SPRING HILL ELEMENTARY SCHOOL

Summary of Findings

Report Card

ITEM	EXISTING CONDITION	L1	L2	L3	COMMENTS
SITE & GROUNDS	A-	X			Minor fence repairs; playground equipment maintenance; exterior guard at retaining wall
STRUCTURAL (foundation, floors, walls, framing)	A-	X			Good condition, minor masonry cracks
LIFE SAFETY	B	X			Eliminate storage in corridors & stairway enclosures
ACCESSIBILITY	B		X		Eliminate vertical steps; fine tune bathrooms
HAZARDOUS MATERIALS	--	--	--	--	None observed
BUILDING ENVELOPE	B	X			Replace original joint sealants at original wings; paint select exterior doors; fix masonry cracks
INTERIOR FINISHES	B-	X			Sagging ceiling tiles; areas with original carpet; areas with open VCT seams, casework/countertops deteriorating
SIGNAGE	B		X		Interior signs replaced meet Accessibility requirements
OVERALL CLEANLINESS	B	X			Continue routine maintenance
SECURITY					
BUILDING SYSTEMS (MEP)	B	X			Secure vestibules with camera; exterior lighting; room number decals on windows and entries; controlled entries

Existing Condition Codes

A Excellent: Clean, safe, functional. New or easily restorable to "like new" only minimal routine maintenance.
B Good: Only routine maintenance or minor repair required.
C Adequate: Some preventive maintenance and/or corrective repair required.
D Fair: Fails to meet code and functional requirement in some cases; extensive repair required.
F Poor: Non-operational; major corrective repair or overhaul required.

Renovation Codes

Level 1 Functional and in good repair with only minimal routine maintenance required.
Level 2 Some maintenance and/or corrective repair required.
Level 3 Fails to meet code and/or functional requirements; extensive repair or replacement required.
--- Not Applicable



Spring Hill Elementary School – Site Aerial



Spring Hill Elementary School – Floor Plan Diagram

Site & Grounds

General | Spring Hill Elementary School was constructed in 1991, with a classroom addition in 2010. Modular classrooms were added in 2012.

Entry Drive | The school is in a neighborhood setting. Its location creates an opportunity to develop walking or biking routes, though nearby neighborhood walks are not developed. Fencing and raised sidewalk separates drop off lane from parking lot. Each building entry point is marked with a striped cross walk.

Drop Off, Walks | Sidewalks have a few cracks needing repair, mainly near railing post penetrations.

Adjacent Buildings or Properties | No issues observed.

Site Topography | The building is set into a hill and has two levels, both with at grade access. Retaining walls facilitate the grade change between each level. Retaining walls are in good condition. Stormwater appears to be draining away from the building; drainage at the lower playgrounds washes wood chips off the playground area.

Landscaping | Landscaping at building front is in good condition. At several locations along the building perimeter, turf grass leads right up to building edge without mowing strip (flat roofed building). This is a difficult condition to maintain and may result in moisture wicking up into the masonry walls. Consider mulch bed or edging material to ease maintenance.

Railings | Generally, railings are in good condition. Some concrete spalling is occurring at the vertical pipe penetrations, which should be repaired. Other observations:

- Near Entry 15, railing adjacent to retaining wall is 35-1/2” high (not a guard rail); grade drop does not occur for approximately 5 feet. At nearby stair, top and bottom handrail extensions are absent.

- Near Entry 11, railing immediately adjacent to retaining wall and grade drop is only 36” high. This should be replaced with a 42” high guard rail and have infill panels to limit passage of a 4” sphere due to the adjacent grade drop that exceeds 30 inches vertically.

- Near Entry 1, opposite the drop off lane, top and bottom stair handrail extensions are absent.

Paving & Parking | Paving is in average condition with cracks, weeds, and worn seal coating in some areas. Continue with periodic maintenance and resealing.

Site Lighting | Building mounted and parking lot light poles in good condition.

Sign | Ground mounted sign with electronic display at main entry drive in good condition. Cast letters mounted to the building are also in good condition.

Utilities | Emergency generator, transformers, and gas meter are protected by fencing (barbed wire around electrical). Dumpsters are separated with fenced enclosure and locking gate.

Building Envelope

Roof | The main roof covering is adhered membrane (EPDM), with small areas of sloped, standing seam metal. Some leaking was noted adjacent to a mechanical mezzanine. A review during a warmer season is advisable. No issues with flashing or fascia were observed.

Exterior Walls | Exterior masonry is in reasonable condition but a mason should e engaged to review select tuckpointing, grout / sealant filling, and masonry repair. Discoloring at concrete block should be investigated by the mason.

Foundation | No issues observed (frost wall; slab on grade).

Entrances/Doors | Exterior aluminum doors and frames are in good condition. Replace weather stripping on all exterior doors in the next 3-5 years.

Windows | Windows are in good condition. Sealants at north wing are nearing the end of their life and should be replaced soon. Surface corrosion has worsened on exterior steel lintels – strip and refinish.

Sealants | It is evident that some sealant work has been done; specifically at areas of cracked masonry and settlement. Sealant replacement should be considered at worn/weathered window perimeters, door perimeters, penetrations, transitions between materials, and movement joints.

Building Interior

Life Safety & Accessibility

Corridors | General observations:

- Doors to classrooms are not rated, have unlabeled glass and unprotected louvers. Code requirements for corridor fire ratings in Group “E” Education Occupancies have become more stringent in recent years (typically 1-hour rated in non-sprinklered “E” Occupancy). Extent of code required upgrades would need to be reviewed under any remodeling scenarios.

Egress | Exit stairs and corridors are being used for storage of furnishings and equipment. While it doesn’t appear to encroach on the clear egress width, these items should be removed.

Security | Improved security at entry vestibule, upgraded reception casework and carpet tile finish

Exit Discharge | Exits generally appear to be adequate, with at grade discharge points leading to playgrounds or parking lots. At Entry, a vertical step has developed between concrete stoops and asphalt. Repair to restore Accessible route and eliminate tripping hazard.

