

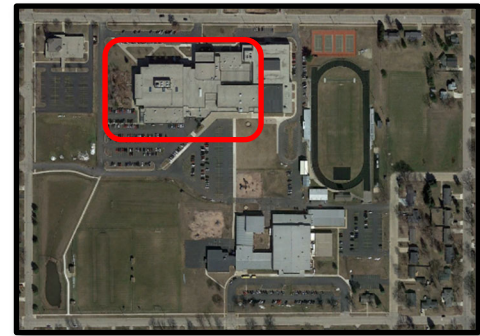
Berlin High School



Building Overview:

Berlin High School is a grade 9 through 12 facility with a grade 6 through 8 middle school attached and shares resources. The high school was constructed in 1995 on the same property as the district's elementary school. Constructed of concrete masonry with clay brick veneer.

The building's location is surrounded by residential neighborhoods to the west and east, with local businesses to the north and the elementary school to the south. The proximity to the Elementary School and being attached to the Middle School facility to the east on a contiguous property allows convenient bus routes. Having a closely grouped campus allows for maximum efficiency for the Facilities and Grounds staff to effectively manage the district's buildings and grounds. The district's business office is also located just south and east of the paved parking lots servicing the elementary school. The Facilities and Grounds team practices diligence in maintaining the building's assemblies and HVAC equipment. In general, the High School HVAC equipment and assemblies are mostly in good condition.



The district continues to perform regimented annual maintenance on systems, equipment, and interiors but also has a unique opportunity to replace existing systems with newer, more efficient technology and improve the learning environment by addressing some architectural features as well.

Building's Highest Priorities

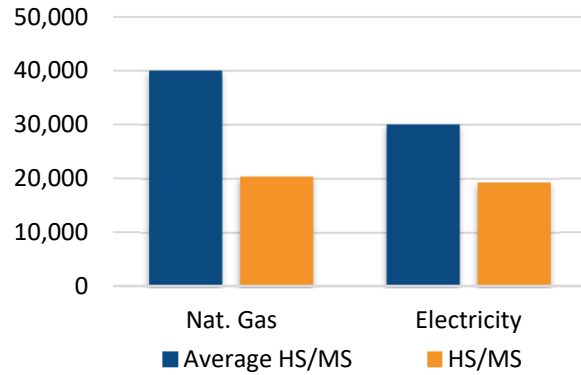
- 1) Select Paving
- 2) Interior Finishes
- 3) HVAC

This summary of facility energy consumption and trends is for 2019 only. Due to COVID-19, electric and gas costs are assumed to be skewed for 2020 and 2021. The building performs with a total energy intensity usage of 39,645 BTU/SF. This is about what is anticipated for a high-performing High School/Middle School in the area.

Building Performance:

Building Area (est):	298,500 SF (includes MS)	
Annual Electric Cost:	\$187,176	\$0.63/SF
Annual Gas Cost:	\$8,836	\$0.03/SF
Total Utility Cost:	\$196,012	\$0.66/SF
Electric Usage Intensity:	19,277 BTU/SF	
Gas Usage Intensity:	20,367 BTU/SF	
Total Energy Intensity:	39,645 BTU/SF	

Average Usage vs. HS/MS (EUI)



Site Features & Improvements

Existing Condition Assessment:

- Concrete walks: There are several conditions with the concrete that could be addressed.

There are locations where the sidewalk has a simple crack (Figure Ext.1). Filling the crack with an epoxy patch may allow deferring replacement. If the condition is left alone, freeze-thaw cycles may heave a portion of the concrete. If a concrete path becomes out of flush by more than one-half inch, it is considered a trip hazard.

Several of the stoops have rust staining the surface (Figure Ext.2 & Ext.3). This is caused by salt and water penetrating the concrete, meeting the uncoated steel reinforcement in the concrete structure. The oxidized iron breaks down and makes its way to the surface. Replacing the concrete is the only way to mitigate the issue at this point.

There are a few locations where heaved concrete surfaces had to be ground down to allow a smooth transition condition between the adjacent pieces of the concrete sidewalk (Figures Ext.4 & Ext.5). This is necessary if the concrete surfaces become out of flush more than one-half inch to prevent a trip hazard and keep the path of travel accessible.

Another observed condition is the patches installed as corrective action where concrete has spalled near the edges of a control or construction joint (Figure Ext.6 & Ext.7). These repairs, although unsightly, are to ensure that pedestrian traffic does not trip on the pothole created at the spalling. The repair may eventually come out as the slated moisture penetrates below the patch. This is intended as a temporary solution to stave off complete replacement, but eventually, replacement will be required. New concrete additives can provide more chemical resistance and reduce the likelihood of this happening.



Figure Ext. 1



Figure Ext. 2



Figure Ext. 3



Figure Ext. 4



Figure Ext. 5

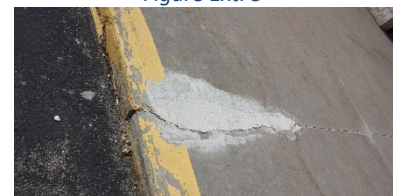


Figure Ext. 6

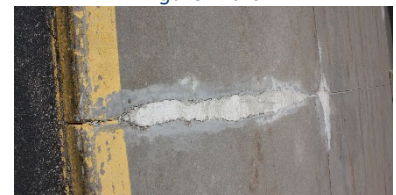


Figure Ext. 7

- Asphalt Paving: Asphalt paving on the high school lot is in good condition despite the number of cracks that have been filled (Figure Ext.8 & Ext.9). Not all the surface area was observed; however, when the asphalt cracks and the sections remain large, the serviceability remains better. When smaller sections are formed, and more of a tight-knit spider web type of condition occurs, the asphalt shifts easily under traffic, dislodges, and creates potholes.



Figure Ext. 8



Figure Ext. 9

Building Envelope Conditions

Existing Condition Assessment:

- Exterior Openings:
- Exit/Entrance Door A: This is the main secure entrance to the high school. The full-light doors are aluminum framed with an enamel finish.

The sweeps, gaskets, and perimeter sealant are in good condition, and no immediate concerns were observed.

There is no immediate action required.



Figure Ext. 10

- Exit Door B: This door is secure and intended to be an exit door. The west leaf has a card reader operation for staff to use as needed.

The door and frame are aluminum and in good condition. The perimeter sealant is intact, not drying out, and should be functioning well. The sweeps at the bottom of the doors have been replaced (Figure Ext.12). The scar from the previous sweep installation could be cleaned up and painted to match, but not necessary for the door to function.

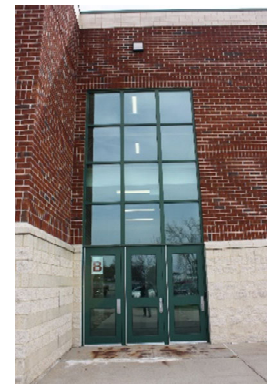


Figure Ext. 11

No action is required for this opening at this time.



Figure Ext. 12

- Exit Door C: This door is secure and intended to be an exit door. There is no card reader operation installed for this assembly.

The stoop has iron oxide staining as described in the exterior concrete assessment. There is also patching around the stoop here to accommodate where the sidewalk has settled (Figure Ext.13).



Figure Ext. 13

- Exit Door D: This door is secure and intended to be an exit door.

The door and frame are aluminum and in good condition. The perimeter sealant is intact, not drying out, and should be functioning well. There is some stressed sealant at the base of the door, likely from snow melting salt. The sweeps at the bottom of the doors have been replaced (Figure Ext.14). The scar from the previous sweep installation could be cleaned up and painted to match but not necessary for the door to function.

No action is required for this opening at this time.



Figure Ext. 14

- Exit Door E: This door is secure and intended to be an exit door. It has been reported that his location is frequently used by the student occupants to let other students in and sometimes, in the past, even propped open.

The door and frame are aluminum and in good condition. The perimeter sealant is intact, not drying out, and should be functioning well. The insulated glazing unit above the western door leaf appears to be failing (Figure Ext.15). There are deposits on the interior surface of the glazing due to the glazing seal being compromised, allowing condensation between the glass.

The compromised glazing unit may need to be replaced. However, there is a security risk that should be addressed.

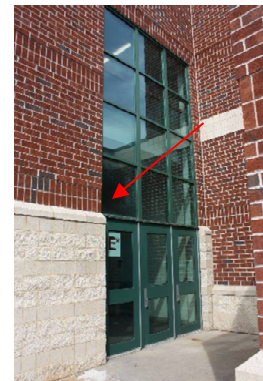


Figure Ext. 15

- Exit Door @ Greenhouse Passage: This door is exit-only as there is no hardware on the exterior side.

This hollow metal door is in good condition, including the perimeter seals, weather stripping, and sweep. There is some rust forming at the base of the frame jambs with bubbling paint (Figure Ext.16).

No immediate action is required, but addressing the rust at the bottom of the jambs will eventually need mitigation.

