September 2022

Hustisford School District

2022 FACILITY ASSESSMENT REPORT

KRAEMER BROTHERS

ARCHITECTURE
ENGINEERING
INTERIOR DESIGN

HSR Associates

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Hustisford School District

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SUMMARY STATEMENT

1.1 INTRODUCTION

In early July 2022, the Hustisford School District hired HSR Associates and Kraemer Brothers to assist in facilitating discussions about the current state of the educational facilities, and their desire to have additional information to assist in making important decisions about the facilities, both short term and long term. Kraemer Brothers and HSR have partnered to optimize these services and cover all aspects of the building facilities study.

The HSR and Kraemer Brothers team are pleased to submit this facility assessment to Hustisford School District. The assessment is compiled through collaborative efforts of the District's Administrators, Staff, Kraemer Brothers and HSR's Architectural and Engineering team. The results of the study are to help with strategic vision for future educational programming and facility planning.

This facility study reviewed all of the school properties with an emphasis on overall site and building condition, capacity, and how the buildings function as a whole in response to the changing needs and methods of education. Based on the evaluation, the purpose of this assessment will propose how best to utilize these facilities and better plan for the future, including a prioritized list of improvements that will assist the school board in making informed decisions. In addition, this study can be used to educate the community on the current state and needs for the facilities in the future.

1.2 METHODOLOGY

Information for this report was obtained through the review of the original architectural drawings and visual observation The existing building drawings were provided by Hustisford School District.

The scope of this report does not include observation or testing of hazardous materials including, but not limited to: asbestos, radon, PCB's, mold or lead based paints.

1.3 PROJECT SCOPE

- Walk-thru of existing buildings
- Review of existing plans and specifications
- Document existing site and building conditions through referencing site maps, photographs of areas on plans and details
- Describe existing conditions (Facility Study) and recommendations, covering but not limited to the following aspects: Site Evaluation, Building Envelope, Interior Spaces Analysis, Mechanical/Electrical/ Plumbing System evaluations.
- School Board Discussions
- Staff and Administration Discussions
- Community Discussions

1.4 PROJECT TEAM (HSR ASSOCIATES)

- Project Manager/Architect - Brad Simonson
- Project Architect - Michelle Maland
- Educational Specialist - Jeff Jacobson
- Interior Designer - Sarah Braatz
- Graphic Designer - Janet Loeffler
- Mechanical Engineer - Jake Beran
- Electrical Technician - Mike Villarosa

PROJECT TEAM (KRAEMER BROTHERS)

- Pre-Referendum Support - Greg Callin
- Pre-Referendum & Pre-Construction Lead - Kyle Kraemer
- Marketing & Communication Specialist - Remington Stittleburg

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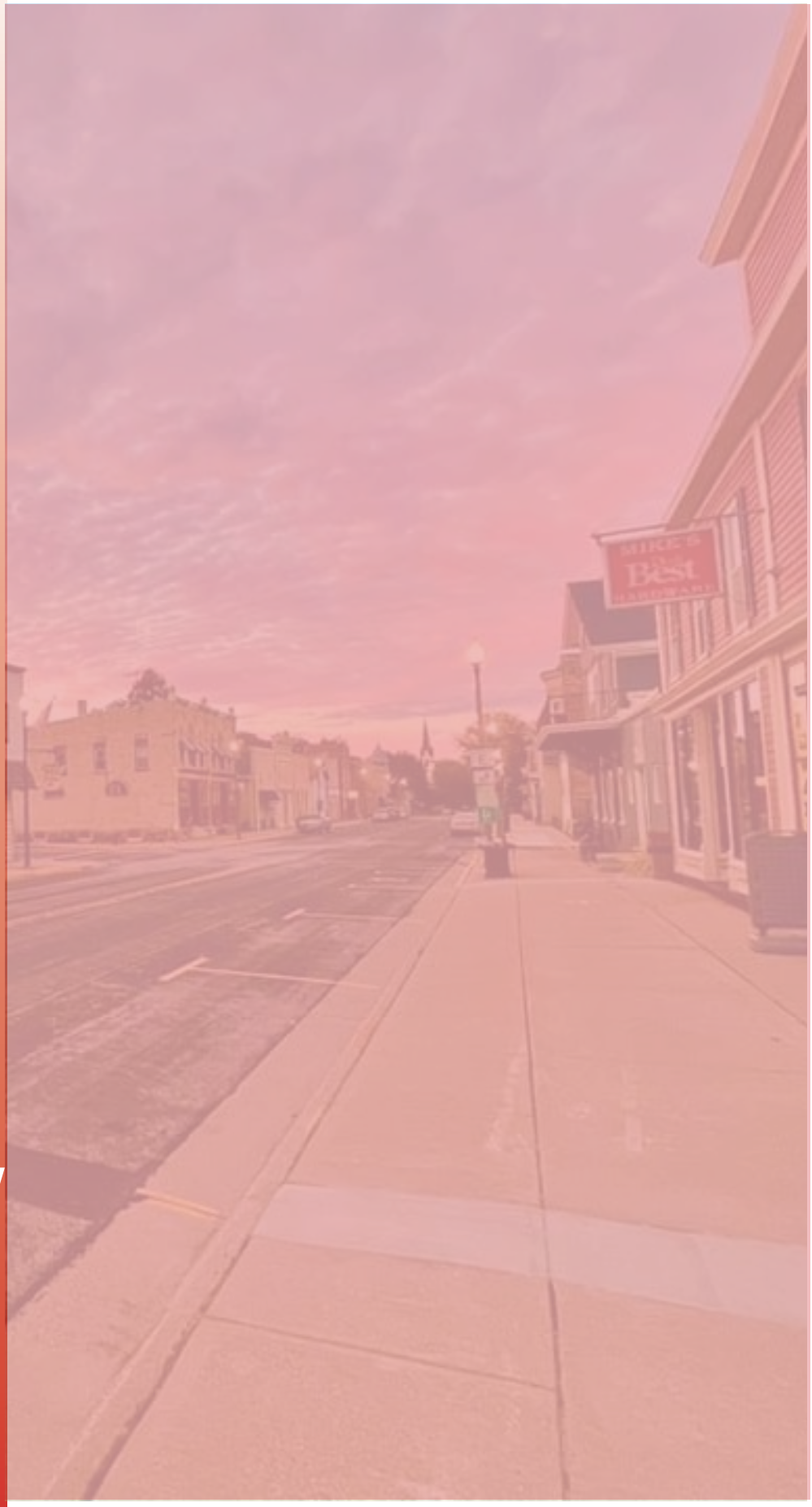
OVERVIEW



2.1 CONTEXT

Hustisford is a village in Dodge County, located in southeastern Wisconsin. The village of Hustisford was named for its pioneer settler John Hustis. In the middle of the 1800's Hustisford was a predominantly German immigrant community. Hustisford sits along the southern edge of Lake Sinissippi, a shallow lake fed by the Rock River. Hustisford has many community organizations, local shops and services for the residents and visitors.

The area provides many outdoor activities including hiking, biking, boating, fishing, skating and cross-country skiing to name a few. The city is host to many events such as the Winter fest on New Year's Day, a big celebration including a parade followed by a "Toilet Pull" Tug-of-War. There is also a Farmer's Market, Music in the Park, Dairy Days Picnic and Lake fest to name a few.

2.2 DEMOGRAPHIC

As part of the 2020 census:

The population of Hustisford was 994 people with a population density of 891.5 per sq. mile (1.1 sq. mi). There were 449 households, of which 25.5% had children under the age of 18 living with them, 70% were married couples living together, 8% had a female householder, 5% had a male householder, and 17% were non-families. The average household size was 2.2 persons and average family size was 2.68.

The median age in the city was 45 years. 23% of residents were under the age of 18; 8% were between the ages of 18 and 29; 30% were from 30 to 49; 25% were from 50 to 69 and 13% were 70 years of age or older. The gender make-up of the city was 47% male and 53% female.

The median household income in Hustisford was $62,063 with a poverty rate of 7.3%. The median house value was $174,700 up 18.8% from 2019. Home ownership was at 63%.

* 2020 Population Data included in charts and summary.

Census	Population	Percent +/-
1900	540	5.3%
1910	615	13.9%
1920	595	-3.3%
1930	537	-9.7%
1940	564	5.0%
1950	622	10.3%
1960	708	13.8%
1970	789	11.4%
1980	874	10.8%
1990	979	12%
2000	1,135	15.9%
2010	1,123	-1.1%
2020*	1,075	-4.3%

2.3 HUSTISFORD SCHOOL DISTRICT BACKGROUND/ENROLLMENT

The Hustisford School District serves approximately 298 Students. The student:teacher ratio of 11:1 is less than the Wisconsin Public School average of 14:1. Individual class sizes range from a low of 15 to a high of 32.

Hustisford School District offers many different learning environments as students grow. They have two school buildings with proper space to keep class sizes small, which helps develop strong relationships between staff and students. This allows the District to meet the needs of all students in the District.

School Choice Options:

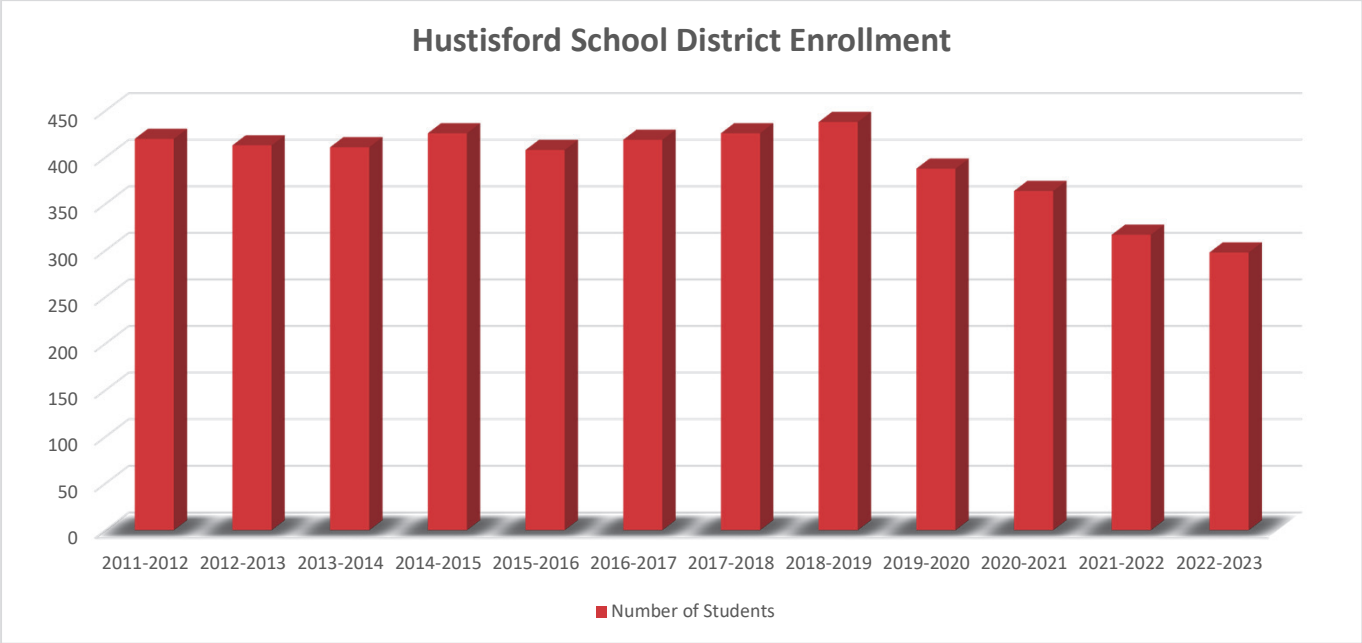
- John Hustis Elementary School
- Junior/Senior High School

2022 Enrollment

Grades Pre-K to 5: 129 Students

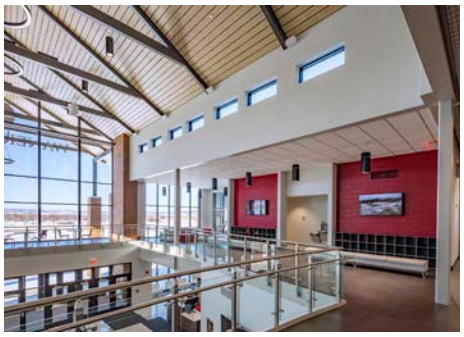
Grades 6-12: 169 Students

Total: Approximately 298 Students


Hustisford School District Enrollment
450
400
350
300
250
200
150
100
50
0
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
2016-2017
2017-2018
2018-2019
2019-2020
2020-2021
2021-2022
2022-2023
Number of Students

2.4 MODERN EDUCATIONAL PLANNING

- Connection to Hallway
- Overlap of Spaces
- Open and Light Filled
- Abundant Use of Glass
- Exposed System



- Hands on Learning
- Utilitarian Industrial Feel
- Working Spaces
- Choice of Furniture
- Exposed Structure

- Building as Learning Tool
- Building Systems Exposed
- Roof Top Use
- Sustainable Design
- Living Wall

- Comfortable Spaces
- Make it a Destination
- Warm Color Palette
- Connection to Multiple Levels

2.5 DAYLIGHTING IN SCHOOLS

HEALTH

Daylight has physiological and psychological benefits for teachers and students. Physiological benefits due to daylight on school children are less dental decay (cavities), improved eyesight, increased growth, and improved immune system. *

ATTENDANCE

Schools that have integrated full-spectrum fluorescent or natural light show an increase in student and teacher attendance when compared to traditionally lit schools. *

ACHIEVEMENT

The study compares the scores of students from newly constructed daylight schools to schools that were artificially lit. Students in the daylight schools had higher reading and math achievement scores. *

SAFETY AND SECURITY

The introduction of windows in classrooms, offices and learning spaces helps build the school's security plan. Natural surveillance involves the designing of features to maximize the visibility of areas that should be observed.