Egress Illumination | Did not observe fire alarm strobes or emergency egress illumination in the 1991 portion of the building. Presuming this complied with the code in effect at the time of construction. Current code requires battery operated egress lights along exit routes and at exterior doors. Extent of code required upgrades would need to be reviewed under any remodeling scenarios.

Emergency Access | Fire Department Knox Box and call button is located at Entry 1. All entries and classrooms have large decal numbers on the outside of the building for safety.

Fire alarm and pulls are present at points of exit discharge.

Fire Extinguishers | Fire extinguishers are mounted too high for current Accessibility code (typically greater than 50 inches above the floor). As reach ranges have become more stringent in the current code, presumption is that these complied with the code in effect at the time of construction.

Accessibility issues include:

- Restrooms do not meet all Accessibility requirements (typical issues include maneuvering clearances, stall dimensions, no lavatory pipe protection, mirrors mounted too high).
- Staff casework at 36” height (Accessibility requirements are 34” height).
- Vertical edges on the accessible route and at exit discharge.

Sanitary fixtures | Assuming the sanitary fixture count complied with the code in effect at the time of construction, the chart below shows the occupant load supported by today’s code standards. While not retroactive, any significant alteration or occupant load increase of more than 20 percent would trigger current code requirements.

FIXTURE	FACTOR	BOYS	MEN (STAFF)	GIRLS	WOMEN (STAFF)	SUPPORTED OCCUPANT LOAD (Per IBC 2009)
Water Closet	1:50	12		29	1	1,500 M | 1,450 W
Urinal	2/3	18				Incl above
Lavatory	1:50	19		20	1	950 M | 1,000 W
Drinking Fountain	1:100	--	--	--	--	Not tallied
Showers	---	10		10	--	
Service Sink(s)	1	---	---	---	---	More than 1 service sink

Finishes

General | Finishes are in good condition, with the following items observed:

- A fresh coat of paint was applied throughout the facility March 2020
- Toilet compartments in select restroom shave been replaced with HDPE (solid plastic)
- Accessible interior signage has been installed throughout the facility.

- VCT floor finish was removed a the main entry and commons and replaced with polished concrete floor finish

- The gym floor is slippery and past its useful life and needs replacement.

- 2 new slides were installed at the playground in 2020

- Showers off gymnasium are not used; maintenance has issues with operation and obtaining parts.

- 2 x 4 ceiling tiles are sagging in nearly all spaces. Consider replacement with 2 x 2 acoustical ceiling system.

- Suspended ceiling and grid in Kiln room 117A (off Art Classroom 117) is highly discolored from heat. Verify proper operation of ventilation system. Replace suspended ceiling system.

- CMU is generally in very good condition. Minor cracks throughout facility, including W128, 123, W112, W108, N106.

- VCT flooring is generally in average condition with areas where seams have opened up cracks have emerged. and furnishings have discolored tiles.

- Wall base is generally in good condition (primarily vinyl with sanitary coved ceramic tile in restrooms). A few areas need routine repairs and maintenance.

- Doors are a combination of painted hollow metal and solid core wood. Doors have numerous sizeable chips, hollow metal frames are heavily to moderately chipped. Specific observations:

    - Storage W128 (Gym Storage) door is sticking; needs repair. Horizontal crack in CMU needs repair.

    - At PE Storage W127, doors and frames are worn; need maintenance or protection plates.

- Metal toilet partitions in gym locker rooms and near classroom restrooms are generally in below average condition and will need replacement in the next 5 years (issues include corrosion, missing latches, and bent panels).

- Casework height varies depending on the age group served; some mismatches have developed over time between current classroom assignments and height of casework.

- Terrazzo is worn and discolored at cafeteria restroom wash fountains.

Entry with upgraded security



Spring H 1

Entry drive - paving in average condition



Spring H 2

From 2015 report - Exterior stair handrail not code compliant



Spring H 3

Window sill sealants cracked and mortar cracks



Spring H 4

Discolored masonry in numerous areas



Spring H 5

Cracked mortar joints in need of repair



Spring H 6

Trip hazard at entry



Spring H 7

Deteriorated window sill joint



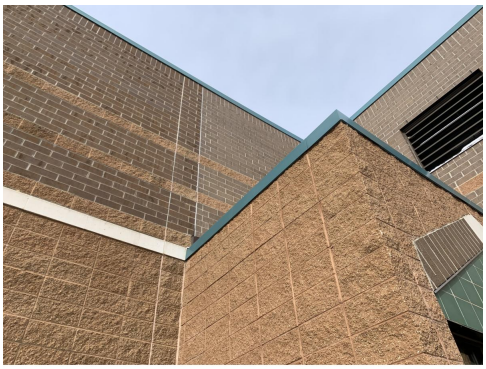
Spring H 8

Open joint in masonry



Spring H 9

Reseal worn expansion joint



Spring H 10

Open joint in deteriorated masonry joint



Spring H 11

Discolored masonry and worn tile



Spring H 12

Rusty steel lintel - strip, treat, and refinish



Spring H 13

Considerable cracking through face brick - cracking is not limited to joints but through brick itself - consider evaluating settlement issues



Spring H 14

Safety hazard as retaining wall should have guardrail - a higher rail



Spring H 15

Most lintels above windows show rust - strip, treat, and refinish



Spring H 16

Broken masonry needing repair



Spring H 17

Interior indication of building settlement - this is found within upper mechanical mezzanine



Spring H 18

Outside mezzanine some repair work has been done - recommend evaluating when weather permits and offers better view



Spring H 19

Overhead door needs refinishing - both rusting and need stripping and refinishing



