



ICON
ARCHITECTURAL GROUP



FACILITY ASSESSMENT FOR HILLSBORO PUBLIC SCHOOLS

Hillsboro, ND | April 2022

BACKGROUND

FACILITY SUMMARY

Hillsboro Public Schools, located in Hillsboro, ND, currently has two buildings: an elementary school that houses grades Pre-Kindergarten through 6 and a combined middle school/ high school that houses grades 7 through 12. The elementary school, located at 128 4th Street SE, is a block south of the high school located at 12 4th Street NE.

ELEMENTARY SCHOOL

The current single-story, 68,50 square-foot elementary school with a 5,538 square-foot gymnasium mezzanine was originally constructed in 1959. It consisted of 12 classrooms, a small gymnasium/cafeteria, office area, courtyard, and a mechanical room, totaling 24,304 square feet. Since 1959, the exterior courtyard was filled, providing the current library space. In 2002, 6,317 square-foot addition including 2 classrooms and an administrative office was built. In 2003, a 28,886 square-foot gymnasium addition was built and included restrooms, locker rooms, a stage, weight room, lobby space, and a 5,538 square-foot mezzanine housing storage and the wrestling practice area. The most recent addition was added in 2014, including 3 classrooms and a 6,116 square-foot fitness center.

HIGH SCHOOL

The current single-story, 51,833 square-foot high school was constructed in four phases between 1894 and 1965. The original four-story school was completed in 1894 with a four-story addition added to the south in 1915. The 11,569 square-foot gymnasium and stage was added in 1949. The existing boiler room in the lower level of the 1894 section of the building was utilized to heat the gymnasium addition. In 1954, a 916 square-foot addition to the boiler room was built with the floor level matching the 1894 structure. In 1965, two additions were added, providing the building layout as it currently sits. During the 1965, all but 2,883 square feet of the original 1894 school was demolished. The remaining 2,883 square foot area contains all the heating equipment for the remaining portions of the school and provides heat for all areas of the 1965 additions. The gymnasium addition was added along the east side, creating an 8,356 square-foot space housing a boy's locker room, shop area, band classroom, and office space. The second 28,102 square foot addition was added to the south and includes 15 classrooms, administrative offices, kitchen, cafeteria, and a library.

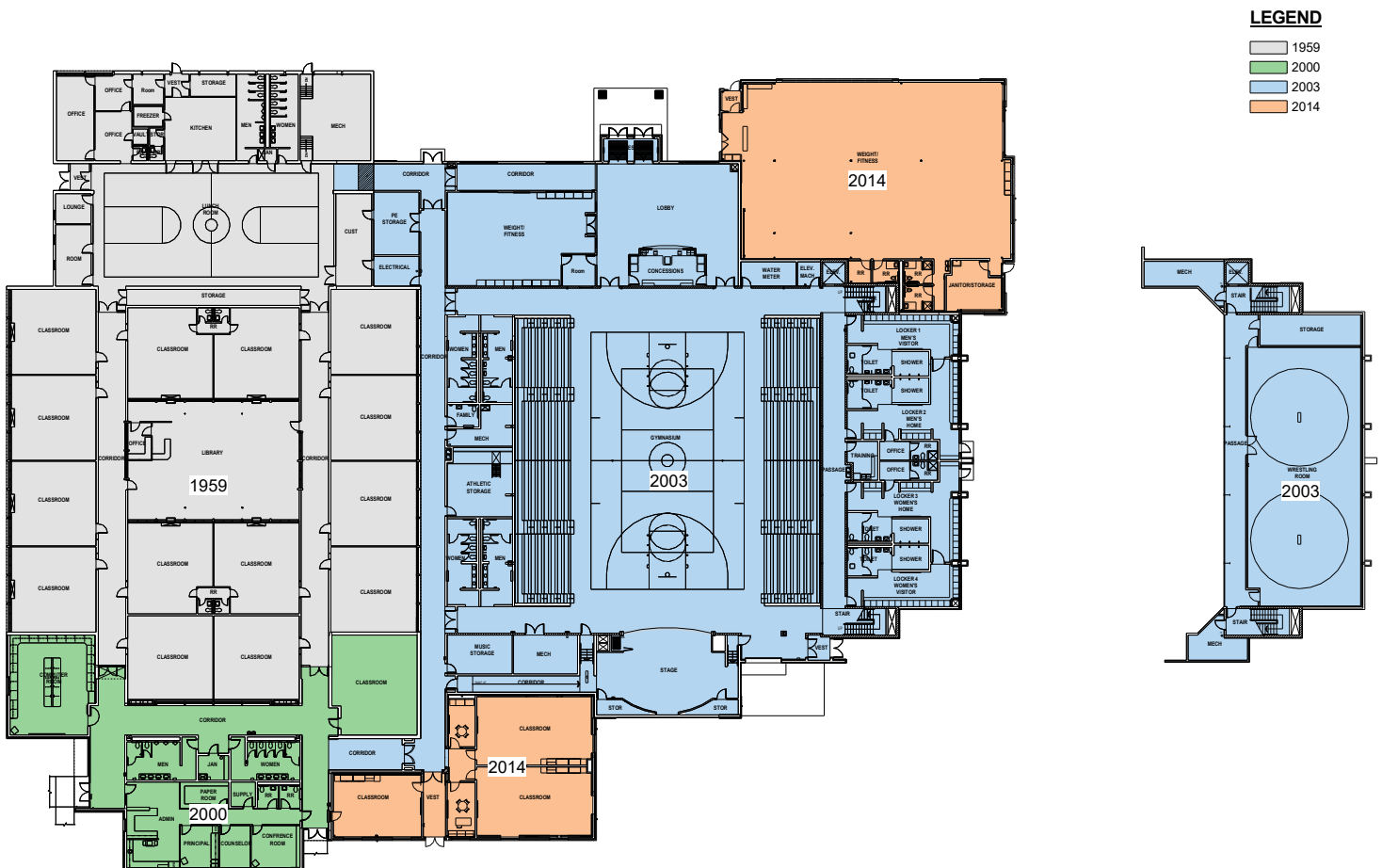
This facility assessment will be broken into two parts –

1. The elementary school and its associated structure condition, electrical and mechanical systems assessment, and building code violations
2. The high school and its associated structural condition, electrical and mechanical systems assessment and building code violations.

The end of the report will outline estimated costs to rectify code issues and capital maintenance items in the future for both buildings.

HILLSBORO PUBLIC SCHOOLS - ELEMENTARY SCHOOL

FACILITY ASSESSMENT



STRUCTURAL CONDITIONS

The original 1959 building is comprised of brick and CMU in addition to plaster-covered wood framing filling old windows at the exterior walls. The original gymnasium has exterior brick backed up by CMU and metal panel covering areas of the exterior walls and roof. The exterior metal wall and roof panels on the original gymnasium are in fair condition. The brick is in good condition while the plaster is failing towards the ground due to moisture. The windows are past their life expectancy, and in many cases are completely covered with plywood and window air conditioning units. Per current code, 62 square feet of daylight is required in each classroom, but only 15 square feet are provided along the west classrooms. Many classrooms are interior and have no natural daylight. Gutters and downspouts have paint peeling and are past their life expectancy.

The roof structure in the 1959 is comprised of wood structural members with wood sub-structure planking. While the roof structure is sound, it is not code compliant based on the size of the structure and its combustibility (in particular because the 1959 section does not have a sprinkler system). Interior finishes are dated and would benefit from a renovation but are not in critical condition. The original 9x9 ACT floor tile throughout the corridors and a small amount of classrooms is assumed to be asbestos-based and it is recommended to be removed in the future. The acoustic ceiling tile is dated and stained from several roof leaks and should be scheduled to be replaced in the event that a sprinkler system is installed in the 1959 section of the school. Wood doors are showing their age, mostly where mopping occurs at all hard floor surfaces. Several doors do not have proper ADA accessible door handles. Door frames are chipping and would benefit from repainting and the doors should be scheduled for replacement.

The 2000 addition is comprised of CMU, brick, steel stud partitions, and a steel bar joist roof assembly. Structurally, the addition is in good condition along with other exterior components. Interior finishes of the addition are in good condition and do not require updates.

The 2003 and 2014 additions were constructed using structural steel, steel stud walls, steel roof joists. Exterior walls are a mixture of minimal brick and metal wall panels. There is a small number of locations where the brick needs minimal replacement, but overall the addition structure is in very good condition with all other exterior components. The locations where the brick need attention are not critical from a structural standpoint. Interior finishes are in very good condition and do not require updates.

LIFE SAFETY AND CODE VIOLATIONS

- Per the most recent energy code, the exit from the lunchroom needs vestibule doors that are currently missing.
- There is not an ADA accessible stall in the girl's restroom off of the lunchroom. In the boy's restroom, the ADA accessible stall does not meet regulations with grab bars or turning clearances.
- The boiler room is not accessible due to the stairs being the only entry point.
- In the 1959 wing of the building, there is not a sprinkler system.
- In the restrooms next to the office, the sinks are too high and it is missing vertical grab bars.
- There is no handrail on the guard rail on the stairs leading up to the mezzanine, and the guard railings are too short.
- Due to the entire building not being equipped with a sprinkler system, corridor doors must be rated with rated hardware and no air movement from rooms into corridor is allowed.
- Throughout the facility, the door handles are round knobs and need to be the accessible lever design.
- Corridor space within the Jack & Jill restrooms in the Kindergarten areas are too narrow and do not provide the required turn-around space.
- Vertical grab bars are missing at all toilets throughout the facility, excluding the fitness center.
- The southeast gym exit has pavement that is sunk around the stoop and is no longer accessible.
- The fitness center exit has pavement that is sunk around the stoop and is no longer accessible.

ELECTRICAL (COLLECTED BY CMTA)

PART 1. OVERVIEW

1.1 OVERVIEW

On October 6, 2021, CMTA performed a site inspection of Hillsboro Elementary School to identify existing conditions of electrical systems. These systems included light fixtures, lighting control, power distribution, data & telecom systems, fire alarm, door security, security cameras, clock systems, and PA systems. The following is a summary of all findings.