FINANCIAL BENEFITS

School administrators and designers have seen daylighting in school pay dividends through lower energy costs and an enhanced learning environment.

* Nicklas, M.G.; Bailey, G.B. (1998). "Daylighting in Schools." Strategic Planning for Energy and the Environment; Vol. 17, No. 2; pp.41-61

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3
SITE EVALUATION

Fast Facts:

- 35.54 Acres of Site Area
- Safety and Security Concerns
- Site Traffic Flow between Buildings
- Define Main Entry at Elementary and Jr/Sr High Schools

OVERALL SITE PLAN

3.1 SITE OVERVIEW

An adequate school site with expansion space will accommodate current and future educational programs and services, fluctuating student enrollments, increased community use of schools, and promote school-community partnerships. Conversely, continuing use of, or selection of an inadequate school site with limited or no expansion possibilities, will create ongoing problems within areas of program development, student enrollment, community use, and school community partnership issues.

The table below summarizes the recommendations for planning school construction. The intent of these recommendations is to ensure that an adequate site support area is available to serve external functions and provide for the safety of students as they arrive and depart from school.

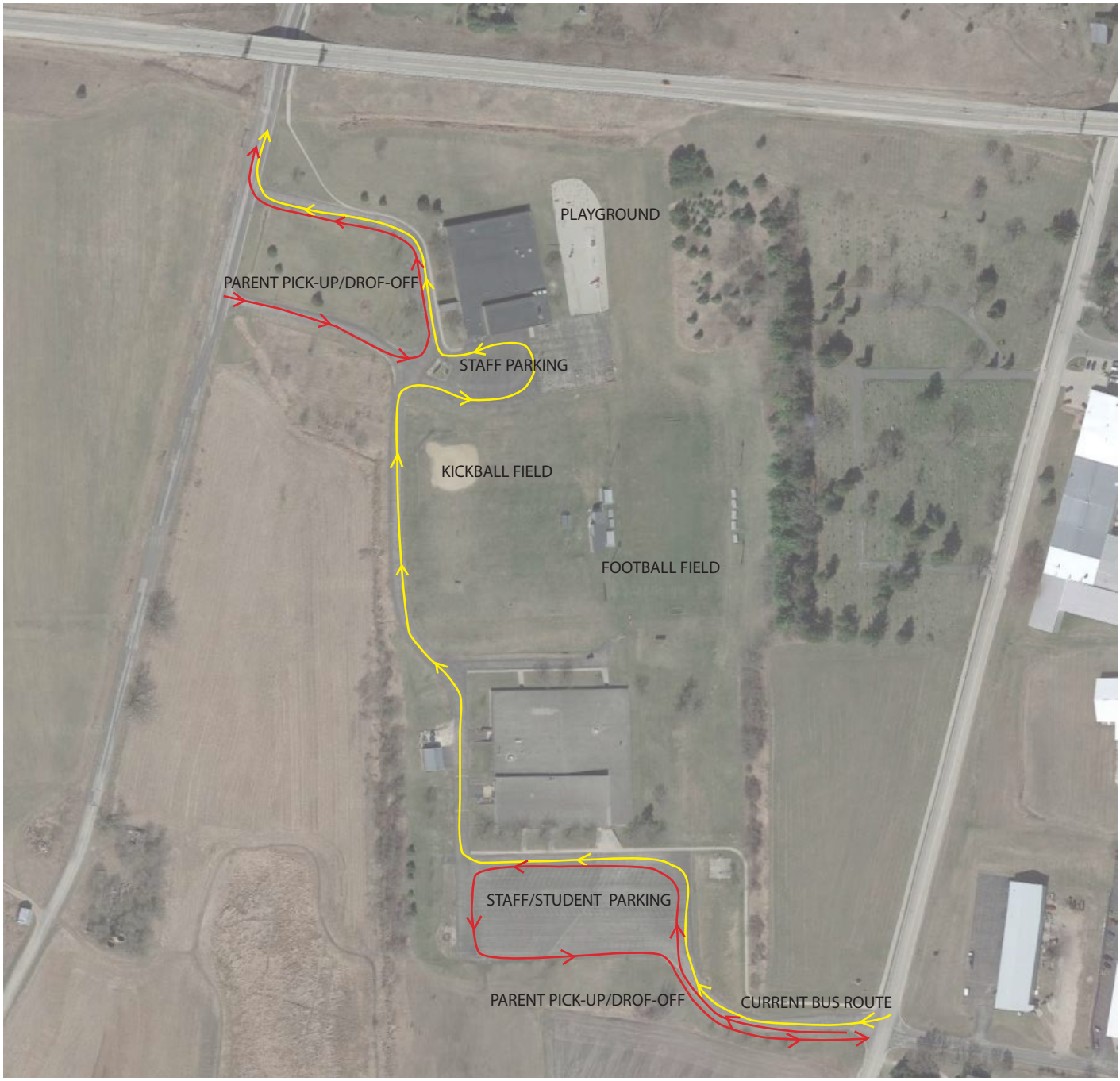
School Level	Recommended Base Site Size
Pre-K through 12	25-35 Acres + 1 Acre/100 Students
Hustisford School District	**Recommended Base Site Size**
Pre-K through 12 (Complete Campus)	34 Acres (35.54 Acres Actual)

The overall site for the campus is adequate for the intended use.

3.2 SITE ANALYSIS

The school site has not changed since the original construction of the John Hustis Elementary facility in 1972; followed shortly by the construction of the Junior/Senior High School in 1979. There was one addition made to the Elementary school in 1988.

The entire site sits across Highway 60, leaving the schools feeling somewhat isolated from the rest of the community. The site is also set down a hill from S. Lake Street, which is the main road used to get to the Jr/Sr High School. Both of these situations make identifying and recognizing the school difficult.


PLAYGROUND
PARENT PICK-UP/DROF-OFF
STAFF PARKING
KICKBALL FIELD
FOOTBALL FIELD
STAFF/STUDENT PARKING
PARENT PICK-UP/DROF-OFF
CURRENT BUS ROUTE

3.3 BUS DROP OFF/PICK UP & TRAFFIC FLOW

Current traffic flow and parking at the elementary school is congested and limited. There is a small area located at the front of the building (west) for visitors and then to the south of the building for staff. The south drive entrance from South Hustis Street is marked as a one way entry. This is where the parent drop off loop starts for the elementary school. It crosses in front of the school and exits the north driveway back to South Hustis Street. The entry and length of parent drop off adjacent to the school is short, and with limited parking options it can cause congestion. The staff park to the south and this seems to work okay, however, when all the spots are used it can cause issues for the buses as they circle around the staff parking spaces to drop off and pick kids up.

Recommendations include the creation of passing and drop off lanes, increased parking for parents and staff in front of the building separate from the buses, new striping, arrows and other way finding.

There is one connecting road between the two buildings on the site and it is quite narrow. It can become congested depending on the time of day.

Current traffic flow at the Jr./Sr. High School comes in from a entry off S. Lake Street down a hill to a large lot located to the south of the building. This is where the bus pick-up/drop-off, parent pick-up/drop-off, student and staff parking all takes place. Deliveries and shop access are from the west side of the building. The parking lot areas seems adequate for all, however, having the buses pull right in front of the school can cause some cross traffic issues with people going to the parking lot. The buses have to circle the parking lot in order to line up along the sidewalk at the Jr./Sr. High School after coming from the Elementary School. This seems inefficient and adds to the confusion in the parking lot.

The buses stop at the high school first and then head to the elementary school in the morning for drop-off, and go in reverse for afternoon pick-up.

3.4 PLAYGROUND/GREEN SPACE

The facilities have the green space required for the size of the currently enrolled student population. While green space is adequate, the playground equipment has reached its end of life and is in need of replacement. This replacement would increase safety and accessibility as the existing equipment is starting to deteriorate. We recommend a replacement in the near future.

Between the school buildings on the site is a football/ soccer field and softball field. Access to the football field is over grass. Recommend looking at a way to improve accessibility to the fields.

There is no paved pedestrian connection between the two buildings. The option now is to walk on the grass or side of the connecting road. The situation is even worse in the winter when walking on the grass is not an option. This is not a safe option for the students and staff that walk this path daily. Our recommendation would be to create a sidewalk connection between the two buildings.

3.5 PARKING

There is limited parking on site. This is especially evident during larger events where parking is at a premium. At the Elementary School, there is limited parking for parents and staff to the South. The staff parking is shared with the bus loop as well. We would recommend to increase the parking stalls at the Elementary School for parents/visitors and staff closer to the entry, to funnel everyone through the main office.

4
BUILDING PROGRAM SPACES

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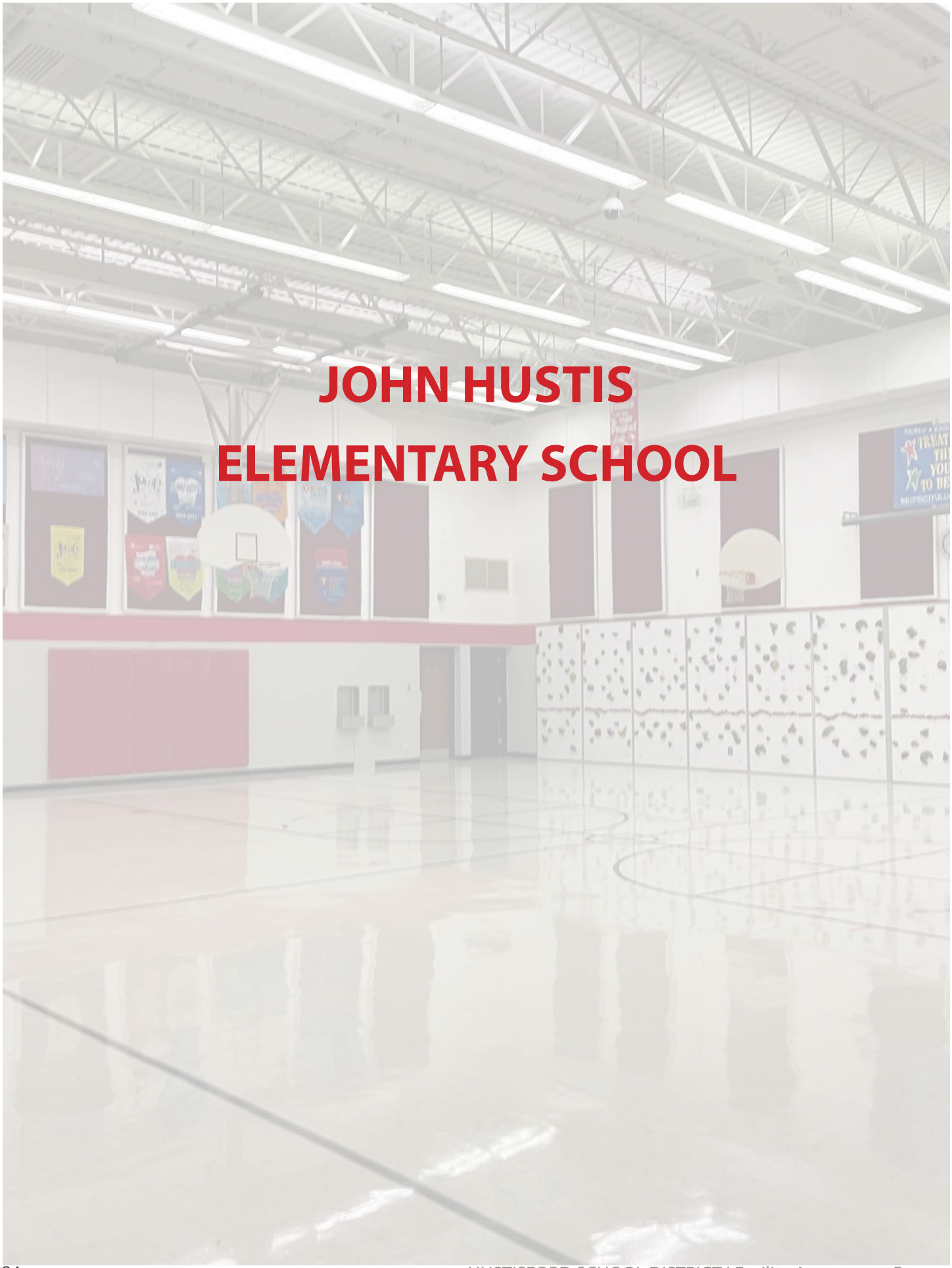


JOHN HUSTIS ELEMENTARY SCHOOL

4.1 ELEMENTARY BUILDING ORGANIZATION

The Elementary building is organized in a "U" shape around a central core. The core contains the LMC and office spaces. The gymnasium and cafeteria are the south side of the "U" shape. This building configuration means most classrooms have windows to the exterior, which is always a positive in the learning environment. It also allows all the classrooms to have a good connection to the LMC and other core spaces. There are four classrooms on the north end where the addition was built that do not have windows, and create a small section of double loaded corridor with classrooms on each side.

