efficient fixtures; ballasts have already begun to fail; fixtures have surpassed their expected life.	3	1978	0	25	$209,000
SUB-TOTAL							**$435,250**

On Friday November 18 and Friday December 2, 2016, The H.L. Turner Group Inc. (TTG) visited the Litchfield Middle School at 19 McElwain Drive in Litchfield, NH, to perform a site assessment of the property and identify any existing deficiencies the school district should address. This report provides a summary of those findings, our opinions regarding the remaining life expectancy of each condition, and an opinion of the associated costs to do so. For this report, the main entrance to the school is considered the west side of the building.

Vehicle and Pedestrian Circulation

West Side

On this side of the school, the terrain slopes steeply away from the facility toward the paved parking lot. The sidewalks slope away from doors 1A and 2A at greater than 10%, which does not comply with Americans with Disabilities Act (ADA) regulations. Adding handrails will make the incline easier to climb but the only way to achieve compliance with ADA is to increase the length of the sidewalks with switchbacks, which appears feasible, given the amount of lawn space between the west face of the school and the fire lane. The sidewalk pavement is in fair condition, although it displays cracks in multiple locations. The sidewalk paralleling the east side of the fire lane shows uneven settlement behind the granite curbing.

The school provides approximately 77 delineated parking spaces on the west side of the school, in two linear lots at different elevations (two tiers). The parking is separated from the building by the fire lane and a vegetated slope. The sidewalks from the upper tier (where the accessible parking spaces are located) to the fire lane slope at 10%, which does not comply with ADA standards. As with the sidewalks adjacent to the building, the only way for these sidewalks to comply with ADA is to increase their length, because although adding handrails will help, the overall rise is excessive. If a ramp slopes at 5% or less, there is no vertical rise limitation and handrails are not required, unless there is a drop-off to the side of the ramp. When the slope is between 5% and 8%, a ramp must have handrails and it is limited to a 30” vertical rise before a level landing is required. When the slope is between 8% and 10%, handrails are required and the limit on vertical rise is 6” between level landings. Slopes in excess of 10% are not permitted.

The upper parking lot has five designated accessible parking spaces, although they do not meet ADA standards for various reasons: The signage is mounted too low or is non-existent, two of the spaces do not have access aisles adjacent to them, and none of the spaces is designated as van accessible. At the west side of this upper lot, a steep grassy slope separates it from the lower lot, with nothing to prevent vehicles from accidentally driving over the edge of pavement. There are two portable classrooms set at the north end of this lot, protected from traffic by portable concrete barriers. When all the parking spaces are occupied, this is a dead end aisle with no room for traffic to turn around and exit.

The sidewalk parallel to the driveway off McElwain Drive is in poor condition, as is the bituminous curb separating it from the roadway. Where it terminates across from the southwest corner of the school the curb does not tip down to create a flush intersection with the driveway.

North Side

The perimeter driveway asphalt is in poor condition. The three sidewalks on this side of the building slope northward down to the driveway in excess of 10%, which as noted above, is not in compliance with ADA.

East Side

The driveway is widened along a portion of its length to provide approximately eleven additional parking spaces, but in spite of this there are still vehicles parked off the pavement on the shoulder of the travel way.

The sidewalk from door 7C has a large crack running across it that should be filled with sealant.

The paved surfaces in front of the doors at the loading dock are exceedingly steep: The slope in front of door 11C is at least 15% and the slope in front of door 14C is 13%. Although these doors may not be part of an accessible egress, the slopes are excessive for pedestrian traffic. The sloping surface curves around the end of the concrete retaining wall defining one side of the loading dock at a near vertical incline. Extending the retaining wall will help soften the sharp grade change. Additionally, there is settlement where the asphalt abuts the concrete pad between the building and the loading area. Correcting this settlement requires an asphalt overlay or reconstruction.

South Side

At door 15D the handrails on the stairs do not comply with ADA standards. The sidewalk leading from this door to the driveway exhibits multiple cracks and it is blocked at its end because of the placement of the dumpster.

In general, the condition of the pavement on this site is poor. A combination of concentrated runoff, age, and vehicle loading has contributed to its current state. Filling cracks and sealcoating the asphalt surface will temporarily slow the continued degradation of the driveways and sidewalks, but does not provide a long-term solution. The district should prepare to reconstruct the sidewalks, roadways, and parking lots, including the base gravels to their full depth. The extensive crack patterns in multiple locations indicate a failure of the base gravels, not only the asphalt.

<u>Summary of Recommendations, Vehicle and Pedestrian Circulation</u>

- Fill pavement cracks with a bituminous sealant and sealcoat the asphalt surfaces (in those locations where the pavement has not deteriorated to such an extent that crack filling and sealcoating is futile).
- Remove asphalt and base gravels. Rebuild pavement bases and repave.
- Install proper ADA signage and restripe parking spaces with proper dimensions.
- Install ADA compliant handrails at sloping sidewalks.
- Reconstruct sidewalks on west and north sides of school to create ADA compliant access and egress.
- Replace stair handrails at door 15D with ADA compliant rails.
- Replace sidewalk along entrance driveway from McElwain Drive.

- Install guard rails or similar vehicle barrier to prevent cars from driving off the edge of the upper parking lot, across the grass slope, and down to the lower lot
- Reserve two parking spaces adjacent to the concrete barriers protecting the portable classrooms to use as a space for vehicles to reverse direction.
- Extend the concrete retaining wall at the loading dock.

Site Drainage

Most runoff flows away from the building because it sits at a relative high point on the parcel. The one exception is along the south face of the school, where the perimeter driveway sits higher than the first floor elevation and the lawn in between slopes from the edge of pavement to the face of the building.

West Side

As water flows west, away from the school, it erodes the grassy slopes between the fire lane and the upper parking lot and between the upper and lower parking lots. The vegetation is very sparse and there is evidence of slope erosion, which also undermines the edge of pavement. In between the upper and lower parking lots is a swale with two catch basins to collect runoff. They pipe the stormwater to an offsite discharge location.

At the south end of the parking lot, there is a vegetated detention basin with sparse vegetation and a lot of accumulated sediment.

In a number of locations, the school has installed pea stone in eroded areas to armor the surface and prevent erosion; however, the stone is undersized to resist the amount of water it experiences. Adjacent to the main entrance the bike rack sets on a bed of this stone and it is spilling across the sidewalk. Even if the school were to install a curb or similar barrier at the toe of this area, the pea stone would accumulate and continue to spill onto the asphalt. A better solution is to remove the stone and install a hardscaped surface, such as permeable concrete pavers or a concrete pad. The sidewalks connecting the parking lots also have stone along their edges, but it is too light to remain in place and flushes either into the swales or onto the pavement. There is a lot of sediment running from the slopes onto the asphalt surfaces and toward the catch basin inlets.

North Side

There is a catch basin on the north side of the school with a cone section constructed of masonry blocks. Some of these blocks have deteriorated and there are gaps between the joints, so the cone requires replacement. The frame and grate castings and the sump section of the basin are in good condition.

East Side

At the northeast corner of the perimeter driveway there is a vegetated swale along the edge of pavement that has lost most of its definition due to sediment accumulation and lack of maintenance. Restoring this channel will help ensure runoff cannot accumulate on or adjacent to the paved surface.

At the loading dock, the catch basin in the corner was in critically poor condition during the November 18 assessment. There was a section of settled pavement around the grate and the concrete sidewall of the basin beneath the settled section had completely deteriorated, so the only remaining part of the structure was rusted reinforcement. There was a concern that an imposed vehicle load would lead to a significant failure of the pavement in the loading dock so

TTG notified Craig Reynolds later that afternoon about this situation. When TTG returned on December 2, work was ongoing to remove and replace the structure.

Immediately south of the loading dock is a catch basin at the edge of the driveway with a corrugated metal pipe culvert feeding into the loading dock catch basin. The structure is in good condition but the spaces around the pipe where it enters this basin need to be mortared to create a watertight connection and prevent runoff from leaking out around the pipe. The edge of pavement upslope from this basin's inlet is armored with more pea stone, which is flushing down into this basin because it is too light to resist being disturbed by runoff.

South Side

The grassed lawn on this side of the building slopes from the paved driveway toward the school. Although no concerns about water infiltrating the building on this side were reported, it remains a possible future hazard.

The runoff from the asphalt driveway is eroding the ground immediately adjacent to the edge of pavement, directing sediment to the catch basins and undermining the paved surface. In particular, the catch basin at door 15D appears to receive a lot of sediment via stormwater runoff.