Spring H 20

Trip hazard at entry



Spring H 21

Damaged keystone avove entry



Spring H 22

Stained and sagging ceiling tiles are typical



Spring H 23

Damaged VCT flooring



Spring H 24

Damaged and aged door



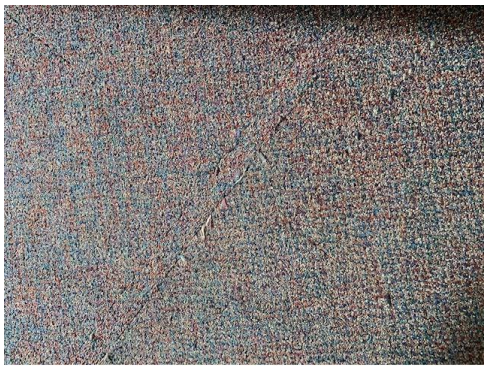
Spring H 25

Aged and sagging ceiling tiles



Spring H 26

Carpet is worn and seams are loose



Spring H 27

Ceiling tile chipped and sagging



Spring H 28

Hole in gymnasium matting



Spring H 29

Damaged and torn



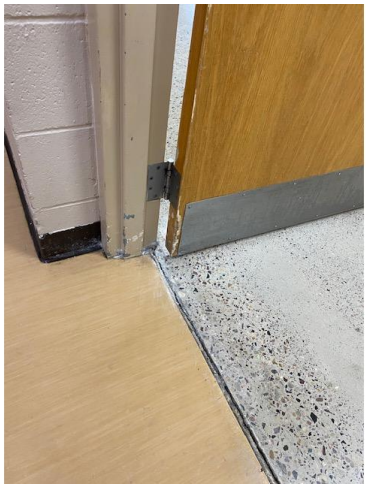
Spring H 30

Damaged fire extinguisher cabinet mounted above code required reach range



Spring H 31

Floor transition and door frame worn and damaged



Spring H 32

Damaged panic hardware at Gym



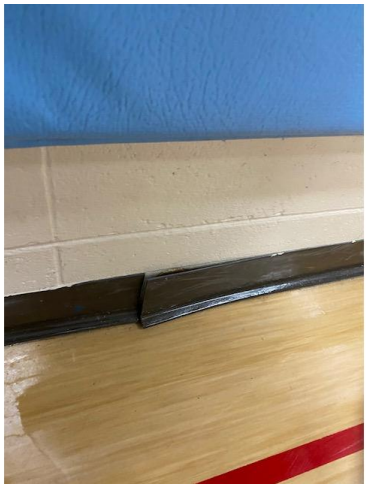
Spring H 33

Damaged door closer at Gym



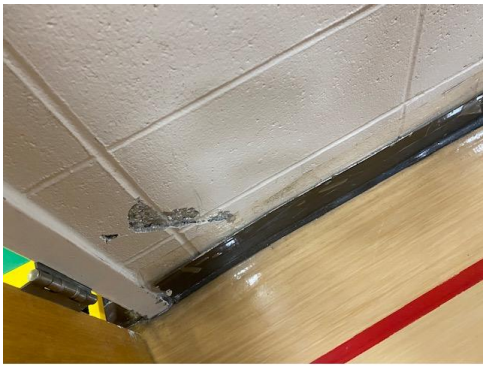
Spring H 34

Wall base pealing away from wall at Gym



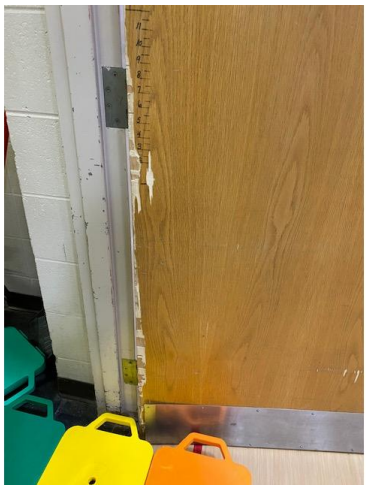
Spring H 35

Masonry is damaged within Gym



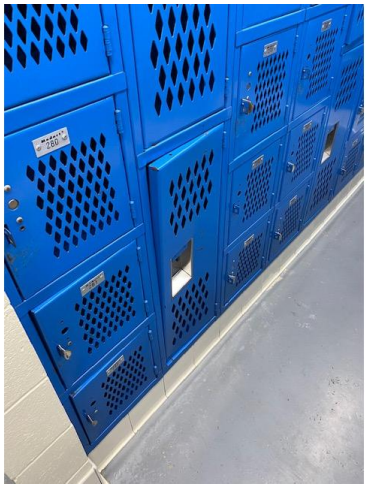
Spring H 36

Damaged wood door at Gym



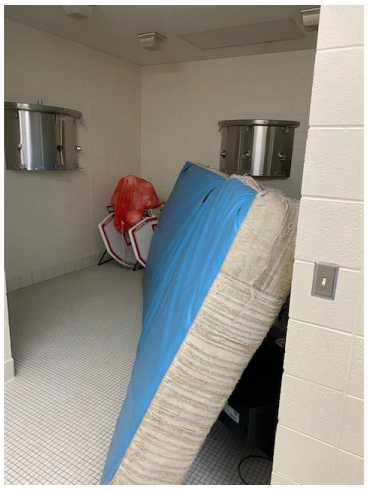
Spring H 37

Lockers are bent and damaged



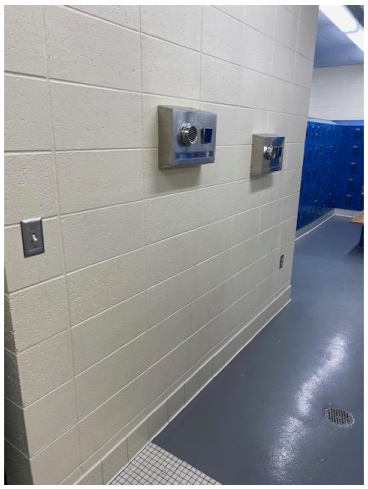
Spring H 38

Showers off gym are unused; current shower fixtures do not function and maintenance cannot obtain parts