Main Entry to the Building

The grade organization starts on the southeast side of the building with Pre-K and progresses north down the hall. The classrooms being all adjacent to each other along one side of the hall allows for clean organization. There is one section of each grade in the building from Pre-K to 5th grade.

Typical Hallway

The east hallway contains grades Pre-K through 2nd grade, and the west hallway has 3rd through 5th grade. Having only one section per grade leaves the building with a few built-in flex rooms to be used as needed. One room in the west hallway is also used for Special Ed.

The educational spaces for the facility are all on one single level. There are some storage and mechanical spaces on a second mezzanine level which work well. This one story configuration inherently makes for a more flexible building layout that is easier to navigate. Handicap accessibility also tends to be less of a challenge with a one story building. Being a one story facility, it can make for more spread out programmatic spaces. Also, the roof and wall surface area are greater, which tends to be less energy efficient due to more outside exposure; but it works well for this size of building.

Pre-K Classroom

The main entry to the building is recognizable with a canopy on the west side of the building. There are three other exterior doors at the end of the corridors. These doors do not compete in hierarchy with the main entry.

Original Building 1972

Addition 1988

- Admin.
- Classrooms
- Special Ed
- Specials
- Building Support
- Circulation
- Restrooms

4.2 ELEMENTARY BUILDING ADEQUACY

The facility has been able to naturally evolve well from the original date of construction 50 years ago. Then the addition of 4 more classrooms 34 years ago. The facility from a space stand point functions well for its age. The appearance overall has been well maintained but the age of the building is starting to show in some areas. The District has done a good job to this point on general maintenance of the facility and that is a positive testament to good planning and use of funds. Below are some identified areas to focus on that would improve the overall building adequacy for the Elementary building.

Cafeteria/Auditorium Space (Cafetorium)

CAFETERIA/ KITCHEN

The cafeteria is contained within a room to the right of the main entry. Being contained within a room separates it from the rest of the school. It also limits its size and number of students able to eat at one time. The cafeteria also shares space with a small serving line as you enter to the right, and warming kitchen equipment in the back. The food is all cooked at the Jr./Sr. High School and brought over. The floor was not updated with the rest of the school and could use replacing. Our recommendation would be to open the cafeteria up to the main hallway creating a better connection to the school. This would also give the space more elbow room and a few more tables to expand into the hallway a bit during the lunch hour, and then contract back after.

Office Space

SECURE ENTRANCE NEEDS

The Elementary School was constructed prior to a two stage entry through the office. With today's school security needs, this is a high priority need that should be addressed. All visitors at non-peak times should be routed through the main entry to the office reception area. A direct line of sight to the vestibule where a visitor is allowed access, is also recommended. A vestibule/entry addition and office reception relocation is recommended to solve this secure entrance need. A vestibule at the entrance will also help energy costs and is required by the energy code now for all main entrances to buildings.

Main Entry

With a remodel of the entry, a new canopy is recommended to replace the worn darker one that is there today. A new canopy can create an identity for the school, bring color and updated lighting to the main entrance.

AGING WINDOWS AND DOORS

The Elementary School has a very limited amount of windows. Generally each classroom has one 3'-0" wide that extends from the floor to the ceiling. The glass starts a few feet off the ground with a spandrel panel below it. It was noted that many of the windows no longer open as they should. A few rooms like the art room and cafeteria have a few additional windows. A recommendation would be to add additional windows and replace the existing frames for improved efficiency and function. Natural daylight has been shown to improve the feeling of a space and the mood of its occupants.

Existing windows

The exterior entrance doors at the end of each hallway are showing their age and beginning to rust. They are hollow metal frames and doors, which require maintenance over time and eventually begin to rust. Recommendation would be to replace the exterior frames and doors.

Rusting door frames

STORAGE SPACE NEEDS

Similar to your home, educational facilities have significant storage needs. This facility in general is lacking adequate storage solutions. There are a few smaller storage closets in each of the main hallways, but more storage is required in the classrooms. The recommendation would be to replace outdated cabinets in each classroom for increased storage.

EXISTING ELEMENTARY LOCKER ROOMS

Being built more than 45 years ago, the locker rooms at the Elementary level are not being used to their full potential. The 5th graders use them to change for gym class in preparation to move to the Jr./Sr. High. Otherwise, the locker rooms appear to be used for storage. The shower stalls are not used and the restroom in the locker room is not ADA compliant. Recommendation would be to reconfigure lockers rooms to create changing room, remove the showers to create more gym storage, and renovate the bathrooms to meet ADA.

Storage in Locker Rooms

HANDICAP ACCESSIBILITY

Throughout the elementary school there are handicap accessibility updates that should be made. The primary areas would be to the restrooms, door sizes, and the music room steps. The restrooms are a primary focus, as they are original to the building and undersized. They are located at the beginning of each hallway easily accessible to all. There are two stalls per gender which does meet code. The stalls, however, are too small to meet accessibility. Recommendation would be to expand the restrooms to meet accessibility standards.

Restroom Stalls

The stairs in the music room create a room that is not accessible for all and is an inefficient use of space, as the room is not used for performances as originally intented. Recommendation to fill in the floor to create a more flexible and accessible space.

It was noticed that a few of the doors are too narrow. ADA requires a 36" wide door. The doors into the gym locker room are one example of being too narrow. Recommendation would be to replace the doors and frames that are too narrow where it can be accommodated.

Music Room

NURSE SPACE TOO SMALL

The nurse space is located within the main office which is ideal. It is large enough for one cot and a little bit of storage. The adjacent restroom is too small to meet accessibility requirements and the needs of some students. This restroom is also shared with the rest of the office space as their staff restrooms. Recommend expanding the nurse space and restroom. Adding an additional restroom for staff separate from nurse area.

4.3 ELEMENTARY EDUCATIONAL ADEQUACY

Recommended educational adequacy spaces and improvements to focus on include:

TRADITIONAL LIBRARY/LMC

The centrally located Library space is a large space that has a lot of potential. It is open to both the east and west hallways, creating a good connection to the classroom areas. While there is adequate space, the space could use a face lift. The carpet is a broadloom and starting to bubble up in places creating tripping hazards. The walls were recently repainted, which helped, but could be enhanced with more color. The function of a library has transitioned

Traditional Library

to much more than just a warehouse for books. The library space is setup to be a traditional library which can limit its potential as an educational hub of the facility that truly becomes an active destination. A renovation of this space to include modern furniture, new flooring, ceiling and lights, would help to enhance the function and make this space more inviting.

There is limited natural daylight in the current LMC. Recommend adding a skylight to the space could help ehance the feel of the space and bring in daylight.

CLASSROOMS AND FLEXIBILITY

When the building was constructed there were movable partitions planned between a few of the rooms. The intent to create flexibility and collaboration in the classroom spaces was great planning and something we look to include in learning spaces today. However, with only one section per grade, the walls do not get moved very often, and there are a few under utilized rooms. Recommendation would be to renovate the under utilized rooms and update the movable partitions to create more small group collaboration areas. The rooms that adjoin the LMC could be used for STEM classes or activities, creating a useful connection and bridge between classrooms, students and flexible learning spaces.

Classrom with moveable wall

WASH STATIONS WITHIN HALLWAYS

To promote better hygiene and ease congestion at the restroom areas, we would recommend maintaining the wash stations outside the restrooms. The wash fountains currently are outdated and sometimes not functional. There is some wall space to expand the capacity at the same location and would recommend replacement of the existing wash stations with a similar design, or like the one pictured below to add additional wash areas.

HUSTISFORD
JUNIOR/ SENIOR HIGH SCHOOL

4.4 JR/SR HIGH BUILDING ORGANIZATION

The Jr/Sr High School buildings overall shape is a square. This creates a circular or "donut" shaped circulation path around a central core. The double loaded nature of the corridors mean the central core spaces have no direct natural light. The central core contains the LMC, commons, stage, around classrooms and support spaces. Along the perimeters of the school are most of the classrooms, kitchen, extra-curricular spaces (art, vo-tech, band/choir, and the gymnasium). The office is near the front of the building near the main entry but not directly connected. The district office is adjacent to the Jr/Sr High School office area.

The building was constructed with earth berms around most of the exterior and small clerestory windows. The center of roof structure of the building slopes up towards the middle creating high volume spaces around the stage and LMC.

The grade organization is mixed throughout the facility between the Junior and Senior high students. All grades share the hallways, passing times, extra-curricular rooms and cafeteria. There is no defined separation between Junior and Senior High.

The educational spaces for the facility are all on one single level. There are some storage, wrestling and mechanical spaces on a second mezzanine level open to the gym. This works okay, but the functionality of the wrestling space could be improved for more multi sport use. The overall one story configuration inherently makes for a more flexible building layout that is easier to navigate. Handicap accessibility also tends to be less of a challenge with a one story building. Being a one story facility, it can make for more spread out programmatic spaces. Also, the roof surface area is greater which tends to be less energy efficient due to more outside exposure, but is works well for this size of building. The exterior walls are only partially exposed as most of the perimeter wall is covered by an earth berm. This helps save on cooling costs, but limits the placement of windows to only a clerestory around the outside.

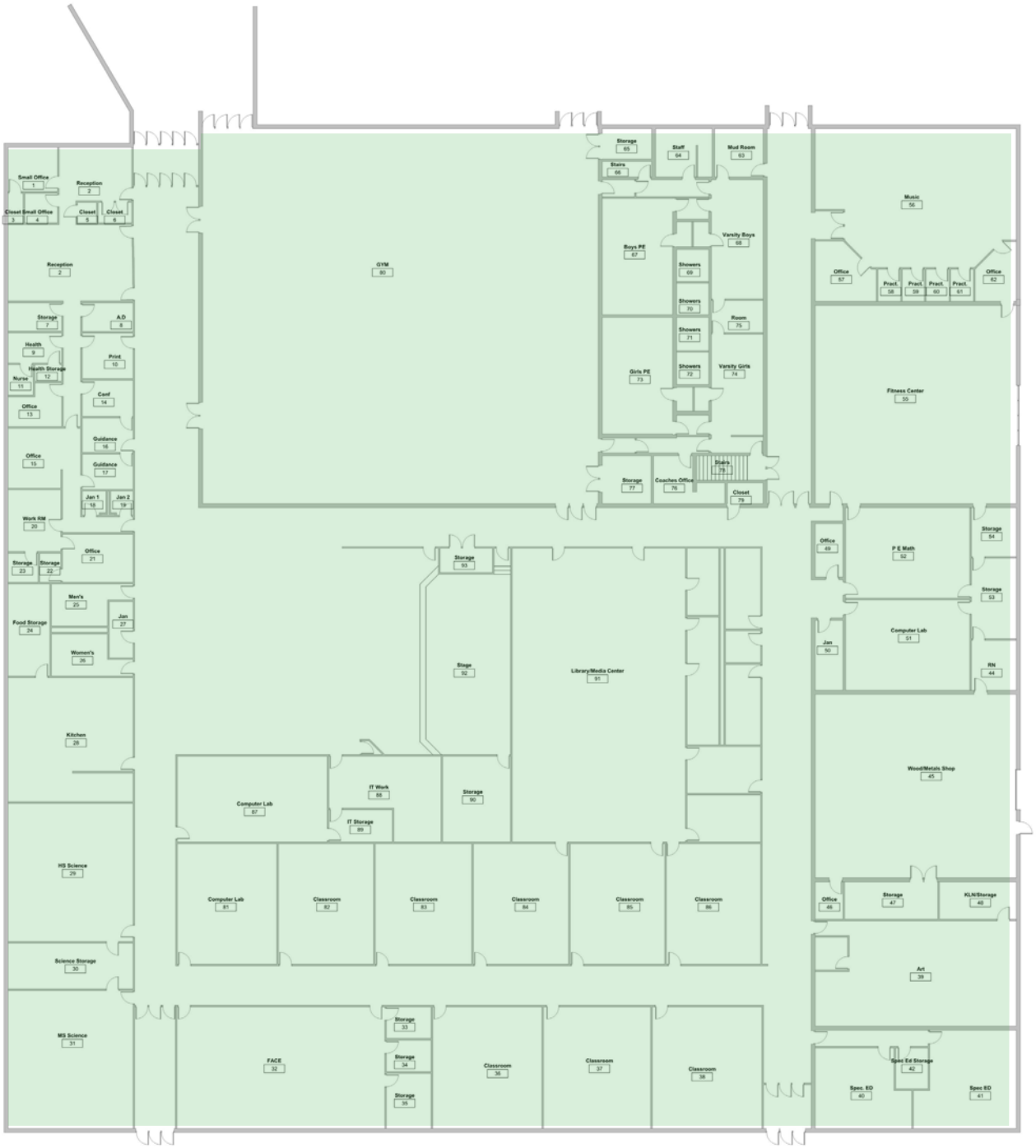
The main entry to the building is slightly more recognizable from the other entrances to the school by the use of signage and wider spaced concrete wing walls. The earth berms around the building and concrete wing walls tend to make all the entries look the same.