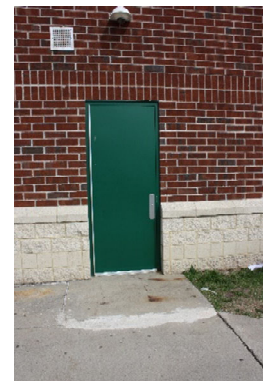


Figure Ext. 16

- Access Door @ Woods Storage: This door is an access door to the woods technical class material stock storage.

This is a hollow metal pair of doors in good condition, including the perimeter seals, weather stripping, and sweep. There is a small dent on the western (Figure Ext.17).

No immediate action is required, but addressing the rust at the bottom of the jambs will eventually need mitigation.



Figure Ext. 17

- Exit Door @ Woods Shop: This door is an exit with only a pull and deadbolt cylinder hardware on the exterior side.

This hollow metal door is in good condition, including the perimeter seals, weather stripping, and sweep.

There is no immediate action required currently at this opening.



Figure Ext. 18

- Access Door @ Dust Collector: This door is an access door to the dust collector.

This is a hollow metal pair of doors in good condition, including the perimeter seals, weather stripping, and sweep.

There is no immediate action required.



Figure Ext. 19

- Exit Door @ Small Engines Shop: This door is an exit that only has only a pull and deadbolt cylinder hardware on the exterior side.

This hollow metal door is in good condition, including the perimeter seals, weather stripping, and sweep. There is a filtered port on the door that serves some function in the small engines/trades shop area.

There is no immediate action required currently at this opening.

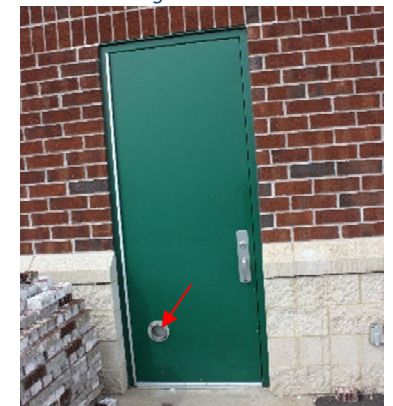


Figure Ext. 20

- Overhead Door @ Small Engines Shop: This is an insulated roll-up door that allows access to the small engines shop area. The door is in overall good condition. There is rust along the bottom stiffener connected to the door bottom seal. The rust hasn't reached an alarming condition, but repainting the metal will prevent further deterioration.



Figure Ext. 21

- Access/Exit Door @ Metals Shop: This door is an access door to the metal's technical education shop.

This is a hollow metal pair of doors in good condition, including the perimeter seals, weather stripping, and sweep. It also appears to have been repainted to cover previously chipped paint.

There is no immediate action required.

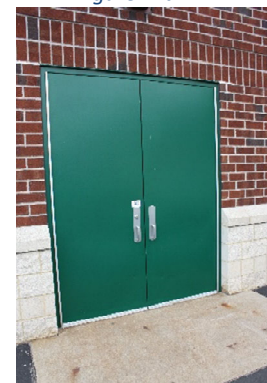


Figure Ext. 22

- Exit Door F: These doors are exit doors, but there is a card reader at the center leaf for staff access as it is near staff parking. It has been reported that this door is also frequently used by the student occupants to let other students in and sometimes, in the past, even propped open.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep.

There is no immediate action required. However, there is a security risk that should be addressed.

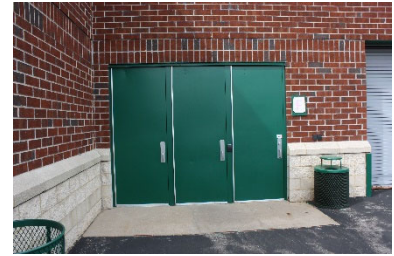


Figure Ext. 23

- Overhead Door @ Mechanical Room: This is an insulated roll-up door that allows access to the mechanical room. The door is in overall good condition. There is rust along the bottom stiffener connected to the door bottom seal. The rust hasn't reached an alarming condition, but repainting the metal will prevent further deterioration.

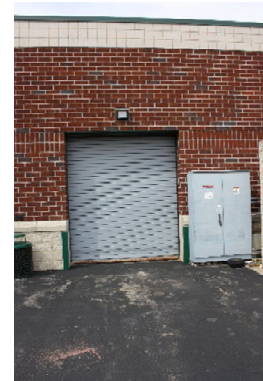


Figure Ext. 24

- Overhead Door @ Receiving: This is an insulated roll-up door that allows access to the receiving area. The door is in overall good condition. There is rust along the bottom stiffener connected to the door bottom seal. The rust hasn't reached an alarming condition, but repainting the metal will prevent further deterioration.

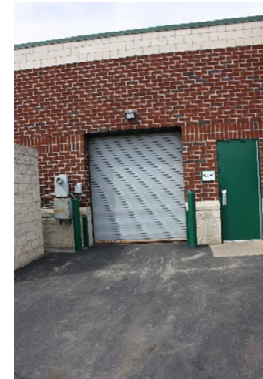


Figure Ext. 25

- Exit Door @ Receiving: This door is an exit and an access door for staff and has a card reader.

Most of the hollow metal door is in good condition, including the perimeter seals, weather stripping, and sweep. There is a severe rust issue on the hinge side of the frame at the bottom of the jamb. The rust has compromised the frame here, and there is a hole in the frame cavity (Figure Ext.27).

The rusted-through hole needs to be addressed as soon as possible. The frame may need to be replaced to correct this deficiency.

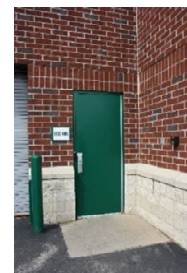


Figure Ext. 26



Figure Ext. 27

- Exit/Entrance Door G: This entry has three pairs of full-light hollow metal doors. These doors serve as the main public entrance for after-school events and activities in the high school and middle school. There is a card reader next to the east set of doors.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep. The doors are protected from the weather, being set back from the face of the building in an alcove.

There is no immediate action required.



Figure Ext. 28



Figure Ext. 29

- Exit Doors @ Gym: This entry has three pairs of flush hollow metal doors. These doors serve as exit doors from the high school gym.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep. There are a few dents in some of the doors, but they do not compromise the integrity of the doors. The doors are protected from the weather, being set back from the face of the building in an alcove.

There is no immediate action required.



Figure Ext. 30

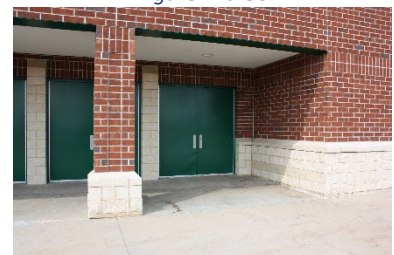


Figure Ext. 31

- Exit Doors @ Gym: This entry has three pairs of flush hollow metal doors. These doors serve as exit doors from the high school gym.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep. There are a few dents in some of the doors, but they do not compromise the integrity of the doors. There is rust at the bottom of the jambs.

No immediate action is required, but addressing the rust at the bottom of the jambs will eventually need mitigation.

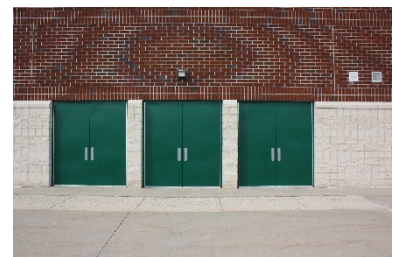


Figure Ext. 32

- Exit Door @ Music room: This is the exit and access door to the larch music room. The full-light door is aluminum framed with side light and has an enamel finish.

The sweeps, gaskets, and perimeter sealant are in good condition, and no immediate concerns were observed.

There is no immediate action required.

- Exit Door @ Music room: This is an exit door from the smaller senior high school music room.

This is a hollow metal pair of doors in good condition, including the perimeter seals, weather stripping, and sweep. There is a chip in the paint on the surface of the west door.

There is no immediate action required. Consider touching up the exposed primer at the paint chip.

It is reported that this exit door from the music room leaks at the lockset when there is a wind-driven rain event. This should be repaired or the lockset replaced.

- Exit/Entrance Door O: This entry has three pairs of full-light hollow metal doors. These doors serve as the main public entrance for after-school events and activities in the high school and middle school. There is a card reader next to the east set of doors.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep. The doors are protected from the weather, being set back from the face of the building in an alcove.

There is no immediate action required.

- Exit Door @ Dressing rooms: This door is an exit from the auditorium dressing room area.

Most of the hollow metal doors are in good condition, including the perimeter seals, weather stripping, and sweep.

There is no immediate action required.