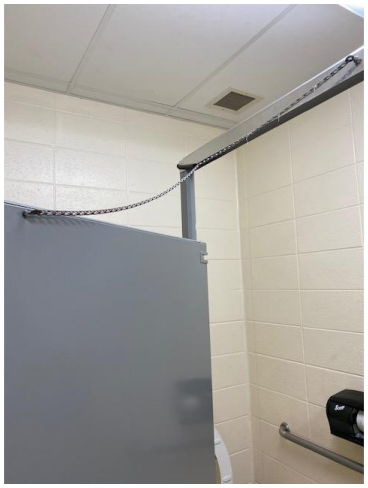
Spring H 39

Damaged air dryer in locker room off gym



Spring H 40

Toilet room partition improvised support system in locker room off gym



Spring H 41

Damaged Exit sign in locker room off gym



Spring H 42

Damaged exit sign in locker room off gym



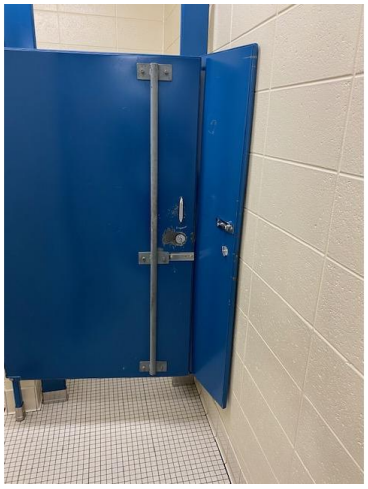
Spring H 43

Damaged wall base tile in locker room off gym



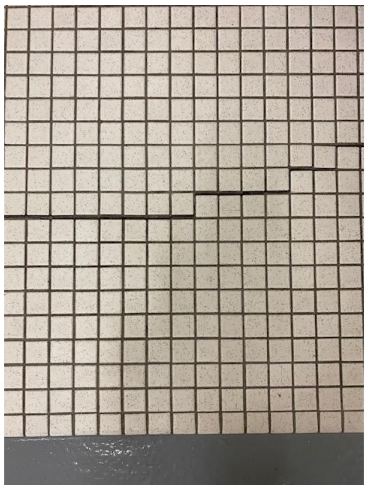
Spring H 44

Improvised door support in locker room off gym



Spring H 45

Floor tile cracking and separating in locker room off gym



Spring H 46

Carpet seams separating



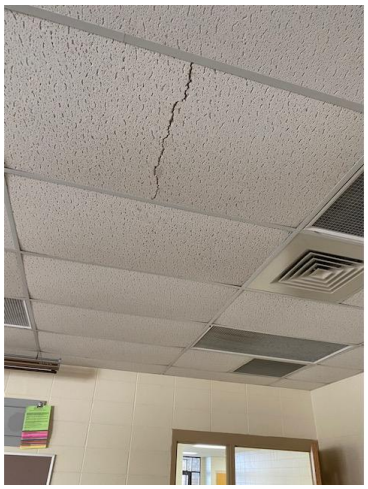
Spring H 47

Typical dated casework



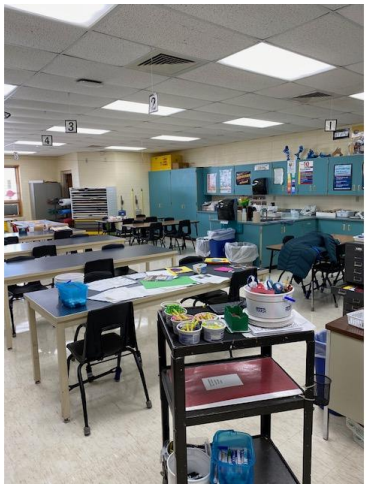
Spring H 48

Broken and sagging ceiling tiles



Spring H 49

Typical classroom - worn floor tiles, sagging ceiling tiles



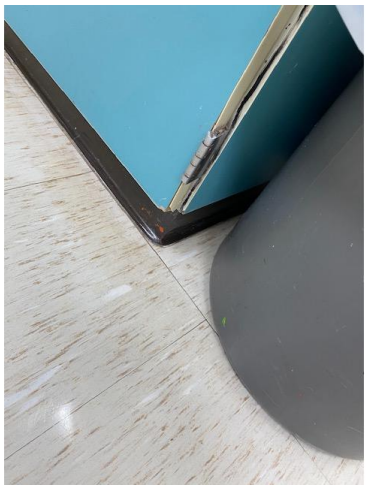
Spring H 50

Typical corridor to classroom condition - worn door frame and damaged door



Spring H 51

Damaged cabinet jamb (typical in classrooms)



Spring H 52

Damaged and worn cabinetry (typical on classrooms)



Spring H 53

Worn and cracking floor tile



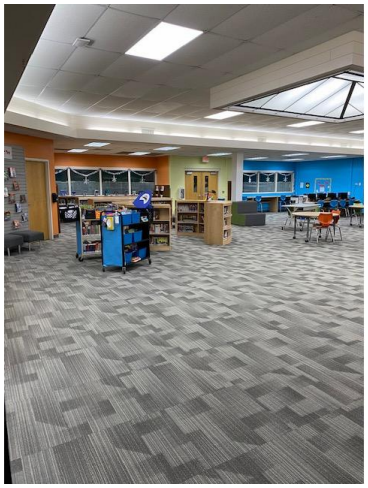
Spring H 54

Worn finish where water runs in terrazo lavatories



Spring H 55

Media Center with new carpet, wall base, and paint (sagging ceiling tiles)