<u>Summary of Recommendations, Site Drainage</u>

- Establish vegetation at sloping areas between parking lots and on the detention basin sidewalls. Erosion control matting will help reinforce the grass and hold the seed in place while it germinates.
- Replace pea stone with a more substantial material. Where the stone is used adjacent to driveways and sidewalks, the district should establish and maintain dense vegetated ground cover (such as grass). In those locations where concentrated runoff becomes channeled and prevents grass from easily growing, roadside ditches lined with NHDOT Class C stone placed over geotextile fabric will provide more permanent protection against erosion.
- Replace the deteriorating masonry block cone section of the catch basin on the north side of the school with a precast cone or flat top section.
- Regrade the swale at the northeast corner of the site to better intercept runoff and direct it to the closed drainage system. Establish dense grass cover and remove sediment and debris on a regular basis.
- Monitor the catch basin at the loading dock for signs of deterioration. Salt concentrations may be the reason behind the noted failure of the structure witnessed by TTG. The district may consider installing an HDPE catch basin liner beneath the grate, which protects the structure's sidewalls and directs runoff through the center of the basin to the sump.
- Place mortar or non-shrink, non-metallic grout around the corrugated metal pipe culvert where it exits the catch basin located east of the underground storage tank, to create a watertight connection.
- Replace pea stone at the edge of the driveway pavement where there is noticeable erosion (refer to first Drainage Recommendation above).
- Install a stone-lined trench with a perforated surface drain along the perimeter of the school on its south side, to intercept runoff from the sloping lawn. The drain should discharge into one of the nearby catch basins.

- Develop a Stormwater Inspection and Maintenance Plan, if one doesn't already exist, identifying the components of the stormwater management system that require regular inspection and maintenance (vacuuming catch basin sumps, restoring eroded areas, maintaining vegetation in drainage swales and detention basins, removing debris….).

Landscaping

Across the entire site, there are several areas with sparse vegetation. Dense grass cover will help minimize erosion and other runoff impacts. See also the comments relative to the use of pea stone under the 'Drainage' section. The soccer fields at the septic system leach fields in particular have poor vegetative cover. The test pits excavated during this assessment reveal there is between 4 and 8 inches of loam across the field. Aeration and reseeding will help restore adequate cover and facilitate aerobic activity in the effluent treatment zone. Sampling the soil can provide a specific analysis of any nutrient deficiencies so a fertilization plan can be customized to this site, yielding better results than a generic approach to applying fertilizer.

In several locations runoff from the driveway and parking areas has eroded the ground abutting the asphalt surface, resulting in an exposed pavement edge and increasing the risk of the pavement becoming undermined during rain events. Creating stone or grass-lined ditches as noted in the 'Drainage' section can help address the matter, and in the short term, the district should replace the eroded material with compacted crushed gravel.

Summary of Recommendations, Landscaping

- Restore vegetation across the grass-covered areas of the site.
- Protect edges of pavement with compacted crushed gravel and stone-lined or grass-lined swales.

Septic System

The design data from the record drawings on file with NHDES indicate the system was designed for 450 students, assuming 25 gallons per person per day of wastewater. Enrollment projections provided to TTG indicate declining enrollments and a review of State regulations show the system complies with current standards. Based on TTG's review and assuming a 10 minute per inch percolation rate (used for the initial design), and 23,000 square feet of effluent disposal area, the existing system can manage up to 496 people at 25 gallons per person per day. NHDES regulations stipulate that for schools the design should assume 25 gpd per student and 15 gpd per staff member. Since our calculations assumed 25 gallons per person, with no differentiation between staff and students, the design is comfortably conservative.

Building maintenance staff reports to TTG that the system is maintained yearly, including septic tank pumping and pump station assessment. This is good practice and should continue, to help ensure the system longevity.

The school effluent drains into two precast septic tanks placed in series on the north side of the building, a 4,000-gallon and a 6,000-gallon tank. The tanks sit approximately 4-feet deep so precast risers with cast manhole frames and covers provide at-grade access to the tank interiors. The inlet and outlet baffles of both tanks appear to be in good condition. The access frames and covers display some scaling and corrosion and they clearly do not provide a watertight connection, because significant amounts of sediment are spilling around the edges of the covers and accumulating on the top of septic tanks. Since there is not a secondary cover at the access holes cored directly through the tanks, TTG suspects sediment is spilling into the tanks and reducing their design capacity.

Effluent drains from the two septic tanks to a precast pump station located further north, at the east end of the leach fields/ soccer field. The hatch is padlocked to prevent unauthorized entrance and is further protected by a chain link enclosure. The concrete, wiring, and piping inside the station appear to be in good condition. The two installed pumps do not have a way to remove or service them without pumping the station dry and manually descending into it. The guide rails initially installed to facilitate pump removal have corroded and should be removed, because the existing pumps are disconnected from them. Installing new stainless steel guide rails and lifting chains will allow for pump maintenance without entering the wet well.

The pump station hatch has no secondary fall protection, nor does it have a warning label posted to its underside cautioning people about the hazardous environment. NHDES regulations recommend installing a label reading "Hazardous Area, Enter Only with Proper Equipment" or "Confined Space, Entry by Permit Only" (Env-Wq 705.08 (j)). The hatch does not appear to be watertight; additional infiltration of rain water and snow melt needlessly burdens the leach field and pumps, and could lead to premature failure of one or the other.

The pump station vent is leaning and appears to be broken at the bend where it turns vertical from the underground portion.

The pump station control panel is located inside the school. Ideally, the controls are located in a weatherproof cabinet within sight of the pump station to allow for ease of maintenance, and the alarm light is in a highly visible location. TTG does not recommend relocating it at this point, but if the pump station is rebuilt or replaced in the future the district should consider moving the controls and alarms closer to the pump station.

The effluent disposal area consists of four traditional stone and perforated pipe beds. Each submersible pump feeds a pair of the beds, which is somewhat unusual because normally a pump system would feed a single distribution box that would then channel the effluent equally to all of the fields. This arrangement is not problematic but the district needs to be aware if one pump stops functioning because in that instance only half of the leach fields will be operational. Each pump moves effluent to a precast concrete primary distribution box with two 6-inch outlets, which in turn drain to precast secondary distribution boxes that route the effluent into the vented leach fields. TTG excavated test pits to locate the distribution boxes and to observe the lateral perforated leach field pipes. The entire system, including the distribution boxes, is covered with a geotextile separation fabric. The fabric lies across the top of the septic stone in the effluent disposal areas, and encapsulates the distribution boxes (with one exception, noted below). The fabric's purpose is to prevent fine soil particles from infiltrating into the voids between individual septic stones. The system is reportedly functioning with no concerns; therefore, TTG did not penetrate the fabric to inspect the system components being protected. The leach fields have 4-8" of loam over 12" of sand which rests directly on the fabric above the septic stone. There was no evidence of effluent ponding above the top of the stone within any of the excavations, nor was there any noticeable septic odor in the holes. Based on these observations TTG has no reason to believe these fields are not performing as designed.

The primary distribution box at the east end of the effluent disposal area (closest to the pump station) was not wrapped in geotextile fabric, which permitted an additional opportunity to assess how the system is functioning. Although it seems to be operating with no problems (there was no evidence of ponding in the structure, the effluent was flowing equally to both outlet pipes) there was a significant amount of soil beneath the concrete access cover. Soil particles flowing in suspension to the leach fields threaten to reduce the permeability of the stone beds. TTG recommends placing geotextile separation fabric over the top of this structure,

wrapping at least 6-inches down all sides of the distribution box, to prevent further soil infiltration.

As noted in the 'Landscaping' section of this assessment, TTG recommends aerating and reseeding this field to restore its grass cover. This will also increase the amount of oxygen able to penetrate the soil cover and reach the effluent layer, which is essential for proper treatment.

Summary of Recommendations, Septic System

- Remove sediment from the top of the septic tanks adjacent to the cored access holes. Install concrete access hole covers to prevent future spilled sediments from falling into the tanks.
- Replace the at grade cast iron frames and covers providing access to the septic tanks to ensure there is a watertight and soil tight seal.
- Replace the pump station hatch with one that is watertight. Provide secondary fall protection and warning labels compliant with State of New Hampshire regulations.
- Install stainless steel guide rails and stainless steel lifting chains for each submersible pump to allow them to be removed and serviced without entering the wet well.
- Repair the pump station vent so it is securely fastened to the underground portion of pipe.
- Install separation fabric over the eastern primary distribution box to prevent sediment infiltration.
- Aerate and reseed the leach fields. Analyze the soil to determine a customized fertilizer application.
- Review controls and alarm signals daily to ensure all components of the system are functioning properly.

Miscellaneous

The dumpster is in a less than ideal location. It sits on an asphalt surface, close to a catch basin inlet, blocking a sidewalk. The paved approach has settled differentially from truck loads and is in poor condition.

There are no guardrails at the edge of the loading dock to prevent accidental falls. At one time there was a railing here, as evidenced by the plugged holes at the loading dock surface.

Existing metal railings around the site are showing corrosion and should be repainted.

One of the cast iron underground oil storage tank frames is partially exposed and is not mortared to the concrete pad supporting it.

There is no audible overfill alarm in close proximity to the underground oil storage tank.