PART 2. ELECTRICAL ASSESSMENT

2.1 ELECTRICAL SERVICE

Existing Condition

1. Power is delivered to the site via underground electrical service from the City of Hillsboro. Service is routed to two utility transformers at north exterior of building.
 - a. The first service is provided from a 750KVA 480V 3 phase transformer for power to the electric boiler. Service is routed from the transformer to padmount CT cabinet and utility meter adjacent to transformer. Power is then routed to service entrance equipment within boiler room to west.
 - b. The second service is from a 225KVA 208V 3 phase transformer that delivers power to the rest of the building. Service is routed from



ELECTRICAL (COLLECTED BY CMTA)

the transformer to a wallmount CT cabinet within boiler room to west. Power is then routed to service entrance equipment within boiler room.

Suggested Improvements

1. The 480V service entrance appears to be adequate, as is. Gear appears to be fairly new and sufficient
 - a. Cost: N/A
2. The 208V service entrance appears to be adequate and sufficient up to CT cabinet at interior of building.
 - a. Cost: N/A

2.2 STANDBY POWER

Existing Condition

1. A dedicated emergency power source is not located on-site. Emergency power is delivered to the school via city-owned emergency generator that distributes emergency power throughout entire town of Hillsboro.

Suggested Improvements

1. It was stated that the current emergency power arrangement has worked fine in the past and has not been an issue. A suggested, but not required, improvement would be bringing in a building dedicated generator to back up all life safety loads, including egress lighting, fire alarm, etc. This would reduce the amount of points of failure and provide emergency power to only the school.
 - a. Cost: \$75,000

2.3 POWER DISTRIBUTION

Existing Conditions

1. 408V service entrances delivered through the east wall of the boiler room into the back of a switchboard with a main service disconnect. This switchboard then feeds all 480V loads.
2. 208V Service entrance is delivered through east wall of boiler room into a CT cabinet. Power is then distributed to two service disconnect switches. One of which appears well past its useful life. The other appears to be fairly new. The older service disconnect feeds several pieces of older equipment that are located adjacent.
3. Majority of branch panelboards throughout building were observed to be in good condition. Some were observed to be original to the building and past their useful life.

Suggested Improvements

1. No suggested improvements for 480V service.
 - a. Cost: N/A
2. Upgrade two 208V service disconnects to a single disconnect serving entire building. Also upgrade all equipment that is past its useful life.
 - a. Cost: \$30,000



ELECTRICAL (COLLECTED BY CMTA)

2.4 LIGHTING

Existing Conditions

1. General Lighting
 - a. Majority of building consists of recessed and surface mounted fluorescent troffers. Building also consists of suspended and surface-mounted 4' fluorescent light fixtures.
 - b. The 2014 additions to the school, including the fitness center and southeast block of classrooms, are the only areas that utilize LED lighting.
 - i. School expressed frustration with LED lighting randomly burning out within the fitness center. In these situations with LED lighting, the entire fixture more than likely needs to be replaced causing unnecessary expenses.
2. Emergency Lighting and Egress Signage
 - a. Battery pack lighting was observed in various locations throughout building.
 - b. Several locations in which illuminated exit signs are required contained exit signs that would not be lit in the event of a power outage.
 - c. Emergency power throughout entire school, including to all lighting, is supplied via city owned community-wide generator.

Suggested Improvements

1. General Lighting
 - a. Upgrade of all building lighting to energy-efficient LED lighting. This would cut lighting energy usage by 50-75%.
 - i. Cost: \$200 per light fixture.
2. Emergency Lighting and Egress Signage
 - a. Installation of new illuminated exit signs at all locations in which exit signage is required, by Code.
 - i. Cost: \$100 per light fixture.
 - b. If emergency generator is installed, all power to emergency egress lighting shall be routed from generator.
 - i. Cost: \$10,000

2.5 LIGHTING CONTROL SYSTEMS

Existing Conditions

1. All lighting control systems throughout building, outside if 2014 additions, were observed to be manual toggle switch. Minimal lighting is capable of dimming operation.
2. 2014 addition areas are controlled via manual and automatic lighting controls.
3. All exterior lighting controlled via centrally-located photocell.



ELECTRICAL (COLLECTED BY CMTA)

Suggested Improvements

1. Upgrade of all lighting controls throughout to digital lighting management. This includes, but is not limited to, occupancy sensors, vacancy sensors, daylight sensors, dimming controls in majority of spaces, and digital monitoring of all controls via manufacturer provided software.
 - a. Cost: \$100 per lighting control device.

2.6 COMMUNICATIONS SYSTEMS

Existing Conditions

1. Telecom Systems
 - a. Telecom services are provided by Halstad Telephone and are delivered to building via overhead fiber. Service enters building through east wall of boiler room via fiber. Fiber is then routed to a data rack that is centrally located within school. All services are then dispersed from here to various remote racks around the building. Various racks located throughout building to facilitate connections because of cable length restrictions.
 - b. Wireless access point coverage appeared to be adequate throughout building with dedicated access points within majority of classrooms.
2. Intercom System
 - a. Existing system is Simplex Building Communications Unit.
 - b. Intercom speakers observed through classrooms and various spaces throughout school. System appeared to be very dated, but was stated to still be in operation.
 - c. Classrooms have IP phones for room-to-room communication throughout school.
3. Bell System
 - a. Older bells observed throughout school which were stated to no longer be in use. Any “bell system” type operations are now carried out through intercom speakers.
4. Clock System
 - a. Existing clock system consists of various hardwired and wireless clocks throughout school communicating with central unit within front office. System is Midwest Time Control, Inc. MTC-400. System is currently in operating condition, but is very old.
 - b. Various atomic clocks were observed throughout building.
5. Classroom Technology
 - a. Digital displays and smartboards were observed in several classrooms.
 - b. Various classrooms contained webcams and appeared to be capable of teleconferencing.
 - c. Various classrooms were observed to utilize dedicated sound reinforcement.
6. Radio Communications
 - a. All radio communications done from Motorola radio equipment located within closet near front desk.



Suggested Improvements

1. Telecom Systems
 - a. Telecom systems appeared to be adequate.
 - b. Telecom service appears to be adequate. One suggestion would be the relocation of all main equipment to a dedicated space that is climate controlled.
 - i. Cost: N/A
2. Intercom System
 - a. Upgrading of existing intercom system to new IP system throughout entire school. This would provide the functionality to adjust the utilization and grouping of each individual speaker, as desired. This system would also include an upgraded wireless clock system. The intercom system and clock system would communicate with manufacturer provided software to set schedules, announcements, bells, etc.
 - i. Cost: \$100,000
3. Bell System
 - a. Bell system functionality would be included within the new intercom system as described in the "Intercom System" section.
 - i. Cost: See "Intercom System" section.
4. Clock System
 - a. Clock system would be included within the new intercom system as described in the "Intercom System" section.
 - i. Cost: See "Intercom System" section.
5. Classroom Technology
 - a. No improvements suggested.
 - i. Cost: N/A
6. Radio Communications
 - a. No improvements suggested. While the CB radio technology is old, it has been proven to be reliable and is still utilized very frequently to this day.
 - i. Cost: N/A
7. Classroom Sound Reinforcement
 - a. No improvements suggested.
 - i. Cost: N/A

2.7 SAFETY & SECURITY SYSTEMS

Existing Conditions

1. Door Security
 - a. Front entrance utilizes AIPhone system with camera, intercom, and door release within the front office.
 - b. Electronic door hardware manufacturer is Keri Systems.
 - c. All exterior doors are monitored via computer at front office and majority of doors can be released/locked via controls at that location.
 - d. Control panel for security and intrusion detection was observed at front office area.



ELECTRICAL (COLLECTED BY CMTA)

2. Security Cameras

- a. Security camera system had recently been updated to IP throughout building. Laser Systems of Fargo is responsible for most upgrades and maintenance work.
- b. All of security camera equipment located with electrical closet at center of building.

3. Fire Alarm

- a. Existing fire alarm control panel is Mircom FX-2000.
- b. Newer east half of school is sprinkled, while the original west half is not.
- c. Fire detection was observed to be adequate in most spaces. Spaces including the cafeteria and media center were observed to have no fire detection. By Code, all spaces that do not contain a fire suppression (sprinkler) system are required to have fire detection. A more detailed investigation of every space would be required to assess all areas of building that do not contain fire suppression.
- d. Notification consists of strobes and horn/strobe devices. Several devices appeared to have been updated within the past several years.

Suggested Improvements

1. Door Security

- a. No improvements suggested. Existing system appears adequate.
 - i. Cost: N/A

2. Security Cameras

- a. No improvements suggested. Cameras are IP and can be added at Owner's desire.
 - i. Cost: N/A

3. Fire Alarm

- a. No improvements suggested. A more in depth assessment of the entire fire alarm system would need to be done in order to evaluate if all required equipment is installed in all areas and locations.
- b. If the system was to be upgraded in the future, a voice-capable fire alarm system would be suggested. This system would emit voice messages instructing occupants what to do in an emergency situation. This would be in lieu of a horn sounding in an emergency situation as the system does now.
 - i. Cost: \$100,000

Respectfully,
CMTA, Inc.



Trevor Fredrickson
Senior Electrical Engineer



MECHANICAL (COLLECTED BY CMTA)

PART 1. OVERVIEW

1.1 OVERVIEW

On October 6, 2021, CMTA performed a site inspection of Hillsboro Elementary School to identify existing conditions of mechanical systems. These systems include heating/cooling system, indoor air quality systems, controls, and fire protection. The following is a summary of all findings.

PART 2. MECHANICAL ASSESSMENT

2.1 HEATING AND COOLING SYSTEM

Existing condition

1. There are two different heating/cooling system serving different parts of the building. The original building (1959 through 1999 remodels/additions) is served by a hot water system based on a 2009 electric boiler upgrade and heating water storage by utilizing an existing boiler. The new additions are served by a geothermal wellfield and heat pumps that serve individual spaces that provide zone heating and cooling. The geothermal wellfield was installed in 2002/3. A geothermal vault was installed in the 2015 addition and the wellfield was expanded at that time.