Spring H 56

Stained ceiling tile indicative of roof leak or leak above ceiling



Spring H 57

Damaged floor tile in Corridor



Spring H 58

Damaged floor tile in Corridor



Spring H 59

Lockers are worn and dented



Spring H 60

Floor tile needing replacement



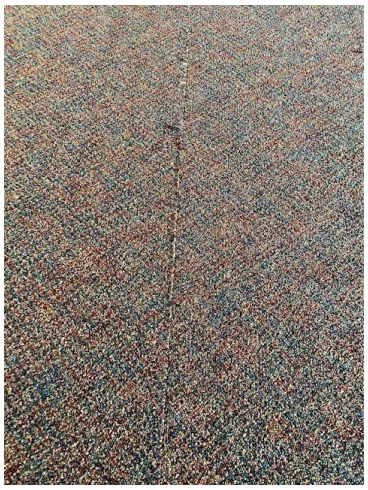
Spring H 61

Worn and rusting lockers



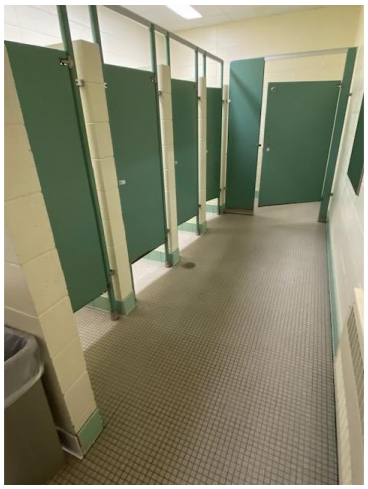
Spring H 62

Carpet seam worn and torn



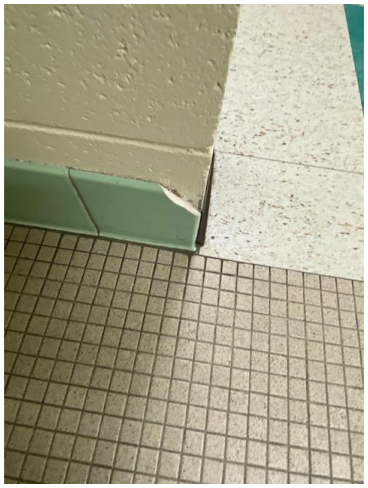
Spring H 63

Student Restroom - rusting metal toilet compartments neeed replacement - suggest fresh coat of paint



Spring H 64

Broken wall tile in Student Restroom



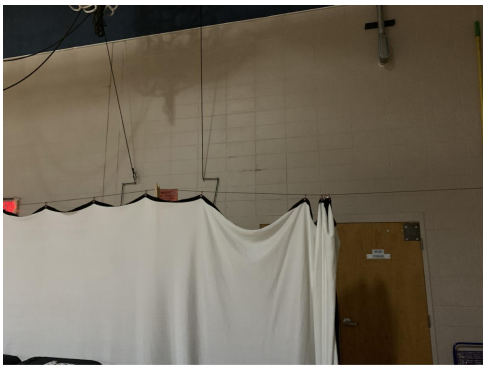
Spring H 65

Broken wall tiles in Student Restroom



Spring H 66

Crack in masonry wall indicative of settlement



Spring H 67

SPRING HILL ELEMENTARY

Building Systems

The following building systems report is the result of a site visit by Jared Ramthun and Neil Gammon of Design Engineers that occurred on January 29, 2021. Site observations and interviews were used in the preparation of this report.

The building does not include a fire suppression system.

Plumbing Systems

Most domestic water piping is original to the building and is generally expected to be in fair condition.

The building does not have a water softener.

Domestic hot water is provided by two systems. The original building utilizes two 55 gallon, 130,000 Btu/h natural gas-fired water heaters that were installed in 2008 and are in fair to good condition. The 2010 addition utilizes a 50 gallon, 4.5 kW electric water heater that is in fair to good condition.

Restroom water closets are wall-hung and urinals are floor-mounted. Both water closets and urinals utilize battery-operated flush valves. A sensor-operated wash fountain is located outside the entrance to sets of restrooms. Single restrooms include wall-hung vitreous china lavatories with sensor faucets.

Classrooms contain stainless steel sinks with manual faucets.

Electric water coolers are located in the corridor and are covered to prevent use due to COVID-19. They appear to be in poor to fair condition.



Fig 1 | Gas-fired Water Heaters


Fig 2 | Urinal (left) and Water Closet (right)


Fig 3 | Wash Fountain

Sanitary for the main level of the building gravity flows to the city sanitary system. The lower level sanitary is routed to a duplex pump sewage ejector and is pumped up into a gravity drained system.

The kitchen waste discharges into an interior grease interceptor, which appears to be in fair condition.

Roof drainage occurs by interior storm piping.

HVAC Systems

The entire building is both heated and cooled.

The heating source for the building is a boiler plant that consists of two 2,650,000 Btu/h output natural gas-fired boilers sized for the full building heating load and that are original to the building and two 414,000 Btu/h output condensing gas-fired boilers that allows for higher efficiency operation for the first stage of heat. The heating hot water piping system is configured as primary/secondary/tertiary pumping. The tertiary pumps serve the 2010 addition to boost the pressure available to the addition since it's the farthest part of the system from the secondary pumps. The secondary and tertiary pumps are redundant allowing the heating hot water system to remain in operation if one fails. The original boilers are in fair condition and the condensing boilers are in good condition. The secondary pumps are very loud and are in poor to fair condition. The other pumps are in fair condition.

The building consists of ten air handling units, nine of which where installed as part of the original building construction and the tenth as part of the 2010 addition. Seven of the original units are constant volume and were modified in 2018 to replace the direct-expansion cooling

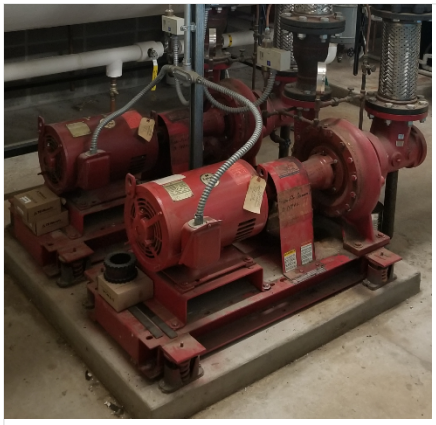


Fig 4 | Electric Water Coolers


Fig 5 | Original Gas-fired Boilers



Fig 6 | Condensing Gas-fired Boilers


Fig 7 | Secondary Heating Hot Water Pumps

coils. The DX coils are connected to air-cooled condensing units located on the roof. Air is distributed to zone-level heating hot water coils for temperature control. The exception is the air handling unit serving the offices, which distributes air to variable air volume boxes with heating hot water coils, despite it having a constant volume supply fan. The other two original units serve the gymnasium and commons. They single zone constant volume units and include a heating hot water coil. All original air handling units are in fair condition and air-cooled condensing units are in good condition.