Summary of Recommendations, Miscellaneous

- Install a concrete dumpster pad and approach apron, in a location that does not slope to the drainage system and does not block any pedestrian or vehicular paths. Provide a perimeter enclosure around the pad for visual screening and debris containment.
- Install railings along the edge of the loading dock.
- Repaint exterior handrails.
- Secure the oil storage tank frame to the concrete below with mortar. Place loam and seed around the exposed sides of the casting so the cover is flush with surrounding grade.

- Install an audible oil tank overfill alarm, mounted to the exterior of the school within sight of the oil storage tank fill valve.

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LITCHFIELD MIDDLE SCHOOL

ARCHITECTURAL

General Information

The Litchfield Middle School constructed in 1987 consists of one story of approximately 55,100 square feet. The school received a single story nine classroom, 12,350 SF addition in 1997. There are also two portable classroom buildings on site holding two classrooms each. Due to the recent construction of the building it is assumed that hazardous materials are not present. Under the current 2009 IBC and 2015 NFPA LSC-101 the building construction type is classified as 2B construction (noncombustible, unprotected). The building has a fire suppression system. The majority of the construction is structural steel, concrete masonry on the interior and exterior back-up walls with a brick veneer.

Occupancy classifications within the building educational and assembly use groups for the auditorium and gymnasium. Proper occupancy fire separations appear to have been provided. Occupant load egress meets current codes for size and travel distance

Building Exterior

Masonry
The exterior masonry walls of the building are in good shape. The masonry control joints are due for resealing. Weep holes were not present on the east elevation of the gymnasium. Repointing of a screen wall on the south side of the cafeteria is required. Masonry Sill repair under wall louvers on the east side require repair. Masonry weeps on the west elevation should be cleared. A glazed brick on the north side has popped loose.

Doors
Steel lintels and columns at the front entrance should be repainted.

Many of the flush doors have been replaced recently. Some door frames should be resealed and all thresholds cleaned, there is a lot of salt and sand remaining on the thresholds that can lead to the bottom of the steel door frames rusting prematurely. Some door frame bottoms have already rusted. Door frames should be repainted for added protection. The exterior overhead doors and associated guardrails should be repainted.

Some exterior doors are full glass doors that could be a security issue, a more resilient glazing should be considered if security is a concern to the district.

Windows

The windows are servicable, broken insulation seals were observed on two windows. All windows should receive new perimeter sealant. Windows on the south side of the building show signs of water intrusion under the window sill, the masonry below the window is efflorescing. The window sills and vents on the north side should be cleaned. All of the skylights are cracked and in need of replacement.

Building Interior:

Flooring

Flooring throughout the building consists of a majority vinyl composition tile (VCT), seamless flooring, quarry tile and carpet in administration and library areas. All of the carpeting shows signs of wear and there are areas where the carpeting has delaminated. The new carpet should be a higher grade then currently installed to prevent delamination. The use of carpet tiles would aid in future ease of replacement for more damaged areas.

The floor mats in the vestibules are in poor shape and should be replaced. This would help improve the perception of the building to visitors when entering. The lobby quarry tiles areas are serviceable. The flooring in the kitchen staff restroom should be replaced.

The cafeteria and some classrooms have received new VCT floor tile. There is a maintenance program in place to replace the tile in the remaining areas, including corridors. This program should be continued until tile replacement is completed.

The seamless flooring in the restrooms has been waxed and will appear dirty all of the time unless stripped and cleaned. The boys and girls locker rooms are in need of new seamless flooring.

The gymnasium floor is original and appears to be in good shape. Care should be taken to not apply too many coats of polyurethane to the floor without sanding or the floor will become slippery for athletes.

Ceilings

Most ceilings throughout the building are 2x4 acoustic ceiling tile mounted in a suspended grid system. Some staining of ceiling tiles was observed from dirty supply ducts and a few drip marks. Sagging ceiling tiles are prevalent throughout the building. This could be a result of humidity, but is probably due to the specified ceiling tiles are not rigid enough for a 2x4 ceiling grid, 2 x 2 ceiling grids can avoid this issue. The ceiling tiles in the addition wing are in better shape. There is a continuing roof drain leak in Classroom 23 which should be addressed immediately. Tiles are not in need of immediate replacement, but a long term replacement program should be planned.

Ceiling tiles that are water stained, dirty, or damaged should be replaced at the end of each school year. Since appearance is purely aesthetic, replacement is not mandatory.

Wall Materials and Finishes

Most walls are in good condition. Many of the walls are constructed of painted concrete masonry and are well suited for taking the abuse of a school. There were a few small wall cracks found, they should be sealed and painted, but they are not a structural issue.

Interior Doors and Frames

Interior doors are serviceable and showing age. A program for repainting of doors and frames should be provided.

Interior Windows

The window sills in the lobby areas and front corridor are damaged and should be replaced.

Restrooms

Most of the restrooms show signs of wear and tear; however, all appear to be in working order. Eventually the fixtures should be replaced to newer, more efficient fixtures. Accessibility has been provided, however some of the toilet partitions at the accessible stalls have been configured incorrectly for the fixture placement. Consideration should be given to waterless urinals in order to conserve water usage. We recommend that consideration be given to an upgrade of all restrooms over a long-term improvement project. A budget should be established to renovate a fixed number of spaces each year or every other year.

Equipment

There are unit kitchens in the nurse's office and the Teacher's room that should be replaced with new casework and appliances. The locker room lockers are showing wear and should be replaced if the locker rooms are to be utilized in the future. The Staff locker room restrooms should be reconditioned. The lockers are dated, but in serviceable condition.

Furniture

Furniture throughout the building is showing normal wear.

General Notes Regarding the Americans with Disabilities Act

The building meets present ADA standards. Toilet partitions should be replaced to provide correct configuration in relationship to fixture placement. Dual height drinking fountains should be provided through the building, it is not required for them to be provided in the same location.

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Mechanical Narrative – Litchfield Middle School

Heating Plant

The primary heating source for the Litchfield Middle School is provided by two Weil McLain Model PL-1188-WF boilers. The two boilers were installed in 1987 when the school was initially constructed and are likely to have served their typical useful life. These boilers use #2 oil as the fuel source. The combustion air intake has low and high openings as required by mechanical code. However, we observed that the damper for this combustion air opens when boiler B-1 is firing, but not when B-2 fires.

The main hot water pumps are Taco Model BB3010 base mounted systems with 7-1/2 horsepower motors. These pumps are constant speed, on/off type. Efficiency of operation for these pumps could be improved significantly by adding variable frequency drives (VFDs) to the motors to allow reduced speed operation during times when less heat is required in the building. Note: Adding VFDs will only allow reduced pump operation if coil valves are re-piped with two-way valves, rather than the installed 3-way valves. Additional heating pumps in the Boiler Room are marked P-3 Baseboard – a 1-1/2 horsepower Taco inline pump – and P-1 &2, installed during the 1997 addition work – both Bell & Gossett 0.75 horsepower inline pumps. Pump P-9, located in Penthouse 'B' is a 3 horsepower Taco base mounted pump installed during the original construction.

We observed no filtration or main strainer for the heating hot water system, which allows debris in the system to constantly circulate and potentially foul sensitive components like control valves.

Domestic hot water is provided by two Superstore indirect water heaters. The water heaters were recently installed and are served by a Grundfos inline pump for the loop off the main heating supply, as well as two Taco inline circulators, one for each tank.

Air Handling Systems

The Litchfield Middle School has eight indoor air handling units that originally provided heat and ventilation to the majority of the school (H&V-1 through H&V-8). Units H&V-6 and H&V-7 have subsequently been fitted with direct expansion (DX) cooling coils. An additional indoor air handling unit, HVAC-1, provides heating, cooling, and ventilation to the office areas.

Units H&V-1, 2, 3, 4, 5 & 8 do not have control valves on the hot water coil. The intent was to have the hot water coil in these units always flowing with hot water and have face and bypass dampers divert the air around the hot coil when heating was not needed. However, many of the controls for the face and bypass dampers have stopped working, causing air to pass through the heated coil at all times. This causes significant overheating of spaces throughout the school and wasted energy.

Units H&V-3 through H&V-8 have an air-to-air heat exchanger installed above the unit to transfer heat from the exhaust air into the incoming air. These are DesChamps Laboratories (DLI) Z-Duct fixed plate, metal heat exchangers. The heat exchangers appear to have been installed without filtration of the intake or exhaust air. After 30 years of operation the interiors of these units are expected to be quite dirty.

Many of these air handling systems were not running when we observed the systems during the normal “Occupied” cycle. Some units were off in ‘Hand’ mode, while others appeared to be on at the disconnect, but were not running.

The nine classrooms added to the school during the 1997 addition are heated and ventilated by Herman Nelson unit ventilators located at floor level on the perimeter under the windows. Several of these units were operated during our site visit and most had malfunctioning thermostats and would only run in heating mode. The few units that did operate in both heating and ventilating modes were noisy, even with the fan in low speed position. It should be noted that the low speed position does not provide the code required ventilation amount for the typical occupancy of the room.