Main Entry to the Building

Typical Hallway

Typical Classroom

Original Building 1979



Admin.
Classrooms
Special Ed
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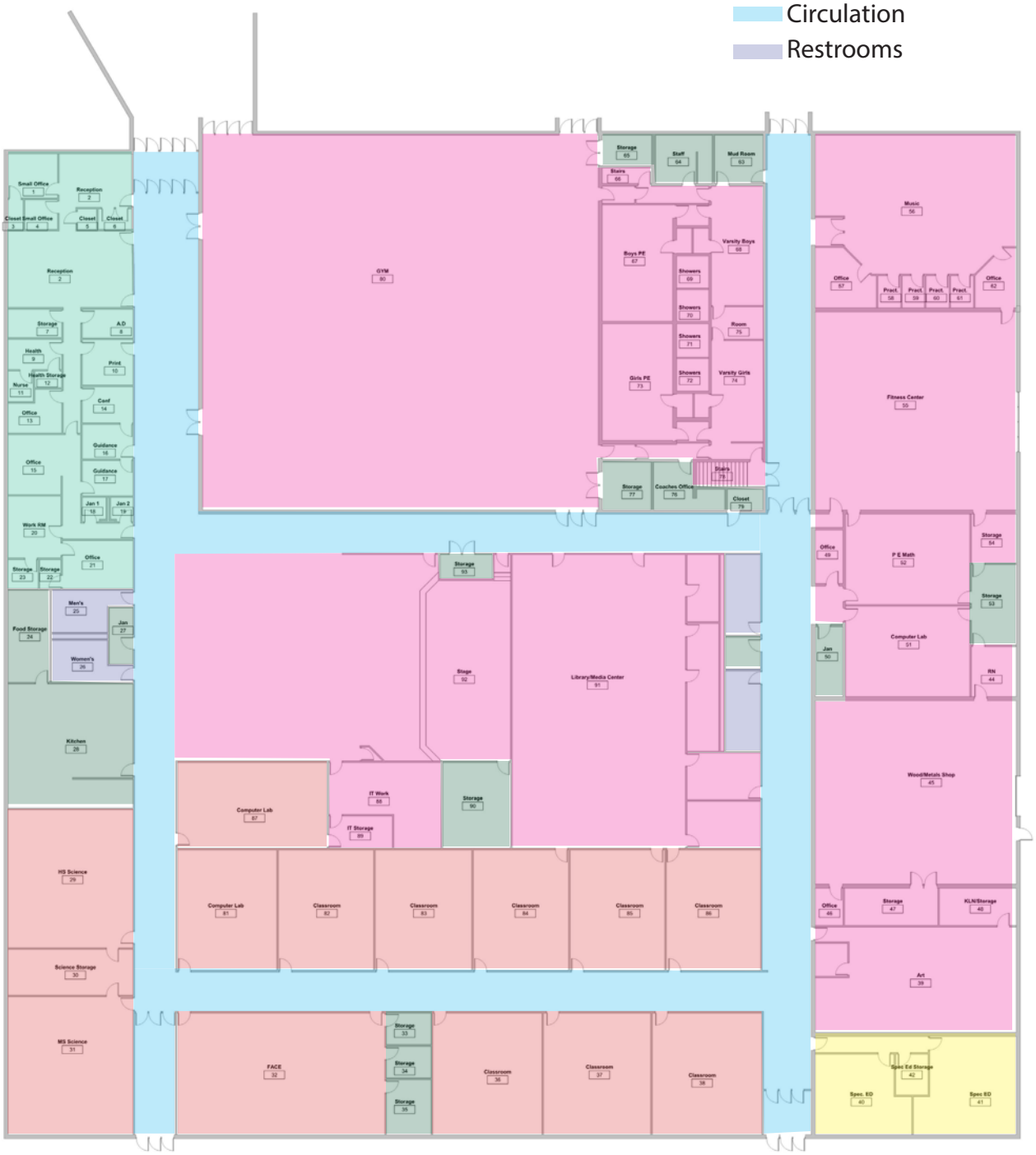
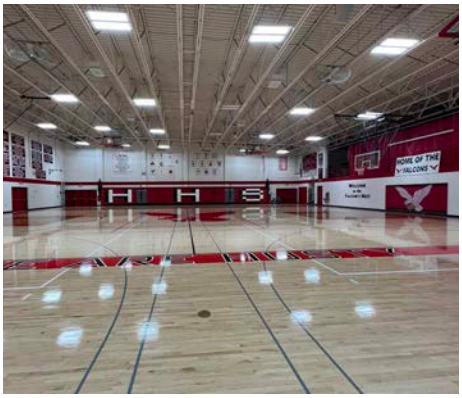


4.5 JR/SR HIGH BUILDING ADEQUACY

The facility has been able to naturally evolve well from the original date of construction 43 years ago. There have been no major changes made to the facility since its original construction. The facility has a decent amount of space in the classrooms, while other spaces are a bit tight and some are under utilized. The appearance overall has been well maintained but the age of the building is starting to show in most areas. The District has done a good job to this point on general maintenance of the facility and that is a positive testament to good planning and use of funds.



Gymnasium

The gym was recently painted and had the floor refinished. The students did a majority of the painting and it has been a major improvement noticed by all. Below are some additional identified areas to focus on that would improve the overall building adequacy for the Jr/Sr High School.

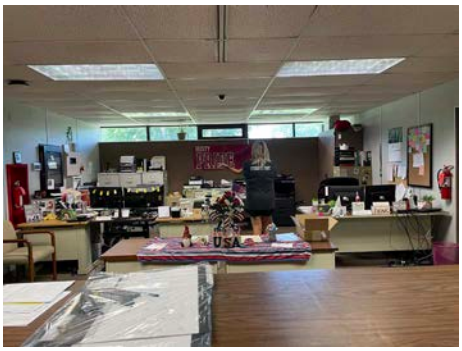
ROOF AT END OF LIFE

The roof system is a single membrane with ballast on a sloped metal roof deck and structure. The roof drains over the roof edge with a few scuppers along the perimeter. The water free flows down the large fascia to grade. A roof system is expected to last around 20 years. The Jr/Sr roof was replaced once in 1998, now 24 years ago. The roof is past the end of its life and leaking in certain spots. With ballast on the roof it is often hard to identify where the leak is happening. Our recommendation would be to replace the roof with a new single adhered membrane, add additional insulation to meet the energy code, and install gutters to help collect and control the water coming off the roof to get it away from the exterior wall.

Existing Ballasted Roof

SECURE ENTRANCE NEEDS

The Jr/Sr High School was constructed prior to a two stage entry through the office. With today's school security needs, this is a high priority that should be addressed. All visitors at non-peak times should be routed through the main entry to the office reception area. A direct line of sight to the vestibule where a visitor is allowed access is also recommended. A vestibule/entry addition or office reconfiguration is recommended to solve this secure entrance need.

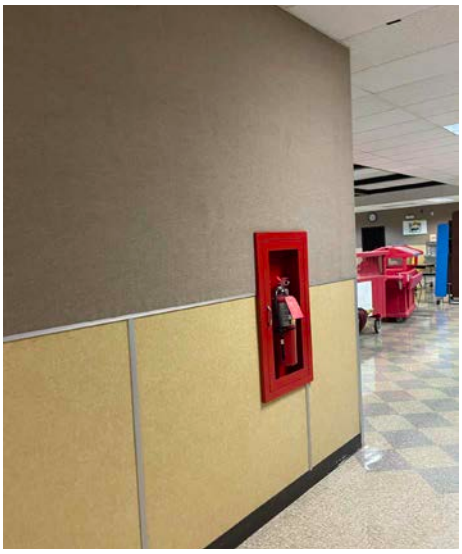


Main Office Space

With a remodel of the entry a new canopy could be added to the exterior of the building to signify the main entry more. A new canopy can create an identity for the school, bring color and updated lighting to the main entrance.

AGING INTERIOR FINISHES

The Jr/Sr High School interior has not changed much since its original construction in 1979. The interior walls are mostly gypsum board and metal studs. The corridor walls have a wall covering along the bottom half and carpet on the upper half that was used for sound control. The flooring throughout the school is mainly VCT. While this type of flooring looks shiny when waxed, it has quite a lot of maintenance with it every year. The library carpet is orange and dated with the wall covering color and could use an update. Wall coverings are only so wide, so every 4'-0" there is a metal strip covering the seam between panels. The recommendation would be to remove all the wall coverings, strips and carpet, and replace with new gypsum board and paint. This will give the building a refreshed updated feel. Replacing the flooring would be recommended as well, to a product that required less maintenance over time to save on costs.



Existing wall covering and carpet

The ceiling tiles being 2'-0" x 4'-0" tend to eventually sag over time. It is the nature of the product and can make the ceilings feel worn. This can be seen throughout the school. Recommendation would be to replace the ceiling tiles with a 2'-0" x 2'-0" grid and ceiling tile, which should wear better over time.

EXTERIOR CLERESTORY WINDOWS

The original construction on the facility has poured concrete walls up to 6'-0" with a band of clerestory windows approximately 2'-0" tall. The concrete walls are backfilled with earth berms around most of the exterior. They allow a good amount of natural light into the classrooms along the exterior, but with the roof overhang, limited control of water, and settling of a concrete apron below the windows, water infiltration has become an issue at the windows and exterior walls. The window seals and joints are failing because caulk only lasts so long. Recommendation would be to replace the windows, install proper flashing, regrade exterior outside of the windows, and control the water from the roof better.

Exterior Celerstory Windows

HANDICAP ACCESSIBILITY

Throughout the Jr/Sr High School there are two areas where accessibility could be improved; the restrooms and access to the stage.

The restrooms have not been updated since the construction of the building, so accessibility was not considered. There was a single use accessible restroom added not to long ago, which is a great improvement.

Restrooms

It is recommend to update the larger restroom facilities as well, to meet accessibility standards.

The other area not accessible is the stage. All access to the stage and supporting storage room is by stairs. A space like this should be incorporated into a remodel. It is required to be accessible by a ramp to allow access for all.

4.6 JR/SR HIGH EDUCATIONAL ADEQUACY

Recommended educational adequacy spaces and improvements to focus on include:

TRADITIONAL LIBRARY/LMC

The centrally located Library space is a large space that has a lot of potential. It is accessed from the south hallway through a set of doors. There are small supporting storage rooms and offices along the west side of the space. The space has great volume to it being right at the center of the facility. The space as a whole could use revitalization and re-imagination as it is not used to its fullest potential today.

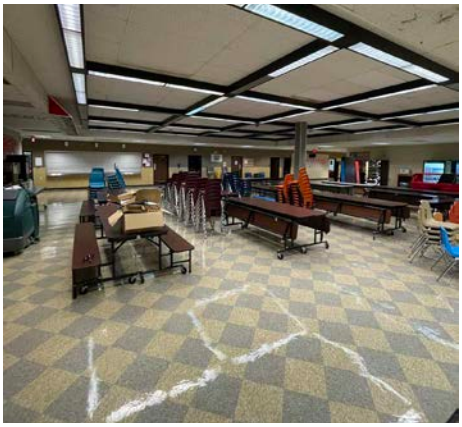
Library/LMC

The Library/Learning Media Center (LMC) can be a hub for a school, being visually and physically connected to the hallways on multiple sides. The space can include small to medium size group work spaces and more flexible furniture. It can be a space students come to, to find a quiet but still lively space before, during or after school. There could be a stronger connection to the commons and cafeteria space as well.

There is no natural daylight in this space currently, it would be recommended to explore the addition of skylights to enhance the feel of the space along with updating all of the finishes from the carpet, to the walls and ceiling.

COMMONS/ CAFETERIA

The commons and cafeteria is open to the hallways in the southeast corner of the center core. The commons/cafeteria is a gathering space in a school, it is a central hub. This space being open to the hallways is great, but the current space is lacking a little life. It has not been updated much since the facility was built. The commons lacks natural daylight being in the core of the building, but it gets a little from the main entry. Exploring ways to increase the natural daylight through a skylight would help improve the feel of the space.



Cafeteria/Commons

The space is also connected to a raised stage area that is used a couple times a year, but could be utilized more. Rethinking this space and how it could be more multipurpose would be recommended. It is possible that the raised area is no longer needed, which would allow for more cafeteria space. When a stage is needed, a portable option could be used for presentations. Being more multi-purpose could integrate it into the rest of the school, creating a central hub complimenting the LMC.

Typical Classroom

CLASSROOMS AND FLEXIBILITY

The classrooms overall are a good size for the size classes in the district. The classroom finishes have not been updated much since the building was constructed; an update to wall colors, flooring and ceilings would enhance each space. Teaching has changed over the years, and being able to provide flexible learning environments for kids is beneficial. We see updating the furniture to provide more flexibility in use of space as a benefit, along with the proper technology to meet todays needs. Collaboration between students is a big part of learning today, and finding space within the school to create more informal and formal collaboration spaces can enhance the learning environment for all.