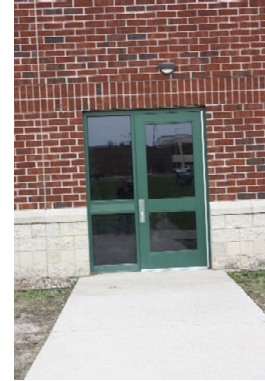


Figure Ext. 33

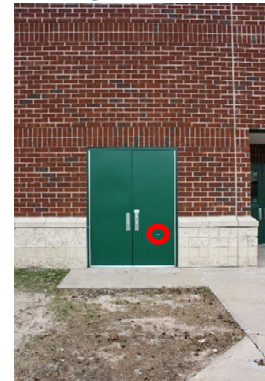


Figure Ext. 34

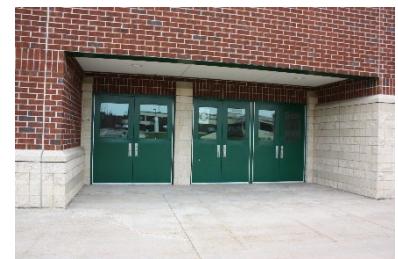


Figure Ext. 35

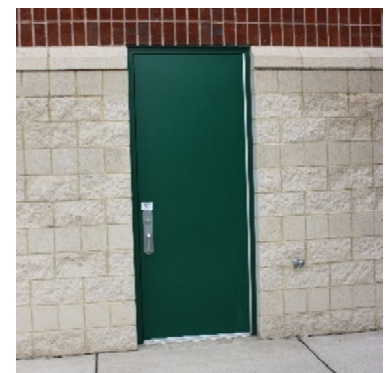


Figure Ext. 36

- Exit Door @ Dressing rooms: This door is an exit from the auditorium dressing room area.

Most of the hollow metal doors are in good condition, including the perimeter seals, weather stripping, and sweep.

- There is no immediate action required.

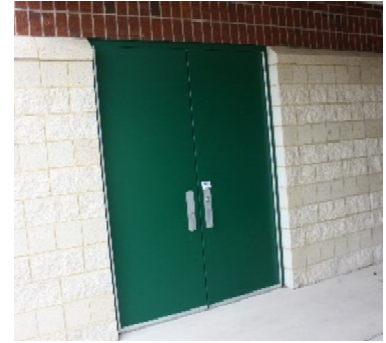


Figure Ext. 37

- Exit/Entrance Door P: This entry has two pairs of full-light hollow metal doors. These doors serve as the main public entrance for after-school events and activities in the high school. There is a card reader next to the east set of doors.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep. The doors are protected from the weather, being set back from the face of the building in an alcove.

There is no immediate action required.



Figure Ext. 38

- Exit/Entrance Door Q: This entry has two pairs of full-light hollow metal doors. These doors serve as the main public entrance for after-school events and activities in the high school. There is a card reader next to the east set of doors.

This is a hollow metal set of doors in good condition, including the perimeter seals, weather stripping, and sweep. The doors are protected from the weather, being set back from the face of the building in an alcove.

There is no immediate action required.



Figure Ext. 39

- Windows General Conditions:

- Window Type 1: The windows are aluminum framed storefront style windows. The perimeter sealant is in similar condition as the aluminum entries. The aluminum entries are also storefront installations. The glazing units are insulating a double pane with spandrel glass on the second-floor plane.

There is no immediate action required.



Figure Ext. 40



Figure Ext. 41

- Exterior wall conditions:

- Wall condition: The facility's exterior is brick masonry with a decorative concrete masonry base. The structural backup is concrete masonry units.

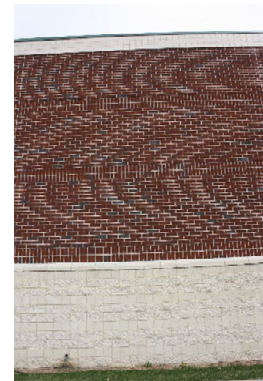


Figure Ext. 42

The mortar on most of the brick portions of the walls is in good condition. No significant issues were observed with the brick mortar or face brick at the time of the survey visit.



Figure Ext. 43

The horizontal mortar joint below the cast stone accent band is discolored and separated horizontally (Figure Ext.43 & Est.44). This discoloration appears to be mildew or mold. The condition may be caused by water escaping from the wall cavity at these locations.

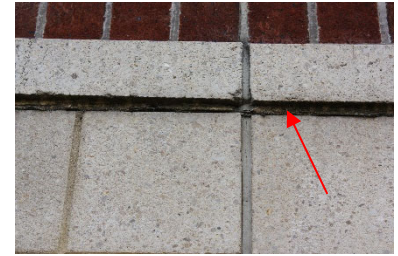


Figure Ext. 44

- Wall accessories:
- Masonry Weeps & Vents: Weeps appear to be installed at the bottom of the decorative concrete block (Figure Ext.45). However, the frequency of the installation is not apparent. The mortar joint at the bottom of the wall is mostly open and may be acting as a naturally formed weep location.



Figure Ext. 45

In at least one location, the head joints at the bottom block have been saw cut (FigureExt.46). This may have been done to relieve water head pressure if water had been trapped in the cavity.

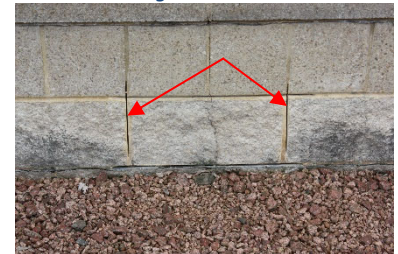


Figure Ext. 46

- Flashing: A flexible through wall flashing that terminates behind the face plane of the masonry. This type of installation is usually acceptable, but without the benefit of a drip edge, there is a chance of capillary action that could pull water in under the flashing. It is not known to be the case with this wall.

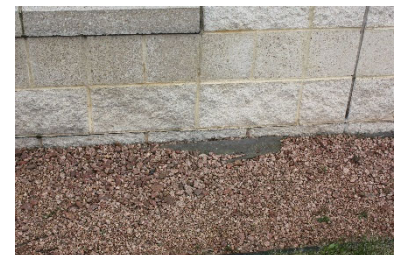


Figure Ext. 47

- **Building Expansion Assemblies:** The control joints installed were correctly spaced and installed. Some of the joints appear newer and may have been replaced. Some of the joints appear original and under the stress of their age (Figure Ext.48).

The joints typically run from the base of the wall to the parapets (Figure Ext.49).

There are a select few locations where a control joint should have been installed where the building's natural movement stresses certain conditions and causes cracking through the masonry units (Figure Ext.50). This condition isn't necessarily alarming, but when control joints are replaced in the future, it would be recommended to install a control joint in these locations.



Figure Ext. 48

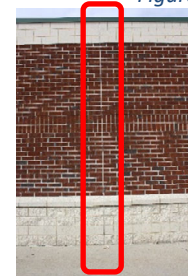


Figure Ext. 49



Figure Ext. 50

- **Roofing:**
- **General Roofing condition:** The high school roof is in good condition and was replaced in 2018. This is a ballasted EDPM roofing installation. There should be no immediate concerns with the roofing currently.
- **Roof Penetrations:** All mechanical and skylight penetrations have been correctly addressed during the re-roofing project (Figures Ext.52 & Ext.53). This means the contractor removed the mechanical equipment to properly flash under the equipment built-in flashings.



Figure Ext. 51



Figure Ext. 52



Figure Ext. 53

- **Flashings:** Some flashing conditions have needed additional sealant that likely was to mitigate a leak. Figure Ext. 54 is at one of the skylights shared between two classrooms.



Figure Ext. 54

- **Parapet Copings:** The parapet sheet metal was also replaced during the last re-roofing project for high school.

Some of the terminations and intersections of the coping cap pieces are not installed by the industry best practices. The sealant applied is already drying and cracking (Figure Ext.55). Typically, a wall termination would have an additional counterflashing to cover the upturned flange (Figure Ext.56).



Figure Ext. 55

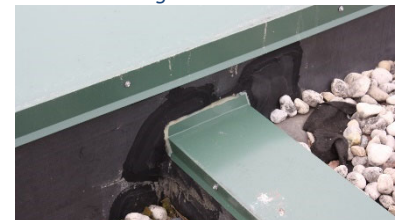


Figure Ext. 56

- **Roof Drainage Components:** The roof drains are in good condition and have the strainer cover over the inlet. The overflow drains do not have a strainer installed over the inlet (Figure Ext.57).



Figure Ext. 57

The lower canopies have a scupper opening and downspout for stormwater control (Figure Ext.58).



Figure Ext. 58

Proposed Exterior Solutions & Benefits:

- **Exit Doors:** Rust at the bottom of the hollow metal doors need to be mechanically removed, primed, and painted. The exit door at receiving needs to be repaired where a hole has rusted through. The hole might be unable to repair and potentially will need to have the frame replaced. These repairs will increase the longevity of the doors and frames.

It is recommended to rinse the exterior doors and frames down in the spring to remove any latent salt deposits left on the assemblies. This will assist in keeping the salt from deteriorating the finish and rusting the metal.

- **Windows General Conditions:** Consider replacing the failing glazing units that have compromised glazing seals. This will increase the thermal performance of that glazing unit to at least the original performance.

Inspect the perimeter sealants around the openings at a minimum of five-year increments until fifteen years after original implementation. After that, two-year inspection cycles are recommended.