Suggested Improvements

1. Upgrade the boiler room to include a secondary boiler and repipe boiler room for new units/loads.
2. Geothermal wellfield does not need to be expanded at this time unless any new units are decided to be added to the geothermal loop. The heat pumps and outside air unit installed in 2003 are past their ASHRAE life expectancy should be replaced. The 2015 heat pumps have about 10 years left of useful life.
 - a. Single zone heat pumps serving multiple classrooms shall be changed to a heat pump rooftop unit with vav boxes served off the existing hot water loop for individual classroom control.
3. Estimated cost to update boiler room
 - a. \$180,000
4. Heat pump update including VAV and heating water zoning for classrooms
 - a. \$340,000

2.2 INDOOR AIR QUALITY

Existing Conditions

1. Classrooms in the original building are served by heating only classroom unit ventilators. The outside air to these units is served either by exterior louver or through ducted gooseneck intakes on interior classrooms to the roof. For conditioning of exterior classrooms, window air conditioning units are installed.
2. The library was building into the courtyard of the original building and is served by a rooftop unit with DX cooling that is past its expected life.
3. Cafeteria units are not providing code required outside air and are past their life expectancy.
4. Kitchen hood and make up air is deficient for equipment underneath the hood. Roof mounted fan is past its life expectancy.
5. 2000 classroom addition rooftop unit is past its useful life.
6. No cooling in the electrical room that also contains the freezer compressor



MECHANICAL (COLLECTED BY CMTA)

Suggested Improvements

1. Provide new variable air volume heating water and DX cooling rooftop units for classrooms to ensure proper outside air is delivered and conditioned to classrooms
2. Replace library unit with new single zone variable air volume hot water heating and DX cooling roof top unit.
3. Provide new hot water and DX cooling cafeteria and kitchen units with new kitchen hood with make-up air. Units will provide proper outside air, heating and cooled by hot water or DX, and hood will have proper containment.
4. Replace existing 2000 addition RTU with hot water heat and packaged DX.
5. Provide indoor wall mounted "mini-split" units for cooling in electrical rooms
6. New heating water piping will need to be ran to new rooftop unit and VAV boxes. The original 1959 piping is past its life expectancy, and new heating loads/requirements cause the piping to be undersized
7. Estimated Cost for above work:
 - a. \$1,200,000

2.3 CONTROLS

Existing Condition

1. The existing controls in the building are a mixture of G&R/Siemens for digital control and Honeywell for pneumatic.

Suggested Improvements

1. Transition all the controls to digital controls and upgrade the existing control system to latest model/edition.
2. Estimated cost:
 - a. \$150,000

2.4 FIRE PROTECTION SYSTEM

Existing Condition

1. The 2002 addition and beyond has been sprinkled, the original building and 1999 addition is not currently sprinkled.

Suggested Improvements

1. Provide new fire protection zone to sprinkle rest of the building.
2. Estimated cost
 - a. \$175,000

Respectfully,
CMTA, Inc.



Erik Aakhus
Mechanical Engineer



HILLSBORO PUBLIC SCHOOLS - ELEMENTARY SCHOOL

STRUCTURAL CONDITION AND BUILDING VIOLATION PHOTOS



The windows are past their life expectancy, and several are completely covered with plywood and window air conditioning units.



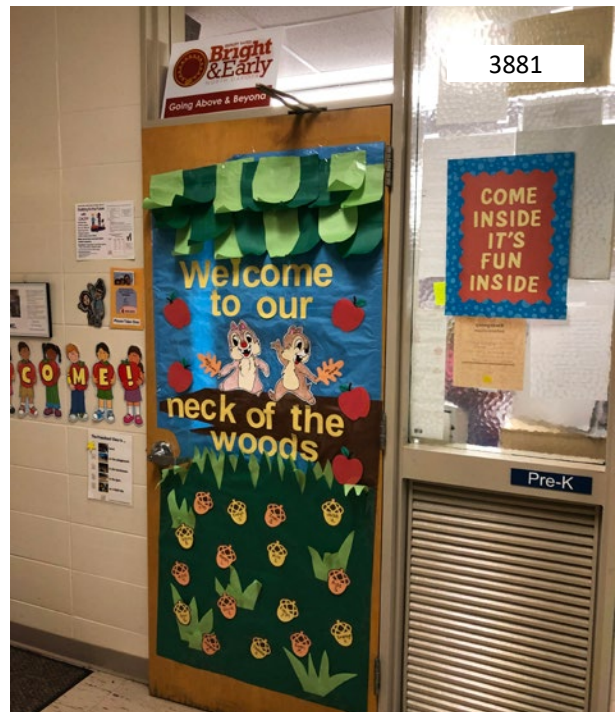
Per current code, 62 square feet of daylight is required in each classroom, but only 15 square feet is provided along the west classrooms.



Many classrooms are interior and have no natural daylight.



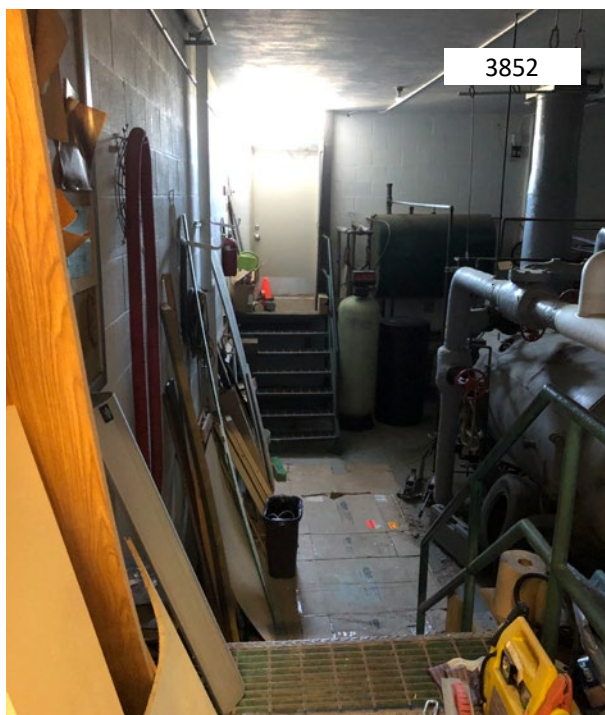
The acoustic ceiling tile is dated and stained from several roof leaks and should be scheduled to be replaced in the event sprinklers are installed in this section of the building.



Door frames are chipping and would benefit from repainting and doors should be scheduled for replacement in the future.



There is not an ADA accessible stall in the girl's restroom off of the lunchroom. In the boy's restroom, the ADA accessible stall does not meet regulations with grab bars or turning clearances.

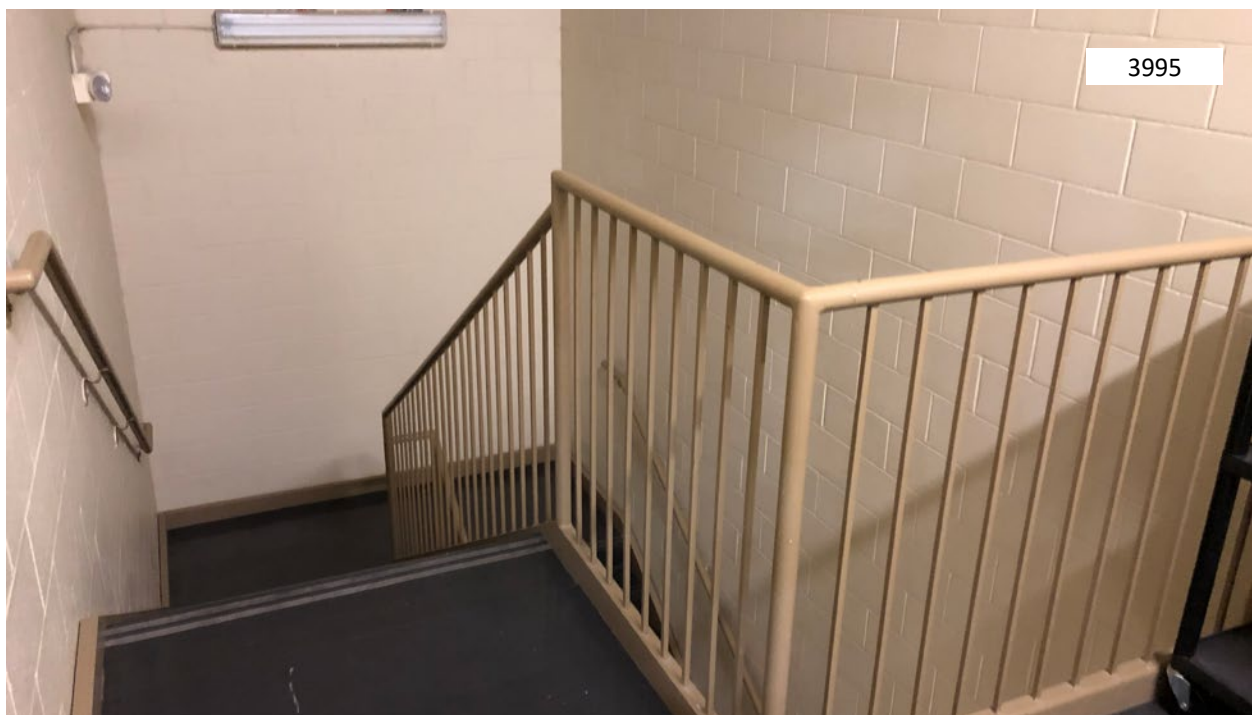


The boiler room is not accessible due to the stairs being the only entry point.



3849

In the restrooms next to the office, the sinks are too high and it is missing vertical grab bars.