Many of the classrooms have limited built in storage for teachers. We would recommend providing new built in storage cabinets and counter space in each classroom for additional storage and work surface.

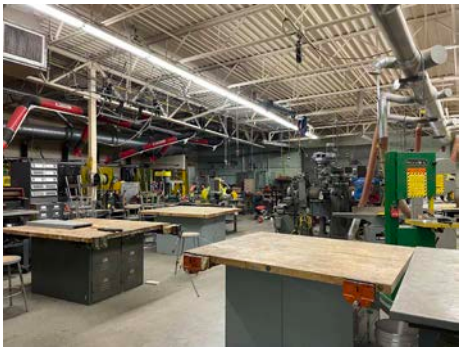
Science Lab

SCIENCE LABS

There are two science labs in the building connected by a prep and storage space for the teachers. The overall size of the science rooms is nice and they are along the exterior so they have natural light from the clerestory windows. The gas in the Chemistry Lab no longer works to some stations and so they do not utilize it at all. The lab casework is also aging and many of the draws are locked and can not be opened. Recommend replacing the lab stations with new casework, and run new gas lines to insure they are functional. This will provide the teachers the necessary equipment and space to teach the kids to the best of their abilities.

VOCATIONAL EDUCATION/ TECH ED NEEDS MORE SPACE

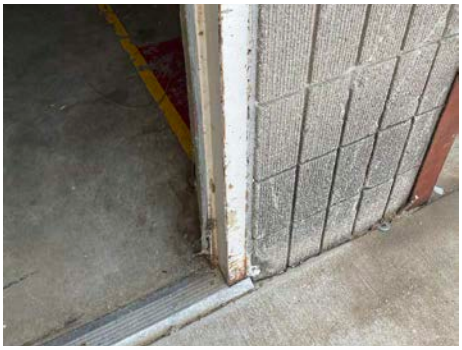
The Vocational Education space is primarily original to the 1979 construction. Minimal facility improvements have been made to this space over the 43 years of operation. The programmatic needs of this space have changed greatly over this time period. The traditional shop has remained a primary need, but space and organization upgrades are needed to adequately meet the needs of new equipment and instructional styles which emphasize 21st Century skills.



Vocational/ Tech Ed Classroom

The Vocational Education space is undersized for all of the activities and classes it holds. The classroom has space for woods, metals and small automotive. Ideally all of these classes would have their own room. The complexity and amount of equipment for each of these classes is overlapping each other, making the space less than functional for any of them. While the district may not have a need for all separate rooms, we would recommend expanding and renovating the Vocational Education space; to provide the right amount of space for the advances in equipment and teaching practices for these fields of study.

There is a lack of natural daylight as well, and a simple modification would be to replace the overhead garage door with one that has glass in it. The overhead garage door is functional, but it is showing wear and rust along with the main door next to it. The recommendation would be to replace both.



Exterior overhead garage door and main door

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5 BUILDING SYSTEMS/ ENGINEERING

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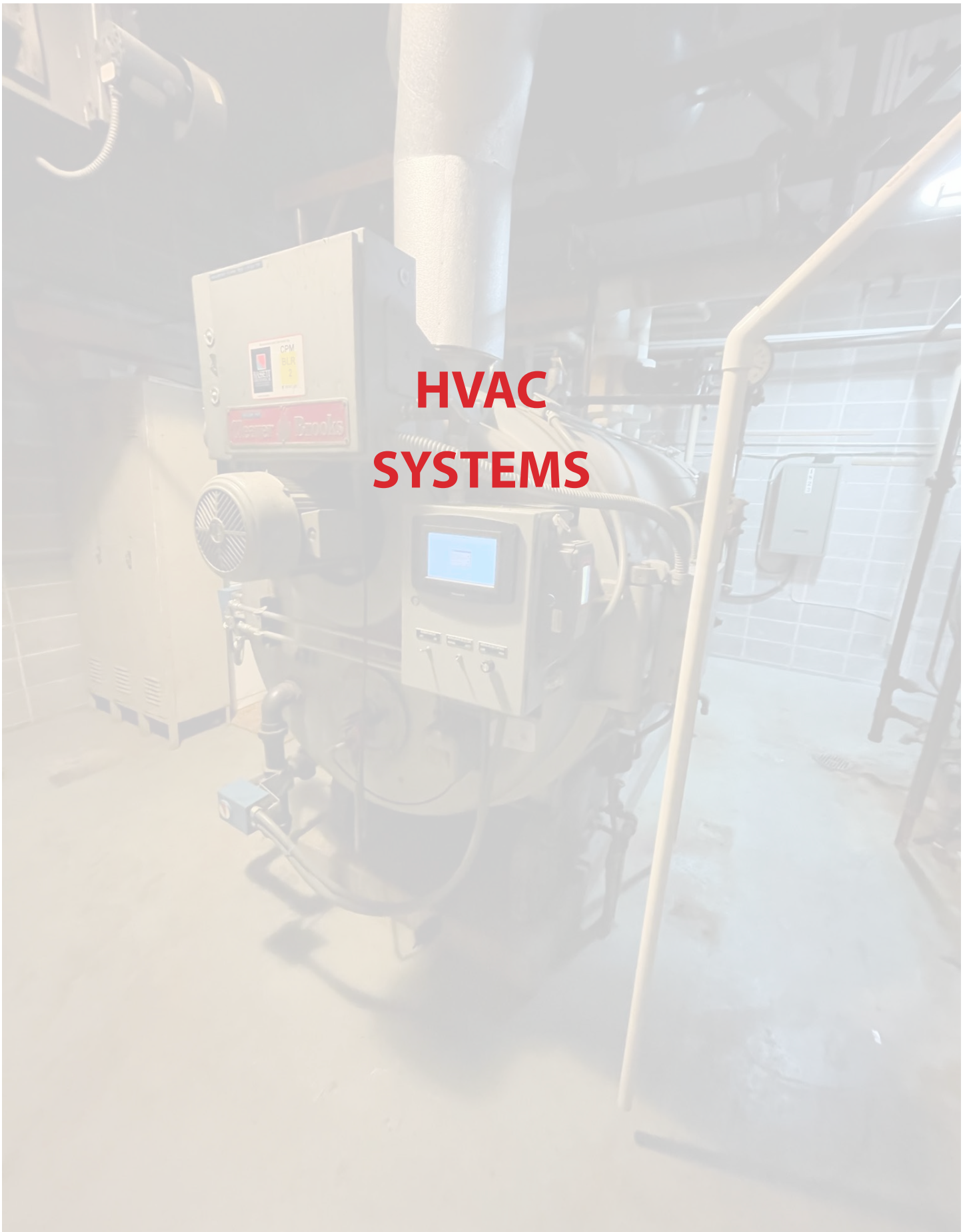


HVAC SYSTEMS

5.1 HEATING SYSTEMS ELEMENTARY SCHOOL

• The building is served by two hot water boilers with hot water piping distributed throughout the building. Both boilers were installed in 1972 and are original to the building.

Make	Model	Input	Output	Efficiency	Age
Cleaver Brooks	CBH200-60	2511 MBH	1758 MBH	70%*	50 years
Cleaver Brooks	CBH200-60	2511 MBH	1758 MBH	70%*	50 years

* Considering the age of the boiler, it is more than likely these are in the 60-70% efficiency range.

• The boilers are currently running on natural gas while the original design had the boilers running on natural gas with #2 fuel oil as backup. It appears the fuel oil system has either been abandoned or removed. The combustion controls have been updated to Honeywell controllers since original installation.

• Hot water is distributed throughout the building with system heating pumps. These pumps are lead/lag, so if one pump fails, the other will automatically run. The heating pumps are base mounted style. The age of the pumps are unknown, but are in need of replacement based on the condition and appearance of some leaks over the years. It appears one of the pumps was replaced and both pump motors have been replaced. Heating loop was originally sized for 200 degree F supply water temperature back in 1972. More than likely this supply water temperature is running at 180 degree F today.

• Entryways and vestibules are served by hot water cabinet unit heaters. Mechanical rooms are served by hot water unit heaters. Restrooms with exterior wall exposures are served by hot water convectors recessed in the wall. Storage rooms with exterior wall exposures are served by hot water fin tube. Various classrooms and elementary office areas contain hot water fin tube along all of the perimeter walls.

RECOMMENDATIONS

• The non-condensing boilers (Cleaver Brooks) has an expected useful service life between 25-30 years. The Cleaver Brooks boilers are well beyond their service life and should be planned to be replaced with new condensing style boilers. Condensing boilers allow efficiencies in the +90% when hot water temperatures permit.

• The hot water system pumps are constant volume meaning they run at 100% speed all the time. With a mixture of 2-way and 3-way valves out in the system, adding variable frequency drives (VFD) to these pumps would be a way to save pump energy. Most of the time, these pumps could be running at less than 100% speed.

• Recommend servicing the boilers and system pumps at the start of every heating season as a preventative maintenance item. Boilers should be tested on natural gas to confirm systems are operating correctly.

5.2 COOLING SYSTEMS ELEMENTARY SCHOOL

• The Elementary Office, Original Building Classrooms, and Addition Classrooms areas are served by indoor air handling units with outdoor air cooled condensing units. The air handling units contain an evaporator coil with refrigerant piping out to the air cooled condensing unit. The air cooled condensing unit contains compressors, condenser coil, and condenser fans. The condensing units are all located on the roof. These units have 1 or 2 stages of cooling (on/off operation) and utilize R-22 refrigerant. Estimate of service life is projected to be around 15-20 years for air cooled units.

• The below building map shows the areas in the building that are currently cooled. With the exception of the gym, kitchen, and locker room areas, the entire building has cooling.

Make	Model	Capacity	Serves	Efficiency	Age
Trane	RA9006A	81 tons	Original Building Classrooms	? EER	50 years
Trane	RAUB-506A	5 tons	Elementary Office	? EER	50 years
Trane	Unknown	15 tons	Addition Classrooms	? EER	34 years

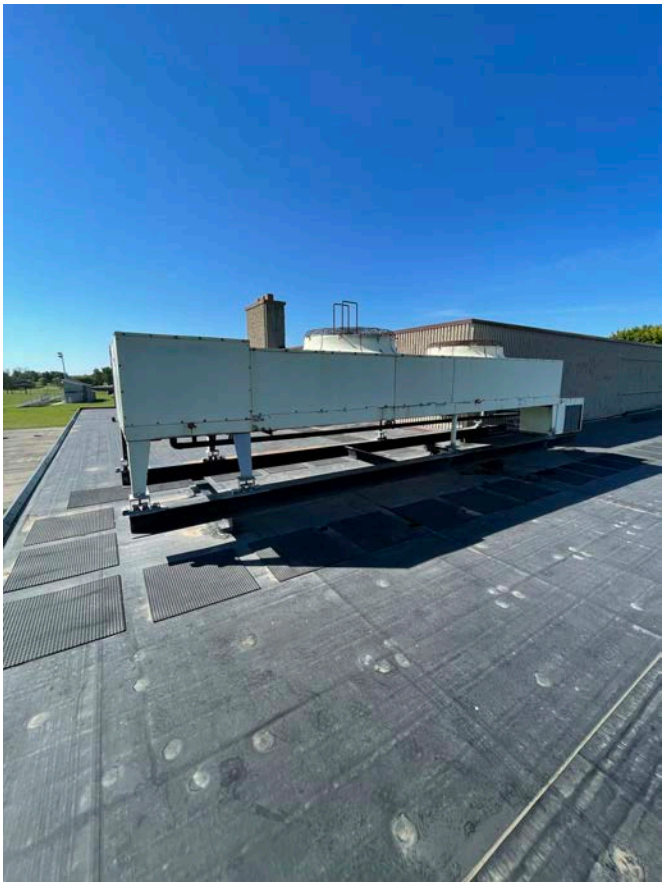

Cooling
AC-1
AC-3
AHU-5A

RECOMMENDATIONS

• The condensing units and associated air handler evaporator coils and refrigerant piping should be replaced. These condensing units are well beyond their useful service life and utilize R-22 refrigerant. All units utilizing R-22 refrigerant shall be budgeted to be replaced with new units using R-410A refrigerant. R-22 refrigerant was phased out of production and import starting January 1, 2020 by US EPA, so providing any service to these units will be more challenging as time passes.

• Recommend servicing the air cooled condensing units at the start of every cooling season as a preventative maintenance item. Cleaning coils, recharging refrigerant, and checking operation can prolong the life of these units and prevent unwanted breakdowns during summer months.

• Even though the building isn't occupied during the summer months, still recommend running the cooling at some capacity to reduce humidity levels within the building. High humidity levels can damage, reduce life of different building components, and lessen mold potential within the building.



5.3 VENTILATION SYSTEMS ELEMENTARY SCHOOL

• The majority of the school has the original air handling units from 1972 with hot water coils, DX (direct expansion refrigerant) coil, supply fan, and filters. The units are listed below on where they serve. Ductwork associated with these systems are original to their installation. Each AHU contains mixing of outside air and return air in the ductwork external to the unit. Minimum outside air is brought in at all occupied times and has the ability for 0-100% air-side economizers with barometric relief to allow for free cooling when outdoor temperatures permit.