The 2010 addition is served by a variable volume air handling unit with heating hot water coil and direct-expansion cooling coil. The DX coil is connected to an air-cooled condensing unit on the roof. Air is distributed to zone-level variable air volume boxes with hot water coils for temperature control. This air handling unit and condensing unit is in good condition.

The Tech Ed classroom (W121) is served by a small blower coil unit with DX cooling coil and is suspended within the room. The telecom room (C130) is served by a ductless split system.

Ventilation air is provided direct to each air handling unit. Exhaust air is provided through roof-mounted exhaust fans. The kitchen appears to have an appropriately sized Type 1 grease exhaust hood above cooking equipment.

The majority of the building is controlled by a Honeywell building automation system that was installed in 2018. A few areas in the original building still utilize pneumatic controls, which is an outdated system requiring frequent calibration for proper operation. Maintenance may be difficult due to limited availability of parts and service technicians with experience



Fig 8 | Typical Original Air Handling Unit with DX Coil


Fig 9 | Air-cooled Condensing Units and Outdoor Air Louvers



Fig 10 | 2010 Addition Air Handling Unit

working on these types of systems. Completing the upgrade to a full building automation system is recommended and was noted as a priority for facilities maintenance personnel.

Electrical Systems

Service Entrance/Distribution/Branch Panel Equipment

The school's electrical service enters the building on the north side through a pad-mounted utility transformer. The main building feeders are routed underground and rise up to an electrical room in a penthouse above the west end of the building where they serve their respective switchboard (2000A 208Y/120V). The switchboard appears to have provisional space for additional breakers to support future loads.



Fig 11 | Service Transformer (and Generator)

The building distribution is 120/208 volt and serves all mechanical loads such as supply fans, and other ventilation equipment as well as the lighting and branch panels. The main distribution equipment was installed in 1991. A newer 600A sub-distribution panel was installed in 2018 and the 2010 includes new distribution panels installed as part of the addition. Overall, the electrical distribution equipment including switchboards and panelboards appears to be in fair to good condition.



Fig 12 | 208V Service Switchboard

Electrical distribution equipment has a published operational life of 25 – 30 years. The published life expectancy for equipment is a good gauge for understanding when it may make sense to replace this equipment in kind. When electrical distribution equipment is kept within a relatively clean environment and is maintained properly, it may be able to operate safely well beyond its published life expectancy, in some cases 50 years and beyond. This is more of an observation than a recommendation to use equipment beyond its published operational life.

Given the overall condition of most of the equipment installed in 1991 or more recently,

replacement is not a high priority at this time. The electrical equipment should continue to be maintained and electrical spaces kept clean from dust and other pollutants to continue use of this equipment for the coming years. As renovations are planned, any electrical distribution equipment in the area of renovation should be considered for replacement as part of the plan. Additionally, a manufacturer's representative could be consulted to come in to review the internal components of the equipment which will help identify any maintenance issues and extend the gear's usable life.



Fig 13 | Panels Installed in the Kitchen Area

In general, most of the electrical panelboards have additional mounting space for breakers to feed future loads. This does not necessarily speak to the actual capacity of these panels as the load is unknown without being metered. It is anticipated that most of the distribution equipment would have some available capacity to serve additional loads although this should be verified by field metering prior to using any of the panels as part of a renovation or to otherwise add new loads.

Emergency Power

Emergency power for the facility is supported by a 75kW Cummins generator located adjacent to the pad mounted utility transformer on the north side of the facility. There is a single automatic transfer switch and emergency panelboard. Emergency power for exit & egress lighting and some HVAC systems are supported. The 2010 addition does not utilize power from the generator. Based on today's codes, the emergency lighting would be considered an *emergency* load while the other loads served by the generator would be *optional standby*. This would require separate transfer switches and panelboards.



Fig 14 | Generator Transfer Switch and Panel EM

Consideration should be given to separating the generator loads in compliance with today's codes as well as supporting the 2010 addition.

Electrical Branch Circuits

The branch circuit wiring throughout the building appears to be in good condition. No open junction boxes were observed above ceiling during spot checking. Ground Fault Circuit Interrupting (GFCI) receptacles appeared to be in appropriate locations and in operating condition. The existing branch raceway systems including conduits and surface mounted raceway appeared to be in fair condition.



Fig 16 | LED Retrofit Replacement Lamps

Interior Lighting

The interior lighting in the building is predominantly fluorescent fixtures with retrofit LED replacement lamps. Duel level and single pole switches for controls are used throughout the facility. All these fixtures are in fair to good condition and appear to be providing adequate illumination levels for the environments they are installed.

In general, classrooms are provided with dual level switching for partial and full light output control. The corridors are controlled by standard switches. Most of the other spaces are also controlled through local switches. The use of automatic controls is limited except in the 2010 addition which uses them throughout. The use of automatic controls using occupancy sensors and even daylighting controls is more consistent with today's energy codes. These modern controls help save energy and improve longevity for light fixtures. For any future renovations, occupancy (auto-on, occupancy stay on) and vacancy (manual-on, occupancy stay on) based controls are recommended and, in many cases, will be required.



Fig 15 | LMC Lighting

Electronic ballasts have an expected life 10-15 years and will require maintenance similar to the lamps in the fixtures that can have a 20,000+ hour life. LED retrofit lamps will extend this life expectancy and save some energy as well. Based on the relatively short timeframe that LED retrofit lamps have been available, it is unknown how well they will perform over time when compared to LED based fixtures. LED technology has become the industry standard for new lighting installations. LED provides long life, usually 50,000+ hours per manufacturer testing and field reports from the installed base. They also provide energy savings and lower maintenance costs compared to fluorescent. The cost of LED has also become very competitive with fluorescent especially when factoring in some of these other benefits. In many cases, LED is a less expensive option. For any future renovations, it is recommended that LED technology be used.