- **Stone and masonry sills:** Replace the cracked and mildew-stained mortar joint just below the stone cap above the decorative CMU base. Where there are cracks located in the vertical mortar joints at this stone band and similar sills, consider installing soft calk joints

- **Roofing:** No action is required currently.

- **Roofing Accessories:** it is recommended to add strainers to the overflow drains.

It is recommended to add fixed ladders to the roof areas that are currently only accessible by a loose ladder. This will provide safety to navigate to those roofs when necessary.

- **Control Joints:** Replace old joints that are cracking and beginning to separate from the substrate.
- **Walls:** inspect the walls for cracks in the masonry units and the mortar joints. Remove mortar and tuckpoint joints for cracks greater than 1/16" in with and greater than 8" long vertically and 16" long horizontally.
- **Paving and lots:** Consider concrete replacement at the severely rust-stained stoops. Using a concrete additive and coated reinforcement can prevent rust staining. Consider replacing the concrete walks and curbs that are deteriorated and patched. Include the sections of concrete that are uneven and ones that need to be ground down.

Continue filling the cracks in the asphalt to keep water from infiltrating the subgrade. Monitor the cracking after every winter to verify the asphalt doesn't crack into small pieces or create potholes.

Interior Spaces & Finishes

Existing Condition Assessment:

- **Ceilings General:** The 2x2 acoustical tile ceiling installed will stand up to humidity longer than the typical 2x4 ceiling tiles usually installed. Some tiles have stains indicating a previous leak (Figure Int.1). It is recommended to verify there are no active leaks in the roof or mechanical equipment above ceilings when replacing the ceiling tile.



Figure Int. 1

Some damaged tiles might be desirable to be replaced. (Figure Int.2)

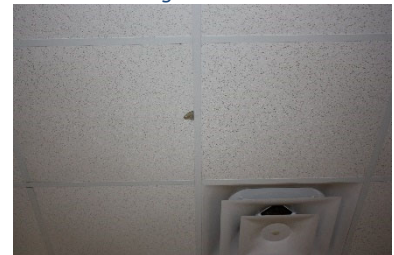


Figure Int. 2

- **Floors General:** There are a few different types of floor coverings in the corridors and common spaces.

Some of the sheet carpeting is still in fair to good condition (Figure Int.3). the sheet carpeting is more difficult to maintain as an unrecoverable stain or damage to sheet carpeting requires entire sections of carpet to be replaced.



Figure Int. 3

On the second floor, there is a large water stain on the carpet that has been reported from a planter previously installed in the space (Figure Int.4).



Figure Int. 4

There is original VCT still present in some areas (Figure Int. 5). The tiles have shrunk over time and now have many gaps in the seams. It is recommended to replace this floor tile as maintaining this floor covering will get increasingly more difficult.



Figure Int. 5

The main commons space has ceramic tile flooring (Figure Int.6).



Figure Int. 6

The tile surface has many scratches, and the tile finish is compromised. The grout lines are also very stained and need a deep cleaning (Figure Int.7). The grout would need to be sealed frequently to prevent additional staining.



Figure Int. 7

At the vestibules, a resilient sheet floor covering was installed (Figures Int.8, Int.9, & Int.10). This product has not stood up to the traffic in and out of the doors where salt and moisture are carried into the building.



Figure Int. 8

This flooring is failing at all locations installed. Particularly at the door thresholds (Figures Int. 9 & Int.10) as well as under the walk-off mats where water may have seeped under the mat by capillary action (Figures Int. 8 & Int.9).



Figure Int. 9



Figure Int. 10

- Walls General: Walls in most of the common spaces in the high school are typically burnished concrete blocks with a polished-looking surface.



Figure Int. 11

The concrete block is very resilient and will last for a very long time. No major issues were observed with the burnished block installations.



Figure Int. 12

There are also areas where plain CMU is installed with a painted finish (Figure Int. 14). This is mainly in the 'back-of-house' areas of the building, such as the service corridors. The painted CMU is also in good condition in most locations.

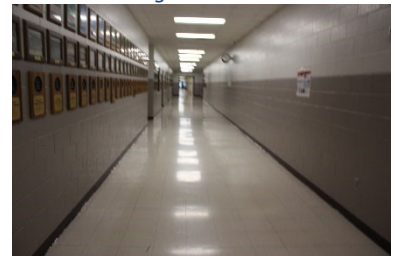


Figure Int. 13

Some locations have cracks in the masonry walls (Figures Int.15 & Int. 16). In these instances, the wall may need to be analyzed by a structural engineer to verify that a major structural issue has not occurred. The engineer would be able to recommend structural repairs or verify a standard tuck-pointing procedure would be adequate.

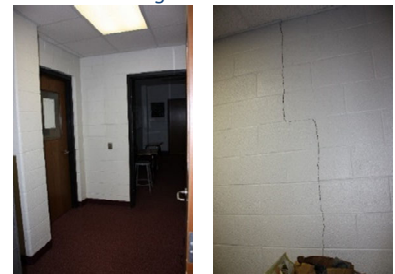


Figure Int. 14

Figure Int. 15

- Classroom General Condition:
- Classroom Doors: The classroom doors are typically flush wood veneer (Figure Int.17). The doors are generally in good condition, and no immediate action is required. We recommend inspecting the wood doors for any chips in the veneer and keeping up on maintenance. The glass in the side-lites is not likely ballistic-rated glazing. This is a concern for active shooter safety.



Figure Int. 16

- **Classroom Ceilings:** The majority of the 2x2 ceilings (Figure Int.18) are in good condition, with some stained and damaged tiles in select locations that can easily be swapped out with new tiles.

The ceiling in the consumer education area does have a higher exposure to humidity as this is a large kitchen area (Figure Int.19). These tiles are recommended to be replaced with a washable vinyl-faced ceiling tile, more typical for areas with higher moisture susceptibility.



Figure Int. 17



Figure Int. 18

- **Classroom Floors:** There is original VCT still present in some classrooms (Figure Int. 20, Int.21, & Int.23). The tiles have shrunk over time and now have many gaps in the seams. It is recommended to replace this floor tile as maintaining this floor covering will get increasingly more difficult.



Figure Int. 19

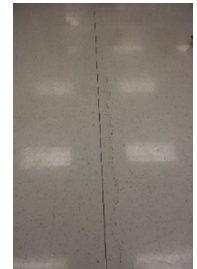


Figure Int. 20



Figure Int. 21

Many classrooms have sheet carpeting installed (Figure int.23). Some of the sheet carpeting is still in fair to good condition. The sheet carpeting is more difficult to maintain as an unrecoverable stain or damage to sheet carpeting requires entire sections of carpet to be replaced.

Classroom A-113 has had the flooring replaced with modern carpet tile (Figure Int.24). Today's modern carpet tile is very stain resistant and allows for mitigating damage or stains to the carpet as only the damaged tiles are required to be replaced in lieu of replacing whole sections of sheet carpeting.



Figure Int. 22

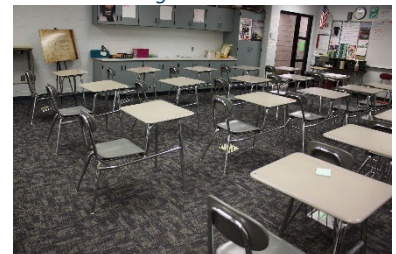


Figure Int. 23

- Classroom Walls:** Most walls of the gypsum board-covered walls in the classrooms are painted and in good condition. Some walls have vinyl wall coverings on them. In areas like these, unless the space is air-conditioned, the vinyl wall covering is susceptible to humidity and can peel. (Figure Int.25).

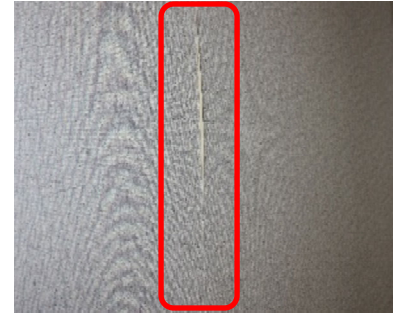


Figure Int. 24

Some locations have cracks in the masonry walls (Figures Int.26). In these instances, the wall may need to be analyzed by a structural engineer to verify that a major structural issue has not occurred. The engineer would be able to recommend structural repairs or verify a standard tuck-pointing procedure would be adequate.



Figure Int. 25

- Casework:** Plastic laminate casework is installed in classrooms (Figures Int. 27, Int.28, & Int.29). The casework is in pretty good condition except for the countertops in the consumer education room, and most of the cabinets in the classrooms have lockable tumblers installed on the cabinets. Having lockable cabinets are important to secure materials for student safety, especially in the science labs (Figure Int.28).



Figure Int. 26

The cabinets are two color schemes, light blue and pinkish color. These might not be a modern color scheme, but they are still functional, and no major issues were observed during the survey visit.