3995

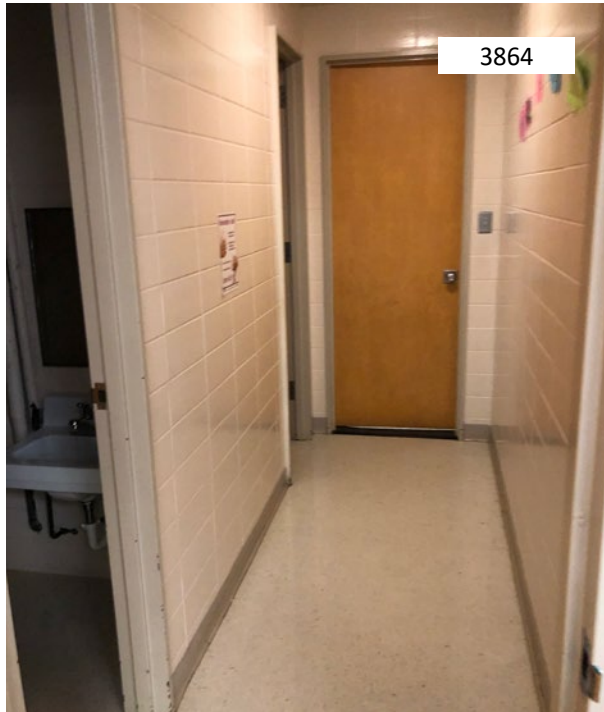
There is no handrail on the guard rail on the stairs leading up to the mezzanine, and the guard railings are too short.



Due to the entire building not being equipped with a sprinkler system, corridor doors must be rated with rated hardware and no air movement from rooms into corridor is allowed.



Throughout the facility, the door handles are round knobs and need to be the accessible lever design.



Corridor space within the Jack & Jill restrooms in the Kindergarten areas are too narrow and do not provide the required turn-around space.



Vertical grab bars are missing at all toilets throughout the facility, excluding the fitness center.



The southeast gym exit has pavement that is sunk around the stoop and is no longer accessible.



The fitness center exit has pavement that is sunk around the stoop and is no longer accessible.

EXTERIOR SITE CONDITIONS

HILLSBORO PUBLIC SCHOOLS - ELEMENTARY SCHOOL

The site containing the elementary school and high school is in overall good condition. Surround asphalt pavement ranges from fair to good condition. Parking lot striping is in good condition and is easily distinguishable. Multiple handicap parking stalls are located at the main entrances and provide the correct curb cuts for accessibility. Concrete sidewalks along the new additions are in good condition with minimal cracking. Sidewalks along and around the original building along the northwest is heavily cracked and sunken around the kitchen entrance, and requires replacement. The main entrance into the fitness center is no longer handicap accessible due to the surrounding concrete sinking at the entrance, forming a ledge. This will require replacement. A dedicated drop-off and pick-up space is located along the west side for both buses and regular traffic. The building would benefit from a more defined location for younger children, but is acceptable per code. The site around the athletic fields and track are relatively new and are in excellent condition. Playground equipment is a mixture of old and new equipment and is in good condition.

EXTERIOR SITE CONDITION PHOTOS



Surrounding asphalt pavement ranges from fair to good condition.



4049

Parking lot striping is in good condition and is easily distinguishable.



4013

Sidewalks along and around the original building along the northwest are heavily cracked and sunken around the kitchen entrance and should be replaced.



Sidewalks along and around the original building along the northwest are heavily cracked and sunken around the kitchen entrance and should be replaced.



The main entrance into the fitness center is no longer handicap accessible due to the surrounding concrete sinking at the entrance stoop forming a ledge. This should be replaced.

TEACHER AND STAFF FEEDBACK

WHAT DIFFERENT TYPES OF SPACES WOULD YOU LIKE TO SEE WITHIN THE ELEMENTARY SCHOOL?

Common Themes

- Breakout Spaces
- Storage (Kitchen, Classrooms, PE, Music, Admin)
- Larger Classrooms
- Increase Special Education/Title Areas
- Teacher's Lounge

WHAT CONCERNS DO YOU HAVE ABOUT THE ELEMENTARY SCHOOL?

Common Themes

- Windows (Lack Of, Unable to Open Them)
- Heat Regulation
- More Outlets
- Lack of Adaptive Spaces
- Safe Area for Drop-Off, Pick-Up, Buses

WHAT IS YOUR VISION FOR YOUR SCHOOL?

Common Themes

- Large Classrooms to Fit Large Class Sizes
- New K-12 Building, All Students Under One Roof
- Improved Parking
- "Build Next Door"/Secure Adjacent Land
- Partitioned Space Rooms/Flexible Classroom Space

Find more staff and teacher feedback at the end of the facility assessment.

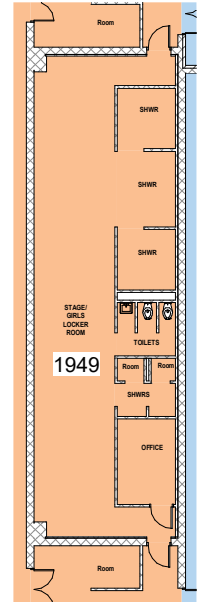
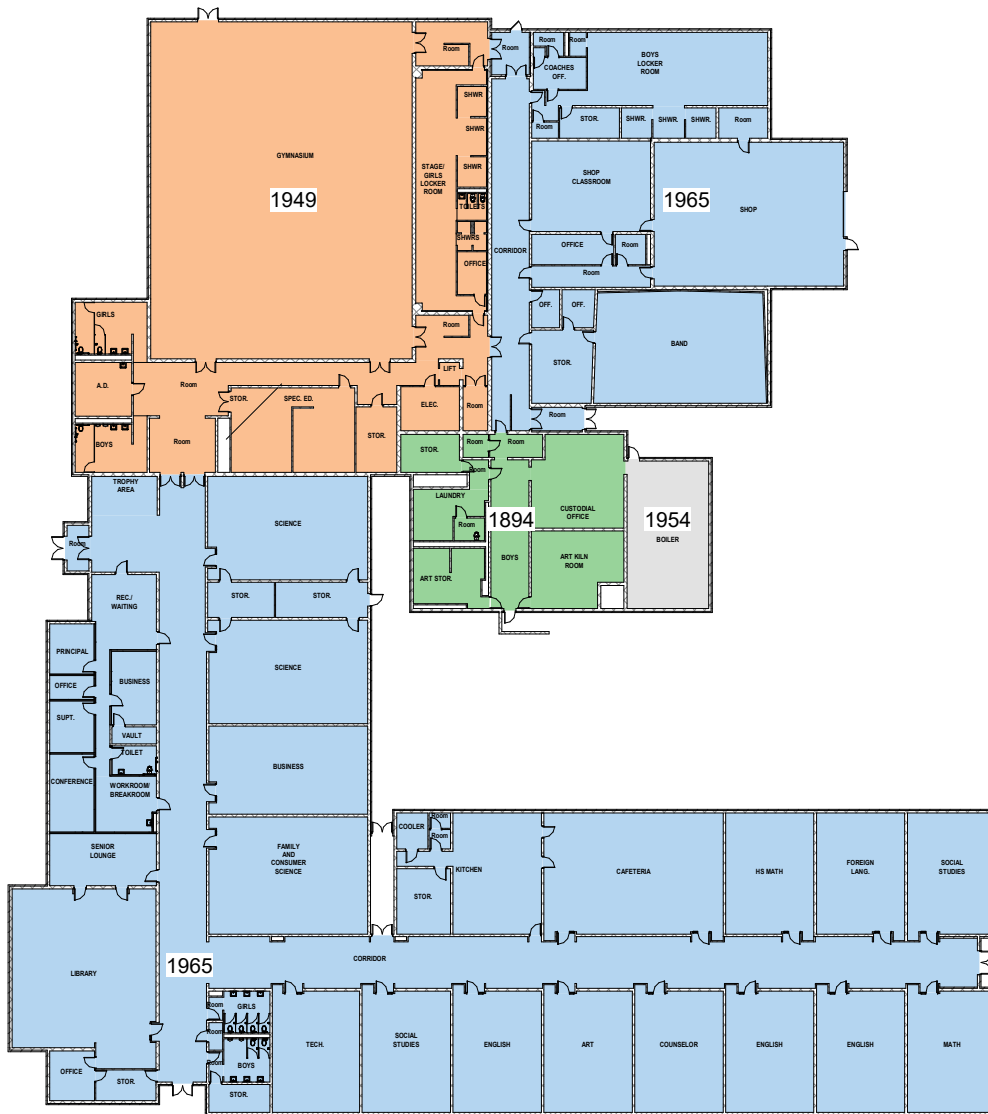
EDUCATIONAL ADEQUACY

HILLSBORO PUBLIC SCHOOLS - ELEMENTARY SCHOOL

	Hillsboro ES Current SF	DPI Recommendation SF	SF Difference +/-
Administration	1,579	2000	-421
Art	770	1,500 SF	-730
Cafeteria	3,130	4,200	-1,070
Classroom (average)	770	900	-130
Early Childhood	825	1,250	-425
Computer Lab	833	1,600	-767
Library	2,165	2,700	-535
Music	2,535	5,000	-2,465
Food Service	900	4,150	-3,250
PE/Athletics	14,418	7,500	6,918
Special Education	1,050	1,600	-550
Mechanical	1,851	4,950	-3,099

HILLSBORO PUBLIC SCHOOLS - HIGH SCHOOL

FACILITY ASSESSMENT



2 Girls Locker Room - Ren. Breakdown
1/8" = 1'-0"

LEGEND

- 1894
- 1949
- 1954
- 1965



STRUCTURAL CONDITIONS

The building is comprised of brick and CMU exterior walls, metal panel on the upper exterior walls, CMU interior walls (either painted or coated with plaster), steel bar joist, steel decking roof, and concrete floors. The exterior brick and mortar are in fair condition on most of the additions, but there are areas that the brick is cracked, or mortar has fallen out and requires repair. Areas with exterior brick in need of attention are on the northwest corner of the gymnasium and around the original 1894 boiler room. The exterior doors and entrance systems are in acceptable condition. The exterior windows throughout the building are past their life expectancy and require replacement. The exterior wall assembly contains minimal insulation throughout, approximately 1/3 of what's required by today's code.