Mark	Make	Serves	CFM	Type	Heating	Cooling	Age
HV-1	Trane	Kitchen	4400 CV	Single Zone	HW	None	50 years
HV-2	Trane	Locker Rooms	1200 CV	Single Zone	NW	None	50 years
AC-1	Trane	Original Building Classrooms	26800 CV	Multizone HW Reheat	None	DX	50 Years
AC-2	Trane	Gym	7700 CV	Single Zone	HW	None	50 years
AC-3	Trane	Elementary Offices	1900 CV	Multizone HW Reheat	None	DX	50 years
AHU-5A	Trane	Addition Classrooms	5440 CV	Multizone HW Reheat	HW	DX	34 years

• AC-1 serving the classroom wings, AC-3 serving the elementary offices, and AHU-5A serving addition classrooms, distribute air through their main supply duct runs. Each classroom is served by a hot water booster coil. Booster coils modulate to maintain space temperature set point. There were a total of 15 booster coils that served the original 1972 building design and 4 booster coils serving the 1988 Addition Classrooms.

• All supply, outside, relief, return, and exhaust air systems are ducted to the respective equipment. There are portions of the supply, return, and exhaust ductwork that are internally lined for acoustic purposes. All supply ductwork (not internally lined) is externally insulated. Ductwork associated with AHU-5A, serving the addition classrooms, has fiberboard ductwork. This fiberboard ductwork is falling apart, collapsing in areas, and in need of replacement.

• All toilet rooms, janitor closets, etc. that need exhaust for code purposes are exhausted using roof exhausters or inline exhaust fans. Kitchen exhaust is exhausted by roof exhausters that are initiated by a wall switch. The bathroom exhausters are tied into the associated air handling units, scheduled to bring in the proper amounts of make-up air when exhausters are in operation.

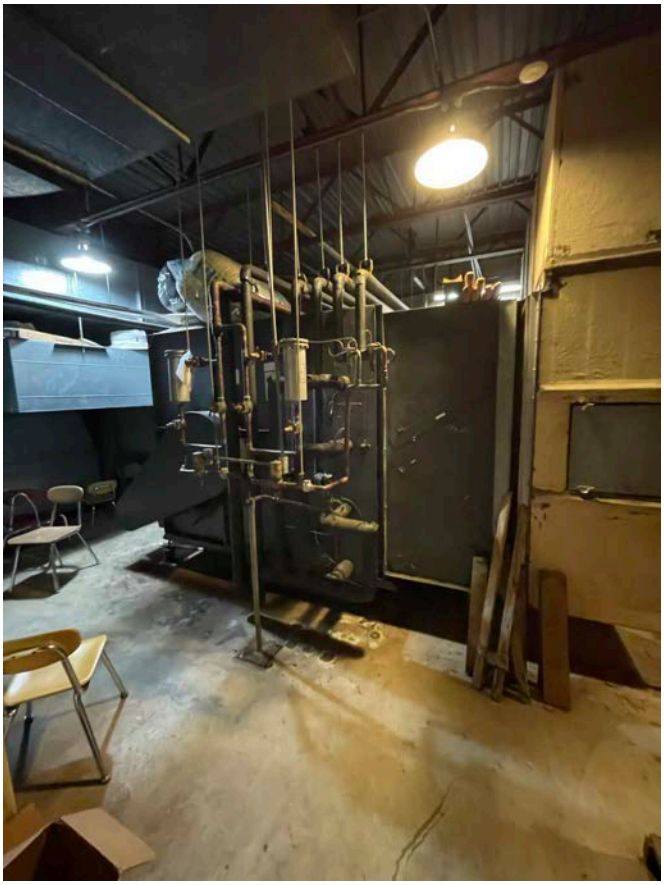
RECOMMENDATIONS

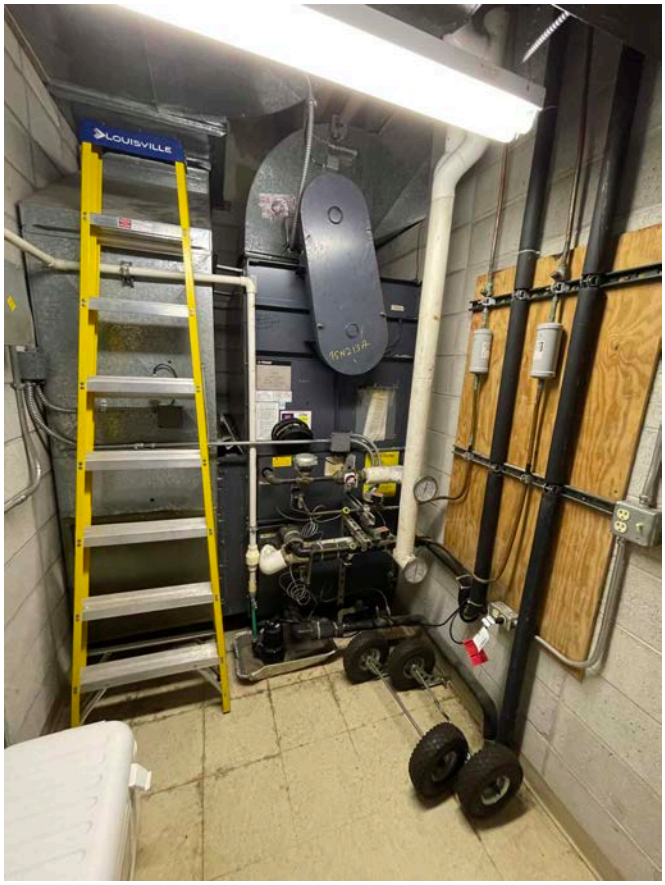
• Air handling units have an expected useful service life between 25-30 years. All of the air handling units are well beyond their service life and should be planned to be replaced with new. These units are in need of replacement as the AHU casings are showing signs of rust and deterioration.

• All fiberboard ductwork should be removed and replaced with low or medium pressure sheet metal ductwork. All ductwork should have a seal class A construction in accordance with SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) requirements.

• Recommend duct cleaning of systems to improve indoor air quality. All ductwork is original to when it was installed and to our best knowledge hasn't been cleaned in the past. Also recommend improving filtering (MERV 10 or MERV 13) to improve air quality on all installed systems.

• All of the existing exhaust fans in the building recently have been replaced and do not require anything at this time.





5.4 CONTROL SYSTEMS ELEMENTARY SCHOOL

• The original 1972 building and 1988 addition are controlled by a pneumatic system that have air compressors with pneumatic air lines running to all of the controllable components. This was a typical system of its time and has become a thing of the past with newer technologies succeeding it. Typical issues that occur with pneumatic systems are loss of accuracy over time, no communication capabilities, extensive ongoing maintenance with compressors, and pneumatic piping, etc. Pneumatic controls require a lot of continual calibration and maintenance to maintain accuracy.

RECOMMENDATION

• Recommend converting the entire building to a central building automation system with direct digital controls (DDC). DDC controls are more reliable, precise, provide feedback relative to the controller position and can be trended for troubleshooting. When building automation systems and direct digital controls are combined, it allows for automated control of the temperature and ventilation throughout the facility. For example, the system can adjust temperatures in spaces based on season, occupancy, time of day, or day of week to reduce energy consumption. The system can also reduce the amount of outside air being brought into the building during unoccupied times, thus saving on heating or cooling that air. They can adjust boiler supply water temperatures based on outside air temperature, which works well for condensing boilers in shoulder months. This system also has the capabilities to send out alarms for break downs, failures, and hazards that many times lead to costly situations being avoided.

• With today's technology, a password protected, Web-based interface, could permit input access from any computer at any of the schools or from remote into the BAS. Scheduling, demand control ventilation, occupancy based exhaust, and other control strategies can be implemented to reduce energy consumption and cost. Typical energy savings when converting to DDC controls can be expected to be around 10-15% on both natural gas and electric.

• The fans associated with the air handling units and hot water system pumps can add variable frequency drives (VFD) to have their speed modulated based on a pressure set point. As VAV dampers start closing, less air is required by the system so the fan will reduce its speed to meet the needs of the spaces. Reducing the speed of the fan saves energy. The load on a motor increases as the cube of its speed. Therefore, reducing the speed of the motor to 80% reduces the power consumption by ≈50%. This same concept is true for water systems (both heating and chilled water) and reducing the speed of the pumps based on the building needs.

• There may be further energy reduction measures that could be implemented to the building. Recommend adding CO2 sensors to high occupant load spaces like gyms, LMC, Commons, Multipurpose, etc. to reduce outdoor air when not fully occupied. Similarly, occupancy or CO2 sensors could be added to classrooms to reduce outdoor air and temperature setpoints during the day if spaces aren't occupied.

5.1.1 HEATING SYSTEMS MIDDLE/HIGH SCHOOL

• The building is served by two hot water boilers with hot water piping distributed throughout the building. Both boilers were installed in 1998 and are original to the building.

Make	Model	Input	Output	Efficiency	Age
Patterson-Kelley	N-1900-2	1900 MBH	1520 MBH	80%*	24 years
Patterson-Kelley	N-1900-2	1900 MBH	1520 MBH	80%*	24 years

* Considering the age of the boiler, it is more than likely these are in the 70-80% efficiency range.

• The boilers are currently running on natural gas, while the original design had the boilers running on natural gas with #2 fuel oil as backup. It appears the fuel oil system has either been abandoned or removed. The combustion controls have been updated to Honeywell controllers since original installation.

• Hot water is distributed throughout the building with system heating pumps. These pumps are lead/lag, so if one pump fails, the other will automatically run. The heating pumps are inline style. The age of the pumps are assumed to be from 1998, but are in need of replacement based on the condition and appearance of some leaks over the years. Heating loop was originally sized for 200 degree F supply water temperature back in 1980. More than likely this supply water temperature is running at 180 degree F today.

• Entryways and vestibules are served by hot water cabinet unit heaters. Mechanical rooms are served by hot water unit heaters. Restrooms with exterior wall exposures are served by hot water convectors recessed in the wall. Storage rooms with exterior wall exposures are served by hot water fin tube. Various classrooms and elementary office areas contain hot water fin tube along all of the perimeter walls.

RECOMMENDATION

• The non-condensing boilers (Patterson-Kelley) have an expected useful service life between 25-30 years. The Patterson-Kelley boilers are starting to reach their service life and should be planned to be replaced with new condensing style boilers. Condensing boilers allow efficiencies in the +90% when hot water temperatures permit.

• The hot water system pumps are constant volume meaning they run at 100% speed all the time. With a mixture of 2-way and 3-way valves out in the system, adding variable frequency drives (VFD) to these pumps would be a way to save pump energy. Most of the time, these pumps could be running at less than 100% speed.

•Recommend servicing the boilers and system pumps at the start of every heating season as a preventative maintenance item. Boilers should be tested on natural gas to confirm systems are operating correctly.

5.2.1 COOLING SYSTEMS MIDDLE/HIGH SCHOOL

• The High School Offices and Original Building Classrooms areas are served by indoor air handling units with outdoor air cooled condensing units. The air handling units contain an evaporator coil with refrigerant piping out to the air cooled condensing unit. The air cooled condensing unit contains compressors, condenser coil, and condenser fans. The condensing units are all located on the roof. These units have 1 or 2 stages of cooling (on/off operation) and utilize R-22 refrigerant. Estimate of service life is projected to be around 15-20 years for air cooled units.

• Computer/IT and Shop Classrooms areas are served by rooftop units in addition to the large central air handler. These rooftop units are cooling only and provide additional cooling and cooling during summer months and other periods, where the large air handler is off. Estimate of service life is projected to be around 15-20 years for rooftop units.

• The below building map shows the areas in the building that are currently cooled. With the exception of the fitness, wood/metal shop, and locker room areas, the entire building has cooling.

Make	Model	Capacity	Serves	Efficiency	Age
Carrier	38AKS044	36 tons	Original Building Classrooms	? EER	19 years
Lennox	LCA072	6 tons	Computer/ IT Area	? EER	22 years
Lennox	LCA042	3.5 tons	Computer/ Shop Classroom	? EER	22 years
Trane	RAUC-406-D	4 tons	High School Offices	? EER	42 years
Trane	RAUC-406-D	4 tons	High School Offices	? EER	42 years


Cooling Map
AHU-1
AHU-3
RTU-1 & AHU-1
RTU-2 & MAU-1

RECOMMENDATION

• The condensing units and associated air handler evaporator coils and refrigerant piping should be replaced. These condensing units are beyond their useful service life and utilize R-22 refrigerant. All units utilizing R-22 refrigerant should be budgeted to be replaced with new units using R-410A refrigerant. R-22 refrigerant was phased out of production and import starting January 1, 2020 by US EPA, so providing any service to these units will be more challenging as time passes.

• Recommend servicing the air cooled condensing units at the start of every cooling season as a preventative maintenance item. Cleaning coils, recharging refrigerant, and checking operation can prolong the life of these units and prevent unwanted breakdowns during summer months.

• Even though the building isn't occupied during the summer months, still recommend running the cooling at some capacity to reduce humidity levels within the building. High humidity levels can damage, reduce life of different building components, and lessen mold potential within the building.