The exhaust fans throughout the school have reached the end of their useful life. The fans serving the Kitchen do not meet current code for their construction.

Heating Terminal Equipment

Most classroom spaces are heated primarily by fin tube radiators along the window walls. Classroom heating in the original part of the building is supplemented by reheat coils in the ducts leading to each classroom. Entrance heating is accomplished by wall mounted cabinet heaters (fan coil units). Unit heaters suspended from the ceiling are used to provide heating in support spaces, like storage rooms and the mechanical penthouses.

Automatic Temperature Controls

The temperature controls at Litchfield Middle School are original to either the school's original construction in 1987, or in the addition areas in 1997. The system provides central control of the on/off function of systems and temperature settings for various spaces. The system is pneumatic, fed from a central compressor located in the Boiler Room. Many of the pneumatic tubes running throughout the school appear to have been severed over the years and the controls are no longer functional to operate equipment or maintain temperature control. Many of the valves have been impacted by inadequate filtration of heating water, which prevents the valves from either opening or closing fully.

In Classrooms 22, 23, 24, and 27 in the addition area, the thermostats were broken and cannot be used to change the temperature setpoint in the room.

Recommendations

Our short term recommendations are based on those items that should be addressed in the next five years. These items include:

- Replacement of automatic temperature controls system
- Replace the air handling systems
- Replace the air-to-air heat exchanger equipment
- Replace the unit ventilators
- Replace the heating pumps for the main part of the building and install variable frequency drives
- Replace the boilers
- Replace the exhaust systems
- Clean all classroom reheat coils

Existing Conditions

The following is a summary of the existing electrical systems for the existing Middle School located at 19 McElwain Drive in Litchfield, NH.

Main Electrical Service

The building's electrical service originates from an NGRID utility pad-mounted transformer (300 KVA, 480 volt, 3-phase), located to the back of the school.

The service size is 700 amps, 277/480 volt, 3-phase. The existing switchgear "MSB" was manufactured by Square D, consists of a 700 amp, 480 volt main circuit breaker and one distribution section. The first section contains bolt on feeder circuit breakers.

The switchgear was manufactured in 1998 and was installed in 1998. The switchgear appears to be in good condition and has an additional 18-20 years of expected life remaining.

Standby/Emergency Generator Power

The building has a manual transfer switch enabling the town to bring in a portable generator in case of an extended outage.

The disconnect switch is in good working condition. With continued exercising and maintenance, the generator and associated disconnect switch has an estimated 18-20 years of remaining life.

Electrical Distribution Equipment

The facility's electrical distribution equipment consists of originally installed (1998) 120/208 and 277/480 volt distribution panelboard and dry-type transformers. The panelboards were manufactured by Square D, continue to be in good condition, are properly located in the electrical rooms or closets. The panelboards should work properly for an estimated 17 years more.

Fire Alarm System

The fire alarm system consists of an addressable Fire Lite Alarm by Honeywell (MS-9200UDLS, ACC-2550) Fire Alarm control panel located in the main lobby, manual pull stations at all exit doors or exit staircases, smoke detectors in corridors, elevator-recall-smoke detectors, speaker/strobe devices in all public bathrooms, strobe-only devices in bathrooms and conference rooms.

The system is working adequately and there have been no reported issues. The system is 19 years old. The devices should be tested to check for proper functionality. The overall system has an approximate 12-15 years of remaining expected life.

Exit and Emergency Lighting

The exit signs and wall mounted emergency light fixtures serve as emergency lighting. Exit signs appear to be LED signs and seem to be in good working condition. There is adequate exit sign coverage throughout.

Lighting

There are numerous types of lighting fixtures throughout the facility. The fixtures consist of numerous 2' x 4' recessed acrylic lensed fixtures in office and classrooms, 2' x 2' recessed acrylic lensed fixtures in corridors, 2-T8 industrial in mechanical rooms, 6-lamp fluorescent fixtures in gym. Lamps have been replaced over the years as needed. It was reported that fixture ballasts are starting to fail.

Speaker/Clock

Simplex System reported to be working adequately with the exception of a few speakers. The internal control cards have been replaced over the years.

Exterior Lighting

Ceiling decorative fixtures under canopy and mini-wall packs.

Electrical Recommendations

Main Electrical Service

The 700 amp switchboard is adequately sized and in good working condition. With proper testing and yearly maintenance, the switchgear should function properly for another 17 years.

Stand-by Generator

The existing manual transfer switch is approximately (5) years old and is in good working condition.

Electrical Distribution Equipment

The facility's distribution equipment and panels were manufactured by Square D and are in good condition and shall be retained.

Fire Alarm System

The existing addressable Fire Lite Fire Alarm control panel should be retained. The devices should be replaced with new addressable devices as needed, as they being to fail. Otherwise, the fire alarm is in good working condition. The entire system should be upgraded/replaced in 12 years.

Exit and Emergency Lighting

The existing exit signs appeared to be in good working condition, as did the emergency light fixtures. The exit sign coverage was adequate. Replace fixtures as needed.

Lighting

All lighting requires an upgrade to new, more energy-efficient LED fixtures. Occupancy sensors should be provided throughout, for better control, reduced energy costs, and to meet Chapter 13 Energy Conservation of the State Building Code.

Speaker/Clock System

The speakers and clocks should be replaced on an as needed basis, over the next 10 years. The entire system should be replaced in approximately 18 years.

Exterior Lighting

The decorative fixtures under the canopy and the wall-mounted mini-wall packs should be replaced with new energy-efficient LED fixtures.

Vehicle and Pedestrian Circulation

Pavement cracks & steep slope.

Pavement deterioraton.

Tipdown, noncompliant w/ ADA.

Steep egress on north side.

Handrails at door 15D, not compliant w/ ADA

End of sidewalk along McElwain Dr.

Slope between parking areas. Note lack of vehicle barrier, sparse vegetation, & erosion.

Dead end parking lot.

Two of the accessible spaces. The existing sign is too low, & each space should have a sign. Note the lack of an access aisle for the space at the left of the frame.

Extend retaining wall to reduce slope.

Settlement at sidewalk on west side of school.

Site Drainage

Erosion on slope off edge of pavement.

Slope erosion between parking lots. Note pea stone getting flushed to inlet.

Sparse cover & erosion at detention pond.

Pea stone at parking lot.

Pea stone at the bicycle rack- note displacement onto sidewalk.

Pea stone washing into catch basin.

Deterioration cone section at catch basin.

Regrade and revegetate swale to drain to catch basin.

Catch basin at loading dock (prior to replacement).

Lawn sloping toward school from driveway.

Erosion at edge of pavement.

Erosion at edge of pavement.

Landscaping

Sparse grass cover at septic tanks.

Sparse grass cover at leach fields.

Erosion at edge of pavement & poor grass cover.

Sparse grass cover at lawn adjacent to school.

Septic System

Sediment piled on top of septic tank, beneath access hatch.

Corroded septic tank frame & cover

Pump station interior- note corroded guide rails & lack of secondary fall protection.

Pump station vent to reset.

Interior of distribution box installed with no separation fabric.

Interior of distribution box after removing soil.

Distribution box with separation fabric.

Test pit at leach field- note fabric at top of septic stone.

Miscellaneous

Dumpster & approach.

Dumpster obstructing sidewalk.

Replace railing along loading dock- note plugged holes where a railing was once installed.

Erosion at oil tank access frame & cover.