The roof is a combination of full adhered and ballasted EPDM rubber membrane. The roof has been repaired/replaced as needed throughout the years. While there appears to be no roof leaks or any other issues with the roof, it is assumed that roof replacement will need to be done in many areas within the next 10 to 15 years.

Other than the science rooms and administrative offices, the interior has had no major renovations. The kitchen is small with many dated pieces of equipment, specifically the coolers and freezers. The flooring throughout the building is either 9x9 asbestos-based VCT or 12x12 VCT and it is past its life expectancy. A small amount of rooms have carpeting or tile carpeting and looks to be in good condition. It is unknown if the carpeting was placed over existing VCT. Ceilings are mainly 2x2 acoustic ceiling tile. Most of the ceiling tile is in fair condition, but it is recommended replacing if sprinkler system or mechanical upgrades were to take place.

The 1949 addition ceilings are mostly plaster and have been painted as needed. Original casework is throughout the facility and is past its life expectancy. Wood doors and hardware throughout the facility are past their life expectancy. The gymnasium floor is in good condition. Lockers, finishes, flooring, and showering facilities within the boy's locker room needs renovating. The girl's locker room is below the stage and not ADA accessible. All finishes within the girl's locker room are past their life expectancy and requires renovating. All portions of the original 1984 school are in poor condition and in need of a complete renovation or replacement. Overall, many of the finishes are dated and past their life expectancy but have been well maintained.

LIFE SAFETY AND CODE VIOLATIONS

- There is not a sprinkler system in the high school.
- Corridor doors are not rated or no return grills for air exchange. Fire rated door hardware is not present on corridor doors.
- The boiler room is in a lower level and is not accessible from either school or from the outside.
- The art supplies and kiln room are in a lower level and is not ADA accessible due to it only having stairs.
- The handrails and guard railings throughout all stairs within the facility do not meet accessibility requirements.
- The shop area does not have ADA-compliant stations.
- Multiple exits from the gymnasium are chained or padlocked shut and is very unsafe under emergency conditions.
- The girl's locker room is underneath the stage and is not accessible due to only having stairs. The locker room is not ADA accessible including the showers (curb in front of the shower), toilets (no grab bars, turning clearances), and sinks (clearance issues). The second exit to the west is locked shut, this does not allow for the minimum accessible means of egress and is very unsafe under emergency conditions.
- Boy's locker room is missing accessible toilet.
- Music room enters to upper tier area and there is no ramp down to the main level.
- The special education room has a second level and is constructed of wood (not permitted in a 2B noncombustible construction building), and is not accessible with only stairs. The stairs do not meet minimum tread depth or riser height requirements, no riser backs on stairs, and guard railings and hand railings do not meet minimum requirements.
- In the main restrooms, the toilet partitions are too small for ADA clearances, the urinals and sinks are too high, the grab bars are the wrong size and were installed at incorrect heights.
- The stage is not accessible due to the stairs.
- There are no accessible locations within the gymnasium bleachers.
- The radio/spotlight platform within the gymnasium is not accessible.
- The kitchen restroom is not accessible due to the door into restroom being too small and there are no grab bars.
- The FACS room is missing an accessible kitchen station.
- The library desk is missing an ADA-height counter area.
- The NE exit (Door 3) has double doors inside the vestibule, but a single door at exterior. The width of the egress to the exit point cannot be reduced from 72" to 36" bottlenecks during emergency egressing.
- The ramp at the exterior SW door has a railing that does not meet accessibility minimums.
- 60% of all exterior doors/exits must meet accessibility. Only 6 of 11 doors are currently accessible.
- Several door handles within the facility are not levers and are not accessible.
- Various exterior doors do not contain a vestibule that is required per new energy code.
- 9x9 asbestos floor tile can be found in most locations throughout.

ELECTRICAL (COLLECTED BY CMTA)

PART 1. OVERVIEW

1.1 OVERVIEW

A. On October 6, 2021, CMTA performed a site inspection of Hillsboro High School to identify existing conditions of electrical systems. These systems included light fixtures, lighting control, power distribution, data & telecom systems, fire alarm, door security, security cameras, clock systems, and PA systems. The following is a summary of all findings.

PART 2. ELECTRICAL ASSESSMENT

2.1 ELECTRICAL SERVICE

Existing Condition

1. Power is delivered to site via overhead service from the City of Hillsboro. Service is routed down pole to 225KVA 120/208V 3-phase padmount utility transformer. The transformer secondary is then routed back up pole, and power is delivered to building via overhead conductor to main electrical closet.

Suggested Improvements

1. Service appears to be adequate, as is. An improvement to an underground service entrance would be suggested, but would be difficult with the current main electrical room location being in the middle of the school instead of in a room with an exterior wall.
2. Another possible improvement, but not required, would be requesting that the City of Hillsboro bury the incoming service to the utility transformer instead of routing overhead. This would increase safety and reduce the possibilities of failure by being exposed to the elements.

2.2 STANDBY POWER

Existing Condition

1. A dedicated emergency power source is not located on-site. Emergency power is delivered to the school via city-owned emergency generator that distributes emergency power throughout entire town of Hillsboro.

Suggested Improvements

1. It was stated that the current emergency power arrangement has worked fine in the past and has not been an issue. A suggested, but not required, improvement would be bringing in a building dedicated generator to back up all life safety loads, including egress lighting, fire alarm, etc. This would reduce the amount of points of failure and provide emergency power to only the school.
 - a. Cost: \$75,000

2.3 POWER DISTRIBUTION

Existing Conditions

1. Service is delivered through roof to 120/208V 1200A ITE-brand main switchboard within main electrical room. Switchboard consists of fused disconnects. All power is delivered throughout building from this switchboard. Main switchboard was installed in 1965 and appears to be past its useful life.
2. Several electrical panelboards were observed to be past their useful life. Kinney brand panelboards were observed for which parts are no longer manufactured and are only available via secondary markets.



ELECTRICAL (COLLECTED BY CMTA)

Suggested Improvements

1. Upgrade of the main electrical switchboard to new switchboard that utilizes overcurrent breaker devices in lieu of fused disconnects. The existing switchboard is well past its useful life and, while it is still operable, does present an increasing element of failure with each passing year.
 - a. Cost: \$35,000
2. Upgrade of all panelboards that are past their useful life. Namely the Kinney brand panelboards. These panels are no longer manufactured and parts are increasingly harder to find and more expensive. Parts can only be purchased via secondary markets, making their reliability questionable.
 - a. Cost: \$5,000 per panelboard

2.4 LIGHTING

Existing Conditions

1. General Lighting
 - a. Majority of building consists of recessed and surface mounted troffers. Building also consists of suspended fluorescent fixtures and fixtures utilizing incandescent light bulbs.
 - b. Various areas throughout school have been upgraded to LED lighting over past several years.
2. Gym Lighting
 - a. Lighting within gym is provided by linear fluorescent lights that are surface-mounted to ceiling. Lighting at floor level appeared to be lower than suggested levels for a high school activities court.
3. Emergency Lighting and Egress Signage
 - a. Battery pack lighting was observed in various locations throughout building.
 - b. Exit signage appeared to be adequate.
 - c. Emergency power throughout entire school, including to all lighting, is supplied via city owned community-wide generator.

Suggested Improvements

1. General Lighting
 - a. Upgrade of all building lighting to energy-efficient LED lighting. This would cut lighting energy usage by 50-75%.
 - i. Cost: \$200 per light fixture.
2. Gym Lighting
 - a. Upgrade of all lighting to LED lighting. New lighting would have increased levels of illumination improving the brightness at the floor level, as suggested by the lighting professionals.
 - i. Cost: \$500 per light fixture.
3. Emergency Lighting and Egress Signage
 - a. If emergency generator is installed, all power to emergency egress lighting shall be routed from generator.
 - i. Cost: \$10,000



ELECTRICAL (COLLECTED BY CMTA)

2.5 LIGHTING CONTROL SYSTEMS

Existing Conditions

1. All lighting control systems throughout building were observed to be manual toggle switch. Minimal lighting is capable of dimming operation.
2. All exterior lighting controlled via centrally-located photocell.

Suggested Improvements

1. Upgrade of all lighting controls throughout to digital lighting management. This includes, but is not limited to, occupancy sensors, vacancy sensors, daylight sensors, dimming controls in majority of spaces, and digital monitoring of all controls via manufacturer provided software.
 - a. Cost: \$100 per lighting control device.

2.6 COMMUNICATIONS SYSTEMS

Existing Conditions

1. Telecom Systems
 - a. Telecom services are provided by Halstad Telephone and are delivered to building via overhead fiber. Service entrance equipment located within main electrical room that also houses main electrical service entrance equipment. Equipment appears to have been pieced together over time with small rack located on floor. Space was observed to be very warm and not an ideal space for important telecom equipment. Various racks located throughout building to facilitate connections because of cable length restrictions.
 - b. Wireless access point coverage appeared to be adequate throughout building with dedicated access points within majority of classrooms.
2. Intercom System
 - a. Intercom speakers observed through classrooms and various spaces throughout school. System appeared to be very dated, but was stated to still be in operation.
 - b. Classrooms are equipped with IP phones for room-to-room communication throughout school.
3. Bell System
 - a. Older bells observed throughout school which were stated to no longer be in use. Any "bell system" type operations are now carried out through intercom speakers..
4. Clock System
 - a. Existing clock system consists of various hardwired and wireless clocks throughout school communicating with central unit within front office. System is Midwest Time Control, Inc. MTC-400. System is currently in operating condition, but is very old.
5. Classroom Technology
 - a. Digital displays and smartboards were observed in several classrooms.
 - b. Various classrooms contained webcams and appeared to be capable of teleconferencing.
6. Radio Communications
 - a. Radio communications antenna located on pole at center of school.
 - b. All radio communications done from Motorola radio equipment at front desk.