Figure Int. 27

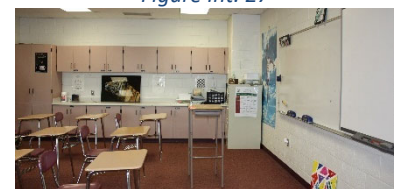


Figure Int. 28

- **Furnishings:** The student desks are typically single desks and chairs in the traditional subject classrooms (Figure Int.31). These are mostly in good condition for the desk that was observed, but not every desk was looked at.



Figure Int. 29

The science labs and art rooms have traditional lab tables and chairs (Figure Int.32). The chairs are older but still in good working order.



Figure Int. 30

Some of the technical and special subject classrooms have standard type, multi-student tables.



Figure Int. 31

- **Technology:** Most classrooms have a video screen that can be connected to a workstation (Figure Int.34). Many of the classrooms also have smartboards (Figures Ext.35 & Int. 36) that are reported to have systematically started failing over recent years.

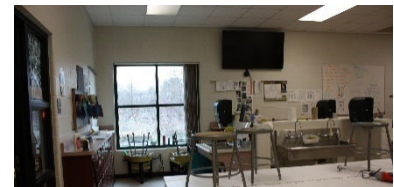


Figure Int. 32

The school district is currently working on a technology upgrade plan to replace television screens and smart boards with multimedia smart touch panels. The elementary school has been completed, and it is reported the high school will get the technology upgrade next.



Figure Int. 33



Figure Int. 34

- Music Room:** The music rooms for the chorus and band are tall spaces (Figures Int.37 & Int.38). The band teacher reported that more storage could be useful for the chorus. There is an underutilized staircase just west of the band room that could be added to the band to be used for more storage and band space. The exterior exit door from this room leaks at the lockset when there is a wind-driven rain event. This should be repaired, or the lockset replaced.

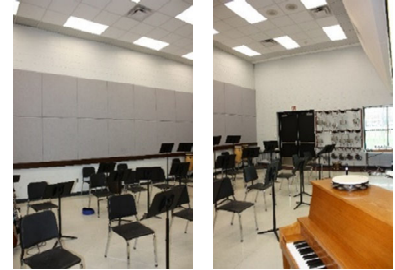


Figure Int. 35

The band room is east of the chorus room (Figure Int.38) and could use more acoustical treatment on the walls.

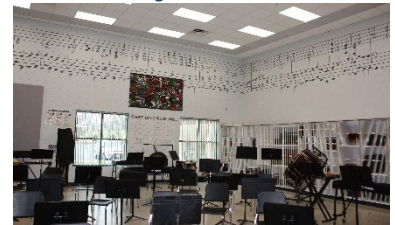


Figure Int. 36

One recommendation is to also install carpet tile on the floor instead of the current VCT to add additional acoustical performance.

The lighting in these rooms has been replaced with LED light panels providing ample light for the spaces, reading, and 81.2-foot candles. These LED lights are tunable and dimmable to allow for different room settings.



Figure Int. 37

Figure Int. 38

Across the corridor from the music spaces are practice rooms (Figure Int.38).

- Art Room:** The art classrooms are equipped with several different learning opportunities, including pottery wheels (Figure Int.39) and a kiln room.



Figure Int. 39

The workstations are lab-type tables for extra space and collaborative learning. The floors are original VCT but are in better condition than some of the other areas in the school. Eventually, the flooring will need more than traditional maintenance can provide. There is no immediate concern currently, though.



Figure Int. 40

There is a storage area segregated for art supply materials.



Figure Int. 41

- Agricultural Studies: The agriculture classroom has casework and two student desks like the other labs. The casework and furnishings are in good condition.



Figure Int. 42

The Ag Lab space used for food processing has three sink stations but only one cooktop. The lab workstations are counter height tables and have the versatility of mobility. The casework and workstations are also in good condition. There are no concerns to report currently.



Figure Int. 43

The floors in these spaces are still the original VCT which have shrunken over time, and there are gaps at the seams.

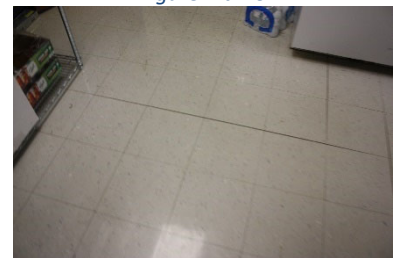


Figure Int. 44

The passage to the greenhouse is used for the storage of the greenhouse. Most of this is open containers and equipment. Lockable storage cabinets would be recommended to install in this space.



Figure Int. 45

The greenhouse is physically in relatively good condition. The shading system is non-functional and damaged. It may be desirable to repair the shading system.

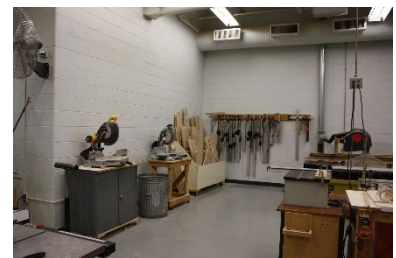


Figure Int. 46

- Tech Ed (Woods): The wood shop has an epoxy-painted floor that will need to be touched up or repainted eventually for aesthetics. No deficiencies were reported with the equipment, and the dust collection system appears to be functioning.

The worktables are in good condition and provide storage in the bases. The CNC machine is located in the tool storage room, and the computer is used for operating it as well. The workstation should be located in a cleanroom-type space and connected to the CNC through networking cables to keep dust away from the workstation.

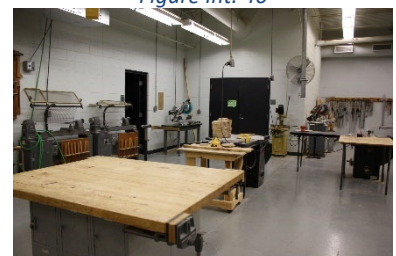


Figure Int. 47

The woods department also has a lot of storage for stock materials and is organized pretty well.



Figure Int. 48

- Tech Ed (Engines/Trades): The small engine shop also has an epoxy-painted floor that will need to be touched up or repainted eventually for aesthetics. No deficiencies were reported with the equipment.



Figure Int. 49

This space is shared with the construction trades curriculum. This shop has metal worktables needed for the engine repair classes. This classroom also has a tool storage area and parts storage racks.



Figure Int. 50

- Tech Ed (Metals): The metal shop also has a bare concrete floor. There is a CNC cutter with a fume extraction hood that is appropriately sized above the equipment (Figure Int.51).



Figure Int. 51

The welding stations along the wall are enclosed by welding curtains and do not have hard walls. The fume extraction system is a ducted system served by one exhaust unit (Figure Int.52). Each station has a point-of-use extension hose with a magnetic foot to hold the point-of-use hood in place (Figure Int.53).

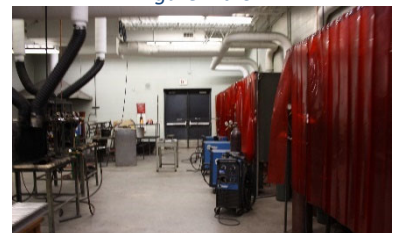


Figure Int. 52

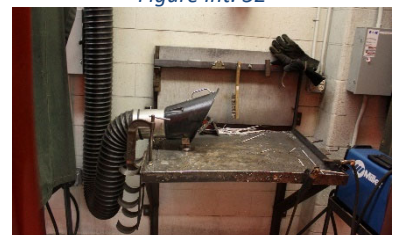


Figure Int. 53

There are additional welding stations that do not have the protection of welding curtains (Figure Int.54). It is recommended to have welding curtains around these stations. It may be desirable to reconfigure the welding stations to be more efficient, with hard walls on the welding booths. It is also recommended to add task lighting at the welding booths.

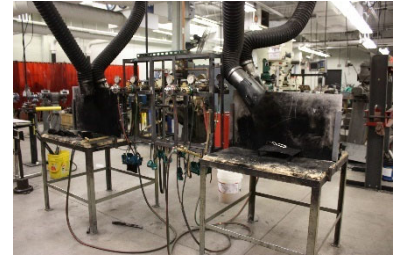


Figure Int. 54

- **Family & Consumer Ed:** The Family and consumer education classroom has two different flooring types. The commercial kitchen used for commercial culinary instruction has quarry tile flooring, which is the same tile installed in the high school kitchen.



Figure Int. 55

The equipment is typical of what you would find in a commercial restaurant kitchen.



Figure Int. 56

There are several residential kitchen stations. The plastic laminate countertops are beaten up a little and have delaminated countertop sections, especially at some of the edges.



Figure Int. 57

There is open shelving with containers and cooking implements (Figure Int.58). There are side rooms that were offices used as storage. Storage could be laid out better.



Figure Int. 58

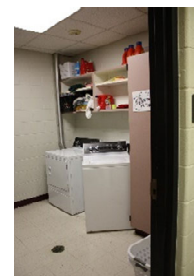


Figure Int. 59

There is a laundry room that has one set of washer and dryer (Figure Int.59).