Fig 17 | 2010 Addition Corridor Lighting



Fig 18 | Typical Occupancy Sensor 2010 Addition

LED fixtures are also inherently dimmable. Costs for dimming controls and ballasts used to be cost prohibitive so they were used sparingly. However, it is common practice today to include dimming capabilities in all occupied spaces such as offices and classrooms. Similar to automatic lighting controls, the ability to change light levels within a space so that full output is a user decision rather than automatic is more consistent with today's energy codes. For any future renovations, use of dimming controls is recommended and, in many cases, will be required.



Fig 19 | Typical Exterior LED Wall Pack

Exterior Lighting

In general, the exterior lighting of the school is in good condition. Each of the exterior doors includes a light fixture(s) above which partially complies with today's egress lighting requirements which also require these lights to be backed with a generator or battery source

for at least 90 minutes. Most of the exterior lighting on the building is LED which is better for aesthetics and security purposes when compared to metal halide or high-pressure sodium. To comply with today's codes, it is recommended that the exterior fixtures at the building egress points be served from an emergency power source if not already.



Fig 20 | Typical Exterior Wall Mounted Fixture

Exit/Emergency Lighting

Emergency and exit lighting in the original 1991 building are backed by the emergency generator. Emergency lighting in the 2010 addition is provided by battery pack lighting located throughout the corridors and in some larger rooms. The overall coverage of the interior emergency lighting system and exit signs appears to be adequate throughout the facility. The emergency lights and exit signs vary from fair to good condition. All exit and exit pathways in the corridors are marked well. If not done already, the emergency batteries in the 2010 units should be checked regularly as they are susceptible to failure when they are most needed. Any failed units should be replaced immediately. Batteries typically last 5 – 7 years. Testing of batteries is an ongoing maintenance item and should be logged to show compliance with egress lighting requirements.


Fig 21 | Typical Exterior Pole Mounted Fixture

Any exterior fixtures mounted to the building at egress points should be served from an emergency power source if not already.



Fig 22 | 2010 Fire Alarm Extension Panel

Fire Alarm System

The building is currently supported by a Simplex 4002 non-addressable fire alarm system with horn notification extended to the 2010 addition with 4009 series panels. The system also has dialing capability for offsite 3rd

party monitoring. The panel is functional and still supported by Simplex. The Fire Alarm Control Panel (FACP) is located in a back of house space, room 507. Compatible initiation and notification devices are still available for expansions/renovations.

By today's codes and standards, a fire alarm panel with voice annunciation capability would be required in an educational facility. Voice capability allows the fire alarm system to provide instruction to the occupants during a fire event. Today's modern fire alarm systems with voice annunciation also allow the system to be used for mass notification purposes should there be an event other than fire that presents danger to the building occupants. Considering the building has an extensive overhead paging system, the additional feature for mass notification, although it would be an upgrade to have supervised signaling (i.e. system monitors signal conductors for breaks and faults) to detect any issues with the announcement system, may not be necessary. Converting to a voice-based fire alarm system would also require the field annunciation devices to be replaced with speakers or speaker/strobes.

Detection devices such as smoke detectors, heat detectors or other initiation devices are minimal which provide limited detection coverage compared to the overall size of the facility. Select storage rooms, kitchen and 2010 addition areas are some of the space types that include detection devices. The air handling units also have smoke detection. Entry/exit points have manual fire alarm pull stations. The detection and initiation devices appear to be in fair condition. Commercial detection devices have a typical service life of 10-15 years after which time they should be replaced. The building does not have a sprinkler system so detection of smoke and fire is even more important for the protection of building



Fig 23 | Smoke Detection in the Kitchen



Fig 24 | Corridor Fire Alarm Strobe Blocked by a Clock



Fig 25 | Smoke Detector in 2010 Addition Corridor

occupants and property. Additional fire detection devices are recommended to limit the impact of fire conditions and to provide early warning for building occupants. One example of additional detection may be to provide corridor smoke detection coverage throughout the facility.

The building has fire alarm notification devices mostly in corridors throughout the 1991 portions of the building. Notification devices are located in corridors as well as classrooms in the 2010 addition. Although not witness tested, the location and spacing of notification devices appears to be sufficient for audible notification throughout the facility although additional strobes may be required in classrooms, offices and other common use spaces where more than one person can occupy the space. As part of future renovations, strobe placement should be reviewed. The current state of the notification devices is fair to good condition.

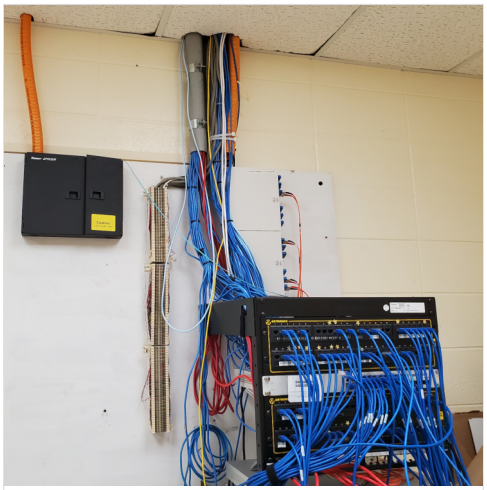


Fig 26 | W121 Incoming Service Rack

Voice/Data Systems

The main incoming service to the facility in is in room W121. There are satellite telecom distribution locations in rooms C130, G9 and 2010 Mechanical room. All telecom cabling is distributed from these types of rooms or satellite racks to field devices. Cables in each of these locations are routed from these racks up into the plenum space and dispersed to serve the building. Very little cable management was found in the rooms or at the racks to support the data cabling for the telecommunications network. Permanent information jacks are installed in many locations including media centers, classrooms, and offices but most of the building also has telecommunication service via Wireless Access Points (WAPs). A Cisco Voice Over IP system is also installed for communications.