ELECTRICAL (COLLECTED BY CMTA)

Suggested Improvements

1. Telecom Systems

- a. Telecom service appears to be adequate. One suggestion would be the relocation of all main equipment to a dedicated space that is climate controlled in lieu of being house within a room with all main electrical service equipment.

- i. Cost: N/A

2. Intercom System

- a. Upgrading of existing intercom system to new IP system throughout entire school. This would provide the functionality to adjust the utilization and grouping of each individual speaker, as desired. This system would also include an upgraded wireless clock system. The intercom system and clock system would communicate with manufacturer provided software to set schedules, announcements, bells, etc.

- i. Cost: \$100,000

3. Bell System

- a. Bell system functionality would be included within the new intercom system as described in the "Intercom System" section.

- i. Cost: See "Intercom System" section.

4. Clock System

- a. Clock system would be included within the new intercom system as described in the "Intercom System" section.

- i. Cost: See "Intercom System" section.

5. Classroom Technology

- a. No improvements suggested.

- i. Cost: N/A

6. Radio Communications

- a. No improvements suggested. While the CB radio technology is old, it has been proven to be reliable and is still utilized very frequently to this day.

- i. Cost: N/A

2.7 SAFETY & SECURITY SYSTEMS

Existing Conditions

1. Door Security

- a. Front entrance utilizes AIPhone system with camera, intercom, and door release within the front office.
- b. Electronic door hardware manufacturer is Keri Systems.
- c. All exterior doors are monitored via computer at front office and majority of doors can be released/locked via controls at that location.
- d. Control panel for security and intrusion detection was observed at front office area.



ELECTRICAL (COLLECTED BY CMTA)

2. Security Cameras

- a. Security camera system had recently been updated to IP throughout building. Laser Systems of Fargo is responsible for most upgrades and maintenance work.
- b. All of security camera equipment located with main electrical room with all main telecom equipment. Refer to telecom systems section for assessment of space.

3. Fire Alarm

- a. Existing fire alarm control panel is Mircom FX-2000.
- b. Building is not sprinkled at all.
- c. Fire detection located at adequate spacing throughout hallways.
- d. Notification consists of strobes and horn/strobe devices. Several devices appeared to have been updated within the past several years.

Suggested Improvements

1. Door Security

- a. No improvements suggested. Existing system appears adequate.
 - i. Cost: See "Intercom System" section.

2. Security Cameras

- a. No improvements suggested. Cameras are IP and can be added at Owner's desire.
 - i. Cost: See "Intercom System" section.

3. Fire Alarm

- a. No improvements suggested. A more in depth assessment of the entire fire alarm system would need to be done in order to evaluate if all required equipment is installed in all areas and locations.
- b. If the system was to be upgraded in the future, a voice-capable fire alarm system would be suggested. This system would emit voice messages instructing occupants what to do in an emergency situation. This would be in lieu of a horn sounding in an emergency situation as the system does now.
 - i. Cost: \$100,000

Respectfully,
CMTA, Inc.



Trevor Fredrickson
Senior Electrical Engineer



MECHANICAL (COLLECTED BY CMTA)

PART 1. OVERVIEW

1.1 OVERVIEW

A. On October 6, 2021, CMTA performed a site inspection of Hillsboro High School to identify existing conditions of electrical systems. These systems included ventilation, heating, dehumidification, and mechanical systems. The following is a summary of all findings.

PART 2. MECHANICAL ASSESSMENT

2.1 CONTROLS

Existing Condition

1. The existing controls area mixture of Digital and pneumatic controls

Suggested Improvements

1. It would be suggested to convert all the controls from pneumatic to digital controls. This would include all RTU's, AHU, terminal devices, boilers, fin radiation, etc. It is suggested that this controls upgrade is in conjunction with replacing the systems indicated below.
2. Estimate cost for new controls with suggested improvements listed further in the report.
 - a. \$250,000

2.2 BOILER ROOM HEATING SYSTEM

Existing Condition

3. The existing steam boilers in the high school are from 1954 and 2005. Both burners have capabilities of burning fuel oil and propane. The existing fuel oil has been disconnected recently, and propane is on site.
4. The 1954 boiler is past its useful life.

Suggested Improvements

1. Fuel oil tank should be removed as it is not serving any equipment in the building
2. Natural gas is available to be brought into the building. Propane tank and piping should be removed.
3. With the 1954 steam boiler past its useful life, and steam being discontinued in the building with the below unit replacements, two new natural gas, hot water boilers to serve the building.
4. Cost for removal of fuel oil, propane, demo boiler and new boilers and boiler room piping
 - a. \$650,000

2.3 FIRE PROTECTION

Existing Condition

1. No fire protection is provided in this building



MECHANICAL (COLLECTED BY CMTA)

Suggested Improvements

1. Provide new fire protection service along with zones required for the square foot of the school.
2. Cost for new service, riser, and sprinklers around the building
 - a. \$250,000

2.4 INDOOR AIR QUALITY

Existing Conditions

1. Existing classrooms unit ventilators do not have any outside air intakes. All outside air is brought in by operable windows in the space. The outside air is brought in is not heated, cooled, dehumidified, etc.
2. The existing corridors are used return air plenum which is not allowed by code
3. Welding room – existing welding room does not have any source capture, and general exhaust in each booth is completely exhausted
4. Gym – existing gym units are original to the building. AHU's are located in a space where access is not easily gained. Outside air is not currently monitored and is not cooled/dehumidified before serving the space.
5. Science classroom and admin offices rooftop unit was installed in 2007. The rooftop units are propane gas fired with packaged DX for cooling. Currently, the offices and science classes are not zoned individually, meaning one thermostat controls the whole office RTU and one thermostat controls the science RTU. In addition, the science classrooms unit is not sized appropriately for updated outside air requirements for classroom spaces.
6. The kitchen hood does not have proper capture overhang around the cooking equipment.
7. Existing RTU over the music area is past its useful life

Suggested Improvements

1. Provide new Rooftop VAV systems for classrooms for occupant comfort and to provide appropriate outside air requirements. The corridors will not be required to be used as a plenum.
2. Provide weld fume capture system that will capture weld fumes at the source, filter and recirculate the air back into the room, saving energy. The existing AHU in the space will be updated to provide correct outside air/recirculation of air to the space.
3. Replace gym units with new system including updated outdoor air values and dehumidification and cooling of the space.
4. With the transition from propane to natural gas, and the rooftop units reaching the end of their average service life as determined by ASHRAE, it is recommended to replace these units. Office unit would be a VAV Rooftop unit with VAV reheats for different zones, and the science classroom would be an energy recovery with VAV reheats for the different classrooms.



MECHANICAL (COLLECTED BY CMTA)

5. It is recommended to replace kitchen hood and size appropriately for the kitchen equipment in the kitchen, with gas fired makeup air unit and supply plenums on the hood.
6. Replace music area RTU
7. Replace any propane-based equipment
8. Replace any Steam unit heater or steam heating unit in the building with hot water units.
9. Provide new heating water piping to all new rooftop unit equipment and vav boxes and terminal radiation
10. Estimated cost for work
 - a. \$2,000,000

Respectfully,
CMTA, Inc.



Erik Aakhus
Mechanical Engineer



HILLSBORO PUBLIC SCHOOLS - HIGH SCHOOL

STRUCTURAL CONDITION AND BUILDING VIOLATION PHOTOS



4080

Areas with exterior brick in most need of attention are on the northwest corner of the gymnasium and around the original 1894 boiler room.



4081

Areas with exterior brick in most need of attention are on the northwest corner of the gymnasium and around the original 1894 boiler room.



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Areas with exterior brick in most need of attention are on the northwest corner of the gymnasium and around the original 1894 boiler room.



4103

The exterior windows throughout the building are past their life expectancy and need replacing.



4105

The exterior windows throughout the building are past their life expectancy and need replacing.



The kitchen is small with many dated pieces of equipment, specifically the coolers and freezers.



The flooring throughout the building is either 9x9 asbestos-based VCT or 12x12 VCT and it is past its life expectancy.



The kitchen is small with many dated pieces of equipment, specifically the coolers and freezers.



It is unknown if the carpeting was placed over existing VCT. Ceilings are manly 2x2 acoustic ceiling tile.



Wood doors and hardware throughout the facility are past their life expectancy.



. All finishes within the girl's locker room are past their life expectancy and requires renovating.



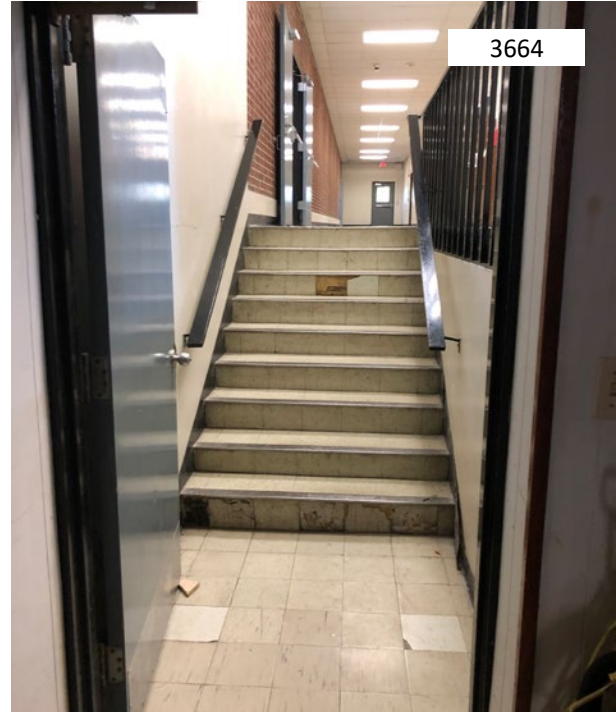
Lockers, finishes, flooring, and showering facilities within the boy's locker room needs renovating.