Middle School Aerial Photo

EDPM Roofing and Skylights

EDPM Roof Membrane and Mechanical Area

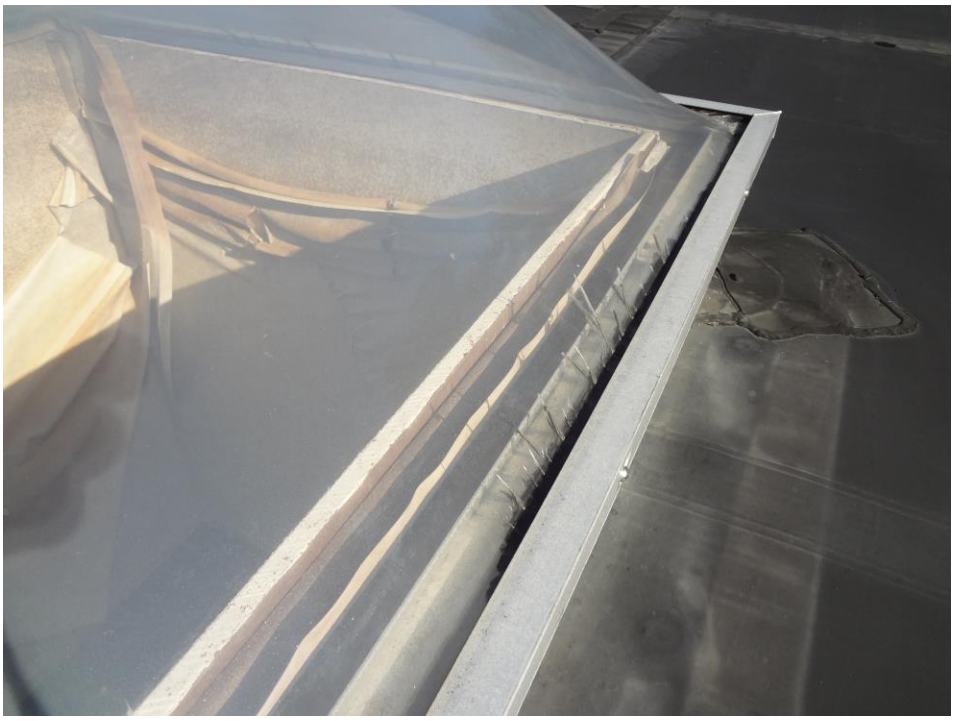
Ponding at Entry Low Roof

Metal Roof Edging

Fasteners at EDPM Roof

Roof Seam Repair

Seam at EPDM Roof



Cracking at Roof Skylight Polycarbonate

Skylight Covering

Ponding at Low Roof

Ponding on Mechanical Area Roof

Electrical Outlet on Mechanical Area Wall

Courtyard

Roof Drain and Ballast at Gymnasium Roof

Gymnasium Roof

Door installed on wrong side of toilet stall

Example of sagging ceiling tiles through building

Non-functioning unit kitchen

Window broken thermal seal

Example of carpet needing replacement

Example of foot grilles needing replacement and adjacent floor damage

Locker room seamless flooring

Control joint to be resealed

Photo #1 Original Weil McLain Boilers

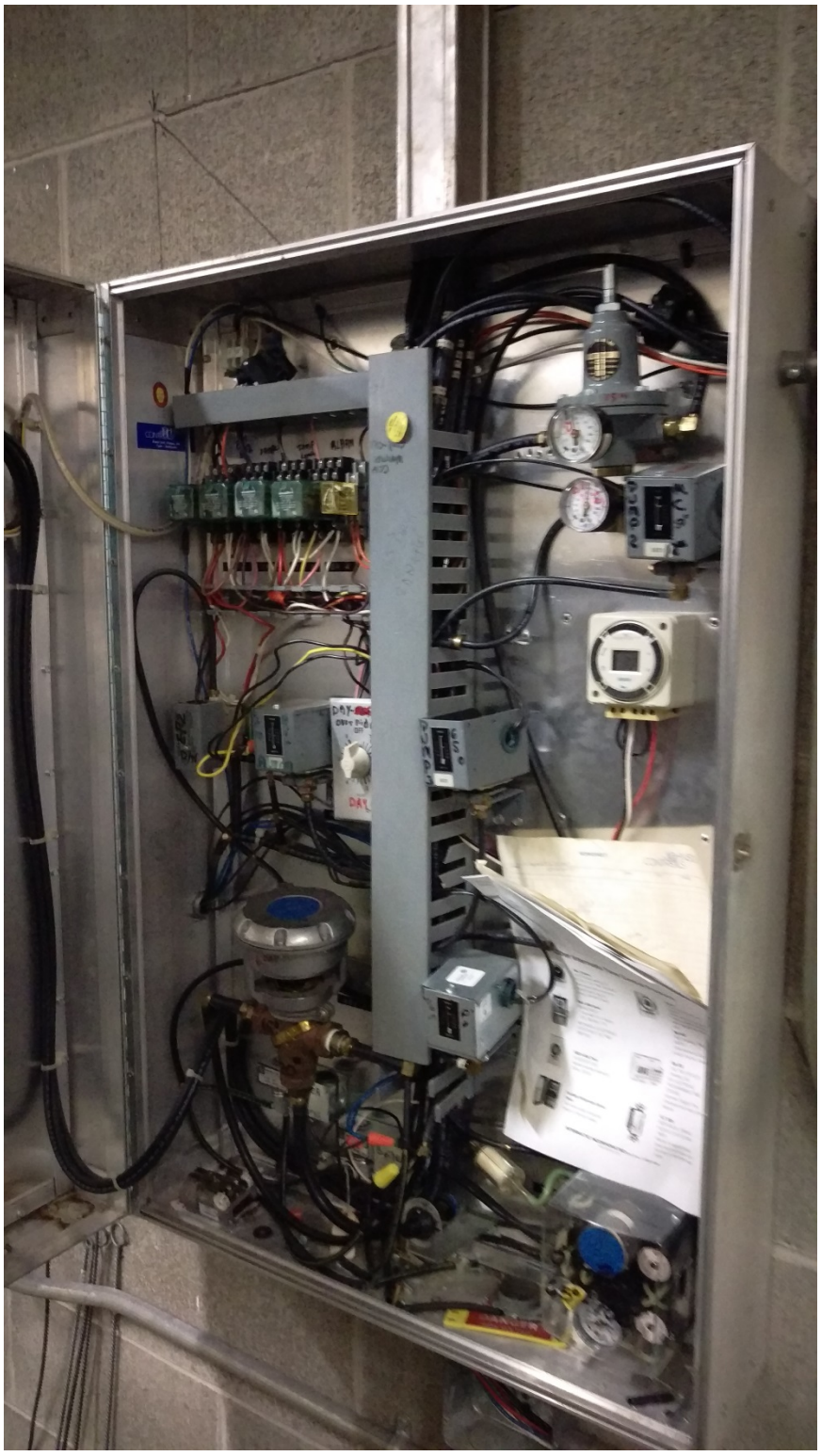


Photo #2 Pneumatic Temperature Controls Cabinet

Photo #3 Main Heating Hot Water Pumps

Photo #4 Air Handling Units in “C” Penthouse

Photo #5 Z-Duct Heat Recovery Unit With Electric Defrost

Photo #6 Typical Classroom Unit Ventilator

SITE/CIVIL							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
VEHICLE & PEDESTRIAN CIRCULATION							
Pavement cracks	Pavement is in poor condition overall. The district will need to plan on reconstructing paved surfaces on this site.	Clean and fill cracks in asphalt driveways and sidewalks. Sealcoat all asphalt surfaces. Some areas of pavement are too deteriorated to repair and this measure is a temporary solution to help prolong pavement life before it can be reconstructed.	3	1986 (unsure if there have been any overlays)	<2 years	20	$12,000
Pavement and base gravels	As noted above, the asphalt surfaces on this site are in poor condition.	Remove pavement and base gravels. Place new gravels and asphalt. A project of this scope will present an opportunity to construct sidewalks and ramps that comply with ADA standards.	3	1986 (unsure if there have been any overlays)	2-5 years	20	$175,000
Accessible parking space signage and layout	Every space requires signage complying with Americans with Disabilities Act (ADA) standards. Spaces must be adjacent to an access aisle.	Install proper signage at each space reserved for accessible parking. Ensure one is designated as a van accessible space. Restripe the lots so all spaces are laid out properly with correct dimensions and access aisles.	2	1986	<2 years		$15,000
Sidewalks at exterior doors	Many of the sidewalks leading to and from egress and ingress doors are steeper than what is permitted by ADA and none have handrails.	Install handrails to more closely comply with ADA standards. Full compliance cannot occur without reconstructing the sidewalks to reduce their overall slope (the best time to do this would be in conjunction with a pavement reconstruction project across the entire site).	2,3	1986 (unsure if there have been any overlays)	<2 years	20	$10,000
Handrails at door 15D	Railings are showing corrosion and are not compliant with ADA regulations.	Replace the railings at door 15D.	2	1986	2-5 years		$10,500
Sidewalk along entrance drive from McElwain Dr.	The asphalt walking surface and the bituminous curb is in poor condition. There is no ADA compliant tip down at its end where pedestrians cross over to the school.	Reconstruct +/-300 lf of sidewalk and bituminous curb.	2,3	1986(?)	2-5 years	20	$15,000