- **Restrooms:** The restrooms typically have ceramic tile finishes on the walls (Figure Int.60) and mosaic tile flooring (Figure Int.61). The ceramic tile is in good condition, but the grout will need periodic deep cleaning and re-sealing. The installed grout does not likely contain epoxy additives that newer grout has.



Figure Int. 60

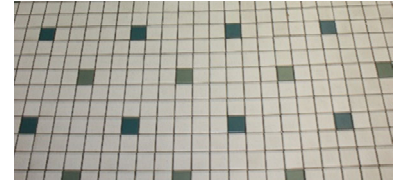


Figure Int. 61

The metal toilet partitions are in fair condition (Figure Int.62), and there is an accessible toilet stall available (Figure Int.63). The wall-hung urinals in the men's restroom have privacy screens installed (Figure Int.64). All these features make the restroom compliant with modern building codes.



Figure Int. 62

The flush valve (Figures Int.63 & Int.64) and faucets (Figure Int.60) are manual controls. We recommend installing touchless controls for the water delivery controls for water savings and to reduce the number of surfaces occupants would touch. This will reduce the spread of bacteria and viruses. The faucets are the push-down spring controls. At the survey site visit, a stuck open control was observed, causing water to run continuously. This is where water savings could be improved upon.



Figure Int. 63



Figure Int. 64

- **Kitchen:** The high school kitchen is a full-service commercial kitchen and services both the high school and the middle school. The floors are quarry tile with dark grout that conceals stains (Figure Int.65). All the fixtures and equipment are stainless steel.



Figure Int. 65

The walls in the kitchen are porcelain-faced CMU (Figure Int.66). This is very durable and easily cleanable. Exhaust hoods are located above the equipment that requires them.



Figure Int. 66

The lighting in the kitchen may be a little dimmer than a kitchen requires. It might be desirable to install a brighter LED light panel.

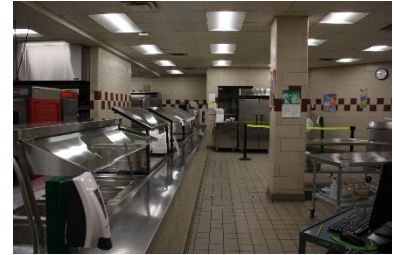


Figure Int. 67

The Kitchen serving lines are securable by the overhead coiling doors installed at the serving line and the dish return. These are in good working order.

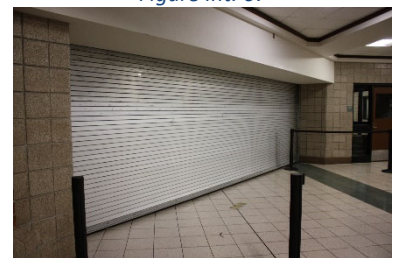


Figure Int. 68

- Commons/Cafeteria: The main commons area has several purposes (Figure Int.69). This space serves as the cafeteria space, student commons area, and a public reception gathering area as it is adjacent to both the gymnasium for athletic events and auditorium for music and theatrical productions. There is an abundance of trophy cases that reportedly have outdated contents. These could potentially be overhauled or updated.



Figure Int. 69

This space is a two-story space and requires destratification. There are adjacent clearstory windows to let in natural light allowing daylight visibility through the second-floor borrowed lights into the media center.

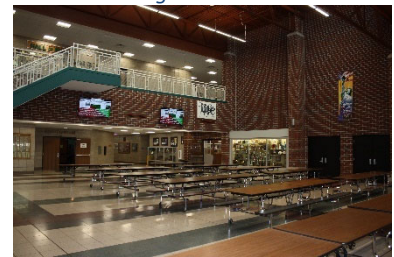


Figure Int. 70

The flooring in this area was covered under the general flooring section previously in this report.

The furnishings are folding tables and are left deployed most of the time during the school year.

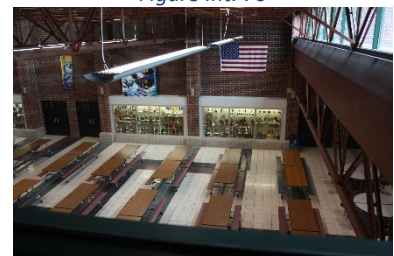


Figure Int. 71

- Marketplace:** There are a couple of marketplaces located in the high school. There is a coffee shop (not pictured), a school store (Figure Int.72), and a concession stand (Figure Int.73).

The store is underutilized now and being used as kitchen overflow storage since closing during the pandemic. It has been reported that the school desires to get the store operating again, and the space could use some light renovations.



Figure Int. 72

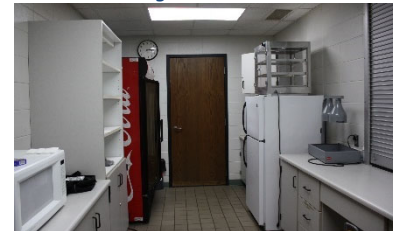


Figure Int. 73

No major deficiencies have been reported for the concessions. The plastic laminate counter is chipped (Figure Int.74) and could use repair or replacement. A stainless-steel countertop is recommended for cleanliness and sustained durability.



Figure Int. 74

- Drinking Fountains:** The drinking fountains located in the high school are original to the building (Figures Int. 75 & Int. 76). None of these have bottle filling stations. It is recommended that at least one drinking fountain at each location is replaced with a bottle filling station, or, in some cases, a bottle filling station is added to at least one of the drinking fountains. The recessed drinking fountains in the gymnasium should be upgraded to bottle filling stations.



Figure Int. 75



Figure Int. 76

- The Media Center:** The media center is carpeted with sheet carpeting, and the seating is typical older style library furniture (Figure Int. 77). Updating the carpet to a carpet tile is recommended, and it may be desirable to update to modern collaborative style seating.



Figure Int. 77

The open collaboration space (Figure Int.78) does not have seating making these areas less usable.



Figure Int. 78

The translucent panel skylight, intended to add diffused natural light to the space, is a little ambered or yellowed, which can happen over time. There is also peeling paint in the skylight well, indicating that there had been a leak (Figure Int.79).



Figure Int. 79

The computer lab located in the media center is currently underutilized (Figure Int.80). This space is being used as a storage area and as a workroom. Since the school district operates as a one-to-one technology, computer labs are not needed as much as they had been in the past.



Figure Int. 80

There are more stacks with the collection than modern school libraries typically have (Figure Int.81). With online resources being available to students, the collection may be able to be reduced, opening the possibility for added collaborative spaces.

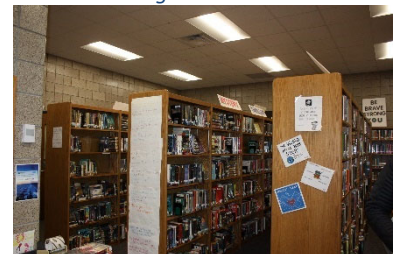


Figure Int. 81

Also located in the media center are the IT production departments. An audio department as well as a video production department (Figure Int.83) is adjacent to the media center. These spaces are a little cramped but are reported as functional. The IT resource repair is also conducted from this space.



Figure Int. 82

Some conference spaces are reported to be underutilized as well. These spaces may need to be renovated to modernize them as collaborative spaces.



Figure Int. 83



Figure Int. 84

- **Gymnasium:** The gymnasium is in good condition, and the wood floors have been well maintained. The bleachers are modern and have ADA spectator accommodations included (Figure Int.85).



Figure Int. 85

This gymnasium also has additional space that can be divided with an operable partition. No issues with the partition were reported at this time. This space serves as a physical education break-out space and an additional basketball court.



Figure Int. 86

- **Locker Rooms:** The locker rooms are in good condition, including the lockers and benches. The locker rooms were renovated when the middle school was added in 2015 (Figure Int.87).

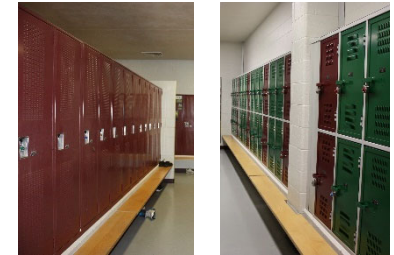


Figure Int. 87

The passage entry to the locker rooms is the original VCT. This floor covering is shrunken, and gaps are present between the tiles (Figure Int.88).



Figure Int. 88

Figure Int. 89

The epoxy-painted floor is worn and chipped in some spots. This should be patched or recoated to prevent the floor covering from worsening (Figure Int.89).

The locker rooms have gang shower posts in the shower rooms. This may limit the use as most students prefer individual shower stalls. It may be desirable to renovate the showers to include individual shower stalls. This may reduce the capacity of the shower room but will increase its usability.

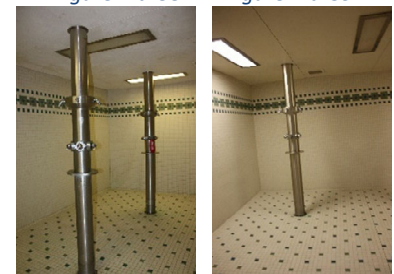


Figure Int. 90

The restroom facilities included in the locker rooms are accessible and provide privacy at the urinals.