All portions of the original 1984 school are in poor condition and in need of a complete renovation or replacement.



Corridor doors not rated or have return grills for air exchange. Fire rated door hardware is not present on corridor doors.



The handrails and guard railings throughout all stairs within the facility do not meet accessibility requirements.



The boiler room is in a lower level and is not accessible from either school or from the outside.



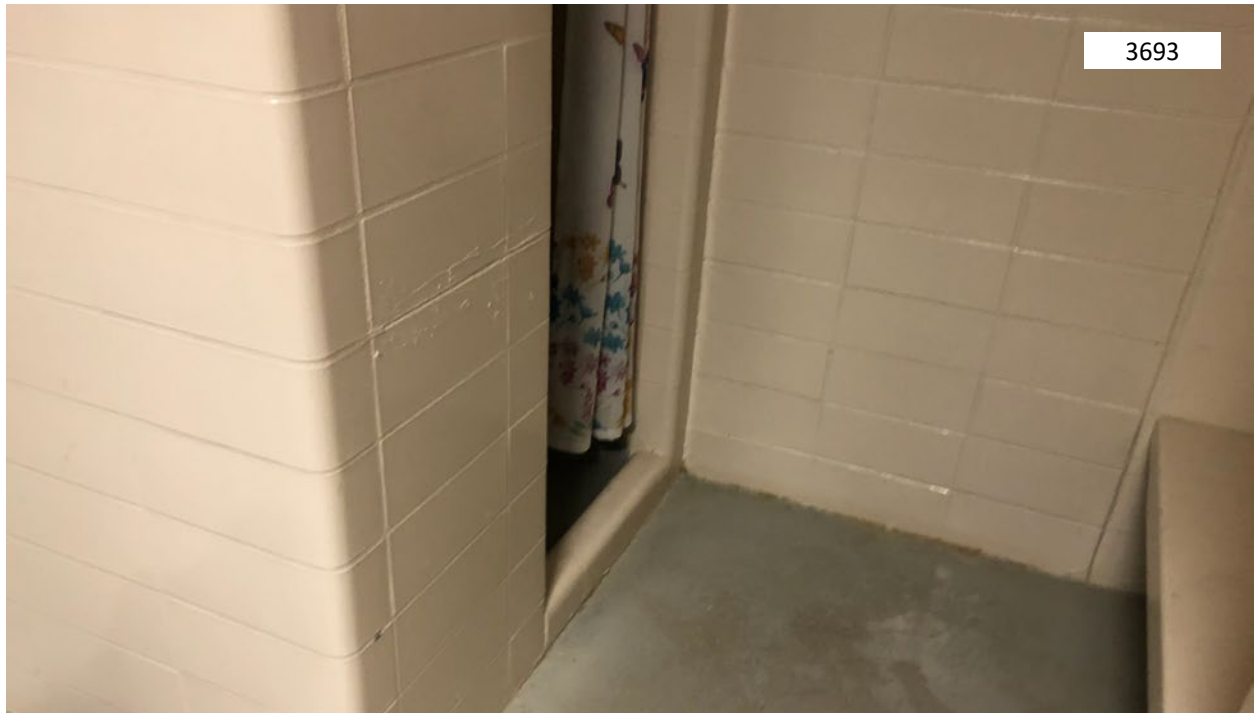
3623

The art supplies and kiln room are in a lower level and is not ADA accessible due to it only having stairs.

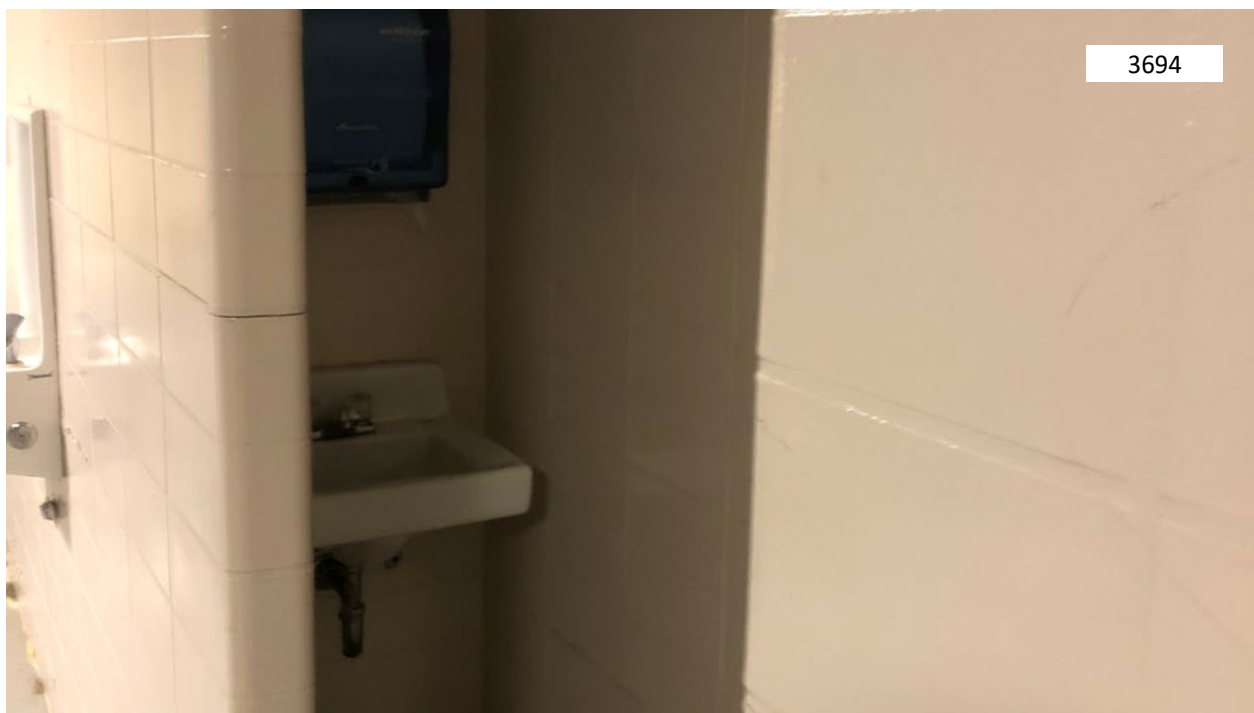


3689

The girl's locker room is underneath the stage and is not accessible due to only having stairs. The second exit to the west is locked shut, this does not allow for the minimum accessible means of egress and is very unsafe under emergency conditions.



The locker room is not ADA accessible including the showers (curb in front of the shower), toilets (no grab bars, turning clearances), and sinks (clearance issues).



The locker room is not ADA accessible including the showers (curb in front of the shower), toilets (no grab bars, turning clearances), and sinks (clearance issues).



Boy's locker room is missing accessible toilet.



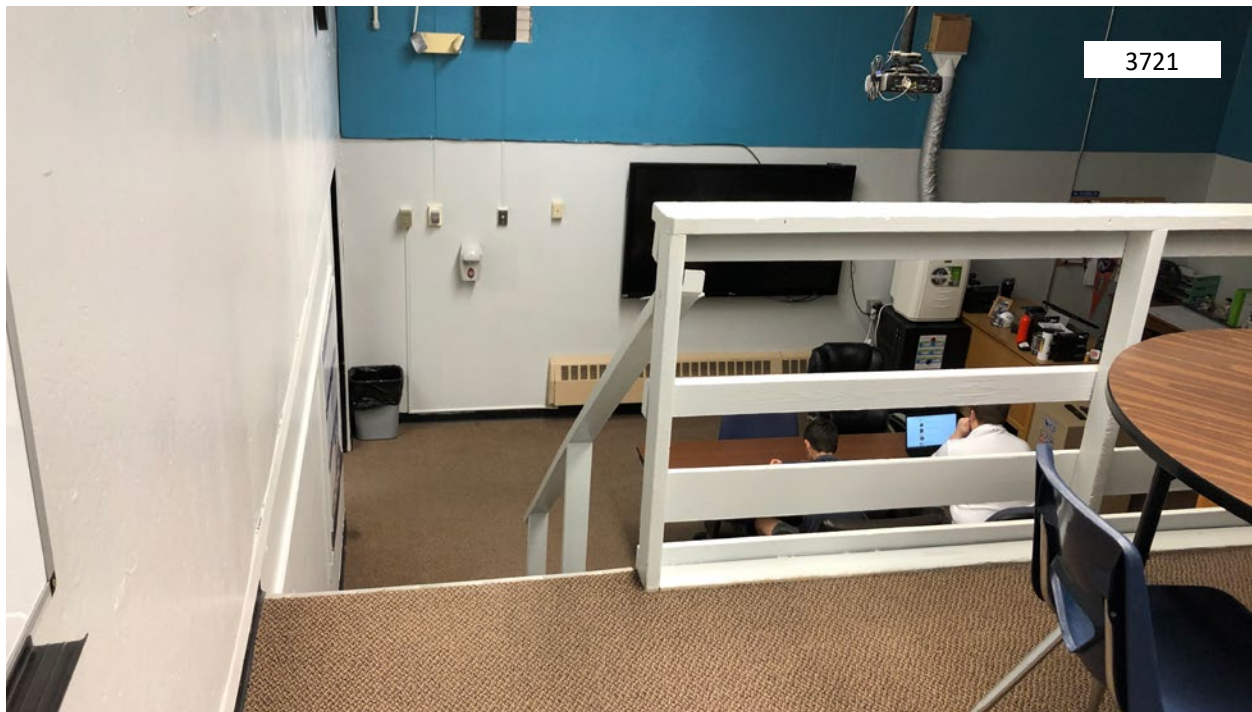
Multiple exits from the gymnasium are chained or padlocked shut and is very unsafe under emergency conditions.



Music room enters to upper tier area and there is no ramp down to the main level.



The special education room has a second level and is constructed of wood (not permitted in a 2B noncombustible construction building), and is not accessible with only stairs.