5.3.1 VENTILATION SYSTEMS MIDDLE/HIGH SCHOOL

• The majority of the school has air handling units from 1980 with hot water coils, DX (direct expansion refrigerant) coil, supply fan, and filters. The units are listed below on where they serve. Ductwork associated with these systems are original to their installation. Each AHU contains mixing of outside air and return air in the ductwork external to the unit. Minimum outside air is brought in at all occupied times and has the ability for 0-100% air-side economizers; with barometric relief to allow for free cooling when outdoor temperatures permit.

Mark	Make	Serves	CFM	Type	Heating	Cooling	Age
AHU-1	Trane	Original Building Classrooms	12000 CV	Multizone HW Reheat	None	DX	42 years
AHU-2	Trane	Locker Rooms	4000 CV	Multizone HW Reheat	HW	None	42 years
AHU-3	Trane	High School Offices	2800 CV	Multizone HW Reheat	HW	DX	42 Years
AHU-4	Trane	Fitness	2610 CV	Single Zone	HW	None	42 years
RTU-1	Lennox	Computer/IT	2400 CV	Single Zone	None	DX	22 years
RTU-2	Lennox	Computer/ Shop Classrooms	1400 CV	Single Zone	None	DX	22 years
MAU-1	Absolutaire	Addition Classrooms	5440 CV	Single Zone	Gas	None	18 years


HVAC Map Legend
AHU-1
AHU-2
AHU-3
AHU-4
MAU-1 & AHU-1
RTU-1 & AHU-1
RTU-2 & AHU-1

• AHU-1 serving the original building classrooms, AHU-2 serving the locker room area, AHU-3 serving the high school offices, and AHU-5A serving addition classrooms, distribute air through their main supply duct runs. Each classroom is served by a hot water booster coil. Booster coils modulate to maintain space temperature set point.

• All supply, outside, relief, return, and exhaust air systems are ducted to the respective equipment. There are portions of the supply, return, and exhaust ductwork that are internally lined for acoustic purposes. All supply ductwork (not internally lined) is externally insulated.

• All toilet rooms, janitor closets, etc. that need exhaust for code purposes are exhausted using roof exhausters or inline exhaust fans. Kitchen exhaust is exhausted by roof exhausters that are initiated by a wall switch. The bathroom exhausters are tied into the associated air handling units schedule, to bring in the proper amounts of make-up air when exhausters are in operation.

RECOMMENDATION

• Air handling units have an expected useful service life between 25-30 years. All of the air handling units are well beyond their service life and should be planned to be replaced with new. These units are in need of replacement as the AHU casings are showing signs of rust and deterioration.

• Recommend duct cleaning of systems to improve indoor air quality. All ductwork is original to when it was installed and to our best knowledge hasn't been cleaned in the past. Also recommend improving filtering (MERV 10 or MERV 13) to improve air quality on all installed systems.

• All of the existing exhaust fans in the building should be evaluated and replaced during this upgrade time. Many of these fans are original and beyond their useful service life. Replacing the fans will improve exhaust flow and overall function of the systems. The existing dust collector and welding exhaust system should be replaced with the upgrade in these spaces. Duct collector appears not to be functioning as it should, and there are some code deficiencies with this system that will need to be addressed if the system is modified.

5.4.1 CONTROL SYSTEMS MIDDLE/HIGH SCHOOL

• The building is controlled by a pneumatic system that have air compressors with pneumatic air lines running to all of the controllable components. This was a typical system of its time and has become a thing of the past with newer technologies succeeding it. Typical issues that occur with pneumatic systems are loss of accuracy over time, no communication capabilities, extensive ongoing maintenance with compressors and pneumatic piping, etc. Pneumatic controls require a lot of continual calibration and maintenance to maintain accuracy.

• The rooftops have a single standalone electric thermostat for each rooftop system. This sometimes presents challenges if zones have different loads and temperature requirements as some zones without the thermostat may be over or under temperature.

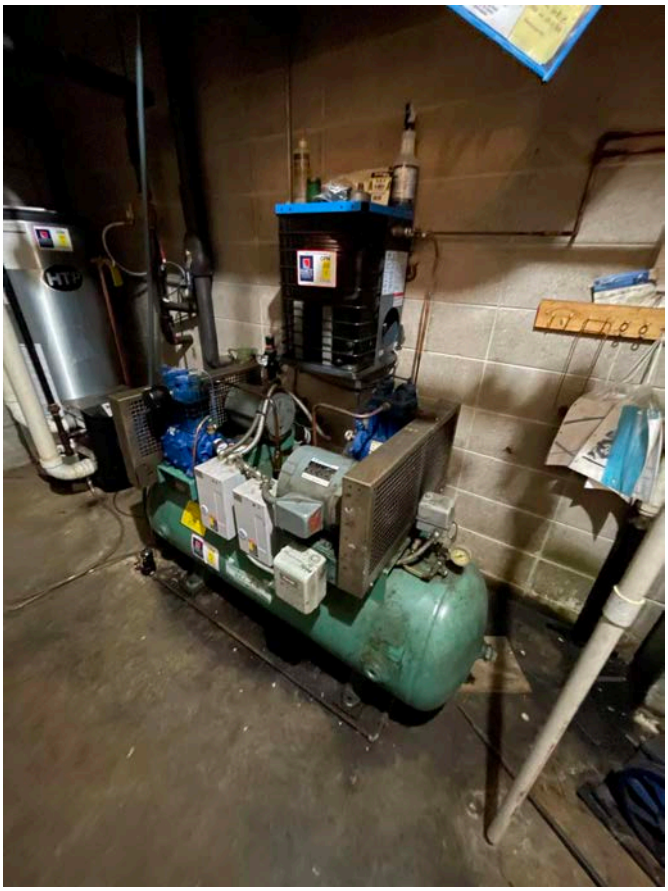
RECOMMENDATIONS

• Recommend converting the entire building to a central building automation system with direct digital controls (DDC). DDC controls are more reliable, precise, provide feedback relative to the controller position, and can be trended for troubleshooting. When building automation systems and direct digital controls are combined, it allows for automated control of the temperature and ventilation throughout the facility. For example, the system can adjust temperatures in spaces based on season, occupancy, time of day, or day of week to reduce energy consumption. The system can also reduce the amount of outside air being brought into the building during unoccupied times, thus saving on heating or cooling that air. They can adjust boiler supply water temperatures based on outside air temperature, which works well for condensing boilers in shoulder months. This system also has the capabilities to send out alarms for break downs, failures, and hazards that many times lead to costly situations being avoided.

• With today's technology, a password protected, Web-based interface could permit input access from any computer at any of the schools, or from remote into the BAS. Scheduling, demand control ventilation, occupancy based exhaust, and other control strategies can be implemented to reduce energy consumption and cost. Typical energy savings when converting to DDC controls can be expected to be around 10-15% on both natural gas and electric.

• The fans associated with the air handling units and hot water system pumps can add variable frequency drives (VFD) to have their speed modulated based on a pressure set point. As VAV dampers start closing, less air is required by the system so the fan will reduce its speed to meet the needs of the spaces. Reducing the speed of the fan saves energy. The load on a motor increases as the cube of its speed. Therefore, reducing the speed of the motor to 80% reduces the power consumption by ≈50%. This same concept is true for water systems (both heating and chilled water) and reducing the speed of the pumps based on the building needs.

• There may be further energy reduction measures that could be implemented to the building. Recommend adding CO2 sensors to high occupant load spaces like gyms, LMC, Commons, Multipurpose, etc. to reduce outdoor air when not fully occupied. Similarly, occupancy or CO2 sensors could be added to classrooms to reduce outdoor air and temperature setpoints during the day if spaces aren't occupied.



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ELECTRICAL SYSTEMS

5.5 ELECTRICAL DISTRIBUTION EQUIPMENT ELEMENTARY SCHOOL

BUILDING SERVICE ENTRANCE AND PRIMARY DISTRIBUTION EQUIPMENT

• The electrical service to main building is 120/208 volt, 3-phase, 4 wire. A Hustisford Utilities pad-mounted transformer feeds the elementary school.

• The school is equipped with a 1200A, 120/208V electric service (Square D). The main distribution panel, CT cabinet, pull section, and meter socket are located in the electrical closet near the kitchen.

Secondary Power Distribution

• Secondary power distribution for the school's main building is comprised of a combination of Square D panels with a couple of Cutler Hammer panels used for an upgrade. The original panelboards are in excellent condition, but they have little or no space for future breakers.

• Classrooms and the Library have extra duplex receptacles accomplished by added surface raceway.

ELECTRICAL SERVICE RECOMMENDATIONS

• The electrical service is more than adequate for existing and future needs.

• Install new secondary panelboards and feeders for any future expansion.

• Receptacle power outlets appear to be a non-issue due to added outlets by surface raceway.

5.6 BUILDING LIGHTING ELEMENTARY SCHOOL

• The Gymnasium is illuminated by industrial fluorescent high bay fixtures. Switch bank of 3-way switches at gym entrance doors.

• Gym locker rooms are illuminated by gasketed surface fluorescent wraps.

• Corridors and computer lab illuminated by 2'x4' recessed troffers equipped with fluorescent lamps.

• Instructional areas are illuminated by 2'x4' recessed troffers and surface wraps equipped with fluorescent lamps.

• The cafeteria/commons/stage/office spaces are illuminated by 2'x4' recessed troffers equipped with fluorescent lamps.

• Emergency egress lighting is accomplished by battery back-up 2-head emergency lights.

• Exit lights are black in color with red stencil with PL or incandescent lamps. Both surface and flush mounted.

• Music room is illuminated by both 2'x4' recessed troffers and stage/theatrical lighting.

SITE LIGHTING AND BUILDING EXTERIOR

• Site and pole lighting appear to have been upgraded to LED lamp fixtures.

• Building exterior lighting is accomplished by a combination of wall paks, canopy surface lights, and arm mounted area lights. All equipped with metal halide lamps.

• Main entrance wall pak appears to be LED and controlled by internal photo-eye.

• Soffits and entries are illuminated by recessed exterior can light.

BUILDING LIGHTING CONTROLS

• Building has limited automatic lighting controls for shut off of building lights during unoccupied times as required by the energy code.

• There appears to be wall mounted occupancy sensors in boys and girls restrooms.

• Classrooms have manual lighting switch to reduce light levels, but no occupancy sensors for automatic light shut off.

LIGHTING RECOMMENDATIONS

• Replace all fluorescent wraps and recessed troffers with new LED type fixtures and/or replace fluorescent lamps with LED lamps.

• Recommend to use LED high-bay lighting fixtures in the Gymnasium, based on longer lamp life, less maintenance, and Focus on Energy rebates.

• Provide emergency light with battery back-up at exterior of any building exit door to attain a minimum of 1 foot candle as per code.

• Recommend to install automatic shut off controls such as occupancy sensors for building lights during unoccupied times; current codes require this.

• Building interior egress lighting meets current codes.

• Provide programmable lighting control panel and low voltage switches to control lights in corridors, exterior lights, gymnasium, cafeteria and other large spaces.

• Provide occupancy sensors in all classrooms, toilet rooms, offices, and storage rooms for energy savings.

• Recommend to install dimmable switches in classrooms and install vacancy sensors to abide by Ashrae 90.1 (Energy Code Requirements for Building Spaces).

• Recommend to remove all theatrical track lighting in music room due to non-use and owner's request.

• Replace all exit signs with LED lamp type.

5.7 FIRE ALARM AND PRIMARY LIFE SAFETY SYSTEMS ELEMENTARY SCHOOL

• The fire alarm control panel is located in the electrical room near the kitchen. Annunciator panels are located in the main entrance and office. Ademco is the fire alarm manufacturer.

• Fire alarm notification devices (strobes and horns) are located in classrooms, gymnasium, commons, and corridors.

• Some heat detectors are located throughout the facility.

• The fire alarm system is monitored by an outside company (Johnson Controls).

FIRE ALARM AND PRIMARY LIFE SAFETY RECOMMENDATIONS

• The addressable fire alarm system is adequate and code compliant. The system has just recently passed inspection.

5.8 BUILDING SECURITY SYSTEMS ELEMENTARY SCHOOL

• There are security surveillance cameras at the main entry, building mounted for area view, gymnasium, library, and corridors. Viewing monitor inside main school office at both receptionist and principal's desks.

• There is an Aiphone door entry intercom system at the main doors. Buzz-in entry at main office.

• A key fob entry system at main door and secondary exterior exit/entry doors, just recently added to the facility.

BUILDING SECURITY SYSTEMS RECOMMENDATIONS

• Security surveillance camera system and fob entry are more than adequate for facility.

• Recommend to have a secure entry vestibule adjacent to main office.

• Recommend a "shooter/intruder" alarm system is in place at the school with 911 direct initiating buttons in each classroom and main office for "Lockdown Process", and intruder lock down security strobes in most corridors.

5.9 INTERCOM/PUBLIC ADDRESS/ BELL SCHEDULING SYSTEM ELEMENTARY SCHOOL

• Building has a speaker system used for paging and is done through an unreliable Bogen system. A combination of wall mounted, flush speakers are located throughout the facility. Loud speakers are used for gymnasium and locker rooms. Many speakers are not functioning properly.

• An IP telephone system is in place and can be used for classroom paging and outside line calls, but some spaces lack an IP phone. ShoreTel telephone system.