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Edge of pavement abutting sloping lawn between parking lots	The upper parking lot (and the edge of the bus loop driveway) abut a sloping grass surface leading to asphalt surfaces at a lower elevation and there are no barriers to stop vehicles from driving over the edge of the slope.	Install +/- 500 lf of guardrail or similar barrier to prevent vehicles from accidentally driving off the edge of pavement onto the lower tier adjacent to the sloping surfaces between the driveway/parking lot.	3	1986	>5 years	20 years	$30,000
Concrete retaining wall at loading dock	The pavement is very steep at the end of the retaining wall, creating a hazardous driving/walking condition.	Extend retaining wall out further to reduce extreme change in elevation at its end.	2,3	1986	>5 years	20 years	$8,500
SITE DRAINAGE							
Sloping grassed surfaces between parking lots and at the detention basin adjacent to the parking lots.	Grass cover very sparse and soil surfaces are eroding.	Reloam and seed sloping landscaped areas between parking lots and in the detention basin. Place erosion control matting on all surfaces steeper than 3 horizontal to 1 vertical (3:1).	3		<2 years		$5,000
Pea stone ground cover at pavement edges.	In multiple locations pea stone has been placed adjacent to hardscaped surfaces to try and reduce erosion. It is too small to remain in place during heavy rain events.	Replace pea stone with a heavier stone material (i.e. NHDOT Class C Stone) or establish dense vegetation.	3		2-5 years		$7,500
Catch basin with deteriorating cone section	On the north side of the building, a catch basin has a cone section that is deteriorating.	Replace the cone section at the catch basin.	3	1986 (?)	>5 years	30	$1,500
Vegetated swale at northeast corner of the site	Swale has filled in with sediment over time and has minimal definition/capacity.	Regrade the swale to collect runoff from the driveway and the grass slope on its east side. Ensure it flows to catch basin at northeast corner.	3		>5 years		$1,000
Catch basin at loading dock	Before it was replaced, the structure was severely corroded.	Install a HDPE liner to direct salt-laden runoff to the sump, not the sidewall.	3	1986	>5 years	30	$1,000
Corrugated metal pipe culvert at catch basin south of loading dock.	There are gaps around the pipe perimeter where it intersects the catch basin sidewall.	Install mortar around the pipe to create a watertight seal at the joint.	3	1986	2-5 years	20-30	$500
Grass lawn adjacent to the driveway slopes toward the school on its south side.	Sloping terrain creates an opportunity for runoff and snowmelt to infiltrate the school.	Install a stone-lined trench with a perforated pipe along the perimeter of the school on its south side. Direct the pipe to an existing catch basin or to daylight.	3		>5 years		$8,500

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Maintenance and inspection of drainage measures	Regular inspection and maintenance (pavement sweeping, swale maintenance, catch basin cleaning….) can help prevent flooding and other drainage problems.	Develop a stormwater inspection and maintenance plan, specifying specific inspection tasks and items to review, frequency, and preventive/corrective measures (if the District does not already have one)	3		<2 years		$2,000
LANDSCAPING							
Grass covered surfaces	In many locations the vegetative cover is sparse.	Reseed those areas of the site that should be grass-covered and display poor coverage. Obtain soil assessments first to identify any deficiencies and to customize a fertilizer specification	3		2-5 years		$5,000
Erosion at edges of pavement	In multiple locations where runoff flows off the edge of pavement to abutting gravels, the ground is eroded and the pavement is undermined	Place compacted crushed gravel at pavement edges across the site where erosion is a problem.	3		<2 years		$2,500
SEPTIC SYSTEM							
Septic tanks	Access hatch covers do not sit securely in their frames and sediment spills through the gap and onto/into the septic tank below.	Replace the access frames and covers. Remove sediments from the top of the septic tanks so it doesn't spill into tank. Install concrete access covers at the openings cored in the tanks	3	1986	<2 years	30 years	$15,000
Pump station hatch	Does not have secondary fall protection. No warning label. Does not appear to be watertight.	Replace pump station hatch with one that is watertight. Provide secondary fall protection and proper signage warning of a hazardous environment	2	1986	2-5 years	30 years	$10,000
Pump guide rails and lifting chains	Existing guide rails have corroded beyond the point of being usable. Lifting chains are corroding.	Replace guide rails and lifting chains with stainless steel components.	2	1986	2-5 years	30 years	$10,000
Pump station vent	Vertical exposed portion is loose and appears to be broken at its bend below grade.	Replace broken component of vent pipe so it is securely connected to the underground portion of the pipe.	2	1986	<2 years	30 years	$500
Primary distribution box-east end of field	The concrete structure is not wrapped in a separation fabric, like the other distribution boxes. Soil is seeping into the box through the joints around the cover.	Place a geotextile separation fabric over the entire top of the distribution box and wrap the edges a minimum of 6-inches down each side.	3	1986	<2 years	30 years	$500

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Grass cover at the leach fields	Grass cover is very sparse- primary vegetation is weeds and moss.	Aerate and reseed the leach fields. Maintain a dense stand of grass over the top of the fields. Perform a soil analysis to customize a fertilizer program specific to the needs of these areas.	3	1986	<2 years	30 years	$2,000
Control panel and alarms	Pump station control panel and the alarms are located inside the school.	Consider relocating the control panel and the alarms to an exterior location with a line of sight to the pump station wet well and so the alarms are highly visible.	2	1986 (?)	2-5 years	20 years	$10,500
MISCELLANEOUS							
Dumpsters	Dumpsters at the site are set on asphalt or grassed surfaces. The approaches to the dumpsters are asphalt.	Install concrete pads on which to set the dumpsters and include concrete approach slabs. Consider installing an opaque enclosure to provide visual screening and containment for spilled debris.	3		>5 years		$12,000
Loading dock- guardrails	At one time the loading dock had guardrails, as evidenced by the plugged holes at the edge of the concrete pad.	The loading dock presents a fall hazard. Install new guardrails along the edge of the loading dock, that can be opened or temporarily removed to receive deliveries.	3	1986	<2 years	20 years	$3,000
Metal handrails and guardrails.	Exposed metal elements show minor corrosion.	Sand, prime, and paint exterior metal railings.	3	1986	2-5 years	20 years	$2,500
Access to oil storage tank	One frame and cover is partially exposed with some erosion around the frame.	Place loam and seed around the exposed side of the cover so the cover is flush with grade.	3	1986	<2 years		$500
Audible overfill alarm- underground storage tank	There is no audible overfill alarm	Install an audible overfill alarm in close proximity to the fill valve at the underground oil storage tank.	3		<2 years		$2,000
SUB-TOTAL							**$379,000**

ARCHITECTURAL							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Roofing							
	Existing EPDM roofing is in good overall condition.	1987 EPDM membrane is coming to the end of its useful life	3	1987	3	30	$754,320
	Existing EPDM roofing is in good overall condition.	1997 EPDM membrane is coming to the end of its useful life	3	1997	10	30	
	Some of the EPDM roof seams have come up.	Reseaming the roof is recommended	3	1987/1997	1	10	$10,000
Skylights	Existing skylight polycarbonate is cracking.	Replace the existing skylights	3	1987	4	30	$70,000
Windows							
	Existing windows are in good overall condition.	Sealant around the windows should be replaced every 10-15 years	3		4 to 6	10	
Doors							
	Existing doors are in good overall condition.	Some door frames have started to rust. Scrap and paint the door frames.	3	1987/1997	1	10	$4,500
Brick Veneer	Vertical joint sealants in good condition.	Sealants at vertical joints should be replaced every 10-15 years	3		4 to 6	10	$15,000
Window Sills	Lobby sills need replacement	Replace sills	3	1987	0	25	$1,500
Windows	2 pane thermal sills broken	Replace window panes	3	1987	0	20	$1,500
Toilet Stalls	Make Stalls ADA compliant	Replace partition portion	3	Unknown	1	25	$5,000
Unit Kitchens	Office & Nurse Unit Kitchen non-functional	Replace with casework	3	1973	0	20	$5,000

COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Locker Room Flooring	Seamless flooring spalling	Replace seamless flooring	3	1987	0	30	$12,000
SUB-TOTAL							$878,820

MECHANICAL & PLUMBING							
COMPONENT	OBSERVATION	RECOMMENDATION	1-LifeSafety 2-BldgCode 3-Maint	YEAR INSTALLED	REMAINING USEFUL LIFE (Years)	TYPICAL USEFUL LIFE (Years)	OPINION OF COST FOR REPLACEMENT
Automatic Temperature Controls	The pneumatic temperature controls no longer function and are wasting heat and energy.	Replace the temperature controls with a modern electronic system	3	1987	0	15	$400,000.00
Air Handling Systems	The central air handling systems have reached the end of their useful life. Many issues were noted with condition and function of components	Replace the air handling systems with new systems that are easily accessible for maintenance	3	1987	0	25	$360,000
Heat Exchangers	The heat exchangers that were installed with the original air handling equipment have never had filters installed and have reached the end of their useful life	Replace the air-to-air heat echangers with modern energy recovery equipment. Reconfigure mechanical equipment so that it can be maintained properly, thus prolonging the life of the equipment.	3	1987	0	25	$180,000
Unit Ventilators	The unit ventilators in the addition have reached the end of their useful life	Replace the unit ventilators with equipment that meets current NH classroom acoustic requirements	2,3	1997	0	20	$120,000
Heating Pumps	The heating pumps have reached the end of their useful life.	Replace the existing heating pumps and provide variable frequency drives for more efficient operation.	3	1987	0	25	$80,000
Boilers	The cast iron sectional boilers installed during the original construction have reached the end of their useful life	Replace the boilers with new equipment.	3	1987	0	30	$100,000
Exhaust Fans	The existing exhaust fans have reached the end of their useful life. Kitchen exhaust equipment does not meet current code.	Replace exhaust systems.	3	1987	0	25	$90,000