Figure Int. 91

The flush controls are manual and could use the same benefits of touchless controls as the main restrooms in the high school.



Figure Int. 92

- Administration: The main reception is where visitors arrive at the school. The arrival sequence is reported to be awkward between the staff as operations ensue during a normal day. The layout may be better served to be renovated, and operations flipped between the reception desk and the workroom/conference room. This could allow better flow and more convenient control when checking in visitors or adjusting attendance while keeping the desk open to help other students.



Figure Int. 93

Still located in the original admin and student services are the guidance offices and conference rooms, as well as other administrative offices. These spaces have adjusted in function but operate adequately. No concerns have been reported; however, there are opportunities that light renovations will upgrade the functionality.

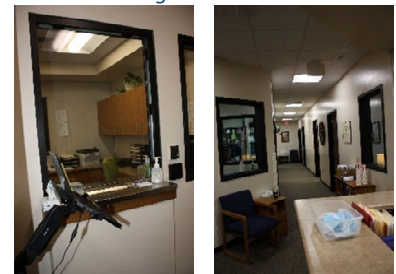


Figure Int. 94

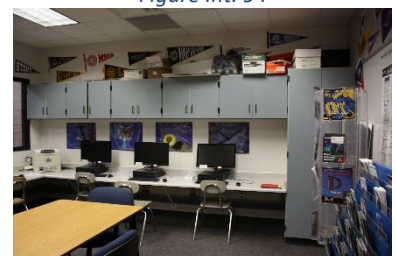


Figure Int. 95

- Acoustical readings and analysis: When evaluating educational spaces, it is important to keep in mind how rooms perform acoustically. Two distinct criteria can be evaluated for a sample set of rooms. These evaluations are best conducted in empty rooms with the normal operation of the HVAC systems.
 1. First is the ambient or background noise that persists in a classroom (noise from lighting, mechanical systems, exterior environment). It is important to keep these noises in check because instructors must be distinctively louder than the background noise at all locations where students are seated and listening for the student to adequately hear. Ideal Classroom Noise Criteria (NC) should be between 25-30. Alternatively, background noise, in general, should not exceed 35 dBA. We conclude that several learning spaces should be evaluated further to reduce noise from the mechanical systems.
 2. The second factor that should be evaluated is the reverb timing in the 500 Hz octave band, a band that is closely related to human speech. Reverb is the persistent echo of noise within a space, so the longer a space echoes (more live), the muddier the speech will sound and become less intelligible. Conversely, humans are naturally used to some reverberance, so too little reverb results in a space sounding too dead. The Acoustical Society of America has published a range of acceptable reverb times for different types of spaces within a school setting.

Proposed Interior Solutions & Benefits:

- Ceilings General: Replace damaged and stained ceiling tiles. Clean ceiling tile not only improves the visual appearance of the spaces but also provides a way to detect new leaks quicker.
- Floors General: Replace damaged carpeting. Consider replacing the sheet carpet installations when replacement is necessary with newer stain-resistant commercial carpet tile. This will greatly decrease maintenance costs.

Consider replacing the VCT with flooring like LVT with diamond 10 finish to significantly reduce the maintenance cost required for the flooring.

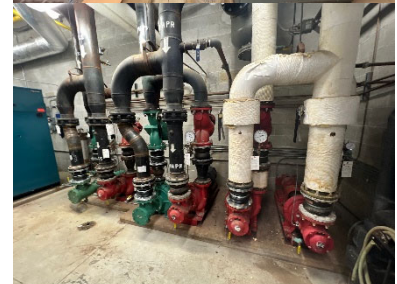
- Walls General: Evaluate crack CMU walls with a structural engineering consultant to verify that there are no structural issues. Repair the cracks in the CMU walls and paint to match the existing wall color.
- Drinking Fountains: We recommend adding bottle filling stations where existing equipment allows and/or replacing drinking fountains with bottle filling stations. This will allow touchless stations to reduce bacteria and virus spreading.
- Classroom Doors: Consider refinishing the scratched doors. Fill small, chipped veneer before refinishing. For doors will be extensively scratched and damaged at the base of the door, it is recommended to install a stainless steel kickplate to as longevity to the door.
- Casework: Replace the countertops in the Culinary/Family and Consumer Education room. These countertops are in the worst shape in the classrooms. Plastic laminate would provide a lower first cost for countertops, but a solid surface will provide a longer-term solution with lower maintenance costs.
- Furnishings: There is no immediate concern for the general furnishings in the school. Consider modern collaborative furnishings for replacement in some areas, including the Media Center.
- Technology: It is understood that there is currently a plan to upgrade classroom technology with smart touch flat panels. No additional recommendations are needed currently.
- Boy's / Girl's Restrooms: Planned renovations of the restrooms could include new modern tile for the walls, refreshed toilet partitions, replacing banks of lavatories with wash fountains, and all touchless flush controls.
- Gymnasium: No recommendations are currently required. Continue to maintain the flooring and refinishing as required. Consider staining the floor striping instead of painting when next doing a major refinishing of the gym floor.

- Locker rooms: Refinish the locker room floors, including the VCT entry passages. Consider an epoxy floor for durability and significantly reduce maintenance. Consider renovating the gang showers into individual shower stalls to provide privacy for the users.
- Media Center: Consider renovating the Media center to be a more modern space with additional collaboration areas and spaces. Consider reverting the workroom to its original use for student and staff resources.
- Administration: Consider renovating the administration and reception area to allow the staff to better control the entry sequences and administration services.

Heating System

Existing Conditions:

- These boiler plants provide hot water heating to the building through unit HW heating coils located in water source heat pumps, unit heaters, and cabinet unit heaters.
- The boiler plant serving the building consists of two (2) HW boilers from Thermal Solutions. The boilers are 3,000 MBH input each and up to 88% efficient. The boilers were installed in 2020 and are in good condition. There is also a decommissioned steam boiler that is not in use.
- The heating plant capacity equates to roughly 25 BTU/SF (output), which is less than typical heating requirements in Wisconsin of approximately 40 BTU/SF; however, primary heating is done through water source heat pumps which traditionally require less capacity than HW heating coils. A holistic approach is required when assessing the heating capabilities of the boiler plants.
- The hot water plant distributes hot water to the building by two (2) inline primary pumps and two (2) base-mounted Taco distribution pumps. Both sets of pumps are at a constant speed and are in good condition. Another set of distribution pumps are base-mounted, constant speed, and should be targeted for replacement.



- The High School has a series of HW cabinet unit heaters which are located at the building perimeters and at entryways. These units are in good condition but, in almost every case, serve transitional spaces.

- The gym air-handling units (AHUs) are equipped with hot water heating coils for primary heating.

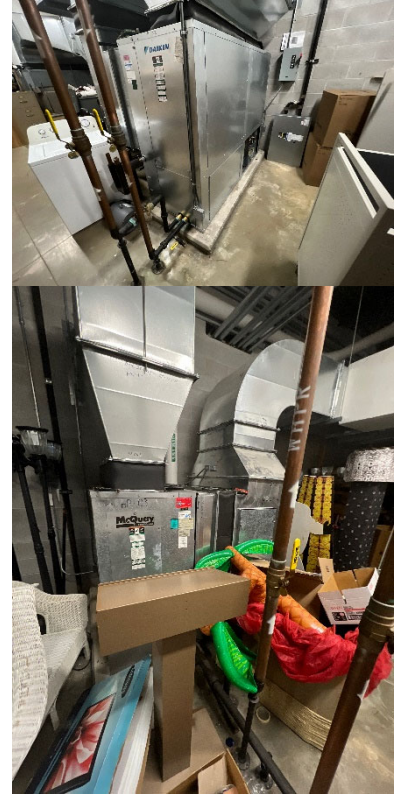
Proposed Solutions:

- Review boiler supply water reset curve to determine if additional energy savings can be achieved.

Cooling System

Existing Conditions:

- All occupied spaces within the school are provided with air conditioning from (96) packaged DX water-source heat pumps that provide cooling and heating to the high school spaces. Though a handful of these units have been replaced due to failure, the majority of them are past their service life and should be targeted for replacement.
- The cooling tower is located on the roof and rejects heat to the outdoors from the loop while the system is in cooling mode. The cooling tower is in fair condition but has more recently been reconditioned and balanced to extend the operational life of the unit.



Proposed Solutions:

- Replace the water source heat pumps that have extended past their service life with either new units or evaluate a different system type if the facilities group has a different preference.

Classroom Air Distribution

Existing Conditions:

- All areas of the school are served with overhead air distribution from the packaged water-source heat pumps and fan coil units. The heat pumps typically serve either one of a couple of rooms and provide conditioned air to the space based on space requirements. The units can slightly vary airflow and air temperature supplied to the space(s) to maintain temperature setpoints.