• Bell scheduling system is accomplished through a Simplex program/timer located in teacher's lounge.

INTERCOM/PUBLIC ADDRESS/BELL SCHEDULING SYSTEM RECOMMENDATIONS

• Existing building speaker system should be replaced both at head-end and speaker locations.

• IP phone system is adequate for school needs.

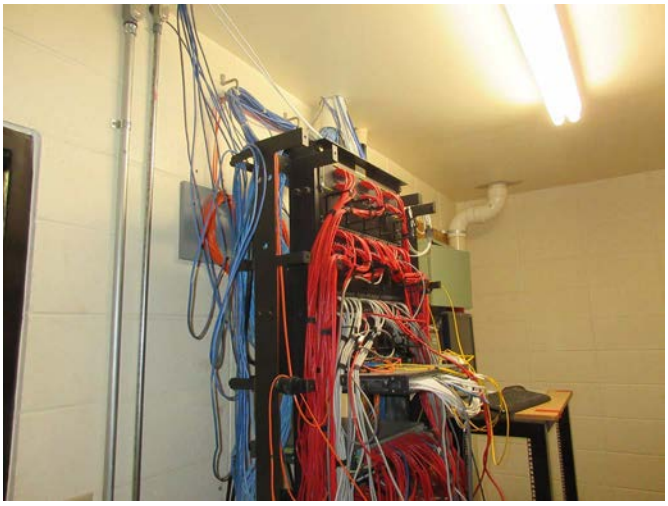
5.10 COMPUTER NETWORKING ELEMENTARY SCHOOL

• Computer networking has been upgraded to this building. Category 5e cable runs to wall jacks. The main server room and data hub are in a closet across from the computer lab.

• Wireless access points are located throughout the building, classrooms, and main office.

• Added data outlets are accomplished through surface raceway and power poles in classrooms and computer lab.

• There is no need for computer networking upgrades.



COMPUTER NETWORKING RECOMMENDATIONS

• Install a cable tray in main hub room for cable management.

5.11 CLOCK SYSTEMS ELEMENTARY SCHOOL

• Facility has a combination of atomic clocks and battery powered clocks.

• A number of different clock manufacturers are located throughout the facility.

• Clocks are located in every classroom and main office. The clocks are 14" analog and are stand-alone batteries.

CLOCK SYSTEMS RECOMMENDATIONS

• Install a wireless clock system. A wireless system which uses a dedicated FM band frequency which is solely generated only inside said facility.

• Standardize all clock manufacturers for easy replacement and continuity.

5.5.1 ELECTRICAL DISTRIBUTION EQUIPMENT MIDDLE/HIGH SCHOOL

BUILDING SERVICE ENTRANCE AND PRIMARY DISTRIBUTION EQUIPMENT

• The electrical service to main building is 120/208 volt, 3-phase, 4 wire. A Hustisford Utilities pad-mounted transformer, in a fenced-in enclosure, feeds the school.

• The school is equipped with a 2000A, 120/208V electric service (Westinghouse). The main switch gear, CT cabinet, and pull section are located in the maintenance closet near the fitness center. Meter socket is located outside the building.

Secondary Power Distribution

• Secondary power distribution for the schools main building is comprised of a combination of Westinghouse panels, with a couple of Cutler Hammer panels used for an upgrade. The original panelboards are in rough condition, and have little or no space for future breakers.

• A few classrooms have extra duplex receptacles accomplished by added surface raceway. Aside from a few rooms, receptacle power is lacking in most areas.

ELECTRICAL SERVICE RECOMMENDATIONS

• The main electrical service is more than adequate for existing and future needs.

• Install new secondary panelboards and feeders for any future expansion.

• Recommend to install added surface raceway for additional receptacle power in class rooms and common spaces where minimal outlets are located.

5.6.1 BUILDING LIGHTING MIDDLE/HIGH SCHOOL

• The Gymnasium is illuminated by 6-lamp fluorescent high bay fixtures. Switch bank of 3-way switches at gym entrance doors.

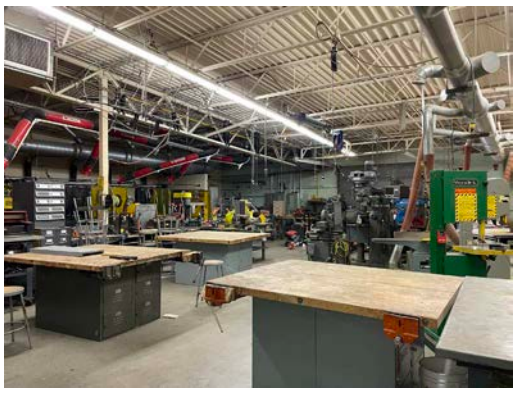
• Gym locker rooms are illuminated by gasketed surface fluorescent wraps.

• Wrestling area is illuminated by continuous industrial linear fluorescent fixtures.

• Corridors are illuminated by 2'x4' recessed troffers equipped with fluorescent lamps.

• Instructional areas are illuminated by either 2'x4' lensed recessed, 18-space parabolic or 12-space parabolic troffers, all equipped with fluorescent lamps.

• The cafeteria and kitchen are illuminated by 2'x4' lensed recessed troffers equipped with fluorescent lamps.



• The stage and commons areas are illuminated by a combination of 2'x4' parabolic troffers, interconnected baffles, and stage/theatrical lighting.

• Wood shop is illuminated by joist mounted open lamp industrial strips equipped with fluorescent lamps.

• Fitness center is illuminated by cable hung open lamp industrial strips equipped with fluorescent lamps.

• Emergency egress lighting is accomplished by battery back-up 1 and 2-head emergency lights. Also by combination exit / egress lights.

• Exit lights are white in color with red stencil with LED lamps. Some are equipped with emergency egress "eye lids".

SITE LIGHTING AND BUILDING EXTERIOR

• Site and pole lighting appear to have been upgraded to LED lamp fixtures.

• Building exterior lighting is accomplished by a combination of wall paks, and area metal halide flood lights. All equipped with metal halide lamps.

• Main entrance is illuminated by recessed metal halide cans and building wal-paks.

• Secondary entry doors are illuminated by wall paks with an internal photo-eye as control.

BUILDING LIGHTING CONTROLS

• Building has limited automatic lighting controls for shut off of building lights during unoccupied times as required by the energy code.

• Classrooms have manual lighting switch to reduce light levels, but no occupancy sensors for automatic light shut off.

LIGHTING RECOMMENDATIONS

• Replace all fluorescent wraps and recessed troffers with new LED type fixtures and/or replace fluorescent lamps with LED lamps.

• Recommend to use LED high-bay lighting fixtures in the Gymnasium, based on longer lamp life, less maintenance, and Focus on Energy rebates.

• Provide emergency light with battery back-up at exterior of any building exit door to attain a minimum of 1 foot candle as per code.

• Recommend to install automatic shut off controls such as occupancy sensors for building lights during unoccupied times; current codes require this.

• Building interior egress lighting meets current codes.

• Provide programmable lighting control panel and low voltage switches to control lights in corridors, exterior lights, gymnasium, cafeteria and other large spaces.

• Provide occupancy sensors in all classrooms, toilet rooms, offices, and storage rooms for energy savings.

• Recommend to install dimmable switches in classrooms and install vacancy sensors to abide by Ashrae 90.1 (Energy Code Requirements for Building Spaces).

5.7.1 FIRE ALARM AND PRIMARY LIFE SAFETY SYSTEMS MIDDLE/HIGH SCHOOL

• The fire alarm control panel is located in the IT room near the Technology Directors office. Annunciator panels are located in the main entrance, office, and near maintenance office. Ademco is the fire alarm manufacturer.

• Fire alarm notification devices (strobes and horns) are located in classrooms, gymnasium, commons, and corridors.

• Some heat detectors are located throughout the facility.

• The fire alarm system is monitored by an outside company (Johnson Controls).

FIRE ALARM AND PRIMARY LIFE SAFETY RECOMMENDATIONS

• The addressable fire alarm system is adequate and code compliant.
The system has just recently passed inspection.

5.8.1 BUILDING SECURITY SYSTEMS MIDDLE/HIGH SCHOOL

• There are security surveillance cameras at the main entry, building mounted for area view, gymnasium, library, and corridors. Viewing monitor inside main school office at both receptionist and principal's desks.
• There is an Aiphone door entry intercom system at the main doors. Buzz-in entry at main office.

• A key fob entry system at main door and secondary exterior exit/entry doors.

BUILDING SECURITY SYSTEMS RECOMMENDATIONS

• Security surveillance camera system and fob entry are more than adequate for the facility.

• Recommend to have a secure entry vestibule adjacent to the main office.

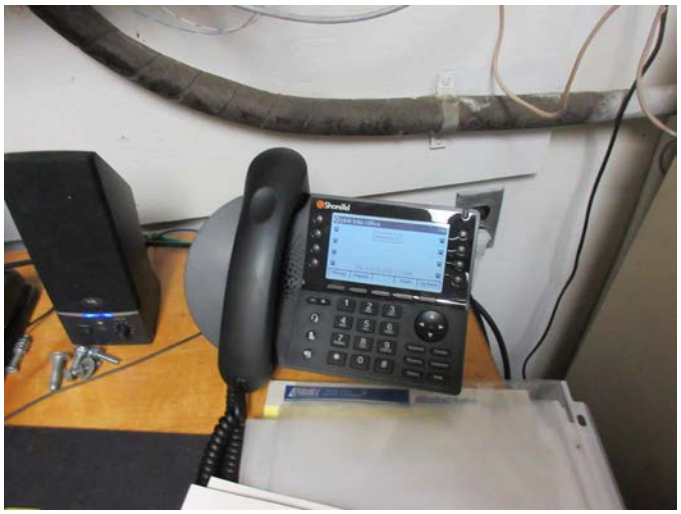
• Recommend a "shooter/intruder" alarm system is in place at the school with 911 direct initiating buttons in each classroom and main office for "Lockdown Process", and intruder lock down security strobes in most corridors.

5.9.1 INTERCOM/PUBLIC ADDRESS/ BELL SCHEDULING SYSTEM MIDDLE/HIGH SCHOOL

• Building has a speaker system used for paging and is done through a Bogen system. A combination of wall mounted, flush speakers are located throughout the facility. Loud speakers are used for gymnasium and locker rooms.

• An IP telephone system is in place and can be used for classroom paging and outside line calls, but some spaces lack an IP phone. ShoreTel telephone system.

• Bell scheduling system is accomplished through a Simplex program/timer located in the main office.



INTERCOM/PUBLIC ADDRESS/BELL SCHEDULING SYSTEM RECOMMENDATIONS

• Existing building speaker system should be replaced both at head-end and speaker locations.

• IP phone system is adequate for school needs.

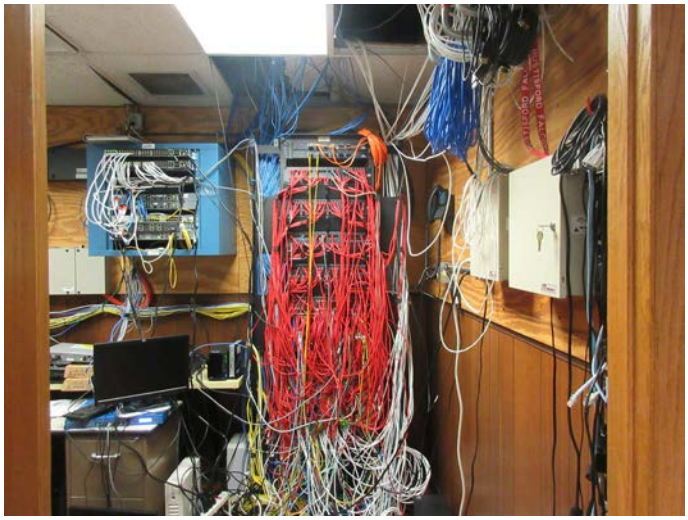
5.10.1 COMPUTER NETWORKING MIDDLE/HIGH SCHOOL

• Computer networking has been upgraded to this building. Category 5e cable runs to wall jacks. The main server room and data hub are in the IT room near the technology director's office.

• Wireless access points are located throughout the building, classrooms, and main office.

• Surface raceway is used for the computer lab and added to some areas.

• There is no need for computer networking upgrades.



COMPUTER NETWORKING RECOMMENDATIONS

• Install a cable tray in main hub room for cable management.

5.11.1 CLOCK SYSTEMS MIDDLE/HIGH SCHOOL

• Facility has a combination of atomic clocks and battery powered clocks.

• A number of different clock manufacturers are located throughout facility.

• Clocks are located in every classroom and main office. The clocks are 14" analog and are stand-alone batteries.

CLOCK SYSTEMS RECOMMENDATIONS

• Install a wireless clock system. A wireless system which uses a dedicated FM band frequency which is solely generated only inside said facility.

• Standardize all clock manufacturers for easy replacement and continuity.

5.12.1 GENERAL SYSTEMS MIDDLE/HIGH SCHOOL

• Gymnasium basketball backboard controls are a toggle switch control cabinet set in the gymnasium wall.

GENERAL SYSTEMS RECOMMENDATIONS

• Recommend to provide a centralized touch screen control panel in gymnasium. Panel where lights, fans, and backstops, etc. can be controlled from.

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