Classroom Reheat Coils	Some debris was observed on the reheat coils that we observed. Excess debris will impact the delivery of ventilation air to the classroom spaces.	Clean the surface of the reheat coils. Install access doors where needed to provide contuned access to the coils for maintenance.	3	1987	-	-	$35,000
SUB-TOTAL							**$1,365,000**

ELECTRICAL								
COMPONENT	**OBSERVATION**	**RECOMMENDATION**	**1-LifeSafety 2-BldgCode 3-Maint**	**YEAR INSTALLED**	**REMAINING USEFUL LIFE (Years)**	**TYPICAL USEFUL LIFE (Years)**	**OPINION OF COST FOR REPLACEMENT**	
Service Equipment	700 Amp 480 volt Square D Distribution Switchboard	Provide yearly maintenance, torqueing lugs and circuit breakers.	3	1998	17	35	$1,000	*per year*
		Provide hi-potential testing every 5 years.					$5,000	*per year*
		Replace in 17 years.					$15,000	
Panelboards	Square D panelboards installed during 1998 addition are in good condition	Replace in 17 years.	3	1998	17	35	$10,000	
	Square D panels from original construction are approaching their expected life.	Replace in 3-4 years.	3	1988	3-4	35	$10,000	
Dry-Type Transformers	Square D transformers are in good working condition. One transformer has dented top.	Replace in 17 years.	3	1998	17	35	$15,000	
Exterior Lighting	Ceiling decorative fixtures under canopy, acrylic lenses mini-wall packs. Fixtures are showing their age.	Fixtures should be replaced with LED versions.	3	1988	0	20	$5,000	
Speaker/Clock System	Simplex Time Control center in good working condition.	No work or maintenance needed at this time. Replace in 18 years.	3	2014	18	22	$137,000	
Emergency Lighting	Self-contained dual heads, wallmounted; tested yearly, in good working condition.	Continue to test the units and replace, as needed.	1,3	1998	1-3	20	$250	*each*
Fire Alarm System	Firelite Alarm by Hooneywell, MS-9200UDLS, ACC-2550 audio command center, voice evacuation, addressable coverage meets NFPA, ADA; system reportedly working properly.	System devices such as smoke detectors should start to be replaced.	1,2	2007	12-15	25	$93,000	
Interior Lighting	Fixtures are from the original construction (1988). Fluorescent fixtures include 2'x4' lensed troffers, 4' and 8' industrials, surface arcylic wraparounds, 4-lamp T-5 gym fixtures.	Replace fixtures with LED energy-efficient fixtures; ballasts have already begun to fail; fixtures have surpassed their expected life.	3	1988	0-1	25	$251,000	
SUB-TOTAL							**$177,250**	

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Original 1930's School House

A subsequent detailed review of the original school house was performed. The building is a two story brick load bearing structure concrete floors and metal joist framing. The first level of the building is approximately 2'-0" lower than the adjacent elementary school wing. The second level is approximately 7'-2" above the adjacent elementary school wing.

The building does not have an operational ventilation system and the heating system appear to be beyond its service life. Staff has noted that the lower level has flooded in the past. There is evidence of water vapor intrusion in the lower level. The site has a high water table which would not allow for the installation of a foundation drain.

The first level holds two small original classrooms, a single restroom, and utility areas. A portion of the lower level is presently holding the janitorial storage area for the elementary school. The second level holds two original classrooms of approximately 560 SF each, three restrooms, and a small office.

With the smaller classroom sizes and difference in floor levels the use of the building as teaching space is limited. The existing classrooms do not meet state standards for classroom size. The area floor levels do not have to be accessible if the service being provided in the building can be provided in another location in the building for students that can't ascend the stairs. Due to the past flooding and present use of the lower level we would not recommend occupancy on that level.

The only recommended use for the second floor would be as an office space for different teaching staff or as a tutoring space. However, we would not recommend this be undertaken without a full renovation of the floor level and the lower level portion leading to the stair. A means of reducing the vapor intrusion to the second floor would be recommended.

Past suggestions of creating one large space on level with the adjacent elementary school wing are not feasible due to the existing construction of the building, with the removal of the second level structure becoming detrimental to the rest of the existing structure.

ORIGINAL BUILDING

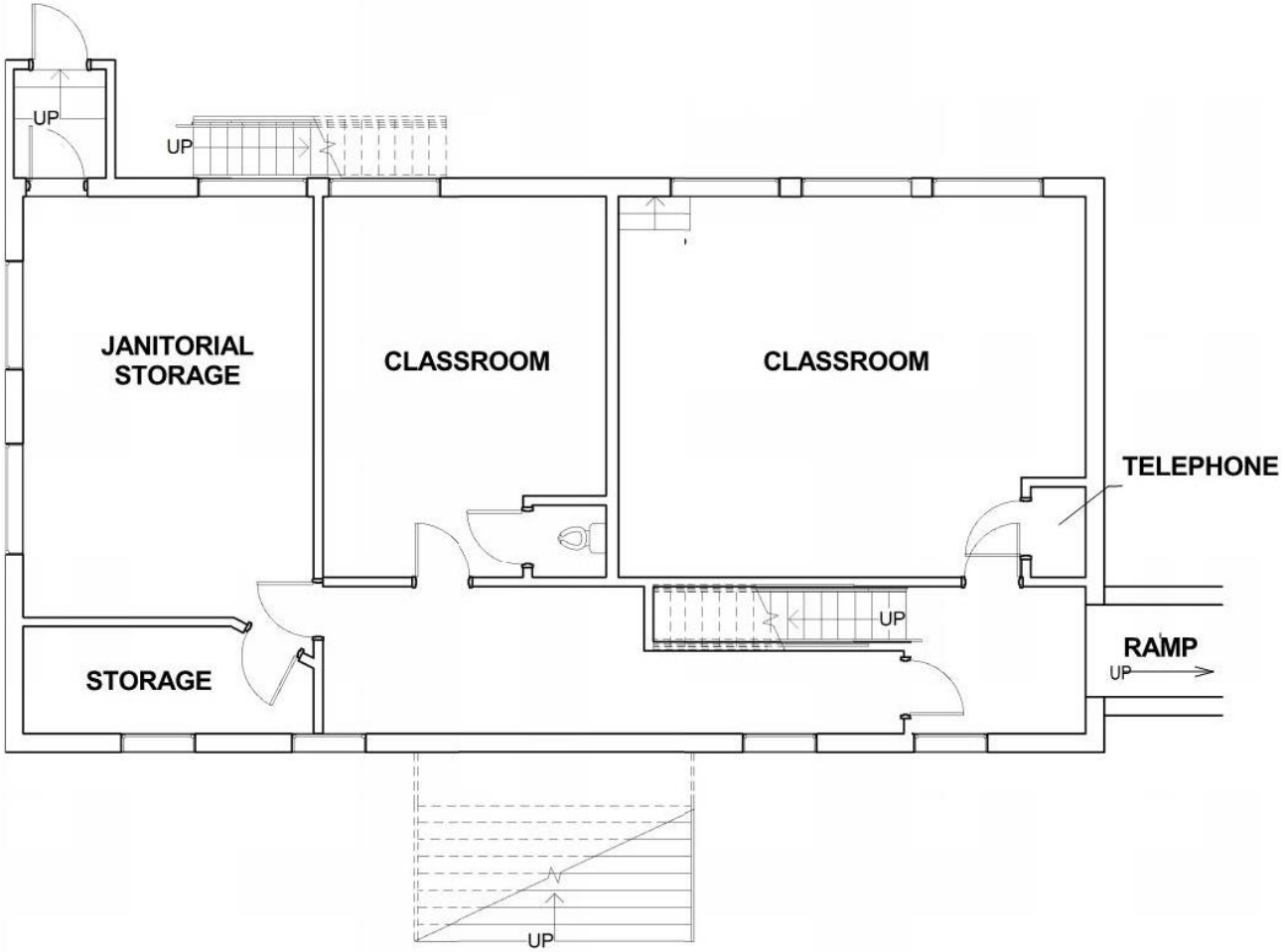
Review for Occupation

1. Floor level changes
2. Building Structure
3. Lack of proper ventilation system
4. Heating replacement
5. Past flooding
6. Vapor Intrusion
7. Custodial Storage
8. Classrooms undersized
9. Accessibility