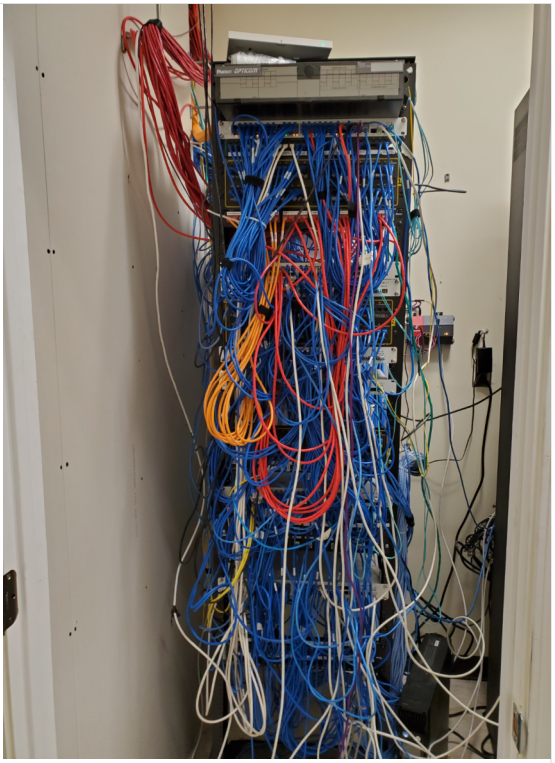


Fig 27 | C130 Data Rack

The overall condition of the telecommunication equipment and cabling in the building is in fair to good condition. The installed cabling is a mix of CAT 5, 5e, 6 and 6e which should be sufficient for the foreseeable future given the function of the facility. The data rack installations are not within dedicated rooms though these rooms typically include secured access. Having dedicated spaces allows for secured access and environmental conditioning. The telecom spaces in W121 and the 2010 Mechanical room are adequate for the installed equipment. C130 and G9 have less space available for telecom equipment. Expansion in these spaces will be difficult. It is worth noting that the equipment in C130 could use some rewiring and cable management to help clean up the installation making future work with this equipment a little easier.

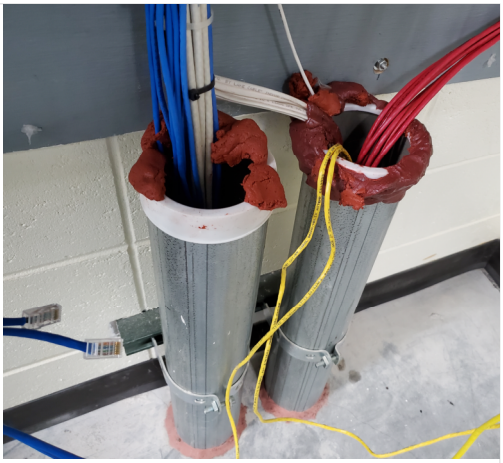


Fig 28 | 2010 Mechanical Room Fire Rated Penetrations

It was also noted that some of the pathways in the 2010 Mechanical room include fire rated sealing for the floor penetrations. This sealant has been removed to modify the cabling installation. The fire sealant helps prevent migration of fire (and smoke) should there be a fire event so this sealant should be reinstalled as soon as possible.



Fig 29 | Typical 2010 Addition Classroom Speaker

The building has no cable management, i.e. cable tray, for routing of the voice/data cabling throughout the building. All the cabling down the corridors is supported either by the ceiling grid or with j-hooks.

All the classroom spaces have coax cable television connections to a TV within the rooms.

Public Address & Clock Systems

The building currently has a Telecor public address system. Each classroom has a minimum of 1 speaker to receive announcements. The corridors also have

speakers. The speakers appeared to be in fair to good condition with varying models installed depending on the age of the speaker and environment it is installed in. The head end equipment is dated and should be considered for replacement to improve reliability and fidelity. Although not tested, the spacing of speakers and locations throughout the building appears to provide adequate overall paging coverage. Adding new or reusing existing speakers in renovated areas is recommended to maintain a comprehensive paging system.

Each of the classrooms have a Simplex clock that is time correction controlled through hardwired connectivity to the headend equipment. The clocks are connected to 120-volt power wiring or receptacles. Extension of the clock system to new renovated areas is recommended for consistency throughout the building. Advances in clock system technology have also led to digital clock displays and wireless time correction which may be desirable in the future.

Intrusion Detection/Access Control/Camera Systems

A Bosch access control system provides Intrusion detection coverage at the main entry points and corridors throughout the building and provides coverage via motion detection sensors. Operational status of the system was not confirmed but the coverage is consistent with industry standards for perimeter and main travel path monitoring to protect the building.

Card or fob access is also provided at some exterior doors. Additional card access locations at all perimeter doors would be beneficial to provide police and other first responders opportunities to enter the building at various locations depending on the event they are responding to. Modern security systems can



Fig 30 | Typical 1991 Corridor Speaker



Fig 31 | Typical Corridor Clock



Fig 32 | Typical Intrusion Detection Device



Fig 33 | Typical Card Access at Main Entry Points

include card readers that also have keypad codes so that first responders would not necessarily need cards or keys to gain entry.

Extending card access to interior doors is also becoming more common in the school setting. This allows access to be granted and revoked more readily without the necessity of tracking keys. Depending on the system selected and how the door card terminals are programmed, doors could also be locked simultaneously should an event necessitate this feature for protection of building occupants or property. It is recommended that the school district review their safety protocols and procedures to see if a modern, comprehensive security system is a high priority addition for the school specifically for interior classroom doors but also for the remainder of exterior doors.



Fig 34 | Typical Dome Camera

There are dome type security cameras installed throughout the corridors of the facility. The cameras have been replaced within the last 3 years according to staff. Overall, the camera layout is extensive and appears to provide a comprehensive view of the overall building corridor system. The cameras appear to be in good condition.