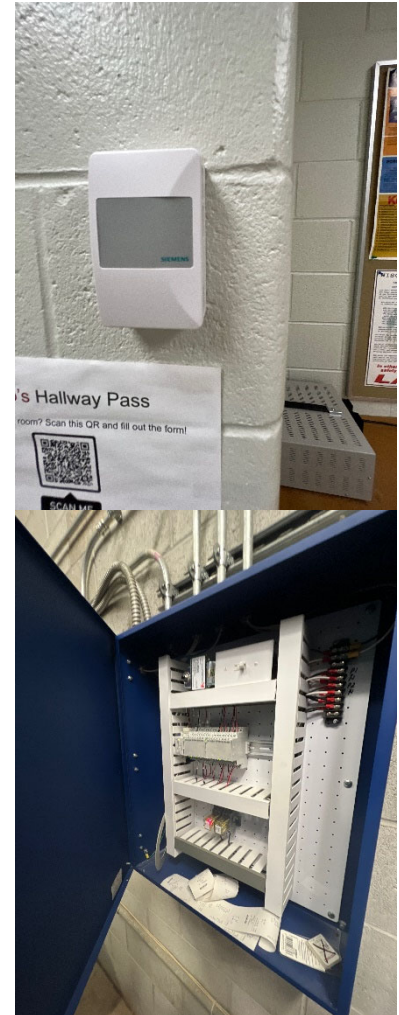
Proposed Solution:

- Replace the water source heat pumps that have extended past their service life with either new units or evaluate a different system type if the facilities group has a different preference.

Temperature Control System

Existing Conditions:

- The building controls systems are DDC with Siemens automation system (BAS) interface. This system is comprehensive over all major HVAC equipment with zone/space controllers. The BAS appears to have the ability to fully control, trend, alarm, and notify the Customer of needs and inconsistencies in the system.



Proposed Solution:

- No recommendations currently.

Domestic Hot Water System

Existing Conditions:

- The building is served by two high-efficiency gas-fired water heaters and recirculation pumps. These units are in fair condition.



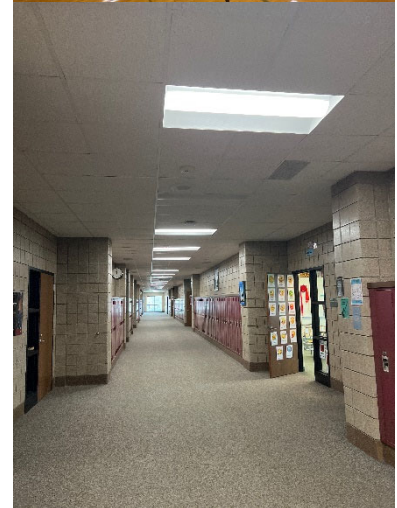
Proposed Solution:

- No recommendations currently.

Lighting System

Existing Conditions:

- All of the interior lighting appears to be LED fixtures that illuminate the space learning environment. Most of the spaces were observed to have adequate light levels.



Proposed Solution:

- No recommendations currently.

Berlin High School												
Building HVAC Equipment Inventory												
Equipment	Make	Model	Location	Quantity	Age	Expected Useful Life	Condition	Targeted Replacement Date				Outstanding Issues and/or Notes
								1-2 Years	2-5 Years	5-10 Years	10+ Years	
Boiler	Thermal Solutions	EVCA3000BNI / 3MMbtu / 88% near condensing	High School Boiler Room	2	10	24	Good				✓	Condensing boiler
Boiler Pump	Primary HW Pump	Taco / 172gpm / 1hp / CV	High School Boiler Room	2	10	10	Fair	✓	✓			Inline pump ready for replacement
Boiler	Hartford Steam	150WBHE / 6MMbtu / Not Used	High School Boiler Room	1	32	24	Poor/Fair					Not used.
HW Pumps - Distribution	B&G	FE11BF / 20hp / 1750rpm / CV	High School Boiler Room	2	17	20	Poor/Fair	✓	✓			Constant Volume
HW Pumps - Distribution	Taco	CI3013E2 / 20hp / 1750rpm / CV	High School Boiler Room	2	1	20	Good				✓	Constant Volume
CHW Pumps - System	B&G	4BC / 7.5hp / 1750rpm / CV	High School Boiler Room	2	17	20	Poor/Fair	✓	✓			Constant Volume
DHW Pumps - Boiler Room	B&G	Inline, brass / 1/6hp	High School Boiler Room	2	11	10	Fair		✓	✓		Constant speed Inline pumps for DHW recirc.
DHW Heater - Boiler Room	HTP Water Heater	Phoenix	High School Boiler Room	2	11	15	Fair		✓	✓	✓	199MBH with 119 gal storage
Water Softener - Boiler Room	Hellenbrand	H-2000	High School Boiler Room	2	5+	18	Good				✓	
Plate-to-plate Heat Exchanger	ITT	GPX678-121	High School Boiler Room	1	27	20	Poor/Fair	✓	✓			
Generator	Onan Genset	150DGEA	High School Generator Room	1	27	20	Good			✓	✓	
Air Handling Unit (AHU-3) - Gym Area	McQuay	MBAF	High School Gym Mezzanine	1	30+	25	Poor/Fair	✓	✓			HW heat / split coil, No Cooling
Air Handling Unit (AHU-4) - Gym Area	McQuay	LHD, 22DH	High School Gym Mezzanine	1	30+	25	Poor/Fair	✓	✓			HW heat, No Cooling
Cooling Tower (CT-01)	Evapoo	LSTA 10-123	High School Roof	1	15+	20	Fair			✓		Recently refurbished w/drives
Heat Recovery Unit (HRV-01)	Heatex	E-RHXC-IB-209000 / 10SF hp / 7.5EF hp	High School Mezzanine	2	27	25	Fair			✓		Recently refurbished w/drives
Water-Source Heat Pump (HP-103)	McQuay	LHP12M / R-22 (1 comp) / 5 hp	High School Theatre Mezz.	1	27	19	Poor/Fair	✓	✓			
Water-Source Heat Pump (HP-104)	McQuay		High School Theatre Mezz.	1	27	19	Poor/Fair	✓	✓			
Water-Source Heat Pump (HP-102)	Daikin	LVD / R-410A (2 comp) / 7.5 hp	High School Theatre Mezz.	1	2	19	Good				✓	R410 Refrigerant
Water-Source Heat Pump (HP-107)	McQuay	LHP27D / R-22 (2 comp) / 10 hp	High School Theatre Mezz.	1	27	19	Poor/Fair	✓	✓			

Berlin High School												
Building HVAC Equipment Inventory												
Equipment	Make	Model	Location	Quantity	Age	Expected Useful Life	Condition	Targeted Replacement Date				Outstanding Issues and/or Notes
								1-2 Years	2-5 Years	5-10 Years	10+ Years	
Cabinet Unit Heaters	Various	Used at entry and transition spaces	Various	Multipl	Varies	20	Fair/Good			✓	✓	
Water-Source Heat Pump	McQuay	1/8hp 3/4ton cooling / 300cfm	High School Classrooms	8	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/8hp 1ton cooling / 400cfm	High School Classrooms	3	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/8hp 1.25ton cooling / 500cfm	High School Classrooms	7	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/8hp 1.5ton cooling / 630cfm	High School Classrooms	5	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/3hp 2ton cooling / 800cfm	High School Classrooms	4	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/3hp 2.5ton cooling / 1000cfm	High School Classrooms	31	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/2hp 3ton cooling / 1200cfm	High School Classrooms	11	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	1/2hp 3.5ton cooling / 1400cfm	High School Classrooms	4	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	3/4hp 4ton cooling / 1600cfm	High School Classrooms	4	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Water-Source Heat Pump	McQuay	3/4hp 5ton cooling / 2000cfm	High School Classrooms	19	25+	19	Poor/Fair	✓	✓			Concealed in ceilings
Automatic Transfer Switch	Onan	400amps	High School Electrical Room	1	27	25	Fair		✓			
Building Electrical Service	GE	3000amps	High School Electrical Room	1	27	25	Fair		✓	✓	✓	No indicated inefficiency
Fire Alarm Panel	Simplex	4100 ES	High School Electrical Room	1	27	25	Fair		✓	✓	✓	No indicated inefficiency
Elevator Machine	Schindler	E-0181	High School Generator Room	1	27	30	Fair		✓	✓	✓	No indicated inefficiency
Kitchen Hood	Greenheck	GCEWX-13-S	High School Kitchen	1	20	30	Fair		✓			No indicated inefficiency
Roof Mounted Exhaust Fans	Greenheck, Twin City, Cook	Various / 1/4-1.5hp	High School and Middle School Roof	31	Varies, many 15+	20	Fair		✓	✓	✓	No indicated inefficiency
Roof Mounted Exhaust Fans	Greenheck, Twin City, Cook	Various / 1/4-3hp	High School and Middle School Roof	30	Varies, many 15+	20	Fair		✓	✓	✓	No indicated inefficiency
Lighting	LED			Various	2+	20	Good				✓	Flourescent, HID, and LED
Building Automation Systems	Siemens			Various	5+	15	Fair/Good		✓	✓	✓	Direct Digital Controls with Electric Actuation