10. Proposed Office Use

ORIGINAL BUILDING

EXISTING LOWER LEVEL



Lower Level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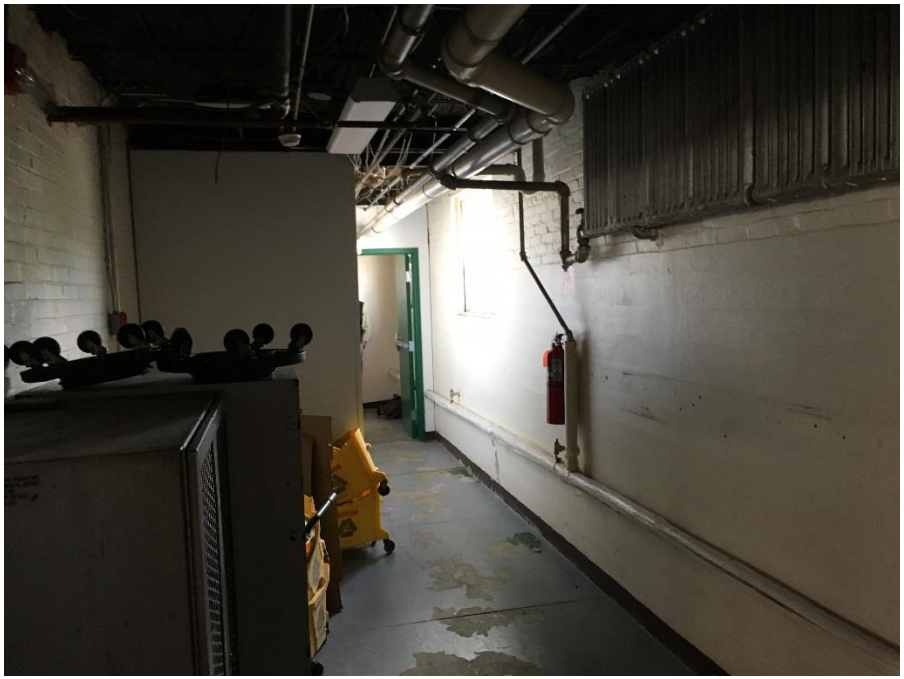
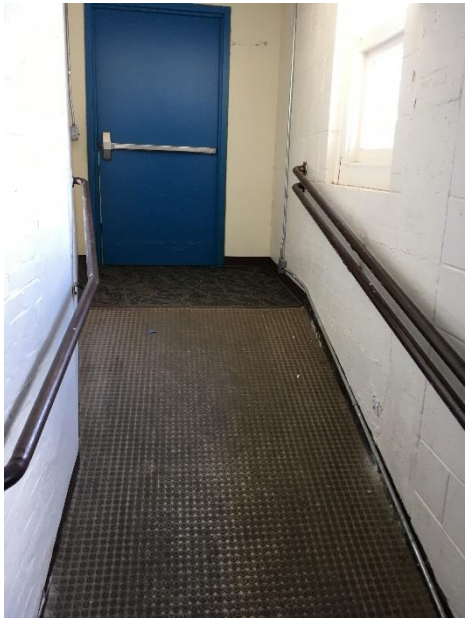
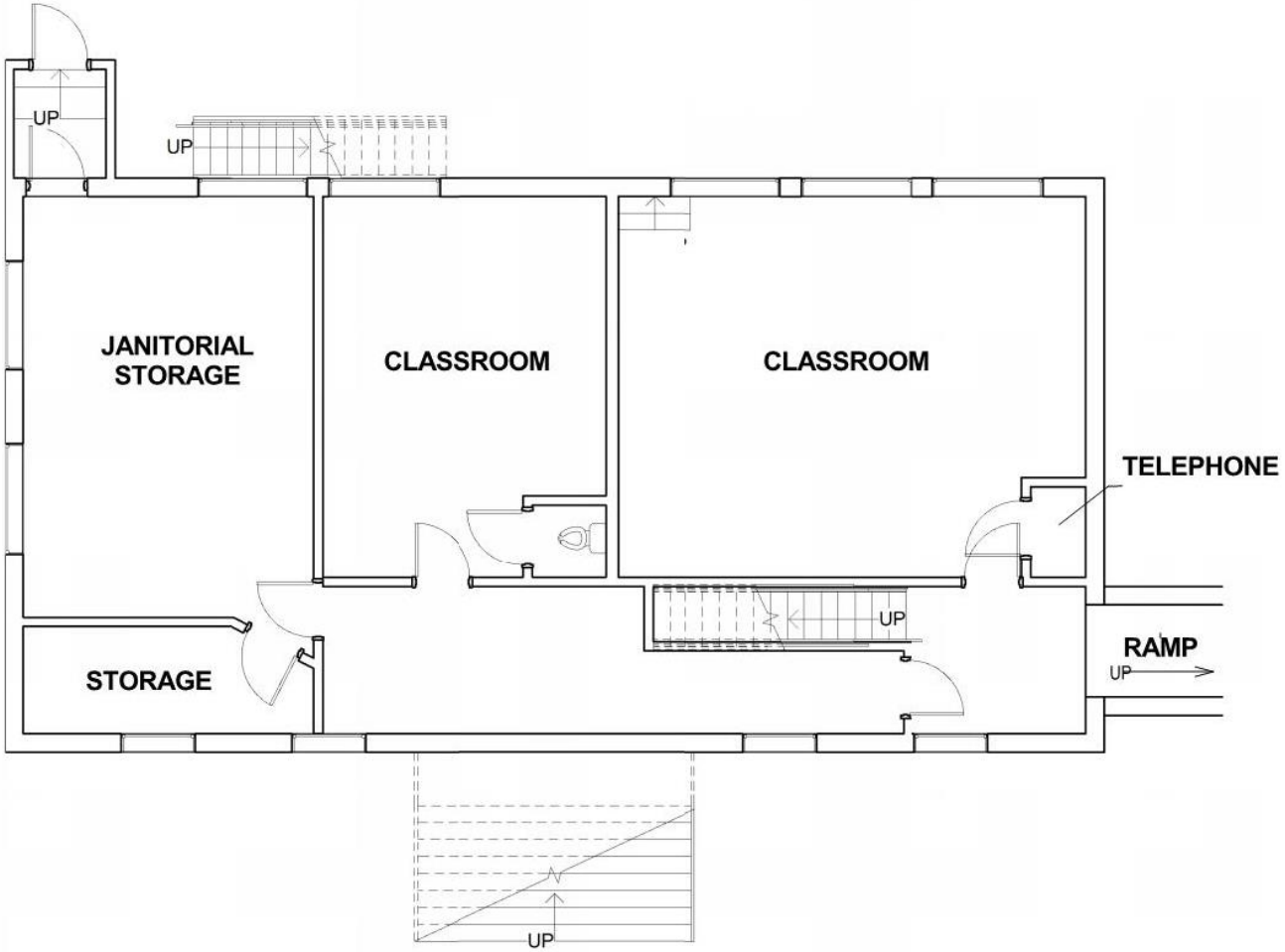
09990 02
09765 00
09736 01



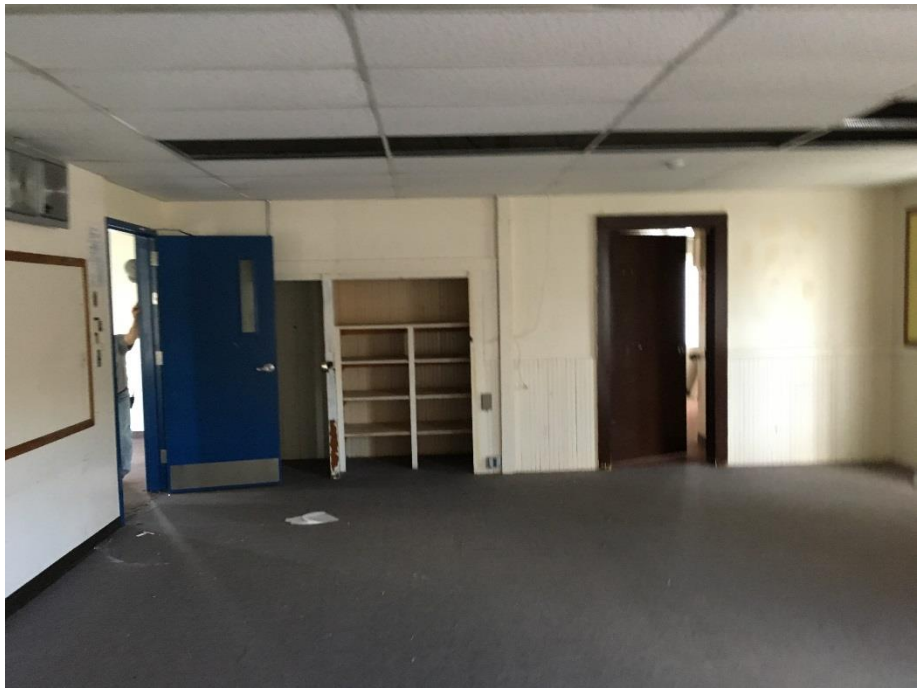


ORIGINAL BUILDING

EXISTING FIRST LEVEL



First Level



ORIGINAL BUILDING

PROPOSED FIRST LEVEL