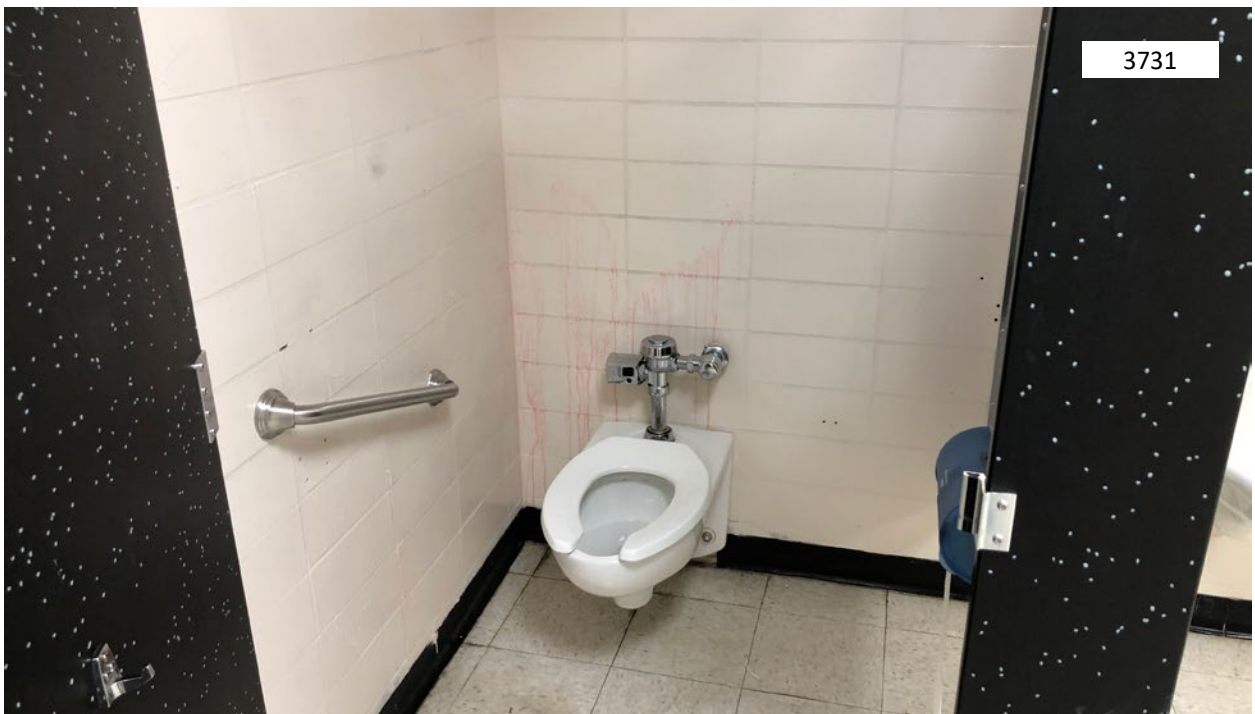


The stairs do not meet minimum tread depth or riser height requirements, no riser backs on stairs, and guard railings and hand railings do not meet minimum requirements.



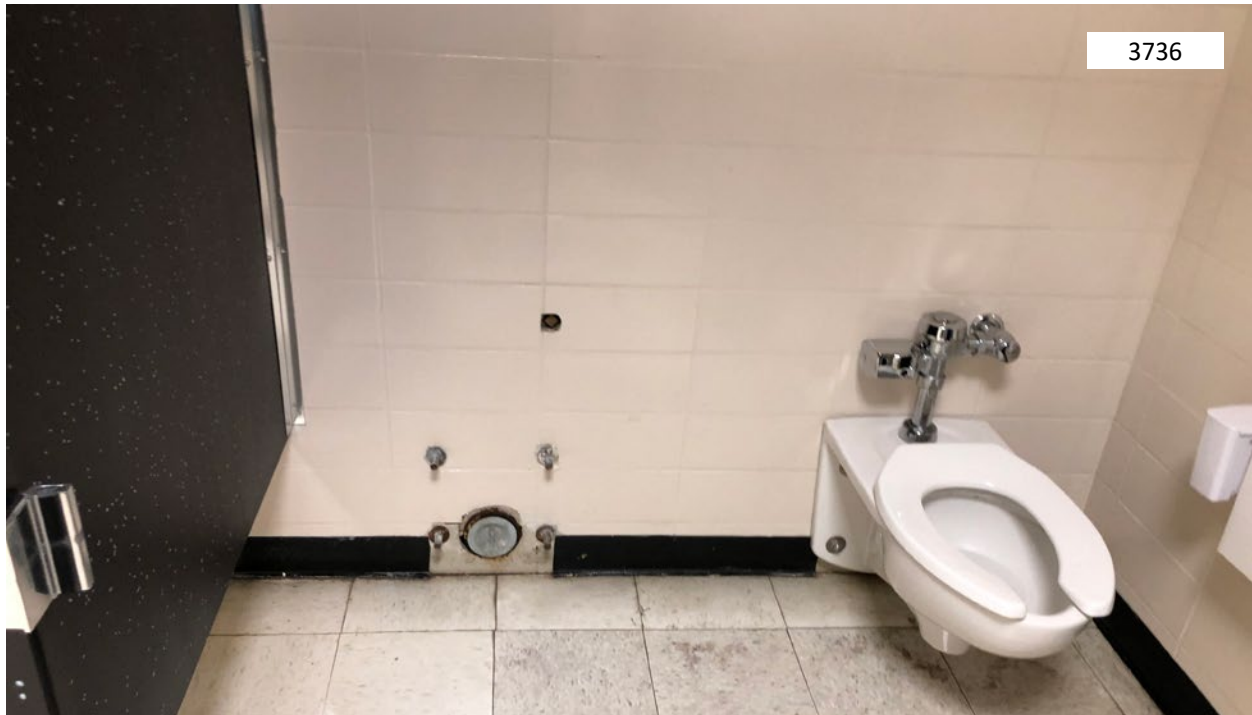
3729

In the main restrooms, the toilet partitions are too small for ADA clearances, the urinals and sinks are too high, the grab bars are the wrong size and were installed at incorrect heights.



3731

In the main restrooms, the toilet partitions are too small for ADA clearances, the urinals and sinks are too high, the grab bars are the wrong size and were installed at incorrect heights.



In the main restrooms, the toilet partitions are too small for ADA clearances, the urinals and sinks are too high, the grab bars are the wrong size and were installed at incorrect heights.



There are no accessible locations within the gymnasium bleachers.



The radio/spotlight platform within the gymnasium is not accessible.



The kitchen restroom is not accessible due to the door into restroom being too small and there are no grab bars.



The FACS room is missing an accessible kitchen station.



Various exterior doors do not contain a vestibule that is required per new energy code.



Ground water enters into boiler room from the walls after hard rains. This typically floods student art areas within the original 1894 addition.

EXTERIOR SITE CONDITIONS

HILLSBORO PUBLIC SCHOOLS - HIGH SCHOOL

The site containing the high school is compact due to the site of the facility being located on an older city block section. The surrounding concrete sidewalks are in good condition with minimal cracking. The main entrances are handicap accessible but lack the necessary handicap accessible parking spots due to most parking being street parking. Handicap accessible spots are located along the southwest corner but are quite a distance from the main entrance. The southwest entrance has a ramp that does not meet handicap accessible requirements for slope and guard railings. The emergency exit for the gymnasium along with exit 3 on the north end has stairs and is not handicap accessible. Additional exits on the east side have concrete but ends after a short distance into gravel and dirt. The only on-site parking is on the east side of the site and is gravel. The area is not well-defined and can be very muddy with inclement weather. Most students and staff park on the city streets due to the lack of adequate off-site parking. Drop-off and pick-up occur along the city street at the west side and is used for general parking when not being used for drop-off or pick-up. There are no dedicated exterior gathering spaces for students and staff.

EXTERIOR SITE CONDITION PHOTOS



The southwest entrance has a ramp that does not meet handicap accessible requirements for slope and guard railings.



4077

The emergency exit for the gymnasium along with exit 3 on the north end has stairs and is not handicap accessible.



4111

The only on-site parking is on the east side of the site and is gravel. The area is not well-defined and can be very muddy with inclement weather.

TEACHER AND STAFF FEEDBACK

WHAT DIFFERENT TYPES OF SPACES WOULD YOU LIKE TO SEE WITHIN THE HIGH SCHOOL?

Common Themes

- Storage (Kitchen, Classrooms, PE, Music, Admin)
- Larger Classrooms and More Classrooms
- Common Area for Students
- Larger Shop Classrooms and Areas
- Updated Science Areas
- Breakout Spaces

WHAT CONCERNS DO YOU HAVE ABOUT THE HIGH SCHOOL?

Common Themes

- Windows (Lack Of, Unable to Open Them)
- Mechanical/Electric System is Dated
- Ventilation Issues, No Regulation Between Heat and AC
- Lack of Handicap Accessibility in Classrooms, Restrooms, Specialty Areas

WHAT IS YOUR VISION FOR YOUR SCHOOL?

Common Themes

- Build a New High School
- Secure Adjacent Land
- Add a Commons Space for Students
- Improved Faculty Lounge and Office Areas
- Better Parking for Students and Staff

Find more staff and teacher feedback at the end of the facility assessment.

EDUCATIONAL ADEQUACY

HILLSBORO PUBLIC SCHOOLS - HIGH SCHOOL

	Hillsboro HS Current SF	DPI Recommendation SF	SF Difference +/-
Administration	1,984	2,500	-516
Art	1,466	5,400	-3,534
Cafeteria	1,480	3,600	-2,120
Classroom (average)	730	900	-170
Computer Lab	980	1,200	-220
Library	1,988	2,950	-962
Music	1,860	8,000	-6,140
Science	2,730	3,400	-670
Food Service	1,223	5,850	-4,627
FACS	1,300	2,500	-1,200
VoAg/CTE	3,150	9,000	-5,850
PE/Athletics	6,141	17,000	-10,859
Locker Rooms	2,921	2,000	921
Mechanical	1,615	3,726	-2,111

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